ONLINE HELP

MAN0129 rev 3.07.00.02

ASPECT®-Studio

Getting Started

Welcome to ASPECT-Studio

Overview

ASPECT-Studio provides a graphical programming tool for configuring ASPECT® applications. Acting as an integrated development environment for ASPECT products, ASPECT-Studio contains a complete library of logical and graphical “widgets” representing the common tools that are used to engineer sophisticated control strategies for a complete control system and graphical user interface solution.

Using this software environment, users create and define all necessary elements for a project – including network device and point programming, global control sequencing, historical trending, alarming, scheduling, as well as graphical user interface pages.

The rapid engineering capabilitiesof ASPECT-Studio include mass editing options, import and export of networked devices and points, and the ability to create custom Device and Point templates.

As a project is created,it can be evaluated through each step of the engineering phase using simulated data, as well as the ability to communicate with defined networks, devices and their associated points.

Complete testing prior to the deployment of a project can also be performed using a local simulation of the ASPECT environment.

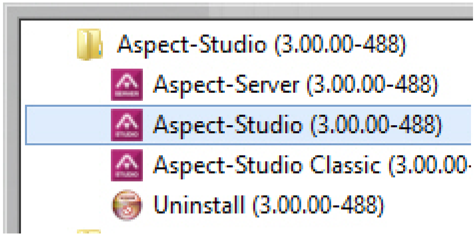
At commissioning time, ASPECT-Studio can automatically generate an HTML5 UI for all defined network devices, allowing smart phone and tablet users to gain access to the energy management system.

Installation and Licencing

To use ASPECT-Studio you must Install and License it. Please be sure to check the "System Requirements" on the facing page before doing so.

Launching Aspect-Studio

Once the software license file has been installed you can launch ASPECT-Studio, by double-clicking on the shortcut on your desktop. You may also access the Start menu to launch ASPECT-Studio.



For detail on starting a **Project** see and "What is a Project?" on page 8

System Requirements

Before installing Aspect-Studio, your PC must meet the following system requirements:

Recommended

- Operating System (64-bit)
  - Windows 7, 8.x, 10
- Modern Web Browser
  - Chrome, Firefox, IE 10+
- Hardware Requirements
  - 2.1Ghz or faster processor (dual or multi-core CPU recommended)
  - Minimum 4GB of RAM - dedicated for Aspect-Studio
  - Ethernet Adapter
  - Available USB Port for USB License Key

Minimum

- Operating System (32-bit or 64-bit)
  - Windows XP Professional - SP3
- Modern Web Browser
  - Chrome, Firefox, IE 10+

- Hardware Requirements
-
  - 1.5Ghz processor (multi-core CPU recommended)
  - Minimum 2GB of RAM - dedicated for Aspect-Studio
  - Ethernet Adapter
  - Available USB Port for USB License Key

Licensing ASPECT-Studio

ASPECT can be licenced using either hardware-based (Dongle) protection, or software-based "Dongle Free" protection.

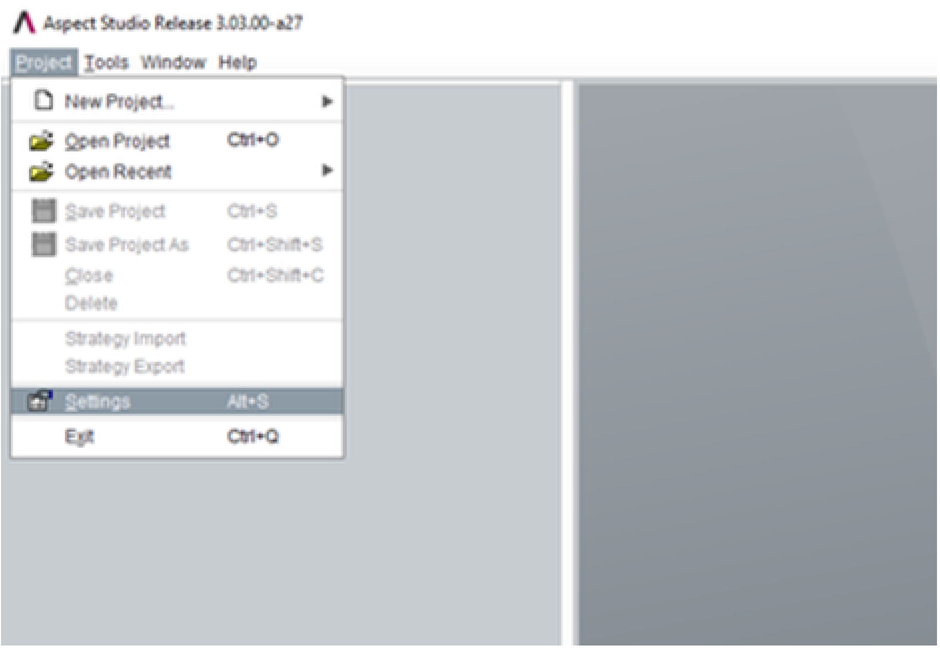
Dongle-Free Licencing

If you would like to license ASPECT-Studio using a **Dongle Free** soft key, then you must request a license from **ABB Cylon**.

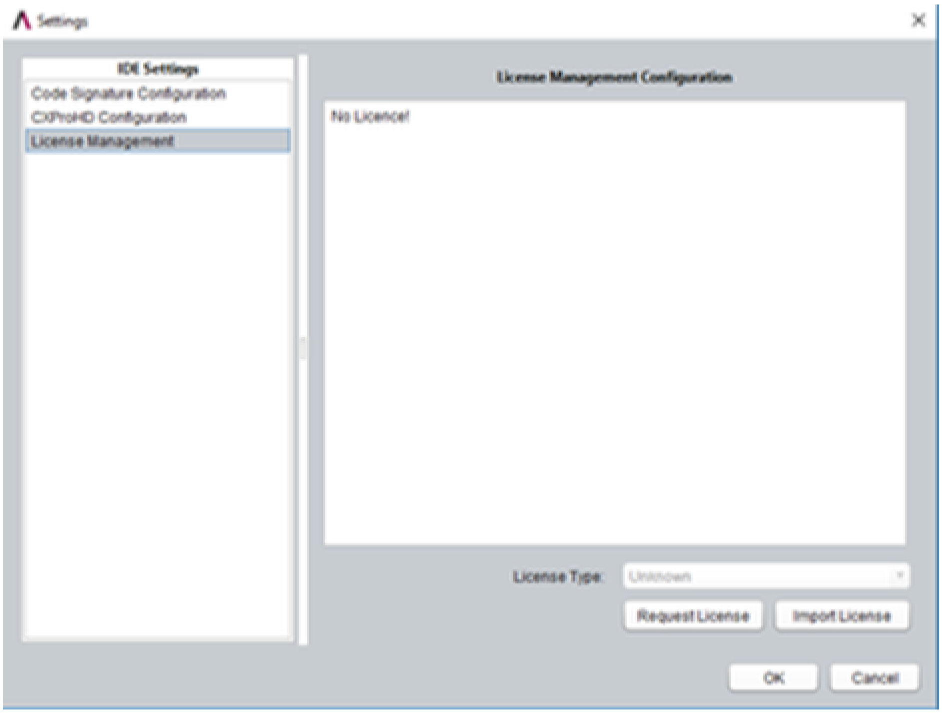
Request a Dongle Free License

In order to enable ASPECT-Studio's **Dongle Free license** you must create a license request file that contains a unique hardware ID from your machine and send it to **ABB Cylon**. **ABB Cylon** will in turn create a **Dongle Free License** file with the appropriate license tokens and expiry dates and return it to you for you to import into ASPECT-Studio.

Select Settings from the Project Menu

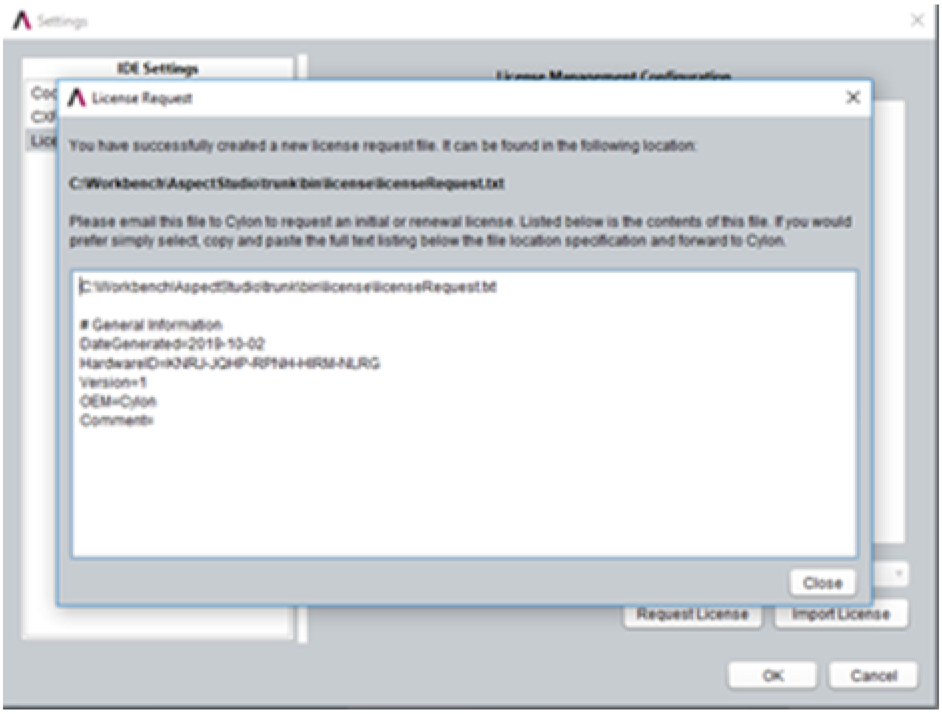


In the `Settings` dialog, select `License Management` and click the `Request License` button:



You will be prompted to choose a name and location for the license request file. By default the file location is the `\license` folder in yourASPECT-Studio installation folder.

*Send the License Request File to **ABB Cylon***



After your license request file has been created, it will be displayed in a dialog window with the text location of the file printed in the first line of the display window, which can be cut&pasted to locate the file.

- If you already have a dongle free license file, the current file will be included in the request.
- If this is the first request for a dongle free license, the file will simply contain the information included in the General Information section of the file with the most important piece of information being the hardware id.

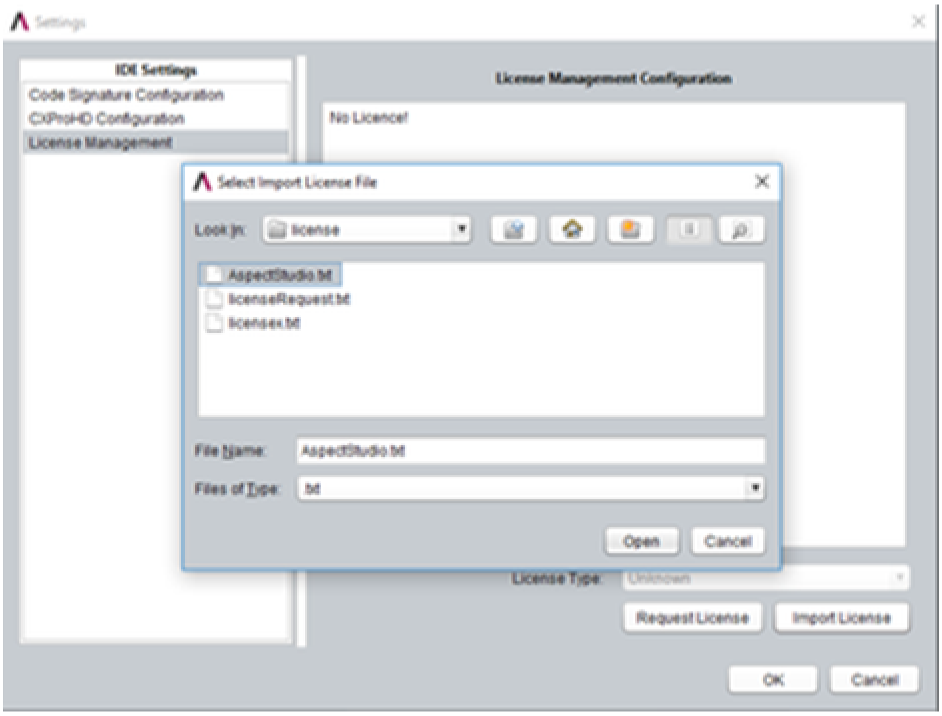
Import a Dongle Free License

When your request is processed by **ABB Cylon** , you will receive a Dongle-Free License file by email. To apply this license file to your copy of ASPECT-Studio,

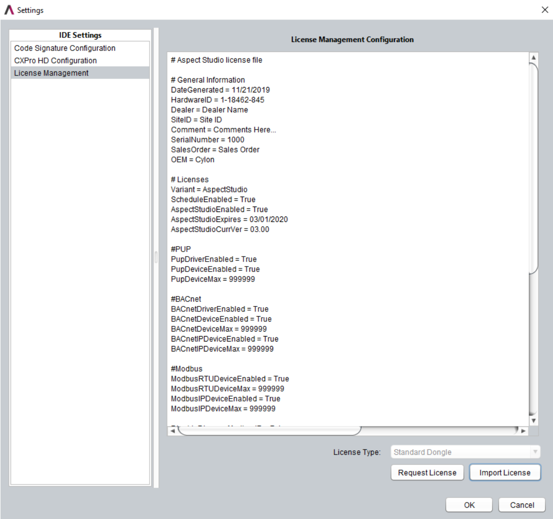
Save the **license file** to your local disc,

Select Settings from the Project Menu to open the Settings Dialog, and click the Import License button.

Locate the **license file** and click the Open button



Once the **Dongle Free License** has been successfully imported it will be displayed in the License Management Configuration console as shown below, with the **License Type** set to "Dongle Free".



Note: If you have used dongle licenses in the past and you have a valid dongle license file and a Sentinel dongle connected, then ASPECT-Studio will show the **License Type** as "Dongle" instead of "Dongle Free". In this case you must disconnect the **Dongle** to enable the **Dongle Free license**.

Hardware Dongle based Licencing

ASPECT-Studio continues to support the **Dongle** License model using the Sentinel SafeNet dongle. If you have a valid **Dongle License** file and a working dongle it will continue to function as it did for earlier (pre-**Dongle Free**) versions of ASPECT-Studio.

How to install a Dongle-based License

If you have purchased a Dongle-based version of ASPECT-Studio, you will require a software license file (available on your ASPECT-Studio CD), to be present on your PC along with the physical USB License Key supplied in the ASPECT-Studio CD case. You must install both the license file and software drivers for the USB License Key prior to using ASPECT-Studio.

Note: The supplied software license file and physical USB License Key reference one another. Using a mismatched license file and USB License Key will prevent ASPECT-Studio from launching.

Installing the Software License File

ASPECT provides a product licensing interface for enabling products and features. The license file itself is a plain-text, human readable file that contains information on enabled features, product, and other items.

```
# Aspect Studio license file

# General Information
DateGenerated = 11/21/2019
HardwareID = 1-18462-845
Dealer = Dealer Name
SiteID = Site ID
Comment = Comments Here...
SerialNumber = 1000
SalesOrder = Sales Order
OEM = Cylon

# Licenses
Variant = AspectStudio
ScheduleEnabled = True
AspectStudioEnabled = True
AspectStudioExpires = 03/01/2020
AspectStudioCurrVer = 03.00

#PUP
PupDriverEnabled = True
PupDeviceEnabled = True
PupDeviceMax = 999999

#BACnet
BACnetDriverEnabled = True
```

The software license file required by ASPECT-Studio can be found on the installation CD for ASPECT-Studio. The file, when opened with a text editor or viewer will look similar to the one displayed in the image above.

Navigate to your computer's optical media drive and find the license folder. Within the license folder, locate a file named license.txt. You must copy this file into the \bin\license directory of your Aspect-Studio installation (e.g. `C:\Cylon \Aspect-Studio 3.00.00\bin\license`)

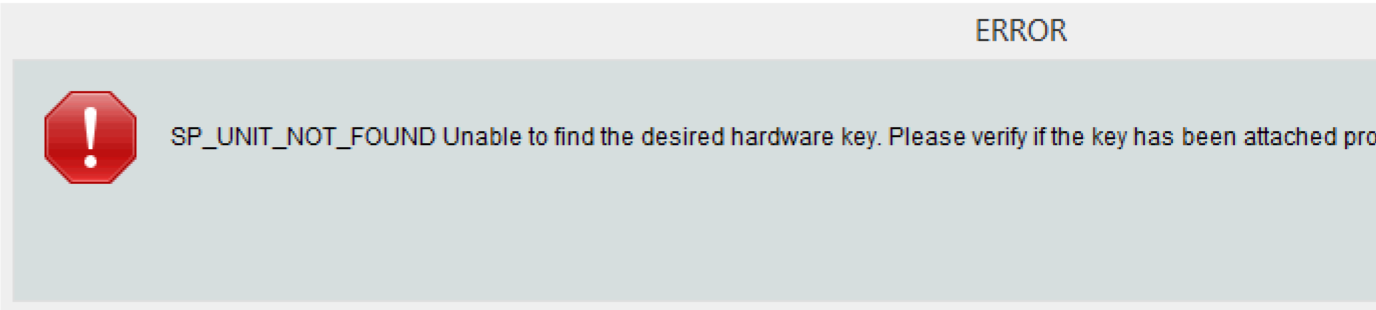
This same process should be used for license updates generated and sent to you by AAM Inside Sales.

> **Note**: The `license.txt` file used by ASPECT-Studio contains an encryption signature to ensure your license is protected. Do not attempt to edit or make changes to this file, as this will damage the file and invalidate your ASPECT-Studio license. If you wish to enable features not included with your license, please contact **ABB Cylon** Inside Sales for additional assistance.

Installing the USB License Key Drivers

To install the USB License Key driver, run the setup.exe file located in `C:\Cylon`

Once the driver has been successfully loaded, insert your USB License Key. The USB License Key, included with your copy of ASPECT-Studio, must be inserted into an available USB port in order for ASPECT-Studio to execute. If you attempt to start ASPECT-Studio without the key present, or without installing the driver ASPECT-Studio will display a warning message and exit.



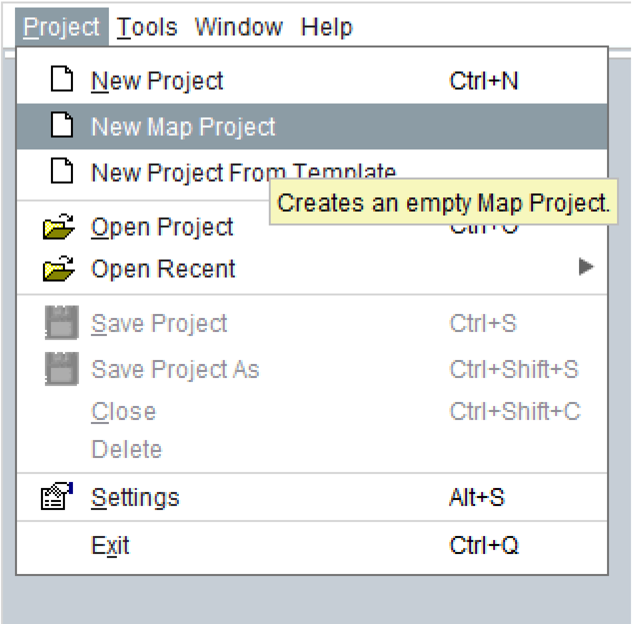
What is a Project?

A supervisory application in ASPECT is called a **Project**. All work within ASPECT centers around creation and configuration of **Projects**.

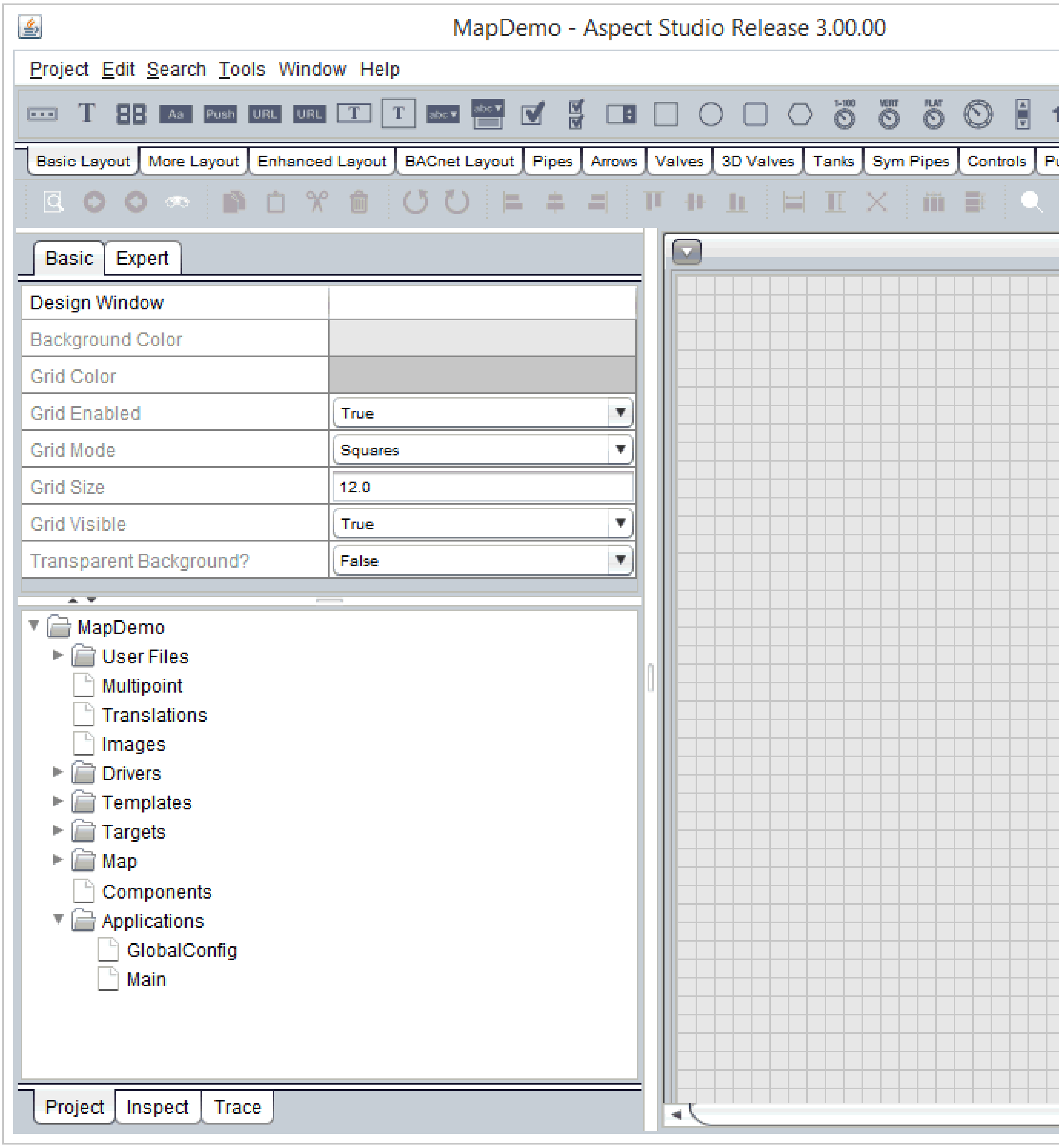
A **Project** is centered around a **Map** that defines the configuration of the network, devices, and points to be used within the **Project**. It may also contain custom logic in the form of ASPECT **Applications**

Creating Your First Project

Open ASPECT-Studio and select "New Map Project". Give your project a meaningful name and save it in your "Aspect Projects" directory so it can be located easily later.



The "New Map Project" option creates a minimal project with **Map** capabilities, useful templates, and several required housekeeping items already set up so you can get to work right away.



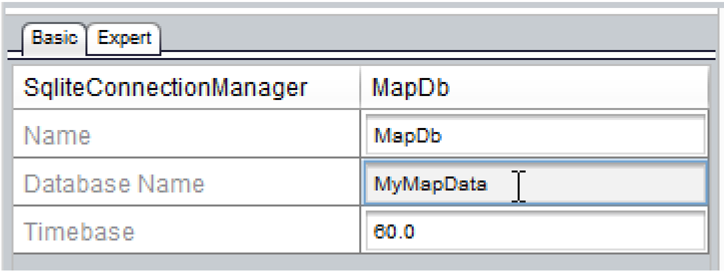
Link to a Database

To make the most of your Map, you will need a database to hold trend data and alarms. The default is to use a SQLite database, but for larger projects (Enterprise, Nexus, Facility) - it is strongly suggested to use the available MySQL database server.

SQLite

Smaller projects, particularly those running in a MatrixMax target may use SQLite as their database. SQLite is a high-performance embedded database, but does not provide for client-server access.

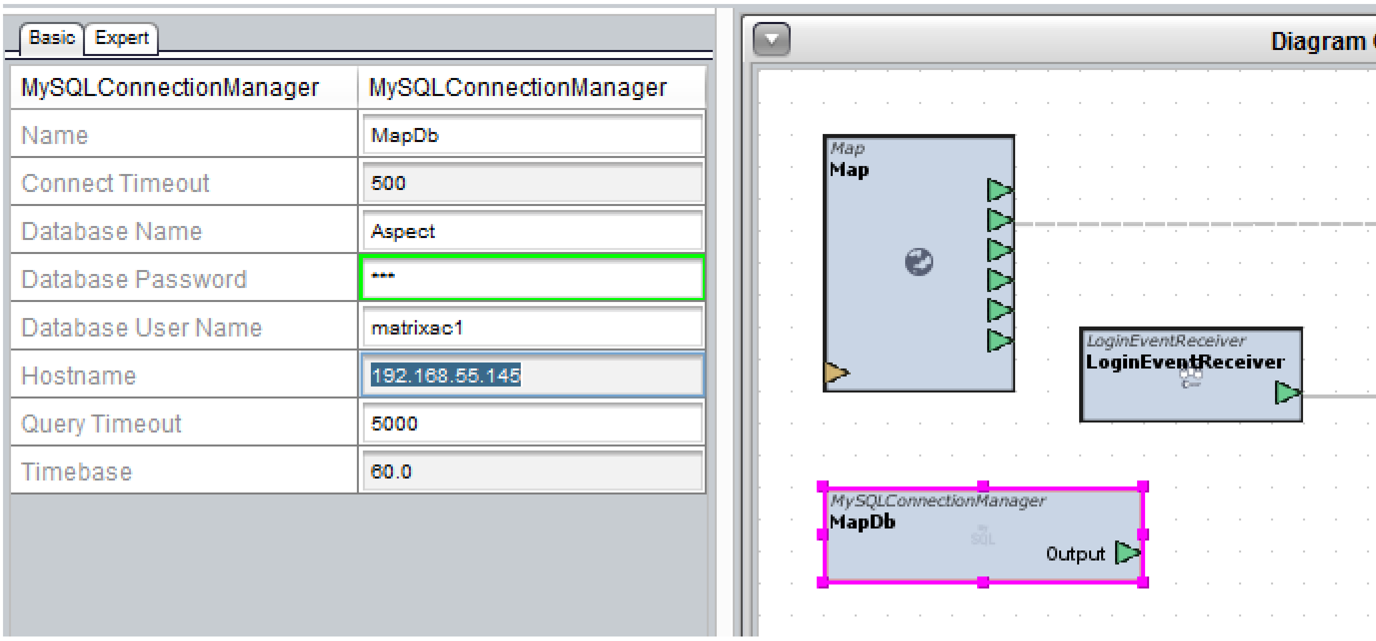
SQLite is configured by default, but it is very important to change the default database name to avoid potential database file collisions.



MySQL

To use MySQL, a MySQL Database Connection Manager should be added to the GlobalConfig application to replace the SQLite Database Connection Manager. Name it MapDb (the default name of the SQLite Database Connection Manager) to avoid having to re-link the Audit Trail Manager and Map Alarm Manager blocks.

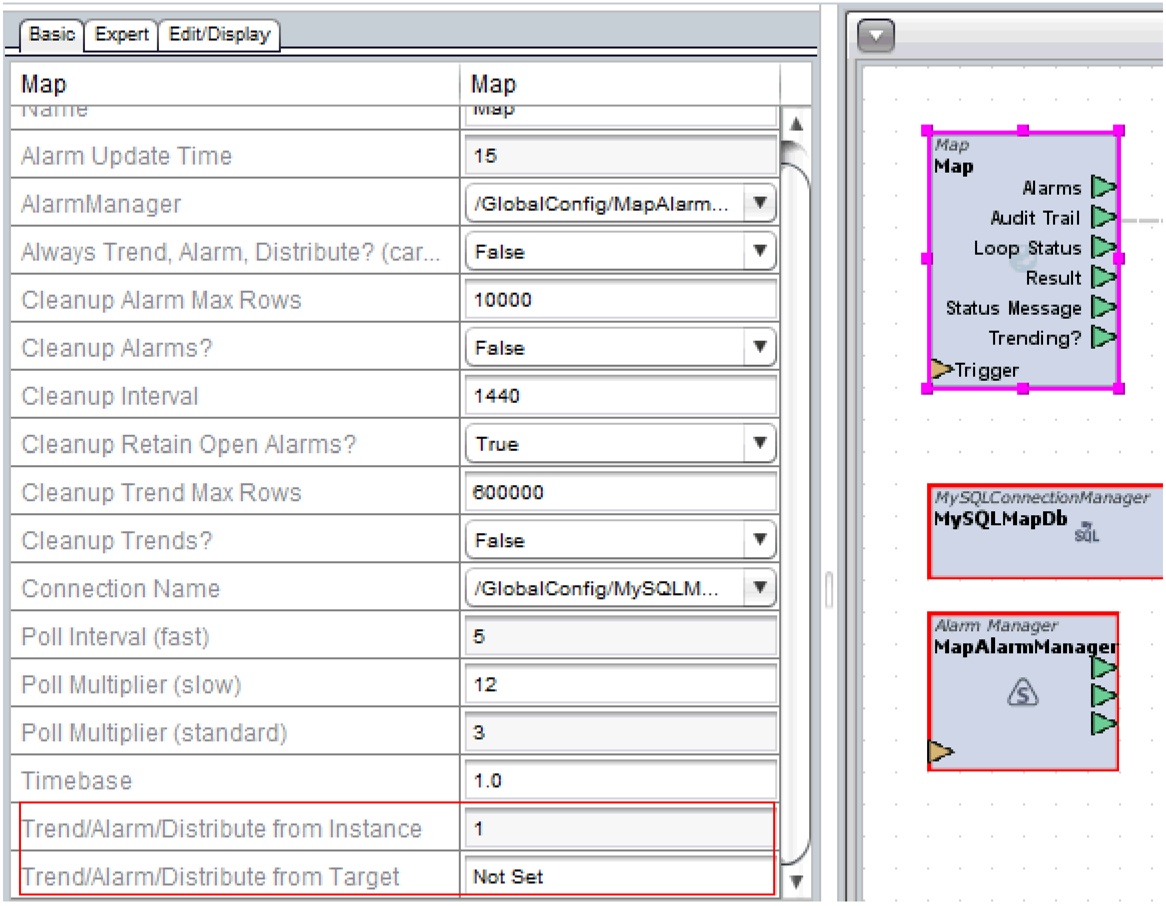
Specify the Hostname, Database Name, Database User Name, and Database Password of the MySQL Server for the project.



Configure the Trend/Alarm/Distribute

To prevent accidental trends and alarms being written to the project database or schedules being distributed to controllers during development and testing, it is necessary to only allow a single Aspect target to perform these tasks at one time. This target is uniquely identified by the Hardware ID and Instance. The Hardware ID of a target is contained in the license file.

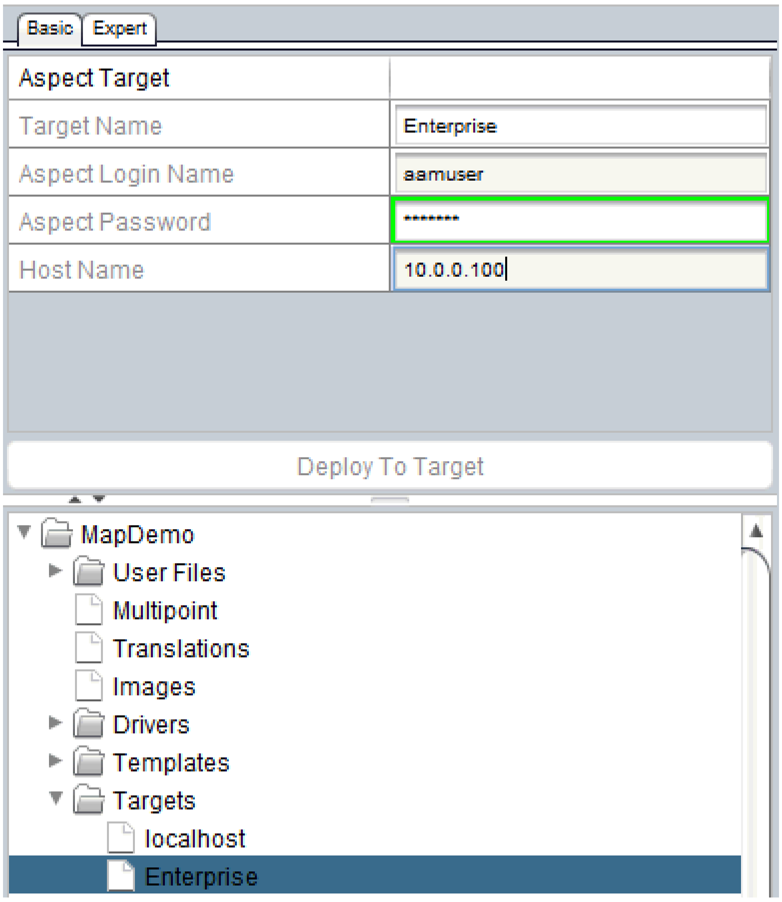
To configure, specify the Hardware ID and the instance number of the Aspect target that is designated to perform Trend/Alarm/Distribute. Select the Map block in the GlobalConfig application and fill in the fields highlighted below:



Configure Deployment Targets

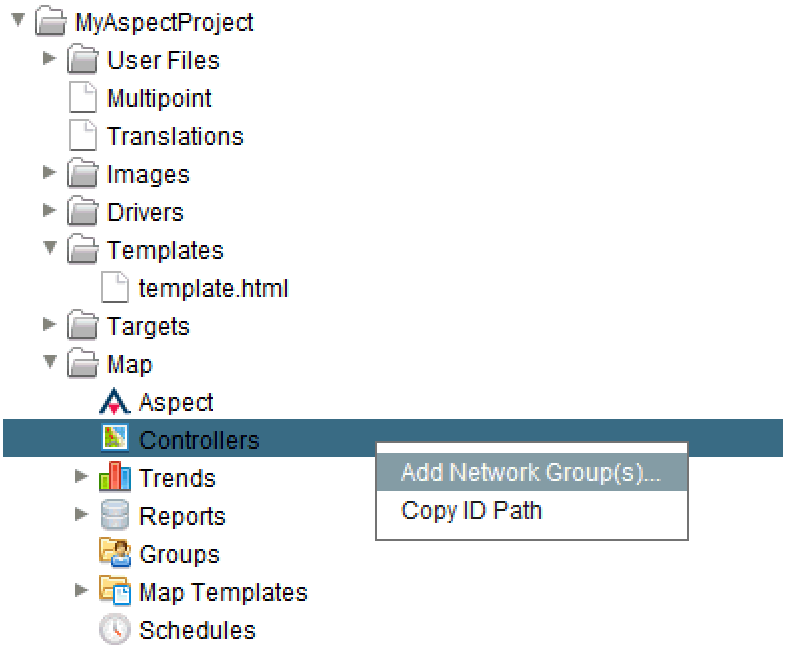
The final prepatory step is to configure the Aspect target which will host the project. From the Project tree, select the Targets node and right click -> Add Aspect

A new target named Aspect will be added to the tree. Select this target. Give it a meaningful name. Supply the hostname or IP address of the target as well as the Aspect Login Name and Aspect Password of the account authorized to deploy projects to the target. If the TargetInstance is not 1, select the Expert tab and enter the desired Target Instance value.

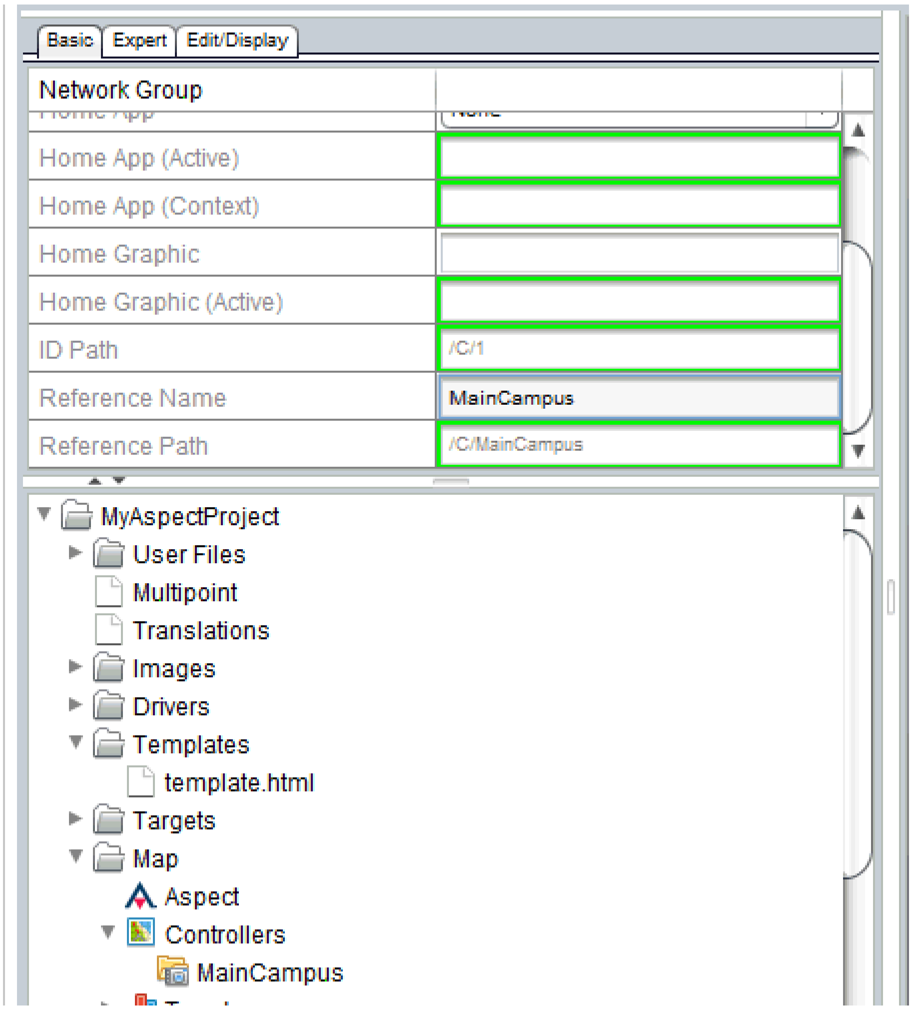


Discover and Add Devices

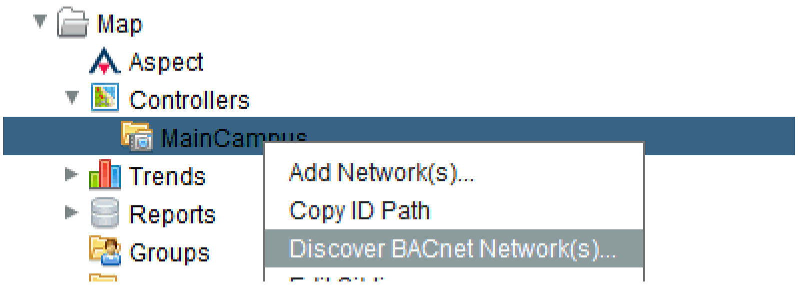
Select the Controllers node in the Map and right click. Choose the Add Network Groups option and add 1 network. The network group is simply a collection of one or more networks.



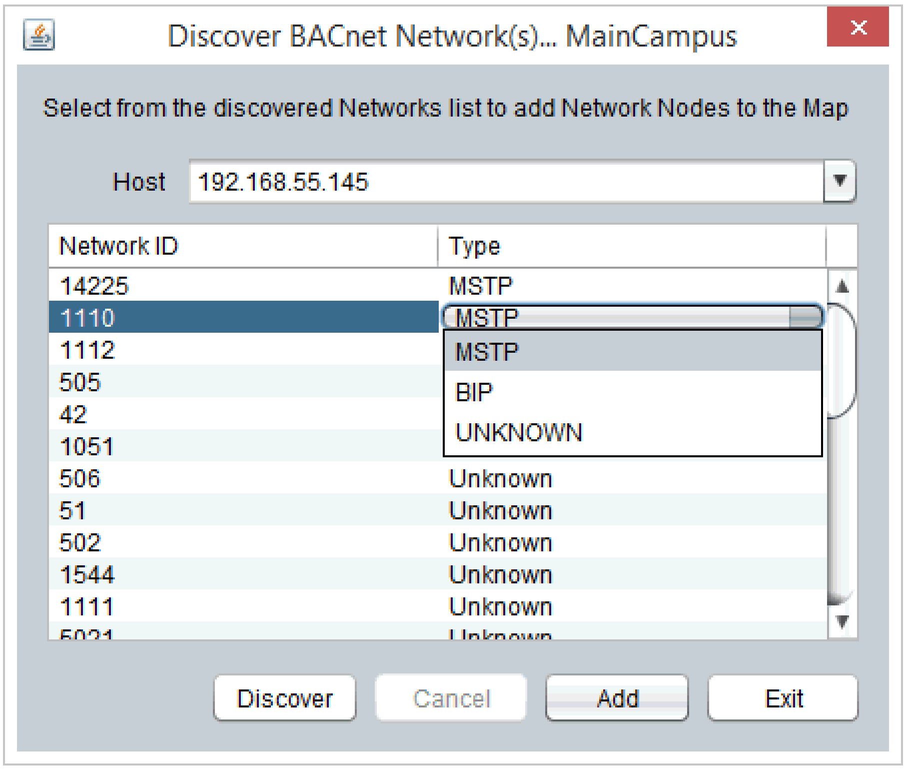
Rename your new Network Group to something meaningful by changing the ReferenceName property - it can be named anything you like, such as MainCampus.



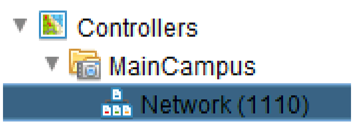
Right click on your new network group and select Discover BACnet networks



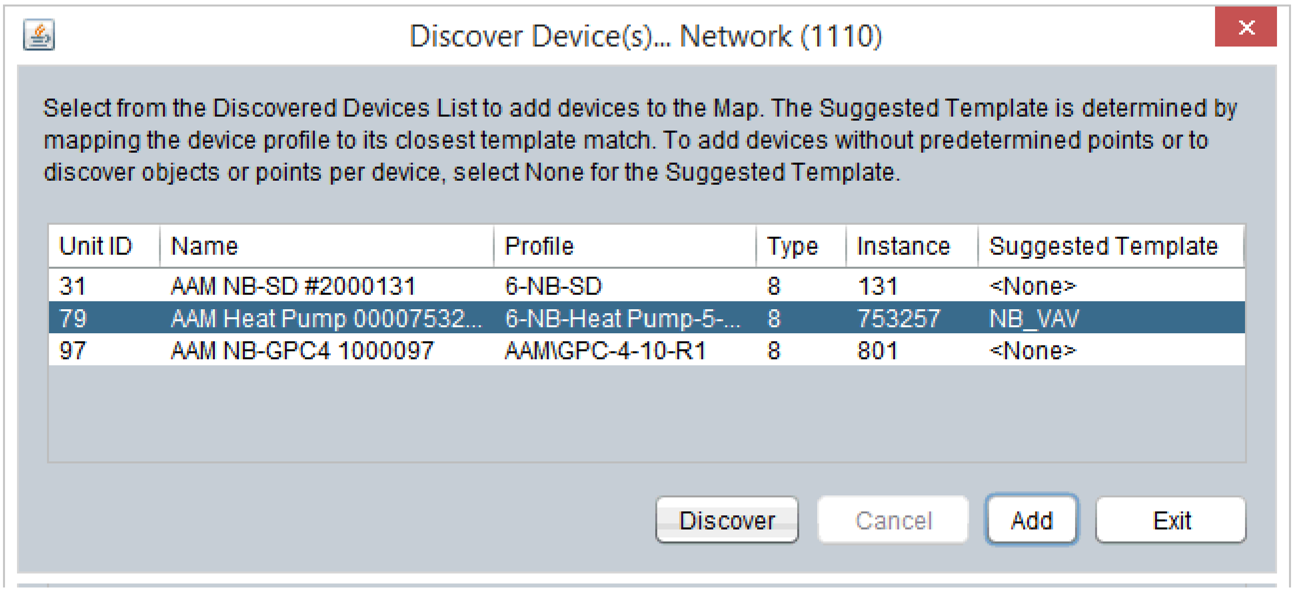
The BACnet discover dialog will appear. Supply the IP Address or DNS hostname of the Aspect Target connected to your BACnet network and click Discover. The discovery results will show any active MSTP networks connected to the target as well as all the other BACnet networks the target is configured to reach. If the network is not directly connected to the Aspect target, you will need to specify if the network is MSTP or BIP (BACnet IP) via the selection box in the Type column.



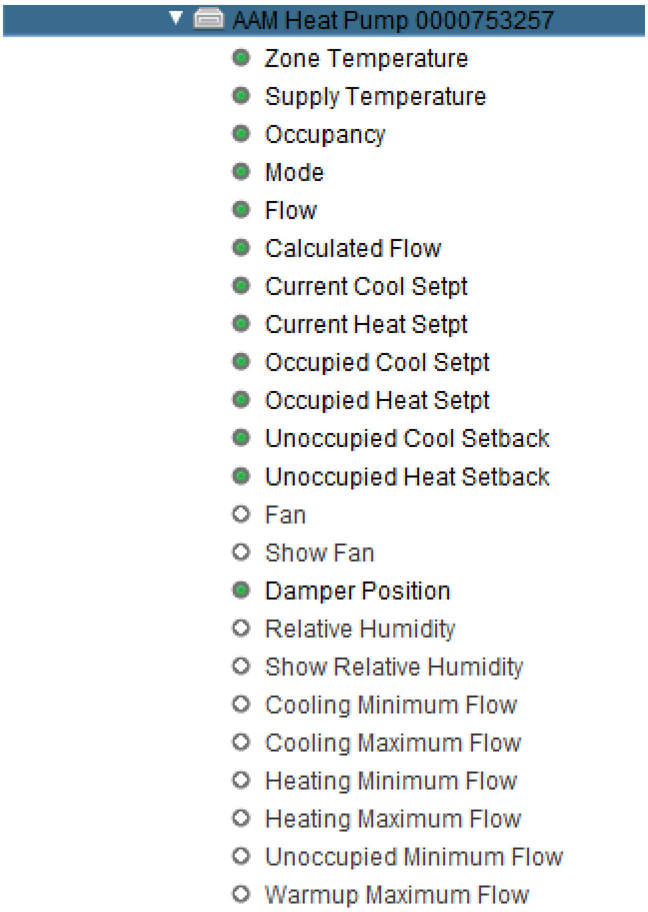
Click the Add button to add the selected network to your network group. You may add any additional networks to your project before closing the discovery dialog. Networks will be added to the Network Group using a default name that indicates the Network Number.



Right Click your network and select Discover Device(s). Select one or more devices with Suggested Templates and click Add. Exit the Discover Devices Dialog.

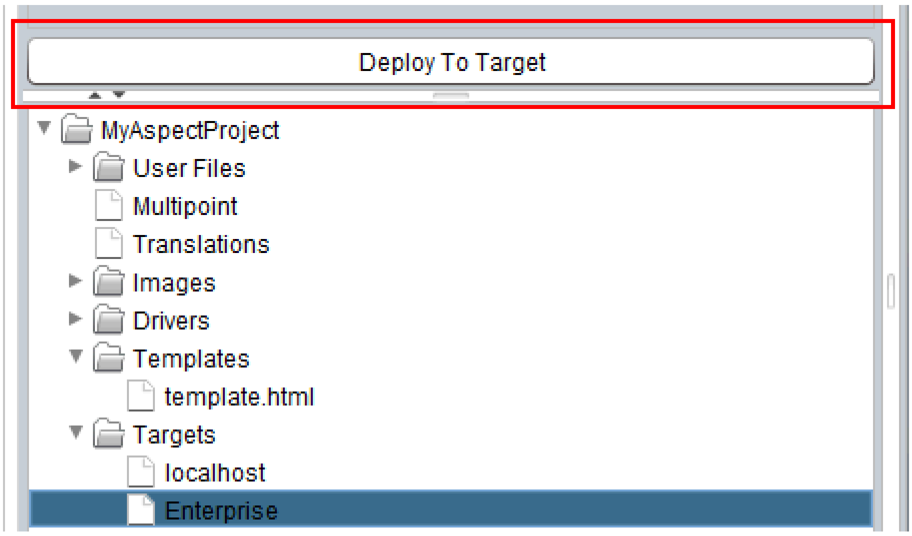


Aspect 3.0 ships with a rich library of templates for the American Auto-Matrix and Cylon controller lines. By leveraging the power of these templates, Aspect-Studio is able to automatically create the devices with intelligent default settings including alarms, trends, sparklines, and even HTML Equipment Graphics!

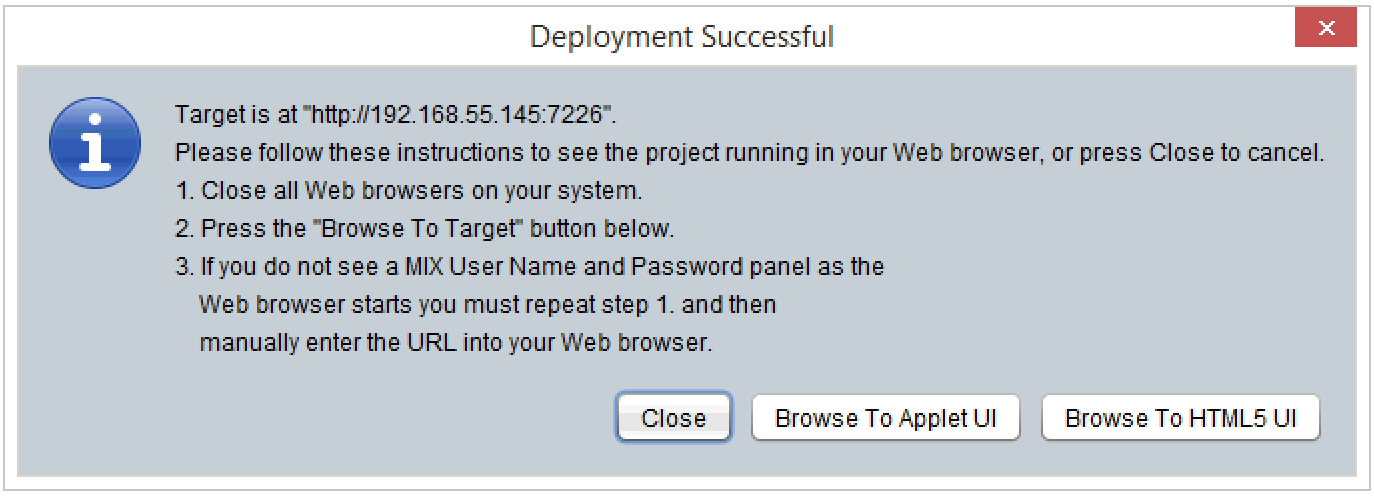


Deploy your project

Your "Hello World" project is now complete and ready for deployment to your Aspect target. Simply select your target from the Project tree and click the Deploy to Target button.



When the deployment completes, Browser to the HTML5 UI to launch your project in the browser



ASPECT-Studio Navigation

ASPECT-Studio Interface Layout

This topic gives an overview of the ASPECT-Studio UI - the Diagram Window, the Design Window, the Palette Toolbar, the Standard Toolbar, the "Inspector" (Property Pane) and the Project Tree.

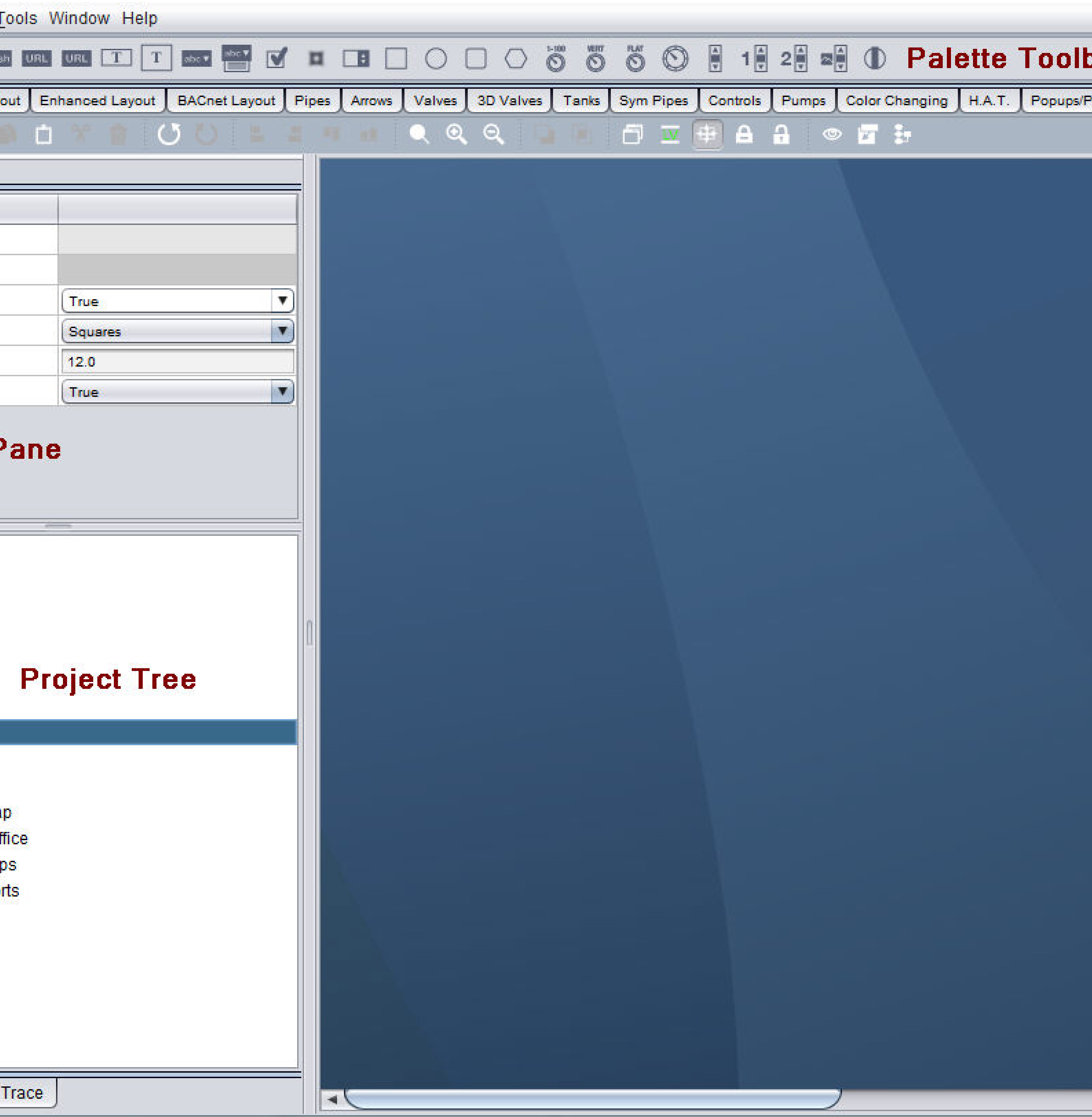
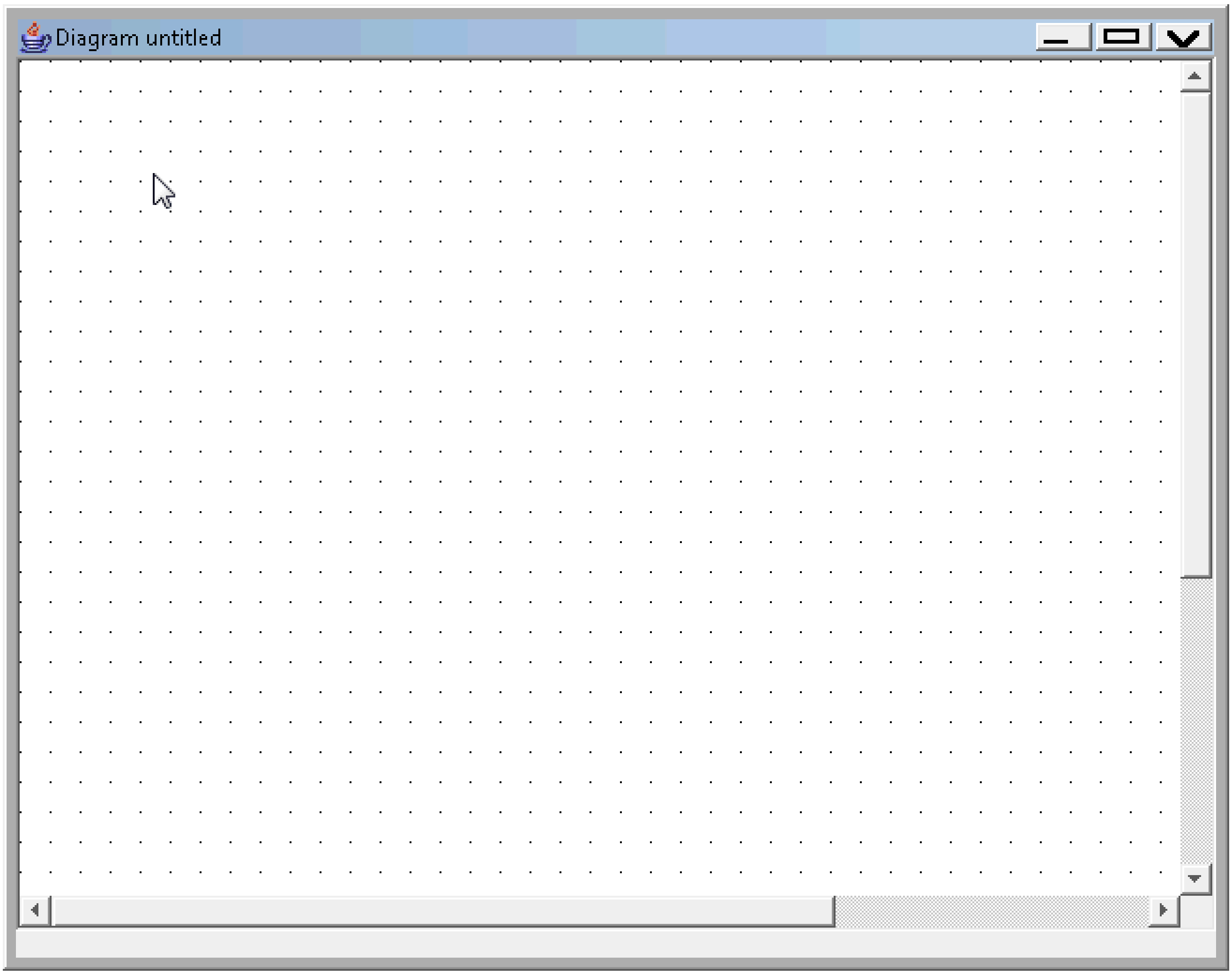


Diagram Window

The `Diagram Window` contains a workspace used to define the logic for your application or component. This includes general logic functions (such as

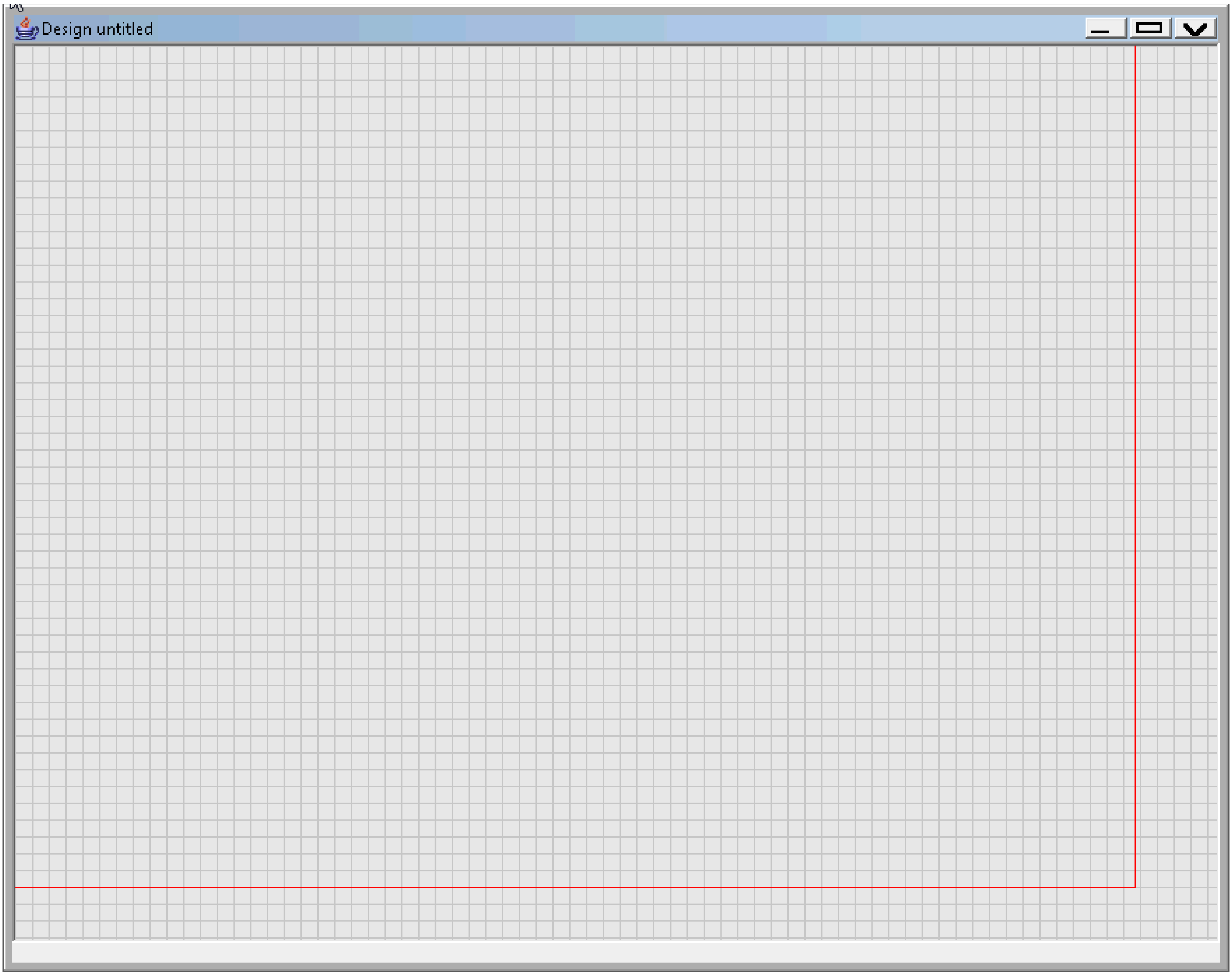
Math, Boolean Logic), animating graphic elements on the design window by connections to field equipment or other logic elements, as well as interactions with databases or other enterprise systems. There is one Diagram Window for each application you create.



When you create a new application within ASPECT-Studio, you will get a blank Diagram Window, along with a corresponding Design Window. If you are looking at the Diagram Window, the name of the application will be shown on the top of the window.

Design Window

The Design Window contains workspace allowing users to define a graphical user interface for the defined application. When you create a new application within ASPECT-Studio, you will get a blank Design Window, along with a corresponding Diagram Window.

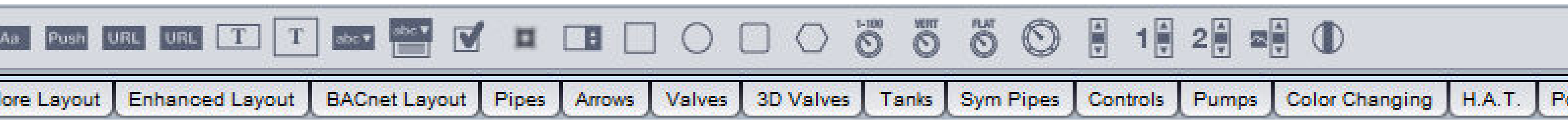


As displayed above, the red border line within the Design Window provides an indication of the maximum screen resolution size you have to work with. By default, the resolution size is whatever your default project size is. The size can be reset by simply editing the basic properties of the application, achieved by simply highlighting the application name from the Project Tree.

The Design Window provides a grid for aligning elements during design time. The grid will never be displayed on deployed applications. Grid information, including size, color, and mode can be set in the Basic Properties of the Design View. The grid is used to "snap" the upper left hand corner of components that are dropped onto the Design workspace, and to resize these components into whole unit grids. If you do not want to see the grid, you may disable grid appearance in basic properties.

Palette Toolbar

The Palette Toolbar of ASPECT-Studio contains elements which are divided up into separate categories. Each category contains related components for a logic application or a graphical user interface screen. Topics are tab-based, allowing users to easily navigate across different selections available for engineering.



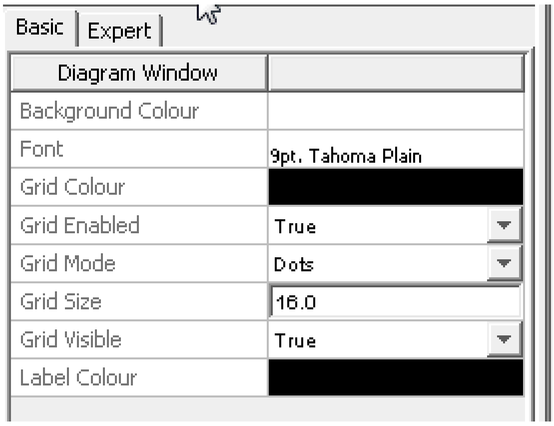
Each element icon represents a valid element that can be created and dropped onto a Diagram or Design page. A complete reference of all of the available categories and elements can be found in later sections of this manual.

Standard Toolbar

The Standard Toolbar provides basic features used within ASPECT-Studio while creating and defining your application. The standard tool bar provides commonly used features such as Search, Advanced Search, Cut, Copy, Paste, Zoom in/out, Undo, Re-do, as well as other advanced features useful during engineering.

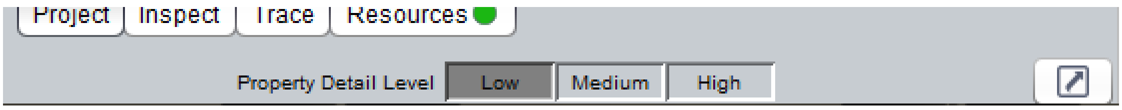
Property Pane (Inspector)

The Property Pane (or Inspector) is a context sensitive menu panel, displaying the properties of any **Map Object** selected in the Tree. It also displays the properties for the element selected in the "Design Window" on page 21 or "Diagram Window" on page 20.



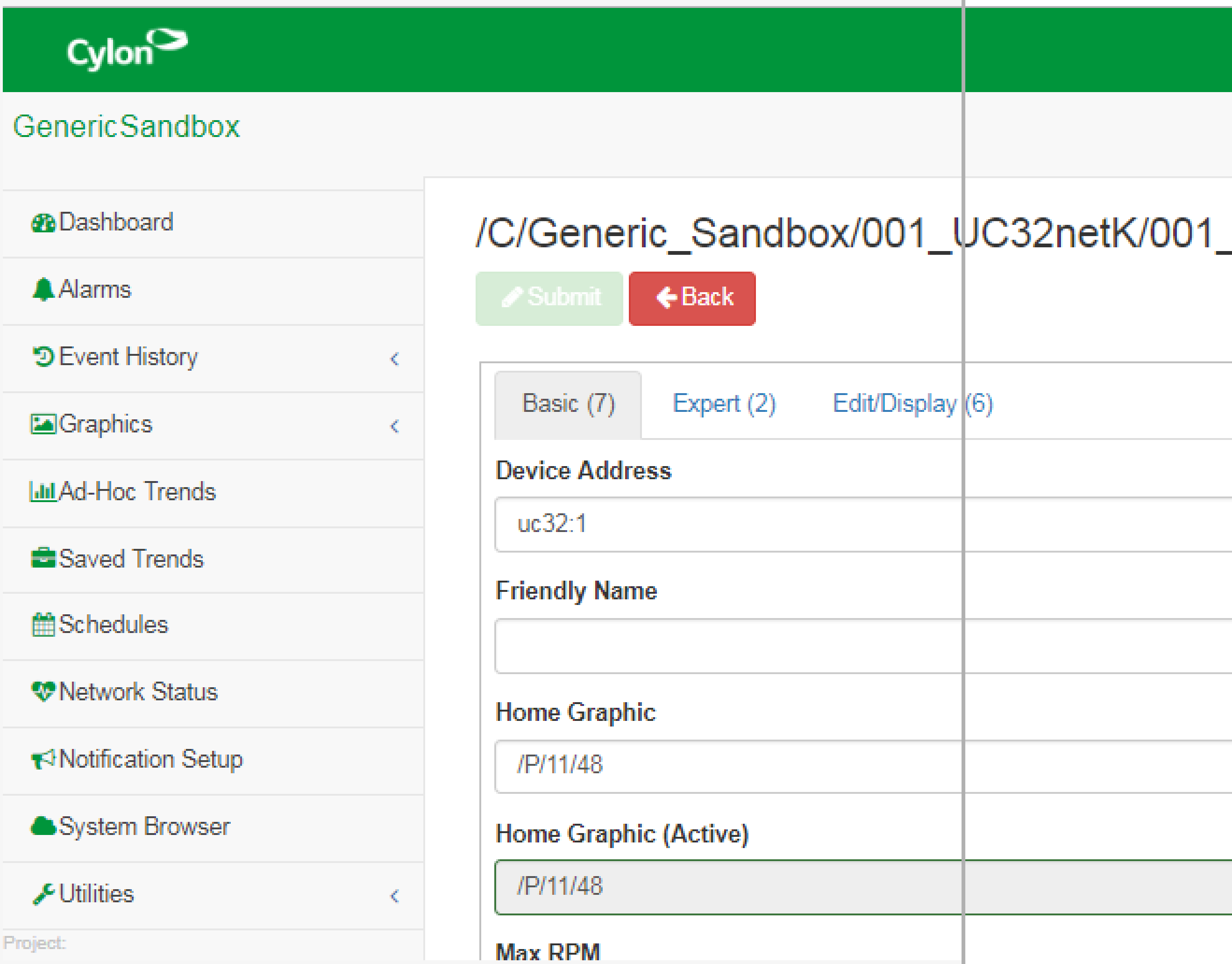
Element properties are divided into categories, e.g. Basic, Expert, Edit/Display or Alarms, selected by the relevant tabs.

In addition, in each category, the list of properties can be filtered to make it easier to find commonly-used properties. At the bottom of the Property Pane are 3 "Property Detail Level" buttons marked Low, Medium and High.



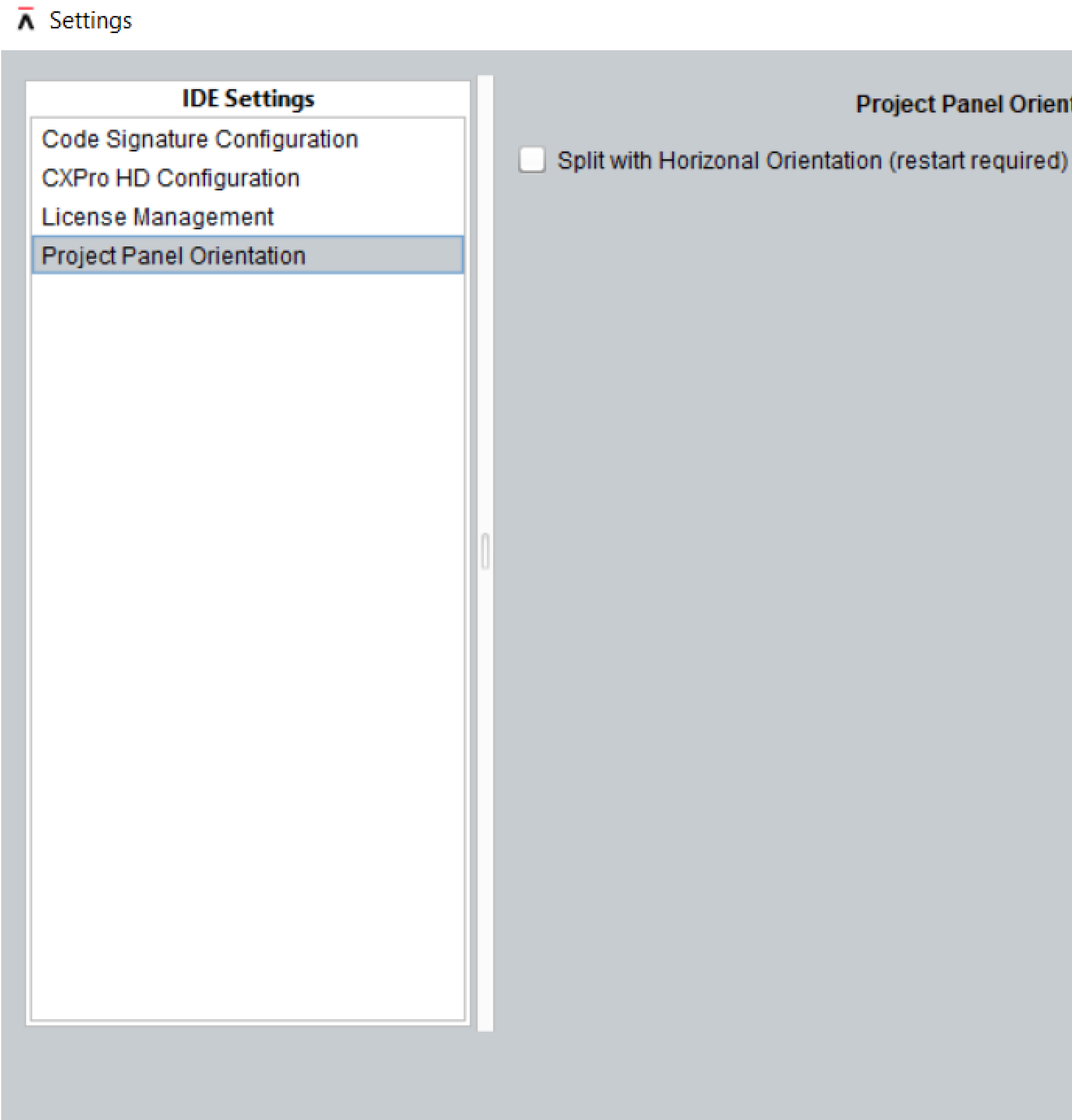
Clicking on the High button shows all available properties. Clicking Medium or Low reduces the number of visible properties by different amounts.

Note: The same filtering is also available in the ngAdmin interface:

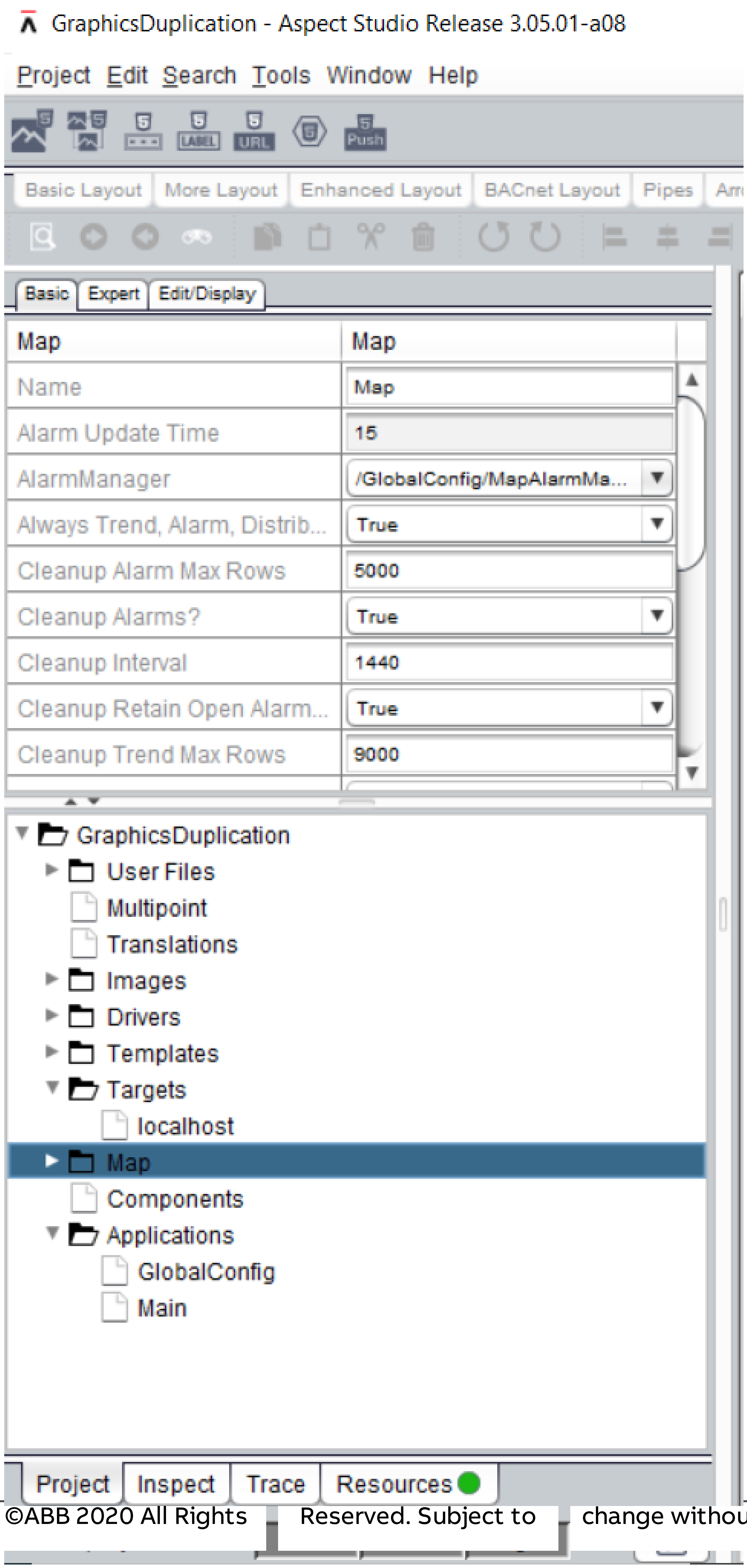


Project Panel Arrangement

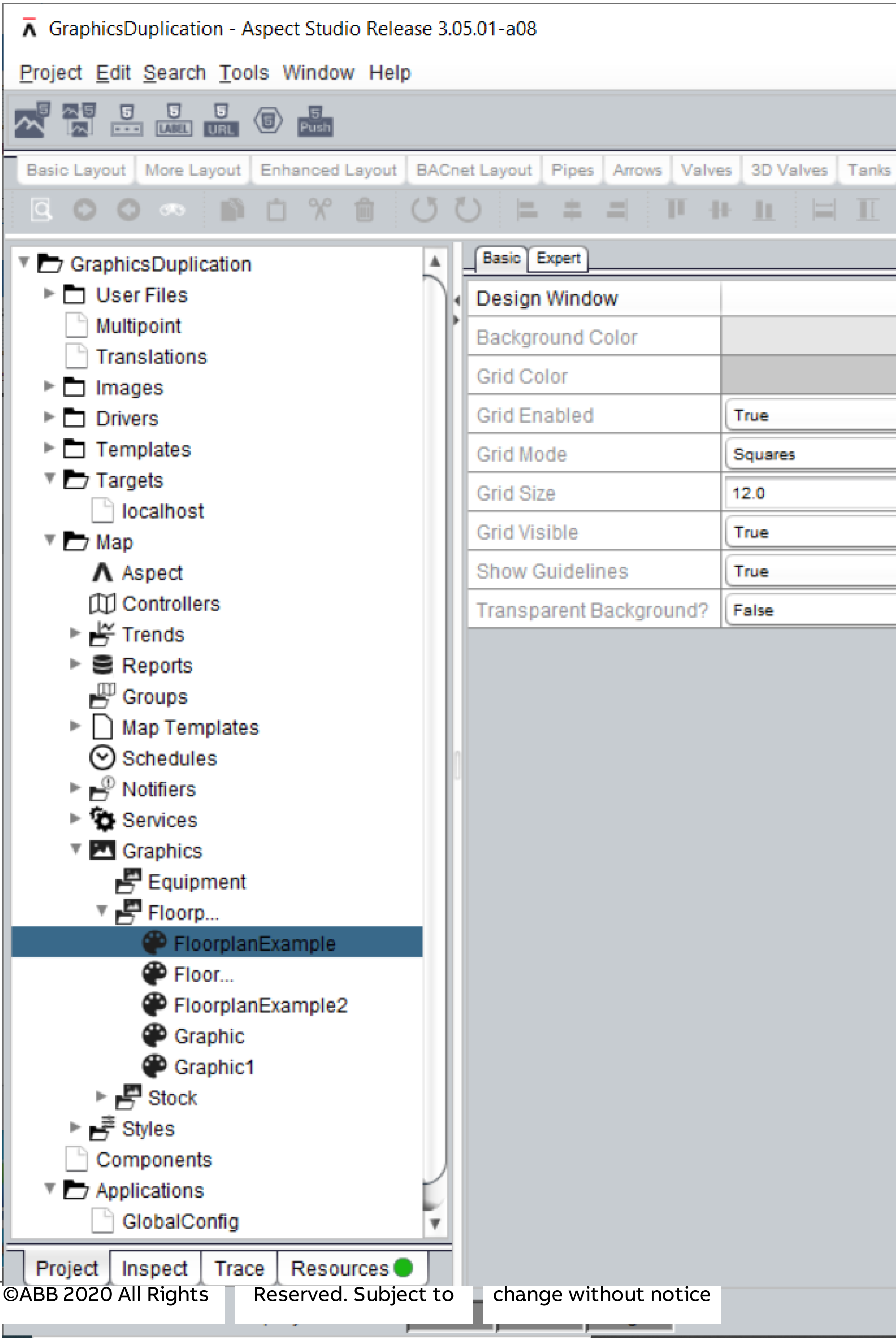
ASPECT-Studio's project panel can be configured to display with the Project Tree and corresponding Property Editor panels aligned horizontally side by side or vertically with Property Editor panels aligned above the Project Tree. This configuration option can be modified from the IDE Settings Panel by selecting the split with horizontal orientation checkbox:


Settings
IDE Settings
Code Signature Configuration
CXPro HD Configuration
License Management
Project Panel Orientation
Split with Horizonal Orientation (restart required)

Vertical Orientation Sample:

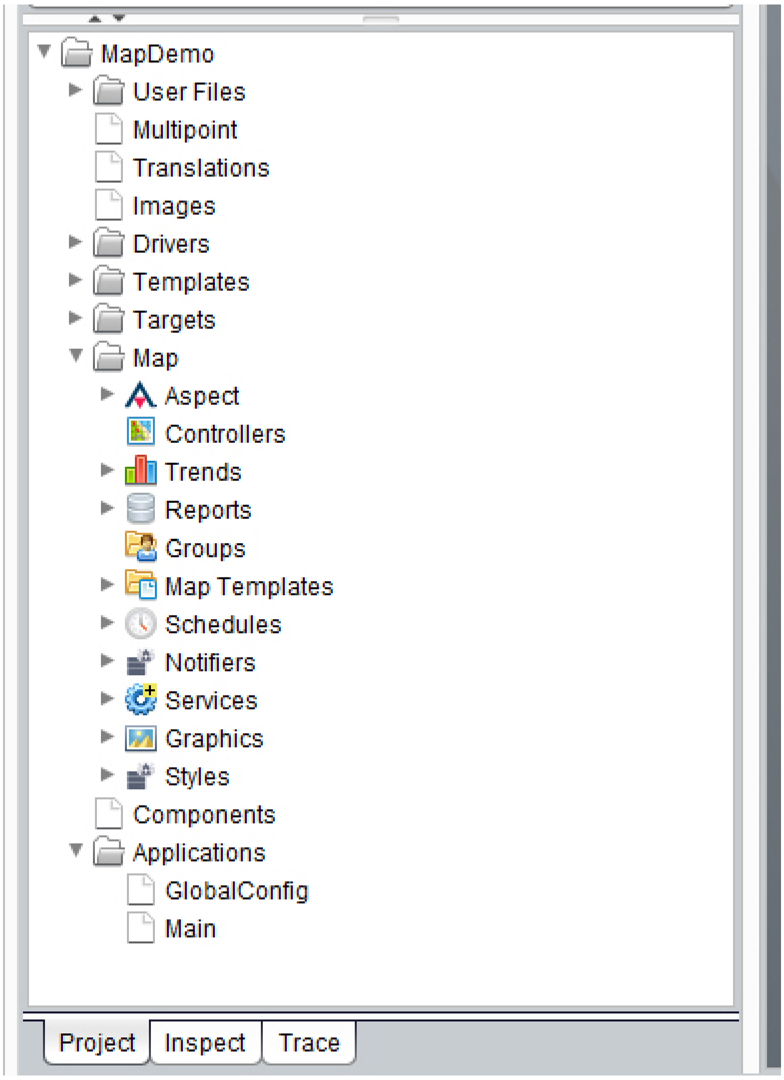

GraphicsDuplication - Aspect Studio Release 3.05.01-a08
Project Edit Search Tools Window Help
Basic Layout More Layout Enhanced Layout BACnet Layout Pipes
Basic Expert Edit/Display
Map Map
Name Map
Alarm Update Time 15
AlarmManager /GlobalConfig/MapAlarmMa...
Always Trend, Alarm, Distrib... True
Cleanup Alarm Max Rows 5000
Cleanup Alarms? True
Cleanup Interval 1440
Cleanup Retain Open Alarm... True
Cleanup Trend Max Rows 9000
GraphicsDuplication
User Files
Multipoint
Translations
Images
Drivers
Templates
Targets
localhost
Map
Components
Applications
GlobalConfig
Main
Project Inspect Trace Resources

Horizontal Orientation Sample:


GraphicsDuplication - Aspect Studio Release 3.05.01-a08
Project Edit Search Tools Window Help
Basic Layout
More Layout
Enhanced Layout
BACnet Layout
Pipes
Arrows
Valves
3D Valves
Tanks
GraphicsDuplication
User Files
Multipoint
Translations
Images
Drivers
Templates
Targets
localhost
Map
Aspect
Controllers
Trends
Reports
Groups
Map Templates
Schedules
Notifiers
Services
Graphics
Equipment
Floorp...
FloorplanExample
Floor...
FloorplanExample2
Graphic
Graphic1
Stock
Styles
Components
Applications
GlobalConfig
Project
Inspect
Trace
Resources
Basic
Expert
Design Window
Background Color
Grid Color
Grid Enabled
True
Grid Mode
Squares
Grid Size
12.0
Grid Visible
True
Show Guidelines
True
Transparent Background?
False

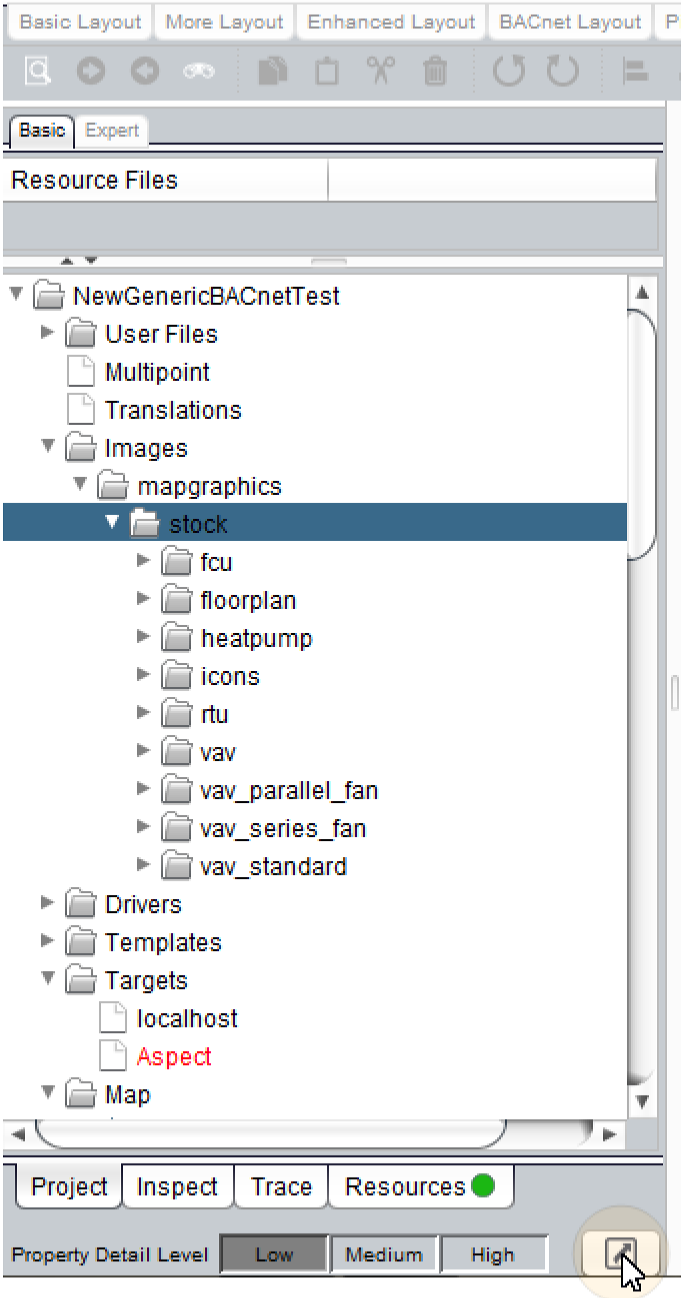
Project Tree

The Project Tree is the centralized area of ASPECT-Studio that provides users with the ability to create project items such as applications and components, importing files for use with the application including database drivers, graphic images, and other user files related to the system.



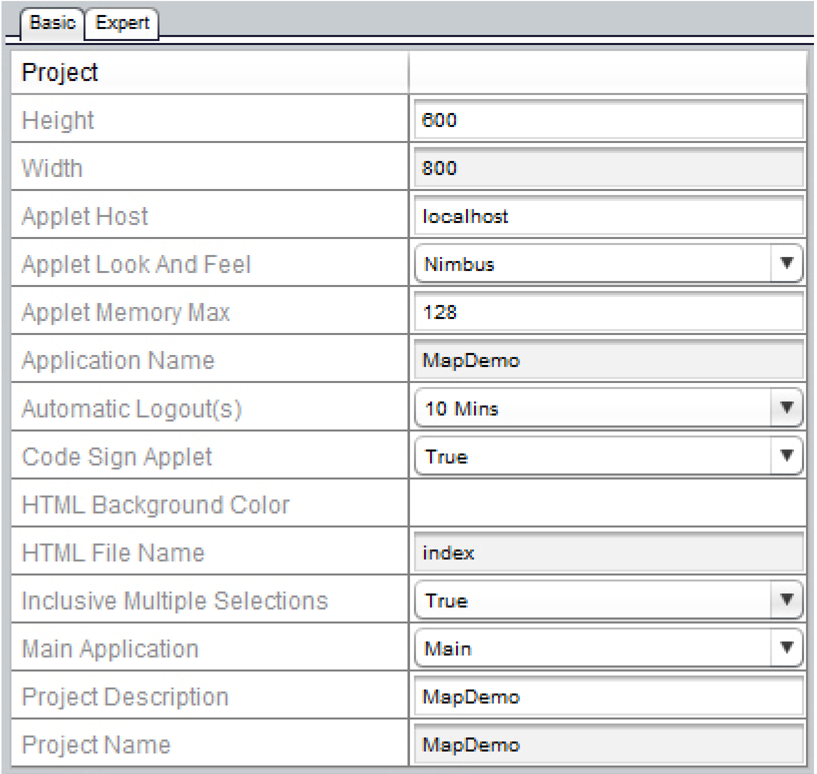
The Inspect Tab provides a high level view of an entire project. Through Inspect, users can view elements, their logical links, as well as locate and find specific items within the project. This reduces the need to open each individual project to find a particular item of interest.

When binding points to graphics, it is often necessary to navigate to other parts of the Project Map tree as part of the workflow. To facilitate this, and for convenience on multi-screen setups, a separate limited-functionality tree can be 'Popped Out' from the main Project Tree. To "pop out" the Tree, click the  button on the bottom right of the Tree pane:



Configuring Project Properties

Before you begin to engineer your **Project**, it is important and helpful to configure the properties of that **Project**. The Project Properties contain key operating parameters used to set up and configure certain parameters of the system, such as default graphic screen width and height, background color for the Java Applet used to display rich-graphics, etc.



To configure Project Properties, simply select the Project Name folder listed at the top of the Project Tree .

Basic Project Property Details

Basic Properties for a Project are defined in the following table and may commonly be modified prior to engineering your project.

Property	Notes
Height	Defines the default height for graphical user interface pages. This default parameter can be superseded at any time for application or components by editing the height when necessary.
Width	Defines the default width for graphical user interface pages. This default parameter can be superseded at any time for application or components by editing the width when necessary.
Applet Host	Defines the Java Applet location variable. This value

	should never be modified.
Applet Look and Feel	Visual presentation of the applet. Nimbus is the default, newer look and feel.
Applet Memory Max	Defines the amount of memory that the web browser will retain to view a system upon login. This value defaults to 128. If you are creating a larger project for targets such as Aspect-Facility, Aspect-Nexus, or Aspect-Enterprise - you should set this property to a higher value (such as 512).
Application Name	User defined application name
Automatic Logout (s)	Defines the amount of time, in seconds, that a user must remain idle before they are automatically logged out of the system. Automatic Logout will also automatically close the browser session (for security purposes).
Code Sign Applet	Enable code signing of applet. Required for new Java versions and requires an installed Java Code signing certificate.
HTML Background Color	Defines the background color displayed by the desktop web browser when viewing rich graphics through the Java Applet launched when navigating the system.
HTML File Name	Defines the name of the HTML file that will be displayed in conjunction with the Java Applet when a user accesses the system via a web-browser. This file directly correlates with any changes you make to the template.html file located under the Templates folder of the Project Tree.
Inclusive Multiple Selections	Defines the behavior of Aspect-Studio as multiple elements are selected (or lassoed) in the Design or Diagram workspace.
Main Application	Defines the default graphical user interface application that users will see when they initially log into the system. To modify the first graphical user interface page that a user sees once logged in, select the appropriate application from the drop down list once you have completed engineering your Project.
Project Description	Defines a description of the system or project. The

	text defined here is placed in the title bar/tab of the desktop web browser used to view rich graphics.
Project Name	Defines the name of the project.

Expert Project Property Details

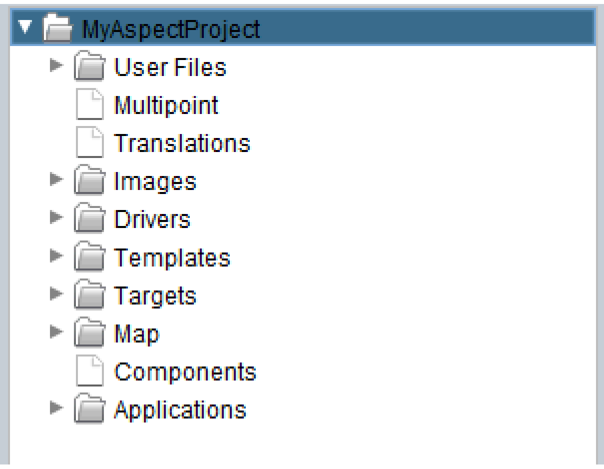
Expert Properties for a **Project** are defined in the following table below. These properties are typically only adjusted when advised so during troubleshooting with **ABB Cylon** Technical Services. For most scenarios, the following parameters should be considered optimal.

Property	Notes
Log Level	Defines the log level for this project. By default, this is set to 40000 and should not be changed unless otherwise directed to by AAM Technical Services.
Pup Thread Model	Defines if PUP based data is polled in a singular manner or shared manner. If done in a single manner, each point will be polled using its own system thread. When shared, common time bases will be grouped together on a single thread. This value is set to Single by default.
Shrink	Defines the shrink factor for the project. This is set to False and should not be changed unless otherwise directed to by AAM Technical Services.
BACnet Target Max	Defines the number of BACnet point elements that can be grouped together on a single thread. This is set to 25 by default.
BACnet Thread Load Factor	Defines the load factor for threading. This is set to 0.0050 by default and is optimal for most projects.
Map Point Target Max	Defines the number of Map point elements that can be grouped together on a single thread. This is set to 25 by default.
Map Point Thread Load Factor	Defines the load factor for threading. This is set to 0.0050 by default and is optimal for most projects.
PUP Target Max	Defines the number of PUP point elements that can be grouped together on a single thread. This is set to 25 by default.
PUP Thread Load	Defines the load factor for threading. This is set to

Factor	0.0050 by default and is optimal for most projects.
Schedule Target Max	Defines the number of Schedule elements that can be grouped together on a single thread. This is set to 25 by default.
Schedule Thread Load Factor	Defines the load factor for threading. This is set to 0.0050 by default and is optimal for most projects.
SDP Target Max	Defines the number of SDP point elements that can be grouped together on a single thread. This is set to 25 by default.
SDP Thread Load Factor	Defines the load factor for threading. This is set to 0.0050 by default and is optimal for most projects.
Global Thread Load Factor	Defines the load factor for all points for thread management. This is set to 0.02 by default and is considered optimal for most projects.

Project Tree Nodes

Each node in the Project Tree is intended to house a specific category ofitems that are used within the project. A description of each node and its intended use is given below.



Project Tree Node Details

Property	Notes
User Files	Used to create, import and store .properties files, which provide image references for graphic animations and other associated elements in the Applet view. This branch can also contain files that can be

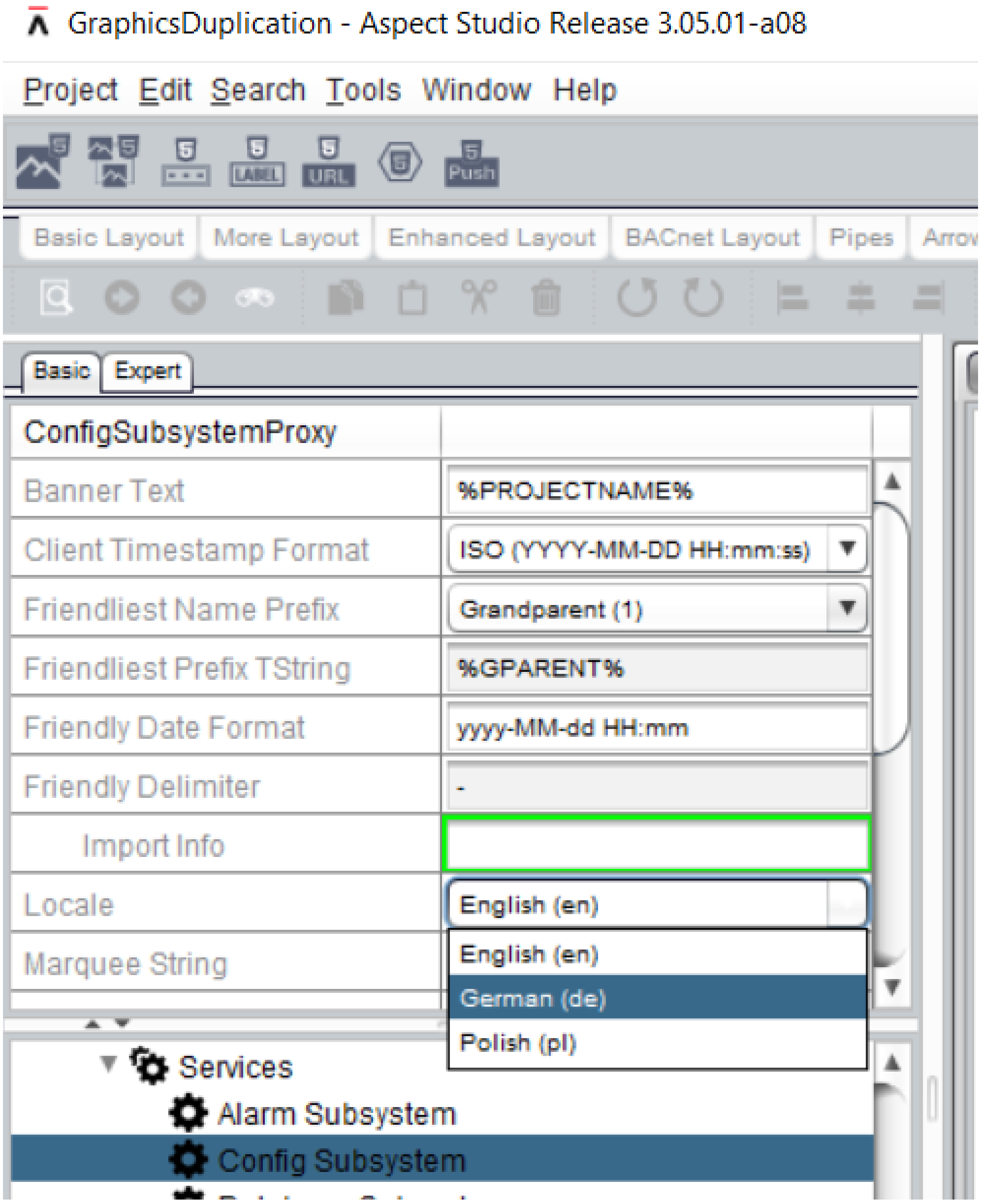
	downloaded from the system by an end-user - such as text based notes, documentation, and any other item you desire to make available. You can create new .properties files at any time by right-clicking this branch and selecting the New Properties File from the shortcut menu.
Multipoint	Used to create, import, and store definition files for use with stand alone BACnet Multi Point and PUP Multi Point elements for 1.x projects
Translations	Not currently used
Images	Used to import and store all graphic files used within a project that define the web user interface of your project. Image files supported by Aspect include PNG, GIF, and JPG/JPEG.
Drivers	Used to import additional drivers used within a project (such as third-party database drivers, etc.)
Templates	Used to define the HTML file template used by the applet view
Targets	Used to import and define the Aspect targets for project deployment
Map	Used to define and create all networks, devices, and points within the confines of your project. This area also serves as the main creation point for defining items for the dynamic HTML5 environment within Aspect.
Components	Used to create and define reusable applications for your project.
Applications	Used to create and define stand-alone or interacting applications for your project.

Internationalization and Localization Support

ASPECT-Studio can be used for project development in localized environments. ASPECT-Studio will start using the native locale as configured in Windows in supported locales.

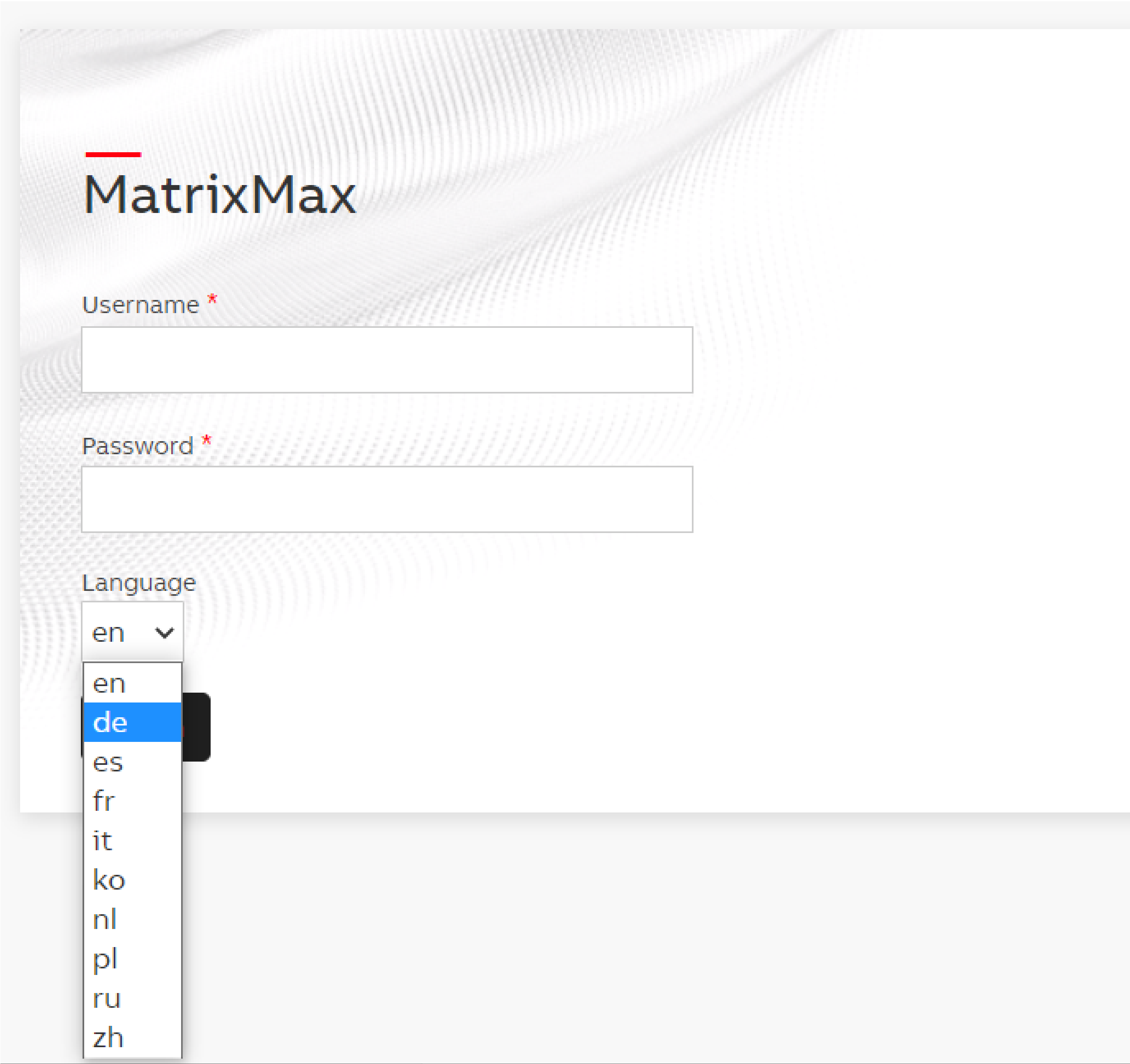
Aspect Target Internationalization Configuration

To configure an ASPECT target for a specific locale, go to the Basic tab of the Configuration Subsystem and select a locale for the target. This configuration option will allow server side strings like `Audit Trail`, `Alarm messages`, `Property labels` and `Tooltips` to be translated to the specified locale.

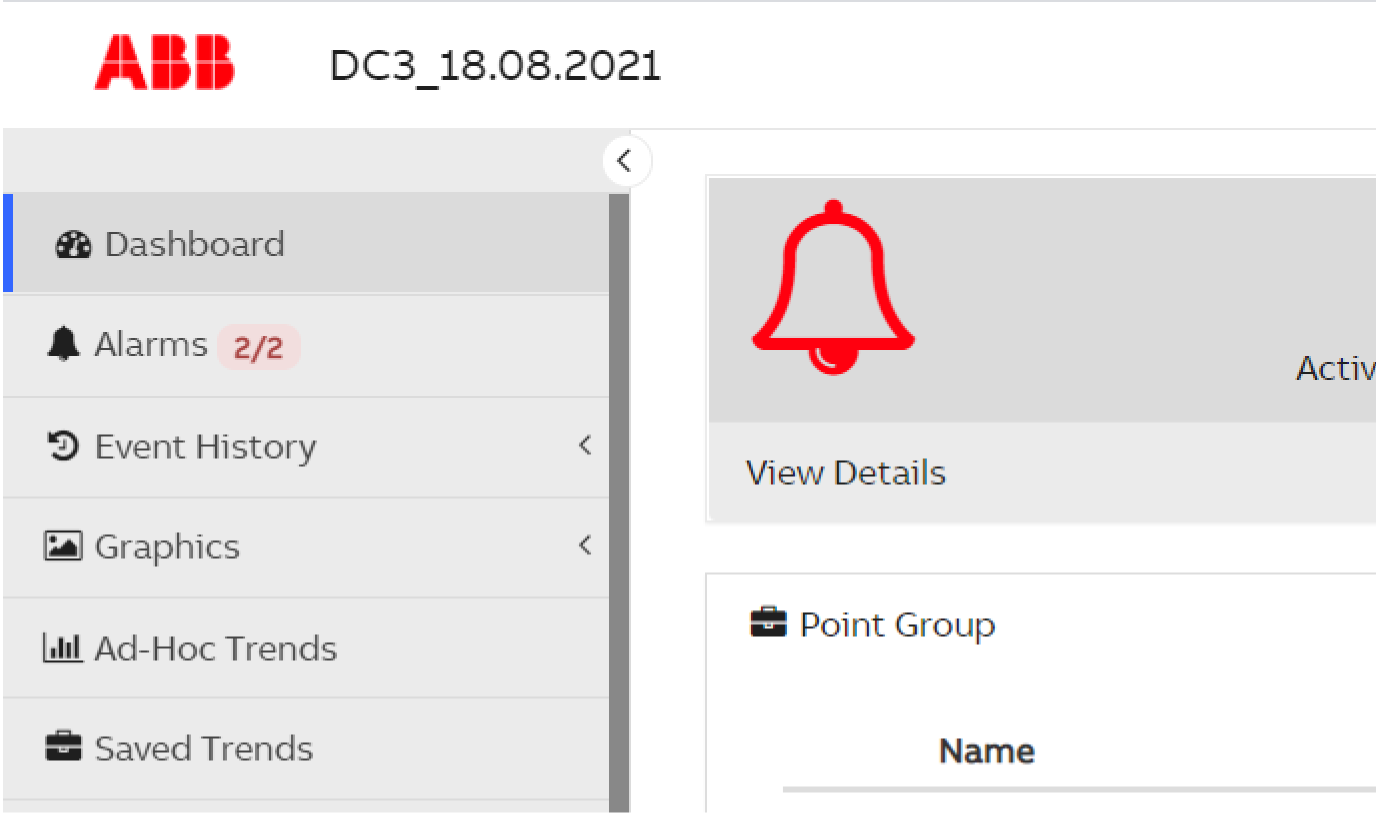


Control Engine Configuration and Visualization

ASPECT-Enterprise, NEXUS Series and MATRIX Series targets can also be dynamically configured to display strings in a selected locale when logged into the **Project Control Engine** Web UI interface ngAdmin. At the login screen the currently available locales are listed in a drop list menu and can be selected and remembered during the login process.



Locale selection can also be modified at any time during a login session. The selected locale will be remembered between sessions if the user returns to the site with the same browser and device.



ASPECT Concepts

Projects

A supervisory application in ASPECT is called a **Project**. All work within ASPECT centers around creation and configuring of **Projects**.

The ASPECT Map

A **Project** is centered around a **Map** that defines the configuration of the network, devices, and points to be used within the **Project**. It may also contain custom logic in the form of ASPECT **Applications**

More Information

Creating a Project

- Creating a Project
- Configuring Project Properties
- Understanding Project Tree Nodes

Defining Networks, Devices and Points

Reference Paths and Map References

Reference Paths, MapRefs, and TStrings

Map Reference (MapRef)

An AspectMapRef is a string that represents a reference to an object in the Map.

An example of a simple MapRef would be a ReferencePath such as:

{/C/Atl/Office/HVAC/ZoneTemp}

which would be used in a custom graphic to bind a widget to the point in the Map that contains its value.

If there is a context associated with a MapRef, then you can reference the parent, ancestor. child, or sibling based on that context. This is useful when creating for, example, an equipment detail graphic (such as VAV) that will be reused by many controllers, or used by a ghost point.

In addition, a MapRef can contain a mathematical expression that contains other MapRefs. This can be used, for example, to:

- subtract the values of a number of meters from the total meter to determine the unmetered load, or
- set point visibility based on a mathematical formula

MapRefs can be used within:

1. Point alarm source, delta and interlock
2. Point ranged status delta
3. Point conditional visibility
4. Ghost point reference (for value) or object reference (for property grabber)
5. Graphic Widgets (Annunciator, Image, Polygon, Button)
6. Notifier active schedule binding

MapRef Context

Some MapRef types require context, which a reference to another object in the map - typically either a point or a device (or other point container).

- In the case of a Map Graphic, the starting context is usually the device that contains the points.
- When dealing with properties of a point (alarm, visibility), the context is the point itself.

MapRef Types

The following concepts, known as “MapRef Types”, can be used within a MapRef :

1. **Map object path** (idPath or referencePath): the full reference path for a given object, beginning with /. For example: {/C/Atlanta/Office/AHU1} or {/C/1/2/3/4} or {/C/Atl/Office/HVAC/ZoneTemp}. A Map object path does not require context.

   Note: For the remainder of this list, all of the examples use {/C/Atlanta/Office/AHU1} as their context, which represents an Air-Handling Unit (i.e. a Device).
2. **Sibling**: the reference name of an object that resides in the same container. For example, a second AHU {/C/Atlanta/Office/AHU1}, which is a sibling of the context, could be referenced by the MapRef "{AHU2}" (the name of the object, without any path).
3. **Child**: an “@” followed by the reference name of an object that is the child of the context. For example the point {/C/Atlanta/Office/AHU1/ZoneTemp} could be referenced by the MapRef “ @ZoneTemp ” (the name of the object preceded by the @ character).
4. **Parent, Grandparent, Ancestor**: The parent of the context would be {/C/Atlanta/Office} (a network) and could be accessed by the

MapRef {../} . The grandparent of the context would be /C/Atlanta (a network group) and could be accessed by the MapRef {../../}.

5. **Self**: there may be applications where it is helpful to reference the context itself from within the context (e.g. a device's online status). This can be accessed by the MapRef {@} (the @ character by itself) or by the MapRef {./}.

MapRef Expressions

A MapRef can contain a mathematical expression that resolves to a number. If your MapRef is enclosed in parentheses () then it is assumed to be an expression (for details on MapRef Expressions see Working with the Map > Core Concepts > Reference Paths and Map References > Map Reference Expressions).

- The expression should always evaluate into a number. If there is an error, then the Value will be set to 0 but Quality will be set to bad.
- If the result of the expression is used in something that requires a boolean value (such as visibility or an alarm interlock), then 0 will represent False and anything else will represent True.

MapRef Property Grabber

Another highly useful form of MapRef is a MapRefProperty Grabber. This allows you to grab the value of any property of a Map object (node) for display. This is very similar in nature to the "Property Grabber" ghost point but can be used anywhere a MapRef or TString is supported.

The syntax for MapRefProperty Grabber is:

{grab: mapref|propname}

Where mapref is a MapRef as described above and propname is the exact name of the property as found by hovering over the property and finding the name located in square brackets and the end of its description. It is also possible to right-click on a property in Aspect Studio and select Copy Property ID.

Examples:

{grab:../../|DisplayName}

{grab:/C/Atl/Office/HVAC/ZT|AlarmTopOfBand}

Important Note: MapRef Property Grabbers always return the value as a **string**.

TStrings (Tokenized Strings)

Several fields in Aspect Studio can be filled using strings containing codes or “tokens” that resolve at runtime to numeric or string values. Such a string is referred to as a tokenized string (TString).

The settings in Aspect Studio where TStrings can be used are:

1. Annunciator MapRef/TString
2. Annunciator Label text
3. Button Text
4. Alarm Event Sentence (in Alarm Subsystem)
5. Marquee String (in Config Subsystem)
6. Audit and Map Event Sentences (Event Subsystem)
7. Startup Notification Message (Event Subsystem)
8. Alarm Description
9. Notifier Content

The tokens that can be used in a TString are:

- %VALUE%
- %DATE% (format as defined in ConfigSubsystem)
- %FRIENDLYDATE%
- %CUSTOMDATE%
- %DESC%
- %ACTIVE%
- %SOURCE%
- %USER%
- %PROJECTNAME%
- %ALARMCONFIG%
- %ACTIVEALARMS%
- %SITEID%
- %SITE%
- %SELF%
- %SELFREF%
- %PARENT%
- %PARENTREF%
- %GPARENT%
- %GPARENTREF%
- %GGPARENT%
- %GGPARENTREF%

Note: If a Token resolves to a MapRef, the TString will display the friendliest version possible of the value resolved by the MapRef.

Note: Some of these tokens are only meaningful in certain circumstances. For example:

- The object that contains the TString must be bound to a point that has an alarm if you are referencing alarm configuration.
- The object that contains the TString must be bound to a Map object if you are referencing lineage (self, parent, etc)

MapRefs inside TStrings

You can embed a MapRef inside a TString and the system will do its best to replace the MapRef with the friendliest version of the result.

If the MapRef resolves to an object in the map, you will get its friendly value.

If it resolves to a number (as it would if there was an expression in the MapRef), you will simply get the number without any pretty formatting or enumeration (if you want that you could instead put this expression in a ghost point which would leverage the formatting/enumeration that is a standard part of a Map point object.

Mapref & TString Caveats and Idiosyncrasies

- If you choose to reference a diagram element, some MapRefoperations may be invalid since diagram elements live outside the Map and therefore are not considered to have children, parents, or siblings (even though technically other elements with the same path are in fact siblings, this construct is not currently supported).
- You cannot use MapRef expressions inside a MapRef inside a TString.
- You cannot nest MapRef inside MapRefExpressions. Indirectly nesting MapRef via ghost points may or may not work depending upon the application. It is important that you confirm that every chain of MapRefs you use ultimately resolves to something appropriate for your application.

More Information

[Map Reference Expressions]

[Config Subsystem]

Ghost Points

Ghost points are a feature of an **"What is the "Aspect Node"?" on page 198** or **"What is the "Controllers Node"?" on page 113**. A point that is set as a **Ghost Point** behaves in the same way as other points, with one noticeable exception: it is not directly bound to a value in a controller or in an ASPECT application.

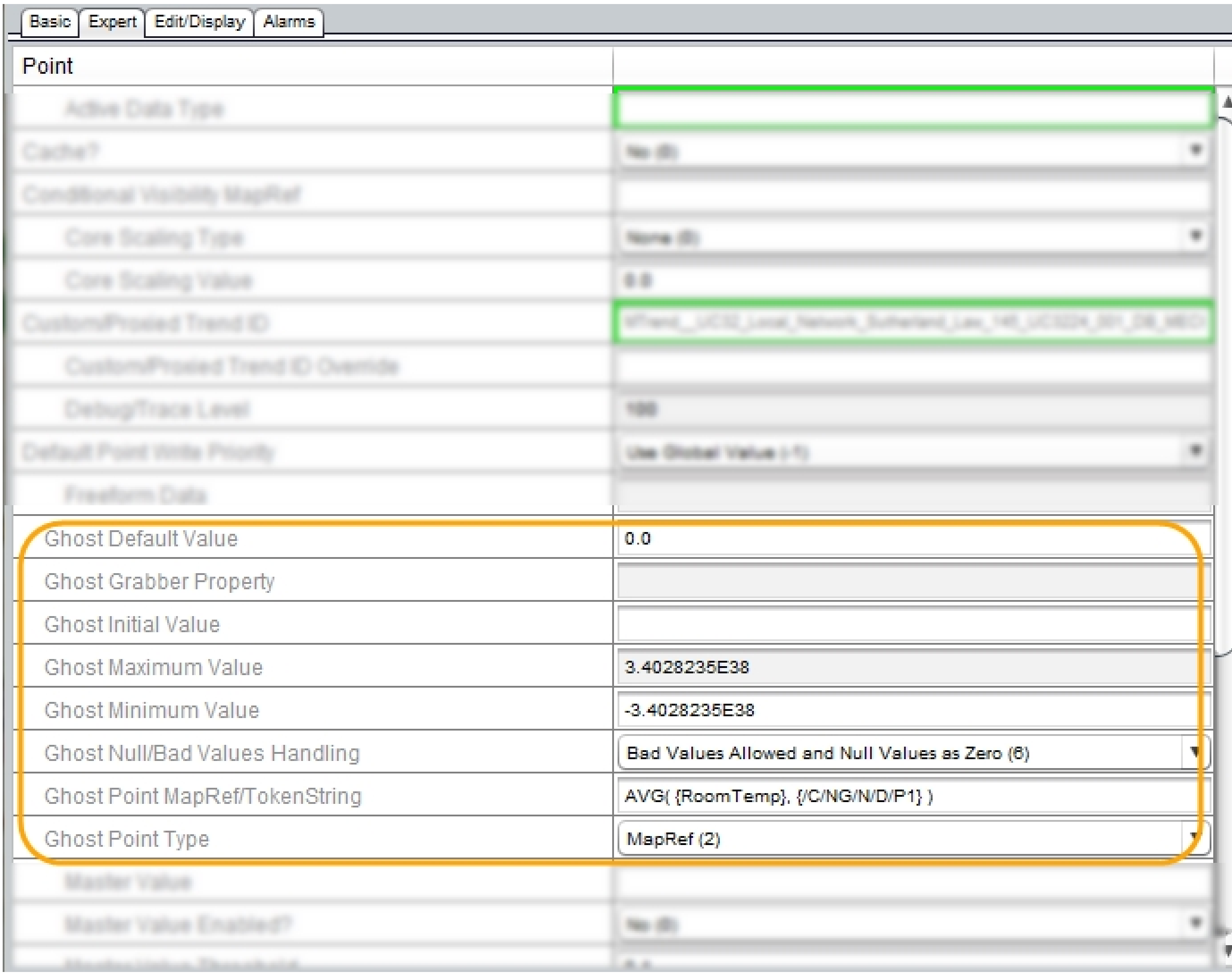
Unless specifically stated otherwise, **Ghost Points** may be treated exactly the same way as non-**Ghost** points.

Ghost Points Types

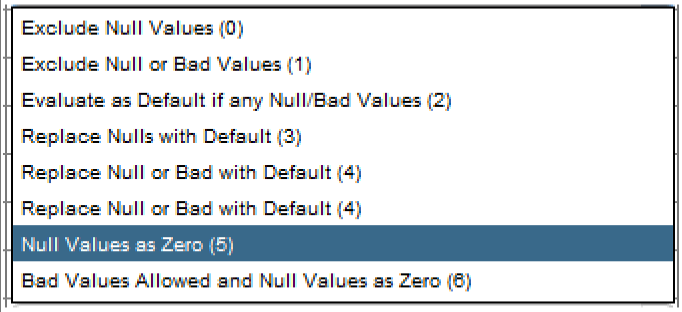
There are several different types of points that are considered Ghost Points. The Ghost Point Type selected determines which properties are active for a Ghost Point.

Type	Function
None	Not a **Ghost Point**
Persisted Via Registry	Similar to a persisted value block. Value is persisted in the Registry database.
MapRef	Reference the value of another map point - see "Map Reference Expressions" on page 51 for syntax.
PropertyGrabber	Uses a **MapRef** and a Property name to grab the value of a property of another map point
InitializedValue	Used to supply an initial value

Ghost Point Properties



Property	Function
Ghost Default Value	Two of the options for the Ghost Null/Bad Values Handling parameter below require a default value, in which case the value of this (Ghost Default Value) parameter is used. By default this value is set to 0.0.
Ghost Grabber Property	Used by points whose Ghost Point type property is set to PropertyGrabber type is selected, this field contains the property name to read from the point designated by the Ghost Point MapRef/Token String property.
Ghost Initial Value	Used by points whose Ghost Point type property is set to Persisted Via Registry or Initialized Value, this property defines the Value to which the point is set at first.
Ghost Maximum Value	If the **MapRef** or **Token String** resolves to a value more than this value, then this value is applied. By default this property is set

	to the maximum allowable value (3.4028235 x 10^{38}).
Ghost Minimum Value	If the **MapRef** or **Token String** resolves to a value less than this value, then this value is applied. By default this property is set to the minumum allowable value (-3.4028235 x 10^{38}).
Ghost Null/Bad Values Handling	If the **MapRef** or **Token String** resolves to NULL rather than a valid value, then the point value will be set as specified by this property.  By default this property is not set.
Ghost Point MapRef/Token String	Used by points whose Ghost Point type property is set to MapRef or PropertyGrabber, this property specifies either a **Reference Name** of a sibling point or a **Reference Path** to any point in the Map.
Ghost Point type	This property defines the function of the point, and determines which other **Ghost Point** properties are active for this Point. See section "Ghost Points Types" on page 48 for a list of options.

Sample Ghost Point usages

In many cases, simple scenarios can be addressed using **Ghost Points** alone, without any **Diagram logic**. For example:

- Add an *Outside Air Temperature* point to **Controllers** that do not physically have an *Outside Air Temperature* input using a MapRef **Ghost Point**
- Selectively expose **Alarm** Limits in a device without granting Configure permissions, using PropertyGrabber **Ghost Points**.
- Display a **Celsius** representation of a **Fahrenheit** setpoint using a relative MapRef **Ghost Point** with **Core** Scaling.
- Create a "**device**" entirely of **Ghost points**, to provide a *zone temperature* overview. (Note: it is best to do this in the Aspect node so that the "**device**" doesn't appear offline).

More Information

[Reference Paths and Map References](#)

[Map Reference Expressions](#)

Map Reference Expressions

What are MapRef Expressions?

A **MapRef** Expression is a type of **Ghost Point** that is defined by a formula. This formula can include

- the Raw Value of one or more **Map References** (including other **Ghost points**)
- and/or static values (e.g.({pointName} + 7))
- and a valid mathematical formula.

> **Note**: the full formula, including all of the above elements, must be enclosed in parenthesis, e.g. **(**ABS({CoolingSetpoint} – {ZoneTemp})**)**

What kinds of expressions are supported?

MapRef Expressions support a variety of mathematical functions as well as Mathematical Boolean and Logical operators. The list of currently supported operations is listed below:

Mathematical Operators

- +
- -
- *
- /
- %
- ^

Boolean Operators*

- =
- ==

- !=
- <>
- <
- <=
- >
- >=
- && (Boolean AND)
- || (Boolean OR)

*Boolean operators result always in a BigDecimal value of 1 or 0 (zero). Any non-zero value is treated as a true value. Boolean not is implemented by a function.

Logical Operators

- & (Logical AND)
- | (Logical OR)

Logical vs Boolean AND/OR (& vs && and | vs ||)

1||2 = 1.0 (representing boolean TRUE)

1|2 =3.00 (i.e. binary 01 | binary 10 = binary11)

1&&2 = 1.0 (representing boolean TRUE)

1&2 = 0.00 (i.e. binary 01 & binary 10 = binary 00)

78&&52 = 1.0 (representing boolean TRUE)

78&52 = 4.0 (i.e. binary 1001110 & binary 0110100 = binary 000100)

78||52 = 1.0 (representing boolean TRUE)

78|52 = 126.0 (i.e. binary 1001110 | binary 0110100 = binary 1111110)

Supported Functions

Function*	**Description**
NOT(*expression*)	Boolean negation, 1 (means true) if the expression is not zero
IF(*condition,value_if_true,value_if_false*)	Returns one value if the condition evaluates to true or the other if it evaluates to false
RANDOM()	Produces a random number between 0 and 1

MIN(*e1,e2, ...*)	Returns the smallest of the given expressions
MAX(*e1,e2, ...*)	Returns the biggest of the given expressions
AVG(*e1,e2, ...*)	Returns the Average (arithmetic mean) value of the given expressions
ABS(*expression*)	Returns the absolute (non-negative) value of the expression
ROUND(*expression*,precision)	Rounds a value to a certain number of digits, uses the current rounding mode
FLOOR(*expression*)	Rounds the value down to the nearest integer
CEILING(*expression*)	Rounds the value up to the nearest integer
LOG(*expression*)	Returns the natural logarithm (base e) of an expression
LOG10(*expression*)	Returns the common logarithm (base 10) of an expression
SQRT(*expression*)	Returns the square root of an expression
SIN(*expression*)	Returns the trigonometric sine of an angle (in degrees)
COS(*expression*)	Returns the trigonometric cosine of an angle (in degrees)
TAN(*expression*)	Returns the trigonometric tangens of an angle (in degrees)
ASIN(*expression*)	Returns the angle of asin (in degrees)
ACOS(*expression*)	Returns the angle of acos (in degrees)
ATAN(*expression*)	Returns the angle of atan (in degrees)
SINH(*expression*)	Returns the hyperbolic sine of a value
COSH(*expression*)	Returns the hyperbolic cosine of a value
TANH(*expression*)	Returns the hyperbolic tangens of a value
RAD(*expression*)	Converts an angle measured in degrees to an approximately equivalent angle measured in radians
DEG(*expression*)	Converts an angle measured in radians to an approximately equivalent angle measured in degrees

*Functions names are case insensitive.

Supported Constants

Constant	Description
PI	The value of *PI*, exact to 100 digits
TRUE	The value one
FALSE	The value zero

How are expressions constructed?

Building an expression is simple but there are a few simple rules to follow:

- Always enclose the entire expression in parentheses. Your expressions may contain nested parentheses within, but the entire expression must also be wrapped. This is the signal to the Aspect engine that it needs to check inside for items that may require evaluation.
- Always remember to observe the mathematical order of operations. When in doubt or performing a potentially ambiguous operation, it is safe to enclose that operation inside parentheses to ensure its evaluation order.
- Ghost Point that use a MapRef Expressions are never writeable by nature, even if permissions indicate they could be written.

To create an expression that uses ASPECT Values, select the element you wish to use as part of the **MapRef** Expression and copy either the `ReferenceName` (if a sibling element to the point that the expression belongs to) or the full Reference Path. Enclose that reference in “curly braces” ({}) and use it directly within the expression. Constant values do not need to be wrapped and may simply be used as-is.

The overall **MapRef** Expression must be enclosed in parenthesis

Examples:

`(ABS({CoolingSetpoint} - {ZoneTemp}))` would yield the absolute value of the difference between the Cooling Setpoint and the ZoneTemp within the same device

`(ABS({/A/DemoApp/OutsideAirTemp} - {ZoneTemp}))` would yield the absolute value of the difference between the ZoneTemp in the current device and the OutsideAirTemp in another ASPECT application

`(MAX({/A/AspectGroup/JimOffice/ZoneTemp},{/A/ AspectGroup/TonyOffice/ZoneTemp},{/A/ AspectGroup/DaveOffice/ZoneTemp}))` would yield the highest of the ZoneTemp values supplied in the `MAX` command.

When using Boolean expressions, be sure to set your point type as integer and supply enumeration values where appropriate, so that the user sees True or False rather than .0 or 1.0 in the following example:

```
({ZoneTemp} > {CoolSp})
```

Schedules

Schedule Overview

ASPECT Schedules allow a **Site** to react to Occupancy and other time-based criteria. They are independent objects (represented in the **Map>Schedules** node of the Project Tree on the left side of the ASPECT-Studio window) that can be ‘bound to’ one or more points – meaning that the value of all of those points is set to match the current value of the **Schedule** object, which varies depending on the current weekday, time and date.

In addition to the HTML5 UI, Aspect Schedules can be maintained by non-technical users through iCal and MS Exchange interfaces.

There are a number of different types of schedules within Aspect:

- Aspect Basic Schedules
- Aspect Calendars
- Aspect Weekly/Exception (combo) Schedule
- iCal (Google, CALdav etc.)
- Exchange

ASPECT **Weekly/Exception Schedules** and ASPECT **Calendar Schedules** exist entirely within the ASPECT system and require no outside network connections. They are ideal for ASPECT users that wish to leverage the existing ASPECT permission structures and have access to the schedule application available directly within the **HTML 5** interface.

ASPECT Basic Schedules can be used both for simple local scheduling and to interact with Unitron controllers.

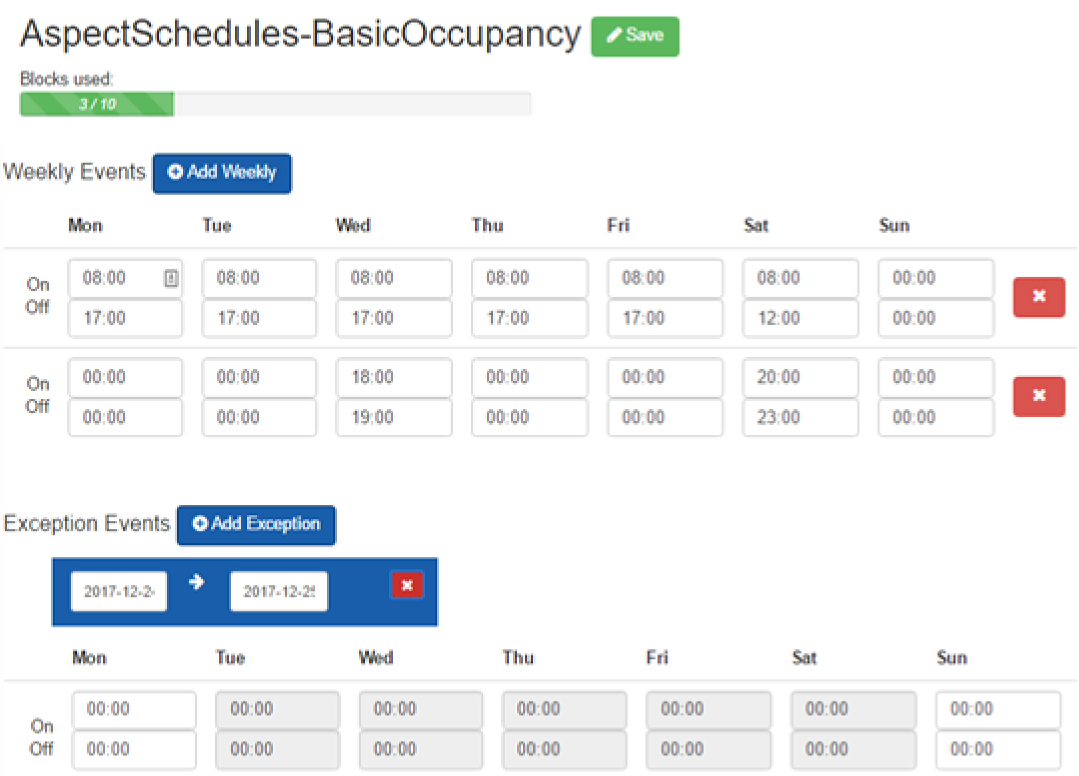
When used in a distributed system, where many **fieldbusses** or even **Sites** are supervised by a central ASPECT **Supervisor**, **Schedules** can be **Local**, **Distributed** or **Remote**.

- **Local Schedules** affect only the ASPECT device in which they are running

- **Distributed Schedules** are ‘bound to’ several points, some of which are in **Satellite** devices, potentially on Unitron or other **fieldbusses**. See Schedule Distribution (BACnet Schedules) for more information.
- **Remote Schedules** run in a **Satellite** device, but are represented in the **Supervisor’s**UI. When opened for editing in the**Supervisor**, the current configuration of the**Schedule**is uploaded from the **Satellite**. When the edit is complete, the edits are sent to the **Schedules** running in the **Satellite** and the updated **Schedule** is not retained in the **Supervisor**. It is recommended that **remote schedules** are set up using the **Satellite** Export and Import functions. However if you want to modify an existing import or create Remote Schedule point see "Remote Schedules – Manual configuration" on page 76.

Aspect Basic Schedule

ASPECT **Basic Schedules** provide core scheduling functionality without the complexity of ASPECT **ComboSchedules**, and while they are the simplest schedules resident in Aspect targets, they are often more than sufficient for many applications and their simplicity translates into ease of operation for end users. They are also 1-for-1 matches for Unitron **Comms Controller schedules**.



- An ASPECT **Basic Schedule**is made up of a fixed number of 10 Blocks (to match the Engineering Center default).

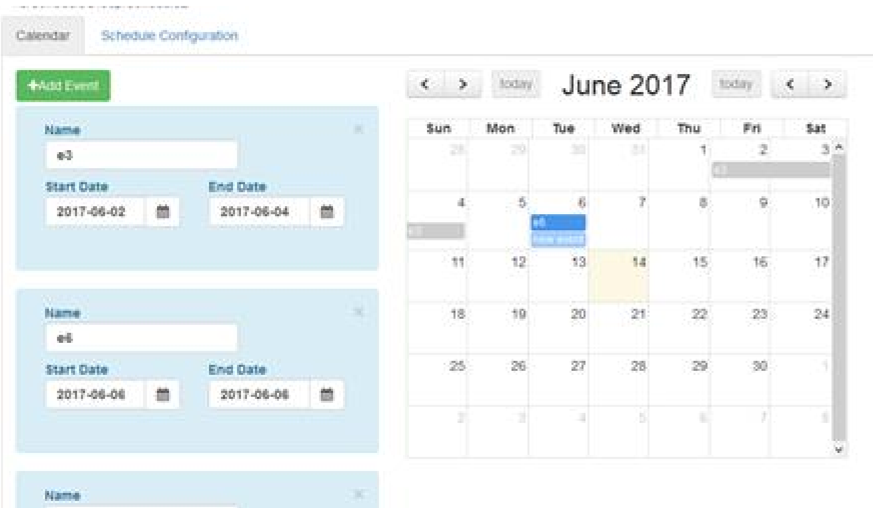
> **Note**: UnitronSchedulesare represented in Aspect as **Basic Schedules**, but the number of blocks for each is set in theUnitron**Comms Controller**.

- Each Block which contains a single ontime/offtime pair for each day of the week.
- Each block can have a different On time for each day of the week, and a different Offtime for each day of the week, but only oneOn time and one Off time per day.
- Each block can be used for either a Weekly event, or an Exception event.
- Exceptions have a start date and end date, and are active only during that date range.
- Weekly events apply at all times unless overridden by an exception.
- If any exception is active, then all weekly events are ignored.

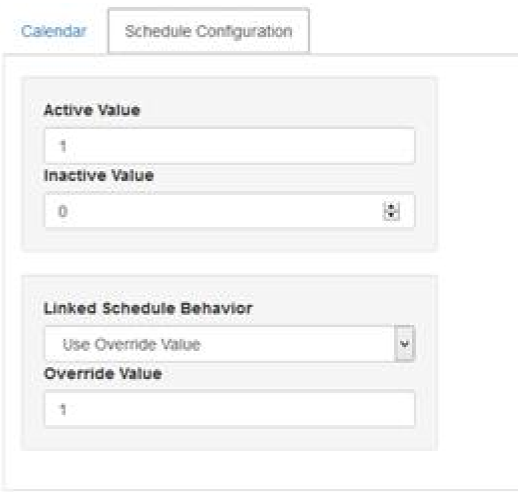
> **Note**: Basic Schedules do not accept input from other sources to modify their calculated state. All holidays must be programmed into *each* Basic schedule as exception events – linking an ASPECT Calendar to a Basic schedule has no effect on the Basic schedule’s output.

__Aspect Calendar Schedule__

An Aspect**Calendar Scheduleis a list of events, each of which sets a value between a Start Date**and an**End Date**:



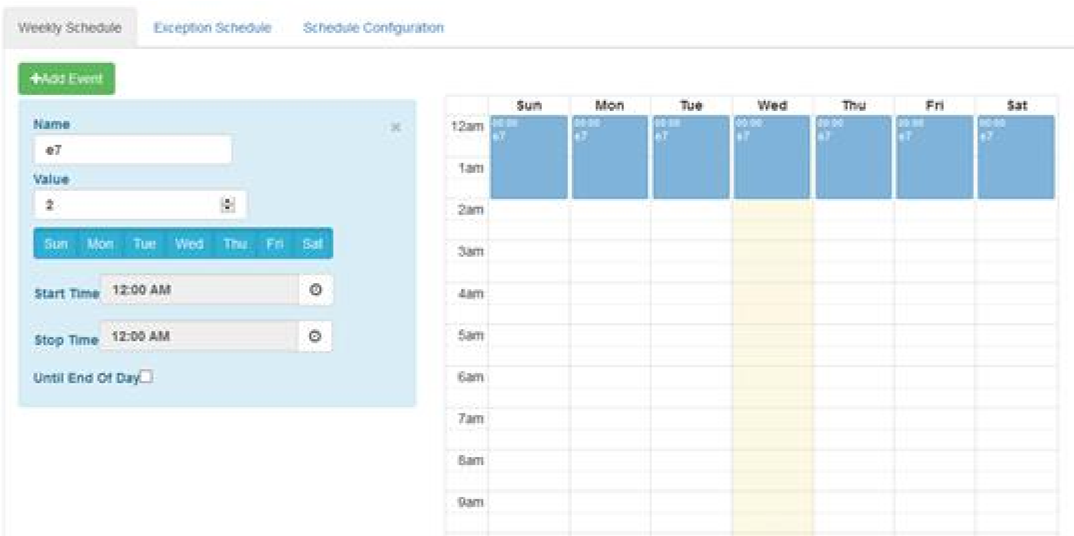
The values that will be set when any event is active or inactive must be specified in the **Schedule Configuration**:



Aspect Weekly/Exception ("Combo") Schedule

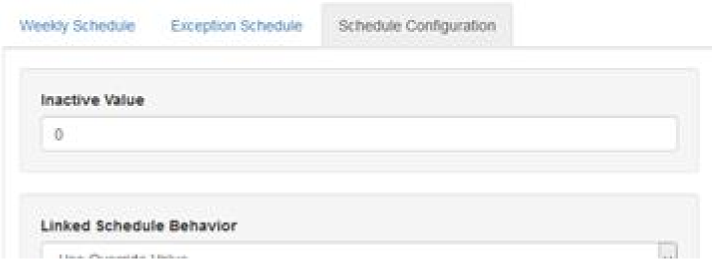
An ASPECT **Weekly/Exception Schedule**combines Weekly Schedule with an Exception Schedule.

The Weekly Schedule is a 7-day pattern of events, each of which sets a value between a Start Time and Stop Time:

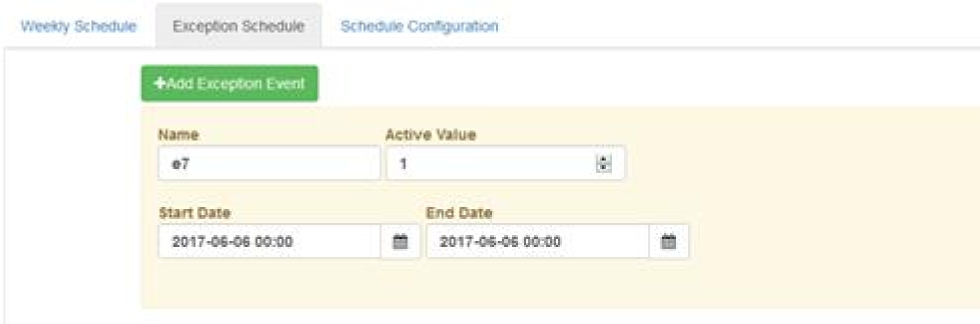


The value that will be set by the schedule when this event is active is set in the event itself (Value).

The value that will be set by the schedule when no event is inactive must be specified in the Schedule Configuration(Inactive Value):

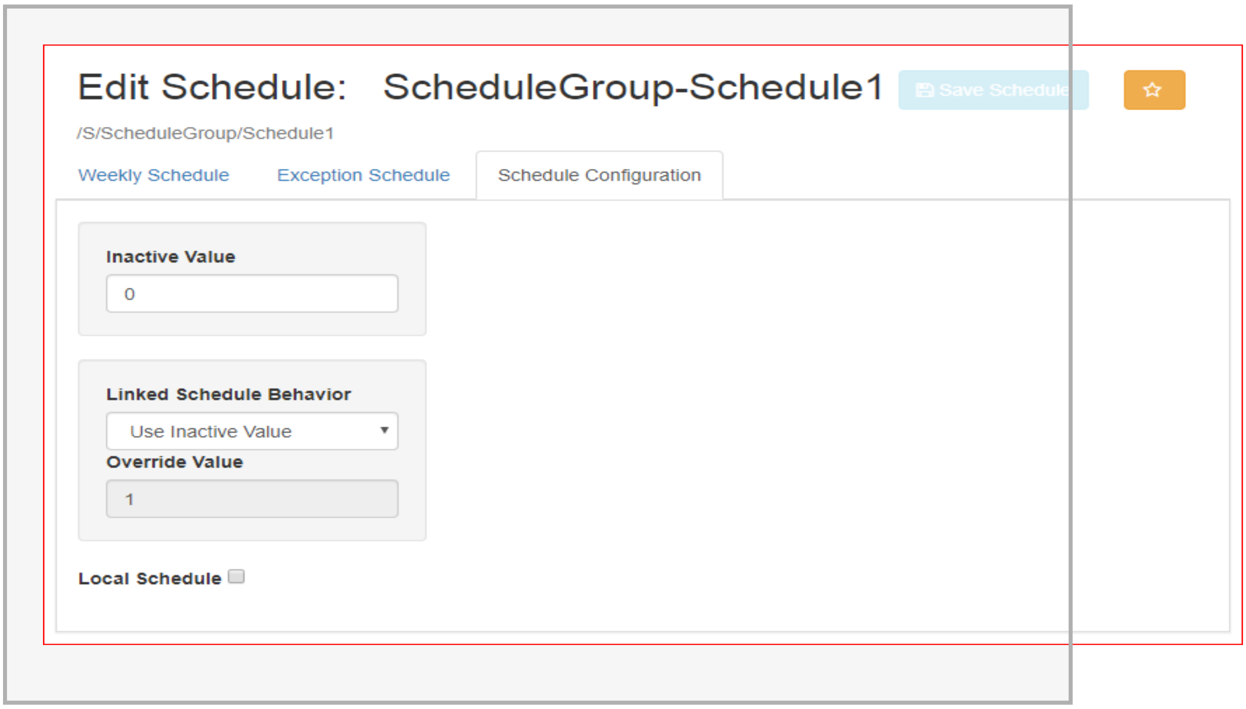


The Exception Schedule is a list of events, each of which sets a value between a Start Date and an End Date:



The value that will be set when the **Exception** event is active is set in the event itself (Active Value).

> **Note**: By default, ASPECT**Combo Schedules** are "distributable" - i.e. they can be deployed to **BACnet** devices as native **BACnet** schedules. In that configuration they allow a maximum of 15 Exception events, which is a restriction on many BACnet devices. If you require more **Exceptions** then a maximum of 45 **Exception** events is available by configuring the **Combo Schedule** as "Local", by checking the Local Schedule box on the Edit Schedule page. Please note that "Local Schedules" will run and output a present value but schedules in this configuration cannot be distributed to BACnet devices.

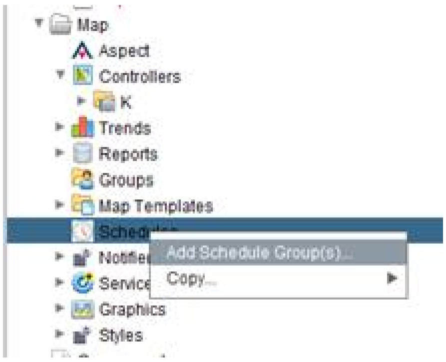


-

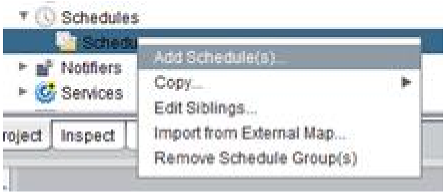
How to create an Aspect Schedule

Scheduleobjects are created in Aspect Studio, the **Project Tree**>**Map**>**Schedules**node.

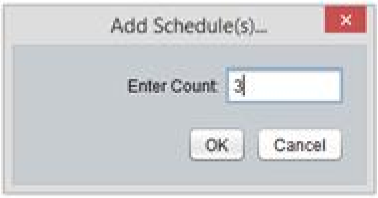
Schedulesmust be organized within **Schedule Groups, so if none exists, right-click on the**Schedules node and select **Add Schedule Group(s)...**:



Right-click on the newly-created **ScheduleGroup**and select**Add Schedule(s)...**:



Multiple Schedules can be created at once, so specify the number that you would like to create:



You can set names for the added Schedule objects by setting the **Basic Tab** > Friendly Name (you cannot edit **Display Name** directly):

For each Schedule object, you must specify whether it will be Basic, Calendar, Combo or other type of object:

-

Configuring Aspect Schedule Objects

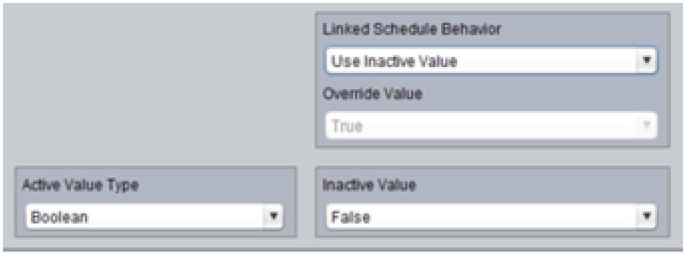
Once the Schedule Type has been set, you can configure each of the schedules by clicking the **Basic**>**Aspect Schedule** > **Configure**button:

The configuration of each type is described in the following sections.

Configuring an Aspect Weekly/Exception (combo) Schedule

The Aspect Schedule dialog box is opened when the **Basic**>**Aspect Schedule** > **Configure**button is clicked, and is divided into 2 sections,**Schedule Configuration**and a tabbed panel. The tabbed panel contains tabs for**Weekly Schedule**,**Alternate Schedule** and **Exception Schedule.**

Schedule Configuration



This section determines the overall behavior of the schedule, including what happens when an override is active.

Inactive Value: the value of the schedule when no events are active

Override Value: the value of the schedule if the override type is “Active" and the schedule is being overridden (typically by a calendar but could be by anything driving the schedule input)

Linked Schedule Behavior. Defines how the schedule behaves when an override is active (something is writing the input with a non-zero value):

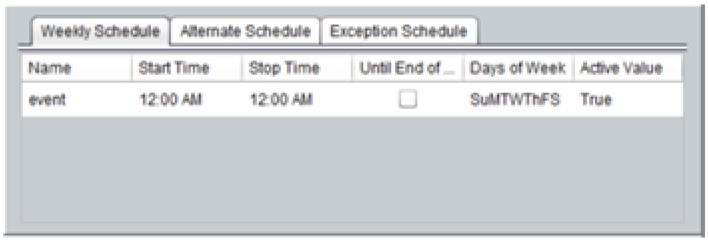
o Normal Operation (currently “Disabled"): if the override is active then use the alternate schedule

o Inactive: if the override is active, force the schedule to an inactive value

o User Override Value (currently “Active"): if the override is active, force the schedule to the Override Value defined above.

Active Value Type: Defines the datatype of the schedule, when distributing the schedule to BACnet Schedules this must match the datatype of the BACnet Schedule. The BACnet schedule type can be verified by reading the schedule default property located in the associated BACnet Schedule Object.

Weekly Schedule



This section of the dialog allows you to create events, each with an ontime/offtime pair, than can be active for any or all days of the week.

Prioritization for overlapping events:

1.Event with the latest start time

2.If start times are equal, the event with the earliest stop time takes priority

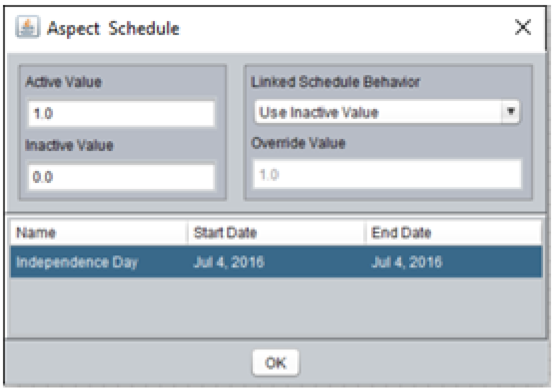
Alternate Schedule

Same as weekly schedule. Activated if the “Override Type" is set to “Normal" (currently called “Disabled")

Exception Schedule

Top priority other than override – if an exception is active then its value is the output value for the schedule.

Configuring an Aspect Calendar Schedule



Determines the overall behavior of the calendar schedule, including what happens when anoverride is active.

1.**Inactive Value:** the value of the schedule when no events are active.

2.**Active Value**: the value of the schedule when there is an active event.

3.Override Value: the value of the schedule if the override type is “Active" and the schedule is being overridden (typically by another calendar but could be by anything driving the schedule input)

4.Linked Schedule Behavior. Defines how the schedule behaves when an override is active (something is writing the input with a non-zero value):

o Use Active Value: if the override is active, force the schedule to the Override Value defined above (same behavior as “Override Value" because this is really the norm).

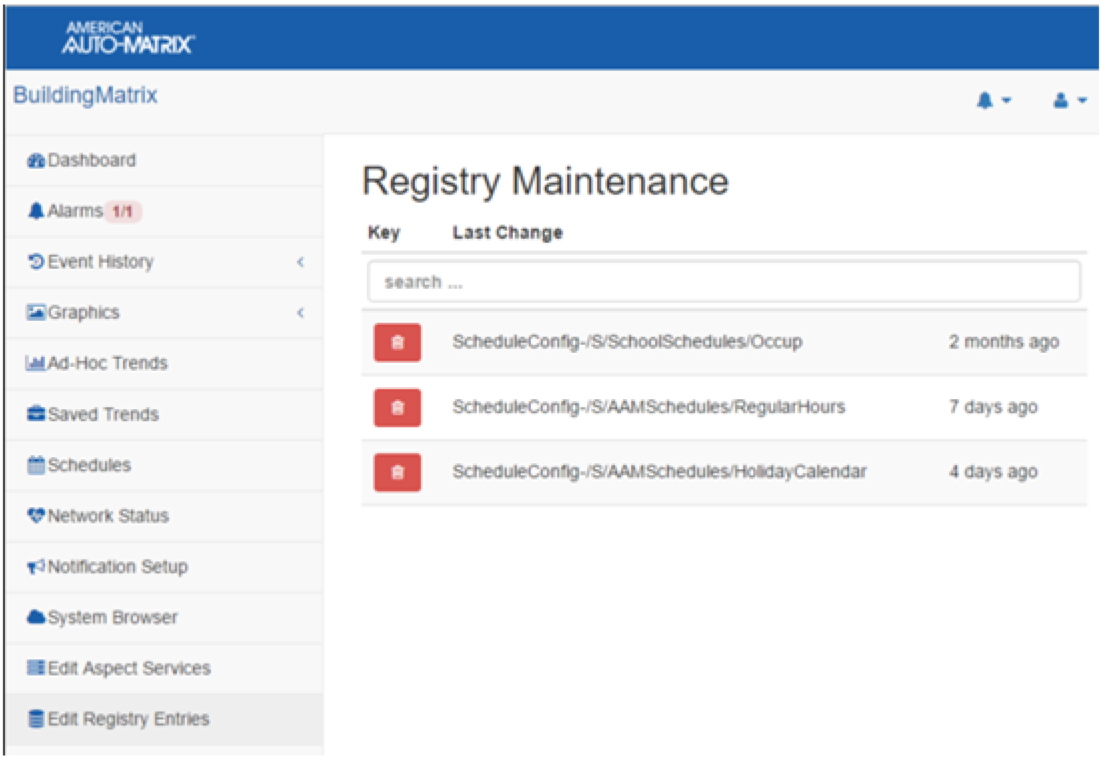
o Inactive: if the override is active, force the schedule to an inactive value.

o User Override Value: if the override is active, force the schedule to the Override Value defined above.

Schedule Persistence

Once a deployed **Schedule** or **Calendar** is modified from the HTML5 UI, the modified **Schedule/Calendar** will be persisted via the registry so that future deployments do not affect **schedules**that were modified by the end users. This feature maintains all modifications through system restarts as well as project deployments.

In some cases there may be instances where you want to remove the stored **Schedule/Calendar**, this can be done via the**Edit Registry Entries**option within the HTML5 UI.



Schedule Distribution

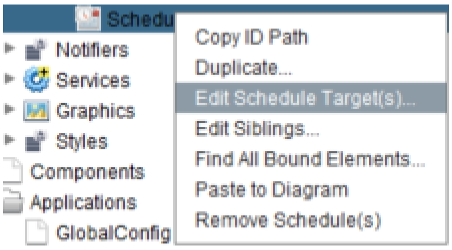
BACnet Schedules

When Aspect**Schedules** are associated with **BACnetschedulesthen the schedules will be distributed to the controllers so that they can work in the event that the front end is offline or down for maintenance.**

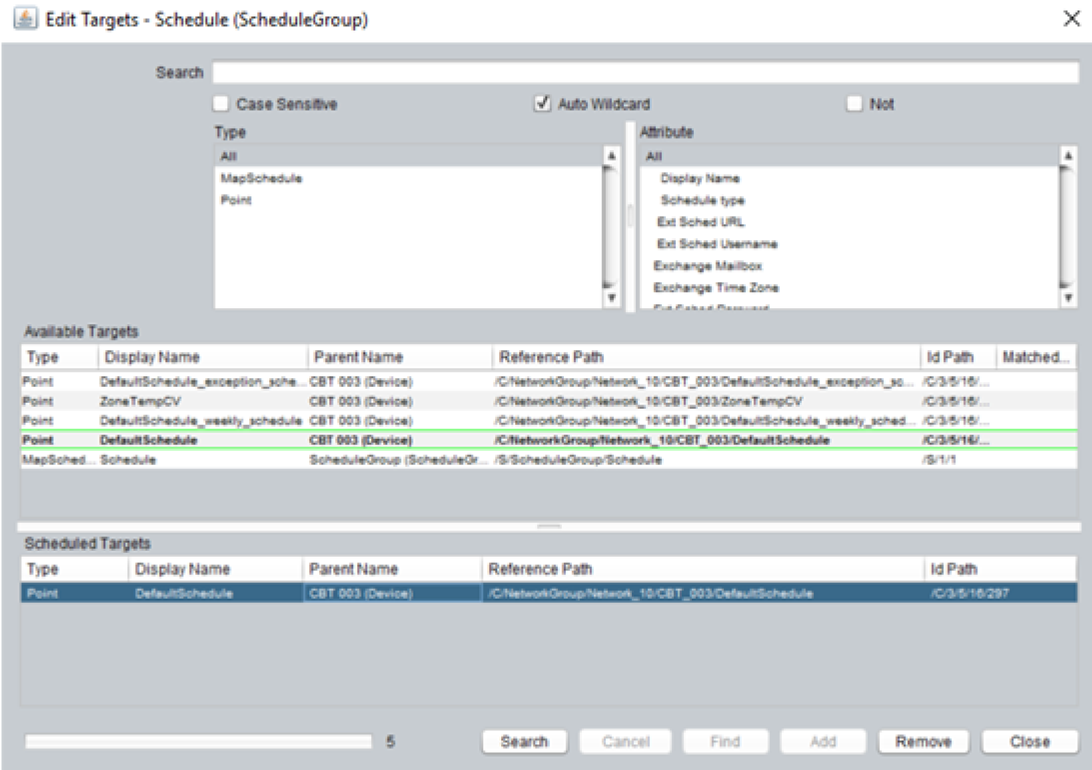
Before starting on this topic please see the Discovering Schedule Points Topic as there are some prerequisites. Schedules will only be written if “Always Trend, Alarm, Distribute" is set to True or the Trend/Alarm/Distribute from Instance and Target are both configured to match the target when deployed. This can be set under the **Basic**properties of the Map.

In order to write a schedule to the proper device, the schedule and device point must be linked as follows:

1. Right-click on the **Schedule**in the**Map** and select Edit Schedule Target(s)....



2. The **Edit Targets** window will be displayed, but will be empty. Click **Search**to discover target options. Under**Available Targets**, double-click the wanted target and it will appear in the **Scheduled Targets**textbox. Then click**close**.



Note: It is only necessary to select the **present-value** point as the target. With this selected as the target, both the **weekly-schedules** and **exception-schedules**can be written and manipulated at any point.

The schedule is now linked to the device point. It is important to check and make sure there is at least one underlined point under the device to verify the target was successful.

After verification, a schedule can now be written to the device point. While events can be written at this time, it is necessary to check the **Data Type** options under the **Basic**tab when the **present-value**, **exception**, and **weekly**schedules are highlighted.

Table 1: Data Types for Scheduling

Present-Value	Distributed Schedule
Exception	BACnet Exception Schedule

Weekly	BACnet Weekly Schedule-Full

Write to Point in controller

When Aspect**Schedulesare configured to have a target of** Any Point then the present value of the schedule will be sent.

In some cases the **controller** may not support a **BACnet Schedule** and you may need to just set the **schedule** status to any point in the **controller**, including non-**BACnet** points. However it is possible that his configuration can be set but the front end is offline. In that case the **schedule** change will not make it to the controller. **Schedules**will only be written if " **Always Trend, Alarm, Distribute**" is set to True or the Trend/Alarm/Distribute from Instance and Target are both configured to match the target when deployed. This can be set under the basic properties of the Map.

In order to write a schedule to the proper device, the schedule and device point must be linked as follows:

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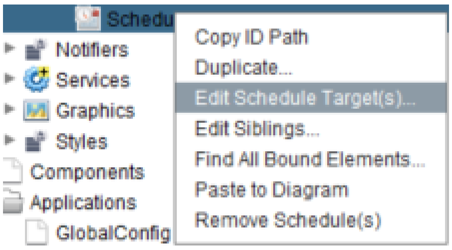

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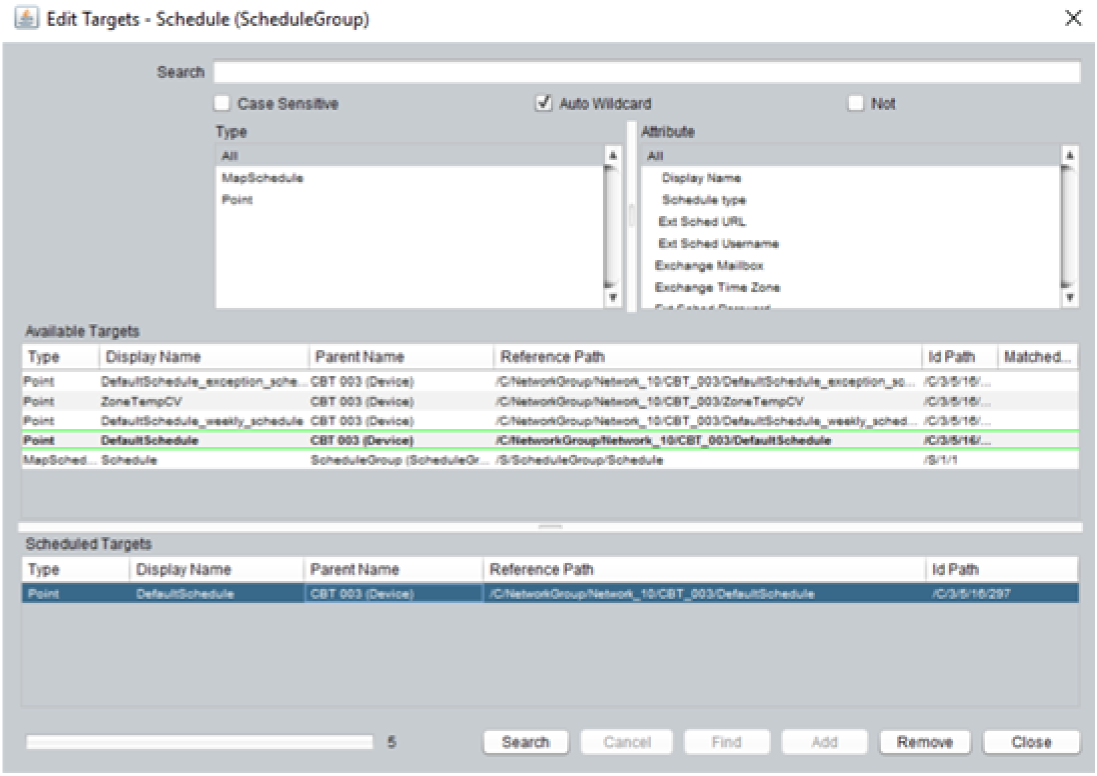


Note: It is only necessary to select the **present-value** point as the target. With this selected as the target, both the **weekly-schedules** and **exception-schedules**can be written and manipulated at any point.

The schedule is now linked to the device point. It is important to check and make sure there is at least one underlined point under the device to verify the target was successful.

After verification, a schedule can now be written to the device point.

Remote Schedules – Manual configuration

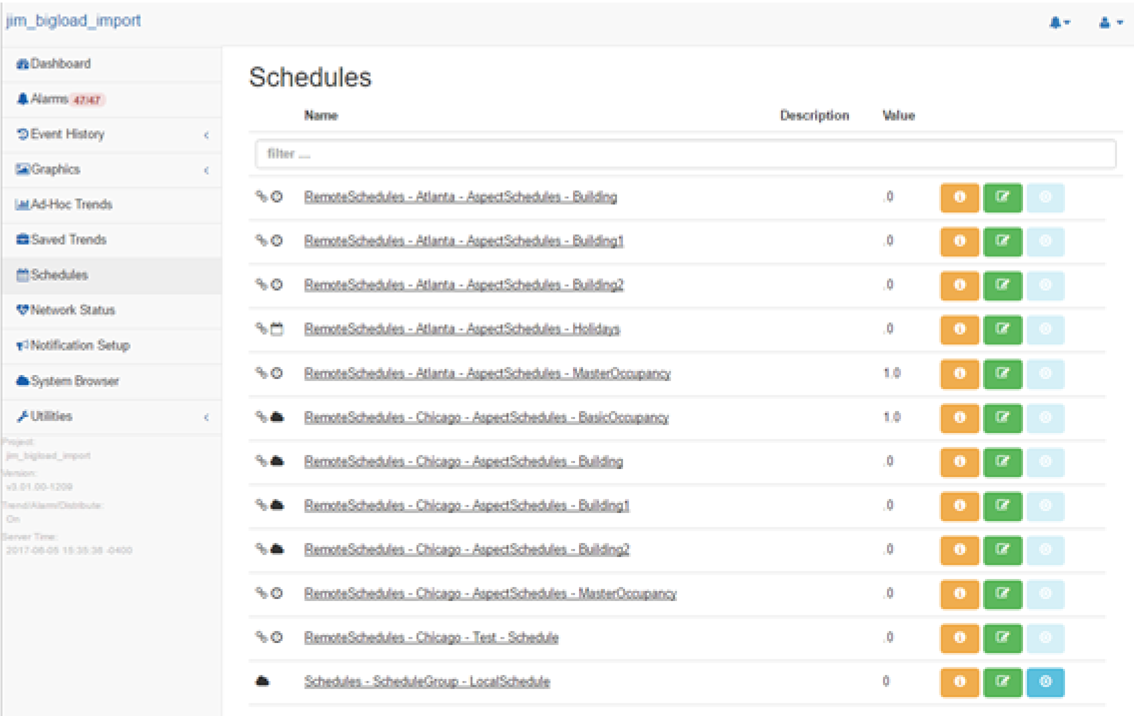
Remote Schedules allow **Schedule**data to be presented centrally, without the user having to know exactly where the data is located.

Remote Schedulesrun in a**Satellite**device, but are represented in the**Super-visor's**UI. When opened for editing in the**Supervisor**, the current state of the**Schedule**is uploaded from the**Satellite**. When the edit is complete, the edits are sent to the**Schedules**running in the Satellite and the updated**Schedule**is not retained in the**Supervisor**.

The easiest way to set up remote schedules is using the Satellite Export and Import functions. However if you want to modify an existing import or create **Remote Schedulepoint from scratch the following configuration information will show you how.**

Presentation

Points that are configured as **Remote Schedules**The only difference the end-user sees is a link next to the schedule. They are available as bulk change sources (if configured) as well as bulk change targets. will appear in the H5 UI as if they are locally resident schedules.



Configuration

Point Configuration

Remote schedulesare created by configuring a point (**NetworkPoint**) within a **Controller**. The **controller**should be configured to communicate with a remote device via a network that supports remote schedules (3.01.xx supports Unitron and eMap, 3.02.xx adds support for BACnet).

The following **NetworkPoint** properties must be set for **remote schedulingNote that in some cases the configuration differs depending upon the protocol: to work properly.**

1.**DataType**– must be set to the appropriate matchingSchedule **Type**that is being referenced in the remote device. In the case of **Aspect Combo schedules** via **eMaptype.** ***data*** **, you must also match the remote**

o Remote **Basic Schedule** – used for **Basic schedules, either**Aspect or Unitron (on/off)

o Remote **Aspect Combo Schedule[bool] – used for Boolean (on/off) Combo schedules**

o Remote **Aspect Combo Schedule[int/enum] – used for integer or enumerated (unoccupied, warmup, occupied, setback) Combo schedules**

o Remote **Aspect Combo Schedule[float] – used for floating point (setpoint based) Combo schedules**

o Remote **Aspect Calendar** – used for **Aspect Calendars(on/off)**

2.**NetworkProperty**– Binds this point to the remote object from which it will get both its current value and the schedule configuration.

· eMap uses standard eMap network property reference: @<path>. Example:

@/S/ASPECTSCHEDULES/BUILDING

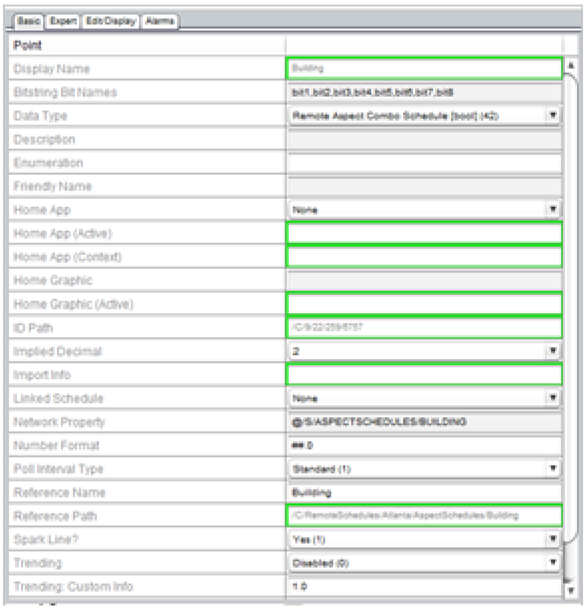
· Unitron uses a reference in the format

s:3:1:10

wheres indicates that this is a **Schedule**object, 3indicated that it is Schedule no. 3, and1:10 refers to block 1 -> 10

3.**Linked Schedule** – SHOULD BE “None". It is not meaningful to have a linked schedule for a remote schedule, as all linking must be local. If this property is configured as anything other than “None" it will be ignored.

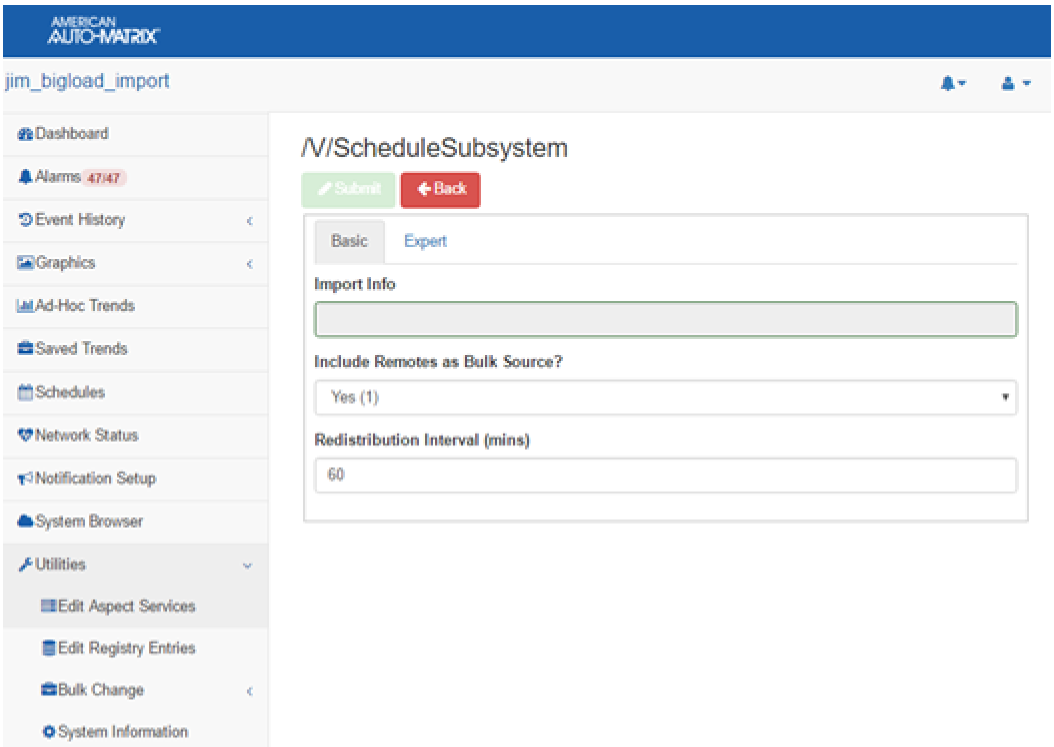
It is recommended that you **cache/sparkline**linked schedules (at a minimum) and probably trend them as well.



Global Configuration

In a large distributed system there may be 1000s of schedules distributed throughout 100s (or 1000s) of sites. In most cases, it is preferable to use only local schedules as bulk change sources. This is the default setting.

If you would like all remote schedules to be included as bulk change sources, change the “Include Rewmotes as Bulk Source?" option toYes. This is located in**Utilities**>**Edit Aspect Services** > **Schedule Subsystem.**



BACnet Schedules (Distributed Schedules)

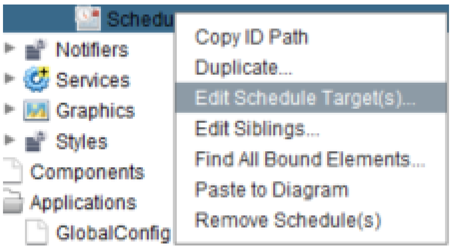
When ASPECT **Schedules** are associated with **BACnetschedules** then the schedules will be distributed to the controllers so that they can work in the event that the front end is offline or down for maintenance. This is the default configuration for ASPECT Combo Schedules .

> **Note**: Distributed Schedules support up to a maximum of 15 Exception events.

Before starting on this topic please read Discovering Schedule Points, as there are some prerequisites. Schedules will only be written if "Always Trend, Alarm, Distribute" is set to True or the Trend/Alarm/Distribute from Instance and Target are both configured to match the target when deployed. This can be set under the Basicproperties of the Map.

In order to write a schedule to the proper device, the schedule and device point must be linked as follows:

1. Right-click on the **Schedule**in the**Map** and select Edit Schedule Target(s)....



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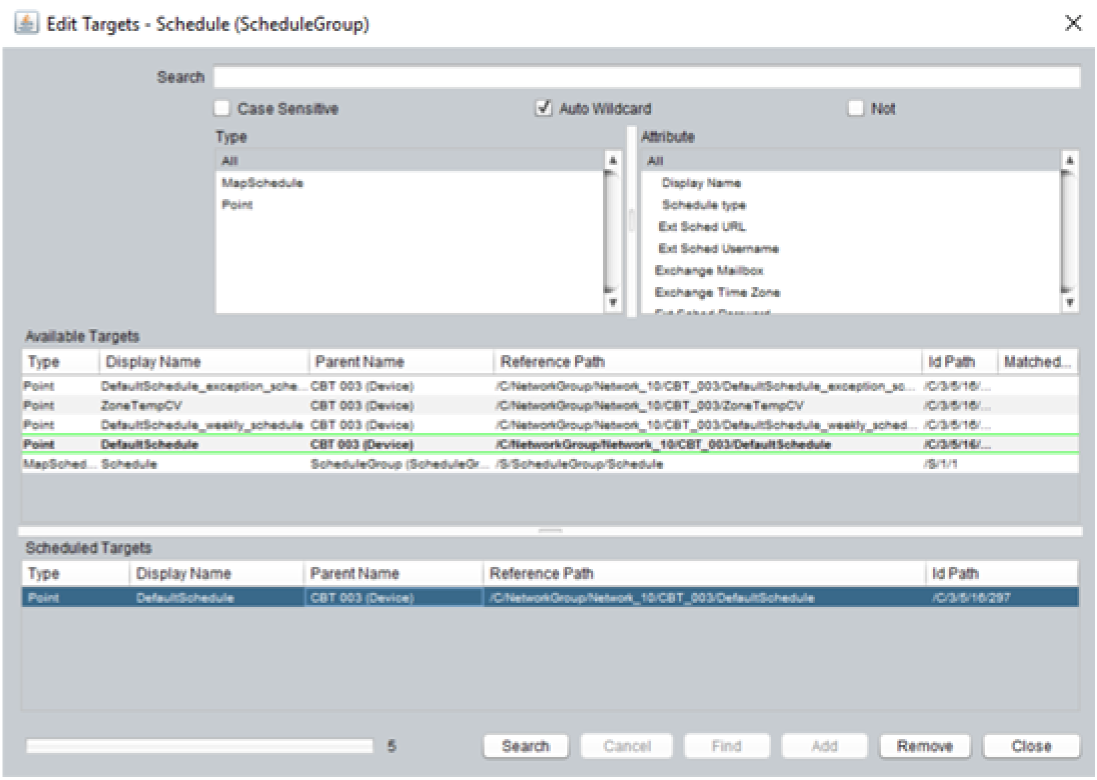

> **Note**: It is only necessary to select the **present-value** point as the target. With this selected as the target, both the **weekly-schedules** and **exception-schedules**can be written and manipulated at any point.

The schedule is now linked to the device point. It is important to check and make sure there is at least one underlined point under the device to verify the target was successful.

After verification, a schedule can now be written to the device point. While events can be written at this time, it is necessary to check the Data Type options under the Basic tab when the present-value, **exception**, and **weekly** schedules are highlighted.

Table 1: Data Types for Scheduling

Present-Value	Distributed Schedule
Exception	BACnet Exception Schedule
Weekly	BACnet Weekly Schedule-

	Full

Write to Point in controller

When ASPECT **Schedulesare configured to have a target of** Any Point then the present value of the schedule will be sent.

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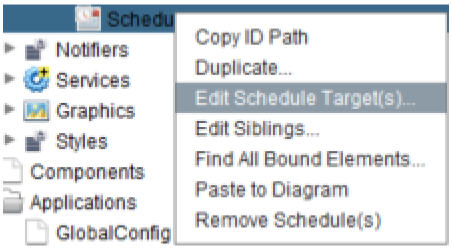

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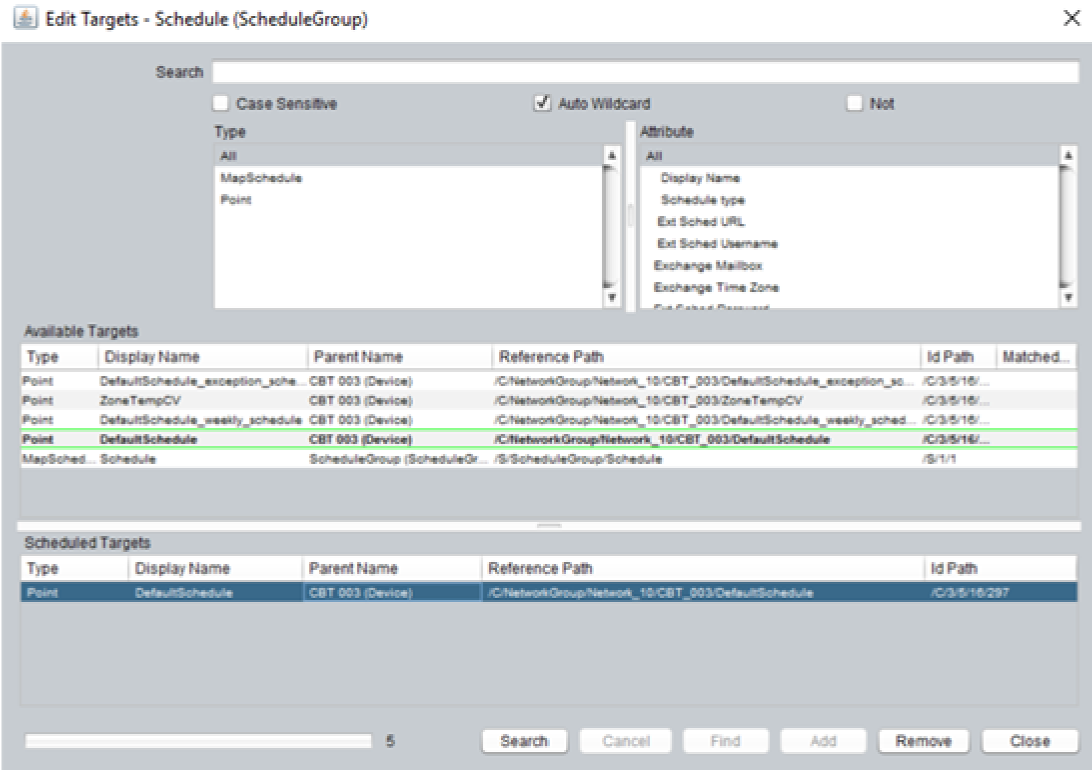

> **Note**: It is only necessary to select the present-value point as the target. With this selected as the target, both the **weekly-schedules** and **Exception-schedules** can be written and manipulated at any point.

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Remote Schedules – Manual configuration

Remote Schedules allow **Schedule** data to be presented centrally, without the user having to know exactly where the data is located.

Remote Schedules run in a **Satellite** device, but are represented in the **Supervisor's** UI. When opened for editing in the **Supervisor**, the current state of the **Schedule** is uploaded from the **Satellite**. When the edit is complete, the edits are sent to the **Schedules** running in the Satellite and the updated **Schedule** is not retained in the **Supervisor**.

The easiest way to set up remote schedules is using the Satellite Export and Import functions. However if you want to modify an existing import or create **Remote Schedulepoint from scratch the following configuration information will show you how.**

Presentation

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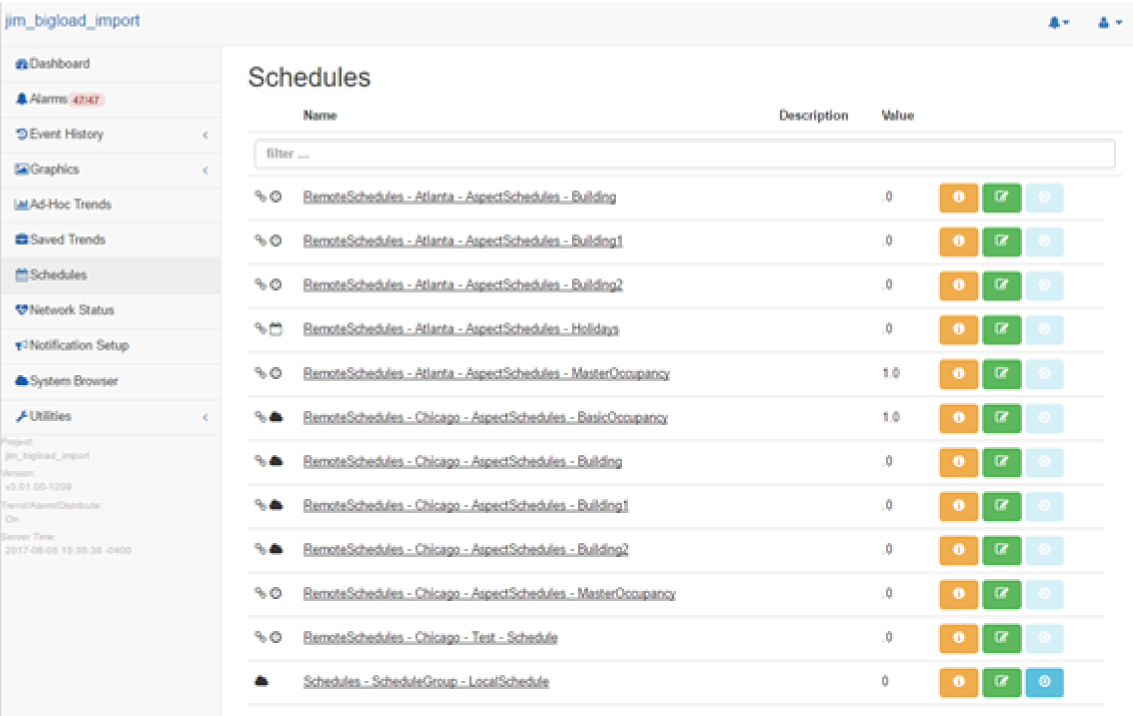


Configuration

Point Configuration

Remote schedules are created by configuring a point (**NetworkPoint**) within a **Controller**. The **controller** should be configured to communicate with a remote device via a network that supports remote schedules (3.01.xx supports Unitron and eMap, 3.02.xx adds support for BACnet).

The following **NetworkPoint** properties must be set for **Remote scheduling**:

1.DataType– must be set to the appropriate matchingSchedule **Type**that is being referenced in the remote device. In the case of **ú** via **eMap**type. *data* , you must also match the remote o Remote **Basic Schedule** – used for **Basic schedules**, either Aspect or Unitron (on/off)

o Remote **Aspect Combo Schedule**[bool] – used for Boolean (on/off) Combo schedules

o Remote **Aspect Combo Schedule**[int/enum] – used for integer or enumerated (unoccupied, warmup, occupied, setback) Combo schedules

Remote **Aspect Combo Schedule**[float] – used for floating point (setpoint based) Combo schedules

o Remote **Aspect Calendar** – used for **Aspect Calendars**(on/off)

2.**NetworkProperty**– Binds this point to the remote object from which it will get both its current value and the schedule configuration.

· eMap uses standard eMap network property reference: @<path>. Example:

```
@/S/ASPECTSCHEDULES/BUILDING
```

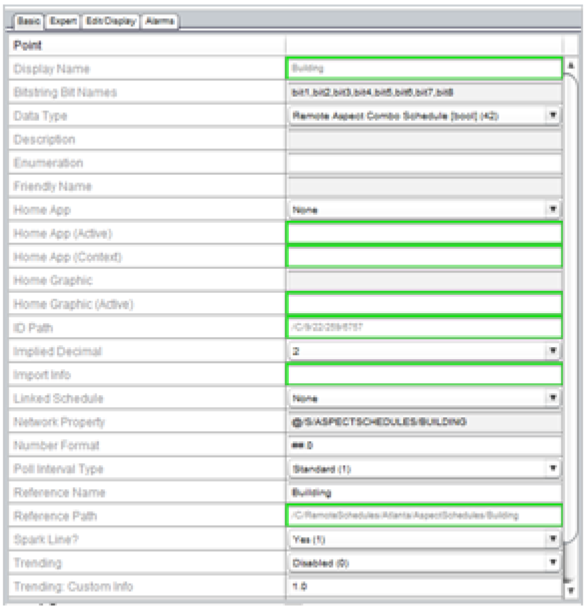
· Unitron uses a reference in the format

```
s:3:1:10
```

wheres indicates that this is a **Schedule**object, 3indicated that it is Schedule no. 3, and1:10 refers to block 1 -> 10

3.**Linked Schedule** – SHOULD BE “None". It is not meaningful to have a linked schedule for a remote schedule, as all linking must be local. If this property is configured as anything other than “None" it will be ignored.

It is recommended that you **cache/sparkline** linked schedules (at a minimum) and probably trend them as well.



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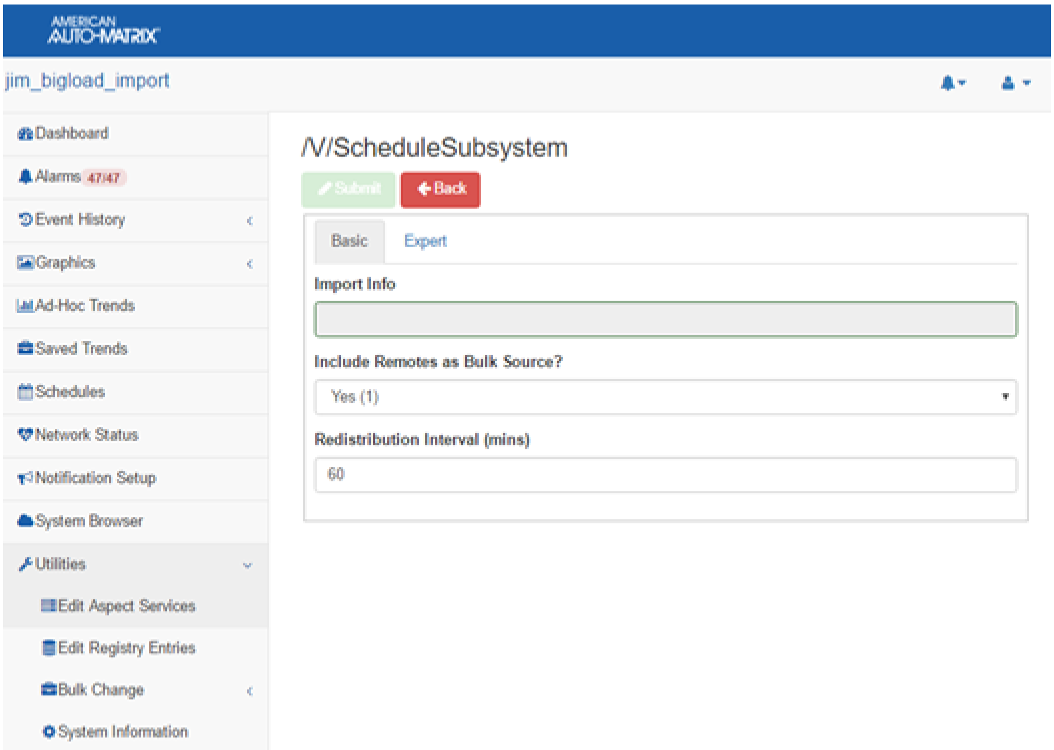
If you would like all remote schedules to be included as bulk change sources, change the "Include Remotes as Bulk Source?" option toYes. This is located in Utilities>Edit Aspect Services > Schedule Subsystem.



Alarms

Alarming Overview

The Alarming subsystem of Aspect provides intuitive capabilities for annunciating alarm and event notifications from the area controller interface, as well as accommodates select field bus protocols and extends support to protocol-specific alarm and event services.

Alarm Types

Type	Function
Disabled	Not performing alarming.
Alarm When On	Boolean type alarm that alarms when the value is 1.
Alarm	Boolean type alarm that alarms when the value is 0.

When Off	
High Limit	Analog type alarm that alarms when the value is greater than the set point.
Low Limit	Analog type alarm that alarms when the value is less than the set point.
Out of Range	Analog type alarm that alarms when the value is out of a specified range.
In Range	Analog type alarm that alarms when the value is within a specified range.
Delta	Analog type alarm that alarms when the value is greater than an offset from a MapRef.
Hi/Lo Delta	Analog type alarm that alarms when the value is outside of a range based on an offset from a MapRef.
Must Match	Boolean type alarm that alarms when the value doesn't match a MapRef.
Must Not Match	Boolean type alarm that alarms when the value does match a MapRef.

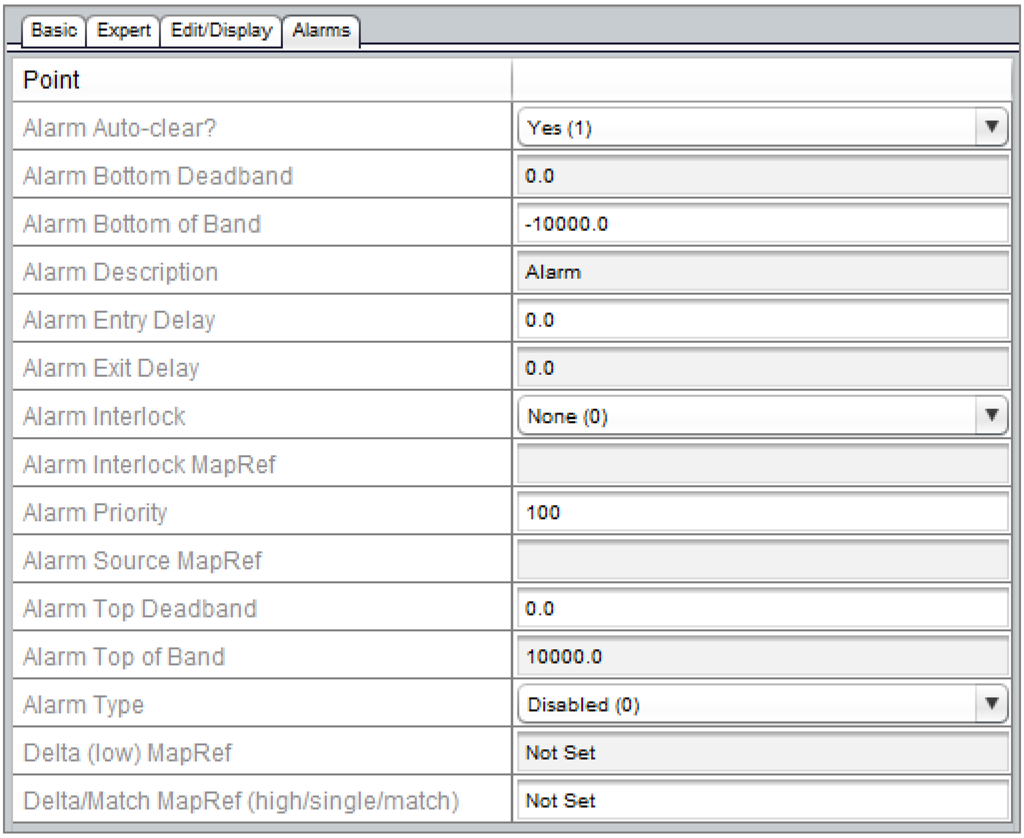
Alarm Properties

Property	Function
Alarm Auto-Clear	When true the alarm will automatically clear by device once the alarm-able condition has cleared.
Alarm Bottom Deadband	The range at the bottom of the band where no action occurs after coming back above the bottom of band. This is to alleviate cycling of alarms that are near the bottom of band.
Alarm Description	The description of this alarm as seen in the alarm table or notification services.
Alarm Entry Delay	The time in minutes before a value entering an alarm range is considered in alarm. This hysteresis is necessary when you need time to prove a must match input or in cases where the zone may need time to respond before considering an alarm-able situation.
Alarm Exit Delay	The time in minutes before a value exiting an alarm range is considered to be cleared. This will allow time to verify that the alarm-able condition is stabilized before declaring the condition has been cleared.

Alarm Interlock	When the alarm is interlocked it will not generate alarms based on the configuration. This can be used to disable cooling alarms if the zone is in heating mode. This function requires a map reference to determine its value object.
Alarm Interlock MapRef	Where to get the alarm interlock value object when alarm interlocking is enabled. This can be the reference name of a sibling, a full id path, a full reference path, or /application/component/element container.
Alarm Priority	The priority of this alarm, typically lower numbers are considered a higher priority. Priorities can be used to filter notifications as well as trigger custom control sequences.
Alarm Source MapRef	Where to get the alarm value if not alarming based on the value object of this map point. This can be used in cases where the controller is generating an alarm via a local object but we want to associate the alarm with a specific point. For example a controller may be monitoring the zone temperature locally and setting a BV to a high state when there is an alarm. This allows you to trigger a low limit alarm on the zone temp point within the map.
Alarm Top Deadband	The range at the top of the band where no action occurs after coming back below the top of band. This is to alleviate cycling of alarms that are near the top of band.
Alarm Top of Band	High limit of the alarm, top of the alarm range, or high alarm delta offset. When configured for high/low delta alarming this is a positive integer that offsets the referenced value.
Alarm Type	Type of alarm for this point. When the alarm type is configured for any value other than zero it automatically becomes cached within the map. Please make sure to set an appropriate pool interval for points configured for alarming. 1. Alarm when ON 2. Alarm when OFF 3. High Limit 4. Low Limit

	5. Out of Range 6. In Range 7. Delta 8. Hi/Lo Delta 9. Must Match 10. Must Not Match
Delta (low) MapRef	Where to get the low setpoint for hi/lo delta alarming. This can be the reference name of a sibling, a full id path, a full reference path, or /application/component/element container.
Delta/Match MapRef (high/single/match)	Where to get the setpoint for delta alarming or the match/not match value. This can be the reference name of a sibling, a full id path, a full reference path, or /application/component/element container.

Default Values


Basic | Expert | Edit/Display | Alarms

Point	
Alarm Auto-clear?	Yes (1)
Alarm Bottom Deadband	0.0
Alarm Bottom of Band	-10000.0
Alarm Description	Alarm
Alarm Entry Delay	0.0
Alarm Exit Delay	0.0
Alarm Interlock	None (0)
Alarm Interlock MapRef	
Alarm Priority	100
Alarm Source MapRef	
Alarm Top Deadband	0.0
Alarm Top of Band	10000.0
Alarm Type	Disabled (0)
Delta (low) MapRef	Not Set
Delta/Match MapRef (high/single/match)	Not Set

More Information

[Alarm Subsystem](#)

[Email Subsystem](#)

[Notification Subsystem](#)

Alarm Types

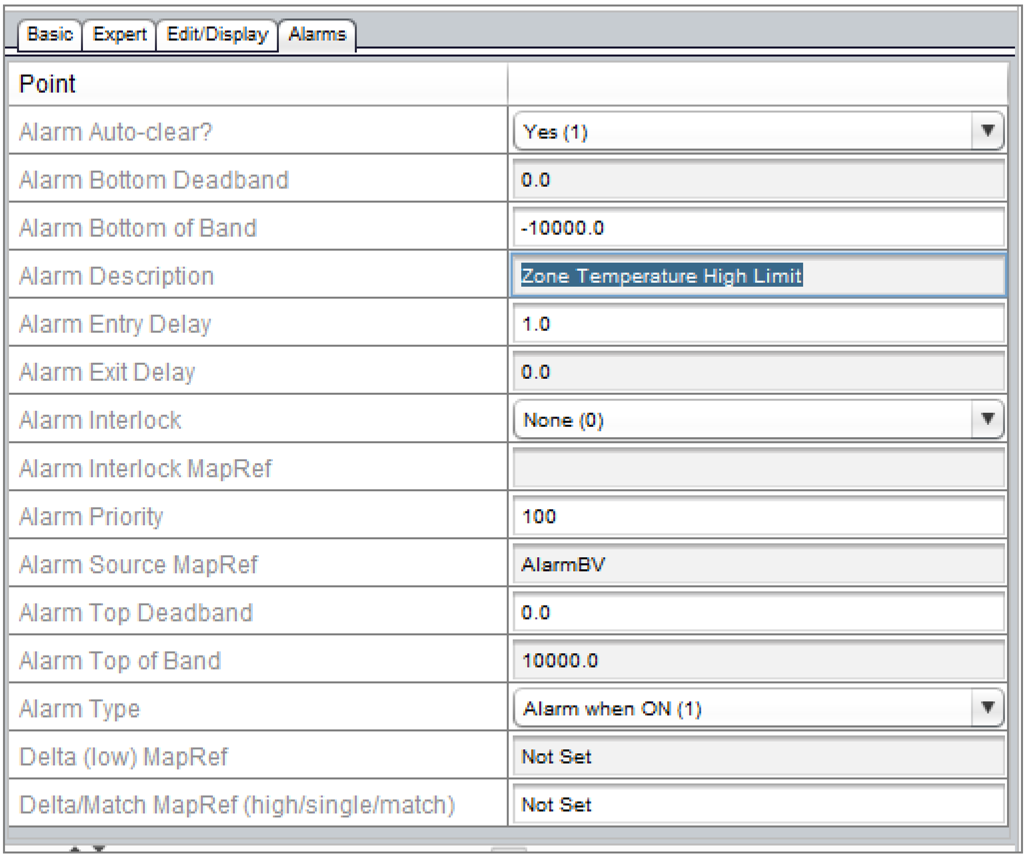
Alarm When On

Application

When using the alarm when on alarm type the alarm will go active anytime the value object is 1 or greater. This function is typically used when the field bus device exposes binary values that are based on alarm conditions. In most cases you would want to use the binary value to trigger an alarm on a different point in the map.

As an example you may have a BV in the controller that signifies that the zone temperature is too high. Instead of showing the BV as being in alarm you want to show that the zone temp is in alarm. In this case you want the zone temp map point to use an alarm source MapRef that points to the BV. This will generate an alarm on the zone temp every time the BV turns on. You may also consider setting the alarm entry delay to 1 so that there is a 1 minute hysteresis on the alarm enable event.

Configuration



More Information

Alarming in the Map

Alarm When Off

Application

When using the alarm when on alarm type the alarm will go active anytime the value object is equal to 0. This function is typically used when the field bus device exposes binary values that are based on alarm conditions. In most cases you would want to use the binary value to trigger an alarm on a different point in the map.

As an example you may have a BV in the controller that signifies that the fan hasn’t proven but the heating is enabled. Instead of showing the BV as being in alarm you want to show that the fan is in alarm. In this case you want the fan map point to use an alarm source MapRef that points to the BV. This will generate an alarm on the fan every time the BV turns off. You may also consider setting the alarm entry delay to 1 so that there is a 1 minute hysteresis on the alarm enable event, it will also allow the CT to have time to make proof. You may also want to set the auto-clear property to no so that you have visibility into the fan failures within your system.

Configuration

Point	
Alarm Auto-clear?	No (0)
Alarm Bottom Deadband	0.0
Alarm Bottom of Band	-10000.0
Alarm Description	Fan Failed
Alarm Entry Delay	2.0
Alarm Exit Delay	0.0
Alarm Interlock	None (0)
Alarm Interlock MapRef	
Alarm Priority	100
Alarm Source MapRef	AlarmBV
Alarm Top Deadband	0.0
Alarm Top of Band	10000.0
Alarm Type	Alarm when OFF (2)
Delta (low) MapRef	Not Set
Delta/Match MapRef (high/single/match)	Not Set

More Information

[Alarming in the Map]

High Limit

Application

When using the high limit alarm type the alarm will be generated when the point's value object is greater than the alarm top of band and will be cleared when the value object has dropped below the alarm top of band minus the top deadband. This type is primarily used in for high temperature alarms and high pressure situations.

To configure a high limit alarm set the alarm type to high limit (3). Then set the Top of band to the value that you want to make as the setpoint for this alarm, 74 degrees in my case. You may also want to set a deadband of a half a degree so that you don't generate multiple alarms when the system is controlling close to the setpoint. Configure the alarm description to have a meaningful message for the operator. With this configuration you will generate an alarm at 74 degrees and clear the alarm at 73.5.

Configuration

Point	
Alarm Auto-clear?	Yes (1)
Alarm Bottom Deadband	0.0
Alarm Bottom of Band	-10000.0
Alarm Description	Zone Temperature High limit threshold has be cros
Alarm Entry Delay	2.0
Alarm Exit Delay	0.0
Alarm Interlock	None (0)
Alarm Interlock MapRef	
Alarm Priority	10
Alarm Source MapRef	
Alarm Top Deadband	0.5
Alarm Top of Band	74.0
Alarm Type	High Limit (3)
Delta (low) MapRef	Not Set
Delta/Match MapRef (high/single/match)	Not Set

More Information

[Alarming in the Map]

Low Limit

Application

When using the low limit alarm type the alarm will be generated when the point's value object is less than the alarm bottom of band and will be cleared when the value object has risen above the alarm bottom of band plus the bottom deadband. This type is primarily used in for low temperature alarms and low pressure situations.

To configure a low limit alarm set the alarm type to low limit (4). Then set the bottom of band to the value that you want to make as the setpoint for this alarm, 66 degrees in my case. You may also want to set a dead-band of a half a degree so that you don't generate multiple alarms when the system is controlling close to the setpoint. Configure the alarm description to have a meaningful message for the operator. With this configuration you will generate an alarm at 66 degrees and clear the alarm at 66.5.

Configuration

Point	
Alarm Auto-clear?	Yes (1)
Alarm Bottom Deadband	0.5
Alarm Bottom of Band	66.0
Alarm Description	Zone Temperature low limit threshold has be crosse
Alarm Entry Delay	0.0
Alarm Exit Delay	0.0
Alarm Interlock	None (0)
Alarm Interlock MapRef	
Alarm Priority	10
Alarm Source MapRef	
Alarm Top Deadband	0.0
Alarm Top of Band	10000.0
Alarm Type	Low Limit (4)
Delta (low) MapRef	Not Set
Delta/Match MapRef (high/single/match)	Not Set

More Information

Alarming in the Map

Out of Range

Application

The out of range alarm type makes use of both the low limit and high limit alarm functions. This alarm type allows you to generate both a high and low limit alarm. When using this alarm type an alarm is generated when the value object is either above the top of band or below the bottom of band and is cleared when the value object is either equal to the bottom of band plus the bottom deadband or when the value object is less than the top of band minus the top deadband.

To configure an out of range alarm set the alarm type to out of range (5). Then set the bottom of band to the value that you want to make as the setpoint for this alarm, 66 degrees in my case. You may also want to set the bottom deadband of a half a degree so that you don't generate multiple alarms when the system is controlling close to the setpoint. Then set the Top of band to the value that you want to make as the setpoint for this alarm, 74 degrees in my case. You may also want to set the top deadband of a half a degree so that you don't generate multiple alarms when the system is controlling close to the setpoint. Configure the alarm description to have a meaningful message for the operator. This configuration will generate an alarm when above 74 or below 66 and will clear once it drops below 73.5 or has risen to 66.5.

Configuration

Point	
Alarm Auto-clear?	Yes (1)
Alarm Bottom Deadband	0.5
Alarm Bottom of Band	66.0
Alarm Description	Zone Temperature Out of Range Alarm
Alarm Entry Delay	0.0
Alarm Exit Delay	0.0
Alarm Interlock	None (0)
Alarm Interlock MapRef	
Alarm Priority	10
Alarm Source MapRef	
Alarm Top Deadband	0.5
Alarm Top of Band	74.0
Alarm Type	Out of Range (5)
Delta (low) MapRef	Not Set
Delta/Match MapRef (high/single/match)	Not Set

More Information

Alarming in the Map

In Range

Application

The in range alarm type makes use of both the low limit and high limit set-points as well as the bottom band deadband and the top of band dead-band. When using this alarm type an alarm is generated when the value object is between the bottom of band + bottom of band deadband and below the top of band - the bottom of band deadband.

To configure an in range alarm set the alarm type to in range (6). Then set the bottom of band to the value that you want to make as the setpoint for this alarm, 66 degrees in my case. You may also want to set the bottom deadband of a half a degree so that you don't generate multiple alarms when the system is controlling close to the setpoint. Then set the Top of band to the value that you want to make as the setpoint for this alarm, 74 degrees in my case. You may also want to set the top deadband of a half a degree so that you don't generate multiple alarms when the system is controlling close to the setpoint. Configure the alarm description to have a meaningful message for the operator. This configuration will generate an alarm when below73 and above 66 and will clear once it rises above 73.5 or has dropped below 66.5.

Configuration

Point	
Alarm Auto-clear?	Yes (1)
Alarm Bottom Deadband	0.5
Alarm Bottom of Band	66.0
Alarm Description	Alarm
Alarm Entry Delay	0.0
Alarm Exit Delay	0.0
Alarm Interlock	None (0)
Alarm Interlock MapRef	
Alarm Priority	100
Alarm Source MapRef	
Alarm Top Deadband	0.5
Alarm Top of Band	74.0
Alarm Type	In Range (6)
Delta (low) MapRef	
Delta/Match MapRef (high/single/match)	

More Information

[Alarming in the Map]

Delta

When using the delta alarm the alarm will go active when the referenced point is greater than the threshold set in the top of band alarm property. This function is typically used to generate alarms based on how far the space has deviated from the setpoint. Since the setpoint changes based on occupancy status we can set an offset or delta that will be the alarm setpoint.

To configure a delta alarm set the alarm type to Delta (7). Copy the ID path or reference name of the current setpoint into the Delta/Match MapRef property. Then set the Top of band to the value that you want to make as the offset setpoint for this alarm, 5 in my case. You may also want to set a deadband of a half a degree so that you don't generate multiple alarms when the system is controlling close to the setpoint. Configure the alarm description to have a meaningful message for the operator. With this configuration you will generate an alarm at + 5 degrees from the referenced points value object and clear the alarm at -.5 from the referenced points value object.

Configuration

Point	
Alarm Auto-clear?	Yes (1)
Alarm Bottom Deadband	0.0
Alarm Bottom of Band	-10000.0
Alarm Description	Space Temperature High Limit
Alarm Entry Delay	1.0
Alarm Exit Delay	1.0
Alarm Interlock	None (0)
Alarm Interlock MapRef	
Alarm Priority	100
Alarm Source MapRef	
Alarm Top Deadband	0.5
Alarm Top of Band	5.0
Alarm Type	Delta (7)
Delta (low) MapRef	
Delta/Match MapRef (high/single/match)	CurrentCoolingSetpoint

More Information

[Alarming in the Map](#)

High Low Delta

The high low delta alarm takes the delta type alarming and creates a top and bottom band so that we can generate an alarm when we are outside of a range that can be dynamic. This type of alarm is typically used to indicate that we have deviated from setpoint on both the cooling and heating side. This type requires 2 references, one will be the current cooling and the other will be the current heating setpoints. This allows for us to set an offset to the setpoints to generate both a high limit and low limit alarms based on a dynamic setpoint. Since the setpoints change based on occupancy status we can set an offset or delta that will be the alarm setpoint.

To configure a delta alarm set the alarm type to Hi/Lo Delta (8). Copy the ID path or reference name of the current cooling setpoint into the Delta/Match MapRef property and the current heating setpoint to the Delta (low) MapRef. Then set the Top of band to the value that you want to make as the offset setpoint for this alarm, 5 in my case and set the bottom band to the offset which the value must go below the heating occupied setpoint, also 5 in my configuration. You may also want to set a deadband of a half a degree so that you don't generate multiple alarms when the system is controlling close to the setpoint. Configure the alarm description to have a meaningful message for the operator. With this configuration you will generate a high limit alarm at + 5 degrees from the cooling setpoints value object and clear the alarm at - .5 from the cooling setpoints value object. You will also generate a low limit alarm when the zone temperature is -5 from the current heating setpoint and return from alarm when the zone temperature is + .5 from the current heating setpoint.

Configuration

Point	
Alarm Auto-clear?	Yes (1)
Alarm Bottom Deadband	0.5
Alarm Bottom of Band	5.0
Alarm Description	Space Temperature out of range
Alarm Entry Delay	1.0
Alarm Exit Delay	1.0
Alarm Interlock	None (0)
Alarm Interlock MapRef	
Alarm Priority	100
Alarm Source MapRef	
Alarm Top Deadband	0.5
Alarm Top of Band	5.0
Alarm Type	Hi/Lo Delta (8)
Delta (low) MapRef	CurrentHeatingSetpoint
Delta/Match MapRef (high/single/match)	CurrentCoolingSetpoint

Must Match

Application

When using the Must Match alarm type the alarm will go active anytime the value object doesn't match the referenced point. This functionality is typically used to indicate a fan failure alarm. This alarm type requires a reference to another point typically under the same device but a full path to any point is acceptable for functionality. This reference is configured by setting the Delta/Match MapRef to a relative or full map path.

As an example you may configure the fan command point to reference a fan status point and when they do not match you can generate a fan failure alarm. To configure this type of alarm set the alarm type to must match (9). Copy the ID path from the fan status point and paste it into the Delta/Match MapRef property. Configure the alarm description to have a meaningful message for the operator. There are no deadbands in this configuration as this is a boolean type of alarm although the entry delay and exit delays should be configured so that there is some level of hysteresis on the alarm enable event. This configuration will generate an alarm anytime the referenced point doesn't match the value object of the point generating the alarm.

Configuration

Point	
Alarm Auto-clear?	Yes (1)
Alarm Bottom Deadband	0.0
Alarm Bottom of Band	-10000.0
Alarm Description	Fan Failure Alarm
Alarm Entry Delay	1.0
Alarm Exit Delay	1.0
Alarm Interlock	None (0)
Alarm Interlock MapRef	
Alarm Priority	100
Alarm Source MapRef	
Alarm Top Deadband	0.0
Alarm Top of Band	10000.0
Alarm Type	Must Match (9)
Delta (low) MapRef	
Delta/Match MapRef (high/single/match)	FanStatus

More Information

Alarming in the Map

Must Not Match

Application

When using the Must Not Match alarm type the alarm will go active anytime the value object matches the referenced point. This functionality is typically used to indicate an inefficient equipment alarm. This alarm type requires a reference to another point typically under the same device but a full path to any point is acceptable for functionality. This reference is configured by setting the Delta/Match MapRef to a relative or full map path.

As an example you may configure the fan status point to reference a filter status point and when they do match you can generate an inefficient equipment alarm. To configure this type of alarm set the alarm type to must not match (10). Copy the ID path or the reference name from the filter status point and paste it into the Delta/Match MapRef property. Configure the alarm description to have a meaningful message for the operator. There are no deadbands in this configuration as this is a boolean type of alarm although the entry delay and exit delays should be configured so that there is some level of hysteresis on the alarm enable event. This configuration will generate an alarm anytime the referenced point matches the value object of the point generating the alarm.

Configuration

Point	
Alarm Auto-clear?	Yes (1)
Alarm Bottom Deadband	0.0
Alarm Bottom of Band	-10000.0
Alarm Description	Inefficient Equipment Alarm
Alarm Entry Delay	1.0
Alarm Exit Delay	1.0
Alarm Interlock	None (0)
Alarm Interlock MapRef	
Alarm Priority	100
Alarm Source MapRef	
Alarm Top Deadband	0.0
Alarm Top of Band	10000.0
Alarm Type	Must Not Match (10)
Delta (low) MapRef	
Delta/Match MapRef (high/single/match)	FilterStatus

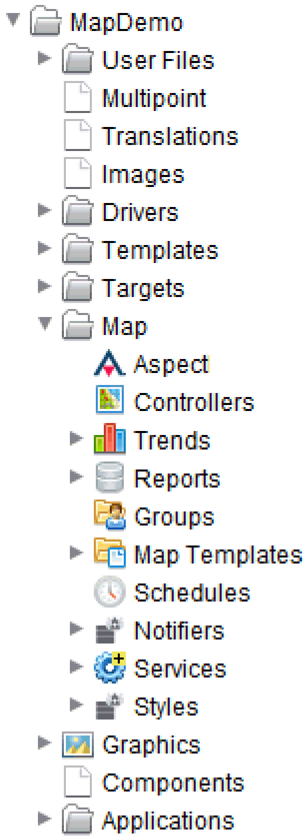
More Information

Alarming in the Map

The ASPECT Map

The ASPECT Map

An ASPECT **Project** requires definitions of **Networks**, **Devices**, and **Points** from the building automation system. These are defined in the `Map` branch of the `Project Tree`.



All of the definitions in the `Map` (i.e. listed under the `Map` branch of the `Project Tree`) will later be referenced by ASPECT once the **Project** is deployed, and will be auto-generated in the **HTML5** interface for use by smart phones, standard desktop browsers, and even tablets that operate on iOS and Android environments.

Map Nodes

The **Map** contains several major branches (nodes):

- Aspect - The Aspect node represents ASPECT data (such as math results, control logic information, and non field-bus related data) in the Map. This node is used to present data into the **HTML5** user interface, as well as reference common data between different applications.
- Controllers - The Controllers node defines collections of **Networks**, **Devices**, and **Points** from the building automation system.
- Trends - The Trends node is for use within the **HTML5** user interfaces to provide a quick navigation path for customized, fixed-query **trends**.
- Reports - The Reports node is for use within the **HTML5** user interfaces to provide a path for Database driven reports.
- Groups - The Groups node is within the Automagic **HTML5** user interface and is intended to provide a classic, tiered hierarchy of system information. A user-defined structure of groups is created within this section.
- Map Templates - The Map Templates node provides ASPECT technicians with a centralized repository of device configurations that may be used, duplicated, and updated during project engineering. Each **Map Template** represents a **Device** and may contain points and their associated configurations, as well as other information pertinent to the device.
- Schedules - Collections of **schedule** items available to the Map. This node may contain iCal calendars, Exchange calendars, Aspect Weekly Schedules or Aspect Calendars.
- Notifiers - A collection of **Notifiers** used by the **Map**'s alarm subsystem. Notifiers define the transport mechanism (email, PushOver, SMS), notification trigger conditions, and the text of the notification when alarm conditions are reached.
- Services - Configuration and listing of the **Map** engine's various services. Commonly configure items here are the Email Notification Service, Pushover Notification Service, and Graphics Subsystem.
- Styles - Collections of colors, font sizes and other visual properties that are assigned to graphics.

User Access to individual nodes

Whether or not a specific user can view or edit a specific Map node is defined by the permissions group to which they belong, and which is assigned to the node. For details see "Map Permissions" on the facing page

Map Permissions

Map Permissions settings allow the ngAdmin HTML interface to determine whether or not a node should be visible to a user and whether or not that user has permission to change that node.

A user is a member of one or more groups, and each Map node is assigned one or more groups that are allowed to view and/or edit properties of that node.

The properties most frequently used to assign **Map permissions** in the Map are View Groups and Edit Groups. These properties are available at most points in the Map

- **View Groups** are groups whose members have the ability to view a node and its properties.
- **Edit Groups** are groups whose members have the ability to write a value to a node, such as changing a set point or altering occupancy.

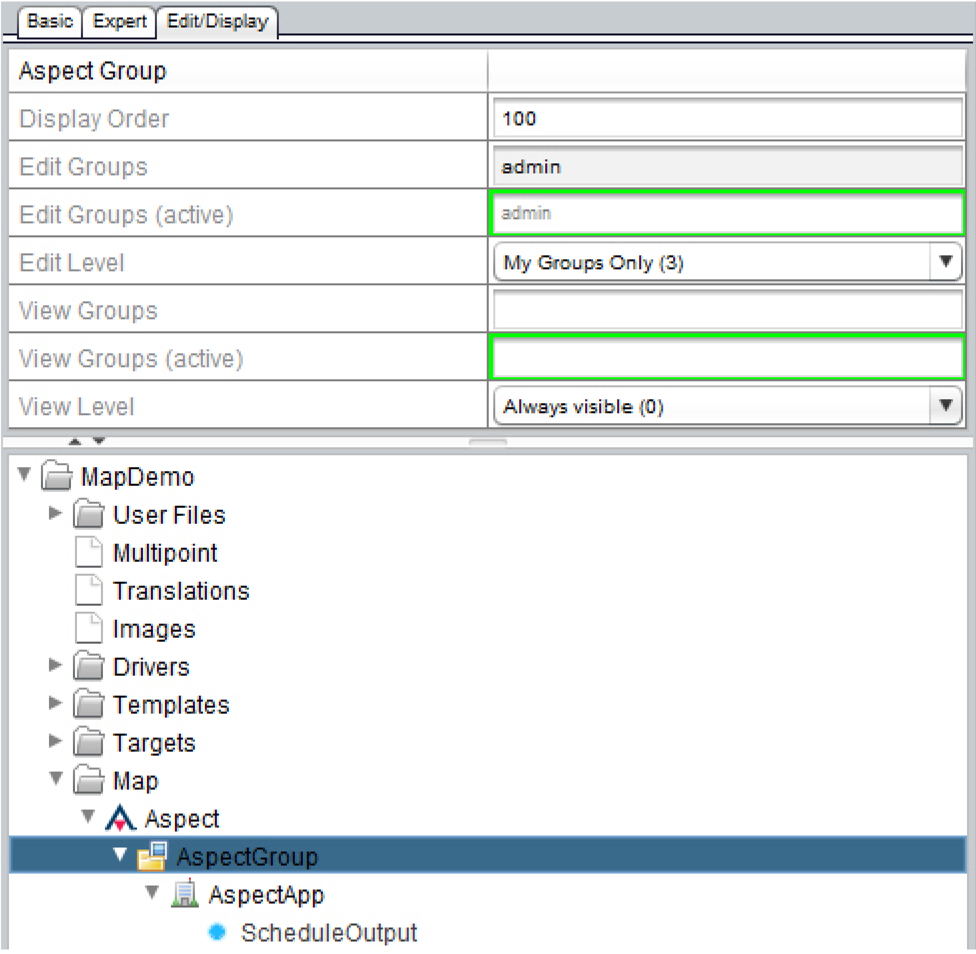
Permission Inheritance

To streamline the process of assigning permissions, the Map provides a very flexible permission '**inheritance**' hierarchy. This allows a **node** to inherit the permissions of the **Parent node** (the node that contains the current node). In most cases, this hierarchy is set by default, to propagate to the base container of that particular branch of the Map.

This **inheritance** is dynamic - if the permissions are changed in one location, all nodes that are set to inherit permissions from it will automatically update without any additional configuration.

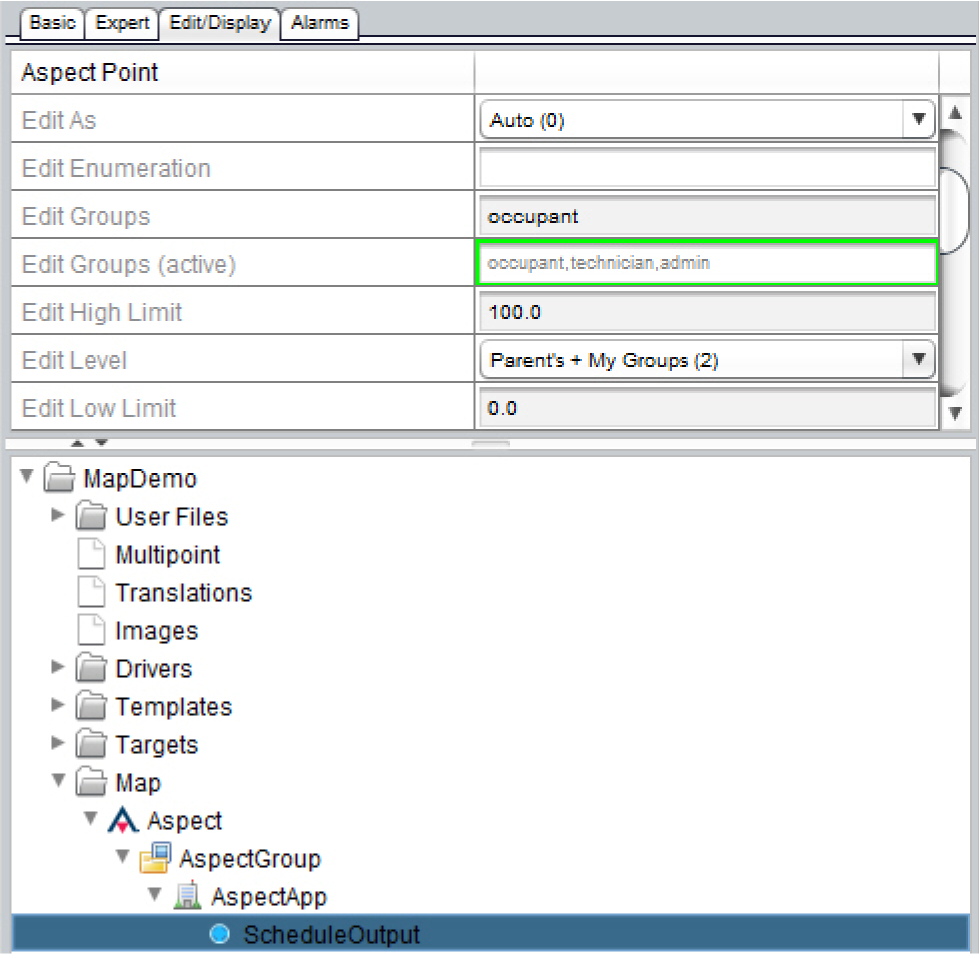
Inheritance Level	Note
Never Editable (0)	Can never be edited, regardless of active **Edit Groups** value
Parents Group (1)	Can only be edited by members of the inherited **Edit Groups**. Members of the node's own **Edit Groups** are ignored.
Parents Groups + My Groups (2)	Can be edited by inherited or node's own **Edit Group** members
My Groups Only (3)	Can only be edited by members of the node's own **Edit Groups**

For example, in the figure below, AspectGroup does not inherit **Edit** permissions (My Groups Only), but AspectApp and ScheduleOutput each are set by default with Parent's Group + My Groups.



When the group "admin" is assigned **Edit** permissions at the AspectGroup node, its child node AspectApp will inherit those permissions and add any **Edit groups** assigned to itself. In turn, any active **Edit groups** at the AspectApp level will be inherited by ScheduleOutput. Notice that the read-only field Edit Groups (active) displays the evaluated permission inheritance for the node.

If the group "technician" is assigned to the **Edit Groups** at the AspectApp level and the group "occupant" is assigned at the ScheduleOutput level, the Edit Groups (active) for ScheduleOutput will be occupant,techncian,admin. This is because AspectApp inherited the Edit Groups (active) value from AspectGroup and ScheduleOutput inherited the Edit Groups (active) value from AspectApp.



View Level

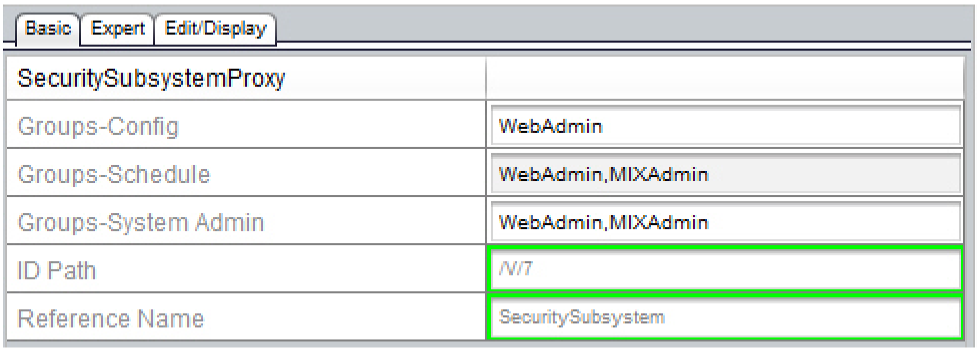
View Permissions function in a similar fashion, with a few minor differences in the available levels.

View Level	Note
Always Visible (0)	Can never be edited, regardless of active **Edit Groups** value
Parents Group (1)	Can only be viewed by members of the inherited **View Groups**. Members of the node's own **View Groups** are ignored.
Parents Groups + My Groups (2)	Can be viewed by inherited or node's own **View Groups** members
My Groups Only (3)	Can only be viewed by members of the node's own View Groups
Never Visible (4)	Is never visible, regardless of View Groups value

By default, map Nodes are set to Always Visible.

Security Configuration

A very important facet of ASPECT's **Map permission** model is the Security subsystem, located in the Services node of the Map. The Security subsystem defines permissions beyond the viewing of nodes and changing of node values.



Property	Note
Groups-Config	Groups allowed to change the underlying properties of nodes in a deployed project via the Map Editor
Groups-Schedule	Groups allowed to manipulate local schedules
Groups-System Admin	Groups allowed to create and delete new nodes as well as change the underlying properties of all nodes

More Information

[Node Based User Permissions]

[Security Subsystem]

Display and Presentation of Map Nodes

The **Map** provides substantial flexibility to control the visibility and presentation of Nodes. If an item is defined to be visible via the View Level and View Groups (active) for the node (see "Map Permissions" on page 98), there are several settings that will define the manner in which the point is presented.

Conditional Visibility MapRef

The visibility of a Node can be set to depend on variable conditions within the Site or Project, using "**MapRef**" expressions (see "Map Reference Expressions" on page 51).

The Conditional Visibility MapRef is located on the Expert tab of nodes that support conditional visibility. It accepts a MapRef or MapRef Expression. A non-zero value will show the node, a zero value will hide it.

Display Order

The Display Order of a node defines the order in which nodes appear within a container in the System Browser or Automagic applications. Lower numbers appear first. When two or more items have the same Display Order value, they will be sorted alphabetically and displayed within that Display Order level.

Display Class

Display Class provides a means to highlight the criticality of points displayed in the System Browser or Automagic applications. For example, a controller may have many points, most of which are not meaningful during normal operation. Display Class allows the points to be grouped by their relative importance.

The user may select the Display Class they wish to use to browse the system in either the Automagic or ngAdmin System Browser applications.

Display Class and Value	Notes
Essential (0)	Will always be displayed
Normal (10)	When user selects Normal display class, nodes with Normal and lower values will be displayed
Detail (50)	When the user select Detail, nodes with Detail and lower Display Class values will be displayed
Everything (100)	When the user selects Everything, all nodes are displayed

Edit As

The Edit As property defines the type of control to be used to edit the node's value from the Automagic or ngAdmin user interfaces. The default is Auto, which allows the Map to make an "educated guess" as to a meaningful editor to apply to a particular node based on its configured Data Type property. To ensure that a specific editor is always used, the Edit As type may be manually assigned. For many types, additional properties are required to be supplied to the editor.

Type	Note	Required Properties
Auto (0)	Based on Data Type, select most appropriate editor	Varies with Data Type and selected Editor
Enum (1)	Display as a series of radio buttons with the current value selected. Integer or Enumeration Data Types are strongly recommended.	Edit Enumeration
Blind Enum (2)	Display as a series of radio buttons with no initial selection. Integer or Enumeration Data Types are strongly recommended.	Edit Enumeration
Slider (3)	Display as a slider control	Edit Low Limit Edit High Limit Edit Step Size
Ranged # Text (4)	Display using the browser's native number input with upper and lower limits.	Edit Low Limit Edit High Limit
Inc/Dec (5)	Display as a numeric spinner or increment decrement control	Edit Low Limit Edit High Limit Edit Step Size
Bitstring (10)	Display as a series of check boxes representing the active bits	Bitstring Bit Names
Time HH:MM am/pm (20)	Display using the browser's native date/time selection controls	none

Time HH:MM 24hd (21)	Display using the browser's native date/time selection controls	none
Date YYYY-MM-DD (30)	Display using the browser's native date/time selection controls	none
Raw Text (100)	Display and edit using a text input field. No client-side verification is possible, use with caution.	none

Properties used by Edit As

The properties used by the various Edit As types are described in the following table

Property	Tab	Notes
Edit Enumeration	Edit/Display	comma separated list of value string pairs used to display the enumeration. value1-1=string1,value2=string2
Edit High Limit	Edit/Display	Highest value available for the supported input controls. Used for data entry protection where available.
Edit Low Limit	Edit/Display	Lowest value available for the supported input controls. Used for data entry protection where available.
Edit Step Size	Edit/Display	For Slider and Inc/Dec controls, the minimum adjustment interval supported.
Bitstring Bit Names	Basic	comma separated list of bit names, starting from the least significant bit. If the value contains bits outside the range of the bitstring, those bit values will be preserved but will not be available for editing. Editable bits must be consecutive - no gaps are allowed and no bits may be masked out

Ranged Status

Ranged Status is configured using parameters similar to alarming, but is not related to alarm functionality. Ranged Status allows for a means of differently presenting points that are outside of their normal operating values.

Trouble Low	Warning Low	Normal Operation	Warning High	Trouble High

Ranged Status Type	Notes
~~None (0)~~	Do not use Ranged Status for node
Direct (1)	Use Fixed Range offsets (Trouble High/Low, Warning High/Low)
Delta (2)	Uses a single Trouble and Warning offset (Trouble High, Warning High) and a the Ranged Status Delta MapRef (single/high). For the low Ranged Status, the Trouble High and Warning high are negated and used as lower bounds. Single Delta is useful when the high and low Trouble and Warnings ranges are symmetrical.
Dual-hi/lo Delta (3)	Uses a both the High and Low trouble and warning offsets and both the Ranged Status Delta MapRef (single/high) and Ranged Status Delta MapRef (low). Useful when the upper and lower Trouble/Warning areas require different ranges.

Styles

The Styles Node is a collection of named styles that may be applied to graphics to change the look and display properties of elements in Graphics. A listing of Style elements controlled by the Ranged Status of a node follows.

Property	Notes
Annunciator Show Normal Status	Apply the "Normal" ranged status properties (Yes/No)
Annunciator Status Display Mode	What method to indicate Ranged Status on annunciators (None/Flag/Value Color/Label Color/Fill Color)
Annunciator Status Flag Trans-	Percentage transparency for Ranged Status flags (0=transparent, 100=opaque)

parency	
Status Color: Normal	Color to apply for Normal status to selected item in Annunciator Status Display Mode
Status Color: Trouble High	Color to apply for Trouble High status to selected item in Annunciator Status Display Mode
Status Color: Trouble Low	Color to apply for Trouble Low status to selected item in Annunciator Status Display Mode
Status Color: Warning High	Color to apply for Warning High status to selected item in Annunciator Status Display Mode
Status Color: Warning Low	Color to apply for Warning Low status to selected item in Annunciator Status Display Mode

Quality

The concept of the **Quality of data** is represented by color. The colors are consistent whether viewed in ASPECT-Studio, ngAdmin, or the ASPECT Java Applet.

Quality	Color	Meaning
Good	normal (typically black)	Good Data
Bad	orange-yellow	A write to a target (typically a controller point) is in progress. The displayed value represents what is being written, not what is in the target.
Initial	dark green	Bad data, most often from an inability to read a source
LastWriteFailed	red	a write to a target is failing. This means that the value that is being written is confirmed to be different than what the target reports. As with WriteInProgress, the displayed value represents what is attempting to be written, not what is in the target
WriteInProgress	dark blue	a write to a target (typically a controller point) is in progress. The displayed value represents what is being written, not what is in the target.
Stale	light blue	data is present but not current; typically the value will be updated in short order
ClientSideStale	blue	same as "stale" except that the staleness of

		the data is limited to a remote client and has nothing to do with what exists on the server. This is typically the case when shifting context. From a user's perspective, it indicates a state that is effectively the same as "stale"
Simulated	green	the data is simulated

More Information

[Reference Paths and Map References](#)

[Writing to Point Values](#)

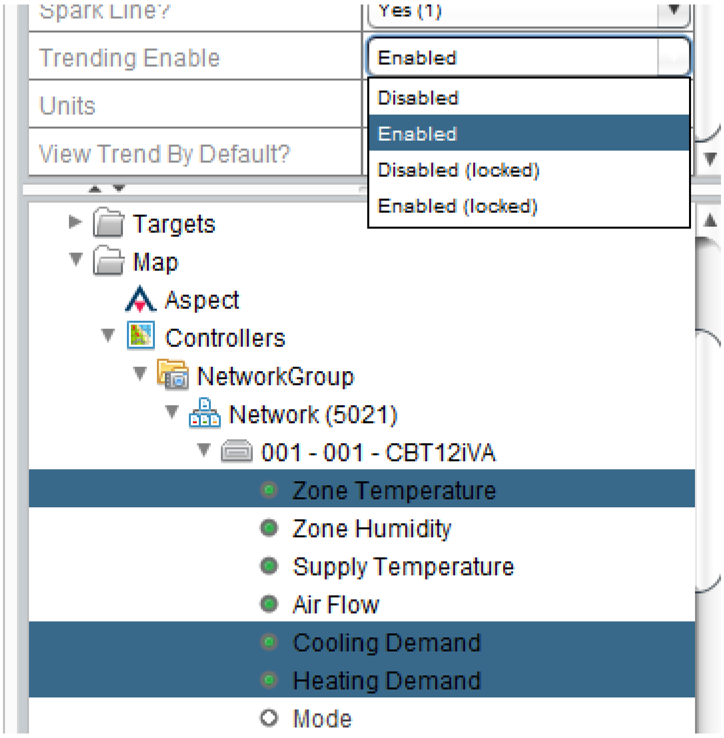
[System Browser Overview](#)

[Alarming in the Map](#)

Editing the Map

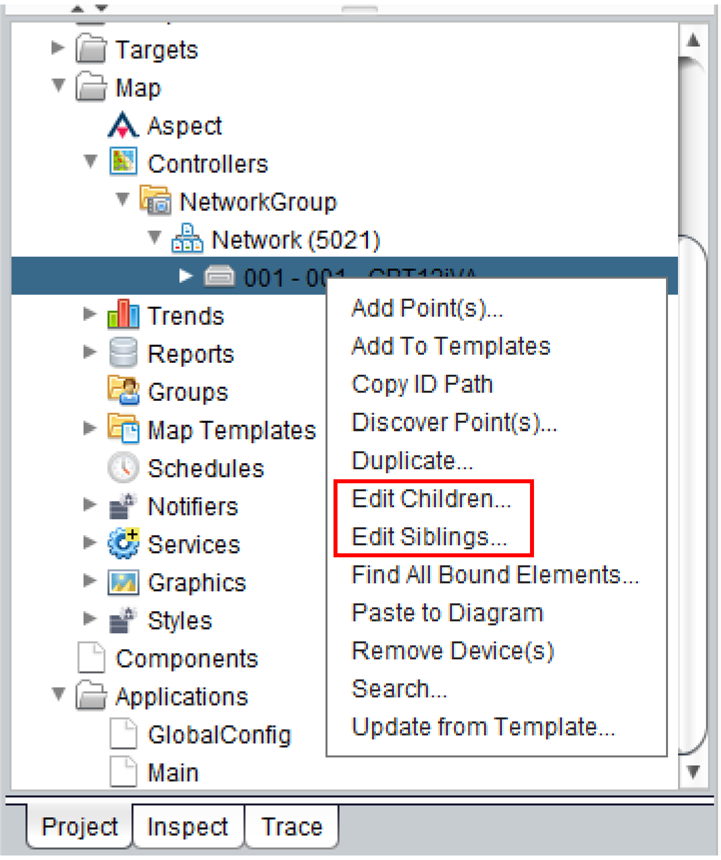
Editing Single or Multiple Nodes

Individual map nodes can be edited by simply expanding the desired branch and clicking on the desired node. The node properties will be available in the Aspect properties pane. It is also possible to use a CTRL+click action to select multiple nodes of like types (typically, Points) and edit the common properties of the selected points.

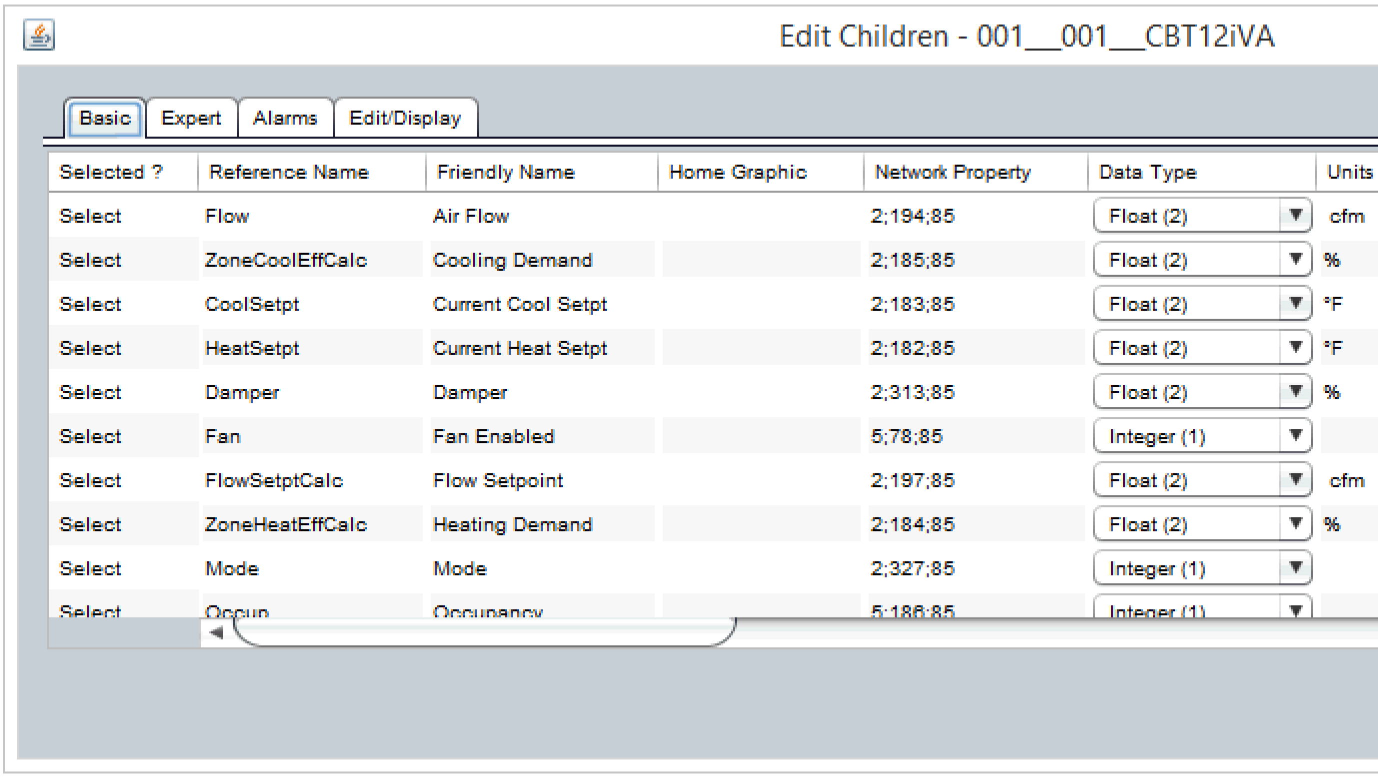


Edit Children/Edit Siblings

Using the Edit Children and Edit Siblings options in the context menu will allow the child or sibling elements to be edited in a table format.

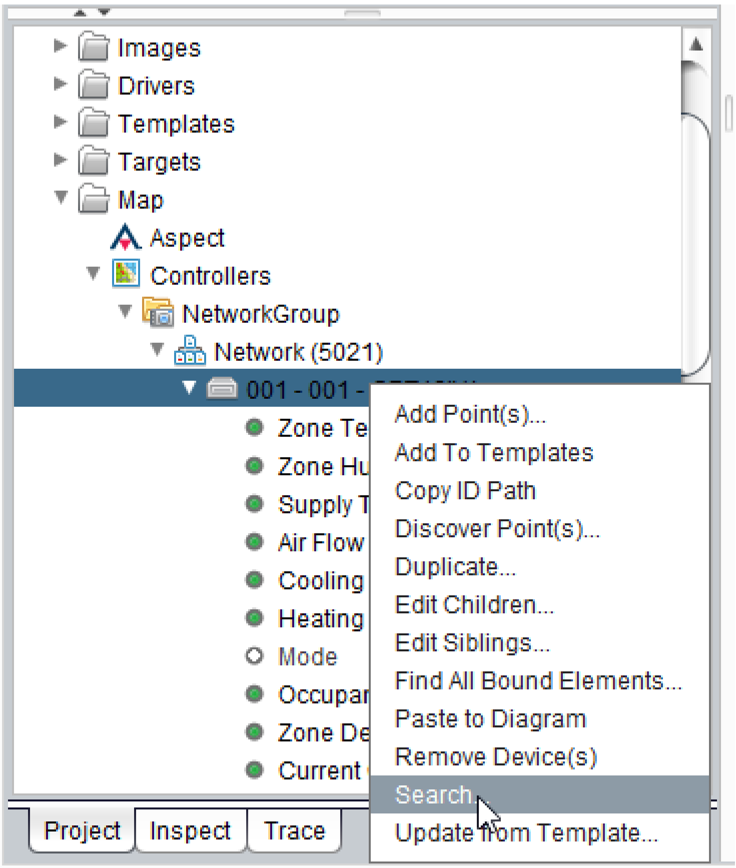


The table view format is very useful for updating properties on selected rows in one action. Columns can be reordered by dragging within this view.

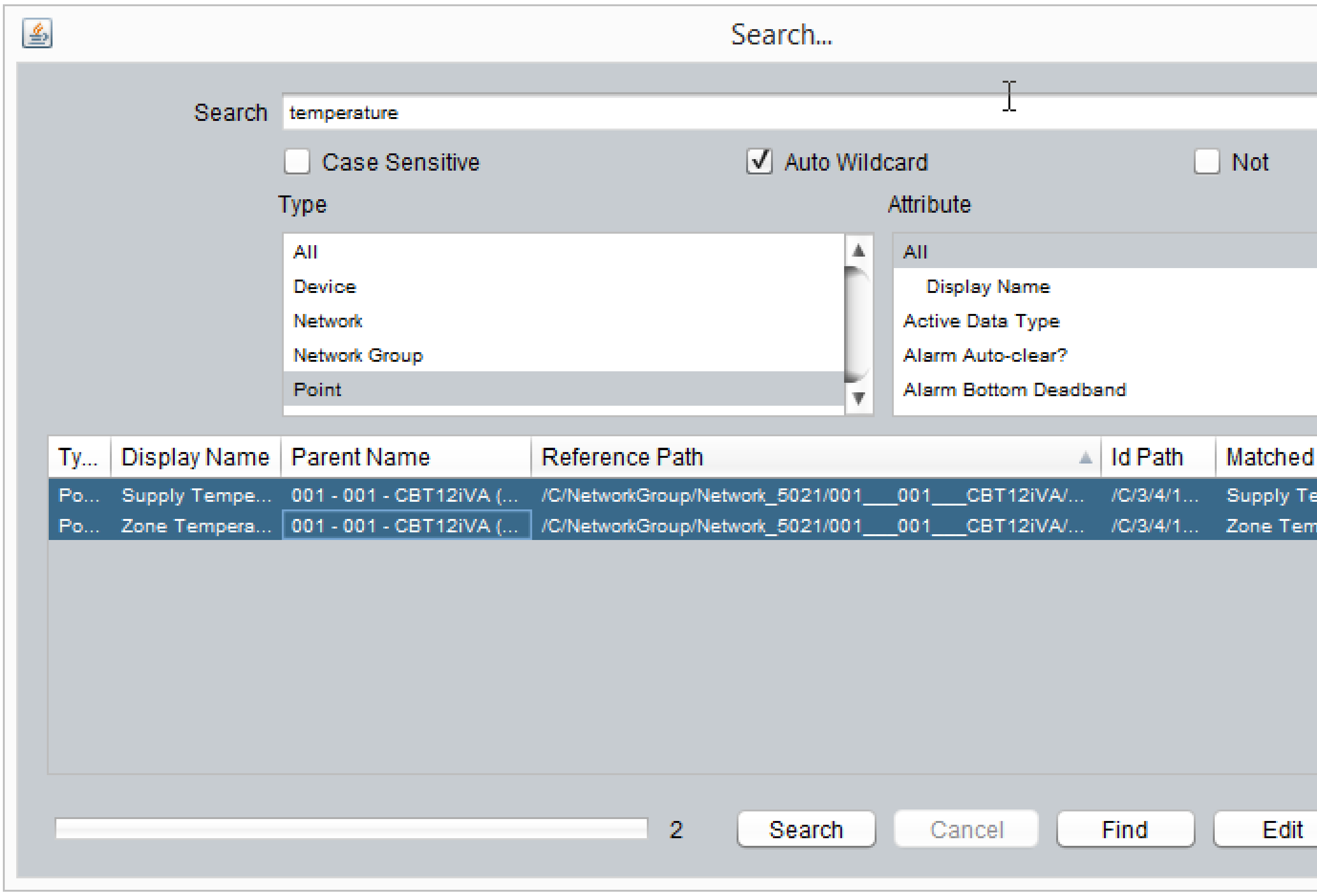


Searching and Mass Edits

It is possible to select nodes for editing via a search as well. This method is very useful when it is required to select all nodes in the Map that share a searchable property.



In the example shown below, all Points containing the case insensitive string temperature are returned and may be edited by selecting the desired rows in the search results to display the edit table.

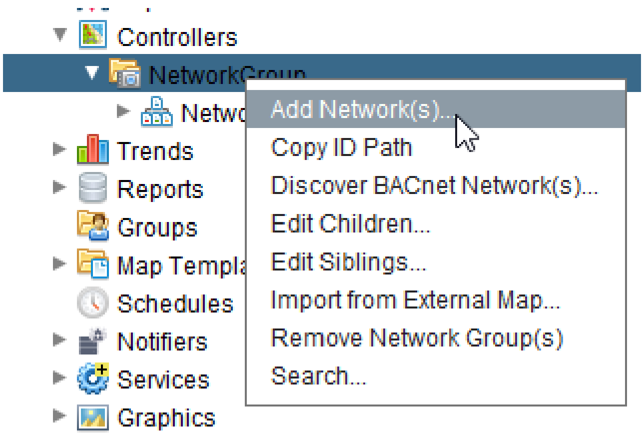


Adding and Duplicating Nodes

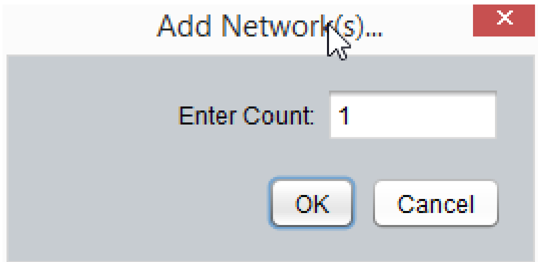
Many nodes in the map have the ability to Add one or more "child" nodes, or the ability to duplicate an existing node one or more times.

Adding Nodes to the Map

For example - if the NetworkGroup level is selected, Add Network(s)... is available because Networks are the child node type of Network Groups.



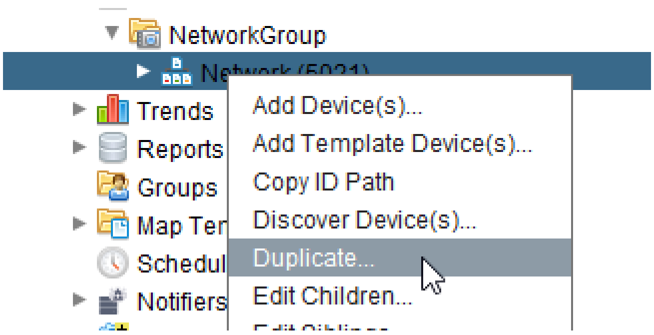
When the Add Network(s)... option is activated, a dialog will be displayed that requests the count of Network child nodes to be attached to the selected parent node.



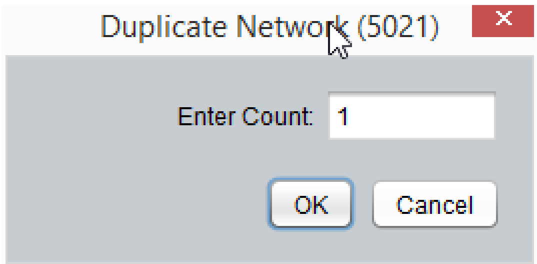
Duplicating Nodes in the Map

Node Duplication is similar in concept to adding node, but it occurs at a peer level in the map, rather than a parent child level. A selected node can be selected for duplication within the parent container. This is a recursive copy - meaning that a node and all of its descendent nodes will be copied as part of this operation. For example, if a building has many similar networks, it may be useful to duplicate an existing network rather than create a new network from scratch.

The desired node is selected, and the Duplicate... option is made available.



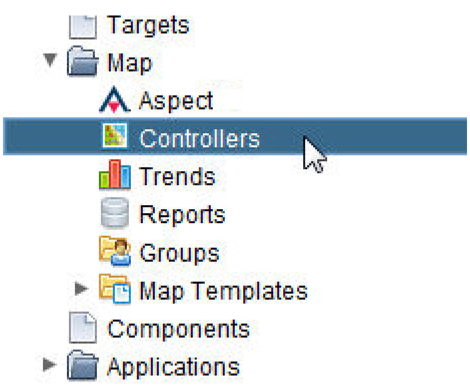
When the Duplicate... option is activated, a dialog is presented that requests the number of times the selected node (and all of its children) should be copied within the parent container.



The [Controllers] Node

What is the "Controllers Node"?

The Controllers Node of the Map contains definitions of all **networks**, **devices**, and **points** on a physical **BMS** site that will be referenced by the ASPECT system, including **BACnet**, PUP and Unitron device networks.



Points listed under this node are referred to as "**Controller Points**"

> **Note**: If you are configuring **Modbus** or **SDP** device networks, see the following topics.
>
> - Modbus Overview
> - SDP Overview

More Information

Adding a Network Group

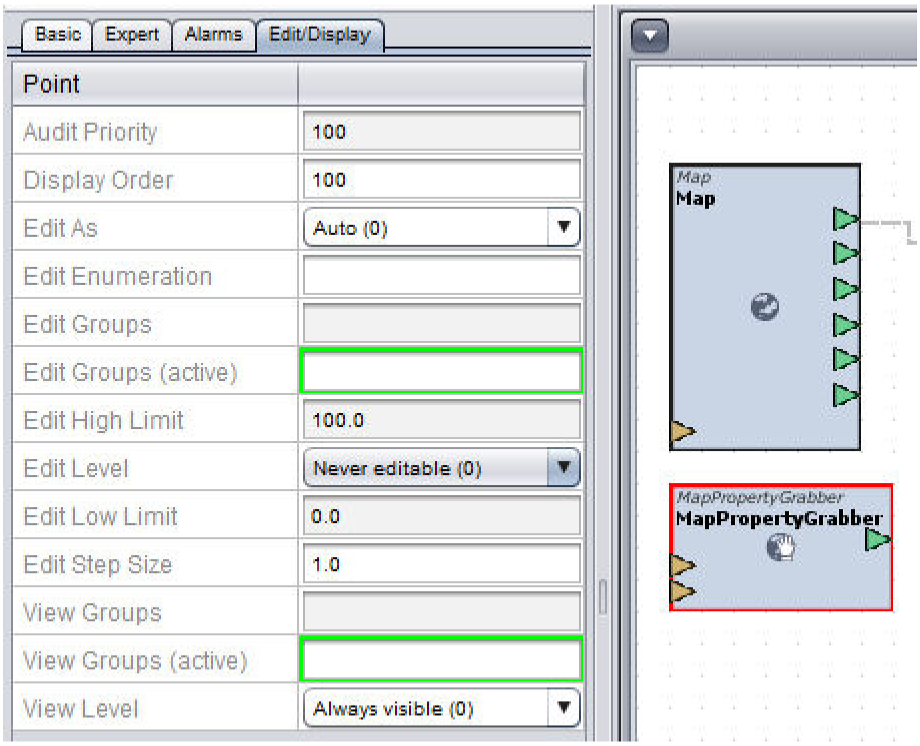
Adding a Network

Adding a Device

Adding Device Points

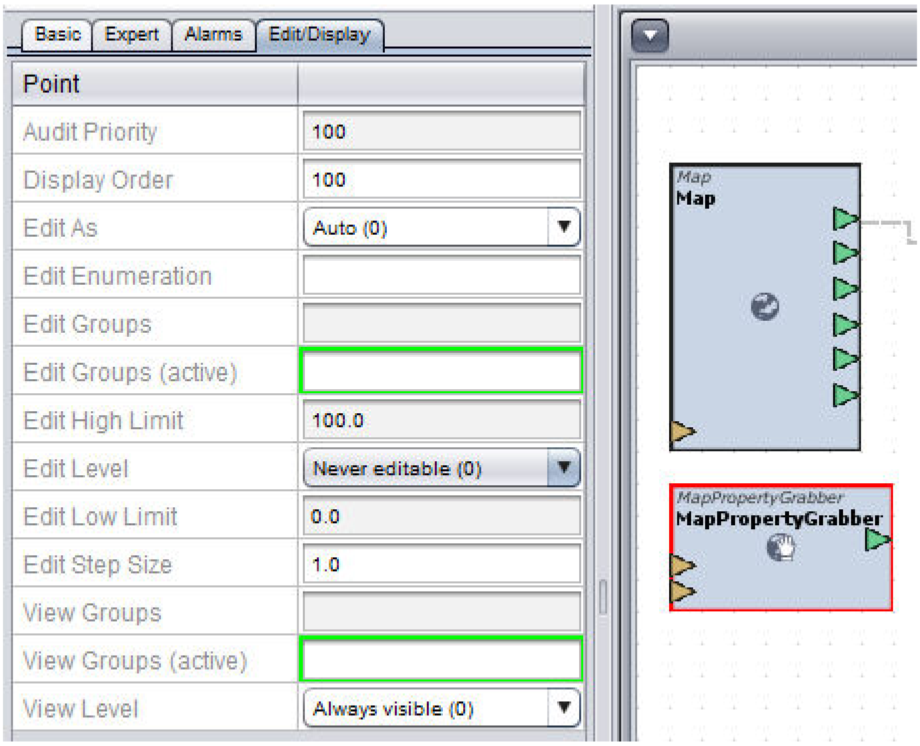
Display Order of Points

Users may now order the points for the HTML5 UI by manipulating the Display Order property on the Edit/Display Tab. The lower the value the closer the point will be showed to the top of the user interface. When multiple points share the same value then they will be displayed alphabetically with other points sharing the same Display Order. This property affects not only points in the Controller node but points in other nodes.

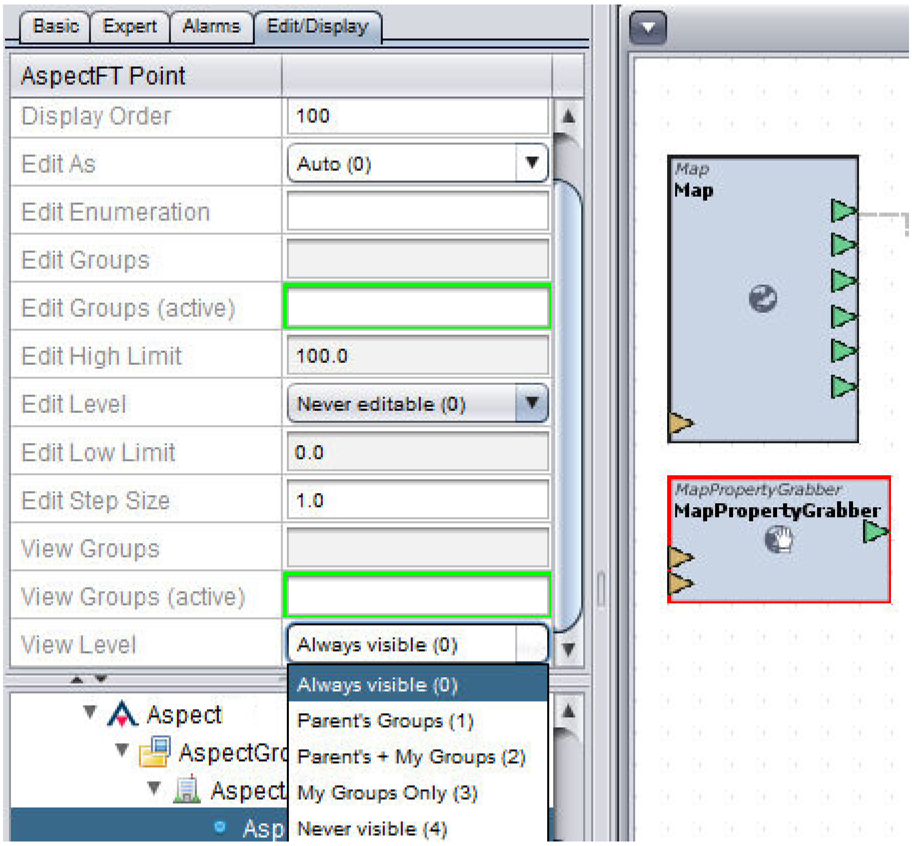


Node Based User Permissions

Not only can you determine the order in which points are displayed but you can also make it so certain users can view or edit certain points within the system. By manipulating the view groups property you can make it so only certain groups have access to view the point.



You must also manipulate the View level property. This will allow you to set it to Always visible, parents groups, Parents + My Groups, or never visible.



Working with Network Groups and Networks

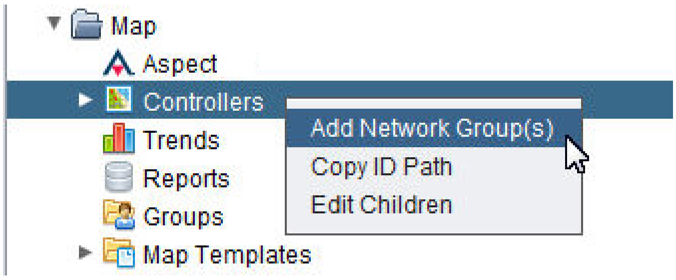
Adding a Network Group

In order to define networks, you must first create a Network Group. A Network Group is a collection of networks that may belong to one or more Aspect-Matrix, Aspect-Nexus, or even MatrixPNC and MatrixBBC network controllers.

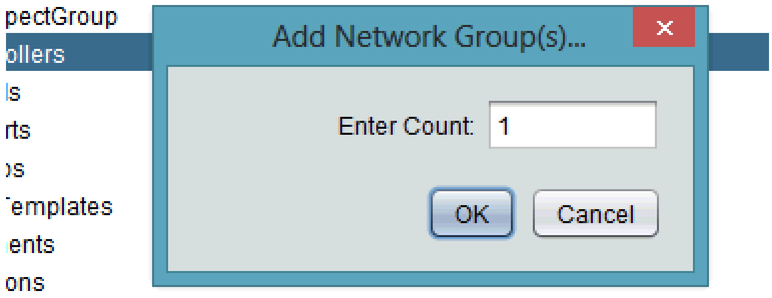
A Network Group can be thought of as a specific geographical location that may have one or more targets, or an alternative topology of your choosing.

To add a Network Group, perform the following steps:

1. From within the Map node of your Project Tree, right click the Controllers node. Select Add Network Group(s) from the shortcut menu.

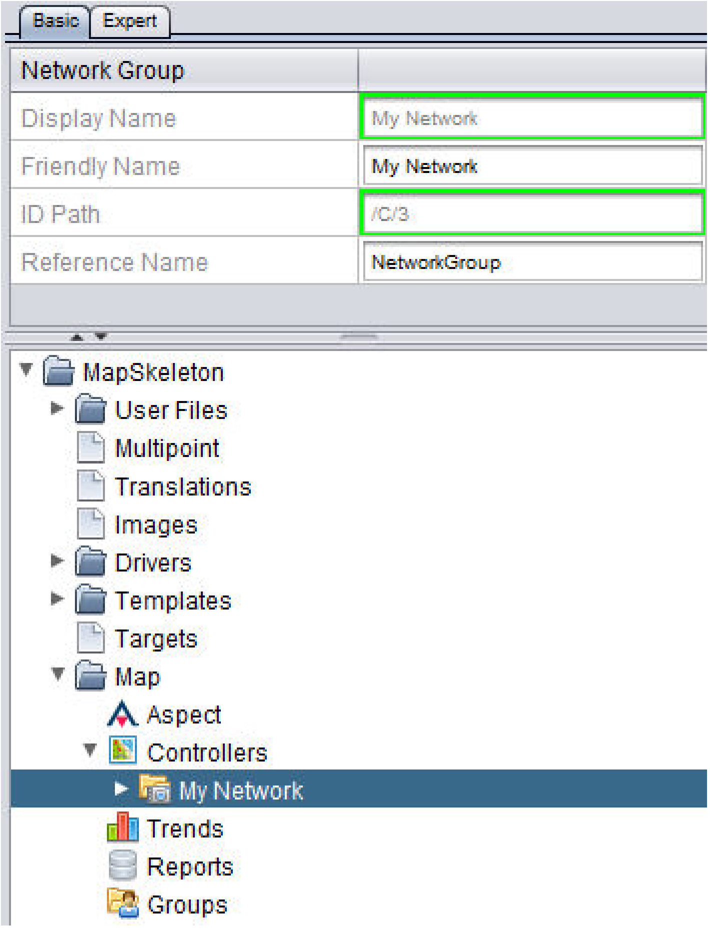


2. Define the number of Network Groups you wish to create in the Add Network Group(s) dialog box. Type an appropriate number into the text box. Click OK.



3. The number of network groups you have requested will be processed and added underneath the Controllers node. The progress bar in Aspect-Studio will provide indication as each Network Group is inserted into the Controllers container. Once added, you can assign a Reference Name and a Friendly Name to the Network Group. This is performed using the Properties Pane.

4. The Friendly Name is a label displayed not only within the Controllers node, but will also be displayed within the HTML5 user interface. Friendly Names can display spaces and other characters that are visible to the user. The ReferenceName is an internal name reference for use by technicians developing and maintaining an Aspect system. This should not contain any spaces or special characters. Finally, the Display Name will provide you with a read-only reference of the way the Network Group will be displayed in the Tree as well as the HTML5 user interface for verification.



More Information

Working in the Controllers Node - Overview

Adding a Network

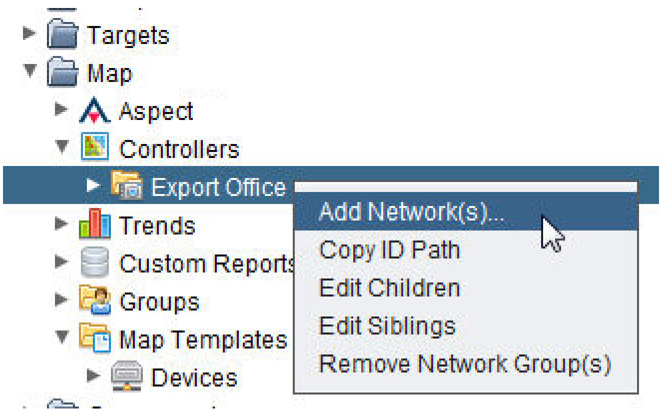
Adding a Network

A Network is defined as a single field bus network that contains one or more connected devices.

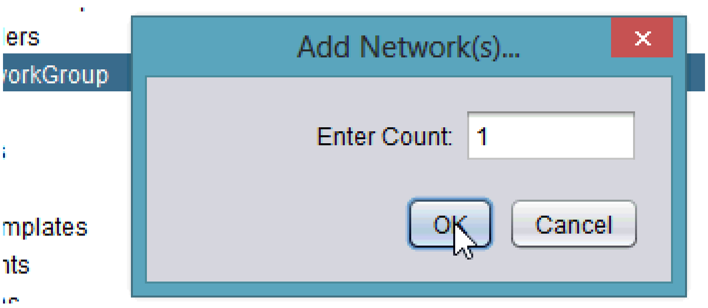
- In the case of BACnet, a Network is a single Network Number that references either a BACnet/IP network, a BACnet MS/TP network, or other inter-connected BACnet network.
- In the case of PUP, a Network is a single RS-485 network that references a port on a network controller.

To add a Network, perform the following steps:

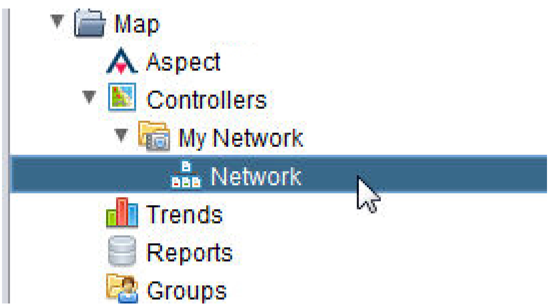
1. From your created Network Group, right click and select Add Network(s) from the shortcut menu.



2. Define the number of networks you wish to create in the Add Network(s) dialog box. Type an appropriate number into the text box. ClickOK.



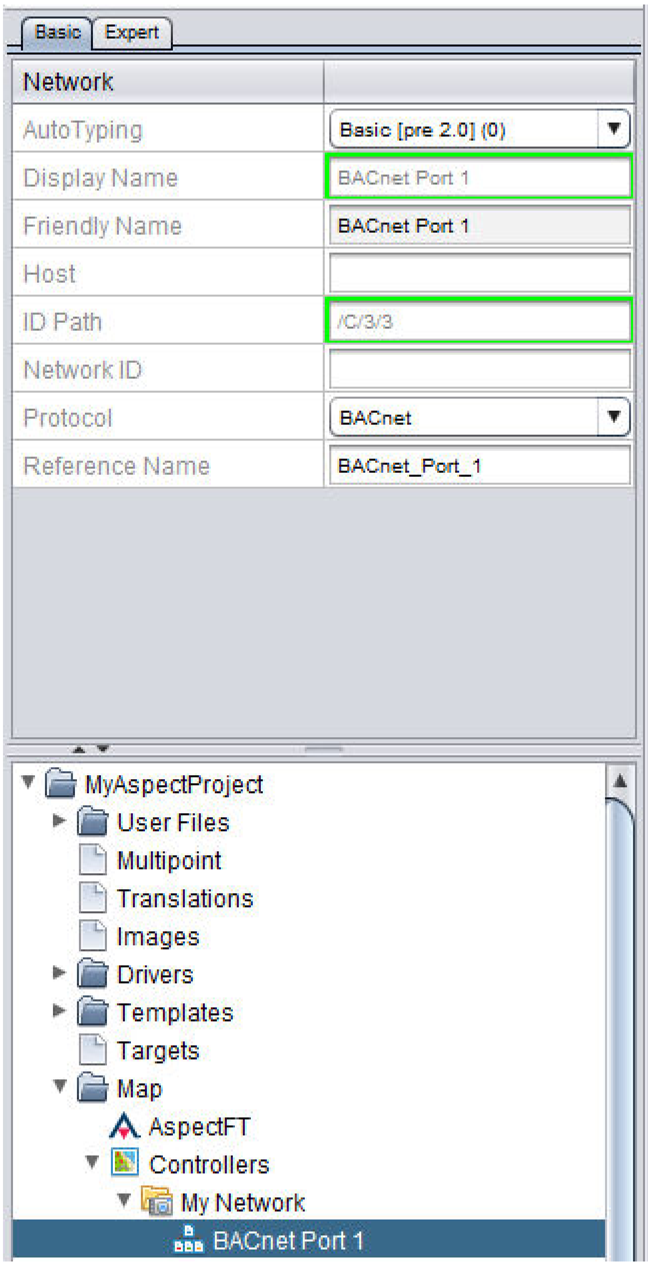
3. The number of networks you have requested will be processed and added underneath the Network Group. The progress bar in AspectStudio will provide indication as each Network is inserted into the Network Group container.



4. To configure the Network, select the newly added Network(s) and access the Properties Pane.

Property	Notes
AutoTyping	This property defines the functional capability for automatically detecting and determining data types for points that are created for devices. By default, this configuration is set for "Basic (pre 2.0)". If you are working with Aspect-Matrix and Aspect-Nexus products that are using v2.00 firm-ware or later, you may change this setting to "Advanced (v2.x and Later)". If you are referencing points from an Aspect target with firmware prior to v2.x, a MatrixPNC, or a MatrixBBC, leave this set-ting as its default configuration.
Display Name	This property is a read-only indication providing feedback of the name that will be displayed within the HTML5 user interface.
FriendlyName	This property defines the FriendlyName for the Net-work as displayed in the Project Tree, as well as the dynamic HTML5 web interface.
Host	This property defines the IP Address or resolvable hostname for the target hosting the network that you will communicate with.
ID Path	This property displays the full unique ID path for the selected Network.
Network ID	This property defines the Network ID for the net-work you are addressing. If you are working withPUPprotocol:Port 1 = Network ID 0Port 2 = Network ID 1 If you are working withBACnetpro-tocol:Port 1 = MS/TP Network Number for Port 1Port 2 = MS/TP Network Number for Port 2BACnet/IP = BACnet/IP Network NumberBACnet/Ethernet = BACnet/Ethernet Net-work Number
Protocol	This property defines the protocol you will be com-municating. Select BACnet or PUP accordingly.
ReferenceName	This property defines the ReferenceName that is

	used within the underlying engine of Aspect.



More Information

[Working in the Controllers Node - Overview]
[Adding a Network Group]
[Adding a Device]

Working with Devices and Points

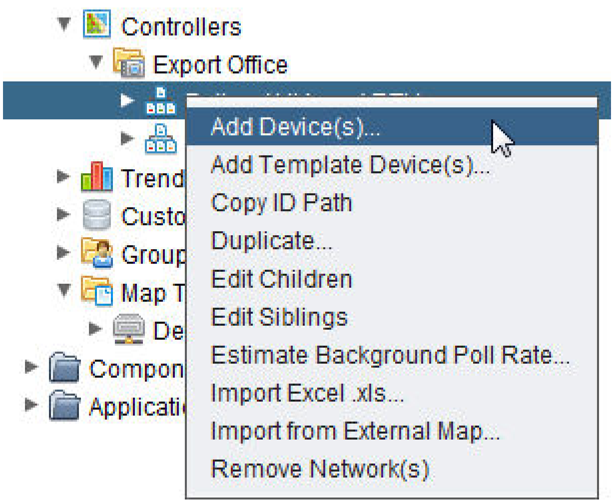
Devices

Adding a Device

Once you have added and defined your networks, you may now begin to add devices to the associated networks you have added to your Topology Map.

To add a Device, perform the following steps:

1. From your defined Network, right-click and select Add Device from the shortcut menu.



2. Define the number of devices you wish to create in the Add Device(s) dialog box. Type an appropriate number into the text box. Click OK.

3. The number of devices you have requested will be processed and added underneath the Network. The progress bar in Aspect-Studio will provide indication as each device is inserted into the Network container.

More Information

[Working in the Controllers Node - Overview](#)

[Configuring a Device](#)

[Duplicating a Device](#)

[Editing Multiple Devices](#)

[Adding a Device via Template Device](#)

[Adding Device Points](#)

[Editing Multiple Device Points](#)

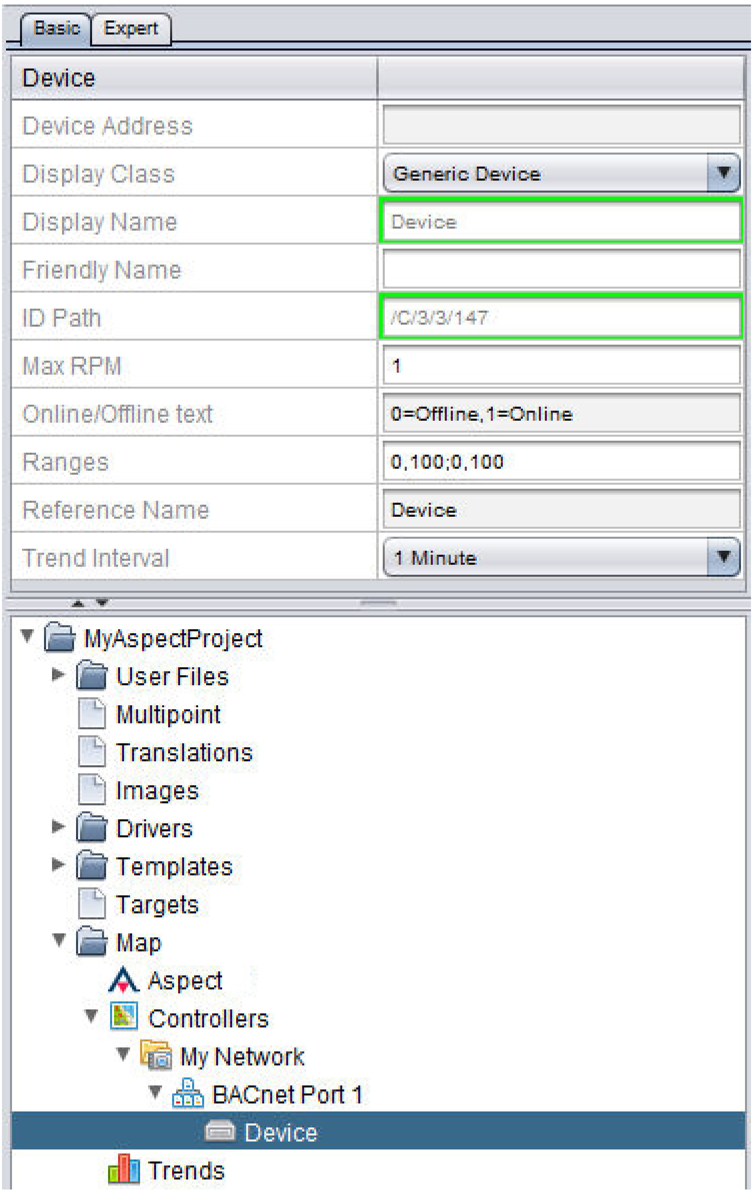
Configuring a Device

To configure the device, you are required to provide key information regarding the device. This information is outlined in the table below.

Property	Notes
Device Address	This property defines the Unit ID or MAC Address of the device. BACnet Devices:For BACnet devices, the Device ID is commonly the MAC Address of the BACnet device. PUP Devices:For PUP devices, the Device ID is the Unit ID number of the controller commonly defined in FF00;ID.

Device Class	This property assigns a generic device class and is used for displaying optional widgets in the auto-generated HTML5 web interface. Options include the following: - Generic Device - defines the device entry as a generic controller, which does not display any standard, preset widget in the HTML5 interface. - HVAC Zone - defines the device entry as a standard HVAC Zone (Rooftop, Heatpump, Fancoil, etc) and will display a widget including Zone Temperature, Supply Temperature, Mode, Occupancy, and Heating/Cooling Setpoint indicators. - VAV - defines the device entry as a VAV zone and will display a widget include Zone Temperature, Damper Position, Heating/Cooling Setpoint indicators, Mode, and Occupancy.
Display Name	This property is a read-only indication providing feedback of the name that will be displayed within the HTML5 user interface.
Friendly Name	This property defines the Friendly Name for the Device as displayed in the Project Tree, as well as the dynamic HTML5 web interface.
ID Path	This property displays the full unique ID path for the selected device.
Max RPM	This property is used to tune Read Property Multiple. Read Property Multiple is a service which allows a client such as Aspect to request multiple points within a single transaction for the purpose of trend collection and other client-based tasks. BACnet Devices:For BACnet devices, this value can be increased under the following situations for specific AAM Native Series products: - NB-ASC/VAV/V3T - no greater than five (5). - NB-GPC and MatrixBBC - no greater than ten (10). NOTE - If you are addressing a third-party BACnet device, please consult vendor documentation to

	verify whether or not the device support Read Property Multiple and how many points per transaction maximum that the device may support. PUP Devices:For PUP devices, this value should be set to a value of 1 at all times.
Online/Offline text	This property defines text displayed when a device is Online or Offline. The default format is 0=Offline,1=Online
Ranges	This property defines the low and high value ranges for HTML5 widgets. These ranges are used to define the min and max values to display for Zone Temperature and Supply Temperature accordingly.
Reference Name	This property defines the Reference Name that is used within the underlying engine of Aspect.
Trend Interval	This property defines the time interval at which trend samples will be collected for points configured for Trending Active. By default, Aspect will collect trend samples from points configured for Trending Active at 1 Minute intervals. This setting is variable and includes the following set options: • 1 Minute • 3 Minutes • 5 Minutes • 15 Minutes • 30 Minutes • 60 Minutes



More Information

[Working in the Controllers Node - Overview]

[Duplicating a Device]

[Editing Multiple Devices]

[Adding a Device via Template Device]

[Adding Device Points]

[Editing Multiple Device Points]

Points

Adding Points

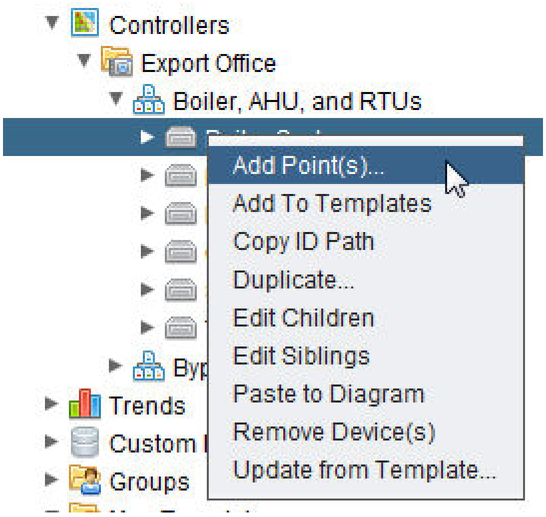
Once you have added a device and configured its associated properties, you may begin to add point references into the device.

This section reviews the method to be used to add points to the device.

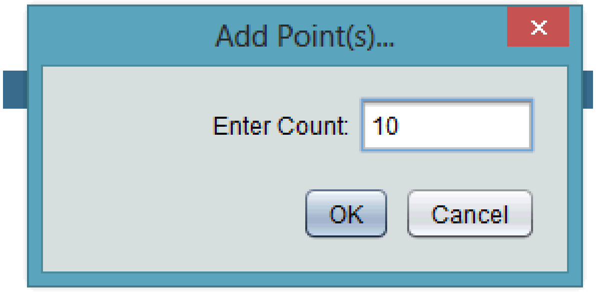
Add Point(s)

This section reviews the method that can be used to add points to the device. To do so, perform the following steps:

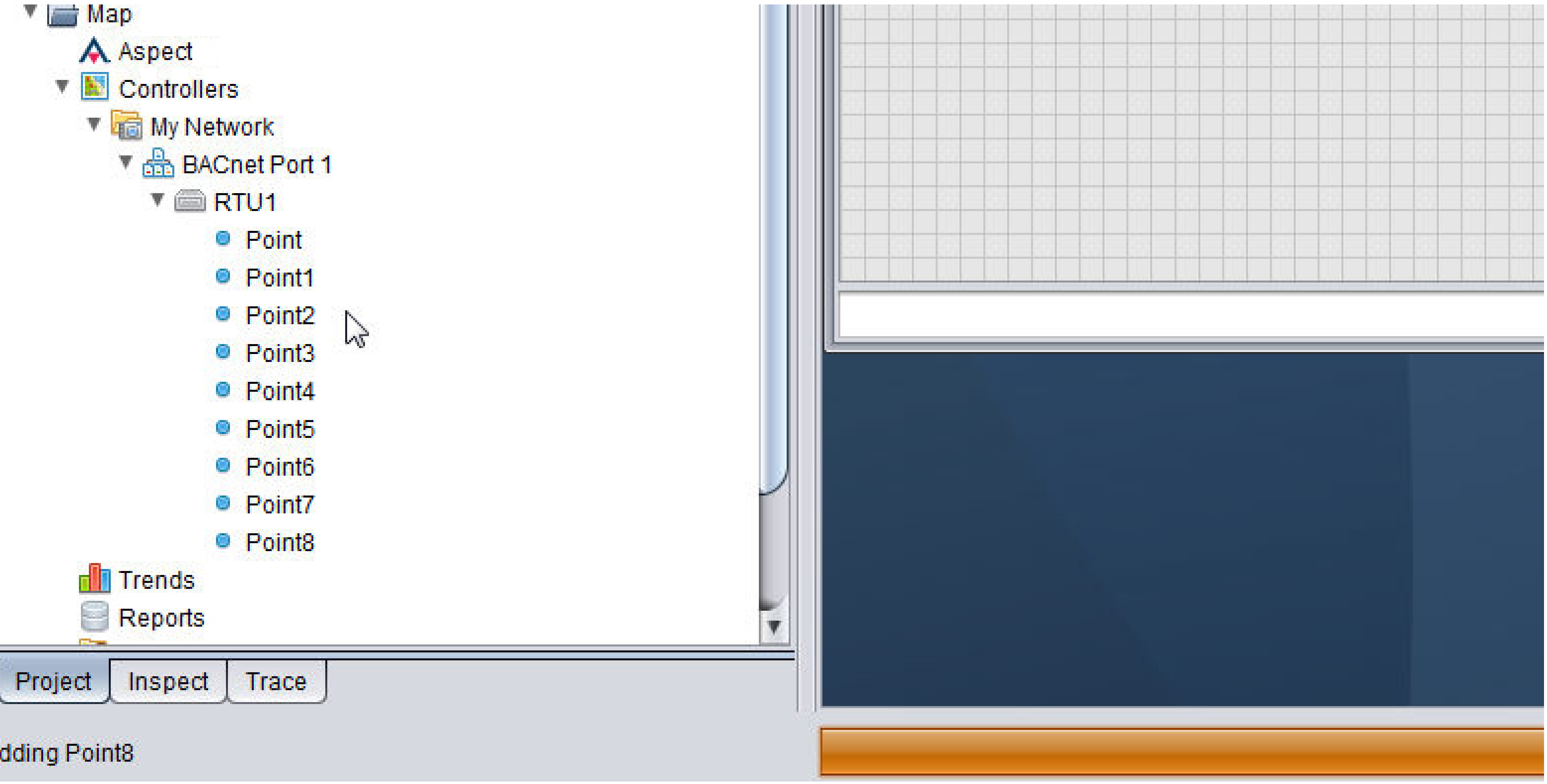
1. From your defined Device, right-click and select Add Point(s).



2. Define the number of points you wish to create in the Add Point(s) dialog box. Type an appropriate number into the text box. Click OK.



3. The number of points you have requested will be processed and added underneath the device. The progress bar in Aspect-Studio will provide indication as each point is inserted into the device container.



More Information

Working in the Controllers Node - Overview

Editing Multiple Device Points

Pasting Device Points to Diagram

Configuring a Point

To configure the Point, go to the Properties Pane with the Point selected within your Project Tree and configure the following properties accordingly. A device's Point contains three different types of properties:

- Basic - Specifies basic information - such as point addressing, engineering units, and other data.

- Alarms - Specifies alarm configuration for the point - such as high/low limits, deadband configuration, entry/exit timing, etc.
- Expert - Contains advanced information and is not used for active point configuration. As such, this information is not reviewed below.

Detailed information regarding configuration for Basic and Alarms is provided below.

Basic

<table>
<tr><th>Property</th><th>Notes</th></tr>
<tr><td>Cache?</td><td>This property defines caching behavior for the point reference.

When set to Yes, Aspect will routinely poll and cache the point value within the system for continual reference for trending configured from the Topology Map.

When set to No, Aspect will only poll for the point when requested (e.g. viewed from the HTML5 user interface).</td></tr>
<tr><td>Data Type</td><td>This property defines the data type for the referenced point. You must set the data type appropriate to the point reference.

Available data type selections are as followed:
<table>
<tr><td>Integer (1)</td><td>This option tells the system this point is an integer data type.</td></tr>
<tr><td>Float (2)</td><td>This option tells the system this point is a float data type.</td></tr>
<tr><td>String (3)</td><td>This option tells the system this point is a string data type.</td></tr>
<tr><td>Date (4)</td><td>This option tells the system this point is a date data type. (PUP only)</td></tr>
<tr><td>Time (5)</td><td>This option tells the system this point is a time data type. (PUP only)</td></tr>
<tr><td>Bitstring (6)</td><td>This option tells the system this point is</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td></td><td>a bit string data type. (PUP only)</td></tr>
<tr><td>BACnet Weekly Schedule (50)</td><td>This option tells the system this point is an BACnet Weekly Schedule.</td></tr>
<tr><td>BACnet Date (60)</td><td>This option tells the system this point is a BACnet Date (BACnet only) and supports read-only access.</td></tr>
<tr><td>BACnet Time (61)</td><td>This option tells the system this point is a BACnet Time (BACnet only) and supports read-only access.</td></tr>
<tr><td>BACnet Calendar List (62)</td><td>This option tells the system this point is a BACnet Calendar List (BACnet only) and supports read-only access.</td></tr>
<tr><td>BACnet Object ID (63)</td><td>This option tells the system this point is a BACnet Object ID (BACnet only) and supports read-only access.</td></tr>
<tr><td>Protocol Native (99)</td><td>This option tells the system this point is Protocol Native. Provides no manipulation from the data returned from the device.</td></tr>
<tr><td>Other (100)</td><td>Not yet implemented.</td></tr>
</table>
</td></tr>
<tr><td>Display Name</td><td>This property is a read-only indication providing feedback of the name that will be displayed within the HTML5 user interface.</td></tr>
<tr><td>Enumeration</td><td>This property defines an enumerated unit for the point reference. For example, if the point you are referencing is an enumerated point (e.g. a point referencing Fan or Equipment status), you may enter comma separated list of enumerations within this property.

The comma separated list must be in the format of value=string.

For example:

0=Unoccupied,1=Warmup,2=Occupied,3=Setback</td></tr>
</table>

	0=Off,1=On 0=Off,1=Low,2=Medium,3=High
Friendly Name	This property defines the FriendlyName for the Point as displayed in the Project Tree, as well as the dynamic HTML5 web interface.
ID Path	This property displays the full unique ID path for the selected point.
Network Property	This property defines the network property (channel;attribute or object;property) for the point. For BACnet: For BACnet points, this format is defined as: ObjectID;Instance;Identifier (e.g. 2;1;85) - Analog Value 1, present-value NOTE - If you are addressing an array-based property (such as priority-array), an optional array index can be included as: ObjectID;Instance;Identifier:ArrayIndex (e.g. 2;1;87:8) - Analog Value 1, priority-array , array index 8 For PUP: For PUP points, this format is defined as: Channel;Attribute (e.g. - FE01;CV)
Number Format	This property defines the Number Format in which data will be presented to the rich graphical user interface and/or HTML5 web user interface. By default, this property is set for a value of ##.0 where a single decimal place will always be displayed for floating

	point values.
Poll Interval Type	This property defines the polling interval for the Point. By default, all Points added to the system are set for Standard Polling. However, this can be overridden on a point by point basis to Slow or Fast as desired
Reference Name	This property defines the Reference Name that is used within the underlying engine of Aspect.
Spark Line?	This property, when se to Yes, will display a spark line within the HTML5 user interface. A spark line shows real-time trended data over the last few minutes of time. NOTE - Enabling a point for Spark Line capabilities will result in periodic polling of the device point based on your polling interval configuration in the Map element.
Trending Enable	This property defines whether the Point will be trended by Aspect. When set to Yes, the Point value will be trended based on configuration Trend Interval property of the Device. When set to No, the Point value will not be trended by Aspect.
View Trend By Default?	This property defines whether the point will be automatically selected for trend viewing from the HTML5 web user interface if/when the point is enabled for trending.
Units	Defines an Engineering unit for the Point that will be displayed and passed onto the HTML5 web user interface, or the rich graphical user interface.

Alarms

Property	Notes
Alarm Auto-clear	Defines if the alarm is automatically cleared once the value returns to normal.

Alarm Bottom Deadband	Defines the alarm deadband for bottom limit alarms. The point will come out of alarm when the value crosses theAlarm Bottom of Band + or - Alarm
Alarm Bottom of Band	Defines the bottom of the alarm band threshold.
Alarm Description	Defines a string description that is inserted into the Alarm Manager database.
Alarm Entry Delay	Defines the amount of time, in seconds, the alarm must be in condition before an entry is routed to the Alarm Manager.
Alarm Exit Delay	Defines the amount of time, in seconds, the alarm must be out of condition before an entry is routed to the Alarm Manager.
Alarm Top Dead-band	Defines the alarm deadband for bottom limit alarms. The point will come out of alarm when the value crosses theAlarm Top of Band + or - Alarm Top
Alarm Top of Band	Defines the top of the alarm band threshold.
Alarm Type	This property defines the type of Alarming for this point. Available alarming selections are as followed: • Disabled (0) • Alarm when ON (1) • Alarm when OFF (2) • High Limit (3) • Low Limit (4) • Out of Range (5) • In Range (6)
AlarmPriority	Defines a priority for the alarm.

Expert

Property	Notes
Active Data Type	Read only. Indicates the points current data type.
Core Scaling Type	NONE=None (0) BOOLINV=Bool Invert (1) NUMINV=Numeric Invert (2)

	ADD=Add Fixed Value (3) SUBTRACT=Subtract Fixed Value (4) MULT=Multiply by Fixed Value (5) DIV=Divide by Fixed Value (6)
Core Scaling Value	Value used in the math operation.
Master Value	The value to write to the network property (If enabled via Master Value Enabled).
Master Value Enabled	If yes, the Master Value will be written to the network property any time the value in the device differs from the Master Value.
Master Value Threshold	Delta at which a Master Value is considered "effect-ively equal" to the target value.
Master Value Write Priority	Priority to use when the Master Value is written.
Minimum Quality For Write	The minimum quality required for any incoming value to be written to the target.
Reference Path	Read Only. The full path of this object, using Reference Names to create the path. Changes with any Refer-enceName change in the path.
Update Master Value on Write?	If yes, the Master Value will be set by any writes to this Map object. If no, then the writes are sent to the target but the Master Value is not updated.
Write Threshold	The delta within which the current value is considered equivalent to the request write value. Used to determ-ine if an actual write to the target is necessary.
Write When Equal	If yes, any write request will write to the target even if the value is equal to the current value of the target.

More Information

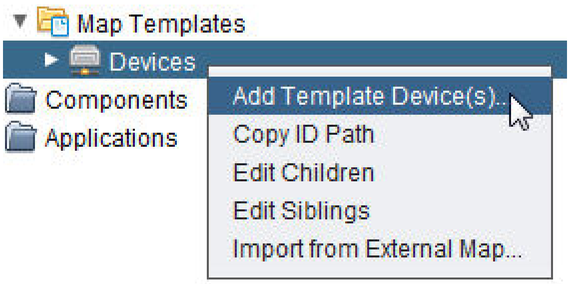
[Working in the Controllers Node - Overview]
[Editing Multiple Device Points]
[Pasting Device Points to Diagram]

Working with Device Templates

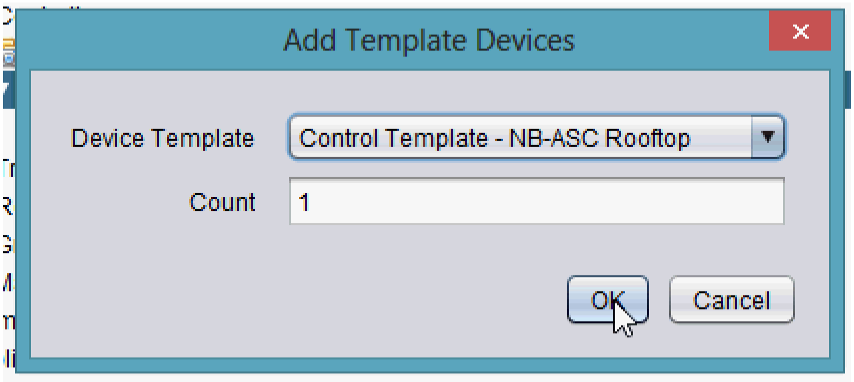
Adding a Device via Template Device

To add a Device using a pre-configured Template Device, perform the following steps:

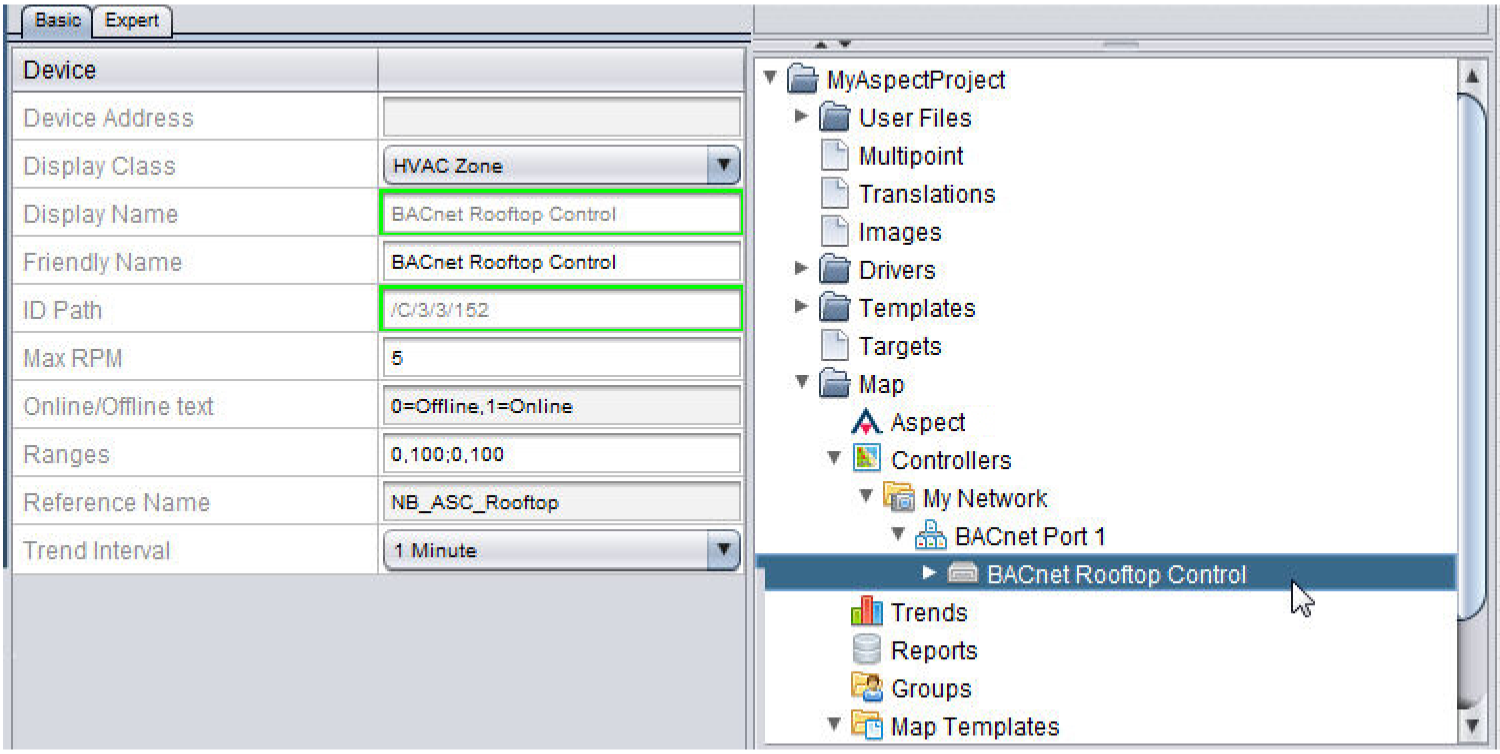
1. From your defined Network, right-click and select Add Template Device(s) from the shortcut menu.



2. Select and define the type and number of Template Devices you wish to create in the Add Template Device(s) dialog box. Type an appropriate number into the text box. Click OK.



3. The number of devices you have requested will be processed and added underneath the network. The progress bar in Aspect-Studio will provide indication as each device is inserted into the network container.



4. To configure the Device, go to the Properties Pane with the Device selected within your Project Tree and configure the following properties accordingly.

Property	Notes
Device Address	This property defines the Unit ID or MAC Address of the device. BACnet Devices:For BACnet devices, the Device ID is commonly the MAC Address of the BACnet device. PUP Devices:For PUP devices, the Device ID is the Unit ID number of the controller commonly defined in FF00;ID.
DeviceClass	This property assigns a generic device class and is used for displaying optional widgets in the auto-generated HTML5 web interface. Options include the following: • Generic Device - defines the device entry as a generic controller, which does not display any standard, preset widget in the HTML5 interface. • HVAC Zone - defines the device entry as a

	standard HVAC Zone (Rooftop, Heat-pump, Fancoil, etc) and will display a widget including Zone Temperature, Supply Temperature, Mode, Occupancy, and Heating/Cooling Setpoint indicators. • VAV - defines the device entry as a VAV zone and will display a widget include Zone Temperature, Damper Position, Heating/Cooling Setpoint indicators, Mode, and Occupancy.
Display Name	This property is a read-only indication providing feedback of the name that will be displayed within the HTML5 user interface.
FriendlyName	This property defines the FriendlyName for the Device as displayed in the Project Tree, as well as the dynamic HTML5 web interface.
ID Path	This property displays the full unique ID path for the selected template device.
MaxRPM	This property is used to tune Read Property Multiple. Read Property Multiple is a service which allows a client such as Aspect to request multiple points within a single transaction. For PUP devices, this value should be set to a value of 1. For BACnet devices, this value can be increased under the following situations for specific AAM Native Series products: • NB-ASC/VAV/V3T - no greater than five (5). • NB-GPC and MatrixBBC - no greater than thirty-two (32). If you are addressing a third-party BACnet device, please consult vendor documentation to verify whether or not the device support Read Property Multiple and how many points per transaction maximum that the device may support.
Online/Offline text	This property defines text displayed when a device is Online or Offline. The default format is 0=Offline,1=Online
Ranges	This property defines the low and high value

	ranges for HTML5 widgets. These ranges are used to define the min and max values to display for Zone Temperature and Supply Temperature accordingly.
ReferenceName	This property defines the ReferenceName that is used within the underlying engine of Aspect.
Trend Interval	This property defines the time interval at which trend samples will be collected for points configured for Trending Active. By default, Aspect will collect trend samples from points configured for Trending Active at 1 Minute intervals. This setting is variable and includes the following set options: • 1 Minute • 3 Minutes • 5 Minutes • 15 Minutes • 30 Minutes • 60 Minutes

More Information

[Working in the Controllers Node - Overview]

[Adding a Device]

[Duplicating a Device]

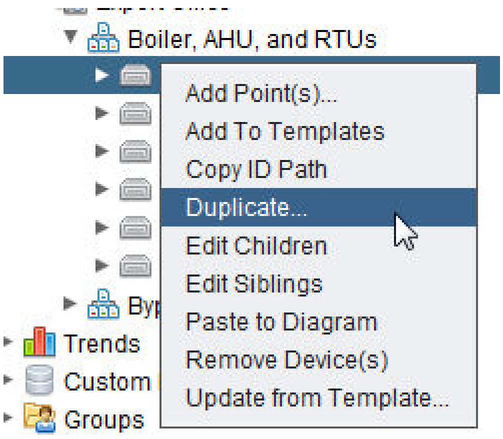
[Editing Multiple Devices]

Quick Engineering Capabilities

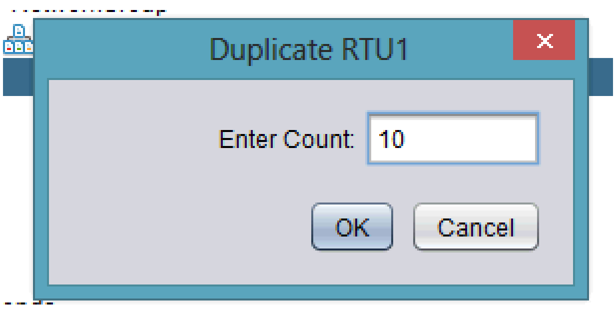
Duplicating a Device

Once you have completed configuring a device and its associated points, you can easily duplicate the device. To duplicate a device, its configuration, and contents, perform the following steps:

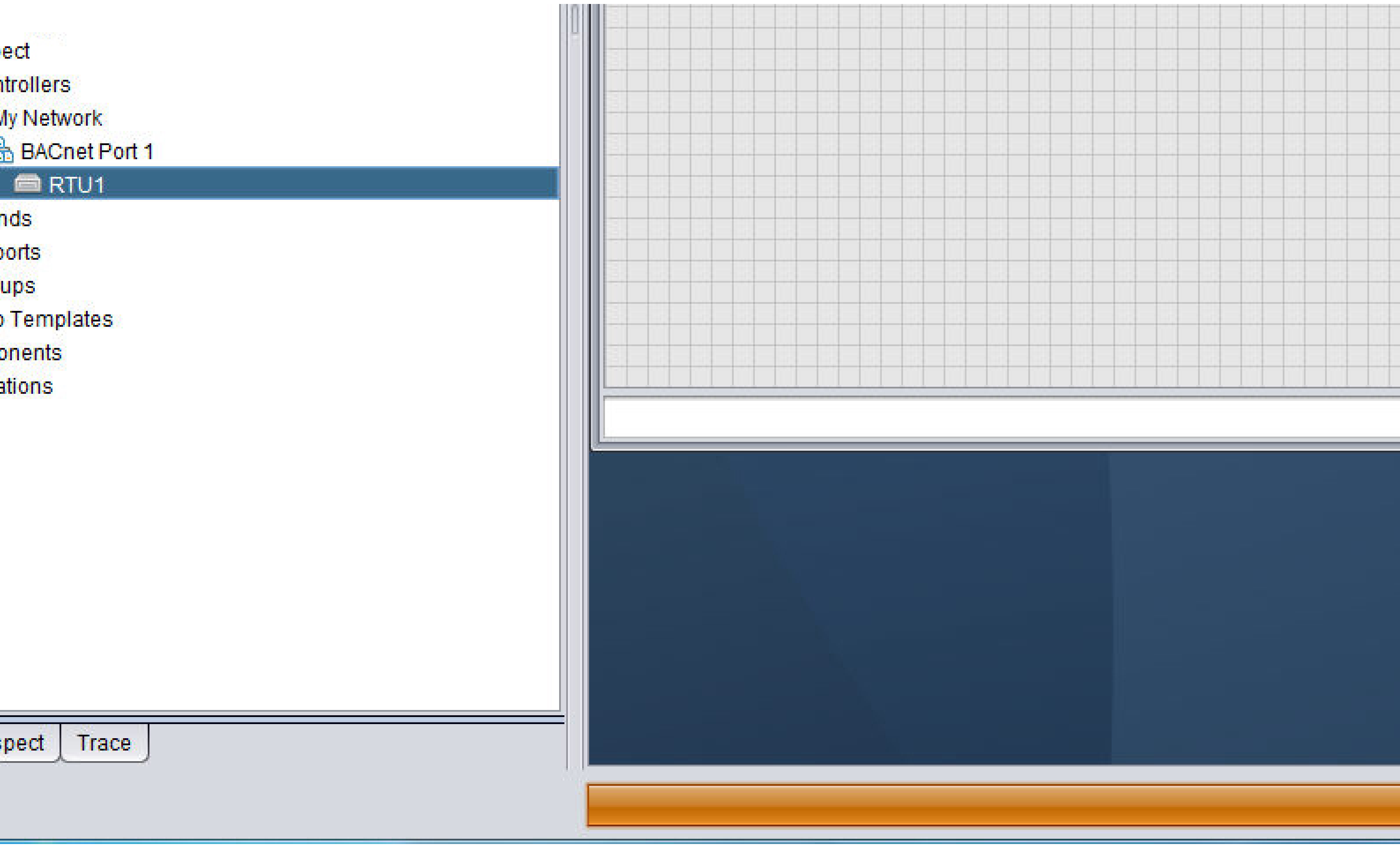
1. Right-click your defined device and select Duplicate Device from the short-cut menu.



2. You will be prompted to enter the number of duplicates you wish to create. Enter the desired number. Click OK.



3. The number of duplicate devices you have requested will be generated within the network container. The progress bar in AspectStudio will provide indication as each point is inserted into the network container. Time to duplicate a device and its associated point configuration will vary based on a number of factors.



More Information

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[Adding a Device](#)

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[Adding a Device via Template Device](#)

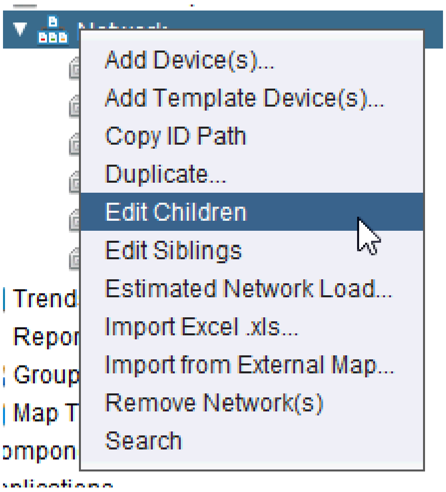
Editing Multiple Devices

As documented in the Adding a Device section, you may edit devices in an one-by-one basis through the Properties Pane. However, if you are duplicating devices or adding devices from Device Templates, editing each individual one can be time consuming. To edit in a more streamlined fashion, it is recommended that you use the Edit Children feature.

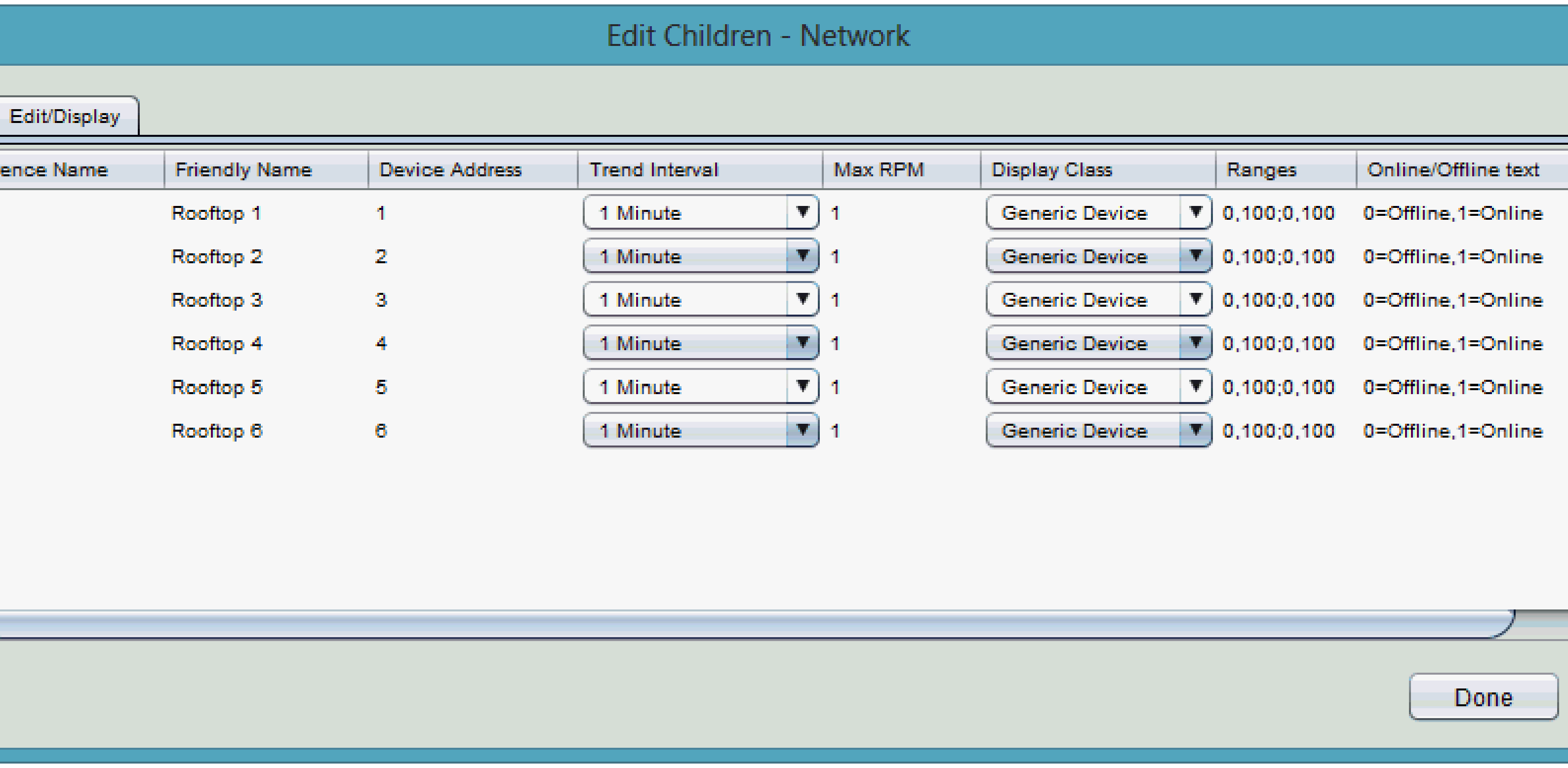
The Edit Children feature provides a spreadsheet-like view of all devices in a Network. Using this feature, you have the ability to edit all Devices belonging to a specific network in one place - thereby reducing the amount of back-and-forth motions that may have been necessary in singular methods.

To edit multiple devices, perform the following steps:

1. Right-click the Network whose devices you wish to edit and select Edit Children. Alternatively, you can right-click on a Device within the Network and select Edit Siblings from the short-cut menu.



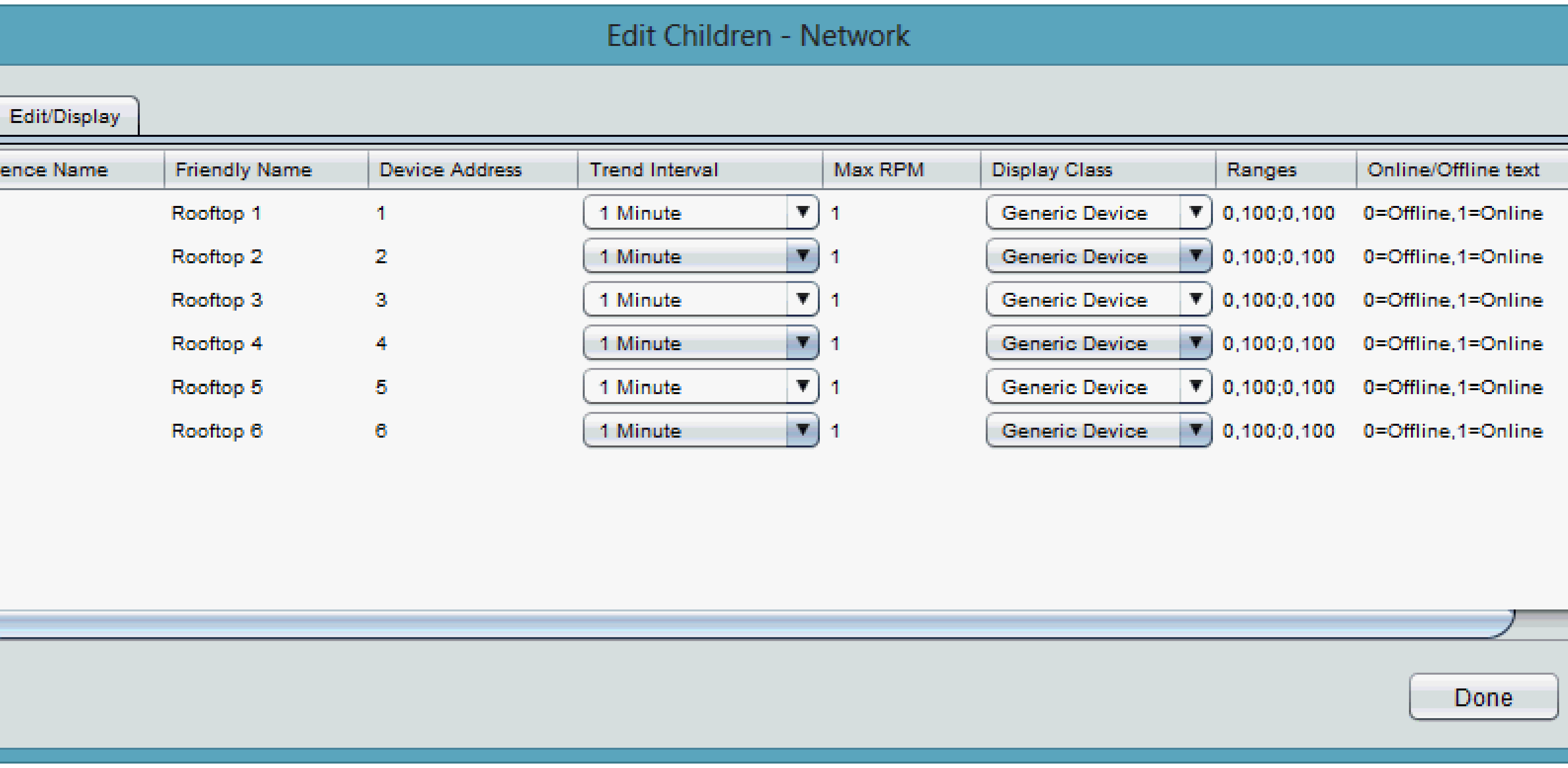
2. The Edit Children dialog editor will appear. Using this editor, you can tab from field to field and edit the various properties of a device. You may also use your up and down arrow keys to move rows.



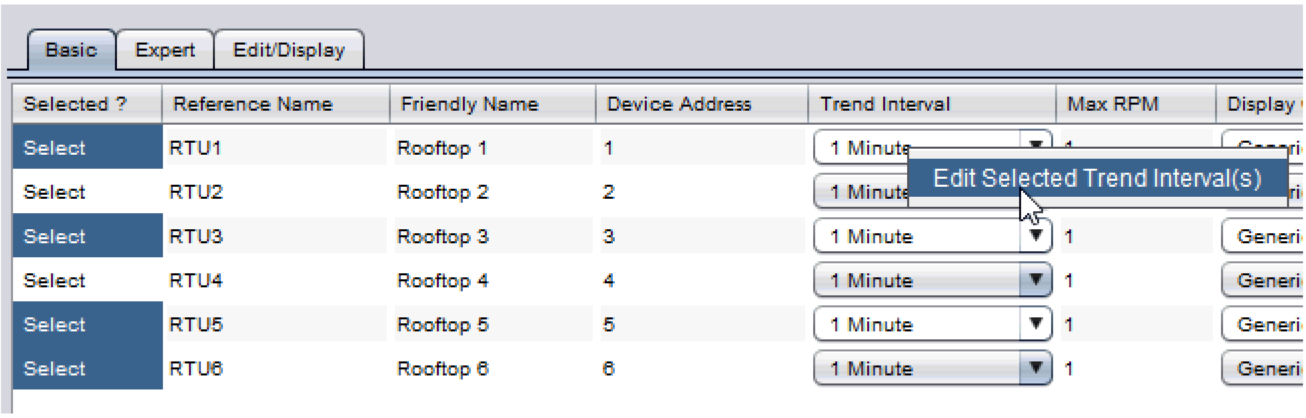
Mass Editing Specific Properties

Through Edit Children, you can mass edit a specific property for multiple Devices if desired. To edit a specific property for multiple points, perform the following steps:

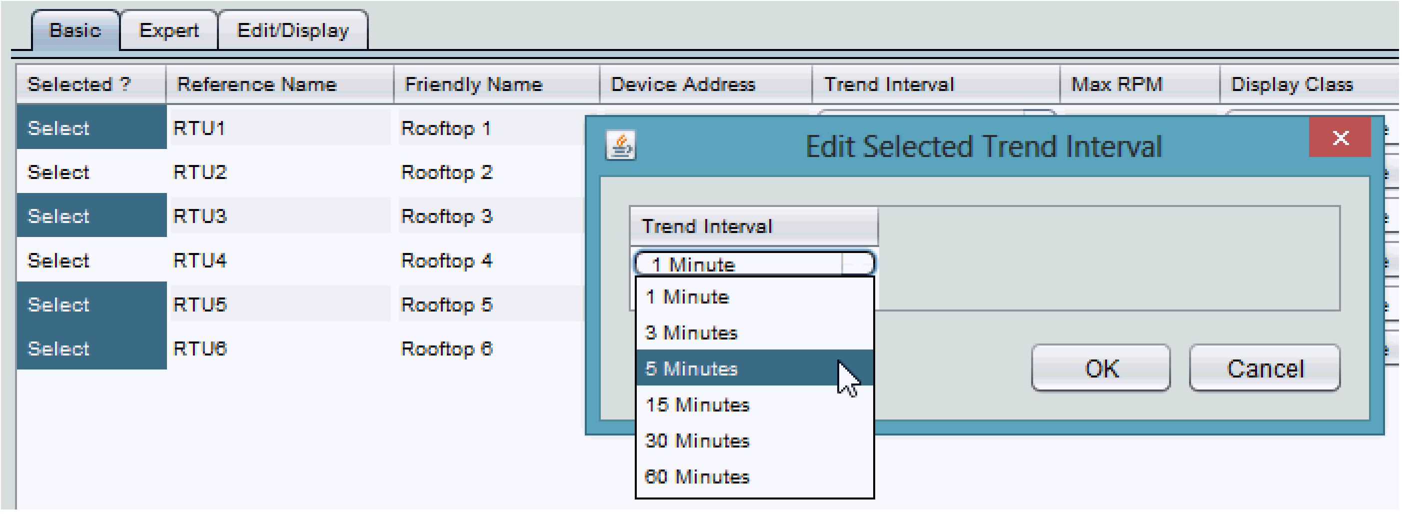
1. Within the Edit Children dialog, hold the CRTL key on your keyboard, then click and select the rows you wish to edit. If you wish to edit all rows, hold the SHIFT key on your keyboard and select the first and last item in the list.



2. Right click the column for the field you wish to edit. A short-cut for that column should appear. Select the option.



3. The Editor for that field will appear. Select or enter the value you wish to populate. Click OK.



More Information

[Working in the Controllers Node - Overview]

[Adding a Device]

[Duplicating a Device]

[Adding a Device via Template Device]

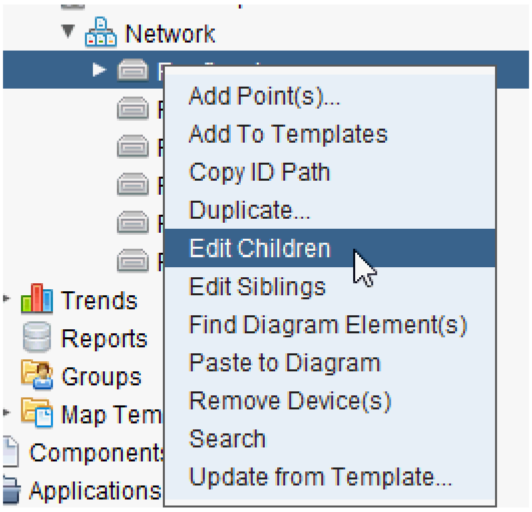
Editing Multiple Points

As documented in the Adding Points section, you may edit devices in an one-by-one basis through the Properties Pane. However, if you are adding multiple points or need to add a common property amongst multiple points (e.g. Enable Trending), editing each individual one can be time consuming. To edit in a more streamlined fashion, it is recommended that you use the Edit Children feature.

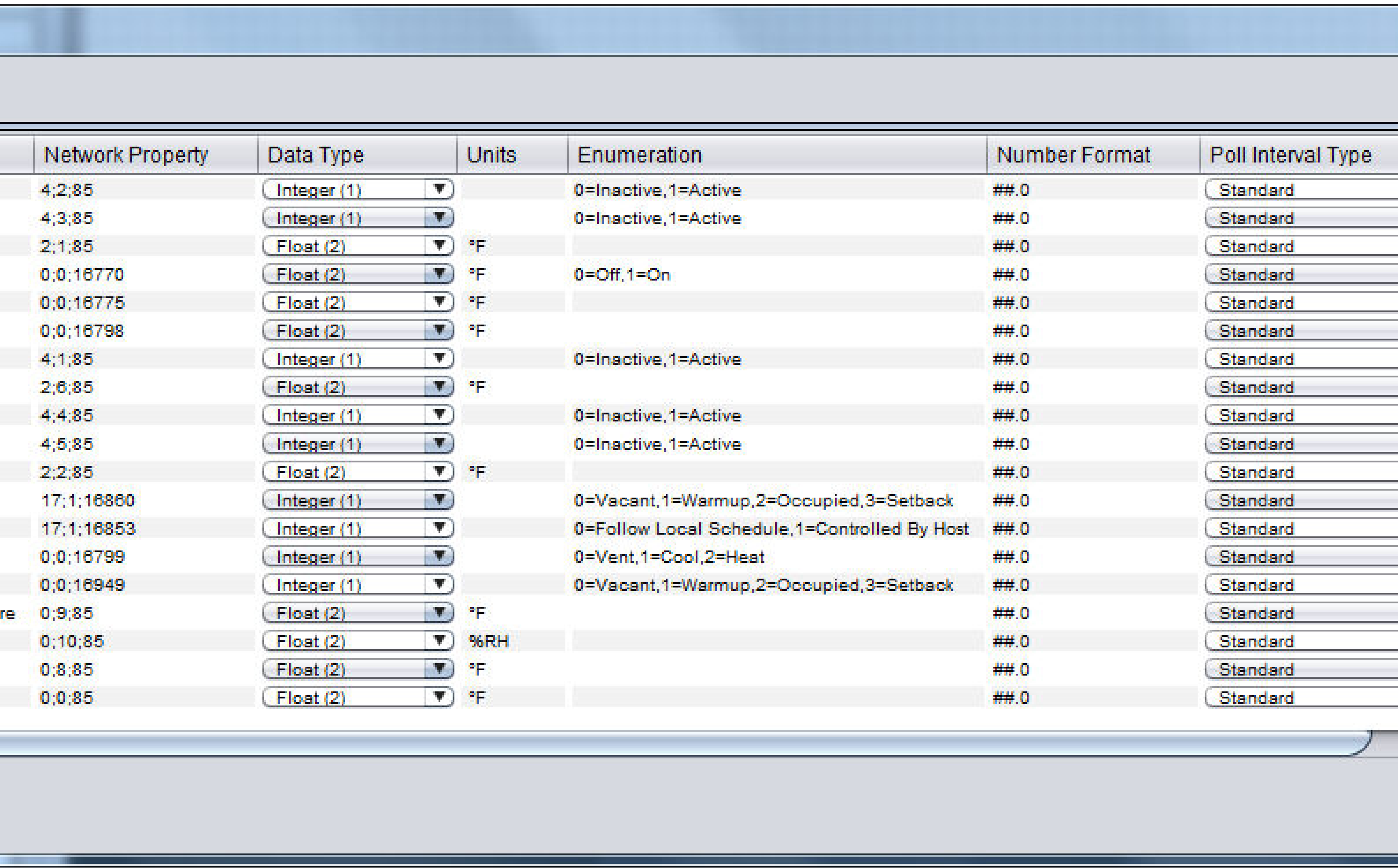
The Edit Children feature provides a spreadsheet-like view of all points that are within the container of a single. Through this feature, you have the ability to edit all the points of a particular device in one place.

To edit points, perform the following steps:

1. Right-click the Device whose points you wish to edit and select Edit Children. Alternatively, you can right-click any Point with a Device and select Edit Siblings from the short-cut menu.



2. The Edit Children dialog editor will appear. Using this editor, you can tab from field to field and edit the various properties of a device.

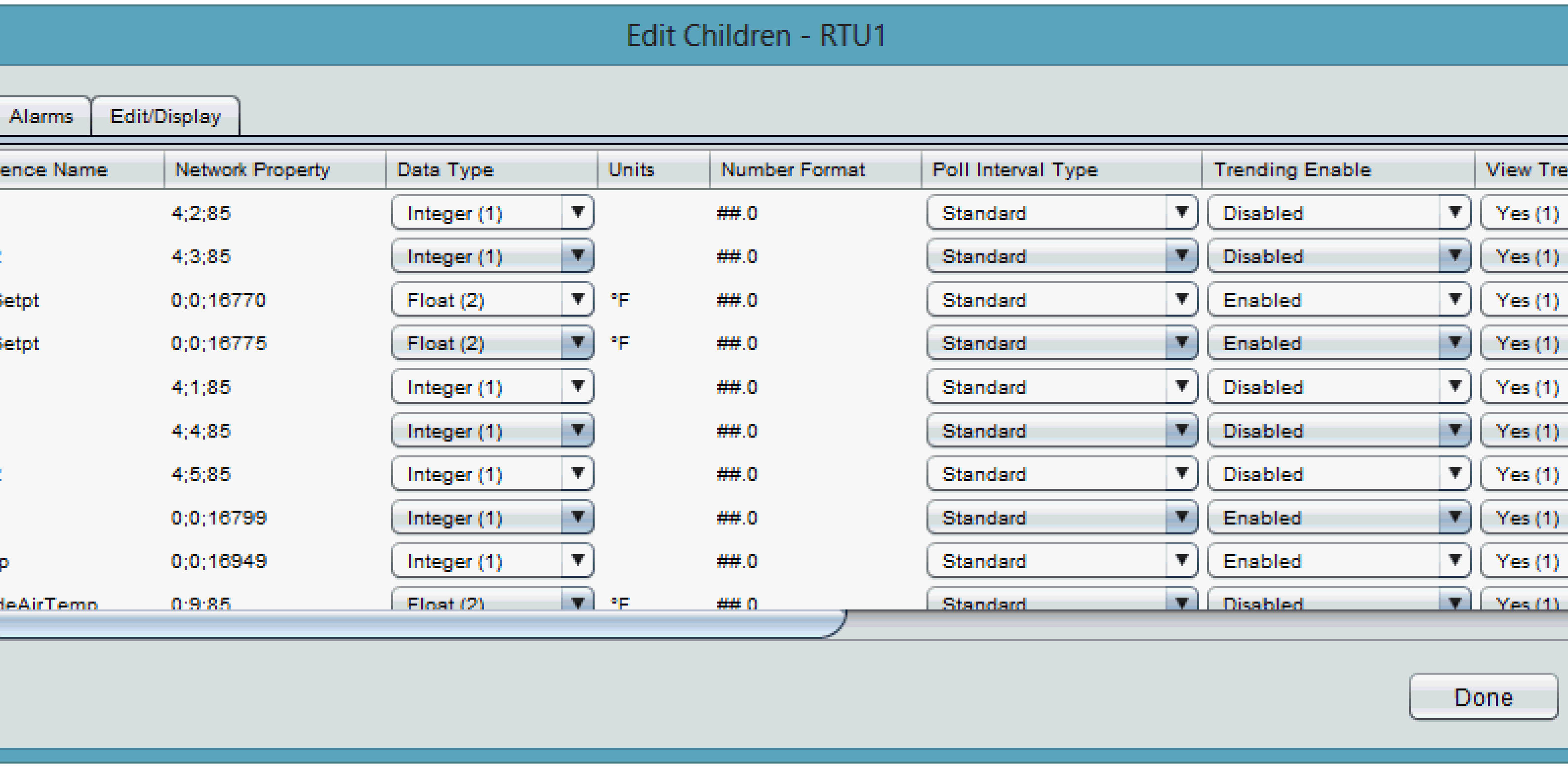


	Network Property	Data Type	Units	Enumeration	Number Format	Poll Interval Type
	4;2;85	Integer (1)		0=Inactive,1=Active	##.0	Standard
	4;3;85	Integer (1)		0=Inactive,1=Active	##.0	Standard
	2;1;85	Float (2)	°F		##.0	Standard
	0;0;16770	Float (2)	°F	0=Off,1=On	##.0	Standard
	0;0;16775	Float (2)	°F		##.0	Standard
	0;0;16798	Float (2)	°F		##.0	Standard
	4;1;85	Integer (1)		0=Inactive,1=Active	##.0	Standard
	2;6;85	Float (2)	°F		##.0	Standard
	4;4;85	Integer (1)		0=Inactive,1=Active	##.0	Standard
	4;5;85	Integer (1)		0=Inactive,1=Active	##.0	Standard
	2;2;85	Float (2)	°F		##.0	Standard
	17;1;16860	Integer (1)		0=Vacant,1=Warmup,2=Occupied,3=Setback	##.0	Standard
	17;1;16853	Integer (1)		0=Follow Local Schedule,1=Controlled By Host	##.0	Standard
	0;0;16799	Integer (1)		0=Vent,1=Cool,2=Heat	##.0	Standard
	0;0;16949	Integer (1)		0=Vacant,1=Warmup,2=Occupied,3=Setback	##.0	Standard
re	0;9;85	Float (2)	°F		##.0	Standard
	0;10;85	Float (2)	%RH		##.0	Standard
	0;8;85	Float (2)	°F		##.0	Standard
	0;0;85	Float (2)	°F		##.0	Standard

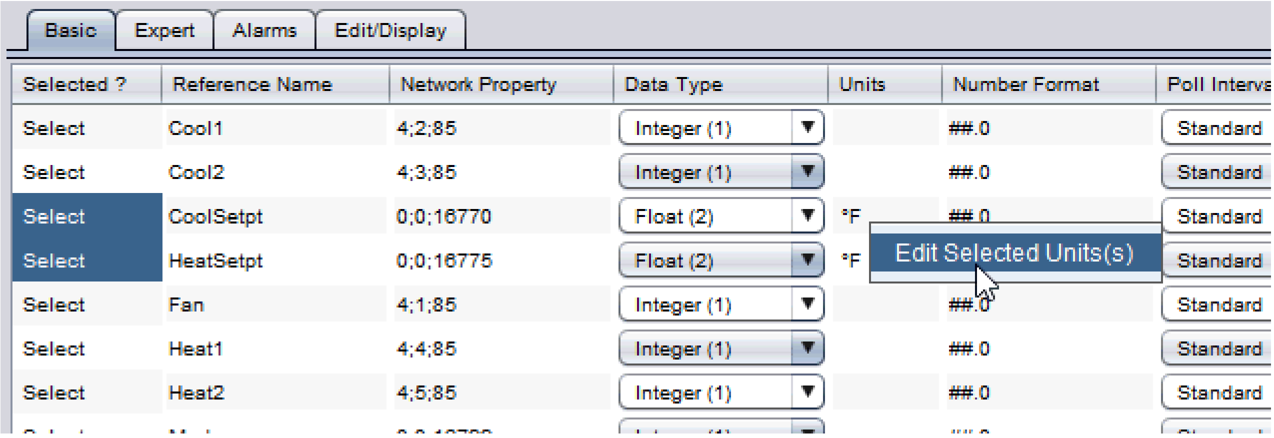
Mass Editing Specific Properties

Through Edit Children, you can mass edit a specific property for multiple points if desired. To edit a specific property for multiple points, perform the following steps:

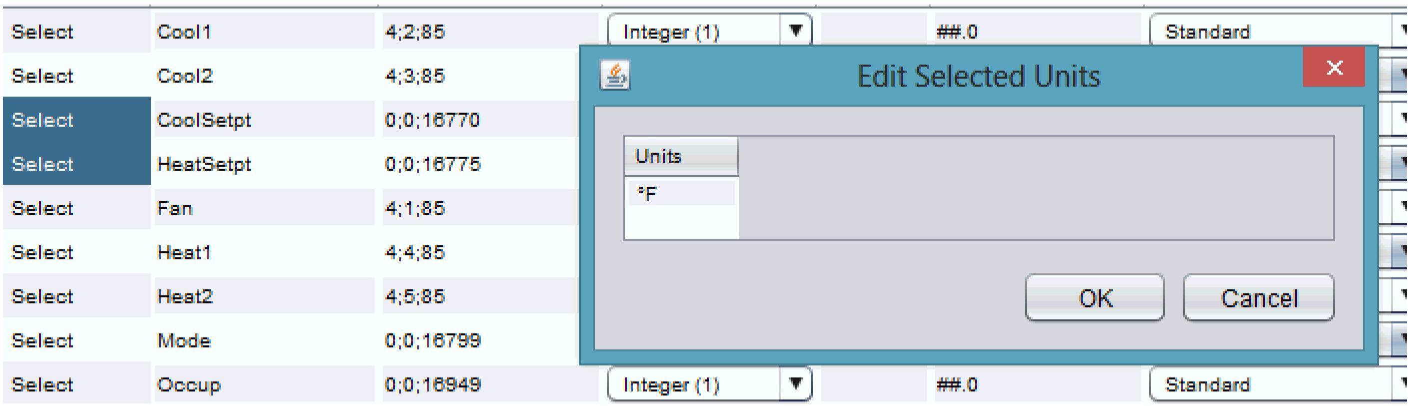
1. Within the Edit Children dialog, hold the CRTL key on your keyboard, then click the Selected Column for each row you wish to edit.



2. Right click the column for the field you wish to edit. A short-cut for that column should appear. Select the option.



3. The Editor for that field will appear. Select or enter the value you wish to populate. Click OK.



More Information

[Working in the Controllers Node - Overview](#)

[Adding Device Points](#)

[Pasting Device Points to Diagram](#)

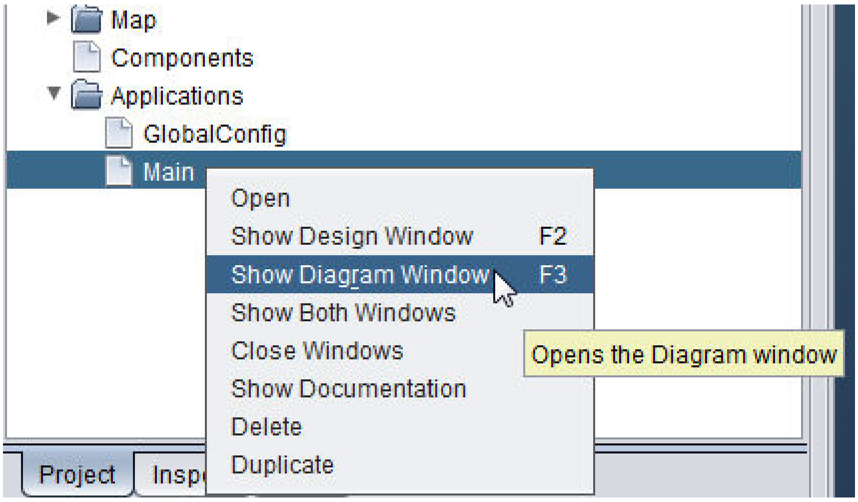
Pasting Device Points to Diagram

In order to use Device points with diagram logic, you will need to copy that point to the diagram view.

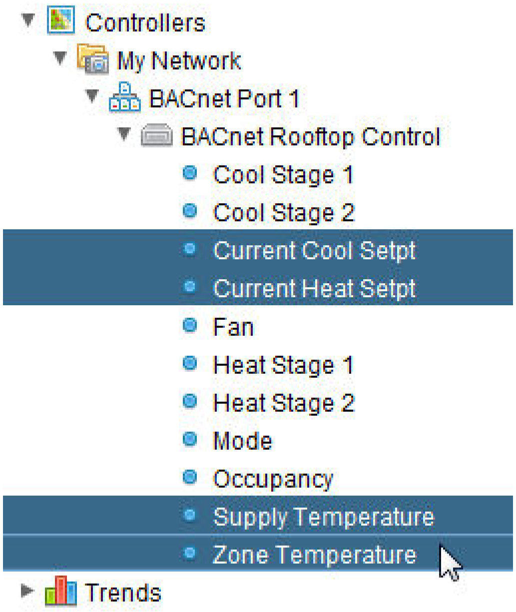
Pasting Aspect Point(s) to Diagram

Device Points may be added one at a time or added in multiples. To do so, perform the following steps:

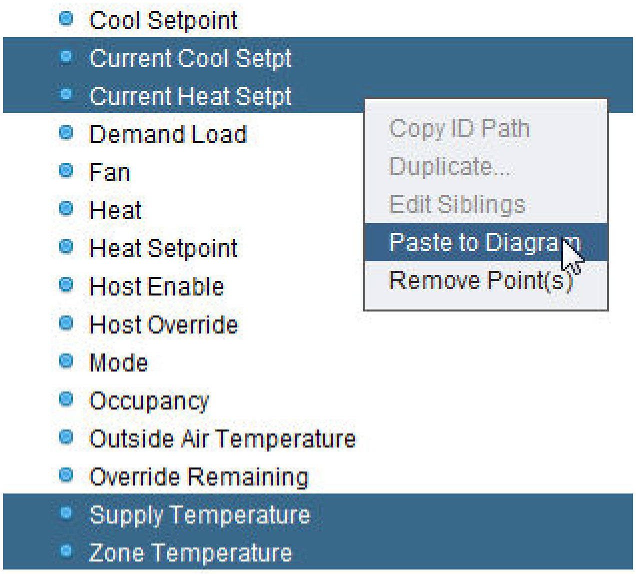
1. Open the application you wish to paste to in Diagram View.



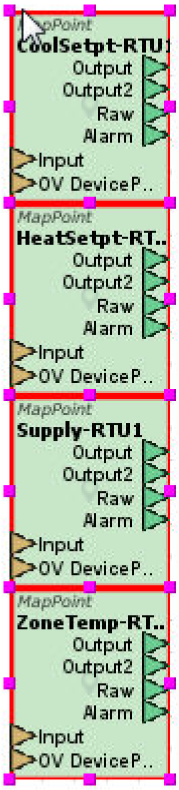
2. From the Device, select one, or multiple points by holding the CTRL key when selecting points.



3. Right click one of the points and select Paste to Diagram.



4. Move the cursor to the Diagram view, where it will change to the + icon. Click anywhere in the Diagram view to paste the selected points.



For more information on Map Points, view the Map Points topic below.

More Information

[Working in the Controllers Node - Overview](#)

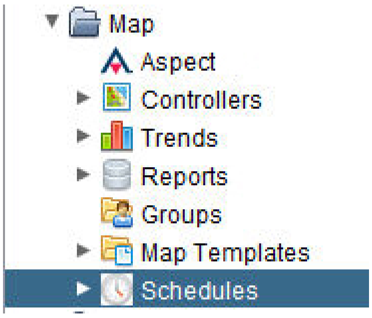
[Editing Multiple Device Points](#)

[Map Point](#)

The [Schedule] Node

Working in the Schedule Node - Overview

The Schedule Node of the Map is used to define all schedules that will be referenced by Aspect. As of v2.02, iCAL and CalDAV are supported for direct access and configuration from the Map.



Each section of this help document will provide you with information on defining the necessary items for referencing information from the building automation system.

More Information

[Adding a Schedule Group](#)

[Adding a Schedule](#)

Schedule Types

Disabled	A schedule of Disabed type never executes
Aspect Weekly/Exception	Local Aspect Schedule. Can be used to either supply occupancy or coerced into other native schedule types (such as BACnet) for distributed scheduling. Contains a weekly schedule, alternate weekly schedule and exception schedule

iCal	iCalendar URL that will be evaluated for events
Exchange	Similar to an iCalendar URL, but utilizes the default calendar of an Exchange mailbox
Aspect Calendar	Local Aspect Calendar can consists of start and stop dates for events

Using the Schedule Editors

Native Aspect Schedules can be edited in two ways - via Aspect Studio/Java Applet or via the ngAdmin HTML interface. Both editors have similar capabilities. It is recommended to create a minimal schedule for test purposes in Aspect studio prior to initial deployment, then perform the schedule modifications later with ngAdmin.

More Information

BACnet Exception Schedule Editor

ngAdmin - Editing Schedules

Aspect Schedule Distribution

The [Graphics] Node

What are Map Graphics?

The ASPECT**Map** contains a node for **User Interface** screens, called "**Graphics**".

These **Graphics** can contain **Graphics Components** such as:

- **images** and **Background Images** representing, for example, items of Plant equipment or Floor Plans.
- elements that react to point vaues, device status, alarm status etc. - **Labels**, **buttons** and **Polygons**.
- **Links** can be added from one **Graphic** to another, and to specialised interfaces for **Trendlogs**, **Schedules** etc.

These components are configured using the Graphics Editor

The result is an interactive **Graphical User Interface** (**GUI**) that an end-user can use to supervise an ASPECT Site.
This **GUI** can be made scalable so that users can browse floorplans using

the zoom and pan mouse gestures that are widely used by on-line mapping solutions.
When editing graphics it is possible to view in real time any changes as they will be displayed when the **Project** is deployed, using the Graphics Preview feature.

Graphic Components

Overview

ASPECT **Map Graphics** components are elements that may be placed onto a **Graphic**. Many **Map Graphics** components can be bound to **Map** values using **MapRefs** (either relative or absolute) and will use this reference and its permissions to determine what the active use sees when the **Graphic** is rendered.

Available Components are:

- **Annunciator**
- **Background Image**
- **Label**
- **Button**
- **Link**
- **Polygon**
- **Image**

ASPECT **Map Graphics** render in web browsers as **SVG** graphics. Any desktop or mobile browser with **SVG** support can view **Map Graphics** without installing browser plugins.

Annunciators

What are Annunciators?

Graphic Components that display conditions from the ASPECT system (such as a **Point** values, **Device** status including **quality**, **alarm** and **override** statuses, an **Alarm** etc.) are called "**Annunciators**".

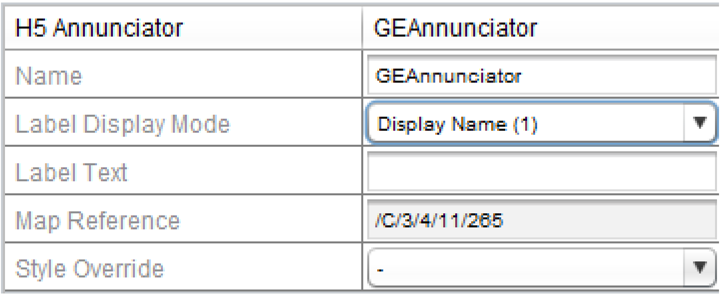
They are added to the **Graphic** using the **Annunciator** toolbar button in the graphics editor, and may be 'bound' to (associated with) a **Map object** (e.g. a **Point**).

When the Supervisor **GUI** is deployed, the **Annunciator** will show the appropriate information e.g. current **Point** value. They can also react to mouse clicks, if required. This click action can open an editor for an editable point (e.g. **Setpoint**), display a **Trend** display page, got to a **Schedule**, configure a

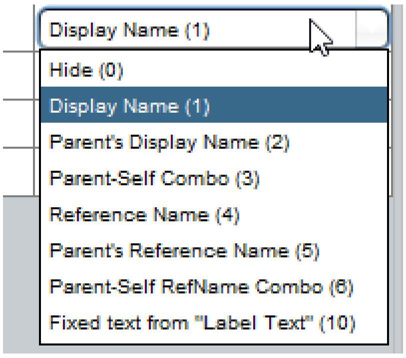
Map Object or even move the display to a different device (""**Graphic Components" on the previous page**").

An **Annunciator** is a multifunctional component that is bound to a map value. **Annunciators** are composed of several areas:

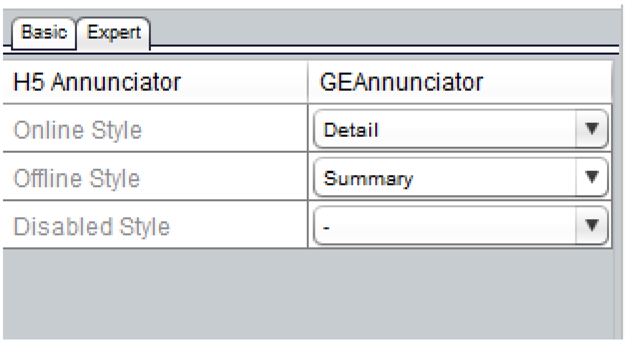
Value Text, Label Text, Status Flags, Alarm LED indicator, and a Quality Border. When clicked, annunciators will display a Click Action menu. The options in the menu are dependent upon the permissions of the user clicking the menu.



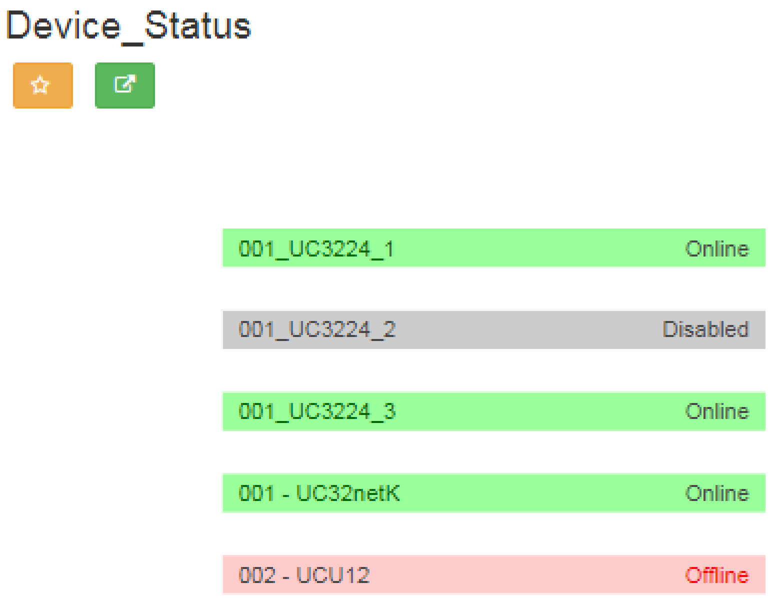
The Label display mode of the **Annunciator** makes it a very flexible component



In addition, if the **Annunciator** is configured to represent a device, the style of the **Annunciator** in the graphic can be set to change depending on the status of the device it represents:



The style specified in the Online Style property will be applied if the device is available, and the style specified in Offline Style will be applied if it is not available, so that for example the colour of the annunciator can change to easily identify problematic devices in a complex graphic.



> **Note**: An **Annunciator** can be configured to represent a device simply by dragging the device in the **Map tree** onto the **Annunciator** in the Graphic window.

> **Note**: if the **Annunciator** is configured to represent a device, the text displayed in the Graphic to represent the online Offline and Disabled states, can be customised in the properties of the device itself - select the device in the Map tree, and edit the Online/Offline text property.

Background Image

The background image is unique among **Map Graphics components** in that there can only be a single **Background Image** in each **Map Graphic**. This image will be rendered as the background of the **SVG** image. It is recommended that the **Background Image** should be locked immediately upon placement so that it does not interfere with the selection and placement of other components.

H5 Background Image	GEBackgroundImage
Image Name	1024_grid.png
Image Resizes ?	False

Label

A **Label** is a piece of text surrounded by a rectangular border, that cannot be linked directly to a **Map node**.

GELabel	GELabel
Name	GELabel
Label Text	Main Floor
Style Override	Default

> **Note**: **Label** text may contain **TStrings**.

Button

A **Button** is a piece of text surrounded by a rectangular border, similar to a **Label**, but has a click action which is connected to a **Map node**. Clicking the button will activate the value editor defined by the **Map node**.

H5 Button	GEButton
Name	GEButton
Button Text	Adjust Setpoint
Map Reference	/C/3/4/11/254
Style Override	-

Link

A **Link** is a piece of text surrounded by a rectangular border, similar to a **Label**, but has a click action which is connected to other **Graphics** (with optional context), or an external **URL**. Clicking the Link will navigate away from the current **Graphic** to the referenced **Graphic** or **URL**.

GELink	GELink
Name	GELink
Link Text	Link to Floor 2
Style Override	-
Xfer Context	
Xfer Graphic	
Xfer Type	Graphic (0)
Xfer URL	

Polygon

Polygons are used to draw an arbitrary shape within a **Graphic**. A **Polygon** can be static for simple illustrative or decorative use. However, a **Polygon** can be associated with (bound to) a point valueso that it can be used to display ranged status indication overlayed on images such as floorplans.

H5 Polygon	GEPolygon
Name	GEPolygon
Click Action	Auto
Display Mode	Fixed Color
Fixed Color	
Map Reference	
Show Handles When Live	False
Style Override	-

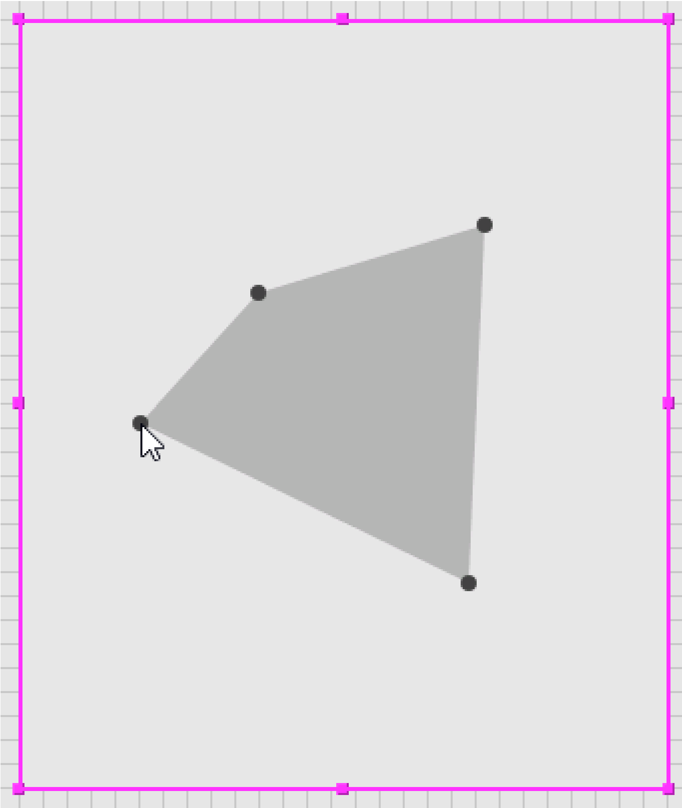
Editing a **Polygon** is a multi-step process.

First, drop and size the **Polygon** component within the **Graphic** view.

Once the box is positioned over the area the polygon will cover, vertices can be added to the polygon by an ALT+click. As the vertices are added, a "handle" will be displayed. Once at least 3 vertices are present, the polygon will be shown in preview mode.

Vertices may be relocated by ALT+clicking on them and dragging them to the desired location. However they may not be deleted once added, so exercise caution when creating very complex shapes.

The vertex handles are only shown in Engineering mode to assist with vertex manipulation. They are not shown during preview or when deployed.



 *Image*

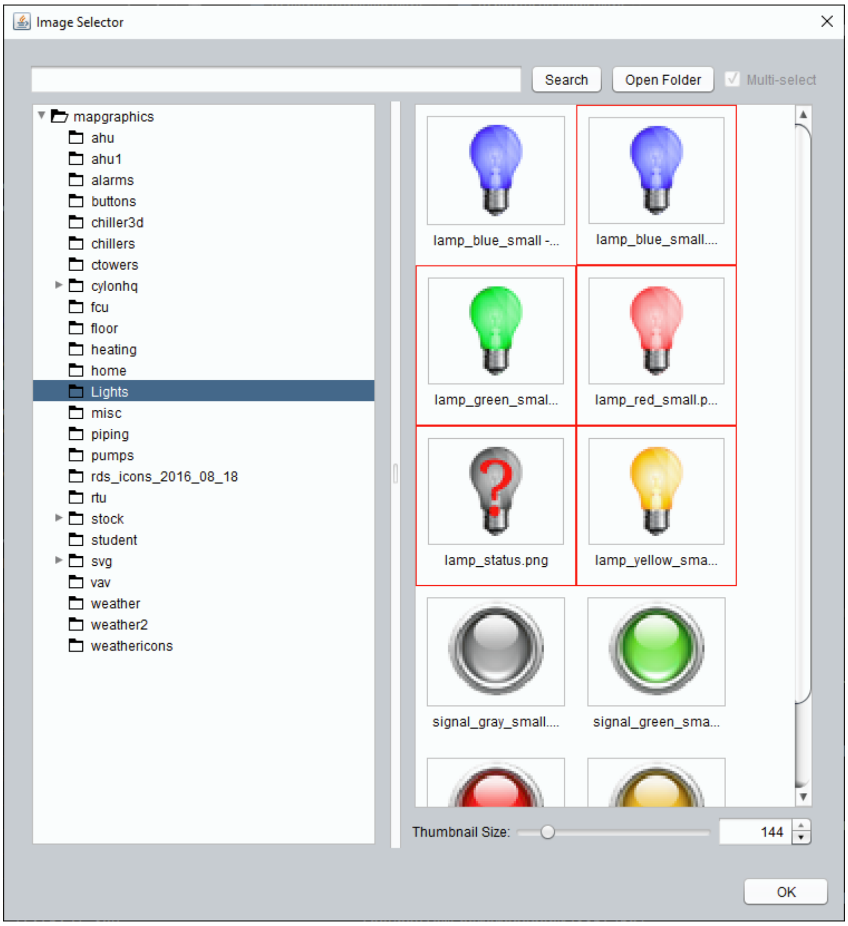
An **Image** component can be either

- a simple image file (.png, .jpg, or .gif)
- or, when bound to (associated with) a **Map node** it can use the **Map node**'s value to select one image from a list defined in the Multi Image Def property.

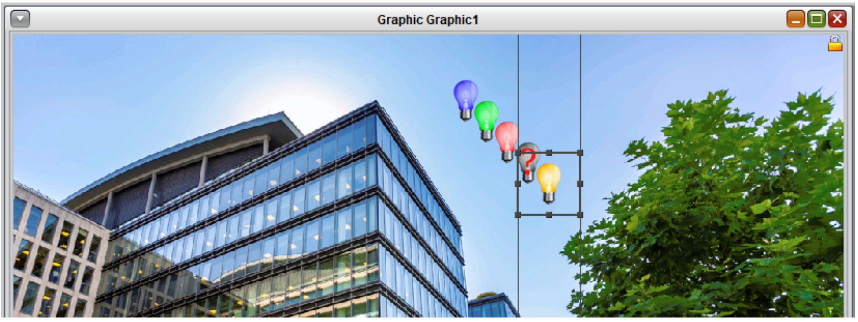
How to place an image in a Graphic

1. Open a graphic for editing and click the H5 Image button
   
2. Click on the **Graphic** where you want to place one or more images.
3. In the Image Selector window, select one or more images. To select multiple images, hold down Ctrl on your keyboard (or use Shift to select

a range, Ctrl+A to select all).



4. Press OK. The selected image(s) will be added to the **Graphic** (in the order they were selected).



Images can also support a transfer click action with optional transfer context.

GEImage	GEImage
Name	GEImage
Image Name	stock\fcu\Fan_Coil_Elec.png
Image Resizes ?	False
Map Reference	/C/3/4/11/271
Multi Image Def	...
Transfer Context	
Transfer Graphic	

Multi Image Def

Multi Image Def is used to define multiple images that can be applied to a graphic depending on the value of an input Point. For example, a point representing a light might have a “lamp on” image for a value of 1 and a “lamp off” image for a value of 0.

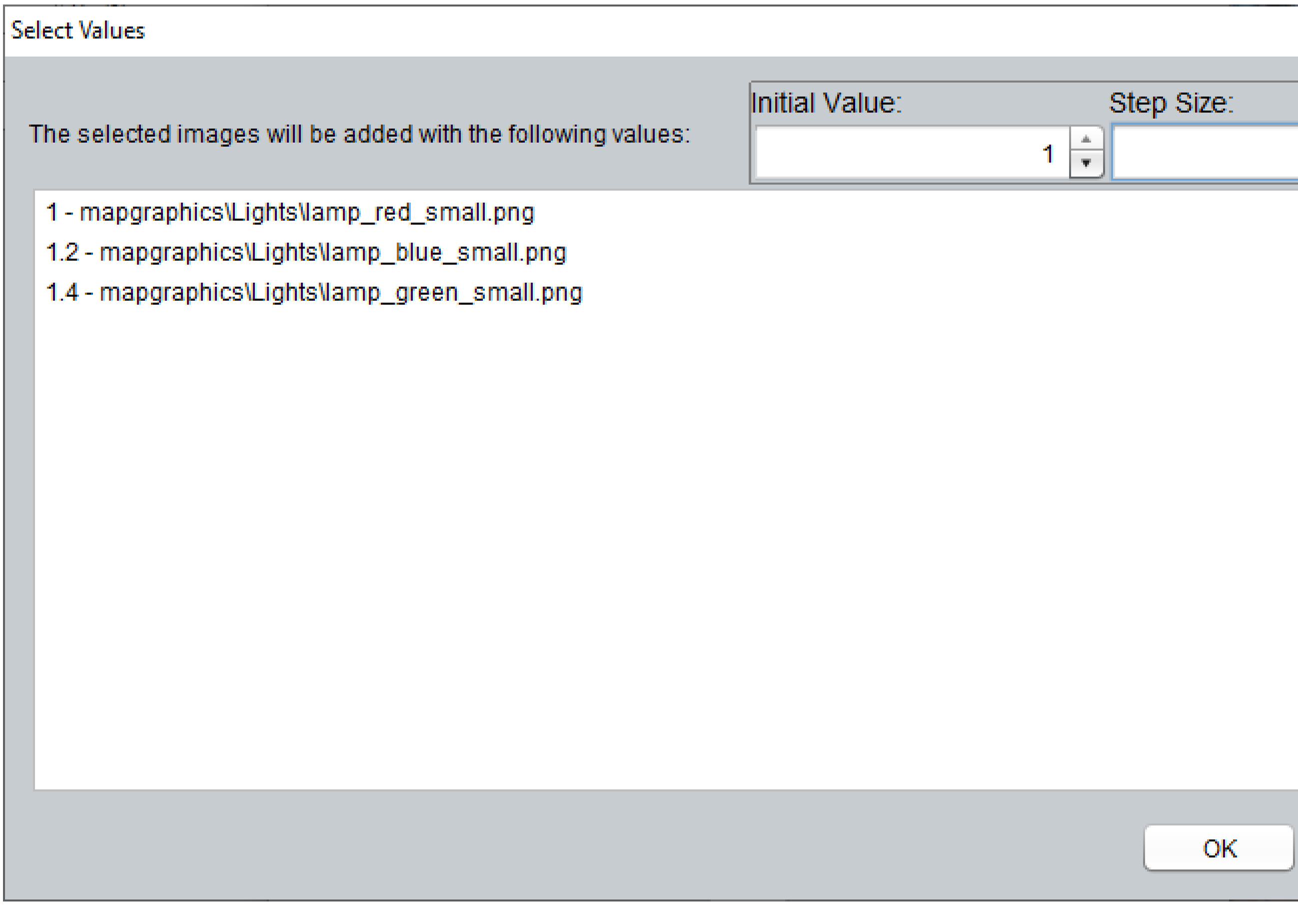
When using the Multi Image Def feature, the **Image** defined in Image Name will be used until the value of the Map Reference is equal to or greater than a value in the Multi Image Def.

The Multi Image Def values are treated as ranged values.

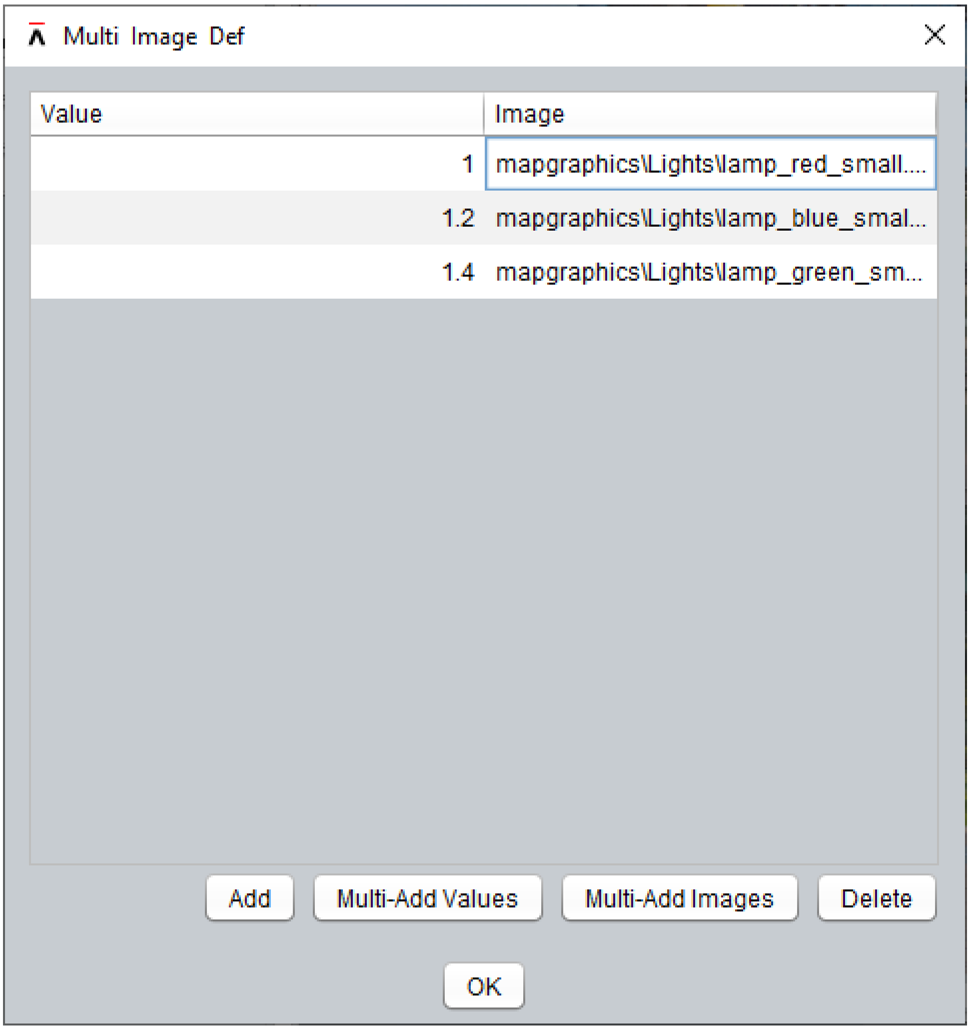
1. Double-click the Multi Image Def property.
2. Press the “Multi-Add Images” button.
3. Use the Image Selector to select multiple images and press Ok.

> **Note**: If you use the Ctrl button to select multiple images, they will be added to the table in the order you selected them. In the below example, the image “lamp_red_small.png” was selected first, followed by “lamp_blue_small.png”, etc

4. Use the “Select Values” popup to adjust what values your new images will be added with and press OK.

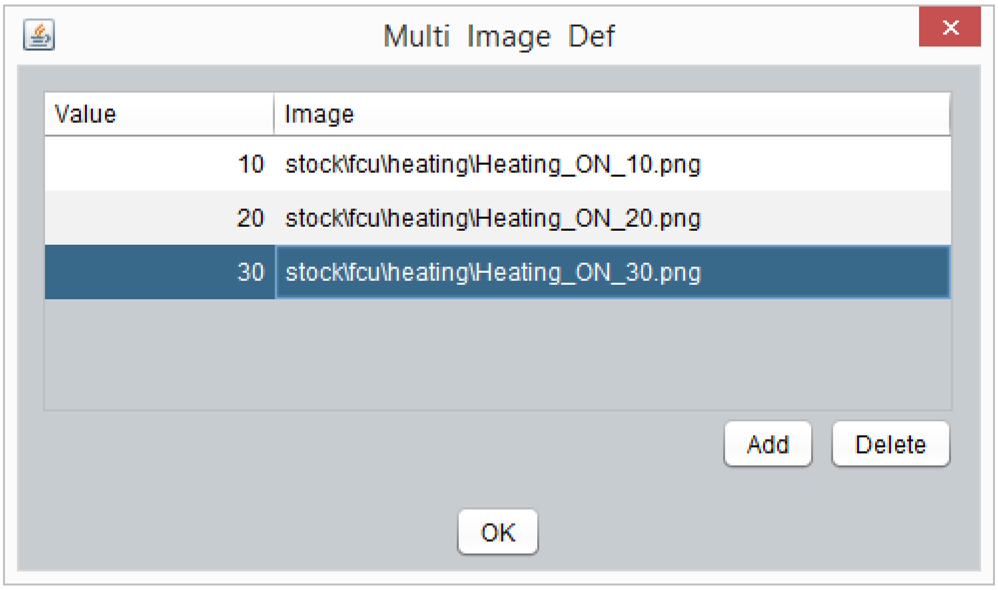


5. Adjust the value that corresponds to each image further if necessary.



6. Click OK to save the **Multi Image Def**.

Example - for the definition below, see the corresponding images for a given point value in the table



Point Value	Displayed Image
-100	stock\fcu\Fan_Coil_Elec.png
0	stock\fcu\Fan_Coil_Elec.png
9	stock\fcu\Fan_Coil_Elec.png
10	stock\fcu\heating\Heating_ON_10.png
11	stock\fcu\heating\Heating_ON_10.png
20	stock\fcu\heating\Heating_ON_20.png
25	stock\fcu\heating\Heating_ON_20.png
30	stock\fcu\heating\Heating_ON_30.png
40	stock\fcu\heating\Heating_ON_30.png

Using the Graphics Editor

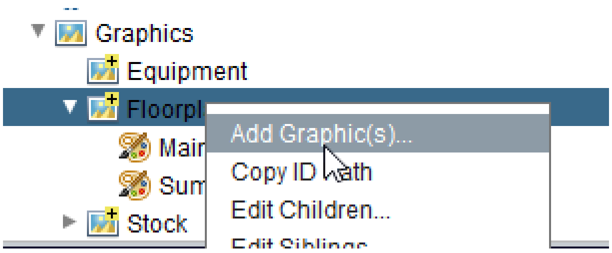
Overview

The ASPECT **Graphics Editor** is a drag-and-drop design view that enables the user to rapidly create floor plans, equipment diagrams and summary screens that are viewable within the ASPECT HTML 5 user interface.

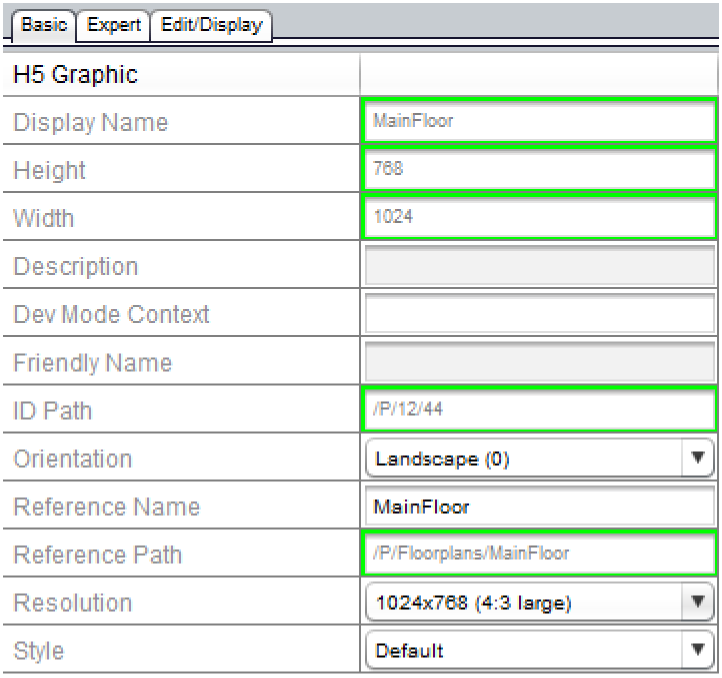
> **Note**: When editing graphics it is possible to view in real time any changes as they will be displayed when the **Project** is deployed, using the Graphics Preview feature.

Creating a Graphic

To create a new **Graphic**, right click on a Graphic Group and select Add Graphic(s)...



After the **Graphic** is created, change the **Reference Name** to a meaningful value and set the desired Style, Orientation and Resolution options.



Context and Non-Context Graphics

Graphics can be configured so that the information they display is relative to the "context" in which the graphic is displayed. This allows a single graphic to be used for different pieces of equipment - for example, a single Fancoil grphic can be used to illustrate the current status of any of the Fancoils in a section of the building.

When this context is supplied, any relative bindings (**MapRefs** associating elements with points or other **Map nodes**) within the **Graphic** will be automatically assigned this context.

> **Note**: Components with relative bindings REQUIRE context - without a valid context, the binding MapRef cannot be resolved and so the component will not be displayed.

To test context sensitive graphics inside ASPECT-Studio, the Dev Mode Context property of the Graphic is used to assign a temporary context to use during development. This property has no meaning in a deployed project.

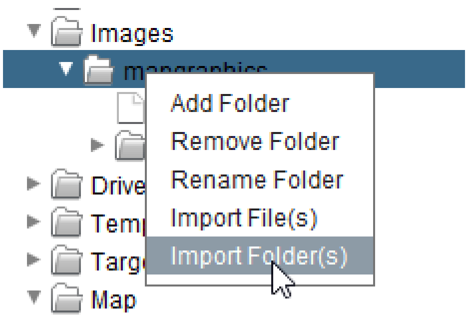
> **Note**: Only graphics that do not require context will be displayed in the Graphics menu item in the ngAdmin interface.

Importing Images

Before images can be used by either the **Background Image** or the **Image** component, they must be imported into the **project**. It is important to use the import mechanism and not manually copy images into the project folder outside of ASPECT.

All images used in HTML graphics must reside under the mapgraphics folder. Subdirectories may be made for organizational purposes if desired.

It is also possible to recursively import an existing image folder.



Adding a Background Image

Once the desired images have been imported, select the Background Image button from the Graphics Editor toolbar and drag a background graphic onto the **Graphic** canvas.

Select the imported image to use in the Background Image component. It is strongly suggested that this image's size and orientation match the defined resolution and orientation defined by the **Graphic** itself to avoid scaling issues.

Once the image is selected and displayed correctly in the **Graphic** canvas, click the lock icon. This will enable the placement of other components on top of the **Background Image** and will prevent it from being moved inadvertently.

Adding Components

A **Map Graphic** is composed of combinations of the following components:

- **Annunciators**
- **Buttons**
- **Images**
- **Polygons**
- **Links**
- **Images**
- **background Images**

To add components to the **Graphic**, select the required component from the Graphics Editor palette. The mouse pointer will change to a crosshairs cursor. Click in each location the component should be placed. To change the type of component to drop, select a new item from the Graphics Editor palette and click to drop the newly selected component.

Once components are dropped, they may be selected and moved around the Graphic Canvas. Selecting a component also activates the properties panel of the selected component. Using the Properties pane, it is possible to change the style, reference name, or any component specific properties of the selected item.

Setting Component Bindings

The behaviors of most components can be driven by a specific **Map** node (often a point). If this is the case, then the component is said to be "**bound**" to that **Map** node, and components that can be **bound** in this way are said to be "**bindable**".

The following components are **bindable**:

Always Bound:

- **Annunciators**
- **Buttons**

Sometimes Bound:

- **Images**
- **Polygons**
- **Links**

Bindings can be set in two ways - either by

1. Manually entering or pasting the **MapRef** of the desired **Map** node in the component's Map Referenceproperty (may be relative or absolute), or
2. via **drag-and-drop**

drag-and-drop binding is the simplest method and is strongly recommended.

To create a **binding**, using **drag-and-drop** select the node in the **Map** and click on it, and drag it to the desired **Graphic element** on the Graphic canvas.

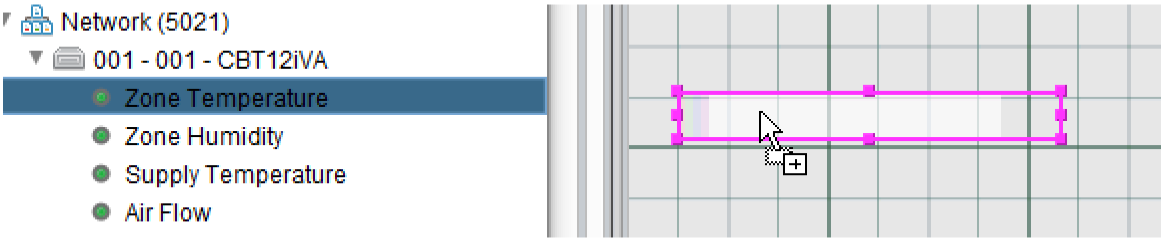
Three types of **bindings** can be created in this way - **Binding ID Path**, **Binding Reference Path** and **Relative Binding**.

Binding ID Path

Dragging-and-dropping from the selected Network/Device/Point in the **Map** to a graphic element in the open Graphic window will copy the selected node's **IdPath** and paste it into the graphic element's Map Reference property.

This will create an **absolute binding** using the **IdPath** of the selected node.

As the cursor enters the target **graphic element**, the cursor will change to indicate a valid drop target is found as shown below.



Binding Reference Path

Holding down the **ALT** key and using a **drag-and-drop** action from the selected Network/Device/Point in the **Map** to a graphic element in the open **Graphic window** will copy the selected node's **reference path** and paste it into the graphic element's **Map Reference** property.

> **Note**: The **ALT** key must be pressed before the initiation of the **drag-and-drop** event and should be held through the duration of the **drag-and-drop** event.

Relative Binding

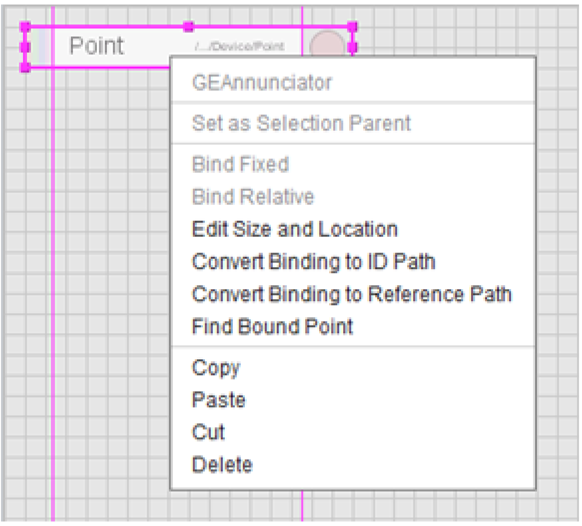
Holding down the **CTRL** key and using a **drag-and-drop** action from the selected Network/Device/Point in the Map to a graphic element in the open Graphic window will copy the selected node's relative path and paste it into the graphic element's Map Reference property.

> **Note**: The CTRL key must be pressed before the initiation of the drag-and-drop event and should be held through the duration of the drag-and-drop event.

Converting Binding Types

An existing **Binding** can be changed from an **ID path** to a **Reference Path** or vice-versa.

To access the commands for making these conversions, right-click on a the graphic element to open the context menu, and select either **Convert Binding to ID Path** or **Convert Binding to Reference Path**



If the selected graphic element is not bound to anything, then these context menu items will be disabled.

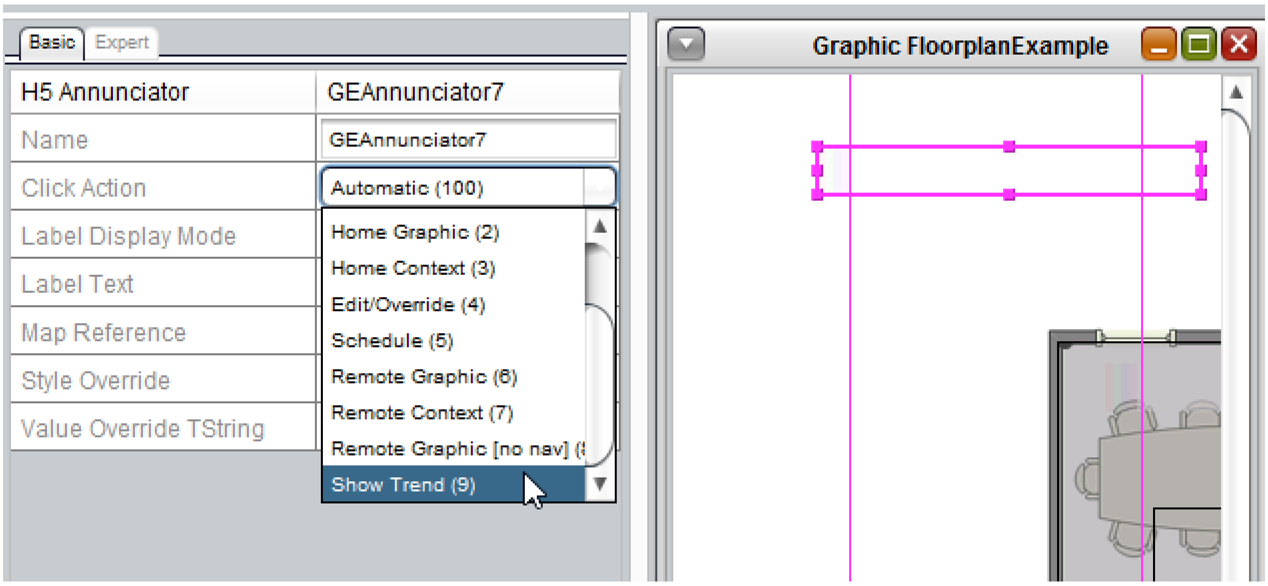
Click Actions

Components such as **Annunciators** or Polygons can be set to respond to mouse clicks in a number of ways such as:

- Opening a Pop-up
- Displaying an Edit/Override dialog
- Edit a schedule
- Show a Trend
- Change Context

etc.

ASPECT by default automatically assigns an appropriate click action based on the component settings, but if a specific action is required, it can be set in the component's Click Action property:



Engineering Mode and Live Mode

Many visual properties of the **Graphics** components are displayed differently in Engineering Mode than in **Live mode**.

- **Annunciators** will show the path to which they are bound, rather than their label and value
- **Annunciators** will not show active alarm indications
- **Polygons** will show the vertex handles
- Dynamic style items (status colors, quality) are not available

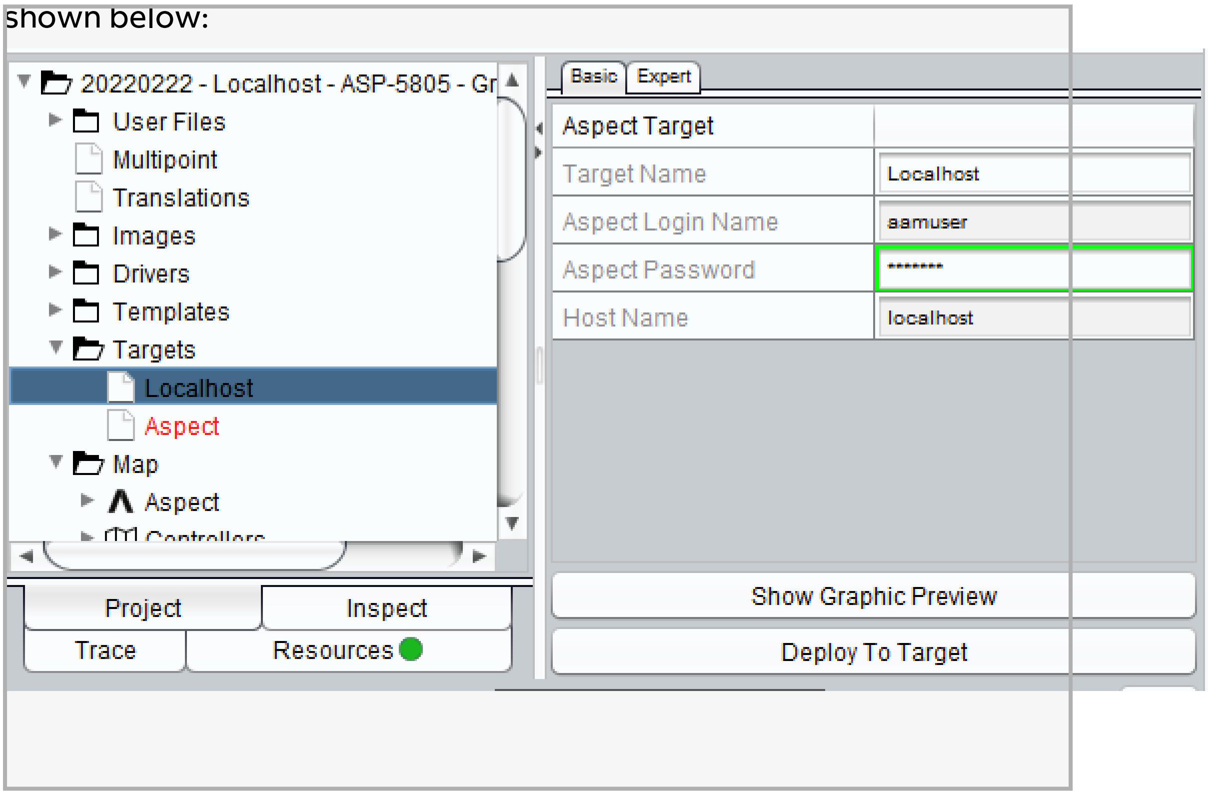
Some features, such as menus and click actions are dependent on server features not available within ASPECT-Studio, even when in **Live mode**, and may only be used in deployed projects.

Graphics Preview

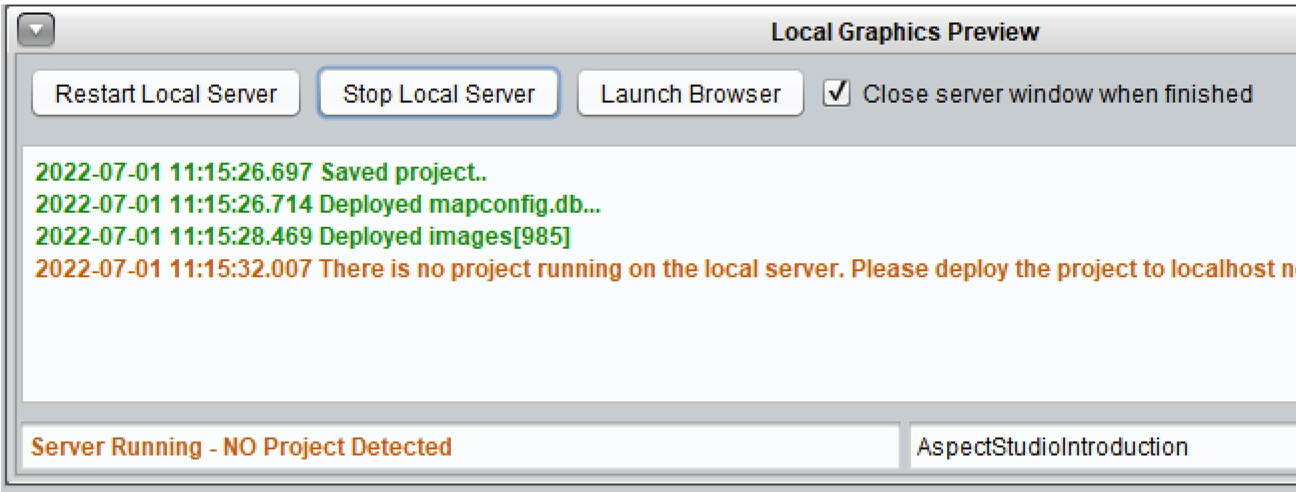
Graphics Preview is a feature that immediately displays any changes made to ASPECT-Studio **Graphics** in a web browser, indicating how they would look when finally deploy them to an ASPECT target device (e.g. MATRIX Series/NEXUS Series).

How to use Graphics Preview

> **Note**: The ASPECT-Studio **Project** must contain a **Target** that deploys to localhost (Host Name=localhost). Most **Projects** include this Localhost **Target** by default. If none is present in the current **Project**, right-click on Targets, select Add Aspect and configure the new **Target** as

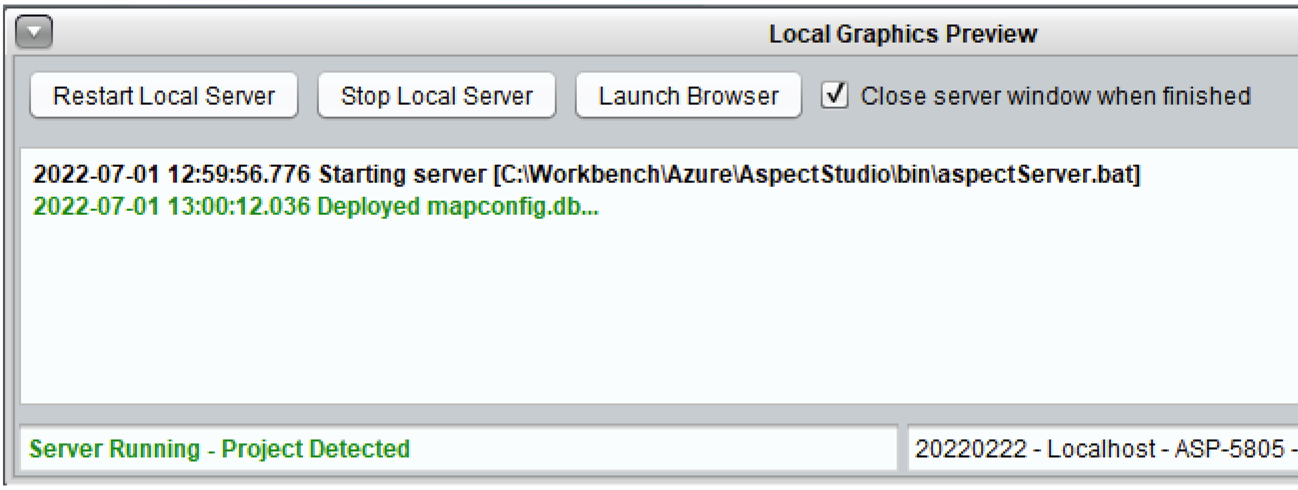


1. Click Show Graphics Preview for the Localhost **Target**.
   This opens the Local Graphics Preview window, showing the status of the local server.
   If the server is not running, it will be started automatically in a new **Windows Command Line** window.
   If there no **Project** has yet been deployed to the server, the status will appear as shown below:

   If the **Project** deployed to the local server is not the same as the **Project** you currently have open in ASPECT-Studio , then a different status message will be displayed. In that case, the **Project** must be

delpoyed once using the Deploy to Target button.
The local server will automatically be restarted after successful deployment.
Once the local server is running and the correct project is deployed, the status will appear as shown below:



2. Click Launch Browser to open the project in your **browser**.
3. In the **browser**, navigate to the **Graphic** you are currently working on, if it is not already showing.
   Any change now made to graphics in ASPECT-Studio should immediately appear in the **browser**, including **Overlay Graphics**.
   For example, when graphics are added or removed, or text is changed, or the font, size, style, position, shape or colour of any element in the graphic is adjusted, that change will appear in the browser.
   It is not necessary for the **Project** to be redeployed or for the local server to be restarted.

Tips:

- If you have an extra monitor, you can drag your browser window onto the spare monitor and see your changes without having to switch windows.
- Only **Graphics**-related changes are automatically refreshed in the **browser**. Other non-**graphics** updates require a deployment for the changes to take effect.
- If you want to adjust the refresh rate (the rate at which the browsers checks the ASPECT server for **graphics** changes), you can set the Graphics Preview Poll Rate in Services > Graphic Subsystem. The default value of 1 second is the lowest allowed value, so you should see any **Graphics** changes quite quickly.

> **Note**: Other Graphics Preview operations will contribute to an average refresh time of slightly more than one second.

- If the local server is slow to start up (i.e longer than one minute with the message Server Running - No Project Detected), it may be trying to connect to a **MySQL** database server that is not present on your localhost. This **MySQL** connection is not required for **Graphics Preview** so the delay can be eliminated by adjusting the Connection Timeout to 2000 in the Expert tab for the MapDb object in Applications > Global Config. If a longer timeout is required on your live ASPECT server, you should increase Connection Timeout again after **Graphics Preview** testing.

Scalable Graphics

Feature description

The "**Scalable Graphic**" behaviour extends the way that floorplans can be created and navigated, so that users can browse floorplans using the zoom and pan mouse gestures that are widely used by on-line mapping solutions.

> **Note**: This is an optional behaviour for floorplans or other graphics - the features listed below are only available on graphic elements where the Scalable Graphic property is set to Yes (1)

Scalable Graphic behaviour supports the following features:

- The available screen area is maximised, regardless of screen size and browser window size. This means that the floorplan or graphic automatically scales based on the available browser space, without any need for browser-based zooming.
- **Scalable Vector Graphics** (**SVG**) image types are supported, to allow clear and sharp zooming.
- Gesture navigation is supported for **panning** and **zooming**
- A "Size Fixed" option can be applied to selected graphic components, so that they maintain a constant size regardless of zoom level. This can be useful, for example, for text labels.
- A "Zoom In" click action can be added to a **polygon** so that when clicked the view will zoom in to the **polygon**'s area. This can be used, for example, to allow the user zoom in on a specific room in a floorplan with a single click.

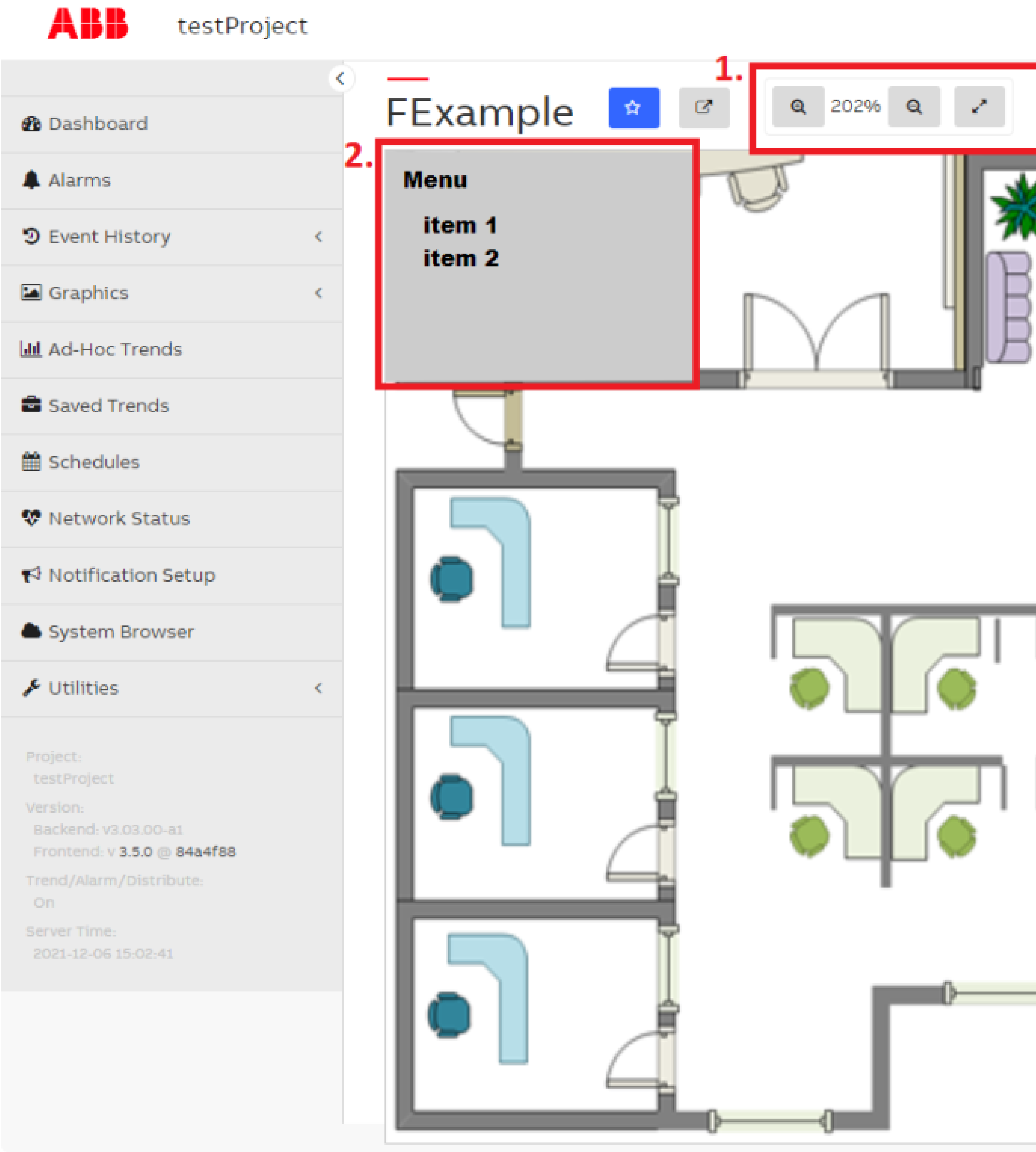
- An “Overlay Graphic” that can be shared between multiple graphics can be configured. This can be used, for example, to create a permanent menu and/or navigation elements.

Example floorplan

The image below shows a floor plan, already zoomed in, using the following features:

1. Navigation elements to zoom in/out/reset and floorplan map showing its visible area

2. An **Overlay graphic** located in the top-left corner of the floorplan (top-left is one of four available alignment options). This same graphic can be shared between multiple graphics



Gestures

When a graphic is configured as a **Scalable Graphic**, the following gestures are available to the user:

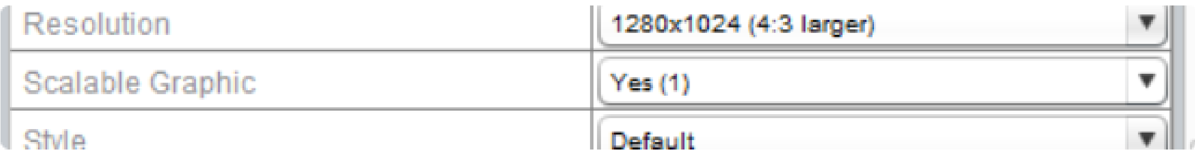
1. to **pan** in all directions (even when no **zoom** has been applied):
   - desktop: drag with the mouse
   - mobile: drag withfinger
2. to **zoom**
   - *desktop*: mouse wheel
   - *mobile*: pinch-to-zoom multitouch gesture
3. reset the zoom level
   - *desktop*: double-click
   - *mobile*: double-tap
4. Zoom to an area: (additional polygon configuration required to use this option)
   - *desktop*: click on the configured polygon
   - *mobile*: tapon the configured polygon

ASPECT-studio configuration

> **Note**: When editing graphics it is possible to view in real time any changes as they will be displayed when the **Project** is deployed, using the Graphics Preview feature.

To create a Scalable Graphic,

1. Create the graphic in ASPECT-Studio as normal.
2. In the Basic menu, set the Scalable Graphic attribute to Yes (1):



- No (0) - legacy mode, non scalable graphic. This mode retains all of the previous behavior of floorplan graphics, including browser-based zoom. The Overlay Graphic attribute is not available in legacy mode.
- Yes (1) - **Scalable Graphic** mode, enabling **zoom** and **pan**, along with the auto-scale feature.

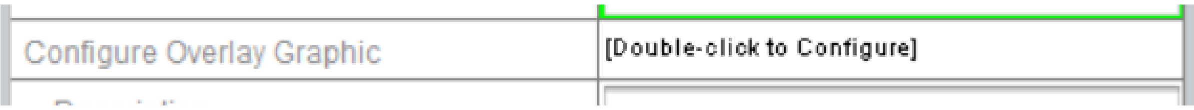
> **Note**: If the Scalable Graphics property is set to Yes (1) the Resolution property no longer determines the screen size of your floor-plan. That is because the graphic will be scaled continuously

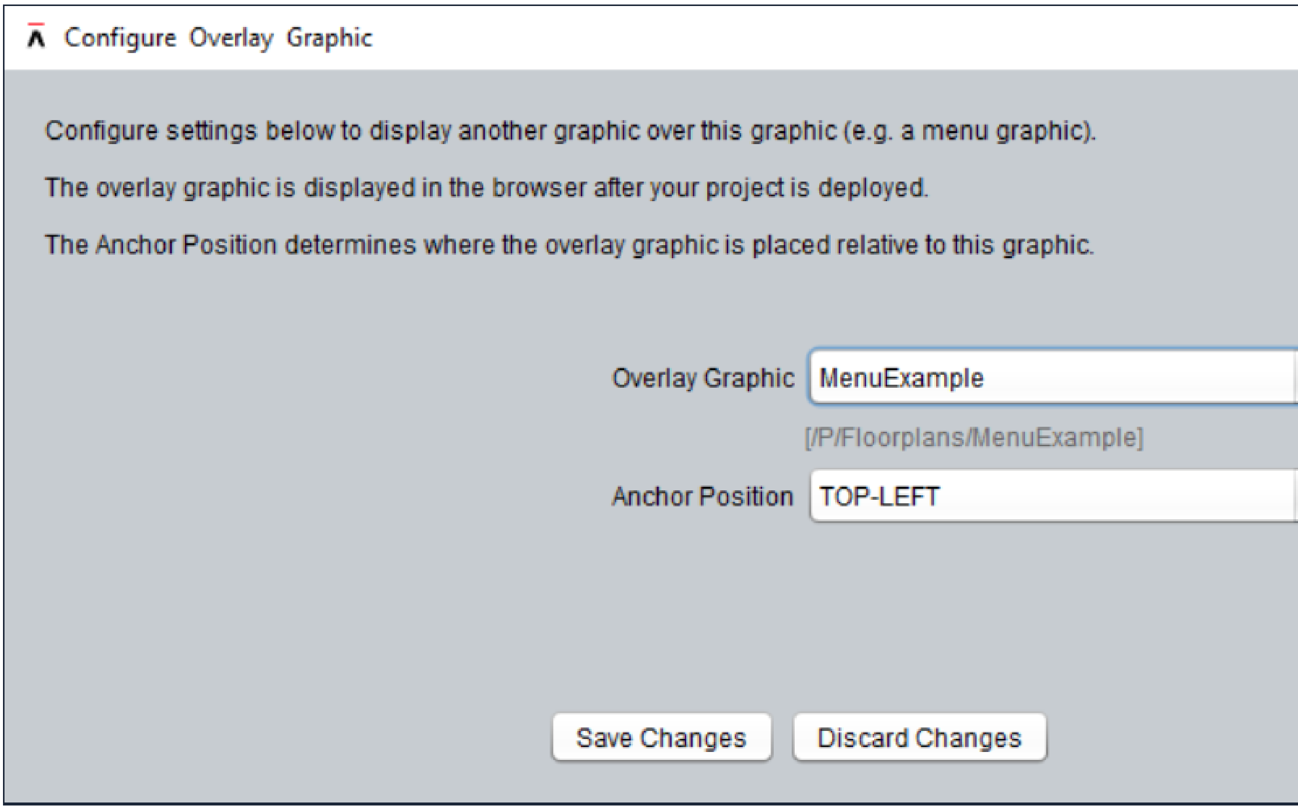
to fill the entire available space in the browser regardless of its size and the screen resolution.

Note: The Resolution property is a bounding box size for scalable graphic. Any element of the floorplan located or spanning outside of the bounding box may be cropped.

3. If you wish to use an Overlay, in the Basic men, double-click on the Configure Overlay Graphic parameter value to open the configuration popup:

Note: the Configure Overlay Graphic parameter is available only when Scalable Graphic is set to Yes (1)





- Use the Overlay Graphic picker to select the graphic file that you wish to use as the overlay.

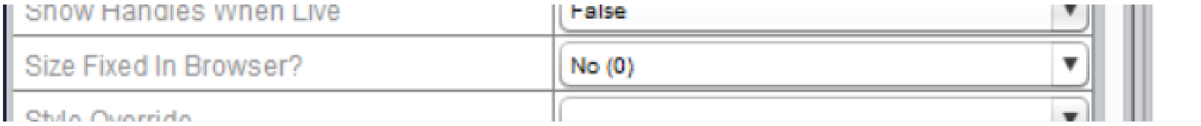
- Use the Anchor Position picker select from one of the four available screen positions

When these are set, the **Overlay Graphic** will be displayed on top of the floorplan. Its size and that position is fixed - i.e. it is not subject to **pan** and **zoom** gestures.

> **Note**: You must ensure that components are positioned so that the **overlay graphic** does not cover important components of the main graphic.

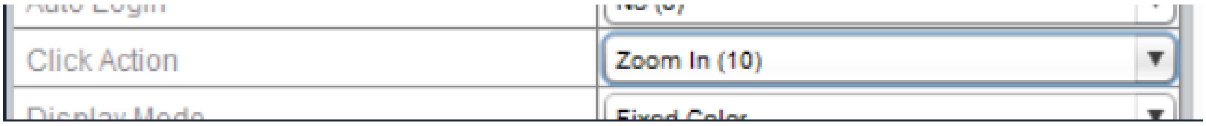
> **Note**: Background Color and Background Image settings have no effect on the **Overlay Graphic**.

4. If required, the size of any component added to a graphic (H5 Label, H5 Link, **H5 Image**, etc.), can be fixed using the Size Fixed In Browser? setting:



> **Note**: This setting has no effect when used on an **Overlay Graphic** or non-scalable graphic.

5. To configure the "**Zoom In**" click action for a **Polygon**, select the **polygon**, and in the Basic menu set the Click Action parameter to Zoom In (10):



> **Note**: Double-click on the floorplan to **zoom out** (inside or outside of the **polygon**).

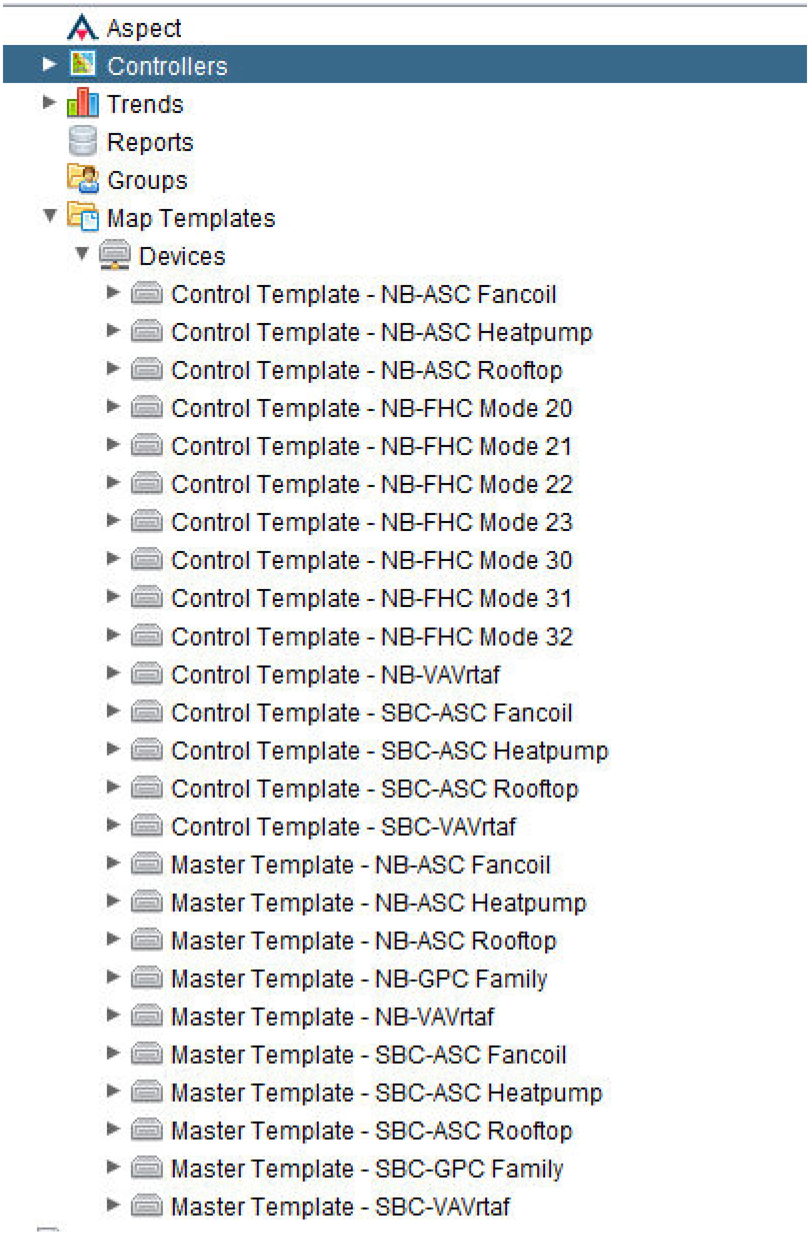
> **Note**: Setting the Click Action for an **Overlay Graphic** to Zoom In (10) has no effect.

The [Map Templates] Node

Working in the Map Templates Node - Overview

The Map Templates Node of the Map is used to store custom device templates. In this area, a Map Template can be created and setup with points for easy replication.

By default, any new project created within Aspect-Studio v2.00 or later includes a complete default library of controller templates for current generation American Auto-Matrix products. These templates can be leveraged at any time to assist with rapid project development.



More Information

[Control and Master Template - Overview]

[Working with Control Templates]

[Working with Master Templates]

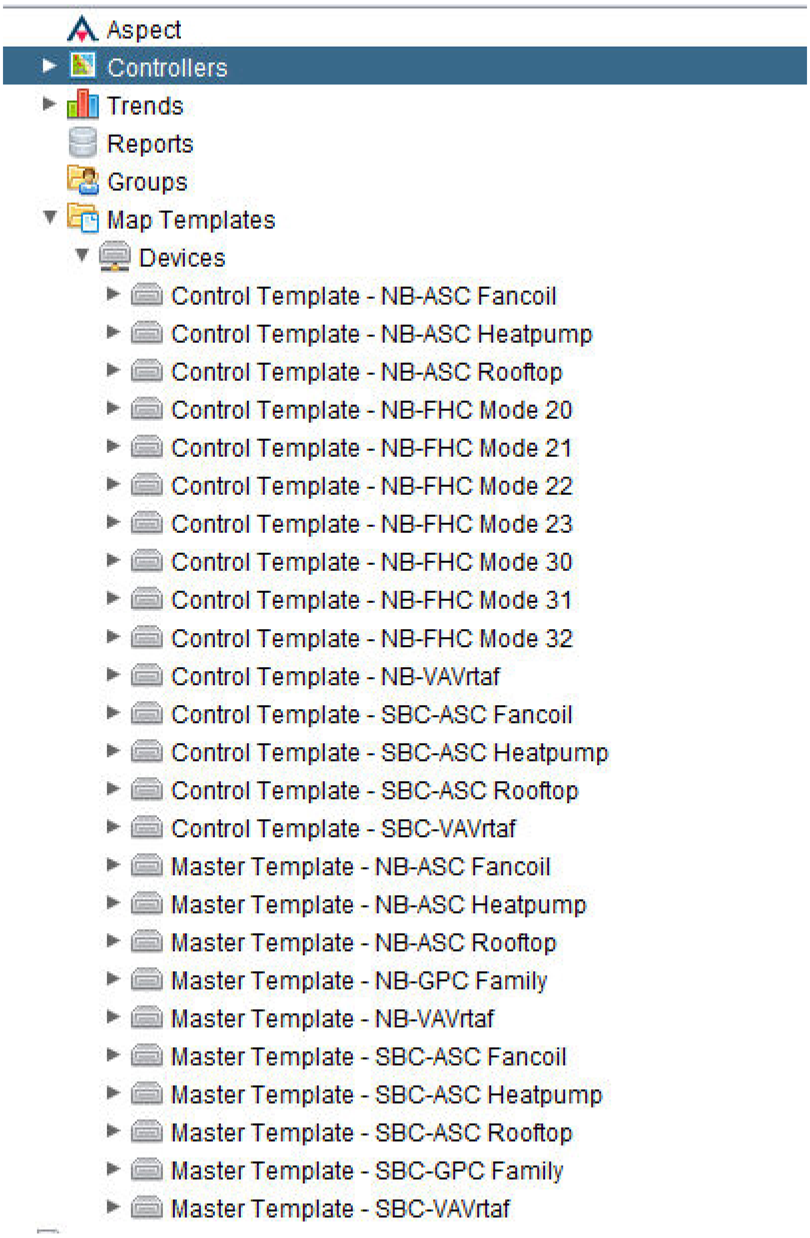
[Adding a Map Template Device]

[Duplicating a Map Template Device]

Control and Master Templates - Overview

Control and Master Templates - Overview

When you create a project for the first time, the default configuration database includes several stock templates. The stock template library contains two forms of templates - Control Templates and Master Templates.



More Information

Working with Control Templates

Control Templates are designed to provide the most minimal subset of important information from a device, and has been optimized to work with the Automagic HTML5 mobile user interface. Control Templates are designed deliberately to provide the following:

1. Basic point information regarding the application specific controller.
2. Default configuration for polling, engineering units, and number formatting.
3. Default configuration for trend collection.

Control Templates can be duplicated and/or modified to meet the needs of your specific application approach. For example, if you wish to enable or disable additional points for trending, this can be done directly at the Control Template level. You can even configure alarming at the Control Template level and apply it to devices you intend to add into the data-base - or even update existing devices created based off of a Control Template.

Control Templates have been created for the following controller models:

- NB-ASC Fancoil
- NB-ASC Heatpump
- NB-ASC Rooftop
- NB-FHC
  - A separate template for each available control mode supported by the NB-FHC has been included.
- NB-VAVrtaf
- SBC-ASC Fancoil
- SBC-ASC Heatpump
- SBC-ASC Rooftop
- SBC-VAVrtaf

Editing control templates occurs in the same manner that Configuring a Device and Configuring Points does.

Control Template - Best Practices

The following are some high level best practice notes regarding Control Templates:

1. If you are working with a particular model of device, but have different sets of configurations within the site (fan powered VAV boxes vs. constant air volume boxes), simply duplicate the VAV control template you are working with to generate a separate template. Duplicating the template allows you to carry over the existing subset, plus any changes you may have made.
2. If you feel that there are specific inputs and outputs missing from the Control Template, check for a Master Template version of the controller you are working with. Master Templates provide more data than Control Templates.

More Information

Configuring a Device

Configuring Points

Duplicating a Map Template Device

Working with Master Templates

Master Templates are designed to provide the a higher level of existing point information and are included to assist you with editing a more expansive device with pre-configured, addressed points. Model dependent, Master Templates commonly contain higher counts of points, but do not provide default configuration for polling, and trend collection.

As with Control Templates, Master Templates can be duplicated and/or modified to meet the needs of your specific application approach. Control Templates have been created for the following controller models:

- NB-ASC Fancoil
- NB-ASC Heatpump
- NB-ASC Rooftop
- NB-GPC Family
    - GPC Master Template includes base I/O and Analog/Binary Value objects only.
- NB-VAVrtaf
- SBC-ASC Fancoil
- SBC-ASC Heatpump
- SBC-ASC Rooftop
- SBC-GPC Family
    - SBC-GPC Master Template includes base I/O only.
- SBC-VAVrtaf

Editing control templates occurs in the same manner that Configuring a Device and Configuring Points does.

More Information

Configuring a Device

Configuring Points

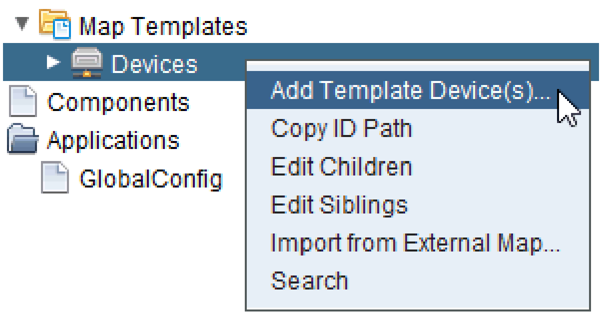
Duplicating a Map Template Device

Working with Map Templates

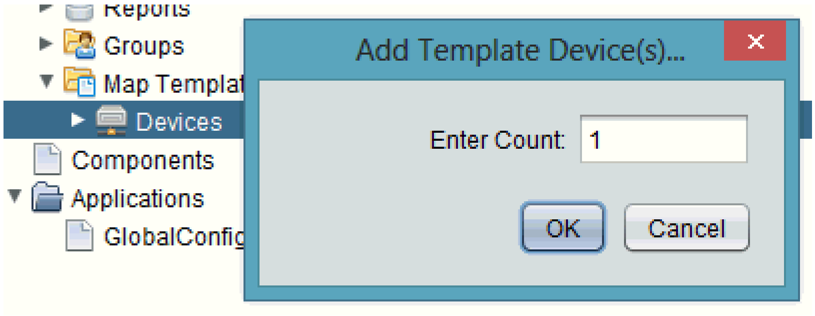
Adding a Map Template Device

You can create your own Map Template Devices in addition to the library already packaged with Aspect-Studio. To add a Map Template Device, perform the following steps:

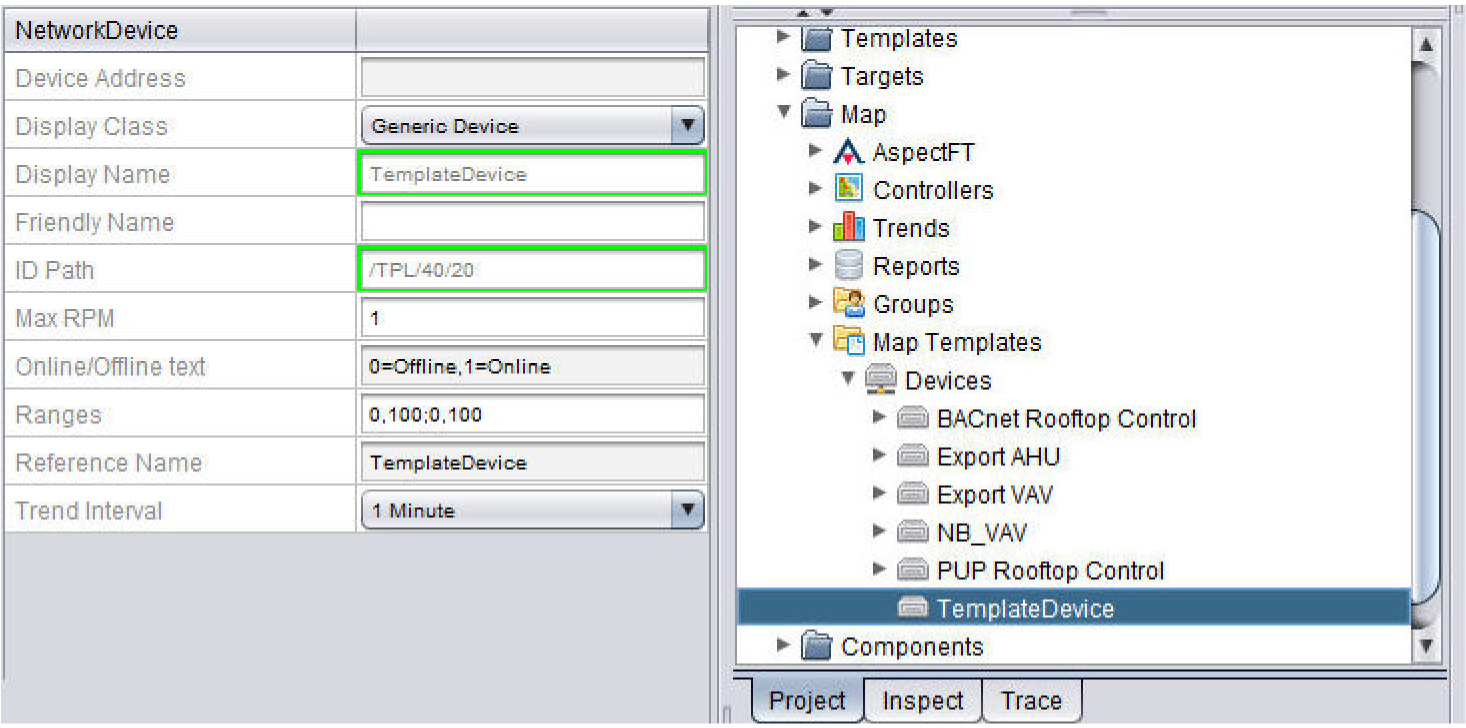
1. From the Map Template group, right-click on Devices and select Add Template Device(s) from the shortcut menu.



2. Define the number of Template Devices you wish to create in the Add Template Device(s) dialog box. Type an appropriate number into the text box. Click OK.



3. The number of devices you have requested will be processed and added underneath the Devices node. The progress bar in Aspect-Studio will provide indication as each template device is inserted into the device container.



More Information

[Working in the Map Templates Node - Overview]()

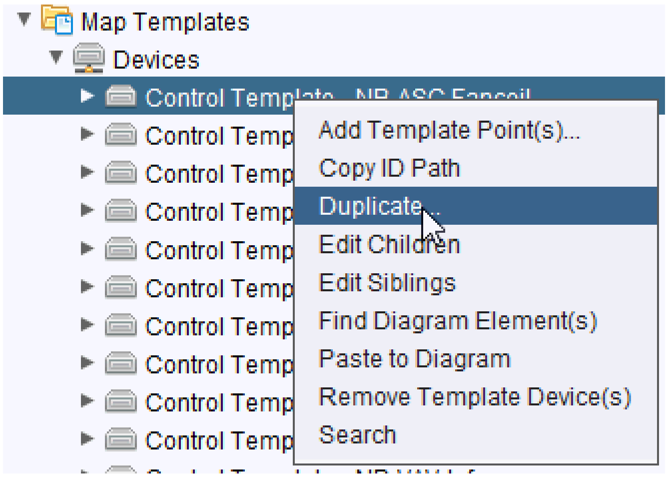
[Duplicating a Map Template Device]()

[Adding Device Points]()

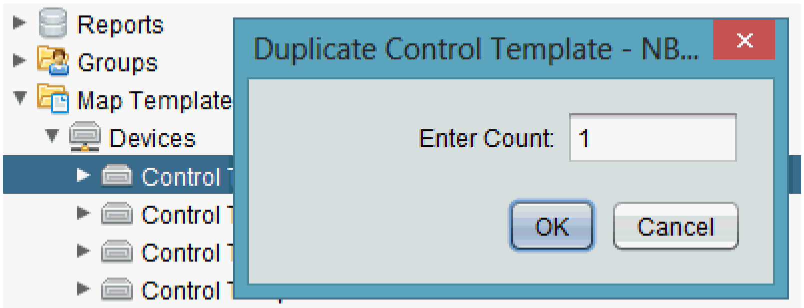
Duplicating a Map Template Device

Any template within the Map Templates area can be duplicated for easy editing or cloning. To duplicate a Map Template device, its configuration, and contents, perform the following steps:

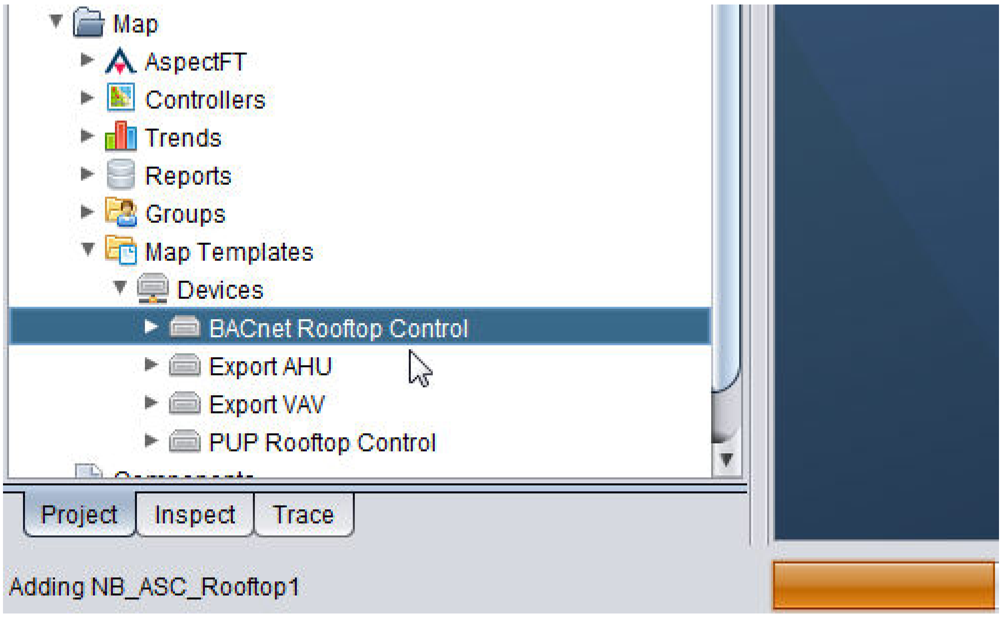
1. Right-click your defined device and select Duplicate from the short-cut menu.



2. You will be prompted to enter the number of duplicates you wish to create. Enter the desired number. Click OK.



3. The number of duplicate devices you have requested will be generated within the map templates container. The progress bar in Aspect-Studio will provide indication as each point is inserted into the map templates container.



More Information

[Working in the Map Templates Node - Overview](#)

[Adding a Map Template Device](#)

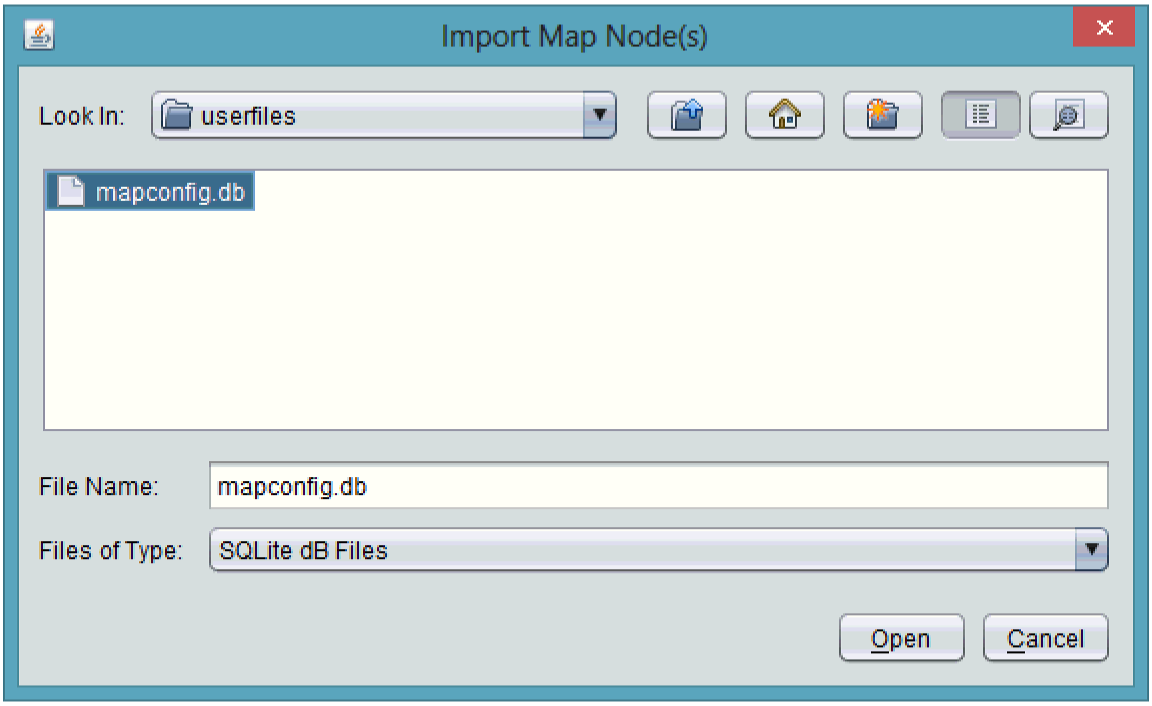
Importing Map Template Devices from Other Projects

In some cases, it may be useful to import Map Template devices from other projects you may have previously configured.

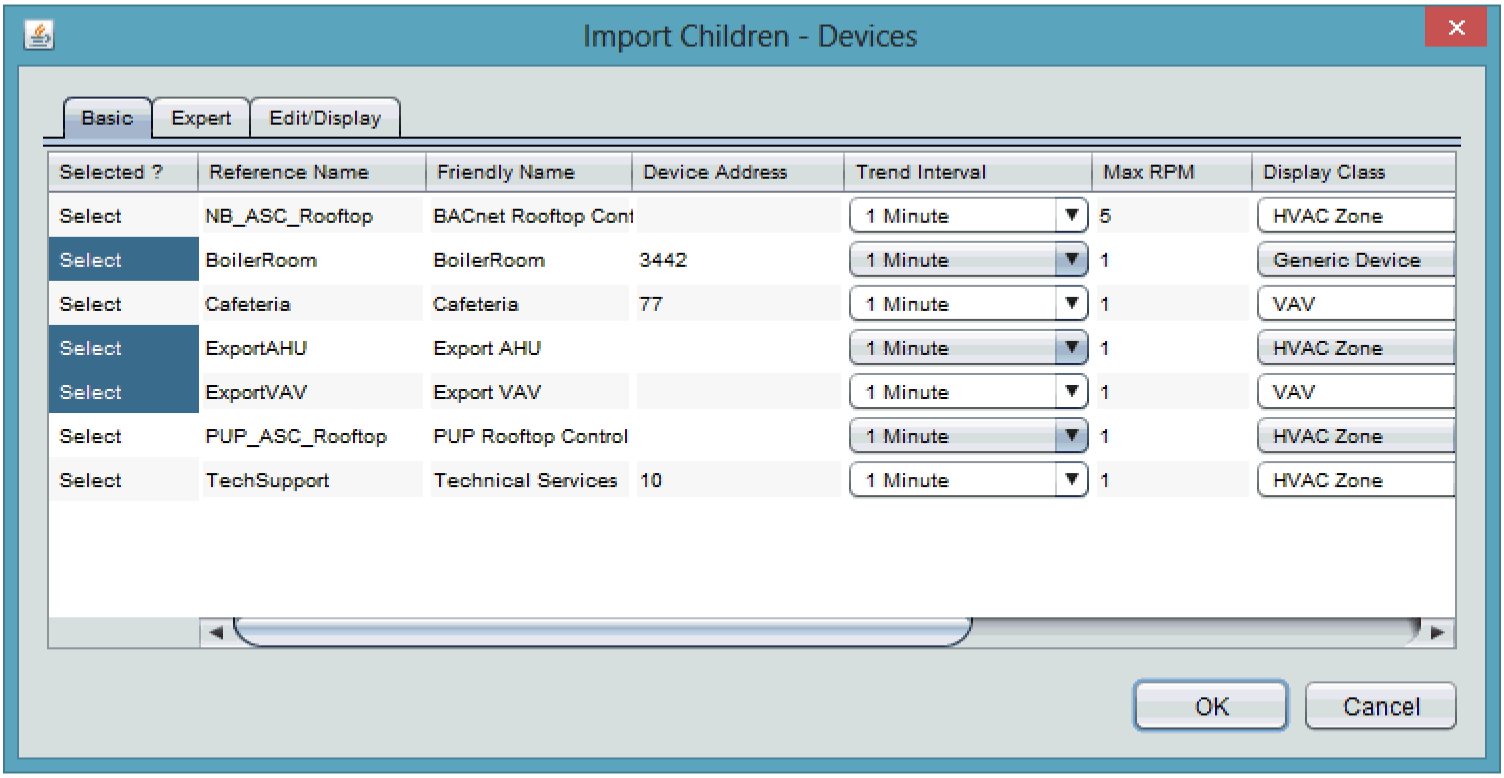
To import Map Template Devices from other projects, perform the following steps:

1. From the Map Template group, right-click on Devices and select Import from External Map from the shortcut menu.

2. Navigate the file directory of your computer and find the Aspect-Studio project you wish to import from. Once located, access the project folder and go into the userfiles directory. Select the mapconfig.db file and click Open.



3. The Import Dialog will appear with a listing of all Map Device Templates available from the referenced project. Select the Map Templates you wish to import by clicking on the Select column field associated with each Map Device Template. To select multiple templates, hold CTRL on your keyboard while performing a single left-click on each row. When complete, click OK.



More Information

[Working in the Map Templates Node - Overview](#)

[Duplicating a Map Template Device](#)

[Adding Device Points](#)

The [Notifiers] Node

Notification Setup

Aspect 3.0 introduces the concept of Notifiers. Notifiers are sets of notification rules and messages that alarms and select system status events (Startup, Deployment) are presented against.

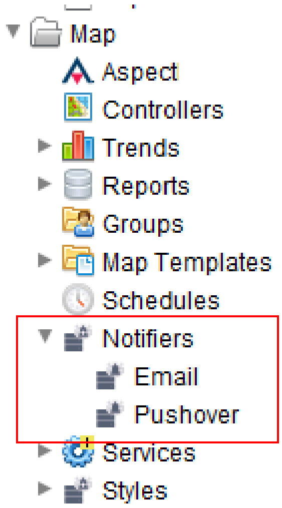
Each notifier that matches an incoming event will be triggered. It is possible to construct a notification flow where a single alarm will match more that one Notifier.

Notifiers will be of a single transport type which may be one of the following:

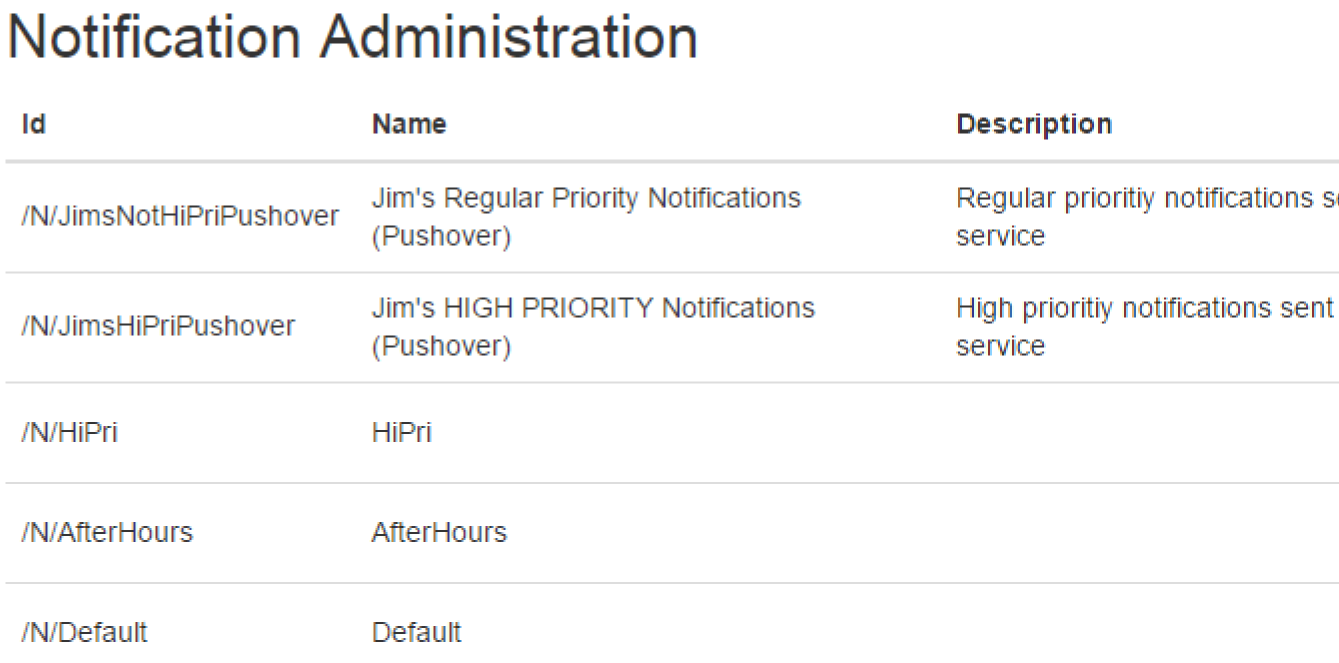
Type	Description

Email	standard SMTP email notification
Pushover	Pushover application notification for mobile and desktop applications
SMSEagle	SMS notifications via an SMSEagle hardware SMS gateway device

Notifications are configured within Aspect Studio in the Map tree under Notifiers



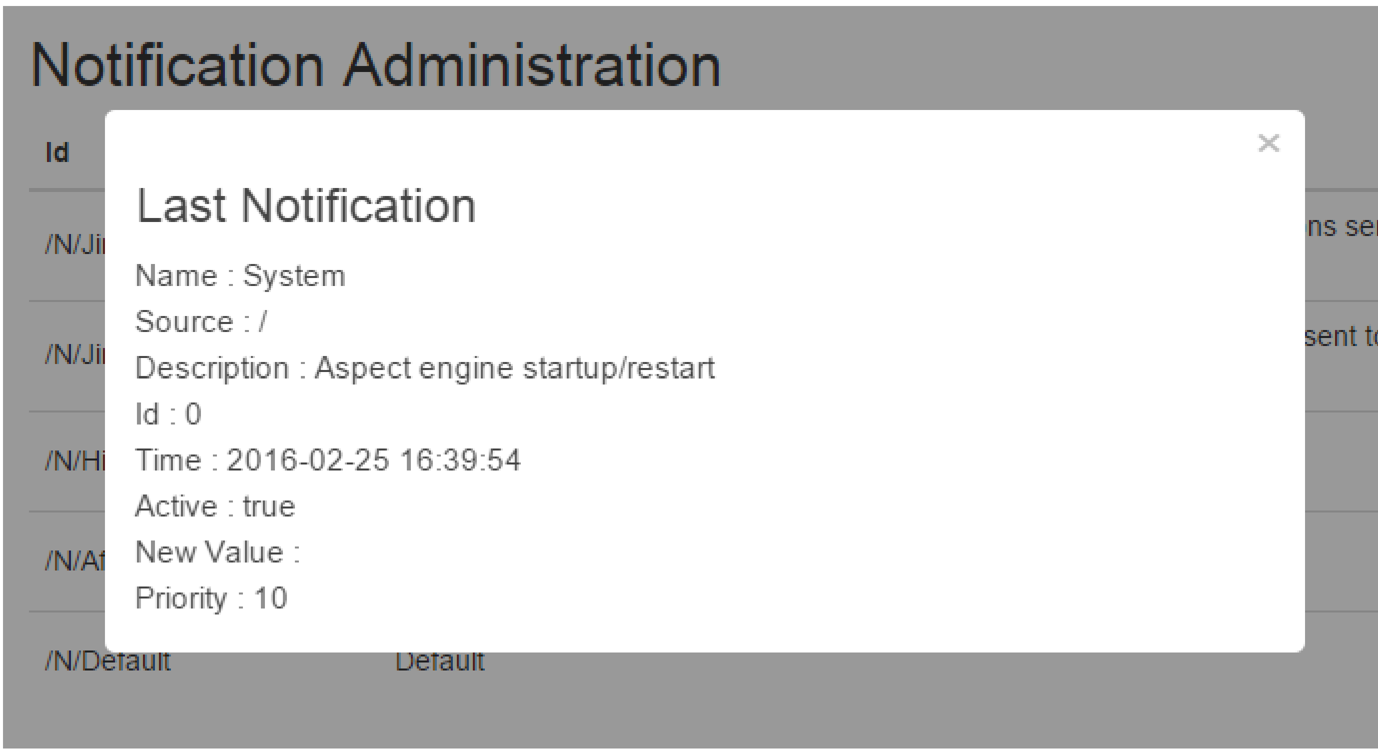
Or in ngAdmin from the Notification Setup menu by clicking on the green edit icon.



Notification Administration

Id	Name	Description
/N/JimsNotHiPriPushover	Jim's Regular Priority Notifications (Pushover)	Regular prioritiy notifications s service
/N/JimsHiPriPushover	Jim's HIGH PRIORITY Notifications (Pushover)	High prioritiy notifications sent service
/N/HiPri	HiPri	
/N/AfterHours	AfterHours	
/N/Default	Default	

From the ngAdmin menu, you may click on the Description field to see what event last matched the configure notification rule



Notifier Properties

Type topic text here.

The [Services] Node

Overview

The Notification subsystem provides an unified interface for modifying the properties of various Aspect Map services.

Only a few subsystems in this tree typically require configuration.

More Information

Alarm Subsystem

Email Subsystem

Event Subsystem

Graphics Subsystem

Links Subsystem

Points Subsystem

Pushover Notification Subsystem

SMSEagle Notification Subsystem

Schedule Subsystem

Security Subsystem

Alarm Subsystem

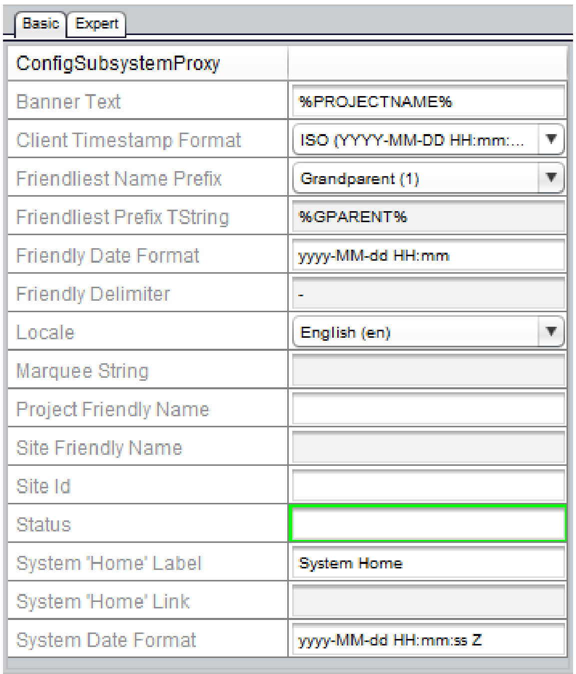
The Alarm Subsystem contains parameters used by the map during the generation of Alarm messages.

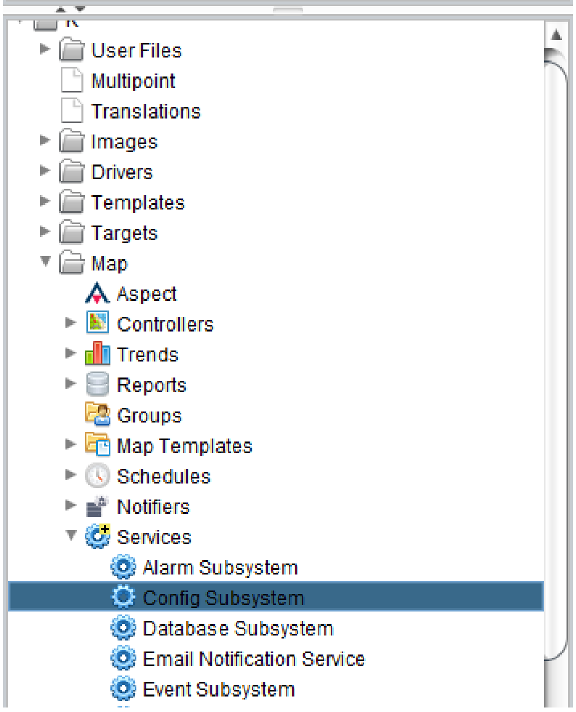
Property	Purpose
Alarm Event Sentence	The tokenized friendly sentence used to display recent alarms in the HTML dashboard. The following tokens are supported: %VALUE%, %SOURCE%, %DESC%, %ACTIVE%, %PROJECTNAME%, %ALARMCONFIG%, %FRIENDLYDATE%, %ACTIVEALARMS%, and %DATE%.
Text: Alarm Active	The text to use for the %ACTIVE% token when an alarm is active

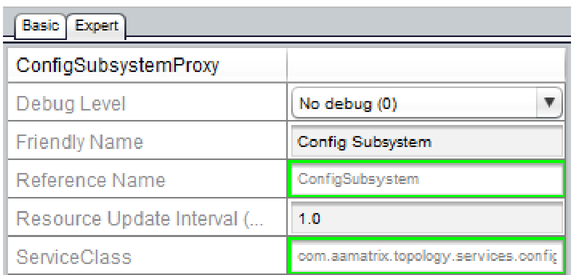
Text: Alarm Inactive	The text to use for the %ACTIVE% token when an alarm is inactive

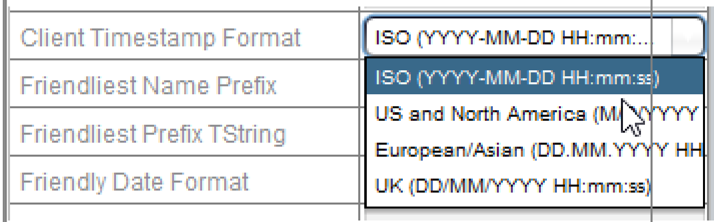
Config Subsystem

The Config subsystem contains system-wide parameters







Property	Purpose
Friendly Date Format	String to display at the top of every page in the marquee area; can include tokens
Client Timestamp Format	This setting will be used as the format in which times and dates in the ngAdmin (H5) UI will be displayed. Four options are available: ISO, US&NorthAmerica, Europe&Asia and UK 
Marquee String	Format to use when creating system dates unless custom or friendly date formats are specified; this is what is used for the %DATE% token
System Date Format	Global format to use when creating friendly dates; this is what is used for the %FRIENDLYDATE% token

Email Notification Subsystem

Contains properties used by the Email notification system. Care should be taken to ensure that the settings provided match the settings expected by the mail server. Some mail systems (such as Google Mail) require additional configuration at the account level to enable the ability to forward SMTP messages from remote systems.

> **Note**: Be careful to use an email account where the password will not expire, because the project must be updated every time the email password changes.

Property	Purpose
Host	The host address (IP or DNS entry) of the outbound email server
From	The email address that the outbound email should appear to come from

Username	The username for the outbound mail server
Password	The password for the outbound mail server
Port	The port number that the outbound mail server uses to receive mail requests
SMTP Local-host	Override the SMTP localhost to this address for EHLO
StartTLS	Many mail servers require TLS authen-tication (and it is preferred to use if pos-sible). If for some reason a mail server doesn't support TLS it can be disabled with this property

Event Subsystem

The Event Subsystem contains settings that pertain to the generation of notifications. The Audit and Map event sentences are tokenized strings that are used for all Audit and Map events. The remaining properties are related to the optional generation of map event messages on startup and redeploment.

Property	Purpose
Audit Event Sen-tence	The tokenized friendly sentence used to dis-play recent audit trail events in the HTML dash-board. The following tokens are supported: %VALUE%, %SOURCE%, %DESC%, %ACTIVE%, %PROJECTNAME%, %ALARMCONFIG%, %FRIENDLYDATE%, %ACTIVEALARMS%, and %DATE%.
Map Event Sen-tence	The tokenized friendly sentence used to dis-play recent Map events in the HTML dash-board. The following tokens are supported: %VALUE%, %SOURCE%, %DESC%, %ACTIVE%, %PROJECTNAME%, %ALARMCONFIG%, %FRIENDLYDATE%, %ACTIVEALARMS%, and %DATE%.
Startup Noti-fication Priority	If notifying on startup, use this priority for the notification
Notify on Star-tup?	If true, send a notification any time the Aspect engine starts up
Startup Noti-	The message sent when notifying at startup

fication Message	
Notify on Deployment?	If true, send a notification any time a project is deployed
Deployment Notification Priority	If notifying on deployment, use this priority for the notification
Deployment Notification Message	The message sent when notifying on deployment

Graphics Subsystem

The Graphics Subsystem contains properties that define the default settings for new Map Graphics nodes

Property	Purpose
Default Resolution	Default resolution used when creating new MapGraphics
Map Event Sentence	The tokenized friendly sentence used to display recent Map events in the HTML dashboard. The following tokens are supported: %VALUE%, %SOURCE%, %DESC%, %ACTIVE%, %PROJECTNAME%, %ALARMCONFIG%, %FRIENDLYDATE%, %ACTIVEALARMS%, and %DATE%.
Default Orientation	Default orientation used when creating new MapGraphics

Links Subsystem

The Links Subsystem provides a series of fields that may be used to define a set of administrative defined links that will appear on the desktop page of the ngAdmin interface.

Property	Purpose
Link {1-10} Url	The URL to use for this link
Link {1-10} Description	The text to display when representing this link
Link {1-10}	Defines how clicking on the link is handled

Action	(open in a new window, open in the current window)

Points Subsystem

The Points Subsystem exposes properties related to the Map engine's point handling. This includes the "stale" data multiplier as well as the new "rotten" data multiplier.

Property	Purpose
Threshold-Stale	This multiplier determines when a point is considered stale. Example: a stale threshold of "3" will cause a point polled at 15 second intervals to go stale after 45 seconds with no update.
Threshold-Rotten	This multiplier determines when a point is considered rotten and its value is discarded. Example: a rotten threshold of "20" will cause a point polled at 15 second intervals to be reset after 5 minutes with no update.

Pushover Notification Subsystem

The Pushover Notification Subsystem contains the application-specific configuration of the Pushover Notifiers used by the alarm engine. The App Token is generated by creating an Application on the pushover.net website

Property	Purpose
App Token	The Pushover application token required to send Pushover notification

SMSEagle Notification Subsystem

The SMSEagle Notification Subsystem is used to configure the connection parameters for use with the SMSEagle SMS gateway hardware.

Property	Purpose
Username	SMSEagle Username
Password	SMSEagle Password
Host	Host IP/name of the SMSEagle gateway
Service Path (Expert)	The URL path required by the SMSEagle gateway to send a message. This should not need to be changed -- modify with care!

Schedule Subsystem

The Schedule Subsystem contains parameters that define the timings of Schedule distribution.

Property	Purpose
Redistribution Interval (mins)	Frequency, in minutes, that schedules are distributed to any bound targets even if they haven't changed. Timer is restarted after any change.
Quiet Time (mins)	Time, in minutes, that a schedule must remain untouched before it is distributed to any bound targets
Inter-distribution Delay (sec)	Delay (in seconds) between each individual distribution. It is expected that this would be 0 except during testing.

Security Subsystem

The Security Subsystem is used to define the groups that have permissions to perform operations not covered by the basic Map node-level permissions.

Property	Purpose
Groups-Config	Comma separated list of groups that have permission to change existing con-

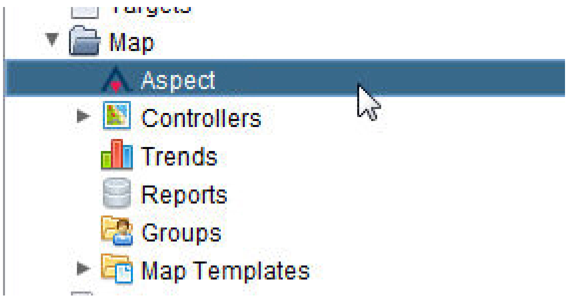
	figuration
Groups-System Admin	Comma separated list of groups that have complete configuration permission, including adding and deleting objects
Groups-Schedule	Comma separated list of groups that have special permission to change local schedule configuration
Groups-Alarm ACK	Comma separated list of groups that have permission to acknowledge alarms
Groups-Alarm CLEAR	Comma separated list of groups that have permission to clear alarms

The [Aspect] Node

What is the "Aspect Node"?

The Aspect Node of the **Map** is intended to provide a means of making control data from the ASPECT system available to the HTML5 graphical user interface.

However, it can also be used to create references to control data that can be used in other portions of your project as read-only data.



The points that are presented under this node are referred to as "**ASPECT Points**"

More Information

Adding Aspect Groups

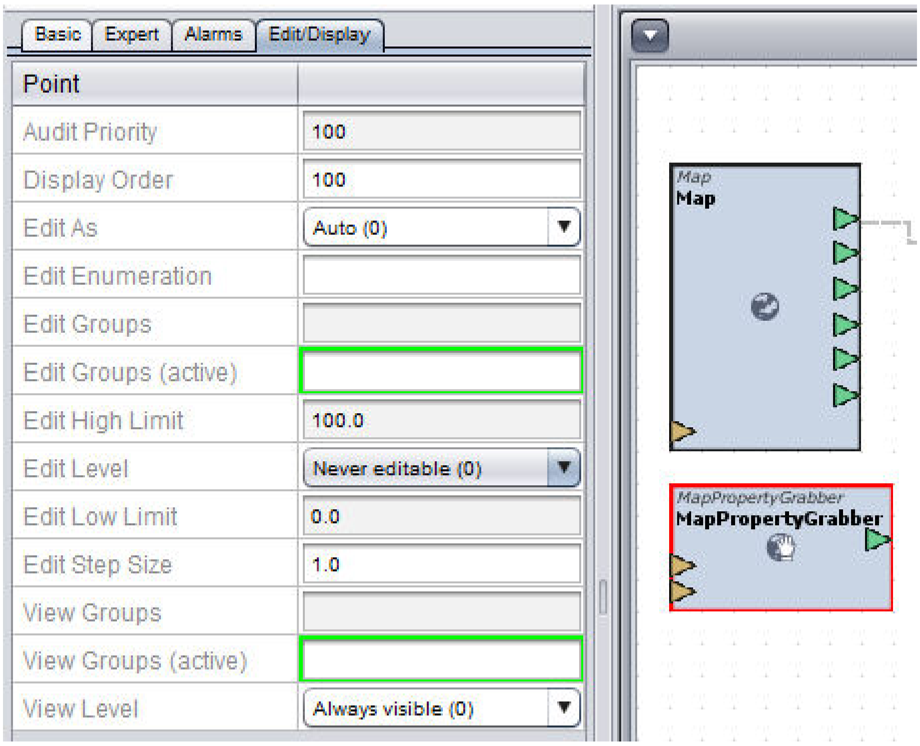
Adding Aspect Applications

Adding Aspect Points

Editing Multiple Aspect Points

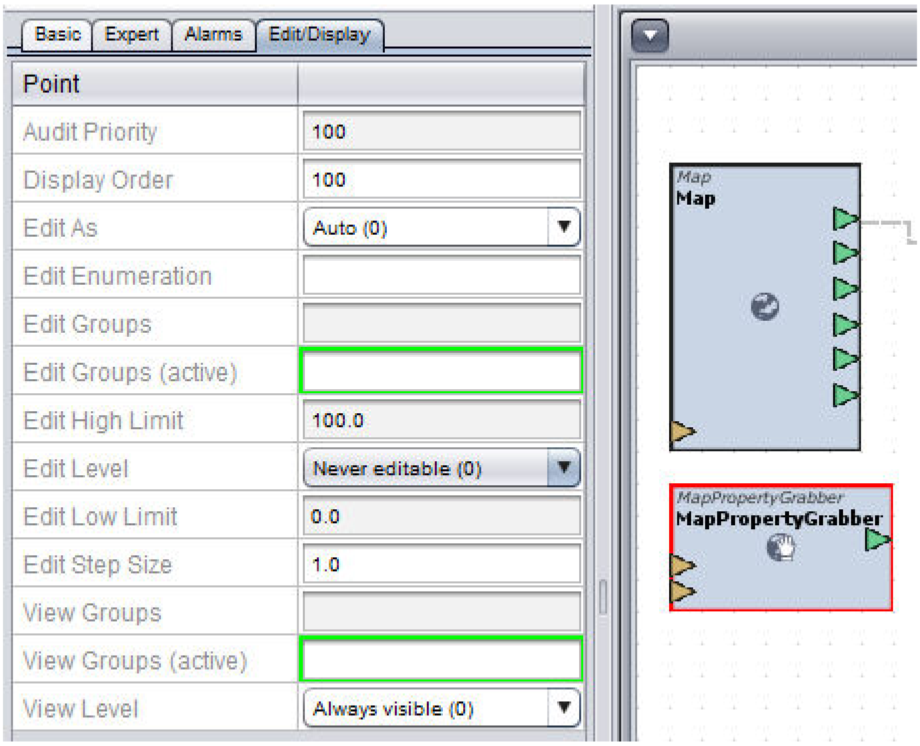
Display Order of Points

Users may now order the points for the HTML5 UI by manipulating the Display Order property on the Edit/Display Tab. The lower the value the closer the point will be showed to the top of the user interface. When multiple points share the same value then they will be displayed alphabetically with other points sharing the same Display Order. This property affects not only points in the Controller node but points in other nodes.

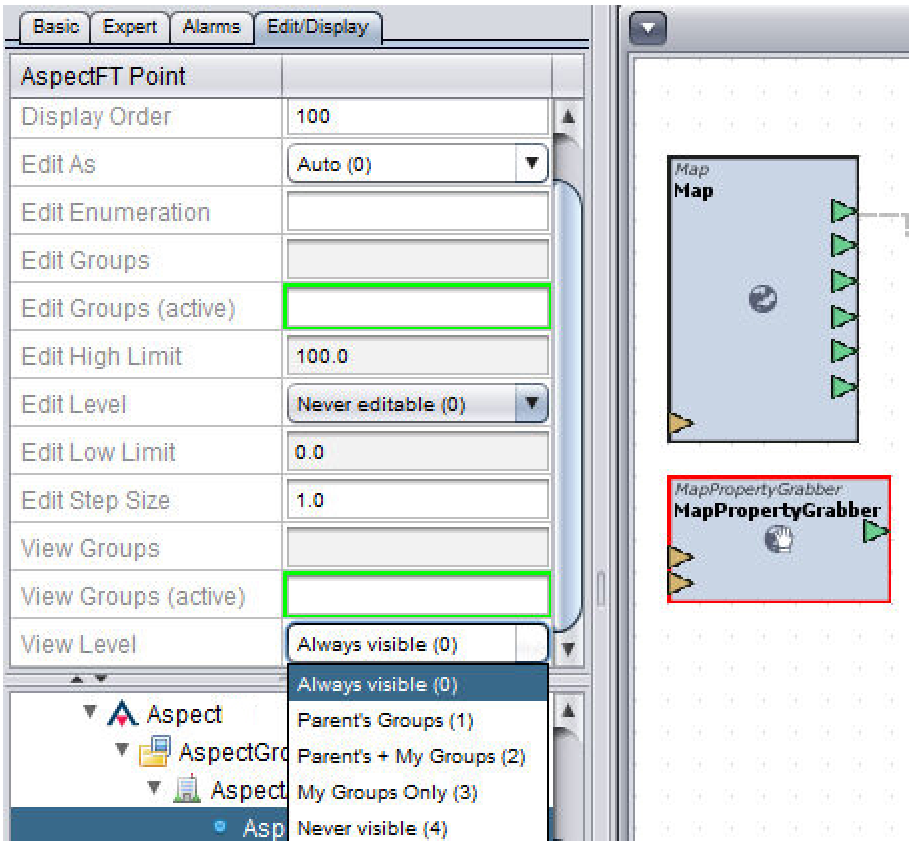


Node Based User Permissions

Not only can you determine the order in which points are displayed but you can also make it so certain users can view or edit certain points within the system. By manipulating the view groups property you can make it so only certain groups have access to view the point.



You must also manipulate the View level property. This will allow you to set it to Always visible, parents groups, Parents + My Groups, or never visible.



Working with Aspect Groups

Adding Aspect Groups

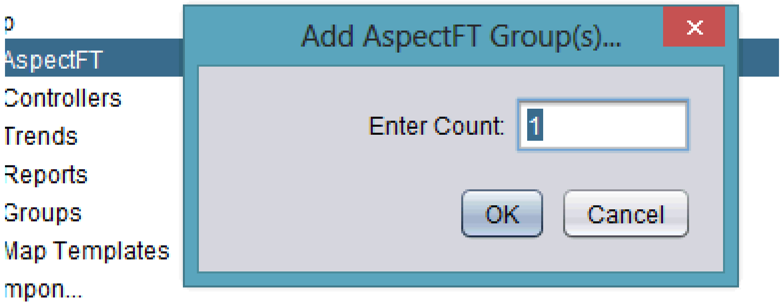
Aspect Groups are used to provide a clean way of referencing Aspect Apps that are defined within your project. Each group can house one or several Aspect Apps.

To define an Aspect Group, perform the following steps:

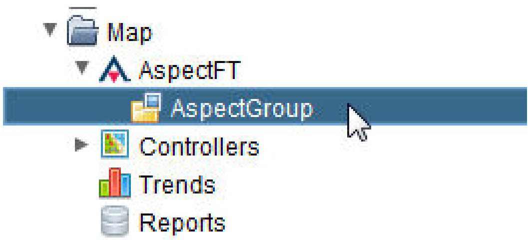
1. Right-click the Aspect node and select Add Aspect Group(s).

2. Define the number of Aspect Groups you wish to create in the Add Aspect Group(s) dialog box. Type an appropriate number into the

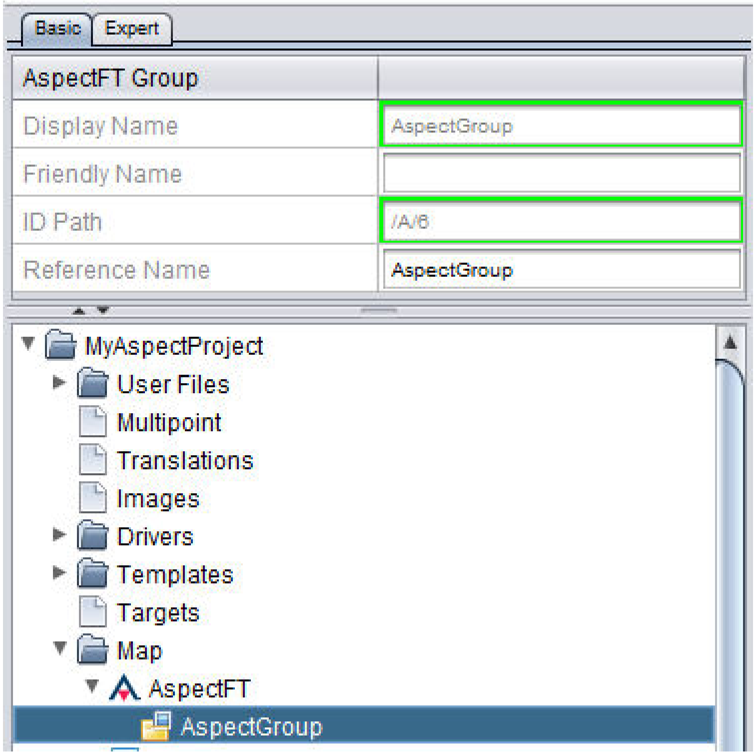
text box. Click OK.



3. The number of Aspect Groups you have requested will be processed and added underneath the Aspect node. The progress bar in Aspect-Studio will provide indication as each group is inserted into the Aspect container. Once added, you can assign a Reference Name and a Friendly Name to the Aspect Group. This is performed using the Properties Pane.



3. The Friendly Name is a label displayed not only within the Map Topology tree, but will also be displayed within the HTML5 user interface. Friendly Names can display spaces and other characters that are visible to the user. The ReferenceName is an internal name reference for use by technicians developing and maintaining an Aspect system. This should not contain any spaces or special characters. Finally, the Display Name will provide you with a read-only reference of the way the Aspect Group will be displayed in the Tree as well as the HTML5 user interface for verification.



More Information

[Working in the Map Topology - Overview](#)

[Adding Aspect Applications](#)

[Adding Aspect Points](#)

[Editing Multiple Aspect Points](#)

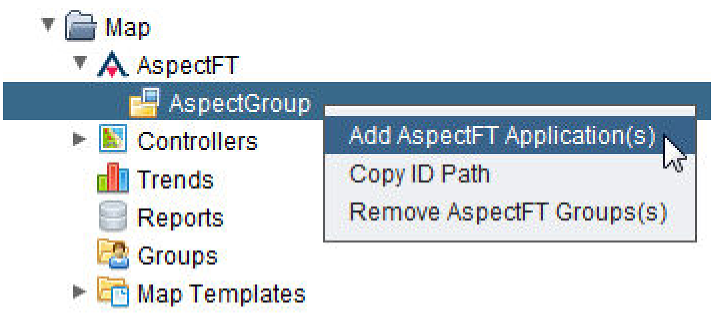
Working with Aspect Applications

Adding Aspect Applications

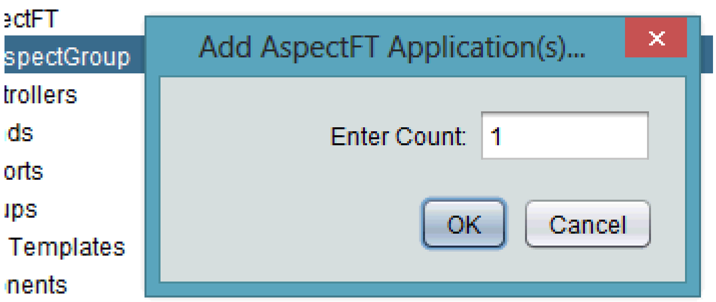
Aspect Applications are direct references to defined applications within your project.

To define a reference to an Aspect Application, perform the following steps:

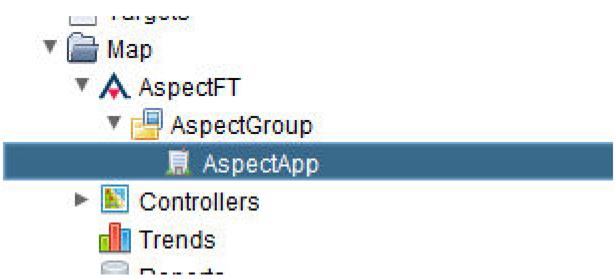
1. Right-click a defined Aspect Group and select Add Aspect Application(s) from the shortcut menu.



2. Define the number of Aspect Applications you wish to create in the Add Aspect Application(s) dialog box. Type an appropriate number into the text box. Click OK.



3. The number of Aspect Applications you have requested will be processed and added underneath the AspectGroup node. The progress bar in Aspect-Studio will provide indication as each application is inserted into the group container. A generic AspectApp listing will be added directly below your AspectGroup node. Once added, you can assign a Reference Name and a Friendly Name to the AspectApp. This is performed using the Properties Pane.

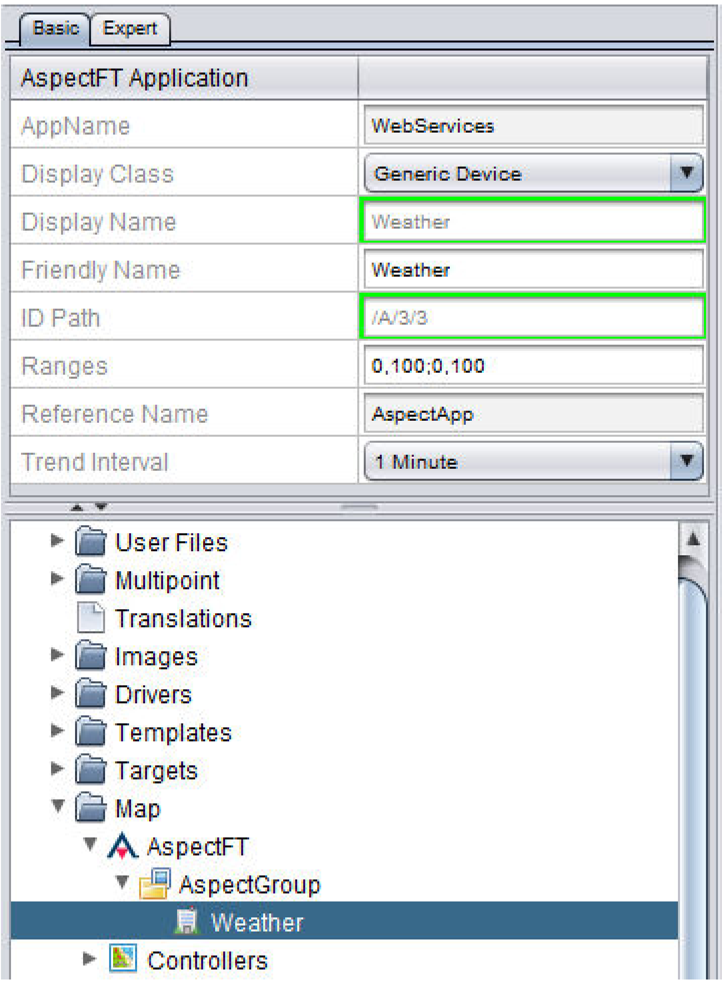


4. Similar to a Device, an AspectApp can contain the same set of properties for reflecting devices from non-routable networks (such as

Modbus and SDP). To configure an App, go to the Properties Pane with the Aspect Application selected within your Project Tree and configure the following properties accordingly.

Property	Notes
AppName	This property defines the name of the Application you are referencing. In order for a direct reference to occur, you must type the name of the Application in appropriately.
Display Class	This property assigns a generic display class and is used for displaying optional widgets in the auto-generated HTML5 web interface. Options include the following: • Generic Device - defines the device entry as a generic controller, which does not display any standard, preset widget in the HTML5 interface. • HVAC Zone - defines the device entry as a standard HVAC Zone (Rooftop, Heatpump, Fancoil, etc) and will display a widget including Zone Temperature, Supply Temperature, Mode, Occupancy, and Heating/Cooling Setpoint indicators. • VAV - defines the device entry as a VAV zone and will display a widget include Zone Temperature, Damper Position, Heating/Cooling Setpoint indicators, Mode, and Occupancy.
Display Name	This property is a read-only indication providing feedback of the name that will be displayed within the HTML5 user interface.
Friendly Name	This property defines the Friendly Name for the Application as displayed in the Project Tree, as well as the dynamic HTML5 web interface.
ID Path	This property displays the full unique ID path for the selected template device.
Ranges	This property defines the low and high value ranges for HTML5 widgets. These ranges are used to define the min and max values to display for Zone Temperature and Supply Temperature accordingly.

Reference Name	This property defines the Reference Name that is used within the underlying engine of Aspect.
Trend Interval	This property defines the time interval at which trend samples will be collected for points configured for Trending Active. By default, Aspect will collect trend samples from points configured for Trending Active at 1 Minute intervals. This setting is variable and includes the following set options: • 1 Minute • 3 Minutes • 5 Minutes • 15 Minutes • 30 Minutes • 60 Minutes



More Information

[Working in the Aspect Node - Overview](#)

[Adding Aspect Groups](#)

[Adding Aspect Points](#)

[Editing Multiple Aspect Points](#)

Working with Aspect Points

Adding Aspect Points

Once you have added an Application and configured its associated properties, you may begin to add point references into the Aspect Application.

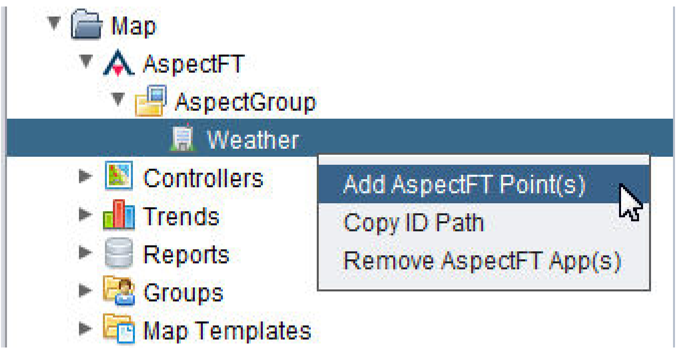
Point references can reference any element that is used within your project. When a point is referenced, the primary output (in most cases, the Output pin) will be exposed and shown as the current value for the point.

This section reviews the method that is used to add points to the device.

Adding Point(s)

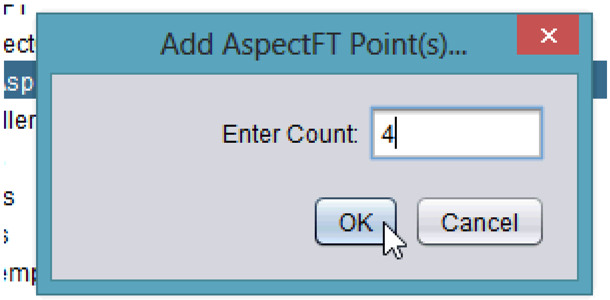
Aspect Points may be added one at a time or added in multiples. To do so, perform the following steps:

1. From your defined Application, right-click and select Add Aspect Point(s).

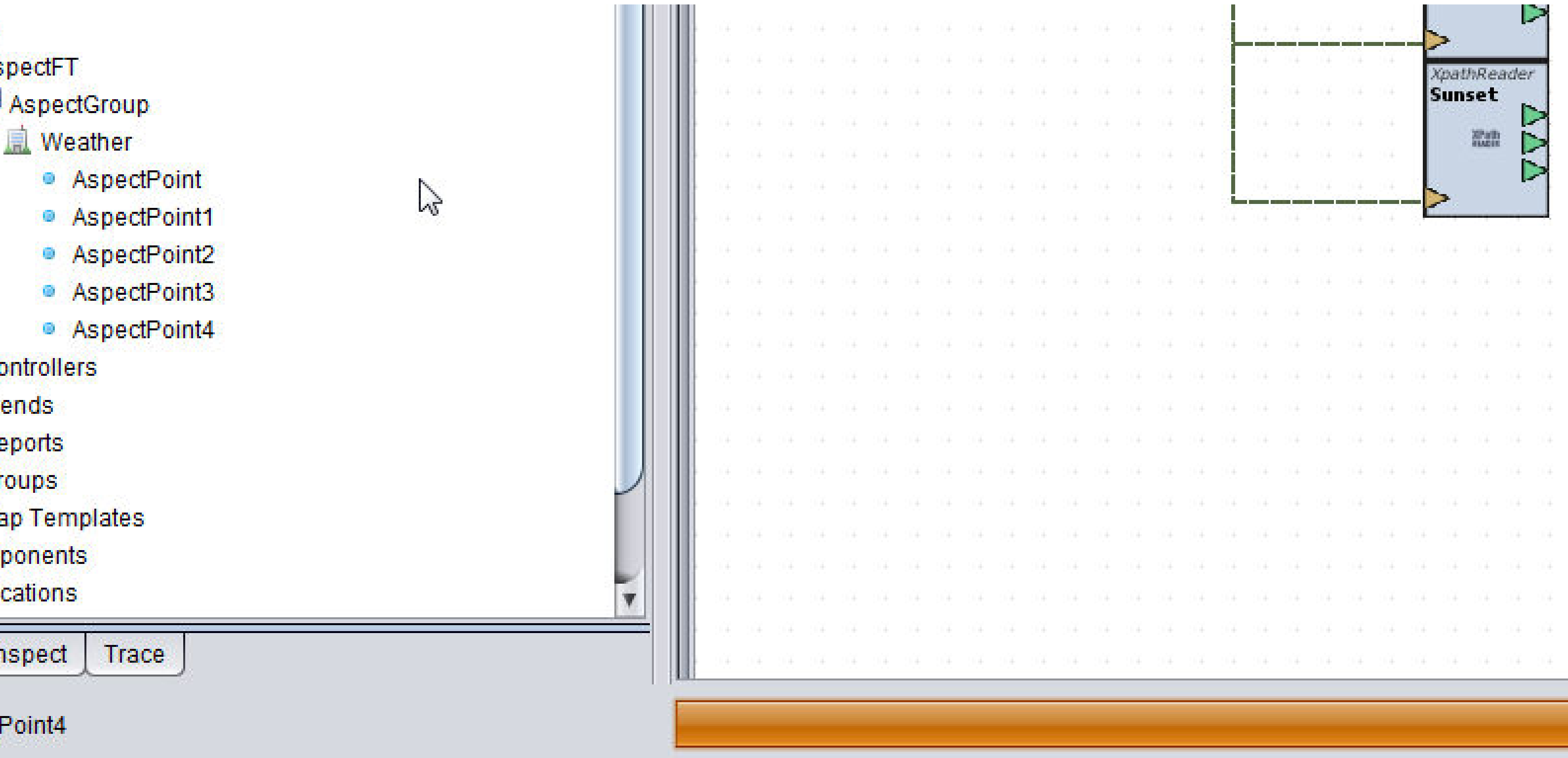


2. Define the number of points you wish to create in the Add Aspect Point(s) dialog box. Type an appropriate number into the text box.

Click OK.



3. The number of points you have requested will be processed and added underneath the Application. The progress bar in Aspect-Studio will provide indication as each point is inserted into the Aspect Application container.



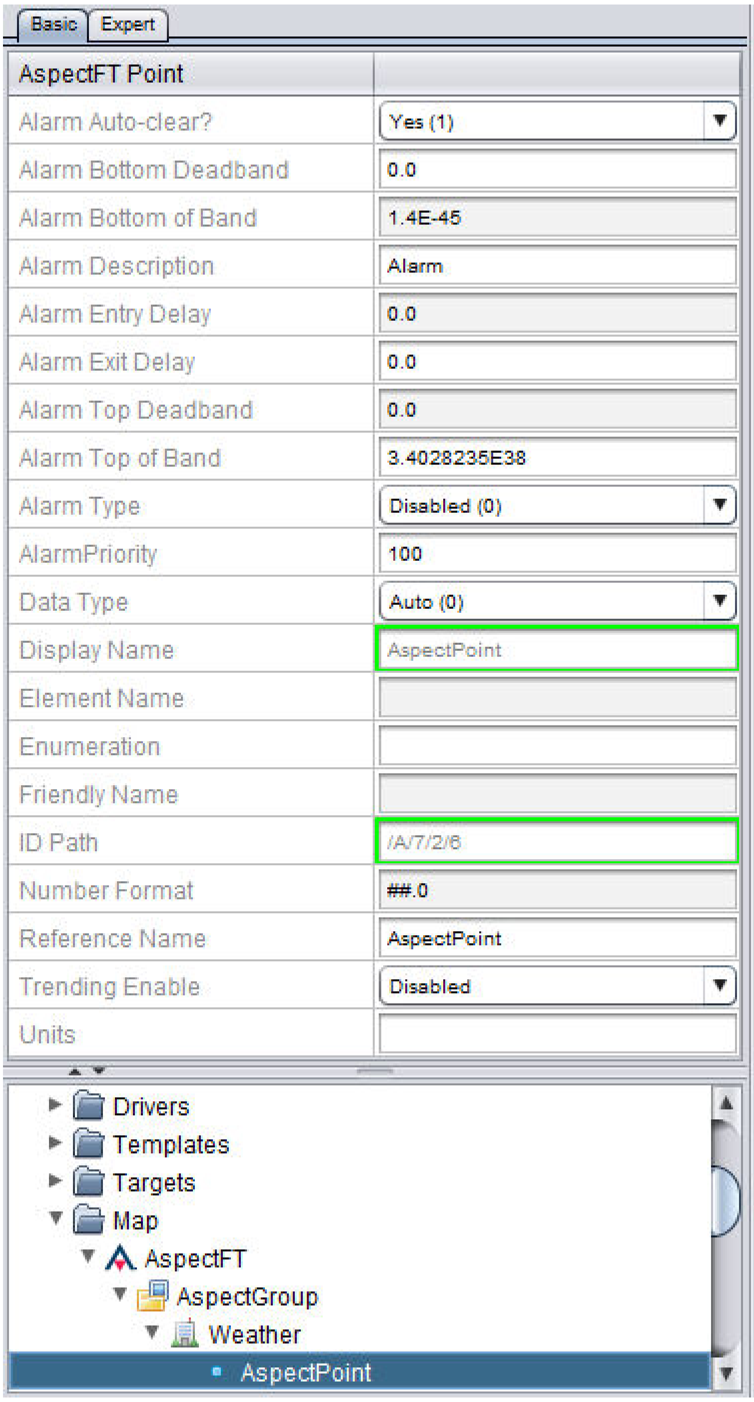
4. To configure the Point, go to the Properties Pane with the Point selected within your Project Tree and configure the following properties accordingly.

Property	Notes
Alarm Auto-clear	Defines if the alarm is automatically cleared once the value returns to normal.
Alarm Bottom Dead-band	Defines the alarm deadband for bottom limit alarms. The point will come out of alarm when the value crosses theAlarm Bottom of Band + or - Alarm
Alarm Bottom of Band	Defines the bottom of the alarm band threshold.
Alarm Description	Defines a string description that is inserted into the Alarm Manager database.
Alarm Entry Delay	Defines the amount of time, in seconds, the alarm must be in condition before an entry is routed to the Alarm Manager.
Alarm Exit Delay	Defines the amount of time, in seconds, the alarm must be out of condition before an entry is routed to the Alarm Manager.
Alarm Top Deadband	Defines the alarm deadband for bottom limit alarms. The point will come out of alarm when the value crosses theAlarm Top of Band + or - Alarm Top
Alarm Top of Band	Defines the top of the alarm band threshold.
Alarm Type	This property defines the type of Alarming for this point. Available alarming selections are as followed: • Disabled (0) • Alarm when ON (1) • Alarm when OFF (2) • High Limit (3) • Low Limit (4) • Out of Range (5) • In Range (6)
AlarmPriority	Defines a priority for the alarm.
Data Type	This property defines the data type for the referenced point. You must set the data type appropriate to the point reference.

	Integer (1)	This option tells the system this point is an integer data type.
	Float (2)	This option tells the system this point is a float data type.
	String (3)	This option tells the system this point is a string data type.
	Date (4)	This option tells the system this point is a date data type. (PUP only)
	Time (5)	This option tells the system this point is a time data type. (PUP only)
	Bitstring (6)	This option tells the system this point is a bit string data type. (PUP only)
	BACnet Weekly Schedule (50)	This option tells the system this point is an BACnet Weekly Schedule.
	BACnet Date (60)	This option tells the system this point is a BACnet Date (BACnet only) and supports read-only access.
	BACnet Time (61)	This option tells the system this point is a BACnet Time (BACnet only) and supports read-only access.
	BACnet Cal-endar List (62)	This option tells the system this point is a BACnet Calendar List (BACnet only) and supports read-only access.
	BACnet Object ID (63)	This option tells the system this point is a BACnet Object ID (BACnet only) and supports read-only access.
	Protocol Native (99)	This option tells the system this point is Protocol Native. Supports BACnet Date, Time, and Bitstring points.
	Other (100)	Not yet implemented.
Display Name	This property is a read-only indication providing feedback of the name that will be displayed within the HTML5 user interface.	
Element Name	This property defines the actual name of the ele-ment point you are referencing.	

Enumeration	This property defines an enumerated unit for the point reference. For example, if the point you are referencing is an enumerated point (e.g. a point referencing Fan or Equipment status), you may enter comma separated list of enumerations within this property. The comma separated list must be in the format of value=string. For example: 0=Unoccupied,1=Warmup,2=Occupied,3=Setback 0=Off,1=On 0=Off,1=Low,2=Medium,3=High
Friendly Name	This property defines the FriendlyName for the Point as displayed in the Project Tree, as well as the dynamic HTML5 web interface.
ID Path	This property displays the full unique ID path for the selected Aspect point.
Number Format	This property defines the Number Format in which data will be presented to the rich graphical user interface and/or HTML5 web user interface. By default, this property is set for a value of ##.0 where a single decimal place will always be displayed for floating point values.
Reference Name	This property defines the Reference Name that is used within the underlying engine of Aspect.
Trending Enable	This property defines whether the Point will be trended by Aspect. When set to Yes, the Point value will be trended based on configuration Trend Interval property of the Device. When set to No, the Point value will not be trended by Aspect.
View Trend By Default?	This property defines whether the point will be automatically selected for trend viewing from the

	HTML5 web user interface if/when the point is enabled for trending.
Spark Line?	This property, when se to Yes, will display a spark line within the HTML5 user interface. A spark line shows real-time trended data over the last few minutes of time. NOTE - Enabling a point for Spark Line capabilities will result in periodic polling of the device point based on your polling interval configuration in the Map element.
Units	Defines an Engineering unit for the Point that will be displayed and passed onto the HTML5 web user interface, or the rich graphical user interface.



More Information

[Working in the Aspect Node - Overview](#)

[Adding Aspect Groups](#)

[Adding Aspect Applications](#)

[Editing Multiple Aspect Points](#)

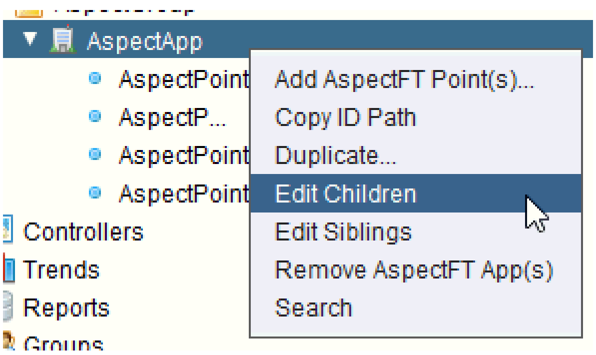
[Pasting Aspect Points to Diagram](#)

Editing Multiple Aspect Points

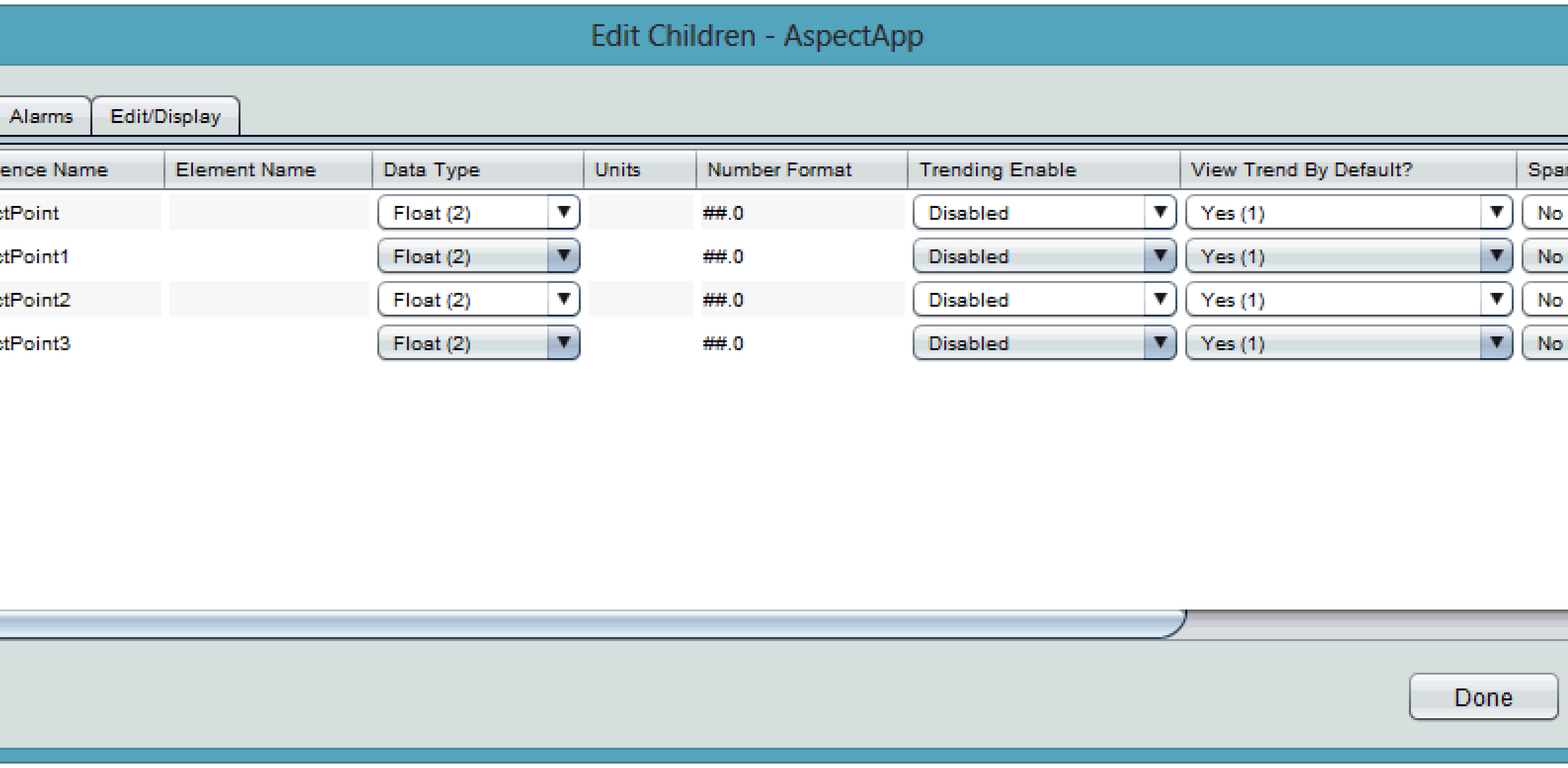
As documented in the Adding Points section, you may edit points in an one-by-one basis through the Properties Pane. However, you can edit points in a more streamlined fashion using the Edit Children feature. The Edit Children feature provides a spreadsheet-like view of all points that are within the container of a device. Through this feature, you have the ability to edit each point in a bulk manner as desired.

To edit points, perform the following steps:

1. Right-click the Aspect Group whose points you wish to edit and select Edit Children.



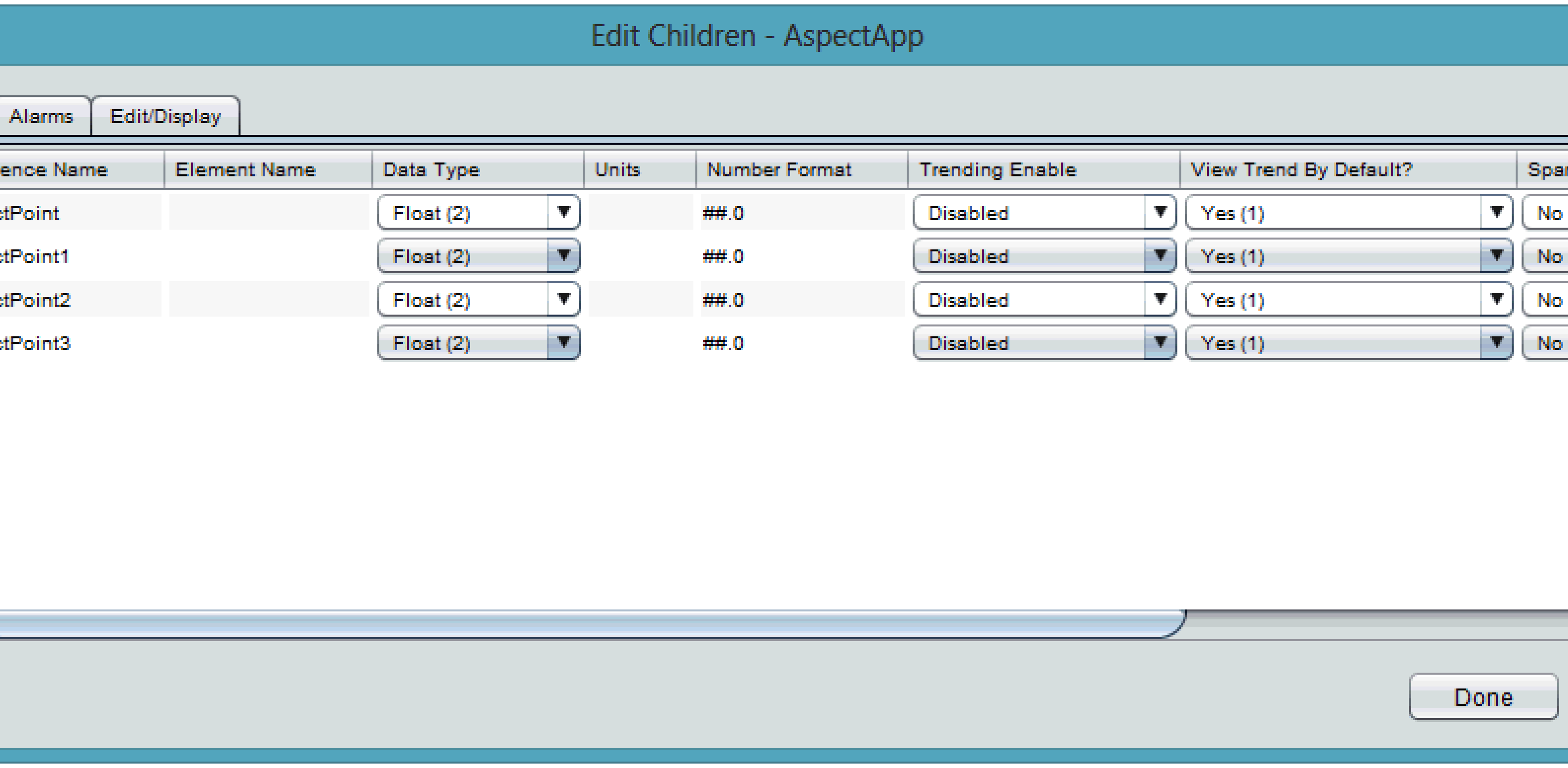
2. The Edit Children dialog editor will appear. Using this editor, you can tab from field to field and edit the various properties of a device.



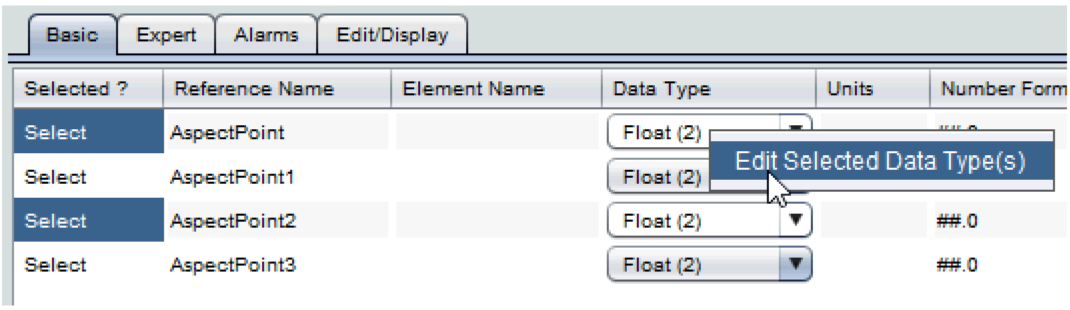
Mass Editing Specific Properties

Through Edit Children, you can mass edit a specific property for multiple points if desired. To edit a specific property for multiple points, perform the following steps:

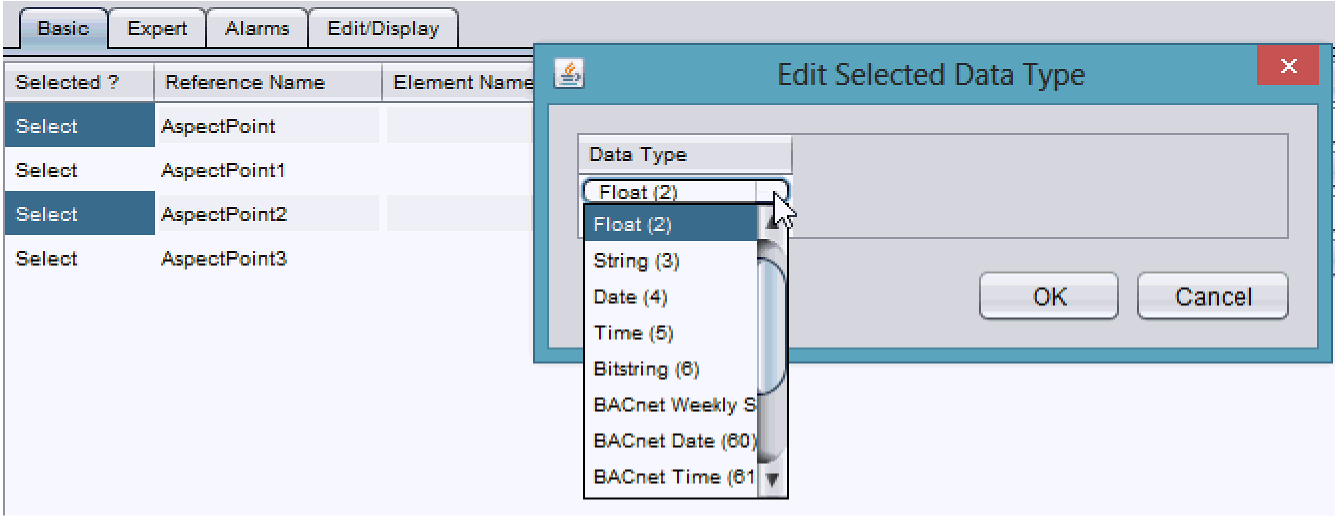
1. Within the Edit Children dialog, hold the CRTL key on your keyboard, then click and select the rows you wish to edit.



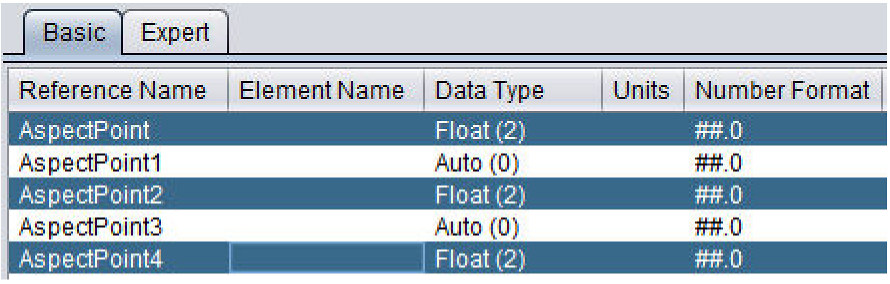
2. Right click the column for the field you wish to edit. A short-cut for that column should appear. Select the option.



3. The Editor for that field will appear. Select or enter the value you wish to populate. Click OK.



4. All selected fields should now contain the newly entered value.



Reference Name	Element Name	Data Type	Units	Number Format
AspectPoint		Float (2)		##.0
AspectPoint1		Auto (0)		##.0
AspectPoint2		Float (2)		##.0
AspectPoint3		Auto (0)		##.0
AspectPoint4		Float (2)		##.0

More Information

Working in the Aspect Node - Overview

Adding Aspect Groups

Adding Aspect Applications

Adding Aspect Points

Pasting Aspect Points to Diagram

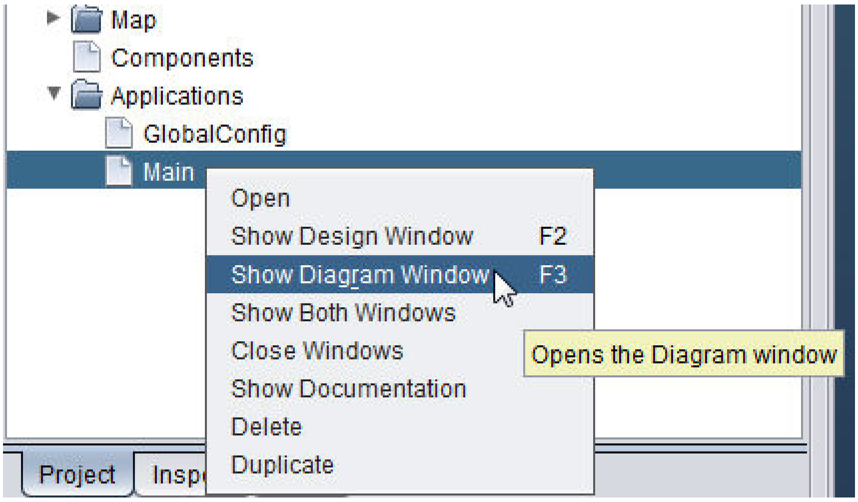
Pasting Aspect Points to Diagram

In order to use Aspect points with diagram logic, you will need to copy that point to the diagram view.

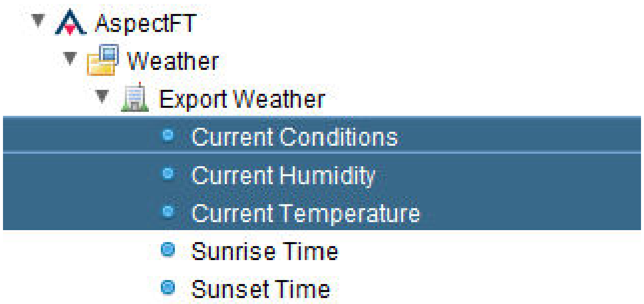
Pasting Aspect Point(s) to Diagram

Aspect Points may be added one at a time or added in multiples. To do so, perform the following steps:

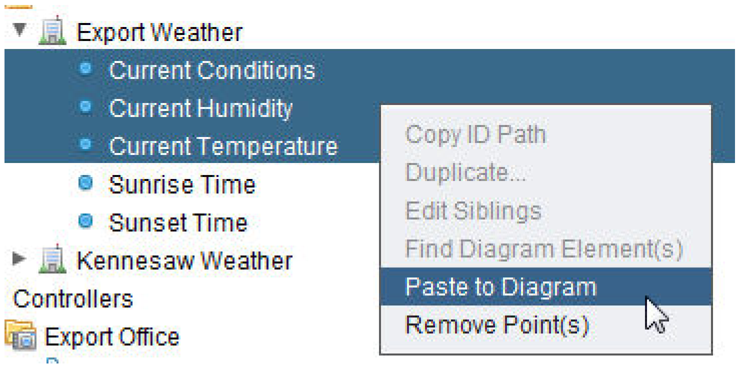
1. Open the application you wish to paste to in Diagram View.



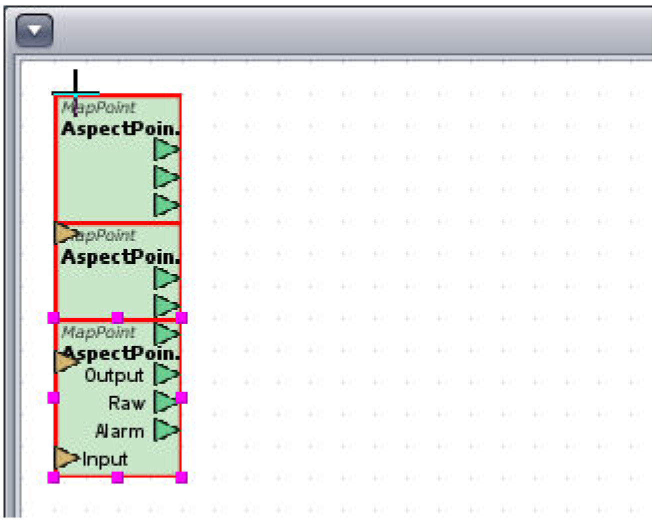
2. From the Aspect Group, select one, or multiple points by holding the CTRL key when selecting points.



3. Right click one of the points and select Paste to Diagram:



4. Move the cursor to the Diagram view, where it will change to the + icon. Click anywhere in the Diagram view to paste the selected points.



For more information on Map Points, view the Map Points topic below.

More Information

[Working in the Aspect Node - Overview]()

[Adding Aspect Groups]()

[Adding Aspect Applications]()

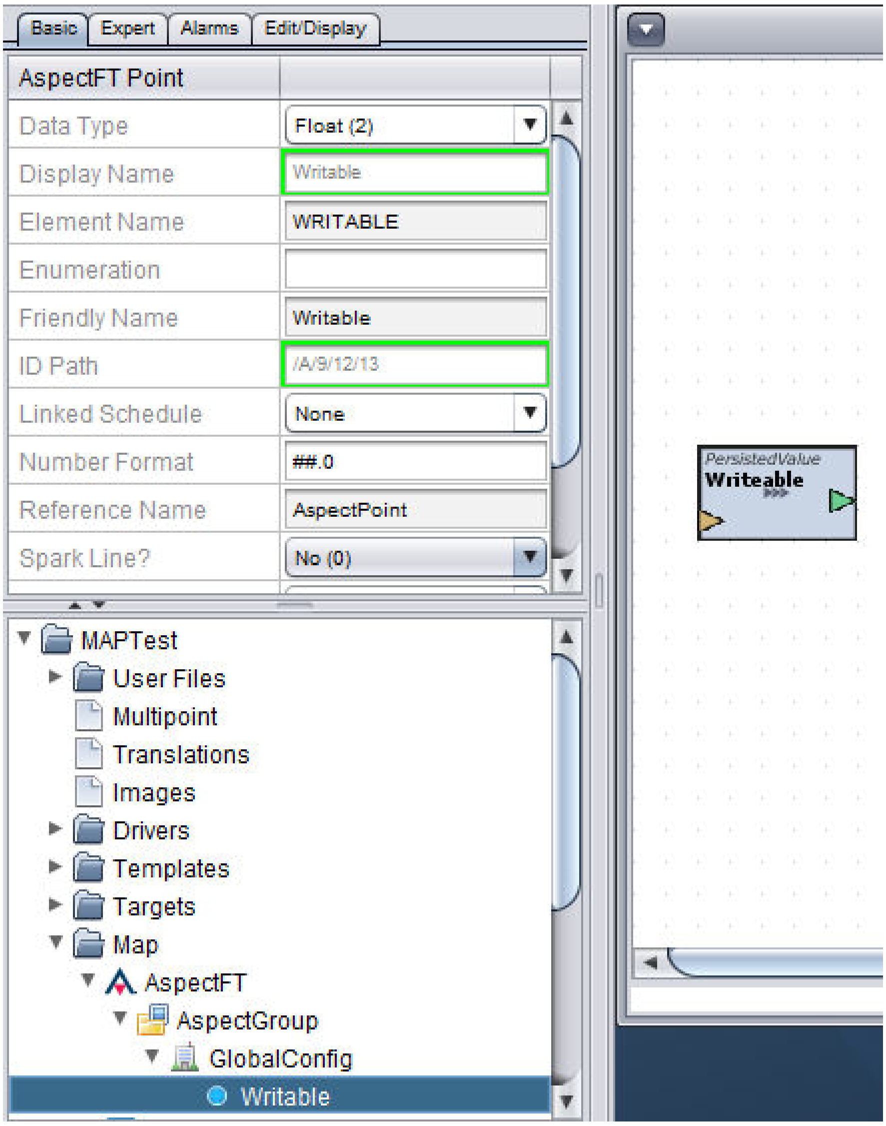
[Editing Multiple Aspect Points]()

[Map Point]()

Writing ASPECT Points

ASPECT Points (points listed under the Aspect node in the Map) may be written to as long as the associated point is a **Persisted Value**.

All permissions and rules apply to this point as if it was an actual controller point.



Style Properties

Styles are a powerful new concept in Aspect 3.0. Styles enable the user to create a named group of visual properties that can be applied to any number of Graphics elements.

Styles are defined as a default per-graphic, but individual elements within the graphic may override the default style to have a different set of visual properties.

For example, a graphic may use the default style Default which has a Label Font Size of 16.0, but if the user needs a larger label in a few places, a Style called LargeLabel could be created that defines a Label Font Size of 24.0. The LargeLabel Style could then be used in any graphic where a larger label was required.

A change to the style will automatically propagate to any element that uses that particular style.

Note that in most cases, transparency is a function of the associated color property and may be accessed by selecting the HSV, HSL, RGB, or CMYK tabs.

Property	Purpose
Description	Comma separated list of groups that have permission to change existing configuration
Friendly Name	Comma separated list of groups that have complete configuration permission, including adding and deleting objects
Reference Name	Comma separated list of groups that have special permission to change local schedule configuration
Annunciator Background Color	Background color for the entirety of the annunciator container (except for the LED)
Annunciator Font Family	Font Family to use for the annunciator value
Annunciator Font Size	Font size to use for the annunciator value
Annunciator Text Color	The color to use for the annunciator value (not the label text)
Annunciator Label Font Fam-	Font Family to use for the annunciator label

ily	
Annunciator Label Font Size	Font size to use for the annunciator label
Annunciator Label Text Color	The color to use for the annunciator label text (not the value)
Annunciator Ranged Status Display	How/where do display ranged status information on an annunciator
Annunciator Status Flag Transparency	Transparency to use for the ranged status flag if using the flag for status indication. Overrides the transparency of the ranged color (0-100%)
Annunciator Show Normal Status?	If yes, show ranged status even if the value is in the normal range
Annunciator Hide Context Alarm Flag?	If yes, hide the context alarm flag (appropriate for detail graphics where you don't want on alarm to put flags on every annunciator)
Annunciator Show LED?	If yes, show the alarm LED (circle indicator)
Button Background Color	Background color for the entirety of the button container
Button Font Family	Font Family to use for button text
Button Font Size	Font size to use for button text
Button Border Color	Color of the container border
Button Border Width	Width in pixels of the container border
Button Text Color	The color to use for the text
Label Background Color	Background color for the entirety of the label container
Label Font Family	Font Family to use for label text
Label Font Size	Font Size to use for label text
Label Border	Color of the label container border

Color	
Label Border Width	Width in pixels of the label container border
Label Text Color	The color to use for the label text
Link Background Color	Background color for the entirety of the label container
Link Font Family	Font Family to use for link text
Link Font Size	Font size to use for link text
Link Border Color	Color of the link container border
Link Border Width	Width in pixels of the link container border
Link Text Color	The color to use for the link text
Status Color: Trouble High	Color to use for indication of high trouble
Status Color: Warning High	Color to use for indication of high warning
Status Color: Trouble Low	Color to use for indication of low trouble
Status Color: Warning Low	Color to use for indication of low warning
Status Color: Normal	Color to use when ranged value is normal
Status Shape Transparency	Transparency of any status shapes (0-100) where 0=totally transparent and 100-0=totally opaque
EXPERT PROPERTIES	
Annunciator LED Pad	The number of pixels used as padding between the edge of the annunciator container and the status LED
Annunciator Alarm LED Radius	The radius (in pixels) of the alarm LED
Annunciator Quality Indicator Width	Width (in pixels) of the quality indicator border that surrounds an annunciator when quality is anything other than "good"

Annunciator Text Pad	The number of pixels used as padding between the edge of the annunciator container and the value/label text
Button Corner Radius	Radius (in pixels) of the button corners
Context Alarm Color: Active	Color to use for context alarm indication (flag) when anything in context is in alarm
Context Alarm Color: Inactive	Color to use for context alarm indication (flag) when nothing in context is in alarm
Override Active Flag Color	The color to use for filling the override flag when an override is active
Override Inactive Flag Color	The color to use for filling the override flag when an override is inactive; often blank (completely transparent)
Shape Color: Alarm Active	The color to use for filling alarm/status aware shapes when the alarm is active; typically translucent
Shape Color: Alarm Inactive	The color to use for filling alarm/status aware shapes when the alarm is active; typically translucent

More Information

Display and Presentation

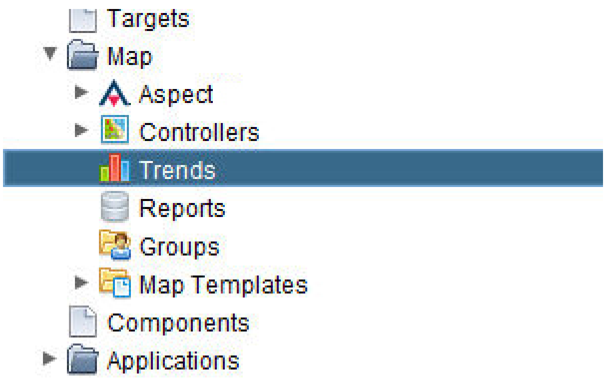
Alarming in the Map

The [Trends] Node

Working in the Trends Node - Overview

The Trends Node of the Map is used to provide a way to expose trend data separately from defined controllers within the HTML5 user interface. In this area, trends can be grouped and organized together in a manner that allows a technician or end-user to quickly navigate and display historical data from the system.

Trends performing using the Triggered Historical element can be exposed, as well as trends created and collected by the Controllers node when configured appropriately.



Each section of this help document will provide you with information on defining the necessary items for referencing Trend information.

More Information

[Adding a Trend Group]
[Adding and Configuring a Trend Group Entry]
[Duplicating a Trend Group Entry]

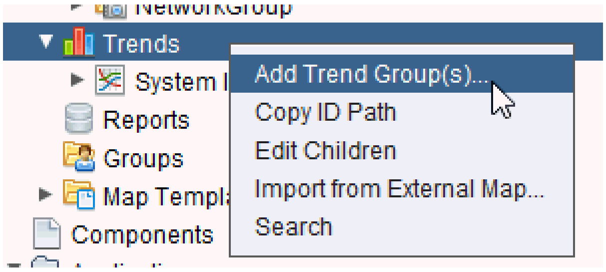
Working with Trend Groups

Adding a Trend Group

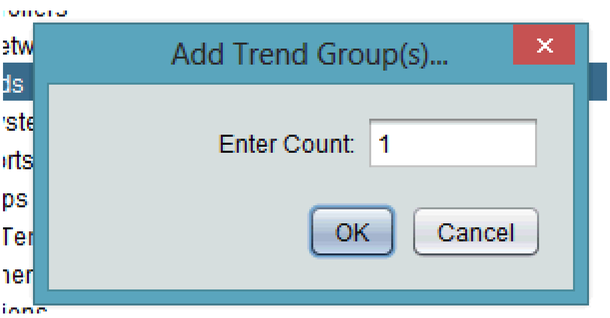
Trend Groups are used to organize various trend collections within the HTML5 user interface. A Trend Group can have one or more trends associated with it.

To add a Trend Group, perform the following steps:

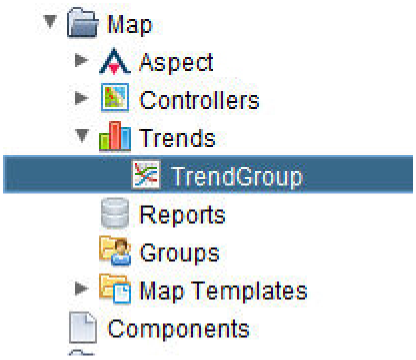
1. Right-click the Trends node and select Add Trend Group(s).



2. Define the number of Trend Groups you wish to create in the Add Trend Group(s) dialog box. Type an appropriate number into the text box. Click OK.

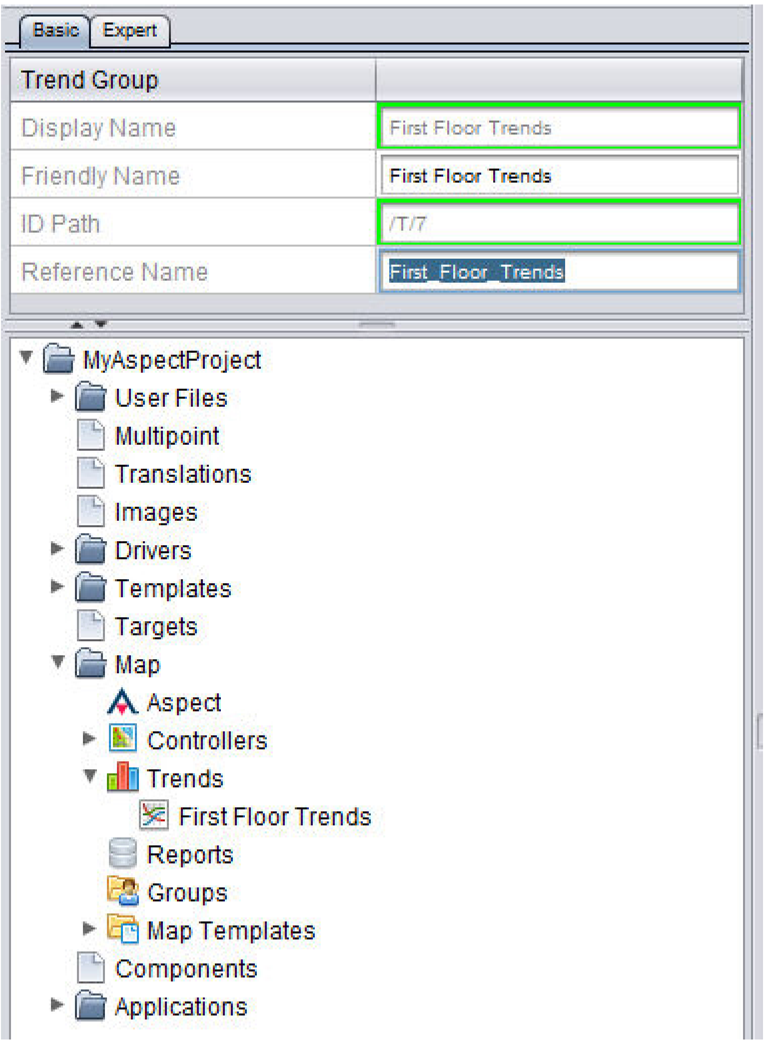


3. The number of Trend Groups you have requested will be processed and added underneath the Trends node. The progress bar in Aspect-Studio will provide indication as each trend group is inserted into the Trends container. Once added, you can assign a Reference Name and a Friendly Name to the Trend Group. This is performed using the Properties Pane.



4. The Friendly Name is a label displayed not only within the Map Topology tree, but will also be displayed within the HTML5 user interface. Friendly Names can display spaces and other characters that are

visible to the user. The ReferenceName is an internal name reference for use by technicians developing and maintaining an Aspect system. This should not contain any spaces or special characters. Finally, the Display Name will provide you with a read-only reference of the way the Trend Group will be displayed in the Tree as well as the HTML5 user interface for verification.



More Information

Working in the Trends Node - Overview

Adding and Configuring a Trend Group Entry

Duplicating a Trend Group Entry

Working with Trend Group Entries

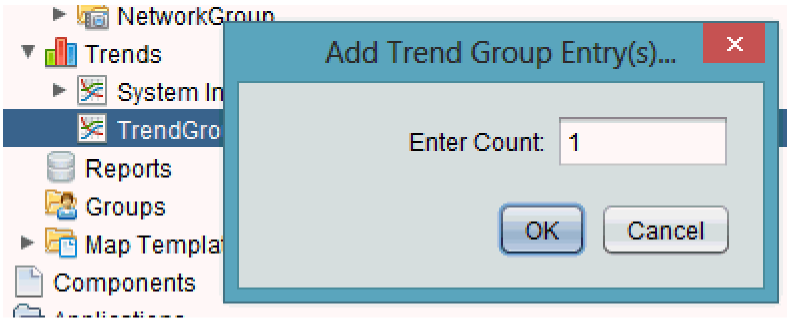
Adding and Configuring a Trend Group Entry

Trend Groups Entries are direct references to collected trends from the system. This can be a trend collected by the Controllers node of the Map Topology, or from a stand-alone Triggered Historical element.

To add a Trend Group Entry, perform the following steps:

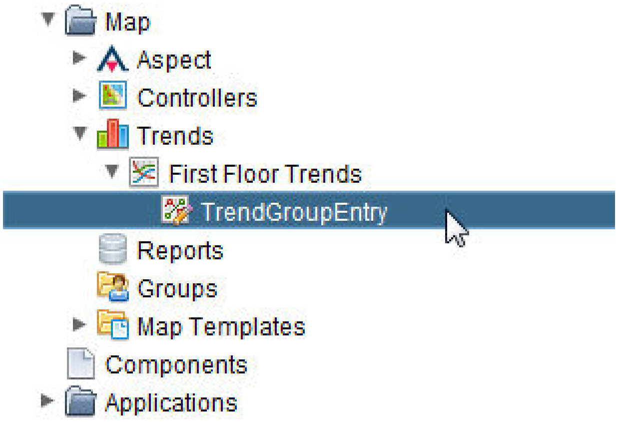
1. Right-click an added Trend Group, and select Add Trend Group Entry (s) .

2. Define the number of Trend Group Entries you wish to create in the Add Trend Group Entry(s) dialog box. Type an appropriate number into the text box. Click OK.

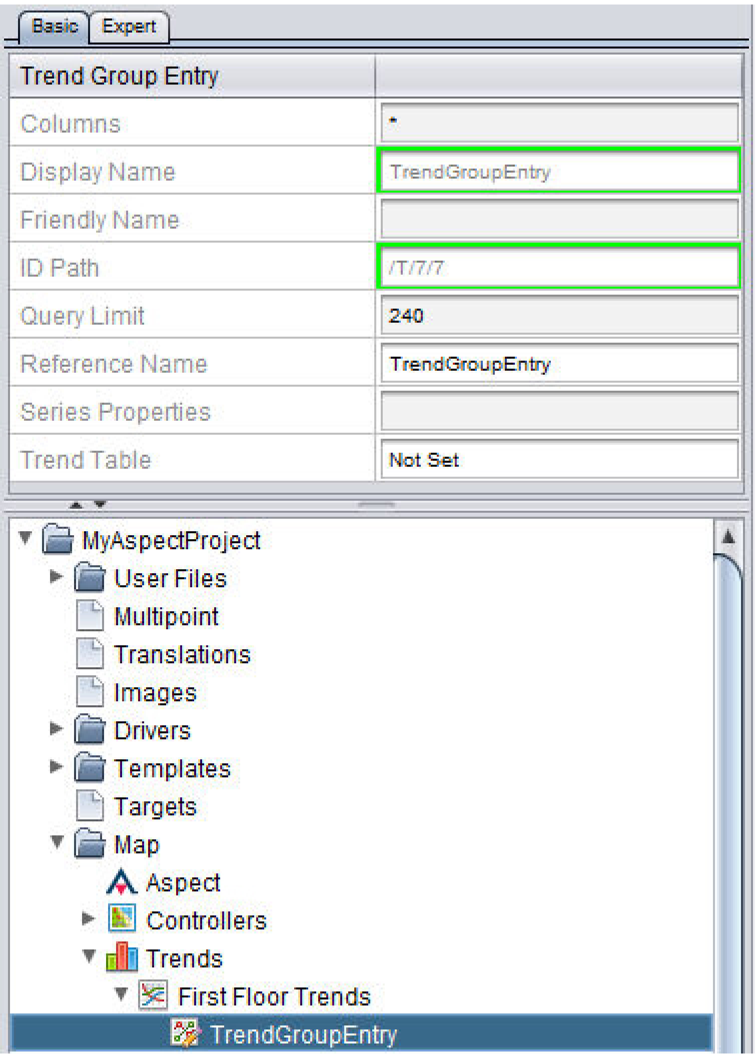


3. The number of Trend Groups you have requested will be processed and added underneath the Trends node. The progress bar in Aspect-Studio will provide indication as each group is inserted into the trend container. A generic TrendGroupEntry listing will be added

directly below your Trends node. Once added, you can assign a Reference Name and a Friendly Name to the Trend Group. This is performed using the Properties Pane.



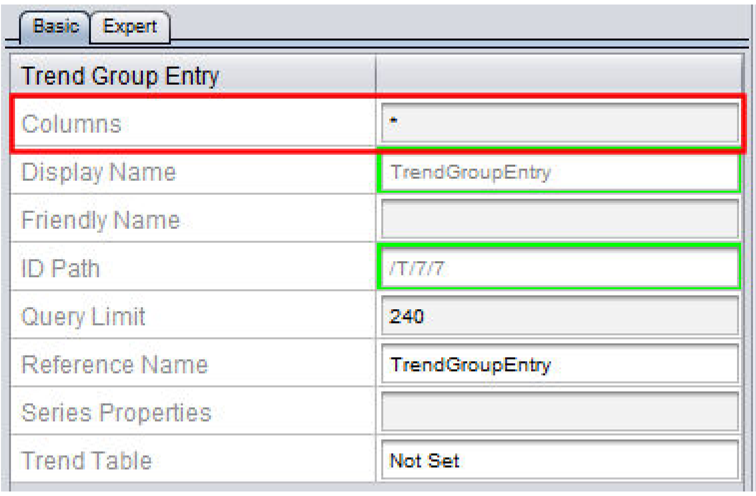
4. The Friendly Name is a label displayed not only within the Map Topology tree, but will also be displayed within the HTML5 user interface. Friendly Names can display spaces and other characters that are visible to the user. The ReferenceName is an internal name reference for use by technicians developing and maintaining an Aspect system. This should not contain any spaces or special characters. Finally, the Display Name will provide you with a read-only reference of the way the Trend Group Entry will be displayed in the Tree as well as the HTML5 user interface for verification.



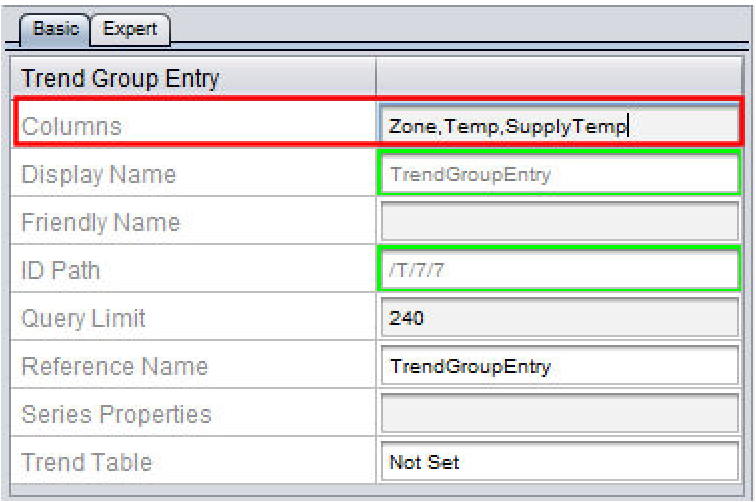
There are specific properties that are essential for referencing a Trend from the system. These properties are as followed:

Configuring the Columns Property

The Columns property defines which columns (points) from the Trend record are retrieved for presentation. By default, an asterisk (*) is configured for this property. This default configuration will retrieve all columns (points) from the trend record.

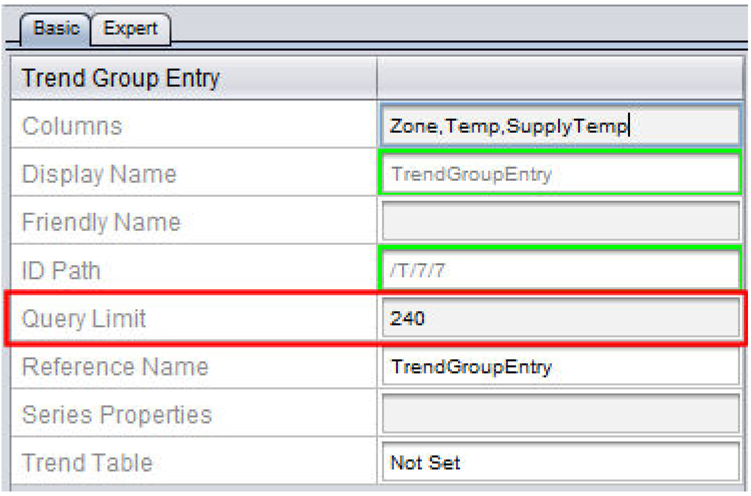


Should your presentation requirements warrant only showing specific point data from a trend record, you may specify the columns (points) from the Trend in a comma delimited manner. For example, if a Trend has ZoneTemp, SupplyTemp, OutsideAir, Fan, and Cool as points that are collected and you wish to only present a few of the listed columns (such as ZoneTemp and SupplyTemp, the configuration for this property would reflect the following:



Configuring the Query Limit

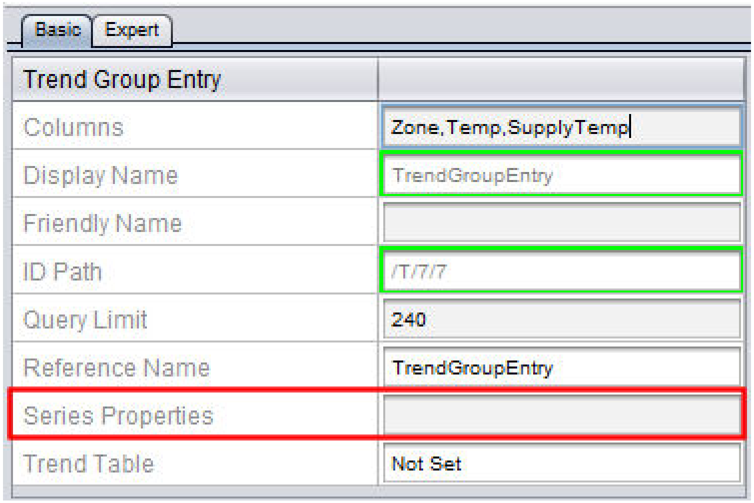
The Query Limit defines the maximum amount of records that will be retrieved and presented to the user. By default, the Query Limit is set for 240 records for each defined column (e.g. trends sampling at 1 minute intervals = 4 hours of trend information).



This value can be adjusted to a higher limit if desired. However, please note that higher configuration limits for this property can result in delays in retrieving the data and presenting it to the HTML5 users. Therefore, please use good judgment relative to how much data may be presented in HTML5 versus the Java-based rich graphical user interface.

Configuring the Series Properties

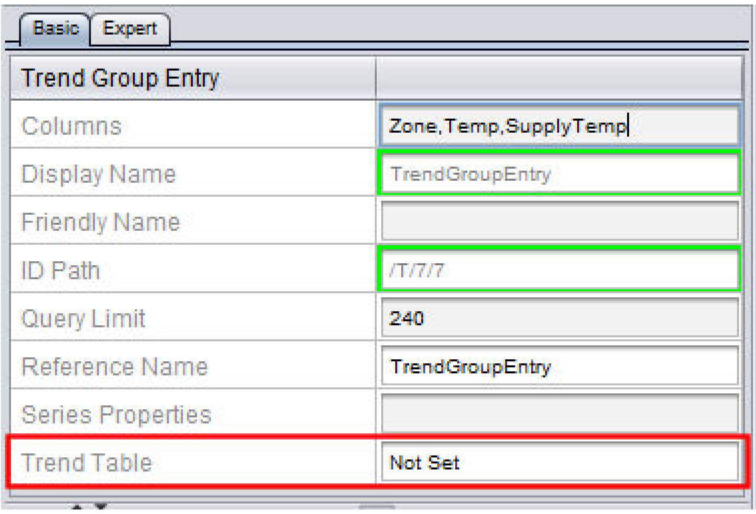
The Series Properties defines the information regarding the step size and limits of how trend data is presented. By default, no configuration data is set for this property. When so, the HTML5 user interface and the browser being utilized to view the data will do its best to format and present the data based on the screen resolution of the device being used (e.g. a 7-inch tablet, a 22-inch wide screen monitor, etc.).



If desired, specific elements can be overridden if need be for fine tuning purposes.

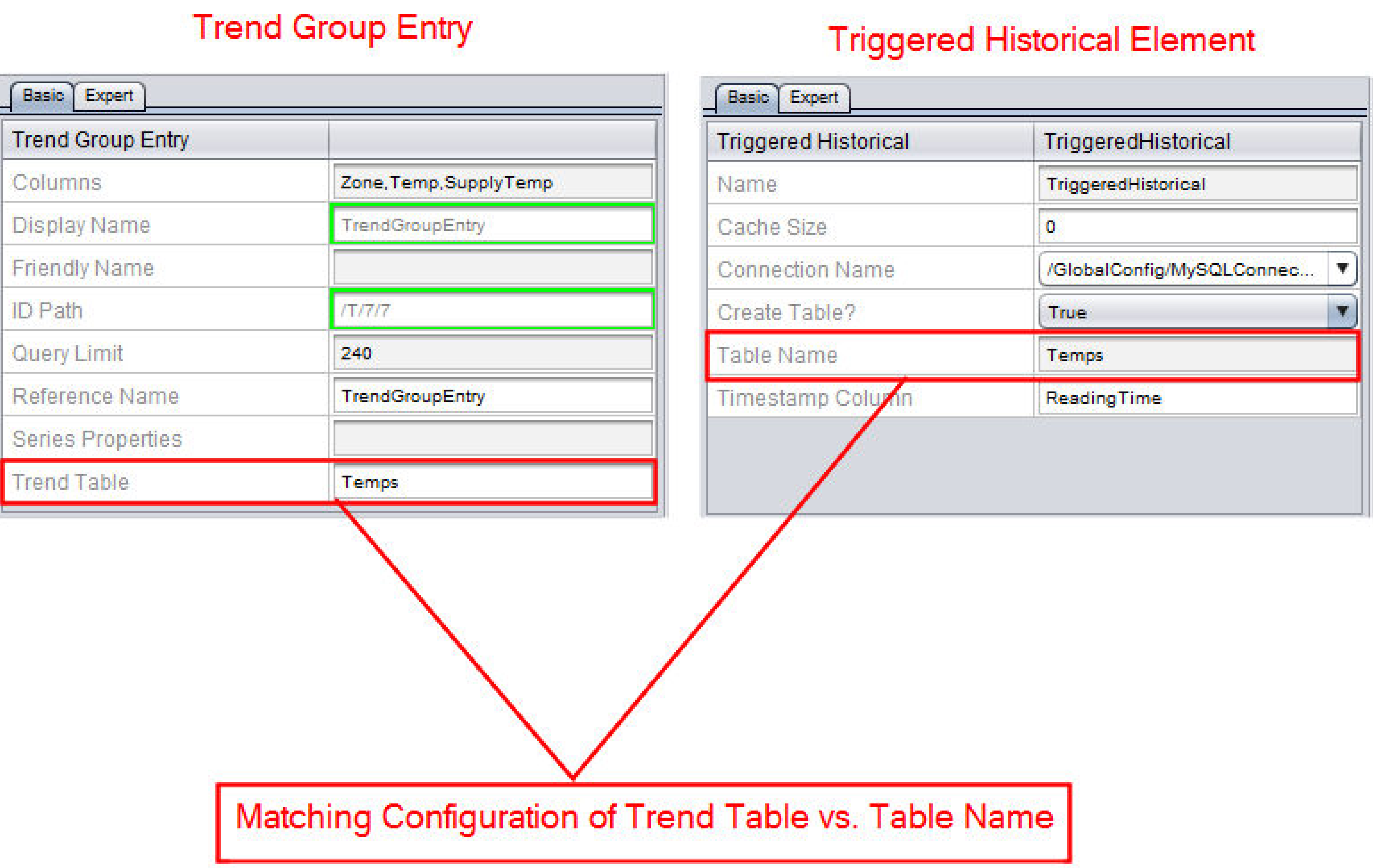
Configuring the Trend Table Reference

The Trend Table defines the actual trend that will be referenced and pulled from a connected database.



Trend Group Entries Referencing Triggered Historical Trends

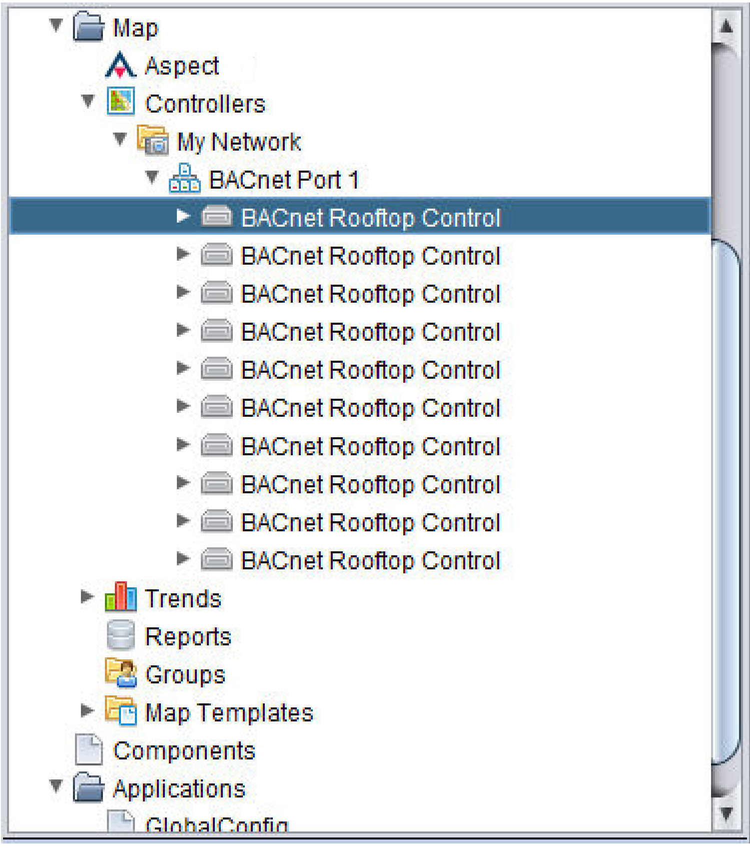
If your Trend Group Entry will reference a trend history being collected by the Triggered Historical element, set the Trend Table property to the value of the Table Name property of the Triggered Historical element.



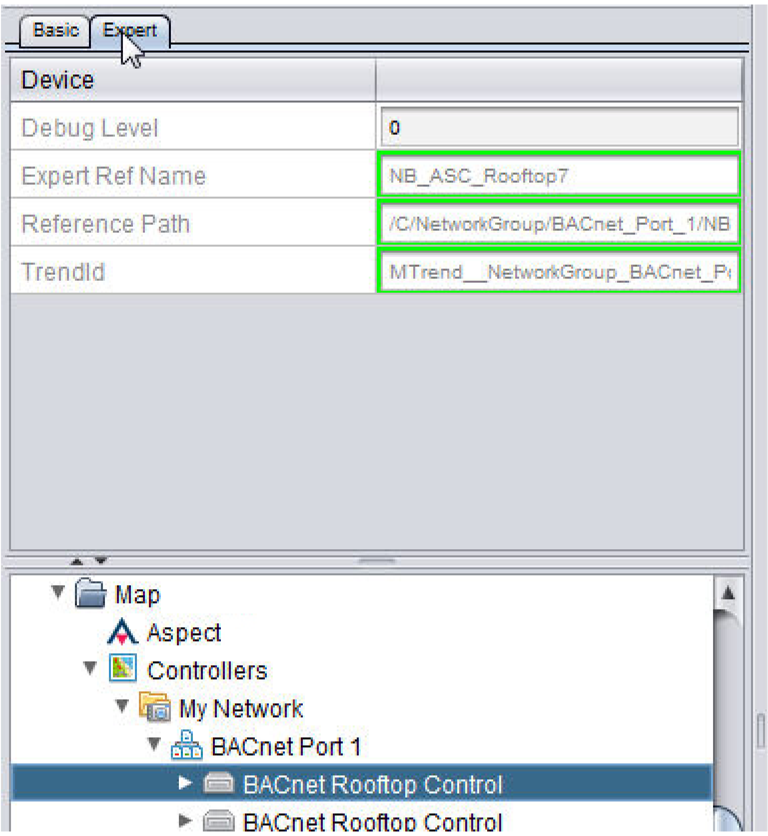
Trend Group Entries Referencing Map Topology Generated Trends

If you Trend Group Entry will reference a trend history being collected defined devices in the Map Topology, the name of the Trend Table can be found by performing the following steps:

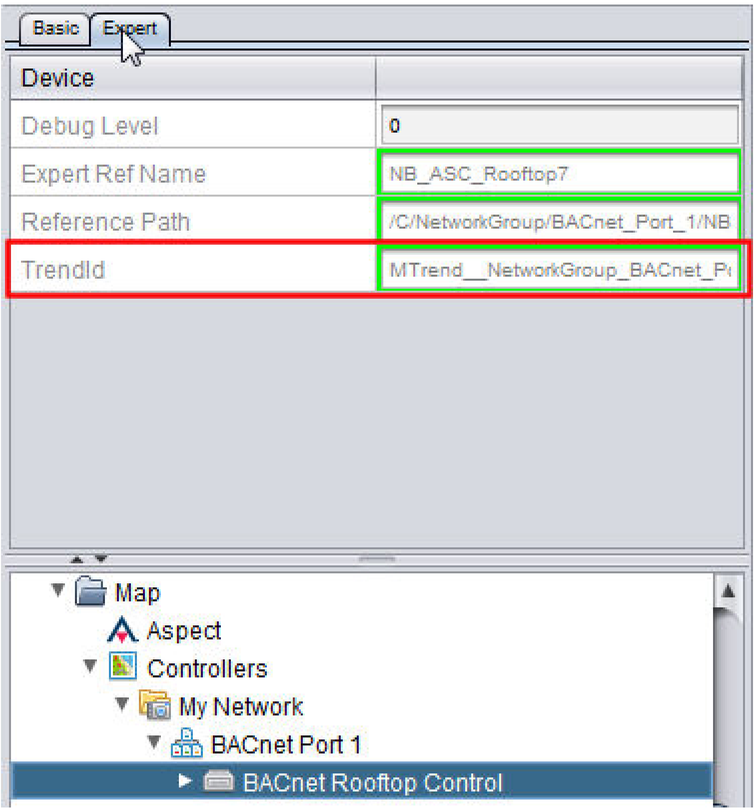
1. Click to select a configured device from your Tree.



2. With the device selected, go to the Properties Pane and click the Expert Tab.

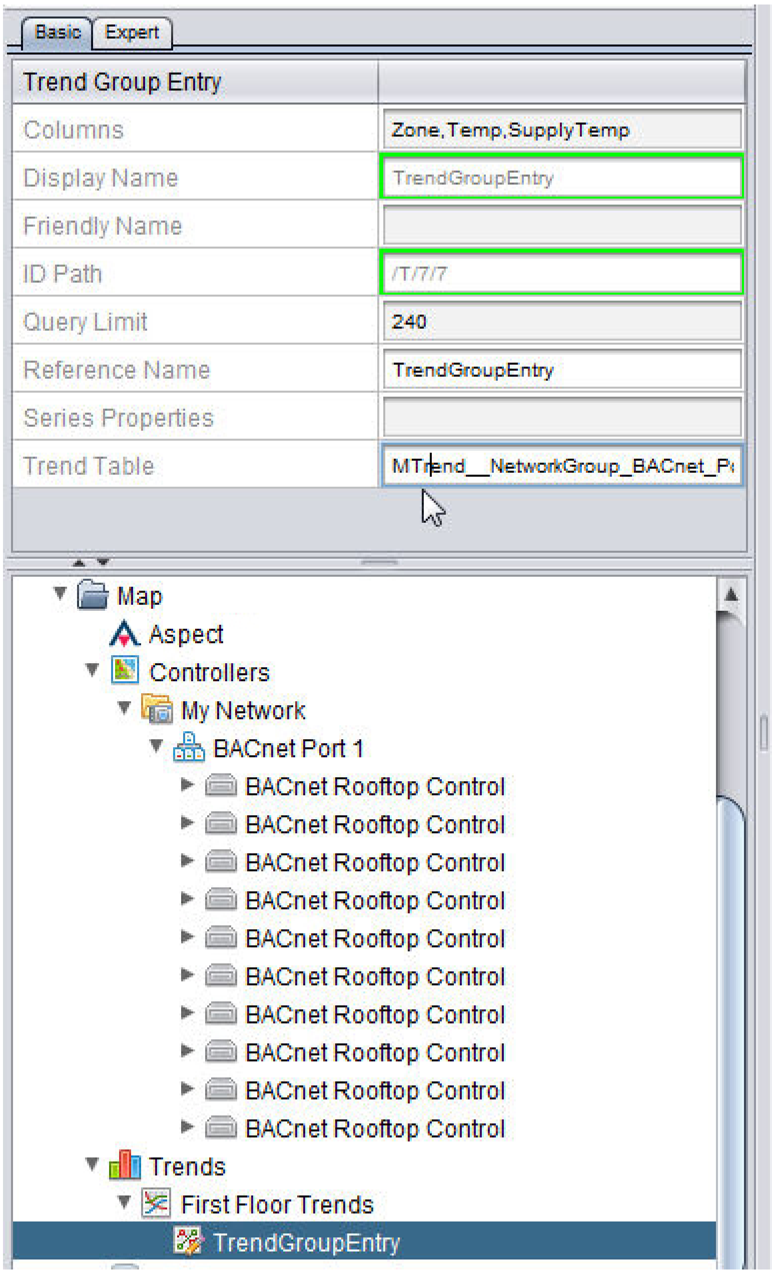


3. Locate the TrendId property. This property contains the name of the Trend record.



4. Using your keyboard, swipe to highlight all information contained within this property. When clicking the property for the first time, information should be automatically highlighted for you. When highlighted, type CTRL+C on your keyboard to copy this information.

5. Click on the Trend Group Entry you are programming. Ensure you are on the Basic Tab for the Trend Group Entry. Click the Table Name property. With the active cursor in the Trend Table property, type CTRL+V on your keyboard to paste this information.



More Information

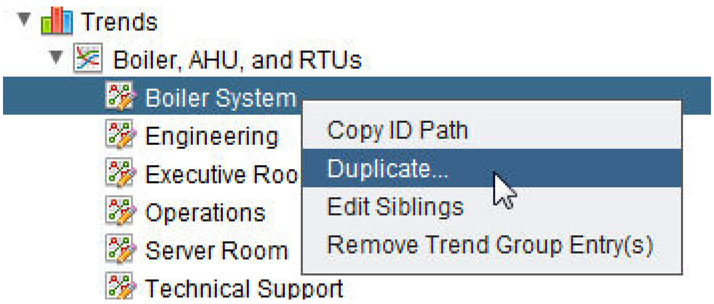
[Working in the Trends Node - Overview]()

[Duplicating a Trend Group Entry]()

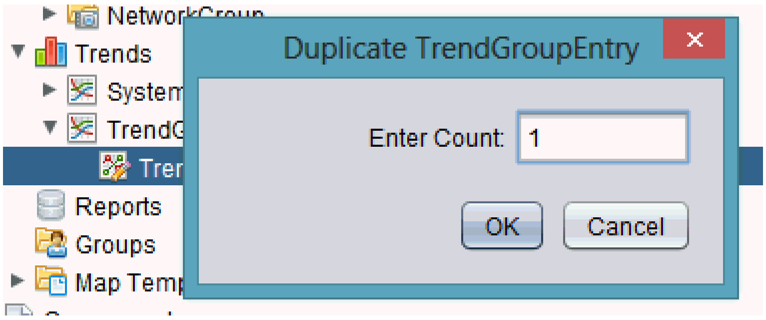
Duplicating a Trend Group Entry

Once you have created a Trend Group Entry, you can easily duplicate the entry. To duplicate a Trend, its configuration, and contents, perform the following steps:

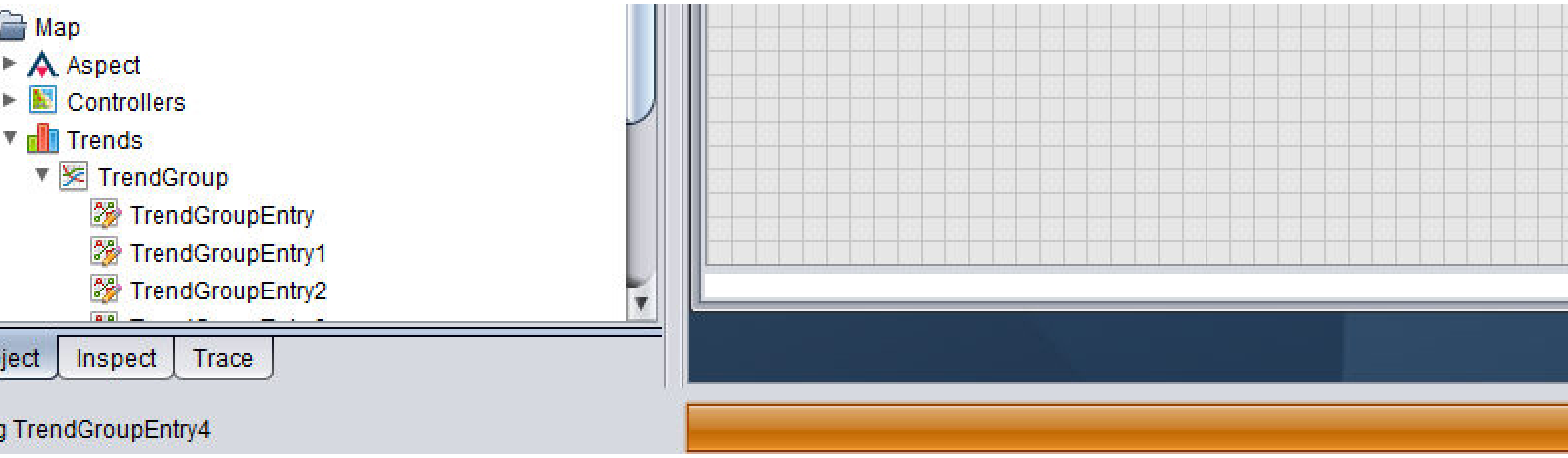
1. Right-click on the Trend Group Entry and select Duplicate from the short-cut menu.



2. You will be prompted to enter the number of duplicates you wish to create. Enter the desired number. Click OK.



3. The number of duplicate trend group entries you have requested will be generated within the trend group container. The progress bar in Aspect-Studio will provide indication as each trend groupentry is inserted into the trend group container.



More Information

[Working in the Trends Node - Overview](#)

[Adding a Trend Group](#)

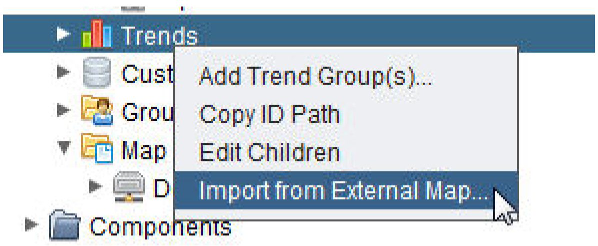
[Adding and Configuring a Trend Group Entry](#)

Importing Trend Groups from Other Projects

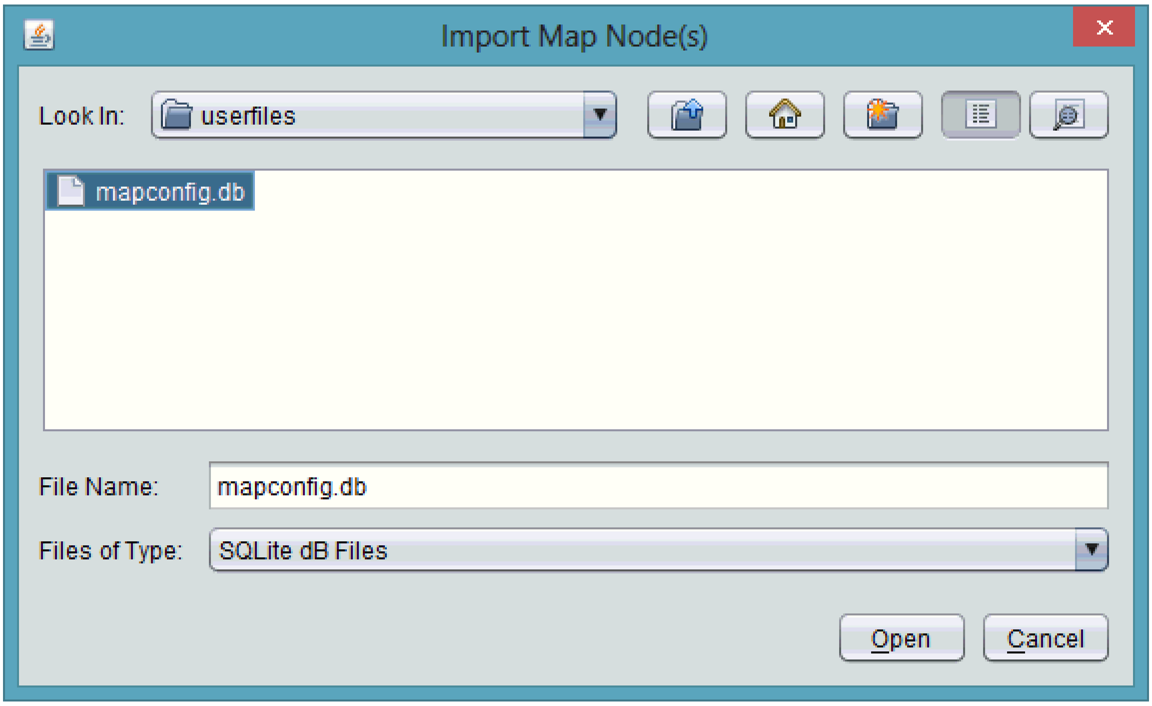
In some cases, it may be useful to import Trend Groups from other projects you may have previously configured.

To import Trend Groups from other projects, perform the following steps:

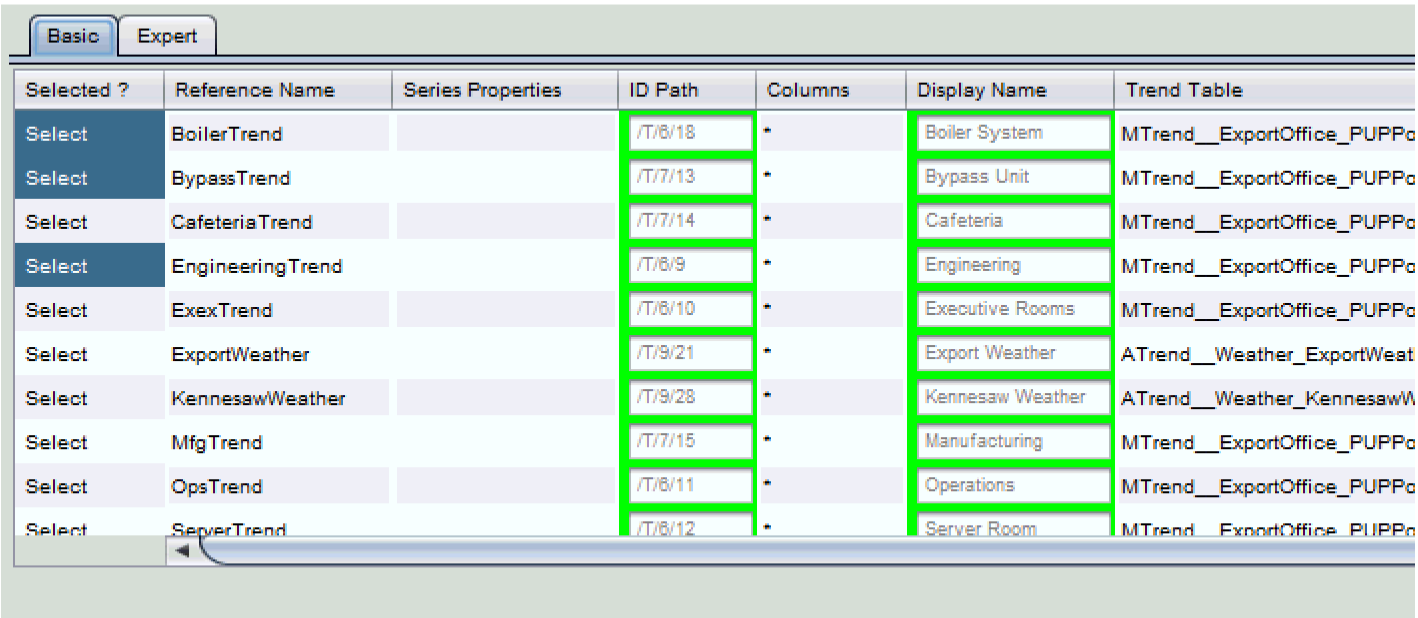
1. Right-click on Trends and select Import from External Map from the shortcut menu.



2. Navigate the file directory of your computer and find the Aspect-Studio project you wish to import from. Once located, access the project folder and go into the userfiles directory. Select the mapconfig.db file and click Open.



3. The Import Dialog will appear with a listing of all Trend Groups available from the referenced project. Select the Trend Groups you wish to import by clicking on the Select column field associated with each Report. To select multiple Trend Groups, hold CTRL on your keyboard while performing a single left-click on each row. When complete, click OK.


Basic | Expert

Selected ?	Reference Name	Series Properties	ID Path	Columns	Display Name	Trend Table
Select	BoilerTrend		/T/6/18	*	Boiler System	MTrend__ExportOffice_PUPPo
Select	BypassTrend		/T/7/13	*	Bypass Unit	MTrend__ExportOffice_PUPPo
Select	CafeteriaTrend		/T/7/14	*	Cafeteria	MTrend__ExportOffice_PUPPo
Select	EngineeringTrend		/T/6/9	*	Engineering	MTrend__ExportOffice_PUPPo
Select	ExexTrend		/T/6/10	*	Executive Rooms	MTrend__ExportOffice_PUPPo
Select	ExportWeather		/T/9/21	*	Export Weather	ATrend__Weather_ExportWeat
Select	KennesawWeather		/T/9/28	*	Kennesaw Weather	ATrend__Weather_KennesawW
Select	MfgTrend		/T/7/15	*	Manufacturing	MTrend__ExportOffice_PUPPo
Select	OpsTrend		/T/6/11	*	Operations	MTrend__ExportOffice_PUPPo
Select	ServerTrend		/T/6/12	*	Server Room	MTrend__ExportOffice_PUPPo

The [Reports] Node

Working in the Reports Node - Overview

The Reports Node of the Map is used to provide a way to display SQL information separately from defined controllers within the HTML5 user interface. In this area, reports can be grouped and organized together in a manner that allows a technician or end-user to quickly navigate and display custom report data from the system.

Reports can be used to display any information that is located in the SQL database when configured appropriately.

Each section of this help document will provide you with information on defining the necessary items for creating Reports.

More Information

[Adding a Report]

[Duplicating a Report]

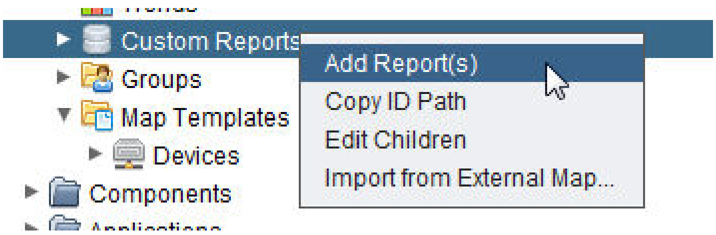
Working with Reports

Adding a Report

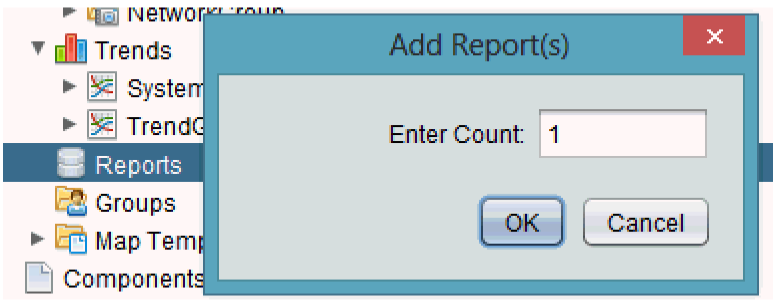
Reports are user-configured SQL Queries that are displayed in table format in the HTML5 user interface.

To add a Report, perform the following steps:

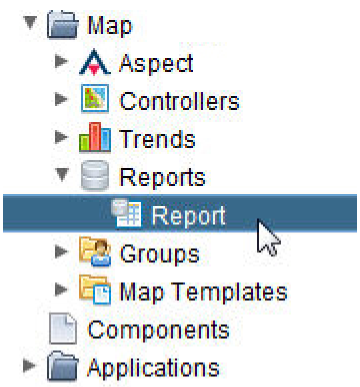
1. Right-click the Reports node, and select Add Report(s) .



2. Define the number of Reports you wish to create in the Add Report (s) dialog box. Type an appropriate number into the text box. Click OK.

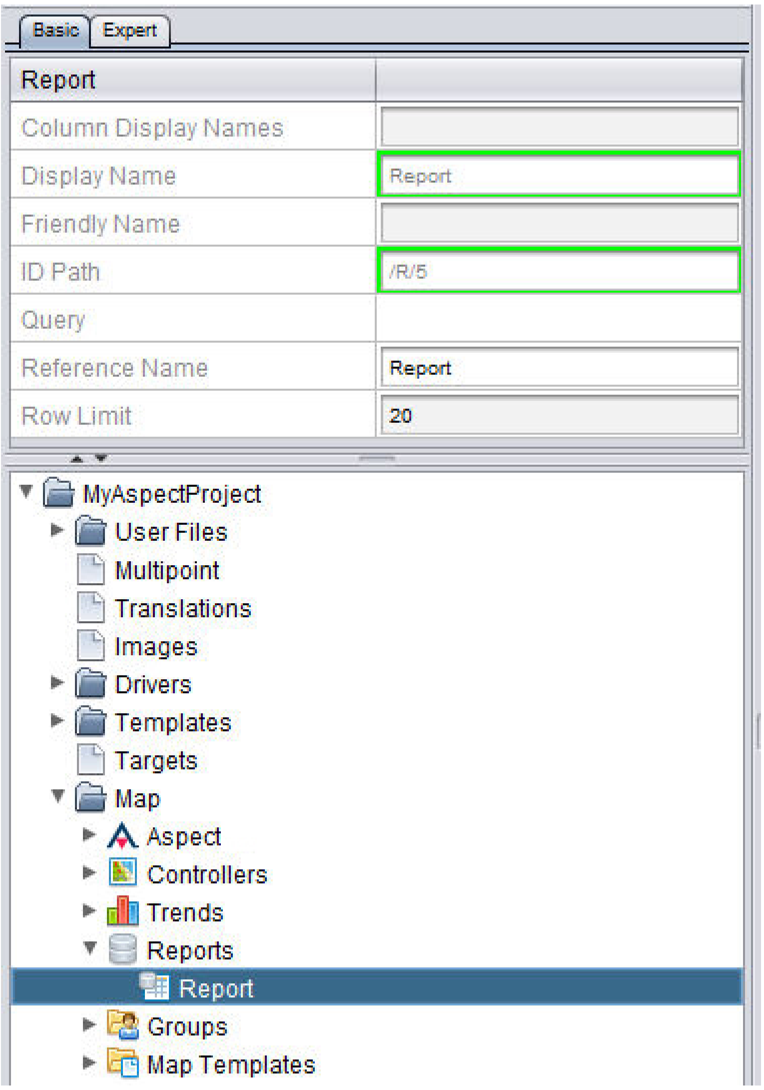


3. The number of Reports you have requested will be processed and added underneath the Reports node. The progress bar in Aspect-Studio will provide indication as each report is inserted into the reports container. A generic Report listing will be added directly below your Reports node. Once added, you can assign a Reference Name and a Friendly Name to the Report. This is performed using the Properties Pane.



3. The Friendly Name is a label displayed not only within the Map Topology tree, but will also be displayed within the HTML5 user interface. Friendly Names can display spaces and other characters that are

visible to the user. The ReferenceName is an internal name reference for use by technicians developing and maintaining an Aspect system. This should not contain any spaces or special characters. Finally, the Display Name will provide you with a read-only reference of the way the report will be displayed in the Tree as well as the HTML5 user interface for verification.

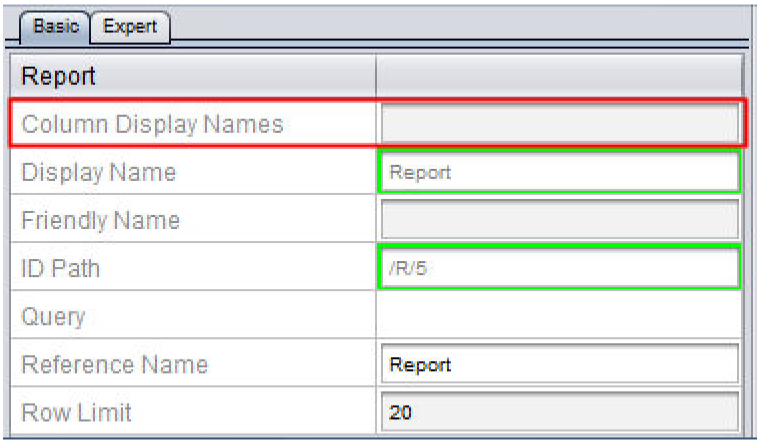


There are specific properties that are essential for configuring a Report from the system. These properties are as followed:

Configuring the Column Display Names

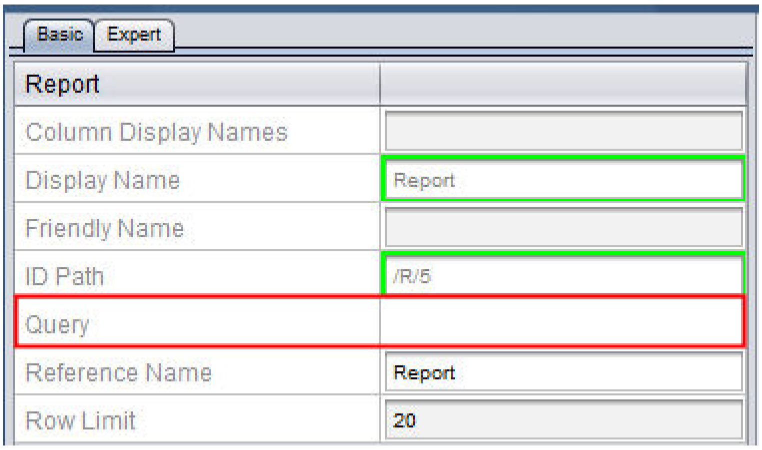
The Column Display Names property allows you to define the names of the Header Row of the Report table.

This comma-separated list of Header row names can be different than the actual names of the columns. If blank, the names of the columns will come directly from the databases that are used.

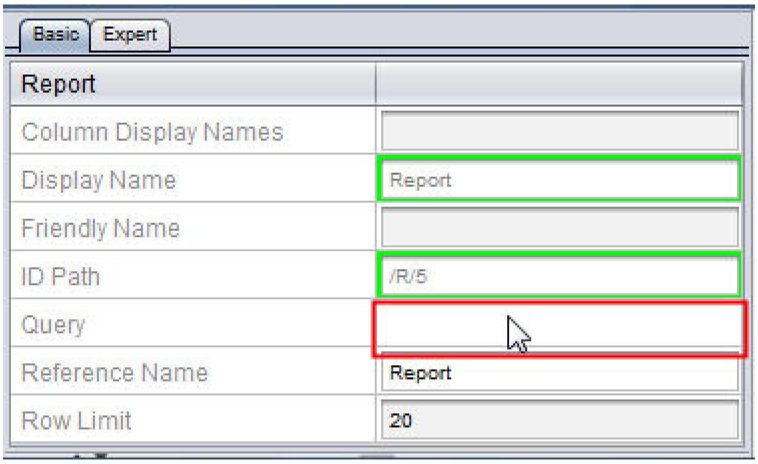


Configuring the Query Property

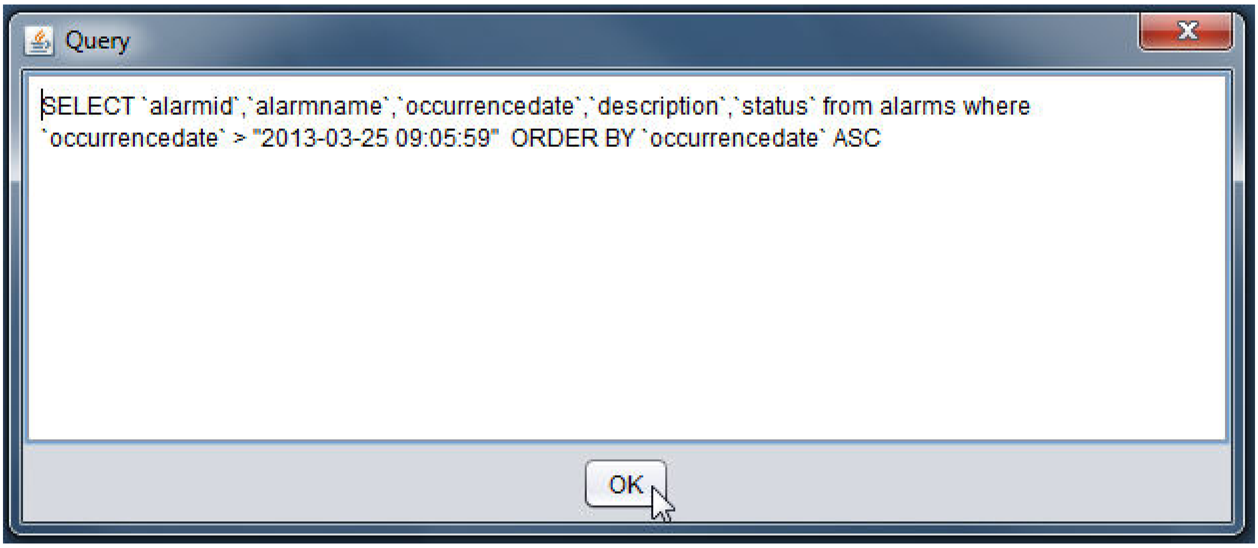
The Query property defines the SQL Query to be executed on the SQL Database.



Double click the Query box to enter a SQL Query.

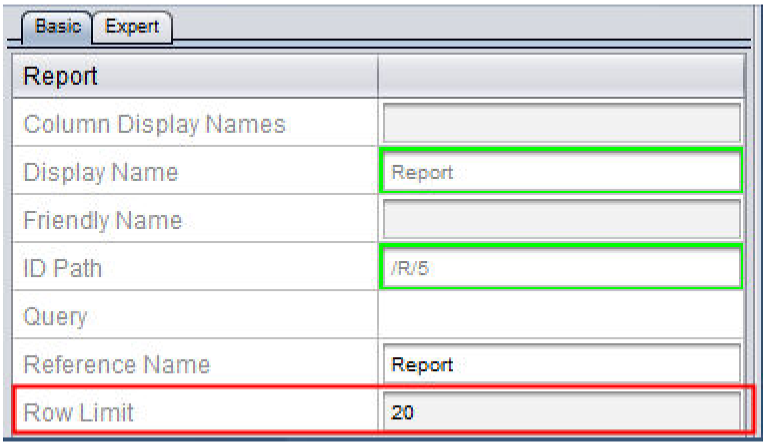


Enter a SQL Query and press OK.



Configuring the Row Limit

The Row Limit defines the maximum amount of records that will be retrieved and presented to the user per page in the HTML5 user interface. By default, the Row Limit is set for 20 records per page.



This value can be adjusted to a higher limit if desired. However, please note that higher configuration limits for this property can result in delays in retrieving the data and presenting it to the HTML5 users. Therefore, please use good judgment relative to how much data may be presented in HTML5 versus the Java-based rich graphical user interface.

More Information

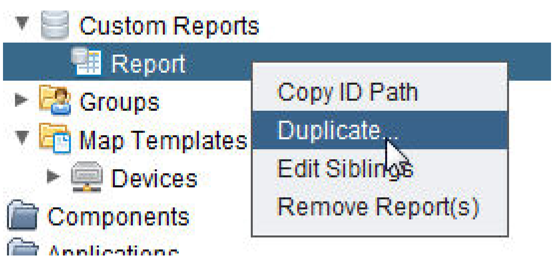
Working in the Reports Node - Overview

Duplicating a Report

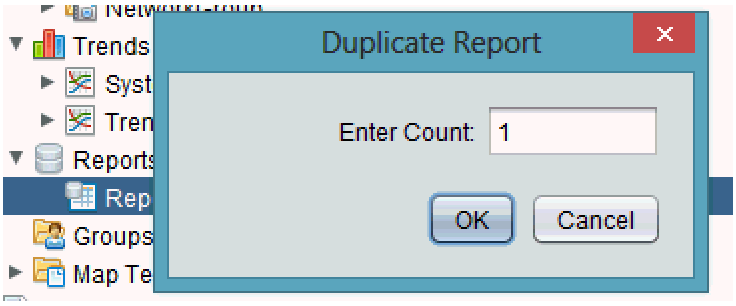
Duplicating a Report

Once you have created a Report,you can easily duplicate the report. To duplicate a Report, its configuration, and query, perform the following steps:

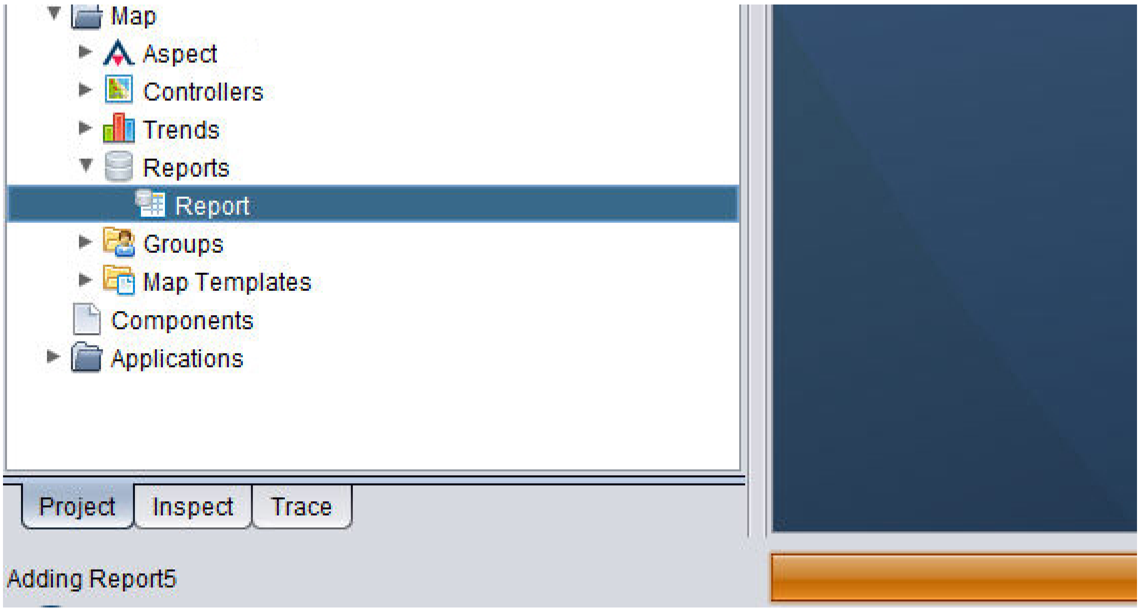
1. Right-click your defined Report and select Duplicate from the short-cut menu.



2. You will be prompted to enter the number of duplicates you wish to create. Enter the desired number. Click OK.



3. The number of duplicate Reports you have requested will be generated within the reports container. The progress bar in Aspect-Studio will provide indication as each point is inserted into the network container.



More Information

[Working in the Reports Node - Overview](#)

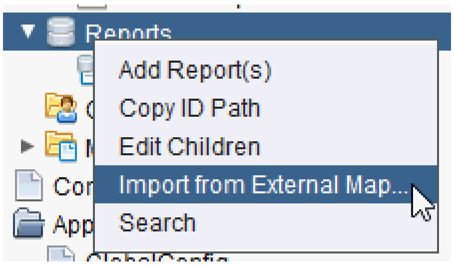
[Adding a Report](#)

Importing Reports from Other Projects

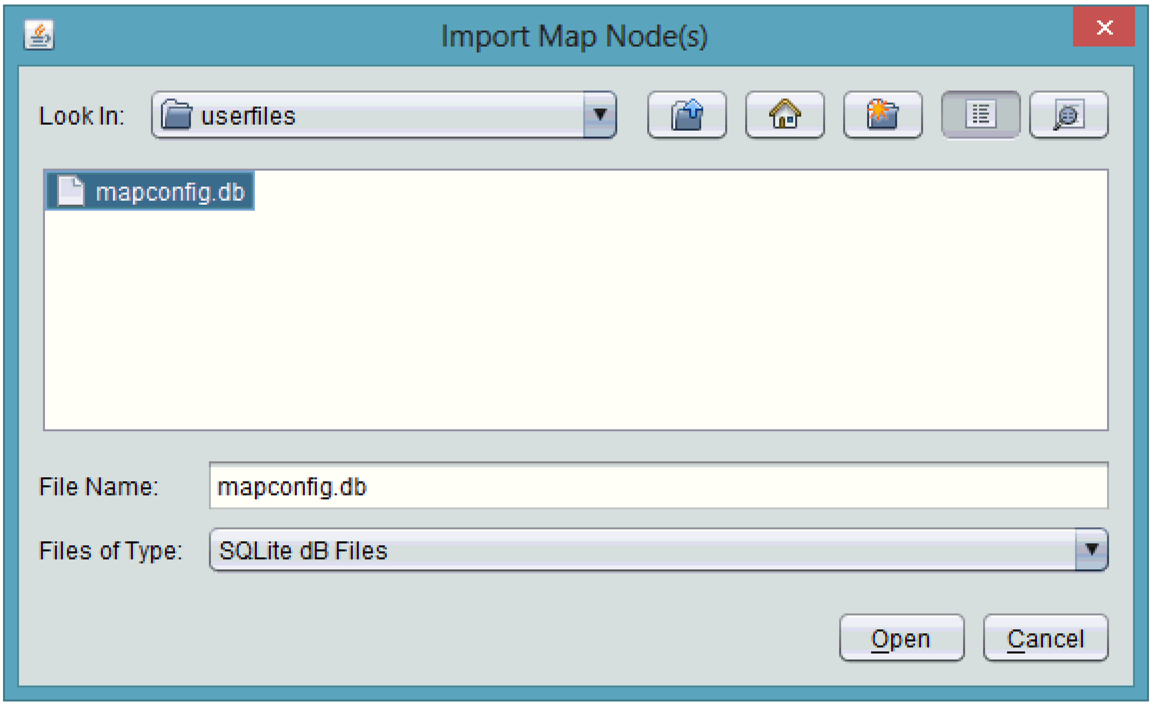
In some cases, it may be useful to import Reports from other projects you may have previously configured.

To import Reports from other projects, perform the following steps:

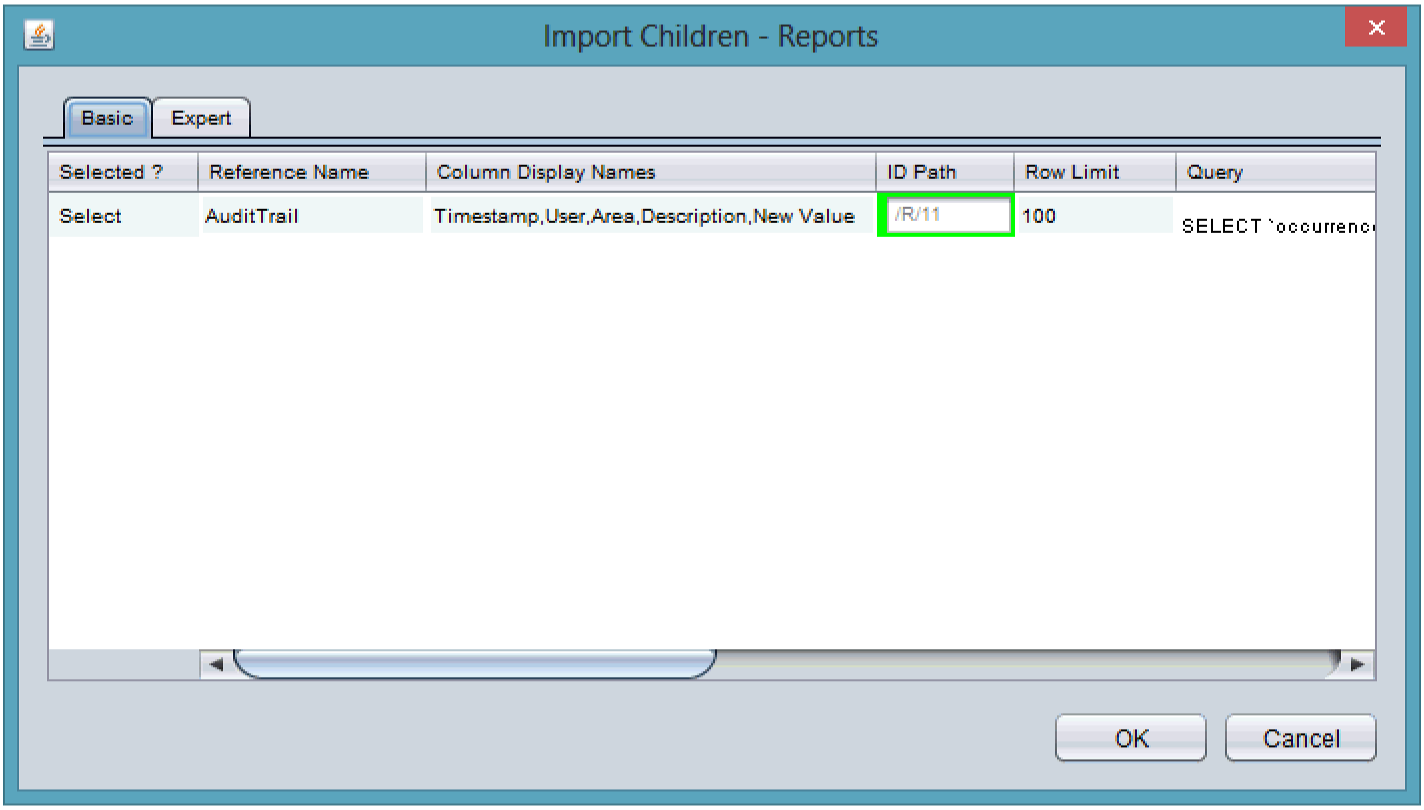
1. Right-click on Reports and select Import from External Map from the shortcut menu.



2. Navigate the file directory of your computer and find the Aspect-Studio project you wish to import from. Once located, access the project folder and go into the userfiles directory. Select the mapconfig.db file and click Open.



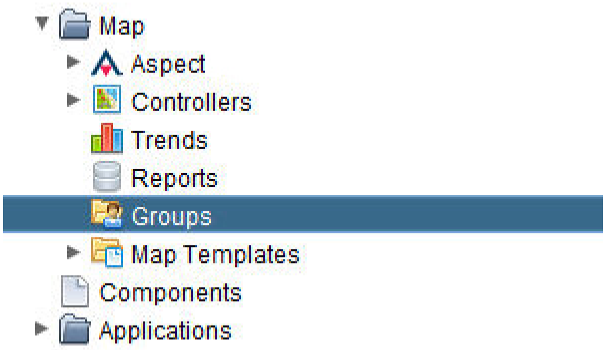
3. The Import Dialog will appear with a listing of all Reports available from the referenced project. Select the Reports you wish to import by clicking on the Select column field associated with each Report. To select multiple Reports, hold CTRL on your keyboard while performing a single left-click on each row. When complete, click OK.



The [Groups] Node

Working in the Groups Node - Overview

The Groups Node of the Map is used to provide a way of organizing links to devices separately from the defined controllers within the HTML5 user interface. In this area, linked devices can be grouped and organized together in a manner that allows a technician or end-user to quickly navigate and display historical data from the system.



Each section of this help document will provide you with information on defining the necessary items for creating Groups and Group Entries.

More Information

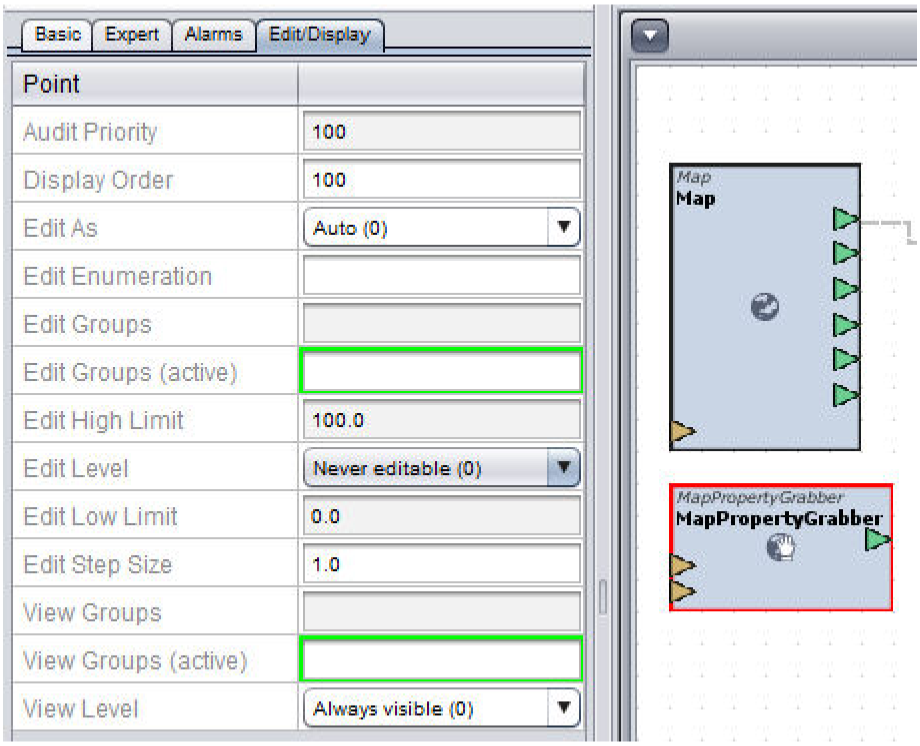
[Adding a Group Folder](#)

[Adding a Group Folder Entry](#)

[Linking a Group Entry to a Map Entry](#)

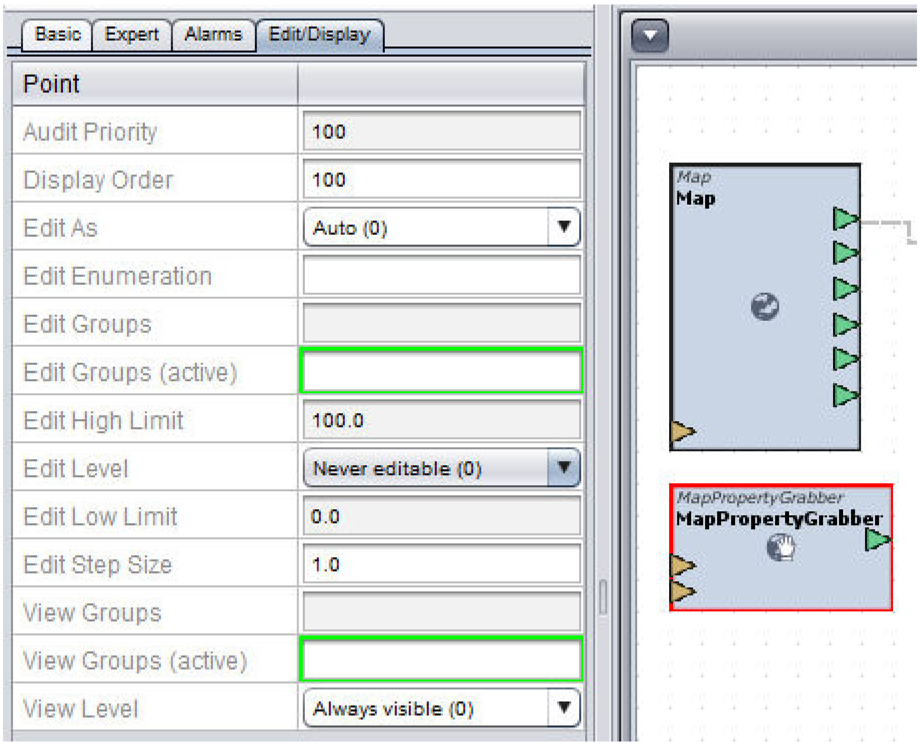
Display Order of Points

Users may now order the points for the HTML5 UI by manipulating the Display Order property on the Edit/Display Tab. The lower the value the closer the point will be showed to the top of the user interface. When multiple points share the same value then they will be displayed alphabetically with other points sharing the same Display Order. This property affects not only points in the Controller node but points in other nodes.

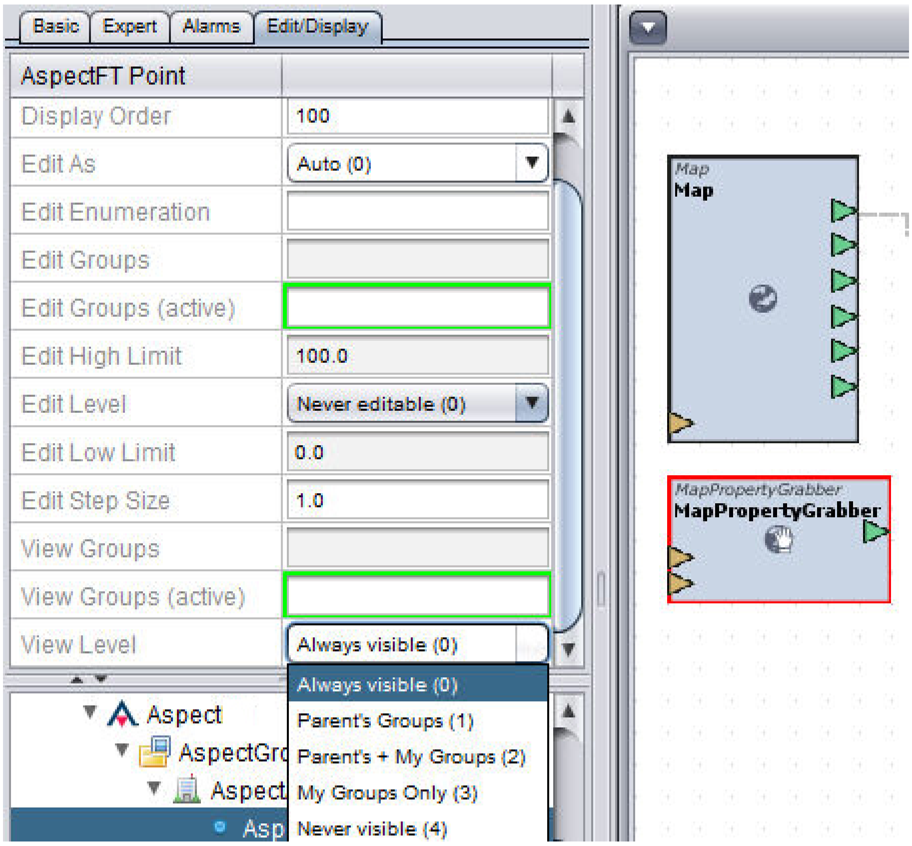


Node Based User Permissions

Not only can you determine the order in which points are displayed but you can also make it so certain users can view or edit certain points within the system. By manipulating the view groups property you can make it so only certain groups have access to view the point.



You must also manipulate the View level property. This will allow you to set it to Always visible, parents groups, Parents + My Groups, or never visible.



Working with Group Folders

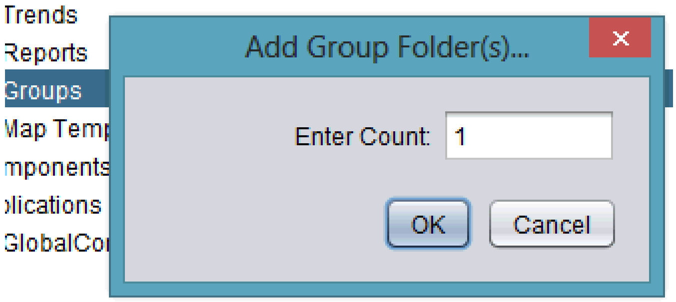
Adding a Group Folder

Group Folders are used to organize various group folders and group entries within the HTML5 user interface. A Group Folder can have one or more Group Folders and Group Entries associated with it.

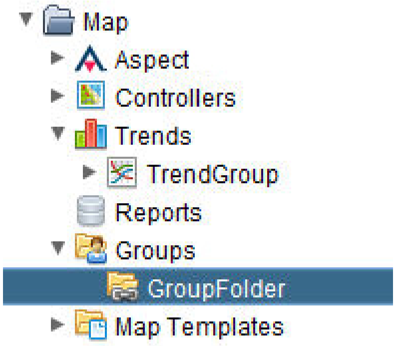
To add a Group Folder, perform the following steps:

1. Right-click the Groups node and select Add Group Folder(s).

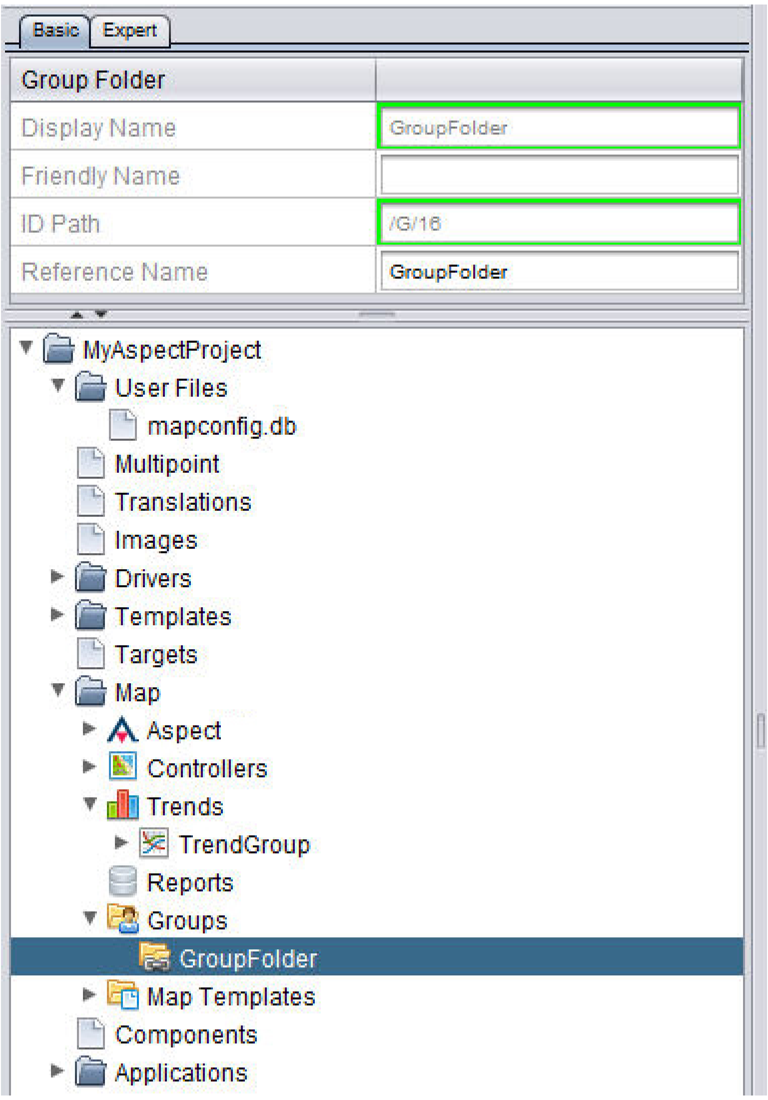
2. Define the number of Group Folders you wish to create in the Add Group Folder(s) dialog box. Type an appropriate number into the text box. Click OK.



3. The number of Group Folders you have requested will be processed and added underneath the Groups node. The progress bar in Aspect-Studio will provide indication as each group folder is inserted into the Groups container. Once added, you can assign a Reference Name and a Friendly Name to the Trend Group. This is performed using the Properties Pane.



4. The Friendly Name is a label displayed not only within the Map Topology tree, but will also be displayed within the HTML5 user interface. Friendly Names can display spaces and other characters that are visible to the user. The ReferenceName is an internal name reference for use by technicians developing and maintaining an Aspect system. This should not contain any spaces or special characters. Finally, the Display Name will provide you with a read-only reference of the way the Group Folder will be displayed in the Tree as well as the HTML5 user interface for verification.



More Information

Working in the Groups Node - Overview

Adding a Group Entry

Linking a Group Entry to a Map Entry

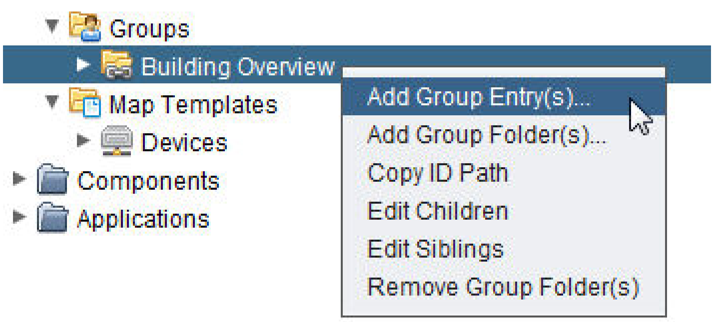
Working with Group Entries

Adding a Group Entry

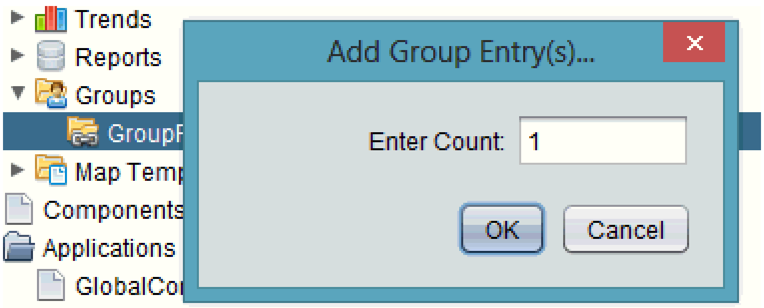
Group Entries are used to organize device collections within the HTML5 user interface. A Group Entry can have one or more devices associated with it.

To add a Group Entry, perform the following steps:

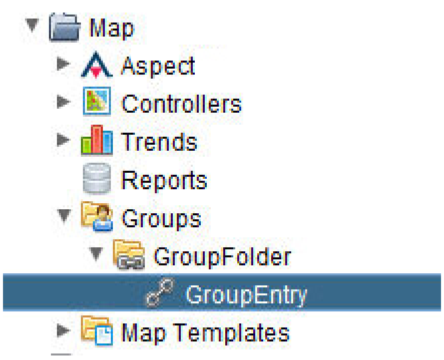
1. Right-click the Group Folder and select Add Group Entry(s).



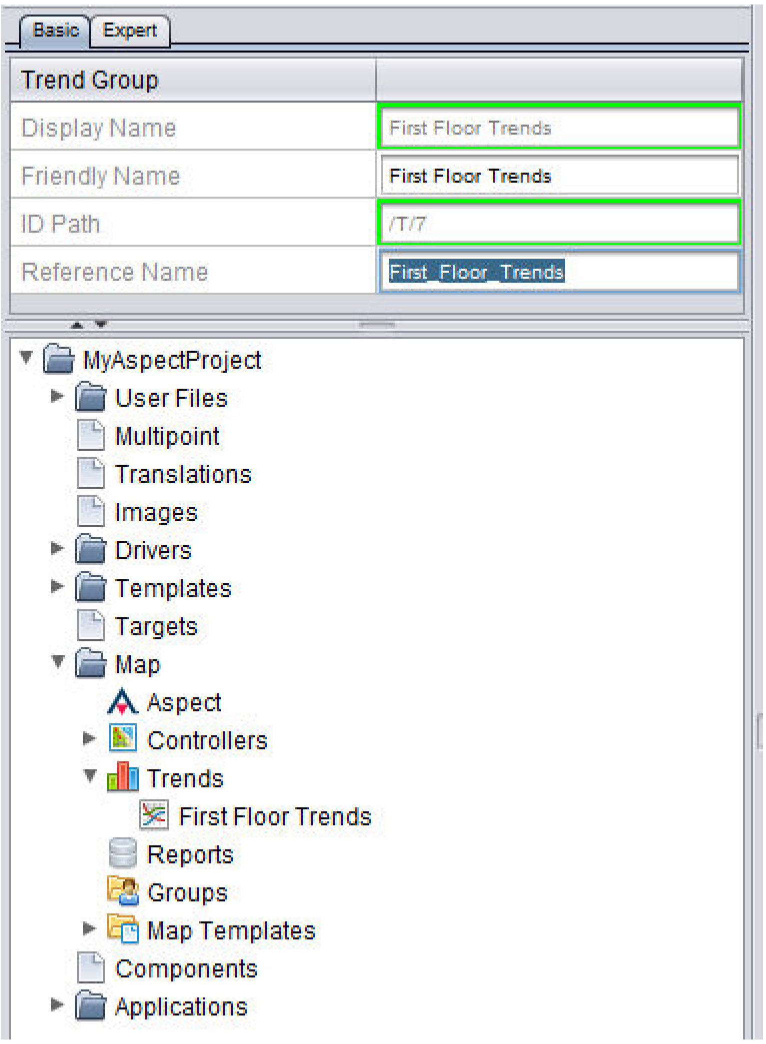
2. Define the number of Group Entries you wish to create in the Add Group Entry(s) dialog box. Type an appropriate number into the text box. Click OK.



3. The number of Group Entries you have requested will be processed and added underneath the Group Folder node. The progress bar in Aspect-Studio will provide indication as each group entry is inserted into the Group Folder container. Once added, you can assign a Reference Name and a Friendly Name to the Group Entry. This is performed using the Properties Pane.



4. The Friendly Name is a label displayed not only within the Map Topology tree, but will also be displayed within the HTML5 user interface. Friendly Names can display spaces and other characters that are visible to the user. The ReferenceName is an internal name reference for use by technicians developing and maintaining an Aspect system. This should not contain any spaces or special characters. Finally, the Display Name will provide you with a read-only reference of the way the group entry will be displayed in the Tree as well as the HTML5 user interface for verification.



More Information

[Working in the Groups Node - Overview]

[Adding a Group Folder]

[Linking a Group Entry to a Map Entry]

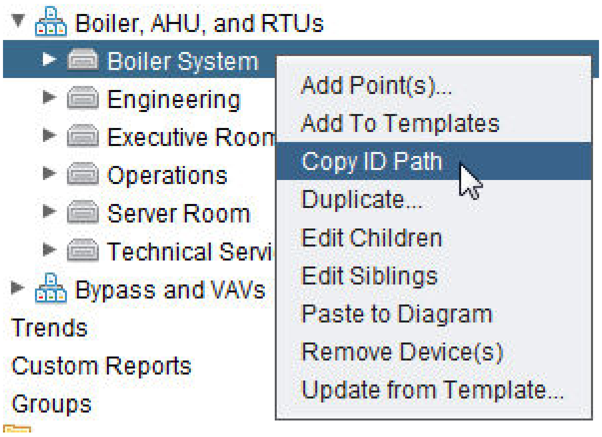
Linking a Group Entry to a Map Entry

Group Entries are used to organize collections of Map Entries within the HTML5 user interface. A Group Entry can be linked to any entry in the Map Tree using the ID path.

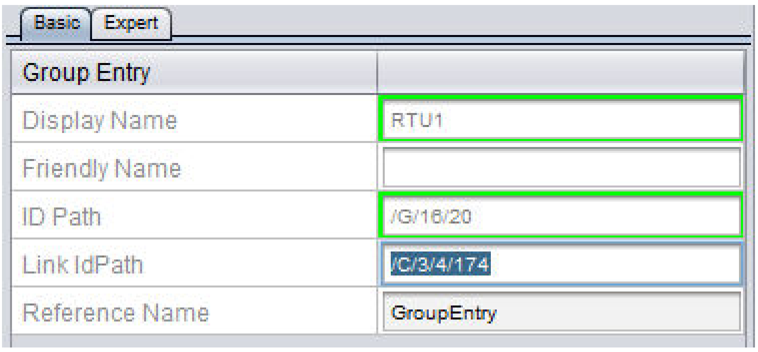
Group Entries can be linked to network groups, networks, devices, points, trend groups, trend entries, reports, and map templates.

To link a Group Entry to a device, perform the following steps:

1. Right-click the device you wish to link to a Group Entry and select Copy ID Path from the short-cut menu.

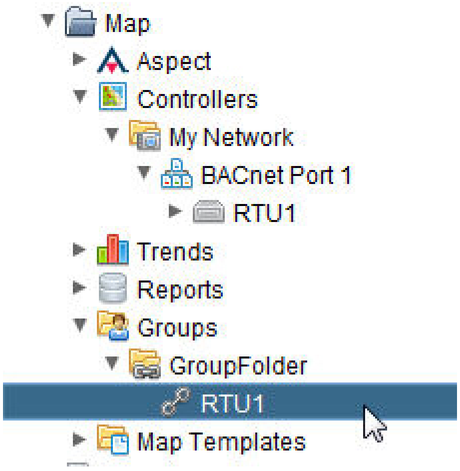


2. Select the Group Entry you wish to link to and paste (CTRL-V) the ID path into the Link Idpath.

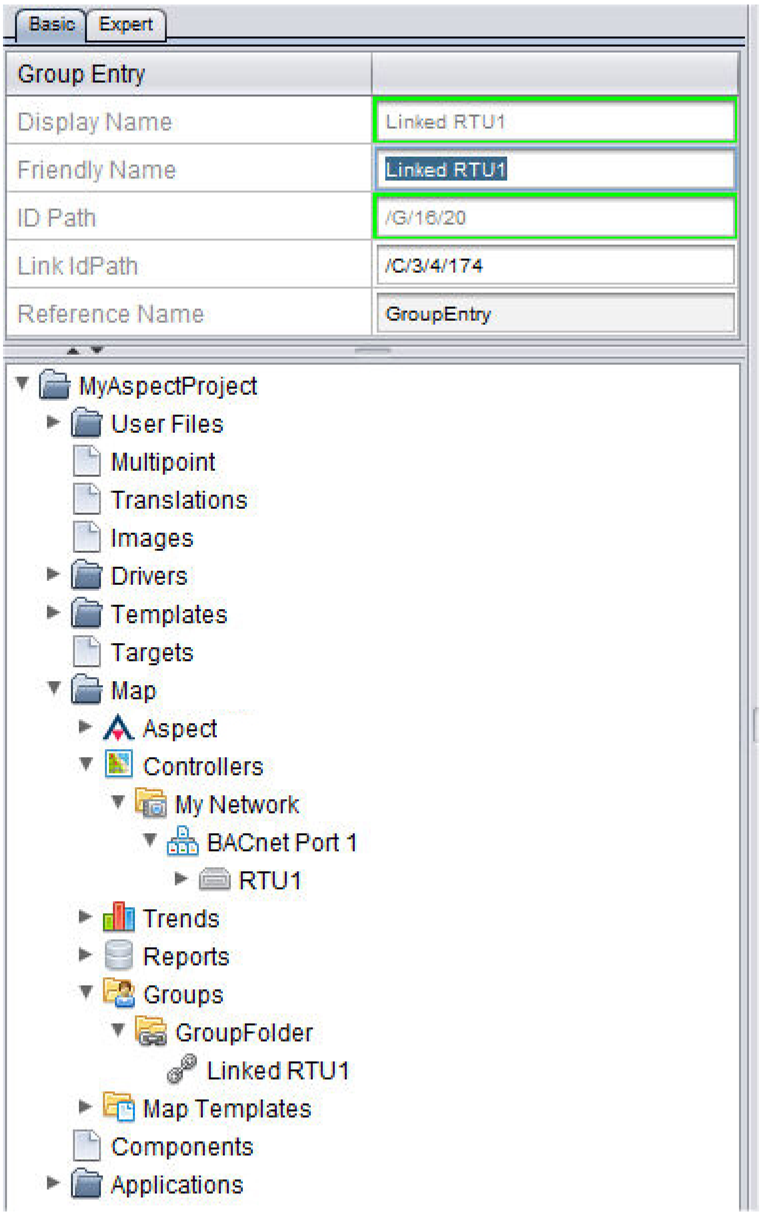


3. The Group Entry's Reference Name in the Group Folder node will change to reflect the name of the referenced entry. Once added, you

can assign a Reference Name and a Friendly Name to the Group Entry. This is performed using the Properties Pane.



4. The Friendly Name is a label displayed not only within the Map Topology tree, but will also be displayed within the HTML5 user interface. Friendly Names can display spaces and other characters that are visible to the user. The ReferenceName is an internal name reference for use by technicians developing and maintaining an Aspect system. This should not contain any spaces or special characters. Finally, the Display Name will provide you with a read-only reference of the way the network will be displayed in the Tree as well as the HTML5 user interface for verification.



More Information

[Working in the Groups Node - Overview]

[Adding a Group Folder]

[Adding a Group Entry]

ngAdmin Interface

ngAdmin What is ngAdmin?

ngAdmin is a dynamic user interface for building ASPECT Applications. It includes key features to streamline ASPECT workflow, increase productivity and reduce engineering complexity.

ngAdmin is designed to take advantage of modern browsers and larger screen sizes. Desktop and laptops, modern tablets, and high resolution smart phones running up to date versions of HTML 5 browsers work best.

Key Features in ngAdmin

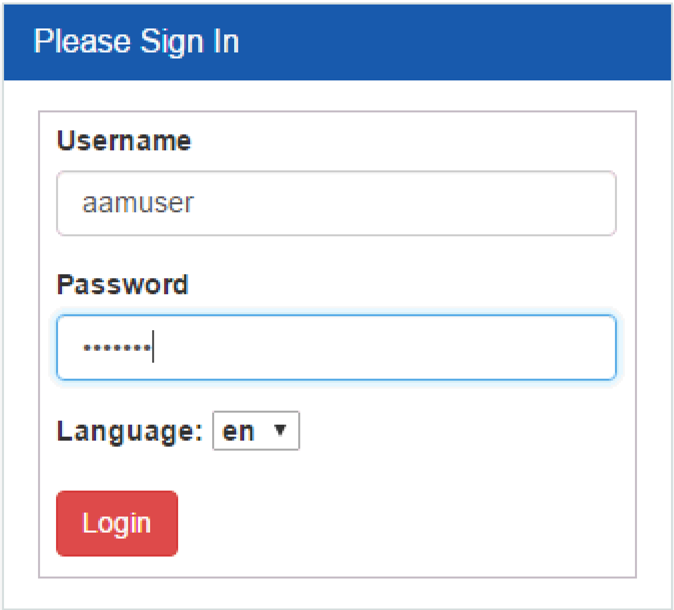
- Built-in Alarming and alarm management
- Flexible notification subsystem
- Improved Historical event browsing
- Context-driven HTML floor plans
- Web Based editing of Aspect Native Schedules
- Per-user favorites
- Online editing of Map properties

Logging In to ngAdmin

When you first access the ngAdmin user interface, a login panel is displayed.

> **Note**: The credentials are shared between the Applet view, "AutoMagic" and ngAdmin.

While logging in you may also select a preferred localization language for ngAdmin.

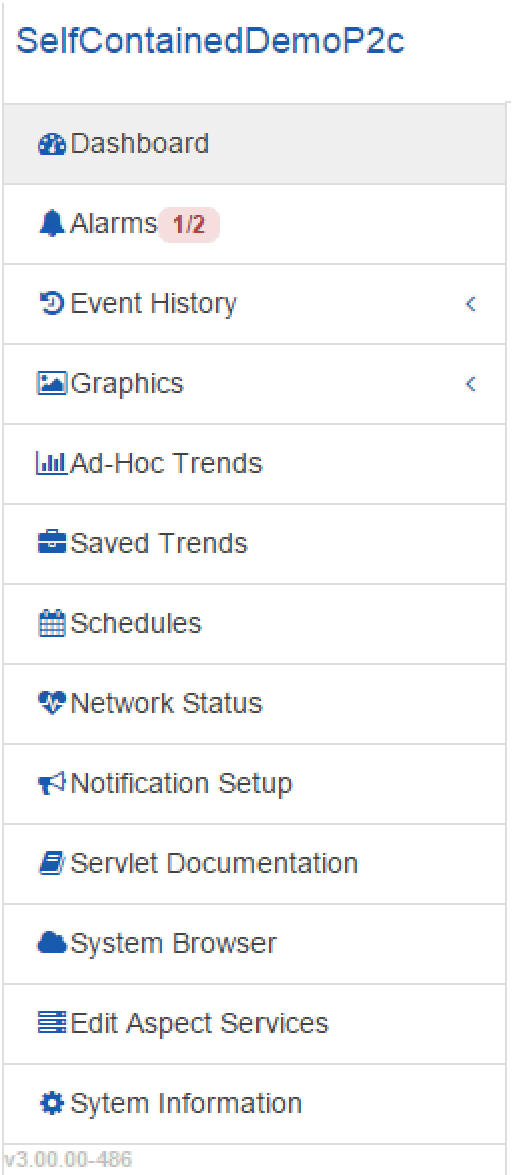


The ngAdmin Dashboard

The Dashboard is the first screen displayed upon successful login to the ngAdmin application.

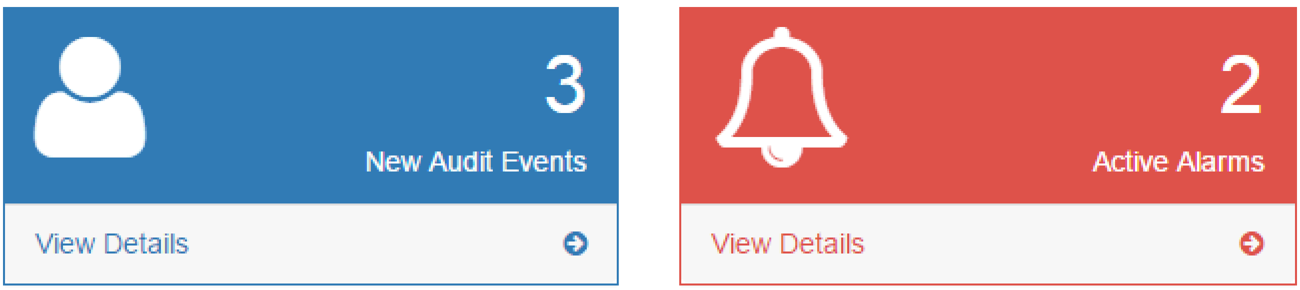
Navigation

Navigation items are normally located in the left-hand menu, but on smaller screens they can collapse into a button-controlled drop-down. The menu will display the name of the deployed project as well as the ASPECT version number.



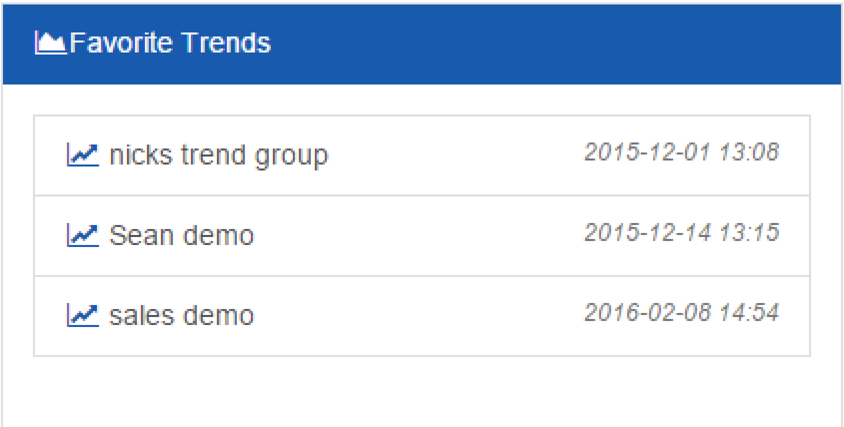
Alerts

The large central window contains prominent alert boxes highlighting new Audit Events as well as Active Alarms when present. When there are no events for the alert to display, it will automatically hide itself until a new event occurs and causes it to reappear.



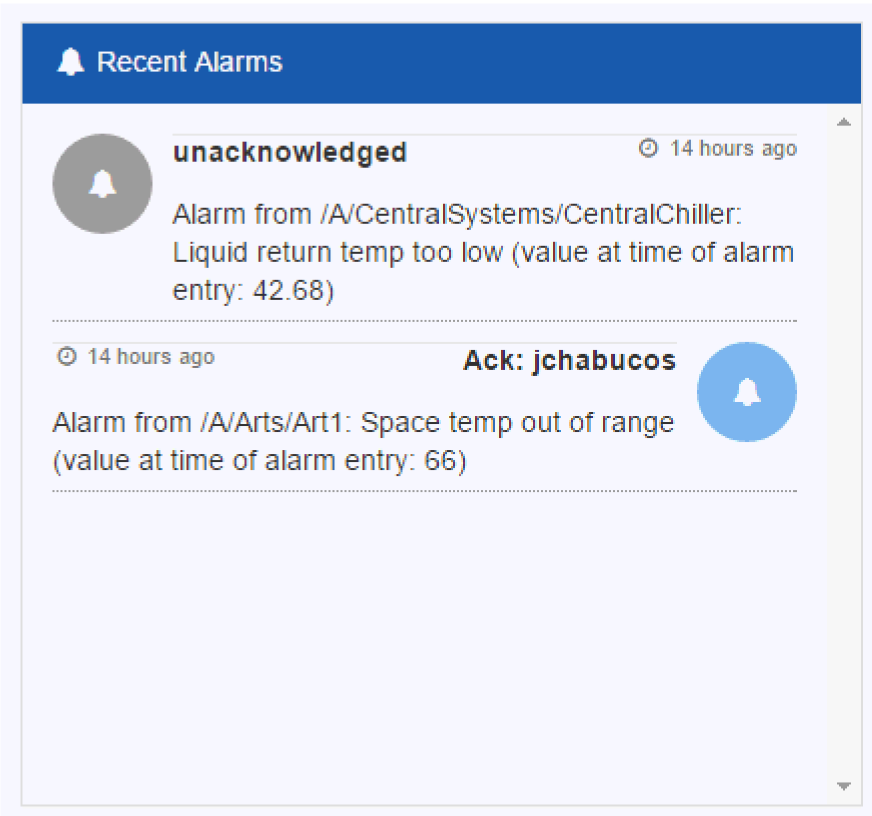
Favorite Trends

The Favorite Trends box is a list of user specified "Favorite" trends for instant access from the Dashboard. Favorite trends are selected by selected a Saved Trend as a "Favorite" Up to 20 Favorite Trends can be selected



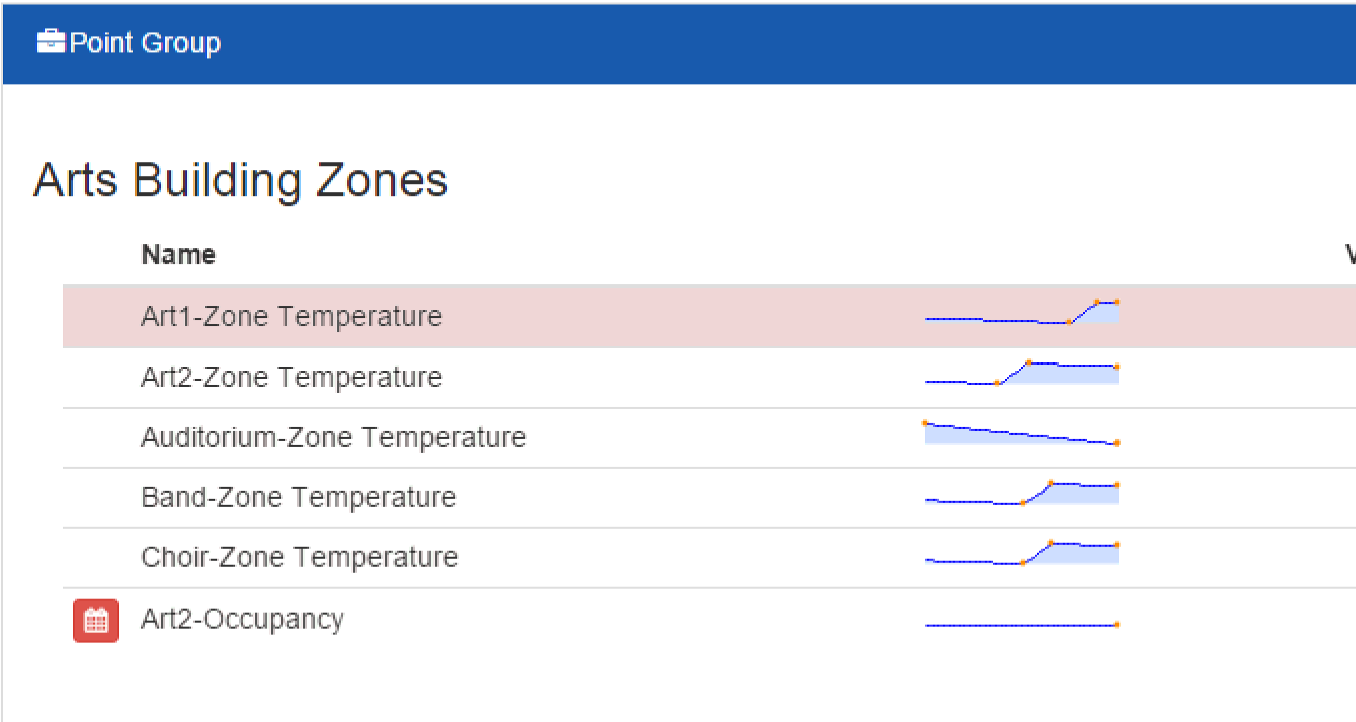
Recent Alarms and Events

The Recent Alarms, Recent Audit Events and Recent Map events give a brief timeline overview of the events ocurring in the system. You may click on the titles of these dialogs to launch their respective applications for more details.



Point Groups

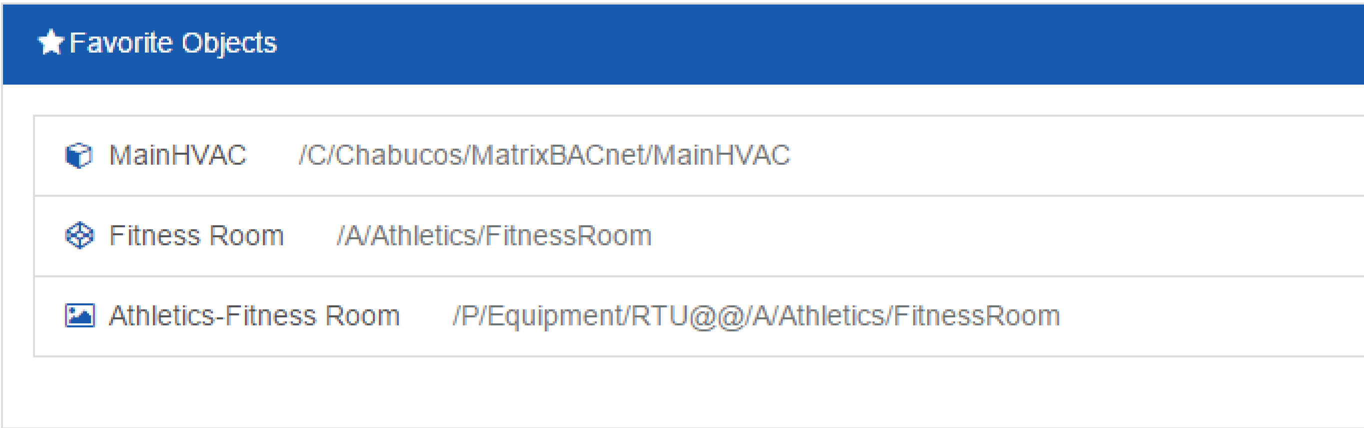
Point Group is a new concept for Aspect 3.0 - it is a user configured digest view of up to 15 points from the system. Any point that is configured for Sparkline is eligible to be added to the Point Group. The point group can convey Alarm, Ranged Status and bound schedule information for all the points contained within the group. Clicking on a point contained in the Point Group will open the point's Home Context in the System Browser to provide additional context info about the point.



Point Groups are managed from the Point Group Manager in the User Preferences panel.

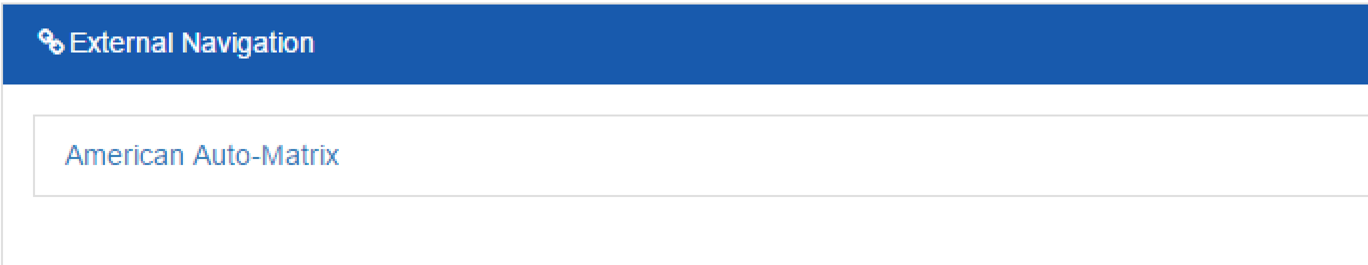
Favorite Objects

Favorite Objects, like Favorite Trends provides a way for an individual user to Favorite important items for easy access from the dashboard. Favorite items can be Map Devices, Aspect Applications, Schedules or even Graphics. Favorite Objects can be selected by clicking on the Favorite button while viewing the object.



External Navigation

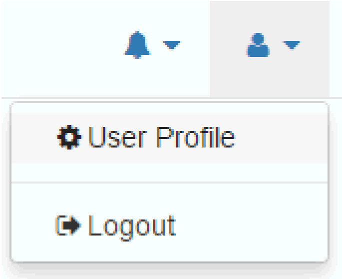
Unlike other items in the dashboard, the External Navigation section is administered centrally. It allows the system operator to provide HTTP/HTTPS links to specific locations. These may include specific Aspect Java applet views, corporate intranet portals, or links to other Aspect ngAdmin installations.



External Navigation links are managed from the Links Subsystem in the Services node.

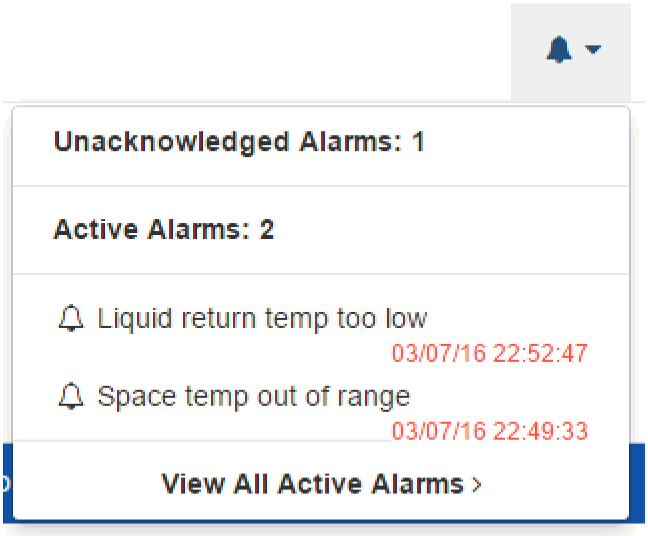
User Preferences

The User Preferences menu item can be used to access the User Profile page for configuration of Point Groups and Favorites Management as well as used to log out of the ngAdmin application.



Alarm Mini-Viewer

The Alarm Mini-Viewer is visible any time there are active alarms in the system. Clicking on the icon will display a drop down showing a summary of the alarm counts, the most recent active alarms, and provides quick access to the Active Alarms application.



More Information

[Saved Trends]

[Point Group Manager]

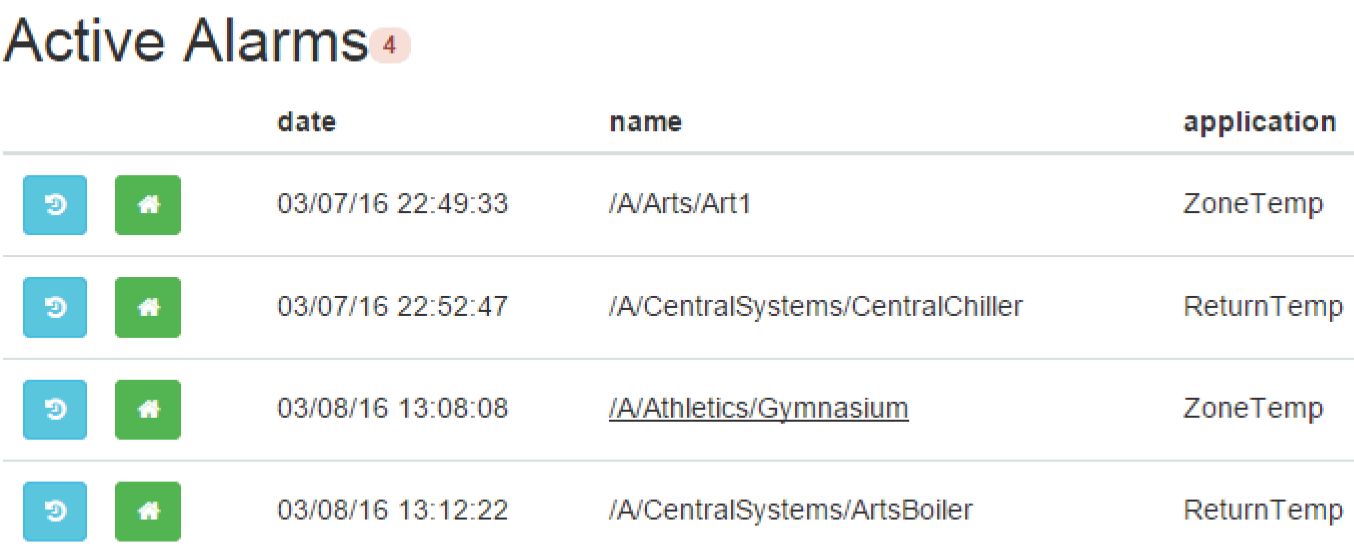
[System Browser Overview]

Active Alarming

The Active Alarms application in ngAdmin provides a context driven view of the active alarms present in the **Map**'s built-in alarm system.

> **Note**: Only alarms in the Map alarm subsystem are displayed. Alarms that are handled by custom alarming within custom application logic must still be viewed by via the Java applet.

The primary view for **Active Alarms** application is the `Active Alarms` table. This table displays a summary of the alarm as well as a series of action buttons.



Button Legend

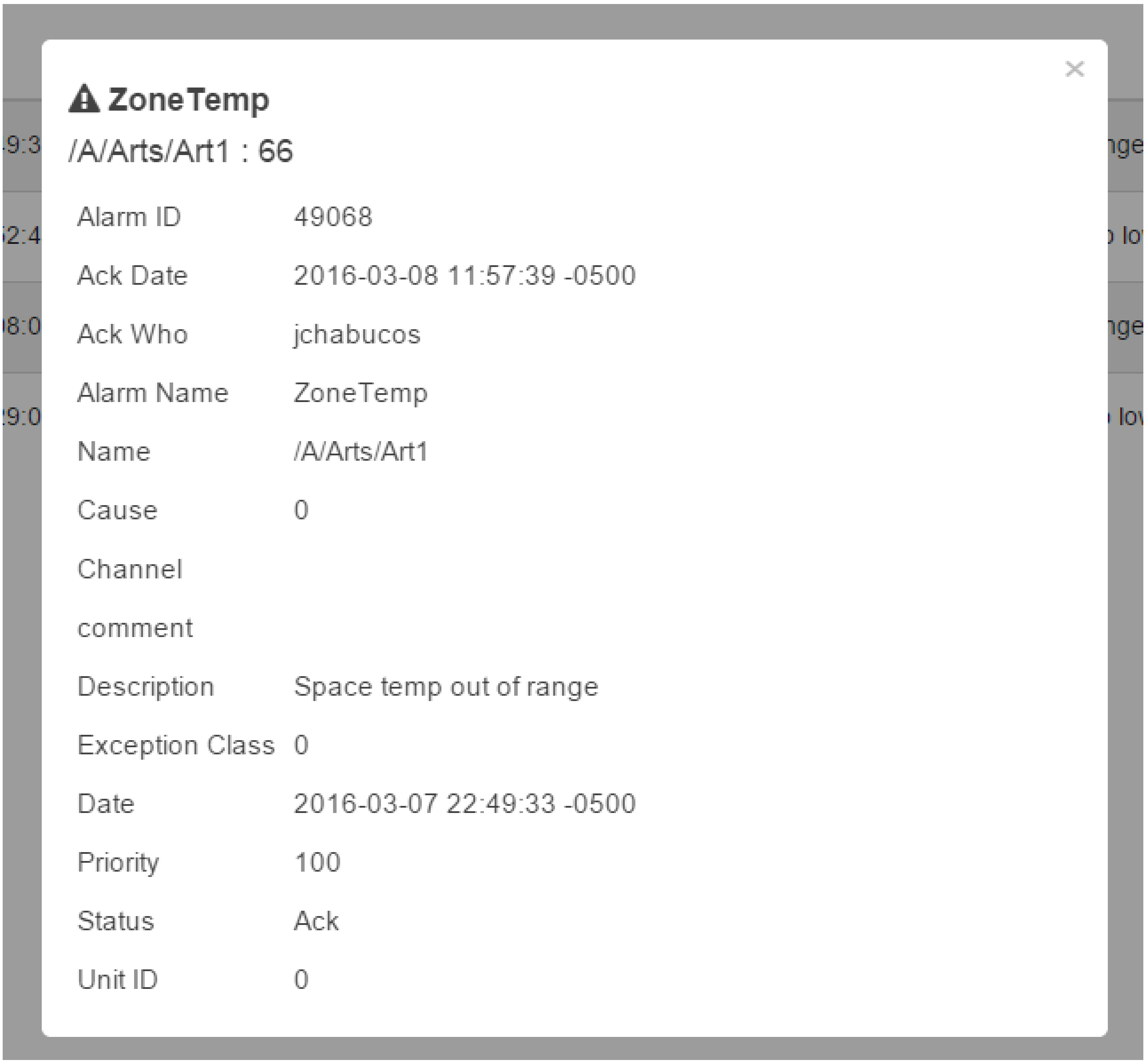
Below is a table listing the functions of the buttons in each row of the `Active Alarms` table.

Button	Action
	View the alarm history for this Alarm. This will launch the Historical Alarm view with a pre-set filter so that the user can see all occurrences of this alarm.
	Navigate to the home context of the alarm. This will show other points related to this point, to assist in determining the cause of the alarm.
ack	Mark the alarm as Acknowledged (only available on alarms not marked as Clear)
clear	Clear the Active alarm. The alarm history remains preserved in the `Historical Alarms` applic-

	ation (see "Historical Alarms" on page 272).

Alarm Details

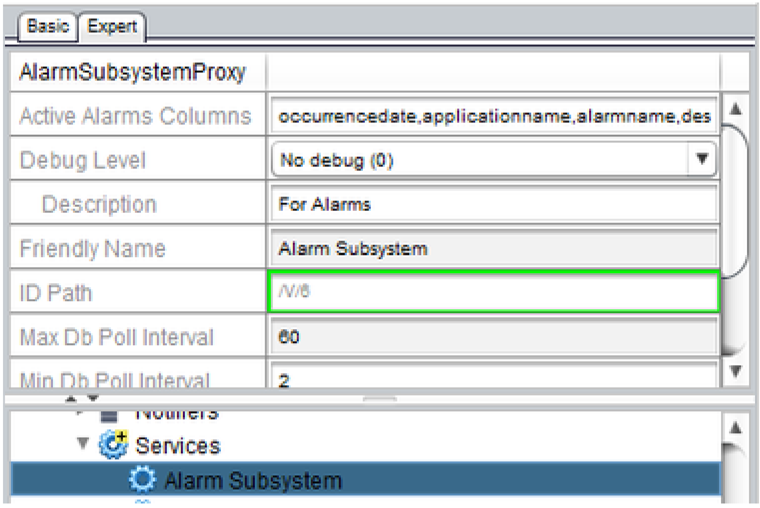
Clicking on any of the text in a row in the `Active Alarms` table will launch a popup dialog that displays the complete details for the alarm record.

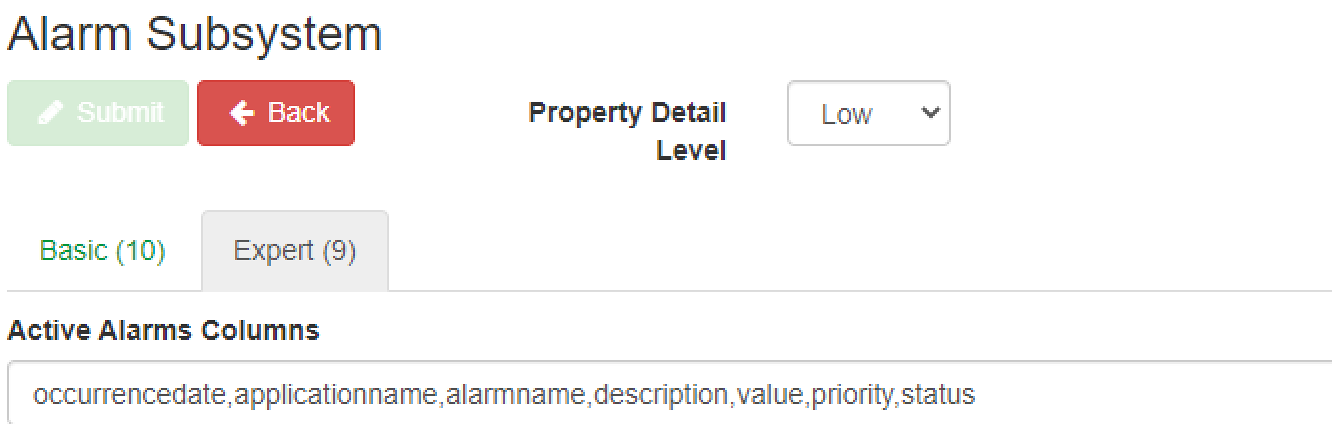


Masking Alarm Columns

Since v3.04.00

The Alarm Console page in ng-admin is designed to allow Aspect engineers an option to mask columns from the table if they are not desired. The default values for this feature are configurable from the Expert tab in the Alarm Subsystem from the “Active Alarms Columns” property in Aspect Studio or ng-admin.

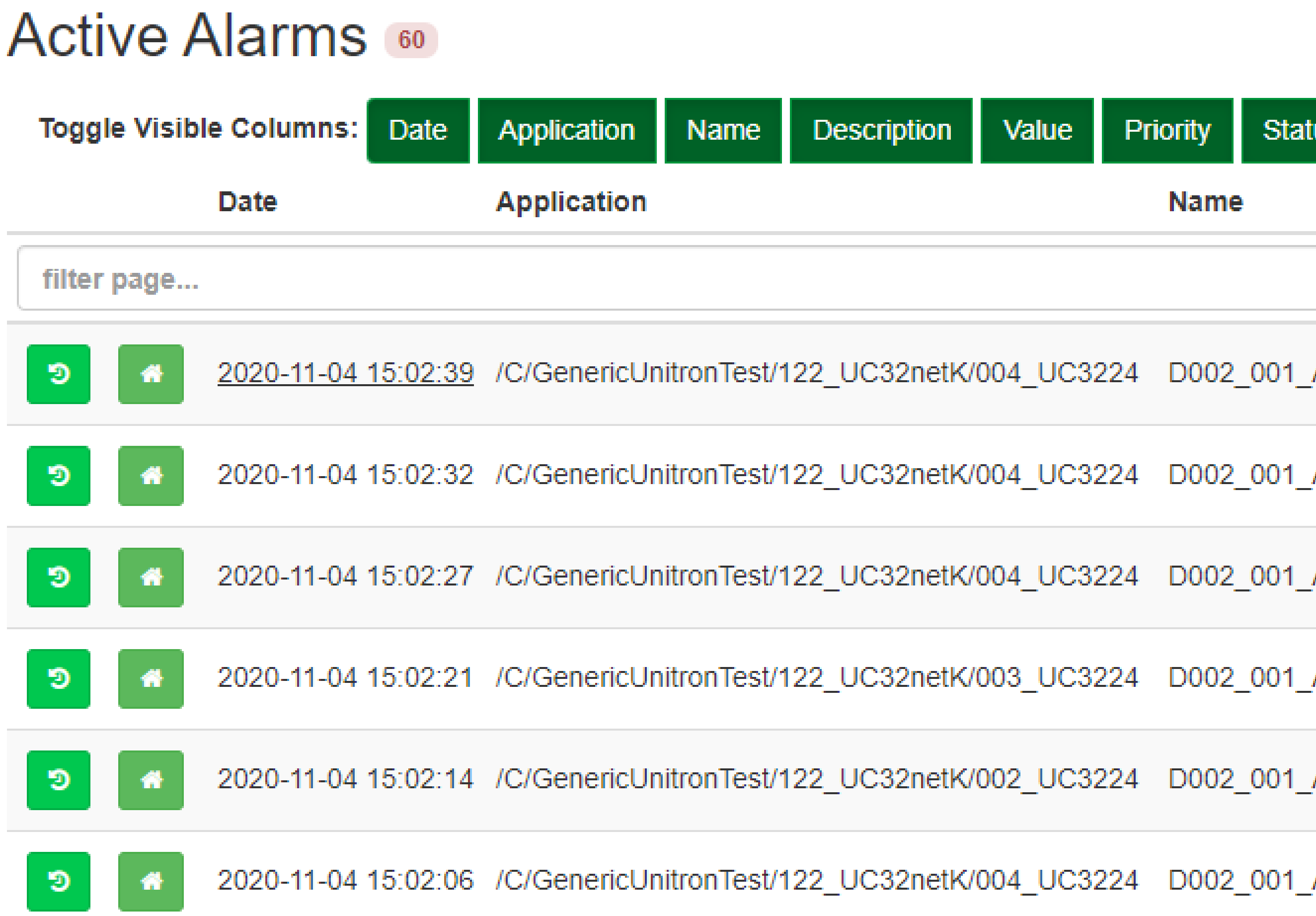




The following columns are available for masking:

- occurrecedate
- applicationname
- alarmname
- description
- value
- priority
- status

Once the default columns for the console have been selected, columns may be further masked on a live console page by clicking the column name mask button on the column to be hidden. This selection is saved in between sessions so browsing to other pages in ng-admin will not reset the masked columns if the alarm console is revisited.



Event History Overview

The Event History submenu provides access to Historical events within the ASPECT system including, among others:

- Previous and current Alarms,
- controller status changes,
- point value writes,
- deployment history

All three applications are **Table** views with additional row context information available by clicking the respective row.

All three applications include "Historical Data Search Filters" on page 278

Alarms

Audit Trail

Map Events

Event History Overview

The Event History submenu provides access to Historical events within the ASPECT system including, among others:

- Previous and current Alarms,
- controller status changes,
- point value writes,
- deployment history

All three applications are **Table** views with additional row context information available by clicking the respective row.

All three applications include "Historical Data Search Filters" on page 278

Alarms

Audit Trail

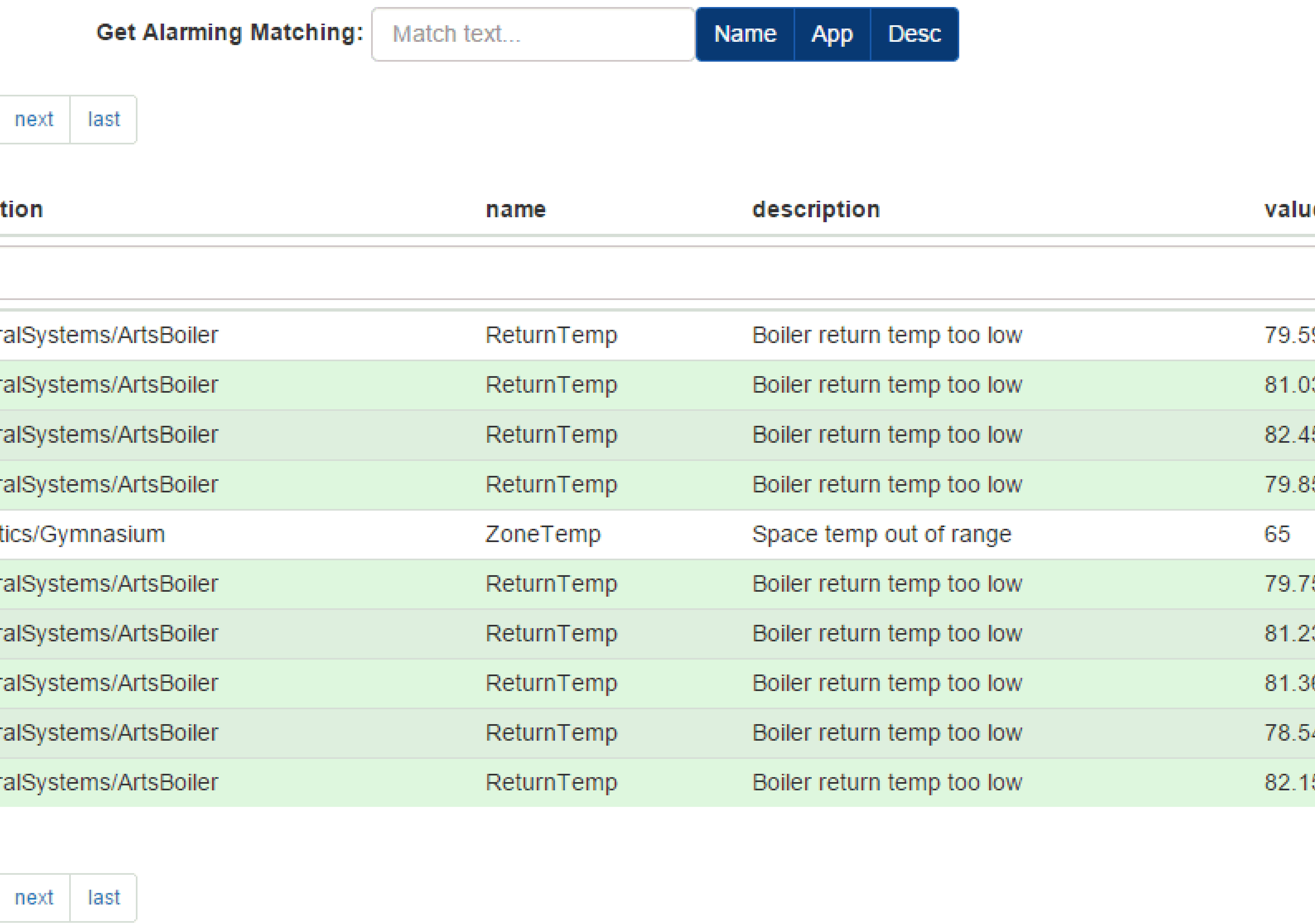
Map Events

Historical Alarms

The Historical Alarms table view shows both current as well as historical alarms. Rows shown in green are alarms which have been cleared, either by a user or by the system exiting the alarm condition (if so configured).

Basic Table View

The number of alarms per page can be configured (up to 100 entries per page). It is important to note that in the Historical View (unlike the "Active Alarming" on page 267 View), results are fetched from the ASPECT Server one page at a time.



tion	name	description	valu
alSystems/ArtsBoiler	ReturnTemp	Boiler return temp too low	79.5
alSystems/ArtsBoiler	ReturnTemp	Boiler return temp too low	81.0
alSystems/ArtsBoiler	ReturnTemp	Boiler return temp too low	82.4
alSystems/ArtsBoiler	ReturnTemp	Boiler return temp too low	79.8
tics/Gymnasium	ZoneTemp	Space temp out of range	65
alSystems/ArtsBoiler	ReturnTemp	Boiler return temp too low	79.7
alSystems/ArtsBoiler	ReturnTemp	Boiler return temp too low	81.2
alSystems/ArtsBoiler	ReturnTemp	Boiler return temp too low	81.3
alSystems/ArtsBoiler	ReturnTemp	Boiler return temp too low	78.5
alSystems/ArtsBoiler	ReturnTemp	Boiler return temp too low	82.1

__Using a server-side filter__

Because a system may have a very large number of cleared alarms, it is possible to perform a server-side search using the `Get Alarm Matching:` input box. Enter a search string to match, and select the fields to which the filter should be applied.

The example below shows the search term "Art" being applied to both the `Name` and `Application` fields, but excluding the `Desc` field.

Client side filter

Sometimes, particularly with larger numbers of rows per-page it is useful to be able to filter the results displayed within the page to rows containing a particular string.

In the example below, the table from the first figure is shown with the client-side filter "Gym" matched. This removes all rows from the display that do not contain the string "Gym". Clearing the text from the filter input area restores the original results from the server without re-fetching them.

date	application	name
Gym		
03/08/16 13:08:08	/A/Athletics/Gymnasium	ZoneTemp

Audit Trail

Table View

The Audit Trail application is a table viewer application, similar to the Alarms and Map Events tables. The purpose of the Audit Trail is to track changes made to the configuration of the Aspect application. Each row in the table represents an event that has occurred within the system.

Audit Trail events reflect a change to a running system or a user login/-logout event.

Audit Trail

Events Per Page (10)

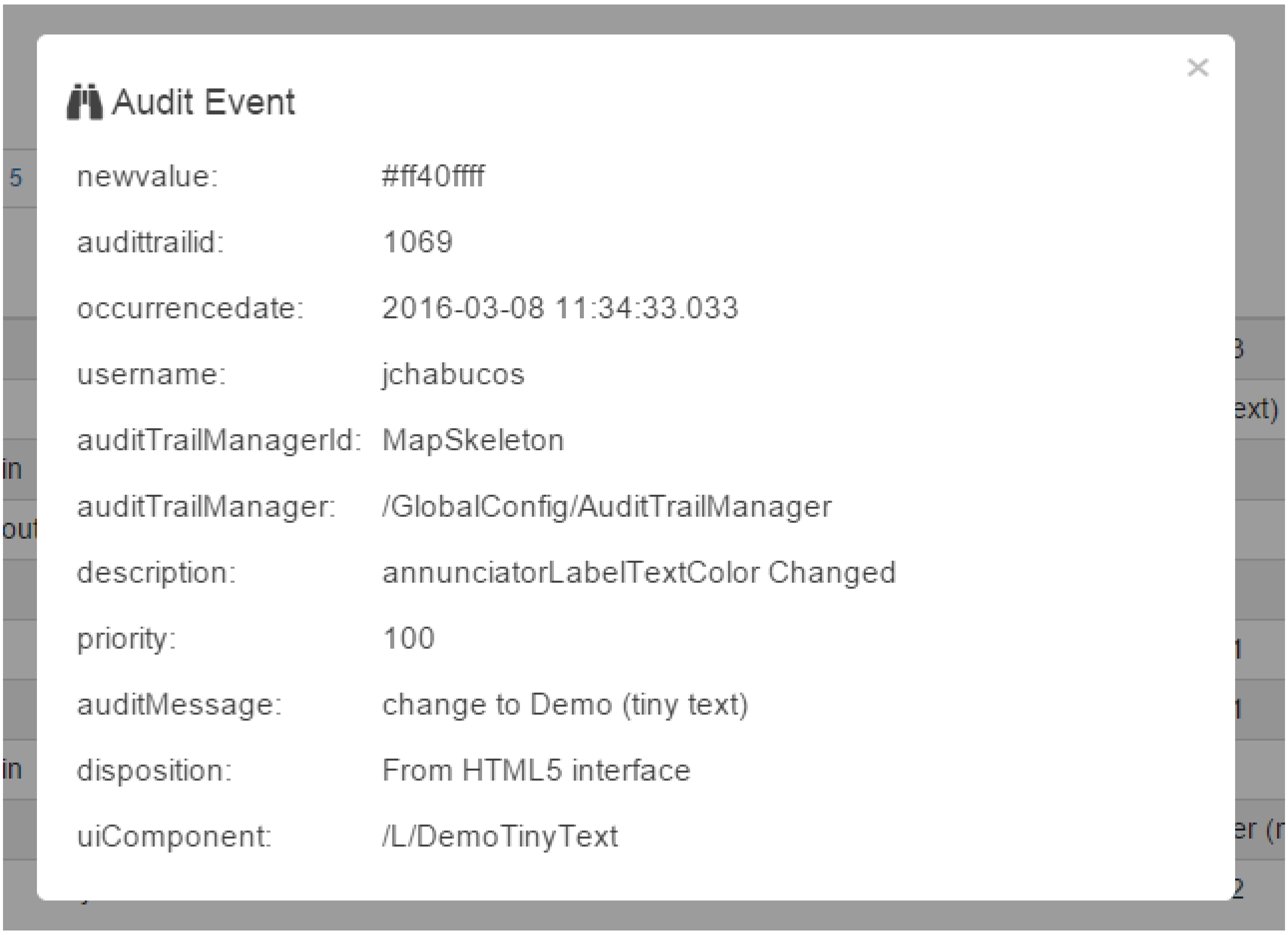
first previous 1 2 3 4 5 ... next last

date	value	username	Component
03/08/16 12:06:32	39	jchabucos	/C/Chabucos/NB11124/JimBBC/AO3
03/08/16 11:34:33	#ff40ffff	jchabucos	/L/DemoTinyText
03/08/16 10:52:27	ngAdmin Login	aamuser	/GlobalConfig/LoginEventReceiver
03/08/16 10:48:41	ngAdmin Logout	aamuser	/GlobalConfig/LoginEventReceiver
03/07/16 22:51:59	45	jchabucos	/C/Chabucos/tony/gpc/av1
03/07/16 22:51:30	32	jchabucos	/C/Chabucos/NB11124/JimBBC/AO1
03/07/16 22:50:58	54	jchabucos	/C/Chabucos/NB11124/JimBBC/AO1
03/07/16 22:50:42	ngAdmin Login	jchabucos	/GlobalConfig/LoginEventReceiver
03/07/16 15:02:29	9	jchabucos	/C/Chabucos/NB11124/JimBBCCondVis/Visibility
03/07/16 15:00:52	47	jchabucos	/C/Chabucos/NB11124/JimBBC/AO2

first previous 1 2 3 4 5 ... next last

__Event Details__

Clicking on the Audit Event will open a popup dialog that contains the full audit event information. The dialog may be dismissed by either clicking the "x" in the upper right corner or clicking outside the dialog.



Map Events

The Map Events table is a table view application similar to the Audit Trail application.

Map Events items are important events logged by the Aspect Map engine itself - such as device online/offline transitions and project startup/deployment.

Map Events

Events Per Page (10)▾

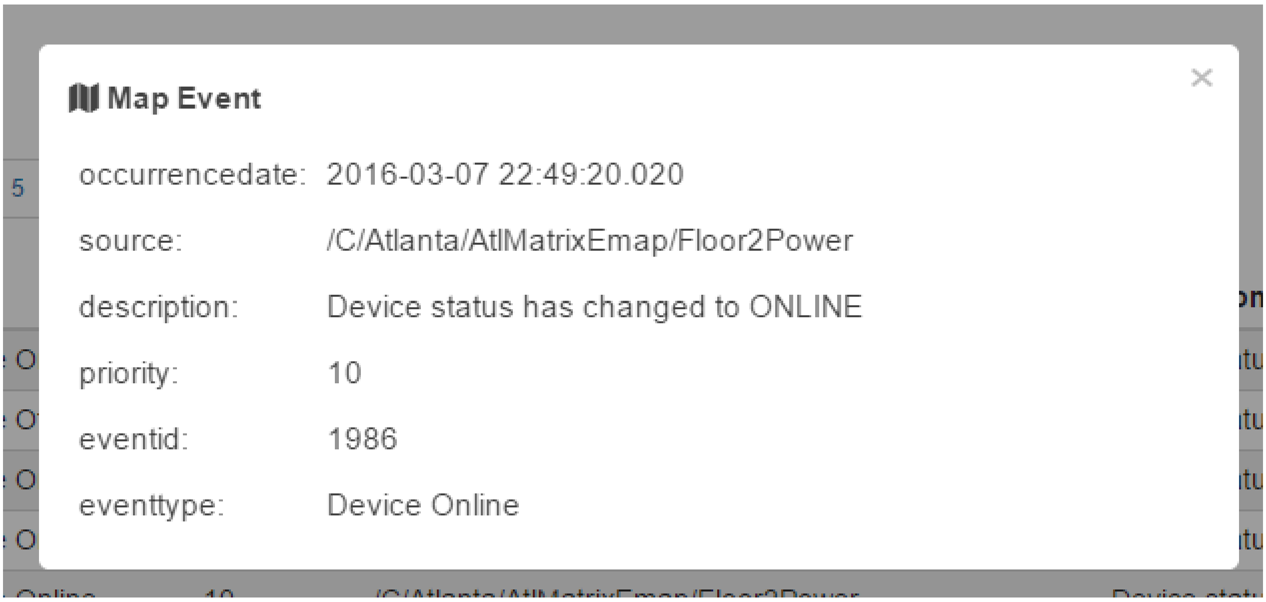
first | previous | **1** | 2 | 3 | 4 | 5 | ... | next | last

date	type	priority	source
03/08/16 06:10:34	Device Online	10	/C/Chabucos/tony/gpc
03/08/16 06:09:34	Device Offline	10	/C/Chabucos/tony/gpc
03/07/16 22:49:20	Device Online	10	/C/Atlanta/AtlMatrixEmap/OfficeTemps
03/07/16 22:49:20	Device Online	10	/C/Chabucos/NB11124/JimBBC
03/07/16 22:49:20	Device Online	10	/C/Atlanta/AtlMatrixEmap/Floor2Power
03/07/16 22:49:14	Device Online	10	/C/Chabucos/MatrixBACnet/MainHVAC
03/07/16 22:49:14	Device Online	10	/C/Chabucos/Home/Device
03/07/16 22:49:14	Device Online	10	/C/Chabucos/tony/gpc
03/07/16 22:49:13	Map Engine	10	/GlobalConfig/Map
03/07/16 22:49:13	Device Online	10	/C/Atlanta/AtlMatrixEmap/Ghost

first | previous | **1** | 2 | 3 | 4 | 5 | ... | next | last

Map Event Details

Additional Map Event entry information, including the precise time of the event and the EventId of the entry is available by clicking on the respective row in the table to display the Map Event Details popup dialog. The dialog may be dismissed by clicking the "x" in the upper right corner or clicking outside the dialog.



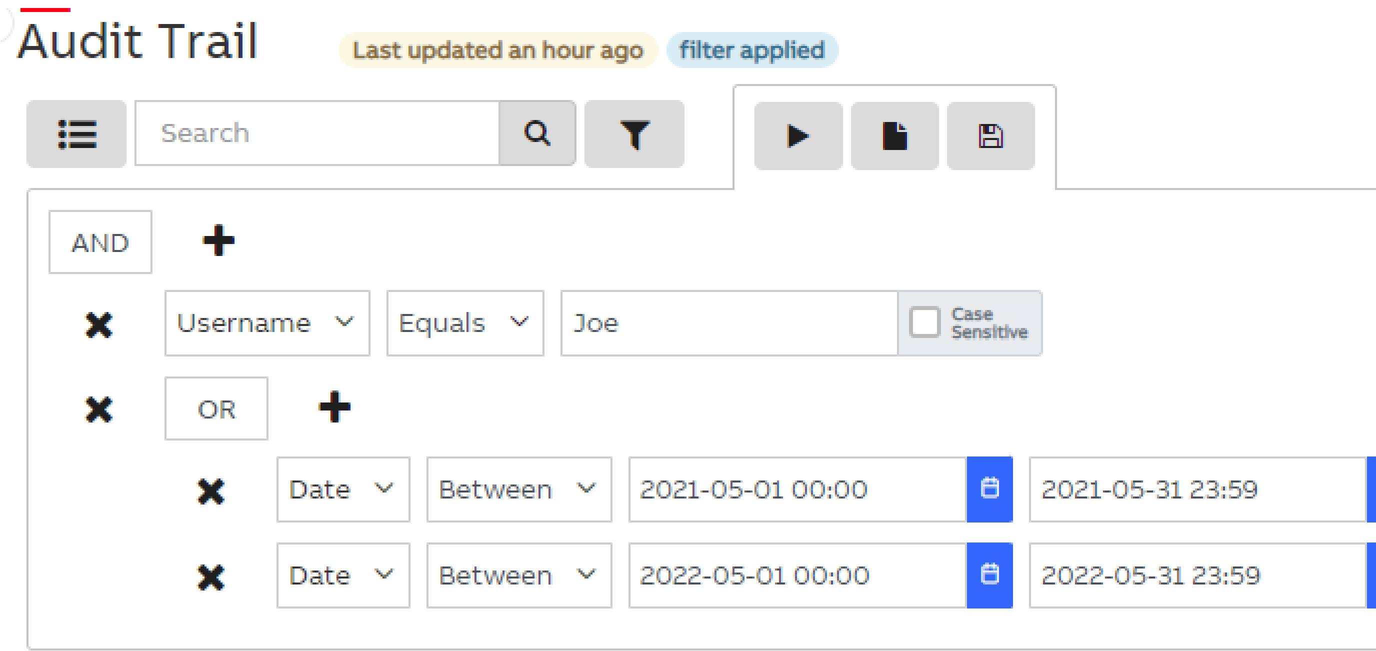
Historical Data Search Filters

Advanced search features are included on each on the three “Event History” pages ("Historical Alarms" on page 272, "Audit Trail" on page 274 and "Map Events" on page 276) to refine the data displayed and exported.

To access the advanced search filters, click on the filter button

How to build and apply filters

In the example shown below, all Audit Trail records are filtered to search for the user Joe in May 2021 and May 2022.



The above example, looks for records where

Username = Joe
AND
(
Date is in May 2021
OR
Date is in May 2022
)

The AND/OR operators can be toggled by clicking on the operator button.

- Use the ✚ button to add a new condition or group (a group is two or more conditions joined by AND or OR).
- Use the ✖ button to remove a condition or group.

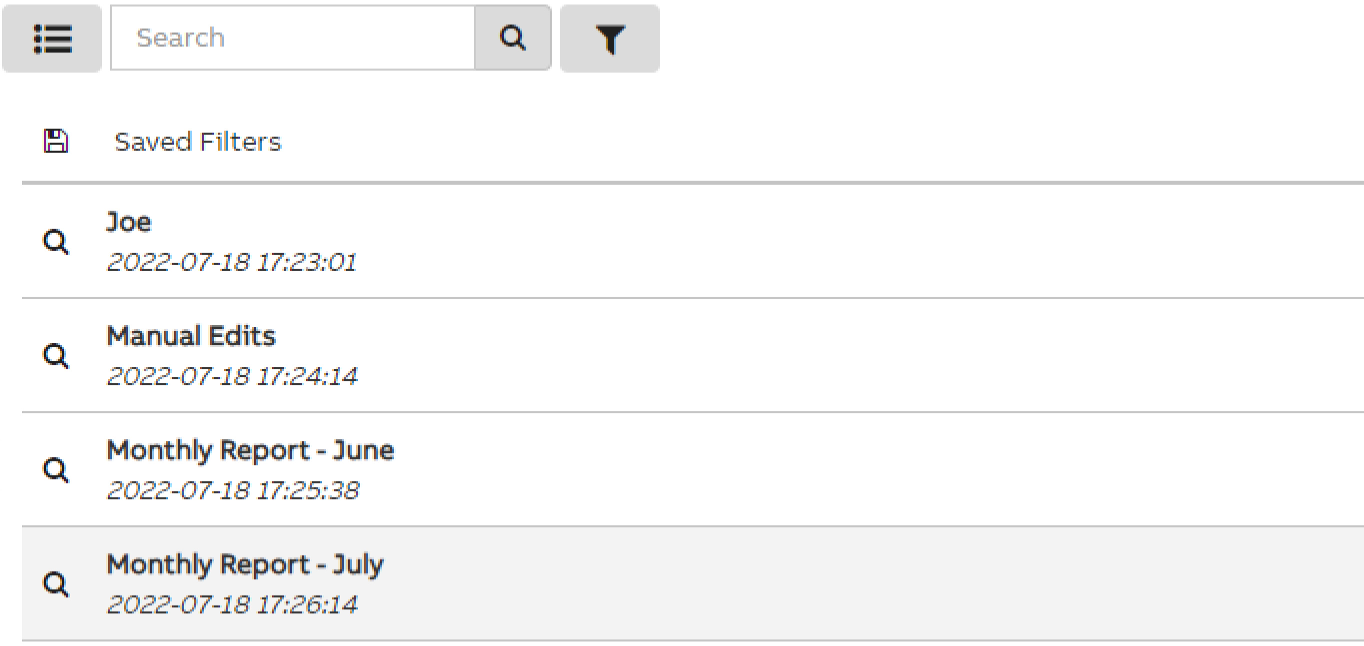
In the example above the AND operator is applied to username=Joe and the OR group that includes two date ranges.

To apply the filter to the list, press the Apply Filter ▶ button.

Saving and Managing Filters

To save your filter, press the Save Filter button and choose a name.

To access a list of your saved filters, press the Saved Filters button.



In this list, you can use the buttons on the right to Apply, Edit, mark as Favourite or Delete a filter. Favourite filters can be accessed directly from the Favourite Filters panel on the ngAdmin Dashboard.

Trending

What is a Trend?

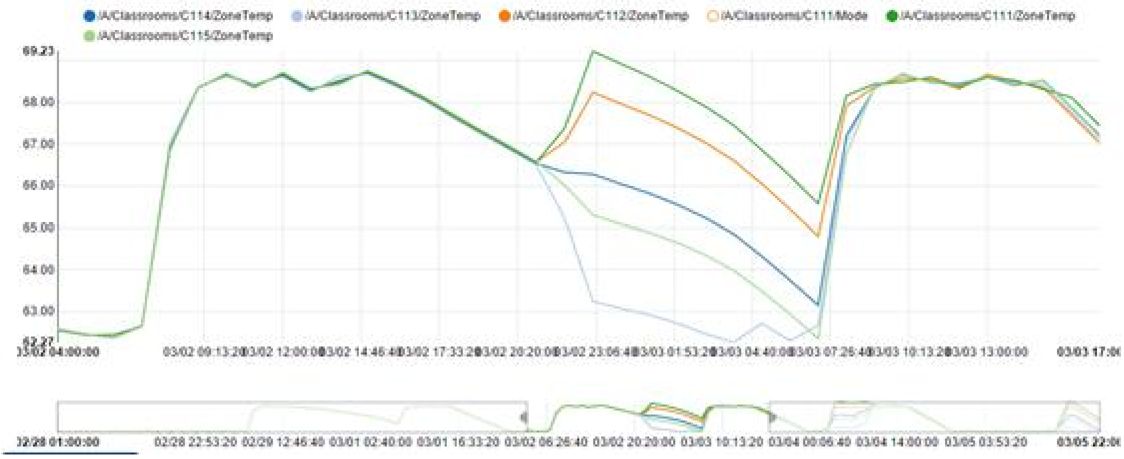
The value of a field controller point at a specific time can be measured and stored in ASPECT. A set of stored values sampled at multiple times for the point can then be displayed as a graph showing how the value varies over time for the purpose of energy monitoring, as well as to assist with troubleshooting problem areas and identifying critical operating trends within a system.

This set of data is equivalent to a **BACnet** "**Trend Log**" or Unitron **Datalog**, and in ASPECT is referred to simply as a "**Trend**".

Viewing Trend Data

ASPECT displays Trended data in the ngAdmin interface, as a line-graph – with tooltips for precise reading and zooming functionality.

See "Understanding Relative Dates" on page 296, "Ad-Hoc Trends" on page 298 and"Saved Trends" on page 307 for more detail



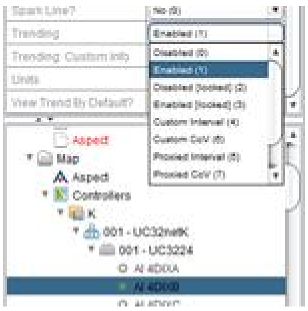
The ASPECT **Supervisor** can display point values stored in an ASPECT database – this is referred to as **Collected Trend**, and is the most common configuration for Trends on ASPECT systems. The data for such **Collected Trends** can be generated by an ASPECT **Device** directly polling point values in a controller ("Map" / "Multiple" Trend – Mtrend or "Custom" Trend - CTrend), or by the **Supervisor** storing **Trend** data fetched (and periodically updated) from a "**Satellite**" (PTrend).

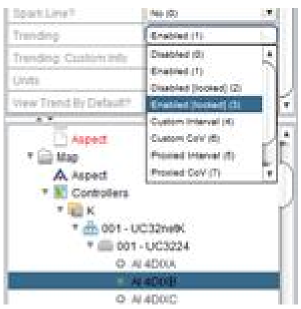
Alternatively, the ASPECT **Supervisor** can request a trend (either complete or a segment between specified dates) which has been gathered by a "**Satellite**" (either another ASPECT device or a Unitron Controller) and display it directly without storing in its own database.

Collected Trends

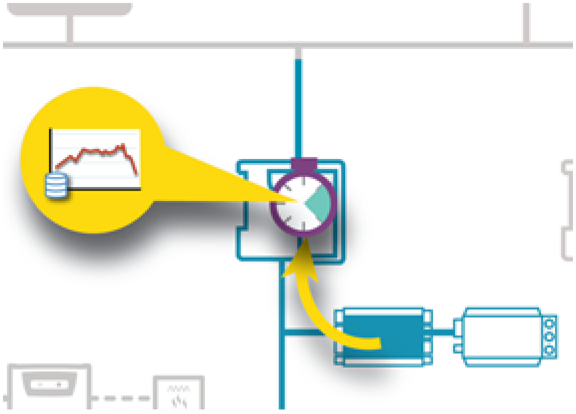
Device Trends

If **Trending** is enabled on a point in the ASPECT **Supervisor**'s **Map**, (by selecting either Enabled or Enabled (locked) in the `Map` tab):



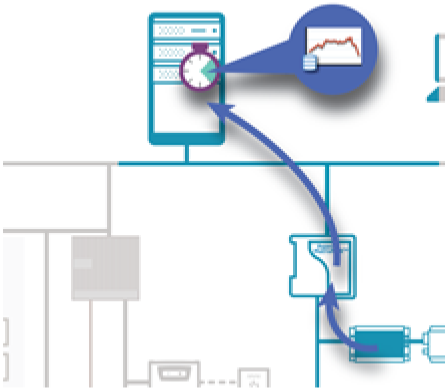


then a **Collected** "**Multiple**" or "**Map**" (Mtrend) **Trend** is created. In this case the point value is periodically stored by the **Supervisor** at the interval specified in the properties of the **Device** that contains the point.



Note: Any point that is Trended is automatically configured for "Background Polling". This means that the Supervisor will request the value of the point more frequently than the Trending interval (the Background Polling period is typically between 5 seconds and 1 minute where Trending period is likely to be 15 minutes or more), and hold the latest value for that point in its local memory. When the Trend goes to store the value of the point, it uses the 'latest value' from the Supervisor's memory rather than polling the controller at that exact point in time.

If the device containing the point is not directly connected to the Supervisor, the Supervisor requests the point from the Satellite, and the Satellite queries the controller:



> **Note**: Data from all points in a single device polled in this way are stored in one database table – the most efficient use of the Supervisor's resources.

> **Note**: In the scenario above, the **Trend** in the **Supervisor** causes the **point** to be **Background Polled**, so that the **Supervisor** requests the point value from the **Satellite** more frequently than the **Trend** interval. It would be common for the same point to be **Trended** in the **Satellite** (in which case it would be **Background Polled** there, and the **Satellite** will already have a value for the **point**) but if not the **Supervisor's Background Polling** will cause the **Satellite** to query the **controller** at the **Supervisor's Background Polling** interval.

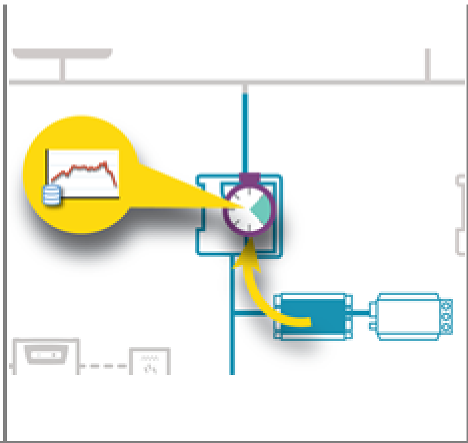
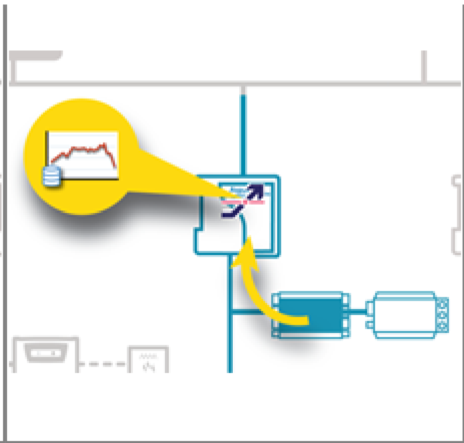
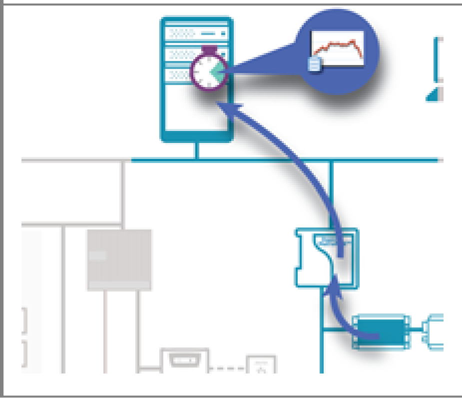
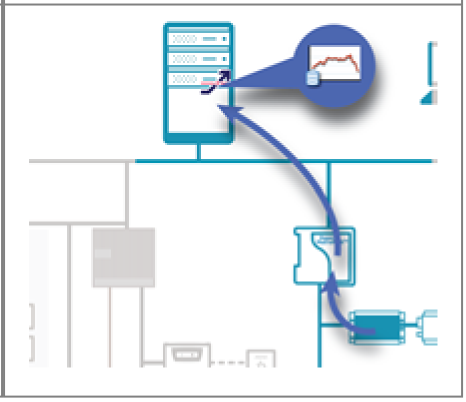
Custom Settings

ASPECT Trends

If the data from a point is to be collected either at a different interval from the device setting, or if it is to be collected when the point value changes by a set amount (Change of Value – **CoV**) then "Custom" settings may be defined by selecting either **Custom Interval** (the time interval at which values will be stored) or **Custom CoV**(specifying the "delta" or change in value that will trigger a value to be stored).

Custom Interval

Custom CoV

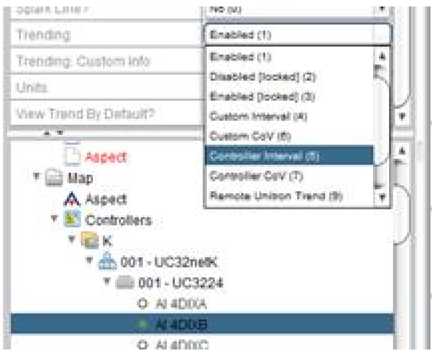
Controller connected to Super-visor:		
Controller connected to Satellite:		

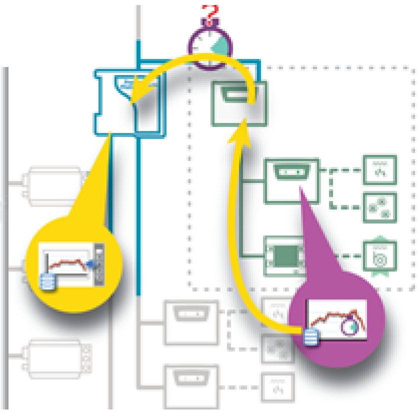
> **Note**: Once "Custom" settings are used for a **Trend**, it will require its own separate database table, using more of the resources of the ASPECT **Supervisor**.

Controller Trends

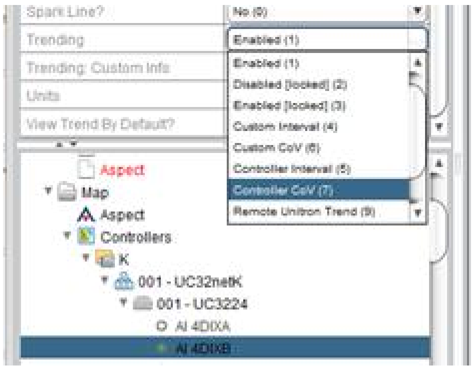
If a Unitron controller is logging a point, the complete log can be copied to the ASPECT **Supervisor** at regular intervals.

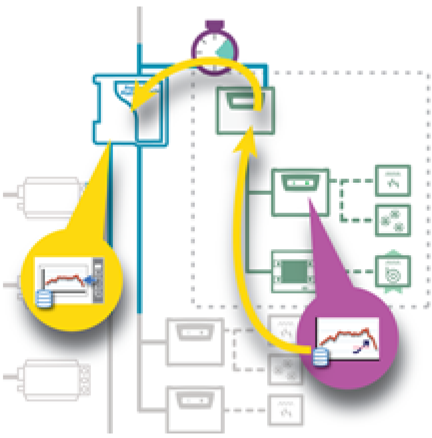
If the Unitron controller is logging data at a regular interval then the ASPECT supervisor can adapt its interval to suit – for example if the ASPECT Controller Trend interval is shorter than the Unitron datalog interval, then the ASPECT **device** can decide not to copy the datalog at every interval because it knows the **datalog** will not have changed. This is referred to as a “**Controller Interval**" Trend.





On the other hand if the Unitron **Datalog** is **CoV** then the ASPECT **Supervisor** can't know if the Unitron **Datalog** has changed or not and will have to request the entire datalog at each Controller Trend interval. This is called "**Controller CoV**" Trend.





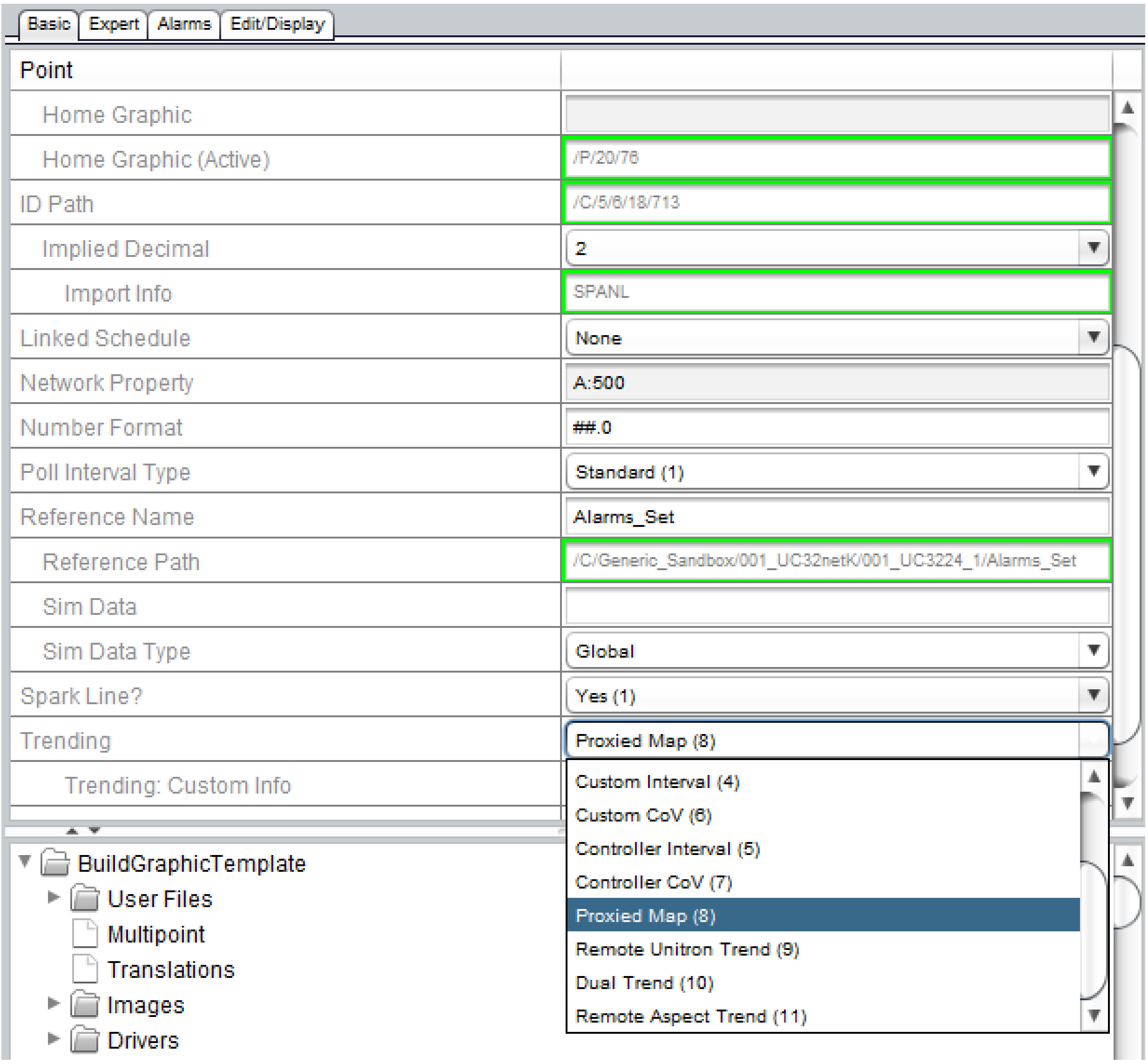
> **Note**: Trends configured for Controller Interval or Controller CoV are automatically set to be collected on-demand also.

Proxied Device Trends

In eMap, **Satellite** "What is a Trend?" on page 280 are represented by default in the **Supervisor** as "Remote Trends" on page 288. This means that trends from a **Satellite** can be viewed from the **Supervisor**, but they are not stored in the **Supervisor**.

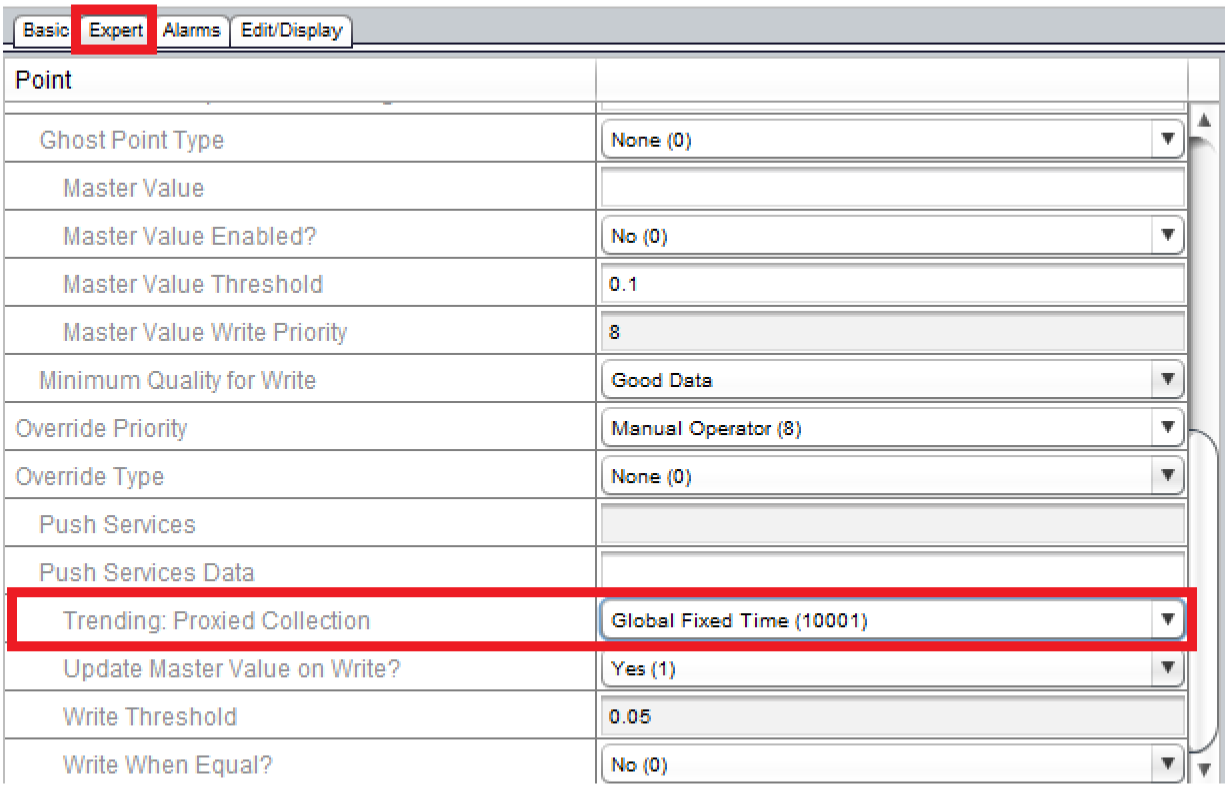
Points that have **Satellite** device trends (i.e. points that have an associated MTrend table) can be configured in the **Supervisor** project as proxied device trends by

1. selecting a trend type "Proxied Map (8)" (See Editing Multiple Aspect Points for more about how to edit multiple points at once).
2. automatically as part of the eMap Export/Import process (see *How to Export a Map* in "What is eMap?" on page 535) or the eMap Discovery process.



This means that the contents of the **Satellite** device **Trend** (MTrend table) will be copied to the **Supervisor** proxied device trend (PMTrend) table at the Proxied Collection Interval (configured on the Expert tab of the **Map Point**), which is set to "Global Fixed Time" by default.

> **Note**: **Global Fixed Time** is a setting on the Trend Subsystem and is set to 02:00 by default.



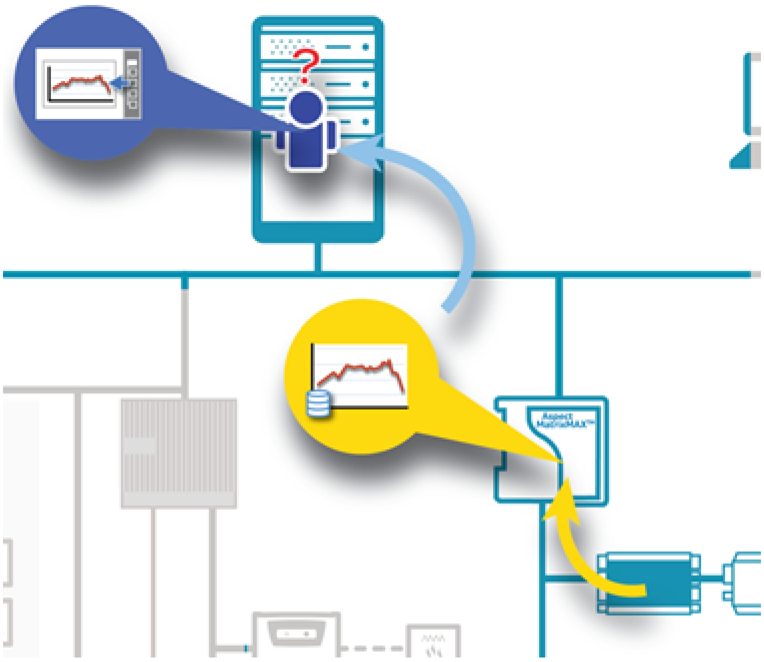
The proxied device trend can be viewed in ngAdmin **ad hoc trends** in both the collected view, and the on demand view. In the collected view, this will display the **trend** data from the database and will be up to date as per the most recent collection. In the on demand view, this will fetch the latest **trend** data from the **satellite**, update the **satellite**, and then display the **trend** data.

> **Warning**: the PMTrend table name must be less than 64 characters. The table name is created from the device reference path (with a 9 character prefix) so if the device reference path exceeds 55 char-

acters then this functionality will not work. **Users of this feature must be aware of this constraint**.

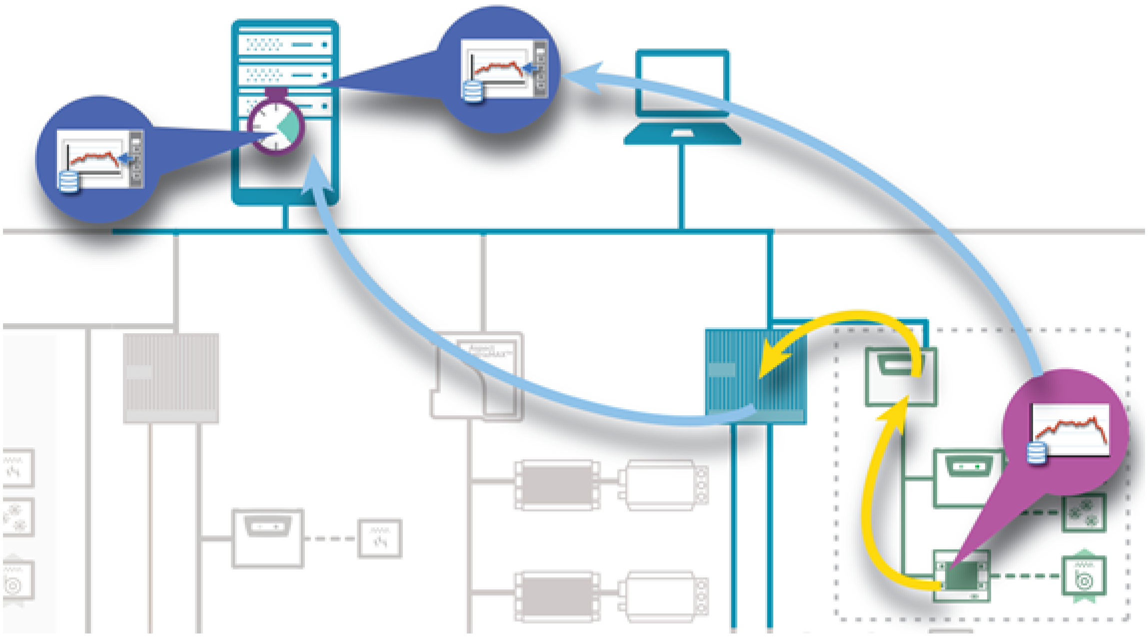
Remote Trends

A **Remote Trend** is fetched from a **Satellite** device when the Trend View is requested, and then displayed in the ASPECT UI. This can take longer to display than a local **Trend** (up to 20 seconds for Unitron datalogs), but does not use any of the ASPECT **Supervisor's** database resources (i.e. **Trend** tables).



Other Types of Trends

If required, a point can be simultaneously but independently trended both on its controller and by direct polling from the ASPECT **Supervisor**. This configuration is called a "**Dual Trend**", because the ASPECT **Supervisor** has allocated both a **Local** and a **Remote** Trend for it.



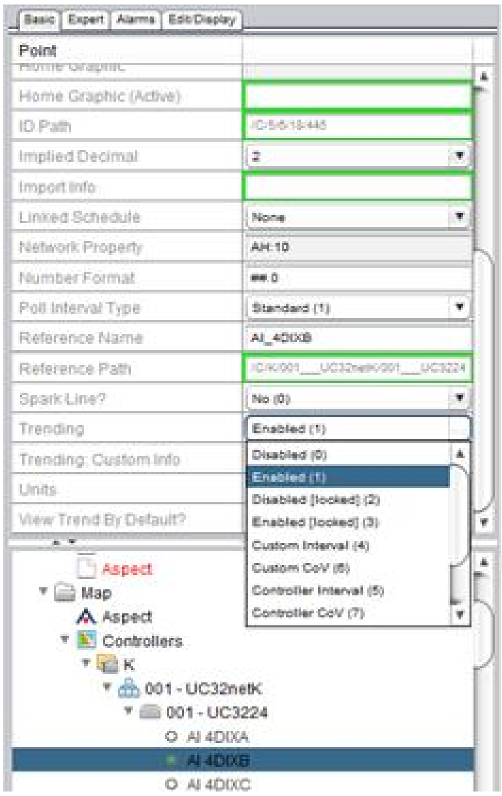
Note: If this feature is to be enabled on an ASPECT-Enterprise project, it is recommended that a NEXUS Series controller is used as a Satellite, rather than a MATRIX Series controller.

Trend Configuration

To configure a Network Point for Trending:

Local And Remote Trends

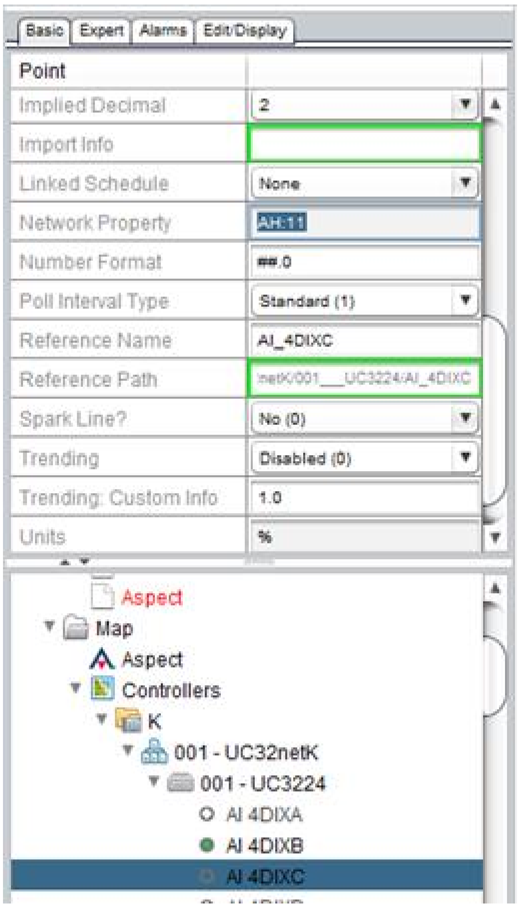
On the Basic tab, set "Trending" to the trending type required.



> **Note**: Importing the settings from the Engineering Center's **Unitron Export** process or **eMap Export** process results in this parameter being set automatically for each point.

Remote Trends

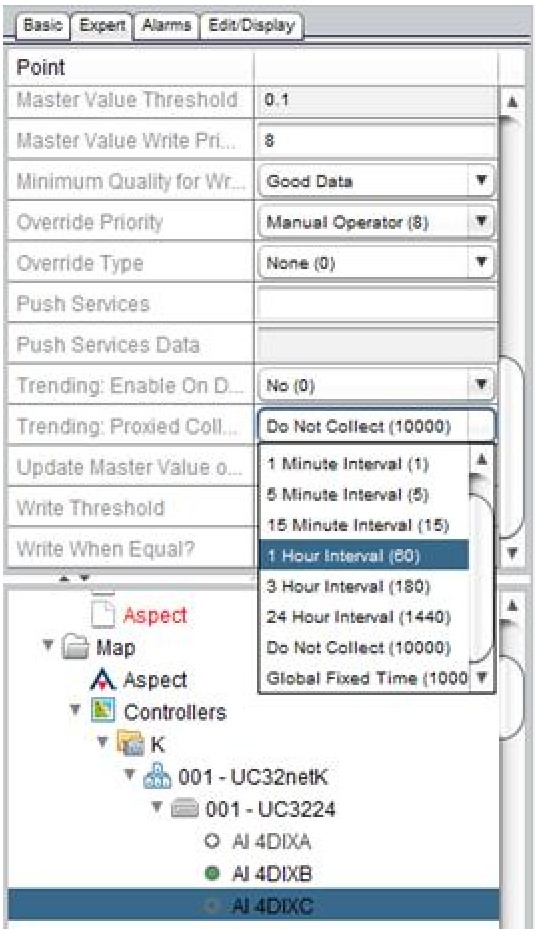
For **Remote** trending or **Controller** (**Proxied**) trending, in the Basic tab set the Network Property to the identifier for the Trend on the remote **Device**.



> **Note** Importing the settings from the Engineering Center's Unitron Export process or EMap Export process results in this parameter being set automatically for each point.

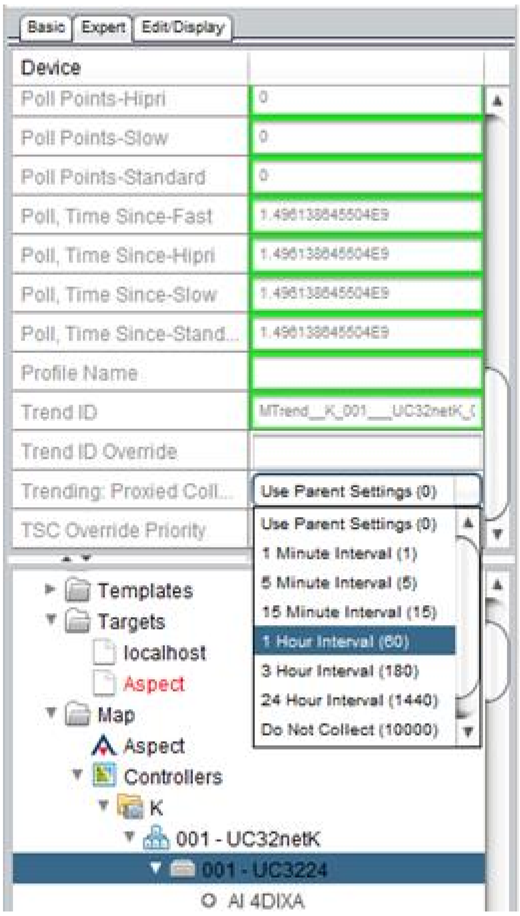
On the **Expert** tab set the **Trending: Proxied Collection** property. Options include:

- Do Not Collect (10000)
- Use Parent Settings (0)
- 1 Minute Interval (1)
- 5 Minute Interval (5)
- 1 Hour Interval (60)
- 3 Hour Interval (180)
- 24 Hour Interval (1440)
- Global Fixed Time (10001)



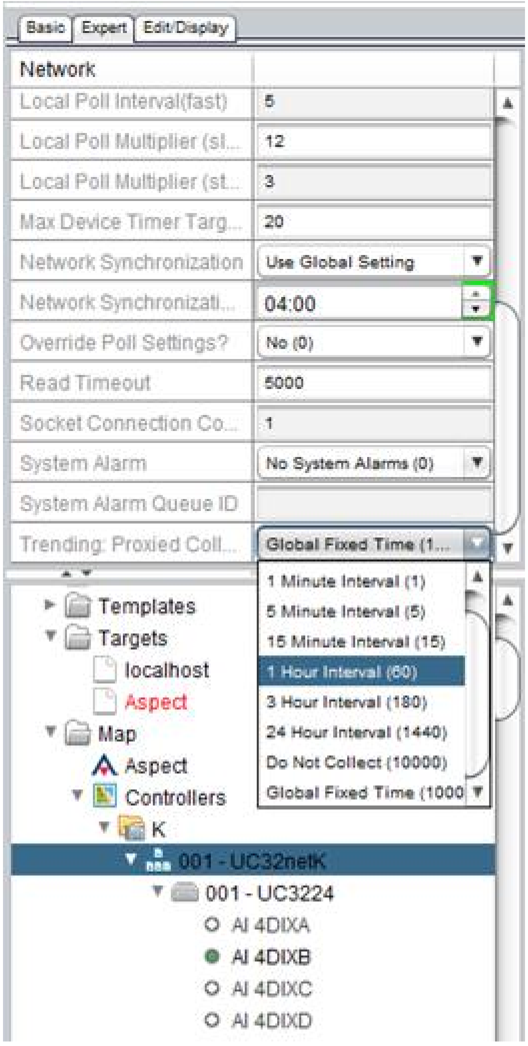
Network Point's Device Settings:

Set the Trending: Proxied Collection for the **Device**. This value will be used for all **Trends** within this **Device** that are set to Use Parent Settings (0)



Network Point's Network Settings:

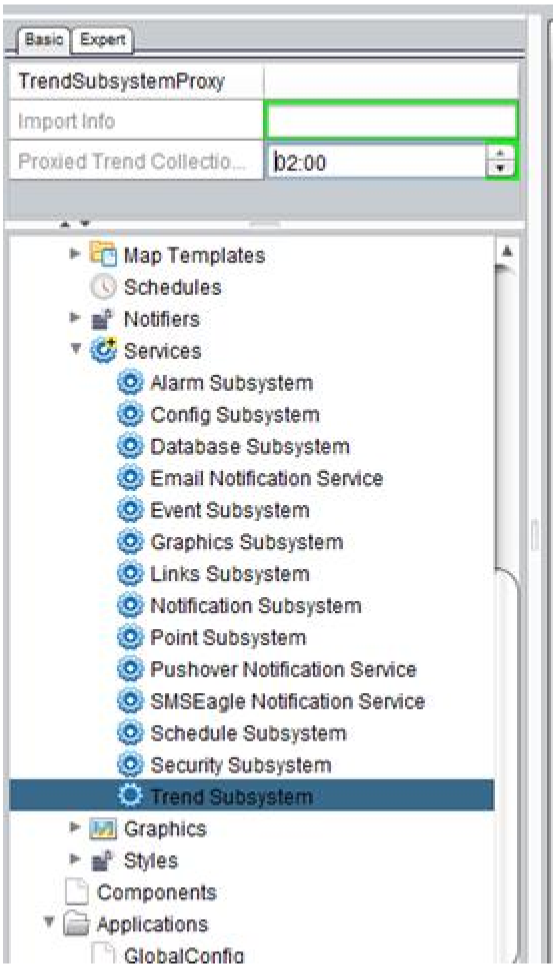
Set the Trending: Proxied Collection for the network. This value will be used for all **Trends** within this **Network** that are set to Use Parent Settings (0) where their parent (**Device**) is also set to Use Parent Settings (0).



If Use Parent Settings (0) is set for a network,**Global Fixed Time**is used.

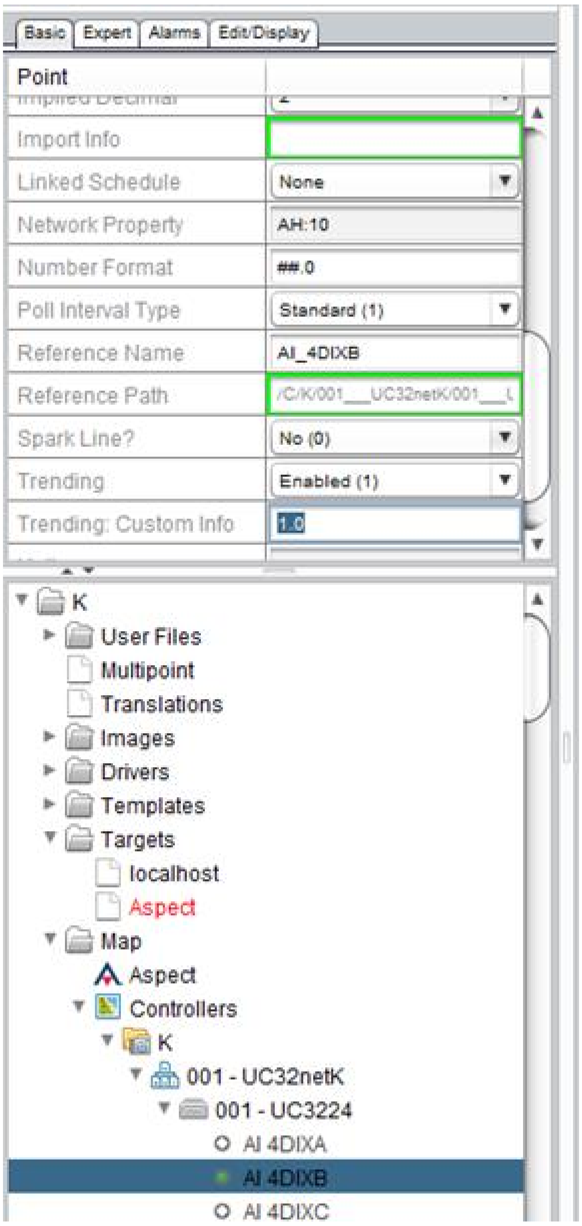
Global Fixed Time

In Services>Trend Subsystem, set Proxied Trend Collection Time (global) to the required time of day (24 hour clock). **Global Fixed Time Proxied Trends** will be collected at this time



Custom Interval Trending

For **Custom interval** trending, on the Basic tab set "Trending: Custom Info" to the number of minutes in the required interval.



Understanding Relative Dates

Relative Date ranges provide a simple way for date ranges to be calculated without specifying and adjusting start and end dates each time and are useful for obtaining information about the current and previous days, weeks, months and years without having to specify exact dates.

Using standard relative ranges, a chart that displays the readings from "Yesterday" or "Last Week" will always be up to date without the user needing to adjust the start and stop times each day.

For more periods other than the current or immediately previous, the nth intervals may be used. nth intervals function similar to the "Last" intervals but instead of specifying the previous interval, the user may look back n intervals ago.

Triggered ranges offer additional flexibility. The nth specifier is still used, but this time it is a counter. The trigger ranges do not make use of the current date - they are bounded by the Date field.

Triggered Range examples:

Using Months from Trigger with an nth Value = 3 and a Date = 2015-12-23 will produce results beginning at 2015-12-01 until 2016-03-31.

Using Days from Trigger with an nth Value = 94 and a Date = 2016-06-20 to represent Summer. All accumulated data will be displayed, so as the period trends toward completion, additional data will become available.

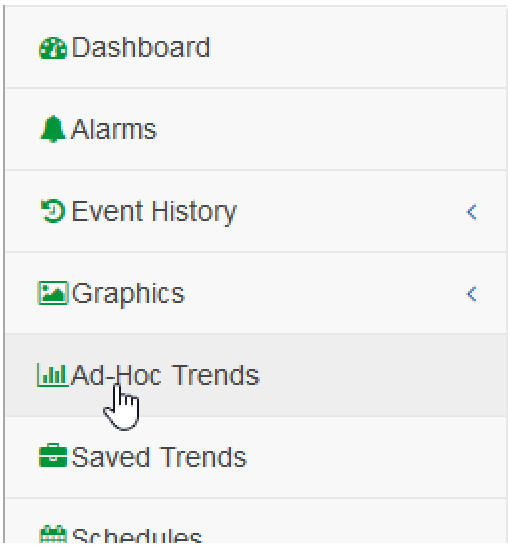
Option	Description
Today	From midnight of the current day until current time
Yesterday	From midnight of the previous day to midnight of the present day
This Week	From midnight on most recent Sunday until current time
This Month	From midnight on day 1 of current month until current time
This Year	From midnight on January 1 of the current year until current time
Last Week	From midnight of the Sunday of the previous week until midnight on the end of Saturday on the previous week
Last Month	From midnight on day 1 of the previous month to the last day of the previous month.
Last Year	From midnight on January 1 to December 31 of the previous year
nth Week Ago	From midnight on Sunday of (current week - n) until the end of Saturday on (current week -n). Obtains one week worth of data starting from n weeks ago.
nth Month	From midnight on day 1 of (current month - n) until mid-

Ago	night on last day of (current month - n). Obtains one month of data, starting from n months ago.
nth Year Ago	From midnight on January 1 of (current year - n) until December 31 on (current year - n)
Days from Trigger	From Date until nth Value days later
Weeks from Trigger	From beginning of week containing Date ending nth Value weeks later
Months from Trigger	From beginning of month containing Date ending nth Value months later
Years from Trigger	From beginning of year containing Date ending nth Value years later

Ad-Hoc Trends

Ad-Hoc trending allows a single chart to combine data from multiple devices or applications seamlessly, without the need to create custom **SQL** views. As new **trends** are added to the system they automatically become available within the Ad-Hoc trending application.

To view **Ad-Hoc trends**, click on Ad-Hoc Trends in the ngAdmin sidebar



This opens the Ad-Hoc trending application:

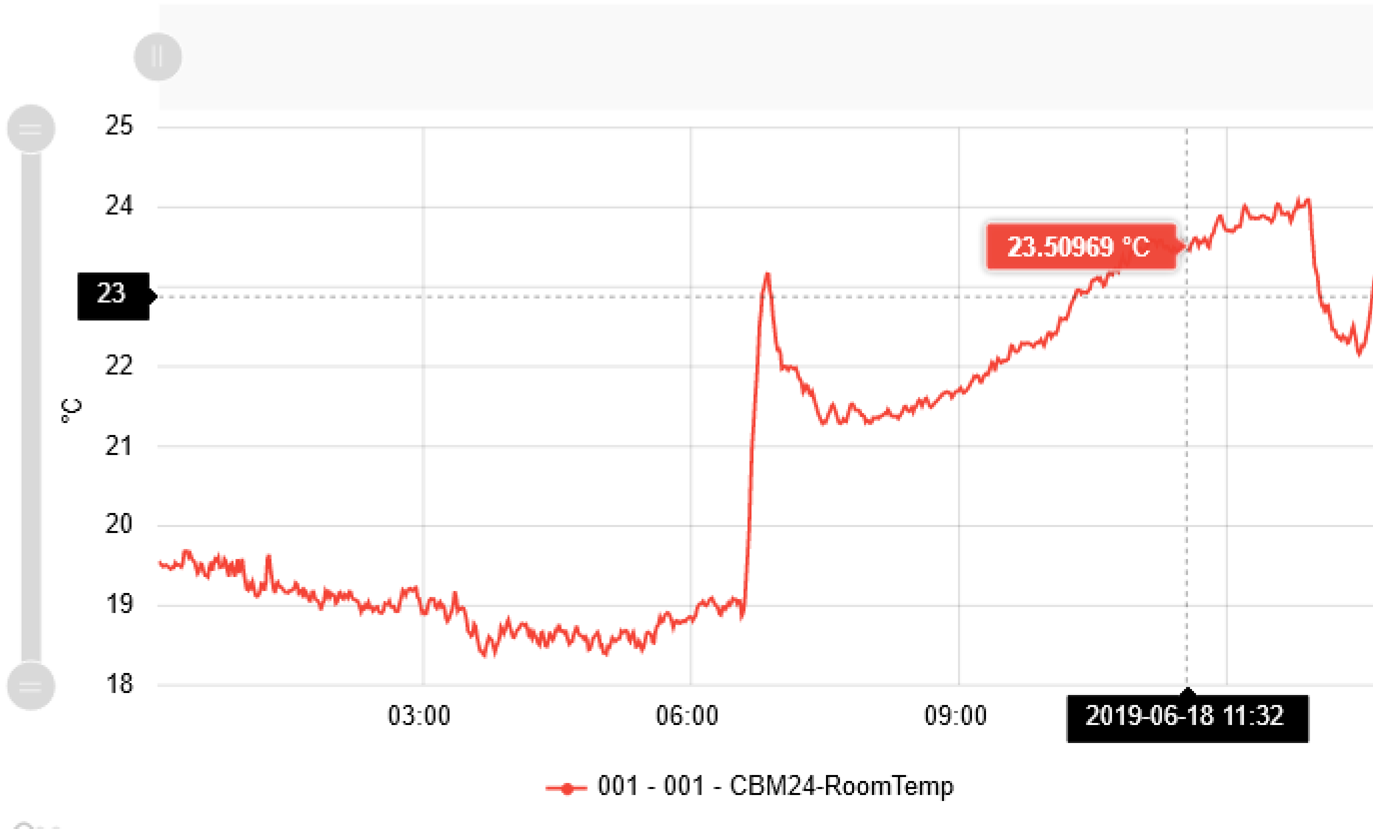

Ad-Hoc Trends
Controllers
UnitronToBACnet
NewGenericBACnetTest
005 - Network
001 - 061 - CBT13V
001 - 001 - CBM24
RoomTemp
001 - 060 - CBT13V
006 - Network
Alarms Testing
VX
25
24
23
22
21
20
19
18
°C
03:00
06:00
001 - 001 - CB
Collected
On-Demand
Get Data
Save Trend
Selected Trends (1/10)
Selection Options
Range:
Relative Date
Relative Range Options
Type:
Today
nth Value:
1
Date:

The Ad-Hoc trending application consists of 4 sections - the "Trend Chart" below, "Available Trends" on page 303, Action buttonsand the "Selection Options" on page 304 control.

Controls are also provided for "Saving and Exporting Trends" on page 305, for selecting between Collected and On-Demand trends and for "Ad-Hoc Trends" on page 298 limits.

Trend Chart

The Trend Chart area contains the active chart, with zoom controls. Tool-tips are displayed when the mouse is over the chart:



Slide the Zoom controls on the left hand side (to adjust the Y axis) and top (to reduce the time period shown) to display a subset of the **trend** data.

If a **Trend** contains more points than can be reasonably displayed at once, ASPECT will perform an automatic **roll-up** of the data using the interval of time that provides the greatest chart resolution while keeping the total number of values manageable.

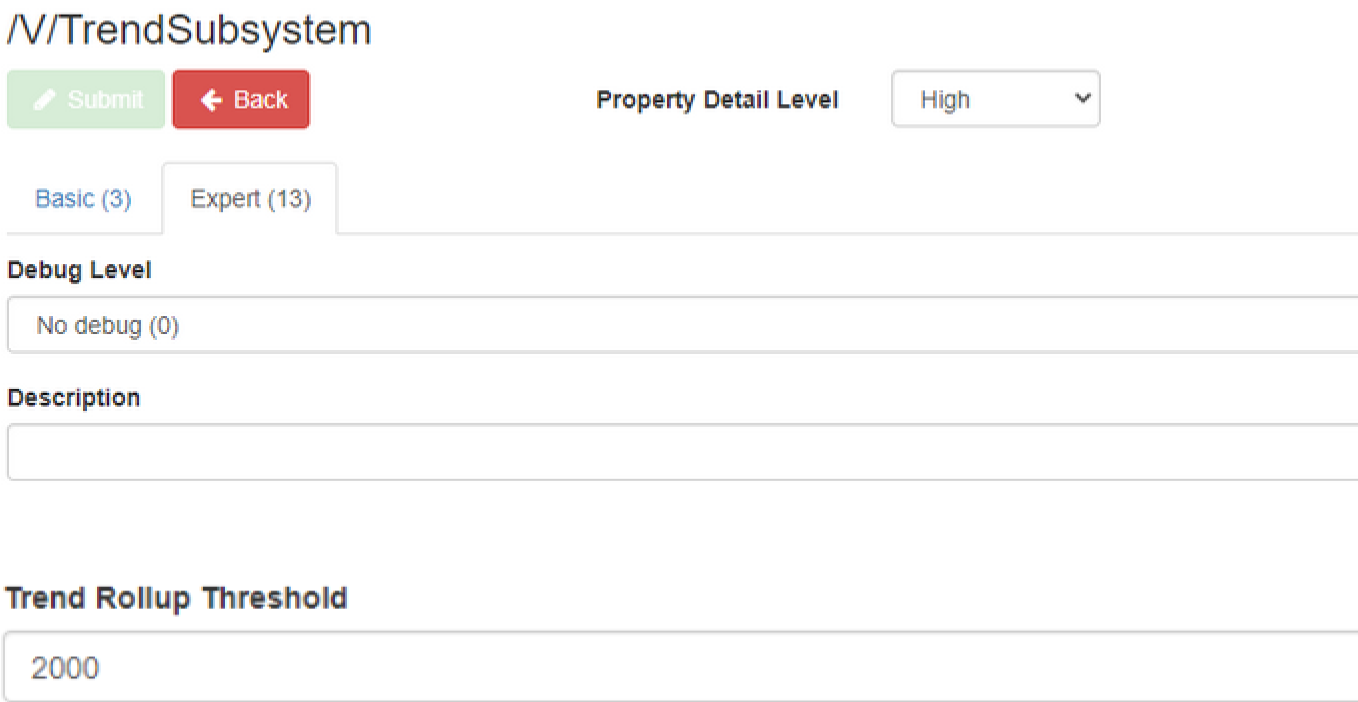
For example, one day worth of trend data at a one minute interval would be displayed at one minute intervals but one week of data at one minute intervals would be averaged and displayed rolled up into one hour intervals.

> **Note** When averaging occurs, **Enum** values become floating point, and are generally less meaningful and cause the scale of the chart to be stretched. Disabling or removing **Enum** values will correct the scaling issue.

Configuring the Roll-Up action

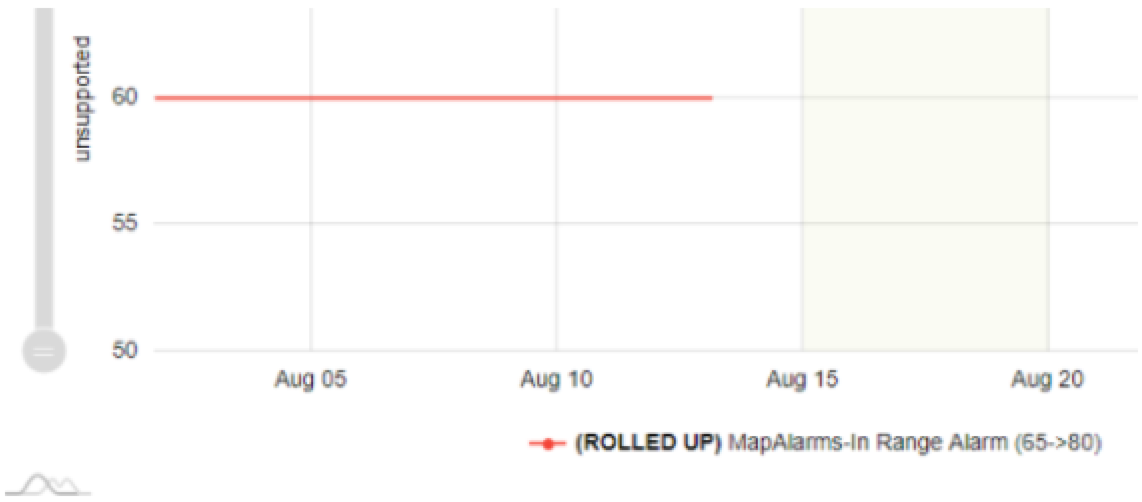
The Trend Subsytem under the Services node in the Map has an option to set how **Roll-up** is applied.

The number of samples returned by a query before rollup is applied is called the Trend Rollup Threshold. This threshold defaults to 2000, but can be set in the TrendSubsystem > Expert tab:

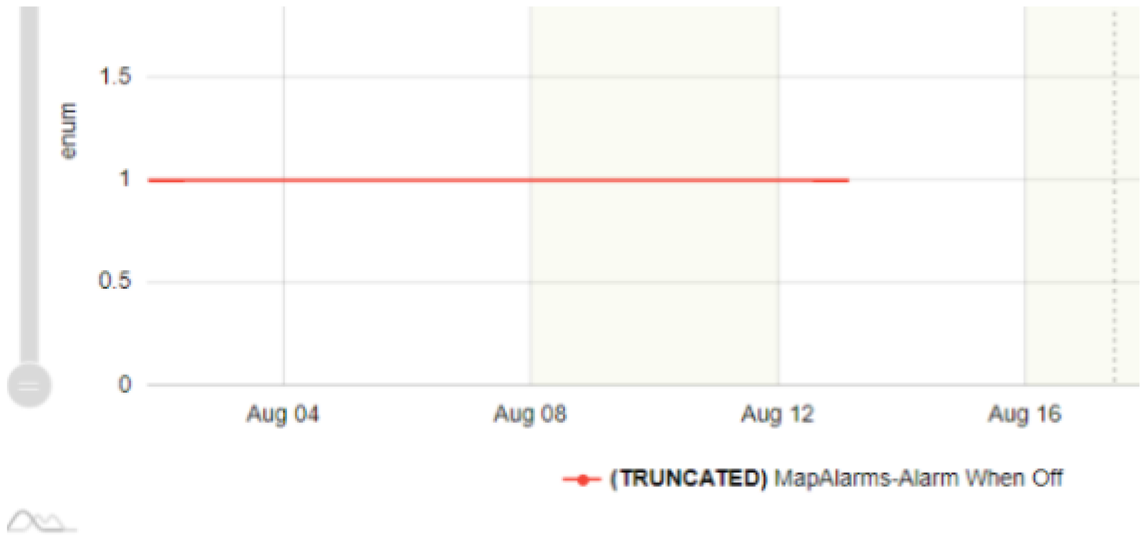


> **Note**: This feature was added in `v3.03.04-qr01`

When a query trend response exceeds the rollup threshold, a roll-up summary displayed and this is indicated in the chart legend:

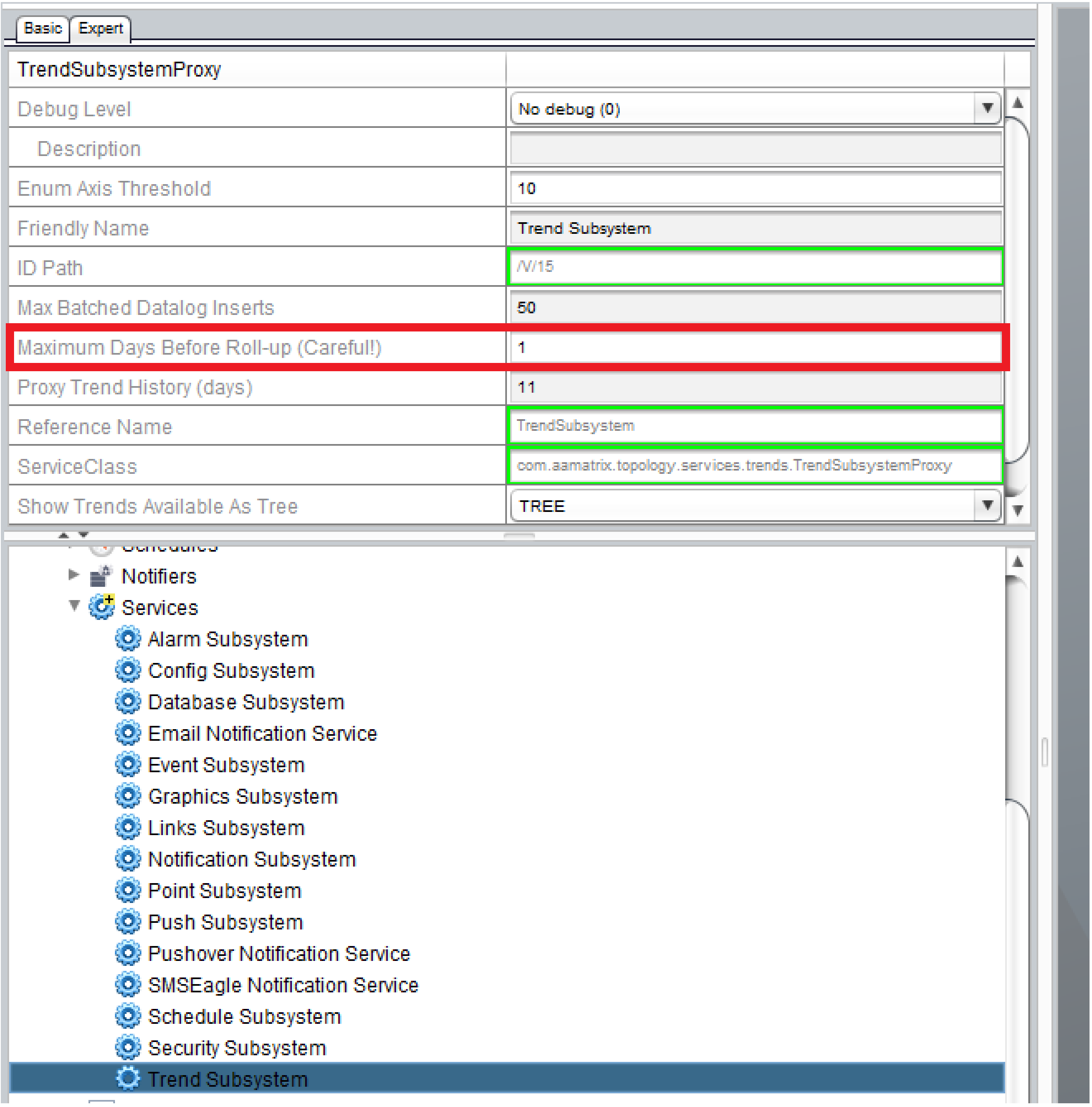


If a trend type cannot be rolled up, for example if the sample consists of digital binary data, then when query trend response exceeds the rollup threshold the number of samples will be truncated. This is indicated in the chart legend:



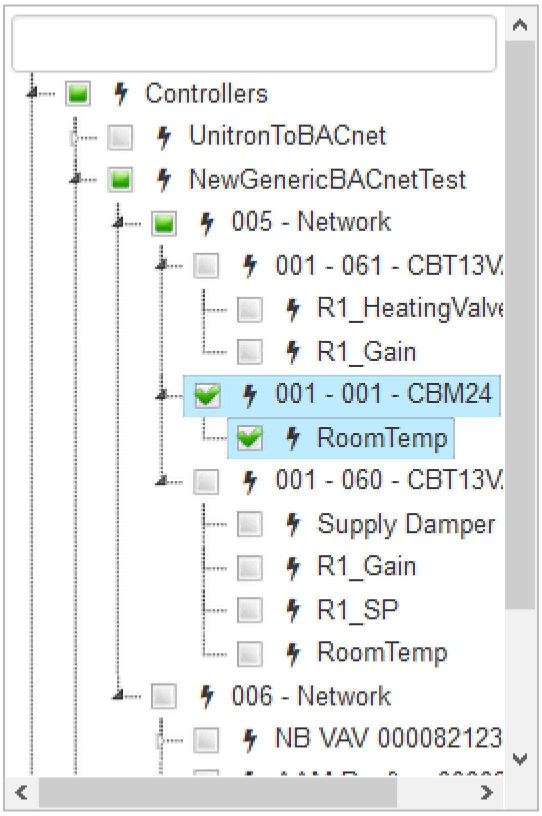
Irrespective of the number of samples in a time range, if a time range is greater than the Maximum Days Before Roll up (default is 1, max observed is 14), then the roll up is applied as follows:

- > 4 years is selected then roll up to a month
- > 2 months is selected then roll up to a day
- Otherwise roll up to hourly



Available Trends

The Available Trends selector is a tree of all the available **trends** in the Aspect Project. A point must simply be enabled for trending to be available in the tree.



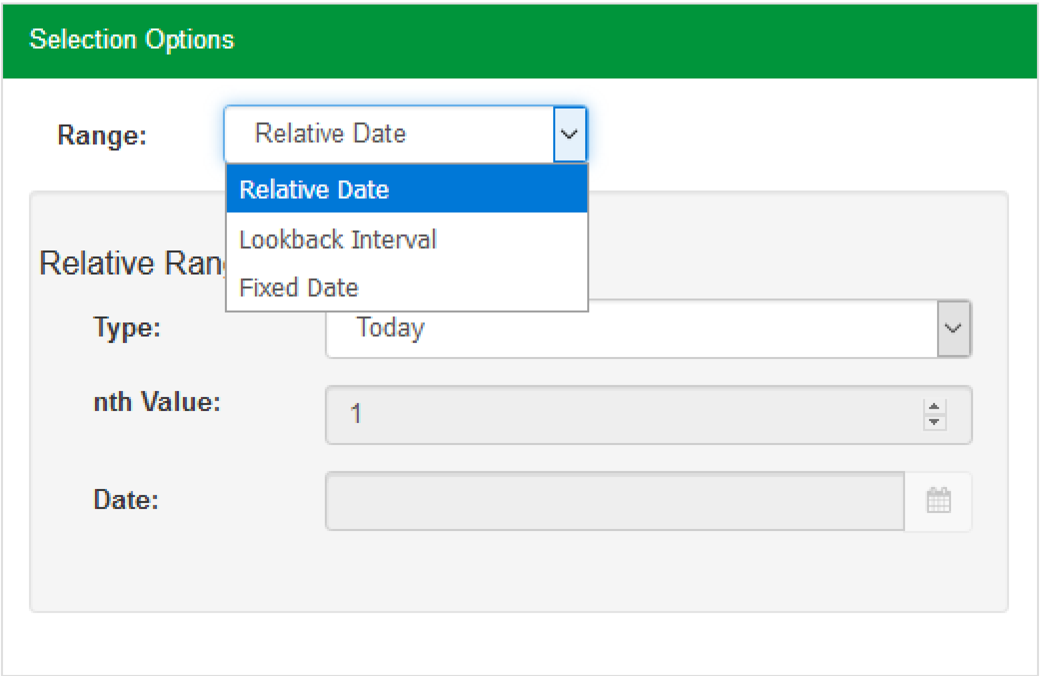
It is possible to restrict access to certain trends using the view permissions for a given point. Only points that a user has view permission for will appear in the listing for that particular user.

Because the number of available trends on a given system may be very large, a filter text box is provided to help locate specific trends.

Selection Options

Selection Options control the type and range of the dates for the Trend Chart. All trend items added to the chart will follow the same Selection Option Criteria.

Ranges



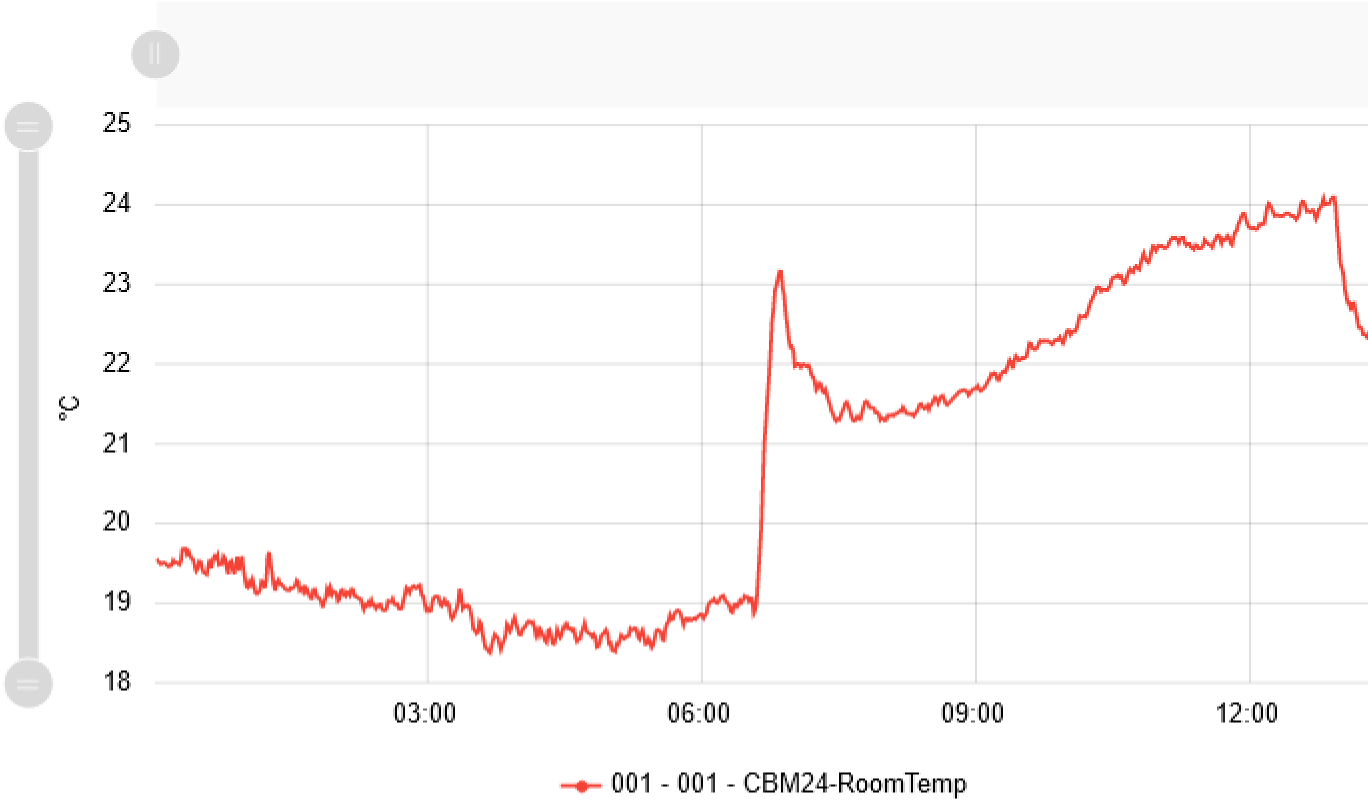
- Relative Dates define blocks of time relative to the current date e.g. "Yesterday", "Last Week", "Two Months Ago".
- Lookback Intervals are a way to specify a custom time range relative to the present time. They are defined using the same lookback text expressions as the Java Applet view

Time Interval	Code
Minutes	m (20 minutes is 20m)
Hours	h (36 hours is 36h)
Days	d (5 days is 5d)
Weeks	w (3 weeks is 3w)

- Fixed Dates are simply a fixed range of data from a starting date and time to an ending date and time.

Saving and Exporting Trends

The data used to generate the Trend Chart area can be exported in several formats for use in Excel or other software by clicking on the Export button at the top right of the chart.



An exported CSV file will have a timestamp column plus one column for each trend on the graph. Trends marked as disabled in legend will still be exported as they are part of the graph even though they are not being displayed.

If a trend is useful at a later date, it may be saved by clicking Save Trend button.

This will open a save dialog that prompts for a name for the trend. Assigning a meaningful name to the trend is important for later use. You may wish to specify a description of not only the included trend items, but also the selection range. Click confirm to save the trend and close the dialog.

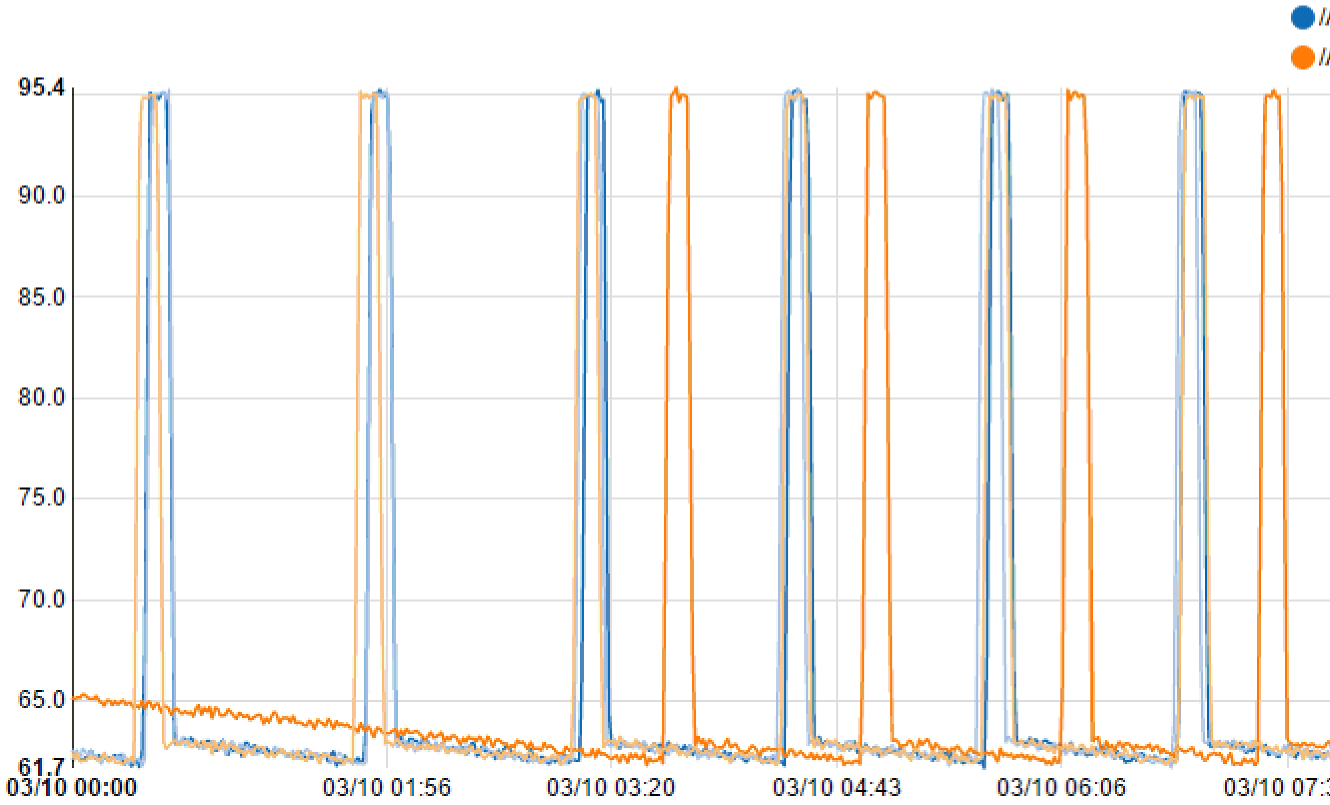
Saved Trends

The Saved Trends application is accessible from the navigation tree or a specific Favorite saved trend can be launched directly from the Favorite Trends container on the dashboard.

Saved trends are a collection of trends created in the Ad-Hoc Trends application that have been saved for re-use.

The Trend Graph in the Saved Trends Application functions identically to the Trend Graph in the Ad-Hoc trends application.

Saved Trends : Athletics Supply - Today



Export as CSV

	Name	Date
0	Admin Zone - yesterday	2015-11-04 09:51
1	sales demo	2016-02-08 14:54
2	Athletics Supply - Today	2016-03-10 11:57

Edit Data Range

Beneath the Trend Chart is the Saved Trends table. Each row in the Saved Trends table shows the name of the Saved Trend as well as the date the Saved Trend was created.

Favorite Trends

Trends may be marked as Favorite Trends by clicking the star icon. Marking a Saved Trend as a Favorite makes it available in the Favorite Trends section of the dashboard. Clicking an item in the Favorite Trends list will open the Saved Trends application and automatically load the saved trend with its default range selection.

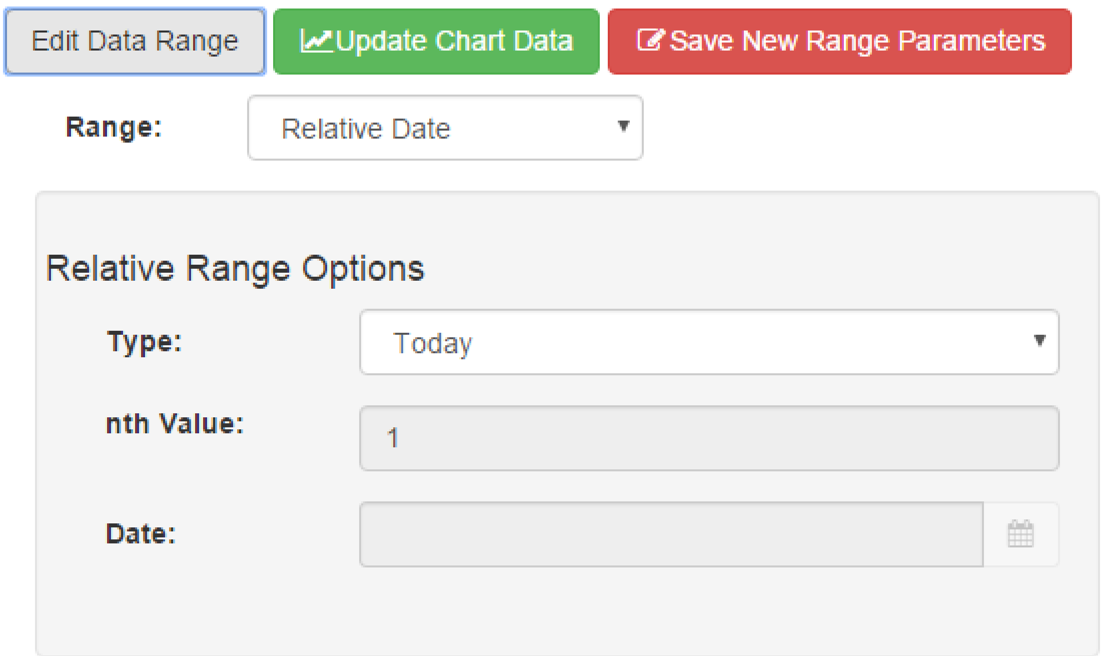
Deleting Saved Trends

Clicking the waste bin icon will delete the Saved Trend for the table. This only removes the Saved Trend itself and has no effect on the Saved Trends of other users or the underlying trend data.

Editing Data Range

By default, a Saved Trend is loaded with the range that was selected when it was saved. By enabling the Edit Data Range button, the Range selection controls appear. These controls function identically to those in the Ad-Hoc Trends application.

When the new range selection is complete, click the Update Chart Data to retrieve the selected trends with the new selection range. To make the new range selection the permanent default, click the Save New Range Parameters button.



Exporting Trends

The trend data used to generate the graph displayed in the Trend Chart area can be exported as a CSV document for use in Excel or other software by clicking on the Export as CSV button. The resulting CSV file will have a timestamp column plus one column for each trend on the graph. Trends marked as disabled in legend will still be exported as they are part of the graph even though they are not being displayed.

Scheduling

Scheduling Overview

ASPECT3.0 supports iCal and Exchange schedules which are a good choice for schedules that need to be maintained by non-technical users. These schedule methods allow users to quickly and easily schedule occupancy using familiar user interfaces such as Microsoft Outlook or Google Calendars.

ASPECT 3.0 uses concept of an ASPECT Weekly Schedule and Aspect Calendar. ASPECT Weekly Schedules and ASPECT Calendars exist entirely within the ASPECT system and require no outside network connections. Weekly Schedules and Calendars are ideal for ASPECT users that wish to leverage the existing Aspect permission structures and have access to the schedule application available directly within the ngAdmin interface.

Scheduling Topics

Editing Schedules

Aspect Weekly Schedules

Aspect Calendars

Time To Next Schedule Transition

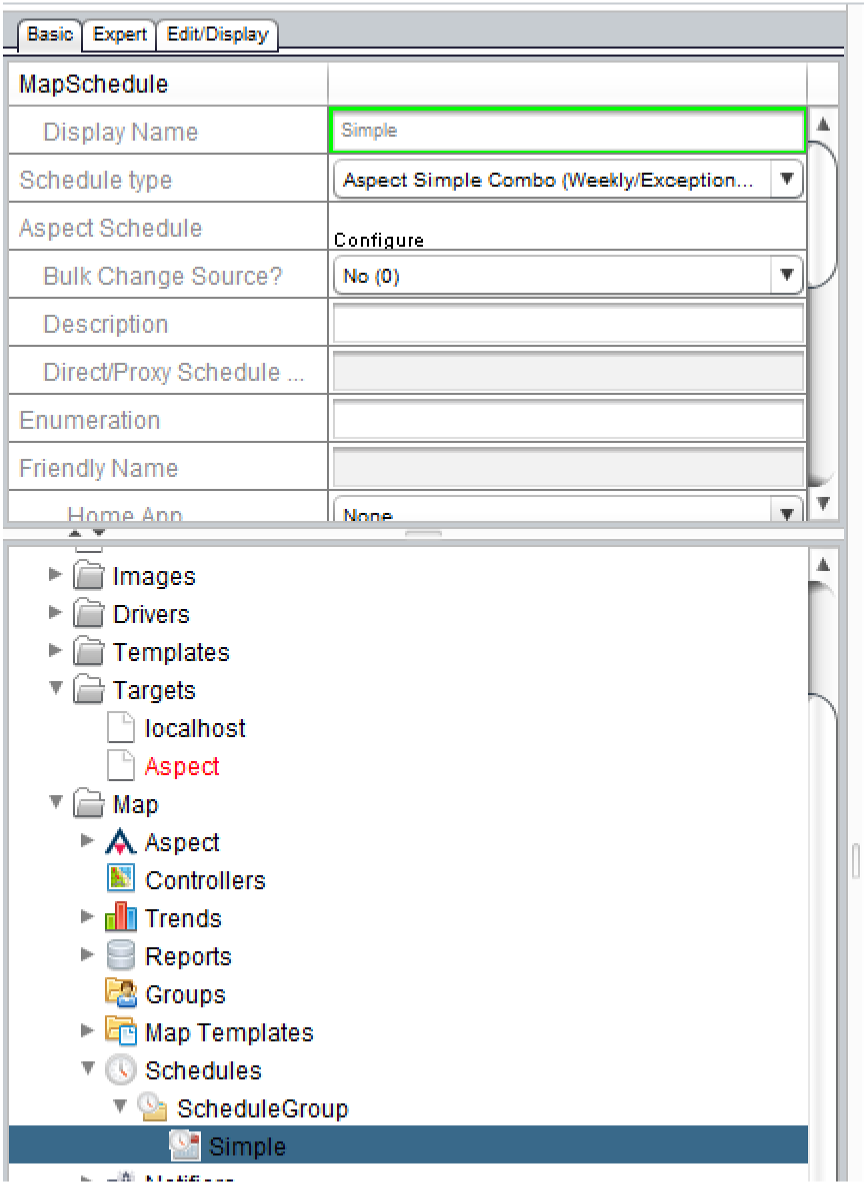
Time To Next Schedule Transition

Since v3.04.00

Schedules have been enhanced so that they can expose the amount of time until the next or time since previous transition state offering project designers the ability to fine tune equipment startup and setback times. See the new Schedule Transitions element on the Time/Rate diagram tab.

Setup and Configuration

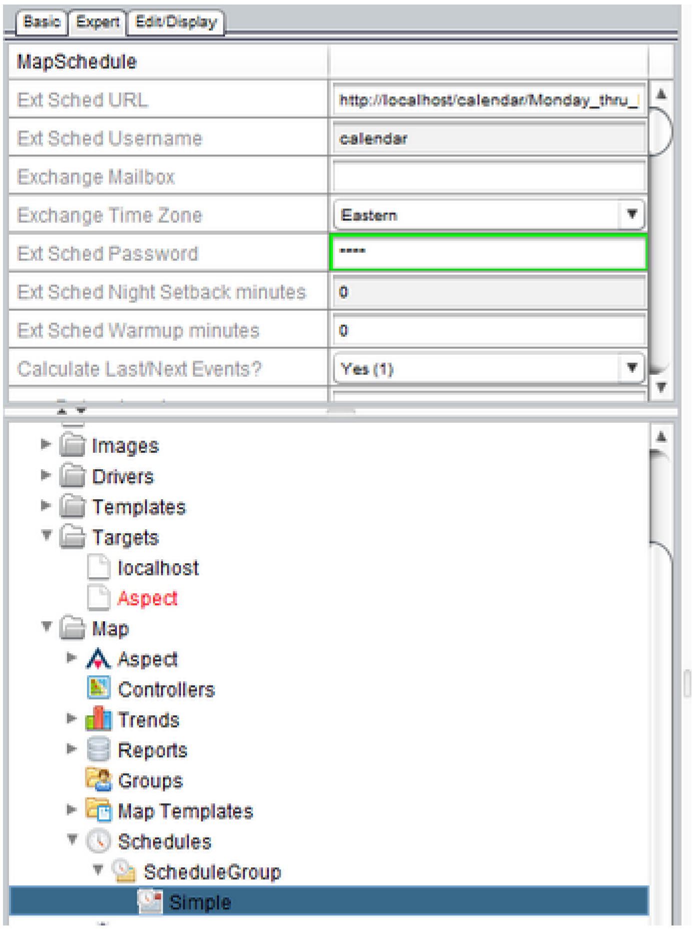
Select a Schedule



The Time to Next feature in ASPECT is designed to work with **Simple Combo** Schedules only. This type of schedule is similar to the **Aspect Combo** Schedule except that its output type is not configurable and will always present Boolean output as either Occupied or Unoccupied and there is no Alterr-ate Schedule option.

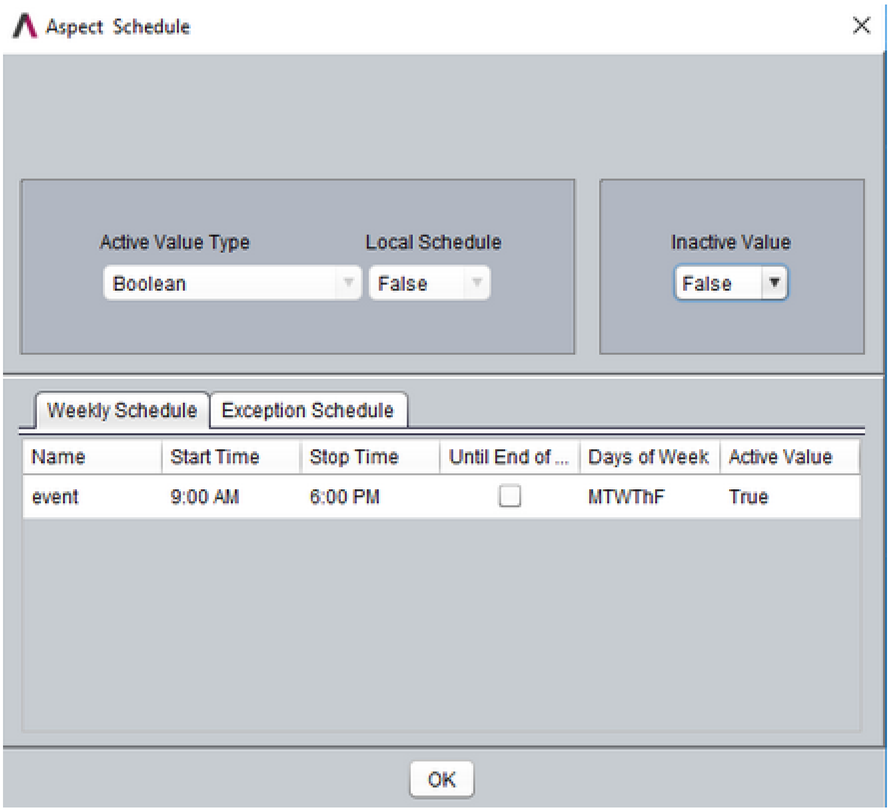
After selecting the **Simple Combo** Schedule, set the Calculate Last/Next Values to yes. If yes, the prior and upcoming active and inactive events will be cal-culated for the schedule.

NOTE: This is CPU intensive (especially on smaller targets) and should be used with care. Required for schedules used as references for relative schedules and for the Aspect Time to Next feature. While you can enable Calculate Last/Next values for any type of Aspect Schedules we strongly recommend against using this option with any calendar type other than Aspect Simple Combo.



Configure a Schedule

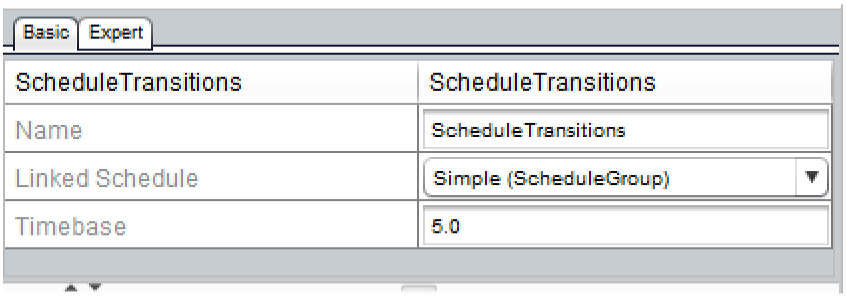
Select **the Aspect Schedule** “Configure” button on the Schedule Basic Panel to bring up the following dialog



The default schedule configuration will be Monday thru Friday 9:00am to 6:00pm this can be modified here or after deployment using Aspect's ng-admin tool. Exceptions may also be added here or added to a deployed project in an active device.

Drop a Schedule Transitions Element

Drop a Schedule Transitions element on the diagram view of an application of you choosing. This element is found on the "Time/Rate" palette or using the Diagram Element Sleuth tool. The Schedule Transitions elements will interrogate the Map for any Aspect Simple Combo schedules available. The default is none, select the appropriate schedule.



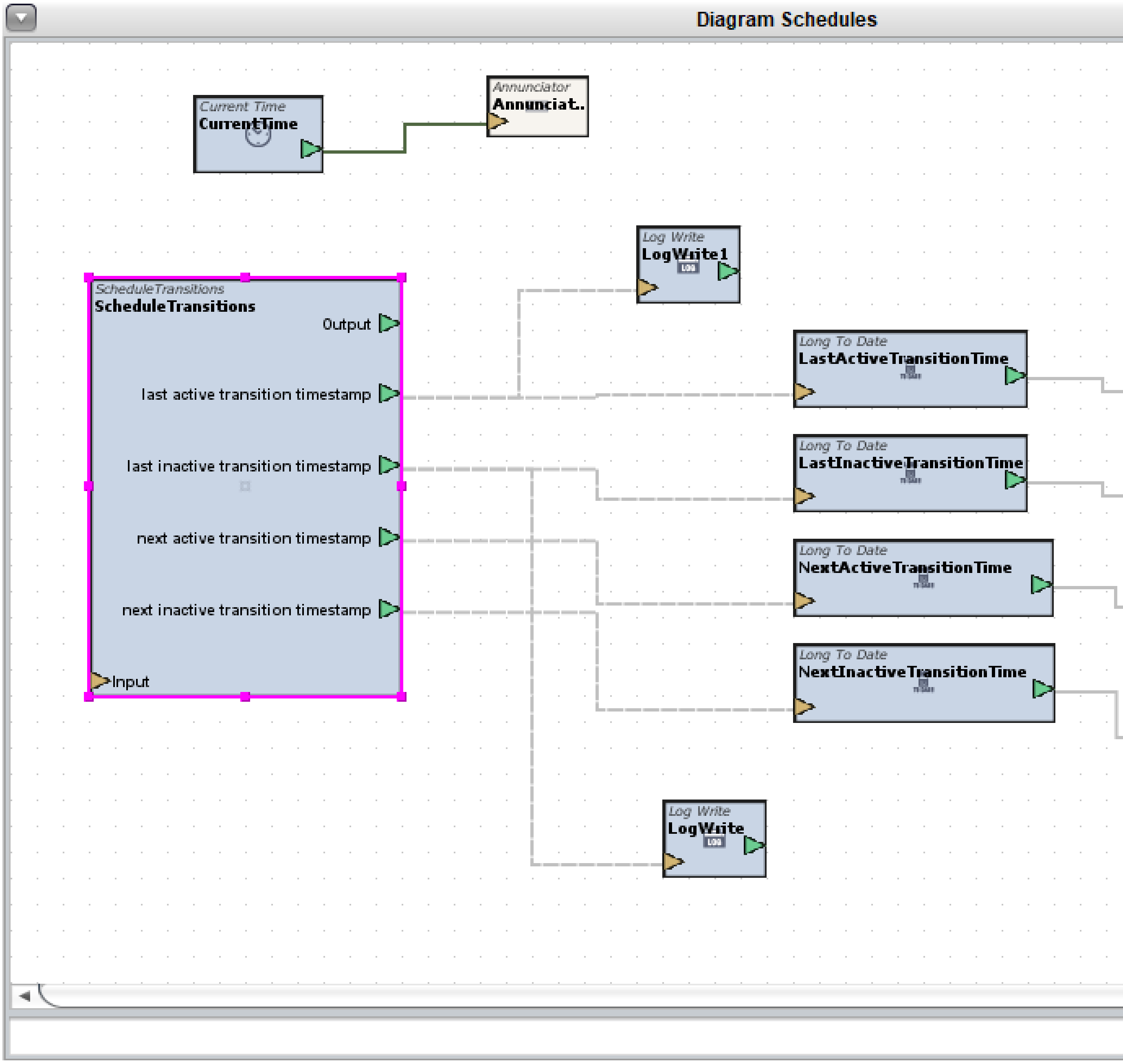
The Schedule Transition Element will output the following values:

- Last Active Transition Timestamp
- Last InActive Transition Timestamp

- Next Active Transition Timestamp
- Next InActive Transition Timestamp

Values are output in milliseconds since EPOCH (January 1, 1970) and can easily be converted to a formatted date using the “Long To Date” element included with Aspect from the Time/Rate palette.

These values can now be manipulated as needed to modify start and stop times per a given schedule.



NOTE: After initial startup, the Last Active and Last Inactive timestamps are computed by iterating through time backwards

> until a match is found. In order to keep CPU utilization low, this is done at 5 minute intervals and may initially compute these values off by up to 5 minutes. This only happens at target startup time and self corrects after natural state transitions. This interval can be modified on the Schedule Subsytem Expert tab under the “Event Search Granularity” property. Use caution on Matrix targets when modifying this value as it will increase CPU utilization.

Editing Schedules

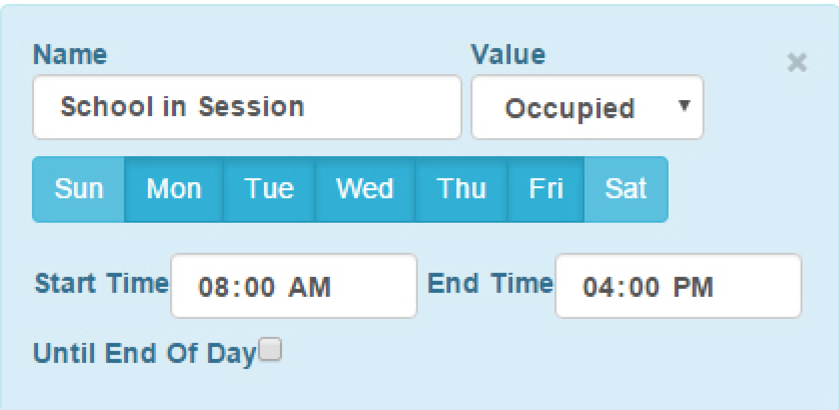
Editing Schedules

Add an Event Entry

New Events are added by clicking the Add Event button. This applies to Weekly Schedule, Alternate Schedule and Exception Schedule Events.

Configure a Weekly or Alternate Schedule Event

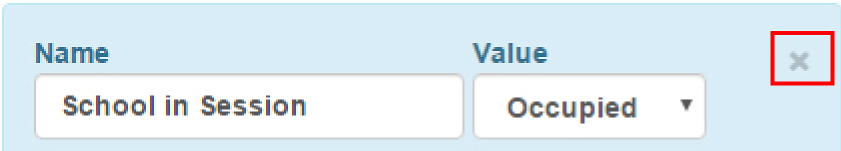
To edit a Weekly or Alternate Schedule using the Schedules application, select the respective tab on the Schedule. Each event appears as a control in the list beside the weekly agenda view.



1. Enter a description of the event in the Name field.
2. Select or insert a Value in the Value field. This field may be either a number entry field or a selection box, depending on the schedule configuration.
3. Toggle the active days for the event. Lighter colors represent inactive days and darker colors represent active days.
4. Select an event Start Time.
5. Select either an End Time or the Until End of Day box.

Delete a Weekly or Alternate Schedule Event

To delete an event, simply click on the x in the upper right of the Event control.



Edit an Exception Schedule Event

Exception Schedule events, unlike Weekly and Alternate Schedule events can span across end of day boundaries. This makes them powerful, but difficult to represent visually. It is suggested that Exception Schedule events be used sparingly.

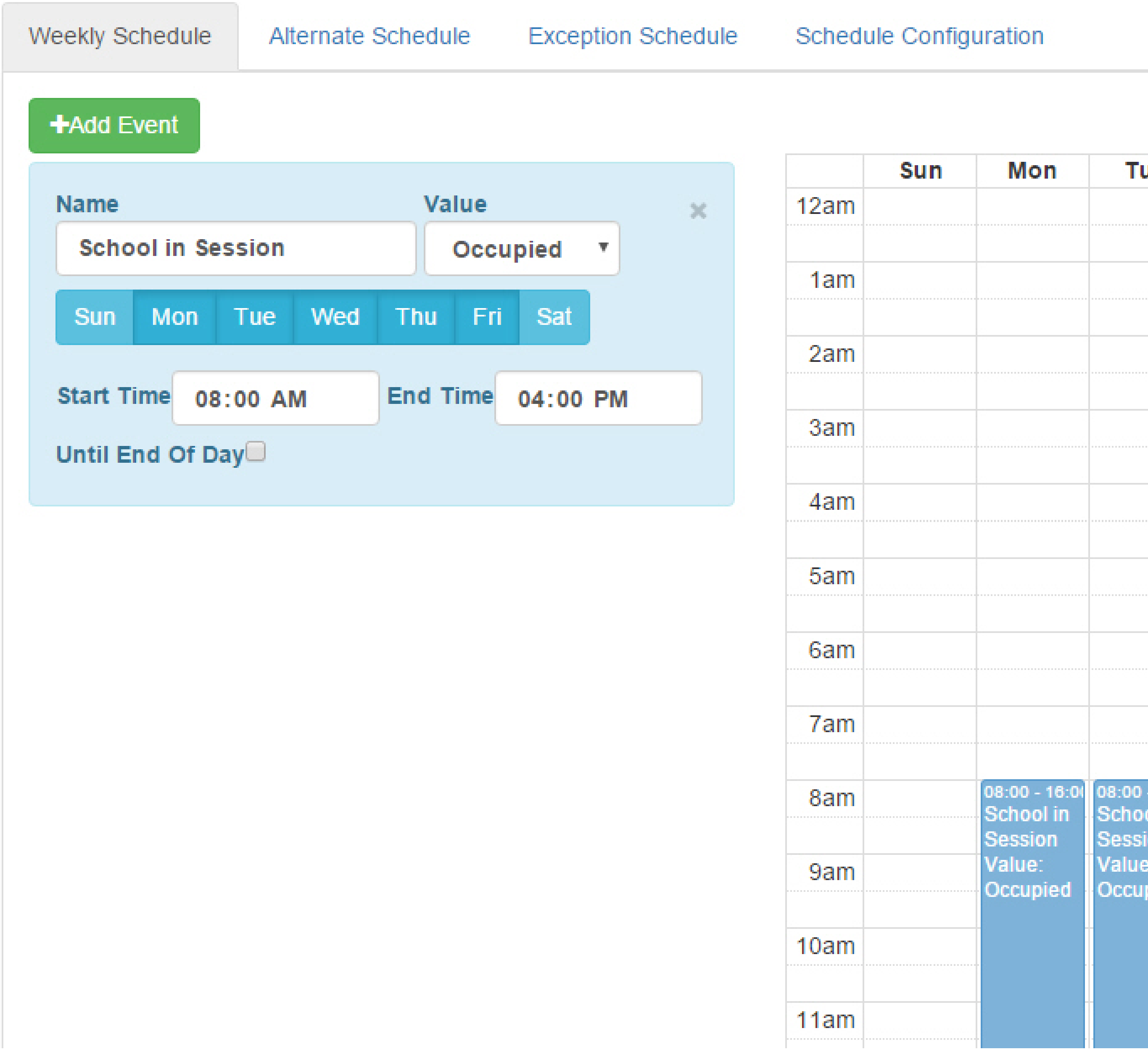
1. Enter a description of the event in the Name field.
2. Select or insert a Value in the Value field. This field may be either a number entry field or a selection box, depending on the schedule configuration.
3. Select an event Start Date (with integral time component)
4. Select an event End Date (with integral time component). Note that the absolute end of a day must be entered as midnight (00:00) of the following day.

Aspect Weekly/Exception Schedules

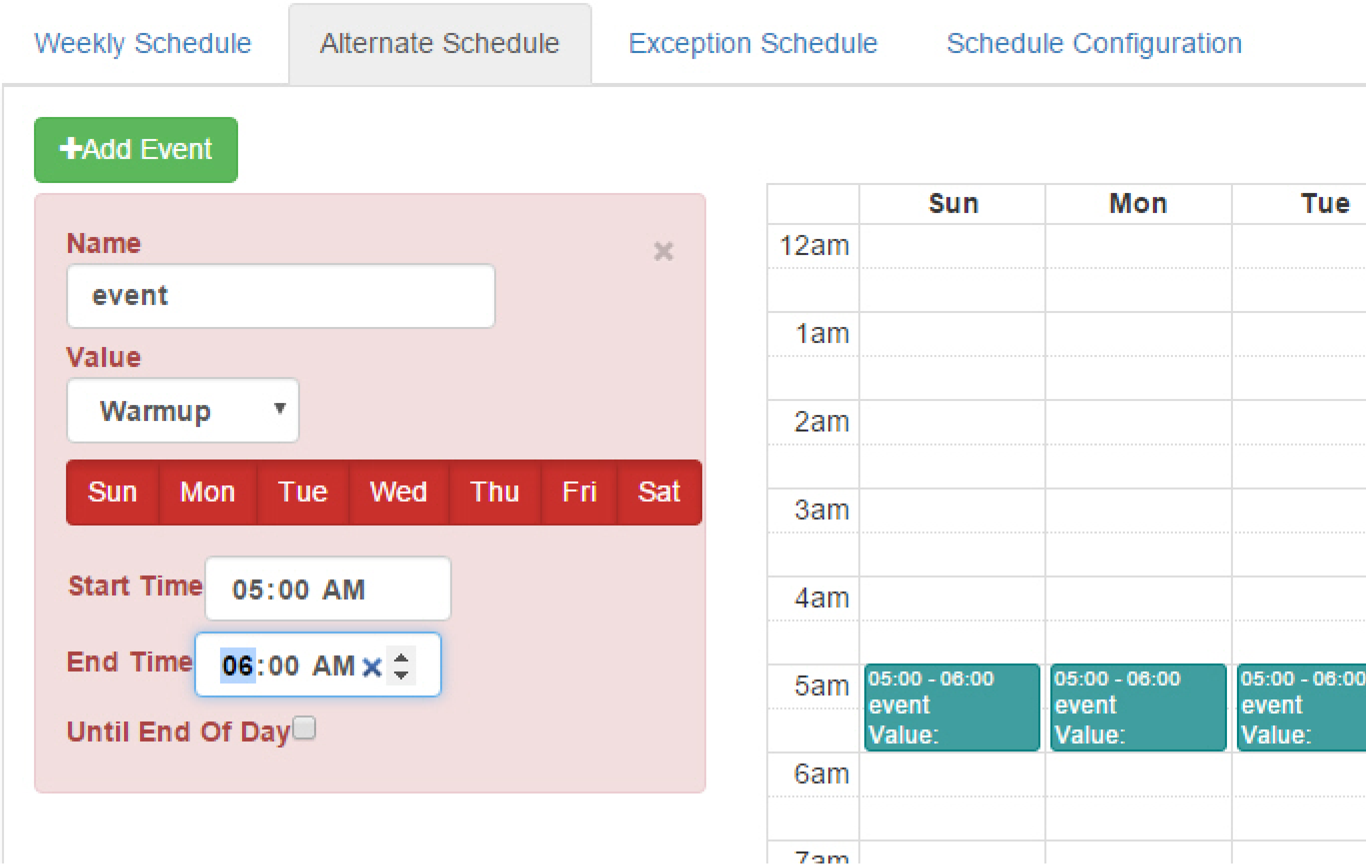
Aspect weekly schedules are similar in concept to BACnet weekly schedules with a few key differences - they provide both a Main and an Alternate Weekly schedule as well as an integral Exception schedule.

Weekly and Alternate Schedules

The Weekly Schedule and Alternate weekly schedule are the same type of entity. Under normal operation, with nothing being written to the input pin (override) of the schedule element's Map Point, the Weekly Schedule will be active.

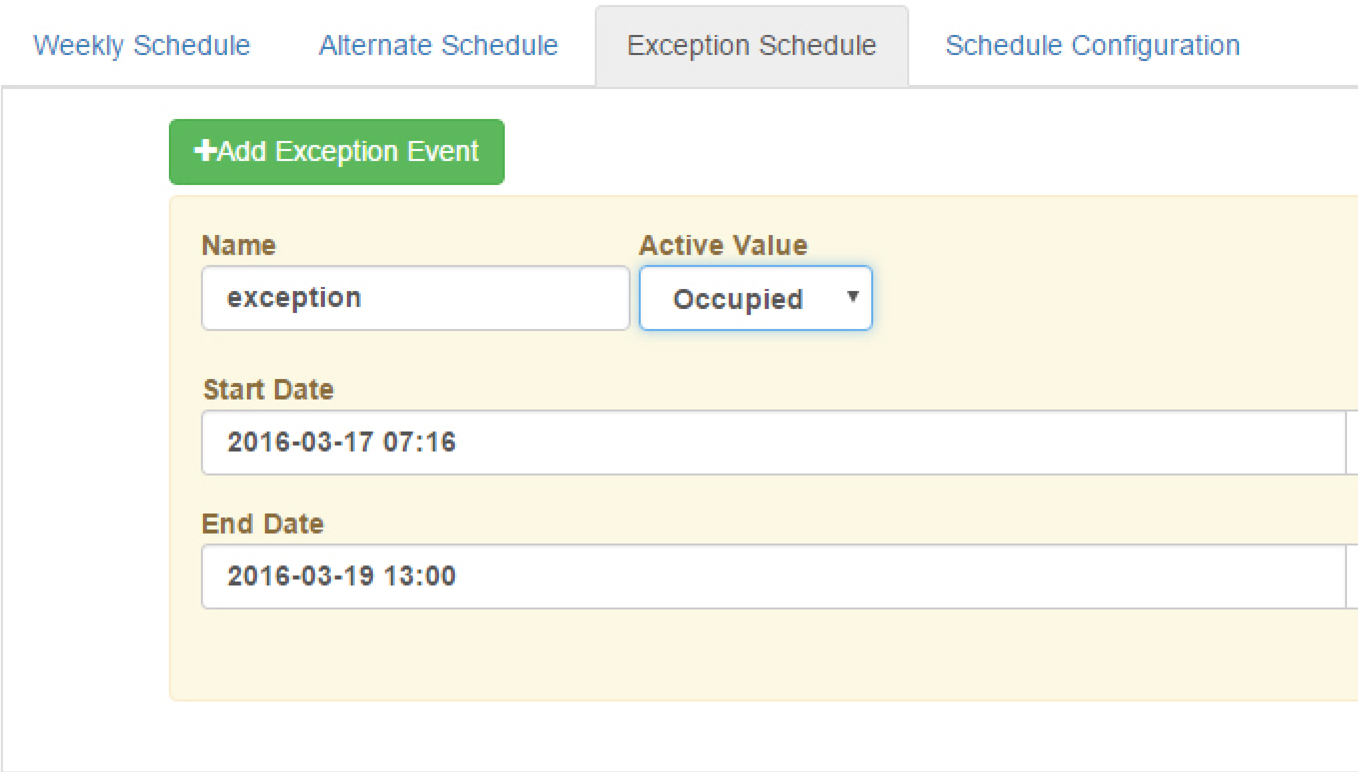


The Alternate Schedule is another set of weekly schedule events with the same capabilities as the Weekly Schedule. The active schedule may be either the Weekly Schedule or the Alternate schedule but never both. Switching between schedules via an override will require the newly active schedule to be distributed to any controllers that are using distributed schedules.



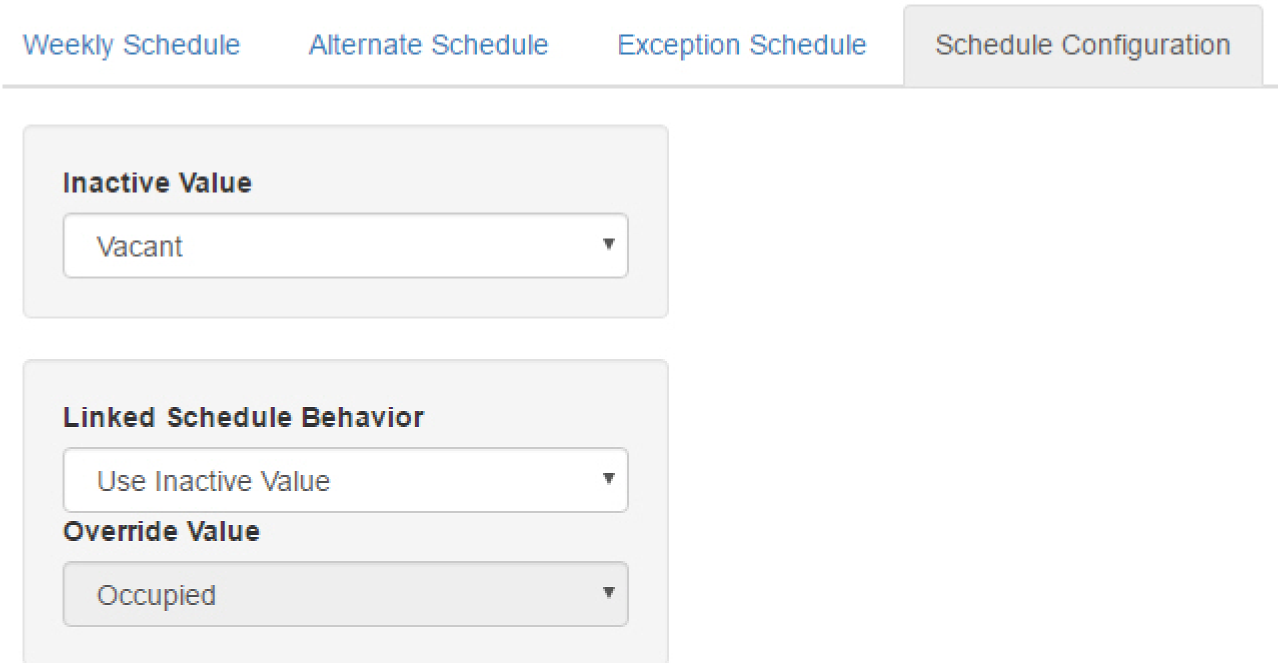
Exception Schedules

Exception schedules will override the value of any weekly schedule or the value of an active override. Exception Schedule events consist of Start/Stop dates and times.



Schedule Configuration

The Schedule Configuration tab contains parameters that affect the operation of the selected Schedule via the Input pin. This behavior is determined by the configuration of the Override Type.



Linked	Function

Schedule Behavior	
Use Alternate Schedule	When a non-zero value is supplied to the linked schedule, the calendar will output the Alternate Schedule value(or distribute the Alternate Weekly Schedule)
Force Inactive	When a non-zero value is supplied to the linked schedule, the calendar will output the Inactive Value
Override Value	When a non-zero value is supplied to the linked schedule, the calendar will output the Override Value

Aspect Calendars

Calendar Basics

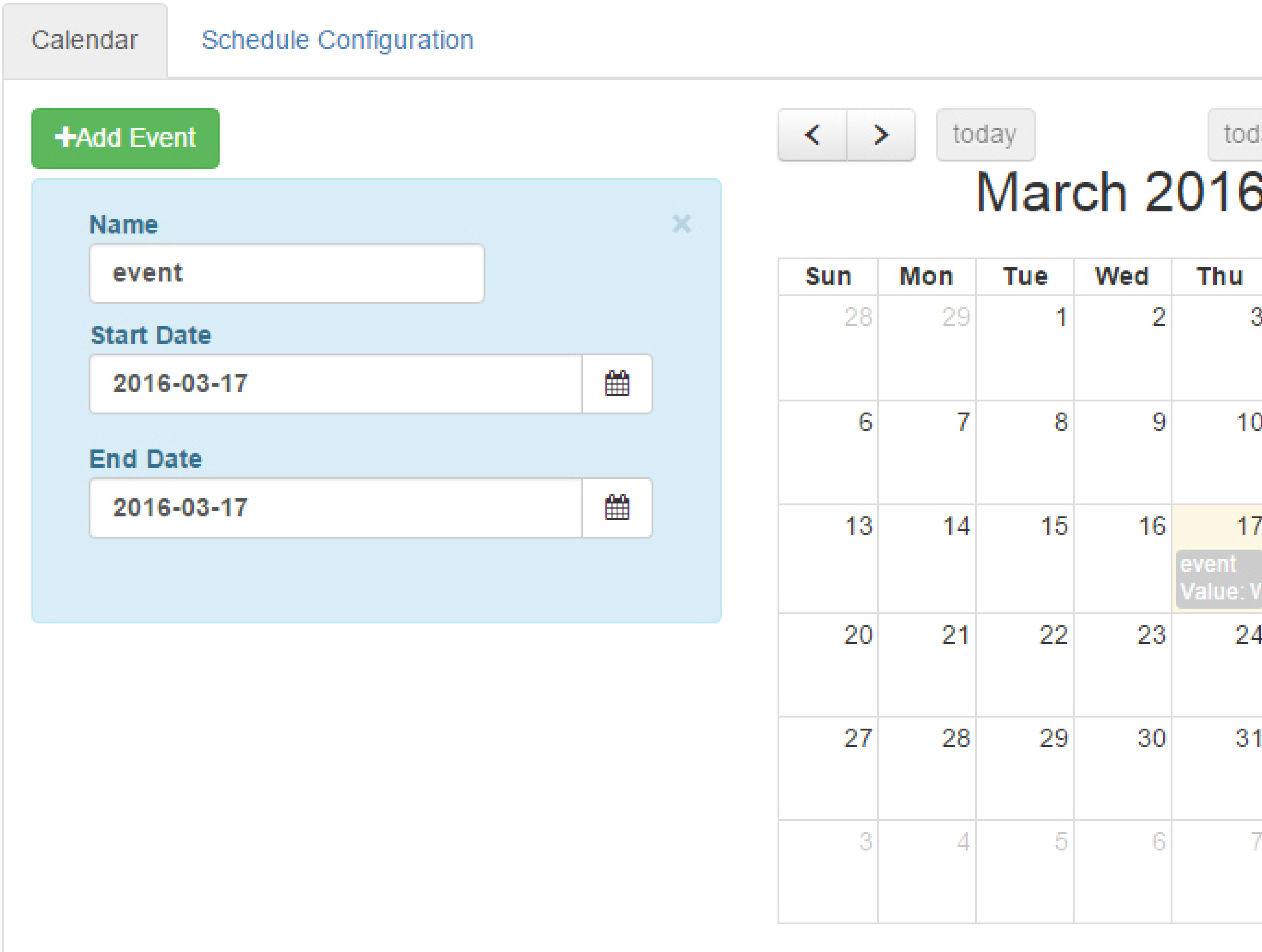
Aspect Calendars are lists of start and stop dates. Note that unlike Aspect Weekly/Exception schedules, Aspect Schedules are not coerced to BACnet objects and distributed to controllers.

Aspect Calendars behave in a similar fashion to the existing iCal and Exchange calendars - they output a value that can be used to trigger components, set an override in a controller, or even enable/disable other calendars.

Editing a Calendar

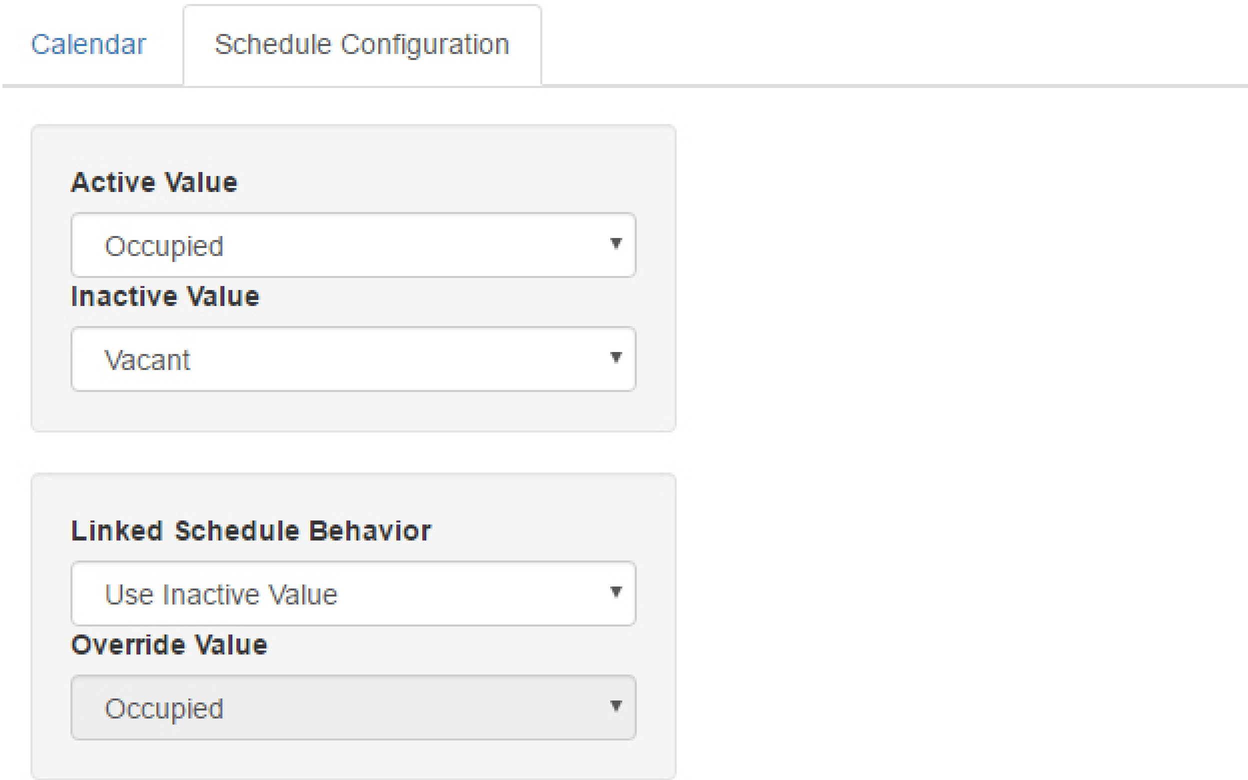
New events are added to a Calendar by clicking the Add Event button. A meaningful name should be specified as well as a Start Date and End Date. Aspect Calendars have no time component.

Events are represented in the monthly calendar view on the right. To change the visible month, use the navigation arrows at the top of the calendar control. To return to Today's Date from any month, click on the Today button.



Schedule Configuration

Like Weekly/Exception Schedules, Aspect Calendars have an Override Type that defines the output behavior of the Aspect Calendar.



Linked Schedule Behavior	Function
Use Active Value	When a non-zero value is supplied to the linked schedule, the calendar will output the Active Value
Use Inactive Value	When a non-zero value is supplied to the linked schedule, the calendar will output the Inactive Value
Use Override Value	When a non-zero value is supplied to the linked schedule, the calendar will output the Override Value

Notification Administration

Aspect Notifiers are a powerful new feature in Aspect 3.0.

Using Aspect Notification, it is simple to construct a flexible notification scheme that can leverage multiple transports (SMTP, Pushover, SMS notifications), different recipients for different alarm conditions, and even leverage schedules.

A list of the available Notifiers is shown in the Notification Setup application. To edit a Notifier, click the green edit button on the right.

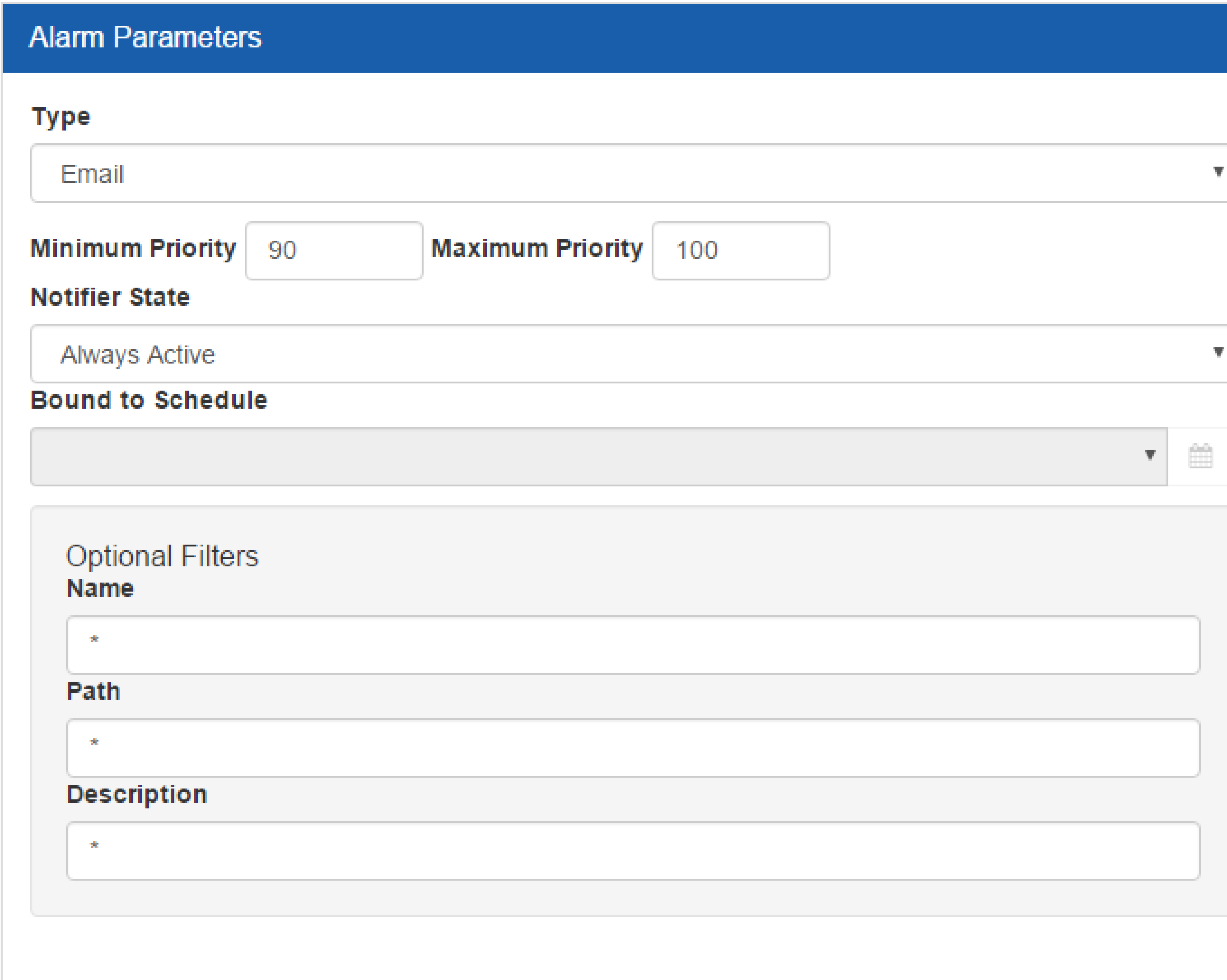
Notification Administration

Id	Name	Description
/N/JimsNotHiPriPushover	Jim's Regular Priority Notifications (Pushover)	Regular prioritiy notifications se service
/N/JimsHiPriPushover	Jim's HIGH PRIORITY Notifications (Pushover)	High prioritiy notifications sent t
/N/HiPri	HiPri	High Priority SMTP notifier
/N/AfterHours	AfterHours	SMTP After Hours
/N/Default	Default	Default SMTP notifier

Editing Notifications

Each "notifiable" event within Aspect (Alarms, certain Map Events) will be evaluated by every active Notifier in the system. If the event satisfies all of the Alarm Parameter conditions specified by the Notifier, a message will be generated using the Notification Text and sent to the recipients designated in the Notification Text.

Alarm Parameters



- Type is the transport mechanism used for the delivery of the Notification event. Type may be Email, SMS Eagle Gateway, or Pushover. Each of these delivery services must be configured in the Edit Aspect Services application before notification delivery will function.
- Minimum Priority and Maximum Priority values are used to perform initial event filtering based on the priority values of the event. If the event is not between the Minimum and Maximum priority levels, no further evaluation of the event will occur for the current Notifier.
- Notifier State is the next level of evaluation. Notifier States are Disabled, Always Active, Controlled by Schedule, and Inverted Schedule Control. Disabled Notifiers will automatically stop evaluation - this is useful to temporarily suspend a notifier without deleteing it.

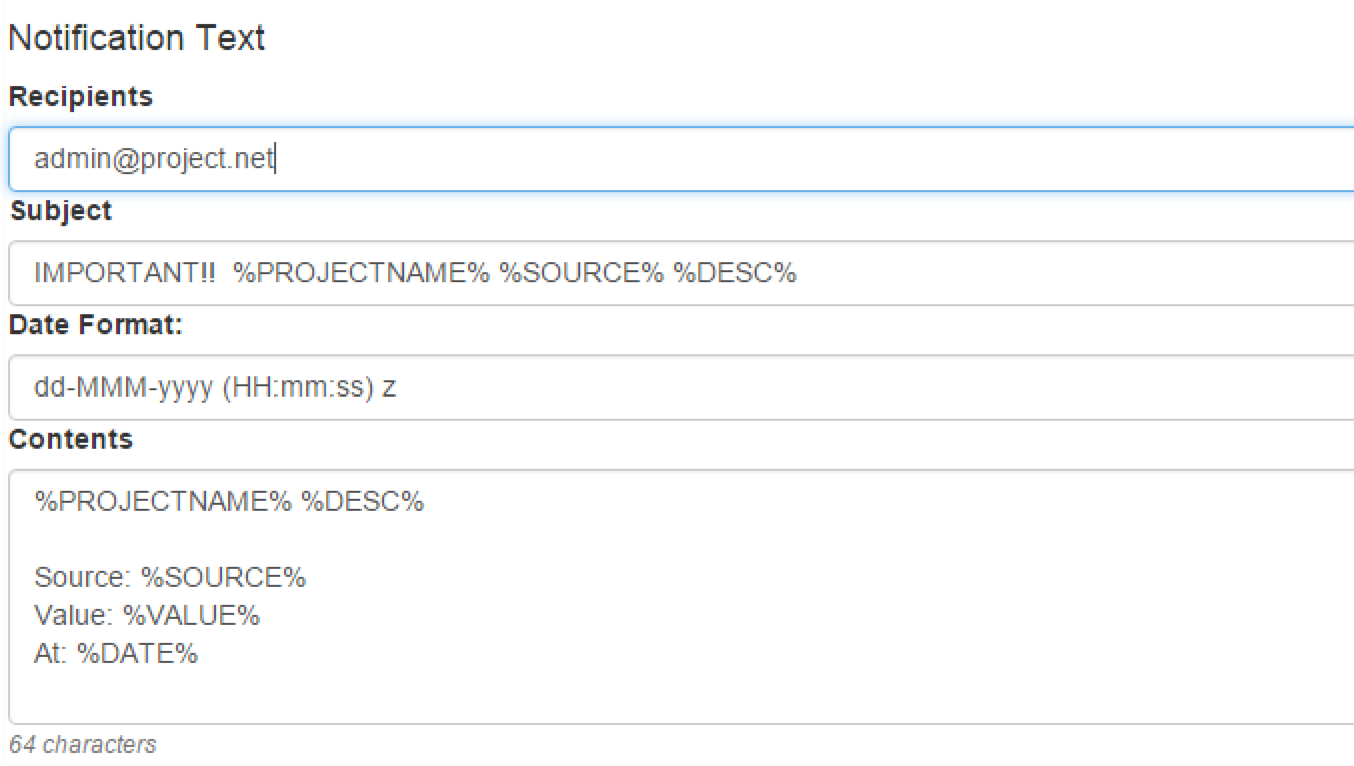
Always Active Notifiers will always continue to evaluate. Controlled by Schedule (with a corresponding schedule selection) will be true any time a schedule has an event/value and false any time it does not. Inverted Schedule control (with bound schedule) will be true any time the bound schedule does not contain a value.

- Bound To Schedule is a list of available schedules in the system. This item is disabled except when the Controlled by Schedule or Inverted Schedule Control options are selected as Notifier State options.
-

Optional Filters are text match strings for the incoming event. By default, the * wildcard is used - this will match any value in the Name, Path, or Description fields of the event. To narrow the match, user-specified patterns may be used in any of the filter fields. All fields must have a successful match (or wildcard value) for notification to occur. For example: *Class* in the Name field will match alarms from /A/Classrooms/C104, /A/Classrooms/C202 but not /A/Arts/Art1.

Notification Text

Notification Text allows the user to configure the recipients of the Notifcation as well as the subject and body of the notification message. A number of Tokens are available to use in the generation of this text. Tokens will be substituted with the values of the incoming alarm at the time the message is created.



- Recipients is a comma separated list of email addressed or SMS phone numbers. If using Pushover, this may be either a single Pushover recipient OR a Pushover Group - it is not possible to specify multiple pushover recipients via a comma separated list.
- Subject is the Email or Pushover Subject (not used for SMS)
- Date Format is a date formatting string to give flexibility over the formatting of the %DATE% token
- Contents contain the body of the Email, Pushover or SMS notification text, including any tokens. Care should be taken to observe length of the Contents field, especially when using SMS or split messages and additional usage fees may result.

Tokens

Token	Substituted Value
%PROJECTNAME%	Aspect Project Name
%DESC%	Description field as it appears in the Active Alarms table

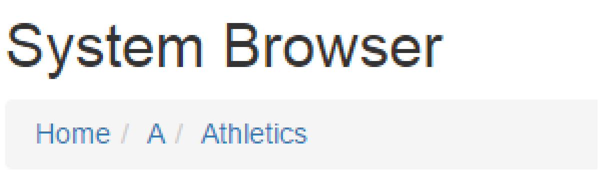
%SOURCE%	Path of the node that has entered the alarm state
%VALUE%	Value of the node at the time it entered the alarm state
%DATE%	Formatted Date as defined by the Date Format string
%ALARMCONFIG%	Alarm source

System Browser

System Browser Overview

The System Browser is similar in function to the view provided by the Automagic interface. It provides a hierarchical view of the Map database with a navigation pane and a content pane. On a computer or tablet in portrait orientation, the navigation is on the left - on smaller screens or in portrait orientation, the navigation will appear on the top and the content below.

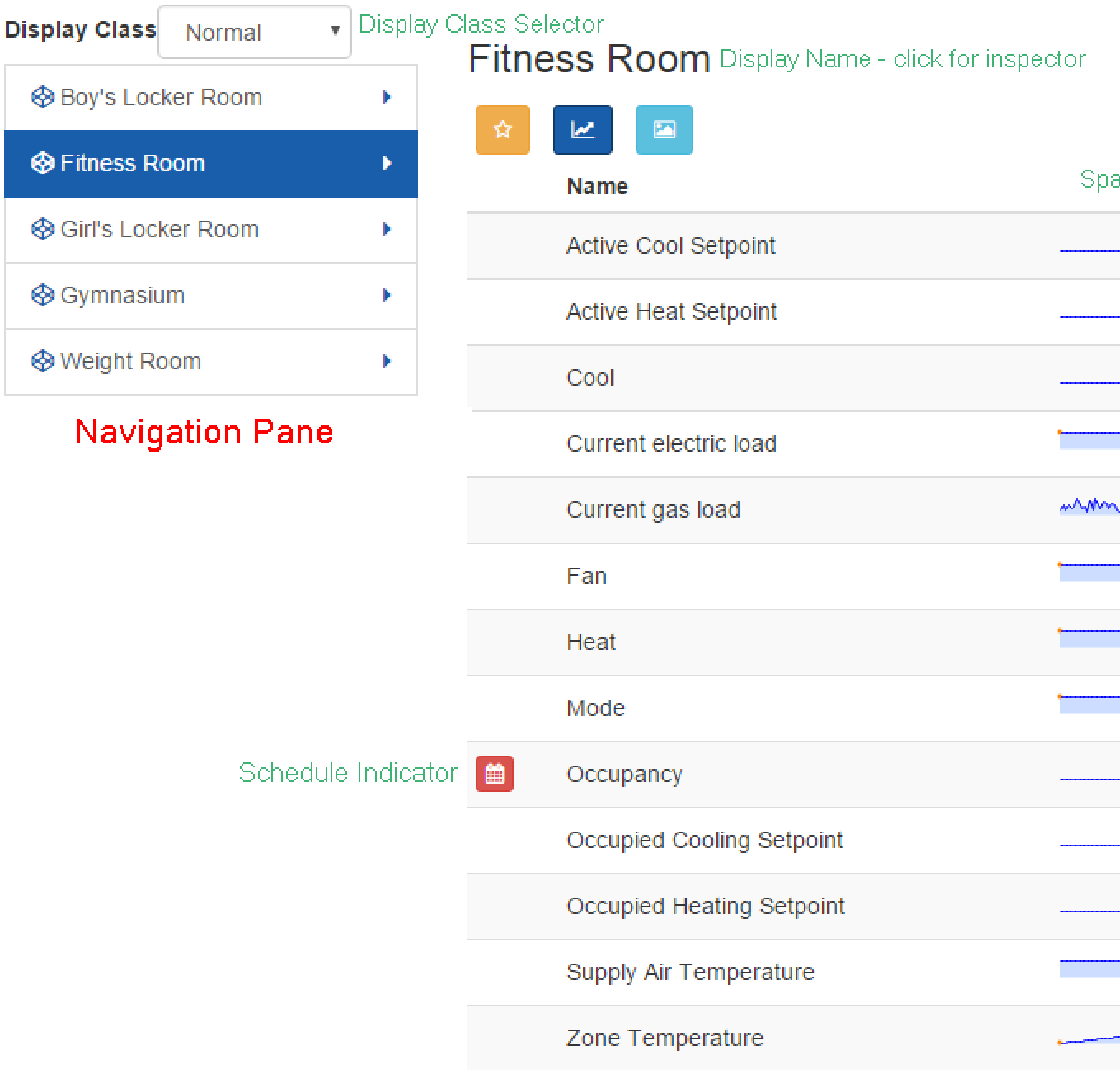
Above the navigation area is a "breadcrumb trail" of links. Clicking on any of the links contained in the trail will navigate to that level in the hierarchy.



Device View

Device View is the basic view of the system browser. Most map nodes default to the Device view.

Navigation is very simple and hierarchical in nature. Clicking on an item in the left will descend into the container that the item represents and new containers located within that item will be displayed in the navigation pane. Items that are not "containers" (typically, points) will be displayed in the main content area of the application



Context Features

The system browser view is heavily context focused. Clicking on the button will navigate to the HomeGraphic of the node. If a point within the node has a different HomeGraphic than its parent, a smaller version of the button will be visible on the row containing that point.

Each point with a bound schedule will have a small schedule indicator icon . Clicking the schedule icon will open the schedule editor for that point.

Points with sparklines available can show an overview of the points value over the last 60 samples. Clicking on the icon beside the sparkline will create a new ad-hoc trend with that point value pre-selected from the list.

Additional Status Indicators

Points in the system browser can convey a number of different status indications in addition to their numeric values

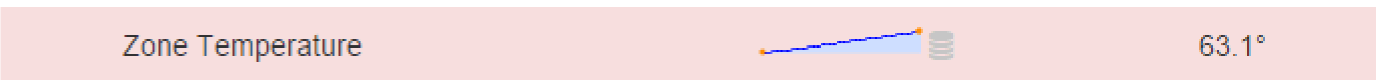
Value Quality

Value Quality indication is represented by the color of the value in the table.

Quality	Color
Worst	
Initial	
Last Write Failed	
Write In Progress	
Bad	
Stale	

Alarm Status

Rows that are currently in Alarm will have a red highlight



Ranged Status

Ranged Status indication (Trouble Low, Warning Low, Warning High, Trouble High) is separate from alarming and is indicated by a set of Glyphs beside the value

Status	Glyph
Trouble Low	
Warning Low	
Warning High	
Trouble High	

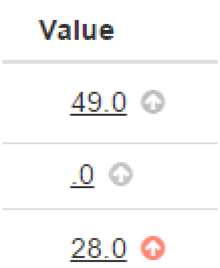
Override Status

Points configured to use BACnet override have an indicator glyph. The color of the glyph denotes the status of the override

Status	Glyph
Override Inactive	
Override Active	

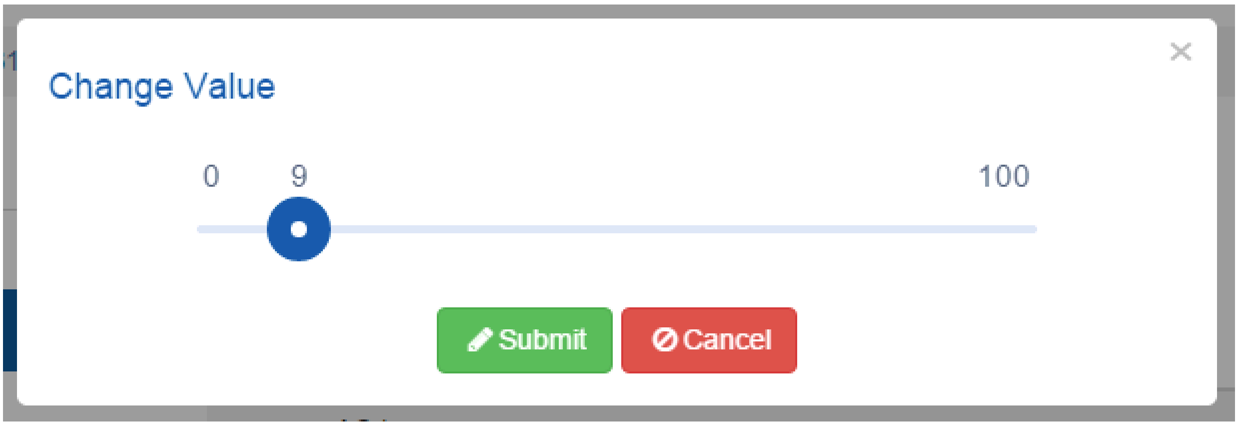
Editing Points

Depending on the user's permissions for a point and the point configuration, the point may be available for edit or override. Points that may be changed by the user have their values underlined. Clicking on the value will open the editor dialog. The type of control available to edit the value will be defined by the Edit As property of the point.



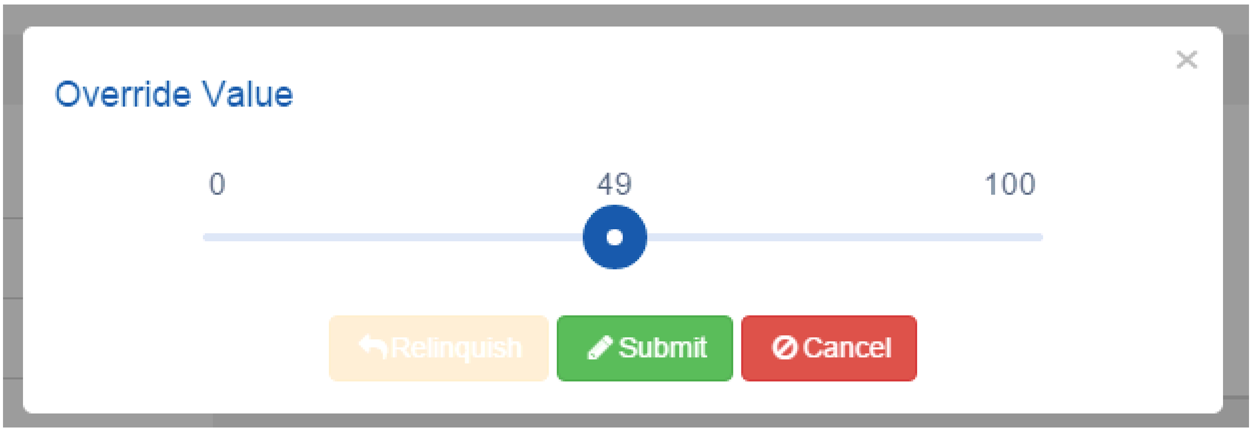
Differences between edit and override dialogs

The edit and override dialogs are very similar. Each will contain a defined edit control, Submit button and Cancel button as shown below. Setting a new value and clicking the Submit button will update the value. Clicking on Cancel or outside the dialog will exit the editor without sending a value to the server.



Override dialogs differ slightly in a few obvious ways. The title for a point that is being overridden or released has the title Override Value instead of Change Value.

The dialog below shows a point that can be overridden, but currently has no value set in the watched Priority Array slot. Because there is no active value to release, the Relinquish button is disabled. Setting a new value and clicking submit will place the point into override.



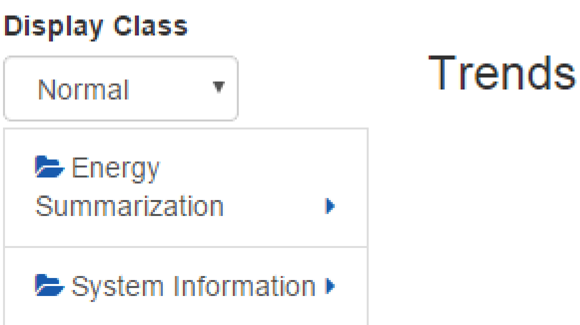
The dialog below shows that the point now has an override value set. The point may be Relinquished by clicking on the Relinquish button or the over-ride value may be updated by selecting a new value using the control and clicking the Submit button. It is not necessary to relinquish a value before setting a new override value.

Other View Types

Besides the Device View, there are a handful of other view types that you may encounter in the Content view. These are often based on the editors for the selected node type.

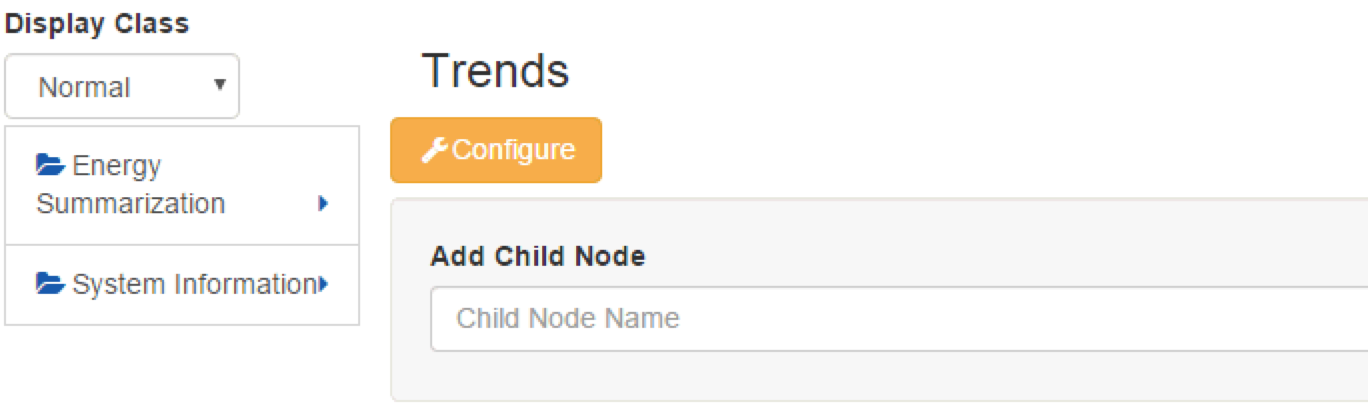
Default View

When a container has no values, the DsiplayName of the currently selected item will be displayed. Clicking the name will display the object inspector, as it does in the Device View.



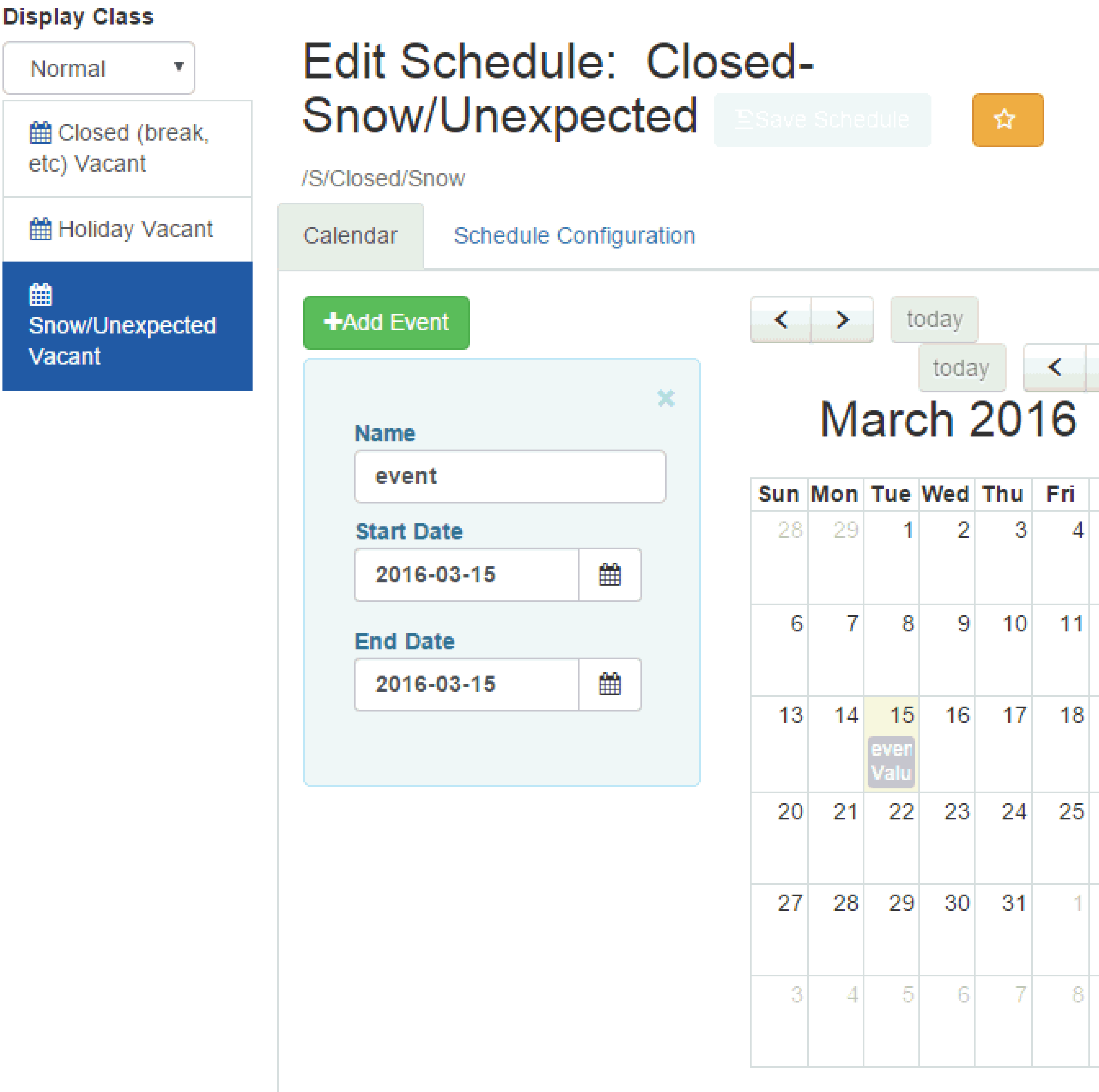
If the user is granted Configure permissions on the selected object, an additional set of controls will be visible. The Configure button will launch the Map Editor for the selected node.

The Add Child Node control will add a new Child Node to the selected parent using the supplied name as the reference name.



Schedules

Schedules will open a copy of the Aspect schedule editor



Trends

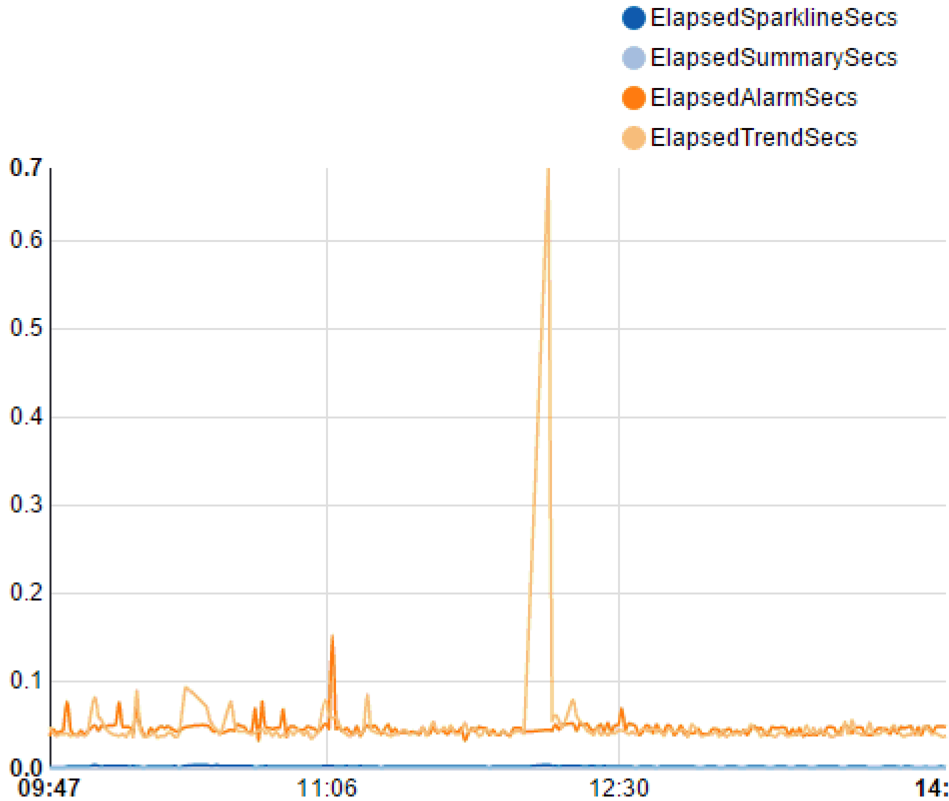
Trends will open a trend chart with the data selected in the trend query as in Automagic

Display Class

Normal ▾

Map Status

Memory Status



Reports

Open a copy of the configured report/database query as in Automagic

Display Class

Normal ▾

Alarms

Audit Trail

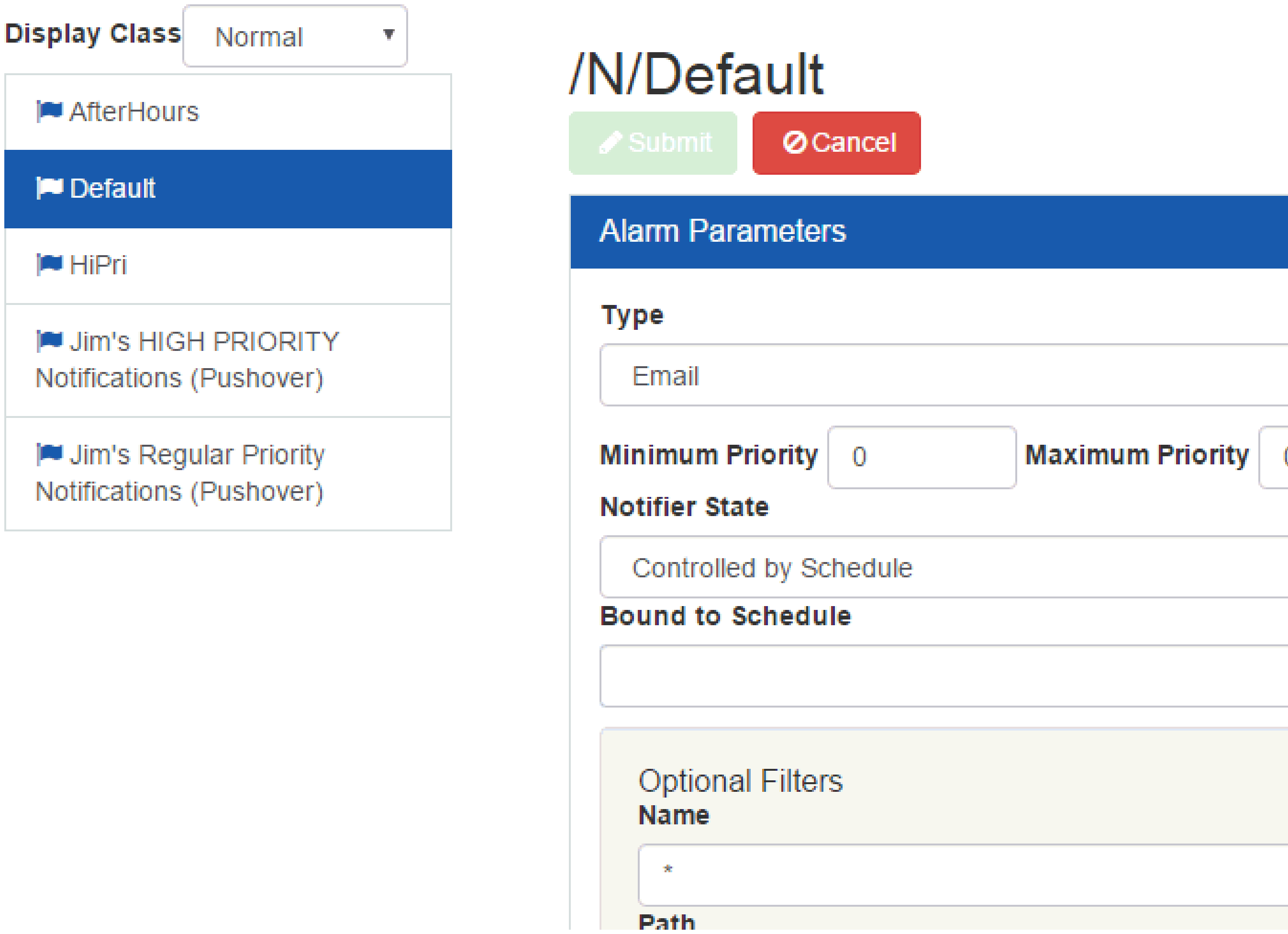
Events

Alarms

ReadingTime	description	applicationname
2016-03-15 12:17:46	Liquid return temp too low	/A/CentralSystems/CentralChiller
2016-03-15 12:15:39	Boiler return temp too low	/A/CentralSystems/ArtsBoiler
2016-03-15 12:15:39	Boiler return temp too low	/A/CentralSystems/PEBoiler
2016-03-15 12:15:26	Space temp out of range	/A/Classrooms/C101
2016-03-15 12:15:26	Space temp out of range	/A/Classrooms/C102

Notfiers

Open the notifier edit dialog for the selected notifier



Graphics

Clicking on a node that is a graphic will exit the system browser and load the selected graphic view. When launching a graphic directly in this fashion, no context can be supplied, so any points that require context to be viewable will be hidden. This is a convenient way to preview layouts of equipment graphics that are largely context driven before they are linked to a floorplan or other statically reference graphic.

Services

Clicking on a Service node will launch the configuation editor for that service. This is equivalent to using the Edit Aspect Services application from the main Navigation menu.

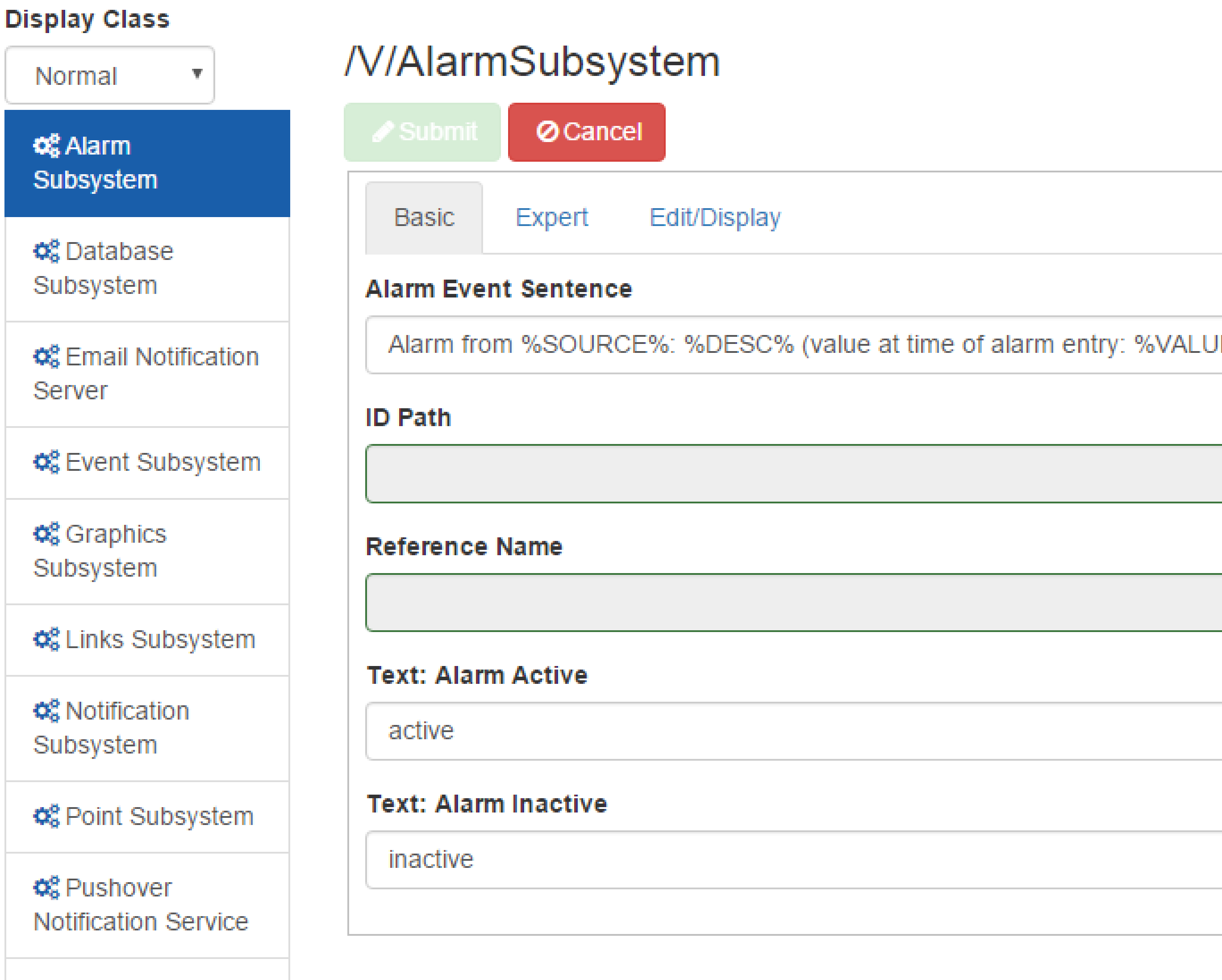
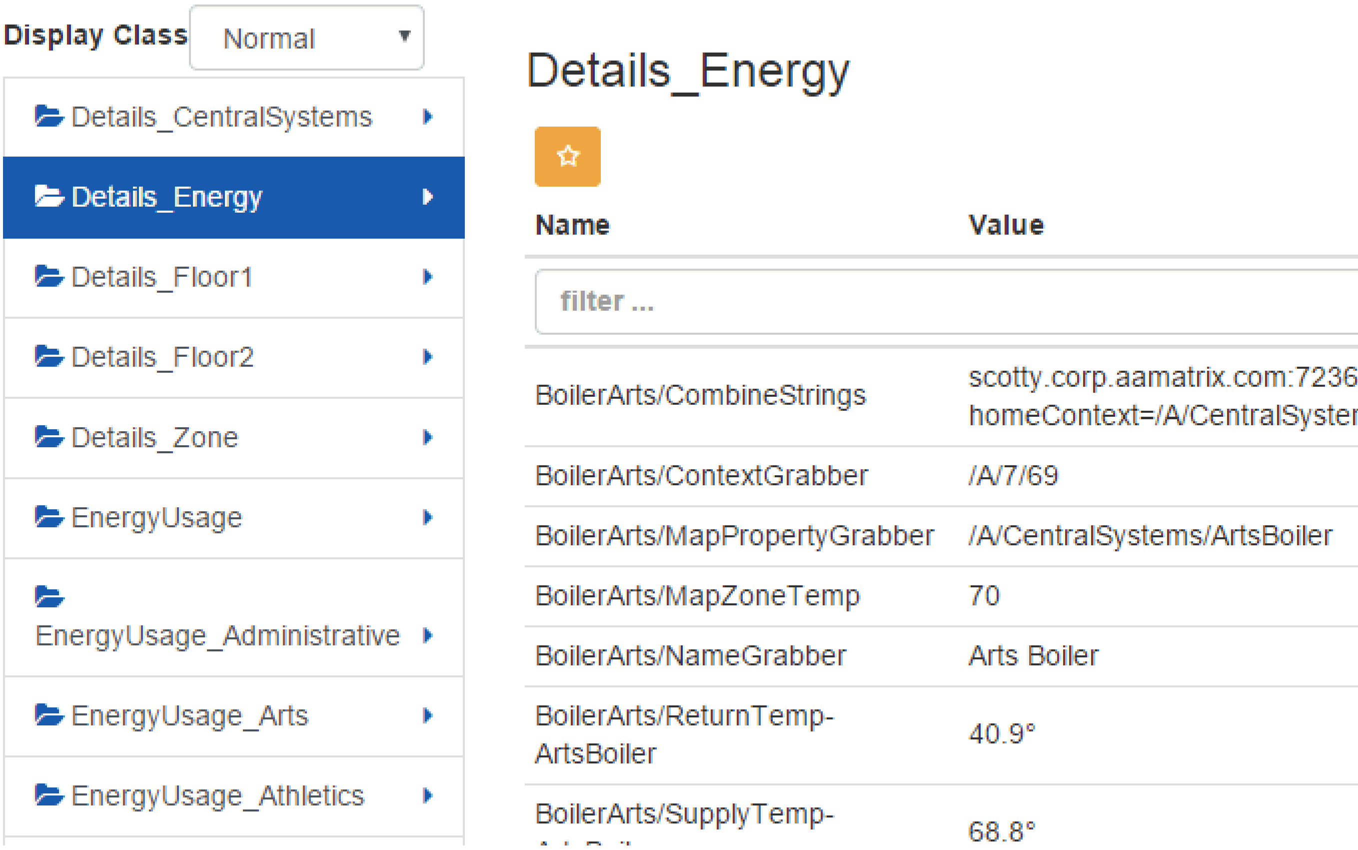


Diagram View

Diagram view is a powerful diagnostic view of values in Aspect diagram views bound to a given application. Application names are listed in the navigation pane. Selecting an application loads a list of points in the application into the content area. Unlike a Device View, editing, alarms and status glyphs are not available for diagram view values. Note that screen local values will not be represented in the Diagram View listing.

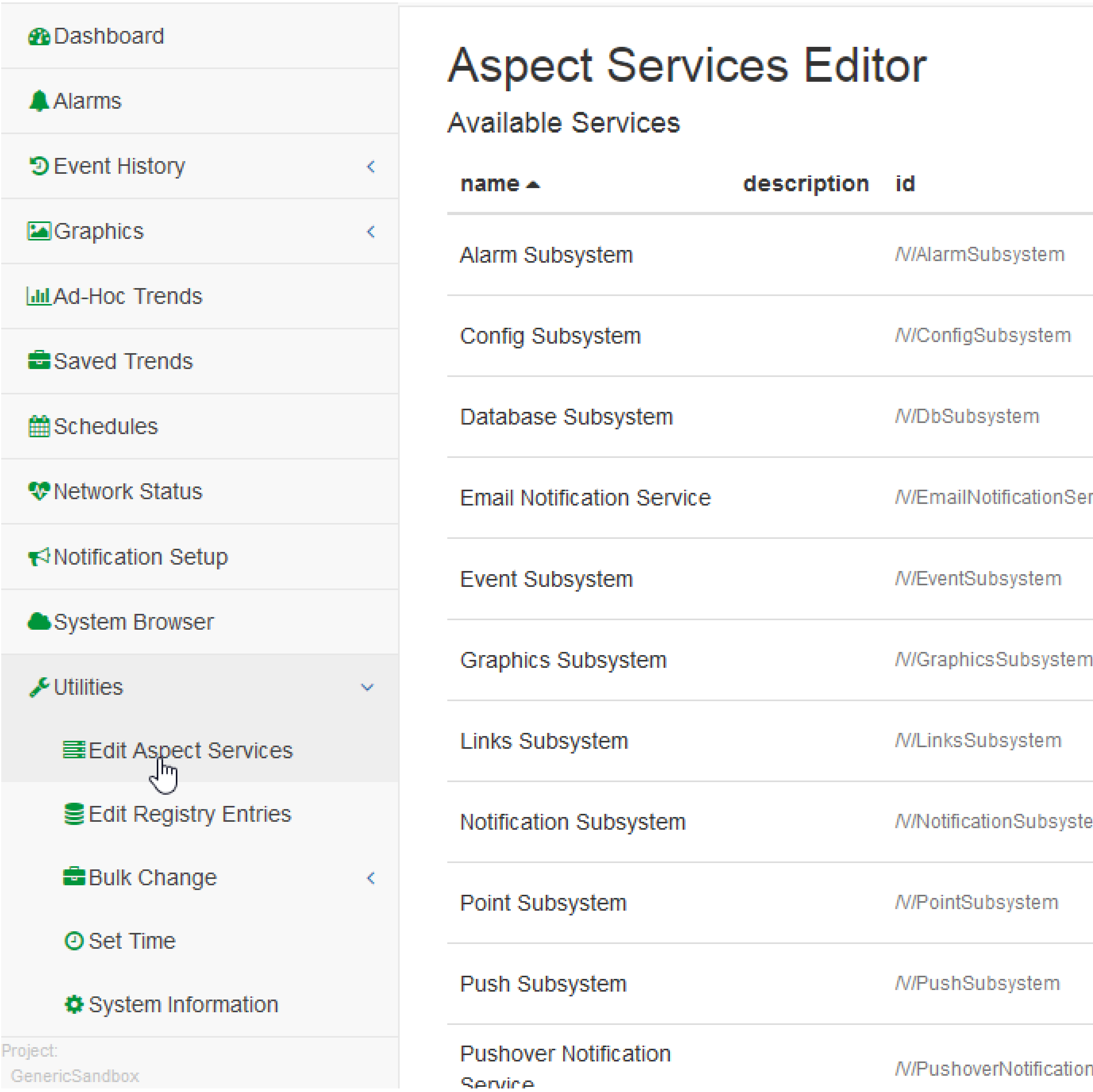


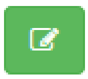
Utilities

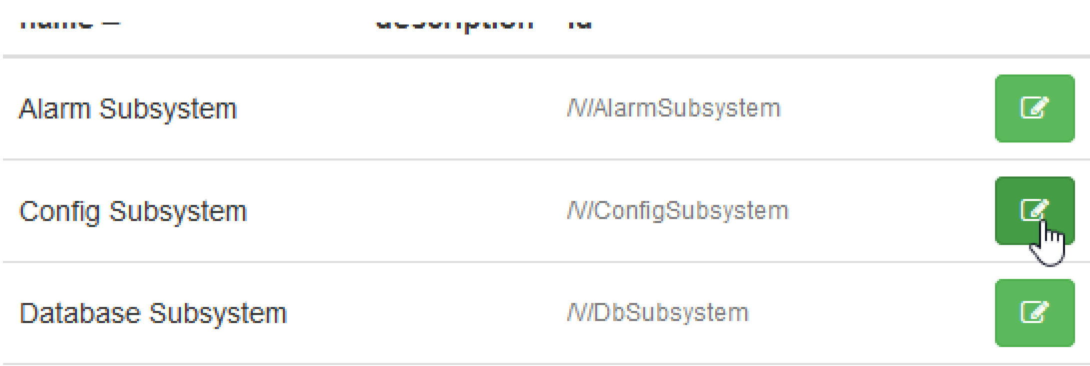
Edit Aspect Services

ngAdmin allows users to directly configure many ASPECT **Subsystems** and **Services**.

This facility is accessed by clicking the Edit Aspect Services link in the ngAdmin sidebar.



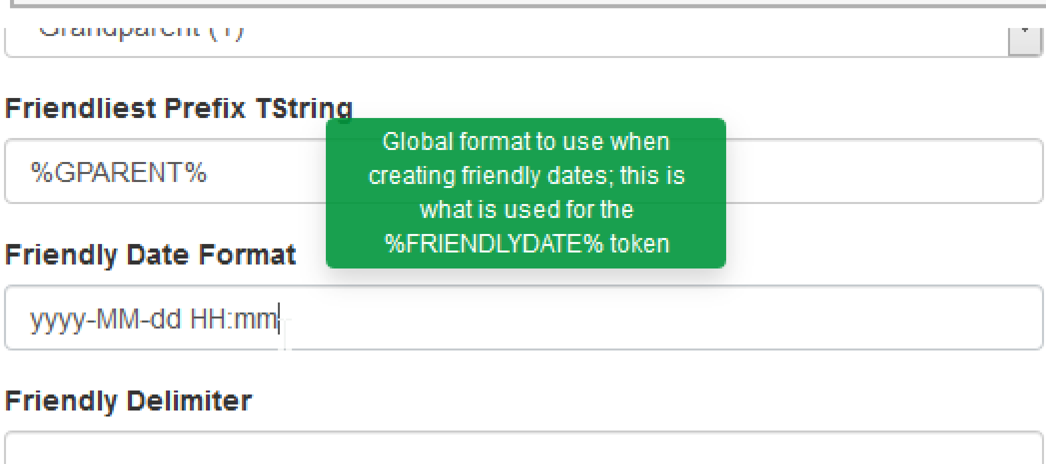
For example, to edit the **Config Subsytem** click the `edit button`  to the right of the `Config Subsystem row`.



All of the **Config Subsystem** parameters are displayed with appropriate editors.

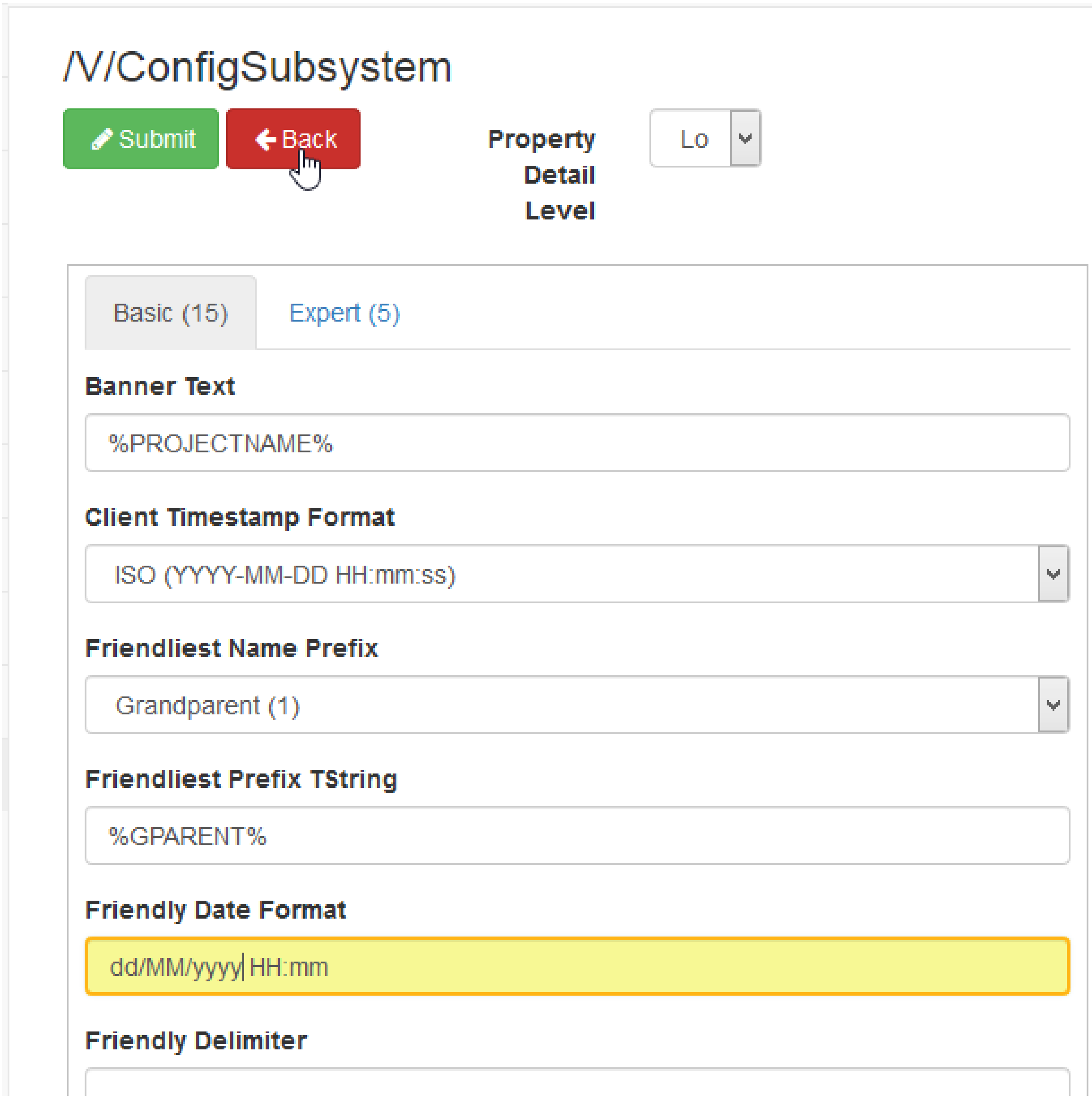
For example, you can set the Clock format to be used in the ASPECT system (by the TString token for Friendly date) by editing the text in the Friendly Date Format box.

> **Note**: when editing a parameter in one of the Edit Aspect Services pages, a **tooltip** is displayed, explaining the specific parameter.



When you edit a parameter, its edit box is marked in yellow to indicate that there are unsaved changes.

Click the Back button to save the changed parameter(s).



Services and Configuration Parameters

Below are the recommended service configuration items for each of the subsystems that requires configuration.

Point Subsystem

Property	Notes
Threshold Stale	poll interval multiplier to determine when a value has become stale
Threshold	New in Aspect 3 - poll interval multiplier after which any

Rotten	cached values will be discarded and set to Initial Quality

Schedule Subsystem

Property	Notes
Redistribution Interval	Time in minutes between schedule redistribution, even if no change has occured. Any changes to a schedule will reset the timer

Link Subsystem

Property	Notes
Link NAction	Open link in new window or Open link in Current window when link is selected from External Navigation display
Link N Description	Text to display in the External Navigation display for Link N
Link N Url	HTTP or HTTPS URL to the location for Link N

Graphic Subsystem

Property	Notes
DefaultOrientation	Orientation for new Graphics in the Graphics editor
DefaultResolution	Default Resolution for new Graphics in the Graphics Editor

Security Subsystem

Property	Notes
Groups-Config	Comma separated list of groups that have permission to edit the properties of existing Map nodes
Groups-Schedule	Comma separated list of groups that permission to edit the local schedules
Groups-System Admin	Comma separated list of groups that have super-user configuration permissions, including adding and deleting nodes from the Map.

Alarm Subsystem

Property	Notes
Alarm Event Sentence	Text for the Recent Alarms display on the Dashboard application. Can use the same tokens as Notifiers
Text: Alarm Active	Title for active alarm transition entries in the Recent Alarms display
Text: Alarm Inactive	Title for inactive alarm transition entries in the Recent Alarms display

Events Subsystem

Property	Notes
Audit Event Sentence	Text for the Recent Audit Events display on the Dashboard application. Can use the same tokens as Notifiers
Deployment Notification Message	Message to use for a deployment event
Deployment Notification Priority	Priority level to assign to a deployment - also drives Notifiers
Map Event Sentence	Text for the Recent Map Events display on the Dashboard application. Can use the same tokes as Notifiers
Notify on Deployment	Notify on deployment Yes/No
Notify on Startup	Notify on Startup Yes/No
Startup Notification Message	Message to use for aspect engine start/restart
Startup Notfication Priority	Priority level to assign to an Aspect Engine start event - also drives Notifiers

SMS Gateway Notification Service

Property	Notes
Host	Hostname or IP address of SMS Eagle Gateway
Password	Password for SMS Eagle Gateway

Username	Username for SMS Eagle Gateway

Pushover Notification Service

Property	Notes
App Token	Pushover App token, as defined in the Pushover portal

Email Notification Server

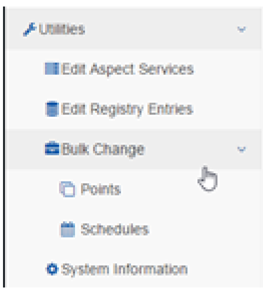
Property	Notes
From	From/reply to email address
Host	Hostname or IP address of SMS Eagle Gateway
Password	Password for SMTP server
Port	SMTP or SMTP/TLS port
Username	Username for SMTP server

Bulk Change and Bulk Copy

Overview

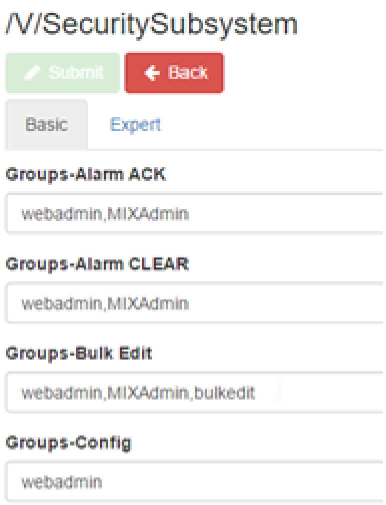
The Bulk Change > **Schedules** and **Bulk Change**>**Points** applications within **ngAdmin** offer experienced system operators a means of finding and updating point values or schedules quickly and efficiently.

The Bulk Change applications are located in the **Utilities** menu in the HTML5 UI and only appear for users with the appropriate security settings.



Security Settings

Due to the advanced nature of the **Bulk Change**applications, these applications are reserved for **Groups**in with Bulk Edit privilege in **Utilites**>**Edit Aspect Services** > **Security Subsystem**

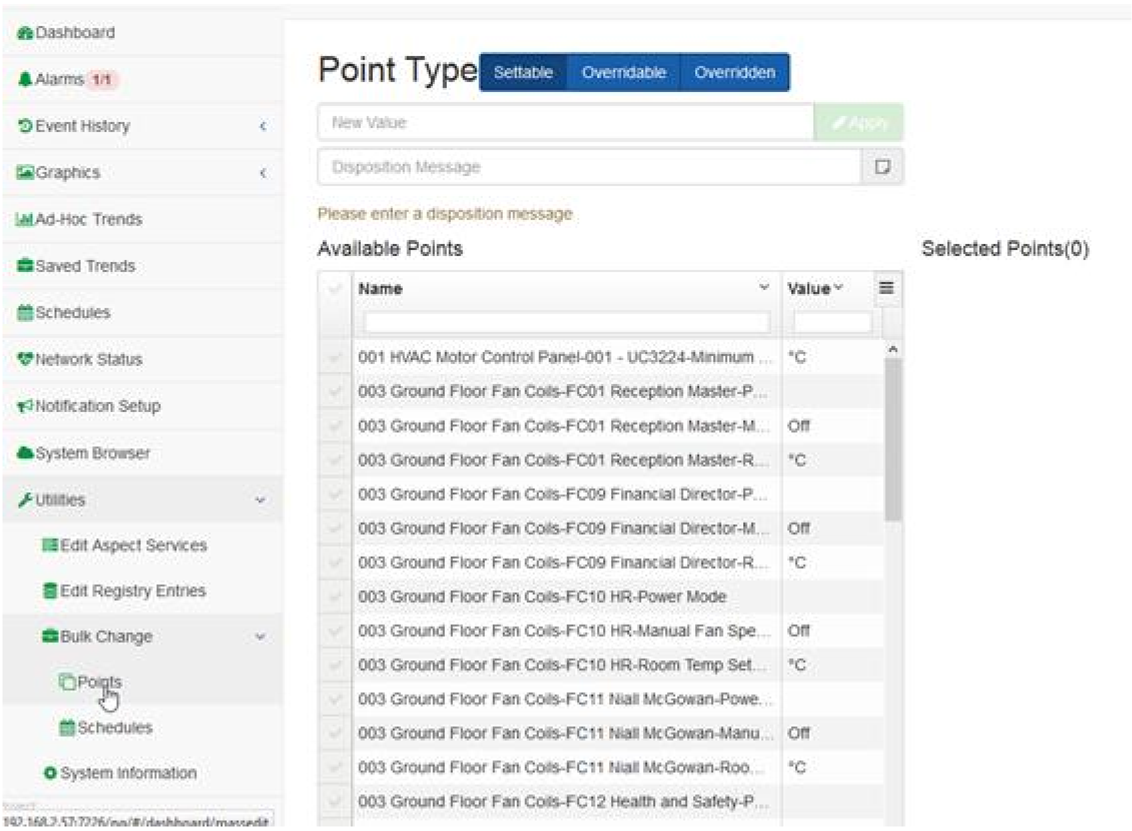


Groupsincluded in the**Bulk Edit** permission are still subject to the write and configuration permissions on the objects being changed within the application.

For instance, the group bulkeditshown above can access theBulk Change > **Points**application, but can ONLY perform bulk change operations on points that are configured to be **writable** by thebulkedit group.

Bulk Change > Points

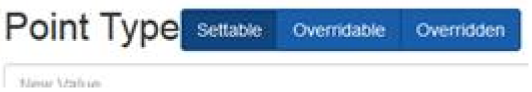
Selecting Utilities > **Bulk Change**>**Points**opens the**Bulk Change Points** screen:



This page contins

- 2 text-entry fields – **New Value**and**Disposition Message**,
- 2 lists of Available Points and **Selected Points**, and
- an Apply button (beside the **New Value**Input).

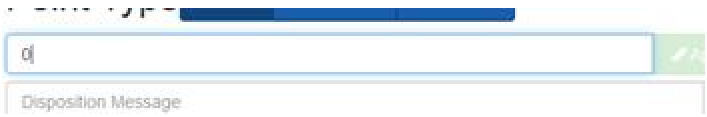
The Available Points list can show **Settable**Points,**Overridable**points, or points that have beenOverridden, and this can be changed using the **Point Type** buttons at the top of the page just above the **New Value**input.



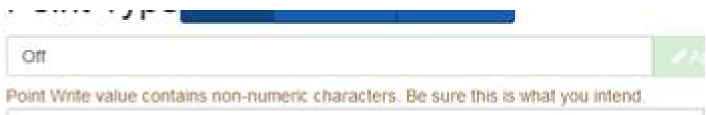
Multiple points can be selected in the **Available Points**list, and when the**Apply**button is pressed the value in theNew Value input will be sent to all of those selected points.

New Value Input

The New Value input is intended primarily for use with numeric values. When writing enumerated values, it is required to send the underlying integer value and not the user-facing string value (e.g. 0instead ofOFF).



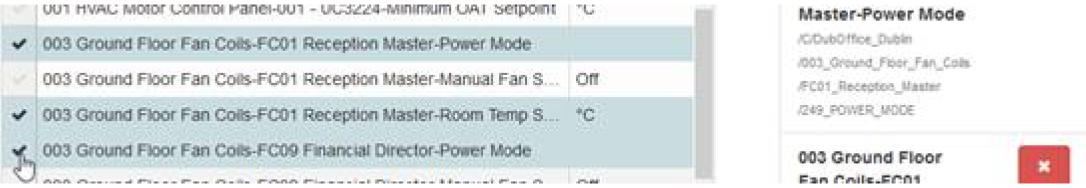
Writing string values to numeric points may have adverse side-effects and will generate a warning, but is permitted.



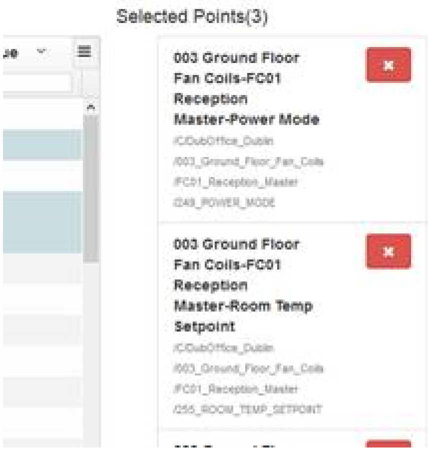
Available Points List

The Available Points list may be filtered using the text areas beneath the Name and/or **Value**column headings.

To select an item to participate in the value copy, check the checkbox column on the left of that item in the **Available Points**list.



Once selected, the points participating in the **Bulk Change**operation are added to the Selected Points list.



To remove a selected point, either click the **Delete**button of the point in the Selected Points list, or uncheck the checkbox in the **Available Points** list.

· Settable Points

When the Bulk Change > **Point**application is selected, the Available Points list will be populated with all points in the Aspect project that are writable by the current user. These are called **Settable Pointsand the Point Type**buttons will indicate that they are currently displayed:

If the value is **background polled**, then it will be displayed in the Value column, otherwise the Value column will be empty.

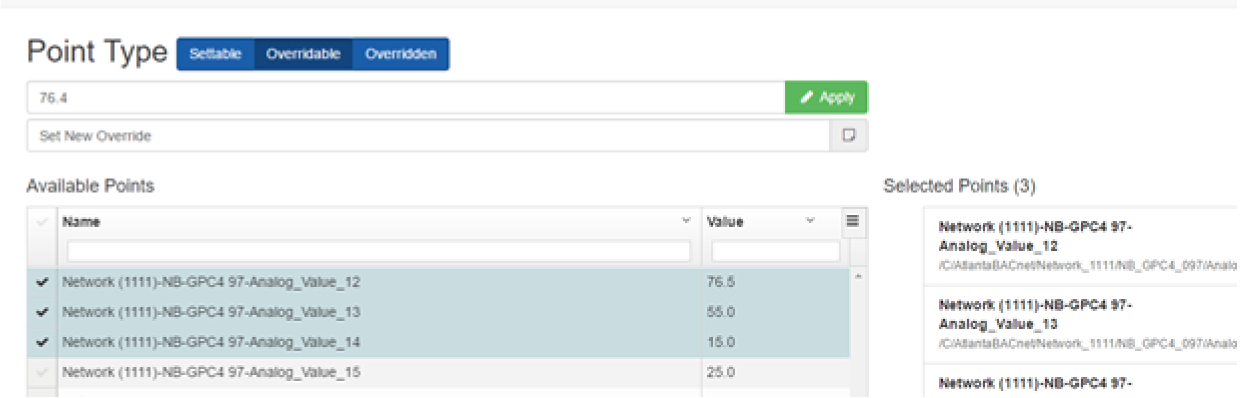
· Overridable Points

The behavior of **Overridable Points** is very similar to the behavior of **Settable Points** within the Bulk Change>Points application. The key difference is that only Points that are capable of one of the **Aspect Override** behaviors will be present in this list.

Conversely, **Overridable Points** do not appear in the **Settable Points** list.

Selection, value change, and **Apply** behavior remains the same.

> **Note**: **Overridable points** Applying an override to these points will replace the existing override with the new value. with an active override value will appear in this list as well.

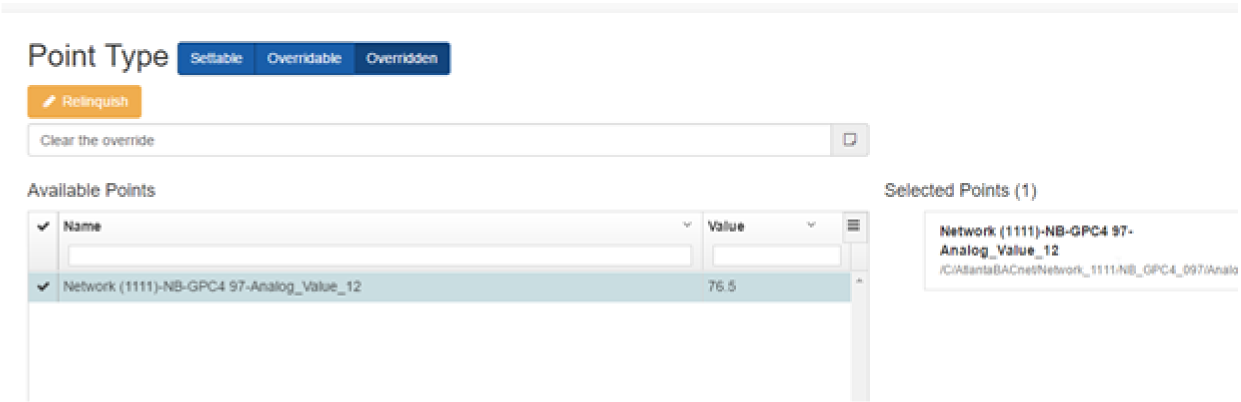


· Overridden Points

Overridden Points will show **Overridable Points** that have an active override state.

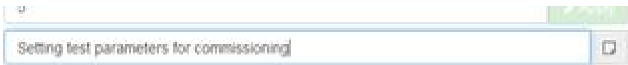
Use the Relinqush option to relinquish active overrides and return the values to the defaults.

> **Note**: A disposition message is rquired to relinquish.



Disposition Message

When the selection process is complete, enter an optional **Disposition Message** to indicate why the change is being made.



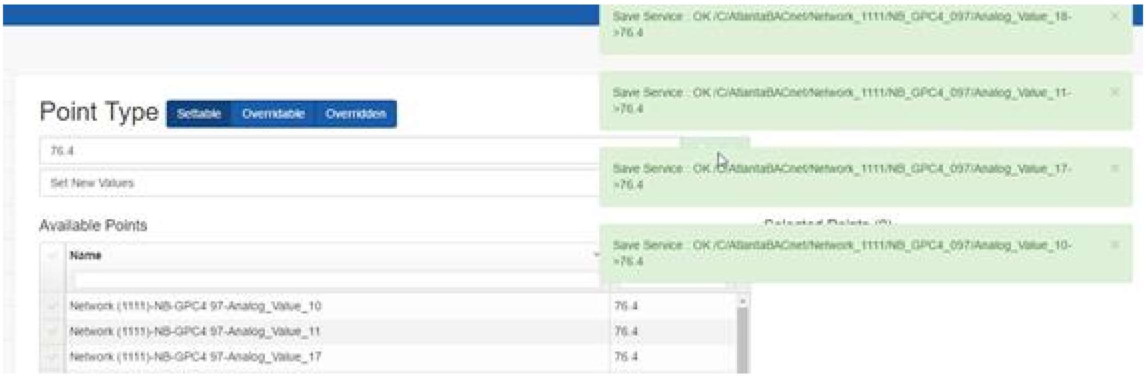
This is recommended, because it is useful for troubleshooting and also helps with implementing validated systems.

Running the Point Change Process

Click the Apply button to begin the **Bulk Change** process.

Each item will in the list will be processed sequentially and will provide either a confirmation message or an error message.

> **Note**: Do not navigate away from the Bulk Change Points page while the operation is in progress or the remaining points will **not** be processed.



Bulk Change > Schedules

The Bulk Change > Schedules (“Bulk Copy) application is similar to the Bulk Change>Points application, but with a few key differences:

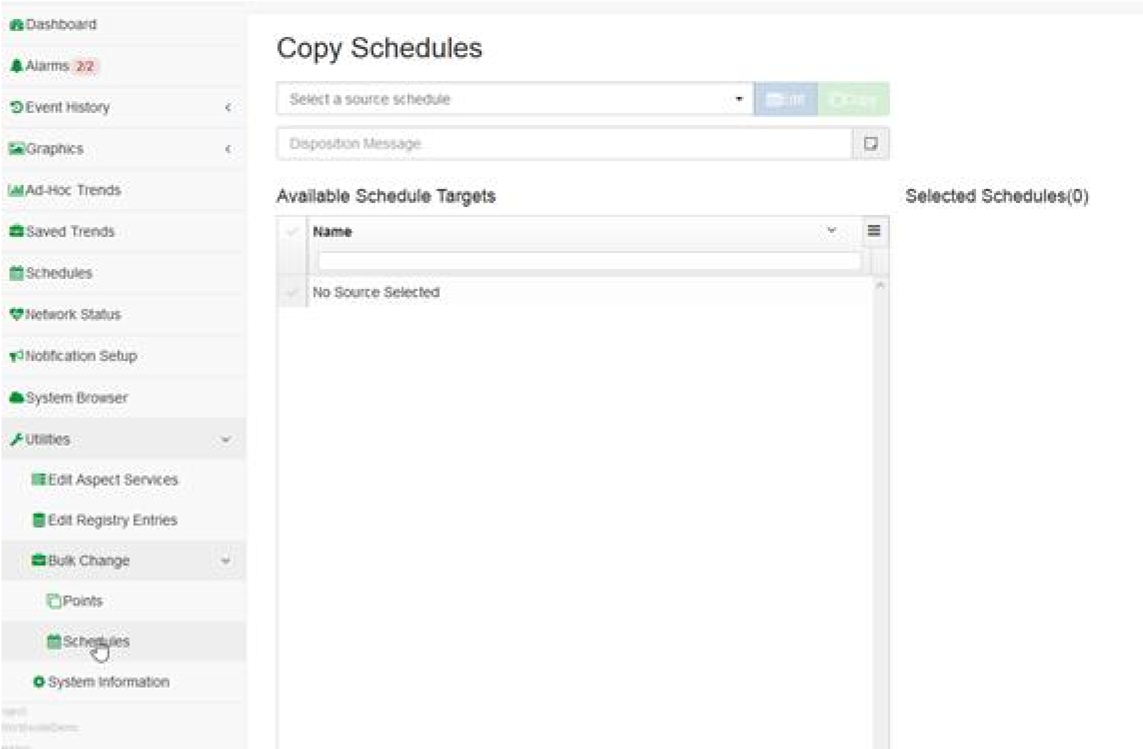
·**Schedules** are complex objects - You must select a source **Schedule** to be copied to the targets, rather than a single value.

·A**Schedule**must be designated as a **Bulk Copy Source** before it can be used as a source for a **Bulk Copy** operation.

·**Schedules** can only be copied to identical types (e.g. an **Aspect Basic schedule** can only be copied to a set of **Aspect Basic Schedules**).

· The **Map Schedule**of the target. **configuration data** within the schedule is copied to the **configuration data** The itself is not copied. **object**

Selecting Utilities > Bulk Change >Schedules opens the Bulk Copy Schedules screen:

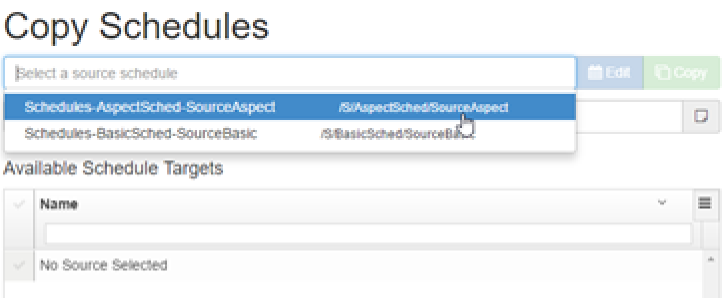


This contains

- a selection list to **Select a source schedule,**
- a list of Available Schedule Targets
- a list of Selected Schedules
- text entry for a Disposition Message

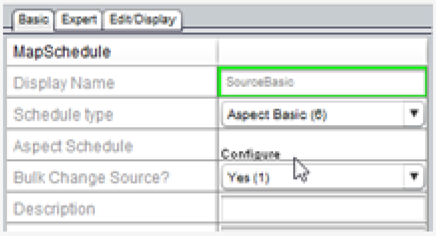
Select a source schedule

The schedules that have Bulk Change Source? Property set to Yes will appear in the selection box.



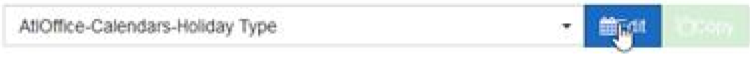
Note: To set this property, in ASPECT-Studio set the property Bulk Change Source? on the Basic tab of the **Schedule's** property pane to Yes

(1).



Once the source **Schedule** is selected and verified, valid destinations for the source **Schedule's** type will populate the Available Schedule Targets grid.

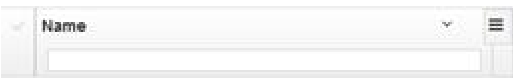
The Edit button is provided as a shortcut to edit the selected **Schedule** .



Note: Editing the source Schedule will exit the Bulk Copy Schedules page and discard any selections.

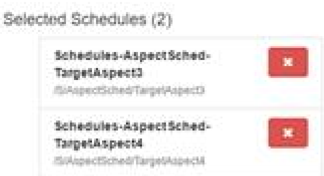
Available Schedule Targets

The Available Schedule Targetlist may be filtered using the text areas beneath the**Name**column headings.



To select a target to participate in the **Bulk Copy Schedule**process, check the checkbox column to the left of that schedule in the**Available Schedule Targets** list.

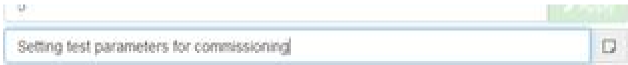
Once selected, the **Schedules** participating in the Bulk Copy Schedule operation are added to the Selected Schedules list.



To remove a selected **Schedule**, either click the `Delete` button of the point in the `Selected Schedules` list, or uncheck the checkbox in the `Available Schedue Targets` list.

Disposition Message

When the selection process is complete, enter an optional `Disposition Message` to indicate why the change is being made.



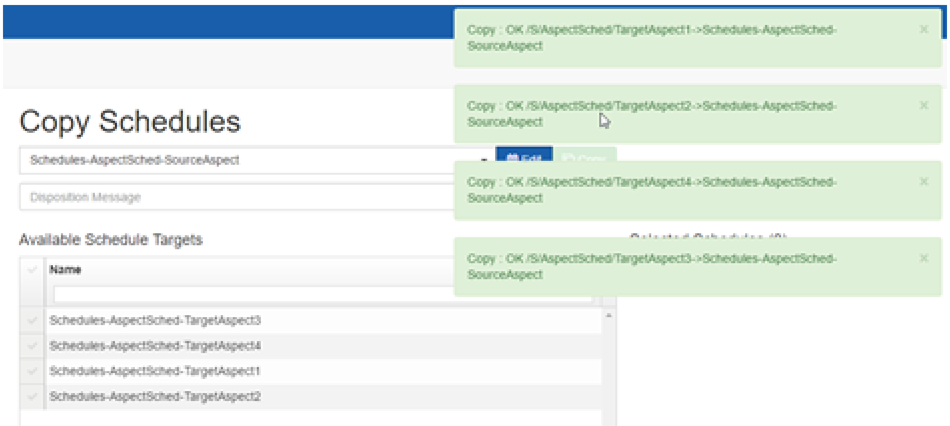
This is recommended, because it is useful for troubleshooting and also helps with implementing validated systems.

Running the Copy Schedule Process

Click the `Copy` button to begin the **Bulk Change** process.

Each **Schedule** will in the list will be processed sequentially and will provide either a confirmation message or an error message.

> **Note**: Do not navigate away from the `Bulk Copy Schedules` page while the operation is in progress or the remaining points will **not** be processed.



> **Note**: **Schedules** are substantially more complex objects than **Point** Values and take somewhat longer for the confirmation or failure messages to return.

Partial Bulk Schedule Distribution

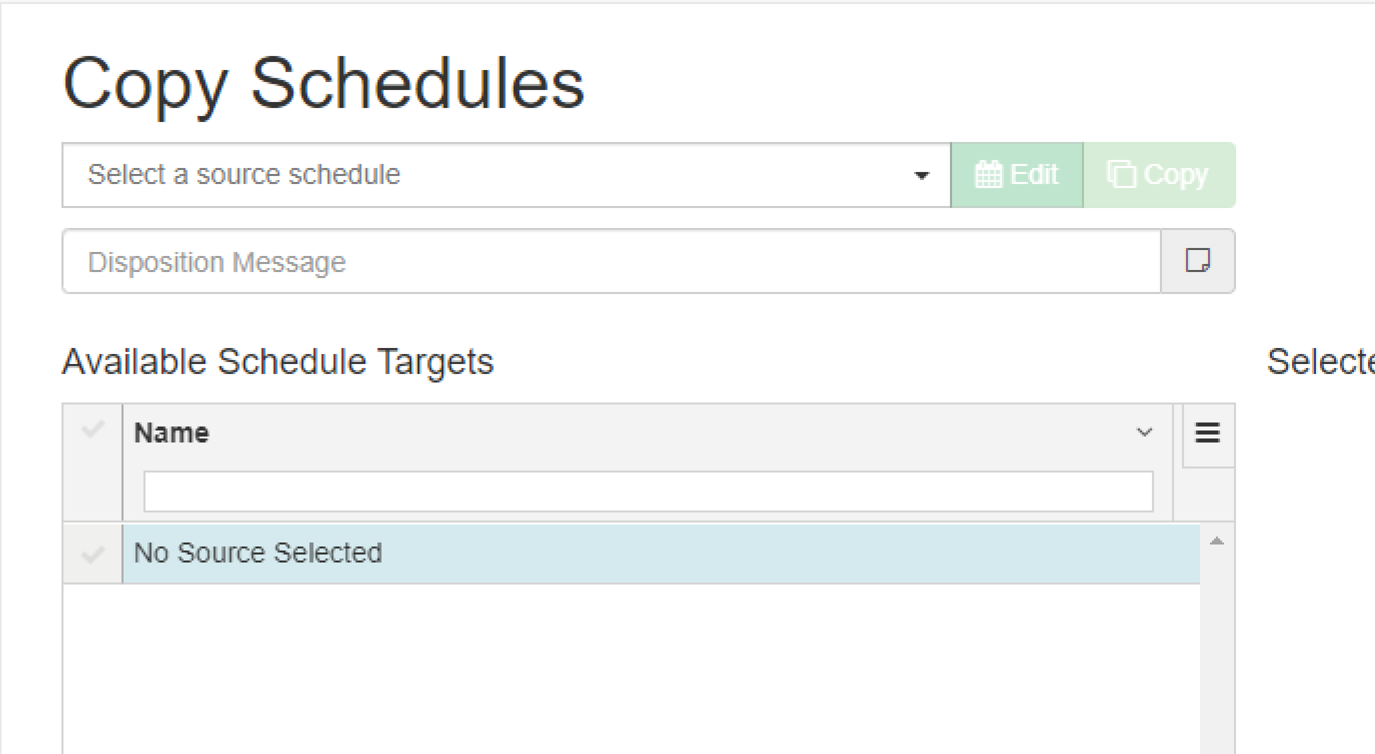
Since v3.04.00

Aspect will allow partial bulk schedule distribution of schedules of type “Aspect Combo Schedule”. This would typically be used in an configuration where schedules need to be distributed to multiple remote devices from a Supervisory Aspect target to Aspect edge devices and subsequently relayed to BACnet device schedule objects.

This allows an ng-admin user with appropriate permissions the option to distribute a schedule exception List to multiple schedule targets without disturbing the standard Week Schedule configuration or to distribute a weekly schedule without changing any exception events in a schedule. For example, holiday exception lists could be distributed to multiple schedules that may have different weekly schedule events that should not be modified.

__Select A Source Schedule__

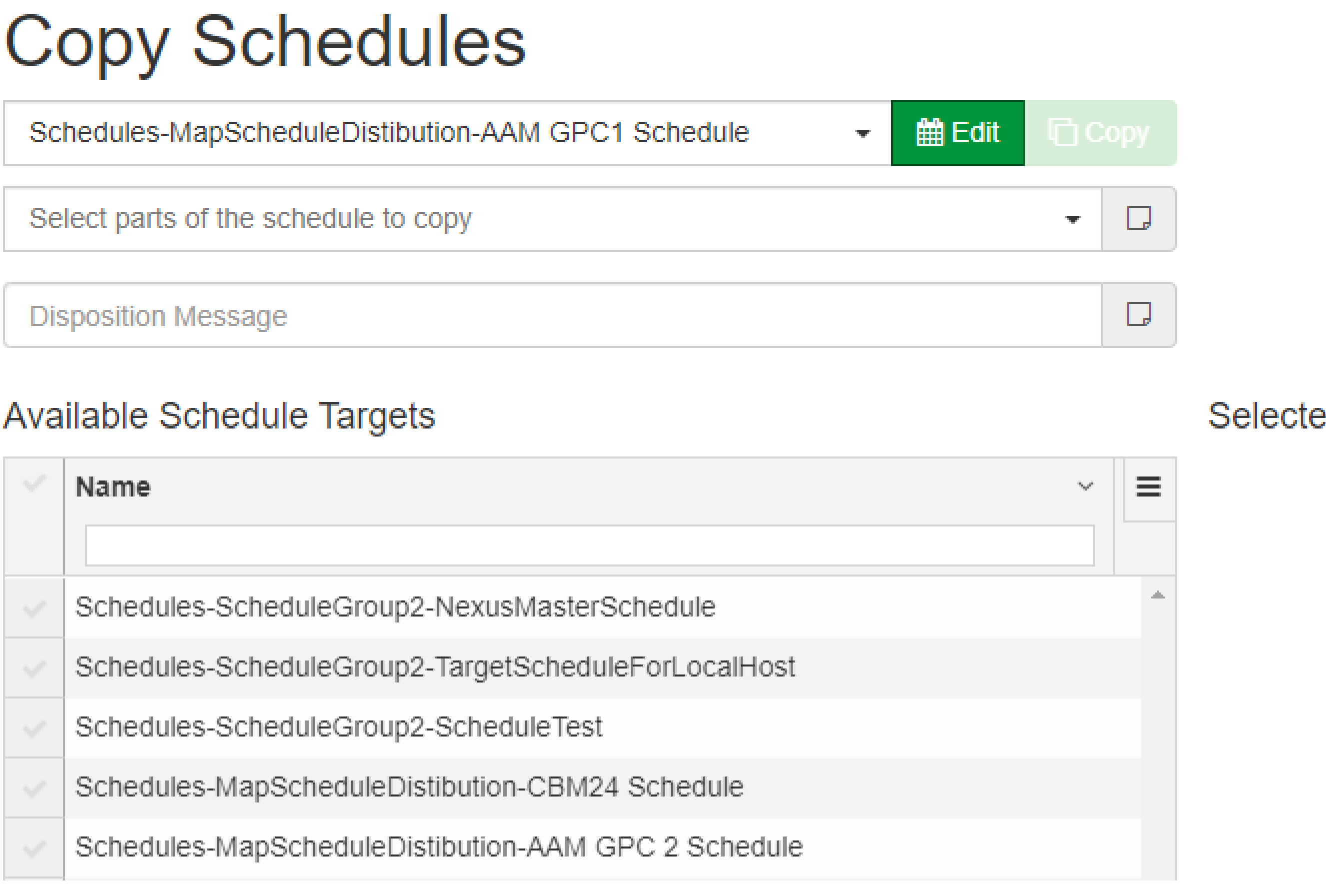
When selecting a source schedule only “Aspect Combo” type schedules will allow partial event bulk distribution.



After selecting the correct type of schedule the user is presented with drop list to select which parts of the schedule to be distributed:

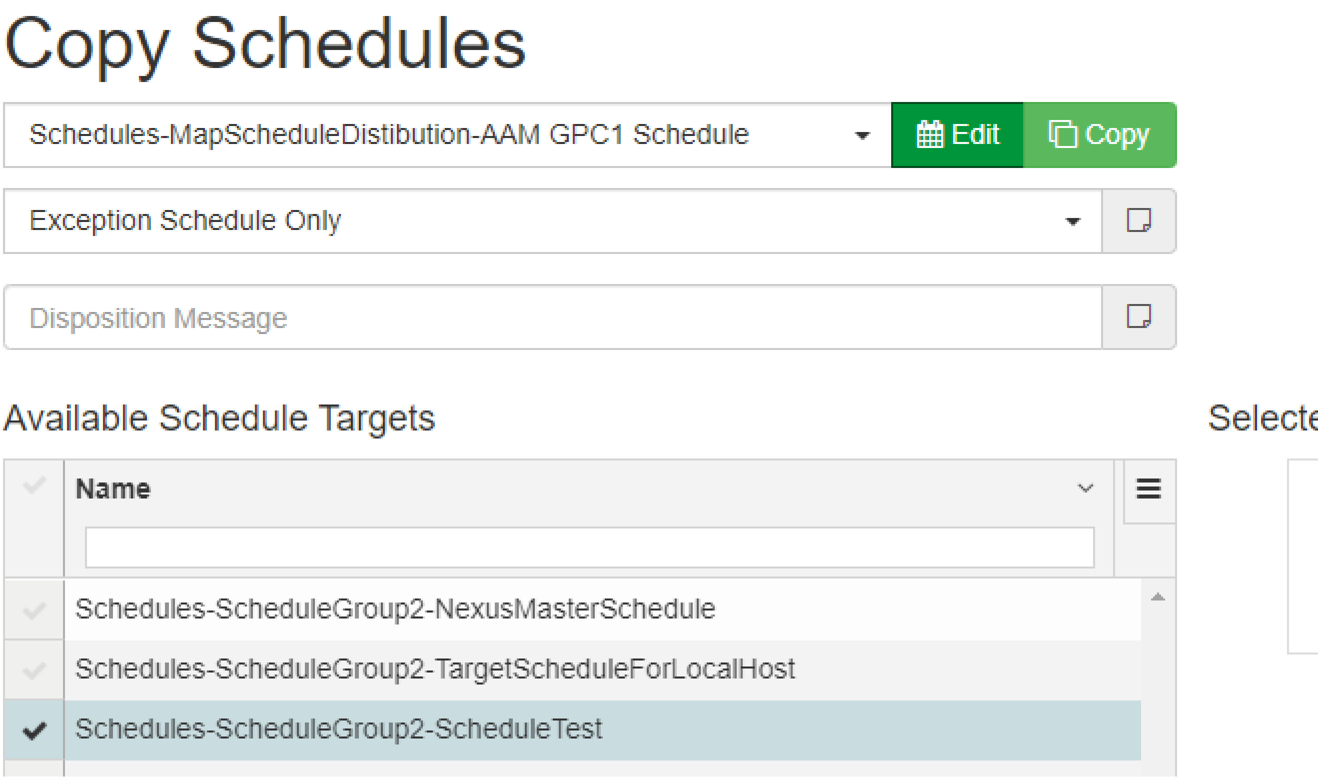
- Full
- Weekly

- Exception



Bulk Distribution

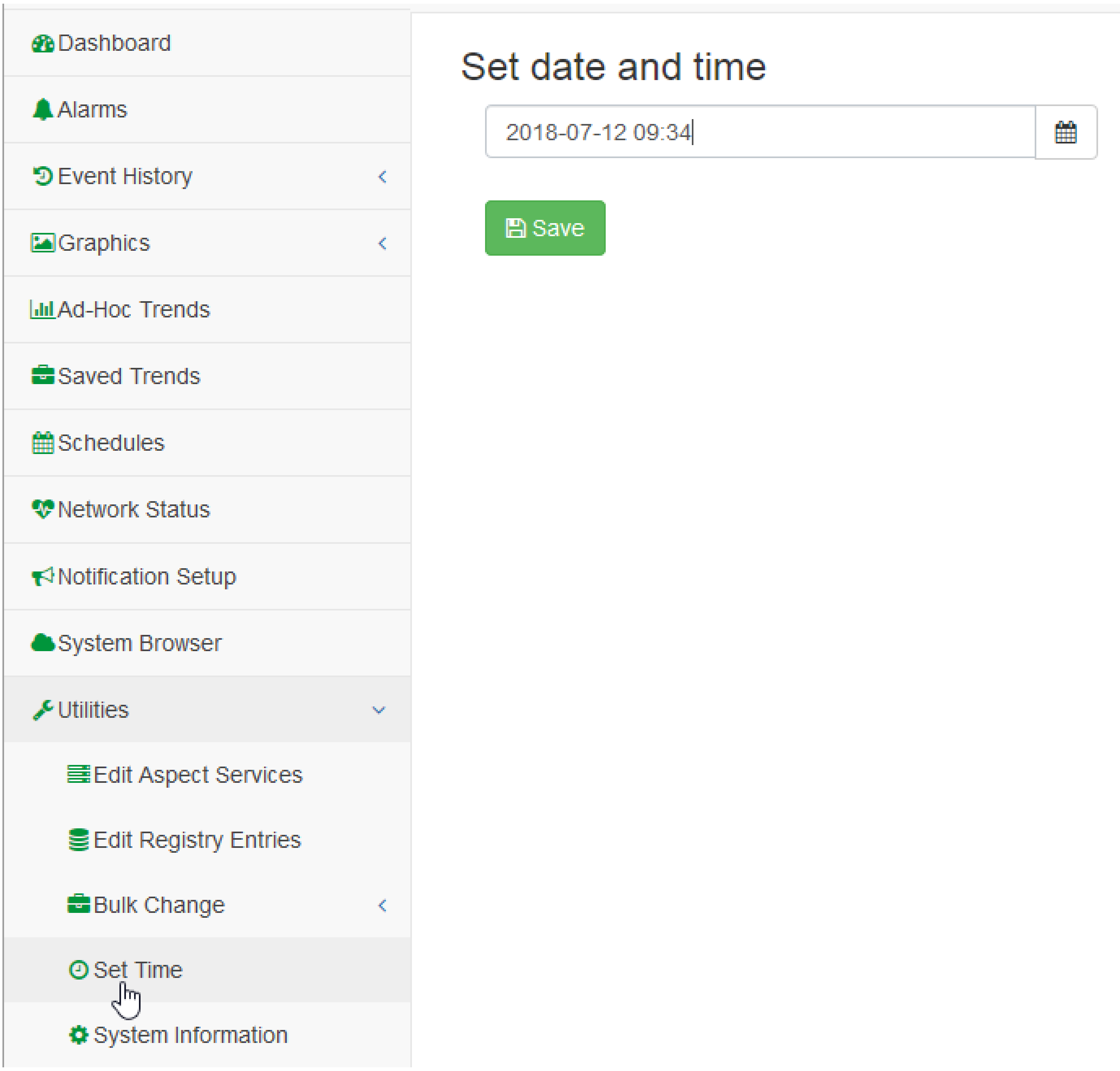
Once the parts of the schedule to copy and the schedule targets are selected the copy button will be enabled. Click the copy button to distribute all selected schedules. After each schedule is distributed, a conformation message will be displayed communicating success or failure of the distribution.

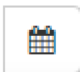


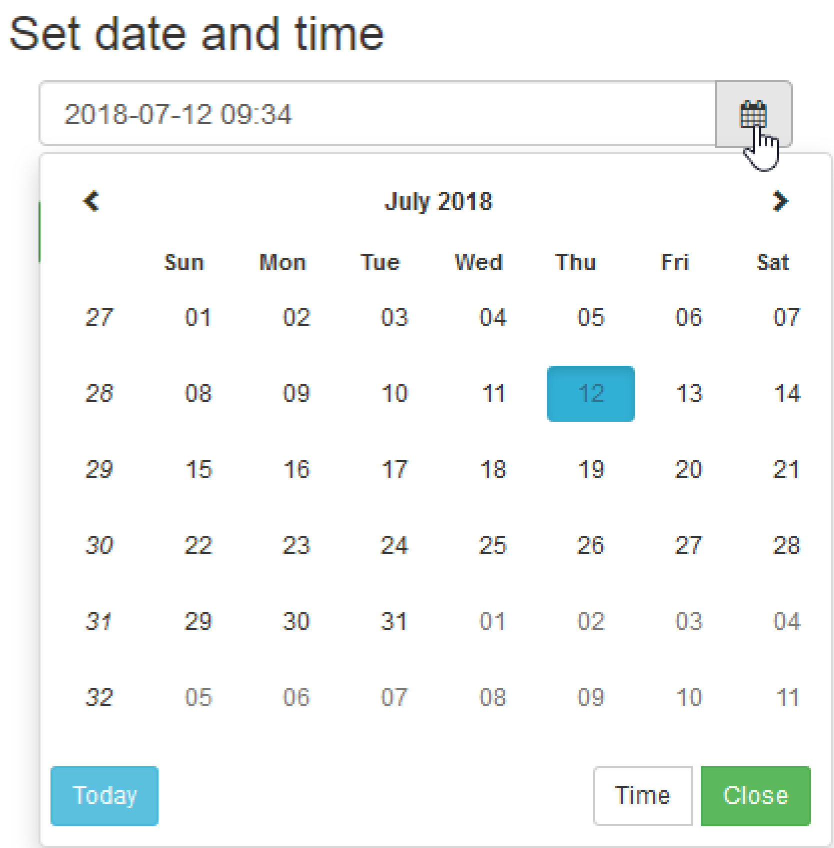
-

Set Time

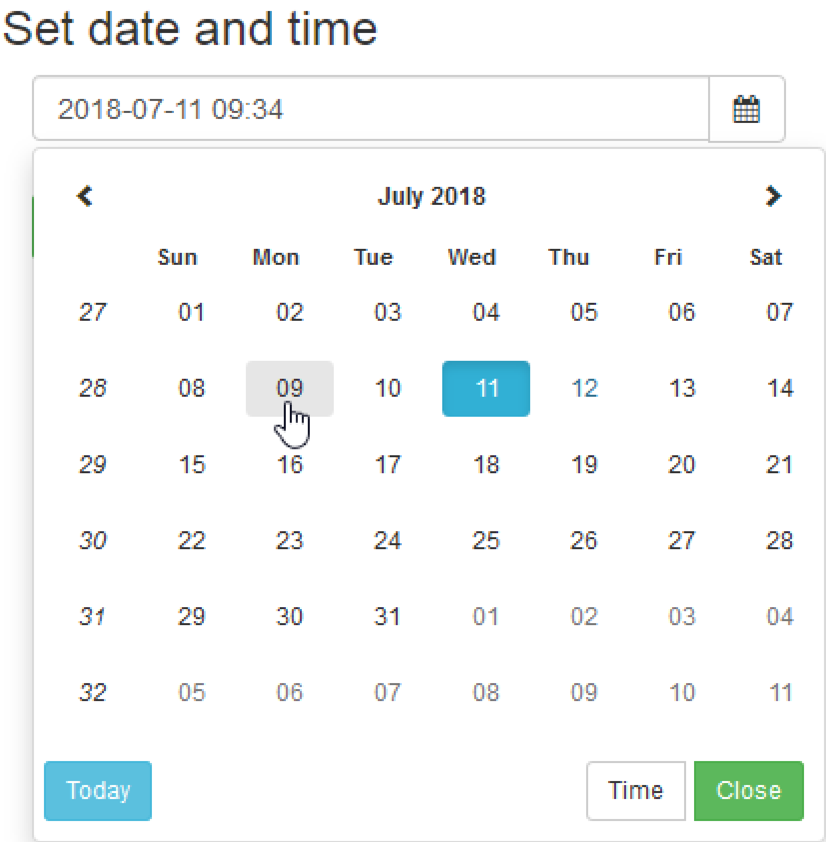
Selecting Set Time from the ngAdmin sidebar opens an page displaying the date and time that is set in the ASPECT device on which ngAdmin is running, and provides an interface for modifying that setting.



To edit the date, click on the calendar button  to the right of the displayed date and time.

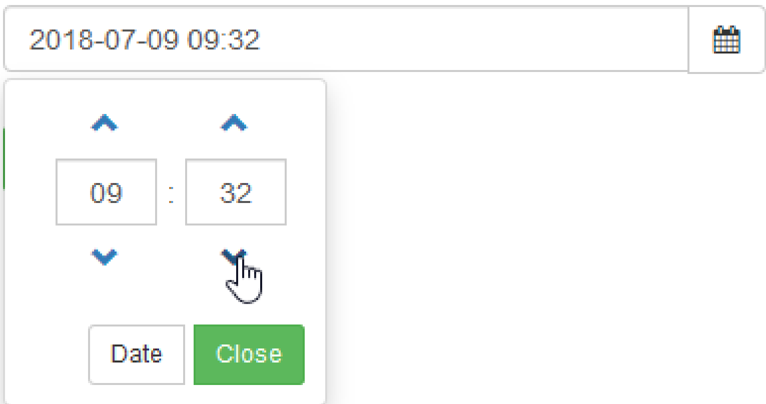


This displays a calendar editor. Clicking on a day in the calendar changes the date setting in the date and time box, and immediately opens a time editor.



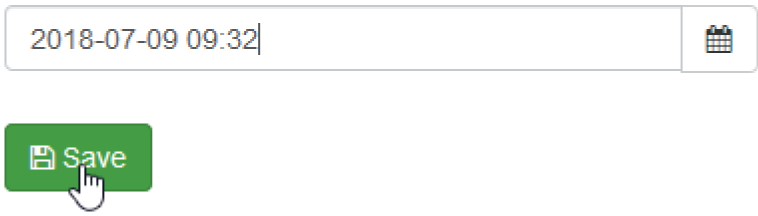
If you want to open the time editor without changing the date, click the Time button at the bottom right of the calendar.

To change the time, click on the arrows above and below the hour and minute displays. The change is immediately reflected in the date and time box.



You can switch back to the calendar editor by clicking the Date button at the bottom of the time editor.

When the value in the date and time box is correct, click the Close button on either the time editor or calendar editor, and then click the Save button to apply that setting to the ASPECT system.

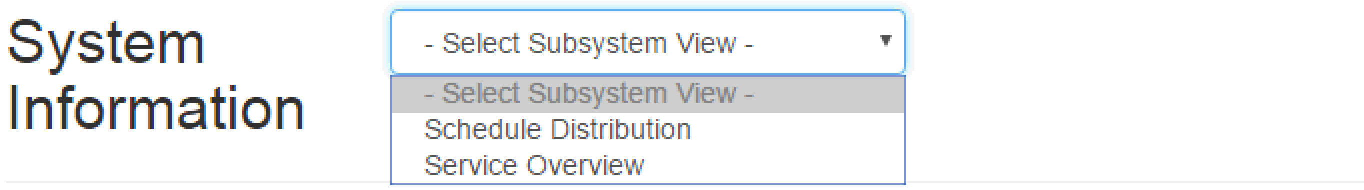


System Information

Instrumentation Overview

The System Information Application gives the Aspect operator insight into the status and health of the new services provided by Aspect 3.0.

Select an available subsystem to view from the drop list and the instrumentation view will appear below.



[Service Overview](#)

[Schedule Distribution](#)

Service Overview

The Service Overview subsystem provides a single table view that shows all of the Map services and information about their timing and "tics". The table automatically refreshes to keep the collected information current.

Service Overview

Service Name	Timebase	Last Elapsed Tic	Max Elapsed Tic	Sec Since Last T
search ...				
LinksSubsystem	5s	0s	0.001s	2.576s
EventSubsystem	5s	0.012s	0.343s	3.614s
ScheduleSubsystem	5s	0s	0.017s	1.983s
PointSubsystem	5s	0s	0.001s	2.483s
TrendSubsystem	5s	0s	0.001s	2.415s
GraphicsSubsystem	5s	0s	0.001s	2.4s
CookieSubsystem	5s	0s	0.001s	2.521s
NotificationSubsystem	5s	0s	0.001s	2.471s
SecuritySubsystem	5s	0s	0.001s	2.521s
DbSubsystem	5s	0s	0.001s	2.458s
AlarmSubsystem	5s	0.029s	0.544s	2.82s

Column Name	Notes
Service Name	Name of the Aspect Service. These match the entries in the Edit Aspect Services application
Timebase	How often the services "wakes up and runs" in seconds
Last Elapsed Tic	The time that the last execution cycle took once it was started
Max Elapsed Tic	The longest execution cycle since Aspect startup
Sec Since Last Tic	The time since the last execution cycle began - generally should be less than the Timebase
Last Tic Start	The system time at the beginning of the last tic

More Information

[Aspect Services Editor]

Schedule Distribution

Schedule Distribution is a new feature of Aspect 3.0 and has a detailed page that permits the operator to see the progress and results of schedule distribution within the system.

The Schedule Distribution view contains three tabs, each providing a view of a different facet of the schedule distribution process.

Active Distributions

Active distributions are schedule distributions that are currently underway. It is not unusual for this table to be empty if no schedule changes or default refresh operations are in progress.

Schedule Distribution

Active Distributions | Schedule Distribution History | Target Distribution History

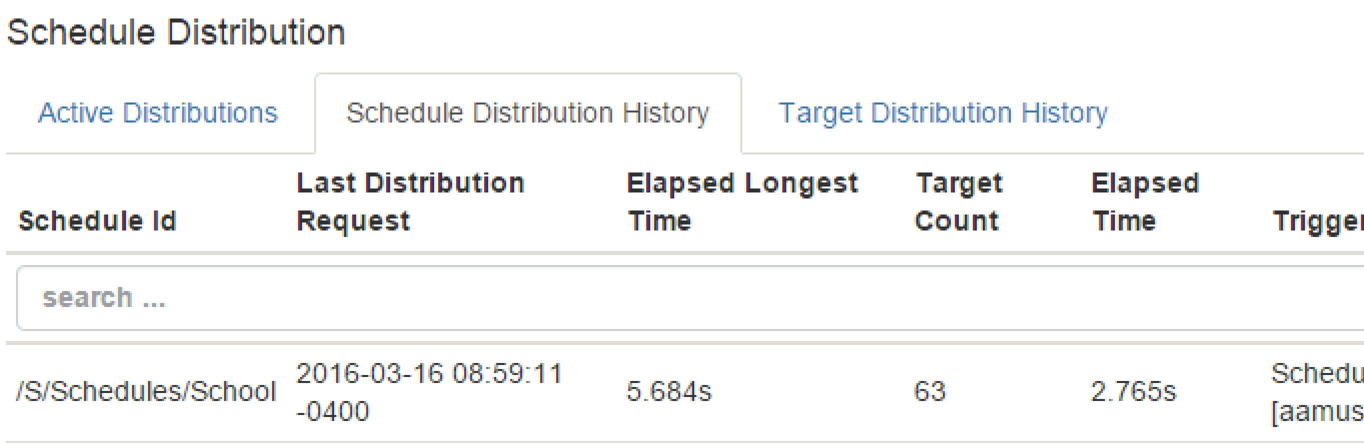
Status	Schedule Id	Target Id	Request Time	Latest Distribu
search ...				
in progress	/S/Schedules/School	/C/Chabucos/NB11124/JimBBCCondVis/SchedClass1	2016-03-16 08:59:11 -0400	2016-03 08:59:1 -0400
in progress	/S/Schedules/School	/C/Chabucos/NB11124/JimBBC/SchedClass2	2016-03-16 08:59:11 -0400	2016-03 08:59:1 -0400
in progress	/S/Schedules/School	/C/Chabucos/NB11124/JimBBC/SchedClass3	2016-03-16 08:59:11 -0400	2016-03 08:59:1 -0400
in progress	/S/Schedules/School	/C/Chabucos/NB11124/JimBBC/SchedClass1	2016-03-16 08:59:11 -0400	2016-03 08:59:1 -0400
in progress	/S/Schedules/School	/C/Chabucos/NB11124/JimBBCCondVis/SchedClass3	2016-03-16 08:59:11 -0400	2016-03 08:59:1 -0400
in progress	/S/Schedules/School	/C/Chabucos/NB11124/JimBBCCondVis/SchedClass2	2016-03-16 08:59:11 -0400	2016-03 08:59:1 -0400
in progress	/S/Schedules/School	/C/Chabucos/NB11124/JimBBC/SchedClass4	2016-03-16 08:59:11 -0400	2016-03 08:59:1 -0400

Column	Notes
Status	Status of the distribution task (queued, in progress)
Schedule Id	The Reference Path of the schedule being distributed to the tar-

	get
Target Id	The Reference Path of the target point that the schedule is being distributed to
Request Time	Time when the distribution request for the schedule was initiated
Latest Distribution	Time for the most recent distribution attempt of schedule to target
Trigger Description	Reason for the distribution attempt (periodic value update, schedule change)
Retries Attempted	Number of retries to distribute Schedule to Target

Schedule Distribution History

The Schedule Distribution History tab is a per-schedule view of the distribution attempts.

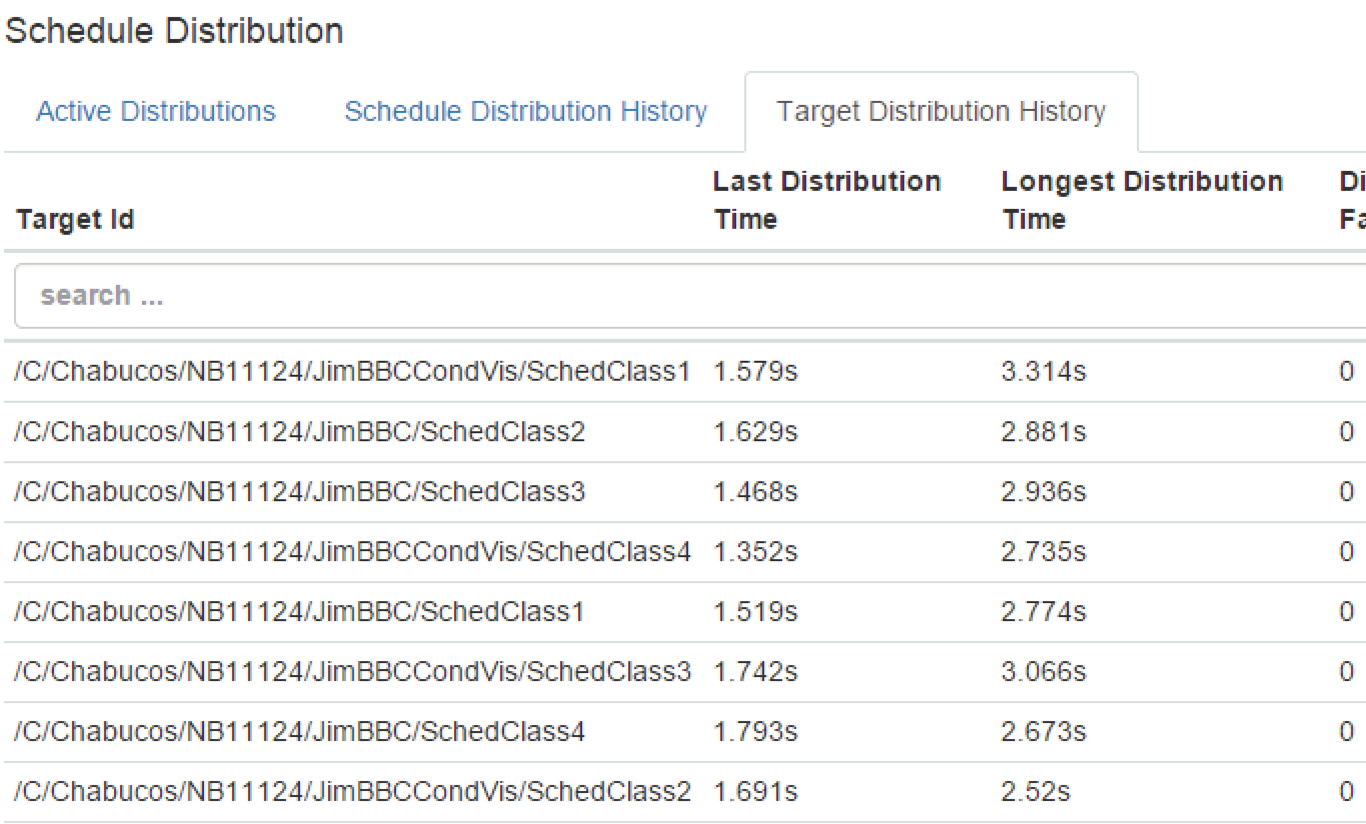


Column	Notes
Schedule Id	The Reference Path of the schedule being distributed to the target
Last Distribution Request	Time that the last distribution request was initiated. May be periodic or result of a user change (see Trigger Description)

Elapsed Longest Time	Longest distribution time since Aspect startup
Target Count	Number of targets for the most recent distribution
Elapsed Time	Time for the most recent distribution attempt of schedule to target
Trigger Description	Reason for the distribution attempt (periodic value update, schedule change)

Target Distribution History

The Target Distribution History is a per-target view of the schedule distribution. It is useful in identifying target that may have having problems receiving schedules from Aspect.


Schedule Distribution

Active Distributions | Schedule Distribution History | Target Distribution History

Target Id	Last Distribution Time	Longest Distribution Time	Di Fa
search ...			
/C/Chabucos/NB11124/JimBBCCondVis/SchedClass1	1.579s	3.314s	0
/C/Chabucos/NB11124/JimBBC/SchedClass2	1.629s	2.881s	0
/C/Chabucos/NB11124/JimBBC/SchedClass3	1.468s	2.936s	0
/C/Chabucos/NB11124/JimBBCCondVis/SchedClass4	1.352s	2.735s	0
/C/Chabucos/NB11124/JimBBC/SchedClass1	1.519s	2.774s	0
/C/Chabucos/NB11124/JimBBCCondVis/SchedClass3	1.742s	3.066s	0
/C/Chabucos/NB11124/JimBBC/SchedClass4	1.793s	2.673s	0
/C/Chabucos/NB11124/JimBBCCondVis/SchedClass2	1.691s	2.52s	0

Column	Notes
Target Id	The Reference Path of the point receiving a distributed schedule from Aspect

Last Distribution Time	Time taken for the last successful distribution to occur
Longest Distribution Time	Time taken for the slowest successful distribution since Aspect Startup to occur
Distribution Failures	Accumulated distribution failures for Target Id since Aspect Startup
Distribution Retries	Accumulated distribution retries for Target Id since Aspect Startup

More Information

Aspect Weekly Schedules

User Preferences

User Preferences Overview

User Preferences are configuration options stored per-user on the Aspect server. These settings allow the user to customize the dashboard and manage their favorite objects so the data that matters most is readily available.

Point Group Manager

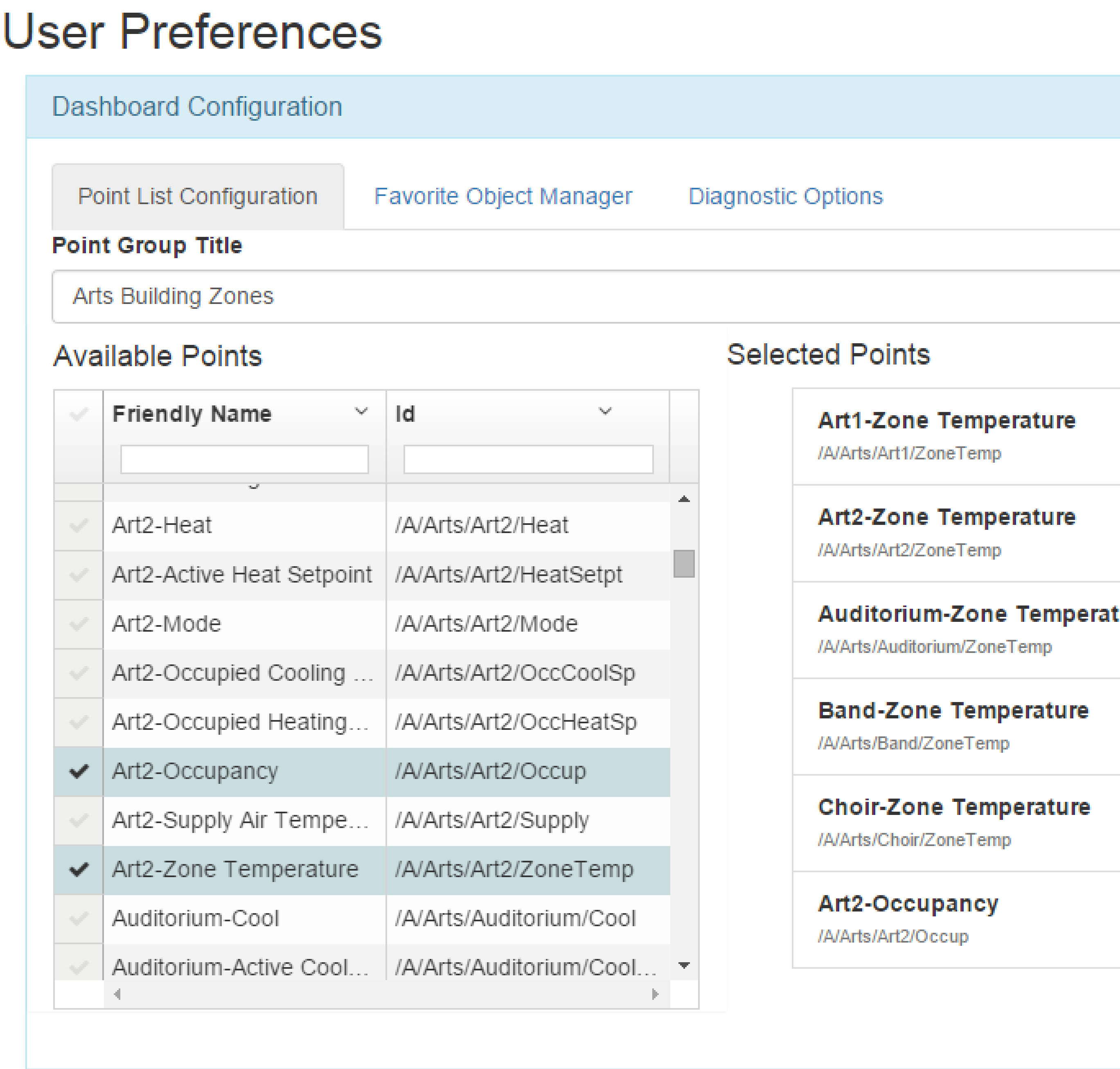
Favorite Items Manager

Point Group Manager

The Point Group Manager is used to select the items that will be displayed in the Point Group display of the Dashboard application. The user can select any points visible to their account that are have the Sparkline property enabled. Up to 15 points may be selected for the Point Group display.

To select a point group, click the checkbox next to the Friendly Name to add it to the selected points list. Points may be deselected by either removing the checkbox from the Available points list or by clicking the Remove button in the Selected Points list.

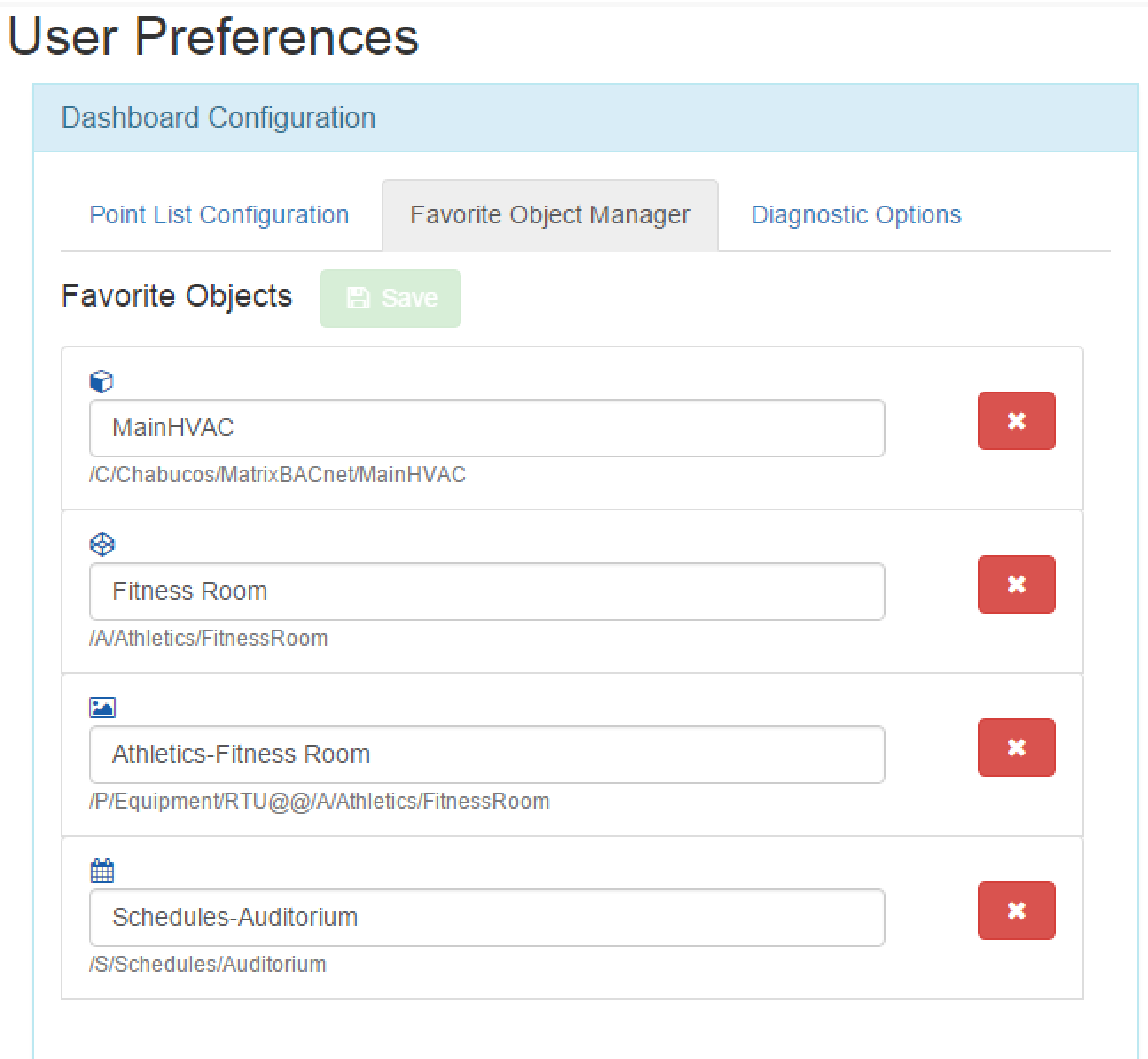
Once the point selection is complete, assign a title to the Point Group and click the  button to commit the changes to the Point Group.



Favorite Items Manager

The Favorite Items manager is used to rename and reorder and delete the favorites as they appear in the Favorite Items display of the Dashboard Application

Items are added to the Favorite objects list by marking them as Favorites in the System Browser, Schedule Editor, or Graphics applications. Items with a  icon are selected as favorites. Items with a  are not currently selected as a Favorite.



__Usage__

- To rename items change the Item's name in the text entry area
- To delete an item from the list, click the Remove button
- To reorder the list, click and drag an item to the desired location in the Favorite Objects list

When all modifications are complete, click the Save button to commit the preference changes

Project Development and Deployment

Creating and Using Applications

Application Basics

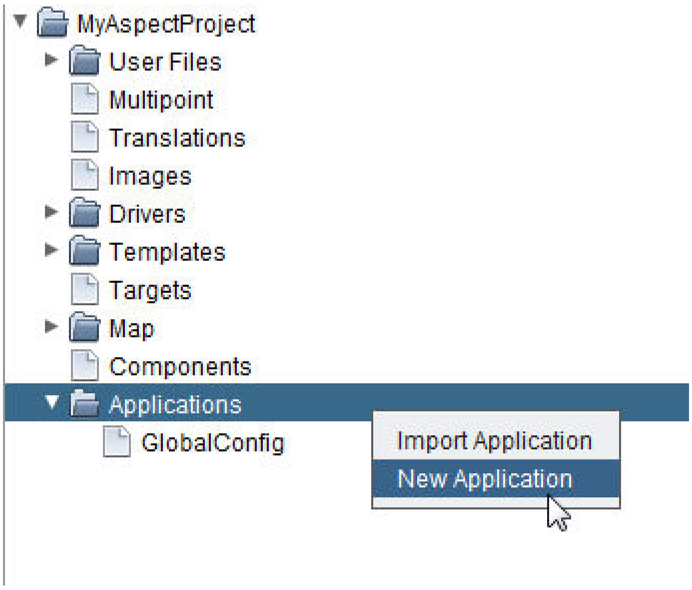
Creating an Application

Applications can define logic, a graphical user interface, or both simultaneously.

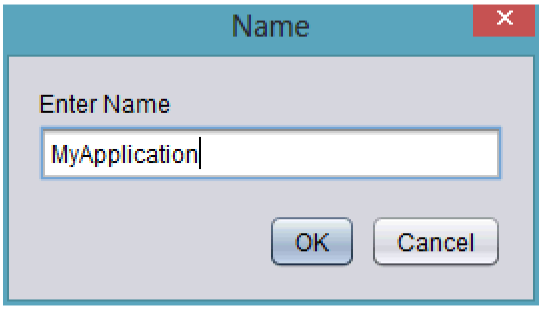
To begin defining logic or to create a graphical user interface screen, you must first create an Application.

To create a project, perform the following steps:

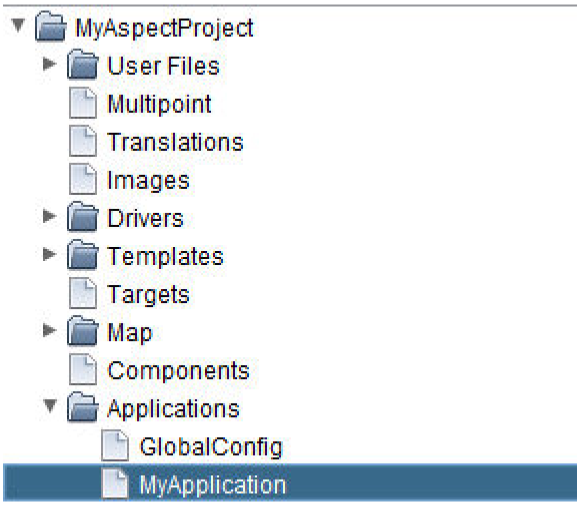
1. In Aspect-Studio, access the Project Tree and find the Applications node.
2. Right-click the Applications node, and select the New Application shortcut.



3. You will be prompted for a name for your Application. If you are creating the first application for your project, Aspect-Studio will provide you with the option to name your first Application as "Main". You may click OK, or delete the name and enter your own name. Once you have entered a valid name, click OK to continue.



3. This action will add a new Application under the Application node folder.



More Information

[Getting Started - Overview](#)

[Preparing Your Project for Engineering](#)

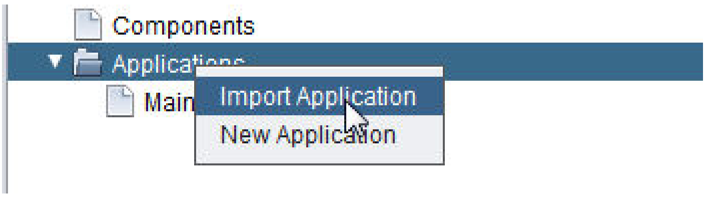
[Working in the Map Topology - Overview](#)

Importing an Application

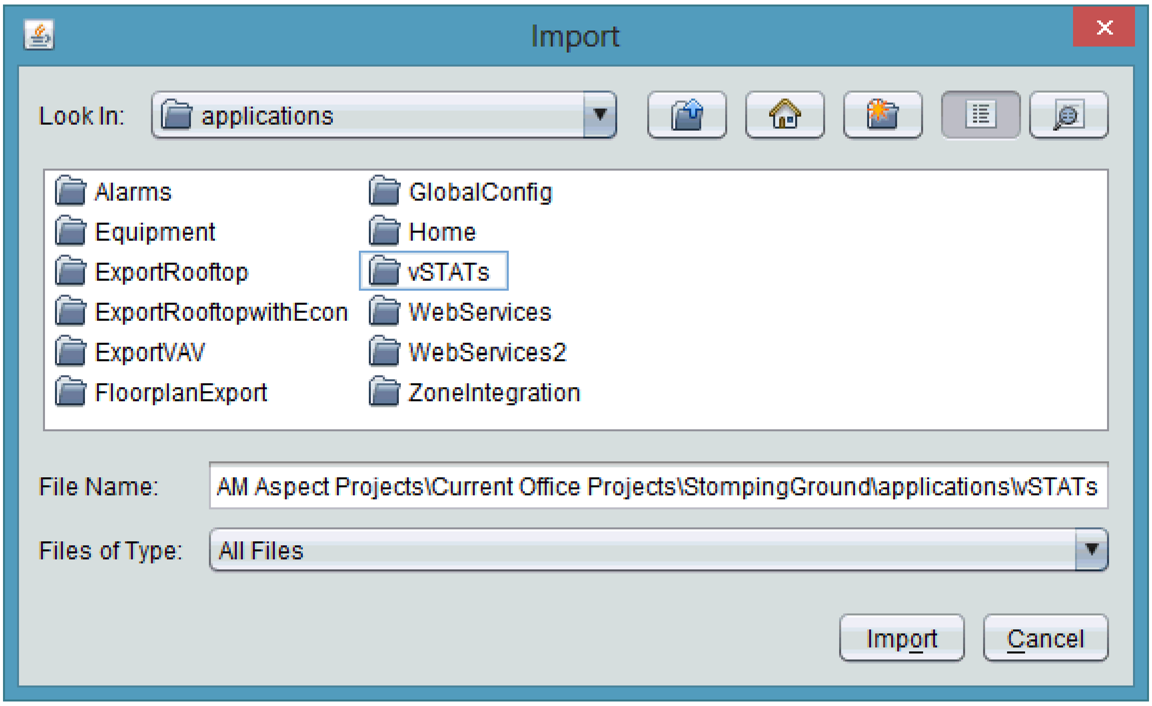
There may be situations where you will want to re-use an Application that was engineered in another project you may have created. Aspect-Studio supports the ability to import an application from another Project.

To import an Application, perform the following steps:

1. From the Project Tree, right click the Applications Node; select Import Application.



2. When selected, the File Browse window will appear. Browse to the appropriate reference project and access the 'applications' folder and select the Application you wish to import. Click Import.



3. If you have any image files, drivers, or user files associated with the Application, you must also import them using the same process for each respective node within the Project Tree.

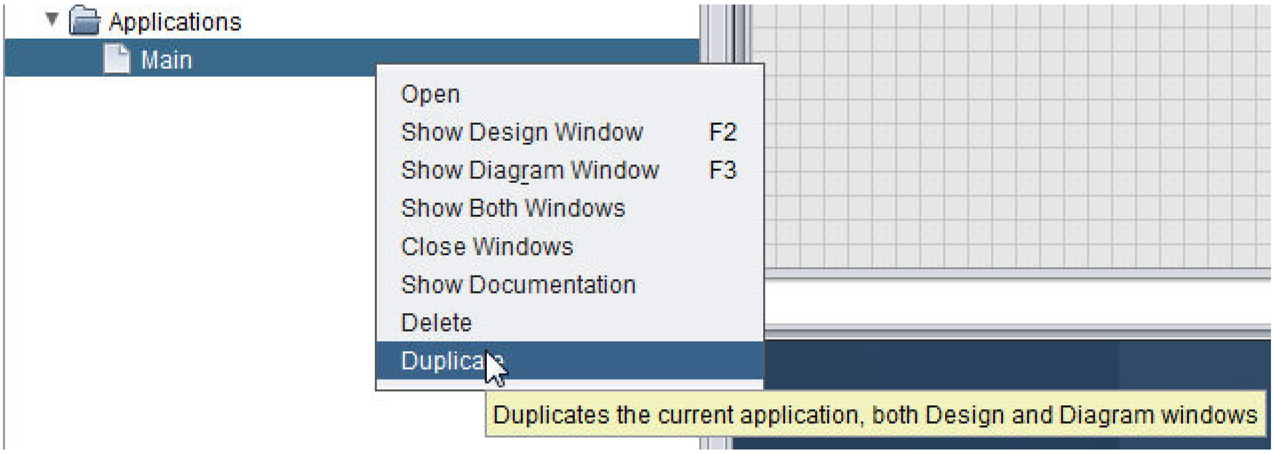
NOTE - The Import Application Process does not automatically import any dependent image files, database drivers, base components, and other user files. In order for your imported Application to operate as intended, you must import dependent items using each respective node of the Project Tree.

Duplicate an Application

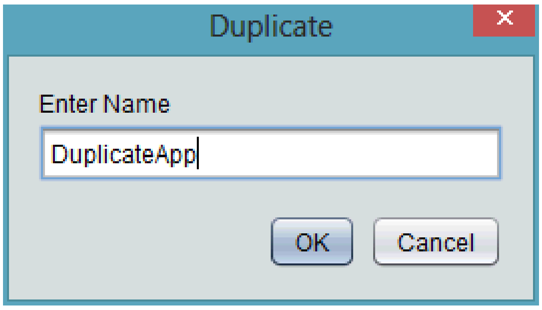
There may be situations where you will want to duplicate a configured Application for re-use. Aspect-Studio supports the ability to duplicate an Application without having to exit Aspect-Studio and perform the work manually via Windows Explorer.

To duplicate an Application, perform the following steps:

1. From the Project Tree, right click the Application you wish to clone, and select Duplicate.



2. You will be prompted to provide a name for the cloned Application. Type in a valid name, then click OK.

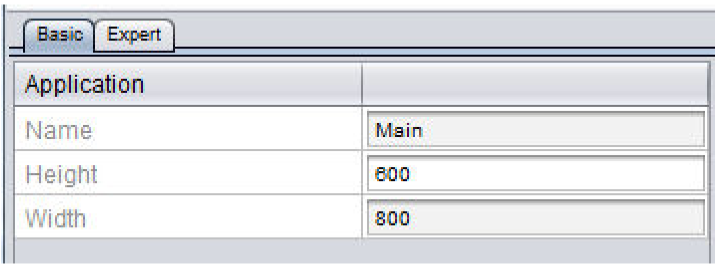


Configuring Application Properties

Configuring Application Basic Properties

Within the Basic Properties, Applications have their own characteristic properties, such as screen width/height.

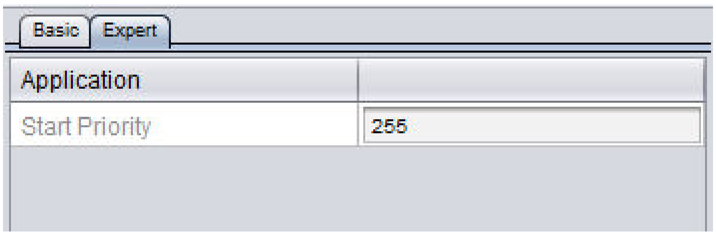
To access the properties of an application, single-click to select the application. Once selected, the Property Pane will display characteristic information regarding the application. By default, an Application's Height and Width will be derived from the Project Properties of your created project. However, they may be overridden at any time by manually editing the Height and Width for each specific application.



Configuring Application Expert Properties

Within the Expert Properties, Applications contains a start priority. The start priority, which is numeric, provides prioritized, sequential initialization, instantiation, and loading of applications upon deployment, as well as during boot-time. The Start Priority ranges from 0 to 255, where 0 is the highest priority, and 255 is the lowest priority.

To access and adjust the Start Priority of an Application, select the application and view the Expert tab of the Application Properties.



Start Priority Configuration - Best Practices

By default, all created applications contain a Start Priority configured for a value of 255 (1 = Highest Priority...255=Lowest Priority). Because projects can vary by design and engineering style, it is difficult for Aspect-Studio to auto-configure the Start Priority of one or multiple applications. You, the programmer of an Aspect project, must configure these priorities.

The following are helpful guidelines that can be used when configuring Start Priority on multiple applications.

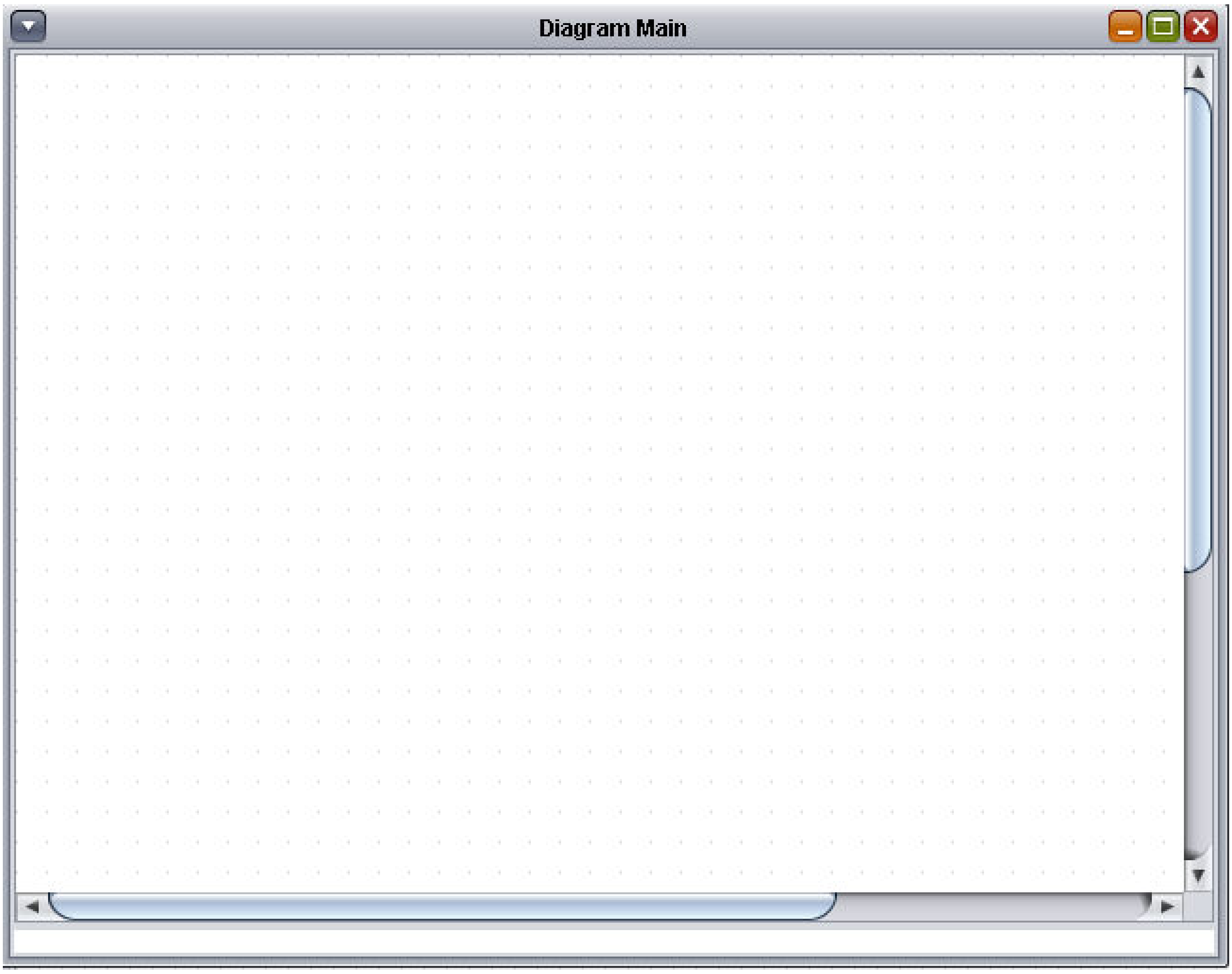
- Applications that contain global configuration data (such as Map Elements, FTNet Devices, Field bus Drivers, Database Connections, and Devices) should be configured with the highest priority (e.g. value of 1).
- Applications that contain global logic should be configured with the next highest priority (e.g. value of 2).
-
    - If you have separate applications that define drivers and devices from one another, configure the Application containing Field bus Drivers as the highest priority, followed by any Applications containing Devices that correspond to configured drivers.
- Applications that simply provide a graphical user interface with no logic should remain configured for lowest priority (255)

If you begin to question whether or not your project is starting up gracefully, you can use the Aspect Control Engine log of your target to troubleshoot start-up issues to help with the configuration of Startup Priority property.

Working in Diagram Mode

Working in Diagram Mode

Diagram Mode is used to define custom logic and sequences, and can also be used to tie field bus and logic information into graphical elements. When you create a new application, the default window is the `Design` Window. If your display does not currently show the `Diagram` Window, you can right-click your new application listing from the `Project Tree` and select `Show Diagram Window`.



Everything within ASPECT is represented by an **Element**. **Elements** can be connected to other **Elements** to create a flow of logic or sequence. **Devices** and **Points** from the **Building Automation System** are referenced in the Map area of the Project Tree and can be added into **Diagram** mode to create graphical user interface screens, as well as logic.

Design and Diagram **Elements** are found in the top bar of ASPECT-Studio called the Palette Toolbar. The Palette Toolbar contains several categories, each of which includes several **Elements** that each perform a specific function. For example, the Add element under the Math category is used to add multiple values together and output the result .

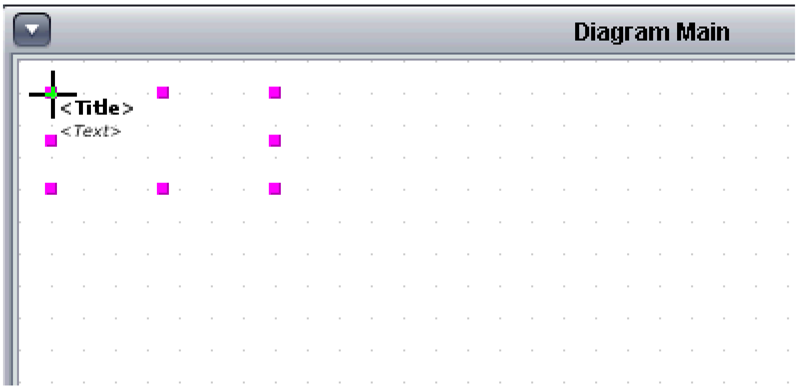
Adding Elements to the Diagram Workspace

To add **Elements** onto the Diagram Window workspace, perform the following steps:

1. From the Palette Toolbar, navigate to the category you wish to work with. In this example, we will add the Diagram Documenter **Element** onto the workspace.

2. Click onthe icon of the function you wish to use. When you single-click the **Element** icon, a red border will highlight the selection.

3. Move your mouse onto the drawing area of the **Diagram** workspace and left-click. This action will create a block representation of the selected **Element** .



When adding **Elements** to your workspace, all **Elements** should be arranged in a logical flow from left to right. This will clearly display the sequence of operation to be defined, and allow for easy visual troubleshooting.

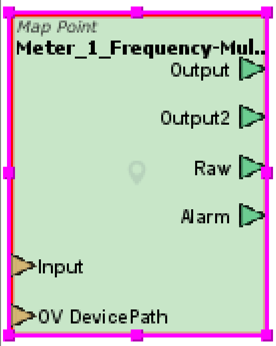
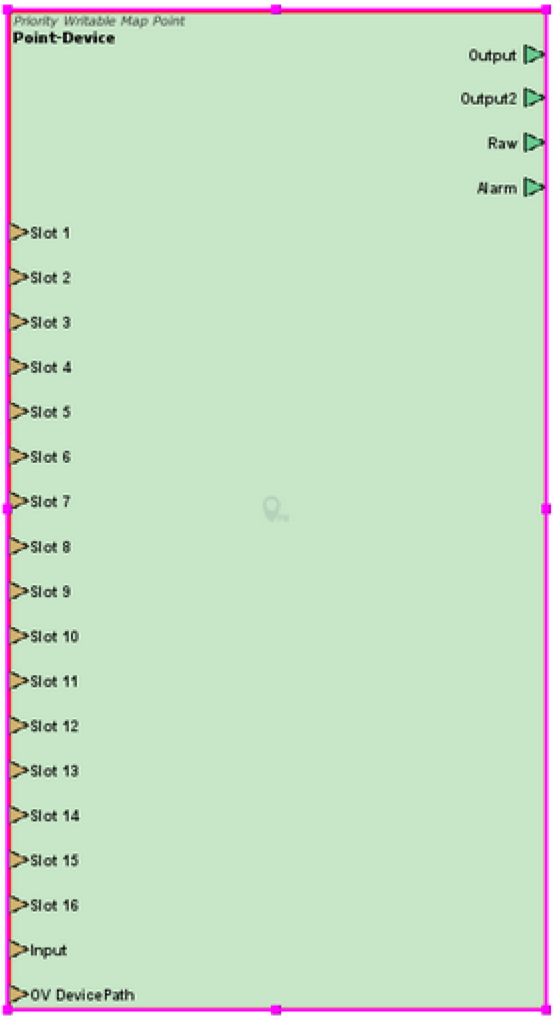
Working with Devices and Points in Diagram Mode

Referencing Points to the Diagram Workspace

Points can be added to an Application's **Diagram** workspace for creating graphical user interface screens, global logic, and other routine items that are part of your overall automation strategy.

There are two seperate kinds of **Map Points** - the" Map Point" on page 1576  and the "BACnet priority writing and clearing" on page 1444 , available from the Map DnD tab:

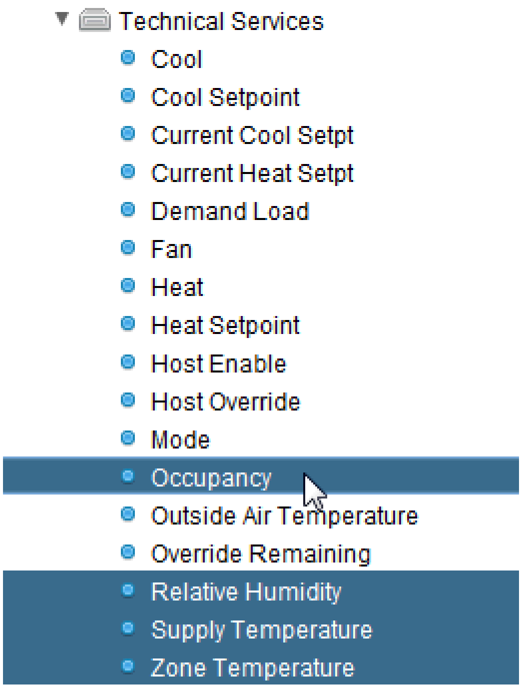
The Priority Writer allows you to set any of the **Priority levels** to any value, including NULL, if the WriteNullValue property is set on the point.

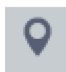
Map Point (Compact block)	PriorityWritableMapPoint (Expanded block)
	

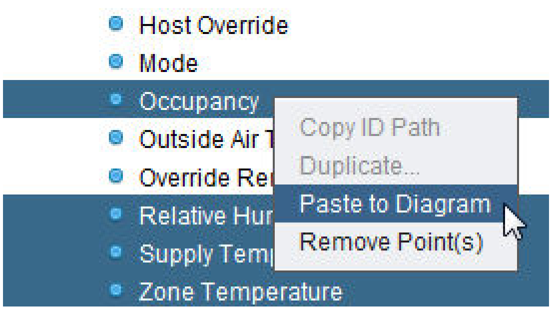
Adding Points to the Diagram Workspace

To add one or more **Points** to the **Diagram** Workspace, perform the following steps:

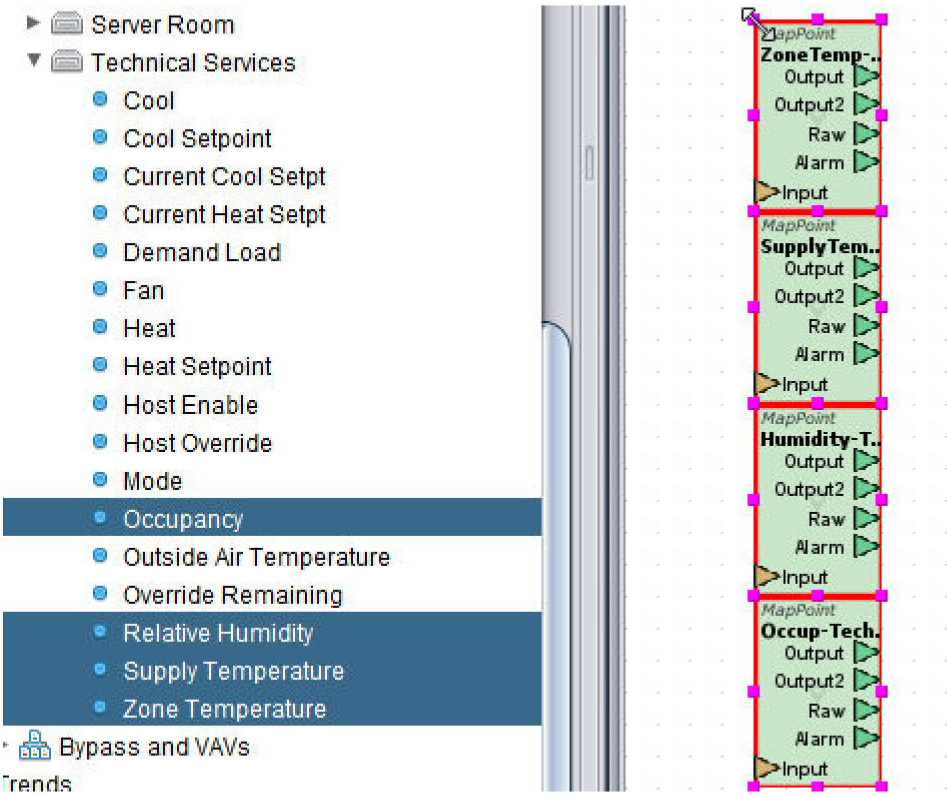
1. On the Map, click on the point you wish to reference. If you would like to select multiple Points, hold the [CTRL] key on your keyboard and click on multiple map points from one or more devices



2. In the Map DnD tab of the Diagram Toolbar, select either Map Point  or Priority Writer 
3. Right-click the selected points to open the shortcut menu, and select Paste to Diagram.

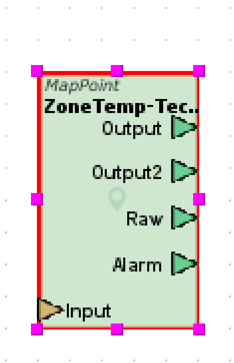


3. Move your mouse onto the drawing area of the **Diagram** workspace and left-click. This action will create a block representation of the point **Elements**.



The Characteristics of a Point

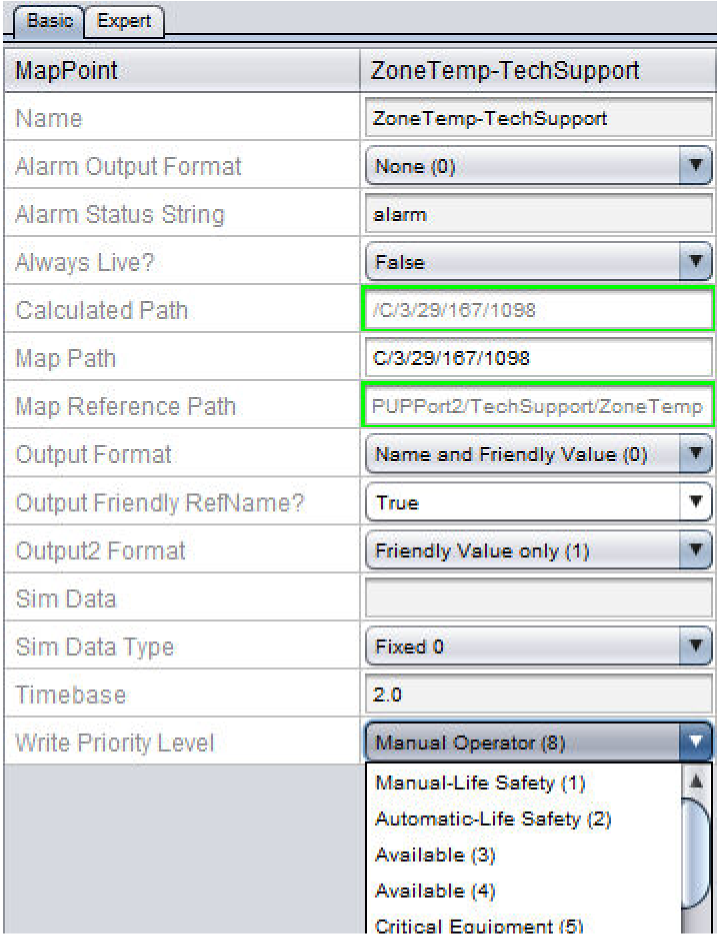
Points referenced in **Diagram** mode have basic characteristics associated to them. The block representation, as shown below, includes multiple nib pins which are used for various items and actions while creating your project.



Characteristics - Input of a Point

The Input of a **Point Element** provides a mechanism to allowing data to be written to the point in a field device. All **Map Points** contain a single Input used for this purpose.

If the point you are referencing comes from a defined **BACnet** device, **Map Points** support the ability to write with **BACnet Command Prioritization** using one of the 16 available levels of the **BACnet priority-array** scheme. To choose a priority at which the point will operate, edit the Write Priority Level property of the **point**, which should be displayed as a **Basic** Property of the **Point** in the Properties Pane.

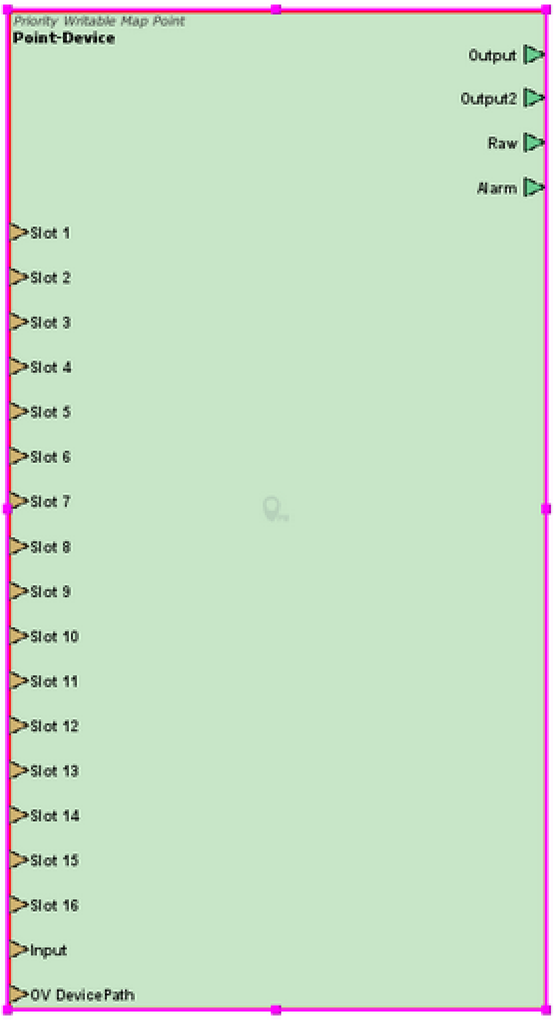


Characteristics - BACnet Priorities

The Priority Writer block representing a point on the **Diagram** work area allows **BACnet Priority Array** levels to be set.

To get the Priority Writer representation instead of the standard Map Point representation, click the PriorityWriteableMap Point icon in the Map DnD tab in the toolbar:

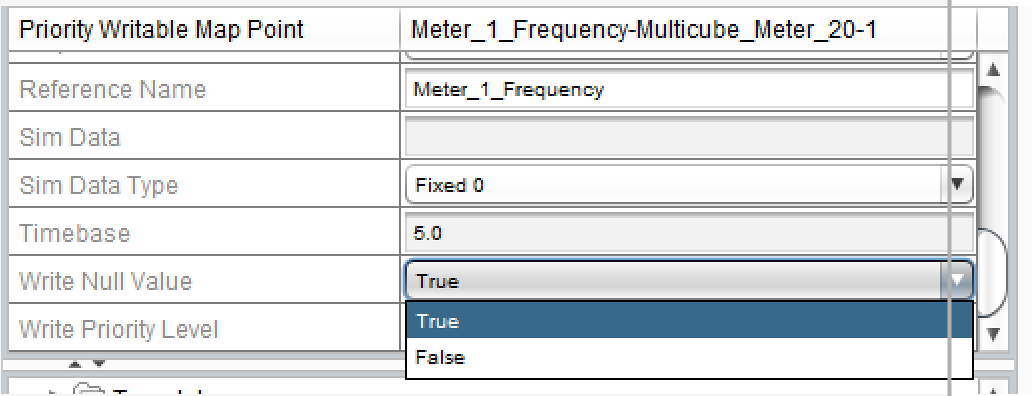
When this is selected, then when a point is dropped on the Diagram area it will have additional inputs - Slot 1 ... Slot 16:



Attaching logic to any Slot input will by default set the corresponding **Priority Level** to the value of that logic. However, if the WriteNullValue property is set on the **Point**, then any write to a Slot input will in fact set that level to NULL rather than the value. This can be used to relinquish overridden values.

> **Note**: In order to write NULL to a point:
>
> - The Network Point must have a data type of BACnet Native (99)

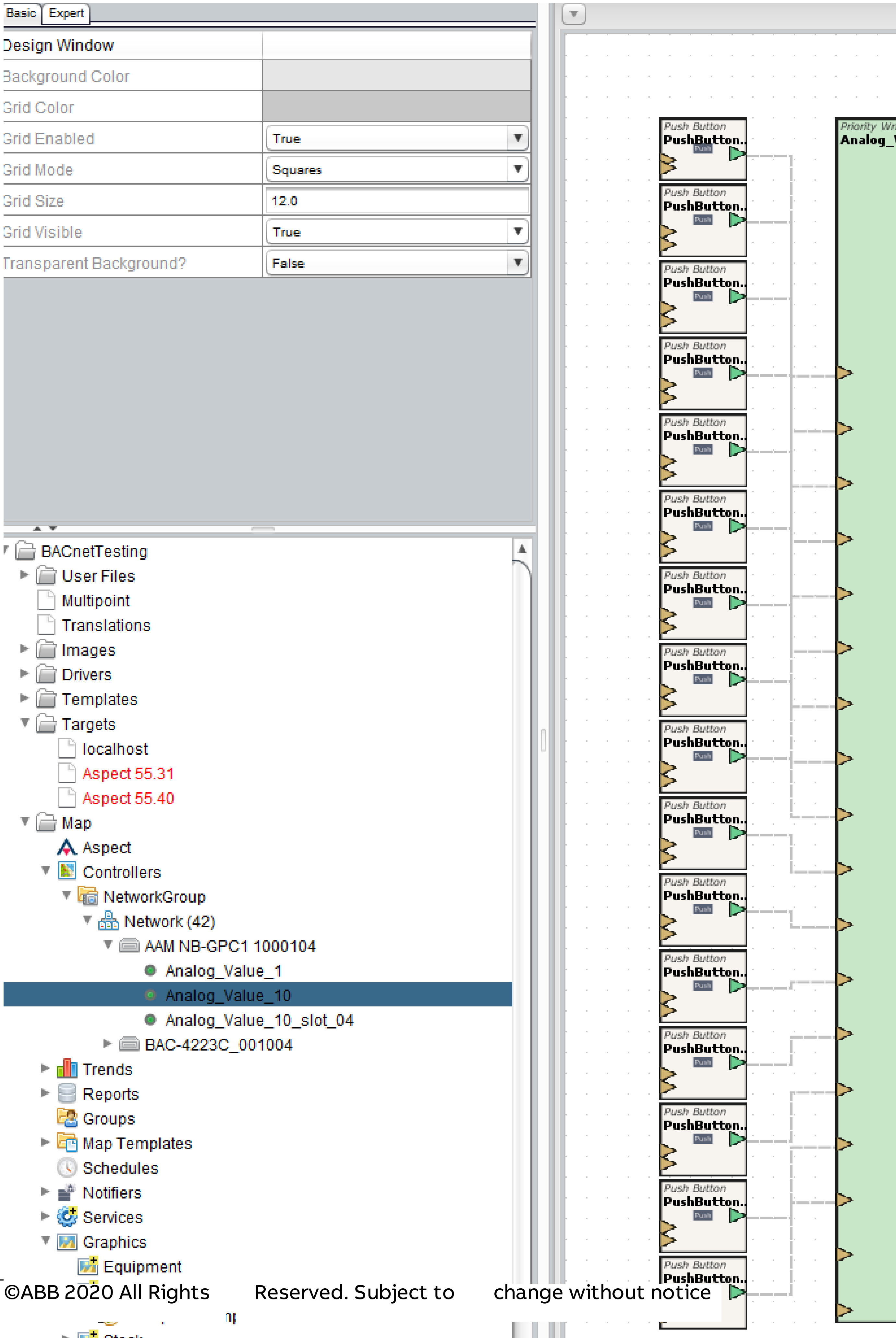
- The Priority Writable Map Point Write Null Value property must be set to True



Note: In order to read NULL from a point:

- The Network Point must have a data type of BACnet Native (99)
- Use a normal Map Point to read the value e.g. 2;1;87;4 to read slot 4 of Analog Value 1
- Use the Null Value Object Validator to determine if the value is NULL

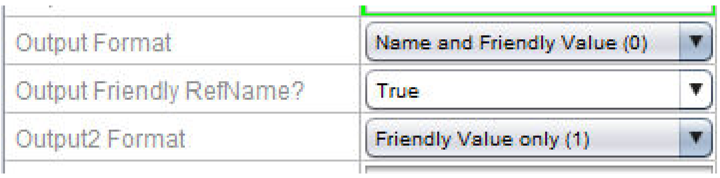
For example:


Basic
Expert
Design Window
Background Color
Grid Color
Grid Enabled
True
Grid Mode
Squares
Grid Size
12.0
Grid Visible
True
Transparent Background?
False
BACnetTesting
User Files
Multipoint
Translations
Images
Drivers
Templates
Targets
localhost
Aspect 55.31
Aspect 55.40
Map
Aspect
Controllers
NetworkGroup
Network (42)
AAM NB-GPC1 1000104
Analog_Value_1
Analog_Value_10
Analog_Value_10_slot_04
BAC-4223C_001004
Trends
Reports
Groups
Map Templates
Schedules
Notifiers
Services
Graphics
Equipment
Push Button
PushButton..
Analog_

Characteristics - Outputs of a Point

Points contain multiple outputs, which can be used in a strategic manner to design graphical user interface screens, perform logical control, as well as obtain information about the makeup of the data.

Output and Output2 are used by default to display point data in a "friendly" manner for use in graphical user interface screens. For example, the Output nib will send to the UI the **Friendly Name** from the controller and **Friendly Value**, which is the point value combined with any relevant engineering unit or enumeration. The format of these outputs can be changed on an individual basis using the Output Format, and Output2 Format properties in the Properties Pane.



The Raw output is used to output the actual point value with no engineering unit or enumeration associated with it, intended for use with logical control schemes that include elements from Math, Logic, and many other categories within the Design Palette.

The Alarm output is used to provide an enumerated value that represents the alarm state of the point. When no alarm is active for the point, an output of 0 (indicting Normal) will be sent. If any alarm event occurs within the system, this point will indicate a non-zero value. Values outputted by Alarm include the following:

- 0 = Normal
- 1 = In Alarm
- 2 = Delay Entry
- 3 = Delay Exit

Properties of a Point

For more information on the Basic and Expert Properties of a Point, see Map Point .

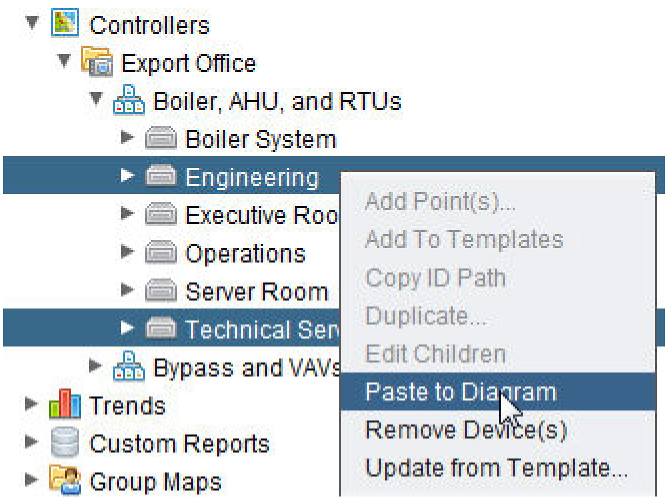
Referencing Devices to the Diagram Workspace

Devices can be added to the Diagram workspace. This feature permits technicians to reference a device and perform alarming against its network status (online/offline).

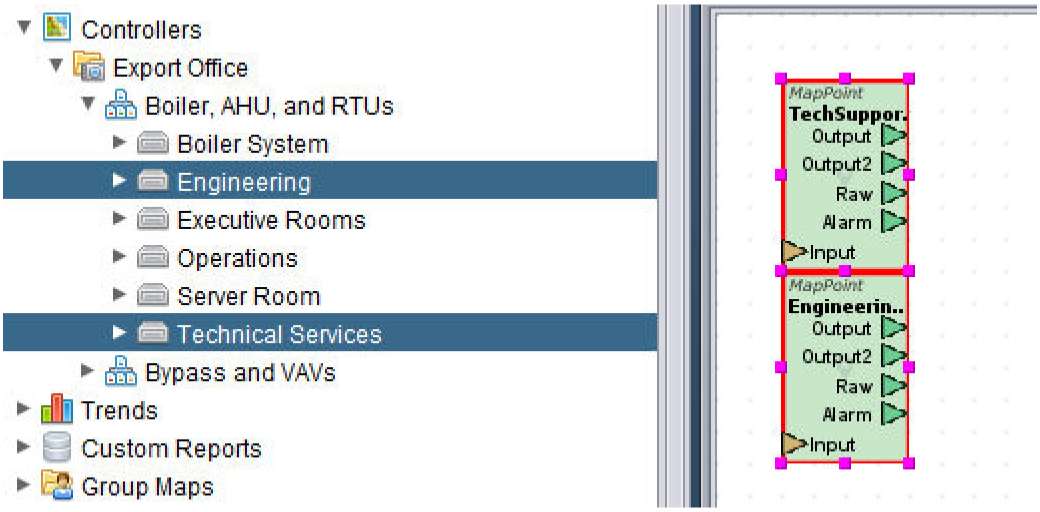
Adding Devices to the Diagram Workspace

To add a Device to the Diagram Workspace, perform the following steps

1. Single left-click to select the device in question. You may also select multiple devices by holding CTRL on your keyboard and performing a single left-click on other devices. Right-click your defined device and select Paste to Diagram from the short-cut menu.



2. Move your mouse to the Diagram workspace. Perform a single left-click anywhere on the Diagram workspace to create block representations of the Devices.



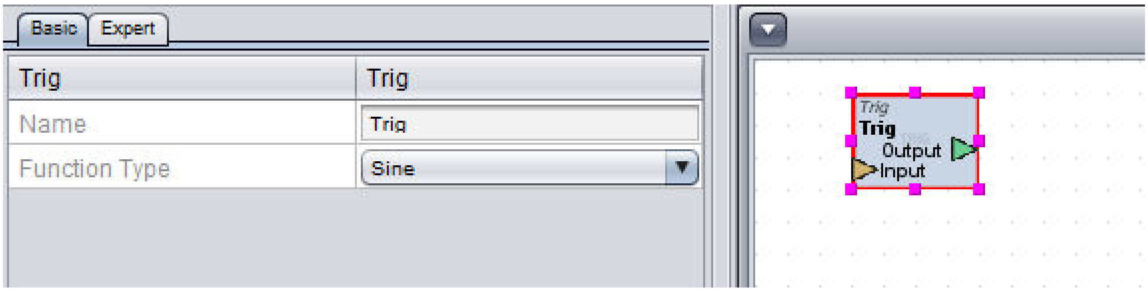
Using the Device

A referenced Device provides the same exact functionality as Points do. However, there are limitations:

1. The Input nib provides no useful functionality. No data can be written to a device.
2. Output and Output2, while they adhere to the output format you elect, provide only online or offline status information for the device.
3. Raw provides a value of 0 (Offline) or 1 (Online), respectively.
4. At this time, Alarm provides no useful functionality. If you wish to perform alarm status notification for the network status of the device, you must use elements from the Alarm category of the Diagram Palette.

Working With Block Elements

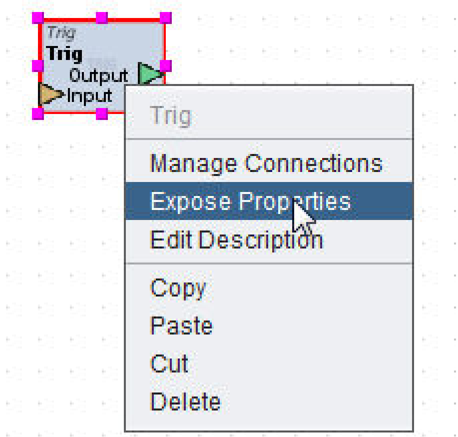
Each element that is added to the Diagram Workspace may contain configurable properties, which are typically used to adjust or setup characteristics of its functionality. For example, a Trig element contains a property for configuring which Trigonometry function that will be applied to an input value. For complete information on each element, please reference the Element Reference chapter of this online help system.



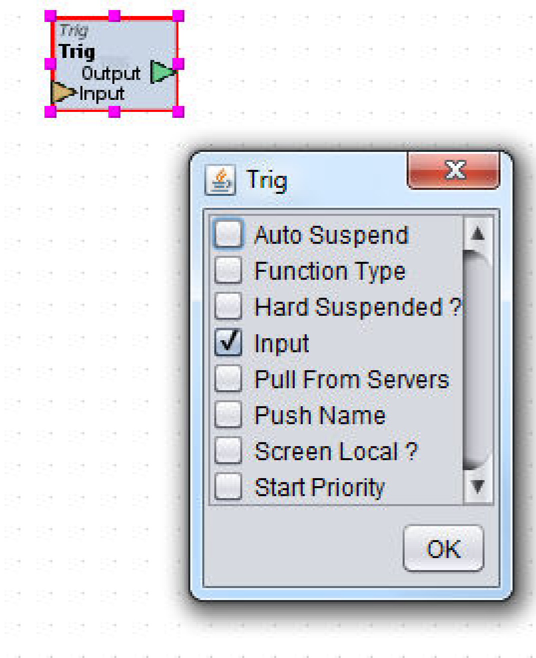
Properties can be modified by selecting the element and referring to the Property Panel. Furthermore, in many cases, many of the available properties of an element can be exposed as input pins, thereby allowing users to enhance their application logic.

To expose additional properties on an element, perform the following steps:

1. Right-click the element, select Expose Properties.



2. The Expose Properties window will appear, providing a complete checklist of properties which are available for exposure.



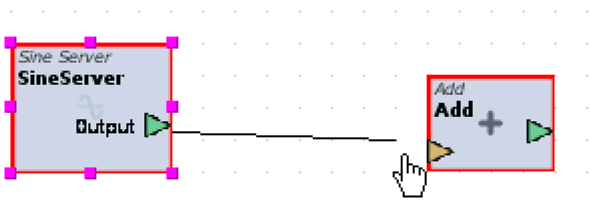
3. Simply place checks into the properties you wish to expose.
4. Click OK.
5. The properties selected should now be available as input pin on the block representation in Diagram Mode.

Establishing Logic Connections

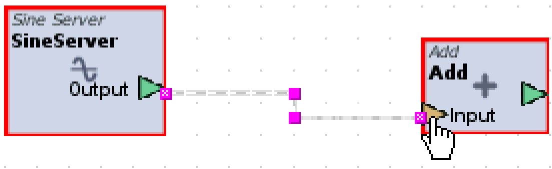
Establishing and creating logic connections is achieved graphically in Aspect-Studio by creating connection lines between elements. Connection lines are made between elements using a wire connection from one element to another. In logical form, the output of one or many elements is connected to an input of another element. The wire connections establish a path for data flow, typically from an output of one element to the input of another element.

To establish a connection line between elements:

1. Click and hold the output terminal pin of the sending element, then drag in the direction you want to go.



2. Release your mouse click once a connection has been established to a pin desired.



Color Coded Logic Connections

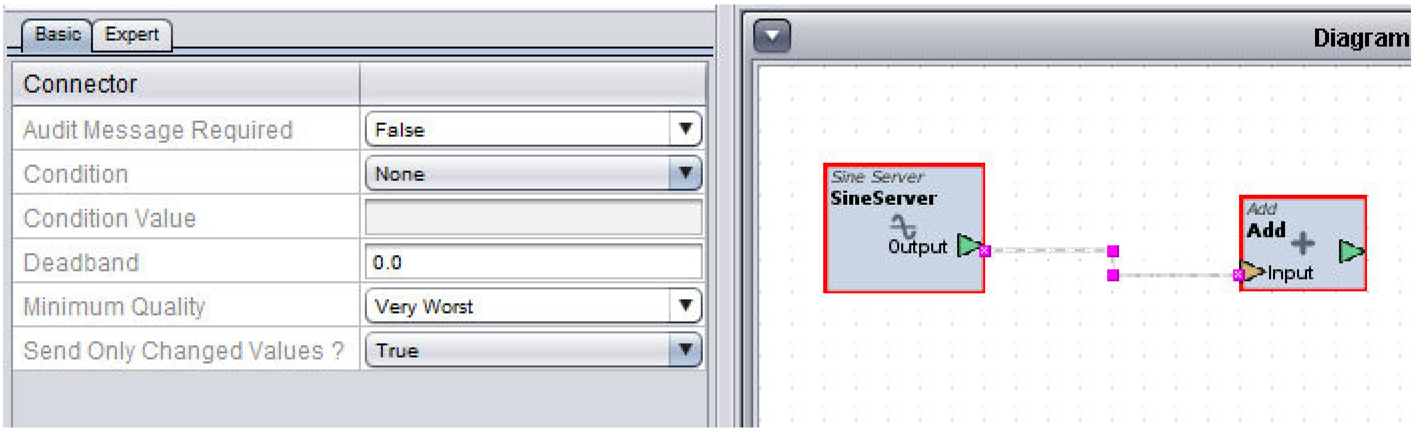
When connections are established, the relationship between the elements is automatically checked for any errors that may have occurred during engineering. The connector wire will display colors depending on whether or not logical flow of data is successful.

The connection links will show the following colors during development:

- Gray - indicates that no logic is being executed. This typically occurs when an element or graphical element/element is not accepting data from the output of the element.
- Green - indicates that data flow and logic is successfully linked and no problems exist.
- Red - indicates that an error in logic has been detected by Aspect Studio. By selecting the wire connection using a mouse, an error description can be located on the status bar of the Diagram Window to assist with troubleshooting the issue.

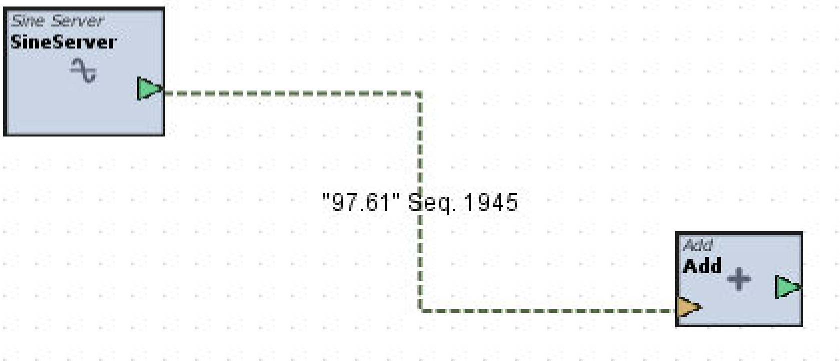
Connector Properties

Logic connectors contain properties which can be utilized to establish deeper control logic in a manner which supersedes the standard element connections. To invoke the properties of a specific connection, simply click to highlight the logic connection.

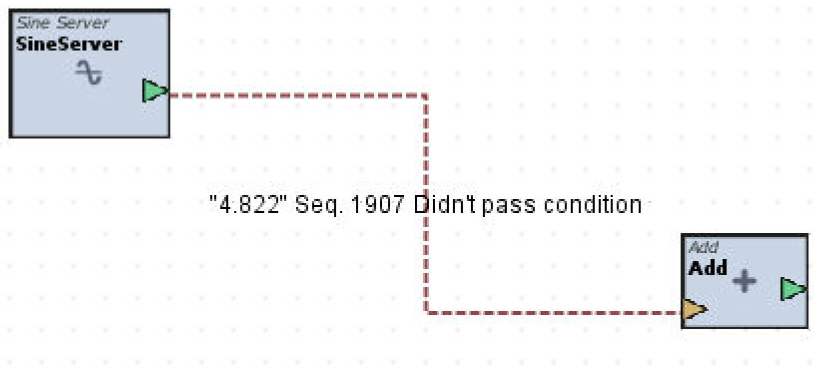


Conditions can be applied to permit values that meet certain conditions or quality to be passed onto other connection elements.

For example, if you only wish to send values that are less than 50, you can configure the Condition property for Less Than (<), and set the Condition Value to 50.0. Once configured, values less than 50.0 will be permitted to pass through to the connecting element. Considered a valid condition, the connector line will retain a green color to indicate sound, established logic.



When a value crosses outside of a configured condition (in this case, at 50.0 or above), the value will not be permitted to pass. Considered an invalid condition, the connector line will indicate a red color to indicate this event.



Property Name	Notes
Audit Message Required	Placeholder for future functionality.
Condition	Defines a condition type which can be applied towards data sent through the connector. Available condition types include the following: • Equal (=) • Greater Than (>) • Less Than (<) • Greater Than or Equal To (>=) • Less Than or Equal To (<=) • Not Equal (!=)
Condition Value	Defines a value to apply towards a selected condition.
Deadband	Defines a deadband which is applied towards the condition value. The Deadband straddles the condition value, where half of the deadband is applied above and below the condition value.
Minimum Quality	Defines the minimum quality that a value must represent in order to allow data to pass. By default, this is set to 'Very Worse'.
Send Only Changed Values	Defines if only a valid change of value is allowed to pass across the connector. When set to false, all value changes and updates (regardless of whether or not the actual value has changed) will be sent as they are received or updated by the element providing the output. When set to True, values that actually change from one sample to

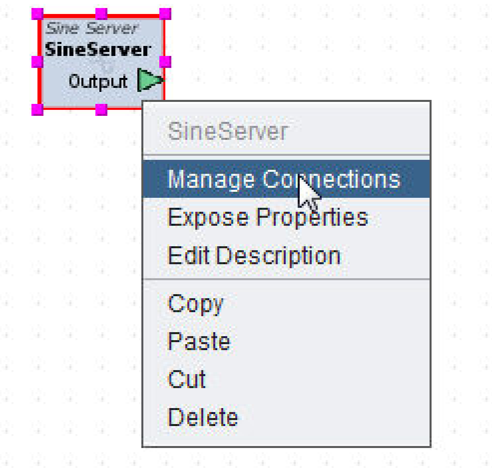
	another will be permitted to pass across the connector.

Establishing Logic Connections Between Different Applications

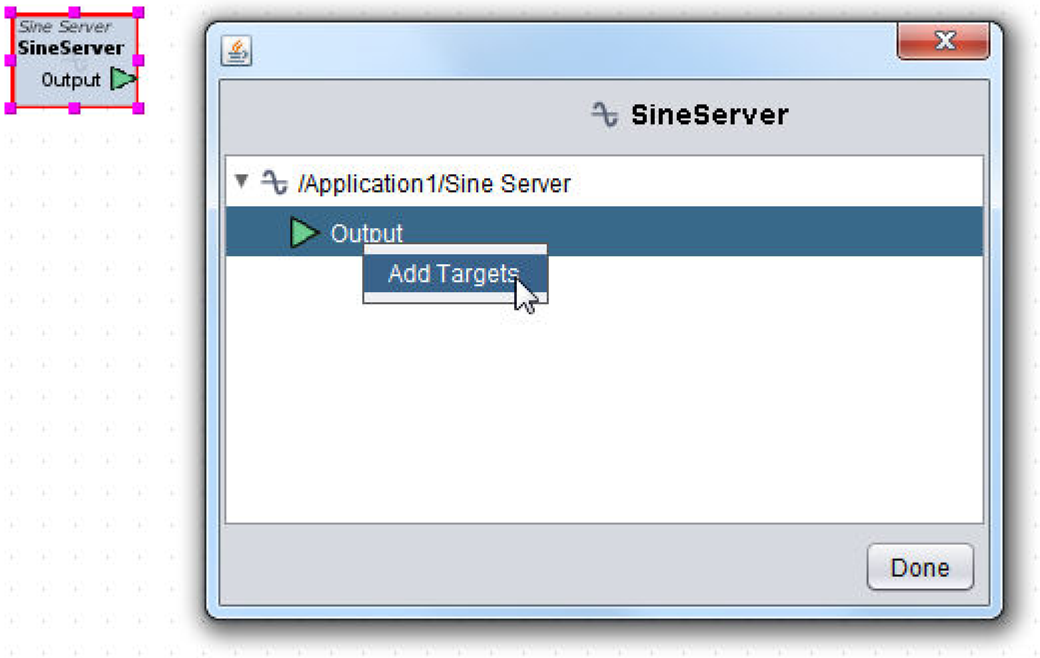
In some cases, it may be necessary to pass information from one Application to another (e.g. sharing a temperature with other devices in the global network). In many cases, you physically cannot draw a line from one application to another. However, you are able to link logic without necessarily having to draw a wire connection. To link logic between different applications, the Manage Connections feature must be used.

To invoke the Manage Connections feature:

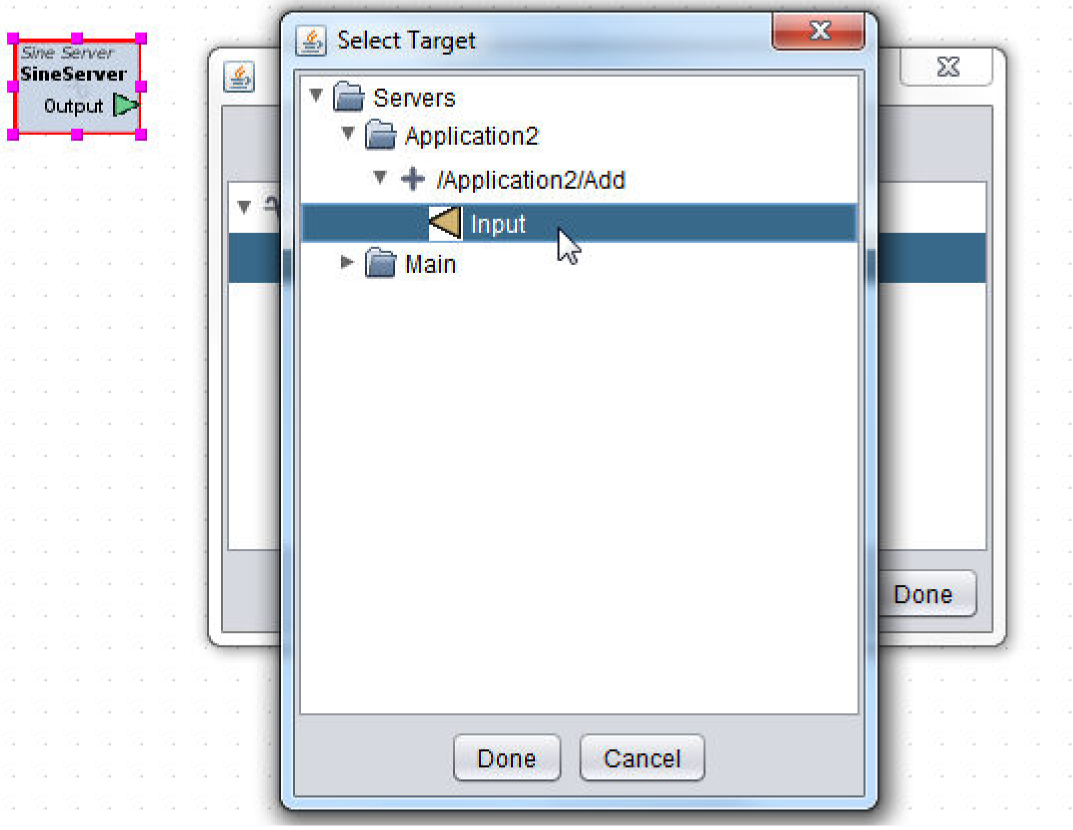
1. Select the target element you wish to send information from in the workspace
2. Right-click, select Manage Connections.



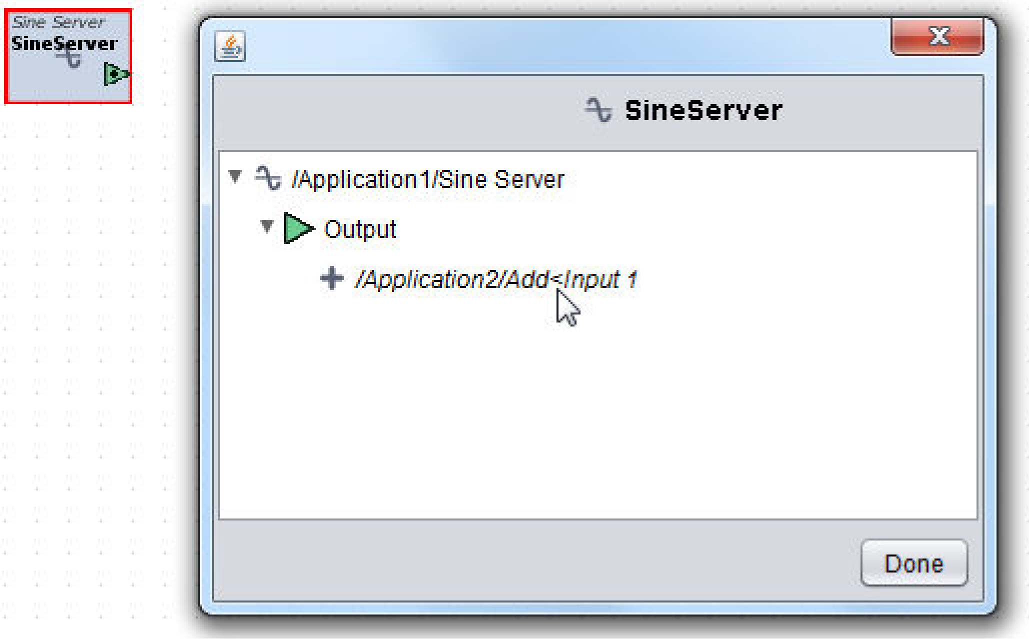
3. From the Manage Connections window, you will see a listing for the element you have selected, along with any visible Input and Output pins commonly used within logic applications. To establish a connection with any of these pins, right-click the pin of interest and select Add Targets.



4. The Select Target window will appear, allowing you to search different applications contained within the project. Locate the application, and data point you wish to connect to. Click Done once complete.



5. The result of this action will show a connection between both targets.



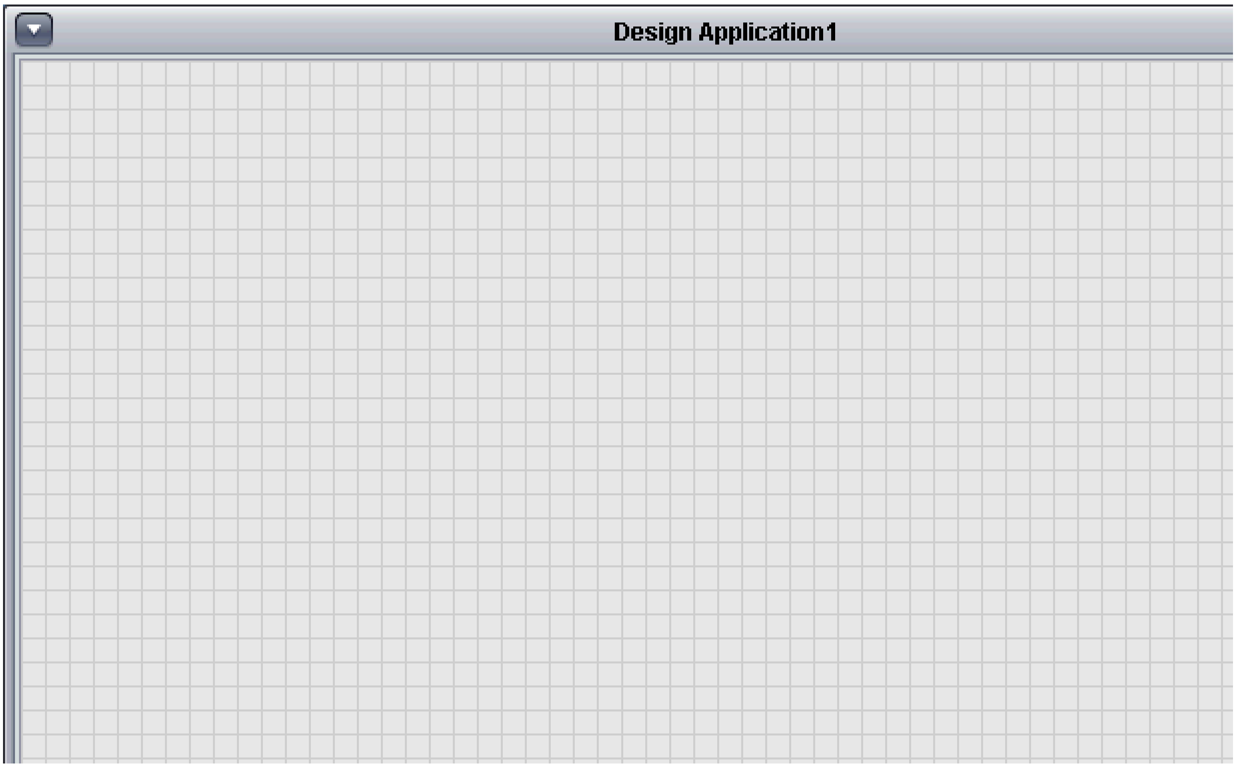
Working in Design Mode

Working in Design Mode

When creating an Application, Design Mode is used to set up or modify a graphical user interface screen.

Information displayed on an application's Design page can include points from the fieldbus associated with the device as well as any back-end logic values that the user shouldbe allowed to access.

The Design Window is the default view when a new **Application** is created, but if the Design Window is not visible it can be opened by right-clicking an **Application** in the Project Tree and selecting Show Design Window.

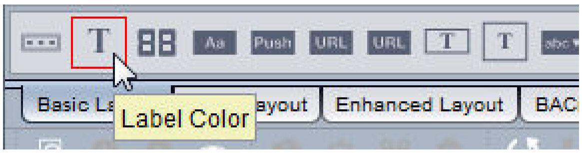


Adding Elements to the Workspace

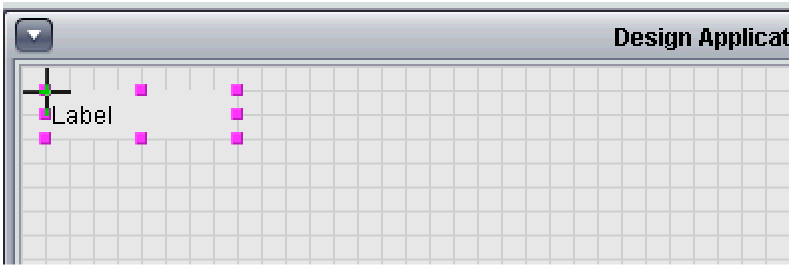
To add elements onto the Workspace, perform the following steps:

1. From the Palette Bar, navigate to the category of choice you wish to work with. Notice that the palette for the Design workspace differs from the Diagram workspace.

2. Using your mouse, single-click the Element Icon of the function you wish to add. When you single-click the Element Icon, a red border will highlight the selection, indicating a valid selection.



3. Move your mouse onto a desired are of the workspace, and perform an additional single-click. This will add the graphical element onto the workspace.



As graphical elements are added to the workspace, you may arrange and build your graphical user interface screen as needed with applicable image elements and other value Annunciator for interacting with data from the system.

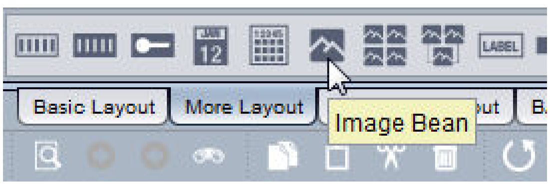
Similar to Diagram elements, **Design Elements** can be added to the Diagram workspace and have logic connected to display values.

To help you decide the layout of Design Elements within the final Graphical User Interface page, ASPECT-Studio can show simulated data instead of placeholders in the Design Window so that you can evaluate how the UI page will look when it is in operation. See Previewing with Simulated Data for more information.

Designing User Interfaces

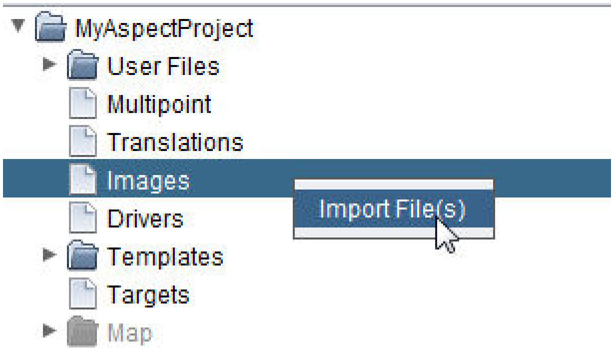
Displaying Static Images and Backgrounds

Static images are typically imported into Aspect-Studio for use as background, as well as to build a library of equipment used within a project (such as terminal boxes, air handling units, rooftop units, etc.). Static images displayed within Aspect utilize the Image Bean element, located in More Layout category of your Design palette.

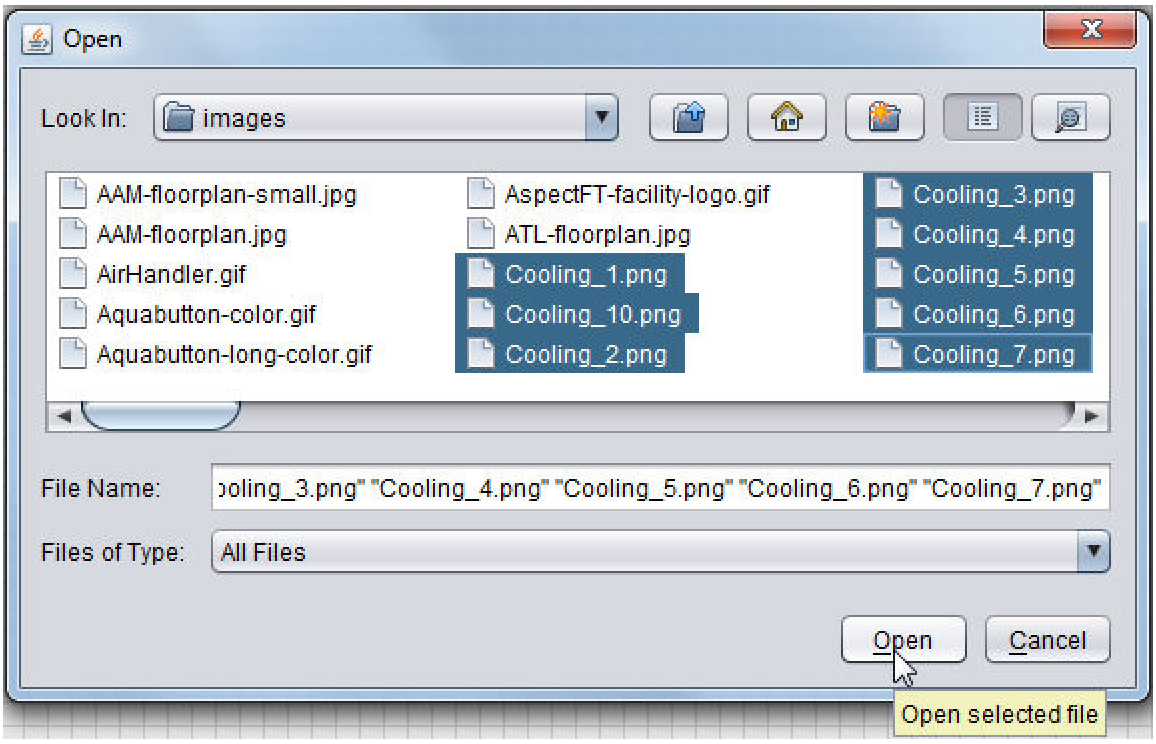


To use this element, you must import images into your project. Aspect Studio supports JPEG, PNG, and GIF (static and animated) file formats. To import image files, perform the following steps:

1. From the Project Tree, right click the Images node, and select Add File(s)



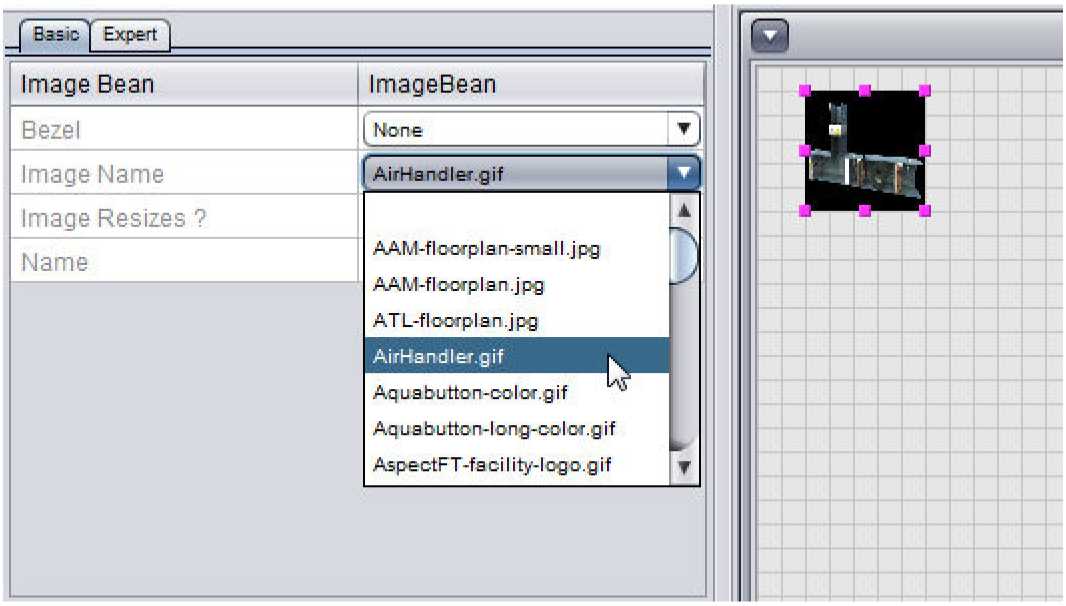
2. Browse your PC for the image file you wish to load. You may select multiple images by holding CTRL on your keyboard and clicking each additional image you wish to have loaded. When finished, release the CTRL key and click the Open button to import the images into your project.



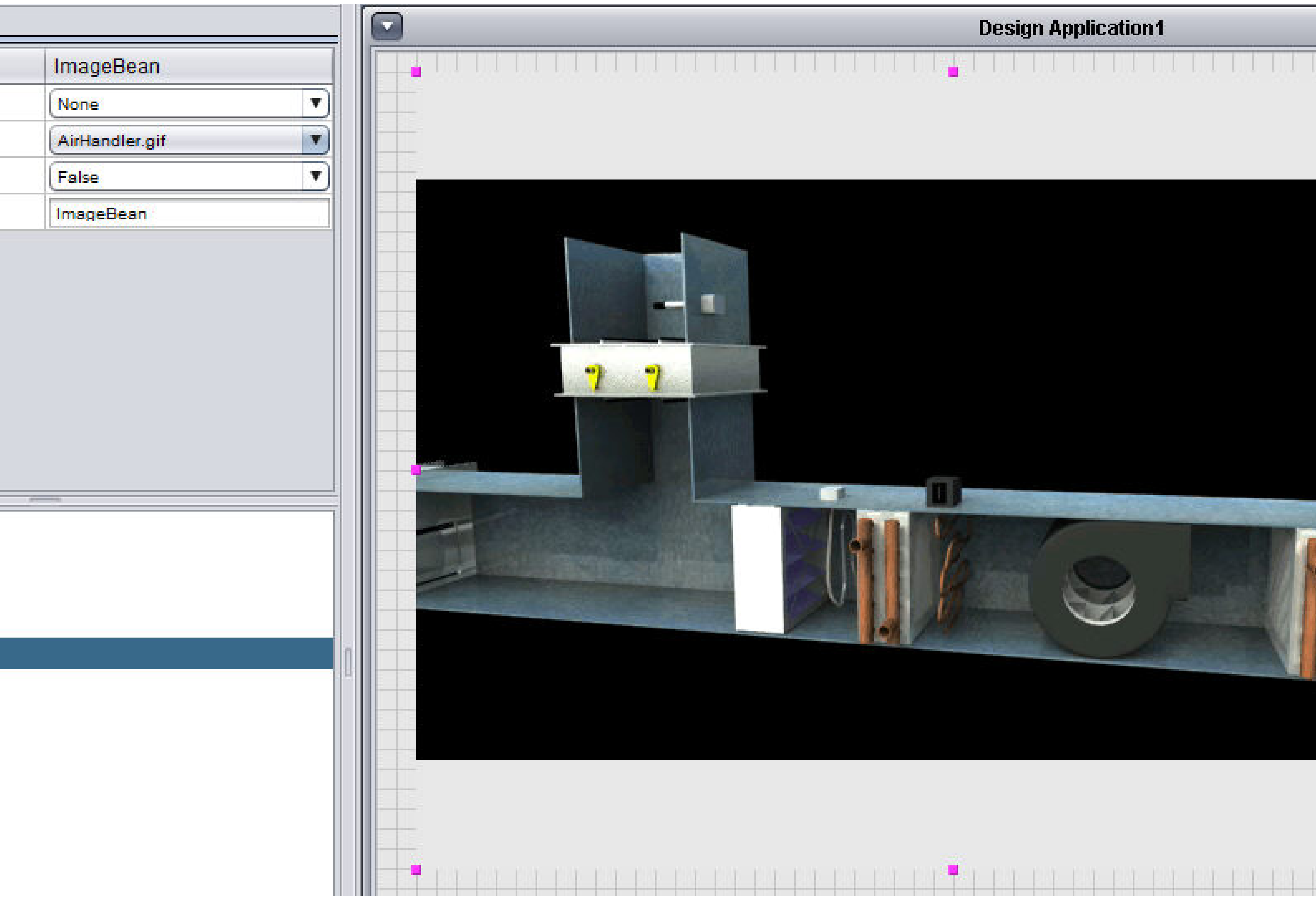
NOTE - Aspect supports the following web-based image formats: .JPG, .PNG, and .GIF (static and animated).

To bind a specific image to the Image Bean element, access the Properties of the Image Bean element and select the appropriate graphic from the Image Name property.

If you are working with fixed sized images that will use animation overlays, it is recommended that you set the "Image Resizes ?" property to False to preserve the aspect ratio of the image.



Once selected, you will need to stretch and scale the boundaries of the Image Bean to fit your selected image.



Working with Text and Labels

Adding text and labels is common when building any graphical user interface. Due to the fact that Aspect can utilize both standard fonts common to virtually any PC, as well as custom fonts that may be installed as part of another software package external to Aspect-Studio, it is important to ensure that you are working with a common font.

In the event that you engineer a graphical user interface with an uncommon font and a PC does not have that font installed, text may:

- display in a different font, potentially leading to cut off text or an inconsistent user interface.
- display no text at all.

Careful consideration should be taken into account relative to using standard fonts. It is typically a good idea to use a common font (such as Arial, Courier, or Times New Roman) when designing screens. The following is a list of standard fonts that Aspect uses below. AAM strongly recommends that a standard, pre-packaged font be used with screens at all time. If you attempt to use a non-standard front, AAM cannot assure you that client browsers will be able to resolve and view text information.

Standard Fonts

- Abadi MT Condensed Light
- Agency FB
- Agency FB Bold
- Algerian
- Almanac MT
- Amazone BT
- Architecture
- Arial
- Arial Black
- Arial Black Italic
- Arial Bold
- Arial Bold Italic
- Arial Italic
- Arial Narrow
- Arial Narrow Bold
- Arial Narrow Bold Italic
- Arial Narrow Italic
- Arial Rounded MT Bold
- Avant Garde Book BT
- Avant Garde Book Oblique BT
- Avant Garde Medium BT
- Avant Garde Medium Oblique BT
- Bank Gothic Medium BT
- Baskerville Old Face
- Bauhaus 93
- Beesknees ITC
- Bell MT
- Bell MT Bold
- Bell MT Italic
- Benguiat Bk BT
- Benguiat Bold BT
- Benguiat Bold Italic BT

- Benguiat Book BT
- Benguiat Book Italic BT
- Berlin Sans FB
- Berlin Sans FB Bold
- Berlin Sans FB Demi Bold
- Bernard MT Condensed
- Bernhard Fashion BT
- Blackadder ITC
- Book Antiqua
- Book Antiqua Bold
- Book Antiqua Bold Italic
- Book Antiqua Italic
- Bookman ITC Demi BT
- Bookman ITC Demi Italic BT
- Bookman ITC Light BT
- Bookman ITC Light Italic BT
- Bookman Old Style
- Bookman Old Style Bold
- Bookman Old Style Bold Italic
- Bookman Old Style Italic
- Bradley Hand ITC
- Britannic Bold
- Broadway
- Brush Script BT
- Brush Script MT Italic
- Californian FB
- Californian FB Bold
- Californian FB Italic
- Calisto MT
- Calisto MT Bold
- Calisto MT Bold Italic
- Calisto MT Italic
- Castellar
- Centaur
- Century Gothic
- Century Gothic Bold
- Century Gothic Italic
- Century Schoolbook
- Century Schoolbook Bold
- Century Schoolbook Bold BT
- Century Schoolbook Bold Italic
- Century Schoolbook Bold Italic BT
- Century Schoolbook BT
- Century Schoolbook Italic

- Century Schoolbook Italic BT
- Chiller
- Colonna MT
- Comic Sans MS
- Comic Sans MS Bold
- Common Bullets
- Compacta
- Compacta BT
- Cooper Black
- Cooper Black BT
- Cooper Black Italic BT
- Cooper Black Outline BT
- Cooper Medium BT
- Cooper Medium Italic BT
- Copperplate Goth Bd BT Normal
- Copperplate Gothic Bold
- Copperplate Gothic Bold BT
- Copperplate Gothic Light
- Courier New
- Courier New Bold
- Courier New Bold Italic
- Courier New Italic
- Curlz MT
- Dauphin
- Dom Bold BT
- Dom Casual BT
- True Type Font List
- Dom Diagonal Bold BT
- Edwardian Script ITC
- Elephant
- Elephant Italic
- English 157 BT
- Engravers MT
- Engravers Old English Bold BT
- Eras Bold ITC
- Eras Demi ITC
- Eras Light ITC
- Eras Medium ITC
- Eras Ultra ITC
- Felix Titling
- Footlight MT Light
- Forte
- Franklin Gothic Book
- Franklin Gothic Book Italic

- Franklin Gothic Demi
- Franklin Gothic Demi Cond
- Franklin Gothic Demi Italic
- Franklin Gothic Heavy
- Franklin Gothic Heavy Italic
- Franklin Gothic Medium
- Franklin Gothic Medium Cond
- Franklin Gothic Medium Italic
- Freestyle Script
- French Script
- Futura Bold BT
- Futura Bold Condensed BT
- Futura Bold Italic BT
- Furura Extra Black BT
- Futura Extra Black Condensed BT
- Futura Heavy BT
- Futura Light BT
- Futura Light Condensed BT
- Furuta Medium BT
- Futura Medium Condensed BT
- Futura Medium Italic BT
- Galliard BT
- Garamond
- Garamond Bold
- Garamond Italic
- Garamond MT
- Garamond MT Italic
- Georgia
- Georgia Bold
- Georgia Bold Italic
- Georgia Italic
- Gigi
- Gill Sans MT
- Gill Sans MT Bold
- Gill Sans MT Bold Italic
- Gill Sans MT Condensed
- Gill Sans MT Ext Condensed Bold
- Gill Sans MT Italic
- Gill Sans Ultra Bold
- Gill Sans Ultra Bold Condensed
- Gloucester MT Extra Condensed
- Goudy Handtooled BT
- Goudy Old Style
- Goudy Old Style Bold

- Goudy Old Style BT
- Goudy Old Style Italic
- Goudy Stout
- Haettenschweiler
- Harlow Solid Italic
- Harrington
- High Tower Text
- High Tower Text Italic
- Hobo BT
- Holidays MT
- Humanist 521 Bold BT
- Humanist 521 Bold Italic BT
- Humanist 521 BT
- Humanist 521 Italic BT
- Impact
- Imprint MT Shadow
- Informal Roman
- Jokerman
- Juice ITC
- Kids
- Kristen ITC
- Kunstler Script
- Letter Gothic MT
- Letter Gothic MT Bold
- Letter Gothic MT Bold Oblique
- Letter Gothic MT Oblique
- Lucida Bright
- Lucida Bright Demibold
- Lucida Bright Demibold Italic
- Lucida Bright Italic
- Lucida Calligraphy Italic
- Lucida Console
- Lucida Fax Demibold
- Lucida Fax Demibold Italic
- Lucida Fax Italic
- Lucida Fax Regular
- Lucida Handwriting Italic
- Lucida Sans Demibold Italic
- Lucida Sans Demibold Roman
- Lucida Sans Italic
- Lucida Sans Regular
- Lucida Sans Typewriter Bold
- Lucida Sans Typewriter Bold Oblique
- Lucida Sans Typewriter Oblique

- Lucida Sans Typewriter Regular
- Lucida Sans Unicode
- Lydian Bold BT
- Lydian Bold Italic BT
- Lydian BT
- Lydian Cursive BT
- Lydian Italic BT
- Magneto Bold
- Maiandra GD
- Marlett
- Matisse ITC
- Matura MT Script Capitals
- Mini Pics Art Jam
- Mini Pics Classic
- Mini Pics Lil Critters
- Mini Pics Lil Edibles
- Mini Pics Lil Events
- Mini Pics Lil Stuff
- Mini Pics Lil Vehicles
- Mini Pics Red Rock
- Mistral
- Modern No. 20
- Monotype Corsiva
- Monotype Sorts
- Monotype Sorts 2
- MS Outlook
- MT Extra
- Murray Hill Bold BT
- News Gothic MT
- News Gothic MT Bold
- News Gothic MT Italic
- Niagara Engraved
- Niagara Solid
- OCR A Extended
- OCR A BT
- OCR B 10 Pitch BT
- Old English Text MT
- Onyx
- PT Barnum BT
- Palace Script MT
- Papyrus
- Parchment
- Park Avenue BT
- Pepita MT

- Perpetua
- Perpetua Bold
- Perpetua Bold Italic
- Perpetua Italic
- Perpetua Titling MT Bold
- Perpetua Titling MT Light
- Playbill
- Poor Richard
- President
- Pristina
- Rage Italic
- Ravie
- Rockwell
- Rockwell Bold
- Rockwell Bold Italic
- Rockwell Condensed
- Rockwell Condensed Bold
- Rockwell Extra Bold
- Rockwell Italic
- Script MT Bold
- Seagull Bold BT
- Seagull Heavy BT
- Seagull Light BT
- Seagul Medium BT
- Showcard Gothic
- Snap ITC
- Snell Bold BT
- Souvenir Demi BT
- Souvenir Demi Italic BT
- Souvenir Light BT
- Souvenir Light Italic BT
- Stencil
- Swiss 721 Black Bt
- Swiss 721 Black Condensed Bt
- Swiss 721 Black Condensed Italic BT
- Swiss 721 Black Extended BT
- Swiss 721 Black Italic BT
- Swiss 721 Bold Extended BT
- Swiss 721 Extended BT
- Swiss 721 Heavy BT
- Swiss 721 Heavy Italic BT
- Swiss 721 Light BT
- Swiss 721 Light Condensed BT
- Swiss 721 Light Condensed Italic BT

- Swiss 721 Light Extended BT
- Swiss 721 Light Italic BT
- Swiss 721 Medium BT
- Swiss 721 Medium Italic BT
- Symbol
- Symbol Proportional BT
- Tahoma
- Tahoma Bold
- Technical
- Technical Italic
- Tempus Sans ITC
- Times New Roman
- Times New Roman Bold
- Times New Roman Bold Italic
- Times New Roman Italic
- Times New Roman MT Extra Bold
- Trebuchet MS
- Trebuchet MS Bold
- Trebuchet MS Bold Italic
- Trebuchet MS Italic
- Tw Cen MT
- Tw Cen Mt Bold
- Tw Cen Bold Italic
- Tw Cen MT Condensed
- Tw Cen MT Condensed Bold
- Tw Cen MT Condensed Extra Bold
- Tw Cen MT Condensed Medium
- Tw Cen MT Italic
- Vacation MT
- Verdana
- Verdana Bold
- Verdana Bold Italic
- Verdana Italic
- Verdana Ref
- Viner Hand ITC
- Vivaldi Italic
- Vladimir Script
- Webdings
- Westminster
- Wide Latin
- Wingdings
- Wingdings 2
- Wingdings 3
- Zapf Calligraphic 801 Bold Bt

- Zapf Calligraphic 801 Bold Italic BT
- Zapf Calligraphic 801 BT
- Zapf Calligraphic 801 Italic BT
- Zapf Chancery Bold BT
- Zapf Chancery Medium BT
- Zapf Chancery Medium Italic BT
- Zapf Dingbats BT
- Zapf Humanist 601 Bold BT
- Zapf Humanist 601 Bold Italic BT
- Zapf Humanist 601 BT
- Zapf Humanist 601 Italic BT

Working with BACnet Priority Array and NULLs

BACnet uses a 16-level priority array control scheme for commanding and overriding output and value-based objects. You may command a BACnet object at any priority level from Map Points, however, should you need to relinquish control, a NULL value must be sent.

Several Design Category widgets support the ability to send a NULL value for the purposes of relinquishing control. At a minimum, most push button widgets and combo box widgets support the ability to send a NULL command. To send a NULL command, a value of %NULL% must be entered (percent symbols included).

The following is a list of widgets that support the ability to send a NULL command to a **Map Point** (using the "BACnet priority writing and clearing" on page 1444 diagram element).

Button

Pushbutton

Secure Button

URL Button

Enhanced URL Button

Secure Enhanced URL Button

Swing Combo Box

Secure Swing Combo Box

Swing Enumerated Combo Box

Secure Swing Enumerated Combo Box

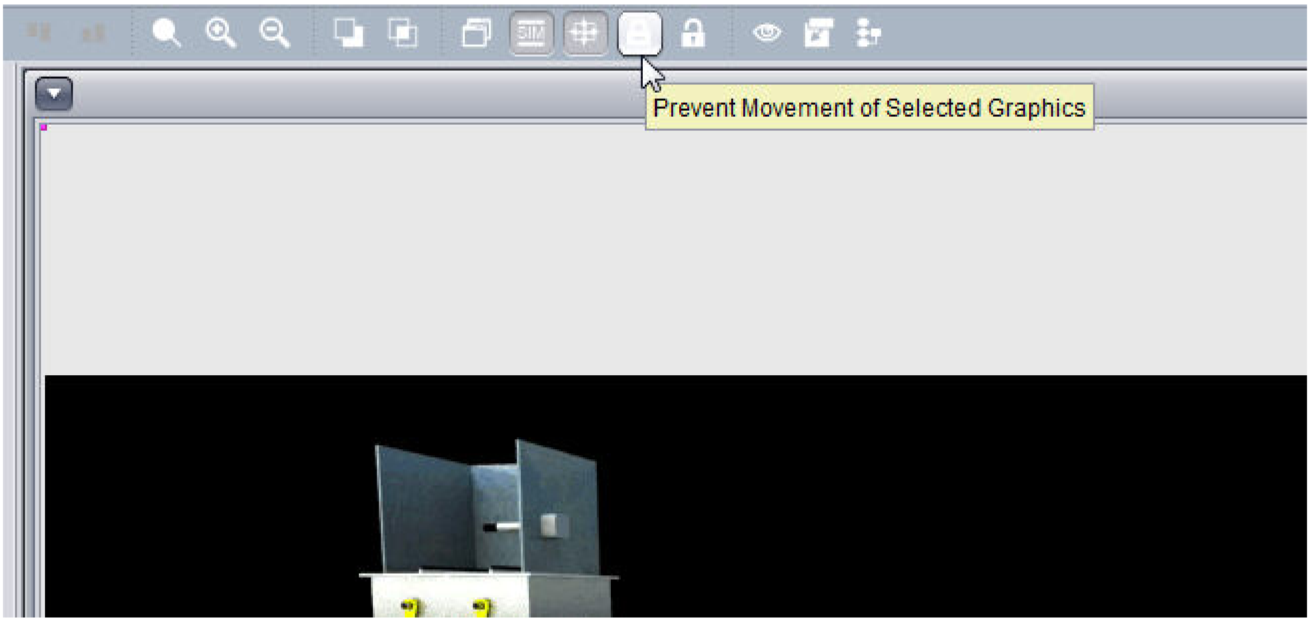
[Enhanced Swing Text Field]

[Secure Swing Text Field]

Locking Down Images

When designing user interfaces, there are many situations that require you to overlay one image overtop of another. To easily do this, your back-ground images should be locked. Locking images prevents loss of focus and restricts movement of base images.

To lock any image, click to select the image, and click the Lock button on the standard tool bar. Once locked, a lock image will appear in the top right-hand corner of the image. Once an image is locked, it cannot be moved, or selected for property editing. Pressing the Unlock icon will unlock all locked images.



Displaying Animations

Animations are commonly required for displaying the on/off status of a particular piece of equipment, or even the position of peripheral devices such as valves.

Aspect supports multiple image bean elements within the Design palette. The most useful for animations is the Multi Image Bean, located in the More Layout category. The Multi Image Bean and Ranged Multi Image Bean are useful for the following scenarios:

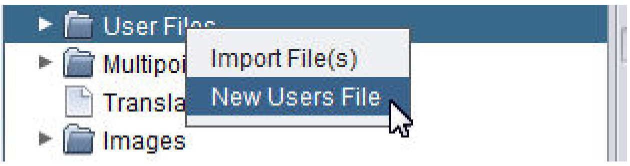
- Enumerations - displaying an image for a specific value - use Multi-Image Bean
- Value ranges - displaying an image for a value range. use Ranged Multi-Image Bean

The use of this element requires images to be imported into the Images node of your Project Tree, as well as creating a corresponding .PROPERTIES file that the element uses to associate what image to display for a particular value. Once configured, the element is then copied to the Diagram workspace and has a input value connected.

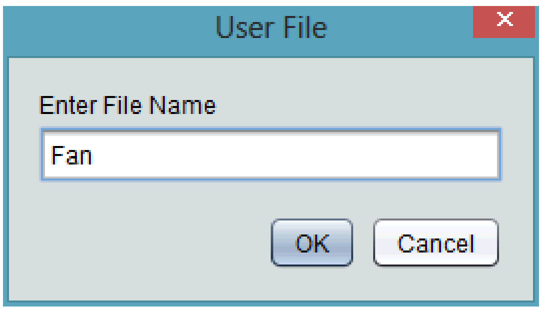
Creating .PROPERTIES Files

.PROPERIES files are used by specific elements to associate a specific image to a value. To create a .PROPERTIES file within Aspect-Studio, perform the following steps:

1. From the Project Tree, right-click the User Files node. Select New Users File from the shortcut menu.

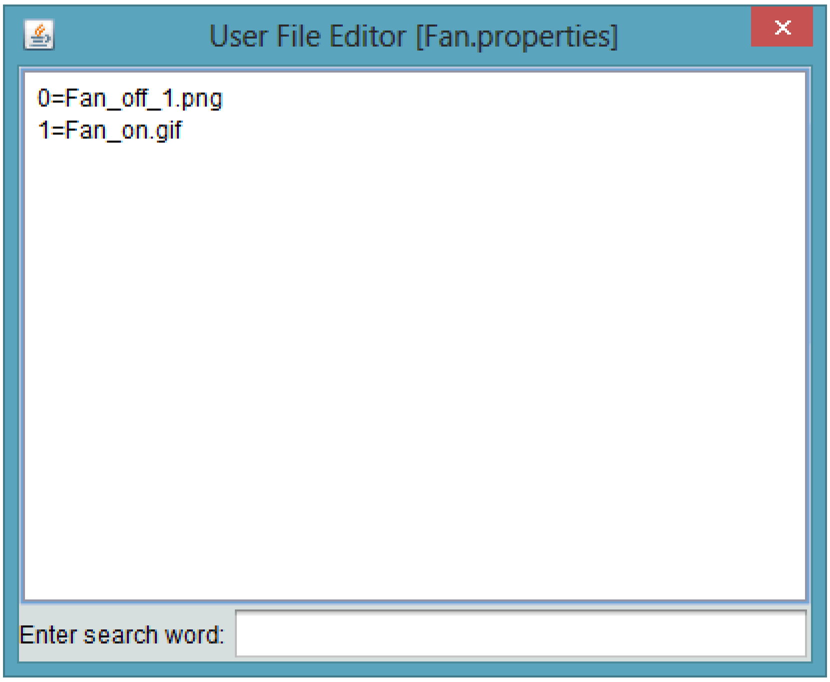


2. Type in a name for the new properties file you wish to create. The file name should be made up of standard characters (no special characters should be used).

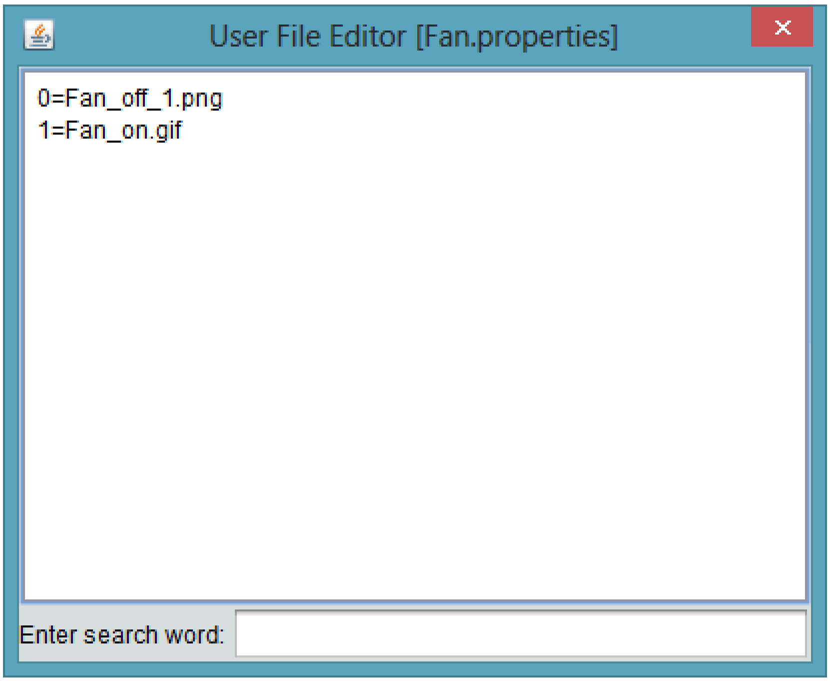


3. A new file will be created under the Users node. In addition, a text editor for this document will automatically open within Aspect-

Studio. You may edit the file directly from the Project Tree at any time.



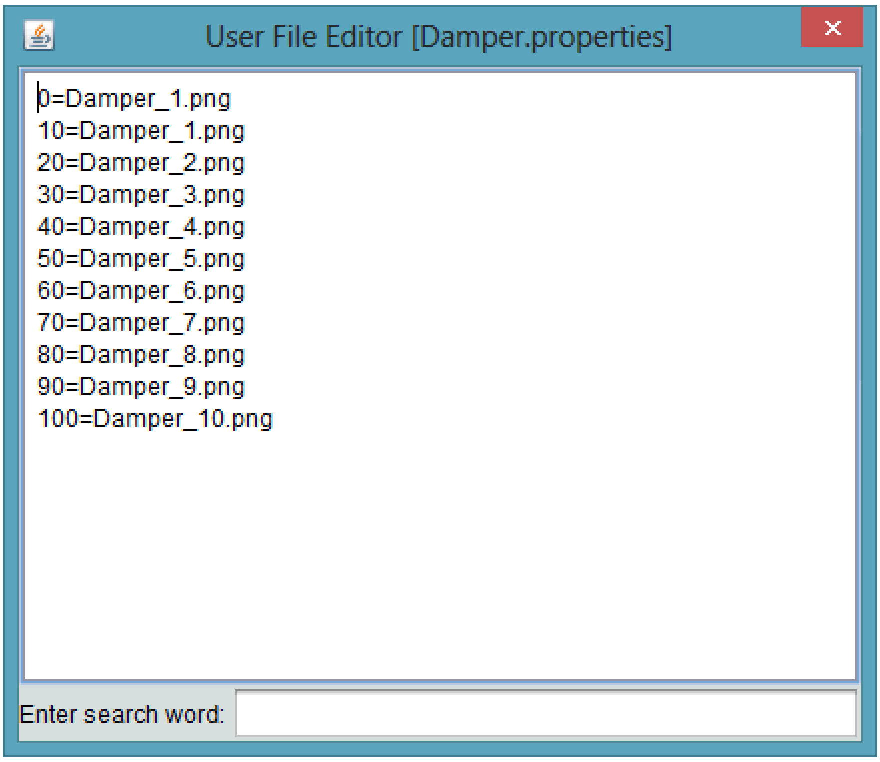
Defining the contents of the file is quite simple. You must specify a value, along with an equal sign, and specify the name of the image file along with its file extension.



In our first example displayed above, two images are defined to be displayed, as well as a default image. The default image, defined using the case sensitive token of "default" (as shown above) will display a specific image should the input value be something other than a value we have defined (whether it be bad data received, or a value you wish to ignore). When the input value received is a value of zero (0), the fanoff.gif image will be displayed, where as a value of one (1) or higher will display the fan-on.gif image. This format is common for use with the Multi-Image Bean.

NOTE - Image file names specified in .properties files are case sensitive and must match the file names imported into the images node of your project tree. Values not referenced will display no image.

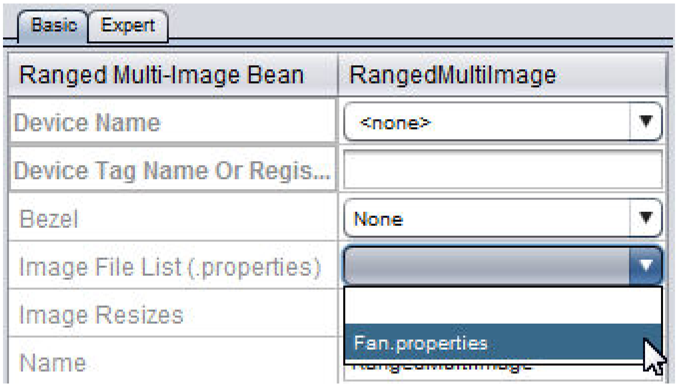
In our second example, we have multiple lists of images, however, then values do not ascend in a particular order. This type of configuration utilizes ranged display, which is useful for showing animations based on a large value range (e.g. 0% - 100%). Similar to above, we also use the default tag to display a specific image should a bad value be received. This format is common for use with the Ranged Multi-Image Bean.



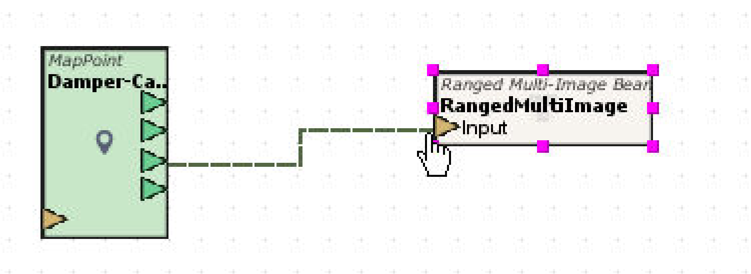
In this case, the following will occur:

- When the input value is between values of 0 and 25, MADamper_ 1.png will be displayed.
- When the input value is between values of 26 and 49, MADamper_ 2.png will be displayed.
- When the input value is between values of 50 and 74, MADamper_ 3.png will be displayed.
- When the input value is at a value of 75 or higher, MADamper_4.png will be displayed.

With a Multi Image Bean or Ranged Multi-Image Bean element clicked and dropped onto your Design workspace, specify the .properties file in the Image File List property of the element.

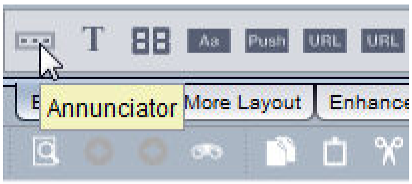


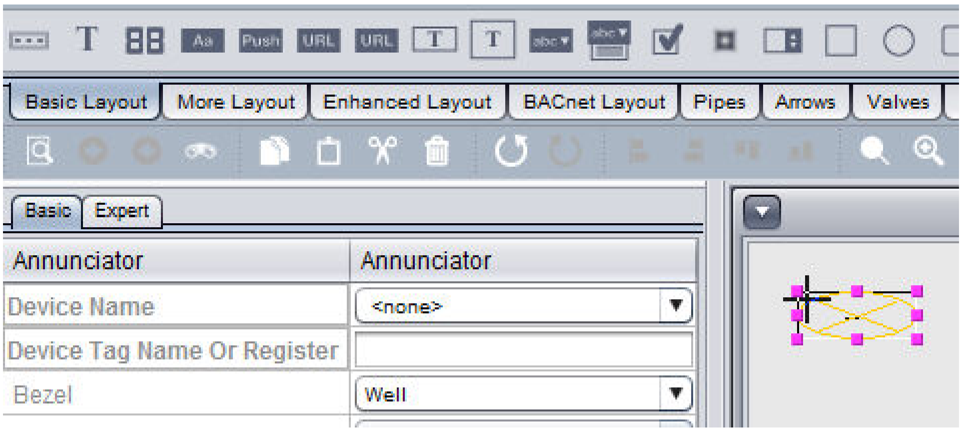
With the configured element selected, click the Copy to Diagram icon from the standard toolbar. Finally, connect the associated value to the Input pin of the Multi Image element.



Displaying Read-Only Values

Some information that is required by a site to be displayed on a user interface is read-only. In this case, the Annunciator element is useful for displaying read-only values. Annunciator elements can display virtually any values consisting of any data type within Aspect. Additionally, values inputted to an Annunciator can have custom engineering units added to the end of a value. The Annunciator element is located in the Basic Layout category of the Design palette.



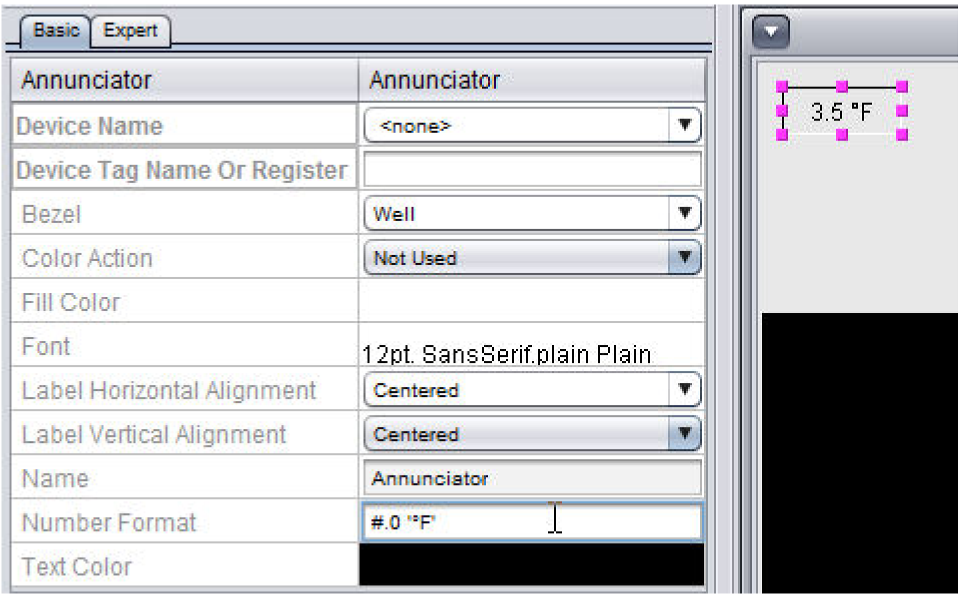


Displaying Engineering Units and Showing All Decimal Places

Displaying engineering units for Raw Values or for data not within the Map can be achieved through editing the Number Format property of the Annunciator.

Any engineering unit you wish to enter must be placed within single quote (‘) marks. For example, if you wish to display the engineering unit for degrees , enter ‘°F’ or '°C' after the #.## entry. Any special character may be displayed as part of an engineering unit provided that it is within single quotes. Only one set of single quotes is permitted. There is no limit to the amount of characters that can be entered.

To display all decimal spots, you can change the Number Format to #.00 to show decimal places for any whole number (such as a temperature reading an even value with no offset).



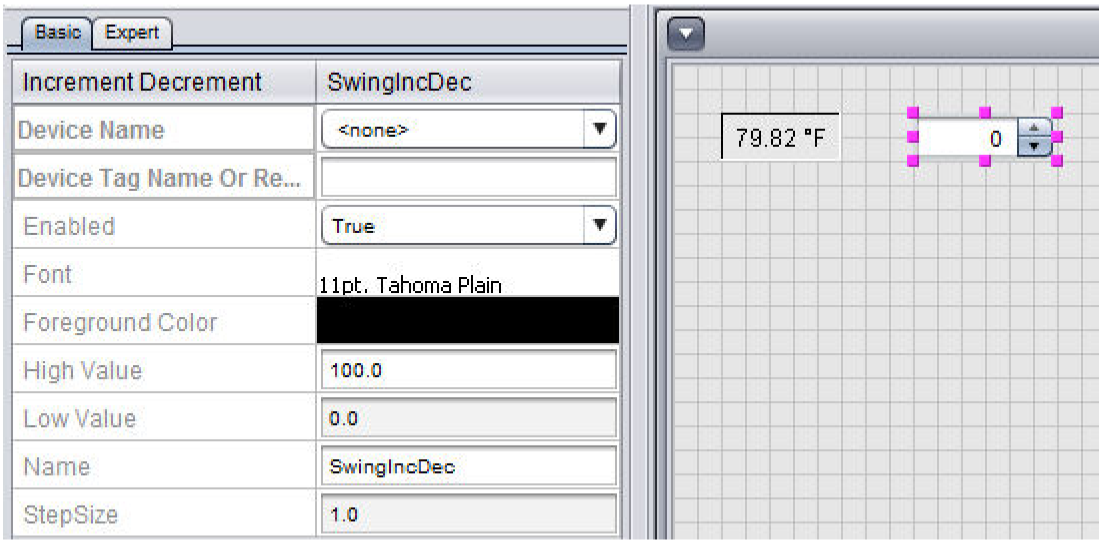
NOTE - If you are connecting Friendly Values of Map Points to the Annunciator, the Map Point can pass the Engineering Unit to the annunciator with no modifications to the Number Format required. Only adjust the number format if you are working with a protocol that cannot be configured from the Map (such as Modbus or SDP).

Displaying Read/Write Values

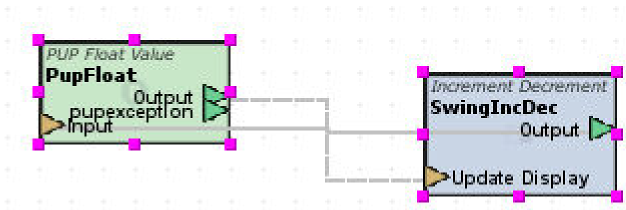
There are several elements within the Basic Layout category of the Design palette that are used to perform both reading and writing of values. While many of the elements are different based on functionality (e.g. scroll bars, text fields, etc.) the process for linking points is the same.

For applications where you wish to secure your project and also perform audit trailing, a special category called Enhanced Layout provides dedicated UI elements that are designed for read/write values. For more information on Security and Audit Trailing, reference the Security and Audit Trailing chapter of this reference.

For example an Increment/Decrement element can be used to adjust setpoints by a defined step size each time the increment or decrement spinner arrows are clicked. In order to display the value, an Input must be linked to the Increment/Decrement element once it has been copied to the Diagram workspace.



In order for the element to have the ability to write to the data it is displaying, you must link the output of the element to the input of the system data it is displaying. This is done by making a recursive connection back to the data element (shown below).



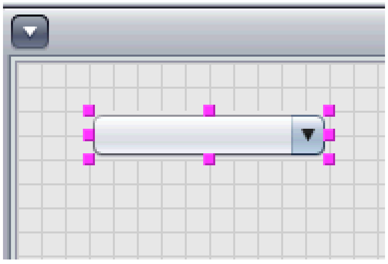
Displaying Enumerated Values

There are many situations where a graphic must display text associated to an enumeration. For example, on a three-speed Fancoil unit, a value of zero (0) refers to off, whereas values one (1) through three (3) refer to low, medium, and high speeds.   Communicating to a device, you will typically only receive the enumerated value and no text. Enumerated values can be displayed using either Combo Boxes, or through an Annunciator using the result of a String Enumeration element from the Diagram workspace. Both examples are provided below.

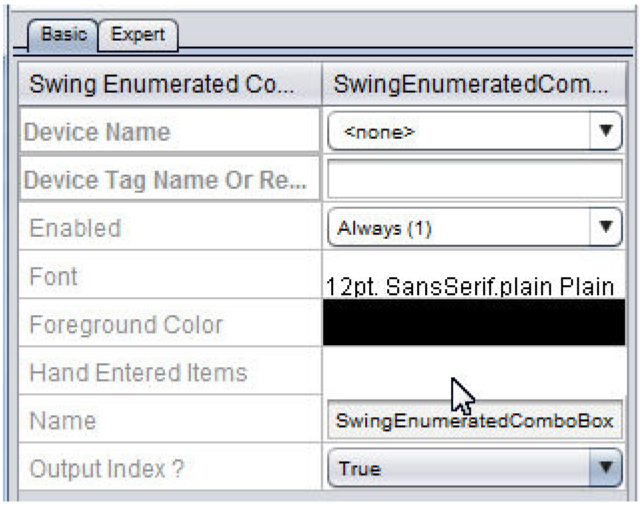
Using Combo Boxes

Combo boxes are helpful for displaying text in an easy and effective manner. To use a combo box to display enumerated values, perform the following steps:

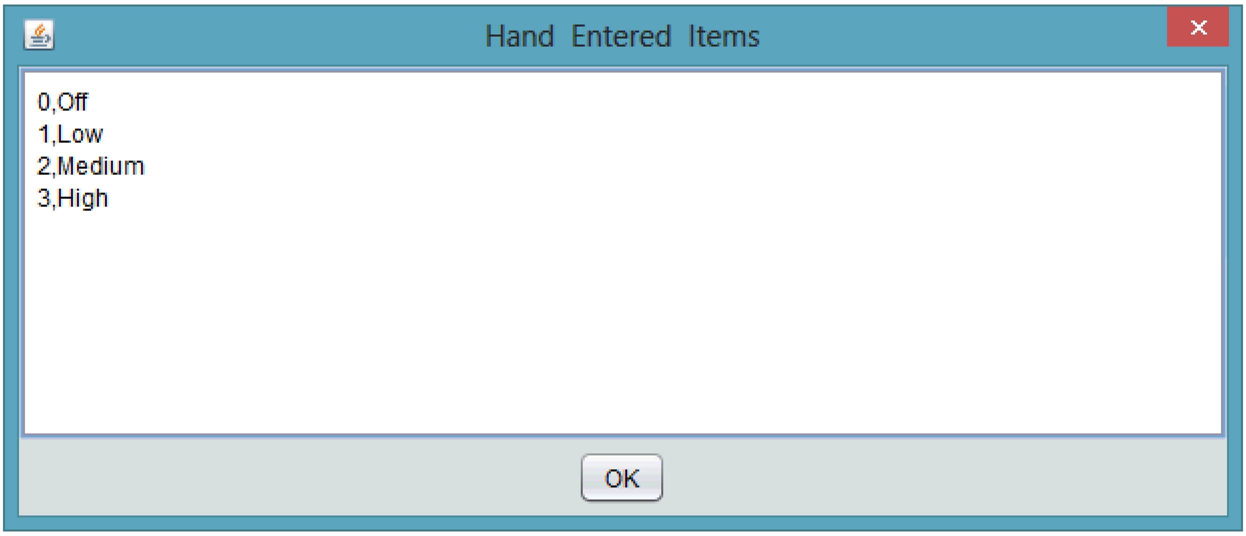
1. From the Basic Layout category of the Design palette, click and drop a Swing Enumerated Combo Box onto the Design workspace.



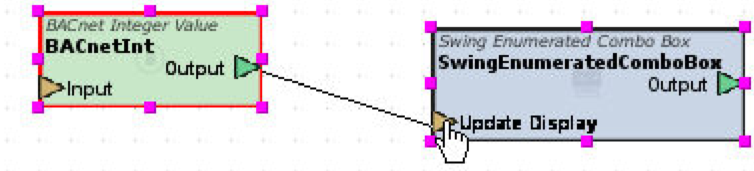
2. From the Property Pane, double-click the Hand Entered Items property to open the item editor.



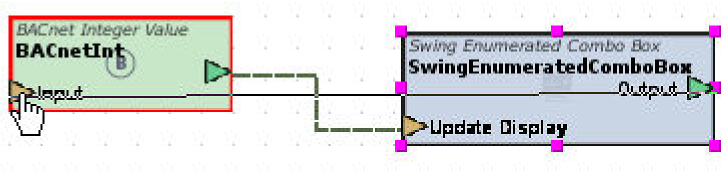
3. In the item editor, define the value,text definition. One line per definition. An example of this format is shown below. When completed, click OK to close the editor.



4. Copy the Comb Box to your Diagram workspace and connect a value input to the Update Display pin of the Combo Box.



5. The Combo Box can also provide write capabilities to a system point. To do this, simply connect the output of the Combo Box to the input of the system point.



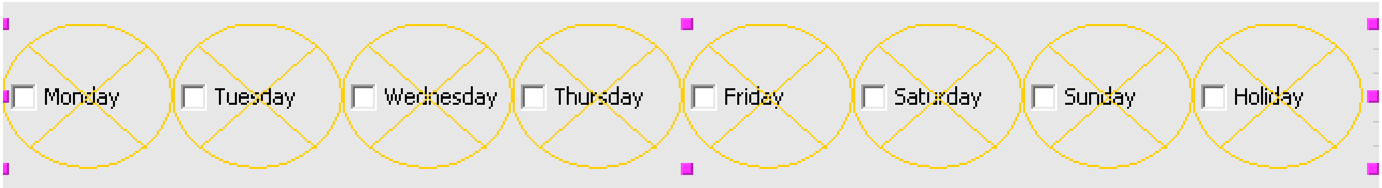
Working with Bit Strings

Bitstring/bitmap data types are used in several protocols to permit inclusive and exclusive selection of one or multiple items for a particular function. The Swing Check Box Panel, located in Basic Layout, provides a method to display and adjust bitmap values.

The Swing Check Box Panel must be configured to work with a specific amount of bits, followed by a choice of arrangement of the bits, along with column and grid options.

The Swing Check Box Panel is most commonly used for interfacing with the following:

- PUP Bitstring Values - such as the Active Days attribute of a Schedule channel.
- BACnet Bitstring Values - such as the Status Flags property of a Analog or Binary object.
- Modbus Packed Bit Arrays - such as a single integer-based register.

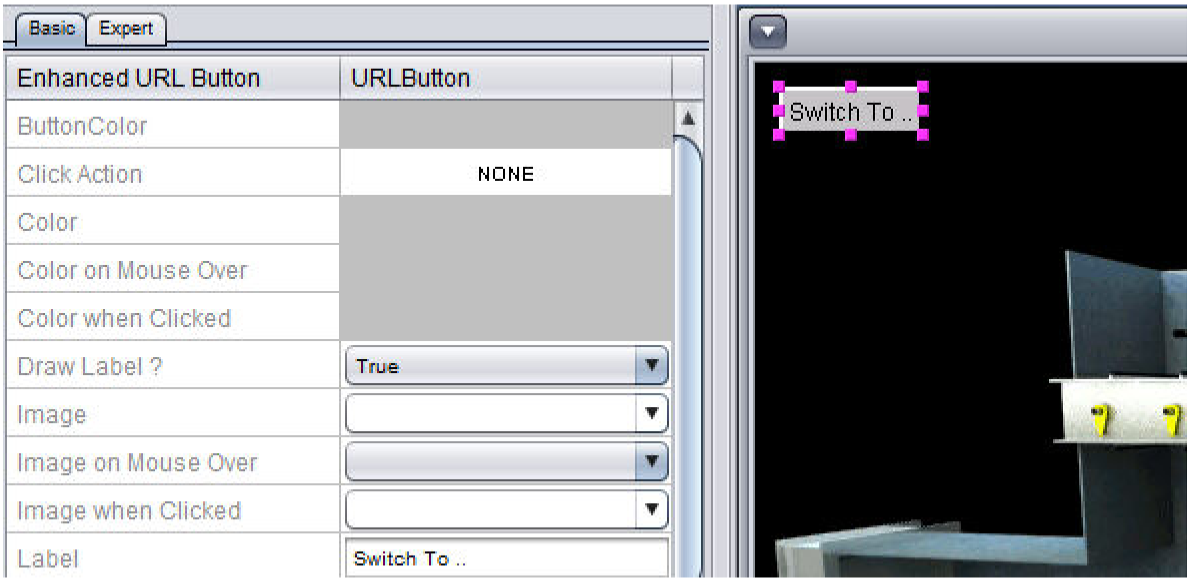


System Navigation Links

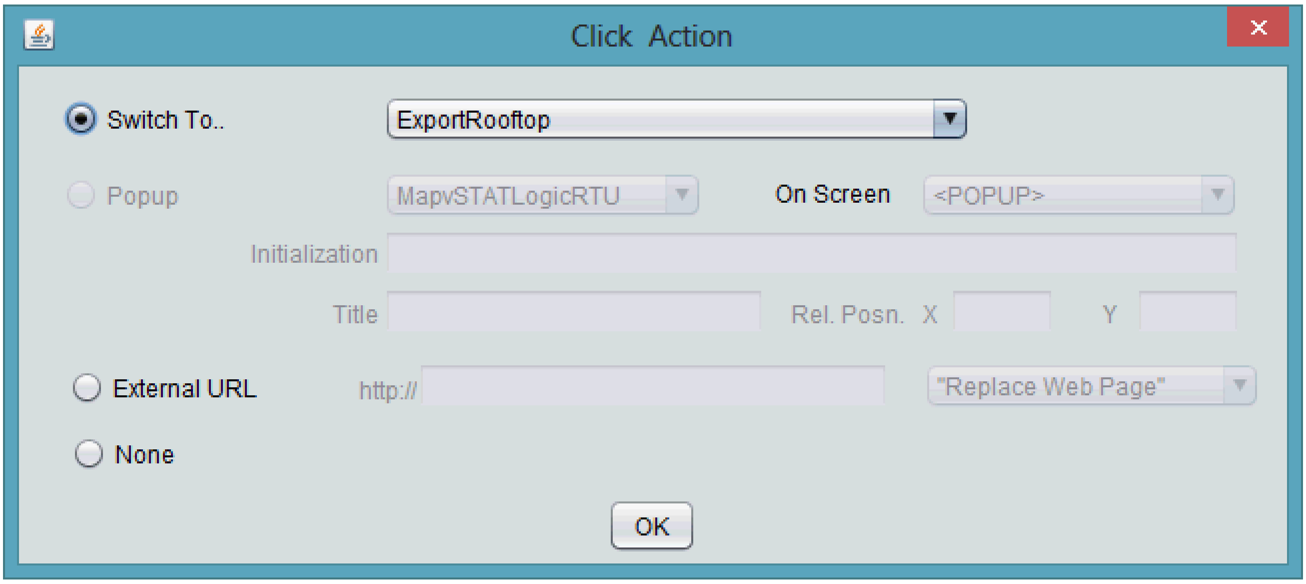
To allow users to navigate between graphical user interface pages, the Basic Layout category of the Design palette provides both basic and enhanced URL buttons. In almost all applications, you want to use the Enhanced URL Button, as it provides additional animation features and user feedback than the standard URL Button.

To utilize the Enhanced URL Button, perform the following steps:

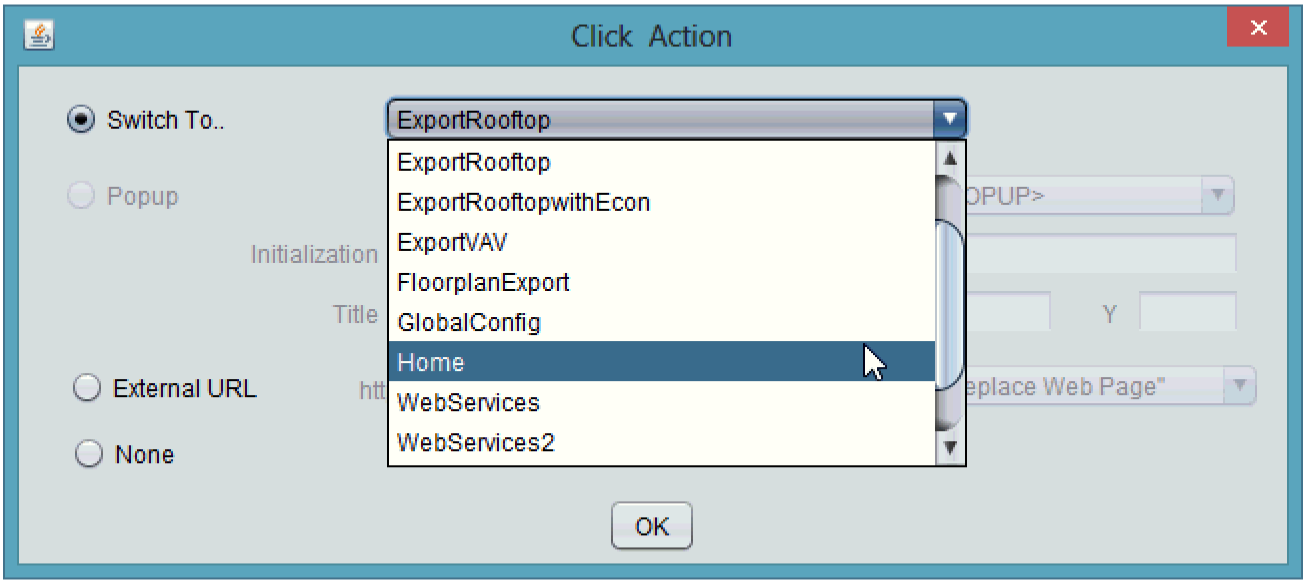
1. Simply click and drop an Enhanced URL Button onto the workspace.



2. With the Enhanced URL Button selected, double-click the Click Action property.



3. Select the Switch To.. radio button, then select the application that will be navigated to when the button is pressed.



4. Configure other remaining properties as you find necessary for style and content.

Leveraging Transfer with Context

Leveraging Transfer with Context Overview

In a number of situations, a graphical user interface project may require you to reference many of the same types of devices (such as VAVs, packaged rooftops, heatpumps, fancoils, etc..). In legacy graphical user interface systems, technicians typically had to create one screen for each device or piece of equipment - resulting in hundreds of graphical image pages with intense labor to link points.

Aspect-Studio supports the ability to shift context data, allowing a user to create a single screen that can be applied to multiple devices. This feature permits technicians to create a base application dedicated to a common graphic and alter key properties of elements on the application when navigating to the application.

Transfer with Context Limitations

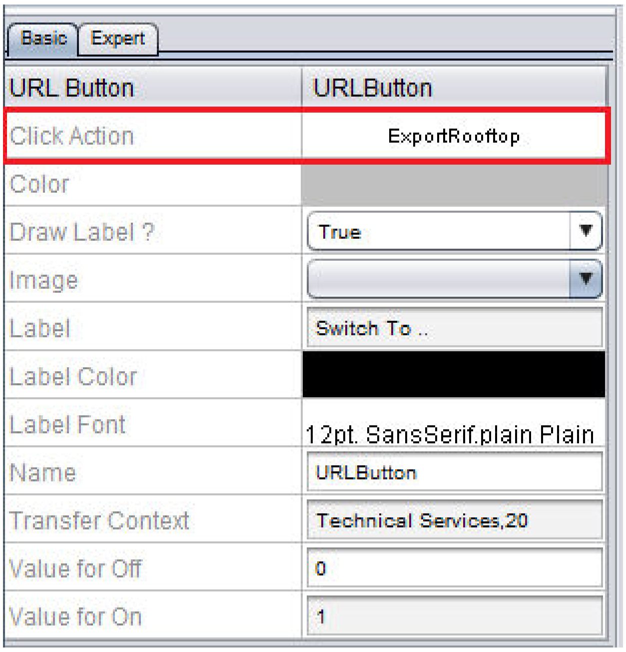
Transfer with Context provides powerful flexibility when developing graphical user interface screens. With flexibility comes some limitations. IP Address or Hostname properties of FTNet Devices and Driver elements (legacy PUP, legacy BACnet, Modbus TCP, SDP, and SQLite) are unable to receive transferred context data. Attempts to do so can cause your target's license to become invalid.

Configuring an Application to Transfer Context

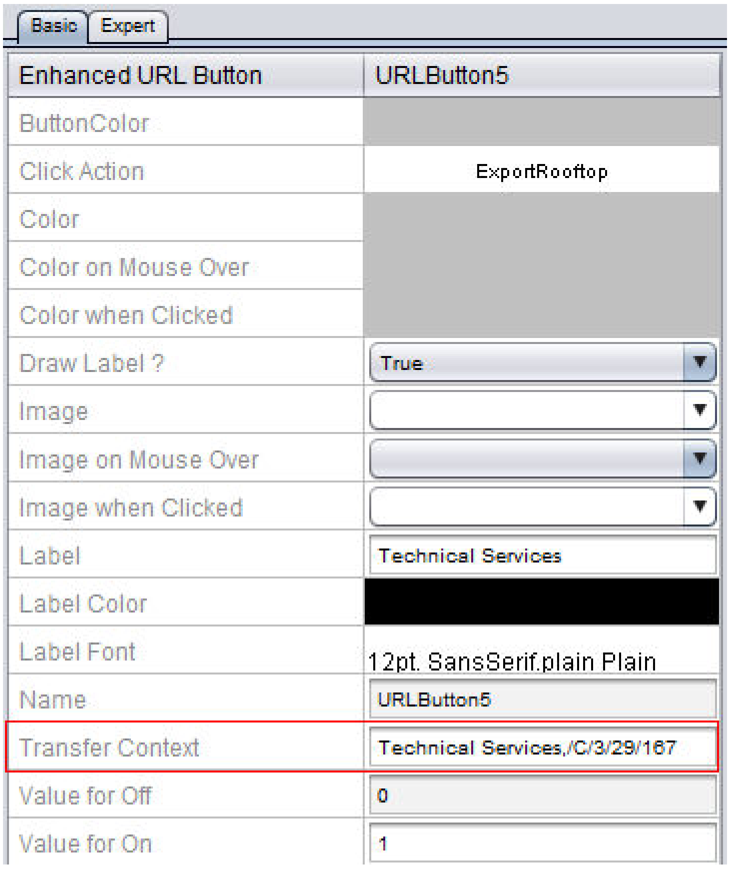
To permit an Application to receive transferred context data, the Transfer Context Initializer element is used. This element is located in the Data Flow/Scripts category of your Diagram Palette.

Configuring URL Buttons to Transfer Contextual Data

Functioning in a similar manner to a Popup Initializer, the Transfer Context Initializer passes parameters on to populate the key data used within your Application. Information is passed by using any of the available URL Buttons from the Diagram Palette. URL Buttons contain a Transfer Context property, which is used to define contextual data that is passed onto the Transfer Context Initializer. In order to successfully pass the contextual data onto the application containing the Transfer Context Initializer, the Click Action property must also be set for the Application containing said element.

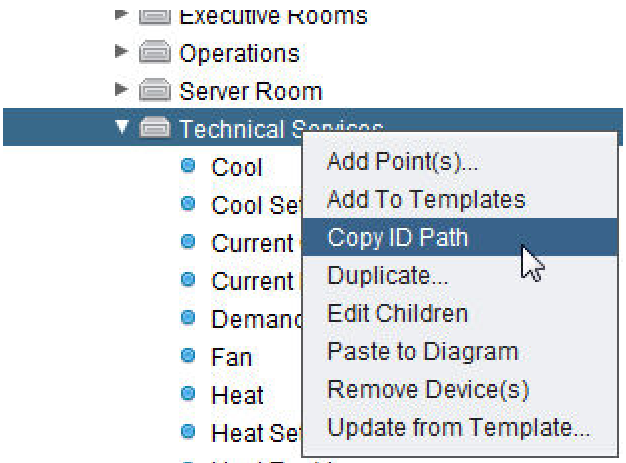


Contextual data that is entered into the Transfer Context property is defined in comma delimited order. For example, to pass text for a screen title, along with the Map ID Path for the device - the information for the property would be entered as shown below.



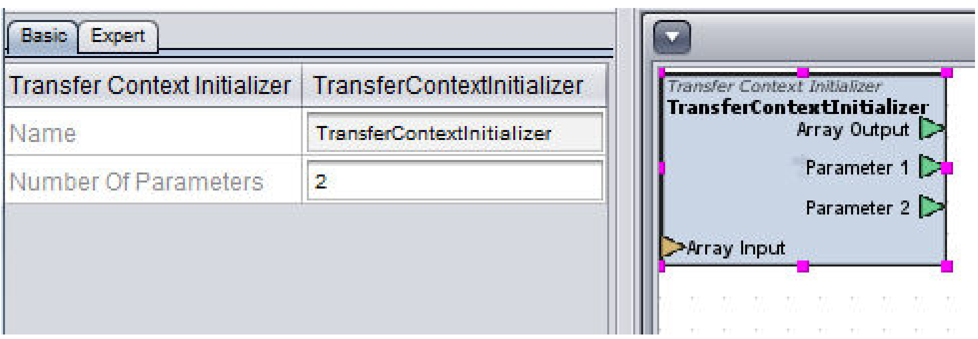
Each key piece of data is separate with a comma. No space should ever follow a comma.

To find the Map Path for a Device, simply right-click on the Device from the Map and select Copy ID Path



Configuring an Application to Receive Contextual Data

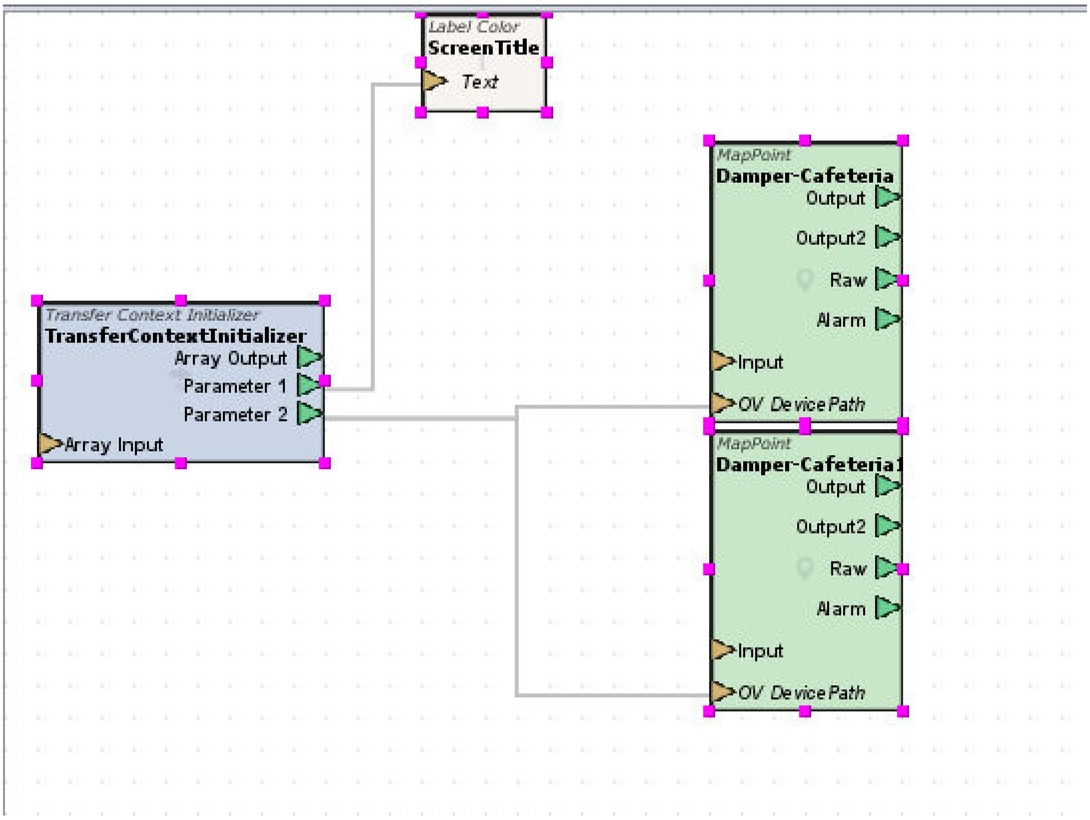
The Application that will receive context data will host the Transfer Context Initializer element. This element receives the contextual data passed by the URL button and passes it along to any connected references. The Transfer Context Initializer must be configured to receive the appropriate number of context parameters. This is done through adjusting the Number of Parameters property of the Transfer Context Initializer.



By adjusting this property, new output pins for each parameter will be created on the block representation of the element. Each output is then connected to the input or exposed property that context data is passed onto. In the example above, the Transfer Context has two parameters, where:

- Parameter 1 will output string "Technical Services"
- Parameter 2 will output the reference Map Path ID copied earlier and will be sent to the OV

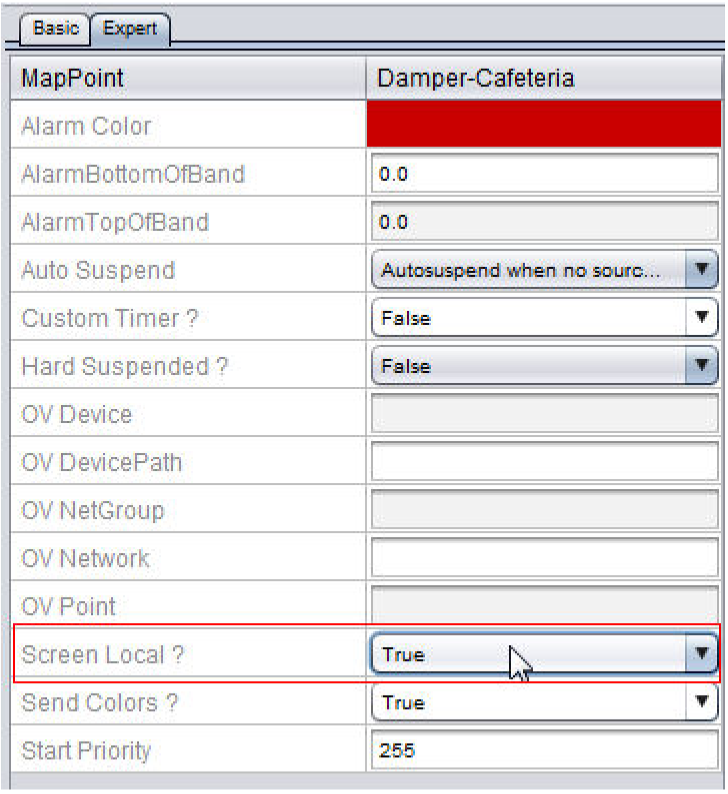
Parameters are always considered in order from left to right.



Configuring All Direct and Indirect Receivers for Screen Local

In order for Context Transfer to be successful, any and all direct and indirect receiving elements must be configured for Screen Local. Screen Local is used to allow the current browser session to generate its own separate view of a user interface. Regardless of whether or not a system will have no more than a single user, Screen Local must be configured on all receiving elements.

Any points within the application that are affected by the context shift are considered direct receiving elements. Because of this, all points bound to that particular device in the Application must also have their Screen Local properties set to True.



NOTE - It is vital that ALL points that are receiving contextual data either directly or indirectly are configured for Screen Local = True. Failure or error to properly set this property will cause system performance issues including, but not limited to: screen navigation failure, point polling errors, point timeout(s), etc..

User Interfaces and Transferring with Context for v1.x Projects

Transfer with Context Overview

In a number of situations, a graphical user interface project may require you to reference numerous application specific pieces of equipment (such as VAVs, packaged rooftops, heatpumps, fancoils, etc..). In legacy graphical user interface systems, technicians typically had to create one screen for each device or piece of equipment - resulting in hundreds of graphical image pages with intense labor to link points.

Aspect-Studio allows users to transfer to screens with context. This feature permits technicians to create a base application dedicated to a common graphic and alter key properties of elements on the application when navigating to the application.

Common actions that can be performed using transfer with context include but not limited to:

- Adjusting the MAC Address and Network Number of a referenced BACnet MS/TP Device
- Adjusting the Port and Unit ID of a referenced PUP Device
- Adjusting the object name and attribute of an SDP Point Element
- Adjusting the Slave ID of a Modbus Device
- etc..

Transfer with Context Limitations

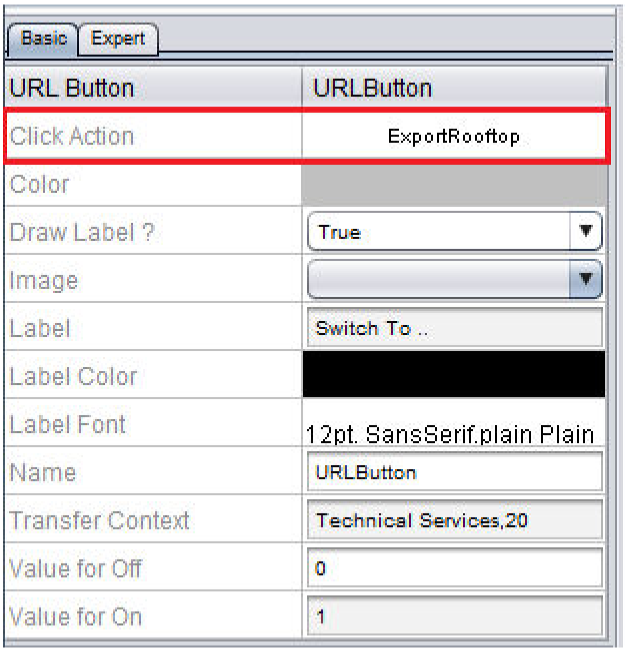
Transfer with Context provides powerful flexibility when developing graphical user interface screens. With flexibility comes some limitations. IP Address or Hostname properties of FTNet Devices and Driver elements (PUP, BACnet, Modbus TCP, SDP, and SQLite) are unable to receive transferred context data. Attempts to do so can cause your target's license to become invalid.

Configuring an Application to Transfer Context

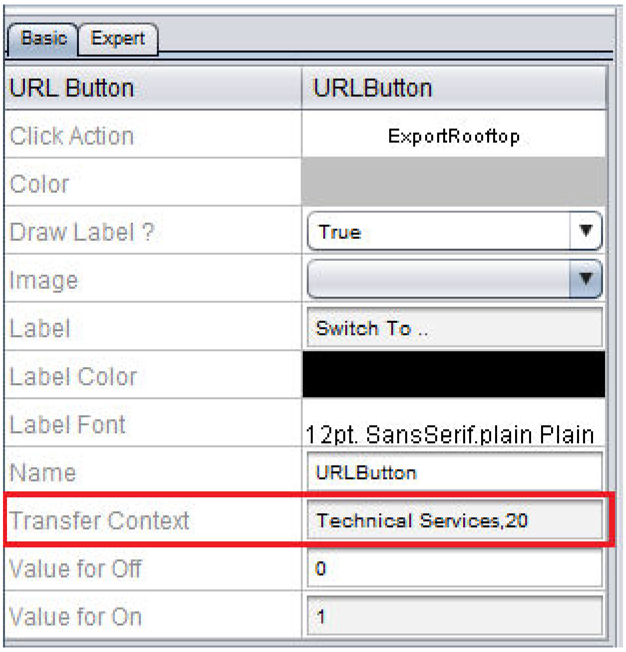
To permit an Application to receive transferred context data, the Transfer Context Initializer element is used. This element is located in the Data Flow/Scripts category of your Diagram Palette.

Configuring URL Buttons to Transfer Contextual Data

Functioning in a similar manner to a Popup Initializer, the Transfer Context Initializer passes parameters on to populate the key data used within your Application. Information is passed by using any of the available URL Buttons from the Diagram Palette. URL Buttons contain a Transfer Context property, which is used to define contextual data that is passed onto the Transfer Context Initializer. In order to successfully pass the contextual data onto the application containing the Transfer Context Initializer, the Click Action property must also be set for the Application containing said element.



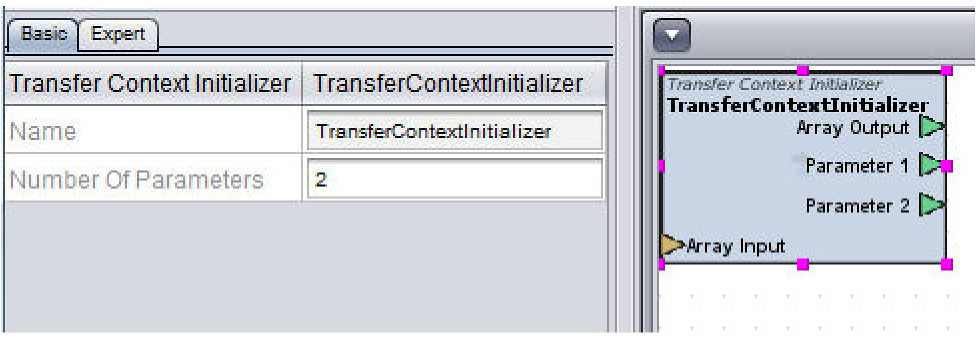
Contextual data that is entered into the Transfer Context property is defined in comma delimited order. For example, if I wanted to pass text for a screen title, along with a Unit ID or MAC Address, the information for the property would be entered as shown below.



Each key piece of data is separate with a comma. No space should ever follow a comma.

Configuring an Application to Receive Contextual Data

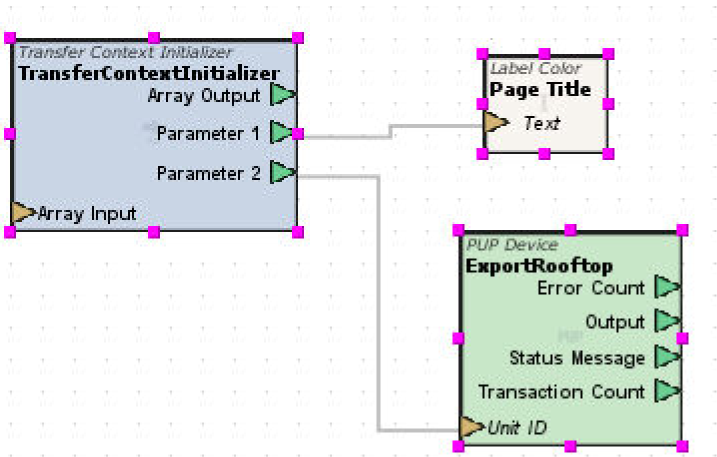
The Application that will receive context data will host the Transfer Context Initializer element. This element receives the contextual data passed by the URL button and passes it along to any connected references. The Transfer Context Initializer must be configured to receive the appropriate number of context parameters. This is done through adjusting the Number of Parameters property of the Transfer Context Initializer.



By adjusting this property, new output pins for each parameter will be created on the block representation of the element. Each output is then connected to the input or exposed property that context data is passed onto. In the example above, the Transfer Context has two parameters, where:

- Parameter 1 will output string "Technical Services"
- Parameter 2 will output the value of 20.

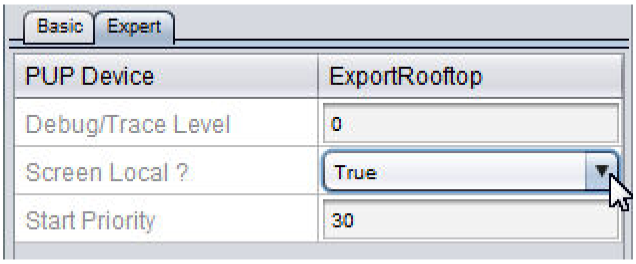
Parameters are always considered in order from left to right.



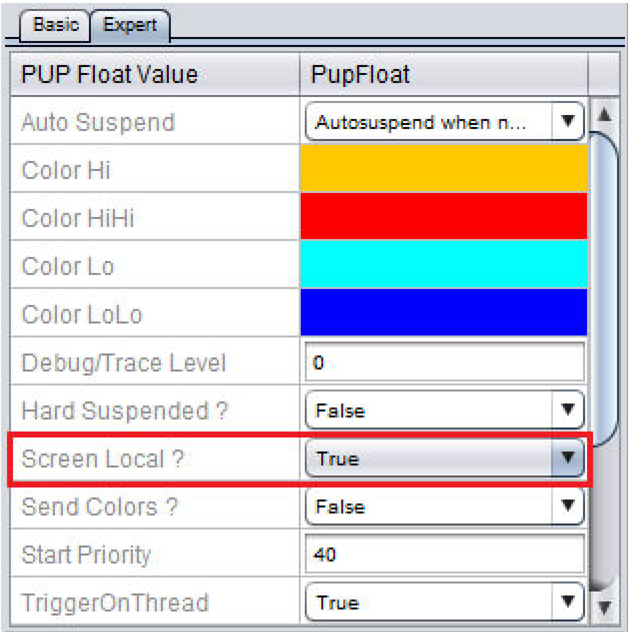
Configuring All Direct and Indirect Receivers for Screen Local

In order for Context Transfer to be successful, any and all direct and indirect receiving elements must be configured for Screen Local. Screen Local is used to allow the current browser session to generate its own separate view of a user interface. Regardless of whether or not a system will have no more than a single user, Screen Local must be configured on all receiving elements.

In the example above, the Export Rooftop PUP Device, and the Page Title have context data passed to them. These elements are considered direct receiving elements and must have their Screen Local properties (available in either the Basic or Expert Properties - element dependent) set to True. Please note that in the case of some Design widget elements (such as the Label element), they may not contain a Screen Local property as their role within Aspect is to actively listen for data, rather than serve data.



Any points within the application that are bound or mapped to the Export Rooftop PUP Device element are considered indirect receiving elements. Because of this, all points bound to that particular device in the Applic- ation must also have their Screen Local properties set to True.



NOTE - It is vital that ALL points that are receiving contextual data either directly or indirectly are configured for Screen Local = True. Failure or error to properly set this property will cause system performance issues including, but not limited to: screen navigation failure, point polling errors, point timeout(s), etc..

Transfer with Context - Best Practices

Transferring with Context provides powerful abilities to minimize the amount of time and labor that may be commonly spent developing graph- ical user interface pages for a project. However, there are some best prac- tices that AAM recommends.

Best Practices

- The feature should be leveraged in all situations where you have graphical user interface pages that you will duplicate. Using this feature versus traditional component methods will significantly reduce the amount of load on targets - whether they are Aspect-Matrix Area Controllers or an Aspect-Enterprise Server
- Transfer with Context can be used to pass data onto field bus protocol points, such as BACnet, PUP, SDP, and others. Parameters addressing the point can be passed, allowing easier creation of graphical user interface pages.
- Transfer with Context can be used to pass one piece of data, or multiple pieces of data if deemed necessary by your application.
- Through use of the PassReference element, connections can be passed and changed if necessary. This allows a single item to be passed onto field bus points, rather than attempting to change the properties of a generic device - which can consume a license of maximum available devices from your target.

What is Java Applet Security?

Java applets are displayed in supported web browsers using the Java plug-In. Historically, Java applets have had two modes of operation - "sandboxed" or "privileged".

"Sandboxed" applets were restricted to a subset of available functionality and were never allowed to access the local file system or change any settings on the host machine. They are called "sandboxed" because their execution was restricted to a safe, limited space that existed only temporarily in the browser.

"Privileged" applets have far fewer limitations - they can behave in almost the same way as a normal desktop application. It has always been a requirement that privileged applets be signed by an SSL code signing certificate that verifies the identity of the author.

Starting in Java 7 and becoming more restrictive in Java 8, Java has deprecated the use of sandboxed applets. Without a per-machine Java configuration, it is very difficult to use unsigned applets while using a secure, up-to-date version of the Java Runtime (JRE).

For these reasons, it is strongly suggested that Aspect applets be deployed as signed applets. Aspect-Studio makes the signing of the applet a simple and automatic step of the applet deployment.

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Purchasing a Certificate

Java Code Signing Certificates can be purchased from many vendors and are generally considered to be equivalent. Many Aspect-Studio users prefer to use Comodo.

Only one code signing certificate is required per system integrator, not per individual Aspect-Studio user. The same code signing certificate may be used for other platforms as well, such as Adobe AIR or Windows Authenticode.

Installing a Certificate into Aspect-Studio

Once the certificate purchase is completed, follow the vendor's instructions for exporting the certificate in a PKCS12 format. This format allows the signing certificate, all necessary trust certificate, as well as the private key to be exported in a single, secure, password protected archive.

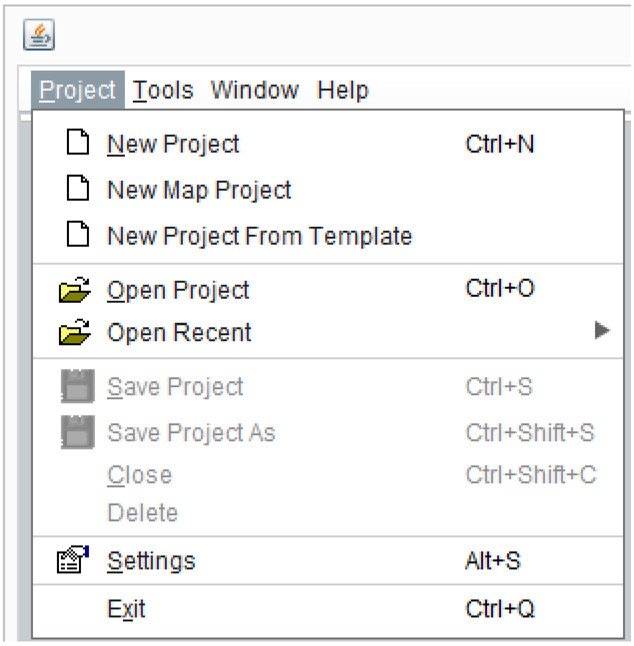
It is critical to follow the vendor's instructions precisely to obtain a valid PCKS12 archive. The export process and file names for each vendor will differ somewhat - contact the vendor for support if unable to successfully export the archive.

Common Errors include:

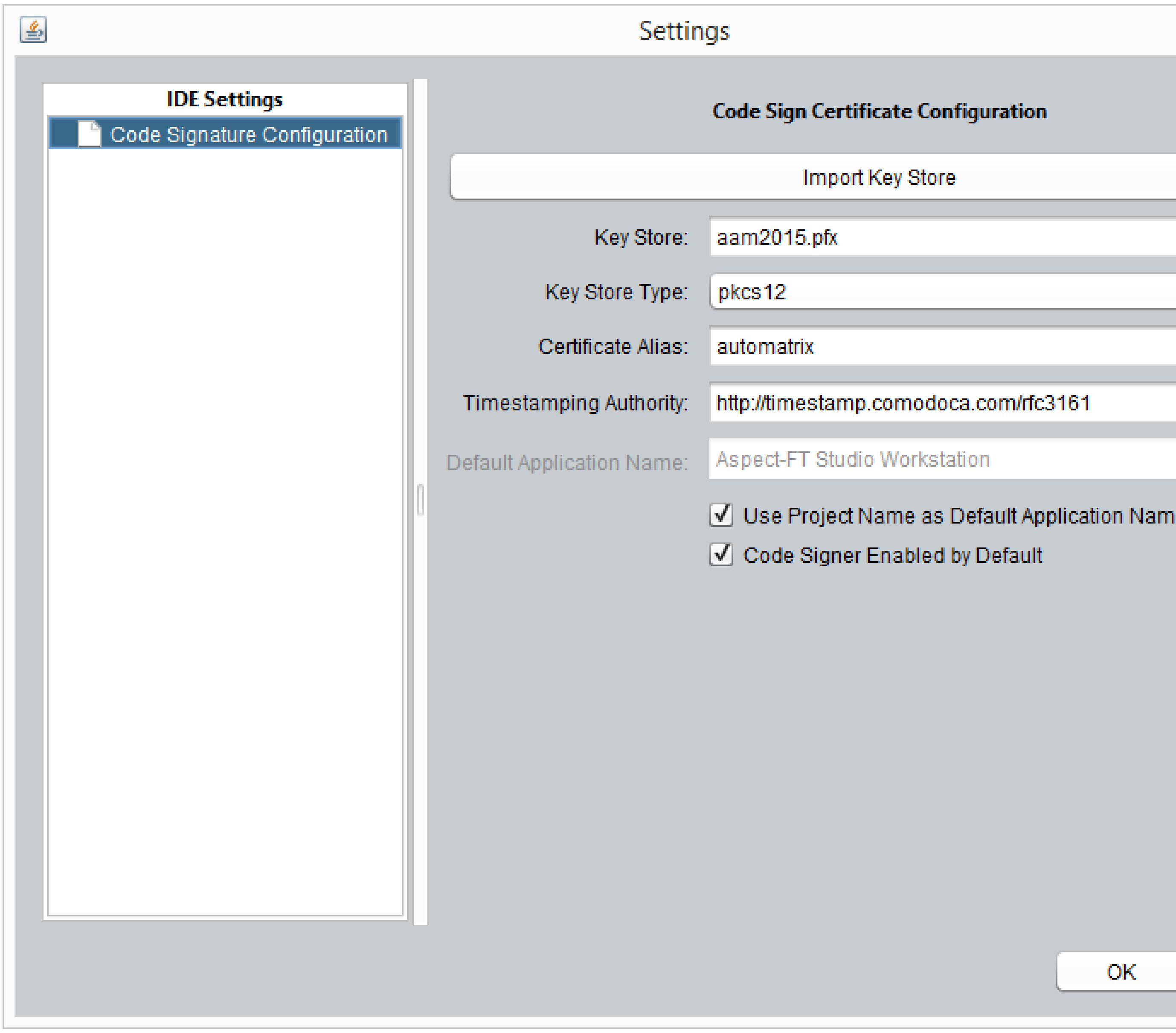
- Using a browser that does not use the operating system's internal certificate store. It is best to use Internet Explorer on Windows
- Failure to include intermediate certificates in the PCKS12 archive
- Attempting to create a PCKS12 without adding the private key

The open-source utility Keystore Explorer can be very useful in examining a PKCS12 file to verify its structure.

To install the certificate into Aspect-Studio, open the Settings item from the Files menu



Click on the Code Signature Configuration option under the IDE Settings panel

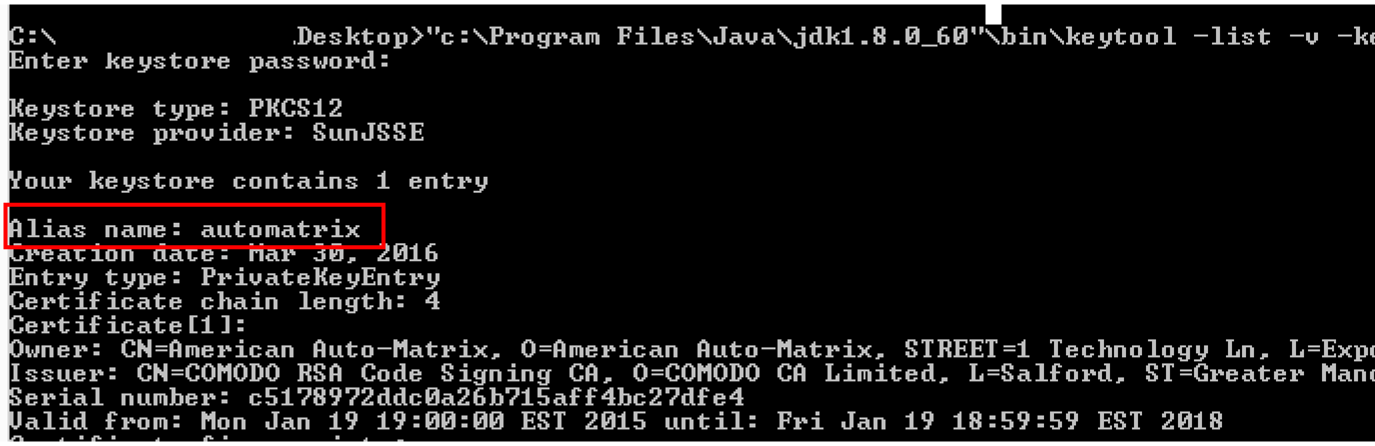


Import the keystore by clicking on the Import Key Store button and navigating to the keystore file. Ensure the Key Store Type is set to pkcs12.

The certificate alias will be unique to each organization and certificate. This can be obtain either by using the Keystore Explorer application or by using the command line application keytool that is available as part of the Java JDK.

The command line is:

<path to keytool>\keytool.exe -list -v -keystore <keystore filename> -storetype pkcs12



The alias will appear near the top of the output and there should only be a single alias. It is likely that the alias present is a long string of random letters and characters to ensure uniqueness.

Copy this alias and store it in a safe location so it does not have to be looked up again.

The timestamping authority will also be unique per certificate vendor. Check the certificate vendor's documentation for the URL. This is sometimes referred to as the RFC3161 server.

This is a server that is "trusted" by the certificate vendor to be an accurate clock that cannot be rolled backwards. While it is permissible to leave the timestamping Authority field blank to allow applications to be signed without an internet connection, this is discouraged. Applications signed without a timestamping authority will expire when the certificate does.

The Default Application Name field will be the name that appears in the Java Security popup when the applet is loaded for the first time. This name is only used if the Use Project Name as Default Name option is left unchecked.

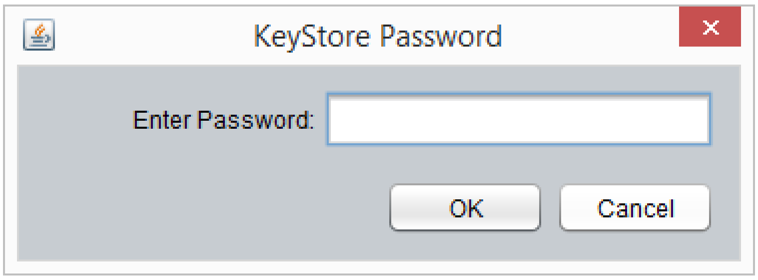
The Code Signer Enabled by Default option will ignore the Code Sign Applet option in the project and automatically sign all applets during deployment.

Deploying a Signed Applet

Deploying a signed applet is similar to deploying an unsigned applet, but incorporates a few more steps.

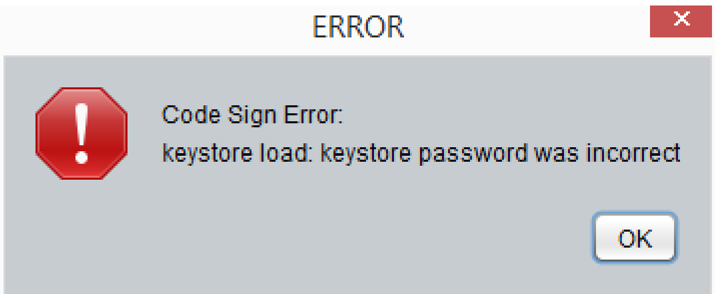
The first time a signed applet project is deployed after Aspect-Studio is started, a password dialog will prompt for the password to unlock the PKCS12 file.

This will only occur once and is done to prevent an unauthorized user from using the signing certificate imported into Aspect Studio.



Enter the keystore password and click the OK button to begin project compilation and deployment.

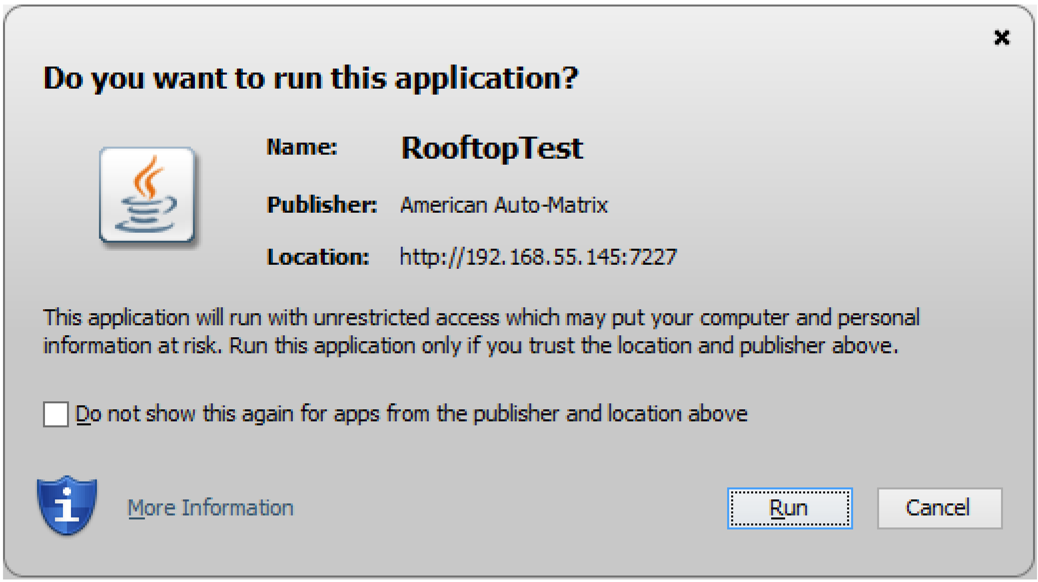
If an incorrect password is supplied, an error dialog will be displayed during deployment.



When a signed applet is accessed by a user, a security dialog will be shown that displays the Application Name and the Publisher (the organization that was issued the code signing certificate).

Clicking on the Do not show this again for apps from the publisher and location above checkbox will store the certificate acceptance in the local Java Security settings and will not show the security prompt on subsequent applet accesses.

Click the Run button to access the applet as normal.



Creating and Using Components

Component Basics

Components Overview

Aspect-Studio provides the ability to allow users to create and design components. Components are intended to be used to provide a template for both logic and graphics to establish a “one-to-many” route to rapidly setup and engineer a project. For example, if you have a project with 60 VAV controllers, or 3 Air Handling Units, all of which will use the same point data, graphical user interface screen, and logic - you would create a component first, then apply the component to an application. This feature significantly reduces the amount of time required to establish multiple applications.

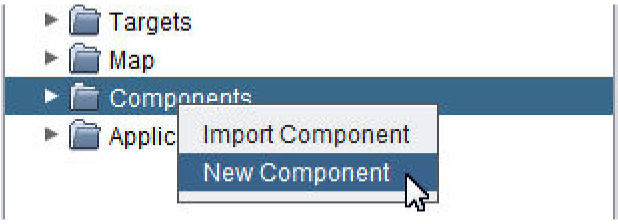
More Information

Creating a Component

Component Development Theory

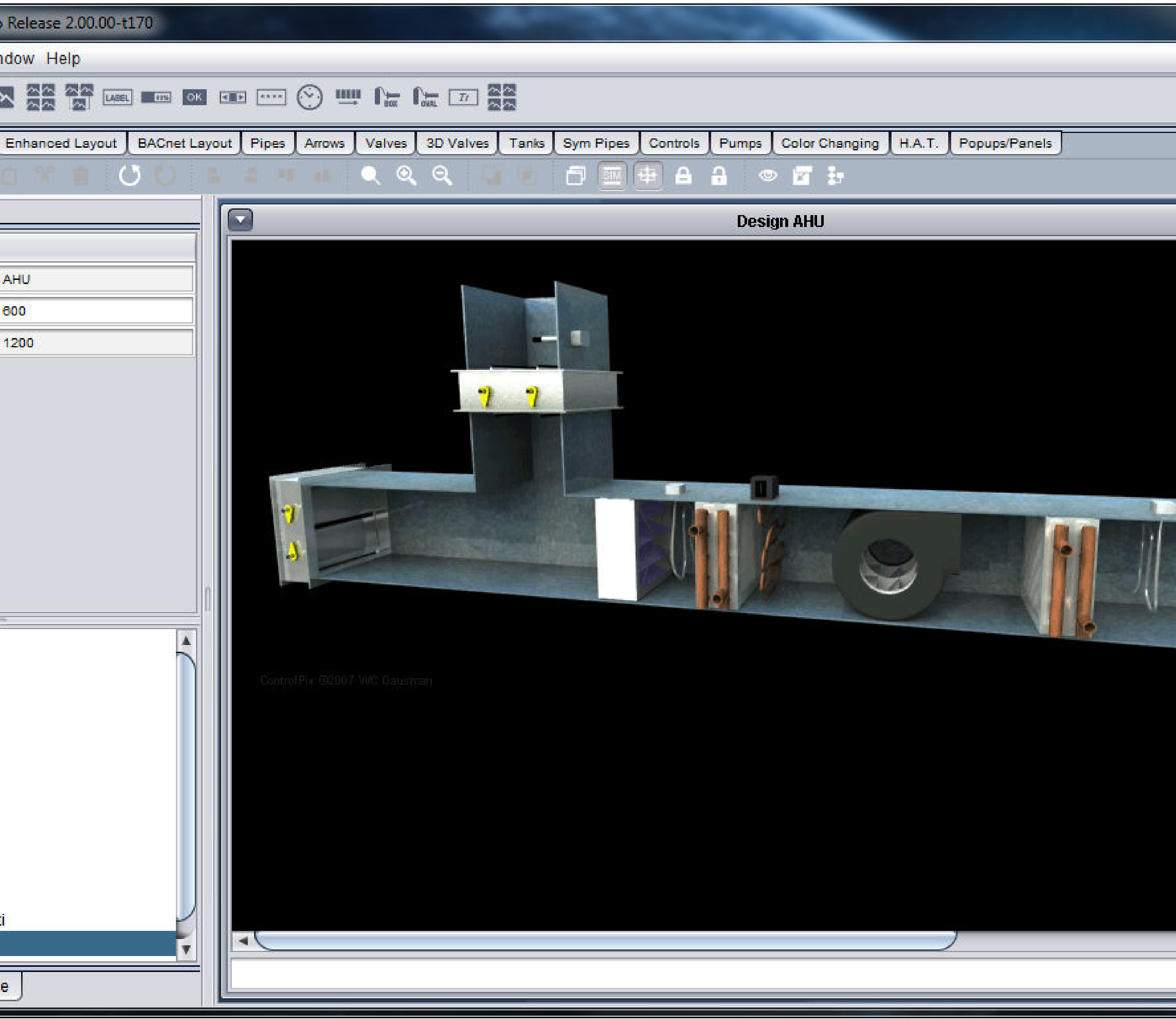
Creating a Component

Components are built in much the same way as Applications. Instead of creating a new Application, you will create a New Component by right-clicking the Components node of the project tree. Normal Design and Diagram windows will be provided.

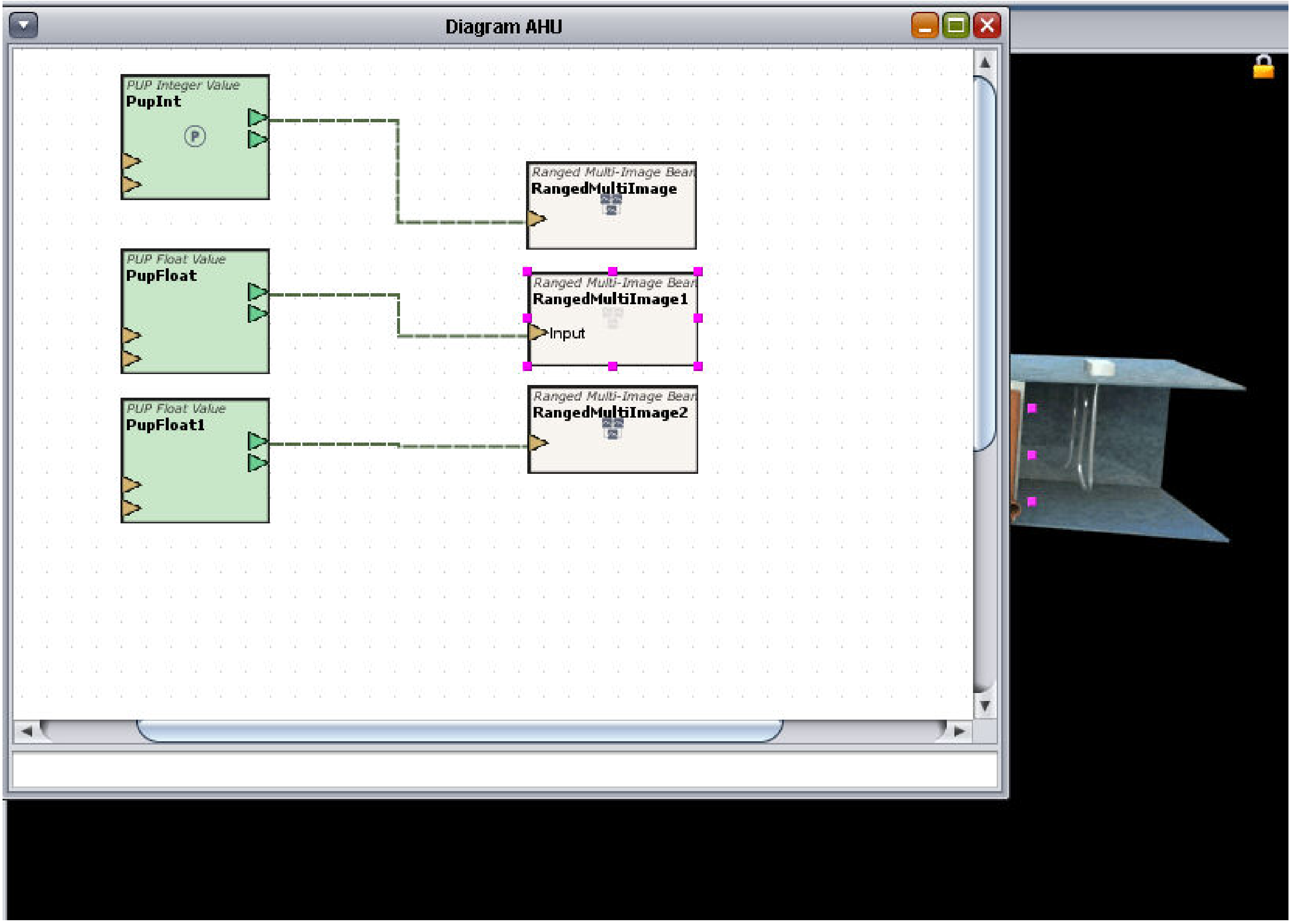


Component Development Theory

In the example provided, we have created an Air Handling Unit component, that will be used across three different devices, pre-created and addressed in a PUP Network application. For this component, we have established a graphical user interface screen along with logic necessary to link data points to the graphic.



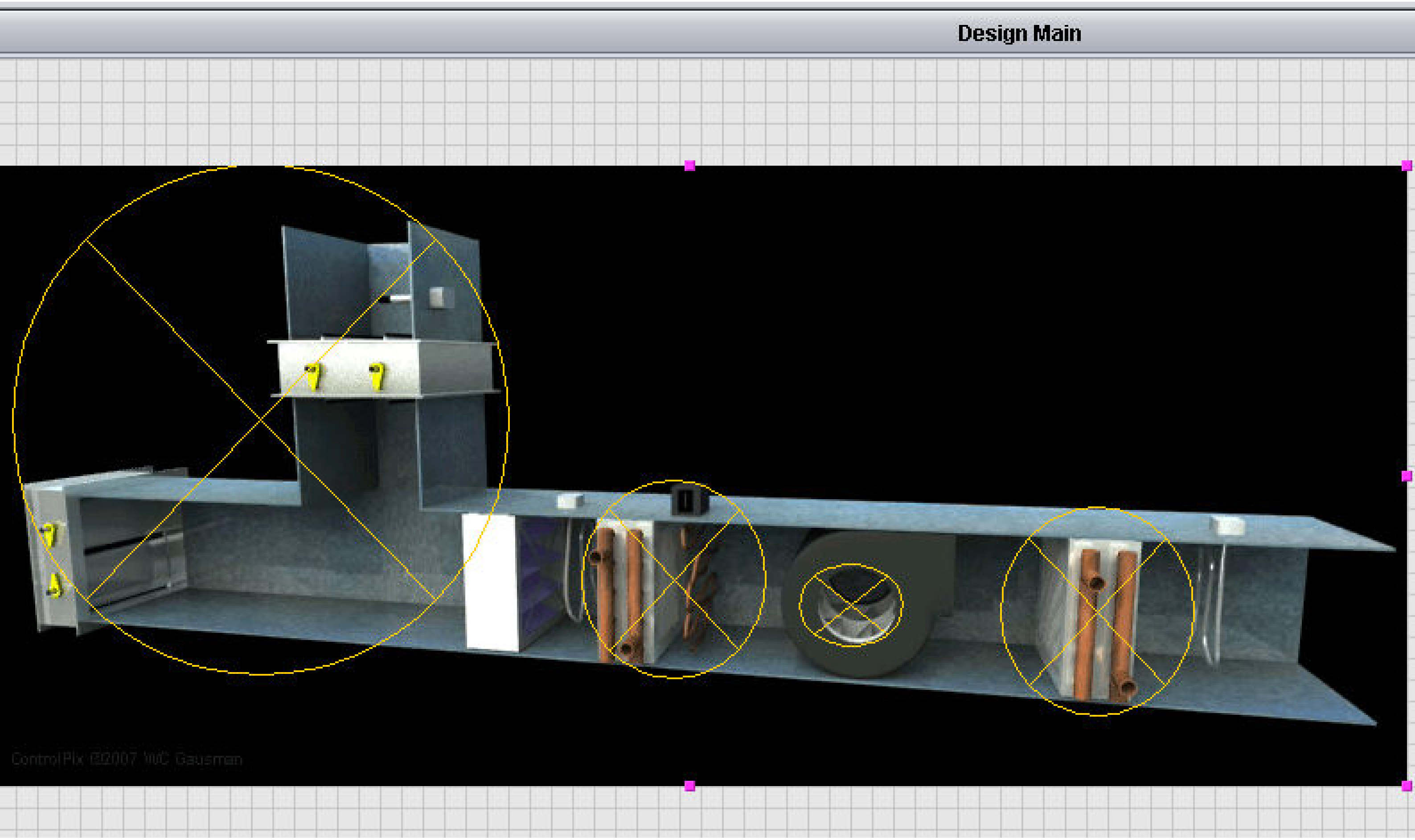
While the graphical user interface screen design is rather cut and dry from a design approach, some additional items need to taken into account specific to Logic when it comes to creating and designing effective components.



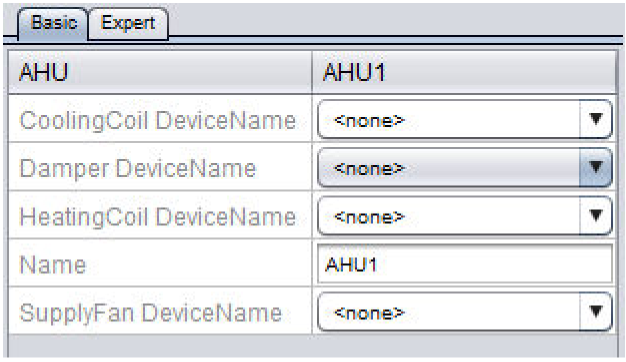
To start, in the Logic example above, we have three points from a PUP network which are currently linked to no device. This allows the Component to stay idle until it is used and applied to an application. In order to allow the Component to carry over the ability to address specific devices created from the PUP Network, each point element we have addressed in Logic will have its PUP Device Name property exposed. This will allow us to later address different devices when we apply the AHU to different applications.

Once we have saved and built our application, it then is time to apply our design to a new Application. To do this, we simply enter the Design Mode of our new application. At the top of the Palette Toolbar, notice a new tab called “My Beans”. Each component created and defined under the Components tab will be present and react similar to any graphical or logic element used within the system.

Simply click the icon associated to the created component, and add it to the Design Workspace. Performing this action will generate both graphic, logic.



When you click on the graphic, notice the Property Panel includes a generic name for the component, as well as three properties that allow us to address which device we wish to look at for data information. These properties exist because we exposed the PUP Device Name property of each PUP Point element during component design. At this stage, the only work required by the user would be to define the device settings for each point we exposed.

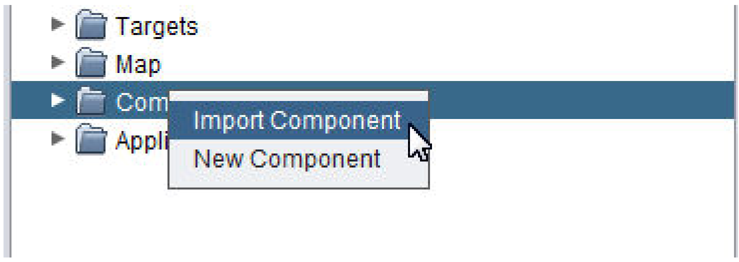


Importing a Component

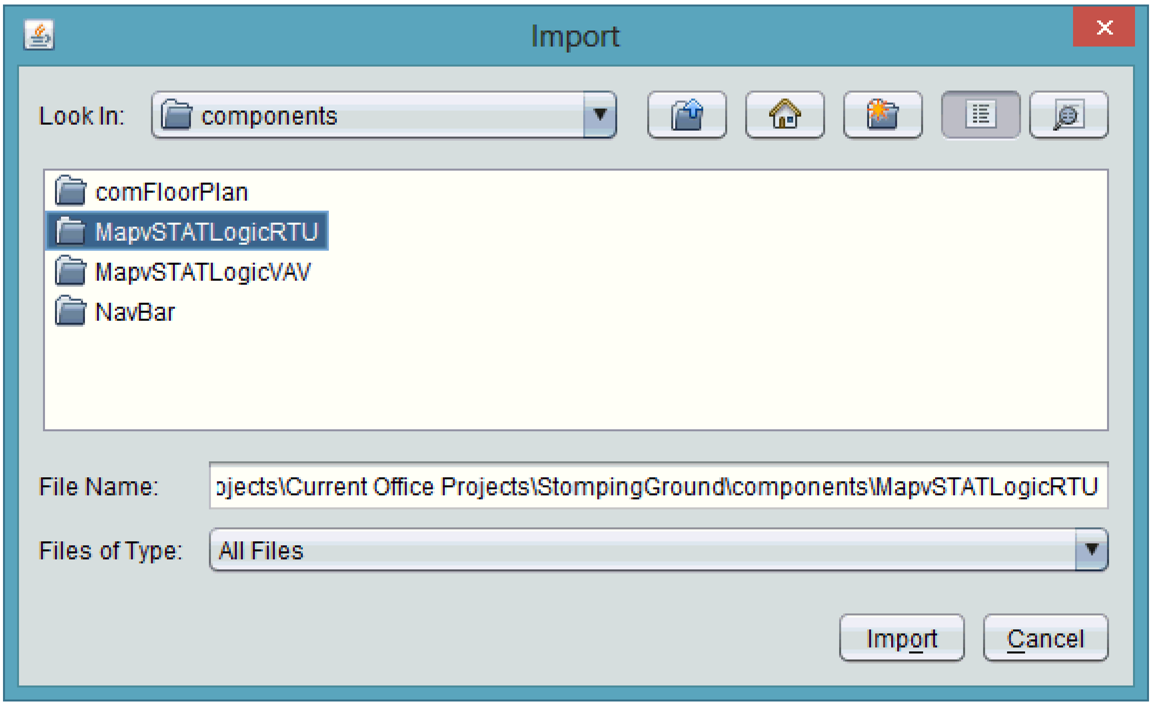
There may be situations where you will want to re-use a Component that was engineered in another project you may have created. Aspect-Studio supports the ability to import an application from another Project.

To import a Component, perform the following steps:

1. From the Project Tree, right click the Component Node; select Import Component.



2. When selected, the File Browse window will appear. Browse to the appropriate reference project and access the 'components' folder and select the Component you wish to import. Click Import.



3. If you have any image files, drivers, or user files associated with the Component, you must also import them using the same process for each respective node within the Project Tree.

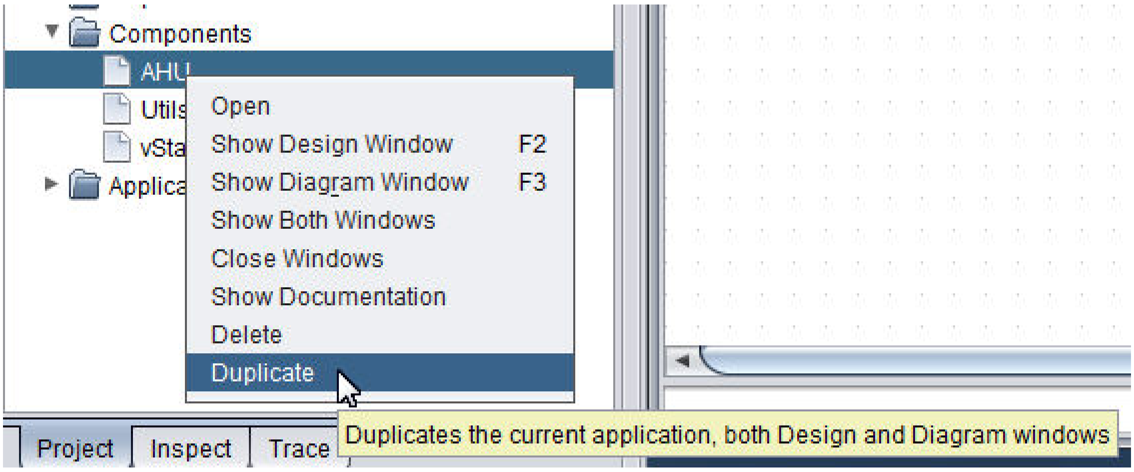
NOTE - The Import Component Process does not automatically import any dependent image files, database drivers, and other user files. In order for your imported Component to operate as intended, you must import dependent items using each respective node of the Project Tree.

Duplicate a Component

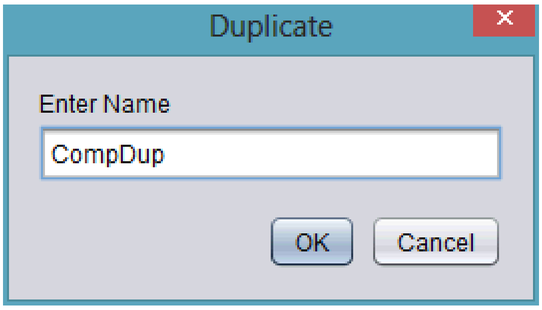
There may be situations where you will want to duplicate a configured Component for re-use. Aspect-Studio supports the ability to duplicate a component without having to exit Aspect-Studio and perform the work manually via Windows Explorer.

To duplicate a Component, perform the following steps:

1. From the Project Tree, right click the Component you wish to clone, and select Duplicate.



2. You will be prompted to provide a name for the cloned Component. Type in a valid name, then click OK.



Popup Development

Popup Overview

Aspect supports the ability to launch pop-ups. Pop-ups can be used to display messages, animations, real-time data, or a combination of any type of element desired. In Aspect, a popup is useful for situations where additional properties of a specific topic need to be displayed. For example, a popup can be used to display the runtime information for a piece of equipment or setup information for a specific universal input.

Pop-ups are designed with the notion that real-time data display will be terminated after the pop-up has been closed. Permanent logic routines, such as trending, alarming, and sequencing should be done as a standard component and dropped onto an application. Please review the Component Development section for more information on this topic.

In all cases, the usefulness of a pop-up will vary dependent on application strategy and implementation.

There are two types of popup that can be created within Aspect:

1. On-Screen Pop-Up - An on-screen popup can be used to display and pass real-time data changes into a display view embedded within an application. This is useful for situations where a user may wish to change a specific value in logic.
2. Launched Pop-Up - A launched pop-up displays a secondary window overtop of the primary design view window. When viewing is complete, the secondary window must be closed in order to view the primary design window view.

The creation process for both types of pop-up are the same with the exception of a few steps.

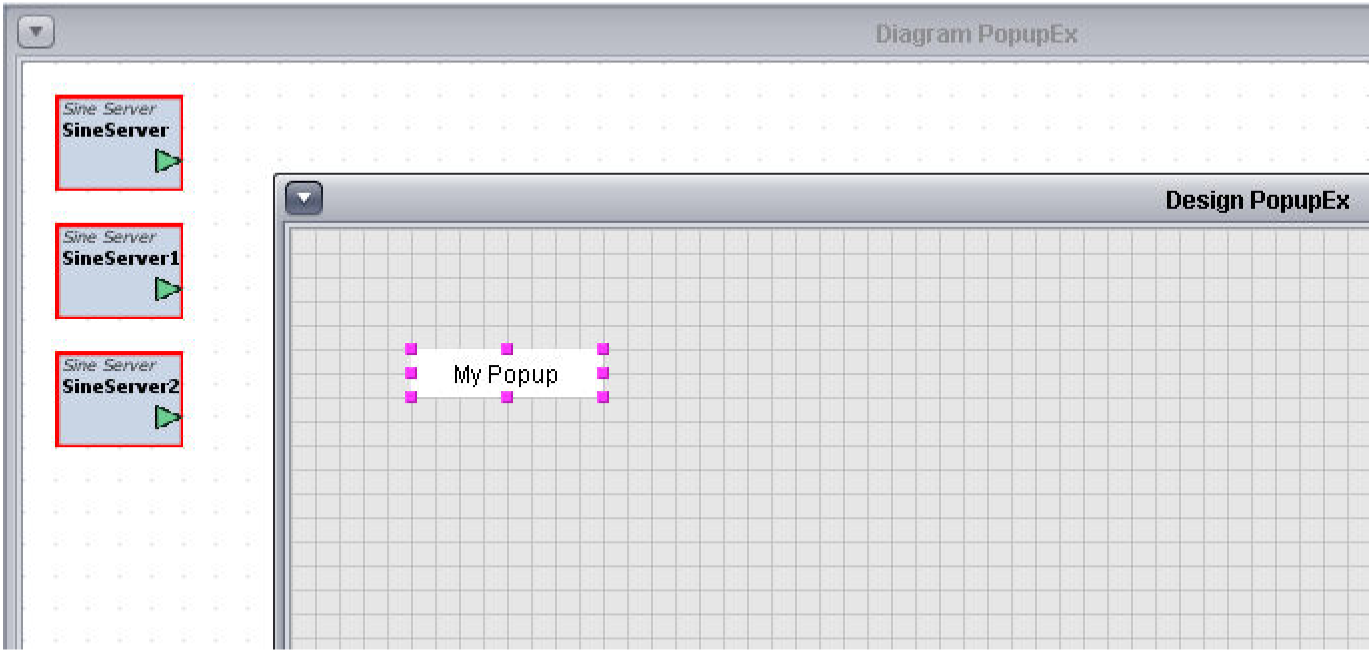
More Information

Building Popups - Quick Start

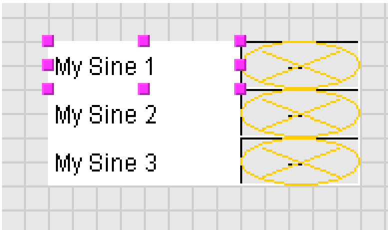
Building Popups - Quick Start

The following section provides a example of a simple pop-up.

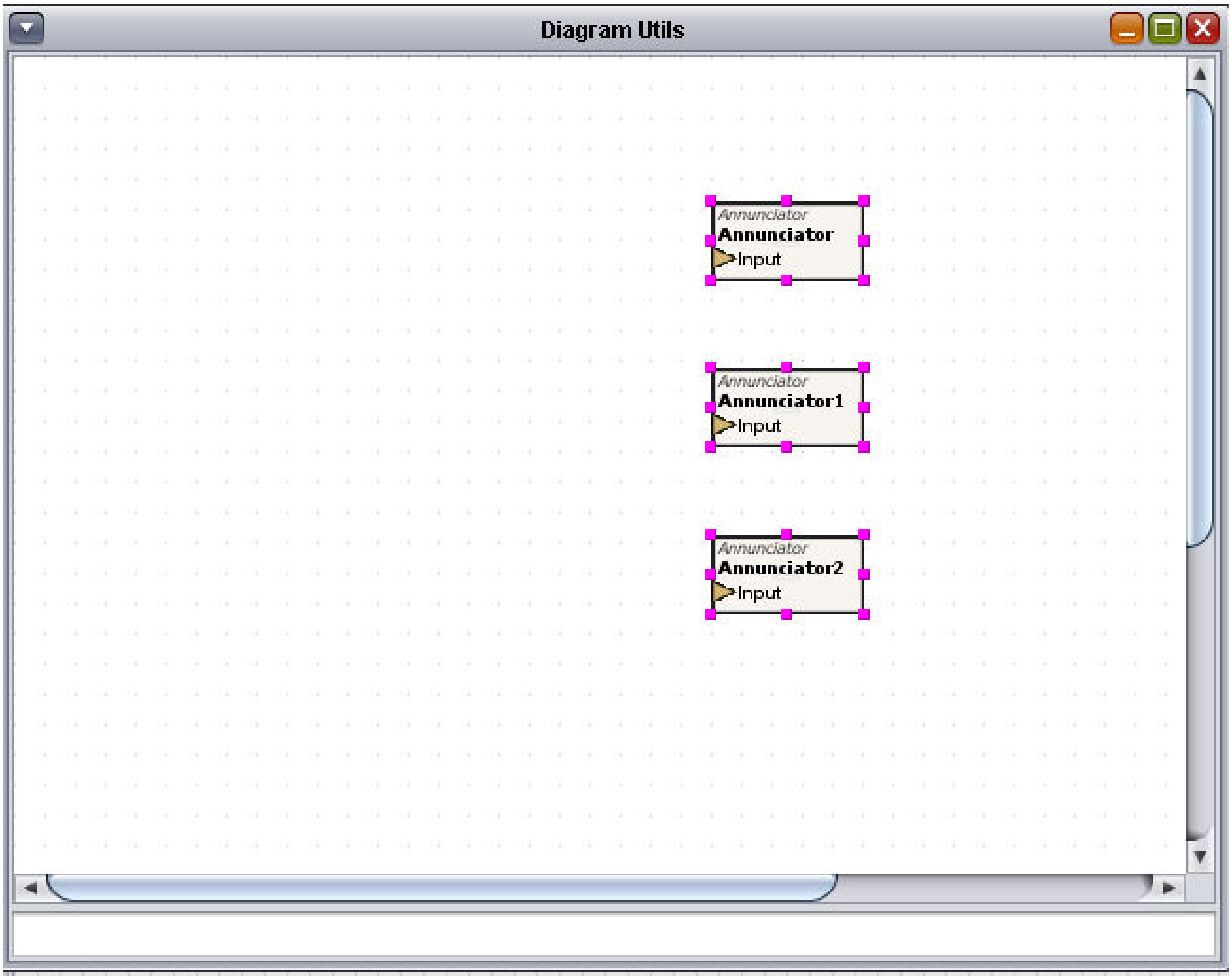
1. First start by creating an Application that has three Sine Server elements in the Application's Diagram. On the Design View of the Application, click and drop a Popup Launcher onto the Design View. In the label property for the Popup Launcher, enter a descriptive string for the Pop-up. If you wish for your pop-up to be an On-Screen pop-up (meaning the pop-up does not occur in a secondary window), you should also add a On Screen Popup element onto your Design View in order to see the pop-up.



2. Simple Pop-ups utilize components to display data. Therefore, we will need to first create a component. To create a component, right-click the Components node and select Add Component. As reviewed earlier, a Component has the exact same look and feel as a Application, rather its intended use is to serve as a skeleton for reusability. On the component, we will place three Annunciator elements, along with labels for identification purposes.

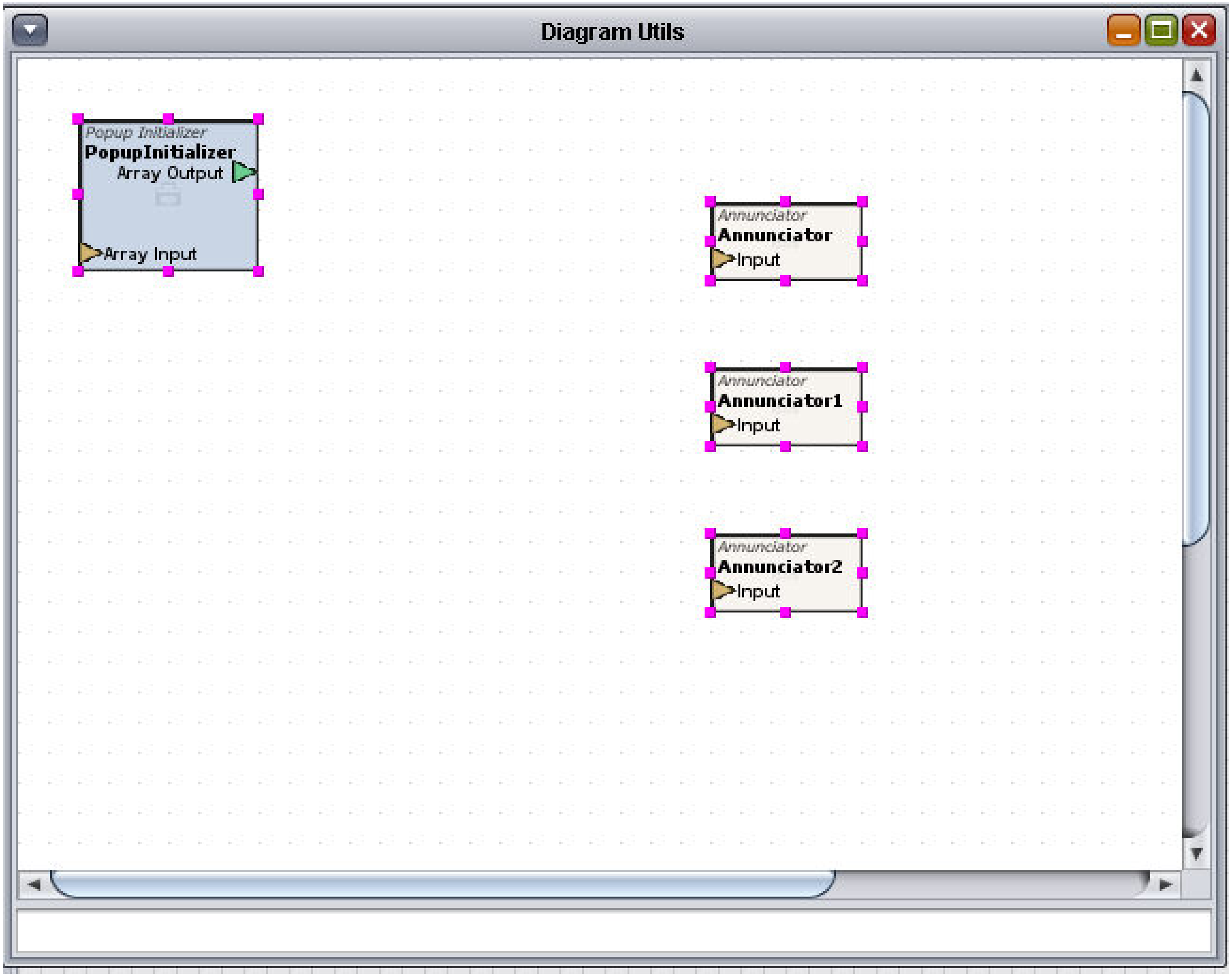


3. Select the three Annunciator elements and copy them to the Diagram View using the Copy to Diagram icon in the Standard Toolbar.

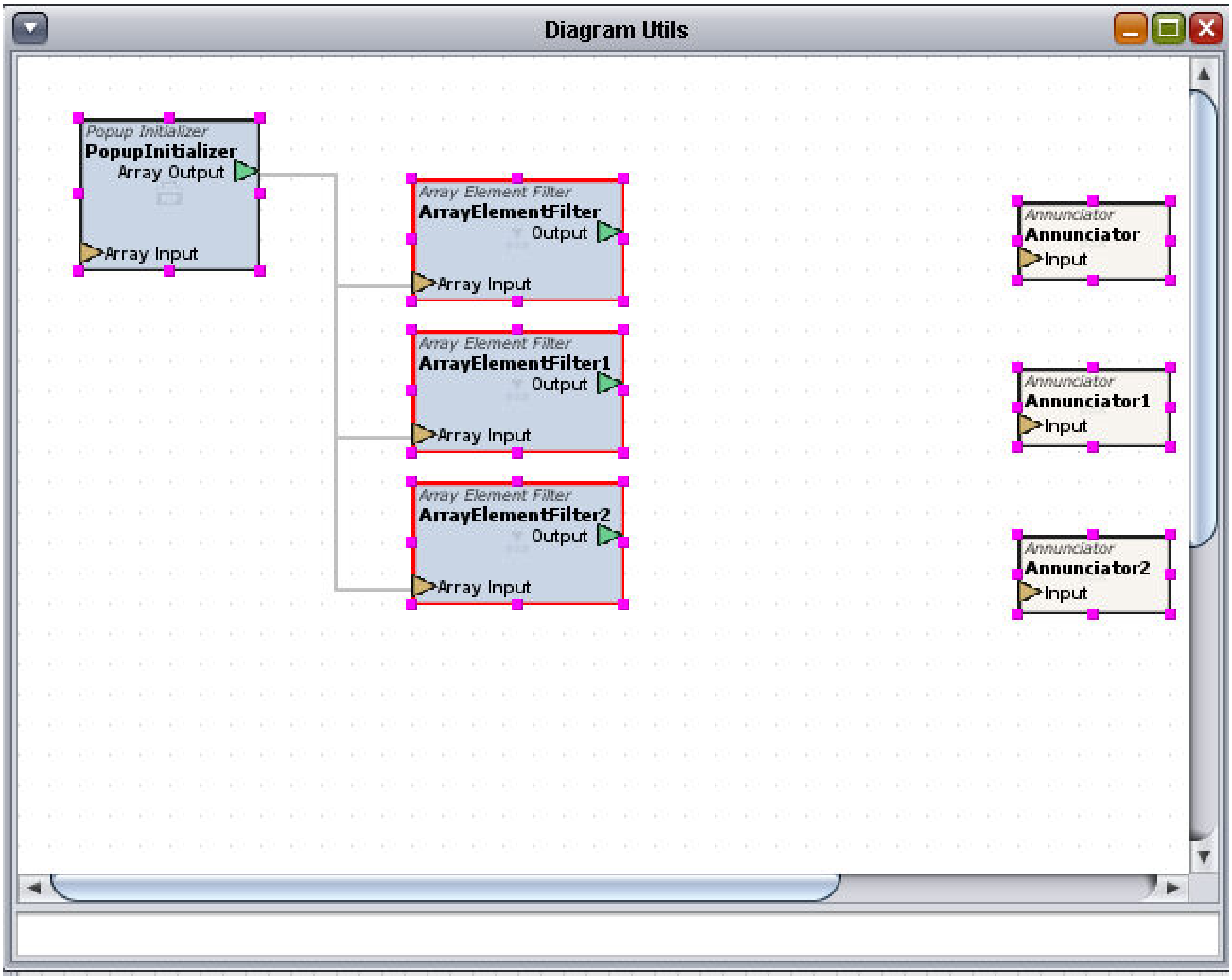


4. At this point, we must create logic to allow the component to accept passed data when the pop-up is activated. To do this, we will use a Pop-Up Initializer, a Broadcast Server, and Array Element Filter elements.

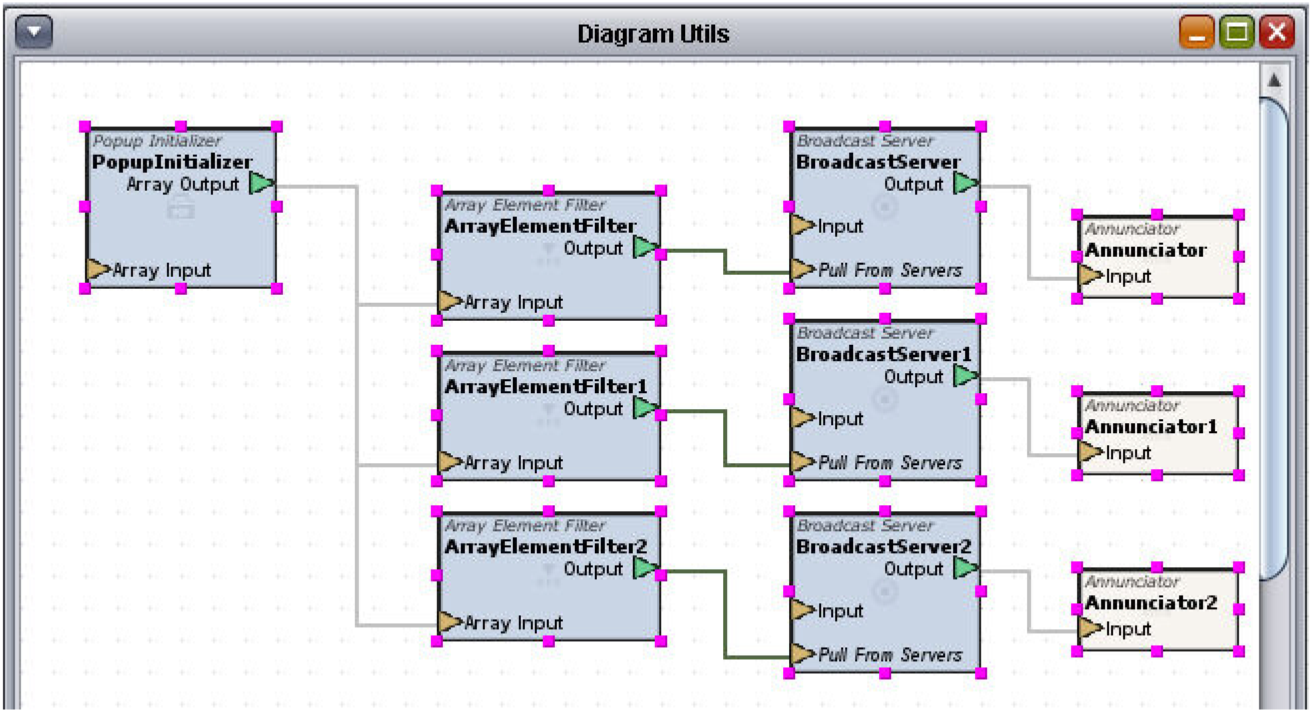
5. We will first add a Popup Initializer to our Diagram. This element should be placed at the top-left hand corner of your Diagram for best arrangement purposes. The Popup Initializer is used to receive pop-up initialization data sent by a Pop-up command. The element them streams that data out to the necessary components. While the Popup Initializer contains some configurable properties, none should be configured for best practices.



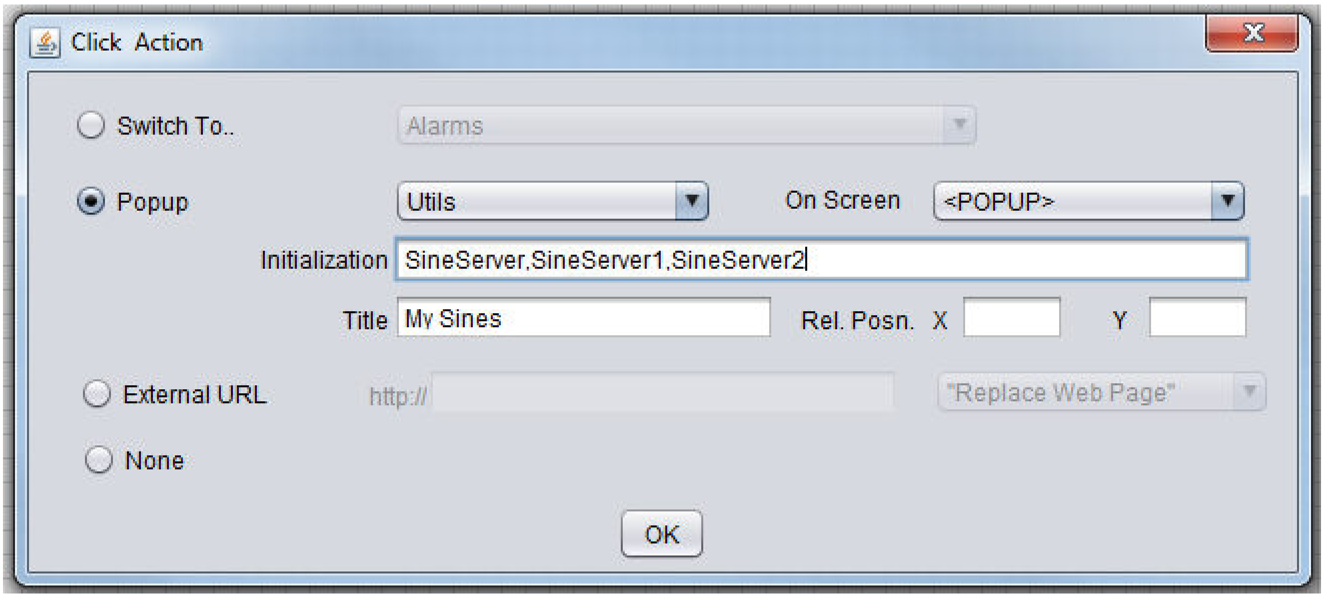
6. Initialization data from a Pop-up command is sent in a string-based, comma delimited format - which for all intensive purposes is an array. When sending multiple pieces of data, the component needs to filter out each array index and direct it to the right place. Since we are displaying three pieces of data, we will need to add three Array Element Filter elements to the Diagram. Since arrays use index numbers to designate information, each Array Element Filter must have its index number configured. They will be configured for 0, 1 and 2 respectively. Once configured, establish a connection from the Array Output of the Popup Initializer to each Array Element Filter's input.



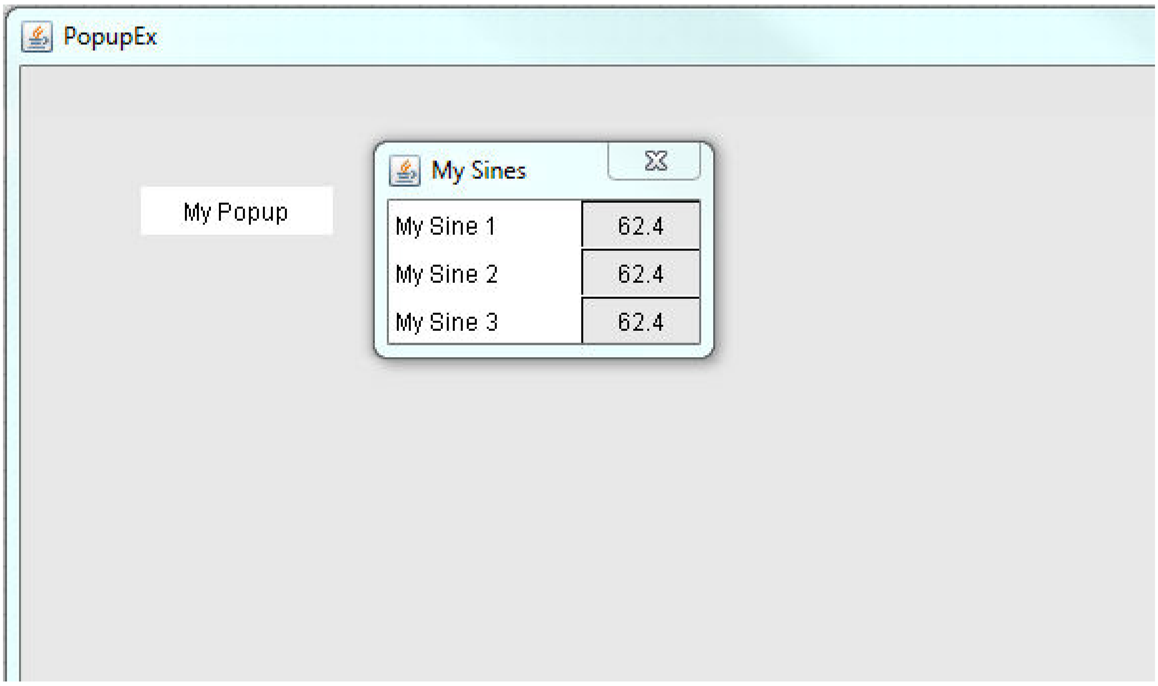
7. In order to pull continuous real-time data values into the pop-up, a Broadcast Server element must be added between each Array Element Filter and Annunciator. Connect the output of each Array Element Filter to the Broadcast Server's Pull From Servers property. Note that this property may need to be exposed prior to establishing the logic connection. Finally, connect the output of the Broadcast Server to the respective Annunciator.



8. Go back to the Application you created in Step 1. Select the Popup Launcher element you had added and select the Expert tab in Properties. Double-click the 'Click Action' property to invoke the Click Action editor. In the editor, select the Pop-up option. In the first drop list, select your created component. Finally, in the Initialization path, we will enter the element names of the three Sine Server elements added in our project. This field must be comma delimited. You may also add a title that will display in the pop-up window. Note that if you wish for your pop-up to occur in an on-screen manner (where the pop-up is embedded into the Design View, select the appropriate application from the On Screen drop-down.



9. Finally, configure the Click Count property of the Popup Launcher. By default, a value of 2 is entered. This controls how many mouse clicks must be initiated by the user before the pop-up is displayed. Configure accordingly.



After following these steps, you should be able to launch your application in a test frame and test the pop-up. If you have followed these steps correctly, a pop-up showing Sine Server data should appear within Aspect-Studio.

Design Considerations

Components that are used as Popups usually need to receive initialization data, and usually need to transfer a calculated value to another part of the application logic. This document will describe how to accomplish this.

Passing Data to Popups

Data is passed to Popups using Initialization parameters entered in the Click Action Panel. This data is passed to the popup's Popup Initializer manipulator. All Popups that need to receive parameters must have one (and only one) Popup Initializer in their logic. The output of the Popup Initializer (an Array Value Object containing the parameters) and a set of can be used to get the individual parameters sent from the graphic to initialize the Popup.

Outputs from Popups

Data is passed back to the logic of the project from a popup by "pushing" the new data to a server (usually a Broadcast Server) in the application logic. To push the data to this server, you need to expose the "Push Name" property of a server in the Popup logic (usually a Broadcast Server), then send the name of the server to push to this property. The value of the server name is sent into the Popup as one of its initialization parameters. When a Value Object (data) is sent to the Input of the Broadcast Server in the popup, this Value Object will be forwarded ("pushed") to the named server.

Values can be sent immediately to the application logic, or you can delay sending the data by triggering a Set Value with the data when the popup closes. Send the data to the input of a Set Value, and use a Popup Closer to trigger the Set Value. The data should be sent from a Broadcast Server for best results (set the Push Name for the destination server on the Broadcast Server, send the data from the output of the Set Value).

Deploying Projects

Deployment Overview

Deployment is the process of publishing an engineered project from Aspect-Studio to an Aspect target. Deployment within Aspect Studio performs the following:

1. Source Clean - An automatic clean of all source files generated within Aspect-Studio is performed to ensure a healthy copy of your project is published to the Aspect target.
2. Source Compile - A compilation of all source files is performed by Aspect-Studio. The Compile process turns all information setup and configured within Aspect-Studio into machine language (Java classes) for the Aspect target to process and make available.
3. Source Upload- Once the compilation is successful, Aspect-Studio will authenticate itself to the Aspect target you wish to deploy to. Once established, all compiled project files will then be uploaded to the Aspect target.

Prior to deploying a project, it is helpful to ensure your project is free of cyclic connections, as well as mis-configured elements that may not have a valid connection (such as field-bus points with no referenced device). This section discusses pre-processing tools that you should run.

More Information

Executing Pre-Process

Executing Verify References

Defining Targets

Basic Properties of a Target

Expert Properties of a Target

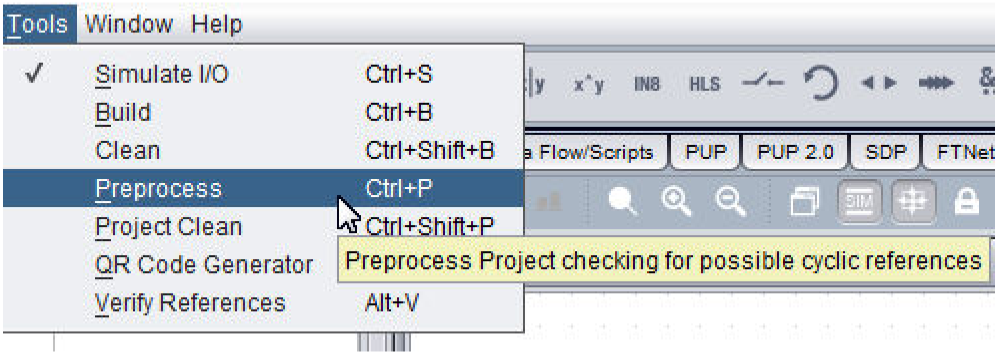
Deploying the Project to the Target

"Light Weight Deployment " on page 465

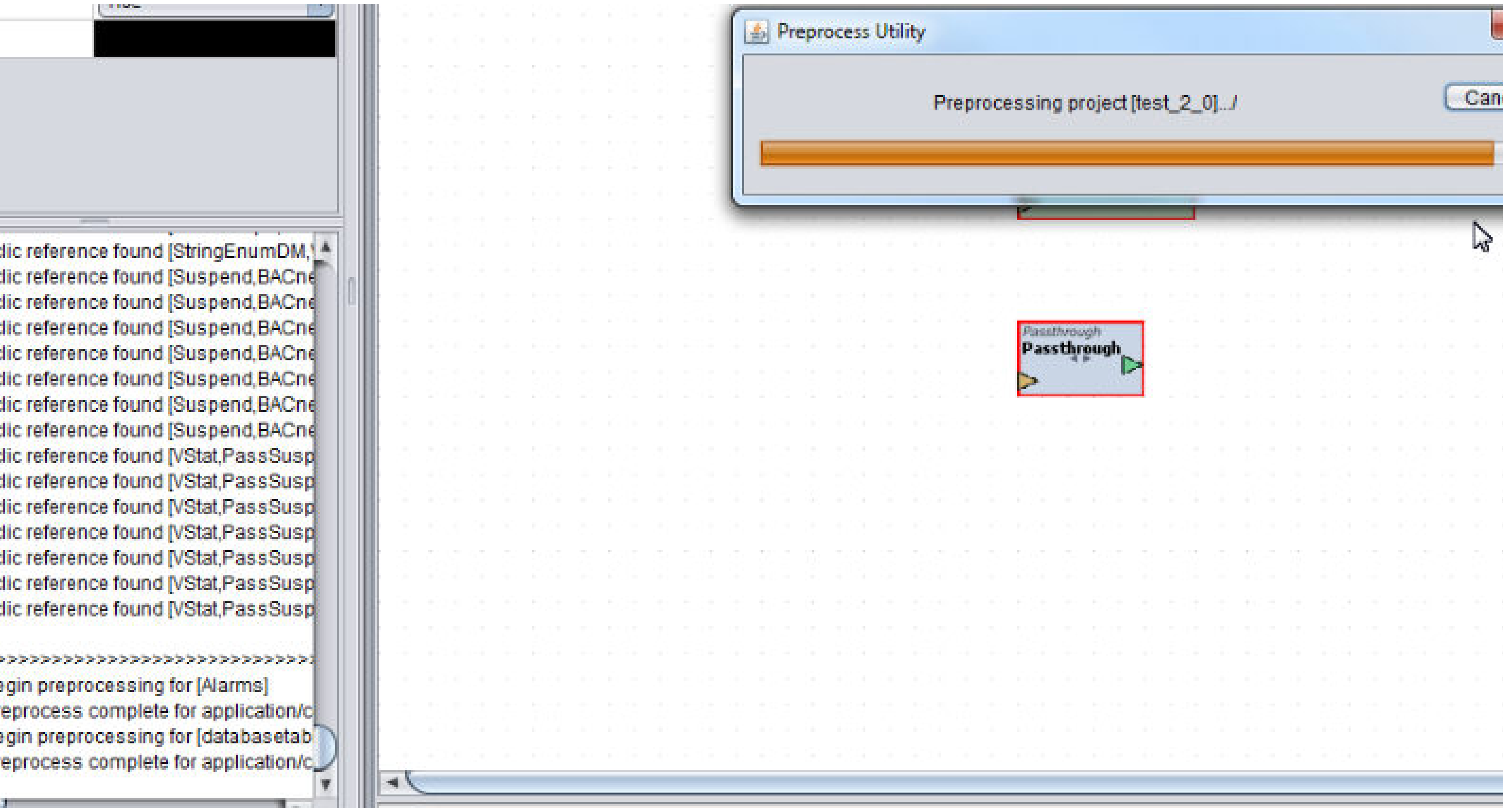
Executing Pre-Process

Available from the Tools menu, Pre-Process is used to verify that your configured Aspect project is free of cyclic logic and connections. Cyclic logic and connections within a project can cause harmful memory usage and unstable operation of your configuration.

To run Pre-Process, select the menu item from the Tools drop-down menu.



The Pre-Process diagnostic will examine every application and component within your project for cyclic connections. Results are automatically logged to the Trace Tab when the process is executed.



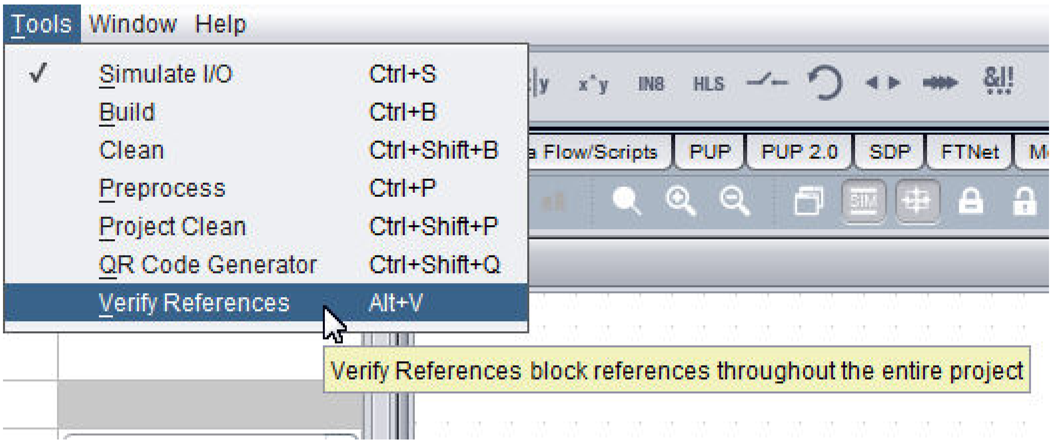
Should any cyclic logic be identified, the log will identify the application, and each element that is connected within the cyclic reference.

Executing Verify References

The `Verify References` tool is used to ensure that any references used by elements configured within your ASPECT-Studio **project** are valid. Invalid references could arise for example when an application or component is imported and it references an element on another application.

> **Note**: Verify References does not check for e.g. 'graphic orphans', as it checks block logic only.

Similar to Preprocess, the tool can be launched from the Tools menu of ASPECT-Studio.



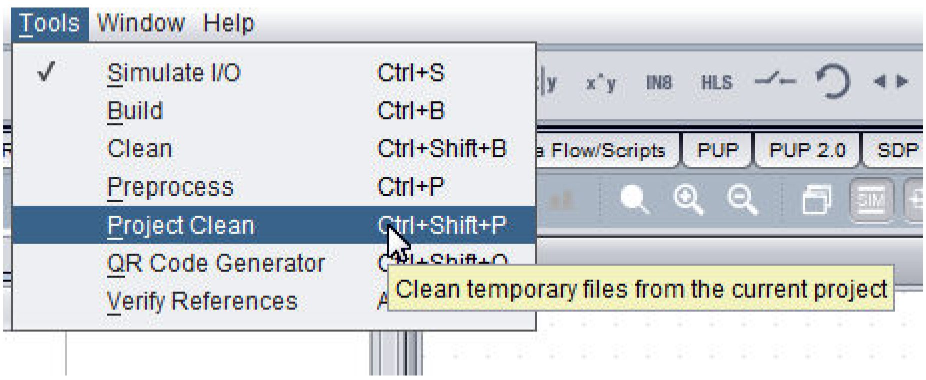
Any element reference that does not have a valid connection will be flagged. Please note that if you have constructed components in a manner where a connection is selected after it has been dropped onto an Application (which is valid), this tool may identify those elements as not being able to run. Please use insight on your own project to determine if this is the case.

```
13:58:06,195 Verifying References...
13:58:06,206 block [/VAVLogic/ZoneTemp] cannot run, reference [
13:58:06,207 block [/VAVLogic/DamperPos] cannot run, reference
13:58:06,209 block [/VAVLogic/PassReference] cannot run, refere
13:58:06,298 Reference Verification complete...
```

Executing Project Clean

Available from the Tools menu, Project Clean is used to perform a deep clean of a project for situations where a standard Clean may not alleviate issues with general build and deployment. The process removes any backup temporary files stored by Aspect-Studio and allows for a new build process to occur.

To run Project Clean, select the menu item from the Tools drop-down menu.



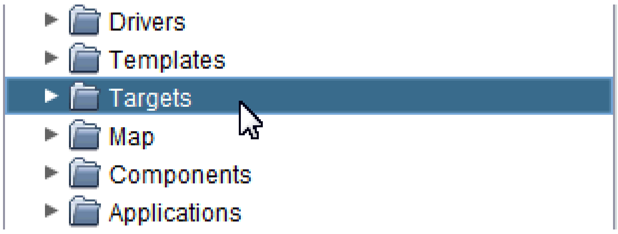
The Pre-Process diagnostic will examine every application and component within your project for cyclic connections. Results are automatically logged to the Trace Tab when the process is executed.

Defining Targets

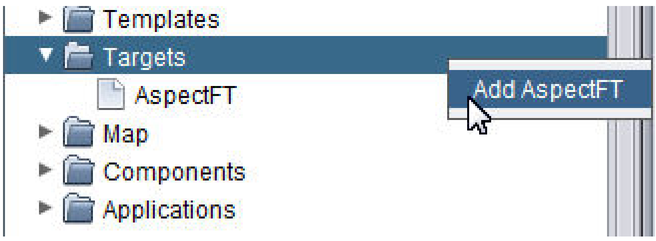
Before you can perform project deployment, you must first identify targets to Aspect-Studio. This is done through use of the Targets node of your project tree.

By default, no targets will exist. You must manually add the targets you wish to deploy your project to. To do so, perform the following steps:

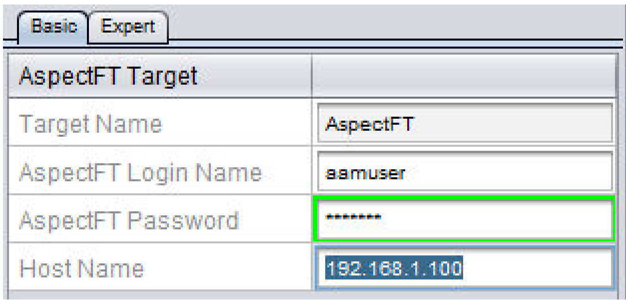
1. From the Project Tree, select the Targets node.



2. Right-click the Targets node, and select the Add Aspect short-cut. This action will add a new target named Aspect into the Targets node.

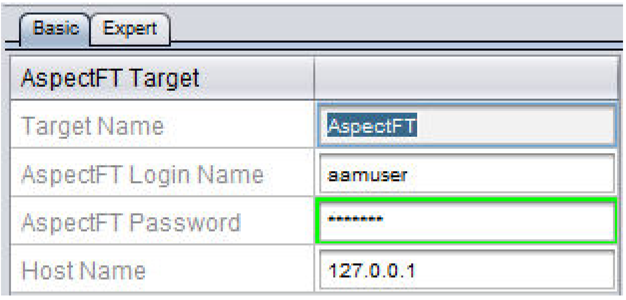


3. Click to highlight the newly added Target definition and configure its properties via the Property Pane window.



Basic Properties of a Target

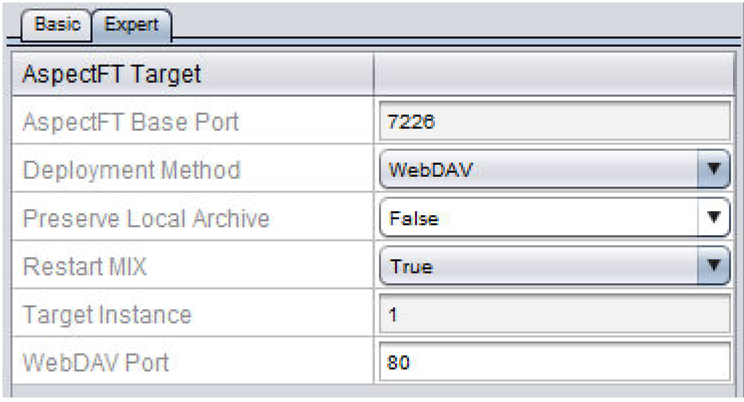
The Basic Properties of a target definition contain simple address and authentication information. The address is commonly the IP address or assigned resolvable name for the Aspect target in question. Deployments require authentication between Aspect-Studio and the target. Therefore, you must include an administrative login name and password for deployment (found in the User/Group setup of your Aspect target).



Property Name	Notes
Target Name	Defines the name of the target, as displayed under the Targets node of your Project Tree.
Aspect Login Name	Defines the administrative user name of the Aspect target.
Aspect Password	Defines the password for the referenced Login Name.
Host Name	Defines the IP address or resolvable name of the Aspect target.

Expert Properties of a Target

The Expert Properties of a target definition contain advanced connection information - including Port assignment, Instance (for Facility and Enterprise products), as well as additional options for an Aspect target to follow post-deployment

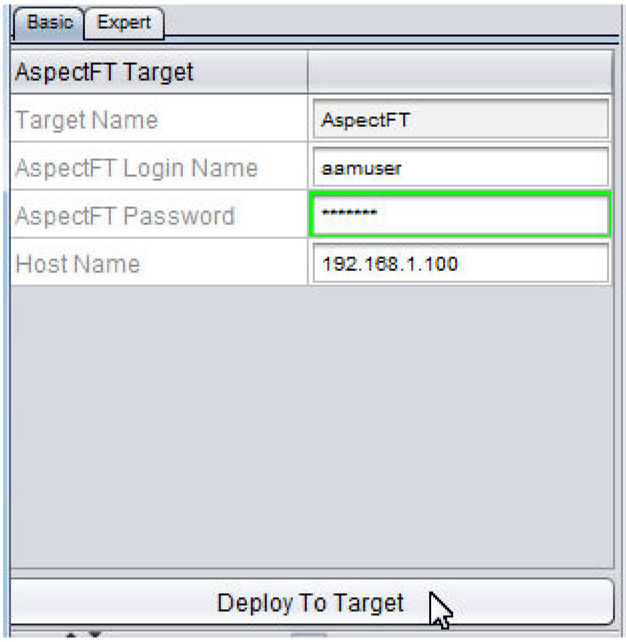


Property Name	Notes
Aspect Port	Defines the port number Aspect is configured for Aspect downloads. Ensure that this value matches the Aspect Port Setting from the Aspect Control Panel of your Aspect target.
Deployment Method	Defines the method in which project data is downloaded to the Aspect target. By default, Aspect-Studio uses WebDAV, which provides uninterrupted access to the system. WebDAV is considered the optimal setting. For troubleshooting situations, this option can be changed to Aspect is desired.
Preserve Local Archive	Defines whether or not a password back-up of the deployed project should be zipped and placed into your PC's local project folder. By default, this setting is set to False, as the source project can be downloaded from your Aspect target at any time.
Restart MIX?	Defines whether or not all mixed services are restarted post project deployment. By default, this setting is set to True, as Aspect and all its base services commonly require a restart to ensure proper project start-up.
Target Instance	Defines the Aspect Instance you wish to deploy to. This value (ranging from 1 to 20) defines the instance slot that the specific project should be deployed to.
WebDAV Port	Defines the WebDAV Port used for project down-

	loads. This value is always 80.

Deploying the Project to the Target

Once you have configured all Target property information, you can then perform Deployment. To deploy your project, click the Deploy to Target button, located between the Property Panel and the Project Tree.

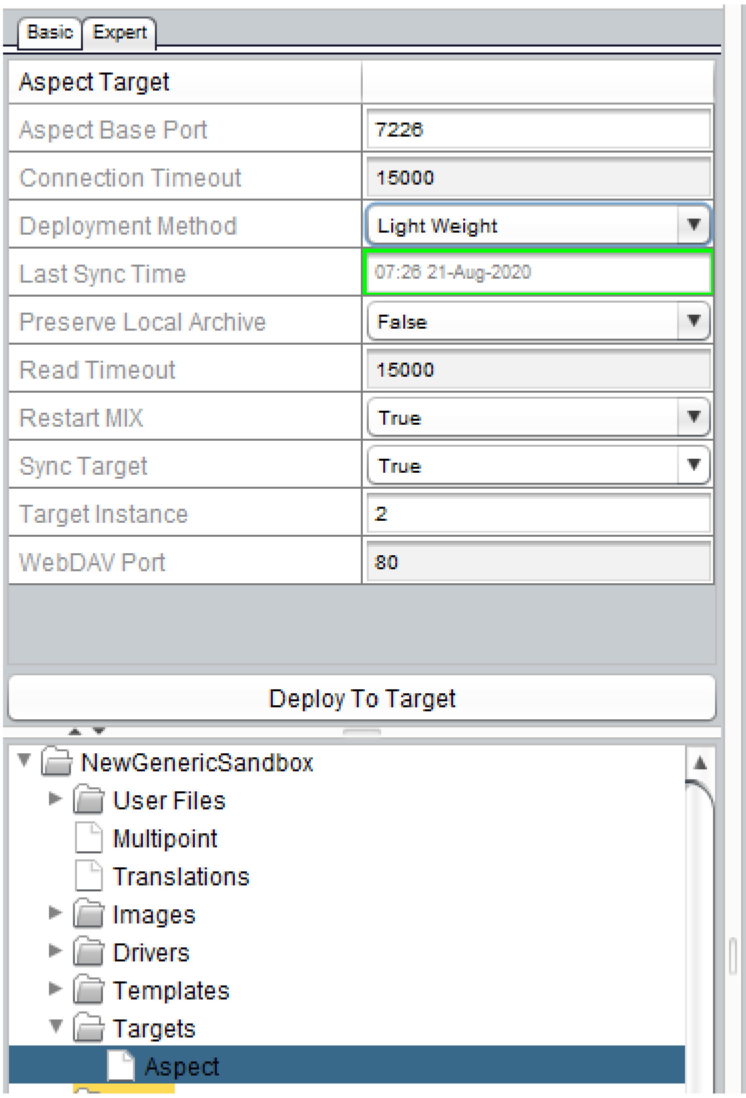


Light Weight Deployment

Since v3.04.00

A new method of project deployment has been added to Aspect Studio to facilitate more efficient transfer of essential dependencies and core project application and configuration files. At project deployment time, Aspect will query a device target to determine which project dependencies are currently installed. A cross match process then determines if any dependencies are current and up to date on the device and will not re-deploy these files. This will speed up deployment times after the first project deploy during project design and development.

This option is enabled by default and is located on the Expert tab of all Target nodes in an Aspect project.



Project Tools

Find and Search

Find and Search Overview

Aspect-Studio includes intuitive find and search capabilities that will enable technicians to find any element or group of elements within a developed project. Selectable from either dedicated short-cut icons from the standard tool bar or from the Search drop-down menu, technicians can easily search and filter through projects for any information they may need.

More Information

[Element Sleuth](#)

[Finding Elements](#)

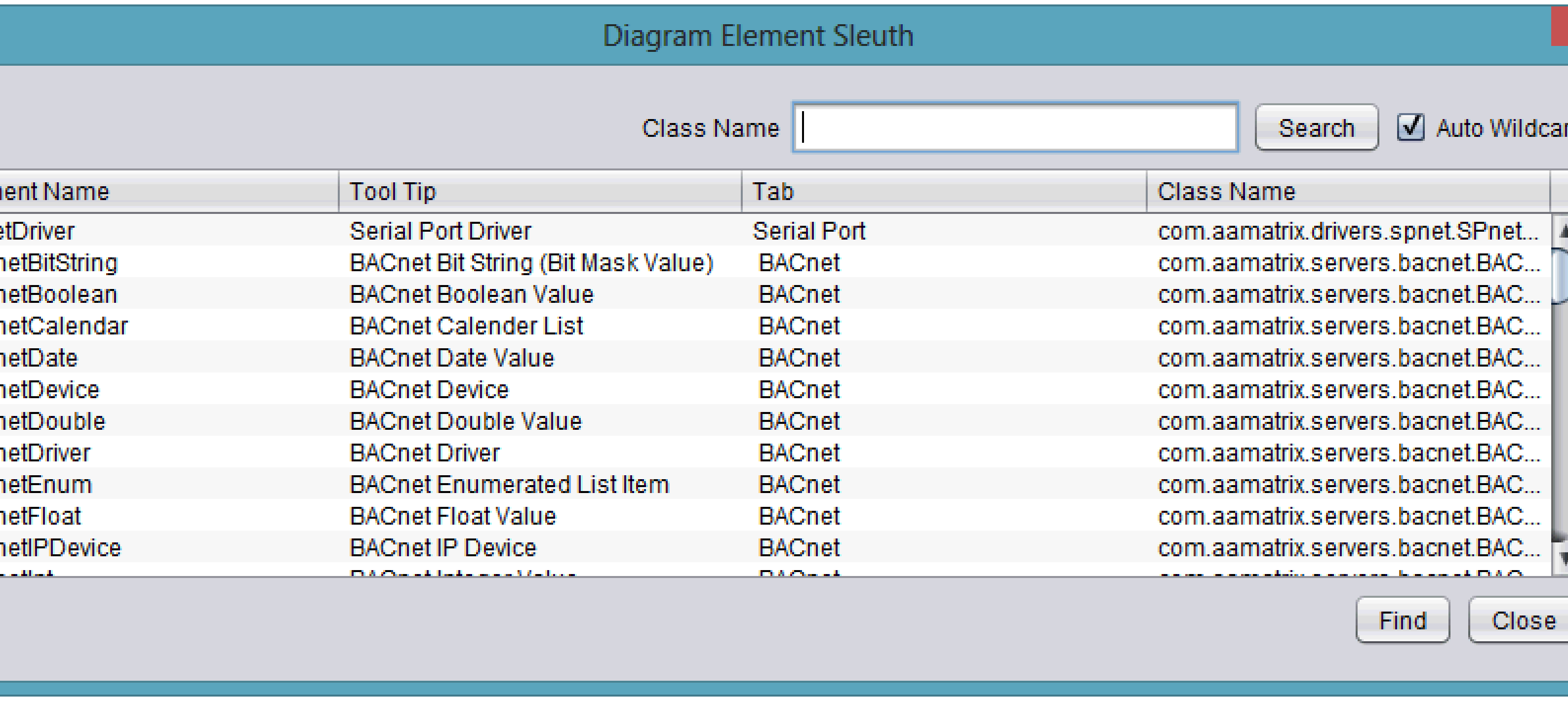
[Advanced Search](#)

Element Sleuth

The Element Sleuth feature of Search provides the ability to quickly find and locate an element within your Design or Diagram Palette. Using this tool, technicians can quickly locate a specific element within a given Design or Diagram palette within Aspect-Studio. To launch Element Sleuth, select Search>Element Sleuth. You can also type CTRL+E to launch the sleuth at any time.

A search field is provided that permits users to enter partial names for an element.

When selecting an element from the list, clicking the Find button will locate the element for the user in the Palette with a highlight around the element icon.

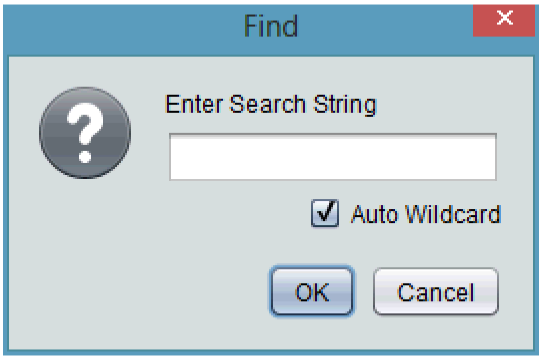


Finding Elements

Finding elements within Studio can be achieved through use of the Find feature. To use the Find feature, select Search>Find from the menu, or select the  icons from the Standard Toolbar. You may also press CTRL+F on your keyboard to invoke the Find Feature at any time.

The Find Feature Dialog Box

Once selected, you will be prompted with a Find dialog box. To find any element within the system, simply enter a search string into the provided text field. By default, the Find Feature will use its Auto Wildcard feature, which maximized the amount of results returned by the Find feature. If you are attempting to Find a specific element and know its exact name, you may remove the check mark from the Auto Wildcard check box to search for one specific item.



When clicking OK, Aspect-Studio will automatically navigate you to each element that meets the criteria you have specified. You will be taken directly to the element in its Design or Diagram view, with the element automatically selected and highlighted.

Using Previous/Next

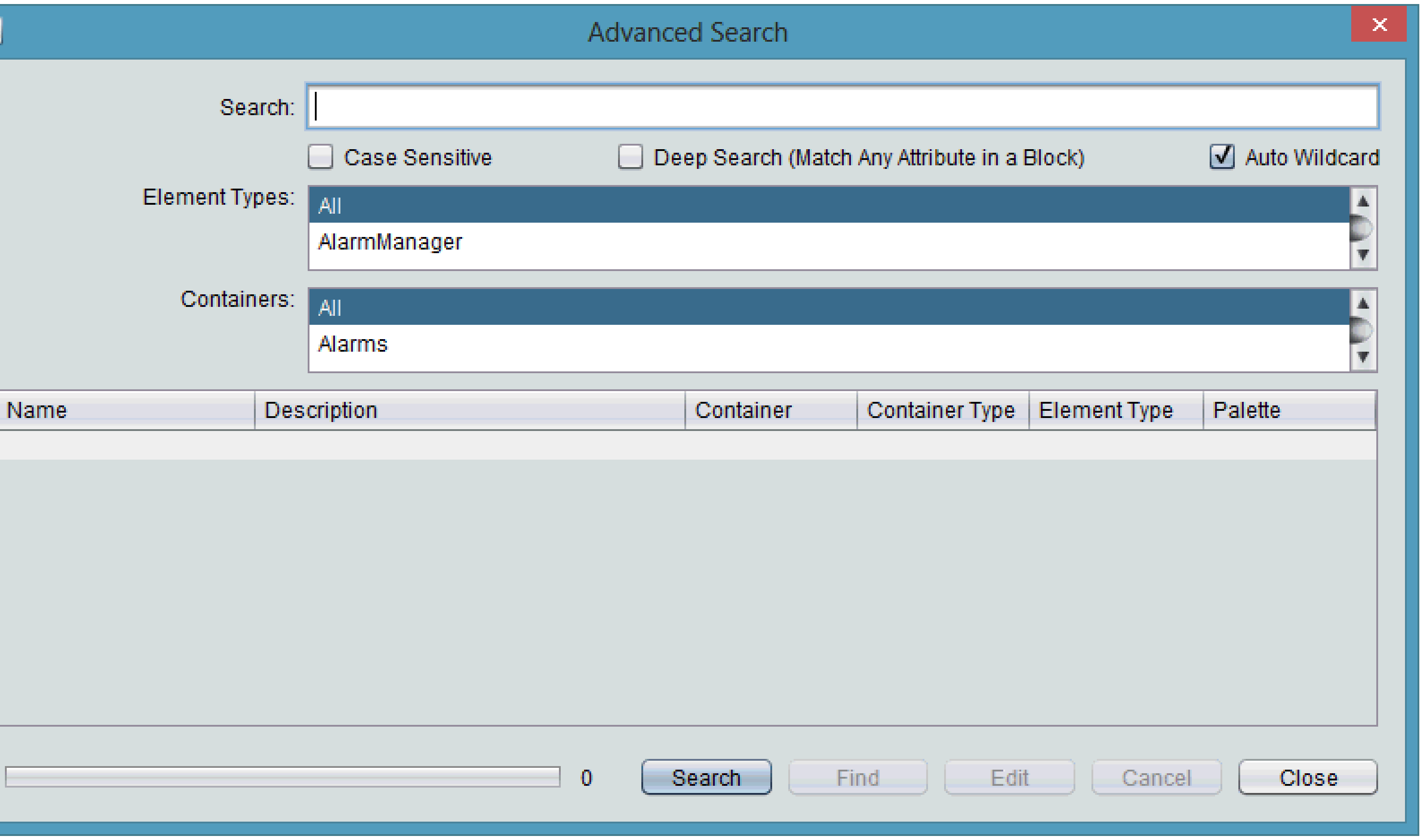
If you are using the Auto Wildcard feature and are searching for numerous elements that are alike in name, Aspect-Studio allows you to move to the next element in the result by selecting Search>Find Next from the drop-down menu, or by selecting the  icon.   The F3 key on your keyboard can also be used as a hot key to the next result.

For situations where you may need to go backwards, Aspect-Studio allows you to move to the previous element in the result by selecting Search>Find Previous from the drop-down menu, or by selecting the icon. Pressing SHIFT+F3 on your keyboard will act as hot keys to performing the same actions mentioned previously.

Advanced Search

Advanced Search provides the ability to perform deeper searches for elements based on type, containers (which are applications or components). Through this view, users have the ability to see all information regarding a specific element, such as its description, type class, and other information such as property values.

To launch the Advanced Search feature, select Search>Advanced Search from the drop-down menu, or by pressing the icon on the Standard Toolbar. You can also type ALT + A on your keyboard to launch it as well.

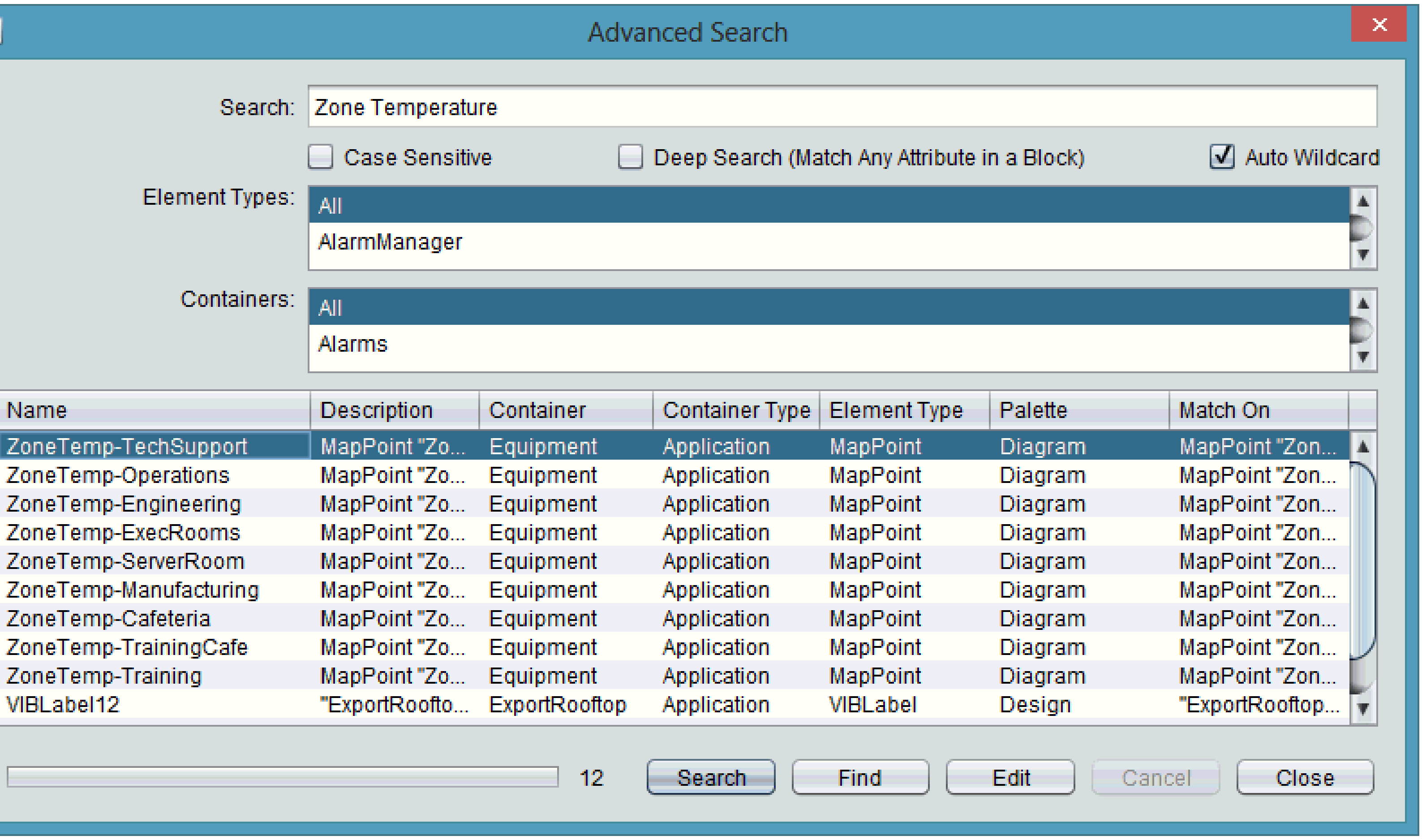


Similar to the Find feature, type the item you want to search for in the provided text field. By default, the Auto Wildcard option is on to maximize results project wide. If you are looking for a specific element and know its exact name, you may elect to remove the check mark from the Auto Wildcard option.

You can also type property value entries by clicking the Deep Search check box.

Working with Results

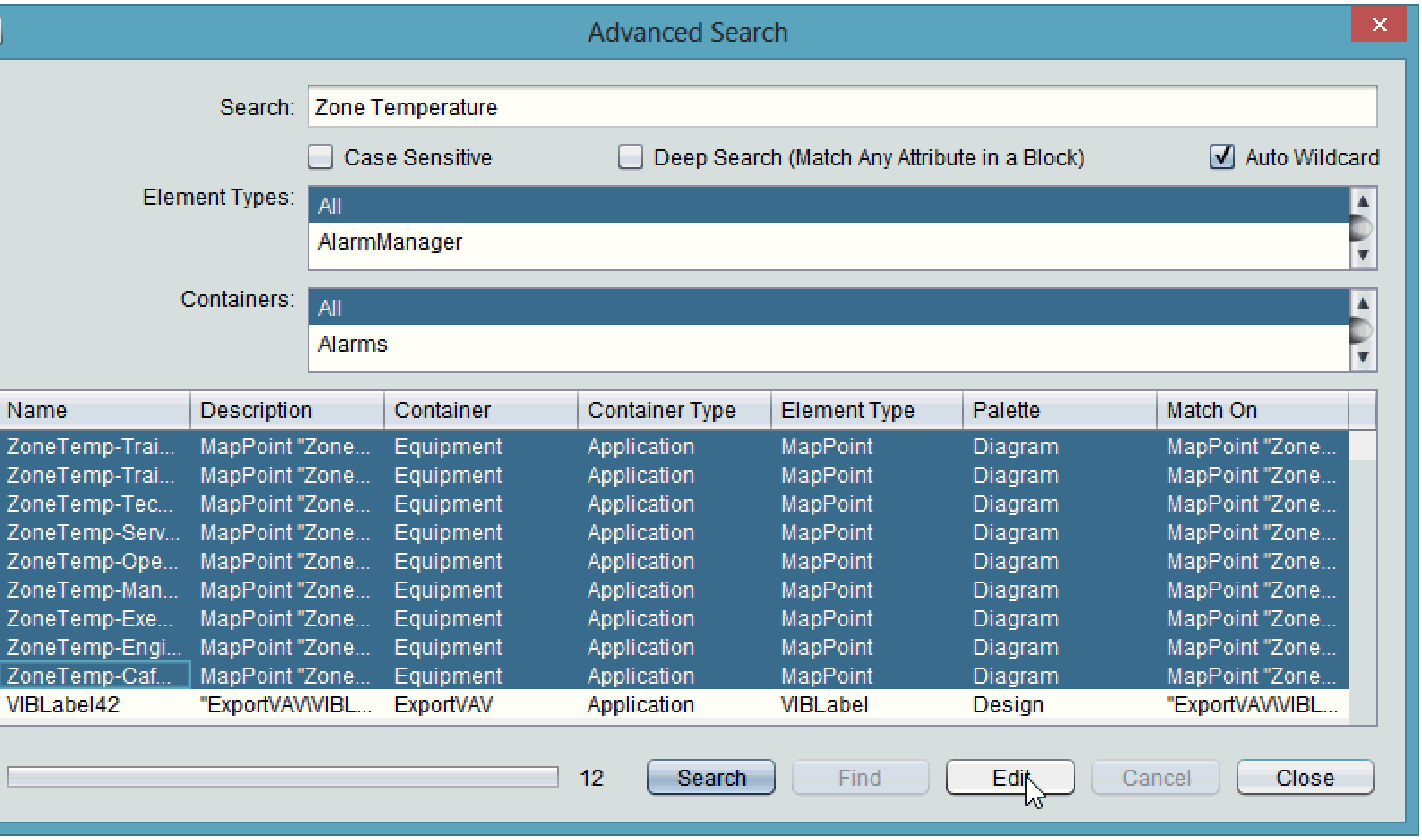
The results will display the name of the element, description (including property information), the container it exists in along with its type, the Element Type, whether the element is a Design or Diagram element and any Match On criteria. You can navigate to the specific element by either double-clicking the row listing for the corresponding element, or single-click to highlight followed by clicking the Find button.



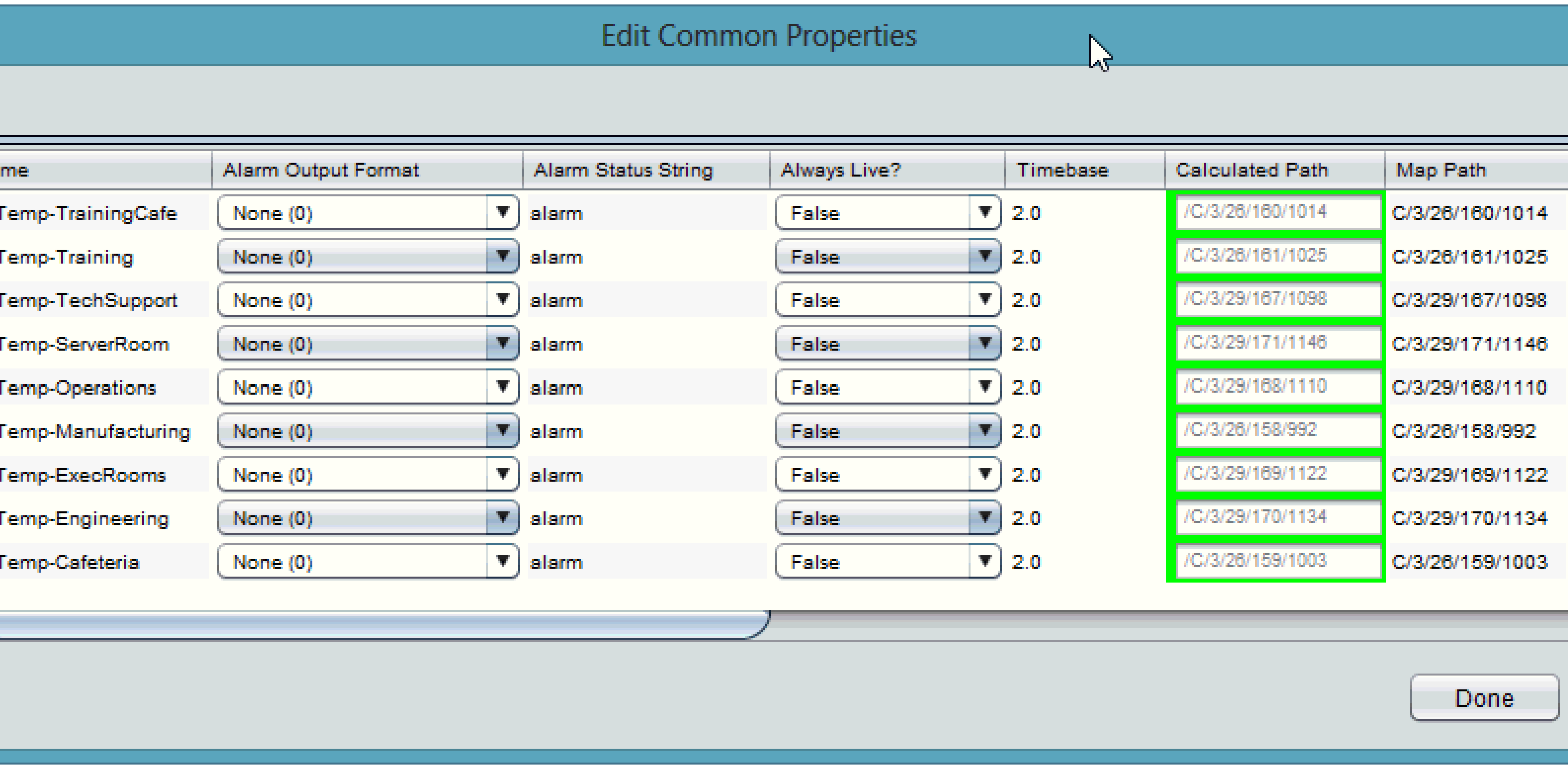
Editing Common Properties

A new feature to the Advanced Search is the ability to edit common properties of two or more search results.

While holding the CTRL key, click to select two or more search results and click the Edit button.

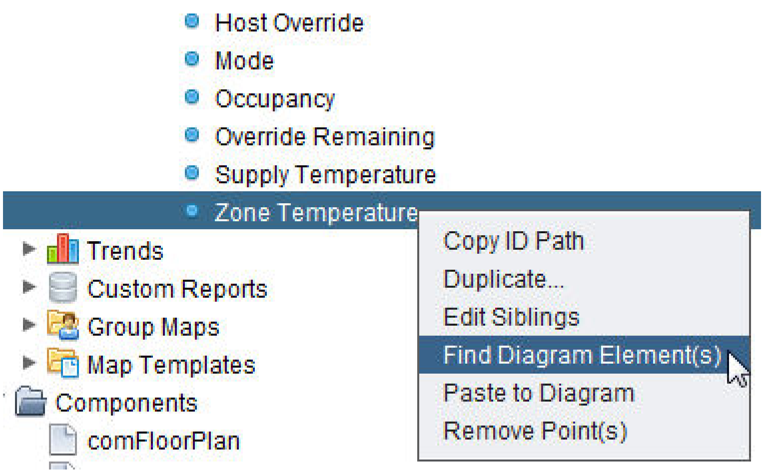


The Edit Common Properties window will appear allowing you to edit several properties at once much the same way the Edit Children window of the Map elements does.

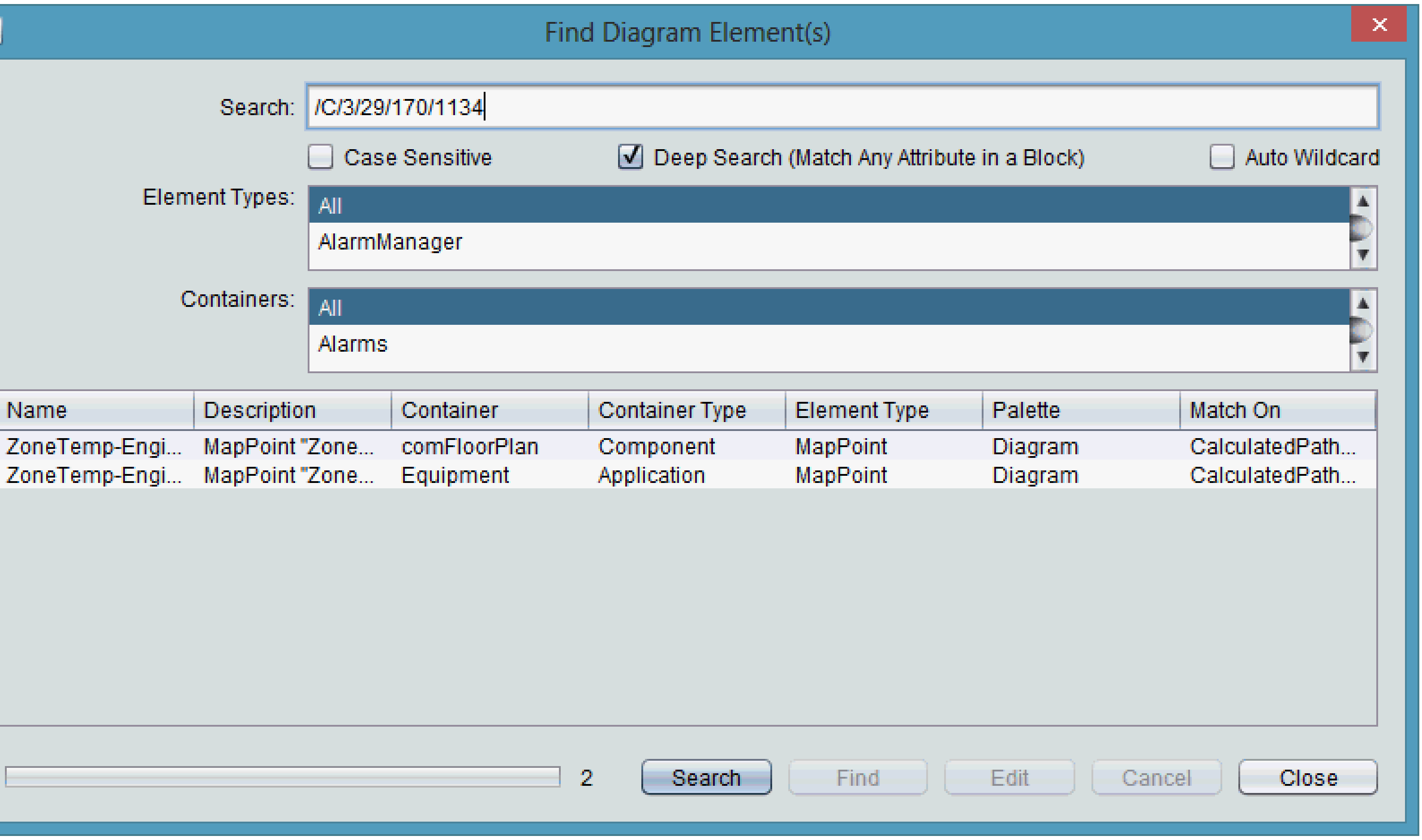


Finding Diagram Elements from the Map

In some cases, you may need to search a project globally to determine where a specific Map Point may be instantiated at. In this scenario, you can right-click on any Map Point listed within the Map Tree and select Find Diagram Element(s).

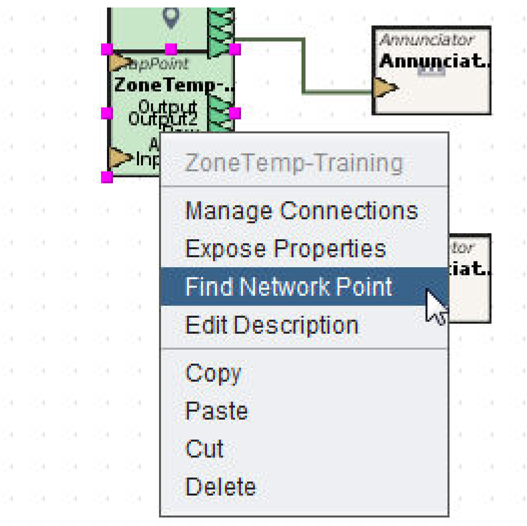


When selected, the Search Windows will appear and automatically search the entire Project for the Map Point you are seeking. Results will be shown as necessary.



Finding Network Map Points from the Diagram Workspace

In certain situations, you may need to find which Map Point a device belongs to. In this scenario, simply right-click the Map Point in Diagram Mode and select Find Network Point from the shortcut menu.



The Map Tree will expand and automatically highlight the point in question.

Project Testing

Testing Overview

While creating and developing projects, Aspect provides multiple ways that a project can be tested incrementally during the creation process.

In general, Aspect-Studio operates full-time in a simulation environment. All data generated within is contained within the software environment, is not sent out to the control network (unless dictated to). While Aspect-Studio is the engineering environment for building parts and pieces that make up the entire project, the software environment itself can be resource intensive as Java classes are maintained, built, and cleaned in the background.

Aspect-Studio users with multiple methods for testing project applications prior to deploying to live sites.

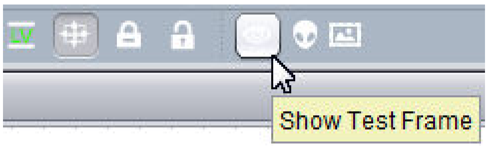
The following methods are discussed, along with their pros and cons:

- Test Frame
- Global Simulation
- Local Aspect Server

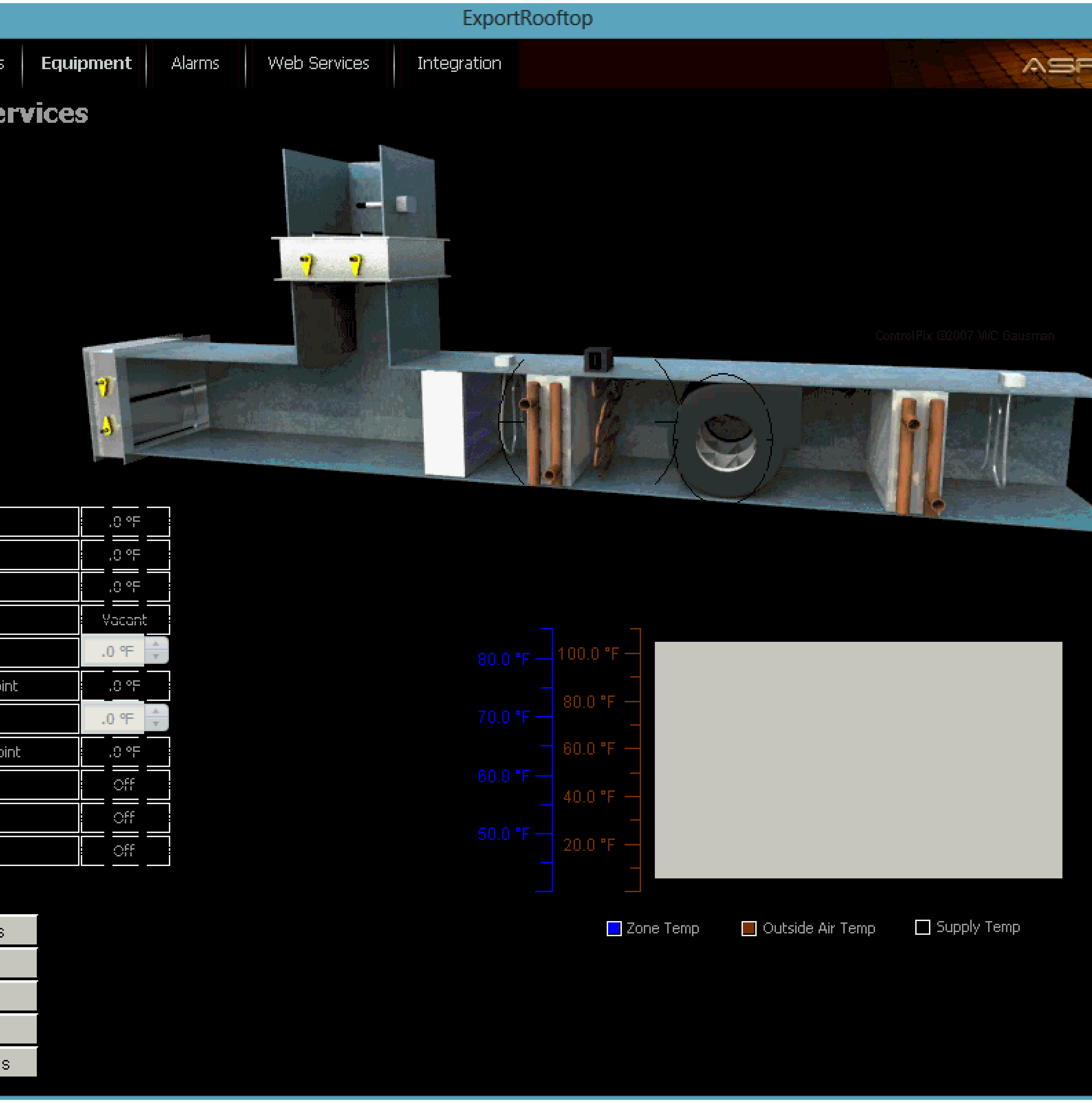
Test Frame

For creating and developing graphical user interface screens, the Test Frame feature is useful for launching a full frame view of the engineered graphic. Test Frame is typically launched from a specific graphic.

To launch Test Frame, select the Show Test Frame icon from the Standard Toolbar.



When launched, the frame will show the graphic as it has been developed. Similar to viewing the graphics through a standard web browser, the Test Frame feature permits users to navigate between Applications.



Pros

The following are Pros to using the Test Frame feature:

- Provides an easy way to test screen navigation locally on your computer.
- Easily allows graphical designers to identify layout issues prior to an official deployment.
- Allows users to manipulated simulated data within Aspect-Studio and see reactions on developed graphics.

Cons

The following are Cons to using the Test Frame feature:

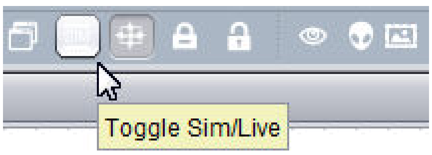
- Live data may sometimes be inconsistent as Aspect-Studio attempts to balance communications to all devices, plus provide all editing features simultaneously.

Global Simulation

The Global Simulation toggle button in Aspect-Studio is used to command the software environment to initiate live communications with a field-bus network, rather than rely on simulated data.

By default, Aspect-Studio is designed to operate in simulation mode. Many of the elements within Aspect (such as database elements, web service integration elements, trending, alarms, etc.) only operate in SIM mode.

To toggle to LIVE mode, click the SIM button. Once pressed, Aspect-Studio will commence network connections to defined devices and display real-time data.



Pros

The following are Pros to using the Global Simulation feature:

- Provides the ability to see live field-bus data directly within Aspect-Studio
- Can be used to debug data within Aspect-Studio.

Cons

The following are Cons to using the Global Simulation feature:

- It is resource intensive to your computer. Because Aspect-Studio is technically a Java class builder, the application can (sometimes) require generous amounts of memory and could lock-out Global Simulation from running successfully.

Local Aspect Server

Local Aspect Server is a PC-based version of the Aspect Runtime Engine. As the preferred method for testing projects and applications, the local version of the runtime engine is launched by selecting the appropriate shortcut from your Windows Start Menu.

The Local Server will act an a intermediate web-server, allowing you to deploy projects locally to your PC, and test them using any standard web browser, similar to if you were deploying to an actual Aspect target. This local server will provide you with the ability to test projects and graphical user interfaces that utilize the Java Applet, as well as the Automagic Web User Interface.

Deploying Projects to Local Aspect

To deploy a project to Local Aspect, perform the following:

1. Start Aspect Server from your Windows Start menu.
2. When launched, the local server will run in a shell window. DO NOT CLOSE THIS WINDOW. Closing this window will terminate the local server.
3. From Aspect-Studio, create a new target under the Targets node and name it Local Aspect. Set the Hostname to localhost.
4. Deploy your project. Once successfully deployed, you will be given an option to navigate to the project locally on your computer.

Pros

The following are Pros to using the Global Simulation feature:

- Provides a completely localized simulation environment for testing large applications outside of Aspect-Studio

- Requires less memory than the Global Simulation option and will not require top-heavy processor resources to fully test your applications with.
- Will perform any control logic, database functions, and other supervisory logic programmed with the appropriate configuration tweaks to your project.

Cons

The following are Cons to using the Global Simulation feature:

- Because it will perform all of the same functions as an actual target, careful planning should be taken into account prior to performing actual simulation tests to avoid issues with erroneous database writes, field device changes, etc.

Resource Management

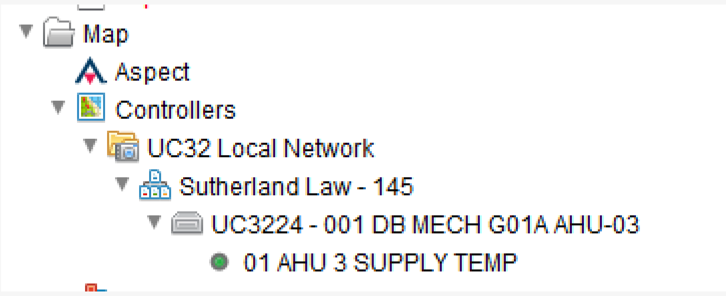
Resource Limits

ASPECT devices perform best if the number of **Points**, **Trend** tables and **Graphics** are kept below the following limits:

Platform	Total Points	Background Points	Alarmable points	Point Containers (controllers)	Trend Tables	Unique Graphics
ASPECT-Enterprise	100,000	40,000	10,000	2,000	2,000	500
NEXUS Series	10,000	4,000	1,000	500	1,000	200
MATRIX Series	2,500	1,000	250	100	200	100
Aspect Facility *	10,000	4,000	1,000	500	1,000	200
Aspect Matrix *	500	200	50	64	100	50

Legacy products – US market only.

Note: A **Background point** is any point in ASPECT that is **polled**, i.e. read from the network continually at it's configured slow/standard/fast poll rate - typically every 15 seconds.
ASPECT-Studio indicates which points are polled by a green "LED"-type symbol:



Several configuration options cause a point to be **polled**:

- alarmed in ASPECT,
- cached,
- spark-lined,
- pushed (as part of a push service) or
- trending set as enabled (or enabled locked)

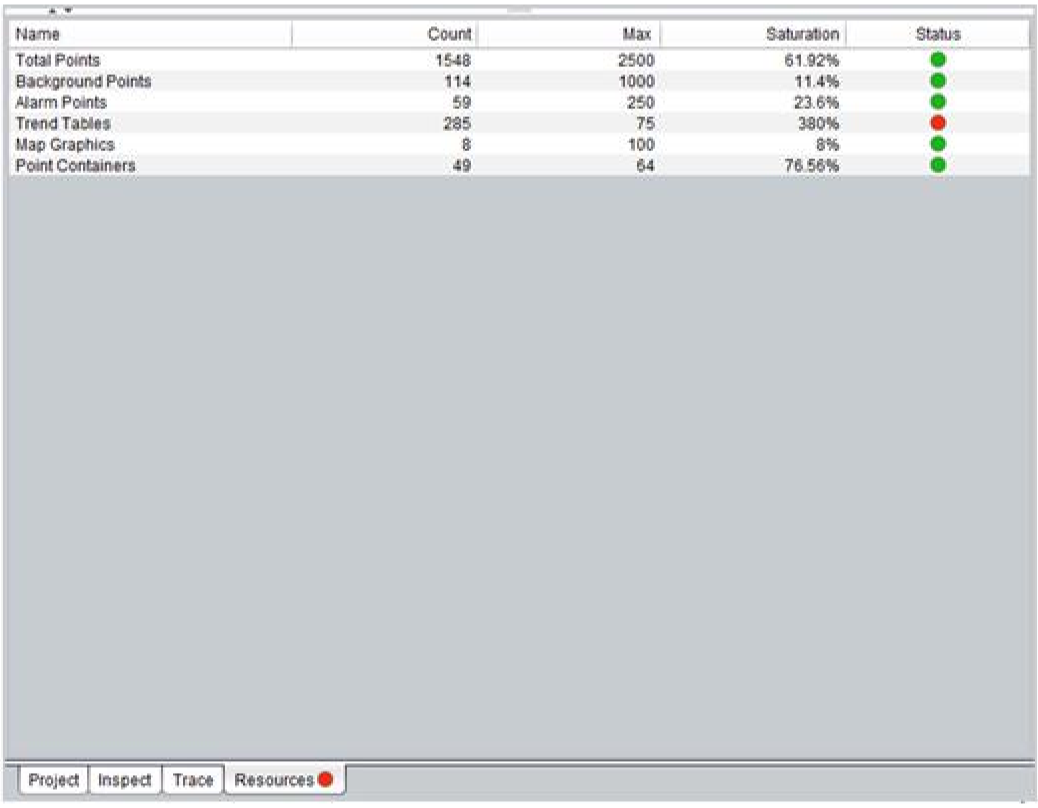
(See "Overview - the Load Estimator" on page 486 for more details).

ASPECT provides Resource Usage and Network Load indicators to allow you to identify the causes of excessive Resource Load on an **ASPECT Device**, and help you to keep your **Site** running smoothly. These are described in the following sections.

Troubleshooting Device Resource Usage

If the configuration of a **Project** exceeds the capabilities of the Target Aspect Device, a highlight will be shown in the Resources tab at the bottom of the Studio sidebar.

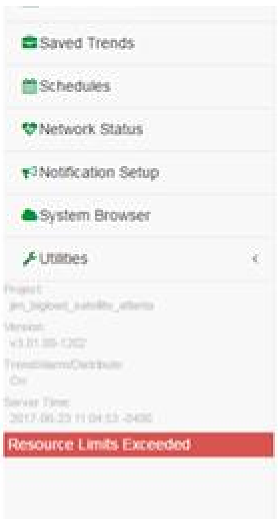
Clicking on this tab displays the Resource Usage Table for that **Target**, along with the "**Saturation**" level that those usages represent for the device type set for that **Target**:



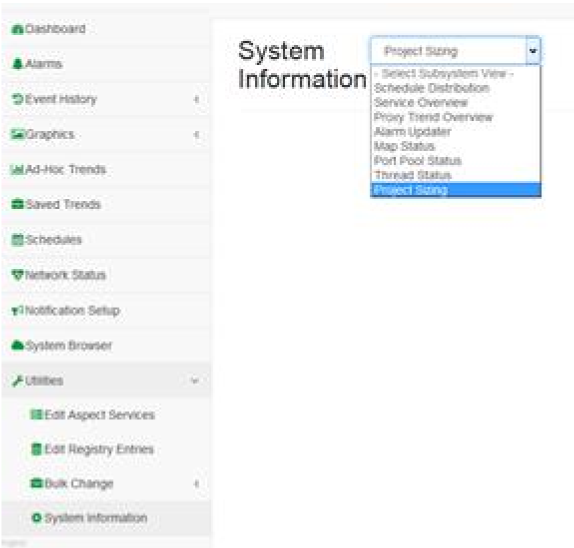
Name	Count	Max	Saturation	Status
Total Points	1548	2500	61.92%	
Background Points	114	1000	11.4%	
Alarm Points	59	250	23.6%	
Trend Tables	285	75	380%	
Map Graphics	8	100	8%	
Point Containers	49	64	76.56%	

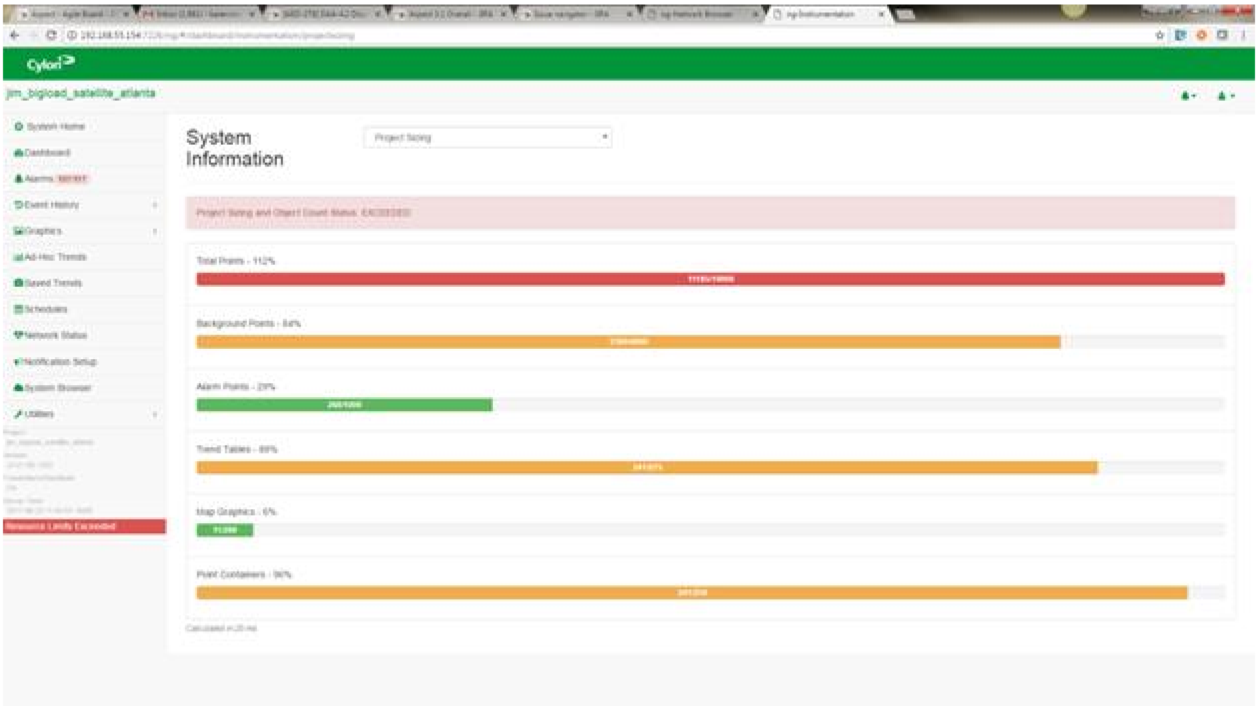
> **Note**: See "Flagged Red or Yellow: What To Do" on page 487 for details on how to address Network Load issues.

In the HTML5 UI of the **Target** Device, if resource limits are exceeded, this is indicated by a red warning notice in the sidebar:



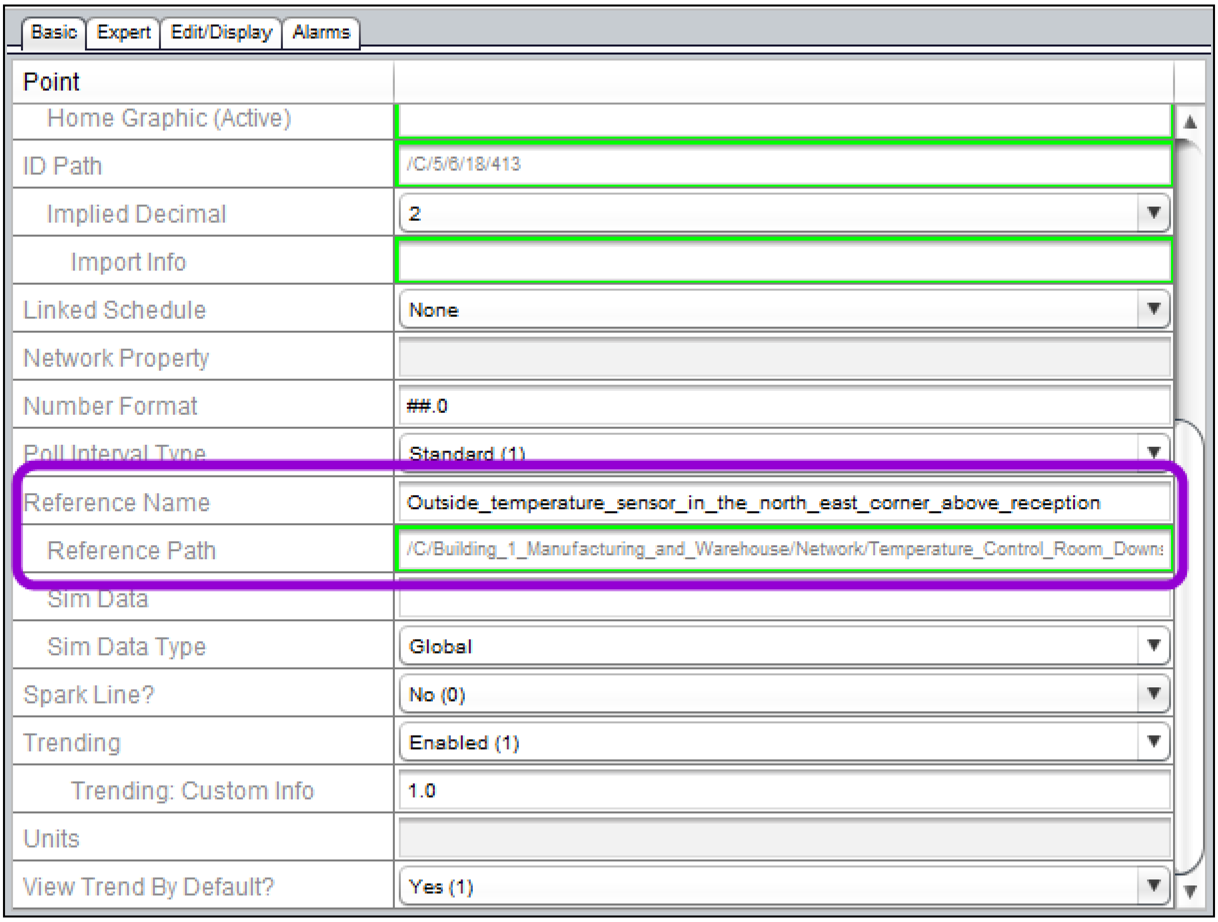
A representation of the Resource Table information is available in the HTML5 UI in Utilities > System Information>Project Sizing:





Reference Path/Name Too Long for Trend Table

Other issues shown in the `Resource Usage Table` relate to trend table names. Here is what the `Resource Usage Table` looks like with trend table name issues shown:



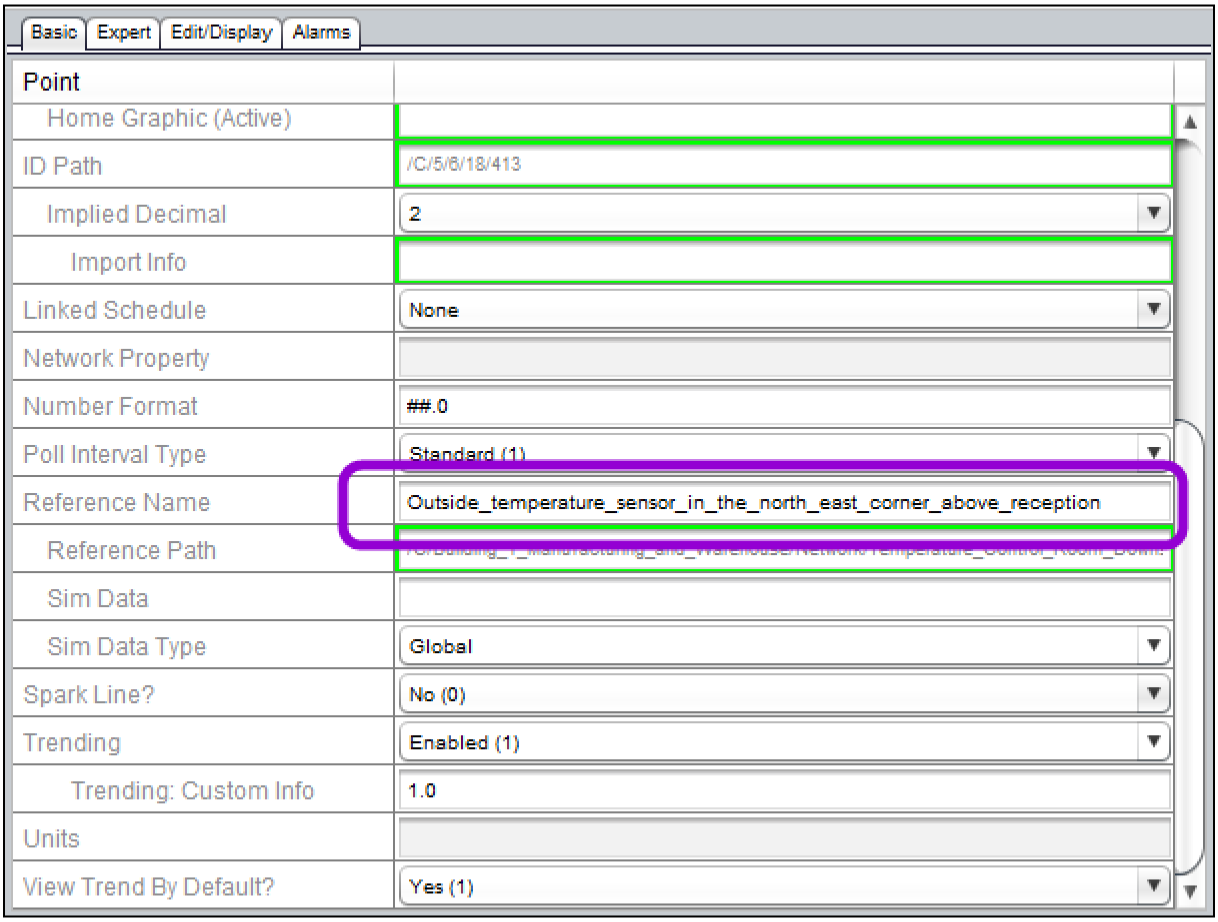
Trend tables are used to store the history of a point's value in a database. The name of the trend table is based on the Reference Path property of the device that contains the point(s) being polled (or 'trended'). The maximum table name length is 64 characters. Similarly, a point's Reference Name cannot be more than 64 characters. Items shown with red status here will **not** be trended successfully on the target.

In the example above, the points under the **device** shown will not be trended because its Reference Path is too long to create a trend table name with less than 64 characters. Also, the **point** "Outside temperature sensor..." has a Reference Name that is more than 64 characters so it will not be trended.

> **Note:** This issue only affects targets with a MySQL database (e.g. Nexus or Enterprise). MATRIX targets use SQLite database and do not have Reference Path or Reference Name limits.

Troubleshooting Reference Path/Name Too Long for Trend Table

To resolve trend table name errors shown in the Resource Usage Table, you can double-click on a row in the table. This will open the device or point in the Properties panel(above the Resource Usage Table). Shorten the Reference Name in the Basic tab as shown below:

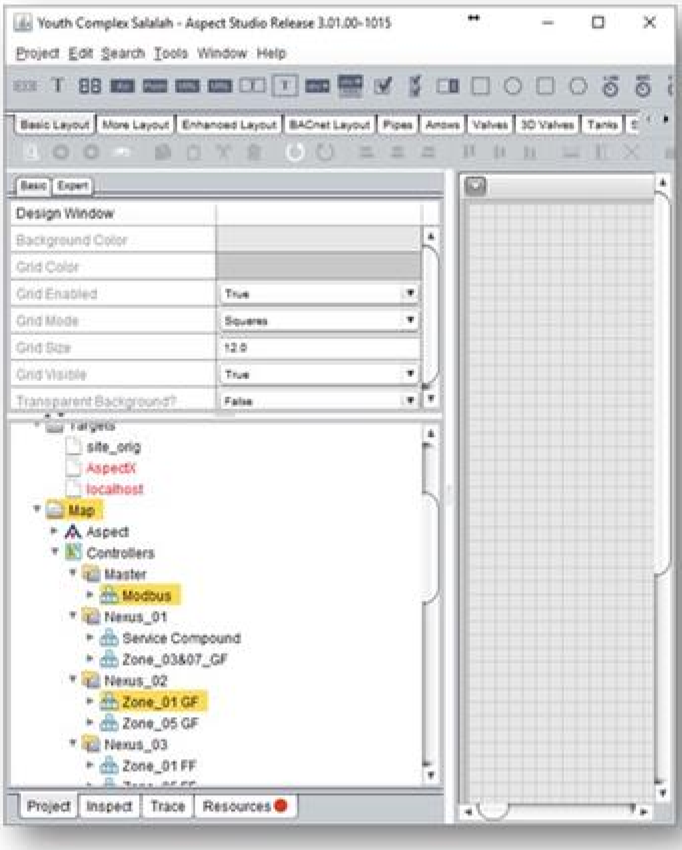


Once the Resource Name or Resource Path is sufficiently shortened, it will no longer appear as an issue in the Resource Usage Table and the points will be trended successfully in the database.

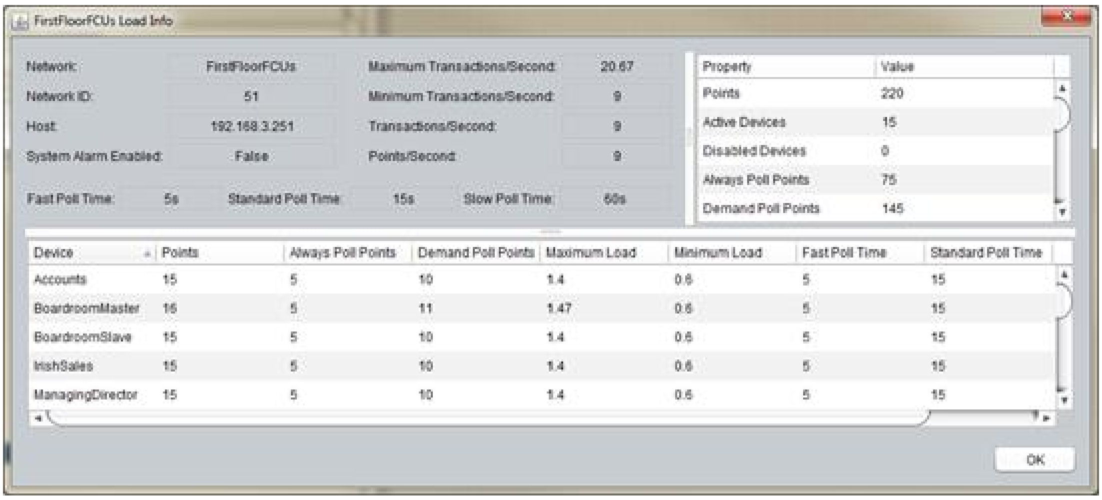
> **Note:** To shorten the Reference Path of a device, you can shorten either the Reference Name of the device or any of its parent items in the tree.

Troubleshooting Network Load

The Aspect **Map** indicates if a **Project** configuration is likely to lead to excessive Network Load, by highlighting in yellow any **Networks** at risk:



If you right-click on a highlighted network, a dialog will be displayed indicating why its Load is considered to be high:



In this example the **Transactions/Second**is calculated as 9, where the limit is 10 so that this Network is close to overload.

For further information about best practice for managing your network load, see Managing the Network Load

Overview - the Load Estimator

Extracting the most data from a network without negatively impacting the user experience can be a challenge. If at all possible, you should leave enough "wiggle room" to allow for on-demand and unexpected traffic as well as future expansion.

When deploying a mid- to large Aspect system it can be easy to exceed the available communication bandwidth available on the various field controller busses. To help help minimize the chance of accidentally exceeding the available bandwidth, Aspect® includes a Network Load Estimator component.

The Aspect® Network Load Estimator runs constantly in the background and will highlight in yellow or red any networks that exceed the recommended network saturation.

However:

1. The numbers calculated by the load estimator **are only estimates** and should not be used as absolutes. It is possible to create a system that passes the estimator but struggles in the real world due to events that are outside the estimator’s visibility (for example, multiple users triggering on-demand reads)
2. The estimator has no visibility into diagram logic **reads** and **writes** nor does it have visibility into 3rd party communications between devices outside of Aspect®. This type of traffic must be considered when evaluating your network load, and additional bandwidth must be reserved for it.

Real-world Considerations

In practice there are many factors that impact overall data transfer rate, so that changing the baud rate does not have a linear effect on the amount of data that can be transferred per second. In fact changing a baud rate from 38.4K to 76.8K can often have little effect on a BACnet network, due to the influence of token passing delays, packet overhead, and transceiver turnaround times as well as other factors.

It is recommended that for most **serial** networks running at 19.2K or higher you should not exceed 10 transactions per second.

- If your device or protocol does not support multiple reads in a single transaction, then this means you are limited to reading 10 point values per second.
- If your protocol supports multiple properties in a single transaction (BACnet does) and your controller supports it as well (many but not all do) then you can expect to read 100 points per seconds in those 10 transactions.

Loading a serial network beyond 10 transactions per second allows very little room for on-demand communications. This makes the system respond sluggishly for any points that are not automatically collected, and creates challenges for trend collection and other large data operations.

> **Note**: IP networks typically outperform serial by a factor of at least 10x; this is accounted for by the load estimator.

Flagged Red or Yellow: What To Do

If Aspect® has flagged a network in red or yellow, then you should reduce the network load on that network segment by changing the following, in order of priority:

1. If your protocol and device supports **RPM** (**Read Property Multiple**), then make sure you've set the RPM max so an appropriate value. For CBM/CBT line controllers, the best number to choose here is 10.
2. Make sure that values are not being **polled** where they only need to be **on demand**.

   > **Note**: Any Values that are being **Trended**, **Alarmed**, **Sparklined**, **Pushed**, or **Cached** are being **background polled** and consuming bandwidth on the network.

3. If you are still in the yellow/red then you must either remove points (less **Trending/Alarming**) or slow down the poll rates.
   1. Make sure that you haven't set a large percentage of points on "fast" poll, and move any inherently slow points to "slow" poll.
   2. Change the overall poll rates and multipliers to globally reduce the load

Distributed Architecture

Overview

The best way to create a reliable and scalable system is to distribute control functions as close as possible to the equipment being controlled. There are many benefits to a distributed architecture, including:

1. Resilience to equipment/network failure. A failure in one part of the system does not cause the entire system to fail or become unstable.

2. Ease of understanding. It is easy to conceptualize a system where each node is responsible for its own area.

3. Scalability. Hosting hundreds of thousands or millions of points requires significant resources. Distributing a system allows for inexpensive hosting of detail data while only requiring more expensive central hosting for important information.

In general it is good practice for large sites to distribute control while centralizing UI functions.

Aspect'sdistributed architecture *encourages* the distribution of graphics, **scheduling**, **trending**, and **alarming** functionality by providing these key features:

·**Satellite** export/import into central server (**Supervisor**) project

· Automagic (zero-labor) configuration of

o Links to remote graphic

o Access to remote **trends**

o Access to remote **schedules**

o Proxying of remote **alarms**

o Centralized collection of audit and event logs

Terminology

ASPECTAspect allows any target (MATRIX Series, NEXUS Series, ASPECT-Enterprise) to be a server of data, a client (consumer) of data, or both at the same time. This provides for a powerful and flexible system, it is sometimes easier to think of the *primary* roles of each target. With that in mind, we will use the following terminology when discussing a distributed ASPECT system

·**Satellite**: this is the ASPECT device – typically MATRIX Series but sometimes NEXUS Series – that is located closest to the controllers doing the actual work. Often called an *edge device* as satellites typically sit at the “edge" of a facility providing IP/Internet/central access to the controllers that are not IP enabled.

·**Central Server**: this is the ASPECTAspect device – typically an ASPECT-Enterprise (VM or physical) but sometimes a Nexus) that is the starting point for user interaction with the system and contains summary/overview graphics, centralized important historical data, and links to all detail information in the **satellites**.

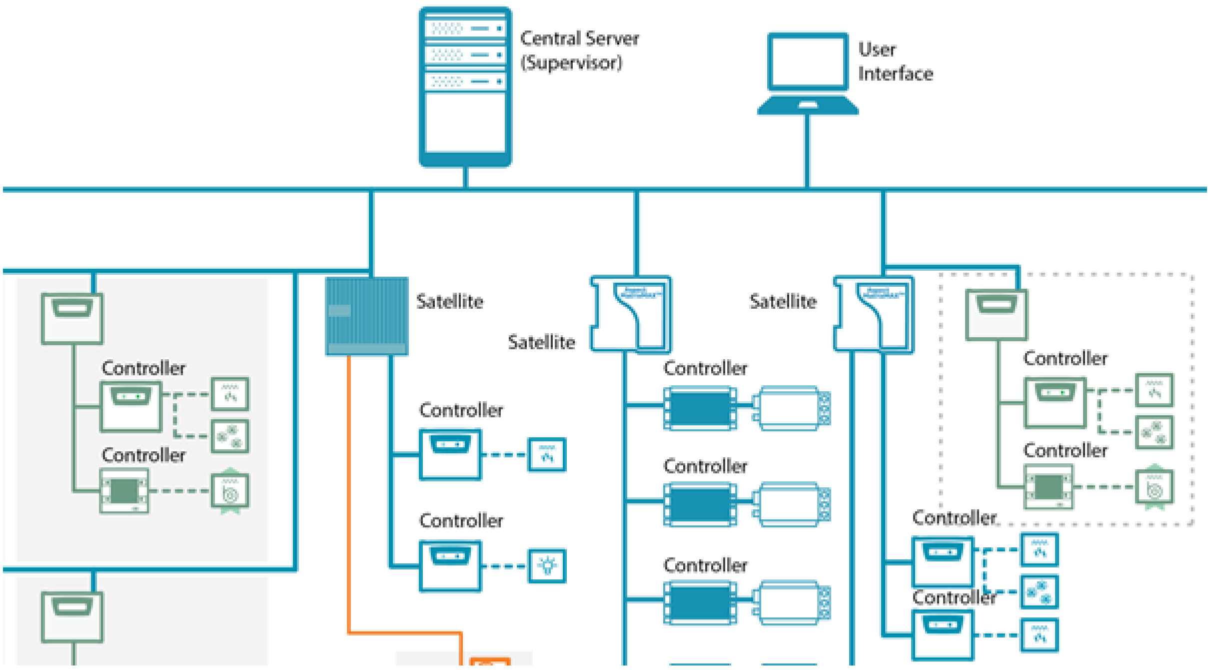
·**Remote**object: an object (**trend**, **schedule**, or **graphic**) that entirely resides in a **satellite** but is referenced in the **central server**.

·**Proxied**object: a local object (**alarm**, **trend** [future]) that has behavior that is synchronized with a companion object in a satellite.

·**Collection**: the act of a **server** collecting data from a **satellite**

·**Distribution**: the act of a **server** distributing (pushing) data to one or more objects that may be local or may be remote.

·**SiteID**: the string that uniquely identifies each site within a distributed system



When to Distribute

If the entirety of a system can be comfortably contained within an ASPECT target’s resource limits and you have highly reliable networking (e.g. they are all within a single building), the incremental benefits of distribution (which are nominal in such an application) are outweighed by the added complexity.

This means that for small and medium sized single building projects (<10K points) it is likely that you will **not** want to distribute the system, although for organizational convenience in some medium sized buildings under 10K points you may want to distribute on a floor or area basis.

If your system consists of multiple buildings or >10K points you should always choose to distribute.

In summary, you should choose to distribute for:

1. Scale (>10K points)

2. Geographic distribution (multiple physical networks over WAN/Internet)

3. Physical proximity needs (by floor or area) if desired.

But otherwise you should keep it simple and choose not to distribute the system.

Distribution Philosophy

Once you have decided to distribute control on your ASPECT system, you must then determine the distribution philosophy. ASPECT allows you a wide degree of freedom in choosing a distribution philosophy but the following is recommended best practice.

It can be summarized as:

Keep all detailed information in the satellites

keep essential and summary information in the central server.

In other words, identify the points that satisfy either or both of the following:

1. They require immediate access for a responsive user experience

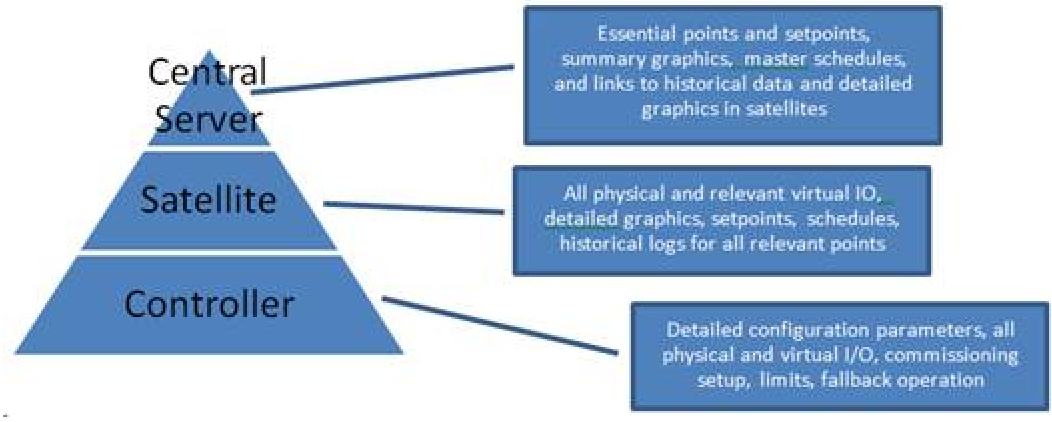
2. They provide easy links to detailed information

These are typically space and process temperatures and pressures, energy usage, lighting and occupancy status, and control modes.

ASPECT's built-in **SatelliteExport/Import** feature uses the "**display class**" to determine which points are important enough to be directly represented in the **Central Server** (by default, those that are configured as "essential"). This is described in the following section.

Satellite Export/Import

When creating a distributed system, it is best to start from the most detailed part of the system and work up through each layer of the distributed hierarchy.



Satelliteproject workflow:

1. (If applicable) export the appropriate subsets of your **site in** Engineering Center to `.json` files for import into your ASPECT **satellites**.

2. Create a new project for each **satellite** and import the above file to provide a starting point for your **map** configuration.

3. Modify the **point** configuration as desired to add **alarming**, edit-as information, permissioning, **trending**, etc.

4. Add detailed graphics (or link the pre-made stock graphics) to make home graphics as appropriate.

5. Set up your ASPECT target for this **satellite** and optionally deploy

6. Perform a "**satellite export**" for this **satellite**

7. Repeat the above steps for each **satellite**

Central server project workflow:

1. Create a new project

2. Import each of the exported `.json` files created in the above steps

3. Add summary graphics, using "remote graphic" as a click action for any **satellite** points that have a home graphic associated with them

4. Deploy

SSL/TLS Configuration

ASPECT SSL Overview

Many **Web Browsers** give a warning message when a website is delivered by insecure **HTTP**protocol. If you would like to avoid users experiencing such warnings, ASPECT can be configured to deliver its **HTML5** UI over a secure **HTTPS** connection.

This section explains **HTTPS** and Certification, shows how to enable **HTTPS** in ASPECT and to install a Certificate, and also provides advice about purchasing a 'trusted' Certificate.

Definitions

SSL refers to "**Secure Socket Layer**" and its successor Transport Layer Security (TLS) which provides a means of encrypting data transmitted between systems.

HTTPS (**HTTP** over Transport Layer **S**ecurity) provides a mechanism for ensuring both *privacy* and *authenticity* of communication with a remote server via the use of cryptographically signed certificates.

HTTPS certificates rely on a system of trust – certificates are issued by "Certificate Authorities" that are trusted. Certificate Authorities issue certificates for servers that can demonstrate their validity and identity.

Once a certificate has been issued by a Certificate Authority, it is installed on the server and presented to the **HTTPS** client when establishing the secure connection. If the certificate is expired, revoked, or does not match the stated information contained in the certificate, web browsers will typically display a warning indicating that the connection is not known to be secure.

For further information see "Managing SSL Certificates" below

Managing SSL Certificates

> **Note**: The default ASPECT settings (`Services` > `Security Subsystem` > `SSL Mode` = "`0`") will accept all certs regardless of identity, CA-signing or expiry. Unless this setting is changed, **SSL** should work for ASPECT outward communications without the need for any other configuration such as accepting or adding certs to the local keystore.

What are SSL Certificates?

SSL Certs are identification files that facilitate SSL/TLS communication (such as **HTTPS**) between two devices . A “**client**” device that wants to securely communicate with another (“**server**”) device needs to download that server’s **SSL** cert, accept it and then add it to its own certificate store or “**keystore**”. Once this is complete, all communications between the devices will be encrypted.

With ASPECT’s default configuration, these steps will all happen automatically.

Self-signed vs CA-signed certs

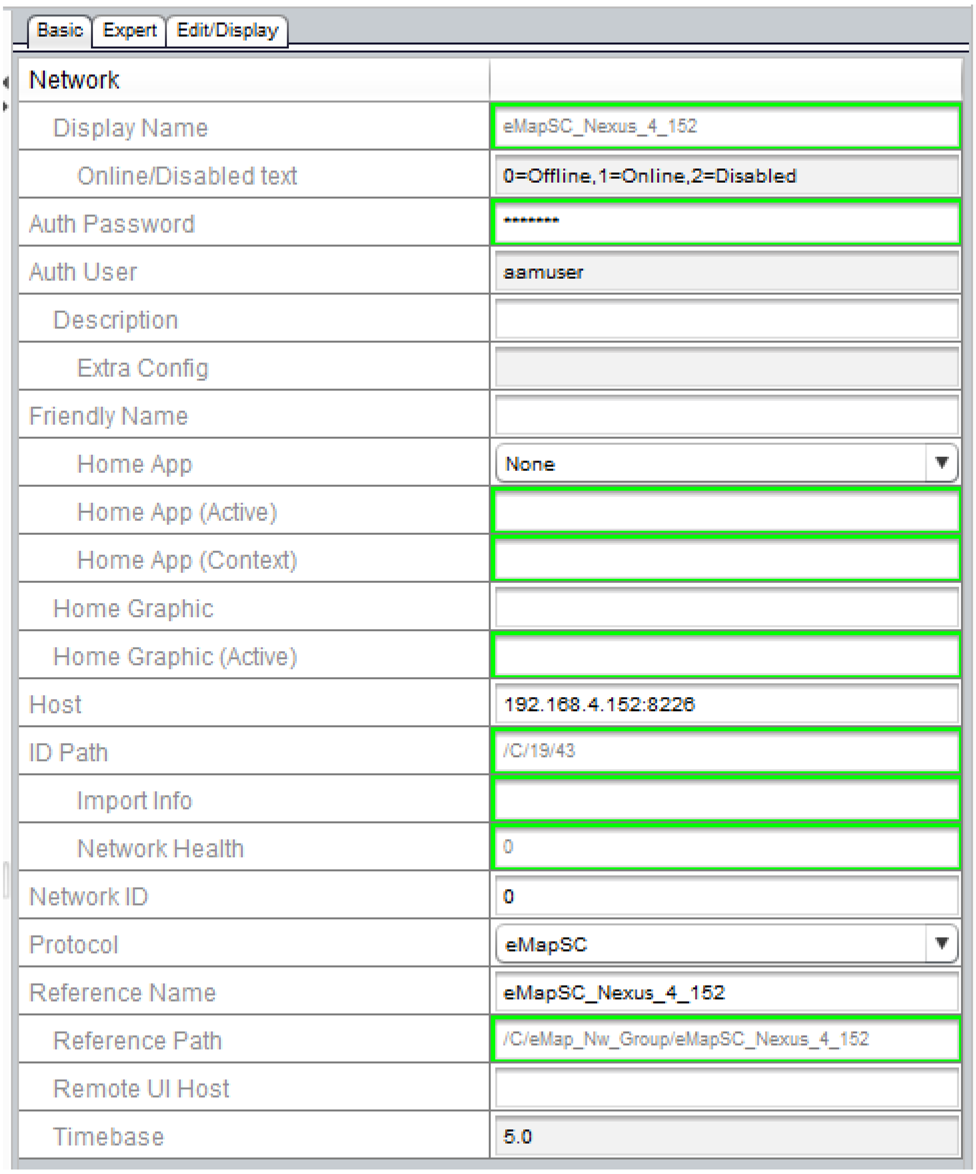
- “**CA-signed**“ or “**publicly signed**” SSL Certificates must be purchased from a trusted provider called a **Certification Authority** (**CA**). These certs are essential if you are hosting a public website, so that users of your website can verify your identity. However, in ASPECT networks, you are the owner of both ends (**client** and **server**) of the communication so you don’t need a third party to verify your own identity.
- “**Self-signed**” certs are certificates that you can generate yourself. Self-signed certs are recommended for ASPECT/eMap purposes.

CA-signed certs should work in ASPECT, but they are not recommended because they often expire after 1-2 years. Also, many ASPECT device **URL**s are based on IP addresses (e.g. “`192.168.1.99`“), not domain names (“e.g. `matrix.mycompany.com`“) and **CA**s don’t commonly issue certificates for IP addresses.

How to Configure SSL for ASPECT Services

Using ASPECT’s default configuration (**SSL** mode), pre-existing certs on the server will be accepted and installed on the client automatically.

If you require ASPECT features to work over **SSL**, see "IP Port Administration and Single Port Access" on page 501 (specifically “Affected Features and Applications“). For example, eMap can be configured to work over **SSL/HTTP** by selecting “`eMapSC`” as the Network Protocol. For eMapSC, the Host can be configured to use port `8226` (as in the example below) or `/aspect1` if using single port access where all comms go through port `443` (e.g. `Host`=“`192.168.4.152/aspect1`” for the example below). See "What is eMap?" on page 535 for more information about setting up eMapSC.



In order for the above example to operate when deployed, the client (the ASPECT device to which the project is deployed) must have a successful “trust-relationship” with the server (192.168.4.152 in the above example). The “SSL Mode” (configured on the client in Services > Security Subsystem) will determine the nature of the trust relationship. See the next section.

SSL Modes

The **SSL** mode of the client can be configured in ASPECT-Studio > Services > Security Subsystem. The client in eMap is sometimes called the “supervisor” i.e. the Aspect device that wants to read/write eMap data to/from the server which is called the “**satellite**“. In a standard setup, a client (supervisor) may want to perform eMap comms with multiple servers (satellites). Depending on the SSL mode, the client may need certs for each individual server it wants to talk to. Here are the SSL Modes and the configuration requirements of each:

0 ("Accept all certs (no host/IP checking - use SSL for encryption only)")

This is the default SSL mode. In this case, any cert that is presented by the server is accepted and eMap SC comms should work. This is a lot more secure than HTTP comms because it's encrypted, however there is no guarantee that the server is authentic. A MIM (Man in the middle) attack could mean a third party is pretending to be the server, however this highly unlikely risk is generally considered acceptable for our purposes.

1 ("Auto-accept and install certs if host/IP matches")

In this case, the cert is automatically accepted if the hostname (e.g. if the target is set up with a working domain name like matrix1.cylon.com) or IP address in the cert match the host being accessed. When auto-accept happens, the cert (public key) is downloaded and added to the client's local keystore for ongoing use. If the cert is replaced on the server, it will automatically update on the client.

2 ("Accept certs if host/IP matches (installed by user)“)

This has exactly the same restriction as mode (1) but instead of the cert being automatically accepted, the user must use the facilities in the WebUI page "Client SSL Configuration“ to manually accept the cert and add it to the local keystore. If the cert changes on the server, SSL comms will stop working and the user will need to manually update and accept the cert in the WebIU. This is less automated and therefore more likely to cause problems, however it is slightly more secure in that the user manually checks the certs.

Modes (1) and (2) above will work with both **self-signed** and **CA-signed** certs. In most cases, **CA-signed** certs will work automatically (without the cert needing to be added to the local keystore) because they are authenticated against a "**Root CA Cert**" that the server already knows about (i.e. a cert used to sign the cert is already in the keystore/cacerts).

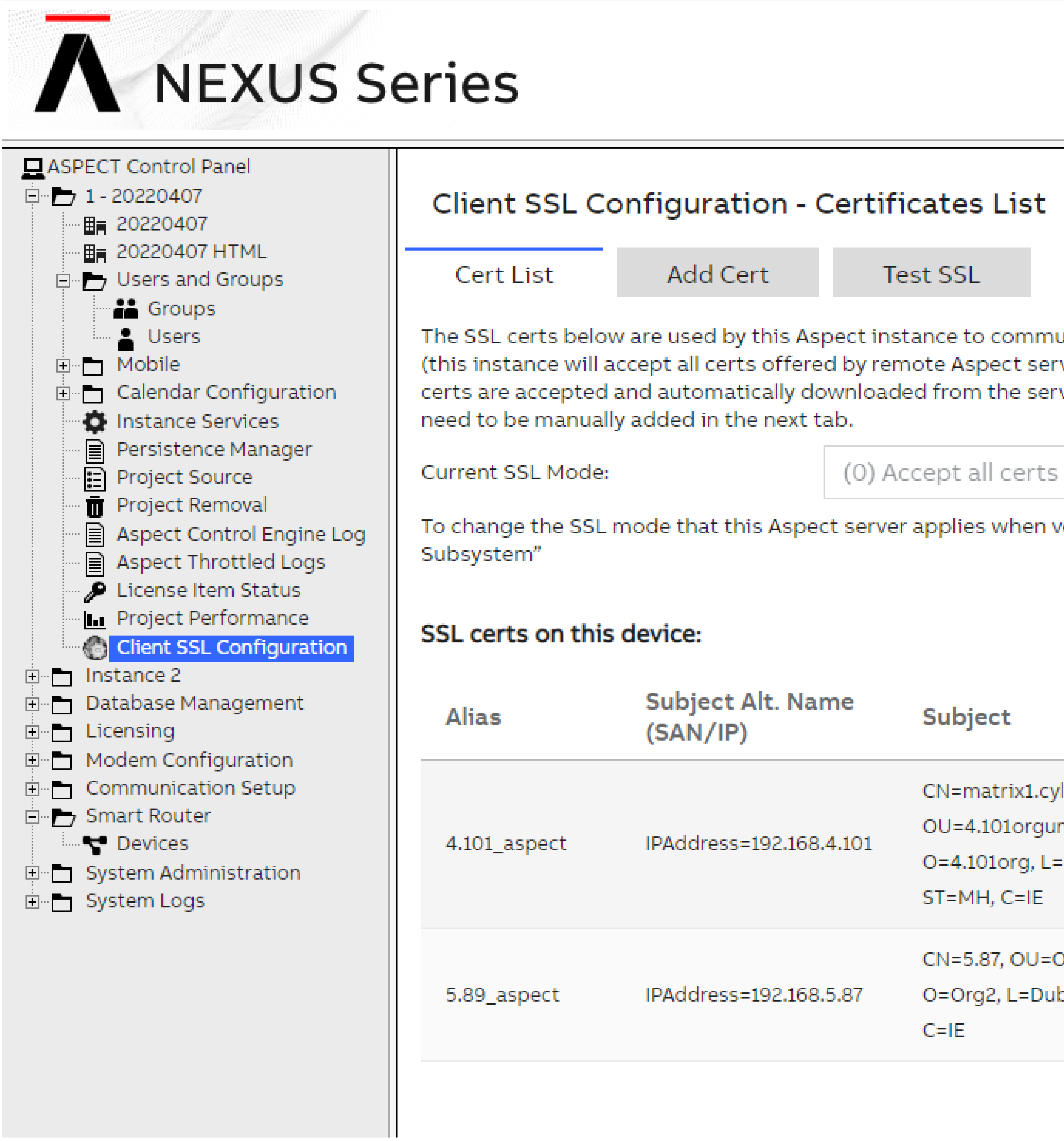
Web UI - "Client SSL Configuration" (Nexus/Enterprise only)

If required, the user can configure and test **SSL** on the client using the Client SSL Configuration page in the WebUI. This will be necessary if the SSL mode is set to (2).

The Client SSL Configuration page includes 3 tabs:

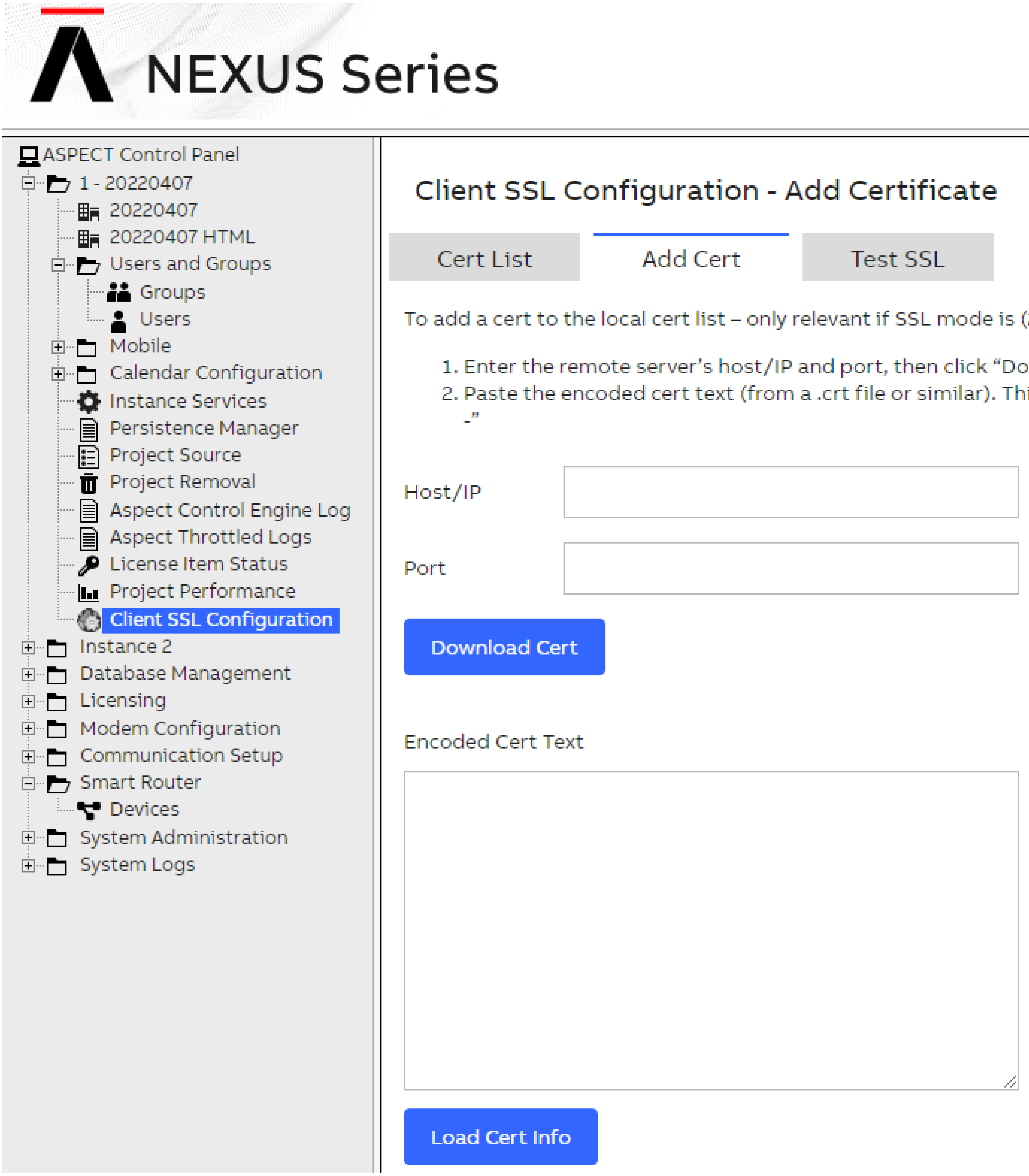
Cert List - This page shows all of the certs included in the local keystore. There should be one cert for each server this client wants to talk to.

These are only relevant if the SSL Mode is (1) or (2). There is a delete option to remove old, expired or unwanted certs.



Add Cert - This page is only relevant if SSL Mode is (2). In this case, the user can manually accept and add certs to the local keystore. There are 2 ways of doing this:

1. retrieve the cert from a given host/port, examine it and accept.
2. paste the encoded cert string (e.g. from a '.crt' file) into a text area, examine the cert content (parsed automatically from the string) and accept.



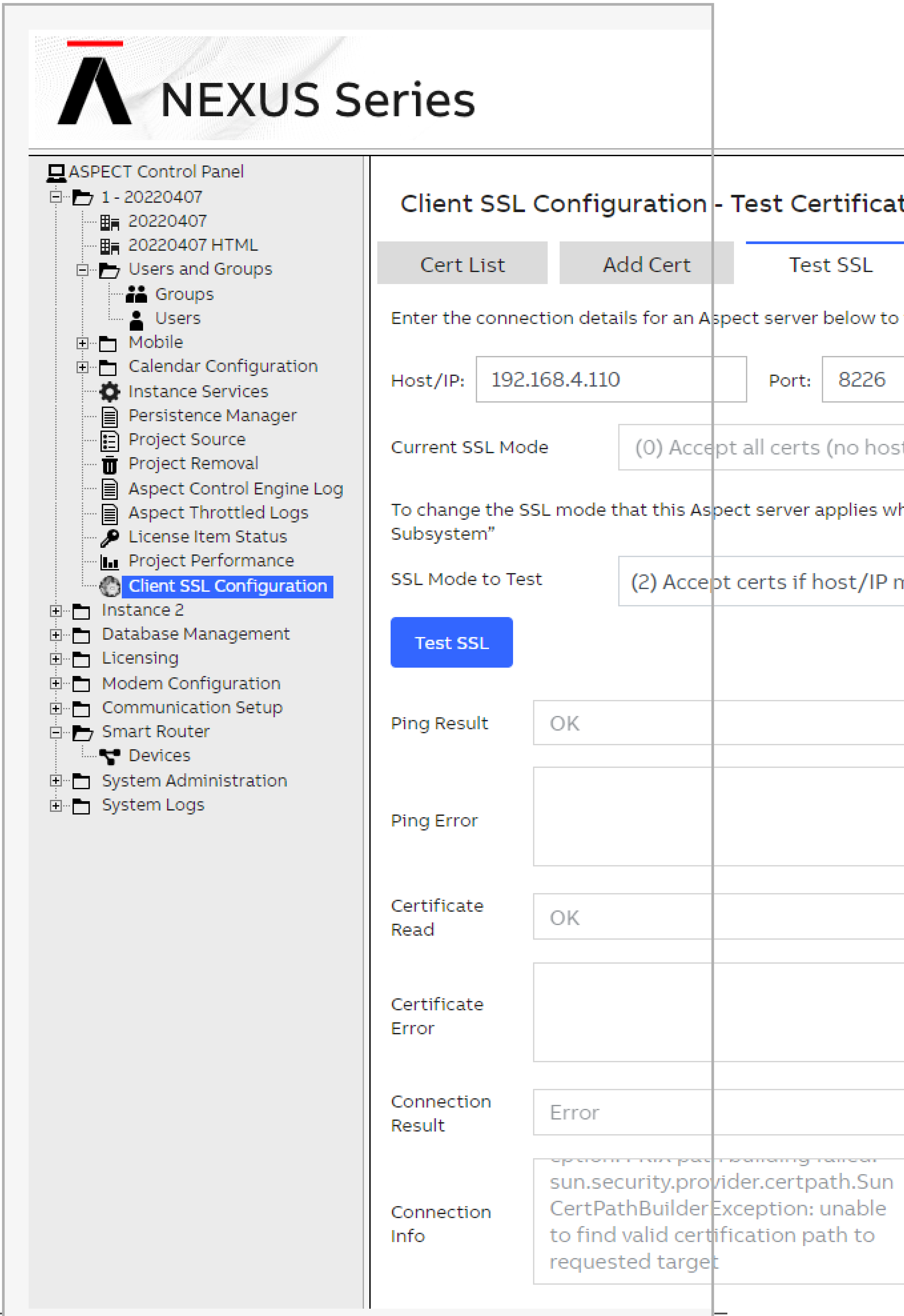
Test SSL - This is a very useful utility which can be used to test SSL/TLS comms in any SSL mode. The SSL mode configured on the client (Security Subsystem) can be overridden to see if/how other modes might work. There are 3 types of test done with the results of each given separately:

1. a socket test which is like a ping for the host/port
2. a cert test which just downloads the cert presented by the server and shows the details
3. an SSL comms test which attempts to talk to the server in the current mode with the cert presented.

If this works, **SSL** comms would be expected to work for that host/port.

> **Tip**: If you set the mode of the tester to (1), this is another way to add certs to the local keystore because in this mode, the cert is automatically downloaded and added to the keystore.
> In the example below, the connection test (3) has failed because the SSL Mode for the test is "2" and the cert for the host 192.168.4.110 has not yet been added to our local keystore. This could be resolved by repeating the test with SSL Mode="1" or by

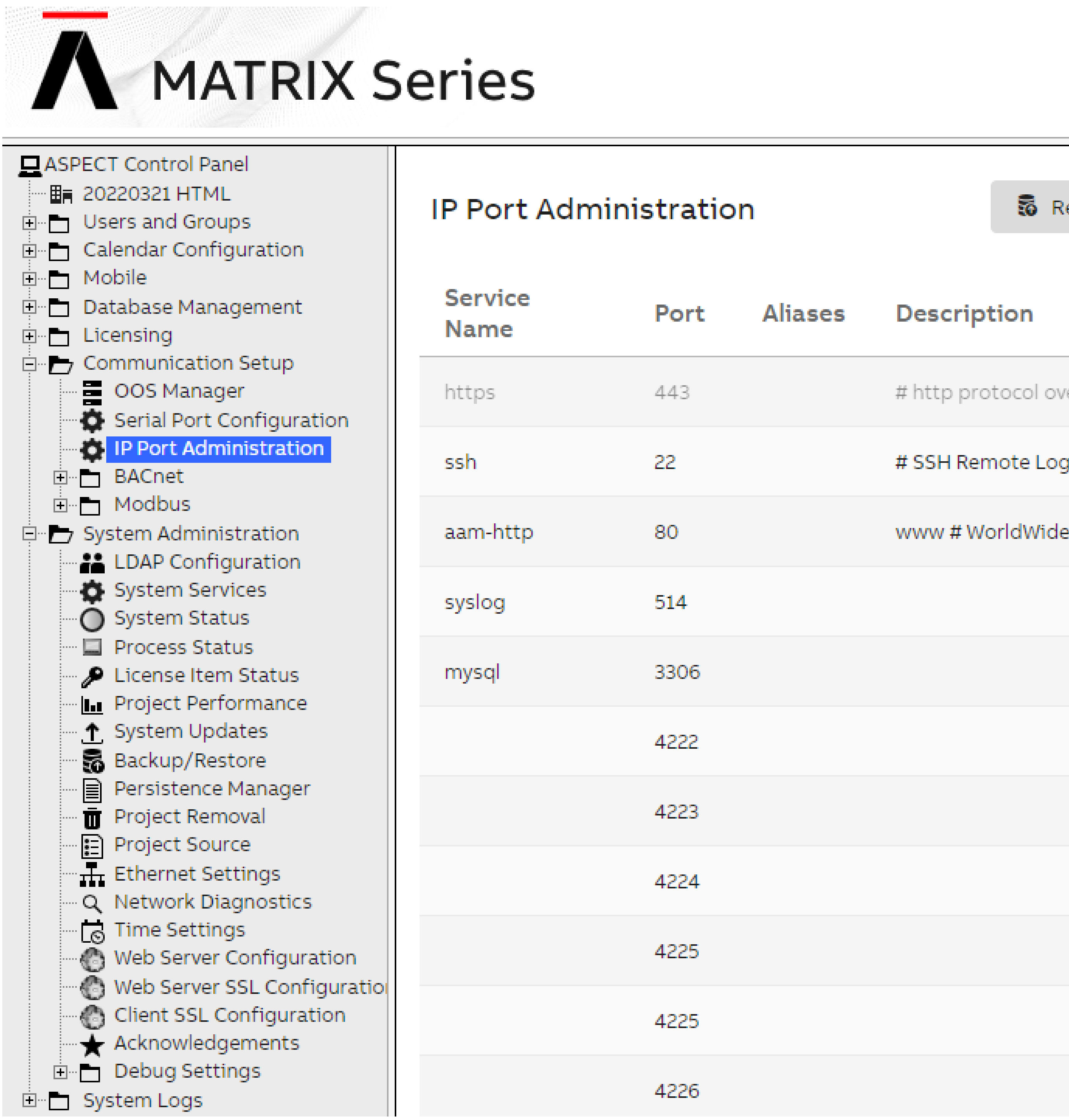
using the `Add Cert` tab.


NEXUS Series
ASPECT Control Panel
1 - 20220407
20220407
20220407 HTML
Users and Groups
Groups
Users
Mobile
Calendar Configuration
Instance Services
Persistence Manager
Project Source
Project Removal
Aspect Control Engine Log
Aspect Throttled Logs
License Item Status
Project Performance
Client SSL Configuration
Instance 2
Database Management
Licensing
Modem Configuration
Communication Setup
Smart Router
Devices
System Administration
System Logs
Client SSL Configuration - Test Certificat
Cert List
Add Cert
Test SSL
Enter the connection details for an Aspect server below to
Host/IP:
192.168.4.110
Port:
8226
Current SSL Mode
(0) Accept all certs (no host
To change the SSL mode that this Aspect server applies wh
Subsystem"
SSL Mode to Test
(2) Accept certs if host/IP m
Test SSL
Ping Result
OK
Ping Error
Certificate Read
OK
Certificate Error
Connection Result
Error
Connection Info
sun.security.provider.certpath.Sun
CertPathBuilderException: unable
to find valid certification path to
requested target

IP Port Administration and Single Port Access

Port Access Administration

Like all IP devices, ASPECT targets use external ports that allow connection to specific applications and services on the target. If you want to increase the security of your ASPECT device, you can close these ports from the WebUI. Use the following WebUI page under Communication Setup > Post Access Administration to toggle ports between Opened and Closed.



How to Open/Close Ports

To open/close ports, use the toggle buttons on the right (blue=**open**, grey=**closed**). Once you have made the changes you require, click the Save button to apply those changes. The Open All and Close All buttons can be used to apply bulk open/close operations. Restore default will reset open/closed states of all ports to factory default settings as indicated in the Default Status column.

> **Note**: Port **443** cannot be closed because it is required to access the WebUI and to manage port access, in addition to ngAdmin.

Single-Port Access (Port Forwarding)

It is possible to “lock down” your ASPECT device to a single port (443). The easiest way to achieve this is to use the Close All button on the IP Port Administration page. In addition, URLs that currently access your ASPECT target through ports 7226, 7227, 8226 or 8227 will need to be updated to instead use /aspect1 or /aspect2 as follows:

Affected Features and Applications

- **ngAdmin URLs** - The end user interface for ASPECT devices, ngAdmin, was previously accessed via port 7226 for instance 1 and 7227 if you have a second instance. This could also be securely access over HTTPS with ports 8226 and 8227. Although these URLs will still work if those ports are open, if you are closing those ports, the URLs will change to include /aspect1 for instance 1 (or /aspect2 to access instance 2). For example, the URL http://aspectNexus.myCompany.com:7226/ng/ will change to http://aspectNexus.myCompany.com/aspect1/. To access ngAdmin securely over **SSL**, change the protocol part to https://. If your ASPECT target includes a self-signed **SSL** certificate (as most do by default), your browser may show a warning when accessing your ASPECT device for the first time over **HTTPS** - this can be manually accepted to proceed to the site. See the "Managing SSL Certificates" on page 492 for more information.
- **Project Deployment** - For the moment, deployment of projects from ASPECT-Studio will work the same way, typically through ports 7226 for instance 1 deployment or 7227 if you have a second instance to which to deploy. These ports need to be temporarily opened on the target device during deployment.

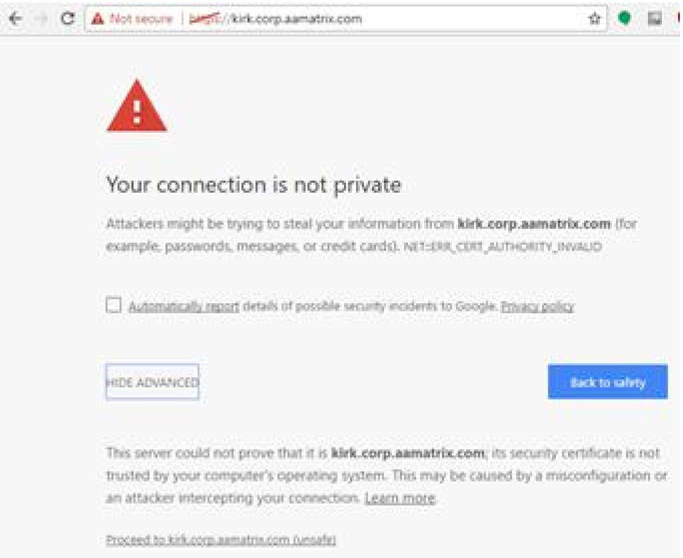
- eMap - If you use eMap to gather data from “**Satellite**” ASPECT devices into a central “**Supervisor**”, and you want to close ports on the **Satellites**, you may need to configure the `Host` property for your **Supervisor**’s eMap Networks. For example, if port `7226` is closed, the `Host` parameter may change from something like `192.168.1.100:7226` to `192.168.1.100/aspect1`. You also have the option of accessing eMap securely by selecting `emapsc` as the Network’s Protocol. See "What is eMap?" on page 535 for more details.
- **Graphic Links** - If your graphics include links to other ASPECT targets, the **URL**s for these links will need to be modified if you are closing ports (for example, the “`Xfer URL`” property of a “`H5 Link`” in a **graphic** may need to be modified from specifying a port like `7226` to instead use the `/aspect1` path).

Configuring Aspect SSL

Initial Connection

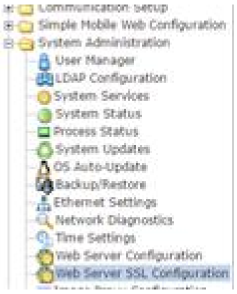
At boot time, if no SSL certificate is present, Aspect will create a fairly generic self-signed certificate to allow for secure connections to the Aspect Web UI for administration purposes.

Web UI access is done via the network standard https://port (TCP/443). Because a self-signed certificate is installed, the browser will display a privacy warning. It will be necessary to press the “**Advanced**" button and click the “`proceed`" link displayed.



Aspect SSL Management

Aspect SSL is performed using the **Web Server SSL Configuration** menu item located in the **System Administration** folder.



This panel contains three areas:

Manage Port	Assign the default https:// port (tcp/443) to either the Administrative Web UI, or Aspect instance 1.
Create Self-Signed Cert	Replace the default generic self-signed certificate with a self-signed certificate that contains more personalized data
Import Existing Cert	Used to import an externally Signed or Self-Signed certificate in PEM (text) format.

SSL Port Listing

The following ports are **SSL enabled in**Aspect3.01.00 and above

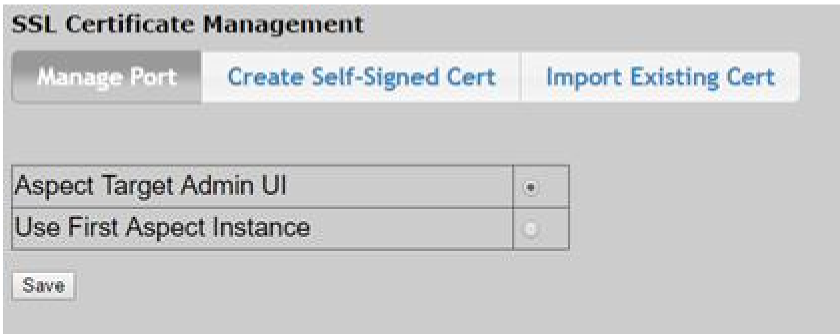
443	Admin Web UI OR Aspect First Instance (controlled by Manage Port tab)
8226	Each base Aspect instance port number + 1000 (e.g. 7226 +1000)
31144	PHPMyAdmin on Facility/Nexus/Enterprise
14443	Alternate SSL port for Admin Web UI, usable when 443 is assigned to instance 1

Manage Port

The Manage Port section simply toggles where the default https port “points". The most common reason for changing this would be the client desires a secure connection to Aspect by default and would prefer to not have a port specified in the URL.

Example:

By default, the Aspect**HTML5 UI**is located at http://192.168.1.250:7226/ng/ and the SSL-enabled version is https://192.168.1.250:8226/ng/. Enabling the “ **Use First Aspect Instance**" option will allow the use of https://192.168.1.250/ng/ (note the lack of a port designation) for a simplified URL.



Installing an SSL Certificate

An SSL certificate may be created (self-signed) or bought (trusted).

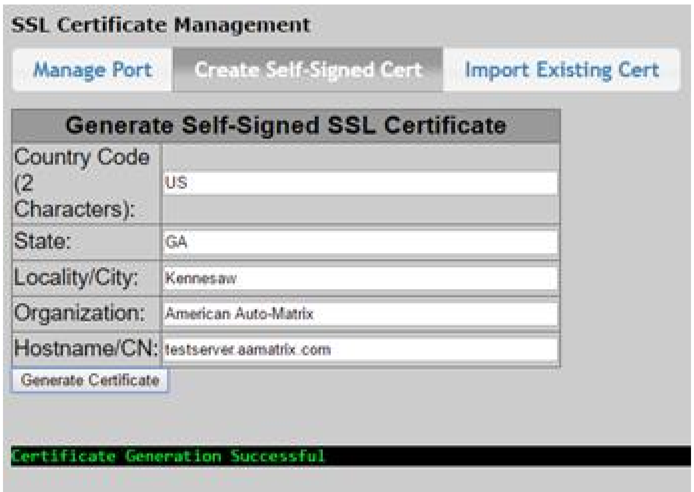
Creating a Self-Signed Certificate

If you do not have or do not want to use a trusted certificate file, click the Create Self-Signed Cert tab in the **SSL Certificate Management** screen. This allows for the creation of a custom self-signed certificate with personalized information, such as server name, location and organization name. This information is visible when examining the certificate.

Note: This will not eliminate the browser privacy warning.

It is important to fill out the fields as prescribed or the certificate generation may fail.

Click the Generate Certificate button to create and the Certificate file and install it in the system.



Once the certificate is generated, it will be used at the next system restart.

Using an Existing Cert

It is also possible to import an existing certificate + private key in PEM format. This will typically require 3 files using during the creation and issuing of the SSL certificate. The most common use of this will be to install a Signed SSL certificate from a certificate vendor.

1. The Private Key - private.key
2. The Primary Certificate - your_domain_name.crt
3. The Intermediate Certificate – ca_intermediate_cert.crt

Open a text editor and paste the entire body of each of the following items into one text file in the following order, making sure to include the beginning and end tags on each certificate. The result should look like this:

-----BEGIN RSA PRIVATE KEY-----

(*Your Private Key: private.key*)

-----END RSA PRIVATE KEY-----

-----BEGIN CERTIFICATE-----

(*Your Primary SSL certificate: your_domain_name.cr*t)

-----END CERTIFICATE-----

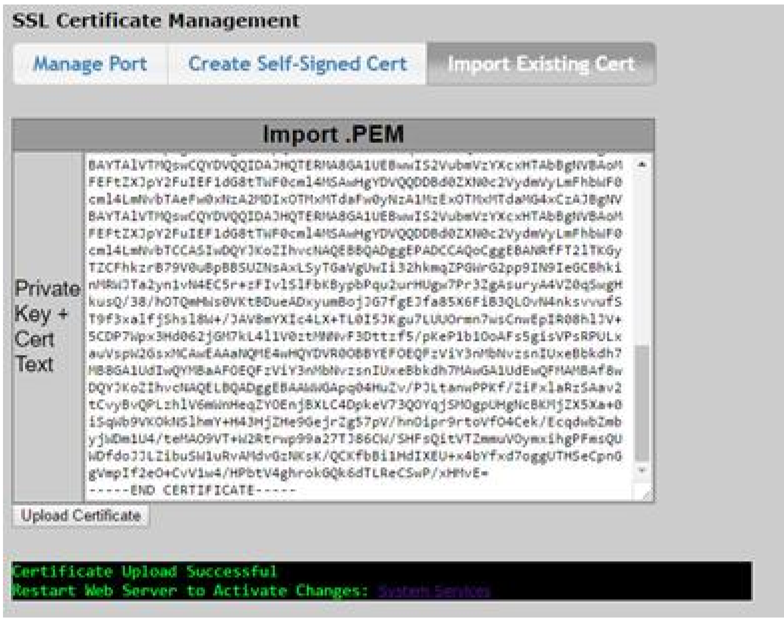
-----BEGIN CERTIFICATE-----

*(*Your Intermediate certificate: ca_intermediate_cert.crt)

-----END CERTIFICATE-----

Add a blank line to the end of the file.

Save the combined file as your_domain_name.pem. Copy the entire contents of this file and paste it into the Import .PEM textbox and then click the Upload Certificate tab in the SSL Certificate Management screen.



Advanced Topic – Obtaining and installing a Signed SSL certificate

There are a number of prerequisites that must be met in order to use a Signed SSL certificate. Once these are fulfilled, there are additional technical operations that must be performed to obtain the signed certificate.

The exact sequence of operations and tools may vary from SSL vendor to vendor, but they are at least generally compatible and can be performed with the same tools.

Most commonly used is OpenSSL. OpenSSL is a set of command line tools for performing many common cryptographic operations. Obtain the most recent version of OpenSSL for your platform at https://wiki.openssl.org/index.php/Binaries and install it.

There is no graphical user interface – it is very important to type the commands precisely as directed in the either this guide or the documentation provided by the certificate vendor.

Choosing a Certificate Vendor

The selection of an SSL vendor is not important for Aspect, as long as the certificates issued by the vendor are trusted by all browsers and Operating Systems without the installation of additional root-level CAs.

- Vendors may be chosen for a number of reasons, any of which are valid:
- Organizational purchasing requirements dictate use of specific vendor

- Existing Security or Hosting services with vendor provide a single portal/payment
- Solely on certificate price

As ASPECT servers are not designed to act as part of an **eCommerce** platform, it is acceptable to purchase a less expensive, lower verification level certificate as long as there are no outside (customer) conditions that dictate otherwise. These will often be referred to as **DV** (**Domain Verification**), **Personal**, or**Small Business**certificates.

Certificate Purchase

For illustration purposes, the low-cost Comodo**SSL Certificate** reseller NameCheap.comThis is neither a requirement to use, nor or an endorsement of is used below. NameCheap.com

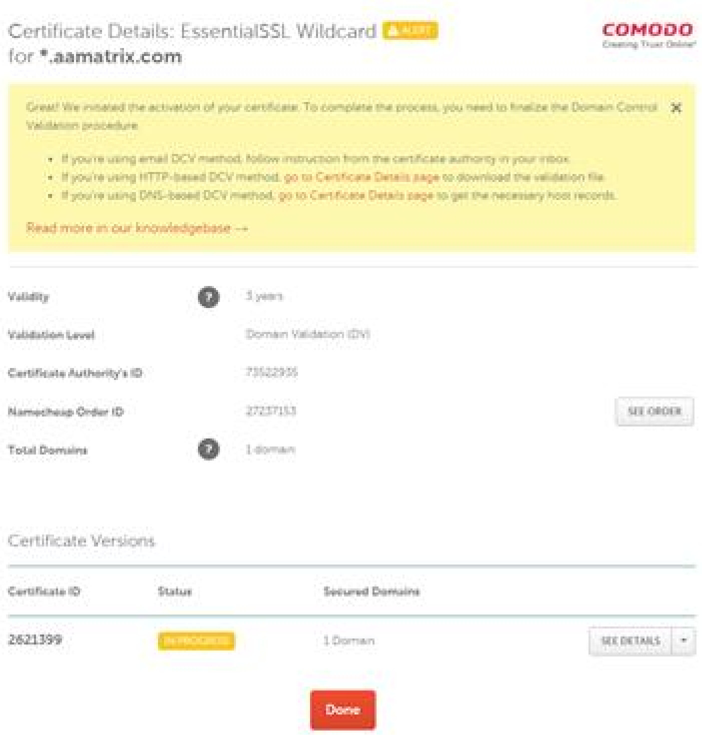
· The purchase of the SSL certificate and the activation are distinctly different phases. To purchase the certificate, simply select the certificate and the number of years, add to cart and click the Buy Nowbutton. Enter payment information and complete the transaction.

It is suggested that you purchase a certificate for the maximum allowable period to avoid having to annually renew the certificate.

· The “PositiveSSL" product is perfectly adequate for small numbers of deployed Aspect systems in a single domain (aspect.customer.com)

· If many systems are being deployed under the same DNS domain, the “EssentialSSL Wildcard" product may make more sense – it allows unlimited hosts within the same domain level (matrix1.customer.com,matrix2.customer.com,nexus27.customer.com, andenterprise.customer.com)

When purchase transaction is completed, the system will display the user profile page showing the certificate process in *In Progress*



Before proceeding, it will be necessary to generate a **Certificate Signing Request to upload.**

Generating a Private Key and a Certificate Signing Request

Open a command prompt and use the OpenSSL command line to build a new *private key* file and issue a *certificate signing request*. The *private key* is used to cryptographically sign the *certificate signing request*. Only the *certificate signing request* is sent to the SSL vendor, never the private key.

Treat the private key as privileged information and keep a copy of it in a safe location.

Execute the following command line:

openssl req -new -newkey rsa:2048 -nodes -keyout AspectServer.key -out AspectServer.csr

After the private key is automatically generated and saved, OpenSSL will ask a series of questions to create the Certificate signing request. These require the same inputs as outlined in the Create Self-Signed Certificate section

```
λ openssl req -new -newkey rsa:2048 -nodes -keyout AspectServer.key -out AspectServer.csr
Generating a 2048 bit RSA private key
..................................................+++
..+++
writing new private key to 'AspectServer.key'
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:US
State or Province Name (full name) [Some-State]:Georgia
Locality Name (eg, city) []:Kennesaw
Organization Name (eg, company) [Internet Widgits Pty Ltd]:American Auto-Matrix
Organizational Unit Name (eg, section) []:Engineering
Common Name (e.g. server FQDN or YOUR name) []:aspectserver.aamatrix.com
Email Address []:

Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:
An optional company name []:
```

Two files will be created – AspectServer.key and AspectServer.csr. Open them in a text editor and verify that the private key contents are wrapped with

-----BEGIN PRIVATE KEY-----

-----END PRIVATE KEY-----

And the certificate signing request contents are wrapped with

-----BEGIN CERTIFICATE REQUEST-----

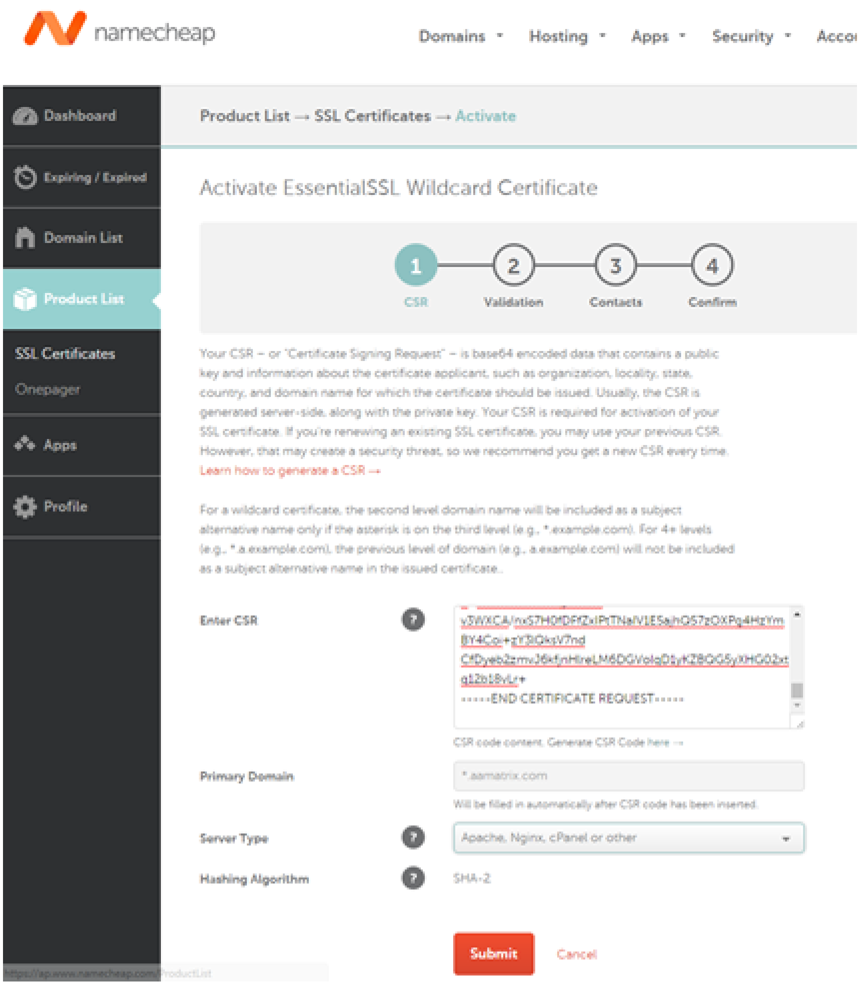
-----END CERTIFICATE REQUEST-----

The bodies of each of the message are encoded in plaintext, but are not readable. This is normal, as they are Base64 encoded.

Certificate Activation

Step 1 - CSR

Click the combo box arrow beside **See Details**to begin the wizard.



Open the CSR file generated in the previous section in a text editor. Copy the entire contents of the file, including the BEGIN/ENDheaders and paste it into theEnter CSR text area. The hostname should automatically appear in the field labelled **Primary Domain**.

SelectApache,NginxcPanel**or**otheras the**Server Type** and click **Submit**

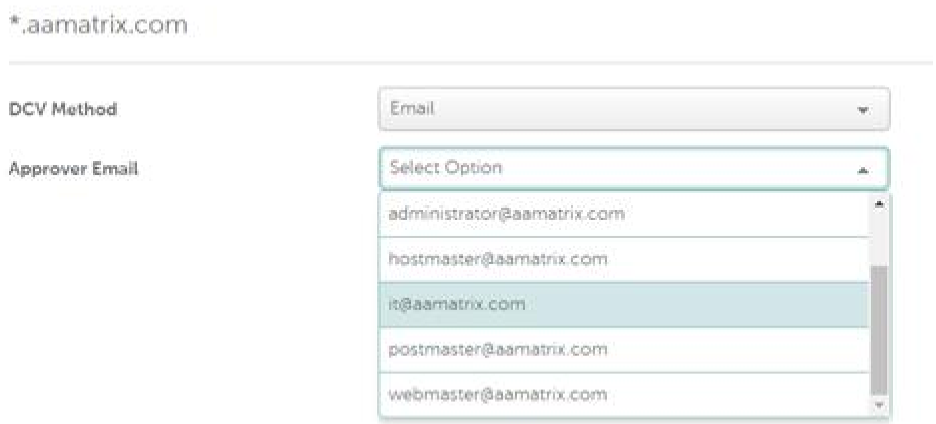
Step 2 – Validation

Email validation is the simplest validation to perform if access to one of the required email address boxes is available. Other options available but not described here are **HTTP and DNS** validation that will require certain special content be made available via either the primary domain's **HTTP** or **DNS**servers.

Select Email in the **DCV Method**field.

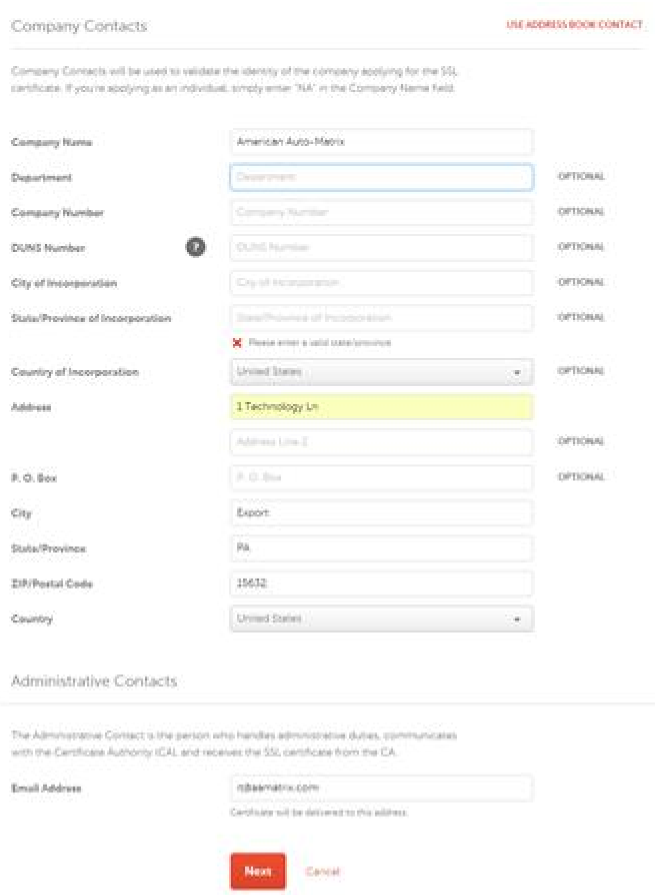
Select an available **Approver Email** address.

Click the Nextbutton to proceed to Step 3.



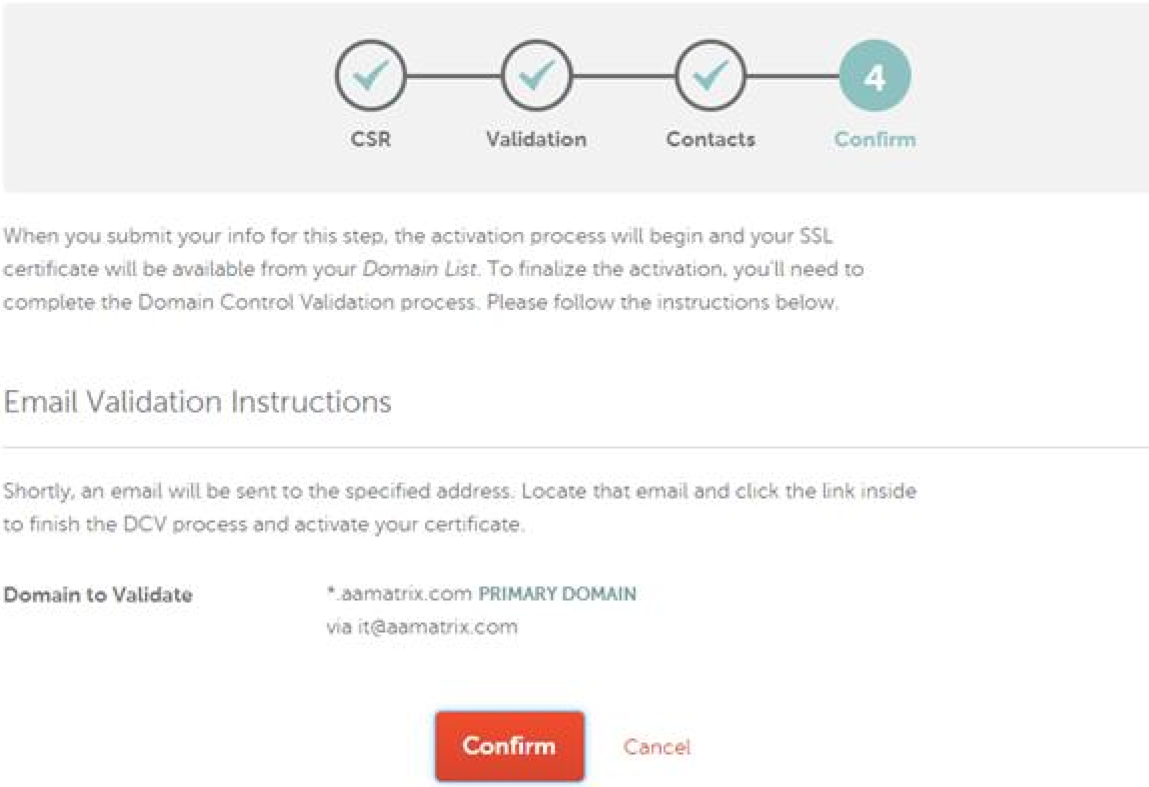
Step 3 – Contacts

Complete all required fields and any desired optional fields in the **Contacts** dialog and click **Next**



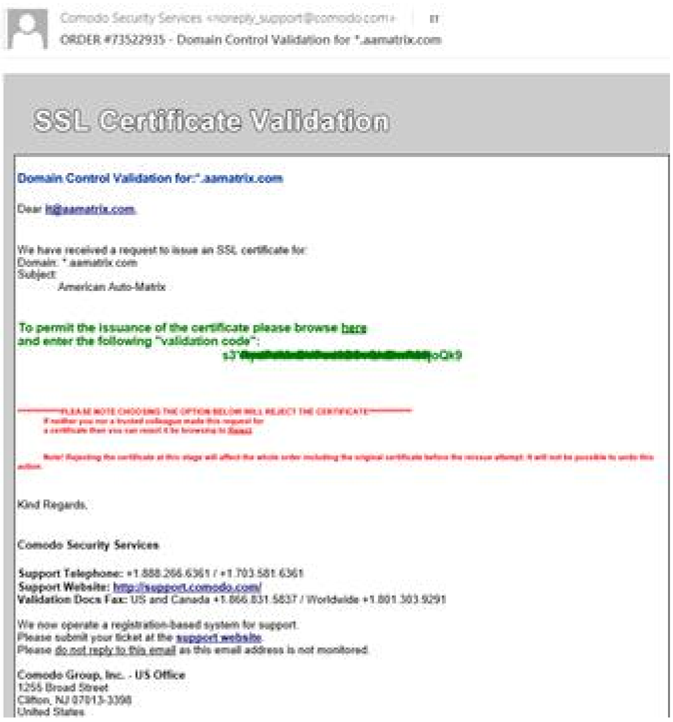
Step 4- Confirm

The Confirm step gives one last chance to go back to a previous step in the wizard and make changes. If all entered information is correct, click the `Confirm` button to finalize the process and generate the verification email.

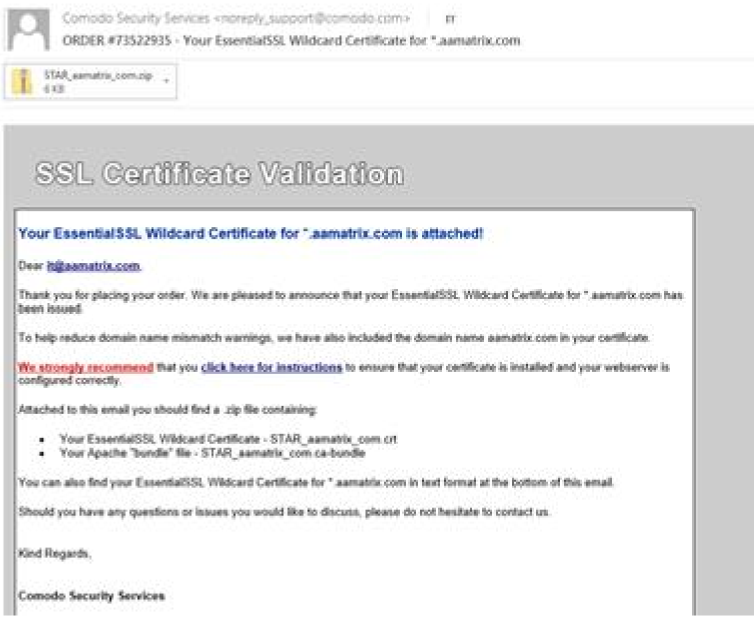


Email Verification and Certificate Delivery

If the Email DCV method was selected, an email should arrive within a few minutes that provides a verification link and validation code. Click the link and enter the code when prompted.



Shortly after the verification code is submitted, a second email should appear containing a confirmation of your order and an attached .ZIPfile with the domain and intermediate certificates



Save and extract this .ZIP file to a convenient location.

PEM file creation

To assemble the PEM file, a text editor, the contents of the certificate .ZIPfile and the private key file created earlier will be required.

Open each of the following in a new text editor window:

· Private Key (default name AspectServer.key)

·.CA-BUNDLEfile from ZIP

·.CRTfile from ZIP

Prepare to assemble the contents of each of the files as shown in the Import Existing Cert section.

1. Create a new empty text file. Name it Aspect.PEM and save it. Open in text editor.
2. Select the Private key window, select all (CTRL+a), copy (CTRL+c)
3. Select the Aspect.PEM window and paste (CTRL+v) the private key.
4. Select the .CRT file window, select all (CTRL+a), copy (CTRL+c)
5. Select the Aspect.PEM window, move to the end of the file and paste the .CRT file data (CTRL+v)
6. Select the .CA-BUNDLE window, select all (CTRL+a), copy (CTRL+c)
7. Select the Aspect.PEM window, move to the end of the file and paste the .CA-BUNDLE file data (CTRL+v)
8. Move the end of the Aspect.PEM file and enter a blank line.
9. Save the Aspect.PEM file

The contents of the PEM file are now ready to be pasted into the Import Existing Cert tab and activated on the Aspect server.

TLS Support in ASPECT

Is TLS v1.3 supported by ASPECT?

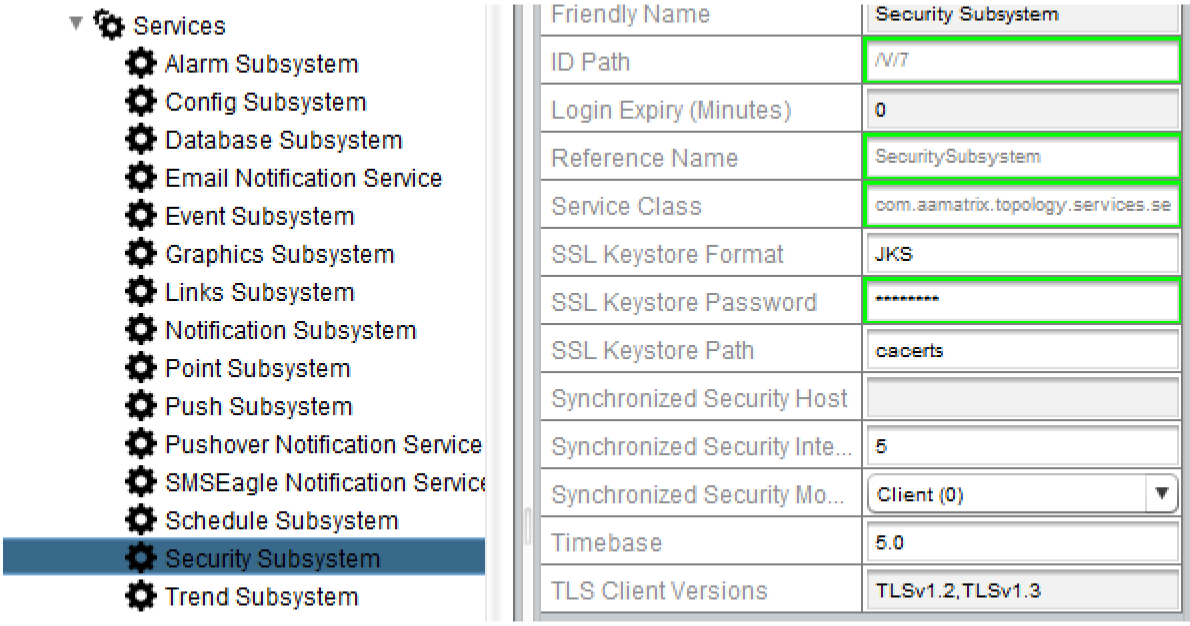
TLS v1.2 is the current industry standard. **TLS** v1.3 is a more secure version that is gradually being adopted. Newer NEXUS Series and ASPECT-Enterprise targets will include support for **TLS** v1.3 as standard. Some older NEXUS Series and ASPECT-Enterprise targets will need a software upgrade (.aam file) to support **TLS** v1.3. MATRIX Series devices do not currently support **TLS** v1.3. To check the **TLS** versions supported on your ASPECT target, open the WebUI page Aspect Control Engine Log and search for “TLS”.

You will see a list of the versions “supported” and also the versions “configured” in the Security Subsystem.

How to Disable/Enable Specific TLS Versions

You can set the **TLS** versions enabled using the “Client TLS Versions” property in Services > Security Subsystem > Expert tab.

This change can be made to your project in ASPECT-Studio (before deployment) or in the “System Browser” page in ngAdmin (after deployment).



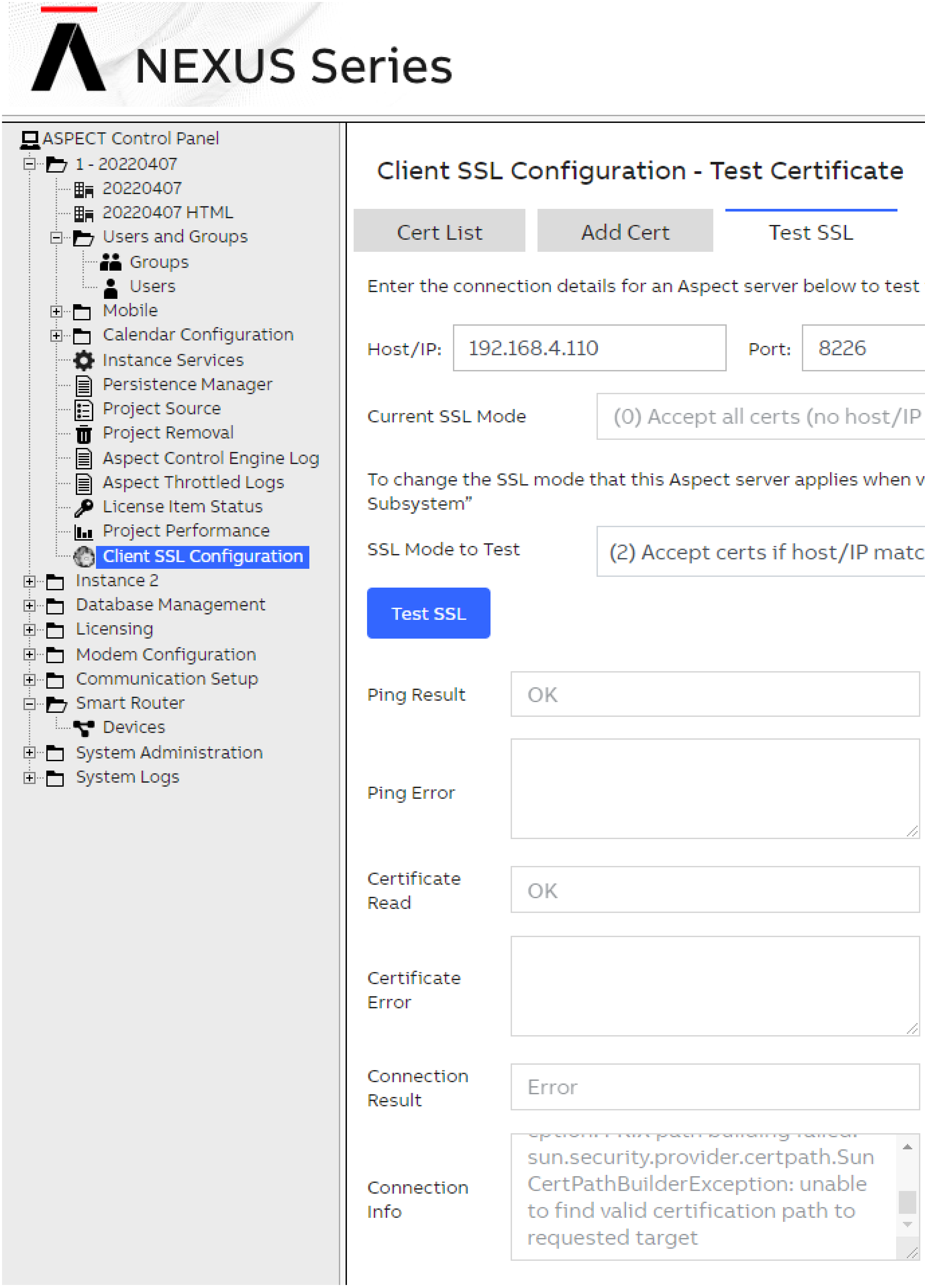
The default for this property is TLSv1.2,TLSv1.3. If the target doesn’t support **TLS** v1.3, only **TLS** v1.2 will be enabled in this case. Older versions like SSLv2Hello, SSLv3, TLSv1 and TLSv1.1 should only be added to this property if required for communicating with an older server.

How to Test SSL/TLS communication from ASPECT to a specific server

TLS connectivity can be tested in the WebUI using the Client SSL Configuration page.

- Click on the Test SSL tab,
- Enter the host/IP and Port of the server to test,
- Click Test SSL.

If the Connection Result shows “Error", the Connection Info text area may show an error message related to "TLS Versions" or "Handshake exception".


NEXUS Series
ASPECT Control Panel
1 - 20220407
20220407
20220407 HTML
Users and Groups
Groups
Users
Mobile
Calendar Configuration
Instance Services
Persistence Manager
Project Source
Project Removal
Aspect Control Engine Log
Aspect Throttled Logs
License Item Status
Project Performance
Client SSL Configuration
Instance 2
Database Management
Licensing
Modem Configuration
Communication Setup
Smart Router
Devices
System Administration
System Logs
Client SSL Configuration - Test Certificate
Cert List
Add Cert
Test SSL
Enter the connection details for an Aspect server below to test
Host/IP:
192.168.4.110
Port:
8226
Current SSL Mode
(0) Accept all certs (no host/IP
To change the SSL mode that this Aspect server applies when v
Subsystem"
SSL Mode to Test
(2) Accept certs if host/IP matc
Test SSL
Ping Result
OK
Ping Error
Certificate Read
OK
Certificate Error
Connection Result
Error
Connection Info
sun.security.provider.certpath.Sun
CertPathBuilderException: unable
to find valid certification path to
requested target

If you want to find out what **TLS** versions any remote server supports, there are online tools available for this, e.g. https://geek-flare.com/tools/tests/y9o4h4f4v

Authenticating Using LDAP/ Active Directory

Overview

With **LDAP,users and groups are not managed on the** Aspect target(s). Instead they are defined on an **Active Directoryserver and are accessible from any** Aspecttargets configured to use **LDAP**.

Aspectsupports an **LDAPconnection to a** Microsoft**Active Directory (AD), leveraging group-related capabilities that are standard with**Microsoft's implementation.

Note: These capabilities are not assured to be available in generic **LDAP** environments and can difficult to configure, so generic **LDAPis not supported.**

Configuration

The primary **LDAPconfiguration must be done outside of the** Aspect engine, in the **Administrative Web UI** .

In many installations the default **LDAP configuration is sufficient. The parameters that must be entered will be provided by the IT system administrator to successfully connect.**

In order to use **LDAP you must have two types of credentials created within your Active Directory :**

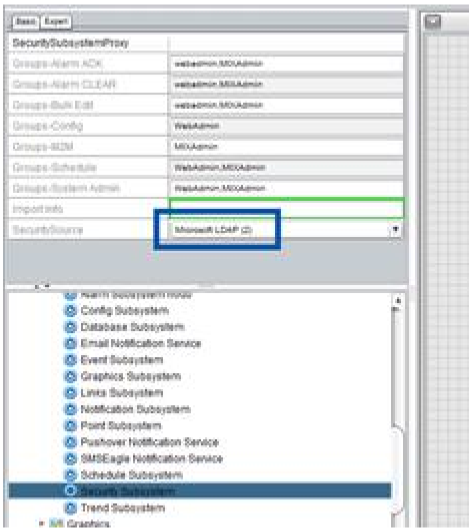
· one that has permission to query for active users (called the “**Bind User) and"**

· one or more **Domain Users that are member of groups that will determine your permissions within the**Aspect system.

In a default installation, the system has the following groups: admin,buildingmgr,guest,MIXAdmin,mobileadmin,occupant,technician, and webadmin. If you are using the default configuration you must ask your **AD administrator to create any of those groups (or any custom groups) that you actively use, and then assign those groups to the AD users that will have access to the system. From that point forward the setting of group-based permissions are identical to the non-LDAP settings.**

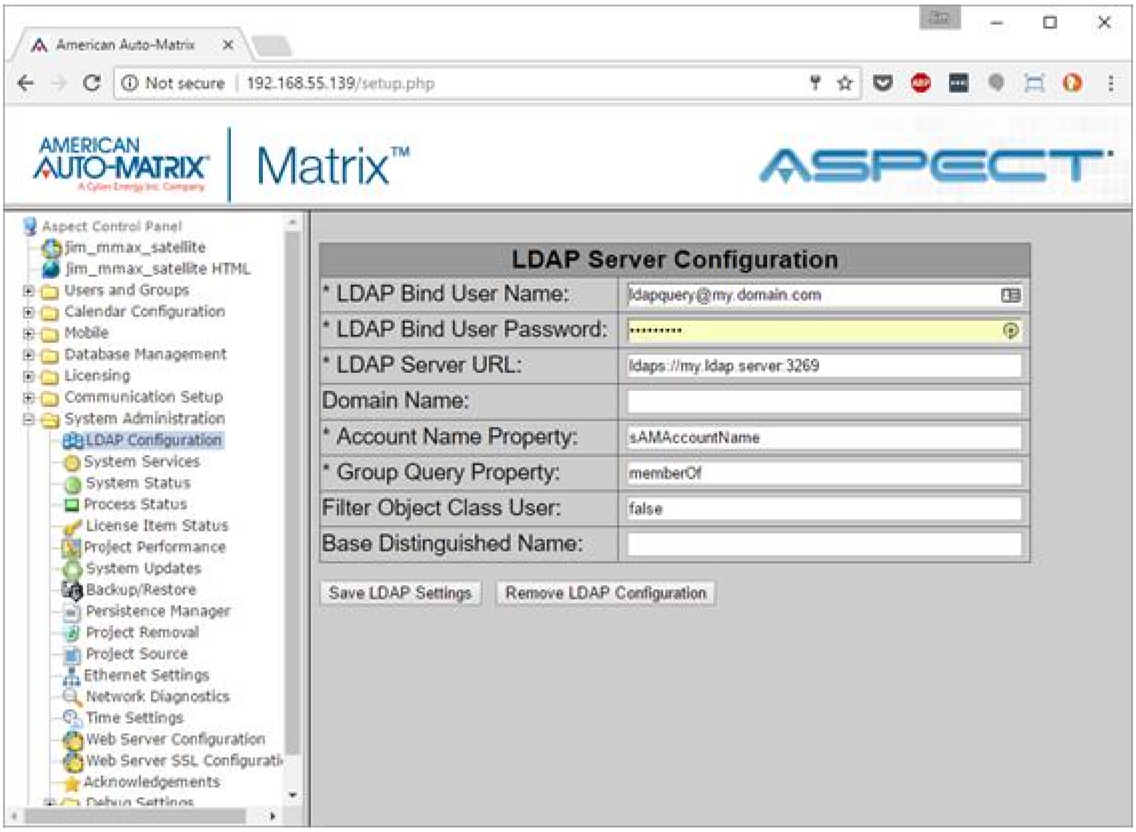
Note: You must also configure the Security Subsystem in Aspectto useMicrosoft**LDAP**. This should be set inAspect Studiobefore deploying the project but is modifiable at runtime viaAspect**Services**

.



Core Configuration

Select System Administration > **LDAP Configuration**in the Admin tree:



The fields noted with an asterisk are required and in most installations all that are needed. Most of this information must come from the **AD administrator:**

·**LDAP Bind User Name:** Distinguished Name (DN) of user with **LDAPbindTypically includes both username and domain in the format privileges.** username@domain.

·**LDAP Bind User Password:** password for the bind user

·**LDAP Server URL**: the **URL** used to access the server for **LDAP**Use requests. ldaps://for **SSLconnections**, ldap:// for non-**SSL connections**.

·**Domain Name**: name of domain if required by **ADconfiguration; typically blank**

·**Account Name Property**: the property used to find the account name. For **AD LDAP** this is almost alwayssAMAccountName

·**Group Query Property**: the property used to find group membership for a given user. For **ADLDAP**this is almost always memberOf

·**Filter Object Class User**: if true, restrict **LDAP**Typically false. queries to only user objects.

·**Base Distinguished Name**: Base DN used to filter LDAP queries. Typically false.

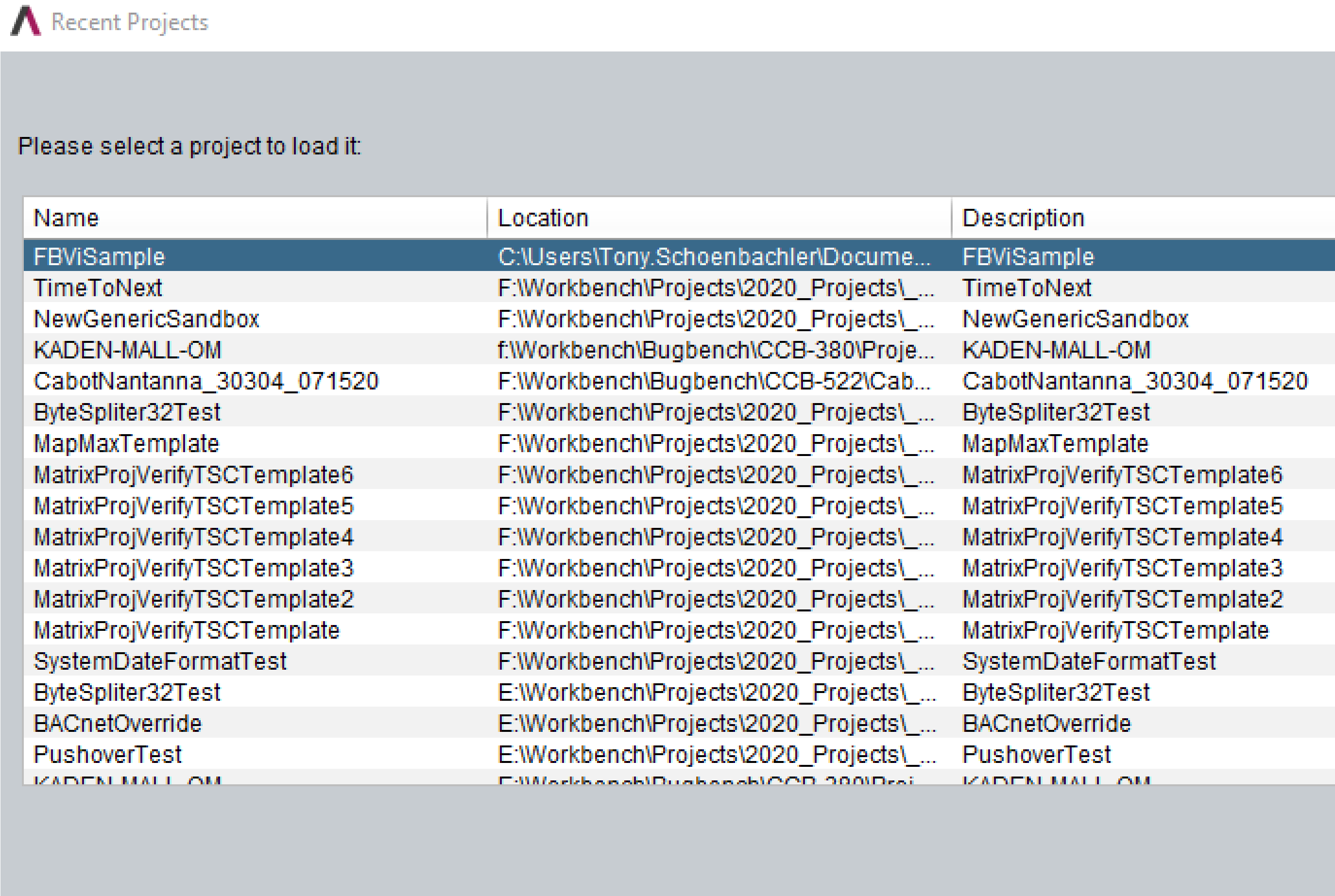
Note: When using **LDAP**, to avail of the “**Import map from Target**" feature a second target must be added with valid **LDAP**credentials.

Modbus in the Map

Project History List

Since v3.04.00

Aspect has a fully sortable and searchable Project History listing to keep track of the location of the last 1000 projects that where opened on a particular P.C. Accessible from the main Project menu option or by pressing F5 before opening an Aspect project. Projects are initially listed by last opened date and descriptions are editable for notes concerning a particular project.



Name	Location	Description
FBViSample	C:\Users\Tony.Schoenbachler\Docume...	FBViSample
TimeToNext	F:\Workbench\Projects\2020_Projects_...	TimeToNext
NewGenericSandbox	F:\Workbench\Projects\2020_Projects_...	NewGenericSandbox
KADEN-MALL-OM	f:\Workbench\Bugbench\CCB-380\Proje...	KADEN-MALL-OM
CabotNantanna_30304_071520	F:\Workbench\Bugbench\CCB-522\Cab...	CabotNantanna_30304_071520
ByteSpliter32Test	F:\Workbench\Projects\2020_Projects_...	ByteSpliter32Test
MapMaxTemplate	F:\Workbench\Projects\2020_Projects_...	MapMaxTemplate
MatrixProjVerifyTSCTemplate6	F:\Workbench\Projects\2020_Projects_...	MatrixProjVerifyTSCTemplate6
MatrixProjVerifyTSCTemplate5	F:\Workbench\Projects\2020_Projects_...	MatrixProjVerifyTSCTemplate5
MatrixProjVerifyTSCTemplate4	F:\Workbench\Projects\2020_Projects_...	MatrixProjVerifyTSCTemplate4
MatrixProjVerifyTSCTemplate3	F:\Workbench\Projects\2020_Projects_...	MatrixProjVerifyTSCTemplate3
MatrixProjVerifyTSCTemplate2	F:\Workbench\Projects\2020_Projects_...	MatrixProjVerifyTSCTemplate2
MatrixProjVerifyTSCTemplate	F:\Workbench\Projects\2020_Projects_...	MatrixProjVerifyTSCTemplate
SystemDateFormatTest	F:\Workbench\Projects\2020_Projects_...	SystemDateFormatTest
ByteSpliter32Test	E:\Workbench\Projects\2020_Projects_...	ByteSpliter32Test
BACnetOverride	E:\Workbench\Projects\2020_Projects_...	BACnetOverride
PushoverTest	E:\Workbench\Projects\2020_Projects_...	PushoverTest

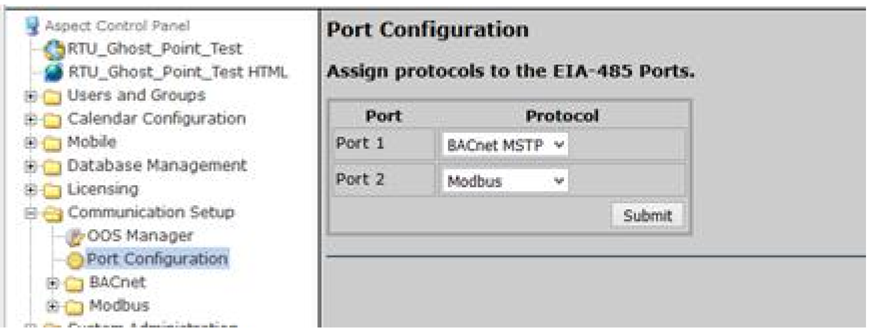
Each column is sortable by clicking on the title bar and the search option will do an “auto-wildcard” search of any column in the history list. The location column is editable in case a drive letter or folder name has changed. Please note, this is a list of projects and their locations the last time opened and is not an archive. If the project has been manually moved it will no longer be accessible.

Adding a ModBus Network to the Aspect Map

Modbus networks and devices can be configured both as a Diagram (see Adding a Modbus Device) or in the Map.

To use **Modbus** in the map, you must manually add a **Network Group** and Network, add **Devices**to the Network and add**Points**to those **Devices**.

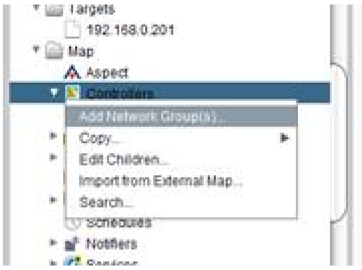
Note: Before configuring **Modbus** in the AspectMap, if the channel to be used is Modbus RTU Network then theAspectDevice must have a comms port set toModbusRTU protocol. To configure this, selectCommunications Setup > Port Configurationin the H5 UI tree:



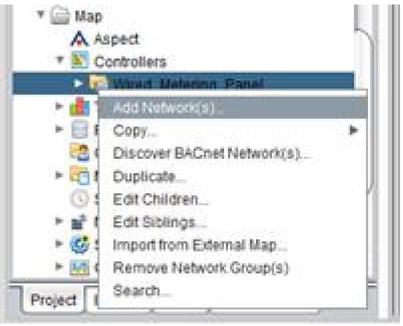
Baud Rate and **Parity** are set in Communication Setup > Modbus. **Word length** is assumed to be 8 bits with 1 stop bit.

Add a Network Group and Network

In the Aspect**Map, add a Network Group**. This can represent any logical grouping of **Modbus** devices (e.g. a Building, a floor, or a utility Type):

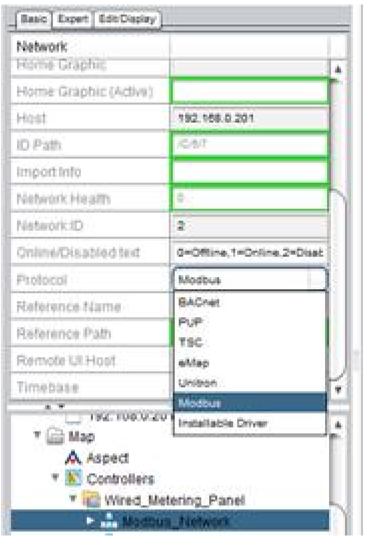


Next, add a Network to that **Network Group**to represent the Modbus driver running in a specificAspect**Device**, which will be connected to the **Modbus** network:



For the new Network, set the Protocol, Host and Network ID properties on the Basic tab:

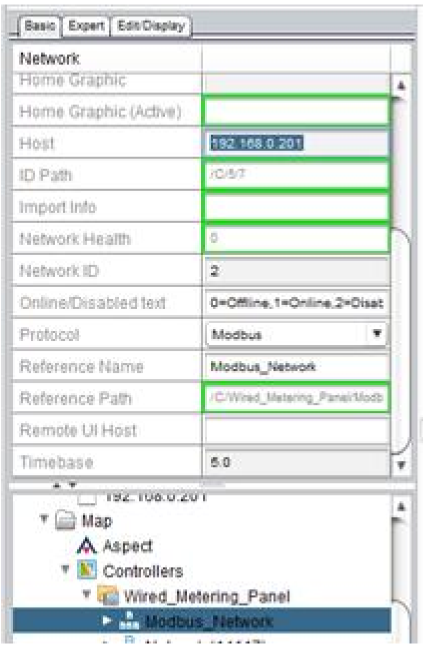
Set Basic > **Protocol**toModbus:



Set Basic > Network IDto match the MSTP Port (MSTP Port1 = 1 / MSTP Port2 = 2 / Modbus IP = 2).

> **Note**: This property must be set for Modbus IP networks, even though no serial port is used.

Set Basic > **Host**to match the **IP address** of theAspect**Device to which the Modbus Devices are connected.**

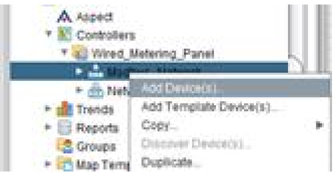


> Note: You **must** set the Basic > Host of the Network to the IP address of the Aspect**Device** to which the **Modbus** devices are connected – i.e. the Aspect**Device** in which the Modbus driver is running.

This means that if the Aspect**Project is be deployed to a different**AspectDevice it will continue to connect to this Modbus network. **However, this property <u>must</u> be set**, even when the **Project** is deployed to the same Device. Failure to do so will prevent Aspect from connecting to the Modbus network.

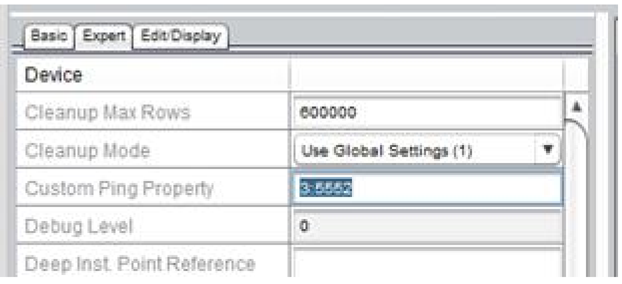
<u>Add Devices to the Network</u>

Right-click on the Modbus Network to add **Devices**:

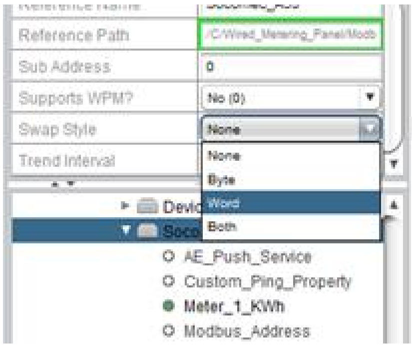


and for each **Modbus** device set the Basic>Device Address property. For **Modbus RTU** networks this will be an integer, for **Modbus IP** networks it will be the IP address of the Modbus device followed by :502 (the IP port on which Modbus communicates) e.g. 192.168.7.196:502

Note: Aspect repeatedly pings **Modbus Register** 4:1 (40001) on each configured device to test if it is online. If a device does not have a **Register** at that address, then it is necessary to manually set a different **Register** for Aspect to use. Do this by setting the Expert > Custom Ping Property in the format <registerType>:<registerAddress>:



If the Modbus Device uses a “Swapped" floating-point data type to support 32-bit data, set the **Basic>Swap Style** parameter to match.



In addition to **Basic>Device Address**, Basic > **Expert>Custom Ping Property** and **Basic>Swap Style**, the following parameters can be set:

·**Basic>Max RRM** Maximum number of contiguous registers that can be read in a single Modbus read request

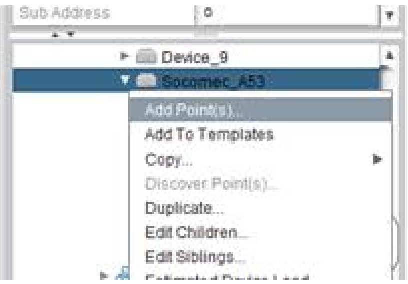
·**Basic>Max WPM** Maximum number of contiguous properties that can be sent in a single **Modbus** write property request

·**Basic>Sub Address** Modbus – Only used by IP Gateways for Multiplexing multiple devices

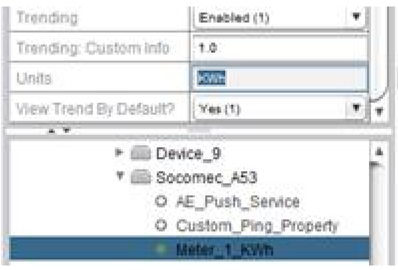
·**Basic>Supports WPM?** Does this Modbus device support write property multiple

Add Points to the Devices

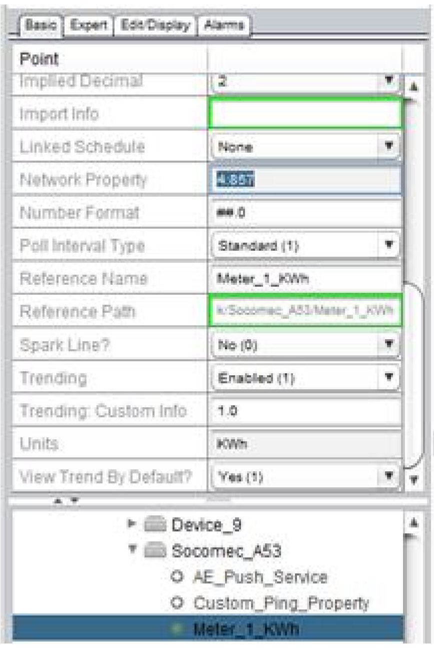
When the **Modbus** device is set up, manually add as many points as required for it:



For each point, set the units in **Basic>Units**:



and enter the identifier for the point within the specific Modbus device in the Basic > **Network Property**parameter:



This identifier is in the format *<registerType>:<registerAddress>:<count>* e.g. 4:857where4indicates Holding Register and857 indicates a KWh reading (for this particular device).

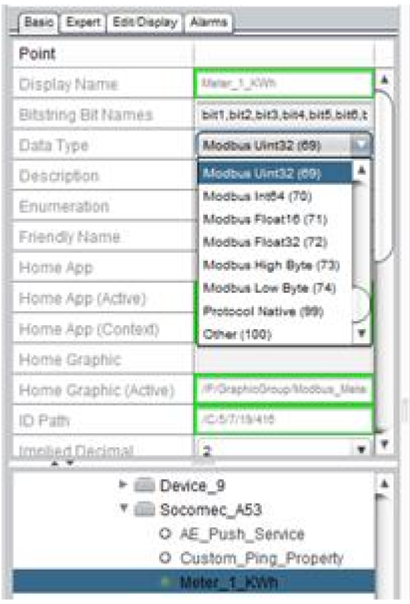
· The *<count>* is the number of contiguous “values" that are read starting with the register address specified. If the count is not specified (as in the example above), it is assumed to be 1.

· The *<registerAddress>* value will be provided by the manufacturer of the Modbus device, but must be increased by one – in the example above the manufacture specified register 856 for a KWh reading, so 857 was used for the identifier. The value can be 1 to 99999 inclusive.

· The *<registerType>* is taken from this table:

0	Coil Outputs
1	Digital Inputs
3	Analog input (Input Register)
4	Holding Register (Analog Value)

Set the Aspect Data Type (**Basic**>**Data Type**) for the point



The value can be one of the following:

Integer (1)	Signed 4 byte integer (2 Modbus registers)
Float(2)	IEEE Float 32 bits (2 Modbus registers)
String(3)	String (n Modbus registers 2 bytes per)
Boolean (8)	Boolean (1 bit Modbus register)
BitString (6)	Bit String (Aspect Style) (n contiguous 1 bit Modbus registers)
Modbus Int16(67)	Signed 16 bit integer (1 Modbus register)
Modbus UInt16 (68)	Unsigned 16 bit integer (1 Modbus register)
Modbus UInt32 (69)	Unsigned 32 bit integer (2 Modbus registers)
Modbus Int64 (70)	Signed 64 Bit integer – (4 Modbus registers) Note: Java does not support 64 bit unsigned integers so large unsigned 64 bit integers read from a device could be
Modbus Float16 (71)*	16 bit float value with implied decimal (1 Modbus Register)
Modbus Float32 (72)*	32 bit float value with implied decimal (2 Modbus Registers)

Modbus High Byte(73)	High order byte of specified 16 bit register (1 Modbus register)
Modbus Low Byte(74)	Low order byte of specified 16 bit register (1 Modbus register)

***Note**: If you specify Modbus Float16(71) or Modbus Float32(72) for the Data Type, you must also set the Basic > **Implied Decimal** property (1 … 10)

Debugging

Debug levels can be set at the **Device and Point** level. Setting the debug level on the **Device** will allow the user to see the ping messages that allow Aspect to determine the online status of a particular **Device. Setting debug levels on the Points will log both read a write requests for individual Points.**

· DebugLevel == 51 will give a fairly verbose human readable dump of the request and response sequences of both read and write operations to the Modbus driver.

· DebugLevel == 76 will dump level 51 messages as well as the raw byte array data sent between Aspect and the Modbus driver.

Note: These dumps are not **MSTP Modbus** wire level dumps, they are TCP dumps of the **AAMnet** protocol communications between Aspect and the low level driver that does both **MSTP** and **TCPModbus** communications.

Application Programming Interfaces (APIs)

ASPECT allows external applications to read ASPECT **map** Point data, and in some cases allows writing to these points.

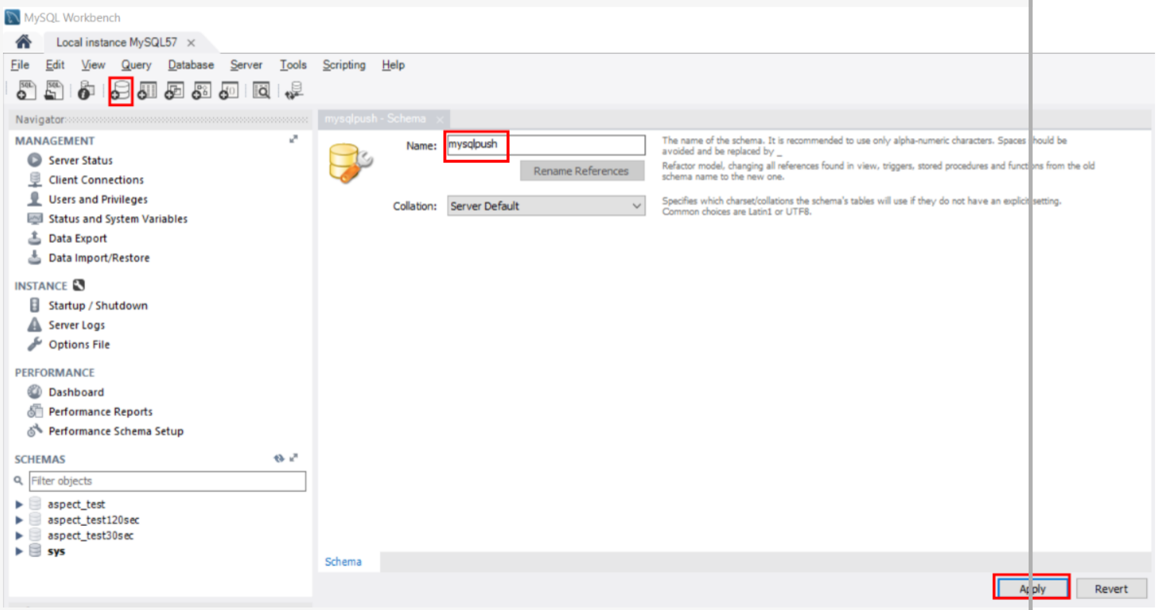
There are 4 ways in which can be done:

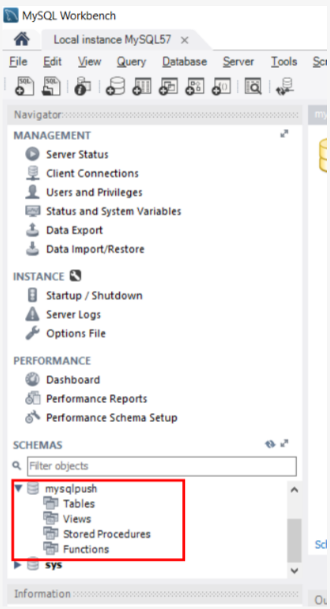
- ASPECT can push point values to any MySQL database
- ASPECT can push point values to any POST service
- ASPECT supports a public read/write API that provides point and map based services for 3rd party integration
- ASPECT supports a read-only REST API for map directory services and values (both points and devices).

How to configure ASPECT to push values to an External database or POST service

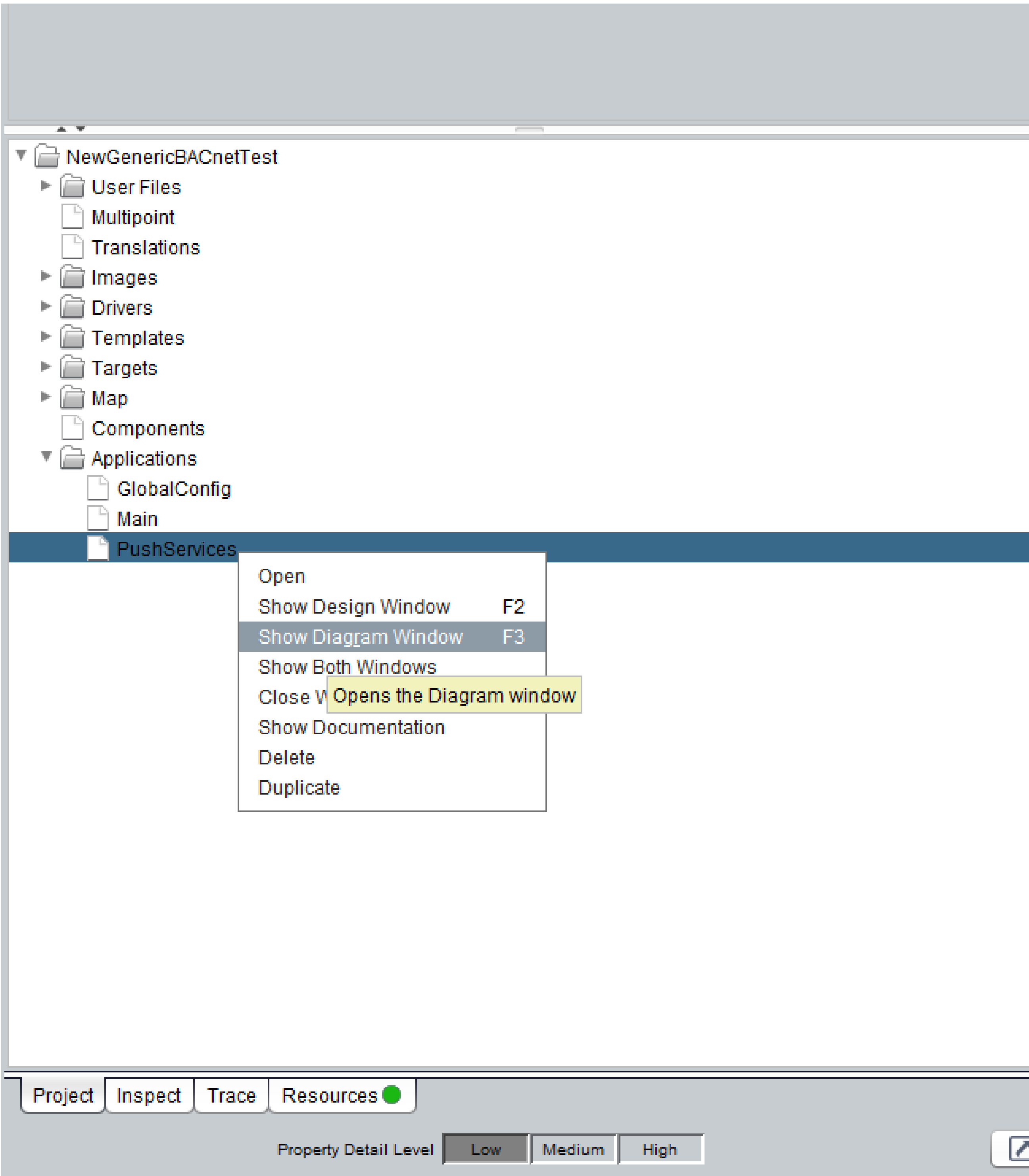
Note: The `MySQL PUSH` feature is compatible with all versions of MySQL up to 5.7 using the '**standard authentication**' method.

Note: In order for the `MySQL PUSH` feature to be used a **MySQL** database, with an appropriate schema, must already exist in the destination. For example, here is an example of a schema set up using MySQL WorkBench:

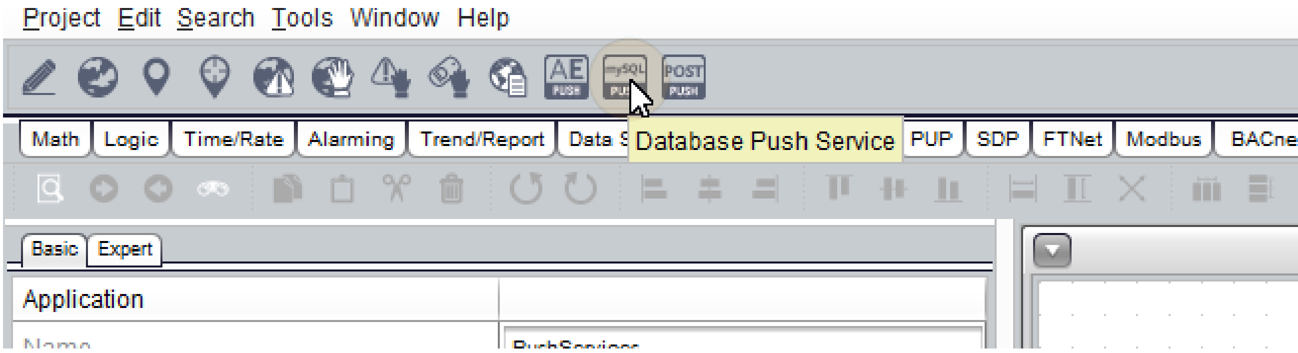




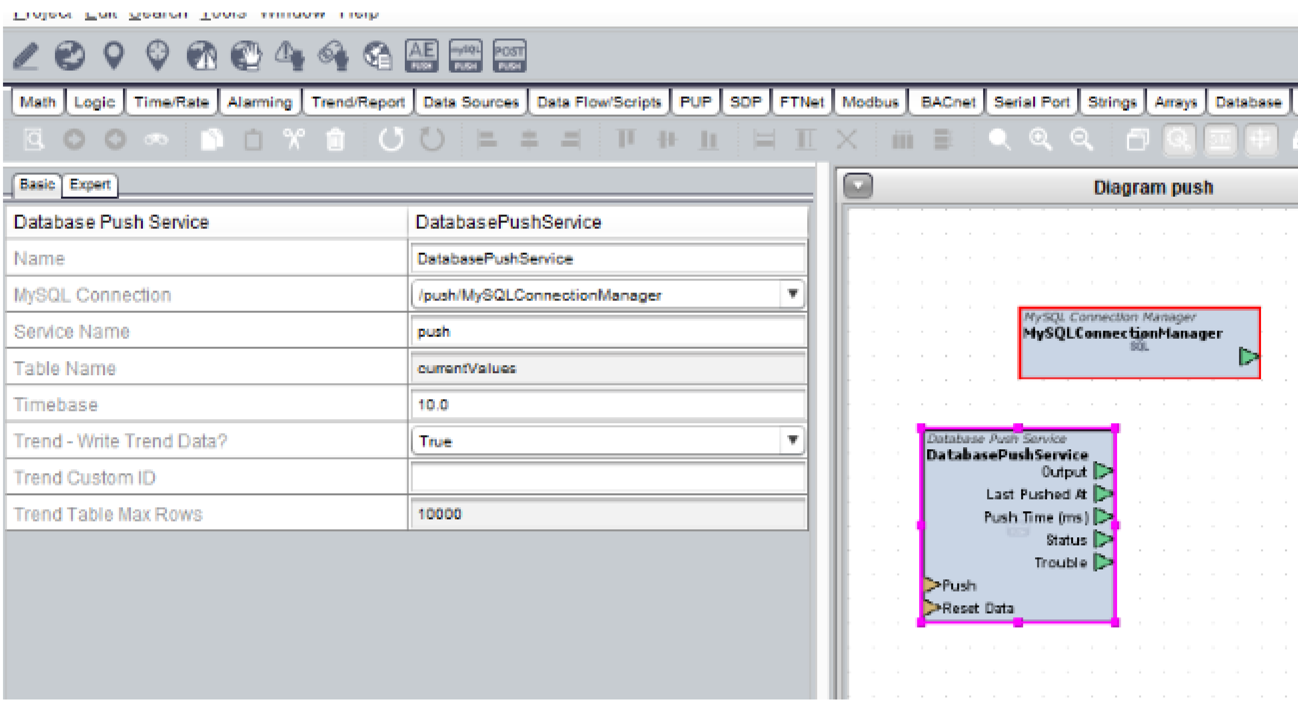
1. Both the **Database push service** and the **POST push service** are configured in the "Diagram View" interface.
   To open the diagram view of any application, right-click on that application in the ASPECT **tree**, and select Show Diagram Window.

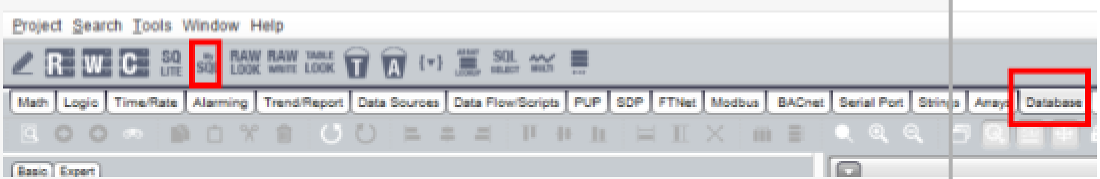


2. In Diagram View there is a tab bar across the top of the ASPECT window. Click on the Mobile/Map tab.



3. Select either the MySQL PUSH block or the POST PUSH block, and drop it on the diagram view



> **Note**: If you are using the MySQL PUSH block, then you should also drop in the MySQL Connection Manager:
>
> 
>

4. Access the block's properties in the Properties window on the left-hand side, by select it in the Diagram window.

5. Set the connection parameters:
   1. For a MySQL connection, in the MySQL Connection drop-down select the external database connection to be used.

MySQL Connection	/push/MySQLConnectionManager
Service Name	push

   For a MySQL connection you can also specify whether or not full **Trend** data should be pushed - i.e. should a separate row be created for each value pushed - and if so specify the maximum rows that should be used for this **Trend**, along with a custom identifier for the **Trend**.

Trend - Write Trend Data?	True
Trend Custom ID	
Trend Table Max Rows	10000

   For a MySQL connection you should set the following parameters:

   Timebase – How often in seconds the ASPECT device should push all data

   Trend Table Max Rows – The number of rows that are available at any time (Buffer size). Every 10 min ASPECT will delete all old row tables above this limit, and the default is 10000 rows.

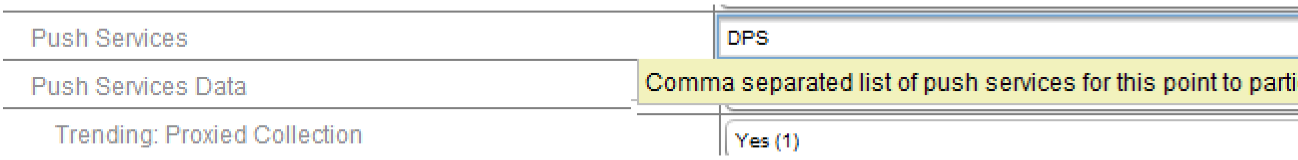
   2. For a **POST** Push Service, set the API parameters and (if required) Auth parameters:

API Content Type	text/plain
API Host	
API Host Port	443
API Path	Not Set
API Query	Not Set
API Use https?	True
Auth - Use Basic Auth?	False
Auth Password (Basic Auth)	
Auth Username (Basic Auth)	

6. In the Service Name property, assign a label that can be used to associate this service with individual points.

Service Name	DPS

7. In the Map node of the ASPECT tree, edit the properties of each point that should have values pushed to the MySQL or POST push services, and in the Expert tab Push Services property, enter a comma-separated list of the labels you specified in the Service Name field of each of the required push services (MySQL Push Service or POST Push Service).



8. Deploy project and check the database or received POST requests.
   - In MySQL, if the user credentials that have been provided have permission to create tables, the schema already exists and ASPECT can reach it, i.e. is on the network or it is publicly available, then the table should be created and data inserted over time. The data logged in the remote database includes for each point its:
     - referencePath
     - valueType
     - currentValue
     - quality
     - alarmStatus
     - overrideStatus
     - lastUpdated time
   - In the POST service, push messages should be received with the following fields
     - pointId
     - timestamp
     - value

Read/Write API

To access the latest documentation on the Read/Write API for your ASPECT, enter the following into a Web Browser:

(your server):(port)/servlets/Api?cmd=getDoc

e.g. http://localhost:7226/servlets/Api?cmd=getDoc

This will return JSON-formatted text describing the usage of the API as implemented in your installed version of ASPECT

REST API (Read Only)

This API has the capability to browse the topology tree (Map) directory, including current values.

For details on its usage and syntax, enter the following into a Web Browser:

(your server):(port)/api/TopologyTree/documentation

e.g. http://localhost:7226/api/TopologyTree/documentation

This will return JSON-formatted text describing the usage of the API as implemented in your installed version of ASPECT

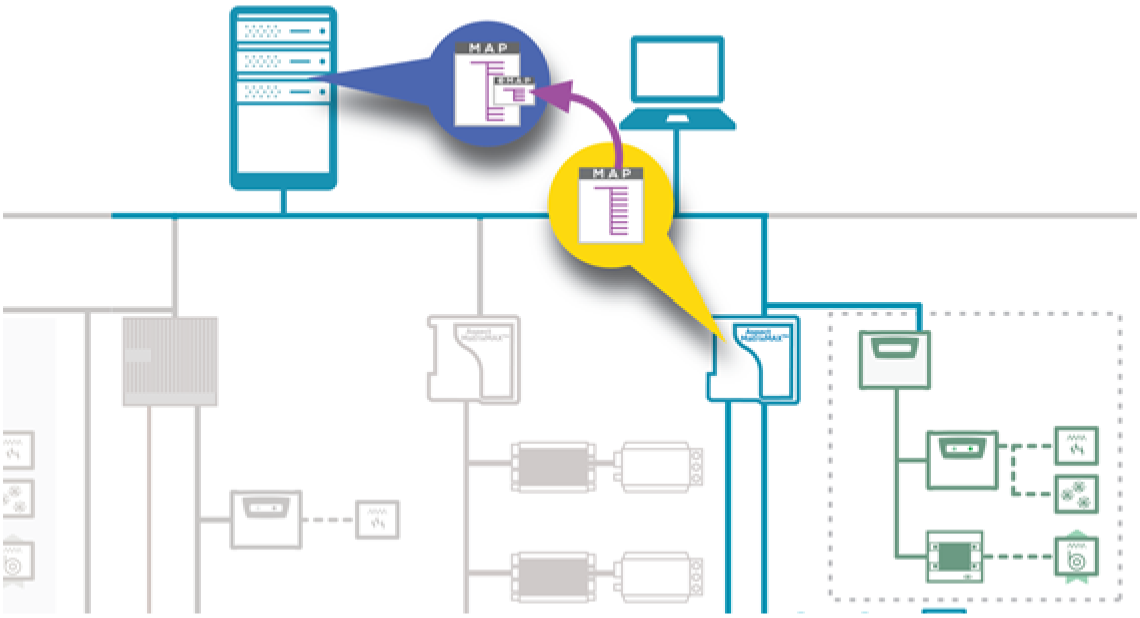
eMap (External map / Embedded map)

What is eMap?

The **Map** of one ASPECT device (the “**Satellite**") can be “proxied" by (copied to/referenced from/embedded in) another ASPECT device (the “**Supervisor**"), so that graphics hosted on the **Supervisor** can access **Points**, **Trends**, **Schedules** and **Alarms** in the **Satellite** as if they were within its own map. The Network can also be configured to copy **Audit Trail** and **Map Events** from the Satellite. This allows an ASPECT **Supervisor** device to bring objects from multiple **Satellites** together into a single **UI**.

This embedded **Map** is referred to as an “**eMap**" (also known as an External Map).

The protocol used by the **Supervisor** to query the **Satellite** is called “eMap", so that the network of devices linked in this way can be called the “eMap network".



What is eMapSC?

It is possible to configure an ASPECT system so that all eMap communications are encrypted by **SSL/TLS**. This secures eMap data and esures that all **URLs** begin with https://.
For more information on managing SSL Certs on ASPECT devices, see "Managing SSL Certificates" on page 492

How to embed a Map from a Satellite device in the Map of a Supervisor device

To embed all or part of a **Device's Map** in this way, you must export the **Map** from the **Satellite Device**, (also referred to as the "**eMap server**") and Import it into the **Supervisor Device**. (the "**eMap client**")

The Controllers node of the **Satellite**'s map will be displayed under the relevant **Device** in the **Supervisor's** **Map>Controllers** node. However, **Schedules** may not be displayed in exactly the same way in the **Supervisor** as they were in the Satellite. There are two types of schedules that span networks in ASPECT:

·**Distributed schedules,**which are schedules that are configured in an ASPECT **project**, and are distributed to a target schedule (on another network, irrespective of the network protocol) via a bound Network Point that references that target.

·**Remote schedules,** which are schedules that can be read and written to in ASPECT, but are configured in an underlying network rather than in the Aspect project.

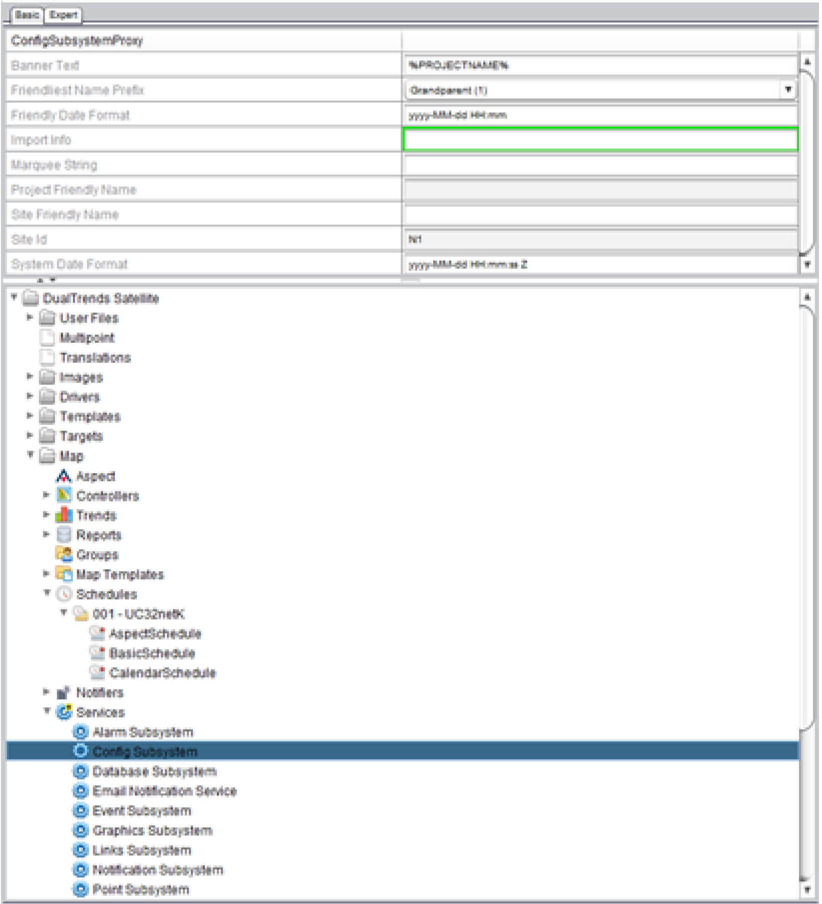
In either case, the schedules in the **Satellite** will be mapped to **Network Points** in the **Supervisor**, so that they become **Remote Schedules**.

> **Note**: It is also possible to manually "discover" individual **eMap** elements in a similar way to **BACnet** discovery. However, elements added in that way have a significant maintenance impact, as they must be manually deleted and re-added whenever they change on the **Satellite**. See eMap Discovery for more details.

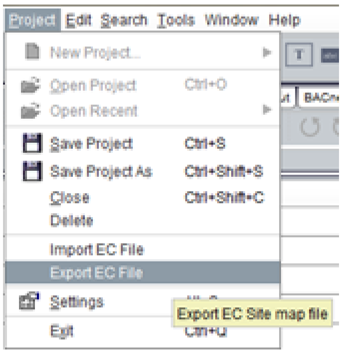
How to Export a Map

1. Open the **Satellite project** in ASPECT-Studio. Set the **Unique Site ID** (e.g. MM1, N101) in the **Config** Subsystem.

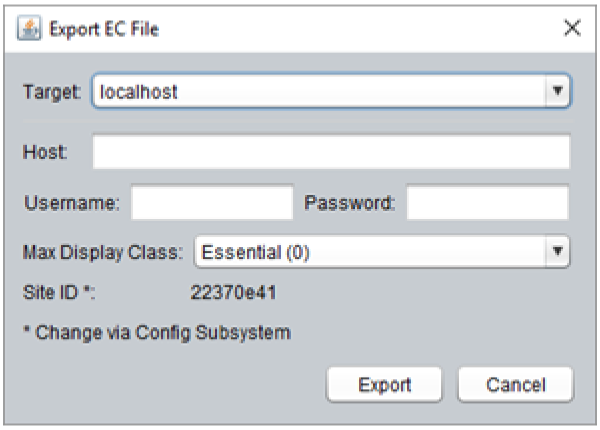
> **Note**: It is recommended that the Unique Site ID text is short because it will be included in the reference path in the **Supervisor**, and the reference path in turn may be used in trend table names.



2. Click Project > Export EC file

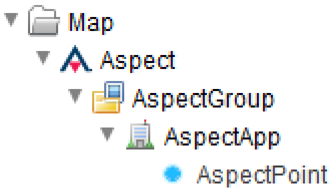


3. Enter the **Satellite** Host, Username, Password, and Display **Class** to export. You can select a target to pre-populate the host, user, and password fields.



- The Host is the **Satellite** IP address and port number e.g. 192.168.5.56:7226, or hostname
- The Username and Password are the admin/system user credentials that the **Supervisor** project will use to authenticate for background tasks
- The Display Class is the group of points that are important enough to be exported for import into the **Supervisor** project. The Display Class is set for a Network Point in the **Edit/Display**tab.

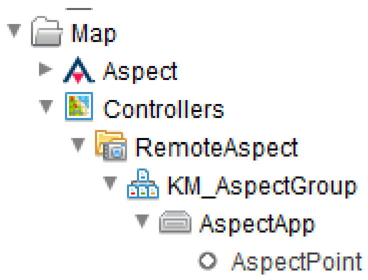
As of ASPECT 3.03.01, points under the Aspect branch in the **Map** are included in the **eMap** export (if they match or exceed the display class setting of the export).



After the import, points under the Aspect branch from the **Satellite** will be represented in the Controllers branch

1. under a **network group** called RemoteAspect,
2. in a **network** with the **Site ID** of the satellite (set in Services > Config subsystem) as prefix,
3. and a **network device** named as per the Aspect-branch point's container.

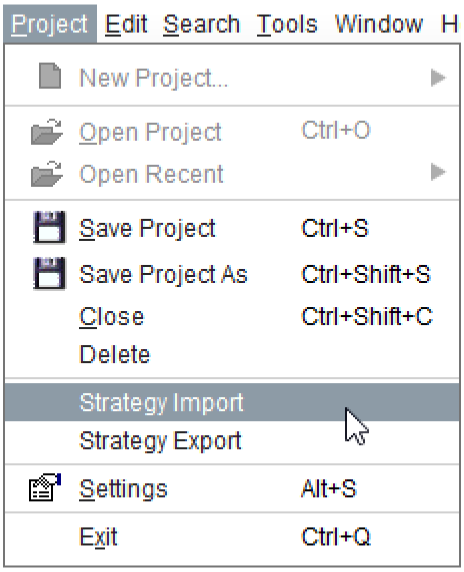
In the example, below "KM" is the **Site ID** of the **Satellite**.



How to Import a Map

Create a new **Map Project** in ASPECT-Studio, or open an existing **project**

Click Project > Strategy Import

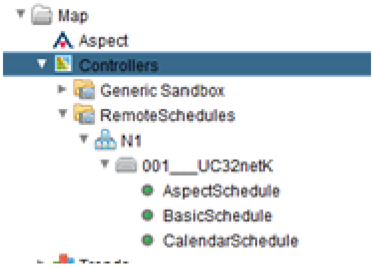


Distributed and Remote Schedules - Examples

Remote Schedules

Remote schedules are schedules that can be read and written to in ASPECT, but are configured in an underlying network rather than in the ASPECT project.

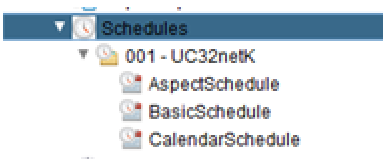
For these schedules, a network group called **RemoteSchedules** is created, with a **Network** named as per the **Site ID** of the network, a **Device** named as per the schedule group, and a **Network Point** per schedule with a data type "Remote Schedule...". The **current value** of one of these **Network Points** is the schedule status of the remote schedule.



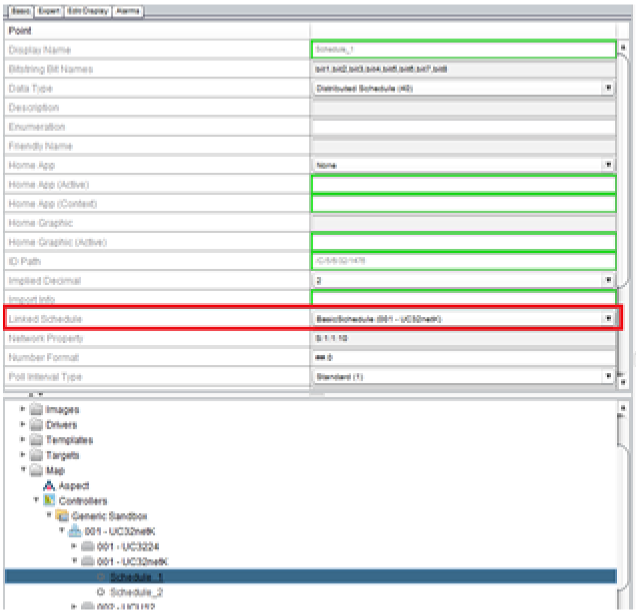
Distributed Schedules

Distributed schedulesare schedules that are configured in an ASPECT project, and are distributed to a target schedule (on another network, irrespective of the network protocol) via a bound Network Point that references that target.

The schedule can be seen in ASPECT-Studio **Map** under **Schedules**:



A network point can be bound to the schedule:



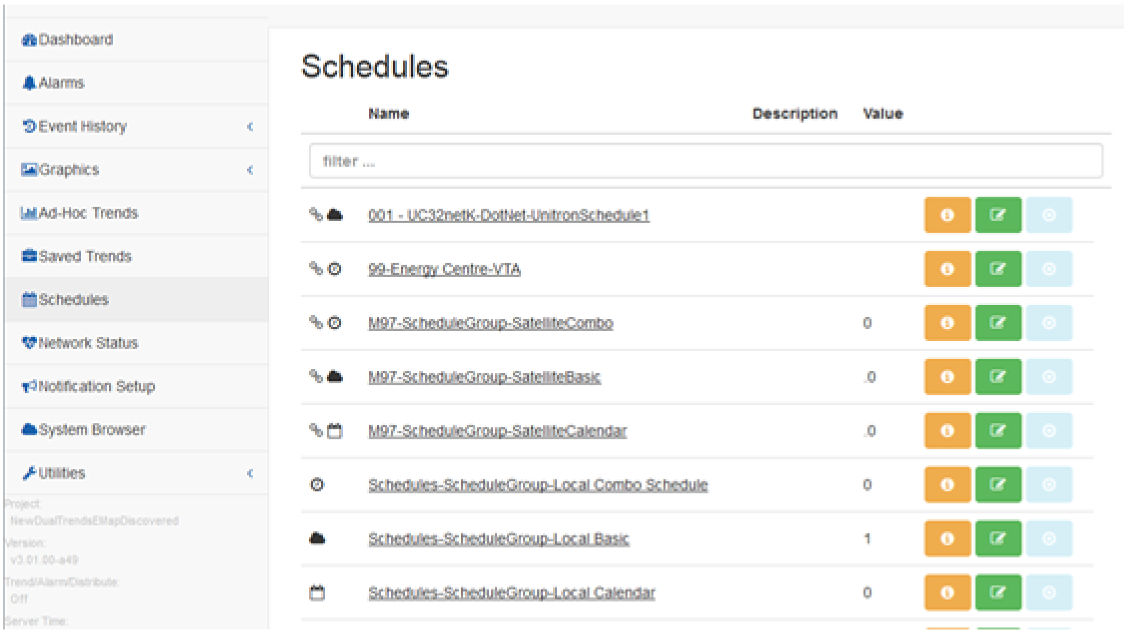
The schedule configuration is created and saved in ASPECT, and periodically distributed to every bound point's referenced schedule.

In this example, the **Network Property**of the **Network Point** indicates that the schedule in the underlying network is a Unitron schedule, schedule 1 in blocks 1 to 10.

A **Network Point** that is bound to a schedule will be exported if its **display class** matches the export. In the **Supervisor** this point is not bound to any schedule, rather it can be used to monitor the current value of the schedule as per the latest read of the point in the **Satellite** which has a **current value** according to the schedule state wherever it resides (**Aspect/Unitron/BACnet/PUP**).

All schedules in the schedule group will be exported as per Remote Schedules (below) whether or not they have been bound to any point(s).

Whether a schedule is local or remote, it can be view/edited in **ngAdmin** under `Schedules`, with the symbol used to indicate that a schedule is remote:

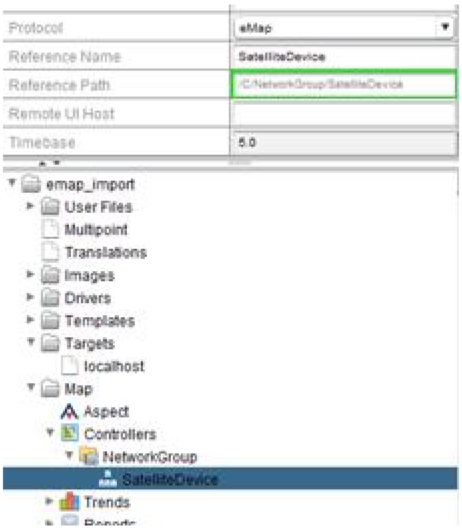


eMap Discovery

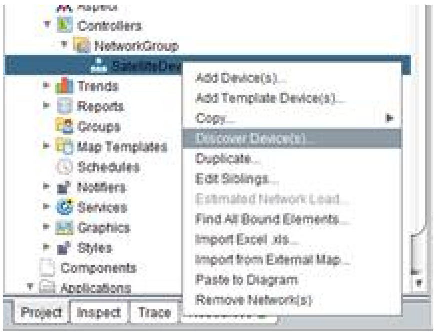
> **Note**: **eMaps** created in this way have a significant maintenance impact, as they must be manually deleted and re-added whenever they change on the Satellite. It is recommended that you instead use Export eMaps and Import eMap wherever possible. See *How to Export a Map* and *How to Import a Map* for more detail.

To manually create an **eMap** in an ASPECT Supervisor, you must create a **Network** to represent the **eMap** in the Supervisor's **Map**, and then populate that **Network** with **eMap Devices** as follows:

Create a new **Network** within a **Network Group**, and configure the **Network Protocol** to be `eMap`



Right-click on the **Network** in the Project Tree and select Discover Devices to open the **Discover eMap Points** dialog.



The Discover eMap Points dialog requires the address of the ASPECT **Satellite** from which the points will be discovered.

Typically, this will be the "lower level" in the ASPECT system architecture - for example, an ASPECT-Enterprise **Supervisor** would use **eMap** to access points in a remote MATRIX Series or NEXUS Series controller.

In the **Network Configuration** section, enter the **Satellite** **Host**, **Username**, **Password**, and **Display Class** to export:

- The Host is the **Satellite** IP address and port number e.g. 192.168.5.56:7226, or hostname
- The Username and Password are the admin/system user credentials that the **Supervisor** project will use to authenticate for background tasks
- The Display Class is the group of points that are important enough to be exported for import into the **Supervisor** project. The Display Class is set for a Network Point in the Edit/Display tab.

In the Proxied Property Mapping section, select the desired options to be used for the discovered **eMap** points:

- Trending: Trends collected on remote system will be transformed to corresponding Proxy Trend type.

- Alarming: Alarm state on point the remote system will be reflected as a Proxy Alarm on the **eMap** point.

Click the Discover button to begin the **eMap** discovery process and prepare for **eMap** point binding

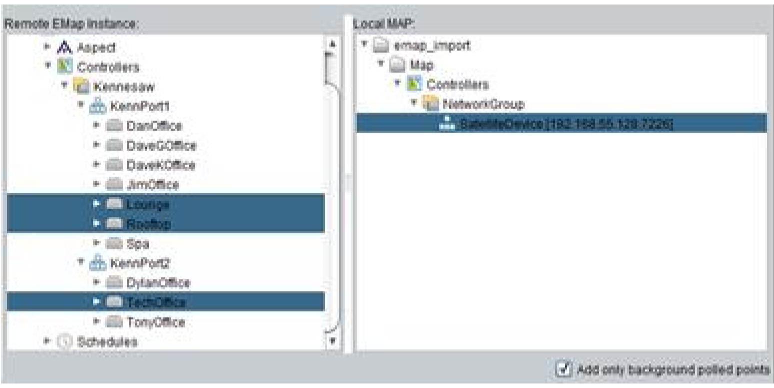
Binding eMap Devices

The most typical use of **eMap** is to discover a device on a remote Aspect **Target**, and import that device into an upper level system via **eMap**.

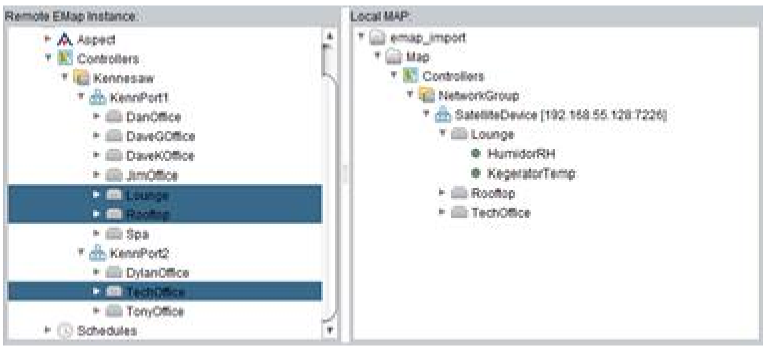
To import in this fashion, select one or more devices from the **Remote eMap Instance** pane and drag them to the **eMap** network on the **Local Map** pane.

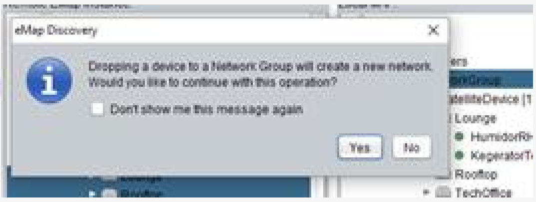
Checking the Add only background polled points option will limit the imported points contained within the selected devices to those that are being back-ground-polled.

Note: The remote devices do not need to reside on the same physical net-work.



When the Remote **eMap** devices are dropped on the **Local Map** pane, the devices will be added to the selected network



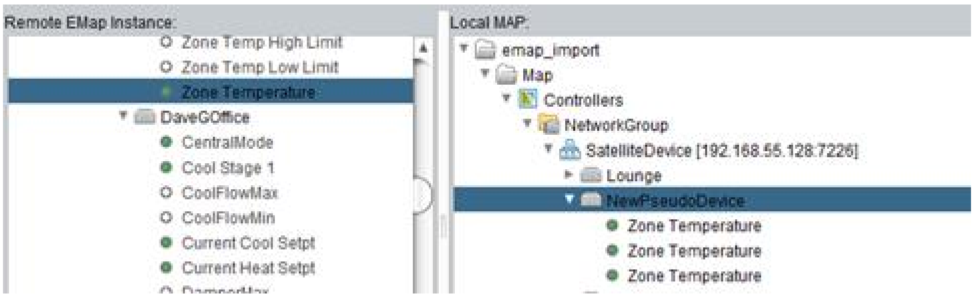
> **Note**: If **Network Group**is selected as the drop target on the Local MAP pane, a new **eMap** network will be automatically created.
>
> 
>

Advanced eMap Discovery Topics

eMap point collection "Devices"

A local **eMapDevice** does not necessarily represent a physical device. It is possible to add individual points from multiple Remote Devices to any **eMapDevice** on the same **eMap** network in the **Local MAP**pane.

In the following example, a new device **NewPseudoDevice**is created on the**Local MAP** in the **eMap** network. Zone Temperatures from multiple devices on the Remote **eMap** Instance are selected and dropped in the NewPseudoDevice:



eMap Schedule Points

Using **eMap**, it is possible to obtain the *value* of a remote **schedule** and represent that in the **Local Map** as a point.

To do this, select one or more **Schedule** types from the **Remote eMap Instance** pane and drop them into an empty or existing **eMap** device on the **eMap** network on the **Local MAP** pane. The remote **schedules** will be created as points within the device. These points will reflect the output value of the **schedule** executing in the remote **eMap** system.

How to Encrypt all eMap communications (eMapSC)

To use secure eMapSC encryption

1. There must be an SSL/TLS Certificate installed on the ASPECT **Satellite** (eMap Server). ASPECT devices typically have a default SSL certificate, which should be suitable for eMapSC. See "Managing SSL

Certificates" on page 492 for details.

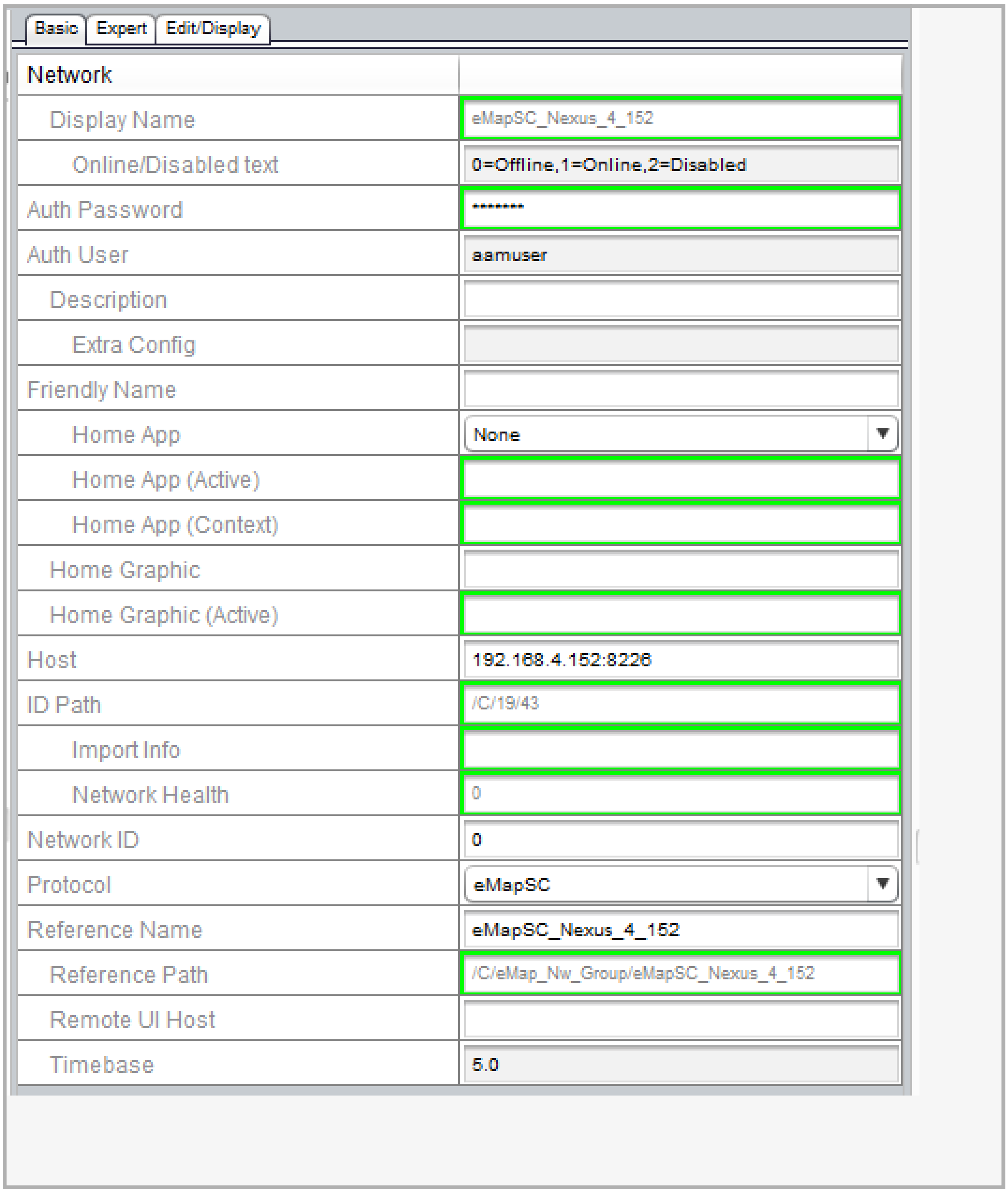
2. The Server (**Satellite**) certificate must be installed on the Client (**Supervisor**). ASPECT-Studio devices are configured to use the **SSL** Mode "0 - Accept All Certs" so **SSL/TLS** communications should work automatically without requiring certificates to be manually accepted or installed. See "Managing SSL Certificates" on page 492 for details.
3. The "Protocol" property of the **Supervisor**'s eMap Network must be set to "eMap SC".
4. The eMap port must be set (the SSL port for the first instance is 8226, the SSL port for instance 2, if applicable, is 8227) unless the **Satellite** target is secured with single-port access, in which case the proxy URL paths /aspect1 for instance 1 and /aspect2 for instance 2 (if applicable) can be used.
5. The Auth User and Auth Password of the remote **Satellite** must be configured.

Examples of valid Host property values for eMap and eMapSC, depending on your configuration preferences:

- 192.168.4.101:7226 (with Protocol=eMap) - standard eMap network connecting to a remote NEXUS Series Satellite on 192.168.4.101, instance 1 (port 7226)
- 192.168.4.101:7227 (with Protocol=eMap) - Instance 2
- 192.168.4.101:8226 (with Protocol=eMapSC) - eMapSC to instance 1
- 192.168.4.101:8227 (with Protocol=eMapSC) - eMapSC to instance 2
- 192.168.4.101/aspect1 (with Protocol=eMap) - eMap to instance 1 via default http port 80
- 192.168.4.101/aspect2 (with Protocol=eMap)
- 192.168.4.101/aspect1 (with Protocol=eMapSC) - eMapSC to instance 1 using single-port access on 443 (port does not need to be explicitly specified)
- 192.168.4.101/aspect2 (with Protocol=eMapSC)

eMap (External map / Embedded map) : How to Encrypt all eMap

:



ASPECT Target Administration

Target Administration Overview

An ASPECT "**Target**" can be one of the following devices:

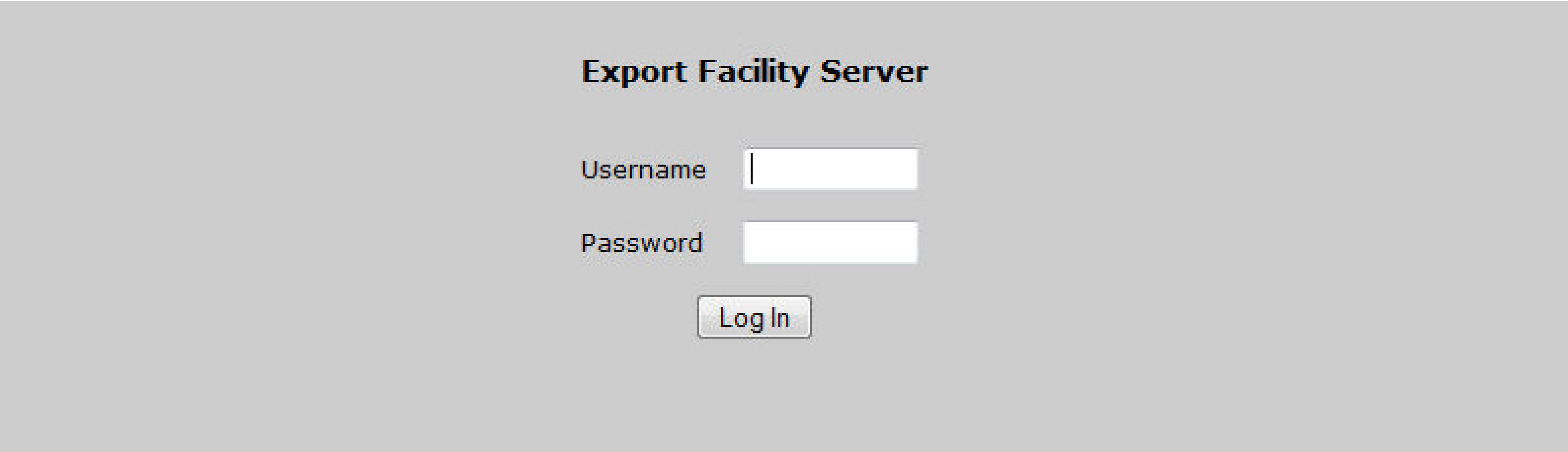
- MATRIX Series Area Controller
- ASPECT-Enterprise Server
- NEXUS Series supervisor

All of these **Targets** are administered through the same web-based Aspect Control Panel, and this section provides information on all pages commonly found within it.

Logging Into the System

Login Page Overview

When browsing to an Aspect target for the first time, you will be greeted by the user log-in page. You will be required to enter your user-name and password to gain access to the system. The base URL of any Aspect system (navigating directly to the IP address or resolvable name) is commonly used to access the Control Panel for Aspect targets. The Control Panel is used to configure device characteristics, such as Ethernet Settings and User/Group administration.

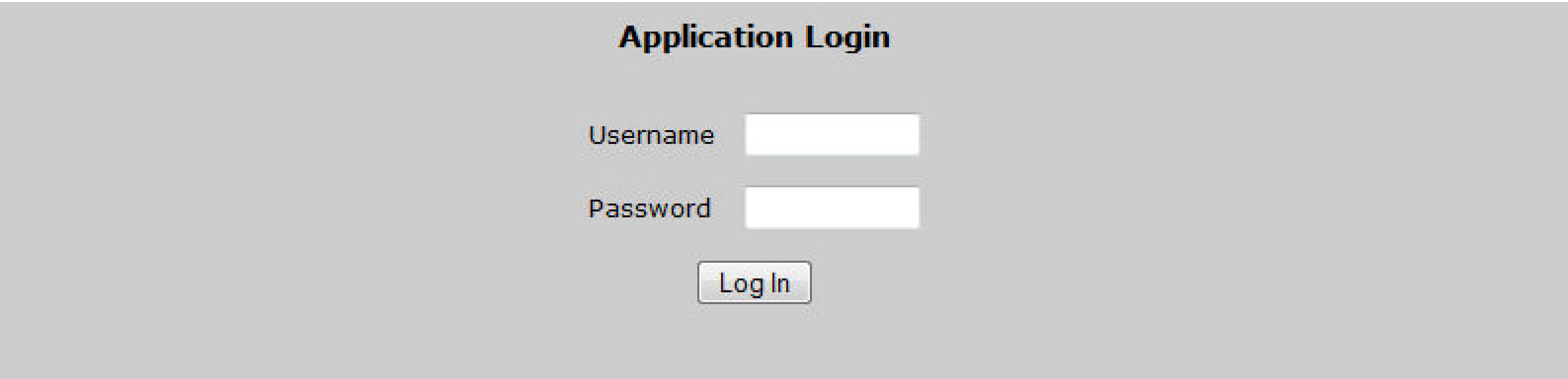


End User Login

End Users that are not administrators of the system have their own dedicated address for logging into a project instance. On Aspect Server products such as Facility and Enterprise, the user must navigate to the instance they are permitted to log in to.

In the case of a project located on Instance 1, a user would navigate to http://servername/1/. In the case of a project located on Instance 2, a user would navigate to http://servername/2/.

In this case, the user is taken to a Application Login page which directly links to the application after log-in.



Single Sign-On

ASPECT's Single Sign-on capability allows users to login once to any ASPECT Control Engine (**ACE**) and subsequently auto-login to any other **ACE** through URL link references nested within Aspect Graphic Pages. One target (typically an ASPECT-Enterprise server or NEXUS Series device) acts as a **Master Device** and is used to maintain user and group authentication and authorization stores that are subsequently synchronized between one **Master Device** and many **Satellite Devices** (Usually NEXUS Series or MATRIX series ACE Targets).

Things to Know and Do as Pre-Requisites

The following items should be considered and/or performed before you start this process.

1. ASPECT revision in all **ACE**s in the system must be 3.03.00 or newer.
2. Username/Password
    a. a. One administrative **m2m** ("Machine-to-Machine") username/password is required and is highly recommended that this username/password be a secure username/password and not shared with any user.
    b. b. This m2m username/password can be per site or universal per your companies' requirements.
    c. c. It is recommended that this username/password not be used as the main MIXAdmin username/password but will need to be in the MIXAdmin group.

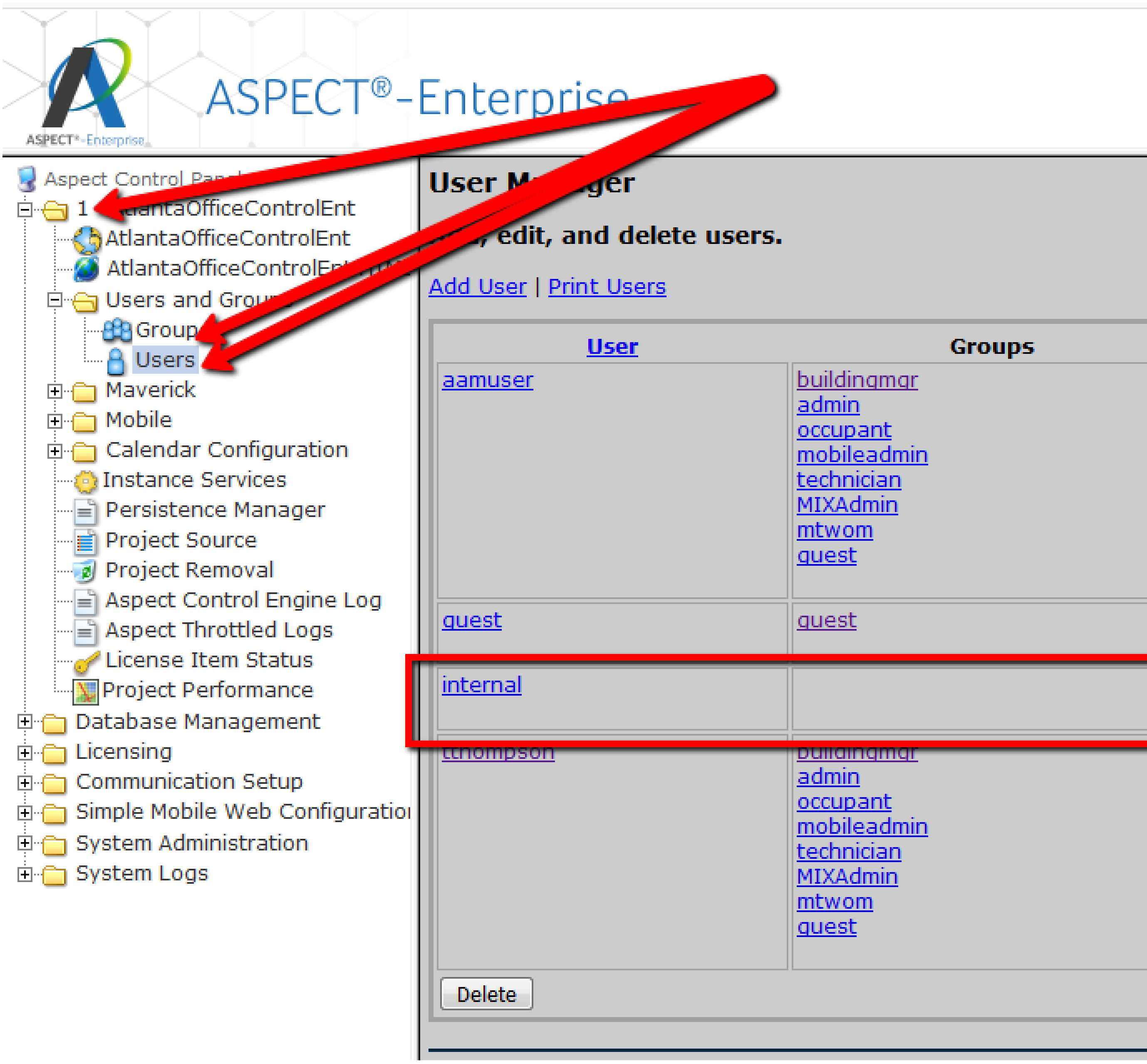
3. IP addresses of all **ACE**s in this system will need to be known up-front.
4. Single Sign-on is primarily used in an eMap system. Please refer to that section for additional details. Navigation thru the system must be planned for graphic to graphic
5. End User IntraNet must allow cookies between the **ACE**s

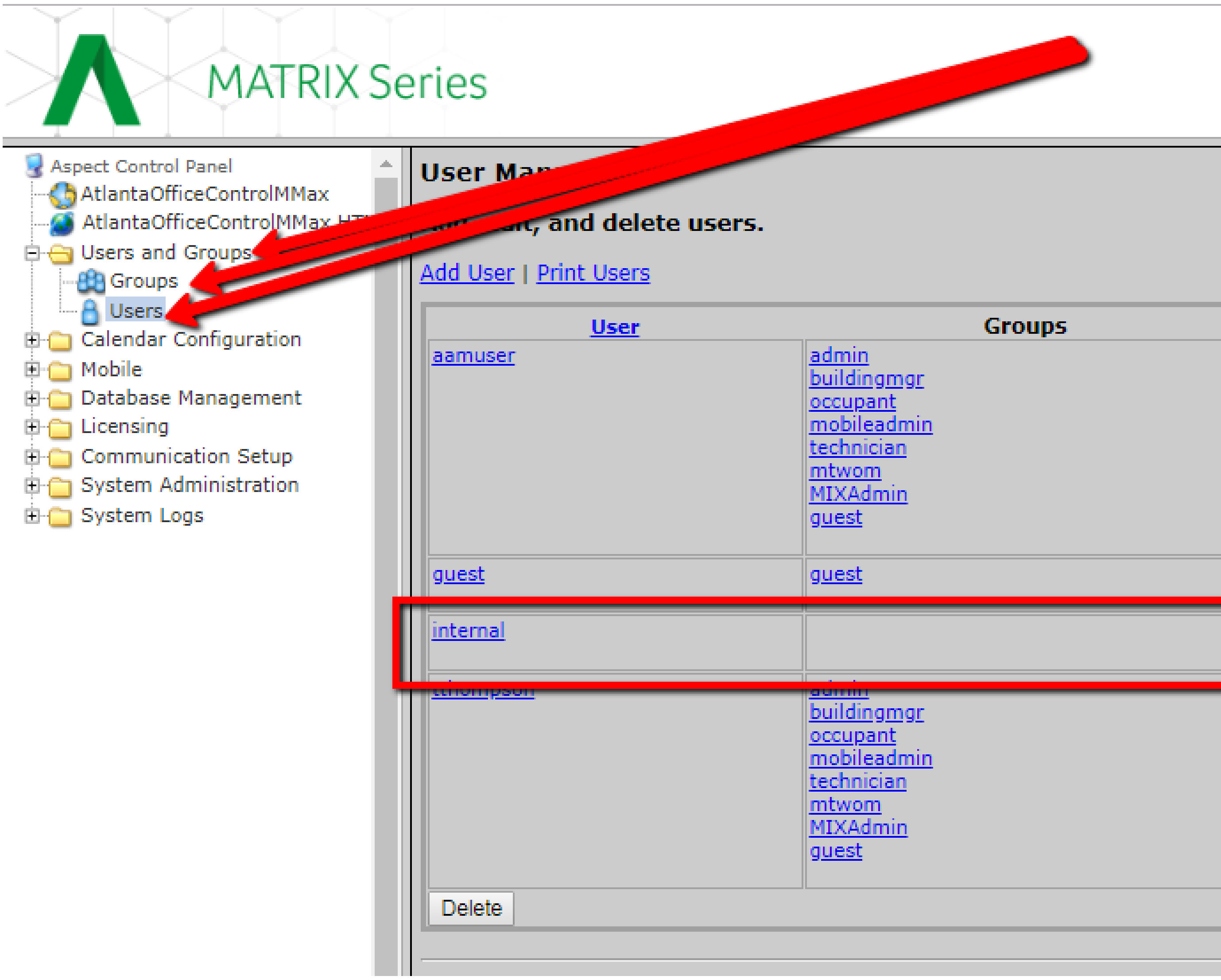
Authentication and Authorization Configuration

One administrative "**Machine-to-Machine**" ("**m2m**") username/password (i.e. a member of the "MIXAdmin" group) **MUST** be added to the **Master Device** and this user's password must **NEVER** change. It is highly recommended that this username and password combination is secure and not shared, and it cannot be the main MIXAdmin username/password.

Also, every **Satellite device** in the network must also have this same administrative user with the same password as the user on the **Master Device** - this is what allows the synchronization of authentication/authorization stores between devices. Please note that this shared user should be used when setting up eMap networks from ASPECT-Enterprise out to the Satellite devices to insure that eMap communications do not become compromised after credentails are synchronized to the Master server. This **m2m** Master username/password is what allows the synchronization of authentication/authorization between **ACE**s.

To set the m2m Maseter username up: on the **Master Device** or any **Satellite Device**, open the Users and Groups > Users page in the **ACE** WebUI:


ASPECT®-Enterprise
Aspect Control Panel
1
AtlantaOfficeControlEnt
AtlantaOfficeControlEnt
Users and Groups
Groups
Users
Maverick
Mobile
Calendar Configuration
Instance Services
Persistence Manager
Project Source
Project Removal
Aspect Control Engine Log
Aspect Throttled Logs
License Item Status
Project Performance
Database Management
Licensing
Communication Setup
Simple Mobile Web Configuratio
System Administration
System Logs
User Manager
edit, and delete users.
Add User | Print Users
User
Groups
aamuser
buildingmgr
admin
occupant
mobileadmin
technician
MIXAdmin
mtwom
guest
guest
guest
internal
tthompson
buildingmgr
admin
occupant
mobileadmin
technician
MIXAdmin
mtwom
guest
Delete

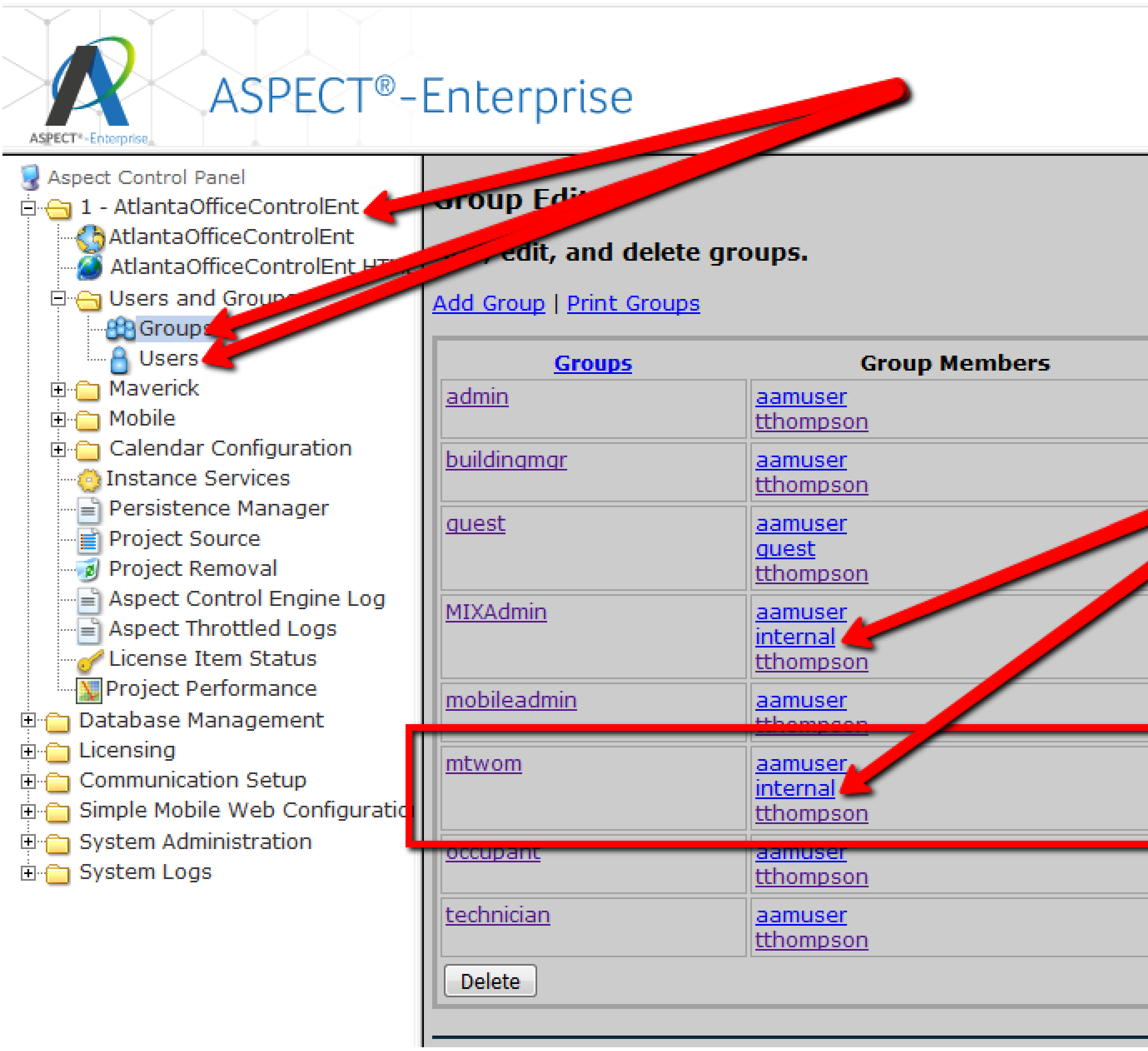


Setting up of a separate **m2m Group** is recommended but not mandatory.To set groups up on the **Master Device** or any **Satellite Device** , open the Users and Groups > Groups page in the **ACE** WebUI.

In the following example, the **m2m** group is called mtwom.

> **Note**: The **m2m** group is not restricted an any way and the name presented here is just for example. This username will be displayed on following screens and if you choose to name the **m2m** group something other than the example given, please remember to use that group name instead of the one shown here.

> **NOTE:** If you are using MIXAdmin as the group for the common m2m user then there is no need to modify anything in groups.



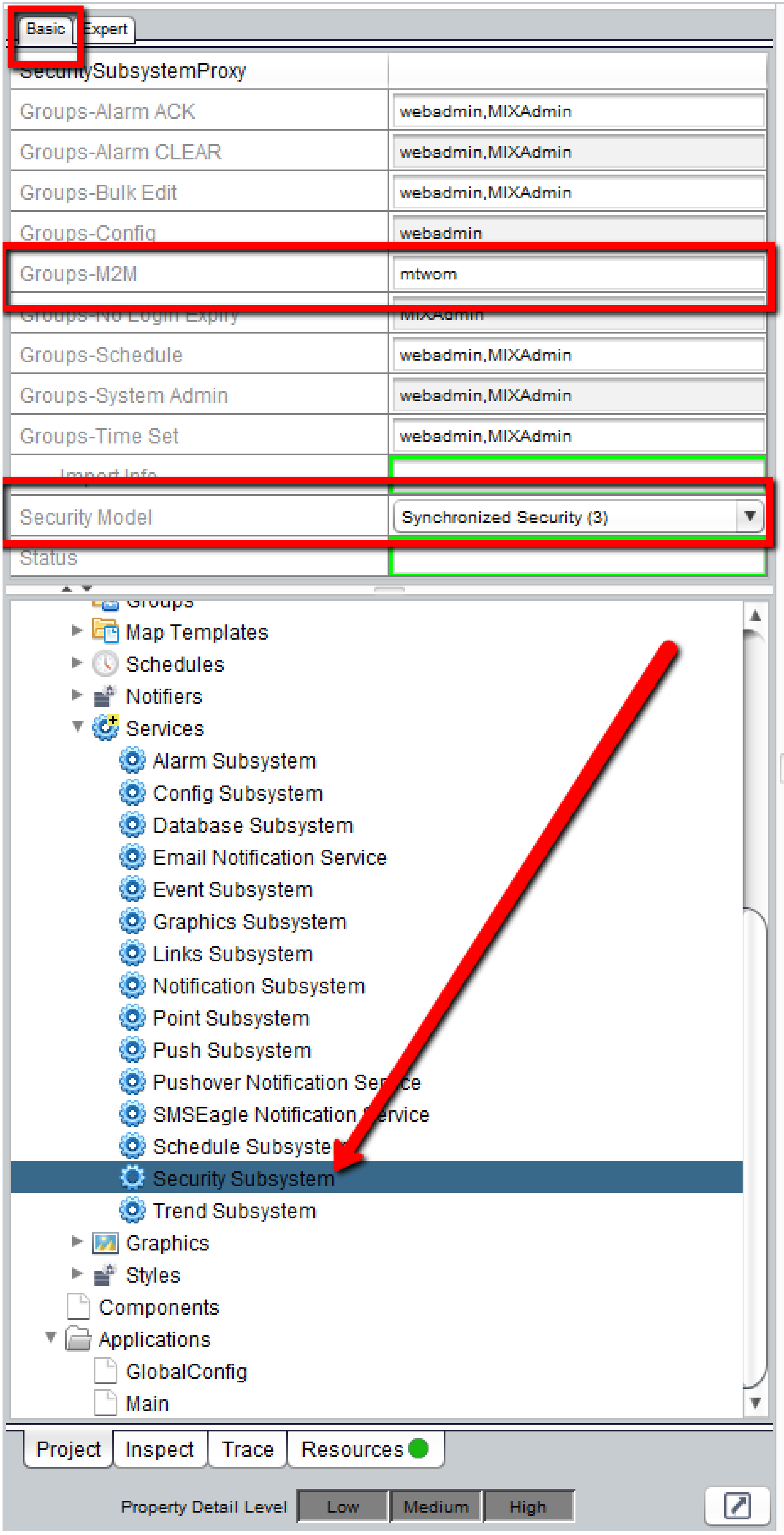
NOTE: When modifying user and group credentials on a ASPECT-Enterprise or **ACE** Target, credentials must be edited from the **Users and Groups** node under the Project Instance menu option. If you are editing credentials on a MATRIX Series **Satellite device** then use the Users and Groups menu option from the root of the navagation menu in the WebUI.

Project Setup and Configuration for the Master Device

In Aspect© Studio, open the Master Device Project and in Services, the Security Subsystem Basic Tab:

• Groups-M2M should be set to the m2m group as previously defined

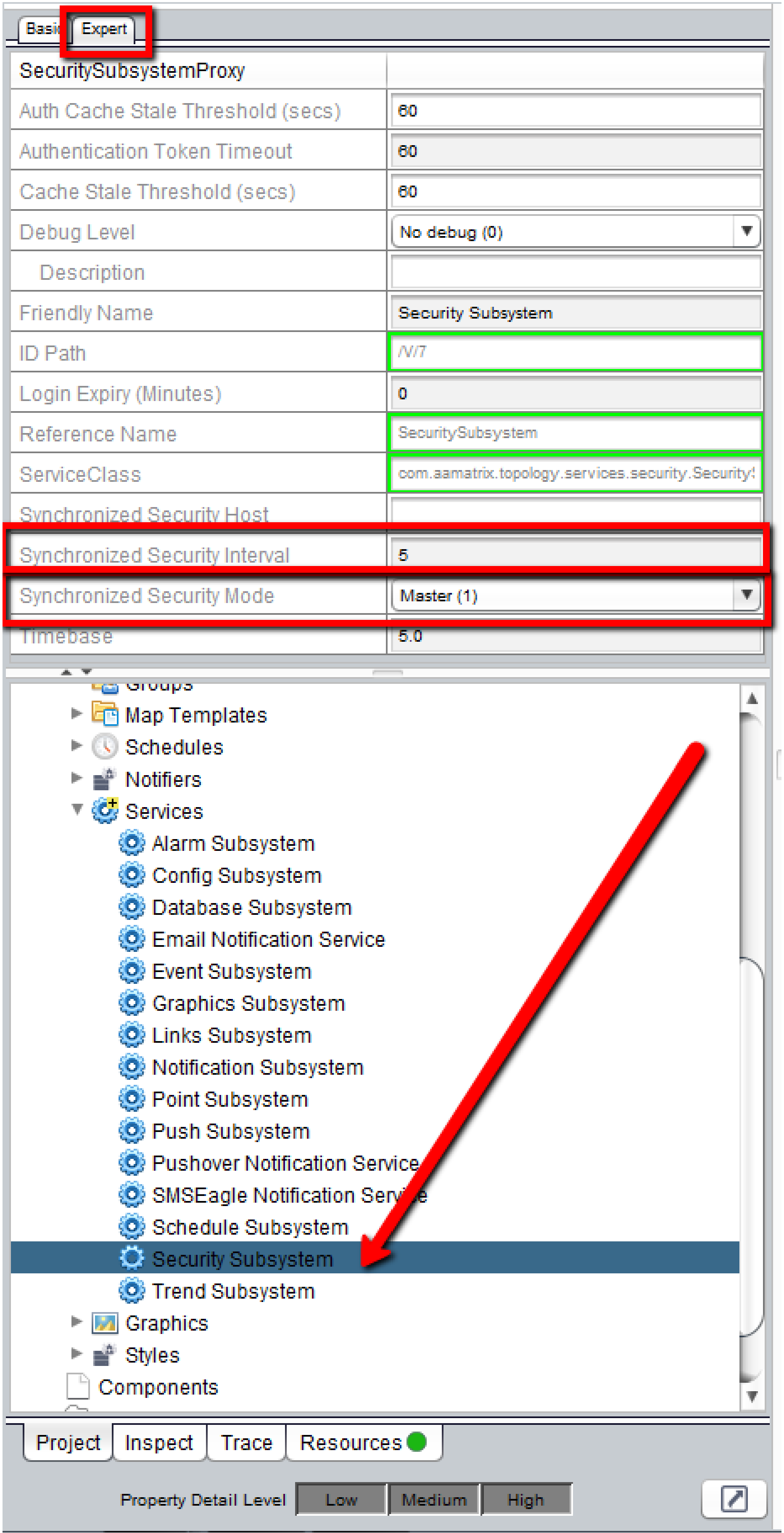
• Security Model should be set to Synchronized Security (3).


Basic
Expert
SecuritySubsystemProxy
Groups-Alarm ACK
webadmin,MIXAdmin
Groups-Alarm CLEAR
webadmin,MIXAdmin
Groups-Bulk Edit
webadmin,MIXAdmin
Groups-Config
webadmin
Groups-M2M
mtwom
Groups-Schedule
webadmin,MIXAdmin
Groups-System Admin
webadmin,MIXAdmin
Groups-Time Set
webadmin,MIXAdmin
Security Model
Synchronized Security (3)
Status
Map Templates
Schedules
Notifiers
Services
Alarm Subsystem
Config Subsystem
Database Subsystem
Email Notification Service
Event Subsystem
Graphics Subsystem
Links Subsystem
Notification Subsystem
Point Subsystem
Push Subsystem
Security Subsystem
Trend Subsystem
Graphics
Styles
Components
Applications
GlobalConfig
Main
Project
Inspect
Trace
Resources
Property Detail Level
Low
Medium
High

In the Master Device project, in Services, the Security Subsystem Expert Tab:

• Synchronized Security Interval needs to be set (5 is the recommended value so that Synchronize credentials occur every 5 minutes).

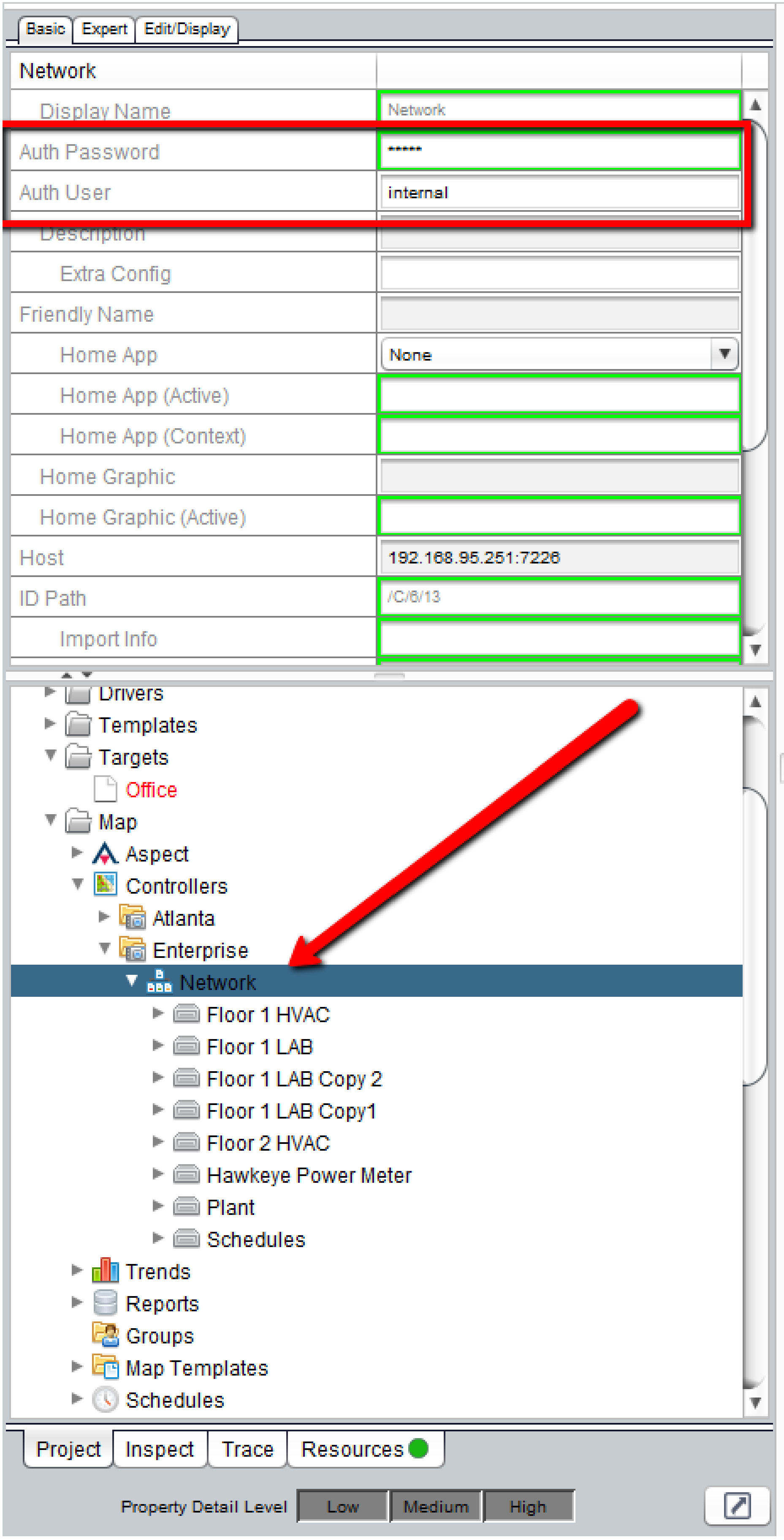
• Synchronized Security Mode should be set to Master (1).


Basic
Expert
SecuritySubsystemProxy
Auth Cache Stale Threshold (secs)
60
Authentication Token Timeout
60
Cache Stale Threshold (secs)
60
Debug Level
No debug (0)
Description
Friendly Name
Security Subsystem
ID Path
/V/7
Login Expiry (Minutes)
0
Reference Name
SecuritySubsystem
ServiceClass
com.aamatrix.topology.services.security.Security
Synchronized Security Host
Synchronized Security Interval
5
Synchronized Security Mode
Master (1)
Timebase
5.0
Groups
Map Templates
Schedules
Notifiers
Services
Alarm Subsystem
Config Subsystem
Database Subsystem
Email Notification Service
Event Subsystem
Graphics Subsystem
Links Subsystem
Notification Subsystem
Point Subsystem
Push Subsystem
Pushover Notification Service
SMSEagle Notification Service
Schedule Subsystem
Security Subsystem
Trend Subsystem
Graphics
Styles
Components
Project
Inspect
Trace
Resources
Property Detail Level
Low
Medium
High

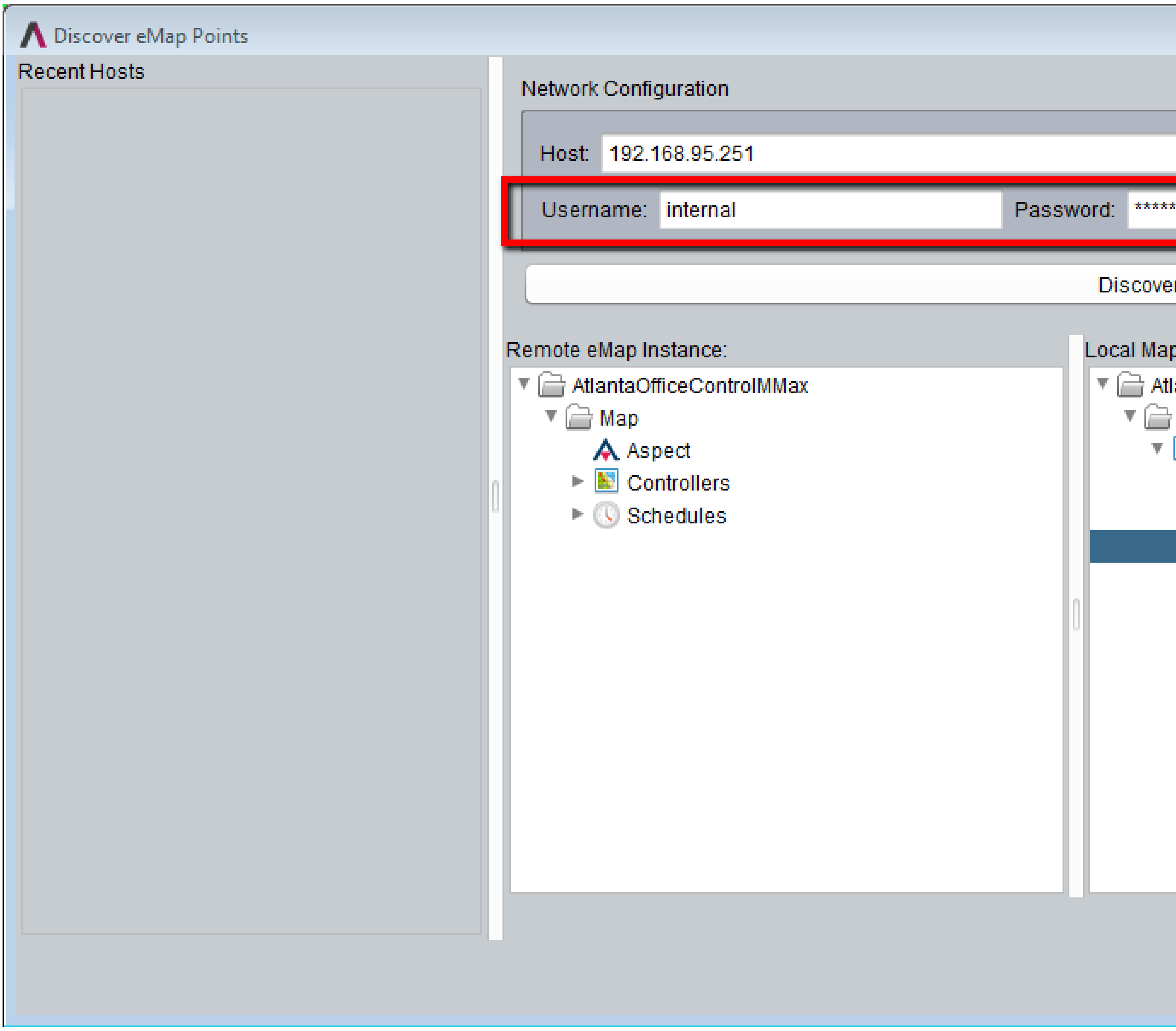
In the Master Device Project and in each existing eMap Network, the Basic Tab:

• Auth Password is set to the m2m username's password. (Don't be alarmed if the password is not displayed)

• Auth User is set to the m2m username.


Basic
Expert
Edit/Display
Network
Display Name
Network
Auth Password
*****
Auth User
internal
Description
Extra Config
Friendly Name
Home App
None
Home App (Active)
Home App (Context)
Home Graphic
Home Graphic (Active)
Host
192.168.95.251:7226
ID Path
/C/6/13
Import Info
Drivers
Templates
Targets
Office
Map
Aspect
Controllers
Atlanta
Enterprise
Network
Floor 1 HVAC
Floor 1 LAB
Floor 1 LAB Copy 2
Floor 1 LAB Copy1
Floor 2 HVAC
Hawkeye Power Meter
Plant
Schedules
Trends
Reports
Groups
Map Templates
Schedules
Project
Inspect
Trace
Resources
Property Detail Level
Low
Medium
High

In the Master Device Project and for each new eMap Network, the m2m username and password will need to be entered as the Username and Password. (Don't be alarmed if the password is not displayed)

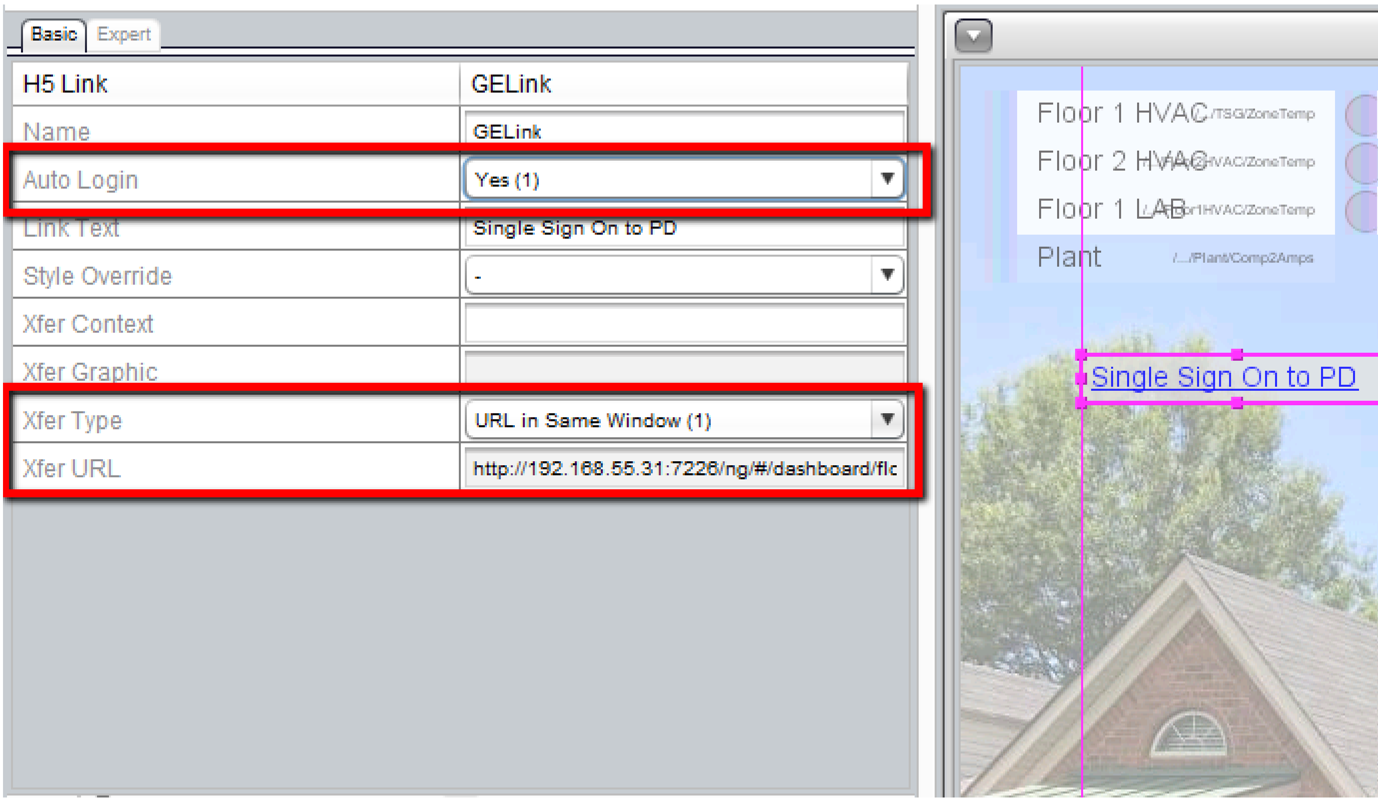


In the Master Device Project each H5Link Basic Tab:

• Auto Login set to Yes (1)

• Xfer Type set to your preferences. (in this example I used URL in Same Window (1)

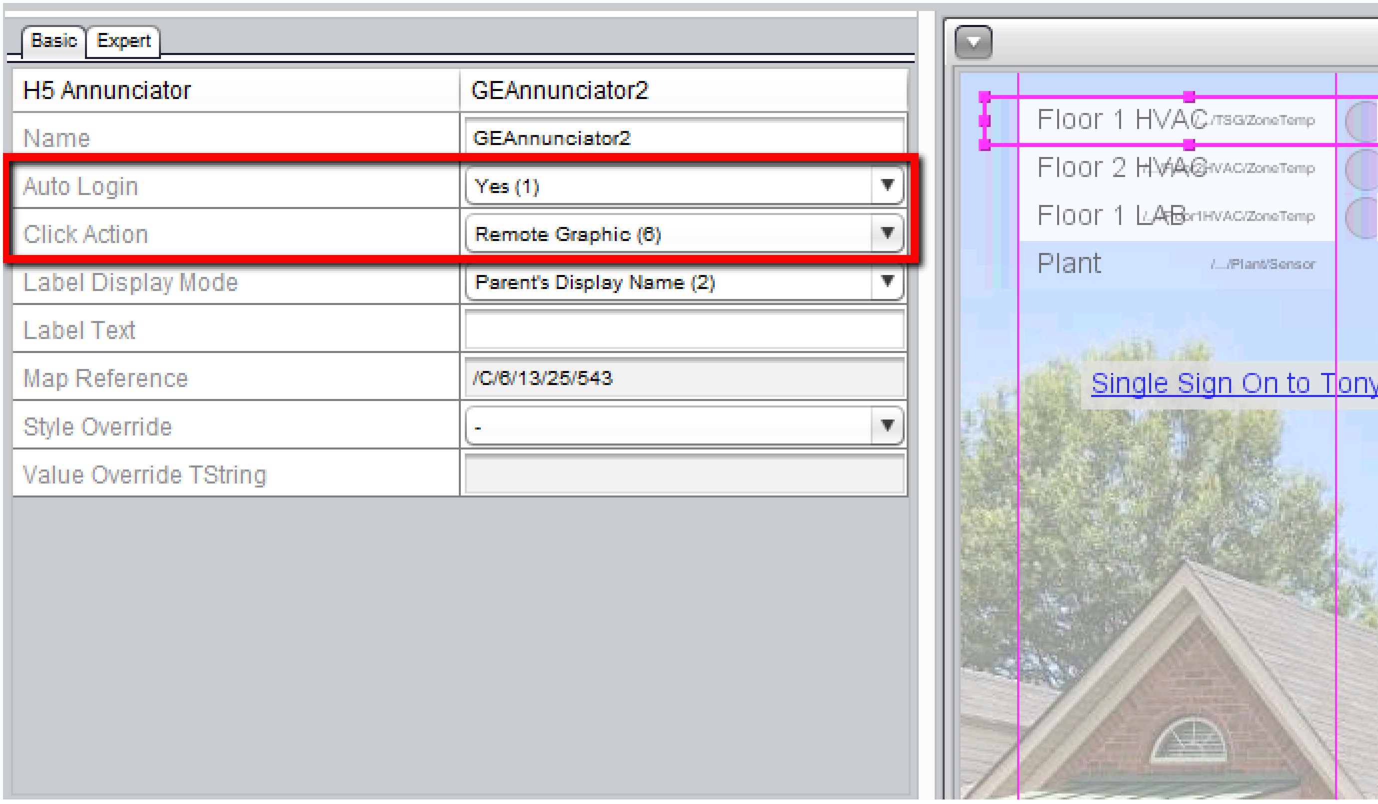
• Xfer URL set to the Satellite Dashboard area which is IP Address or Host-name ended with :7226 (don't forget the colon)



In the Master Device Project each H5Annunicator used for a Value such as Temperatures and Setpoints, the Basic Tab

- Auto Login set to Yes (1)
- Xfer Type set to Remote Graphic (6).

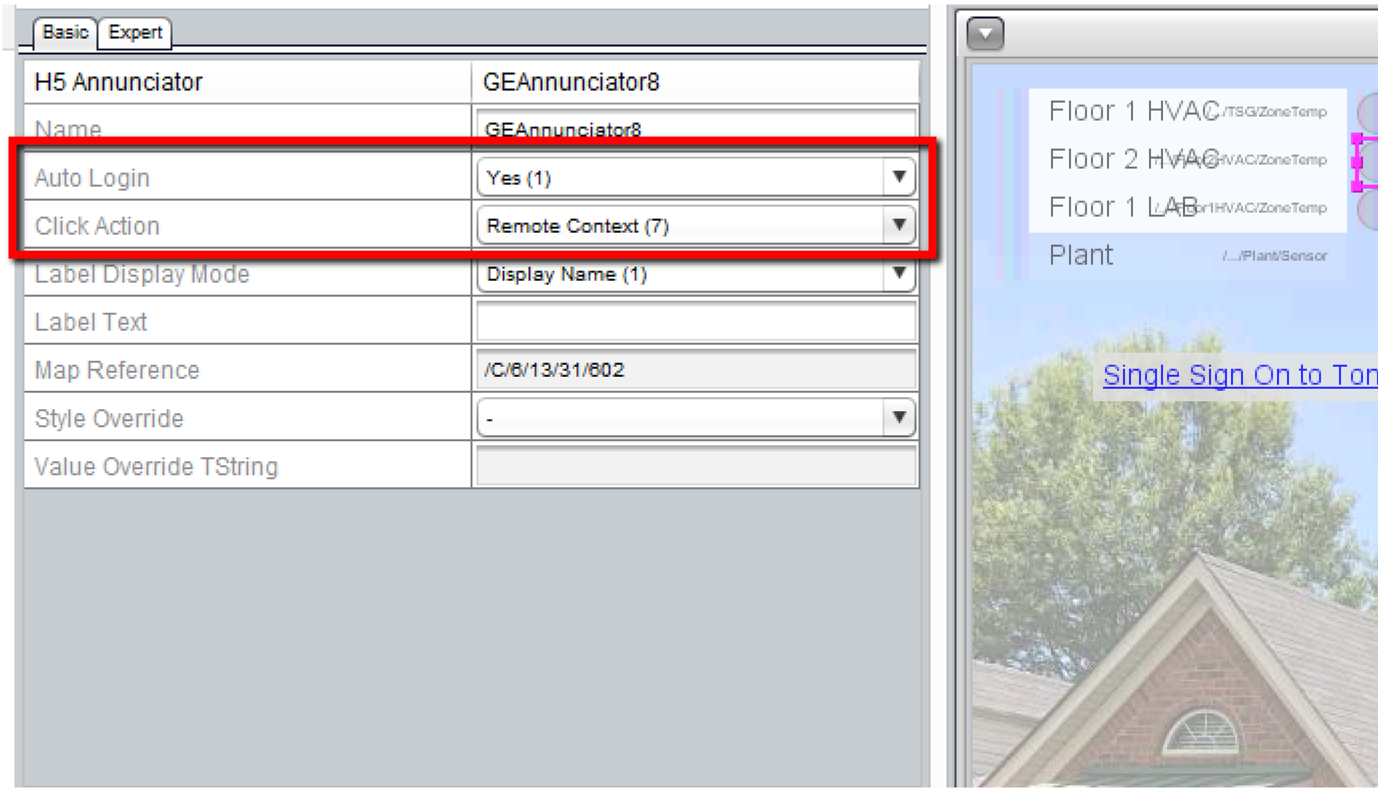
(NOTE: Map Reference is already set to Point Value From eMap Network)



In the Master Device Project each H5Annunicator used for Context such as Schedules and Calendars, the Basic Tab:

- Auto Login set to Yes (1)
- Xfer Type set to Remote Context (7).

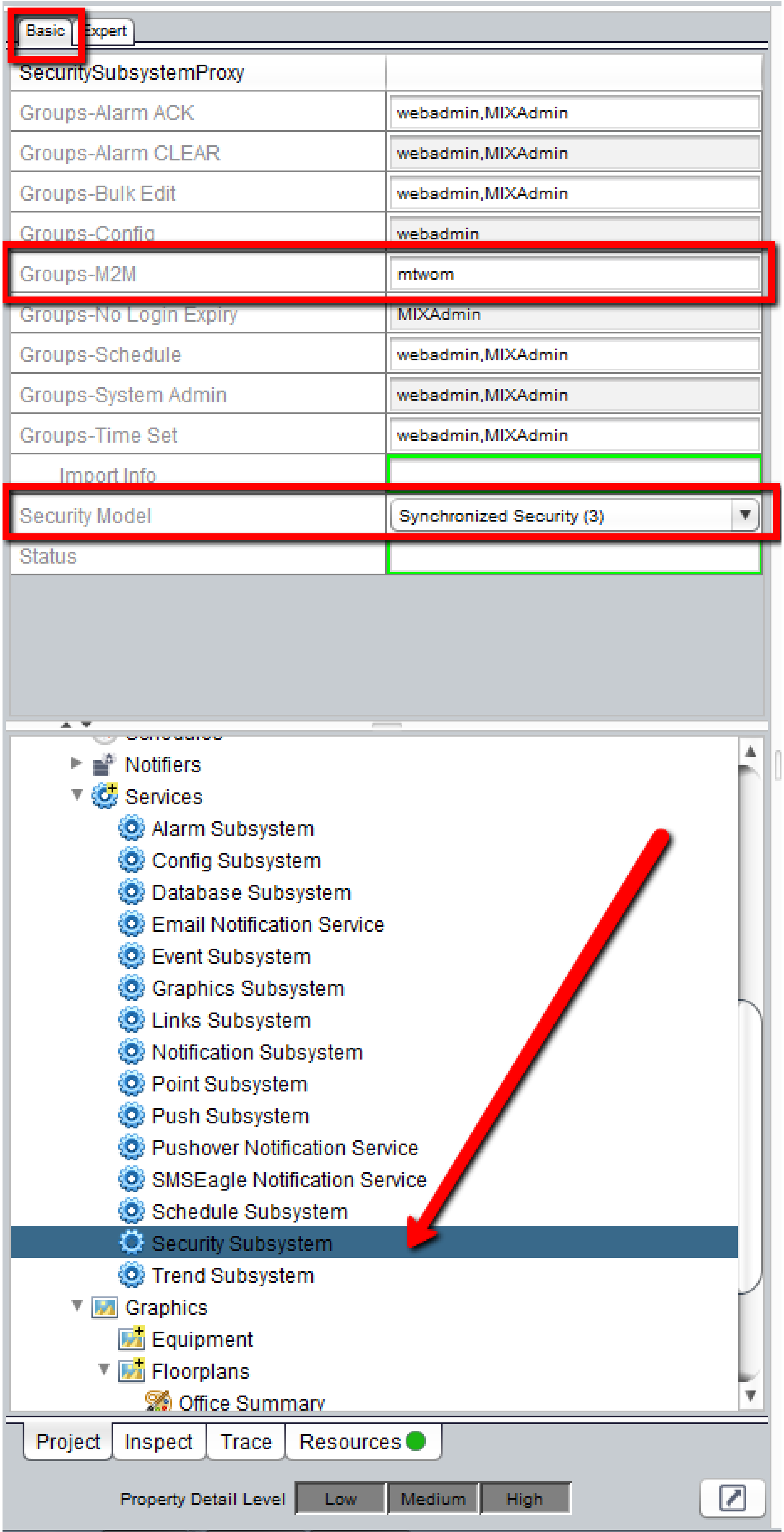
(NOTE: Map Reference is already set to Point Value From eMap Network)



Project Setup and Configuration for the Satellite Devices

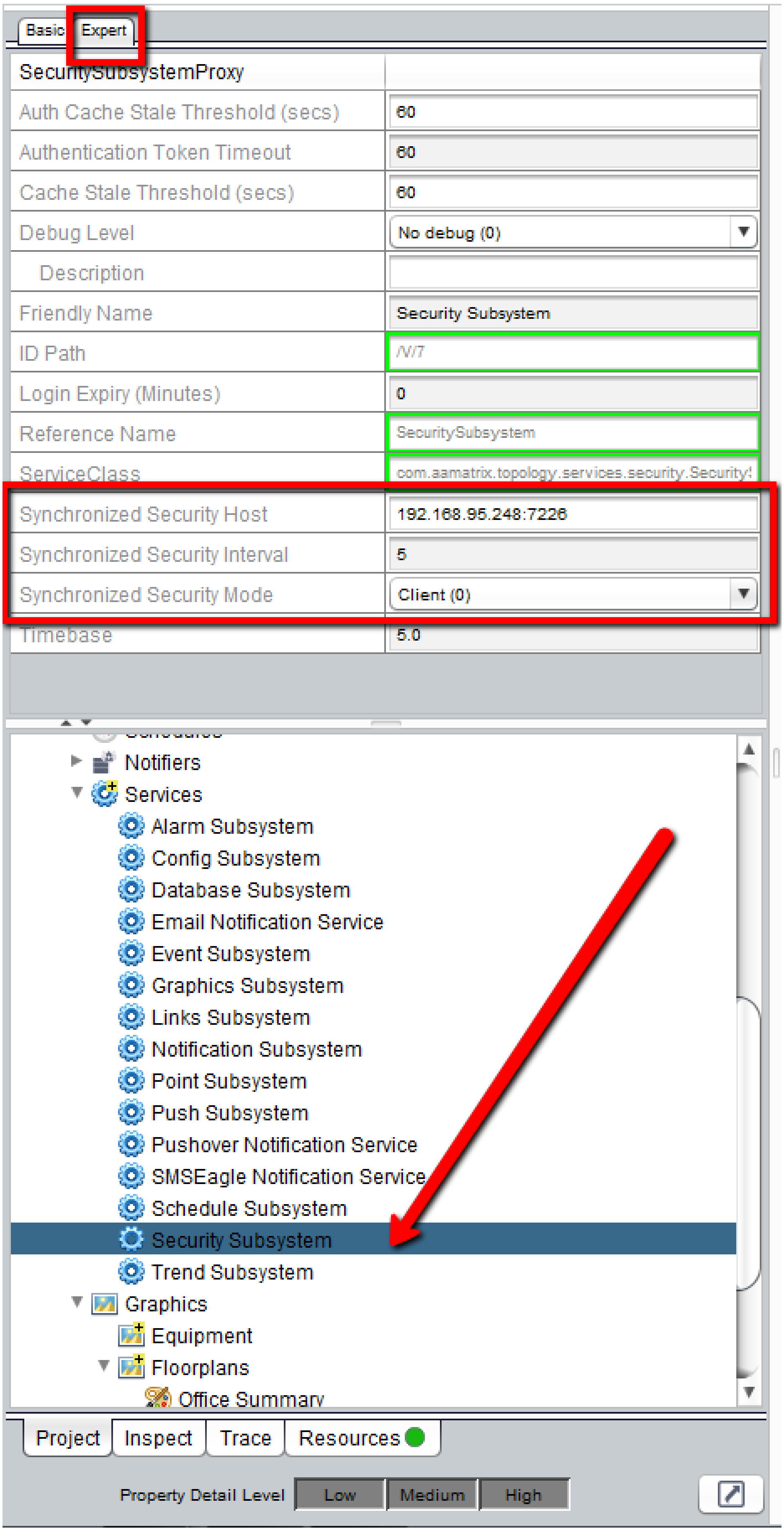
In ASPECT-Studio, open each of the **Satellite Device** Projects and in Services, the Security Subsystem Basic Tab:

- Groups-M2M should be set to the m2m group previously defined
- Security Model should be set to Synchronized Security (3).


Basic
Expert
SecuritySubsystemProxy
Groups-Alarm ACK
webadmin,MIXAdmin
Groups-Alarm CLEAR
webadmin,MIXAdmin
Groups-Bulk Edit
webadmin,MIXAdmin
Groups-Config
webadmin
Groups-M2M
mtwom
Groups-No Login Expiry
MIXAdmin
Groups-Schedule
webadmin,MIXAdmin
Groups-System Admin
webadmin,MIXAdmin
Groups-Time Set
webadmin,MIXAdmin
Import Info
Security Model
Synchronized Security (3)
Status
Notifiers
Services
Alarm Subsystem
Config Subsystem
Database Subsystem
Email Notification Service
Event Subsystem
Graphics Subsystem
Links Subsystem
Notification Subsystem
Point Subsystem
Push Subsystem
Pushover Notification Service
SMSEagle Notification Service
Schedule Subsystem
Security Subsystem
Trend Subsystem
Graphics
Equipment
Floorplans
Office Summary
Project
Inspect
Trace
Resources
Property Detail Level
Low
Medium
High

In each of the Satellite Device Projects, in Services, the Security Subsystem Expert Tab:

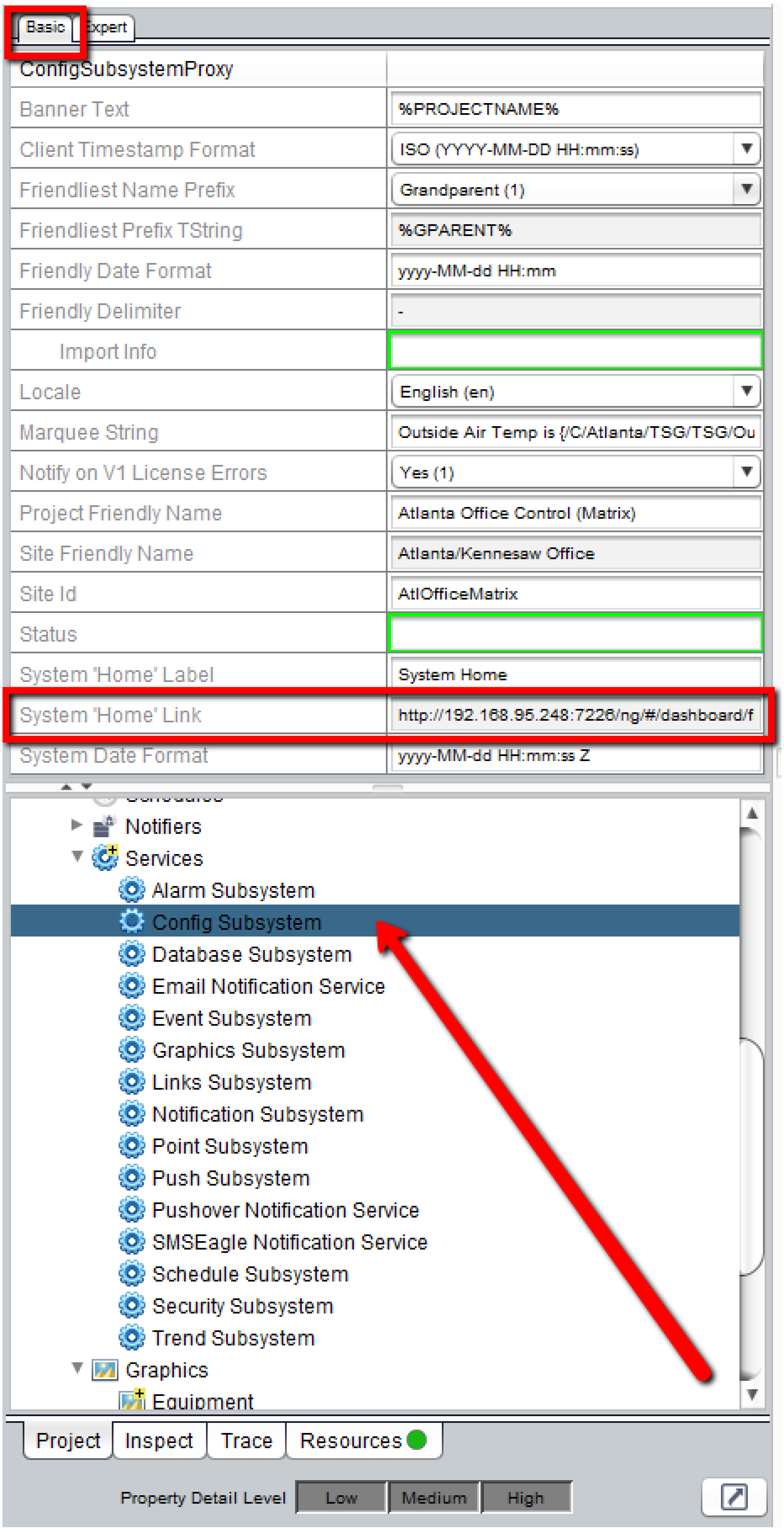
- Synchronized Security Host must contain the Hostname or IP address of the Master device ended with :7226 (don’t forget the colon).
- Synchronized Security Interval needs to be set (5 is the recommended value so that Synchronize credentials occur every 5 minutes).
- Synchronized Security Mode should be set to Client (0).


Basic
Expert
SecuritySubsystemProxy
Auth Cache Stale Threshold (secs)
60
Authentication Token Timeout
60
Cache Stale Threshold (secs)
60
Debug Level
No debug (0)
Description
Friendly Name
Security Subsystem
ID Path
/V/7
Login Expiry (Minutes)
0
Reference Name
SecuritySubsystem
ServiceClass
com.aamatrix.topology.services.security.Security
Synchronized Security Host
192.168.95.248:7226
Synchronized Security Interval
5
Synchronized Security Mode
Client (0)
Timebase
5.0
Notifiers
Services
Alarm Subsystem
Config Subsystem
Database Subsystem
Email Notification Service
Event Subsystem
Graphics Subsystem
Links Subsystem
Notification Subsystem
Point Subsystem
Push Subsystem
Pushover Notification Service
SMSEagle Notification Service
Schedule Subsystem
Security Subsystem
Trend Subsystem
Graphics
Equipment
Floorplans
Office Summary
Project
Inspect
Trace
Resources
Property Detail Level
Low
Medium
High

In each of the Satellite Device Projects, in Services, the Config Subsystem Basic Tab:

- System ‘Home’ Link must contain the Hostname or IP address of the Master device ended with :7226 (don’t forget the colon). This will get you to the Dashboard of the Master Device.

> **Note**: If you wish for the Target to go to ONE (1) and only ONE graphic (like a floorplan or list of controllers) then this is an acceptable substitute. Please see eMap Section for further details.


Basic
Expert
ConfigSubsystemProxy
Banner Text
%PROJECTNAME%
Client Timestamp Format
ISO (YYYY-MM-DD HH:mm:ss)
Friendliest Name Prefix
Grandparent (1)
Friendliest Prefix TString
%GPARENT%
Friendly Date Format
yyyy-MM-dd HH:mm
Friendly Delimiter
-
Import Info
Locale
English (en)
Marquee String
Outside Air Temp is {/C/Atlanta/TSG/TSG/Ou
Notify on V1 License Errors
Yes (1)
Project Friendly Name
Atlanta Office Control (Matrix)
Site Friendly Name
Atlanta/Kennesaw Office
Site Id
AtlOfficeMatrix
Status
System 'Home' Label
System Home
System 'Home' Link
http://192.168.95.248:7226/ng/#/dashboard/f
System Date Format
yyyy-MM-dd HH:mm:ss Z
Notifiers
Services
Alarm Subsystem
Config Subsystem
Database Subsystem
Email Notification Service
Event Subsystem
Graphics Subsystem
Links Subsystem
Notification Subsystem
Point Subsystem
Push Subsystem
Pushover Notification Service
SMSEagle Notification Service
Schedule Subsystem
Security Subsystem
Trend Subsystem
Graphics
Equipment
Project
Inspect
Trace
Resources
Property Detail Level
Low
Medium
High

WHen the steps above are complete all **Projects** can be re-deployed and your testing can start.

Direct Application Login Methods

Aspect supports the ability to log-in to an application without the need to continually enter login credentials.

Instance to Instance Navigation

In Aspect-Facility and Aspect-Enterprise projects that require you to navigate from one instance to another -it is possible to log-in to a system, or provide a URL that logs a user into a specific application, rather than the main application. To do this, Aspect supports a definable URL that can be crafted. The base URL configuration string is:

http://servername/1/?startapp=ApplicationName.

In order for navigation to the application to work as expected, the following rules must be met:

- servername - references your IP address or resolvable name for the Aspect target.
- 1 - references the Application instance. For Aspect-Matrix Area Controller, this value is always 1. For server products, this may vary based on the deployed instance.
- ApplicationName - references the case-sensitive Application name you wish the user to view. The exact case-usage for the Application name must be preserved, otherwise, log-in will be unsuccessful.

For example, if you have an application named "Vav101", the direct URL would be http://servername/1/?startapp=Vav101. Case sensitivity between the URL and the actual application name must be preserved. Failure to preserve case sensitivity will result in failure of successful navigation.

Navigating to Applications With Context and Credentials

In some custom applications where external navigation is created, custom navigation URLs can be created to pass not only the application name, but also transfer context as well as user credentials.

The format of this URL is as followed:

- startapp=Application Name - case sensitive, must match application name exactly.
- context=<Context String> - normally a comma separated list. Only valid when a startapp is specified. It is suggested that this should be
- username=<Aspect username> - optional/not recommended - must be used with password parameter
- password=<base64 encoded mix password> - optional/not recommended - must be used with user name parameter

Application Example 1

To load the MyApp application and pass context transfer string 123,Room101,VAV-1017,West Wing with the context string and log in as aamuser/default:

http://192.168.55.31/1/?

- In this case above, the %2C markers divide up each piece of context data, as %2C is a URL encoded replacement for commas.
- In this case above, the %20 marker is used to pass a space character, as %20 is a URL encoded replacement for commas.

Application Example 2

To load MyApp with the context string 123,

http://192.168.55.31/1/?

- In this case above, the %2C markers divide up each piece of context data, as %2C is a URLencoded replacement for commas.
- In this case above, the %24marker is used to pass the dollar sign character ($),as%24is a URL encoded replacement for dollar signs.

Application Notes

- The username/password parameters are for expert use only and must appear together. It is required that the password be base64 encoded. There are numerous tools online for performing base64 encode/decode - (http://meyerweb.com/)

- The embedded passwords should be of a low privilege or read-only user.

WARNING - If using username and password parameters within a "normal" web page link, the base64 encoding of the password plaintext is visible to anyone that can "view source" on the page or download the page contents. Please use caution with this feature in securing your site.

Aspect Control Panel

Aspect Instances

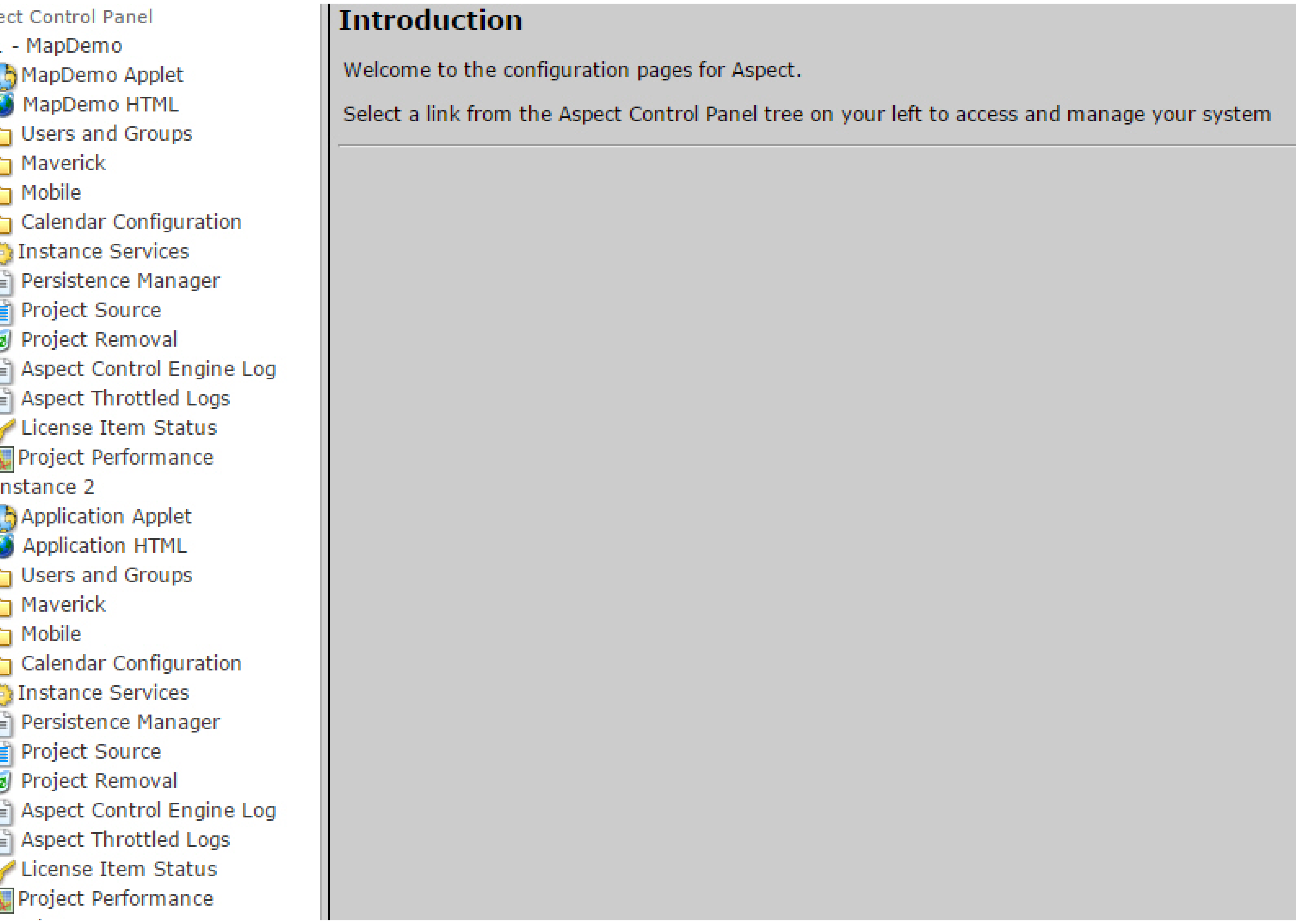
Instance Overview

At the lowest level of the Aspect architecture, each target supports the ability to permit one deployed project. In the case of Aspect-Matrix Area Controller, it is capable of hosting one deployed project.

In the case of server based targets such as Aspect-Facility and Aspect-Nexus, they are capable of hosting up to two project instances. One instance may be used for a graphical user interface, whereas the other instance can be used for additional global logic.

Aspect-Enterprise provides users with the ability to perform multi-instance execution of Aspect projects. Multi-instances within the Aspect-Enterprise product family can be used to divide up sites by building, location, or portions of a project. For example, Instance 1 may contain a project representing the graphical user interface for the building installation, whereas Instance 2 may be used to store critical logic performed by the server (such as trending, alarming, etc.) Additional instances past the base two provided with the product can be optionally licensed by contacting AAM Inside Sales for pricing and options.

Each instance includes its own set of Users/Groups, Calendar Configuration, and other items.



Each instance runs its own Aspect Control Engine - complete with its own User/Group Management, Source Archive, iCalendar Repository, and Service Controls. These instances are designed to allow technicians and engineers to perform service on separate instances and sections of an engineered project without interrupting other areas of the building automation system.

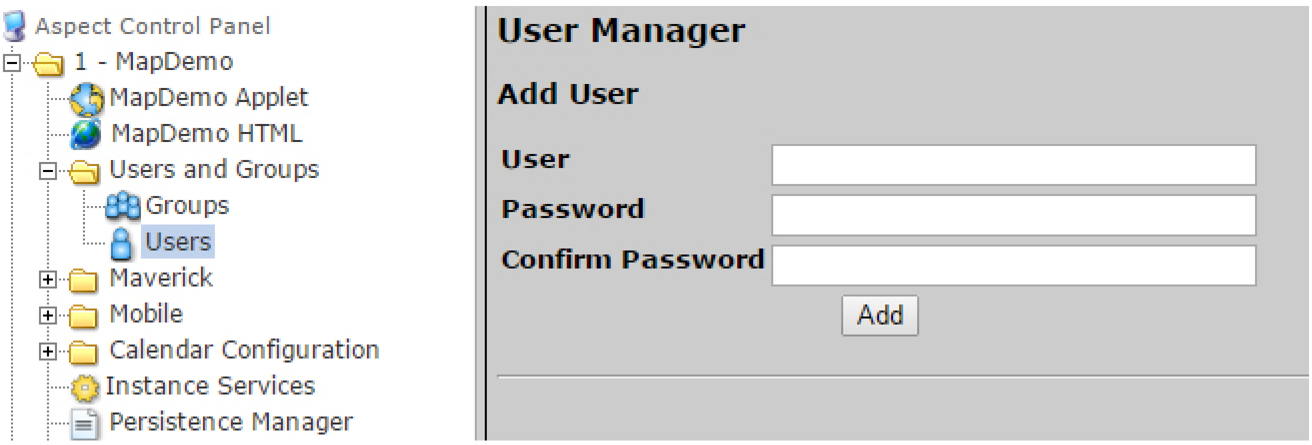
Users and Groups

Users

The Users page provides the ability view, print, add, and delete users from the Aspect control instance it serves.

Adding Users

To add a user, select the Add User link located above the User List. Fill in the name for the User, along with their password.   You will be required to confirm the password prior to successful creation of the user account.



The User Manager provides support for passwords containing the following:

- Uppercase Letters
  - ABCDEFGHIJKLMNOPQRSTUVWXYZ
- Lowercase Letters
  - abcdefghijklmnopqrstuvwxyz
- Numbers

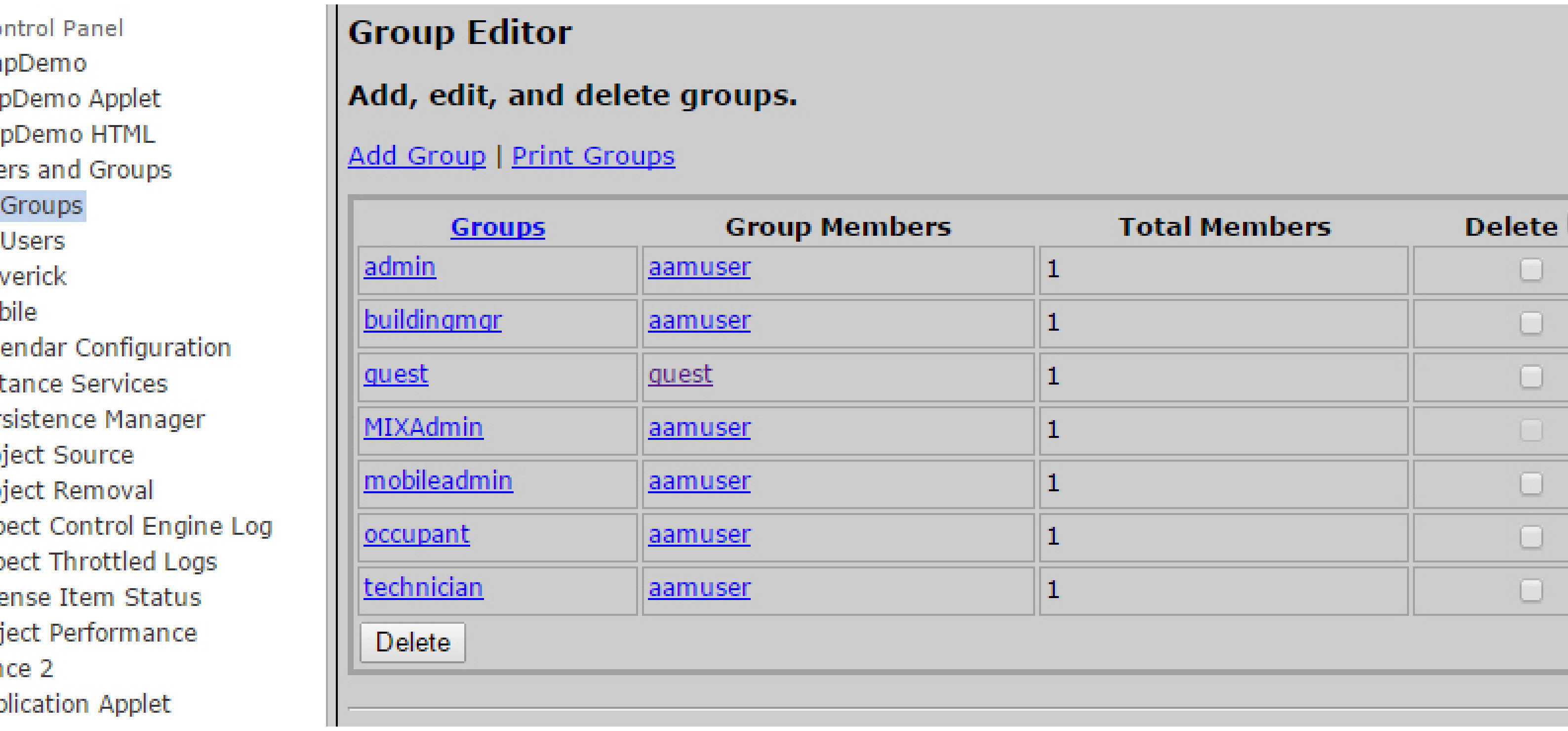
    - 0123456789
- Special Symbols
    - Underscore Symbol _
    - Hyphen Symbol -
    - Period Symbol .
    - Question Symbol ?
    - Exclamation Symbol !
    - At Symbol @
    - Hash Symbol #
    - Dollar Symbol $
    - Percent Symbol %
    - Caret Symbol ^
    - Ampersand Symbol &

Deleting Users

To delete a user, simply place a check next to the corresponding user in the overview page. Then, click Delete.

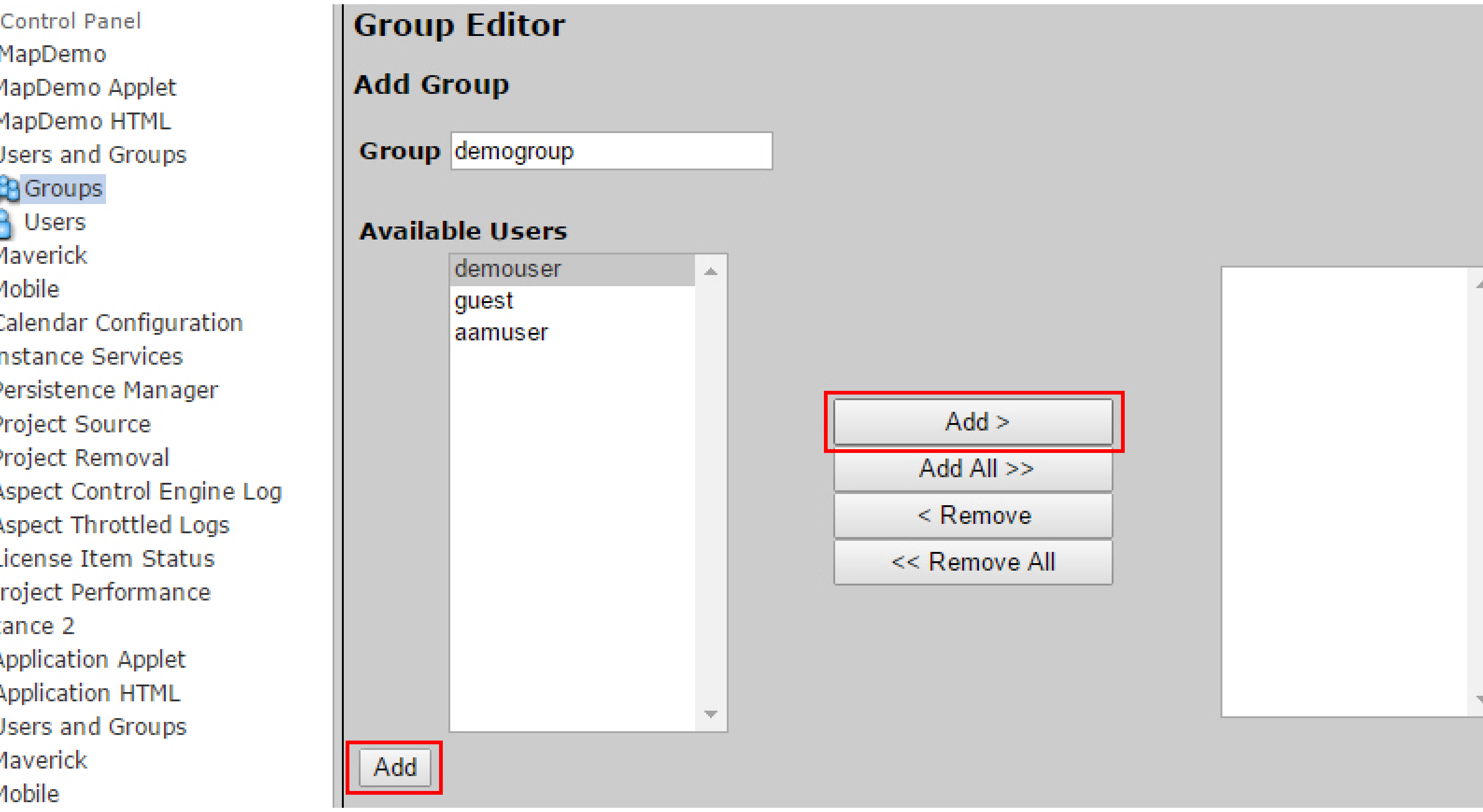
Groups

The Groups page provides the ability view, print, add, and delete user groups from the Aspect control instance it serves.



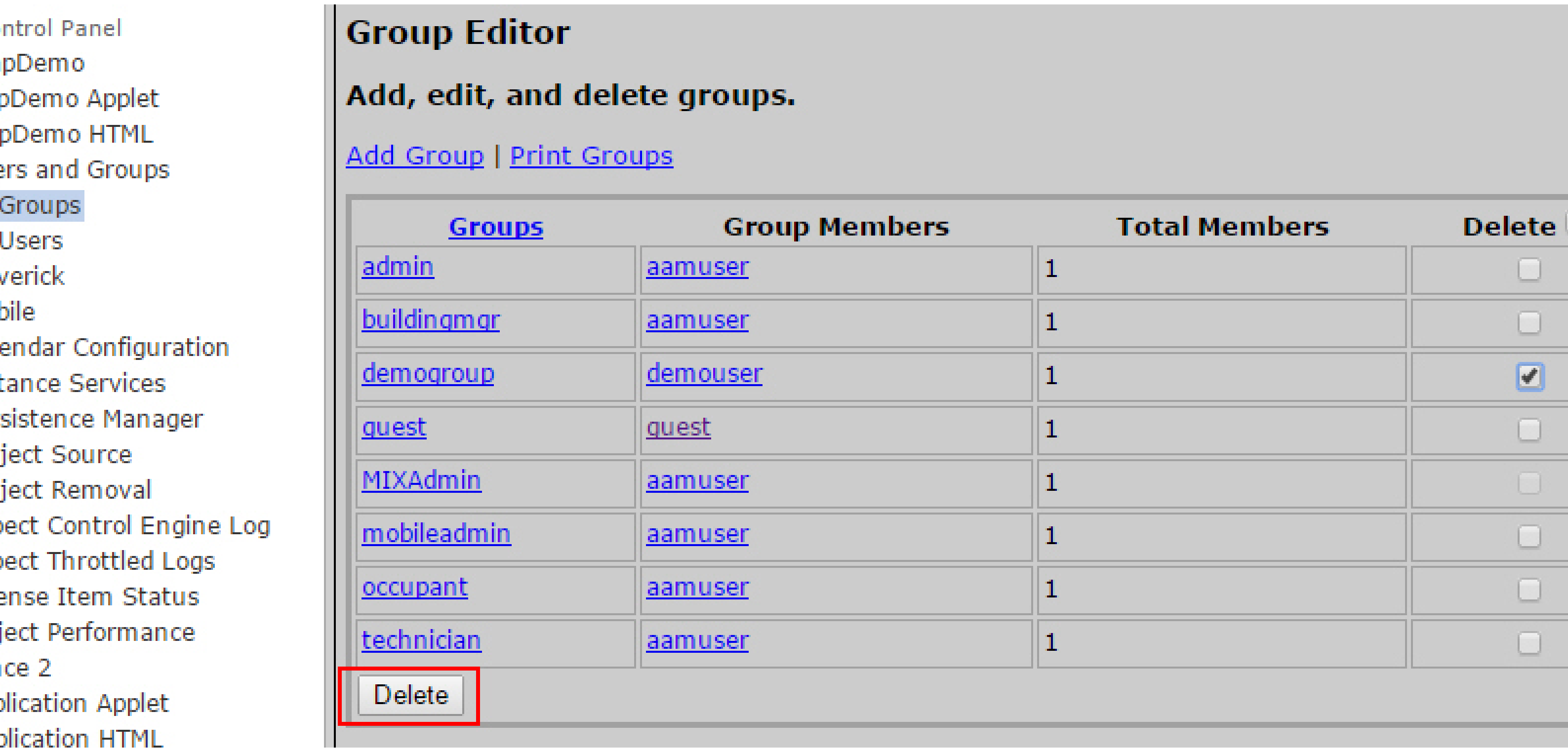
Adding Groups

To add a Group, select the Add User link located above the User List. Fill in the name for the Group, and select any users you wish to correspond with the Group. When done, click Add.



Deleting Groups

To delete a group, simply place a check next to the corresponding user in the overview page. Then, click Delete.

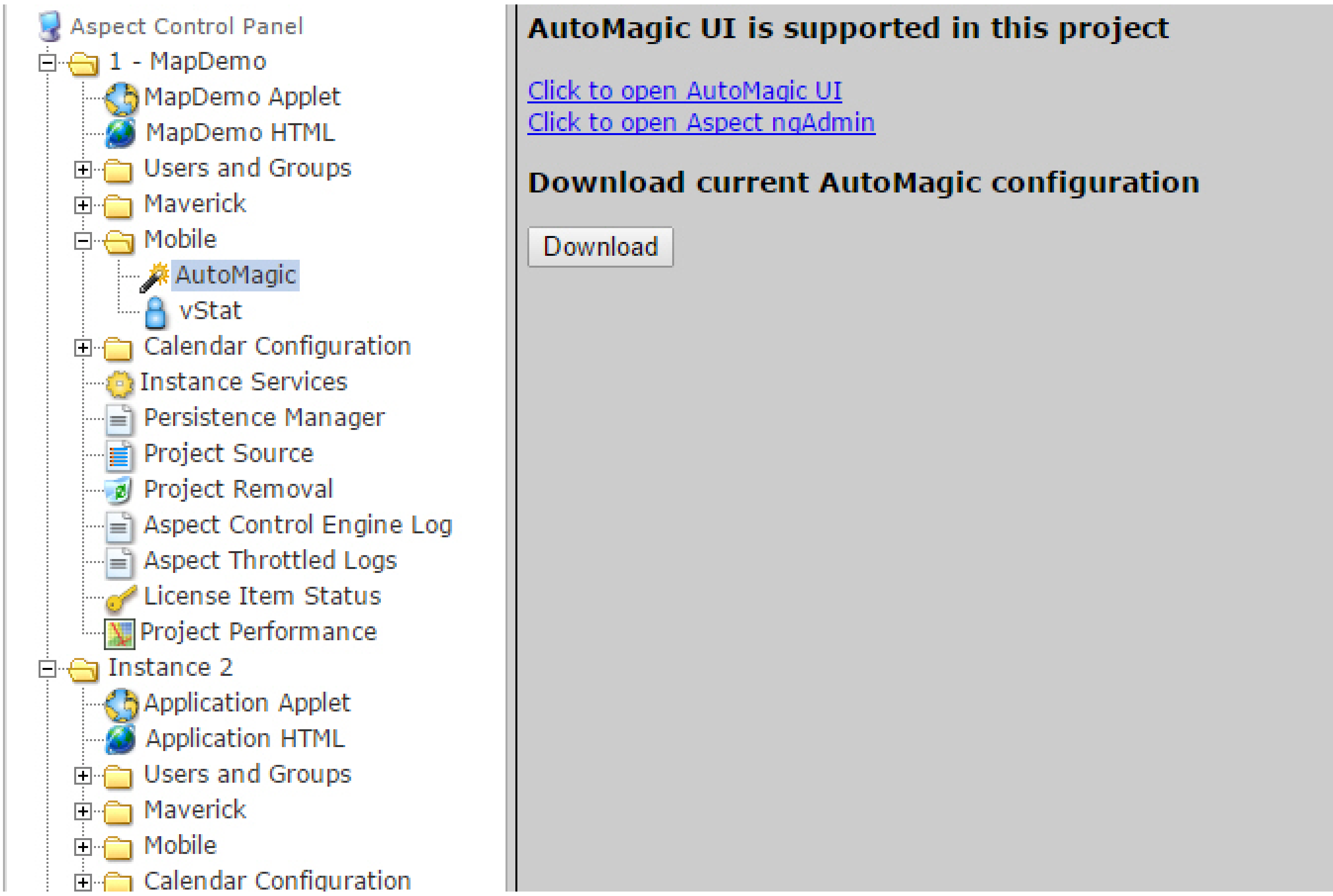


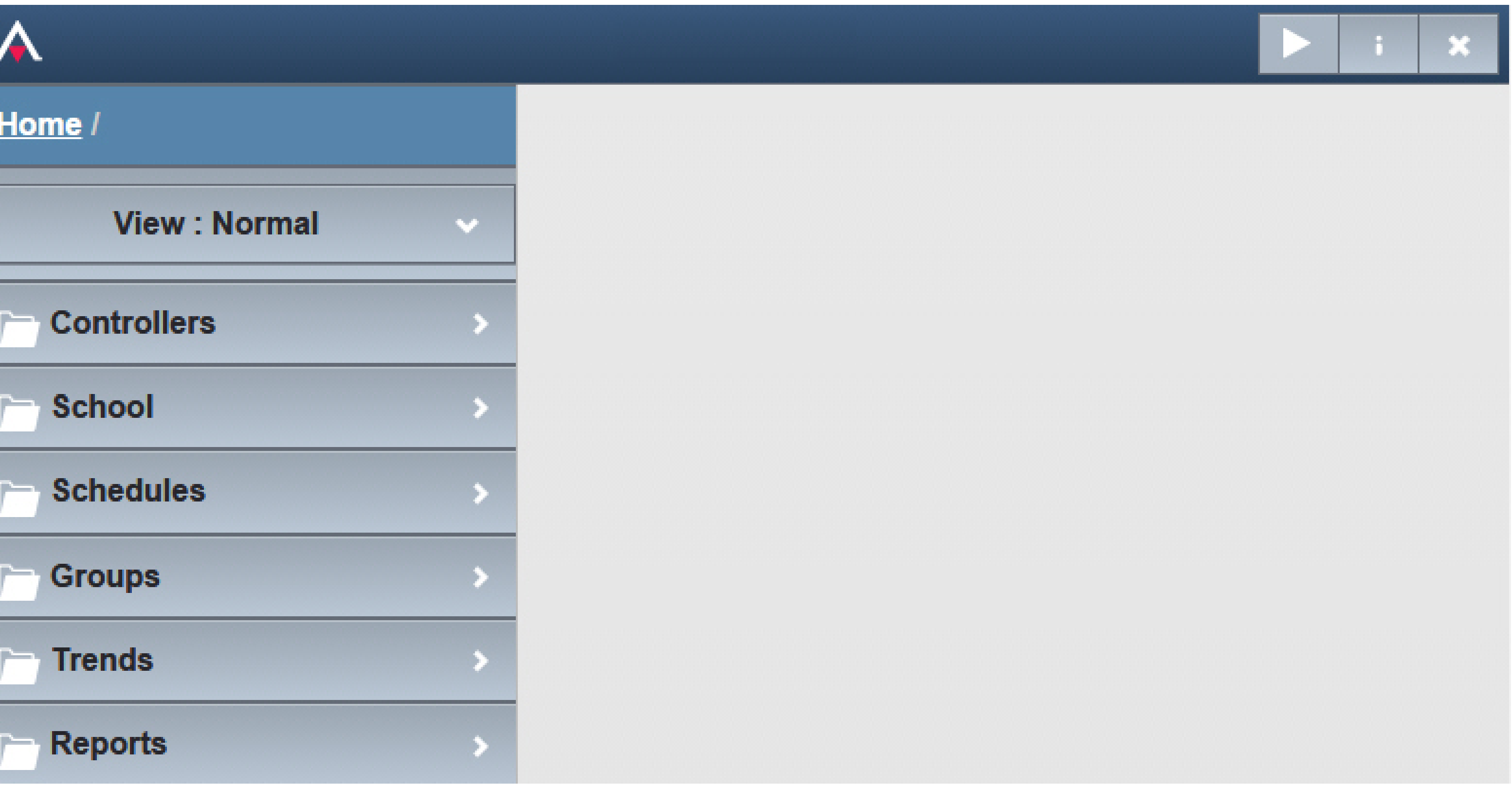
Mobile

Accessing the AutoMagic UI from the Aspect Control Panel

In order to access the AutoMagic HTML5 User Interface, navigate to the Aspect Control Panel (WebUI) of an Aspect target. When logging in as an administrative user, a Mobile folder is present under each licensed instance of Aspect. To open the AutoMagic UI, expand the Mobile group and select AutoMagic.

Click the "Click to open AutoMagic UI" link to open the AutoMagic UI.





The AutoMagic UI can also be access using the following URL formats:

- Instance 1: http://192.168.1.250:7226/automagic/
- Instance 2: http://192.168.1.250:7227/automagic/

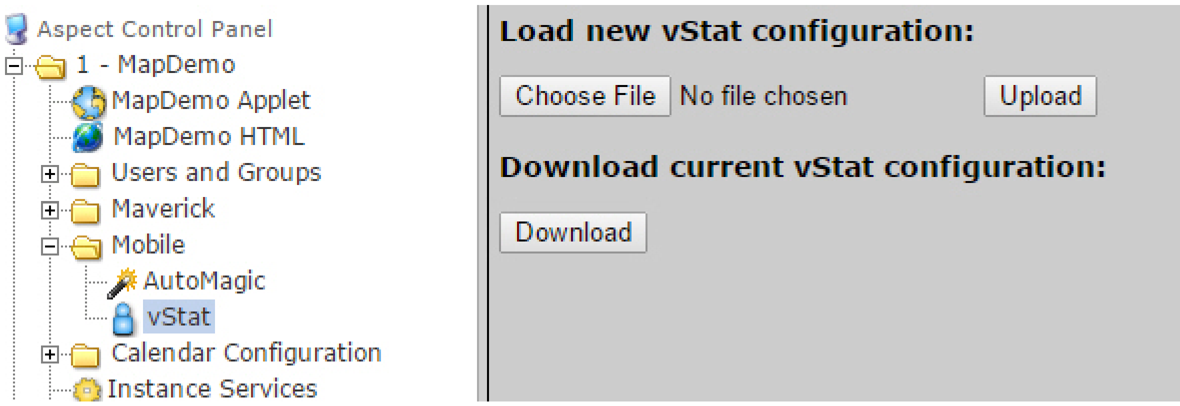
Note: Replace 192.168.1.250 with the IP address of your target platform. For Aspect Matrix systems, use the Instance 1 URL format.

Automagic Configuration Download

This page also provides a direct download link of a deployed project's mapconfig.db file. This file is provided for situations where it is not known if an end-user may have made changes to the system (enabled/disable trends, added or deleted points, etc.) since your last deployment.

Retrieving vSTAT Information from the Aspect Control Panel

Administration of vSTAT users is accomplished through the Aspect Control Panel (WebUI) of an Aspect target. When logging in as an administrative user, a Mobile folder is present under each licensed instance of Aspect. The page provides the ability to download the current vSTAT configuration.

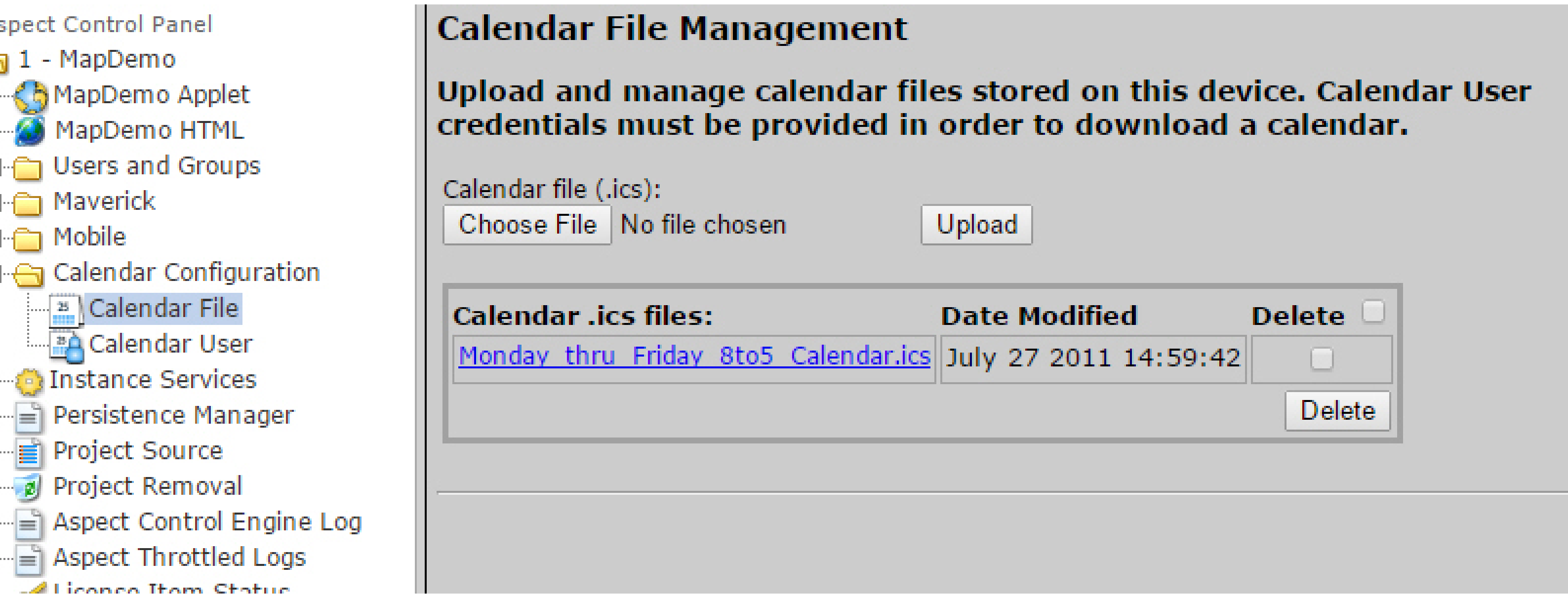


vSTAT configuration is downloaded as a .CSV file, which can be edited with any standard spreadsheet program such as Microsoft Excel, or even a text editor. To download the current configuration, click the download button and follow your browser's prompts to save the file locally to your PC.

Calendar Configuration

Calendar File

The Calendar File page provides centralized management of iCalendar files published to the specific instance of Aspect-Enterprise. On this page, users can view all of the iCalendar files that are published to the instance, along with their publish dates. Additionally, users can manually upload calendar files, as well as delete files from the system.

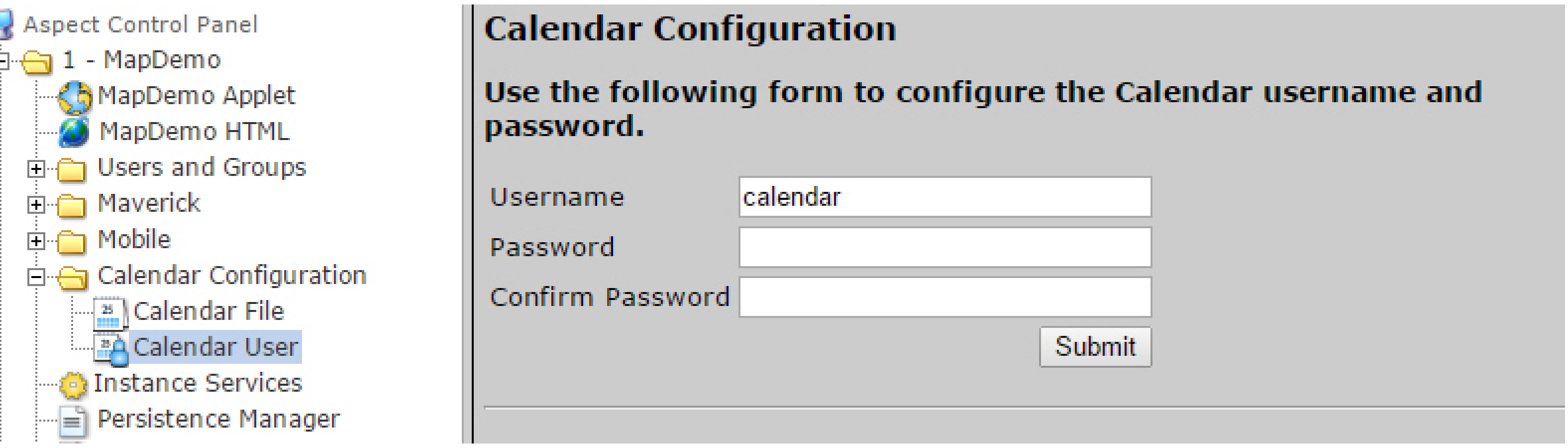


Calendar User

The Calendar User page is used to configure credentials that are required by Aspect's iCalendar system to publish calendars to the target. By default, all Aspect targets use the following default credentials:

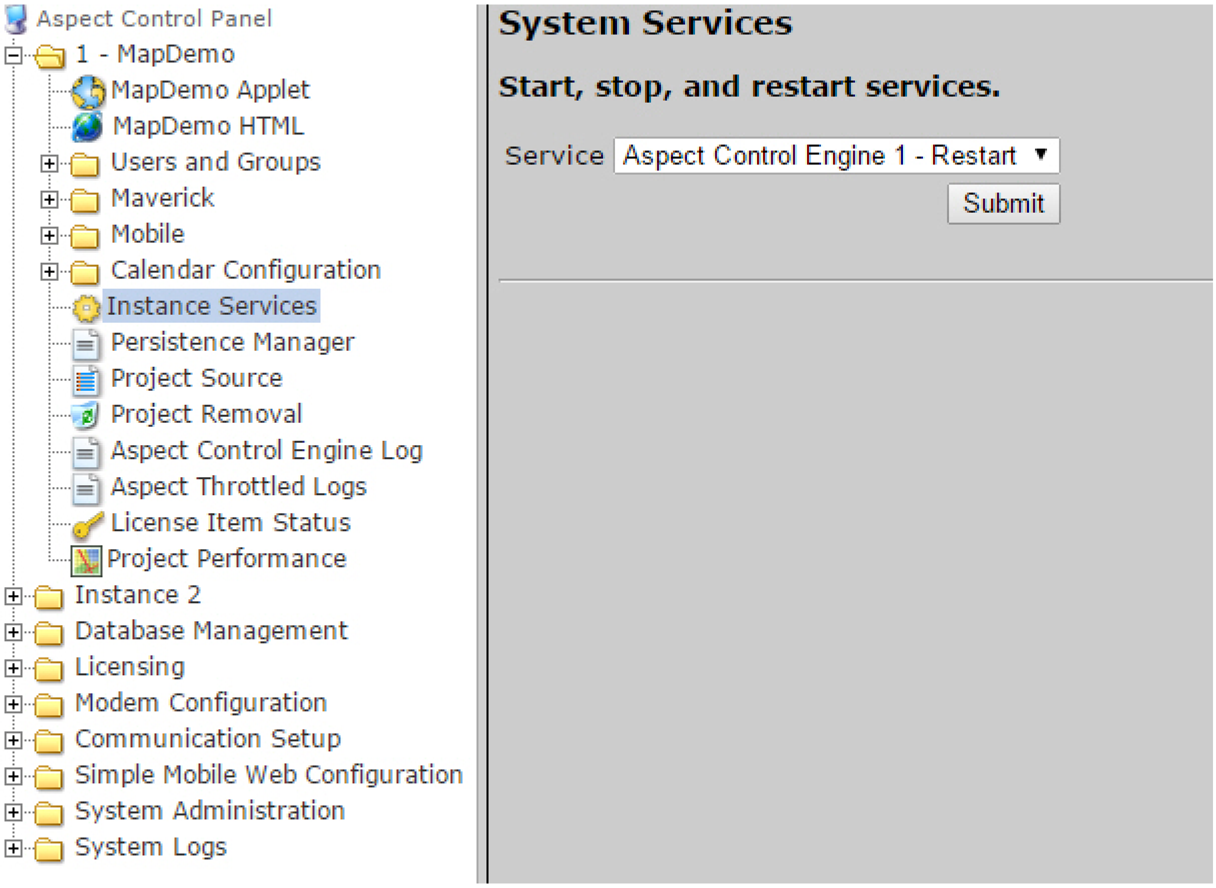
- Username - calendar
- Password - aam

The credentials may be changed at any time as needed using this form.



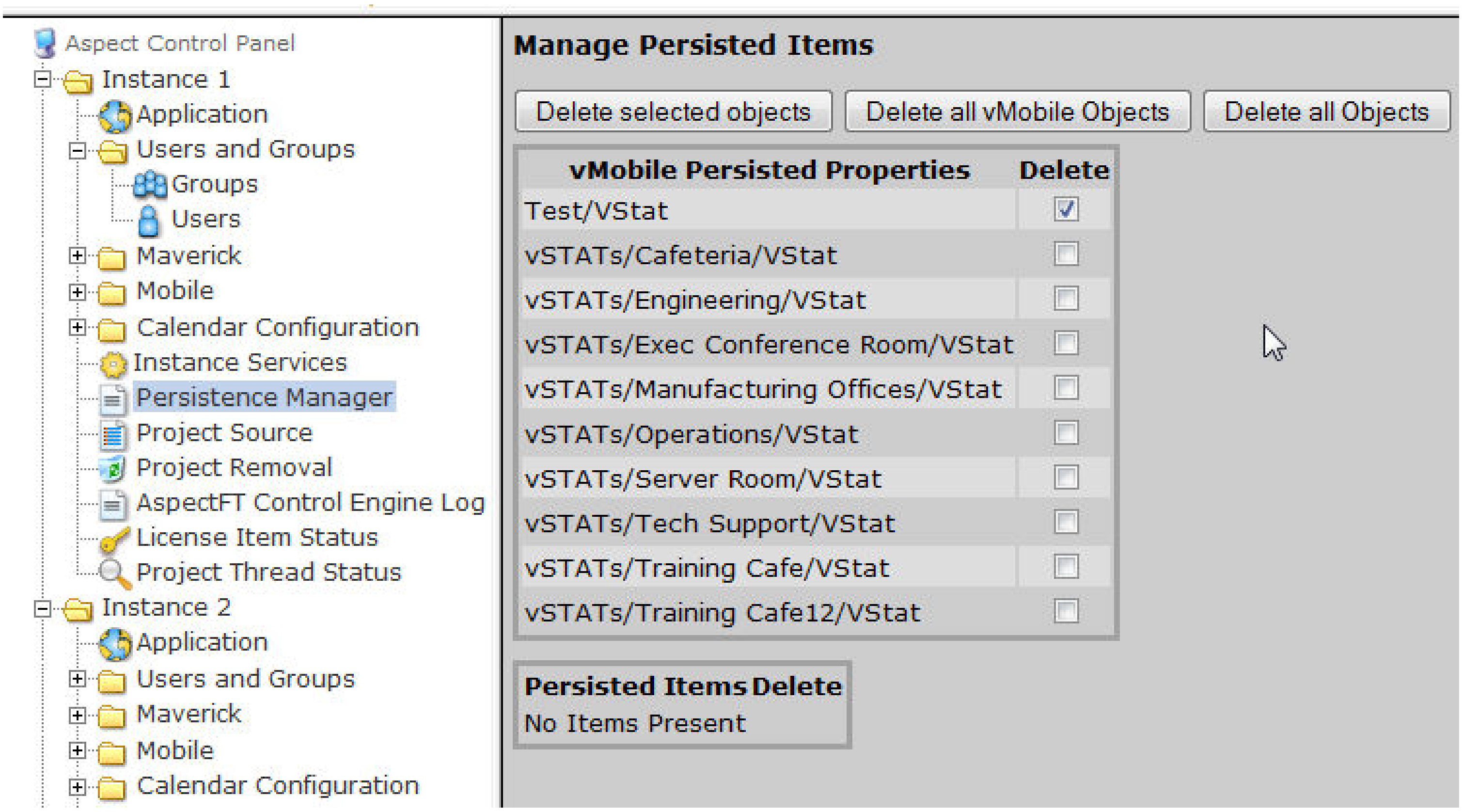
Instance Services

The Instance Services page provides administrators with the ability to restart services pertaining to the Aspect instance they are working with. Instance services are valid only for Aspect-Facility, Aspect-Nexus, and Aspect-Enterprise targets.



Persistence Manager

The Persistence Manager area is used to manage and delete Persisted data. Persisted data is localized data stores from Persisted Elements that may be present in an Aspect project, as well as data persisted by vSTAT elements when such functionality is implemented in a delivered solution.



The Persistence Manager permits you to observe a persisted record. In addition to this, you may select and delete specific persisted values from the system. This is helpful in situations where if you need to change a persisted value, you may delete the item, and re-deploy your Aspect project to ensure new data has been stored as expected. For ease of use, the ability to delete vMobile objects (corresponding to vSTAT elements), as well as delete all objects is available.

Project Source

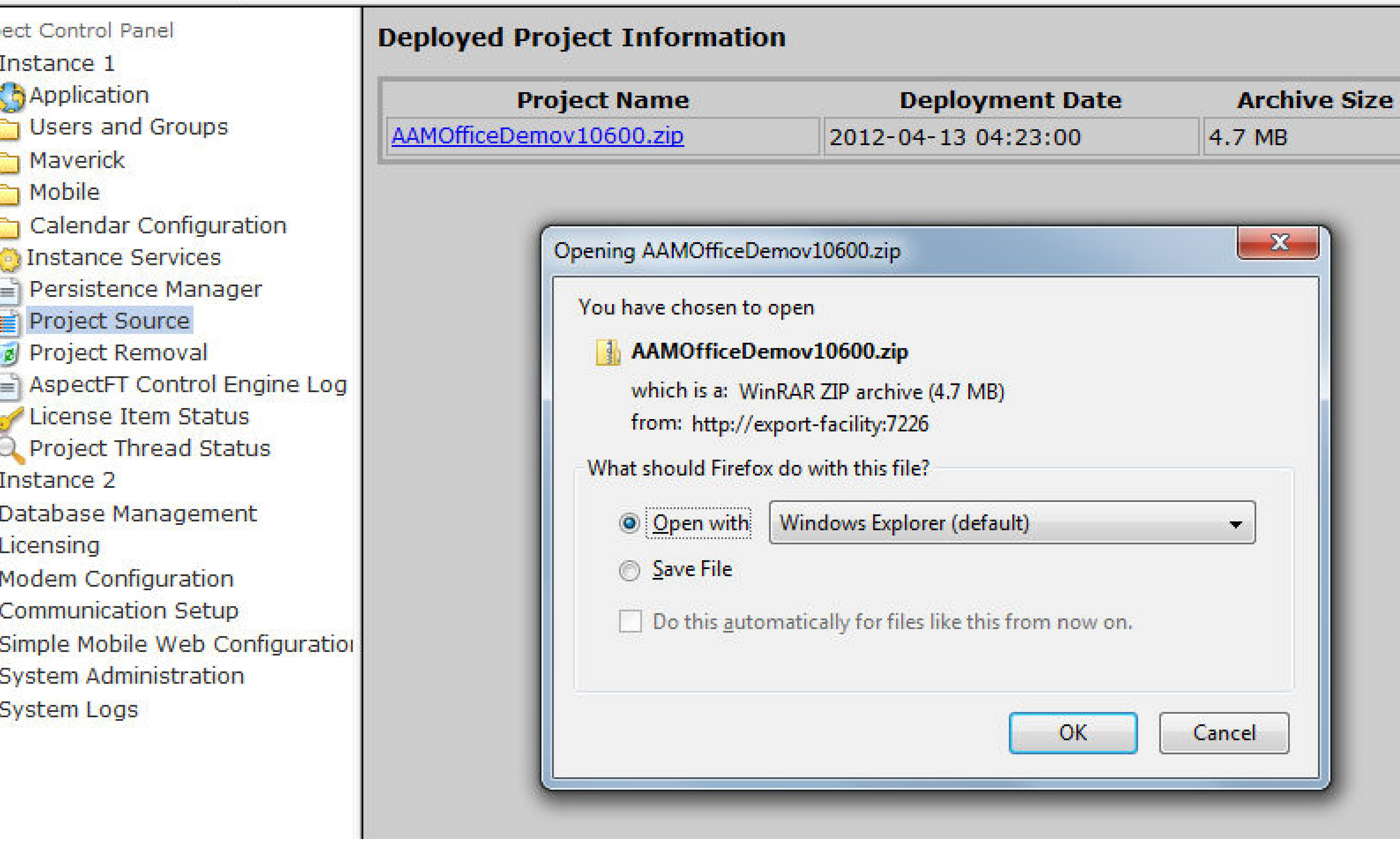
The Project Source page provides administrators with the ability to download a password protected copy of the engineered ASPECT **project** deployed to the instance.

> **Note**: When selecting this node from the Control Panel tree, you may be challenged to enter your username and password credentials prior to gaining access the **Project** Source Files. The username and password required are those that were used to deploy it.

The **Project** Name, along with the date of deployment and the size will be displayed.

Once downloaded, **the Project** Source code is contained within an encrypted **ZIP** archive file. The file itself is password protected. The password for retrieved **Project** Source files follows the administrative username and password for the target. For example, if your username is aamuser and the password is default, the **ZIP** file password is set to aamuserdefault.

The encryption method used to protect the archive uses **AES**-based encryption. By default, standard ZIP utilities built into Windows operating systems may not be capable of opening the archive. To open the archive, you may use any number of third-party compression utilities, such as WinZip or 7Zip.



Backing up configuration

Note: The `mapconfig.db` file can be modified by a running project, and so it must be synchronized anytime a **project** is downloaded, modified and redeployed so that config changes made from ngAdmin will not be lost. This applies for a full deploy as well as for a "Quick Deploy".

After the source has been downloaded, unzip it and sync with the target (using the Import Map from Target option) to get the current configuration database.

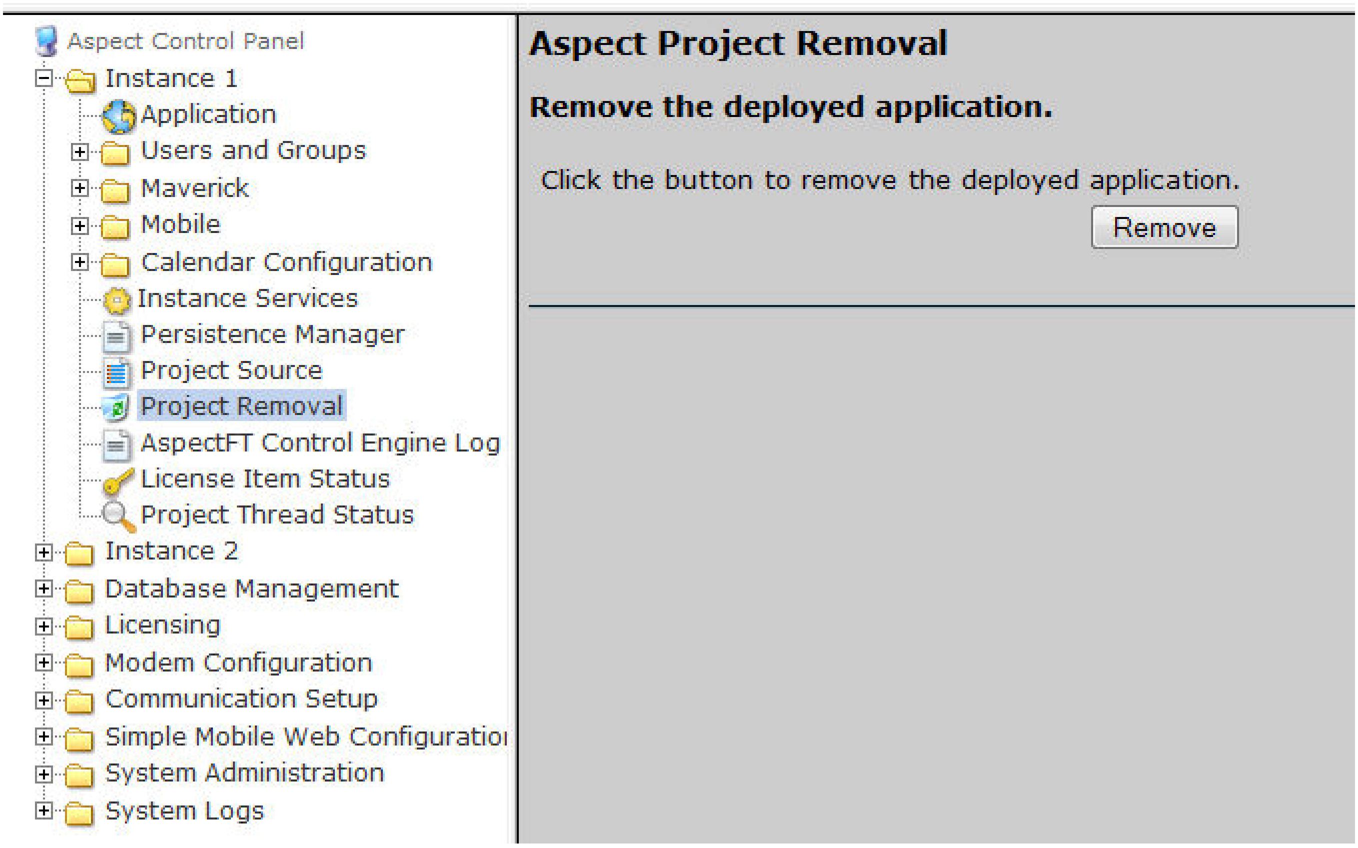
Alternatively you can download the mapconfig.db file directly from using on of the following url(s):

- MATRIX Series: `http://<ipaddress>/mix/mapconfig.db`
- NEXUS Series / Facility / ASPECT-Enterprise: `http://<ipaddress>/<instance_number>/mix/mapconfig.db`

> **Note**: The Project Source process does not backup or restore your target's license. Your license file should be backed up manually from the License page.

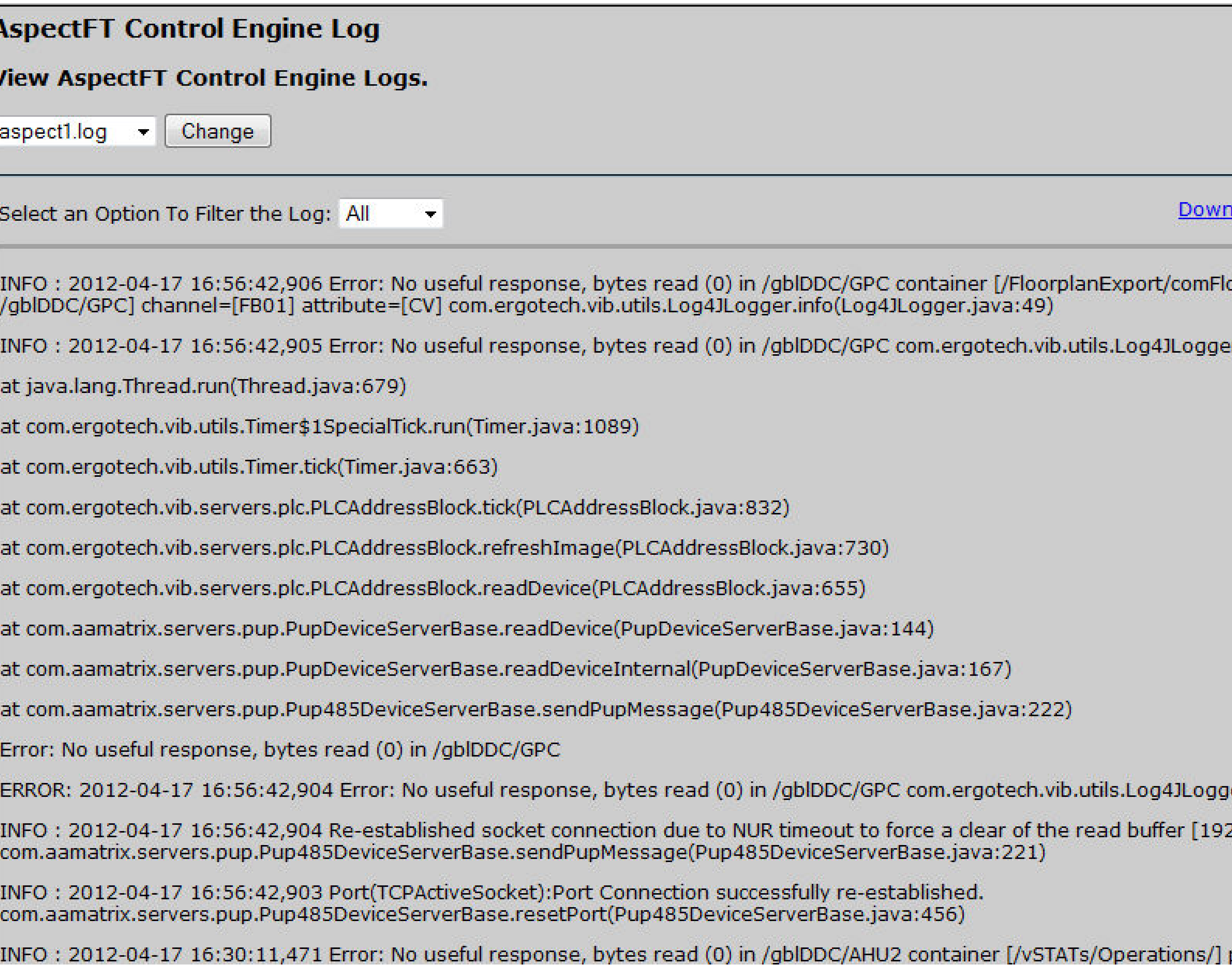
Project Removal

The Project Removal page provides administrators with the ability to remove a deployed project from an Aspect instance. This ability is useful in rare situations where a project may be unstable, or cannot be deployed over top of using Aspect-Studio.



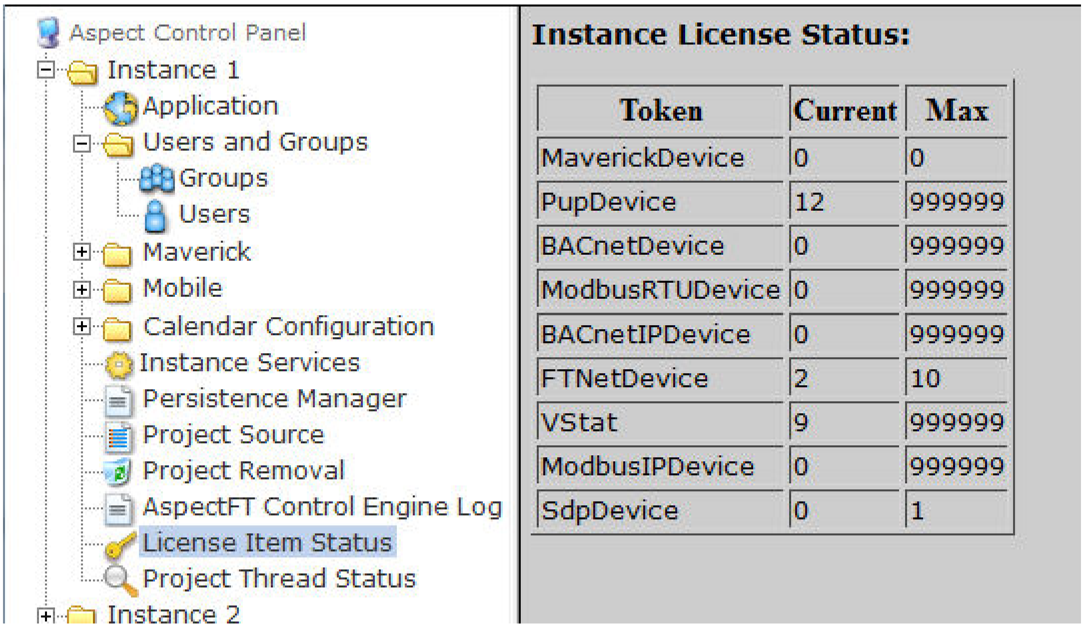
Aspect Control Engine Log

The Aspect Control Engine Log page provides administrators and technicians with the ability to view status and debug information regarding the health of the actual executed project. Pages of history can be reviewed, as well as downloaded from here.



License Item Status

The License Item Status area provides the ability to view how many current license items a project may be using, as well as the maximum amount of licenses available for a particular feature or function.



Project Performance

The Project Performance area provides the ability to dynamically view and monitor the status of Threads, Maps, and Ports being used by the Aspect project loaded into the target.

By default, all Tabs will update information every 15 seconds. You may adjust this update timer by choosing the Settings tab, and changing the Global Settings Update time.

hreads | Maps | Port Pool | Settings

Thread Status at 12:49:04 GMT-0400 (Eastern Daylight Time)

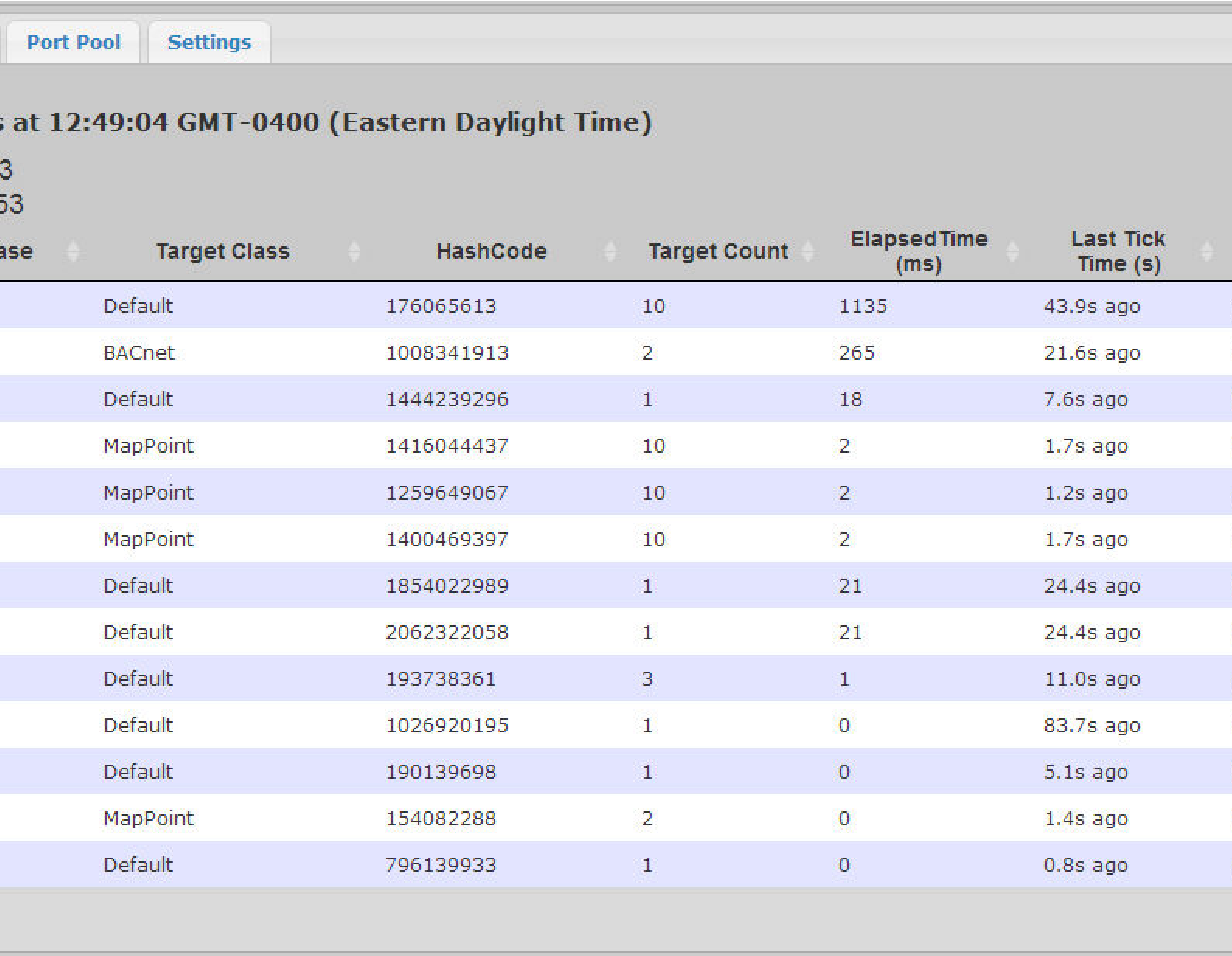
Total Timers: 13
Total Targets: 53

	Timebase	Target Class	HashCode	Target Count	Elapsed Time (ms)
	60.0	Default	176065613	10	1135
	30.0	BACnet	1008341913	2	265
	14.0	Default	1444239296	1	18
	2.0	MapPoint	1416044437	10	2
	2.0	MapPoint	1259649067	10	2
	2.0	MapPoint	1400469397	10	2
	30.0	Default	1854022989	1	21
	30.0	Default	2062322058	1	21
	15.0	Default	193738361	3	1
	3600.0	Default	1026920195	1	0
	10.0	Default	190139698	1	0
	2.0	MapPoint	154082288	2	0
	1.0	Default	796139933	1	0

Threads

The Project Thread Status area provides the ability to dynamically view and monitor the status of active threads being executed by the Aspect project loaded into the target. Dependent on the configuration of your project using either single threaded or shared threaded methods, a thread entry will be displayed for each thread as it is created or executed. To view the status of information related to each thread, simply click the plus icon displayed next to each time base to expand the details on each thread.

By default, the interface will update thread information every 15 seconds. You may adjust this update timer by choosing the Settings tab, and changing the Global Settings Update time. You can actively monitor threads that may be running late by clicking the Auto-Open Detail check box in the Project Thread Settings. In the event that threads begin running late, the corresponding thread will be opened for you. Threads that run late are color coded based on the information displayed in the Project Thread Settings of the Settings tab.


Port Pool | Settings

s at 12:49:04 GMT-0400 (Eastern Daylight Time)

3

53

ase	Target Class	HashCode	Target Count	Elapsed Time (ms)	Last Tick Time (s)
	Default	176065613	10	1135	43.9s ago
	BACnet	1008341913	2	265	21.6s ago
	Default	1444239296	1	18	7.6s ago
	MapPoint	1416044437	10	2	1.7s ago
	MapPoint	1259649067	10	2	1.2s ago
	MapPoint	1400469397	10	2	1.7s ago
	Default	1854022989	1	21	24.4s ago
	Default	2062322058	1	21	24.4s ago
	Default	193738361	3	1	11.0s ago
	Default	1026920195	1	0	83.7s ago
	Default	190139698	1	0	5.1s ago
	MapPoint	154082288	2	0	1.4s ago
	Default	796139933	1	0	0.8s ago

Each thread contains the following information:

- Timebase - defines the programmed time base in which the thread is executed.
- Target Class - defines the type of element or class that the thread is responsible for.
- Hash Code - defines a unique code for each thread class that is used internally by the Aspect Control Engine.
- Target Count - defines the number of elements or processes that a given thread is currently servicing.
- Elapsed Time (ms) - defines the amount of time, in milliseconds,
- Last Time Tick (s) - defines the amount of time, in seconds ago, that the thread executed its logic.
- Load (%) - defines the current percentage of CPU load the thread is using.

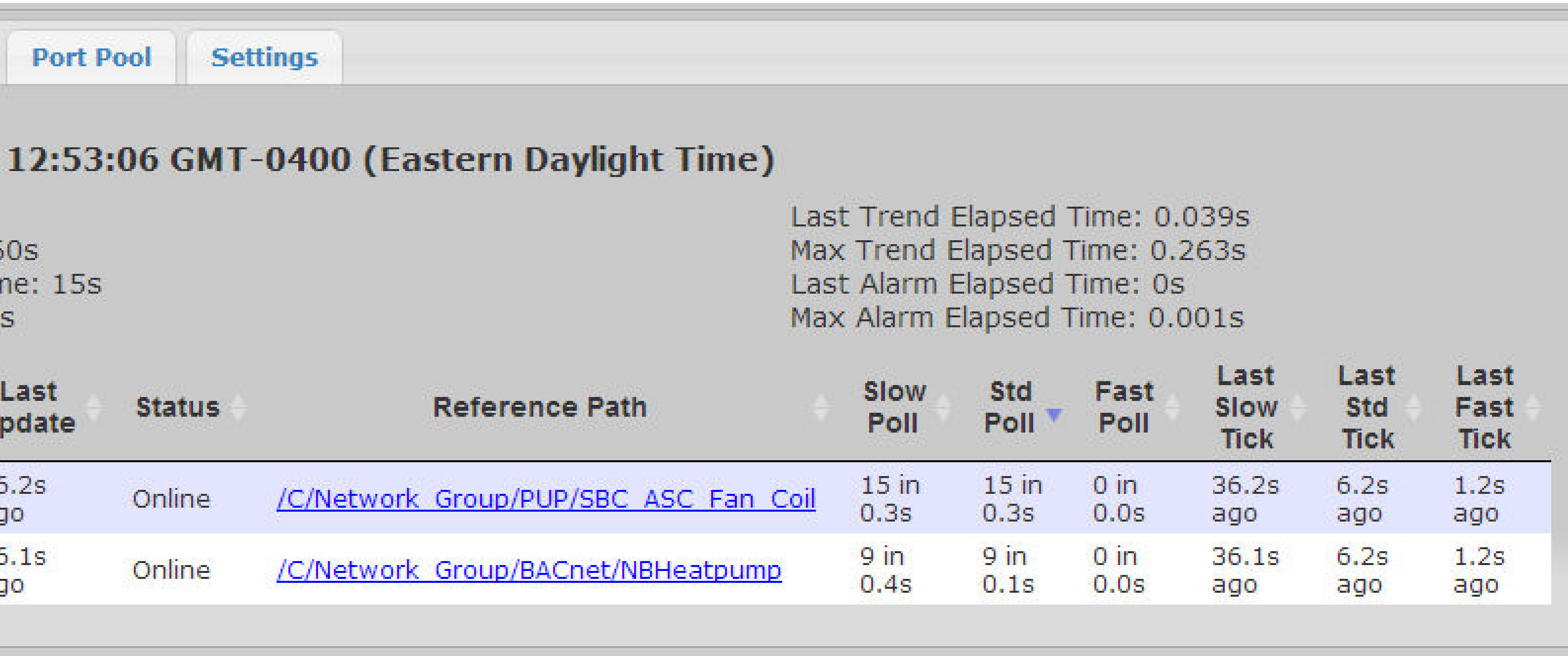
When thread information is expanded, the following information is given:

- Description - defines the location and element.
- Elapsed Time (ms) - defines the total amount of time, in milliseconds, that a specific element took to carry out its task of updating, and sending any information onto other logic (if applicable).
- Last Time Tick (s) - defines the amount of time, in seconds ago, that an element executed its logic.

Maps

The Map Engine Status area provides the ability to dynamically view and monitor the status of active Map devices being executed by the Aspect project loaded into the target. A Map entry will be displayed for each Map device. To view the status of information related to each Map device, simply click the Reference Path link listed on each thread.

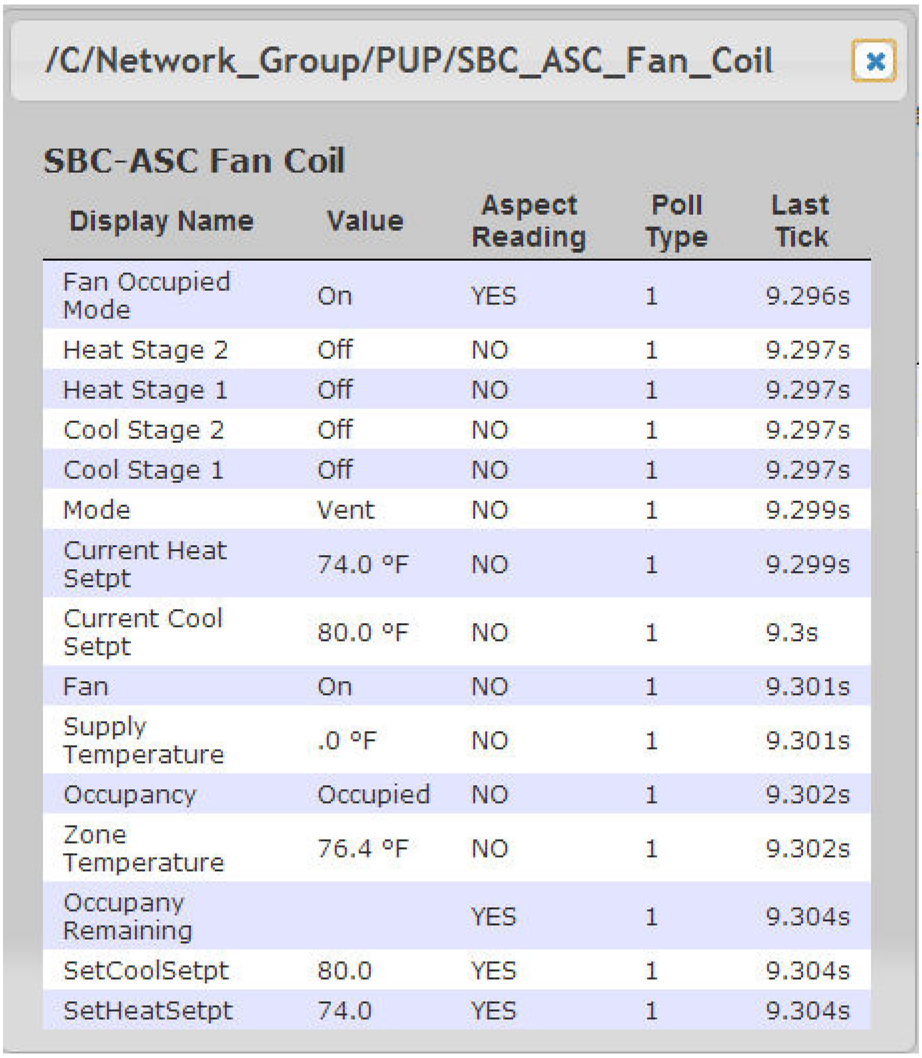
By default, the interface will update Map information every 15 seconds. You may adjust this update timer by choosing the Settings tab, and changing the Global Settings Update time.



Each Map Device contains the following information:

- Last Update - Displays the time since the last update.
- Status - Displays the communication status of the device.
- Reference Path - Displays the Reference Path for the device.
- Slow Poll - Displays the number of points polled in the last Slow Poll and the time it took to poll the points.
- Std Poll - Displays the number of points polled in the last Standard Poll and the time it took to poll the points.
- Fast Poll - Displays the number of points polled in the last Fast Poll and the time it took to poll the points.
- Last Slow Tick - Displays the time since the last Slow Tick.
- Last Std Tick - Displays the time since the last Standard Tick.
- Last Fast Tick - Displays the time since the last Fast Tick.

When a Reference Name is clicked, the following information is displayed in a popup window:



/C/Network_Group/PUP/SBC_ASC_Fan_Coil

SBC-ASC Fan Coil

Display Name	Value	Aspect Reading	Poll Type	Last Tick
Fan Occupied Mode	On	YES	1	9.296s
Heat Stage 2	Off	NO	1	9.297s
Heat Stage 1	Off	NO	1	9.297s
Cool Stage 2	Off	NO	1	9.297s
Cool Stage 1	Off	NO	1	9.297s
Mode	Vent	NO	1	9.299s
Current Heat Setpt	74.0 °F	NO	1	9.299s
Current Cool Setpt	80.0 °F	NO	1	9.3s
Fan	On	NO	1	9.301s
Supply Temperature	.0 °F	NO	1	9.301s
Occupancy	Occupied	NO	1	9.302s
Zone Temperature	76.4 °F	NO	1	9.302s
Occupancy Remaining		YES	1	9.304s
SetCoolSetpt	80.0	YES	1	9.304s
SetHeatSetpt	74.0	YES	1	9.304s

- Display Name - Displays the name of the point being polled.
- Value - Displays the current value of the point being polled
- Aspect Reading - Displays whether or not the Aspect project is currently polling a point.
- Poll Type - Displays the current polling type being used. (0 = Slow, 1 = Standard, 2 = Fast)
- Last Time Tick (s) - Defines the amount of time, in seconds ago, that an element executed its logic.

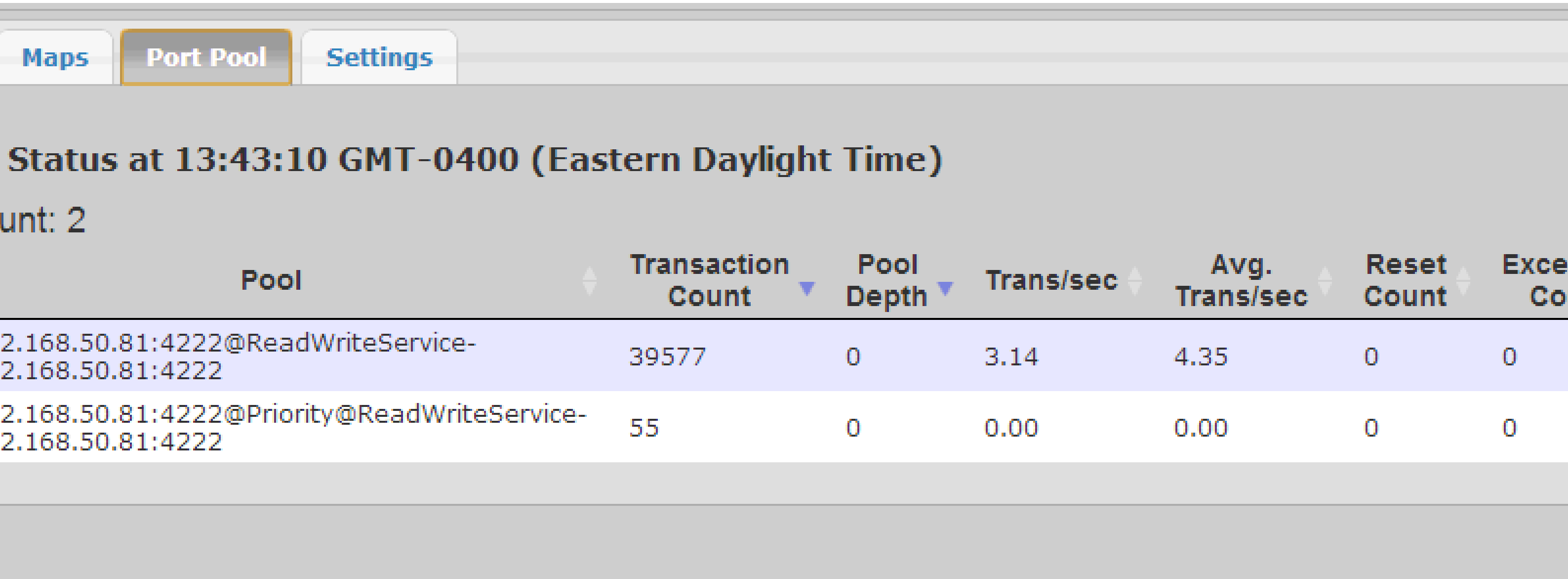
Map objects that run late are color coded based on the information displayed in the Map Settings of the Settings tab.

Port Pool

The Port Pool area provides the ability to dynamically view and monitor the status of active Port connections being used by the Aspect project. A Port entry will be displayed for each port actively being polled for data by the target.

- Pool - defines the address connection for established port communications. Two connections will be established to each target, including:
  - ReadWriteService - this service provides general read/write transactions between defined targets.
  - Priority@ReadWriteService - this service provides a higher priority channel for initial read/write requests that may be made at start-time or during periods of intense communication requests.
- Transaction Count - defines the total number of transactions (read and write) that have occurred.
- Trans/sec - defines the current calculated amount of transactions per second that are being actively performed.
- Avg. Trans/sec - defines a running historic calculation of the average transactions per second.
- Reset Count - defines the total amount of port resets that have occurred since start-up.
- Exception Count - defines the current and total amount of exceptions that have occurred during read and write transactions. An exception is commonly classified as a transaction time out when waiting for a field-bus device to respond, as well as rejected writes.

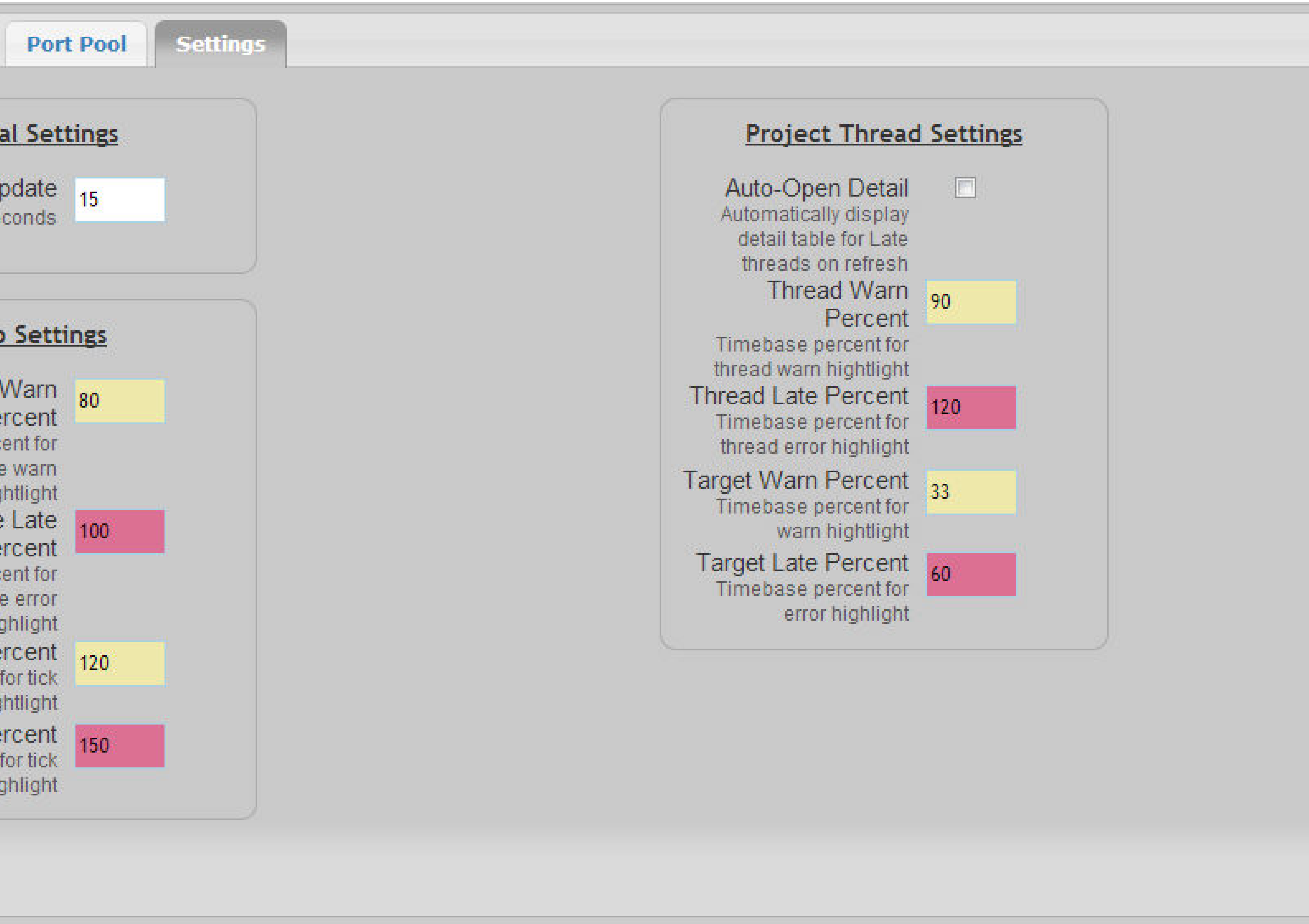
By default, the interface will update thread information every 15 seconds. You may adjust this update timer by choosing the Settings tab, and changing the Global Settings Update time.



Pool	Transaction Count	Pool Depth	Trans/sec	Avg. Trans/sec	Reset Count	Exce Co
2.168.50.81:4222@ReadWriteService-2.168.50.81:4222	39577	0	3.14	4.35	0	0
2.168.50.81:4222@Priority@ReadWriteService-2.168.50.81:4222	55	0	0.00	0.00	0	0

Settings

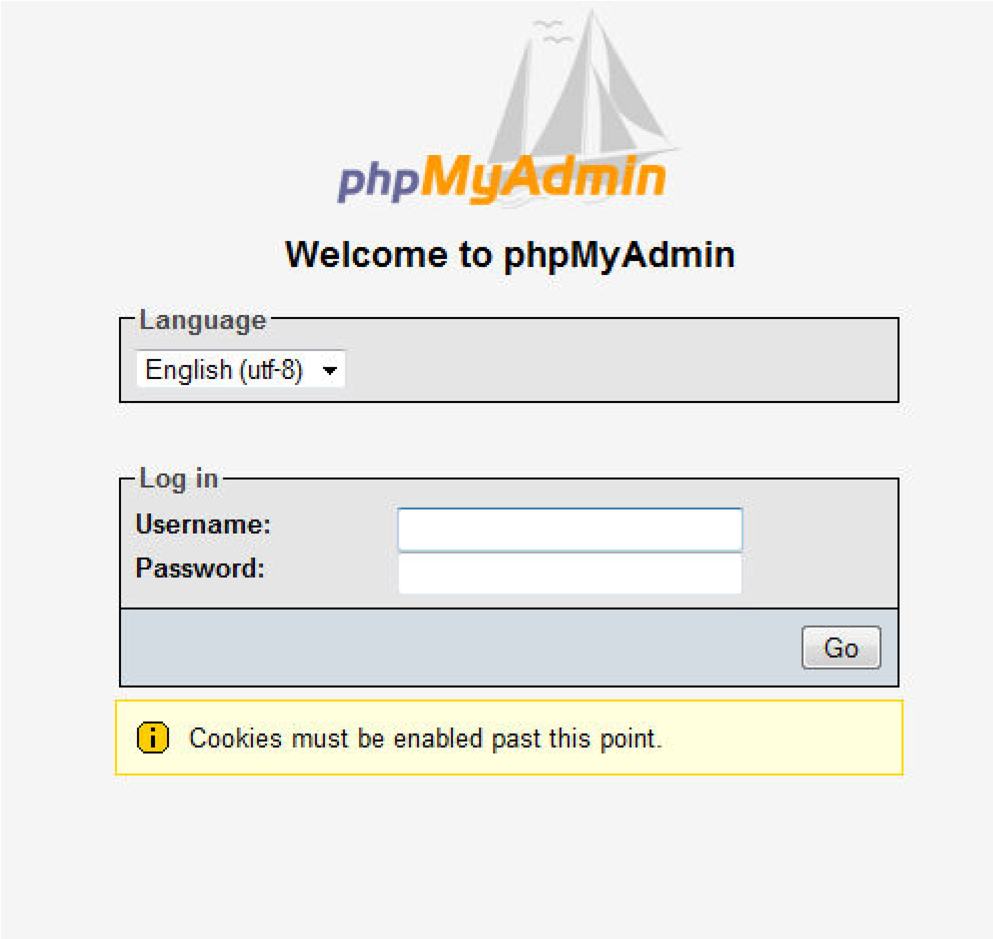
The Settings area allows the user to modify the settings of the different Project Performance pages.



Database Management

MySQL Administration

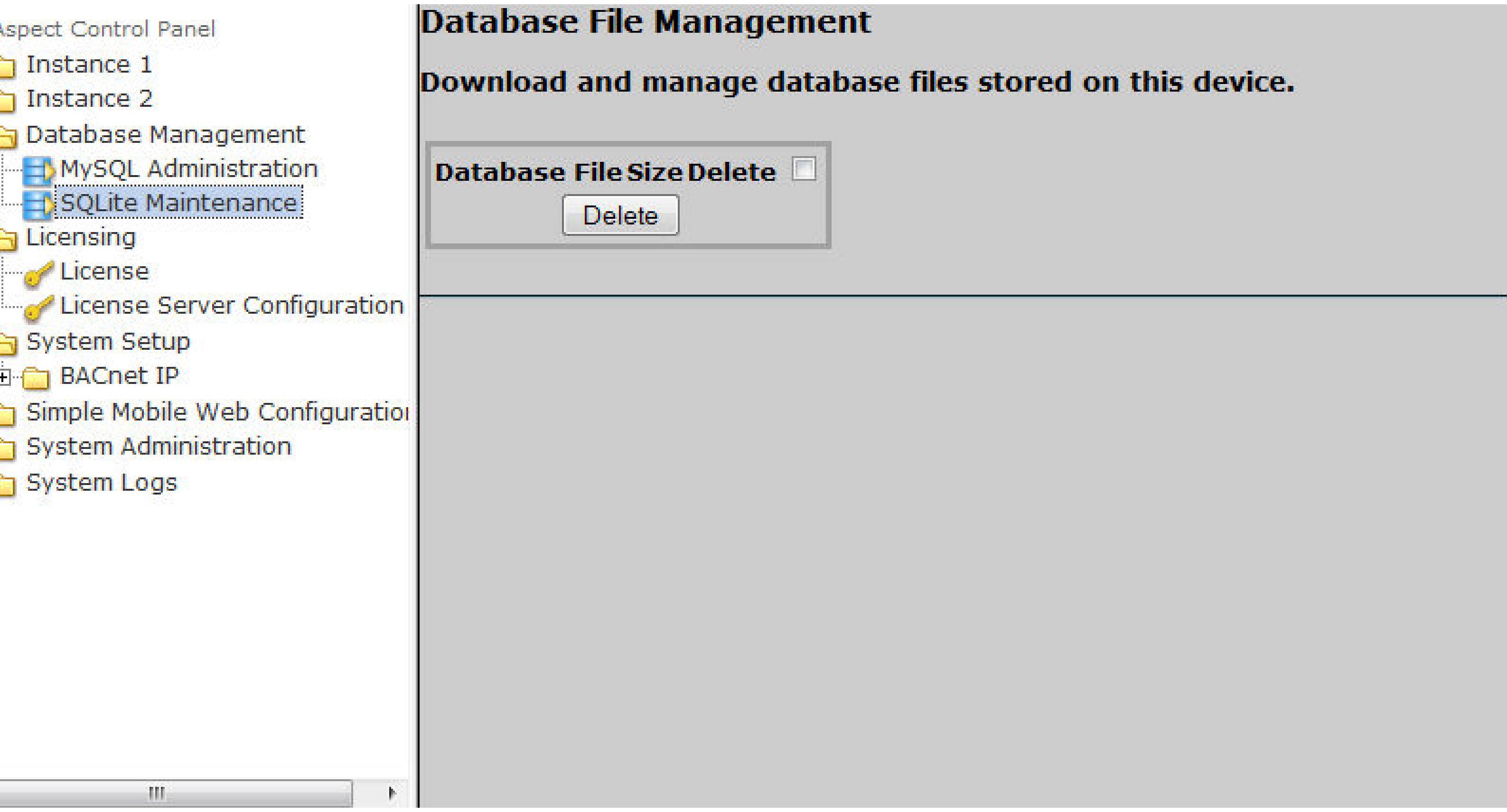
The MySQL Administration page provide users with a link to access the phpMyAdmin side of an Aspect server target, which contains the MySQL Database Server.



For more information on accessing phpMyAdmin, click here.

SQLite Maintenance

The SQLite Maintenance page provides users with the ability to download, delete, and view the sizes of SQLite databases.



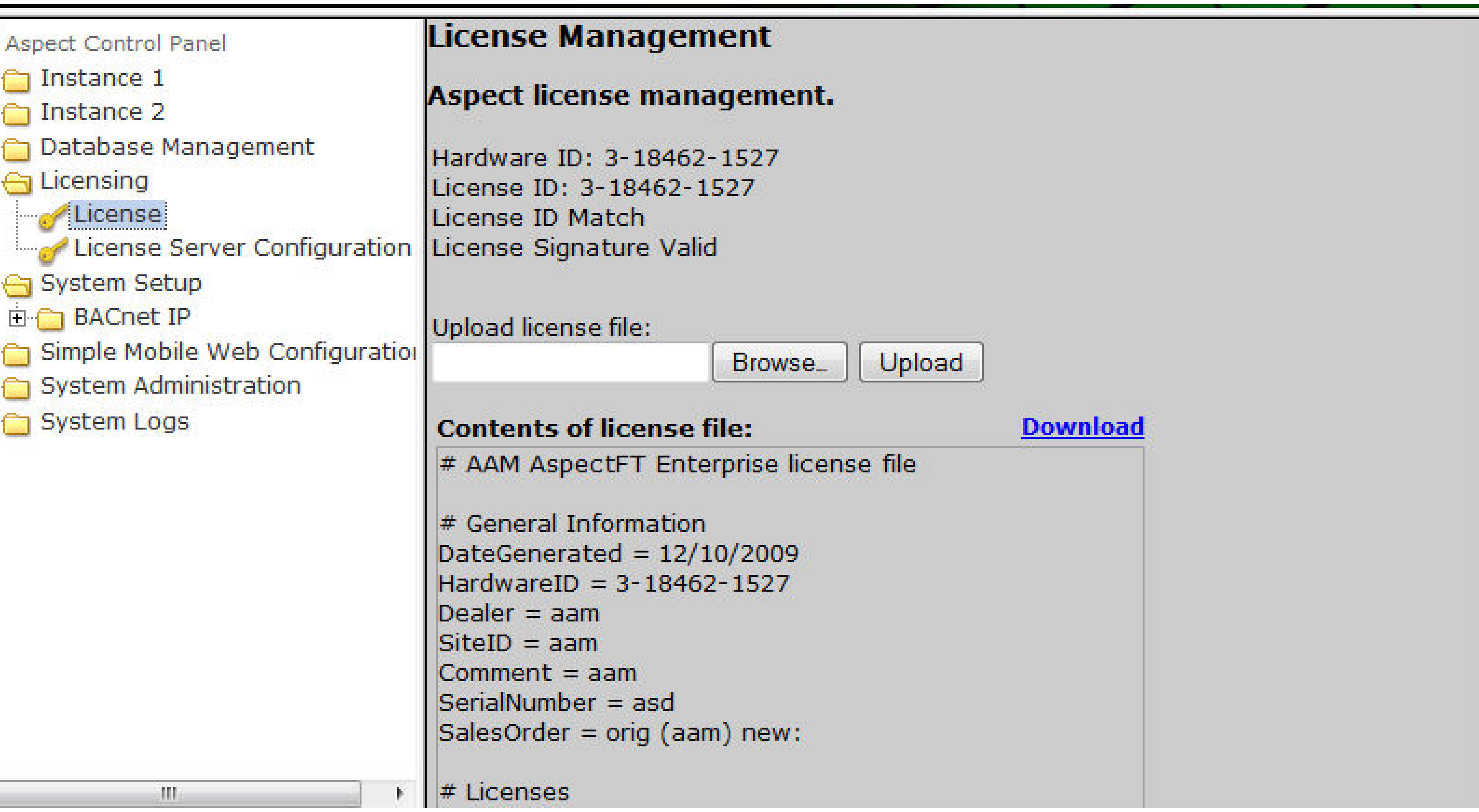
Licensing

License

The License area of the Aspect Control Panel displays the current license of the ASPECT-Enterprise target, as well as providing the means to upload/-download license files.

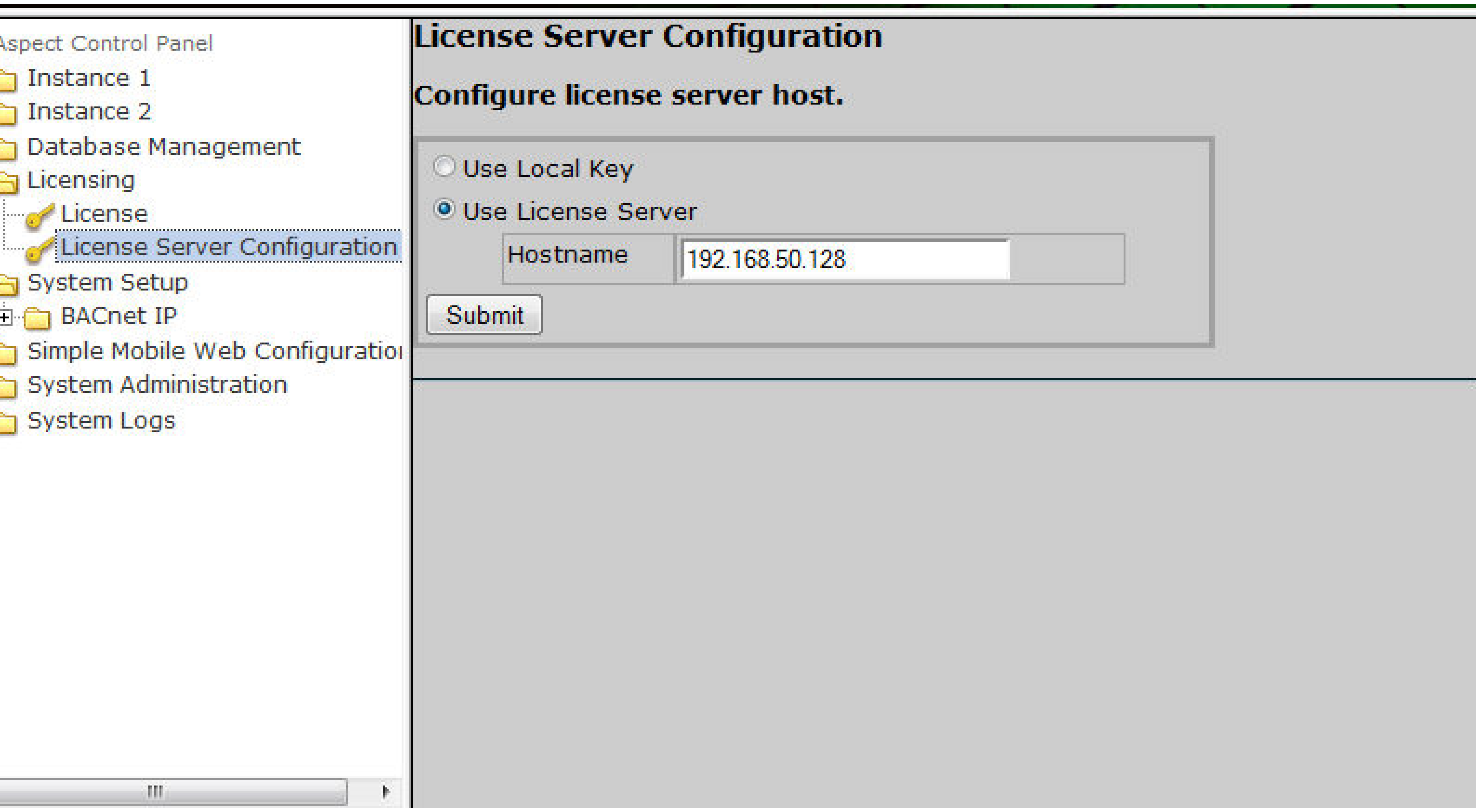
If you upload a new license, **ABB Cylon** recommends rebooting the target to ensure that your license file is applied accordingly.

If you are licensing an ASPECT-Enterprise target to include additional Instances of Aspect, you must apply the license, then re-apply the latest firmware release of ASPECT onto the target to allow instances to properly become available for use (even if the Navigation Tree displays instances to you).



License Server Configuration

Exclusive to the ASPECT-Enterprise products running on VMware, the License Server Configuration area provides the ability to define and locate a license server PC containing the copy protection key required to run ASPECT.



Port/Driver Configuration

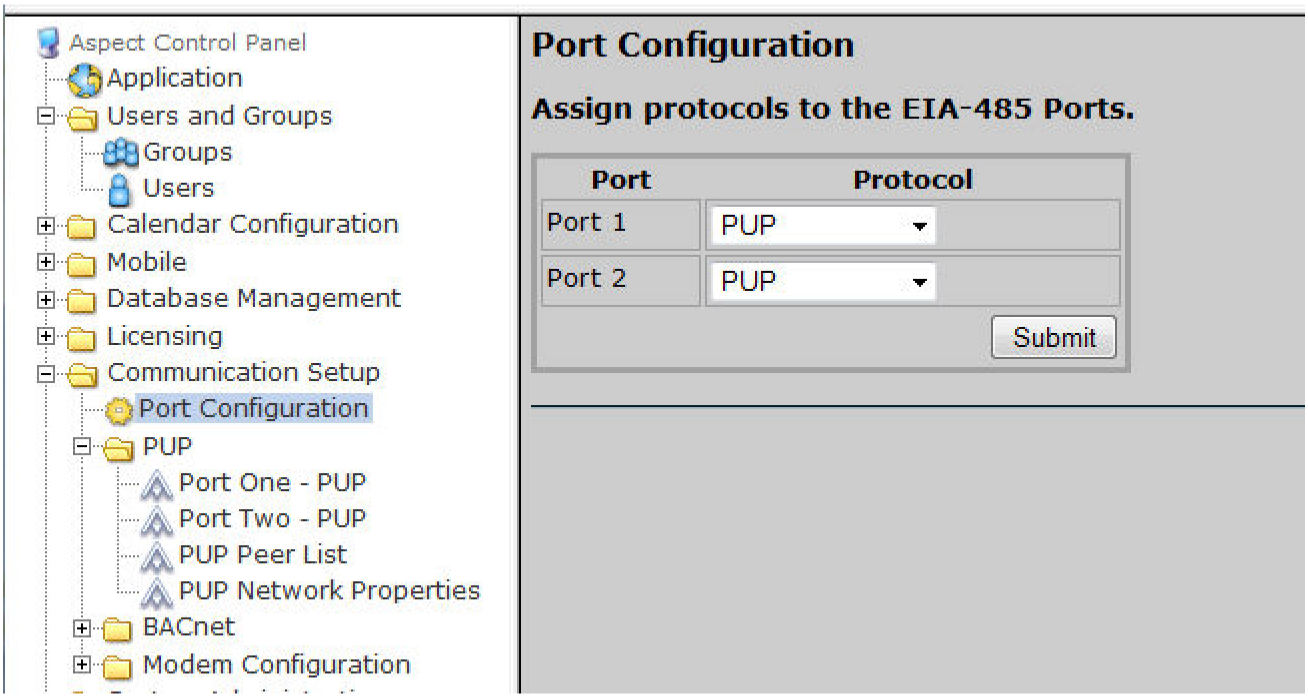
Port Configuration

The Port Configuration area is specific to Aspect-Matrix and Aspect-Nexus targets and is used to configure RS-485 ports for specific field-bus protocols. Drop-downs are provided to select the protocol you wish to use.

To configure a port for PUP network communications, select PUP.

To configure a port for BACnet MS/TP network communications, select BACnet MS/TP

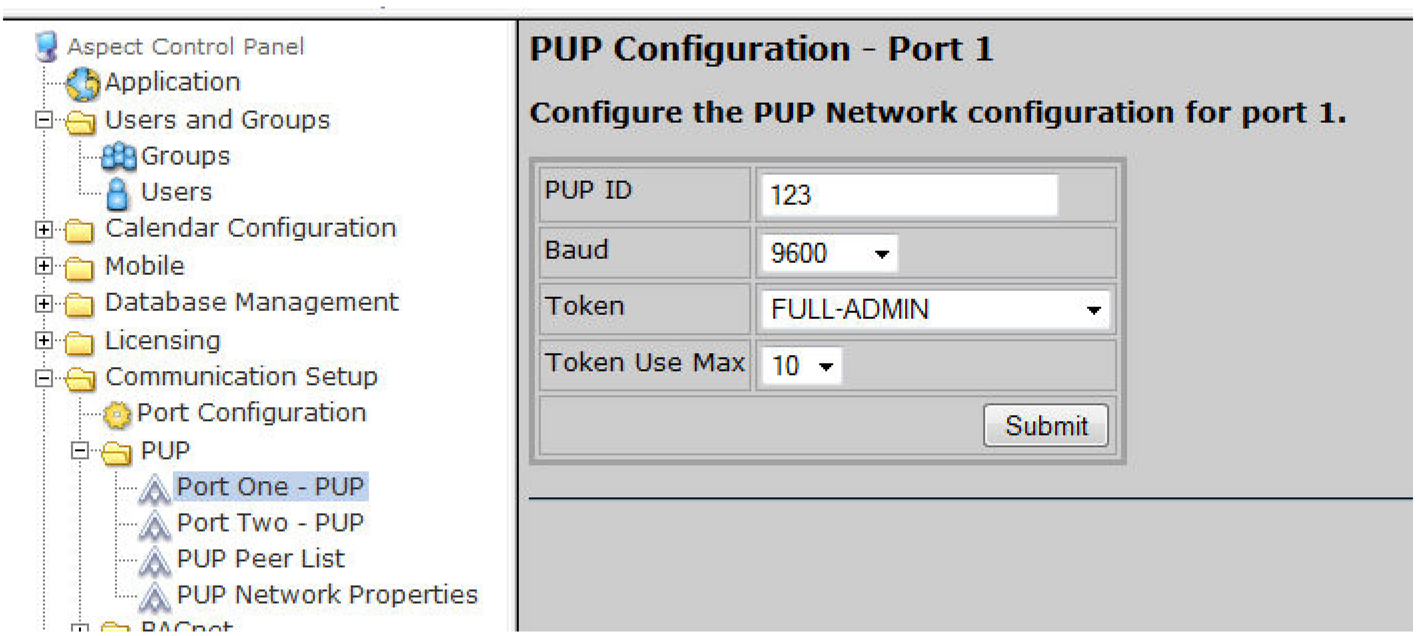
To configure a port for Modbus network communications, select Not Assigned.



PUP Port Configuration

PUP Port Configuration

The PUP Port Configuration area is specific to Aspect-Matrix Area Controller and Aspect-Nexus; used to configure PUP communication settings for the specific port - including Unit ID, Baud Rate, and Token Usage.

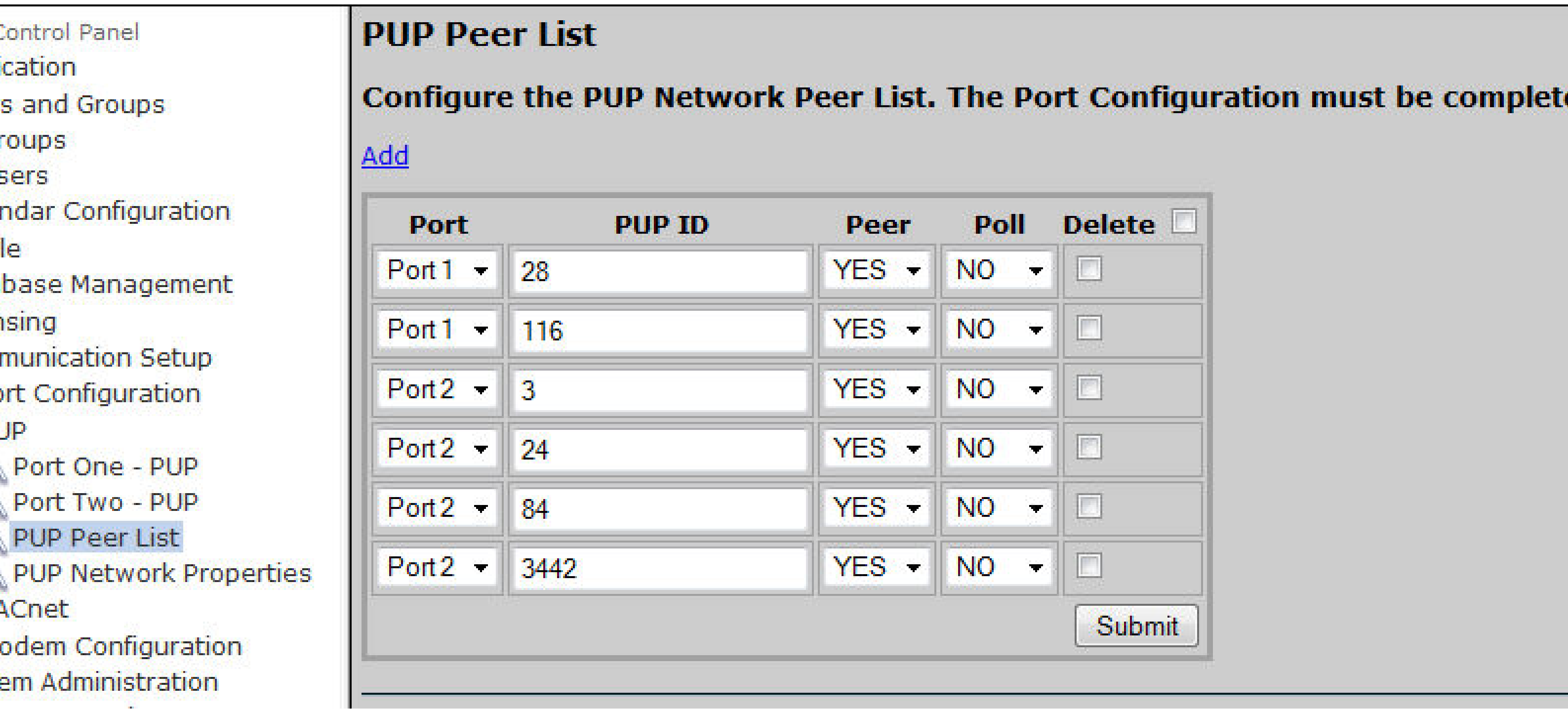


PUP Port Configuration Notes

Property	Notes
PUP ID	defines the Unit ID number of the target for PUP network communications. This address defaults to 123.
Baud	defines the network speed for communications. Most PUP devices default to 9600 baud.
Token	defines the token configuration for this device. Full Admin allows the target to freely ask for information on the network and allows it to pass a network token to devices configured in the PUP Peer List. Sole Master performs the same operation as Full Admin, but does not pass network tokens. Irresponsible Peer forces the target to act as a slave and will not solicit information on the network unless it is passed a token by another device on the network.
Token Use Max	defines the maximum amount of transactions before the target must pass the token.

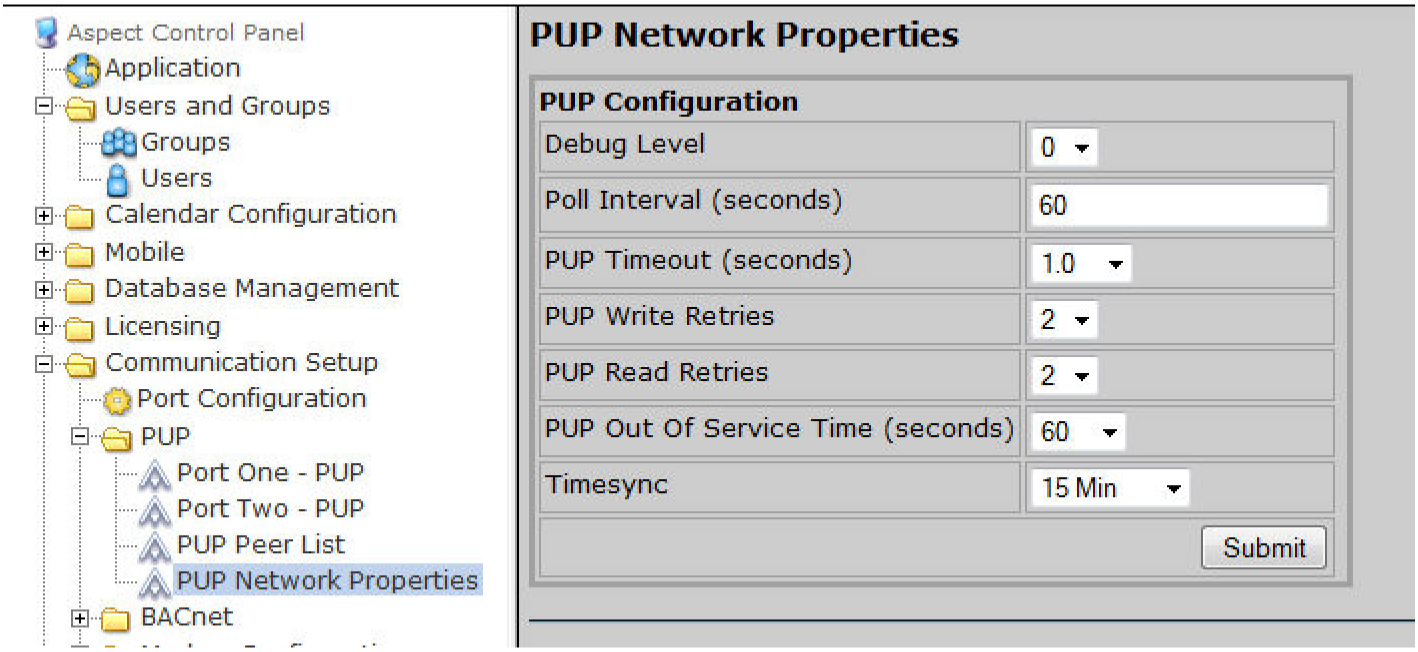
PUP Peer List

The PUP Peer List area is used to configure peers for token passing and alarm polling.



PUP Network Properties

The PUP Network Properties area is used to fine-tune PUP driver polling and time out communication parameters.



PUP Network Properties Notes

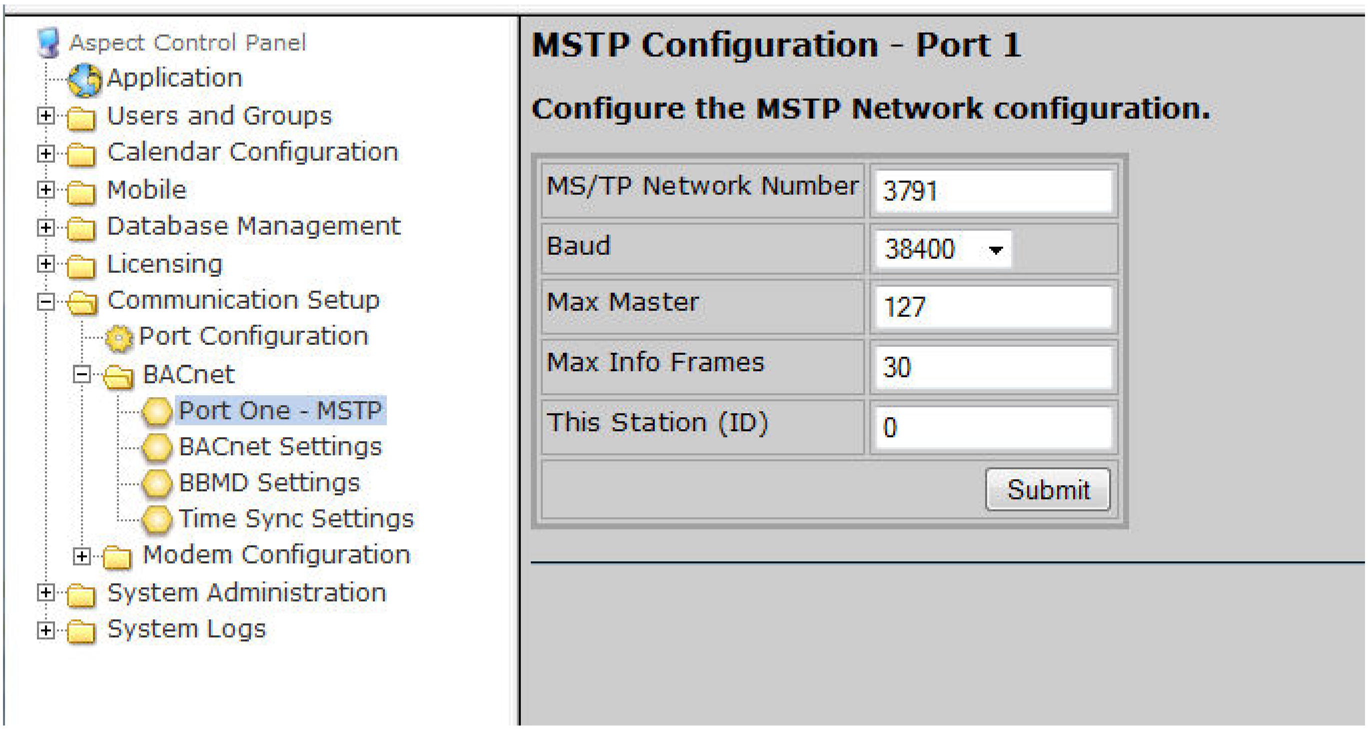
Property	Notes

Debug Level	indicates the debug level for advanced troubleshooting with AAM. By default, this value should always be set to a value of zero (0) unless otherwise directed by AAM Technical Services.
Poll Interval	indicates the amount of time, in seconds, that a PUP device is polled for alarms.
PUP Timeout	indicates the amount of time, in seconds, that the target should wait for a response to a message before declaring a transaction to be timed out.
PUP Write Retries	indicates the amount of retries that the target will attempt to perform a write request in the event of a time out.
PUP Read Retries	indicates the amount of retries that the target will attempt to perform a read request in the event of a time out.
PUP Out of Service Time	indicates the amount of time, in seconds, that the target will wait after a device is deemed to be offline. By default, a target will wait 60 seconds before attempting to poll an offline device.
Timesync	indicates the frequency of when a time synchronization message is sent to PUP networks.

BACnet Port Configuration

BACnet Port Configuration

The BACnet Port Configuration area is used to configure BACnet MS/TP communication settings for the specific port - including MAC Address, Baud Rate, and token control properties.



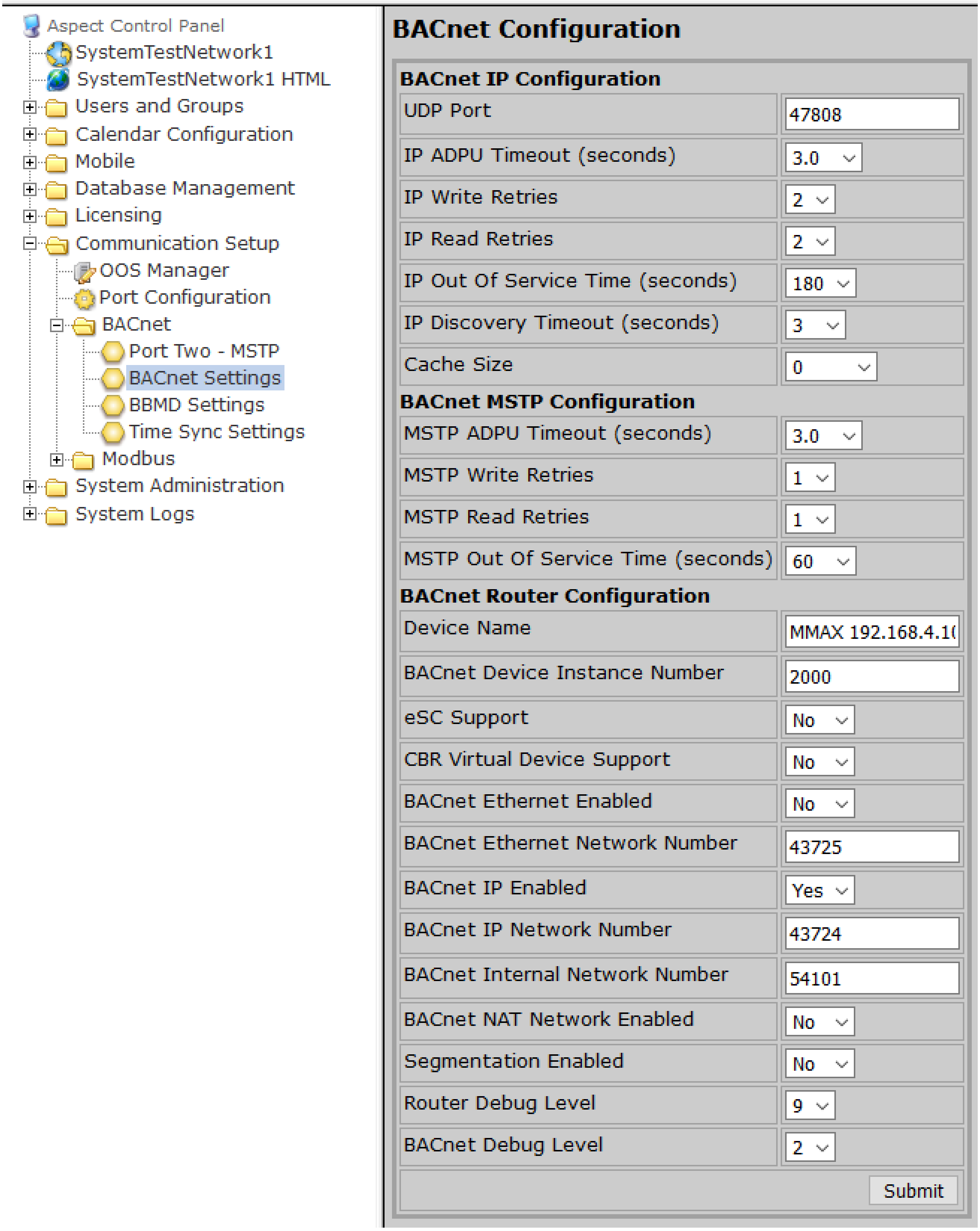
BACnet Port Configuration Notes

Property	Notes
MSTP Network Number	defines the network number for this MS/TP network bus. Valid ranges are 1-65534, and must be unique for each MS/TP network system wide.
Baud Rate	defines the network speed for MS/TP network communications.
Max Master	defines the highest maximum MS/TP master node address on the network.
Max Info Frames	defines the highest number of frames permitted to be used by the device before the network token is passed.
This Station (ID)	defines the MAC Address/Unit ID for this device. By default, this is set for zero (0) and should remain at this assignment.

BACnet Router Settings

BACnet Configuration

The BACnet Configuration page allows configuration of BACnet/IP and BACnet MS/TP connections.


Aspect Control Panel
SystemTestNetwork1
SystemTestNetwork1 HTML
Users and Groups
Calendar Configuration
Mobile
Database Management
Licensing
Communication Setup
OOS Manager
Port Configuration
BACnet
Port Two - MSTP
BACnet Settings
BBMD Settings
Time Sync Settings
Modbus
System Administration
System Logs
BACnet Configuration
BACnet IP Configuration
UDP Port 47808
IP ADPU Timeout (seconds) 3.0
IP Write Retries 2
IP Read Retries 2
IP Out Of Service Time (seconds) 180
IP Discovery Timeout (seconds) 3
Cache Size 0
BACnet MSTP Configuration
MSTP ADPU Timeout (seconds) 3.0
MSTP Write Retries 1
MSTP Read Retries 1
MSTP Out Of Service Time (seconds) 60
BACnet Router Configuration
Device Name MMAX 192.168.4.1(
BACnet Device Instance Number 2000
eSC Support No
CBR Virtual Device Support No
BACnet Ethernet Enabled No
BACnet Ethernet Network Number 43725
BACnet IP Enabled Yes
BACnet IP Network Number 43724
BACnet Internal Network Number 54101
BACnet NAT Network Enabled No
Segmentation Enabled No
Router Debug Level 9
BACnet Debug Level 2
Submit

BACnet IP Configuration Notes

Property	Notes
UDP Port	defines the UDP port that general BACnet/IP communications will occur on. By default, most BACnet/IP devices uses Port 47808.
IP Timeout	defines the amount of time, in seconds, that the target should wait for a response to a message before declaring a transaction to be timed out for BACnet/IP client communications.
IP Write Retries	defines the amount of retries that the target will attempt to perform a write request in the event of a time out for BACnet/IP client communications.
IP Read Retries	defines the amount of retries that the target will attempt to perform a read request in the event of a time out for BACnet/IP client communications.
IP Out of Service Time	defines the amount of time, in seconds, that the target will wait after a device is deemed to be offline. By default, a target will wait 60 seconds before attempting to poll an offline BACnet/IP device.
IP Discovery Timeout	defines amount of time, in seconds, that the target will wait before transmitting discovered information back to an Aspect-Studio user.
Cache Size	defines the number of points that can be cached in the BACnet driver to reduce network polling load

BACnet MSTP Configuration Notes

Property	Notes
MSTP ADPU Timeout	defines the amount of time, in seconds, that the target should wait for a response to a message before declaring a transaction to be timed out for BACnet MS/TP client communications.
MSTP Write Retries	defines the amount of retries that the target will attempt to perform a write request in the event of a time out for BACnet MS/TP client com-

	munications.
MSTP Read Retries	defines the amount of retries that the target will attempt to perform a read request in the event of a time out for BACnet MS/TP client communications.
MSTP Out of Service Time	defines the amount of time, in seconds, that the target will wait after a device is deemed to be offline. By default, a target will wait 60 seconds before attempting to poll an offline BACnet MS/TP device.

BACnet Router Configuration Notes

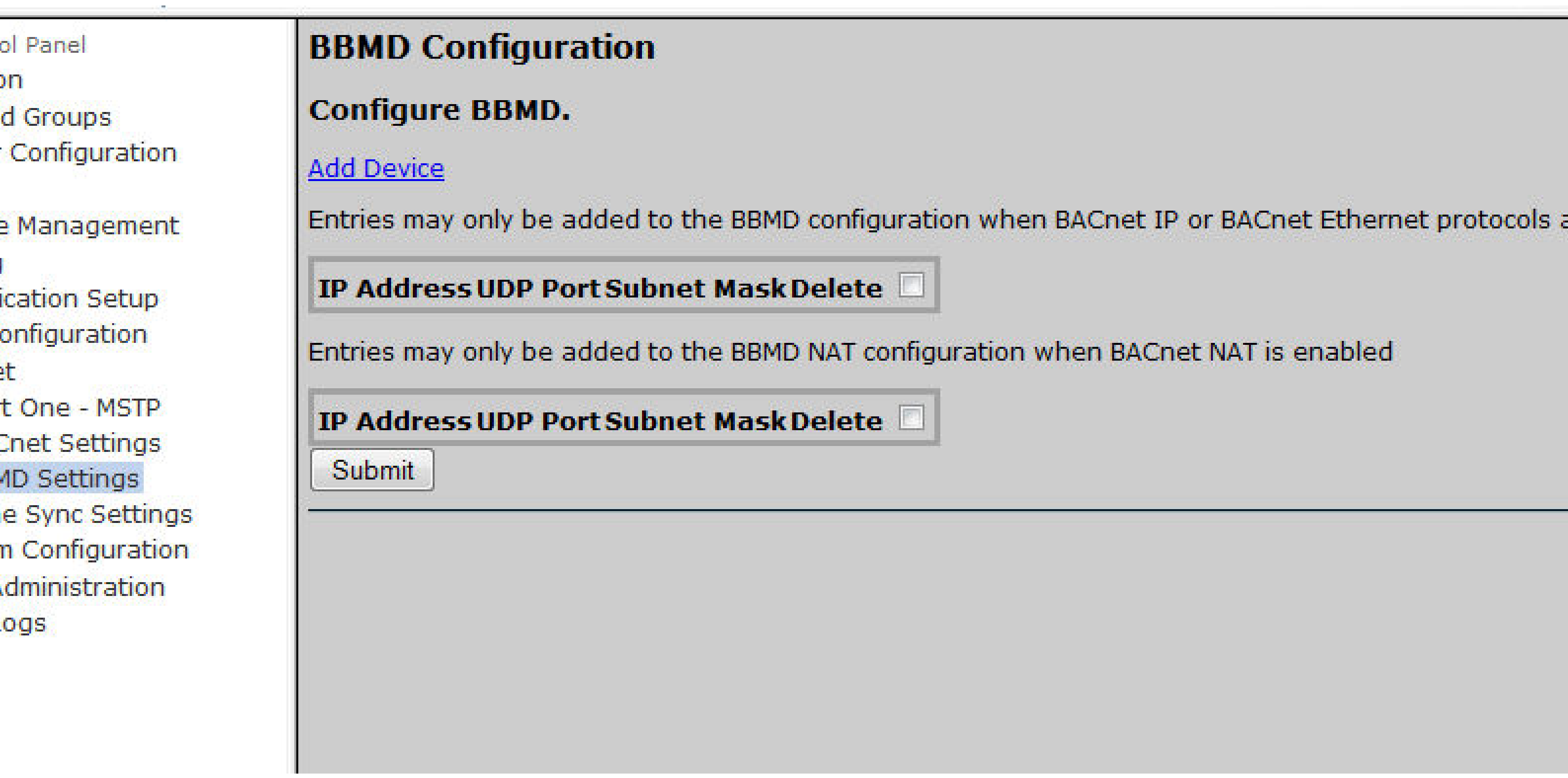
Property	Notes
Device Name	defines the network identifier name for this target as a BACnet device.
BACnet Device Instance Number	defines the Device ID for this target as a BACnet device. Valid ranges are from 0 - 4194302.
eSC Support	Enable or disable support for eSC devices
CBR Virtual Device Support	Enable or disable support for legacy CBR routers
BACnet Ethernet Enabled	defines if BACnet/Ethernet routing is enabled. In order for Aspect to display and interact with BACnet/Ethernet devices, this must be set to Yes. NOTE - On a local network, only one device should be configured to have BACnet/Ethernet enabled. Having more than one device enabled for BACnet/Ethernet can result in cyclic routing of packets.
BACnet Ethernet Network Number	defines the network number this device either hosts or is joined to. Valid ranges are 1-65534.
BACnet IP Enabled	defines if BACnet/IP routing is enabled.
BACnet IP Network Number	defines the BACnet/IP network number this device either hosts or is joined to. Valid ranges are 1-65534.
BACnet Internal Network Number	defines the internal network number to allow Aspect to interact with objects local to itself.

	This network number must be unique across all devices and cannot conflict with any established network numbers for IP, Ethernet, or MS/TP. Valid ranges are 1-65534
BACnet NAT Network Enabled	defines if BACnet BBMD NAT functionality and accessibility is enabled. When enabled, this feature permits NB-Pro to access a site remotely in a more efficient manner when NAT routers are involved. If enabled, the following properties must be configured to ensure proper operation: • BACnet NAT Network Number - Defines a unique network number for NAT access. This network number must be unique from other networks within your BACnet internetwork. Valid ranges are 1-65534. • BACnet NAT External IP Address - Defines the external IP address for the NAT router that the device will forward packets through. • BACnet NAT External Port - Defines the UDP Port assignment that BACnet packets will be forwarded through. This cannot conflict with the standard BACnet IP UDP Port Setting. If you intend to connect to the device remotely using NB-Pro, this port would be used in your NB-Pro Connection Settings.
Segmentation Enabled	Allows Aspect to communicate with devices on a BACnet network that has been split into separate isolated segments.
BACnet APDU Timeout	defines the APDU time out for BACnet communications. This value defaults to 3000ms and is considered optimal.
Router Debug Level	defines level of debugging for the device. This should be set to zero (0).
BACnet Debug Level	defines level of debugging for general BACnet communications. This should be set to zero (0).

BBMD Settings

The BBMD Settings area is used configure BBMD table setup for BACnet networks. Within this section, two BBMD tables are available - one for standard BBMD configuration, and another for BBMD over NAT. Either or must be enabled in order to add entries into the corresponding tables.

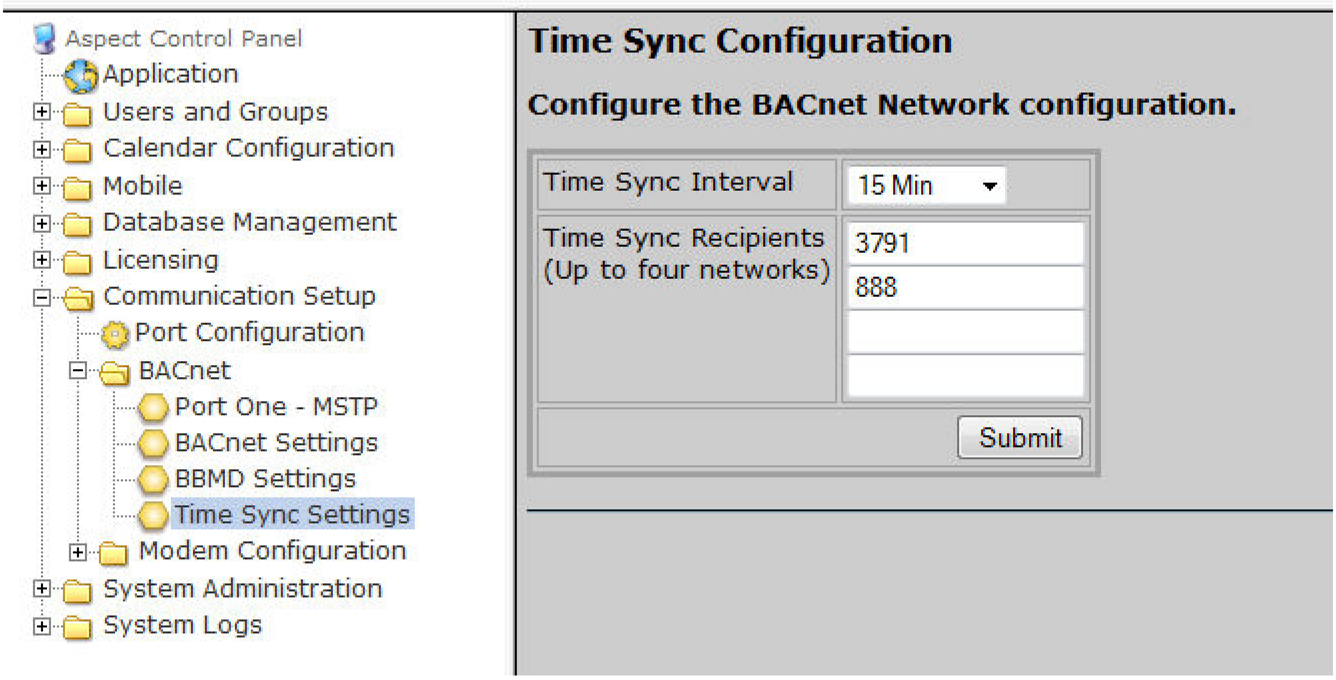
When entering addresses into the table, it is recommended that two-hop distribution methods be used, where an entry should contain a mask of 255.255.255.255 (indicating two-hop, global). This reduces the potential for standard IP routing issues that could occur on an IT infrastructure.



Time Sync Settings

The Time Sync Settings area is used configure BACnet network time synchronizations. A target may send a time synch message onto four separate networks if desired. Simply define the network number you wish to have the target send a time synchronization onto, and define the interval.

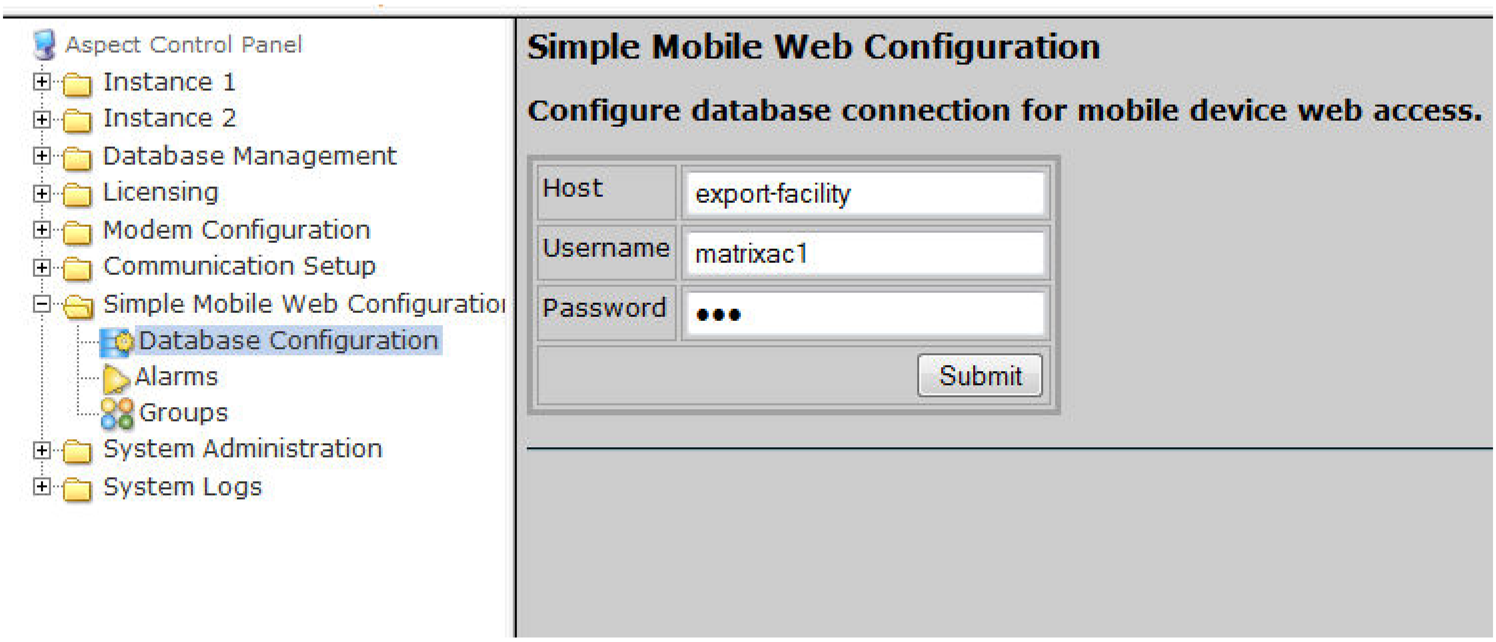
For global broadcast of a time synchronization, set one of the recipients for a value of 65535.



Simple Mobile Web Configuration

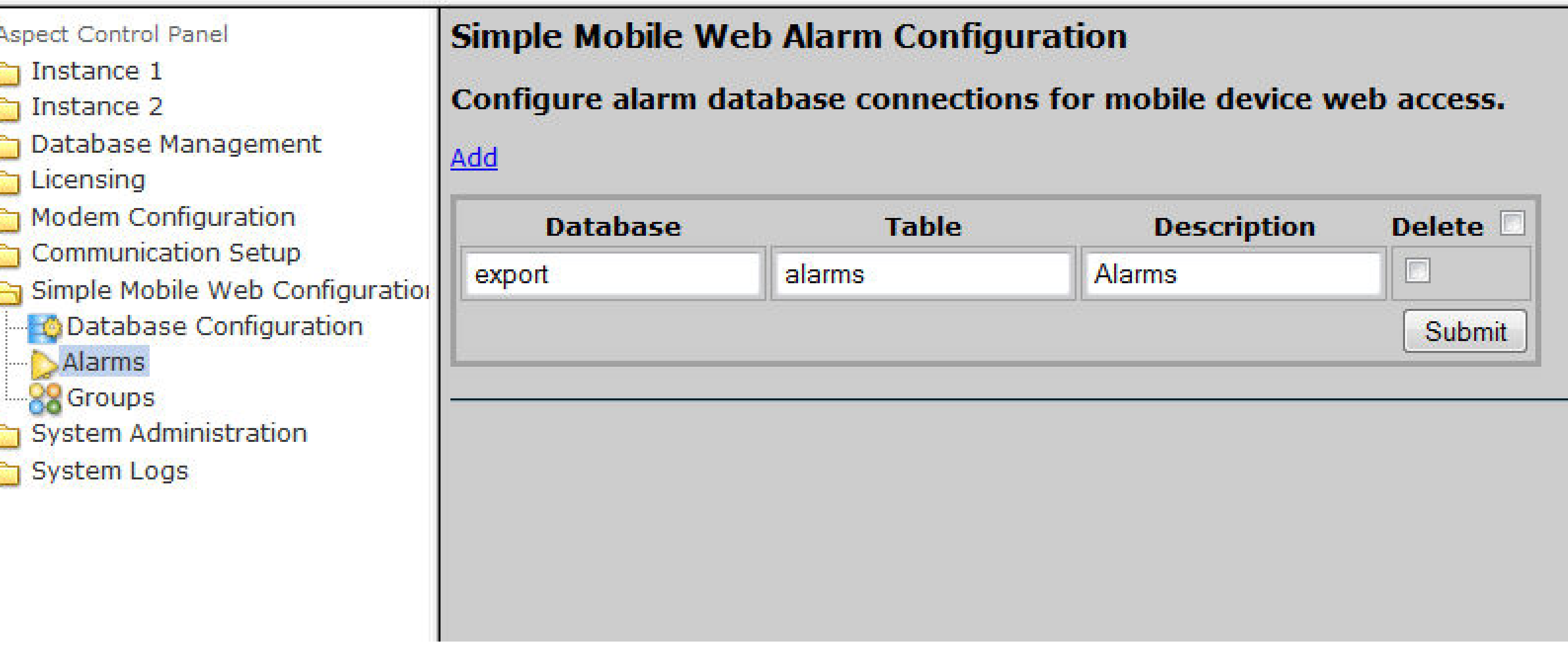
Database Configuration

The Database Configuration area of Simple Mobile Web is used to bind the configuration to a specific MySQL Database. The Database can be local to the server, or remote.



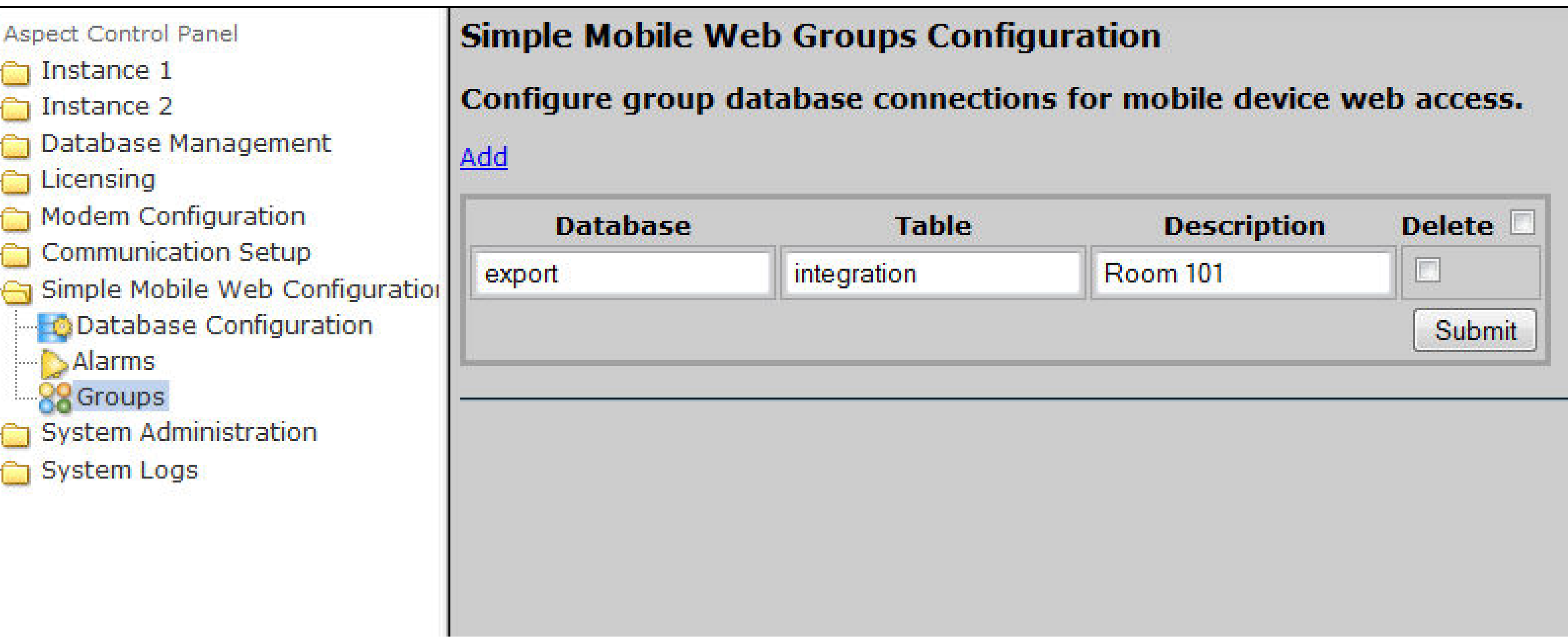
Alarms

The Alarms area of Simple Mobile Web is used to bind the configuration to a specific database table containing alarms collected by Aspect.



Groups

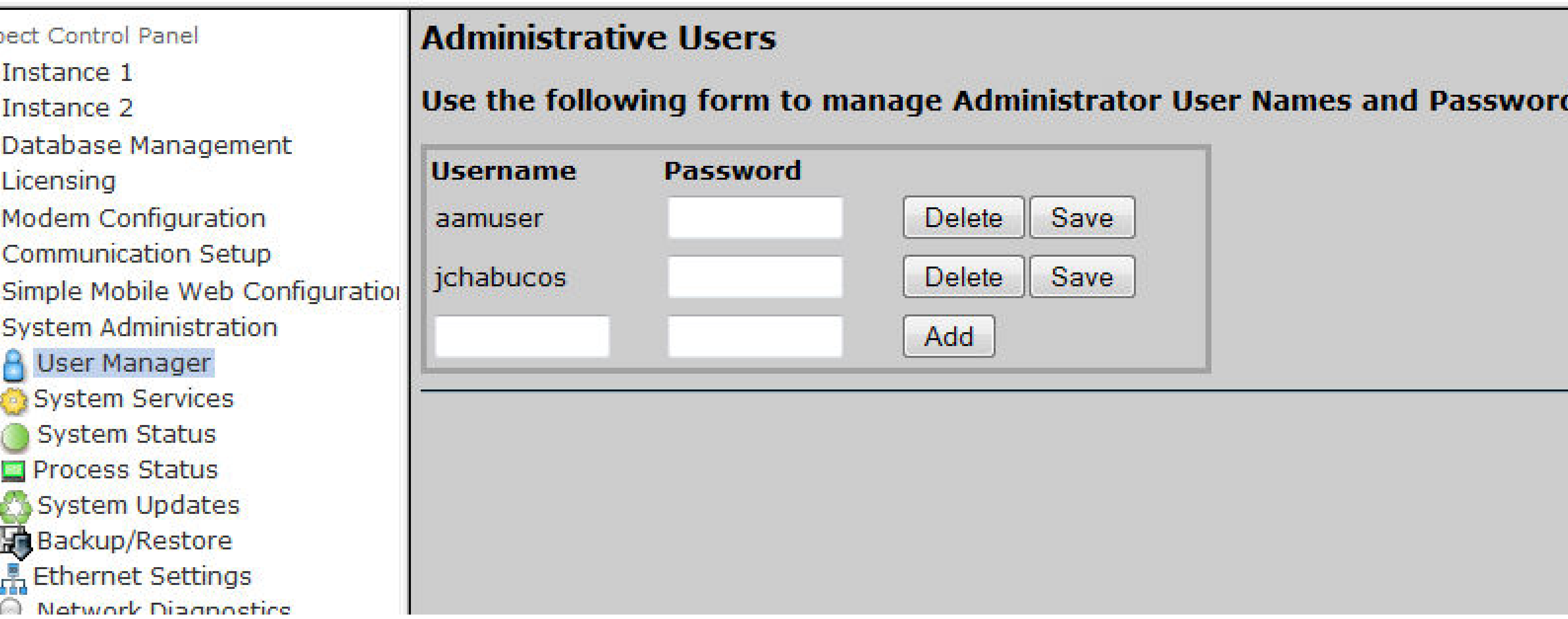
The Groups area of Simple Mobile Web is used to organize grouped point listings relative to when they appear in a mobile browser.



System Administration

User Manager

The User Manager area provides a form to setup, add and remove administrative users from Aspect-Facility, Aspect-Nexus, and Aspect-Enterprise targets. In these targets, Administrative users are permitted access to the Aspect Control Panel, where as instance-based users and groups are used solely for accessing deployed projects.



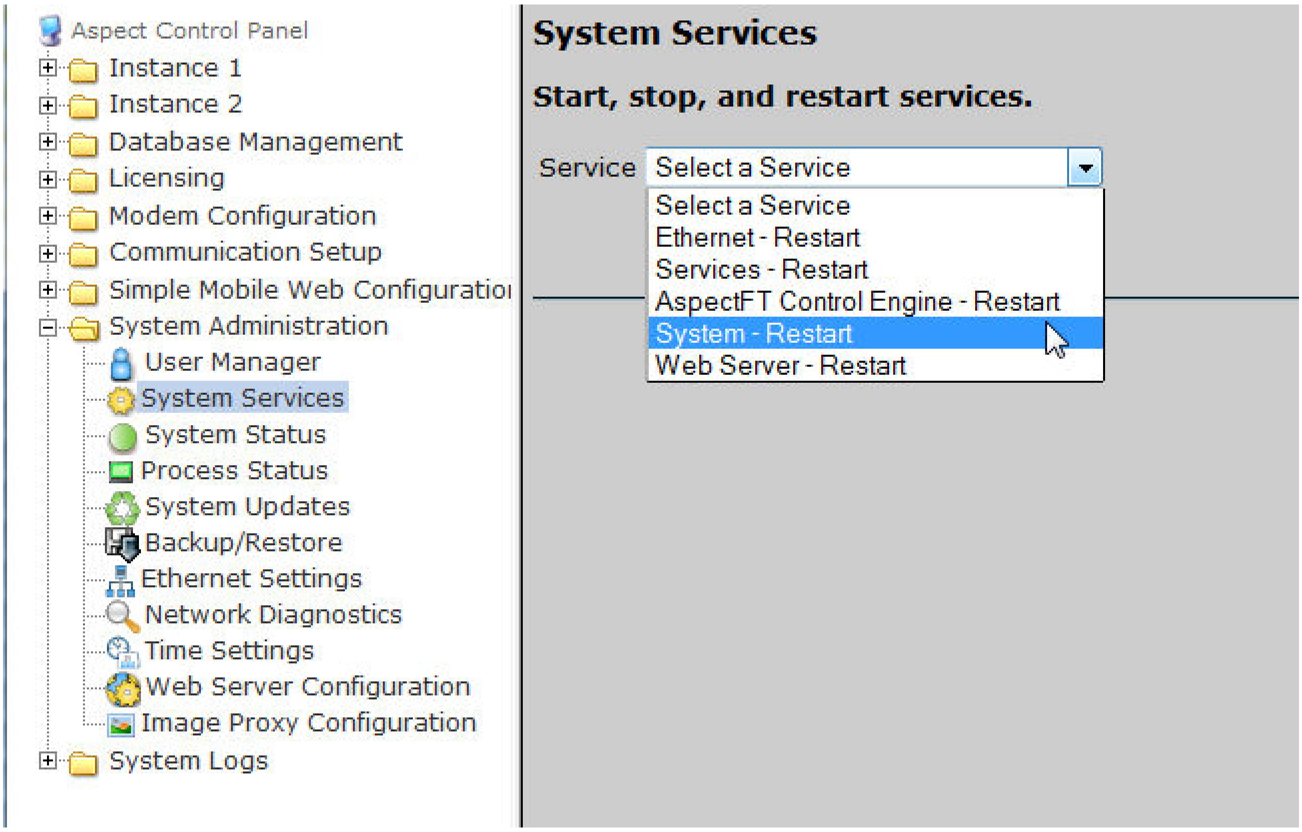
The User Manager provides support for passwords containing the following:

- Uppercase Letters
  - ABCDEFGHIJKLMNOPQRSTUVWXYZ
- Lowercase Letters
  - abcdefghijklmnopqrstuvwxyz
- Numbers
  - 0123456789
- Special Symbols
  - Underscore Symbol _
  - Hyphen Symbol -
  - Period Symbol .
  - Question Symbol ?
  - Exclamation Symbol !
  - At Symbol @
  - Hash Symbol #

- Dollar Symbol $
- Percent Symbol %
- Caret Symbol ^
- Ampersand Symbol &

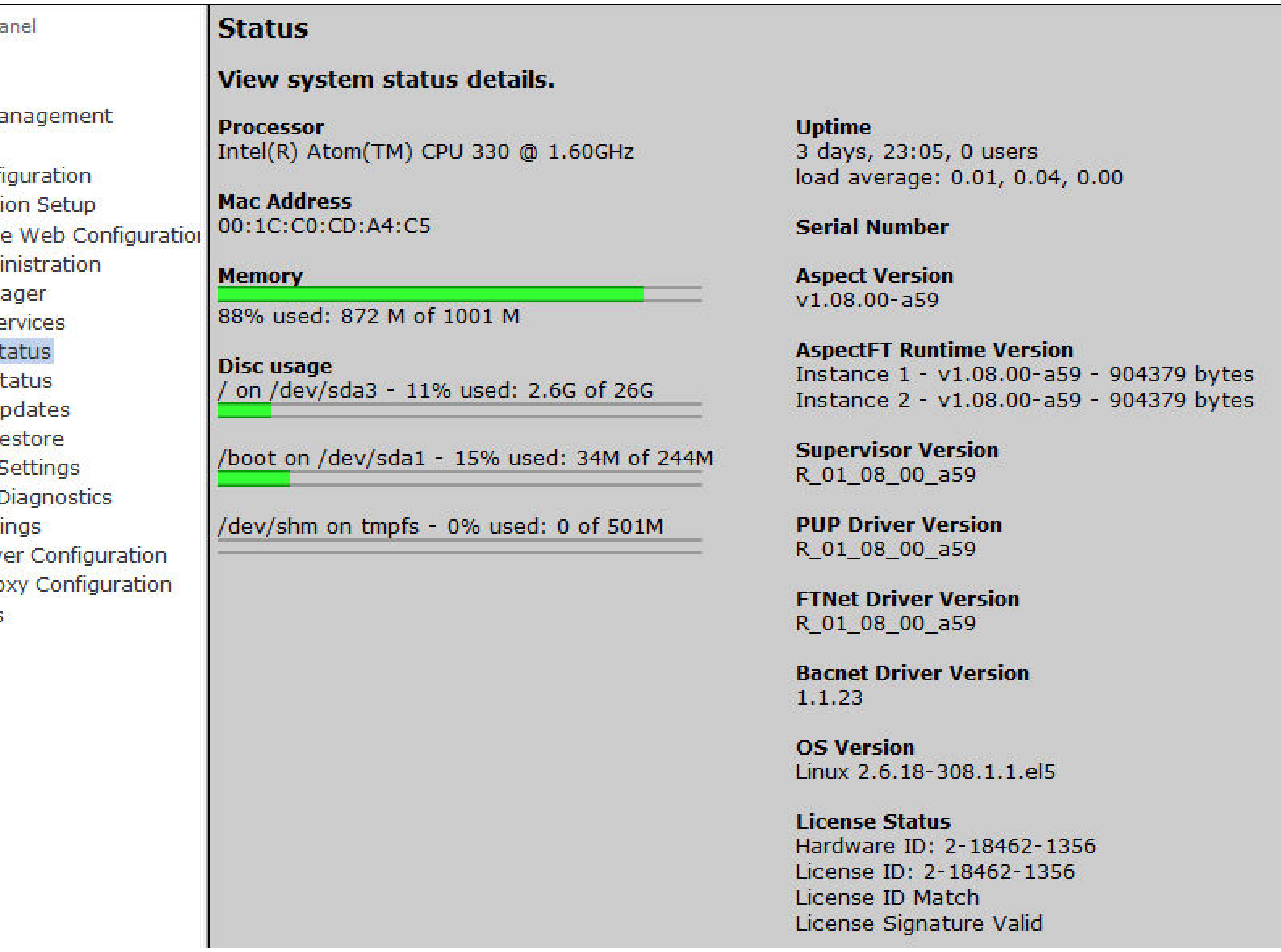
System Services

The System Services area is used to perform global service functions on an Aspect target (such as a system restart, global Aspect Restart, etc..).



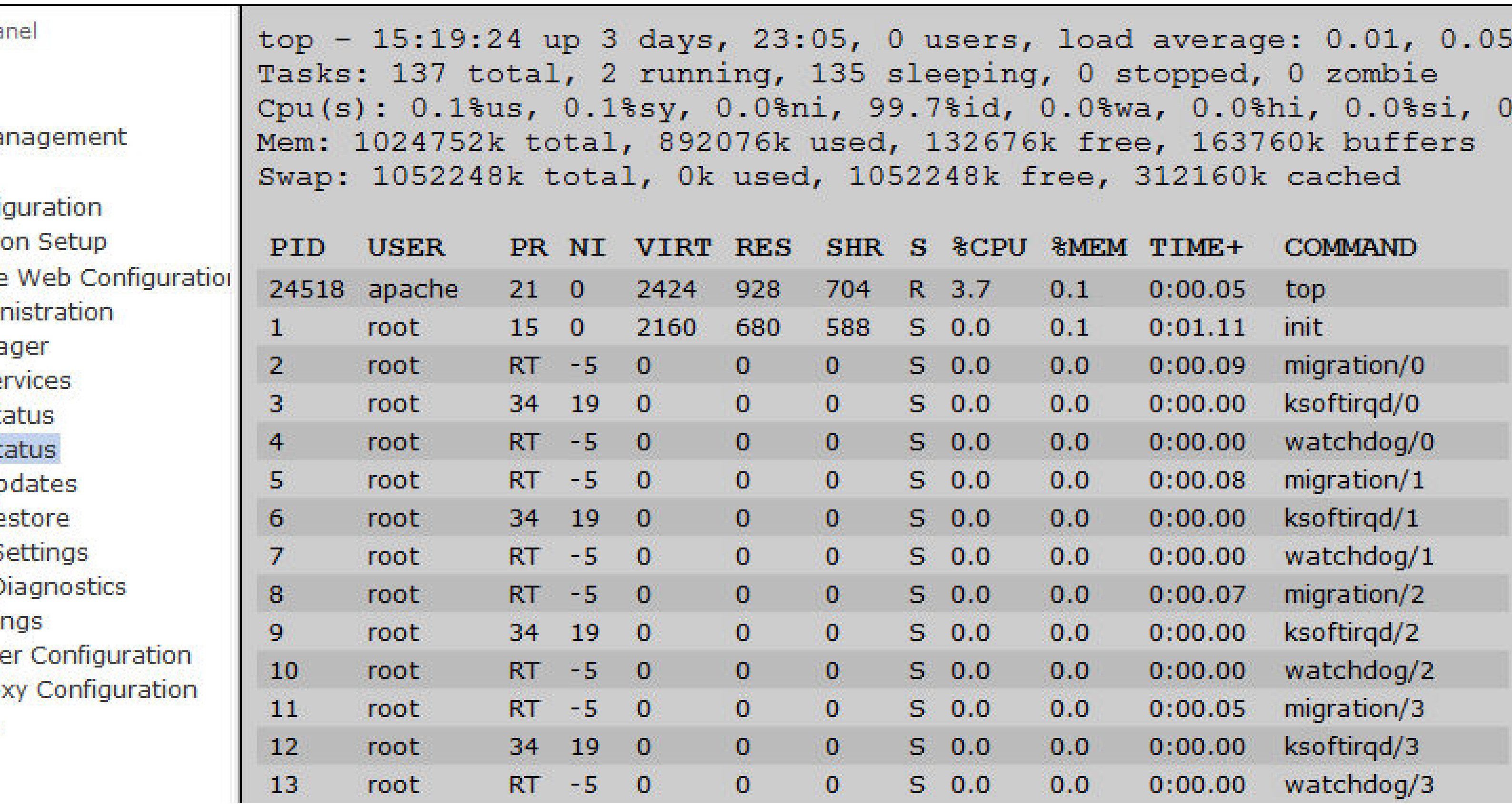
System Status

The System Status page provides details on the health of the system, including Memory (RAM) utilization, disc storage, and all pertinent revision information.



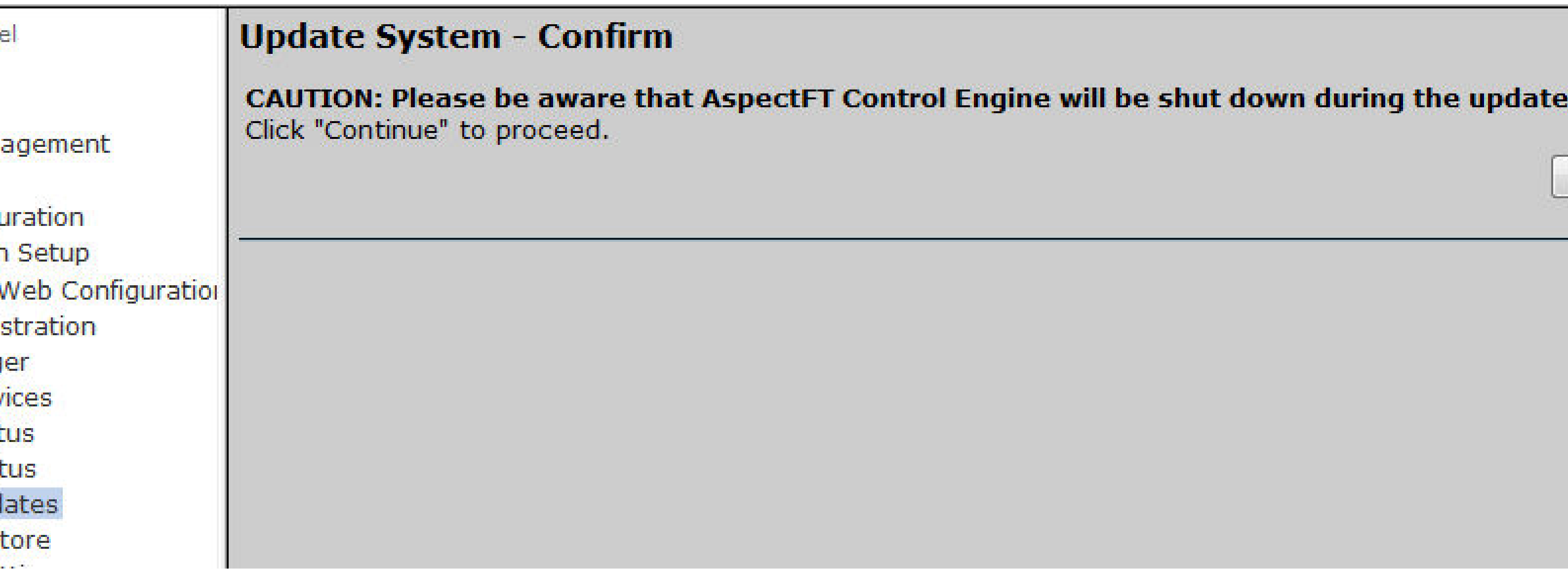
Project Status

The Project Status page provides access to the TOP utility of the target's Linux operating system. Details of this utility provide general information such as uptime, CPU utilization, and many other advanced parameters that may be requested during troubleshooting with AAM Technical Services.



System Updates

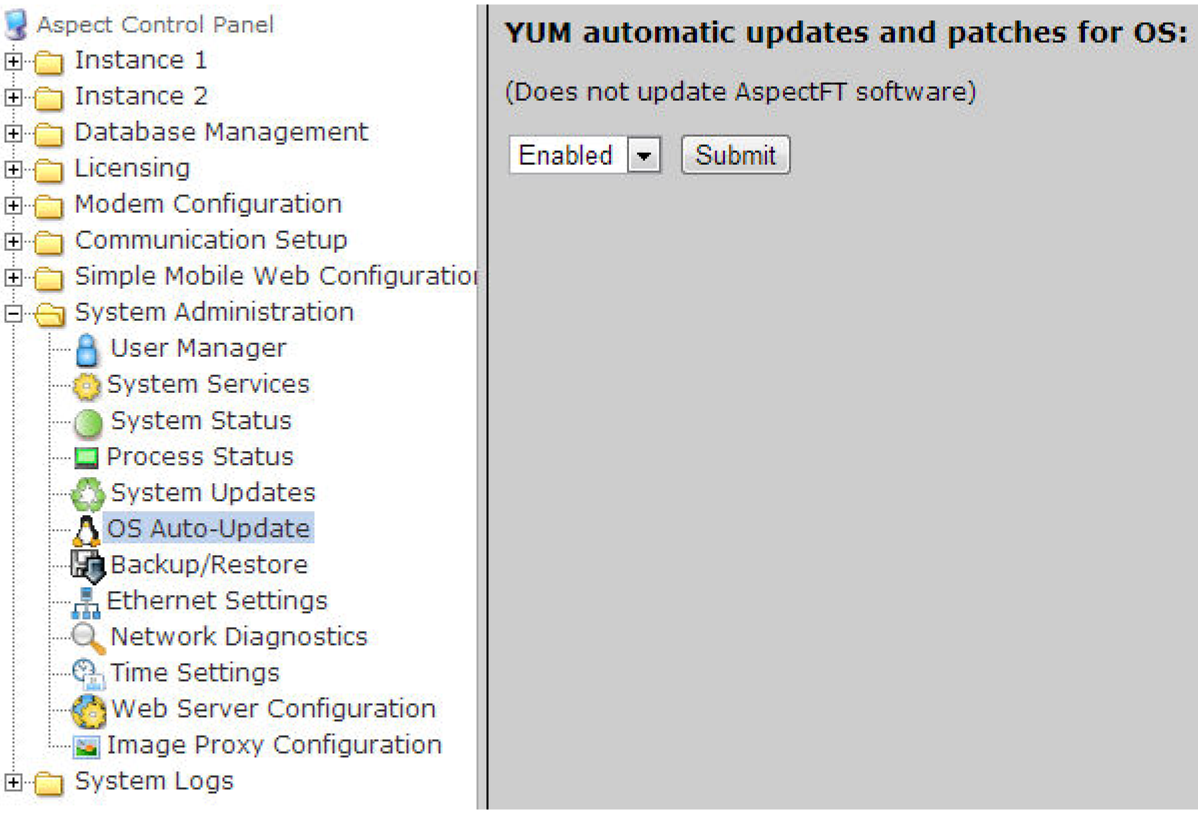
The System Updates area is used to perform firmware/software upgrades for the Aspect target.



OS Auto-Update

For troubleshooting purposes, the OS Auto-Update page has been added to the Aspect Facility, Nexus, and Enterprise platforms.

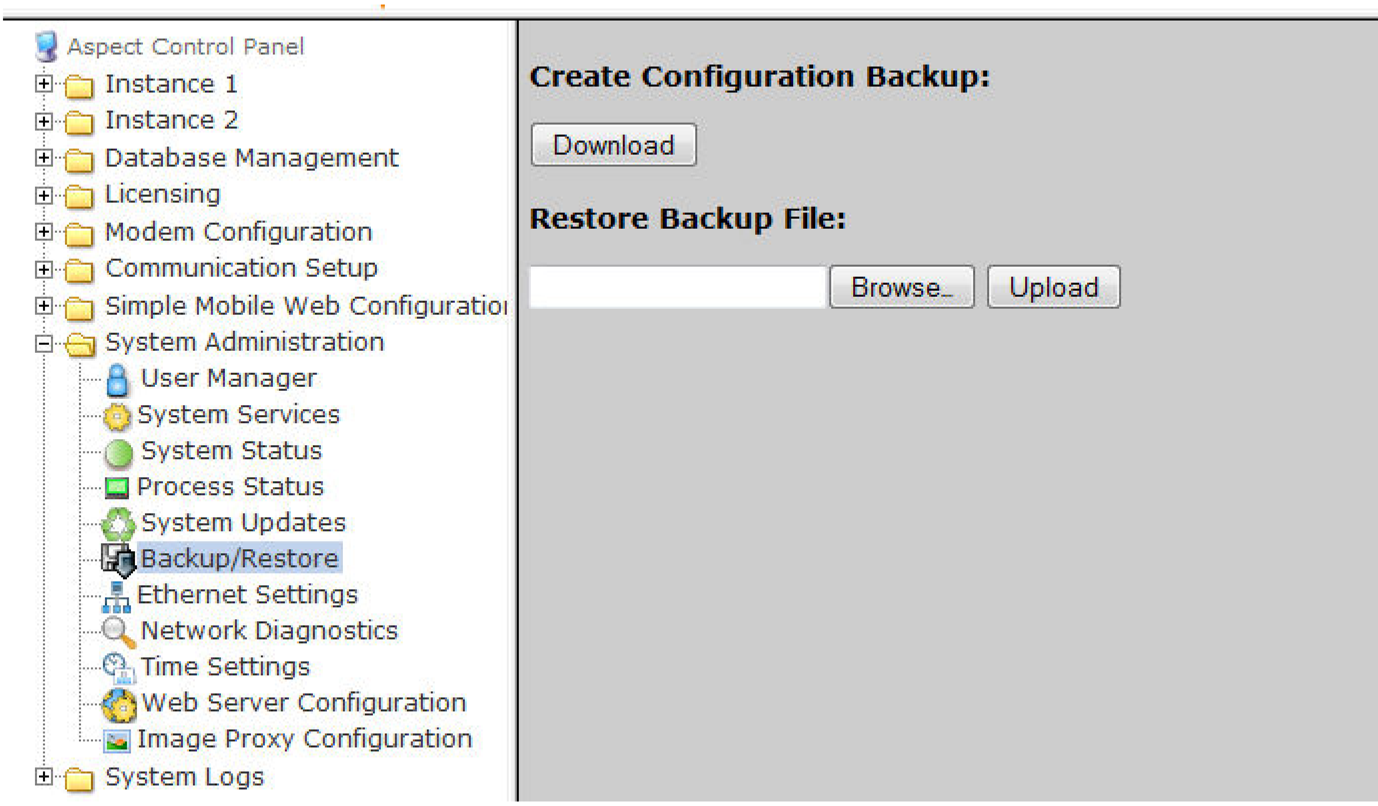
This setting should remain at its default setting of Enabled, unless instructed by the AAM Technical Services to disable.



Backup/Restore

Backup/Restore provides the means to backup an ASPECT target's device configuration (network addresses, port and driver configuration, etc).

To create a backup of the **project** configuration, simply click the Download button.



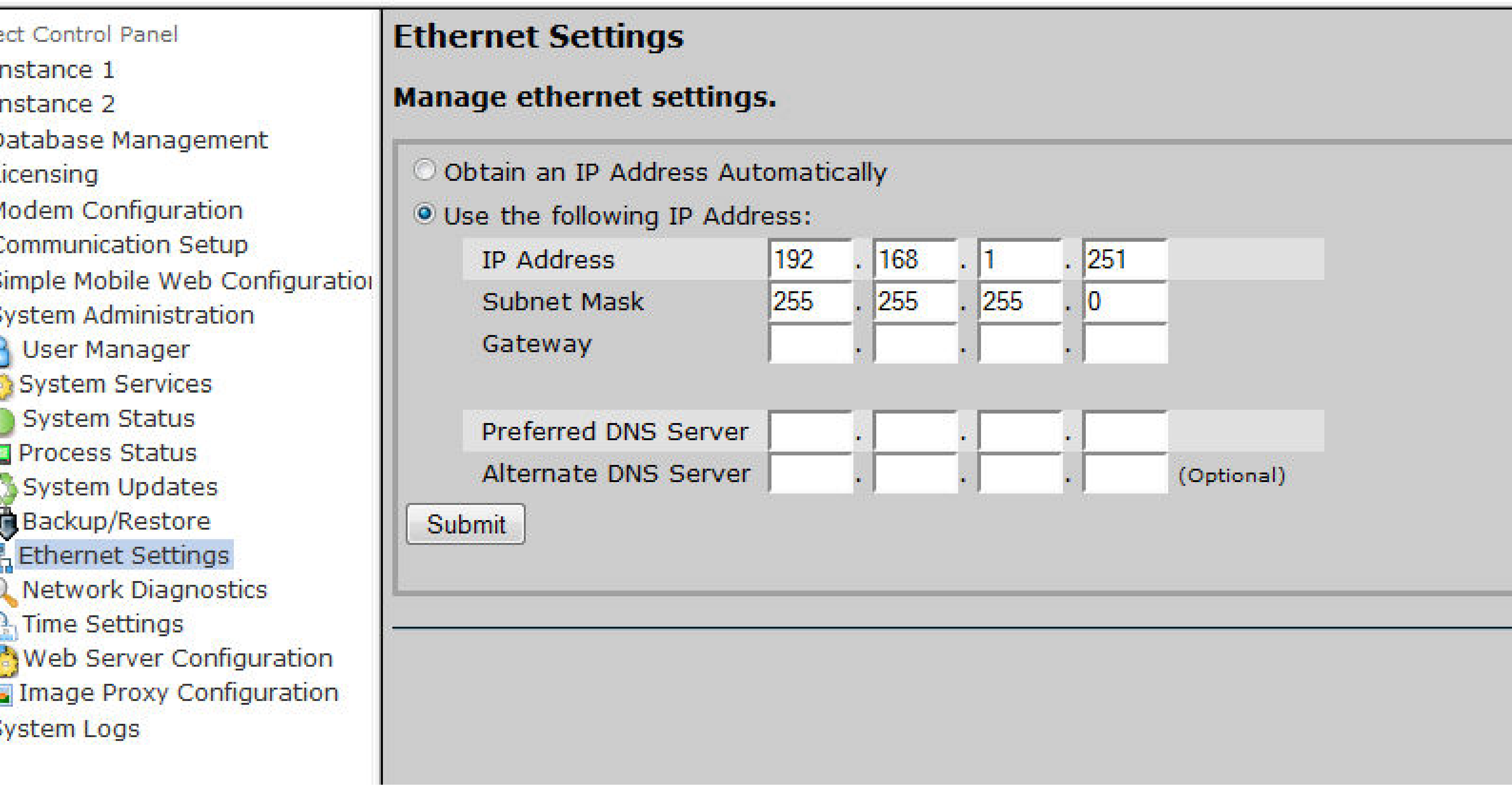
Backup Project Source

To create a backup of the **project** source, see Project Source

> **Note**: The Backup/Restore process does not backup or restore your target's license. Your license file should be backed up manually from the License page.

Ethernet Settings

The Ethernet Settings area provides the ability to perform Ethernet address configuration for the target. Aspect targets support static IP address configuration, as well as DHCP network addressing.

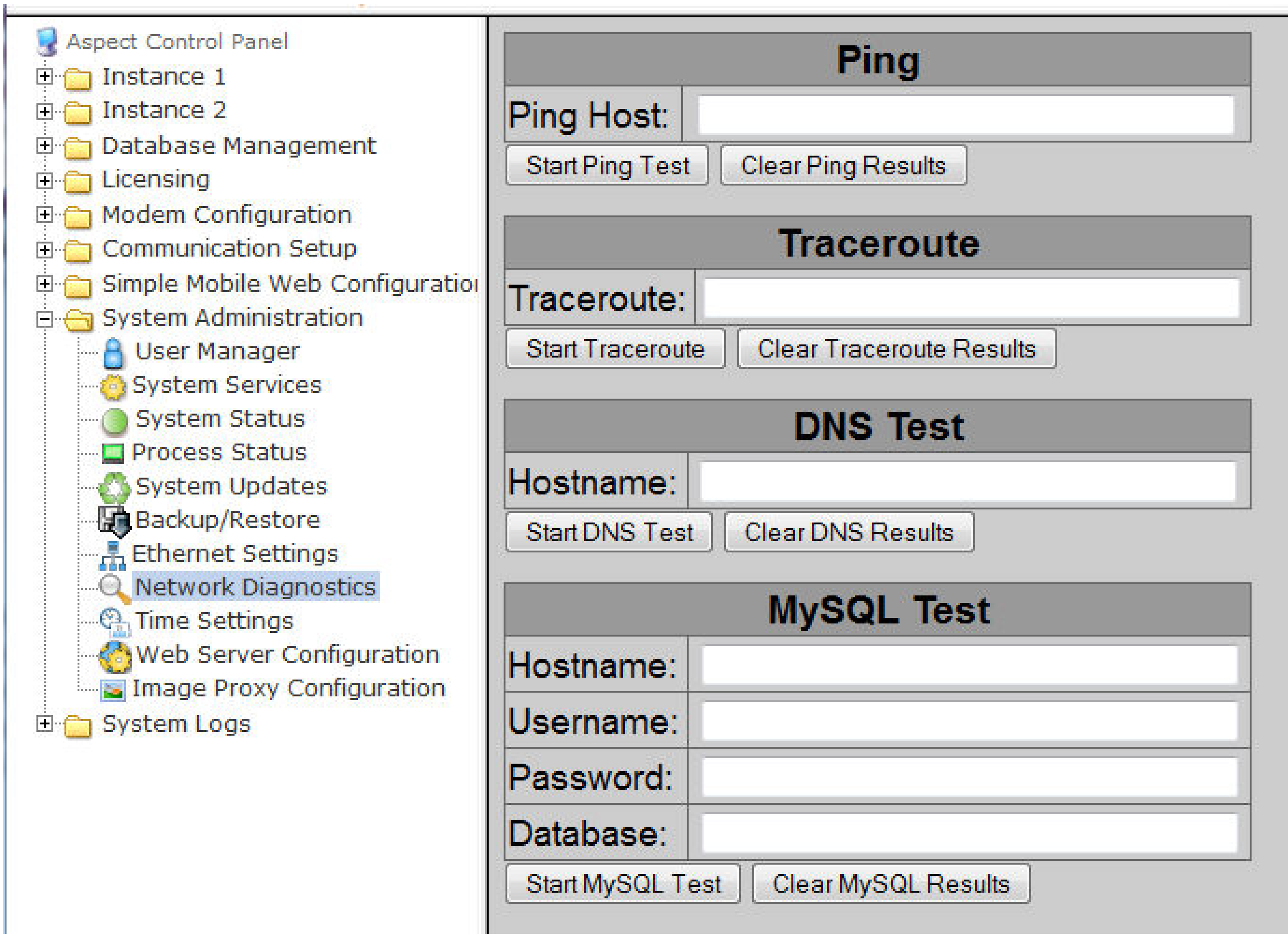


In optimal applications where DHCP is the preferred method, AAM Technical Services recommends that a reserved address be assigned to the Aspect target to prevent against mis-matched or recycled addresses.

Network Diagnostics

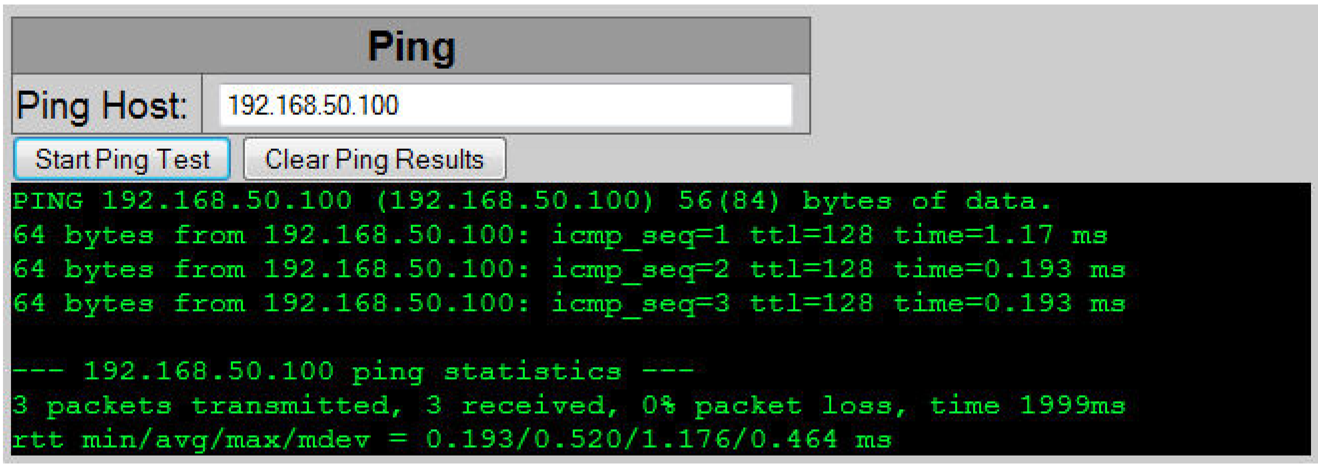
The Network Diagnostics page provides technicians with the ability to perform basic, common network diagnostic tools from an Aspect target. Utilities are available to perform the following functions:

- Ping
- Traceroute
- DNS Test
- MySQL Test (Nexus, Facility, and Enterprise only)



Ping

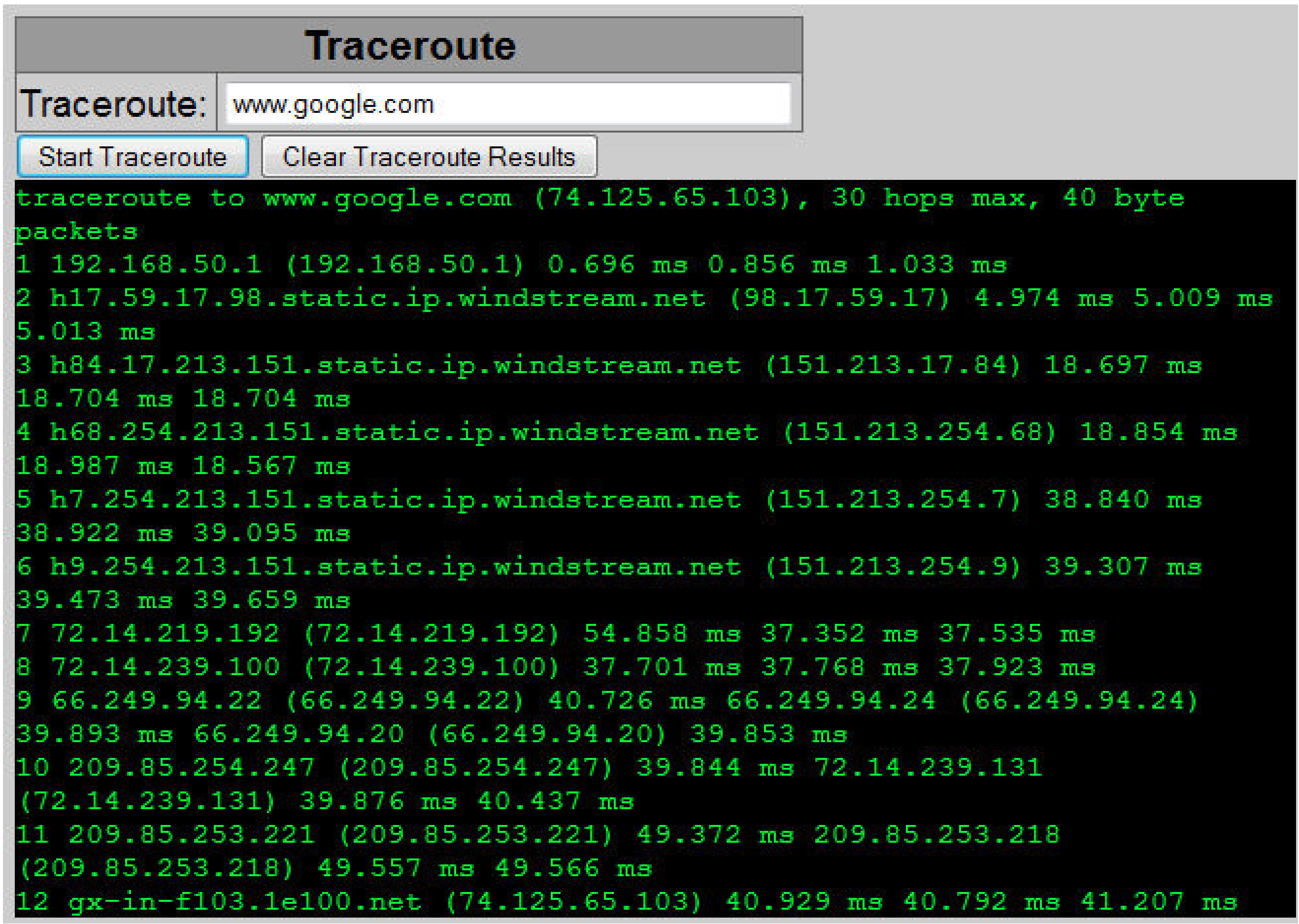
Ping provides the ability to perform a PING test against a specific address or resolvable name. Ping tests are commonly used to verify connectivity to a particular device or server. To perform Ping test, simply enter the address or resolvable name into the field provided and click Start Ping Test. A result window will be displayed for the test indicating the sequence number, the time to live, and the response time.



The Clear Ping Results button will clear the result information from the WebUI.

Traceroute

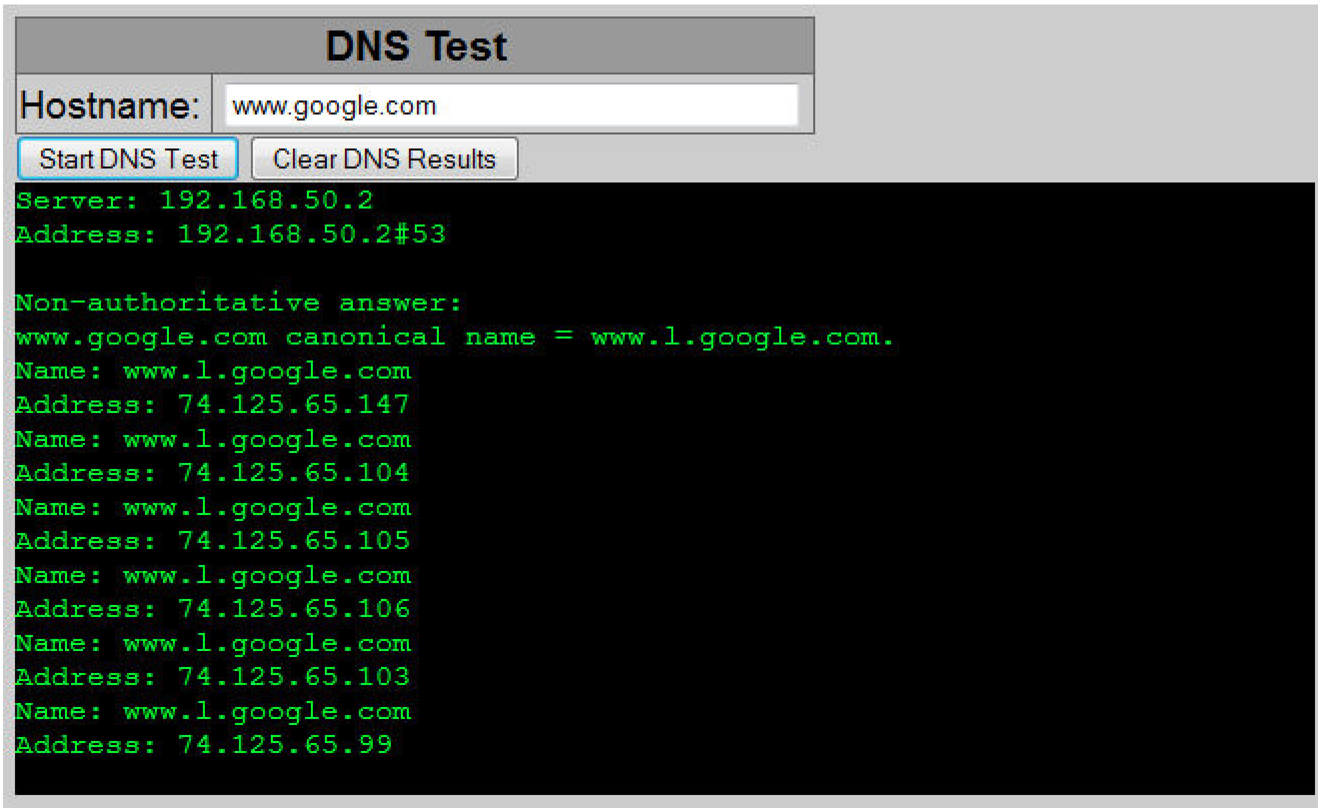
Traceroute provides information for displaying a route (path) and measuring transit delays of packets across the network. To perform a traceroute test, simply enter the address or resolvable name into the field provided and click Start Traceroute. A result window will be displayed for the test indicating each hop and route.



The Clear Traceroute Results button will clear the result information from the WebUI.

DNS Test

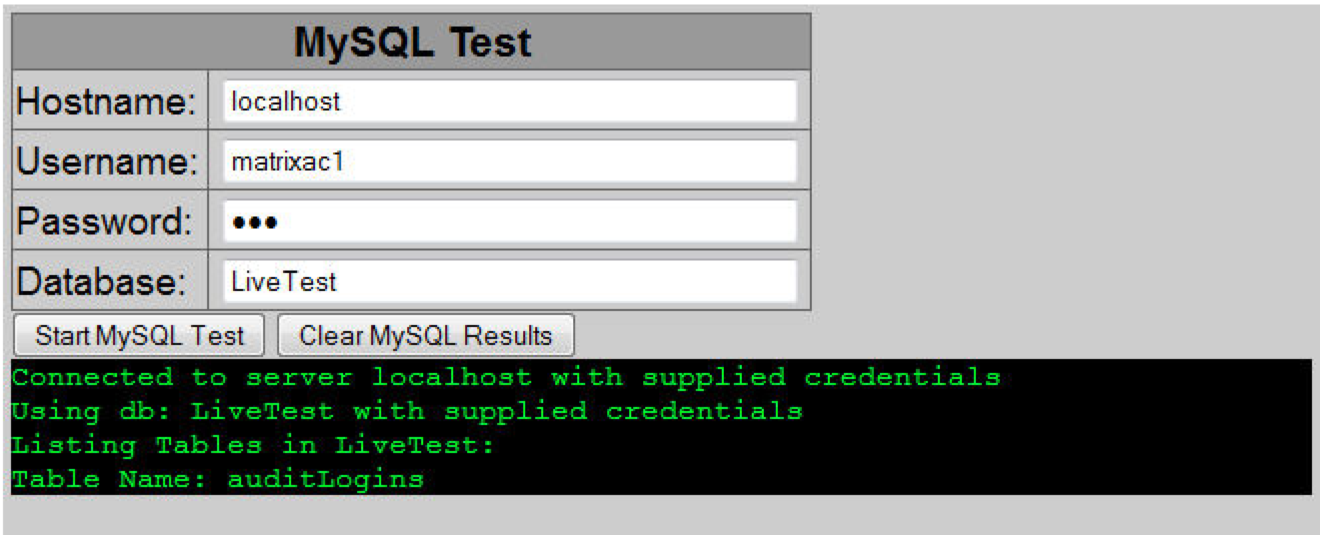
DNS Test can be used to verify name resolution of an assigned resolvable name. Simply enter a resolvable name into the provided field and click the Start DNS Test button.



The Clear DNS Results button will clear the result information from the WebUI.

MySQL Test

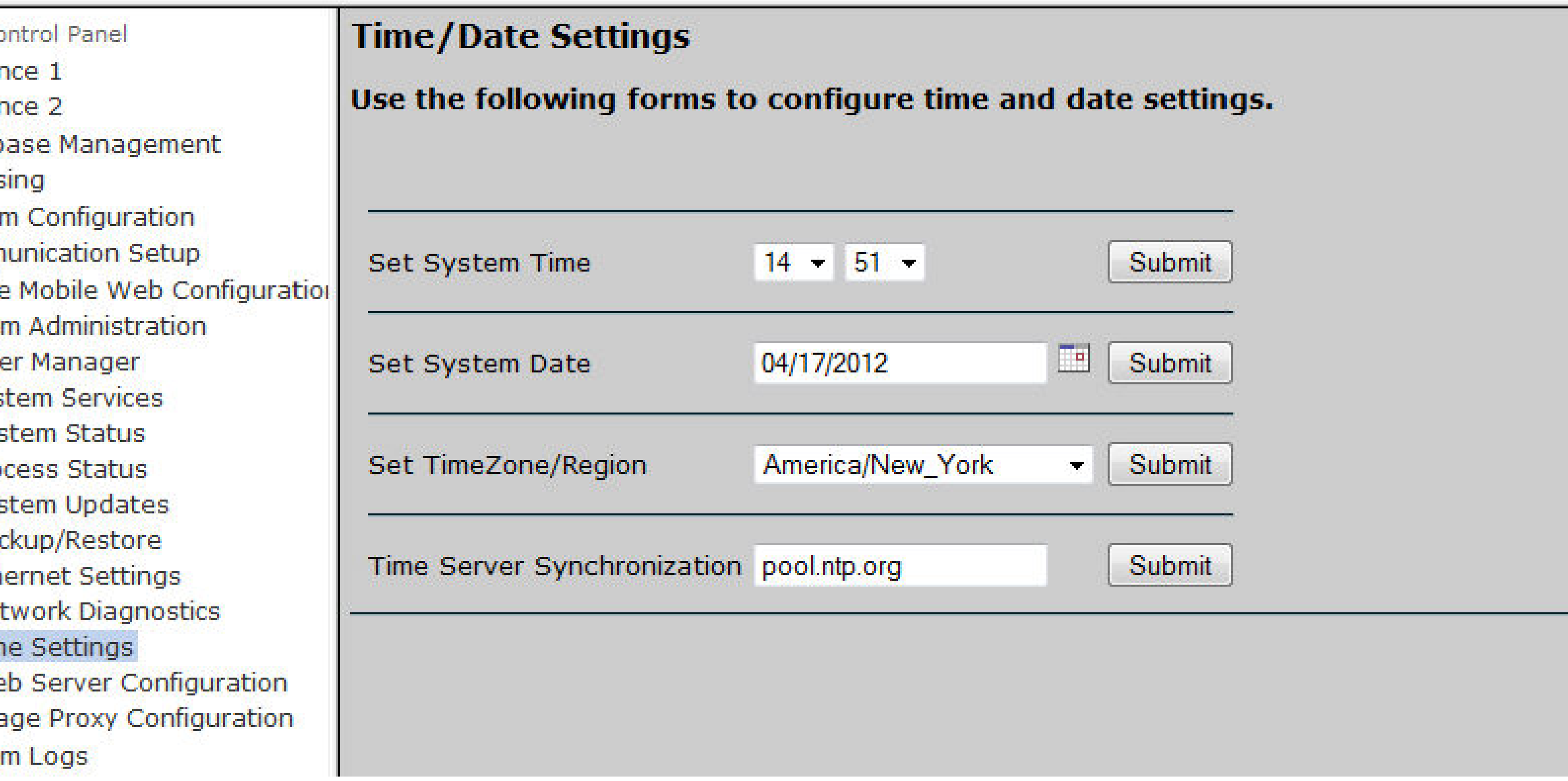
MySQL Test can be used to verify access to a MySQL Database either locally on an Aspect server-based target, or a remote MySQL database. Enter a host name (IP address or resolvable name), along with the username, password, and table name. If connection is successful, table names accessible by the provided credentials will be echoed back in the result window.



The Clear MySQL Results button will clear the result information from the WebUI.

Time Settings

The Time Settings area permits the configuration of the target's clock, timezone, as well as configuration for NTP time synchronization addresses.



Web Server Configuration

The Web Server Configuration Area is used to change web port settings for:

- Device Label - blank by default. Contents of this value are displayed on the main sign-in page of the Aspect target.
- Aspect Control Panel - uses Port 80 (HTTP) by default
- Aspect Control Engine - uses Port 7226 by default
- Simple Mobile Web - uses Port 8080 by default

Aspect Port and Multi-Instance Considerations

For multi-instance systems, please note that each instance derives from the base port configuration of your Aspect Control Engine port. For example, if your Aspect-Enterprise installation contains two instances, each instance would be available as:

- Instance 1 - Port 7226
- Instance 2 - Port 7227

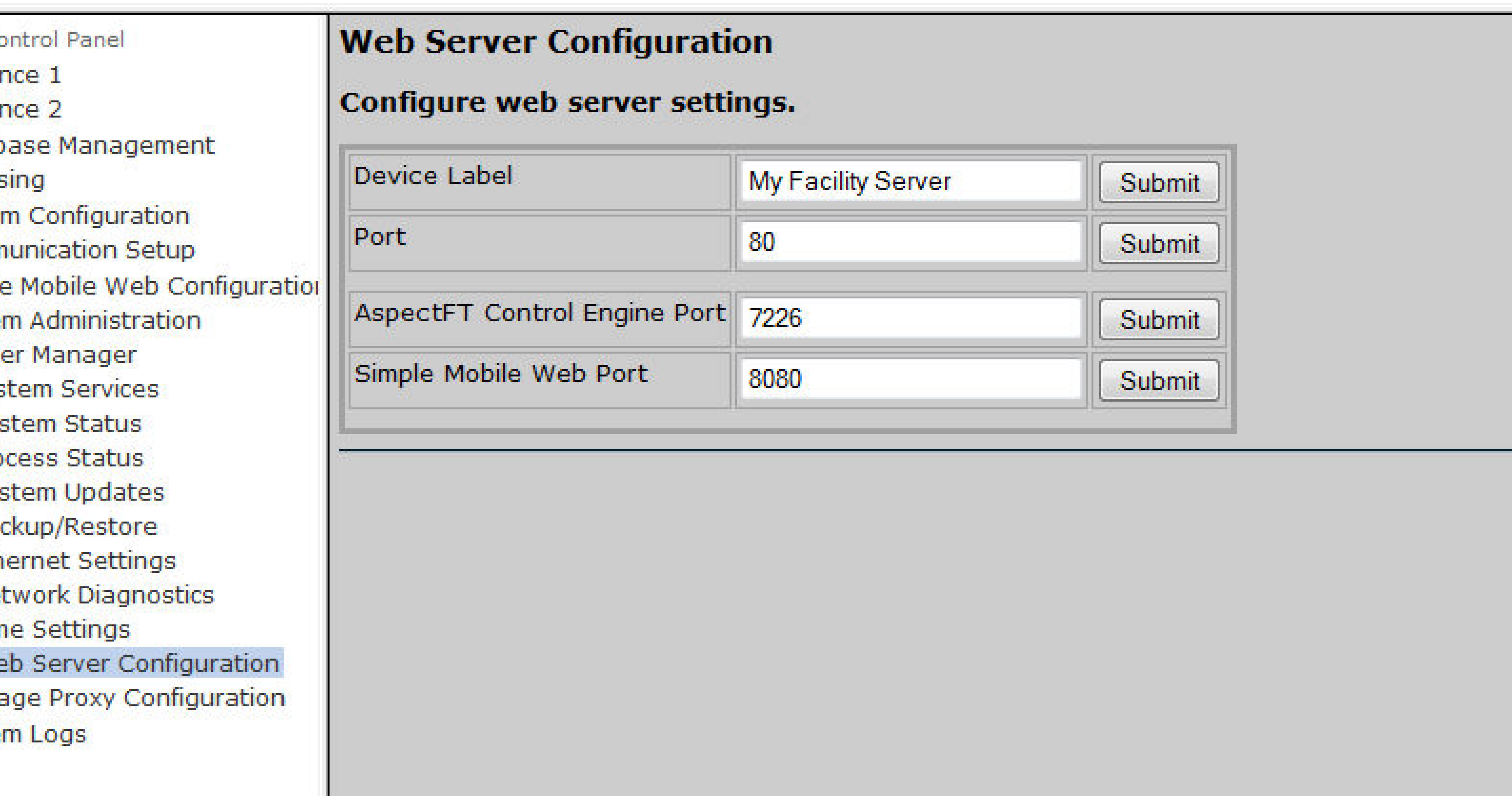
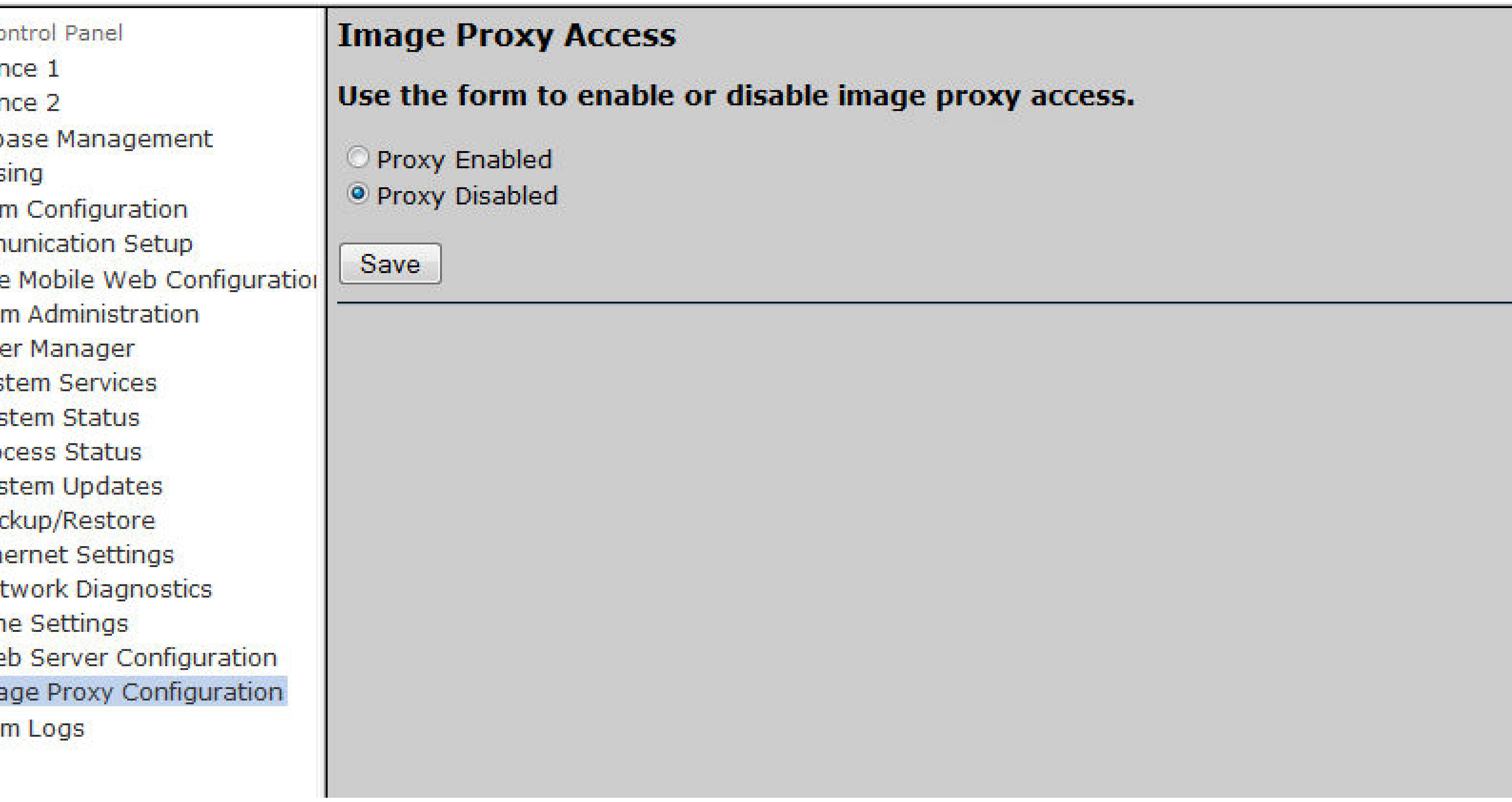


Image Proxy Configuration

The Image Proxy Configuration page permits users to enable and disable image proxy access, allowing Aspect to access external sites to retrieve graphics.



The Image Proxy feature uses cURL to check the status of the remote image and if it is HTTP200, will retrieve the image and echo it into the system after setting the image accordingly.

Only GIF, JPG, and PNG are supported. To establish a proxy connection from Aspect via URL, use the following string:

http://<address>/imageProxy.php?

where:

<address> - your target's IP address.

<imageurl - the address of the image you want to retrieve

<

- image/gif
- image/png
- image/jpeg
- image/jpg
- image/jpe
- image/jfif

Limitations

- Does not currently support authentication
- Only supports HTTP (no HTTPS,
- Aspect-Matrix does not support this feature at this time.
- cURL is manually set to timeout after 3 seconds to prevent loading huge images
- The image data retrieved by cURL is resident in memory until the cURL session is freed (probably not a huge deal on Facility, could be a very big deal on a Matrix serving multiple images)
- Some sites protect images in clever ways, such as placing them in special DIVS/
- Be careful with “images” that perform HTTP redirection (i.e. as in content distribution systems)

Before You Begin

Overview

CalDAV is installed on the Aspect family using two open source applications. – Baïkal Calendar Server, and Thunderbird.

Baïkal Calendar Server provides the CalDAV server back-end and serves calendar objects using the Distributed Authoring and Versioning (**DAV**) protocol, which is an extension of the **HTTP** protocol.

Thunderbird is an email client that includes a calendar editor to facilitate view and modification of the calendars hosted by **Baikal**. While we recommend using this client for calendar modification, it is not the only client that can be used to access the hosted CalDAV calendars.

Required Resources

Installation is supported on 64-bit ASPECT platforms (ASPECT-Enterprise, Aspect Facility, or NEXUS Series) with ASPECT 3.04.00 or higher.

• Active Internet connection

or

- Baïkal - https://github.com/sabre-io/Baikal/releases/download/0.6.1/baikal-0.6.1.zip
- Thunderbird - https://www.thunderbird.net/

  Aspect Target must be upgraded to PHP 7.3 – Contact Technical Support for v3.03.03 security patch upgrades

More Information

Installation

Server Configuration

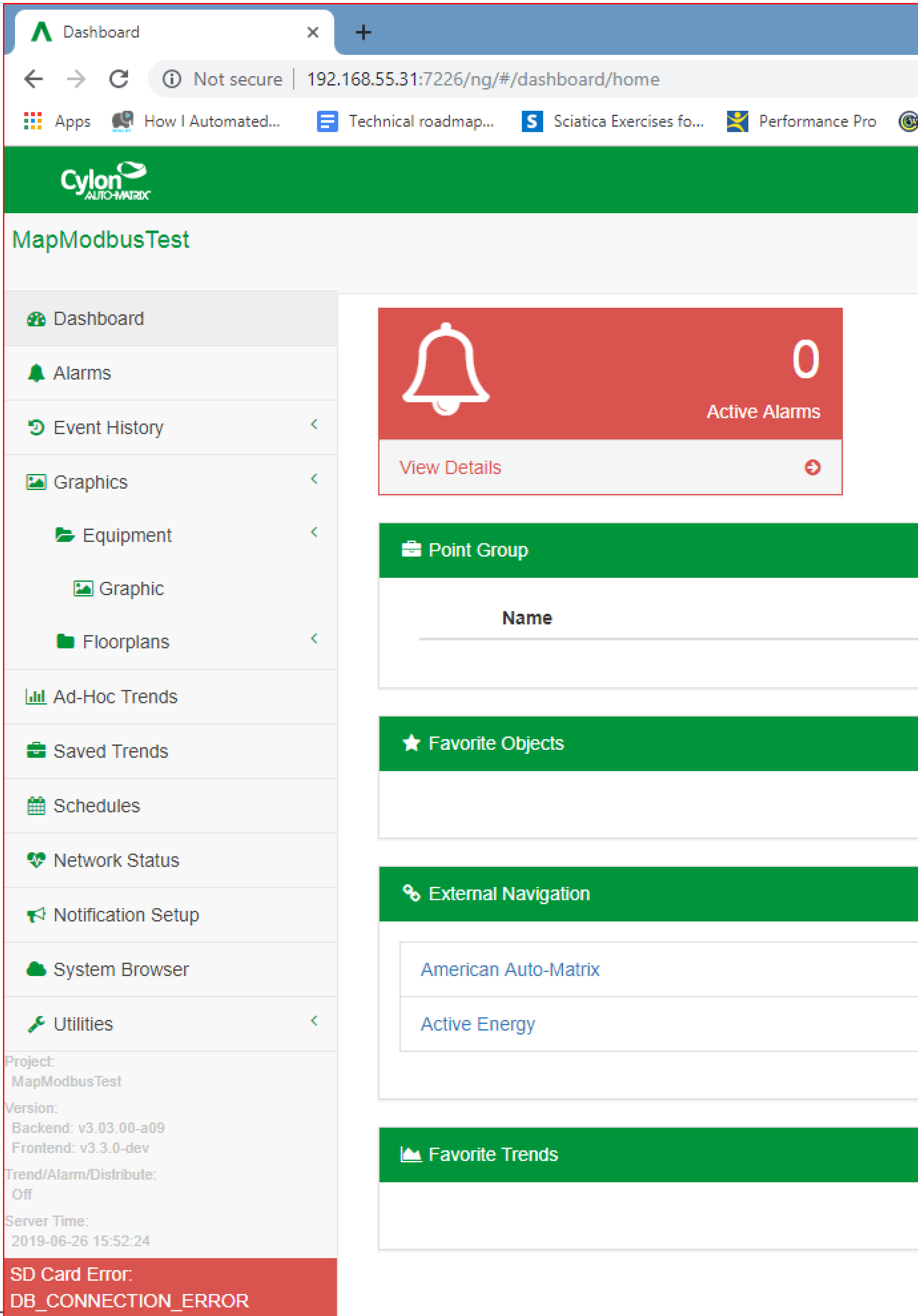
Using the Thunderbird Client

Use with Aspect-Studio

Using Third Party Clients

Hardware Fault Detection

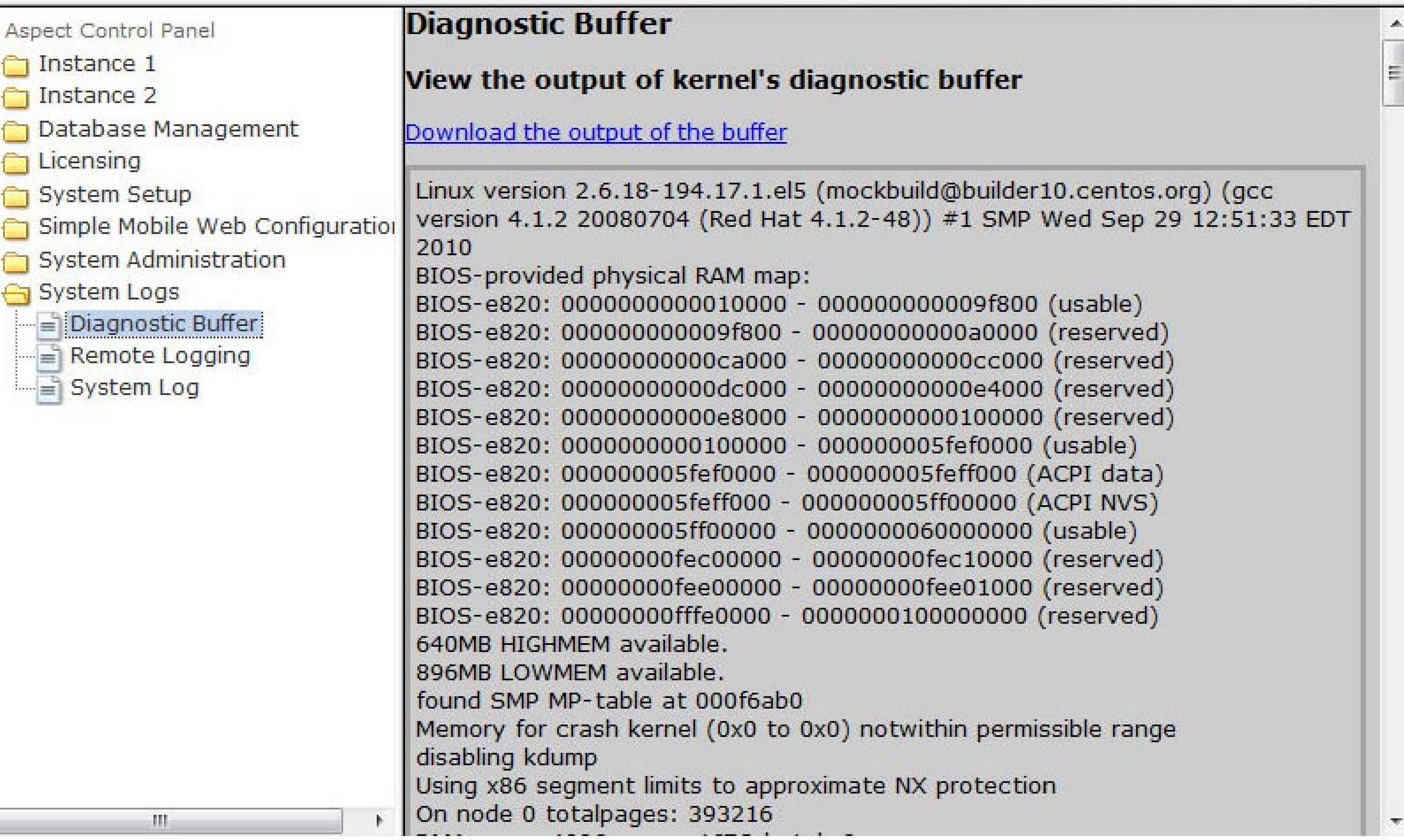
If a hardware fault occurs that impacts Trend logging, for example if an SD card goes into a failed state, then the ACE will continue to run in "Control Only" mode, i.e. trend and statistic logging will be turned off but I/O control will continue.


Dashboard
Not secure
192.168.55.31:7226/ng/#/dashboard/home
Apps
How I Automated...
Technical roadmap...
Sciatica Exercises fo...
Performance Pro
MapModbusTest
Dashboard
Alarms
Event History
Graphics
Equipment
Graphic
Floorplans
Ad-Hoc Trends
Saved Trends
Schedules
Network Status
Notification Setup
System Browser
Utilities
Project:
MapModbusTest
Version:
Backend: v3.03.00-a09
Frontend: v3.3.0-dev
Trend/Alarm/Distribute:
Off
Server Time:
2019-06-26 15:52:24
SD Card Error:
DB_CONNECTION_ERROR
0
Active Alarms
View Details
Point Group
Name
Favorite Objects
External Navigation
American Auto-Matrix
Active Energy
Favorite Trends

System Logs

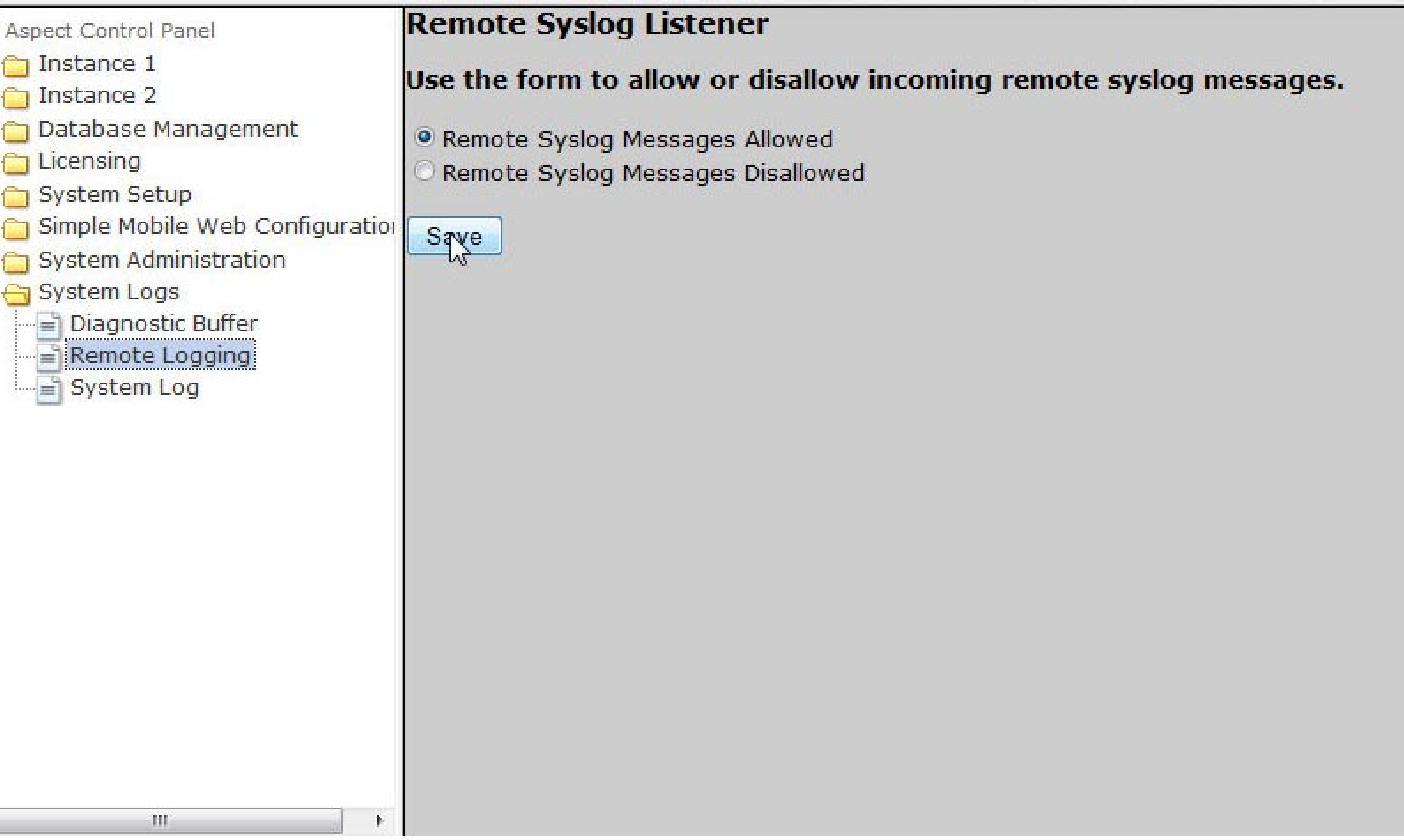
Diagnostic Buffer

The Diagnostic Buffer area provides diagnostic information regarding the target hardware and OS details.



Remote Logging

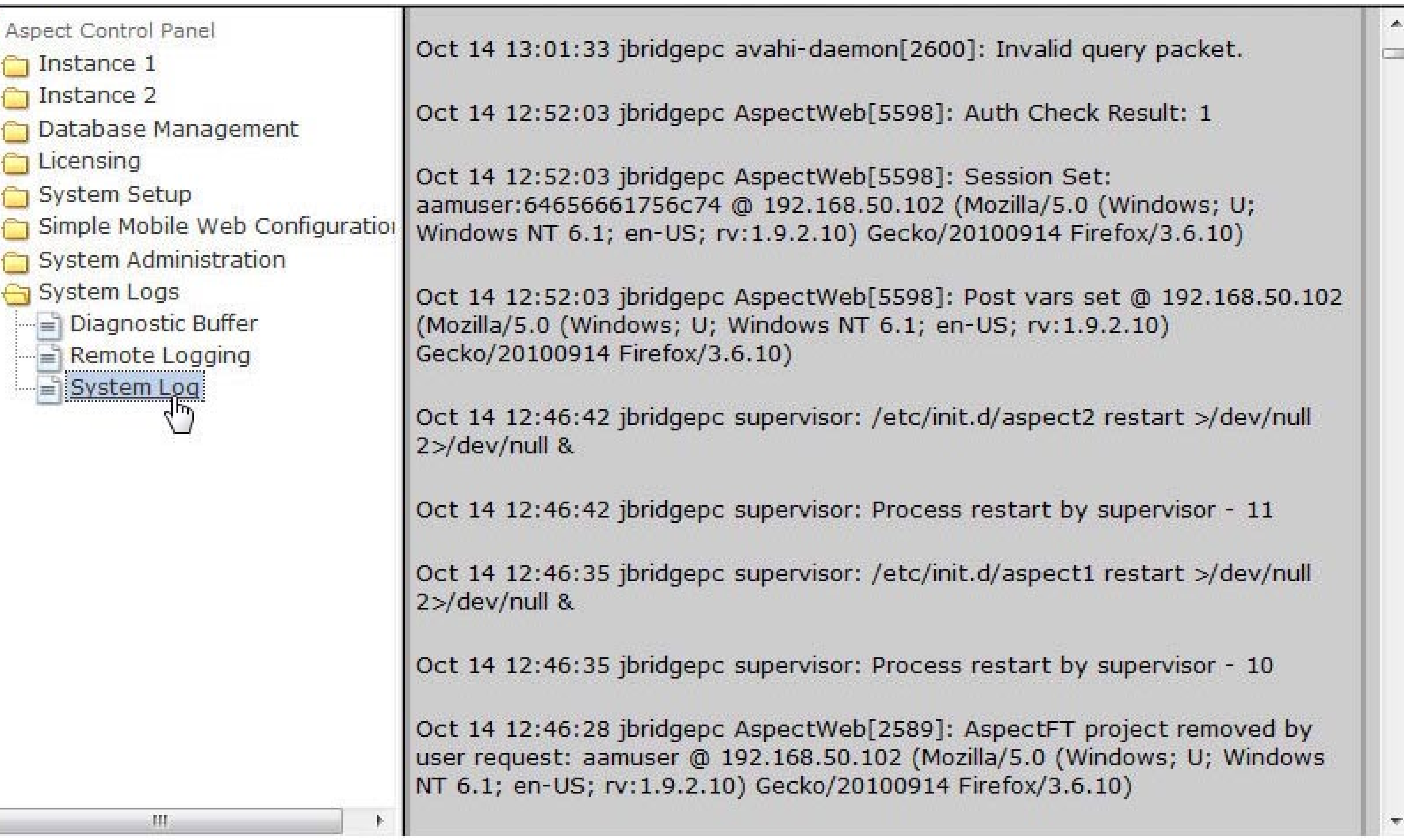
The Remote Logging page is used to either allow or disallow centralized syslog messaging. All Aspect targets support the ability to send their syslog information to a centralized Aspect target or IT-supported syslog server for tracking. This form is used to allow the target to allow or disallow itself to be a formal syslog server.



System Log

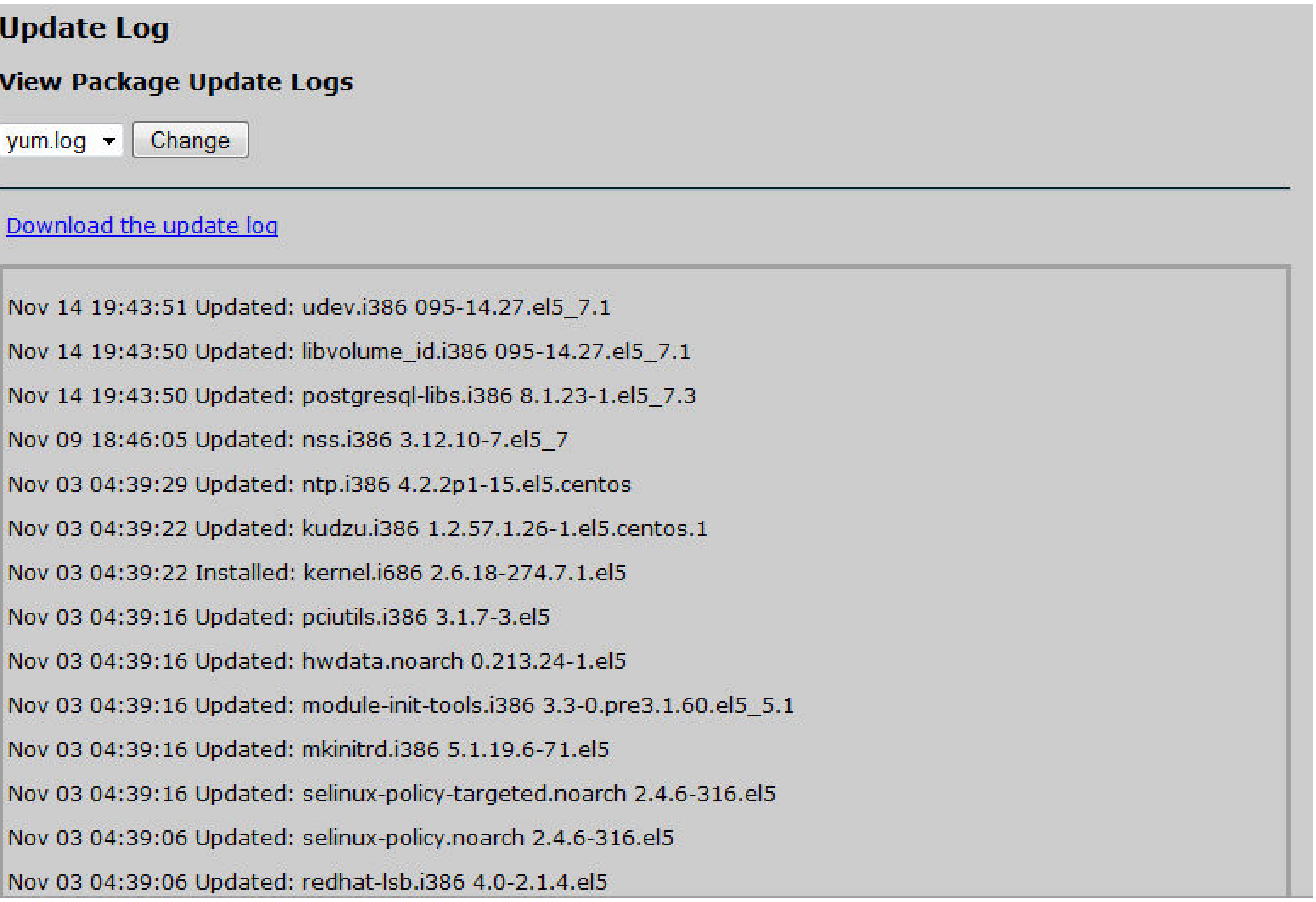
The System Log area provides complete syslog information for the hardware target. Information provided within this section includes boot up details, and lower level information regarding the normal runtime of the system.

ASPECT Target Administration : Aspect Control Panel : System Logs



Update Log

The Update Log area provides complete details on Linux OS updates for Aspect-Facility and Aspect-Enterprise.



Local File Storage

Local File Storage Overview

In some situations, it may be necessary to store files that may or may not be part of your Aspect deployed project. While the User Files node of the Project Tree can accomplish this, files are commonly inaccessible or changeable without modifying the project and red-deploying the application.

Aspect targets with firmware revision v1.06.00 or later permits users to store files on a target. These files could be project files, technician notes, or other items that assist with the management of a site.

Administration and management of files is accomplished using any standard WebDAV client software - open-sourced (such as BitKinex) or commercial software application.

Target Requirements

- Aspect-Matrix Area Controller
-
    - v1.06.00 firmware or later
    - USB Flash Drive connected to available USB Port
    -
        - The USB Flash Drive must contain a folder called "localfiles" (case-sensitive, no quotations) prior to attempting to host or manage files.
    - LIMITATIONS - Due to limited resources common to any embedded platform utilizing a smaller processor, each file hosted on a connected USB Flash Drive should not exceed 1.5MB in size

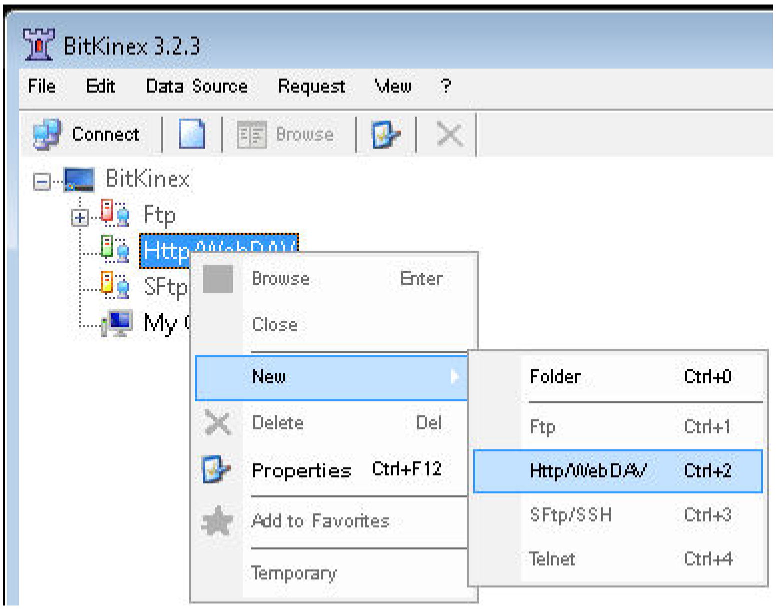
- Aspect-Facility, Aspect-Nexus, Aspect-Enterprise Platforms
-
    - v1.06.00 firmware or later
    - NOTE - a USB Flash Driver is not needed to use this feature with Aspect-Facility, Nexus, and Enterprise platforms. Local File Storage is achieved using on-board storage (solid state drive).

- Additional Software for File Administration
-
    - Any open-sourced or commercial WebDAV client.

Connecting and Copying Files to the Local Storage Area

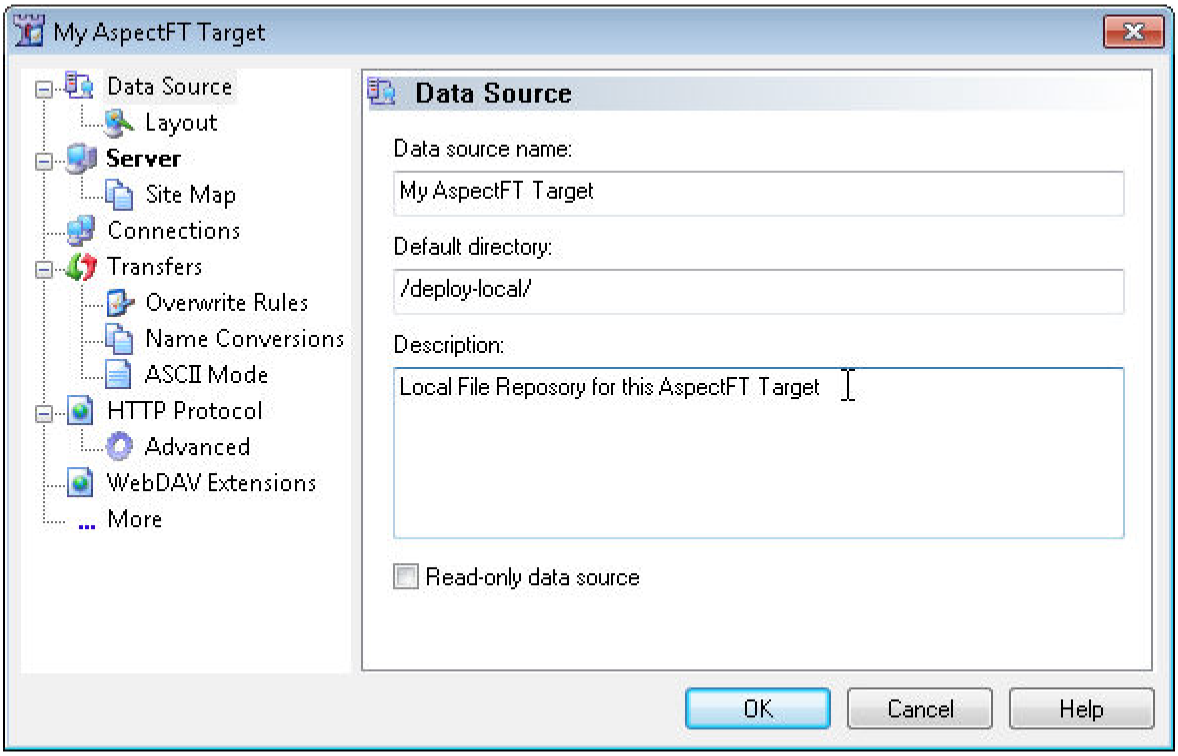
To connect to the Local Storage Area, a WebDAV software client must be used. For the purpose of these instructions, the open-source client BitKinex is used.

1. In BitKinex, select the Http/WebDAV section. Right click and select new, followed by Http/WebDAV selection.

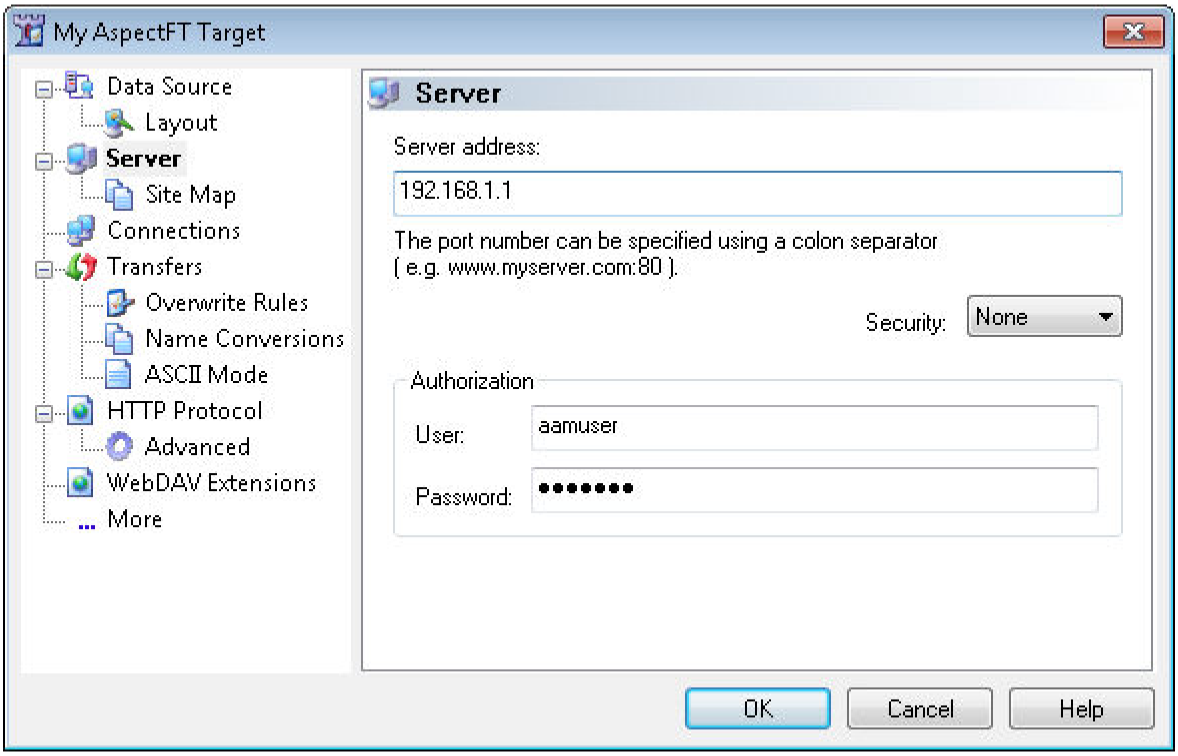


2. Enter a descriptive name for the target you wish to connect to.

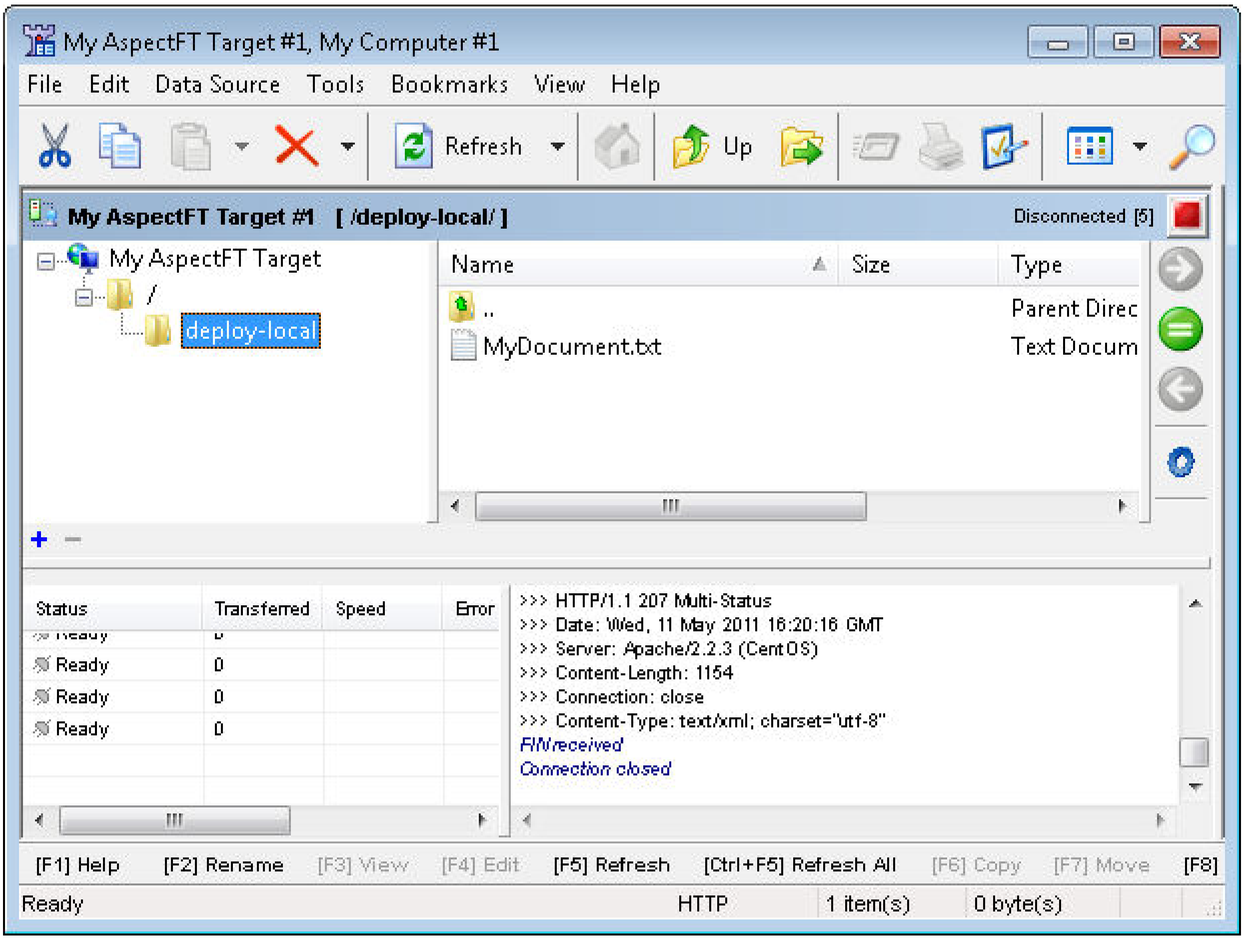
3. Right-click the added target and select Properties to access the Connection Properties for the server. You will be greeted with the Data Source properties. In the default directory, add /deploy-local/ as shown below. You can also enter a description if needed. Click OK.



4. Click Server in the Data Source window on the left side tree. Enter the address of your Aspect target. The Authorization fields require a valid user and password.
   - NOTE - For Aspect-Matrix Area Controller targets, these credentials can be any member of the MIXAdmin group.
   - NOTE - For all Aspect server-baed targets (Nexus, Facility, and Enterprise), these credentials come from the System Admin | User Manager settings. Any user listed in this area can be used to authenticate and perform local file storage tasks as needed.



5. Once finished, you are ready to connect to the repository. To connect, simply double-click the target reference from the main program area of BitKinex. When connected, an explorer window will appear. To add files, simply drag them from your PC into the explorer window.



Referencing Files from the Storage Area for Downloads

Files stored in the storage area can be referenced by Aspect, or a web browser if necessary for download purposes. To access files, the Aspect target provides a non-WebDAV URL link for this purpose. To access the file from Aspect or browser, the non-webDAV URL should be used.

Example:

A file "sample.jpg" published to http://192.168.1.1/deploy-local/ will be accessible as http://192.168.1.1/local/sample.jpg

ASPECT Feature Configuration

Field Device Protocols

BACnet (for Existing Aspect v1.x Projects)

BACnet Overview

The following discusses Aspect and its inter connectivity with BACnet. Aspect targets are capable of communicating to BACnet devices and equipment manufactured by American Auto-Matrix, as well as third-party vendors. Aspect products support the following media layers of BACnet:

- BACnet/IP (Full Annex-J Support - routing, BBMD, and foreign-device registration)
- BACnet/Ethernet (BACnet over 8802-3 Traditional Ethernet)
- BACnet MS/TP (BACnet over EIA-485, Master Slave Token Passing).

Before configuring a project to communicate BACnet, you must first configure the communication ports of your Matrix Area Controller. For information on how to do this, please read the following topics below:

- BACnet Port Configuration
- BACnet Configuration
- BBMD Settings
- Time Sync Settings

More Information

Defining FTNet Devices

Adding the BACnet Driver

Working with Devices Overview

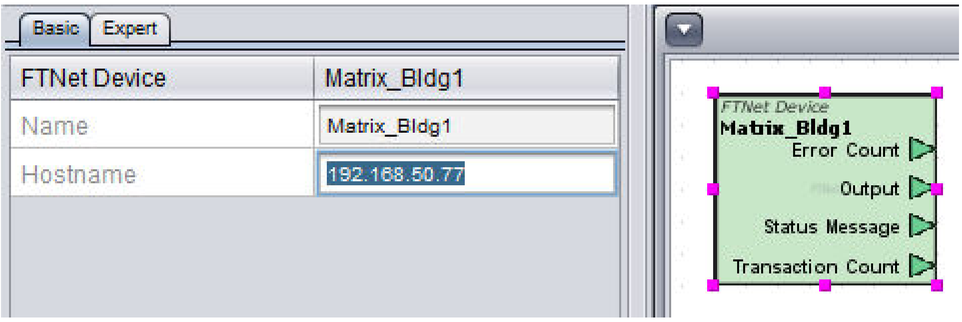
Working with Object Properties Overview

BACnet Communication Setup

Defining FTNet Devices

Prior to adding any BACnet elements onto your Diagram, you must first define the Aspect target that a device resides on. For each target, an FTNet Device must be present and defined. A project may have more than one FTNet Device referenced - for situations where you may need to communicate to a BACnet network on a remote Aspect platform.

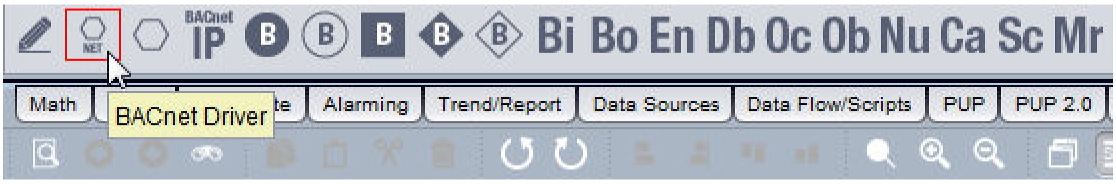
Simply click and drop an FTNet Device element onto a Diagram page. Configure the FTNet Device element with the IP address or resolvable name (e.g. matrix.mysite.com) of the target. For ease of programming, associating a descriptive name to the FTNet Device element is recommended, especially for projects that involve communicating with multiple Aspect targets.



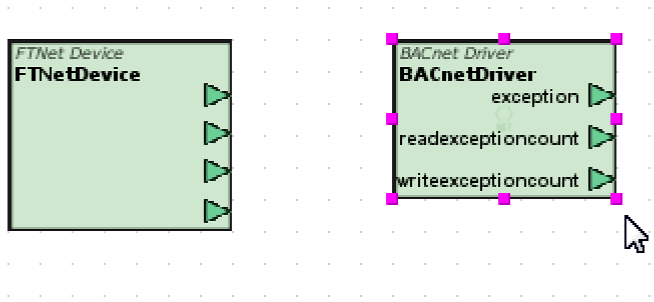
Adding the BACnet Driver

To add the BACnet driver, perform the following steps:

1. In Diagram Mode, select the BACnet category from your palette. Locate the BACnet Driver, which is the first icon to the immediate left side.



2. Click and drop the BACnet Driver element onto your Diagram page.



3. With the BACnet Driver selected, simply configure the FTNet Device Name property to focus on your configured driver.

Working with BACnet Devices

Working with Devices Overview

Aspect supports the ability to communicate with devices communicating on BACnet/IP, BACnet/Ethernet (via BACnet/IP), and BACnet MS/TP. These types of devices can be automatically discovered by Aspect-Studio once your Aspect target is up and running. However, they may also be manually defined for offline configuration of a project. Both device types are explained below.

BACnet/IP

BACnet/IP and BACnet/Ethernet communications are gained naturally through the Ethernet port of an Aspect target. To address BACnet devices network through BACnet/IP or BACnet/Ethernet, you must use the BACnet IP Device element. This element is used to address stand-alone BACnet/IP Devices that do not act as a router.

BACnet MS/TP

BACnet MS/TP device support is gained through the use of a Matrix Area Controller, Matrix BACnet Router, or other router approved by AAM. In the cases of the Matrix Area Controller and Router, these devices contain physical RS-485 ports to provide the physical connection. To address BACnet MS/TP devices, you must use the BACnet Device element.

More Information

Discovering Devices

Working with BACnet/IP Devices

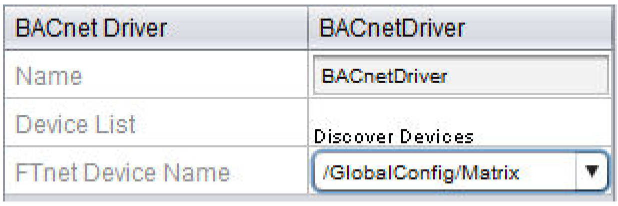
[Working with BACnet MS/TP Devices]

Discovering Devices

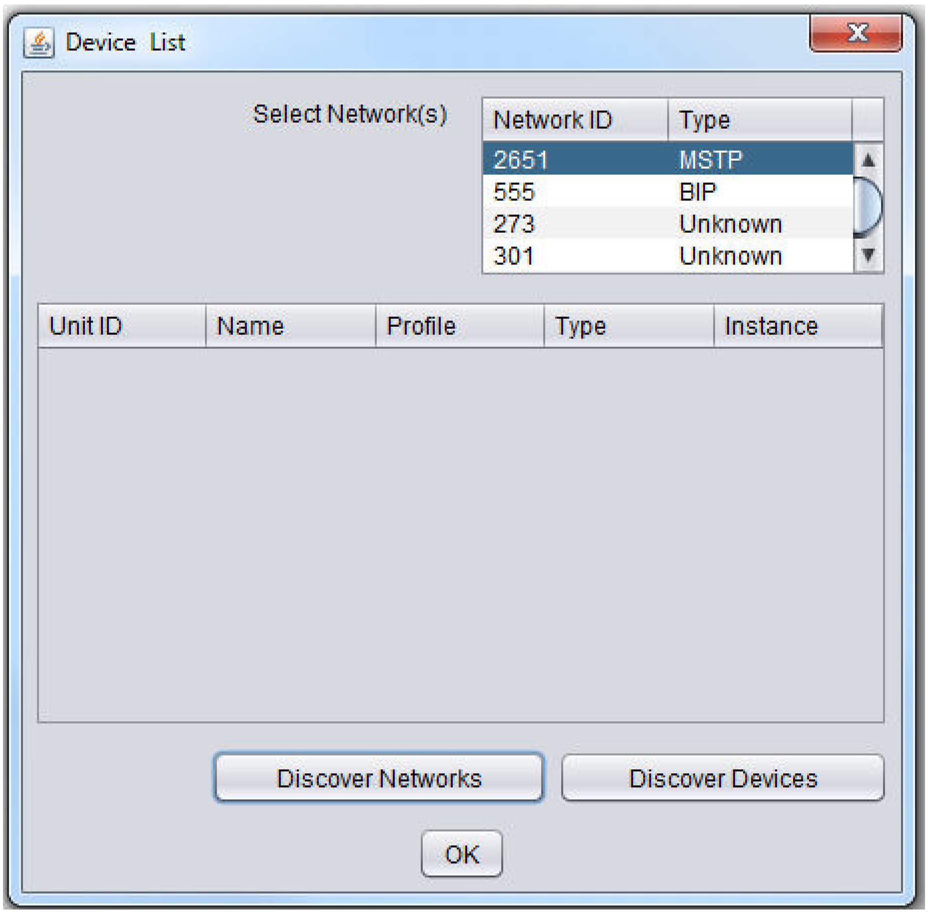
Aspect-Studio supports the ability to perform a network discovery of BACnet devices. Discovery can be performed on a single network, multiple networks, or all networks based on your networking scheme.

To discover BACnet devices, perform the following steps:

1. From your configured BACnet Driver element, single-click the Discover Devices property value associated with the Device List property of the BACnet Driver.

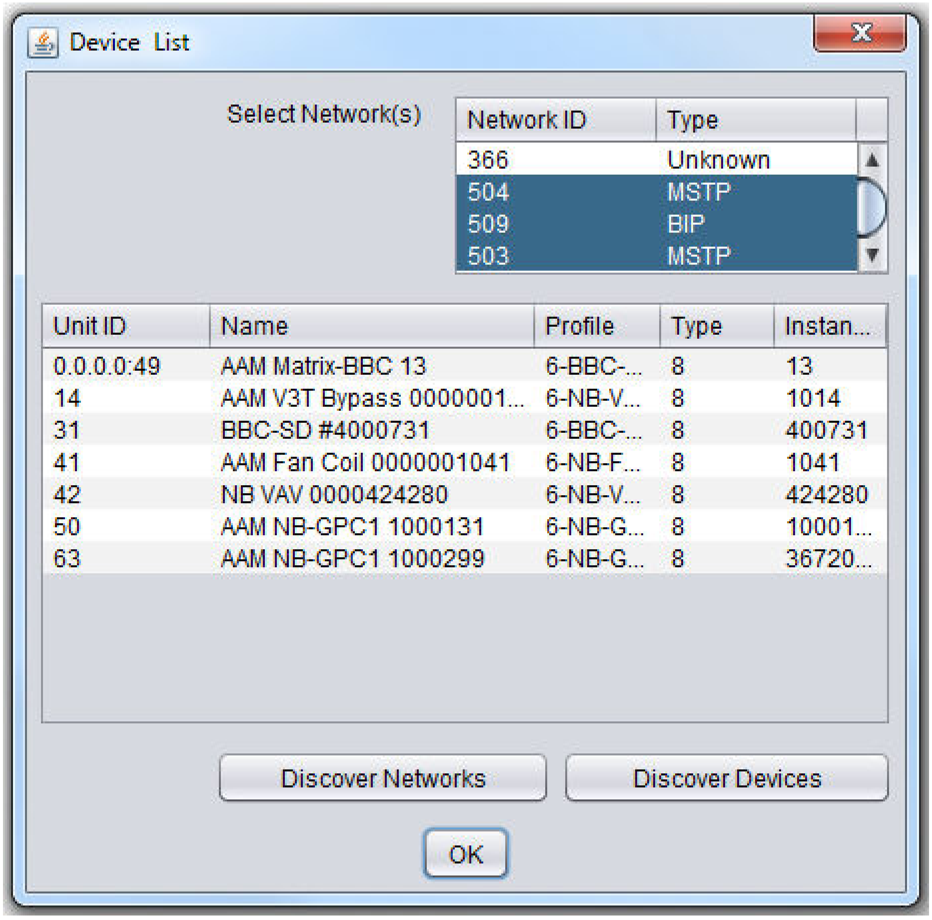


2. The Device List window will appear. Before you can discover devices, you retrieve information regarding all of the networks known to your target. Click Get Networks. At the top right hand corner of the window, all of the Network ID numbers known to your target device will be displayed in the Select Networks) window. In the case of your target being a Matrix Area Controller, the first networks listed will be configured MS/TP networks, BACnet/IP and BACnet Ethernet Networks (if enabled). Any other Network ID displayed will be networks managed by other routers or devices acting as routers.



If you have planned your networks and know which network type a specific Network ID may belong to, you may change the Network Type for easier configuration and tracking by selecting the type listed next to the Network ID and select a type from the drop-down.

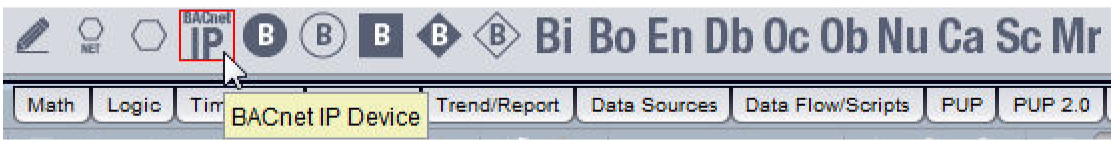
3. Click to highlight the network(s) you wish to discover devices from. For ease of configuration, you may select one network at a time, or all of the networks by holding the CTRL key on your keyboard and selecting each network with a single mouse-click. Click the Discover Devices button to begin the discover process. Note that this button will be unavailable (grayed out) during the process and remain so until complete. Devices will be listed including the name of the device, the MAC Address (Unit ID), a corresponding profile name, and the Device Instance. The list is maintained by simply clicking the OK button.



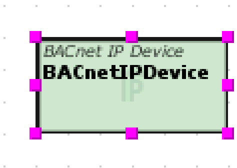
Working with BACnet/IP Devices

To add and reference a BACnet/IP device, perform the following steps:

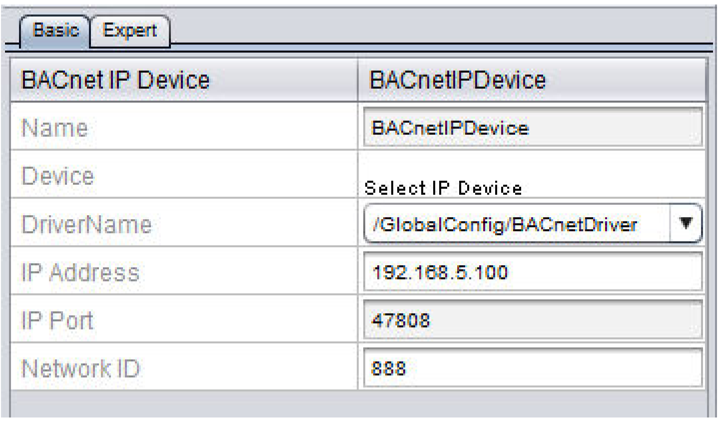
1. With the BACnet category selected on your palette, locate the BACnet IP Device element. The BACnet IP Device element is located to the immediate right of the BACnet Device element.



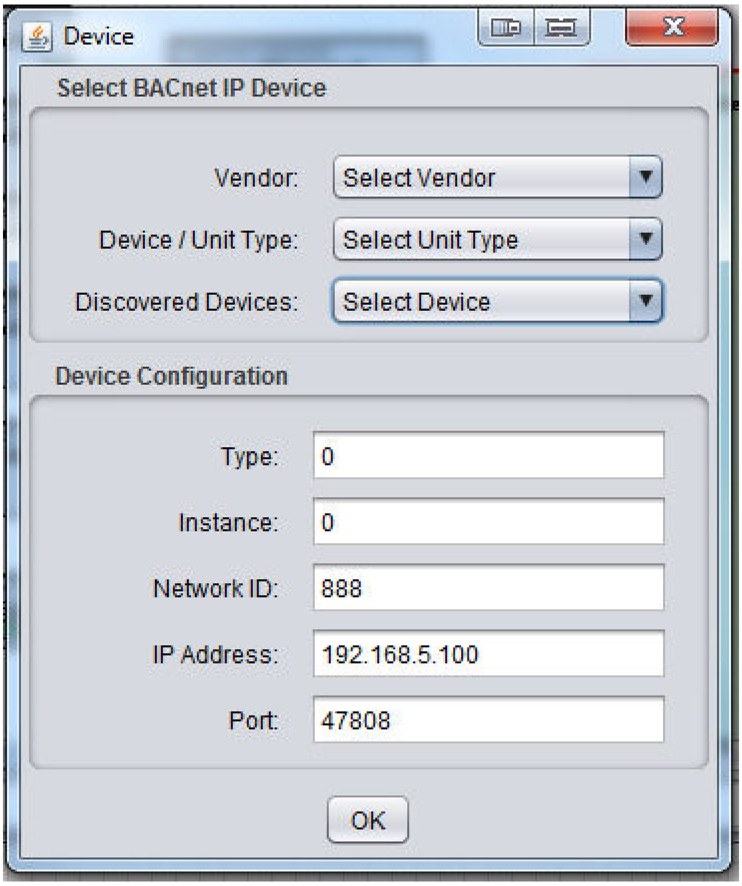
2. Click and drop the BACnet IP Device element onto your Diagram page. This will create a BACnet IP Device element, used to address a BACnet IP device networked with the Matrix Area Controller or Aspect Server target.



3. Configure the properties of the BACnet/IP device. If you are configuring the device in an offline manner, you can manually enter the IP address, IP port, and Network ID on which the BACnet/IP device resides. The Network ID is commonly your target's BACnet/IP Network Number.



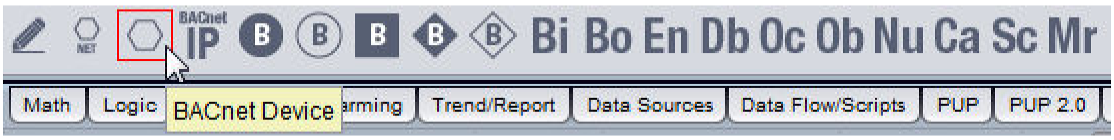
4. If you have discovered devices on a live network, you may select the discovered device by double-clicking on the Select IP Device value corresponding to the Device property. All addressing information will be automatically filled in for you.



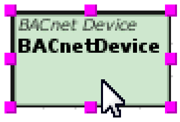
Working with BACnet MS/TP Devices

To add and reference a BACnet MS/TP device, perform the following steps:

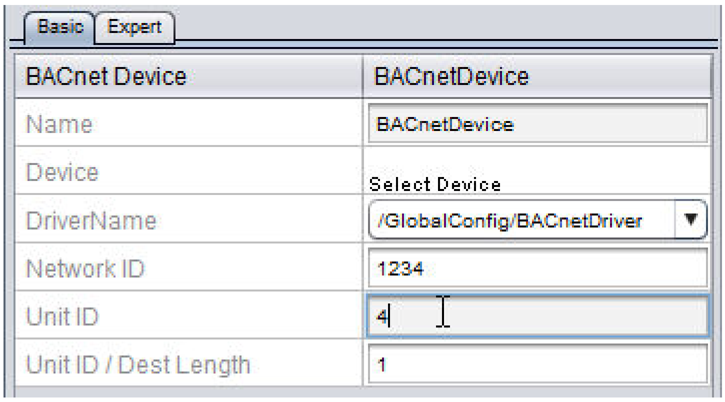
1. With the BACnet category selected on your palette, locate the BACnet Device element. The BACnet Device element is located to the left of the BACnet IP Device element.



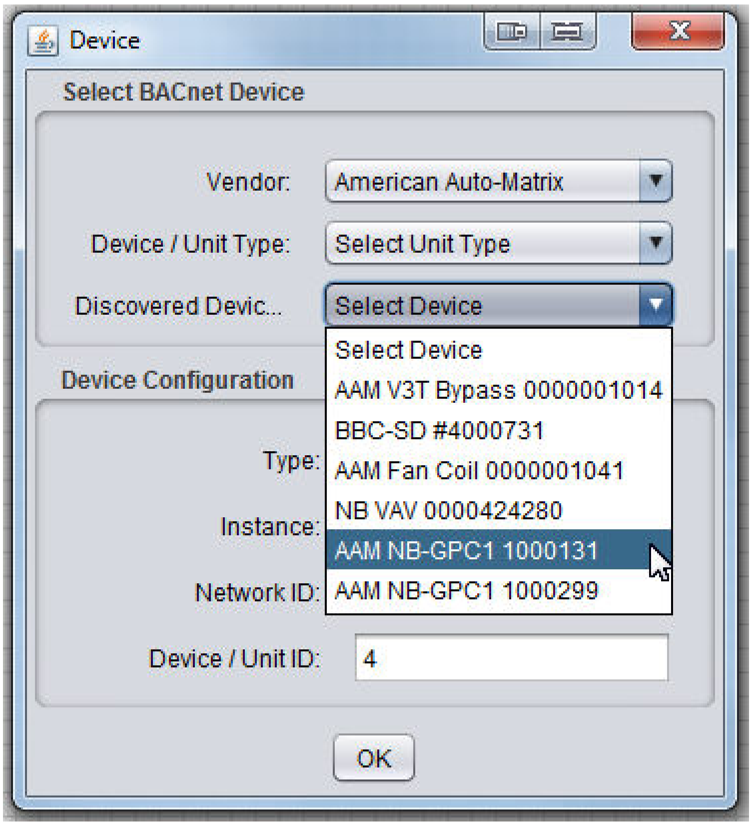
2. Click and drop the BACnet Device element onto your Diagram page. This will create a BACnet Device element, used to address a BACnet MS/TP device networked with the Matrix Area Controller or Aspect Server target.



3. Configure the properties of the BACnet Device. If you are configuring the device in an offline manner, you can manually enter the Unit ID (MAC Address) and Network ID of the device. The Network ID corresponds to the MS/TP Network Number for the port location of the residing device.



4. If you have discovered devices on a live network, you may select the discovered device by double-clicking on the Select IP Device value corresponding to the Device property. All addressing information will be automatically filled in for you.



Working with Object Properties

Working with Object Properties Overview

Within Aspect, points are addressed on a specific basis. In the case of BACnet, a point is defined as an addressed object property. An addressed object property is a specified object type, instance, and property. For example, Analog Input - Instance 1;present-value is an example of an object property.

In the BACnet category of the palette, there are several elements that correspond to a specific data type within BACnet. Because BACnet is a data type sensitive protocol, it is important that addressed object properties use the correct data type.

BACnet contains several data types, all of which are based on primitive data types found in most communication protocols. Each supported data type will commonly map to a specific property within a standard object type in BACnet. For each data type supported by BACnet, an element in the BACnet palette corresponds with it.

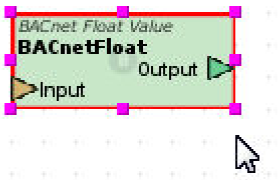
More Information

[Addressing an Object Property](#)
[Working with Commandable Object](#)
[Schedule and Calendar Object Overviews](#)

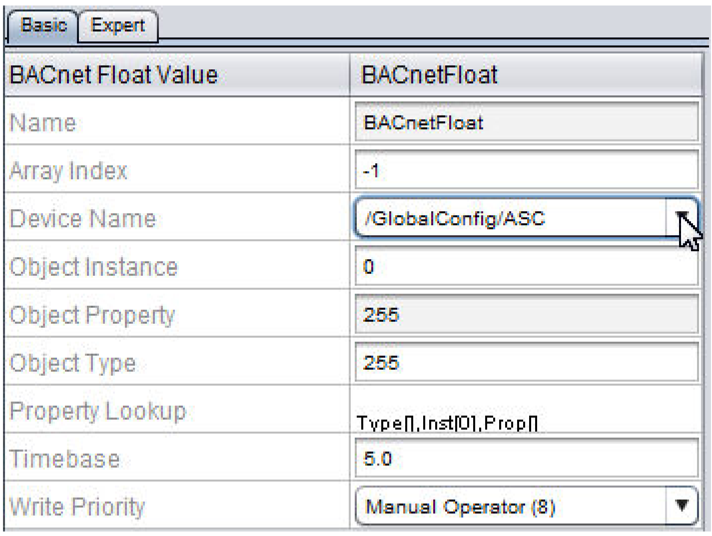
Addressing an Object Property

To address an object property (point) from a BACnet device, perform the following steps:

1. From the BACnet category, select a BACnet point element from the palette that corresponds to the object/property you are working with. Click and drop it onto the Diagram workspace.

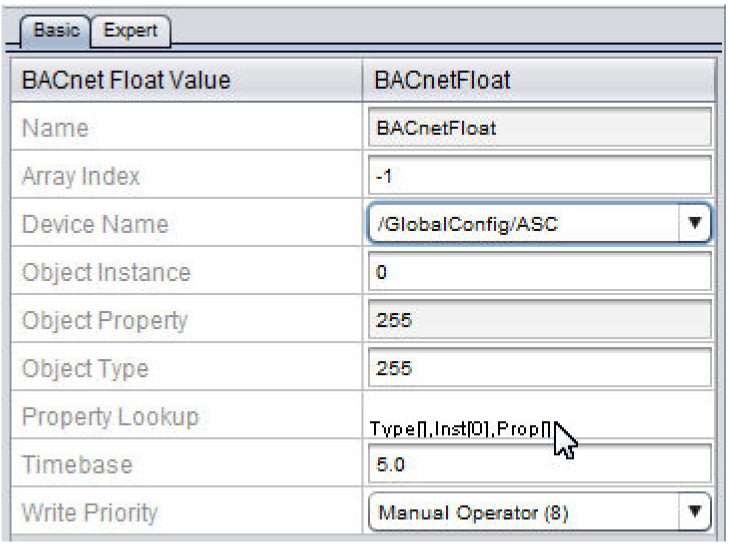


2. Configure the basic properties of the point element. You should first start by associating the device to the point. Do this by selecting the Device from the Device Name property.

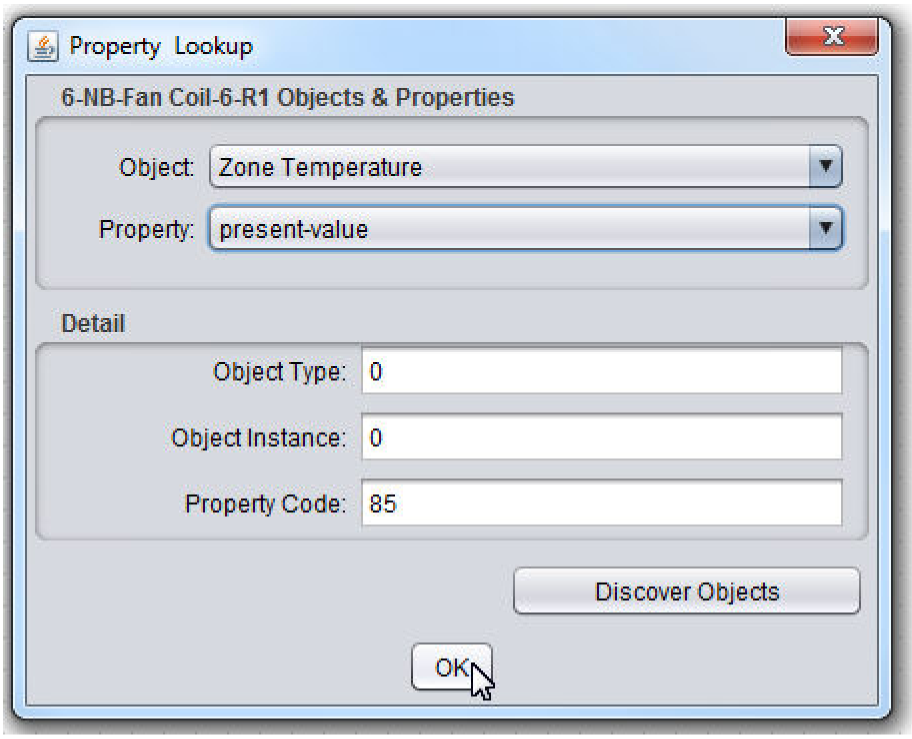


3. You may then address the object property. This is done through the use of Property Lookup. Double-click on the Property Lookup value

to invoke the lookup utility.



4. In Property Lookup, you can manually define the object type, property, and instance from the corresponding drop-downs. In the case of devices manufactured by American Auto-Matrix, Aspect-Studio will automatically provide users with the object list for the corresponding controller model. As the object and property is selected, all instance information will be automatically filled.



5. If you are working with a BACnet device manufactured by a third-party vendor, you can discover the objects from the device by clicking the Discover Objects button. In order to discover objects from a device, your PC must be connected to the BACnet network via IP. This button will stay unavailable (grayed out) until the process is complete. Discovered objects will be displayed in the Object drop-down field with (D) listed next to each object (indicating that the object was determined using the Discover Objects feature).

6. When you have finished addressing the object property, click OK.

More Information

BACnet Boolean

BACnet Integer

BACnet Enum

BACnet Float

BACnet Double

BACnet String

BACnet Octet String

BACnet BitString

BACnet Date

BACnet Time

BACnet Object ID

BACnet NULL

Working with Commandable Objects

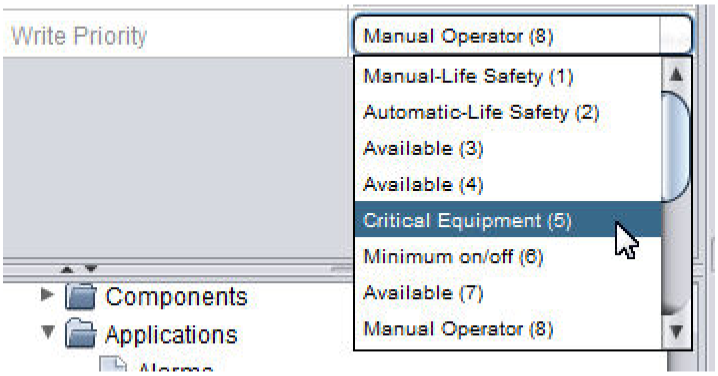
Commandable Objects in BACnet are commonly encountered. This is due to the Command Prioritization Mechanism in the BACnet protocol, otherwise known as Priority Array. Specific objects in the BACnet standard require writing (or overriding) to a present-value of an object to be done with a priority level.

In BACnet, it is possible for many different sources to try to modify the same device's object property values. If multiple devices tried to write to the same object property, errors could occur and values could be set incorrectly. To avoid this, BACnet uses priority arrays to determine the order in which property changes will be performed.

A priority array assigns unique levels of priority to the different types of devices that could write values to a device. There are 16 prioritization levels with Level 1 being the highest and Level 16 being the lowest.

Using Write Priority

All BACnet element elements contains a Write Priority property. This property is used to control the Priority Array level at which writes are sent to a command-able object. This property can be optionally exposed as a pin. To set the write priority from the Property Pane, simply select the write priority desired for your application. Any value sent to the Input pin of the point's element will be written using the priority specified in the Write Priority property.



As mentioned above, the Write Priority property can be exposed and effectively changed for override situations. The Write Priority element can be modified by using a Swing Enumerated Combo Box.

Sending a NULL Value

The ability to send NULL values to field devices points is a new feature that has been added to Aspect-Studio. This feature can be used to send NULL values to field devices points that support Priority Arrays.

A NULL value is indicated by setting the string value to %NULL% and is case insensitive.

The following elements currently support sending NULL values:

- Button
- PushButton
- SecureButton
- URLButton
- EnhancedURLButton
- SecureEnhancedURLButton
- SwingComboBox
- SecureSwingComboBox
- SwingEnumComboBox
- SecureSwingEnumComboBox
- SwingTextField
- SecureSwingTextField

The following is an example of using a Button to toggle the Binary Output 1 of a NB-GPC controller Active at Priority 7 and to clear the Priority:

1. Set the Labels for the button and set %NULL%for the values:

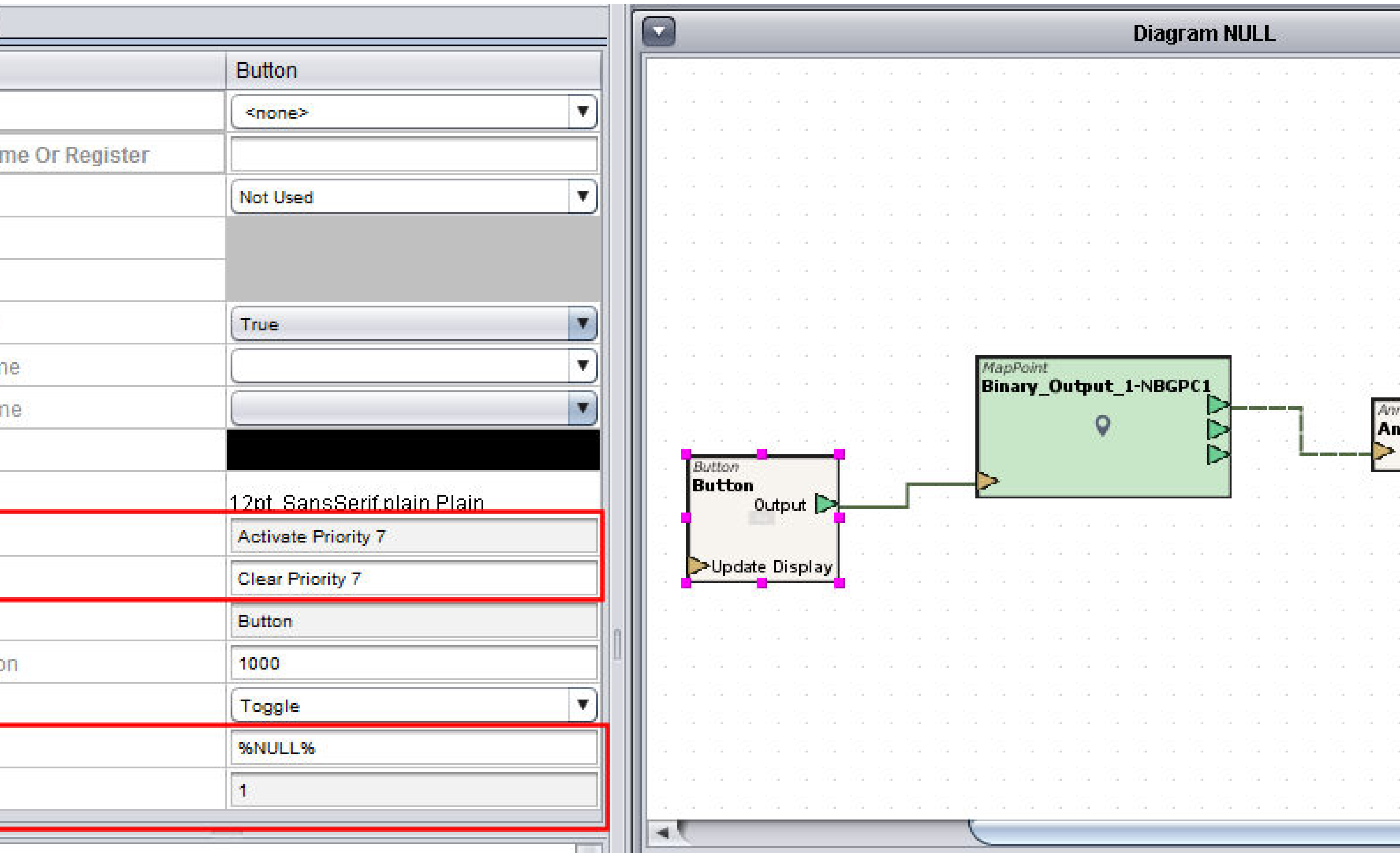
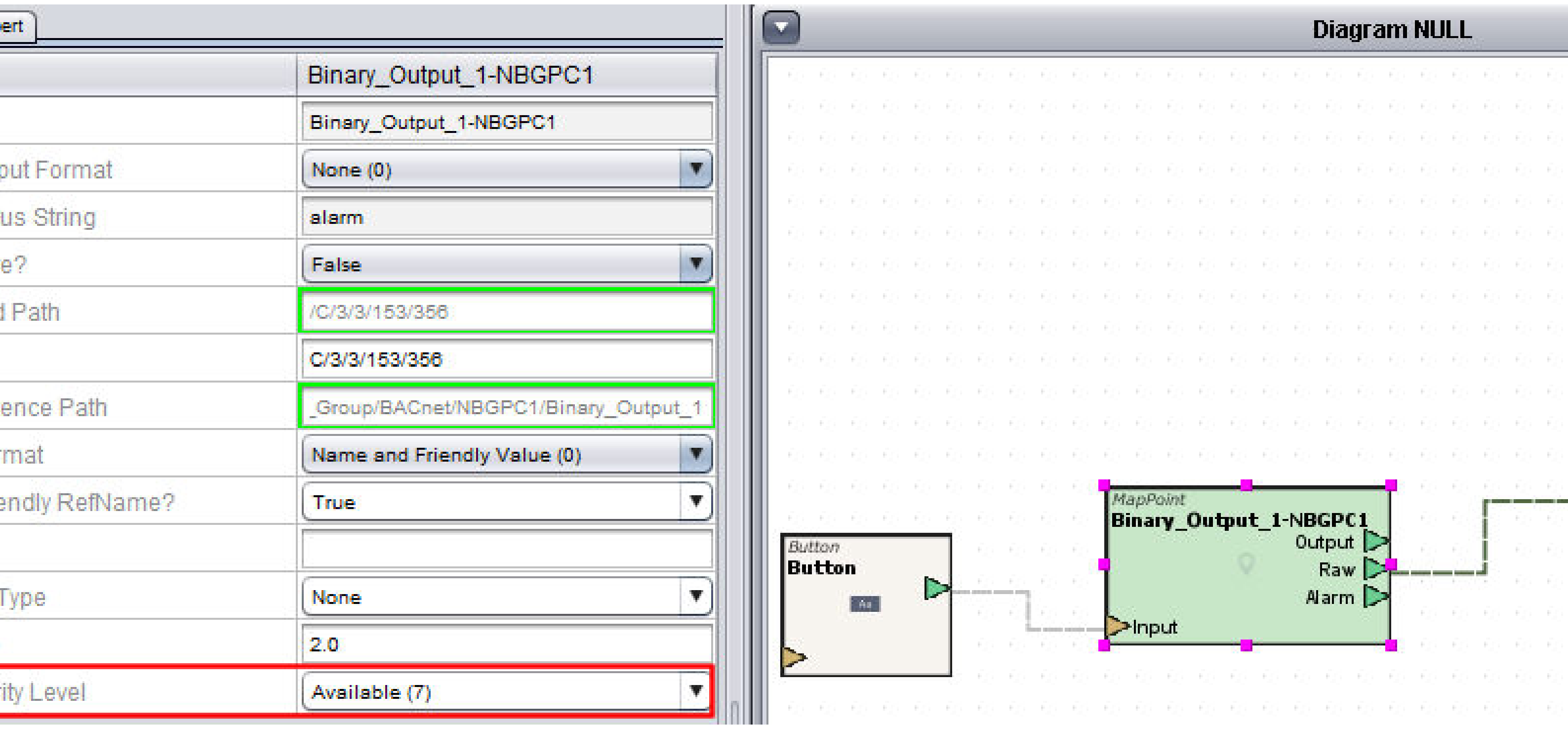


Diagram NULL
Button
<none>
me Or Register
Not Used
True
ne
ne
12pt SansSerif plain Plain
Activate Priority 7
Clear Priority 7
Button
on
1000
Toggle
%NULL%
1
Button
Button
Output
Update Display
MapPoint
Binary_Output_1-NBGPC1

2. Set the priority at which you wish to NULL out.



3. If using Enumeration on the point the example will look as follows deployed:

BACnet Object Enumerations

BACnet Object	Enumeration Value
Access Door	30
Accumulator	23
Analog Input	0
Analog Output	1
Analog Value	2
Averaging	18
Binary Input	3

Binary Output	4
Binary Value	5
Bitstring Value	46
Calendar	6
Character String Value	40
Command	7
Date Value	42
Date Pattern	41
Date Time Value	44
Date Time Value Pattern	43
Device	8
Event Enroll-ment	9
Event Log	25
File	10
Group	11
Global Group	26
Integer Value	45
Large Analog Value	46
Life Safety Point	21
Life Safety Zone	22
Load Control	28
Loop	12
Multi-State Input	13
Multi-State Output	14
Multi-State Value	19
Notification Class	15
Octet String Value	47

Positive Integer Value	48
Program	16
Pulse Converter	24
Schedule	17
Structured View	29
Time Value	50
Time Pattern	49
Trend Log	20
Trend Log Multiple	27

Working with Schedule and Calendar Objects

Schedule and Calendar Object Overview

BACnet Schedule and Calendar objects often present a level of complexity for some standard operator workstations to interact with. Aspect, however, provides users with the ability to view and interact with these objects similar to any other piece of data in the system.

In addition to directly editing BACNet schedules from the Applet, Aspect 3.0 now has the capability to distribute an Aspect Weekly/Exception schedule to BACnet devices via the Map.

More Information

Addressing Schedule - Weekly Schedule

Configuring the Weekly Schedule Editor

Viewing and Modifying Schedule Data

Addressing Calendar - Datelist

Configuring the Calendar Editor

Viewing and Modifying Calendar Data

[Aspect Schedule Distribution](#)

[Schedule Types](#)

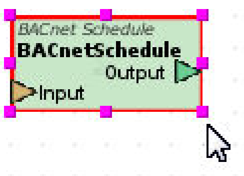
[Using the Schedule Editors](#)

Addressing Schedule - Weekly Schedule

To address a weekly-schedule, you must use the BACnet Schedule element. The element must be configured to address the Schedule object, its instance, and the weekly-schedule property. To this perform the following steps:

1. From the BACnet category, select a BACnet Schedule element from the palette.

2. Click and drop it onto your Diagram page.



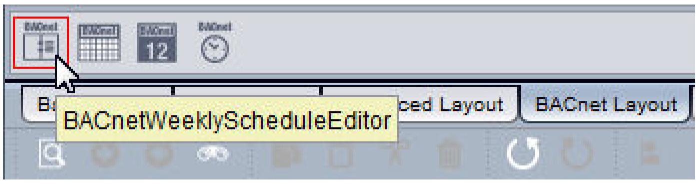
3. Configure the BACnet Schedule element to monitor Schedule; weekly-schedule. Be sure to address the correct object instance for the Schedule object.

Configuring the Weekly Schedule Editor

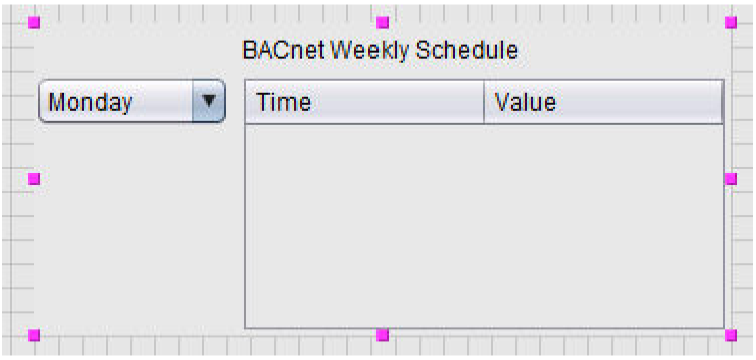
To deliver information from BACnet Schedule element to the user, a special Design element is available to do so (Swing BACnet Weekly Schedule Editor). This element can be found in the BACnet Layout category of the palette.

To view and modify a weekly-schedule, perform the following steps:

1. From the Design View, select the BACnet Layout category of your Palette

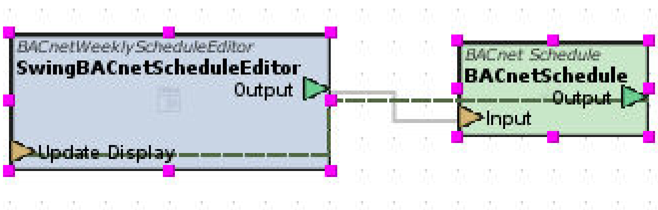


2. Click and drop the Swing BACnet Weekly-Schedule Editor onto your Design page.



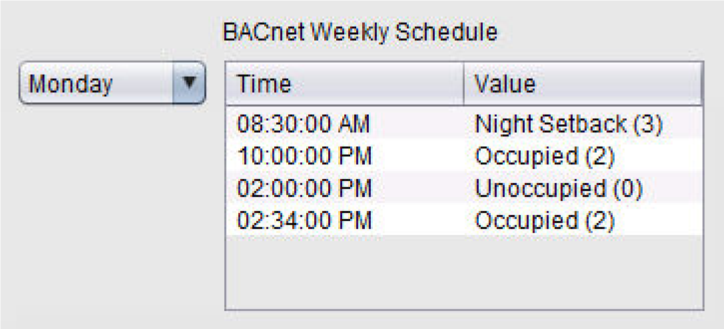
3. With the Weekly Schedule Editor select, copy it to your Diagram page using the Copy to Diagram button.

4. Link the output of the BACnet Schedule element to the Update Display input pin of the Weekly Schedule Editor. Then, link the output of the Weekly Schedule Editor to the Input pin of the BACnet Schedule element.

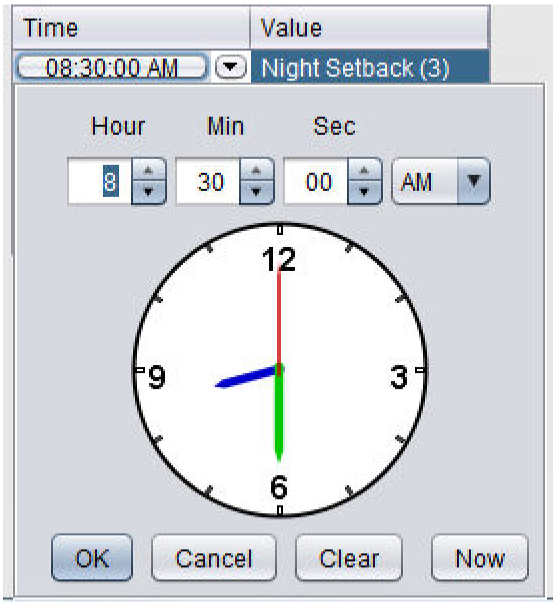


Viewing and Modifying Schedule Data

With your application deployed, or Aspect-Studio's simulation mode set to Live, you can launch a test frame and view the weekly-schedule. The weekly-schedule contains information for each day of the week (Monday though Sunday). To view a specific day, select the combo-box to the left of the Weekly Schedule Editor to select a day of the week. When the timebase of your BACnet Schedule element expires, the Weekly-Schedule editor will update and display the current day you have selected from the list.



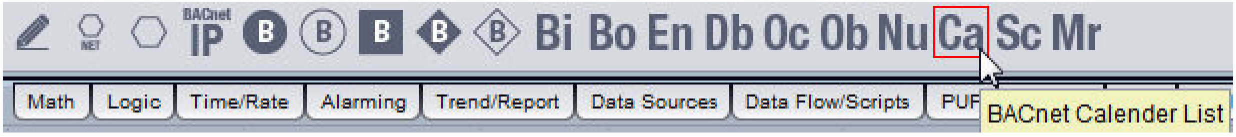
To edit the time or value, simply click on the listing and click on either the time or value field to invoke the editor. Times can be edited to the precision of HH;MM;SS. Values are pre-canned to use the 4-state schedule mode used by all of AAM's products.



Addressing Calendar- Datelist

To address a weekly-schedule, you must use the BACnet Calendar element. The element must be configured to address the Calendar object, its instance, and the datelist property. To this perform the following steps:

1. From the BACnet category, select a BACnet Calendar element from the palette.



2. Click and drop it onto your Diagram page.

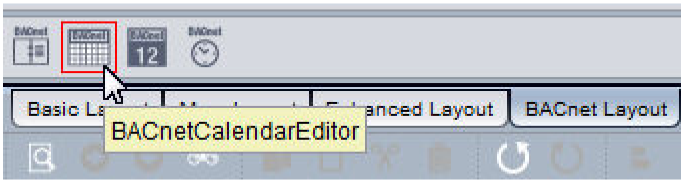
3. Configure the BACnet Calendar element to monitor Calendar; datelist. Be sure to address the correct object instance for the Calendar object.

Configuring the Calendar Editor

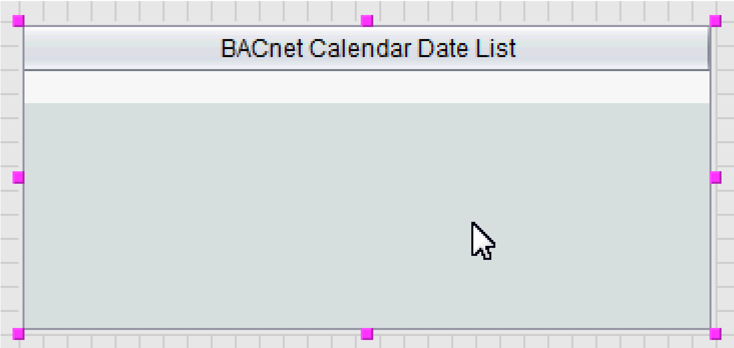
To deliver information from BACnet Calendar element to the user, a special Design element is available to do so (Swing BACnet Calendar Editor). This element can be found in the BACnet Layout category of the palette.

To view and modify a datelist, perform the following steps:

1. From the Design View, select the BACnet Layout category of your Palette

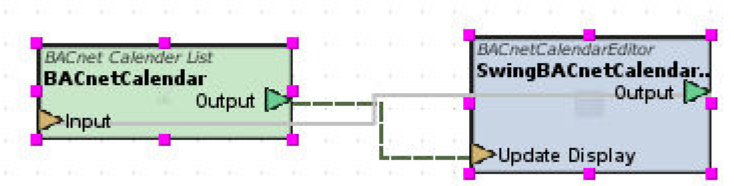


2. Click and drop the Swing BACnet Calendar Editor onto your Design page.



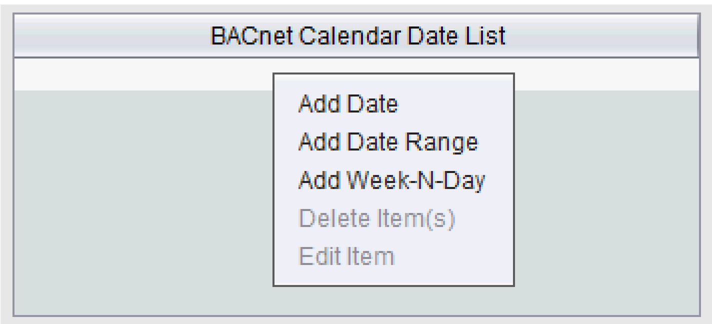
3. With the Calendar Editor select, copy it to your Diagram page using the Copy to Diagram button.

4. Link the output of the BACnet Calendar element to the Update Display input pin of the Calendar Editor. Then, link the output of the Calendar Editor to the Input pin of the BACnet Calendar element.

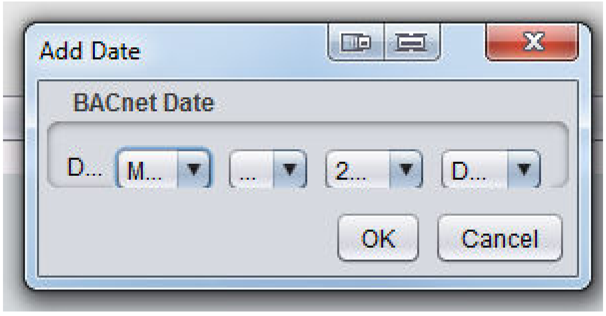


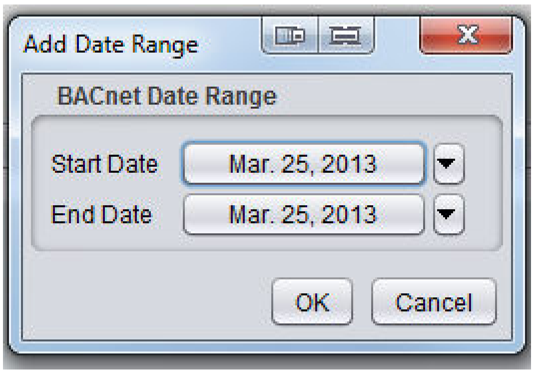
Viewing and Modifying Calendar Data

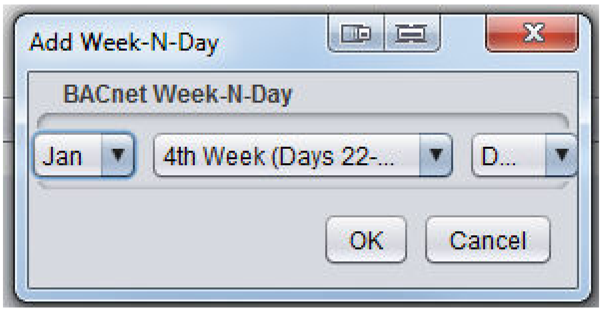
With your application deployed, or Aspect-Studio's simulation mode set to Live, you can launch a test frame and view the datelist.



The Datelist is purely a listed format. It provides a list of date, date ranges, and week-n-day entries that are commonly entered into a list. If no contents exist in the calendar, a blank list will appear. To add entries in the list, right click on the title bar of the editor or in the white space, and select the appropriate entry. All of the editors provided support wildcard definitions for specified fields for date and week-n-day. To specify a wild-card, select the top entry from each drop-down.







Working with Multipoint Elements

BACnet Multipoint Element Overview

Beginning in Aspect v1.08.00, projects can now be designed with multipoint elements. A multipoint element is a single element block that can be defined to address several object properties from a single device. This element is useful in situations where you wish to have one element that reads multiple points from a device for situations such as graphics, trending, and other program scenarios.

While this element provides a single element solution for reading multiple pieces of data, the element can also be leveraged for reducing the amount of bandwidth that is necessary to retrieve data. Bandwidth is reduced through the Multipoint element's ability to perform Read Property Multiple (RPM) transactions in BACnet. Read Property Multiple uses a single requests to obtain multiple values from a single controller.

The following products in AAM's Native BACnet Product Line support Read Property Multiple:

- NB-GPC Product Family (v2.00 or later)
    - Maximum amount of properties per RPM - 10
- NB-ASCe Product Family (v6.03 or later)
    - Maximum amount of properties per RPM - 5
- Matrix-BBC Product Family (v1.00 or later)
    - Maximum amount of properties per RPM - 10

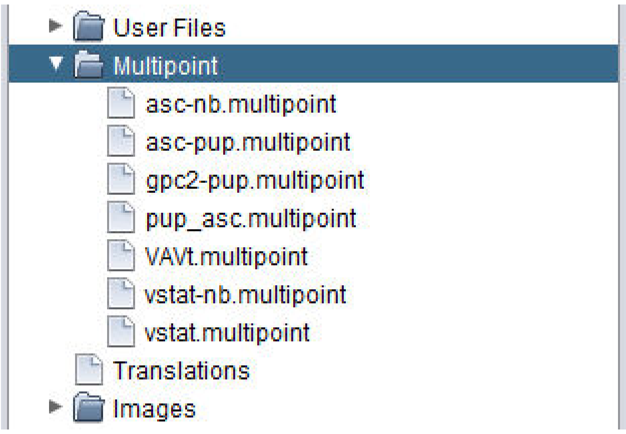
Many third-party devices may also support Read Property Multiple. Please consult manufacturer documentation for additional details and limitations of said service.

NOTE - Multipoint Elements cannot be used to obtain multiple properties from multiple controllers. Currently, the BACnet standard does not provide a service or transport to perform such transactions.

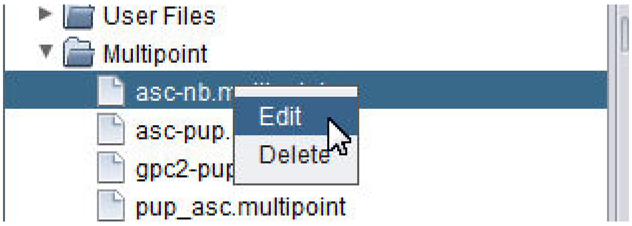
Designing Multipoint Files for BACnet Multipoint Elements

Prior to using Multipoint elements within your project, you must first design a corresponding file to use with the element. The file includes information relative to the object, instance, and property for each value you wish to obtain from a device.

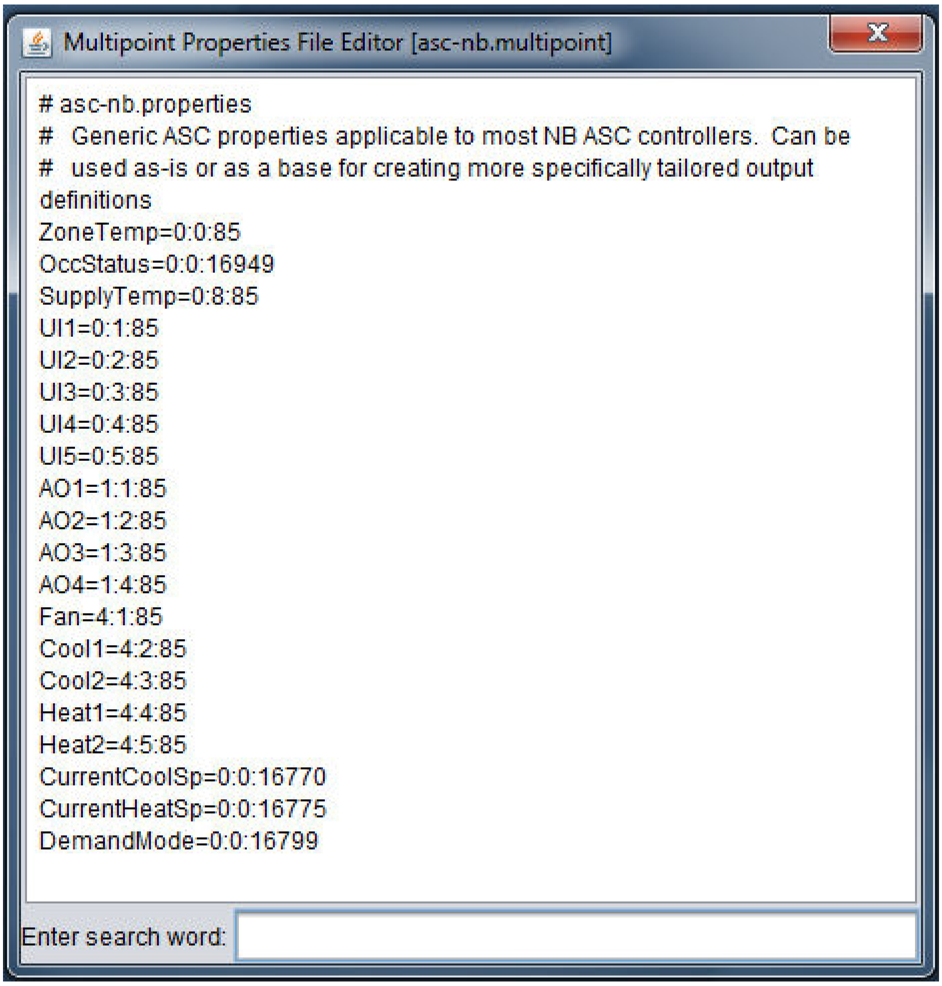
The files for Multipoint elements are stored in a brand on the project tree called Multipoint. By default, newly created Aspect projects (as well as previously designed projects opened in v1.08 or later) will contain template files that can be referenced for designing your own multipoint files.



To open one of the sample multipoint files, open the Multipoint folder. Then, right-click on the file and select Edit.



The Multipoint Editor will appear displaying the contents of the file.



The Format of the File

For BACnet Multipoint files, each line is entered in the format of Name-e=x:y:z, where:

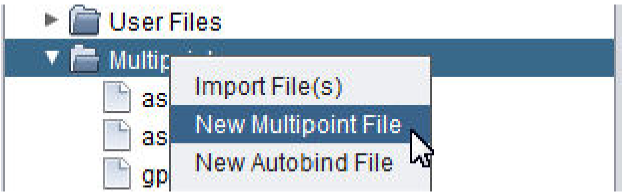
- Name - Short, descriptive name for the point
- x - BACnet Object Enumeration for the Object
- y - BACnet Object Instance Number
- z - BACnet Property Identifier Number

Colons must be used to delimit between the object enumeration, and object instance, and property identifier as shown above. For a table referencing common object enumerations, and property enumerations, click the link for each.

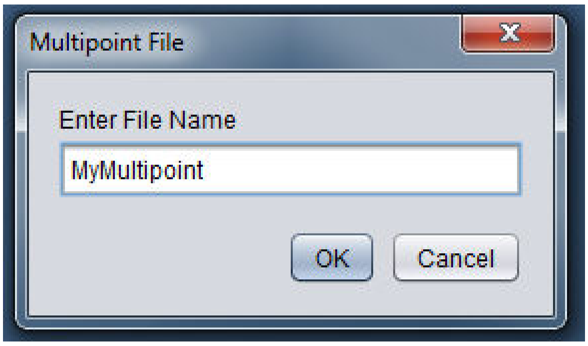
Creating a New Multipoint File

To add a new multipoint .PROPERTIES file to your project:

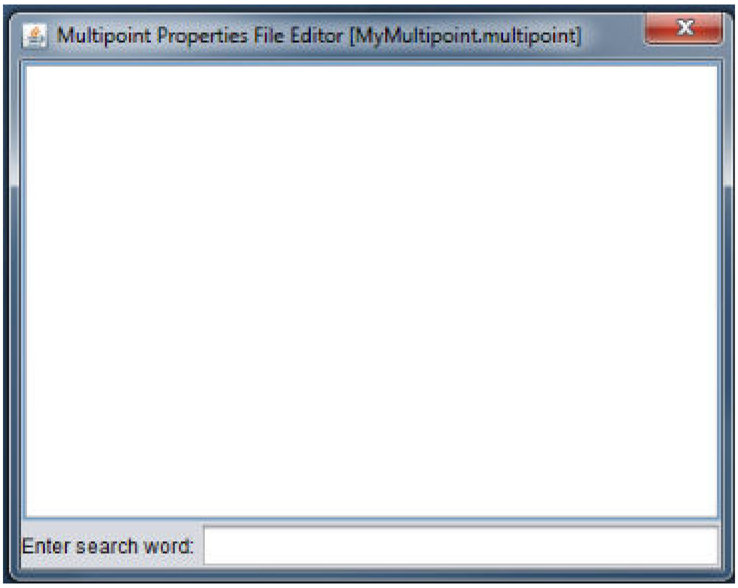
1. Right-click the Multipoint branch of your Project Tree and Select New File from the shortcut menu.



2. Enter a valid name into the Enter File Name dialog. Click OK when finished.



3. A new file will then be created under the Multipoint folder, and the editor will automatically open for the file.



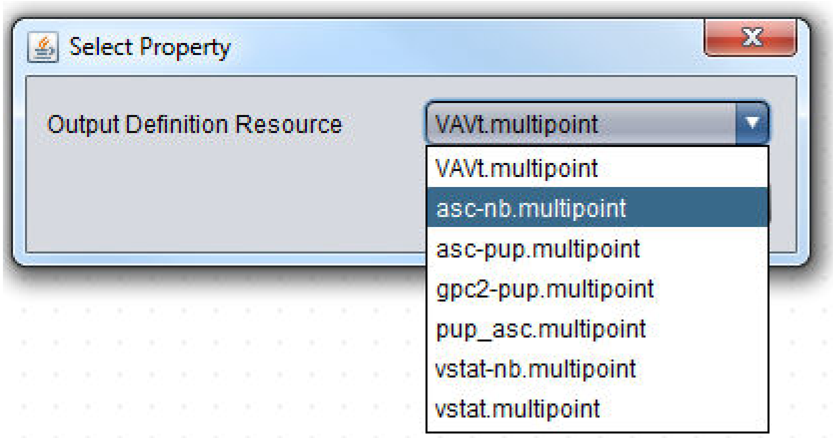
Adding BACnet Multipoint Elements into a Project

Once you have created your multipoint file(s), you may then begin to add multipoint elements into your project. For BACnet, an element for multipoint can be located in the BACnet category of your design palette. To add it, perform the following steps:

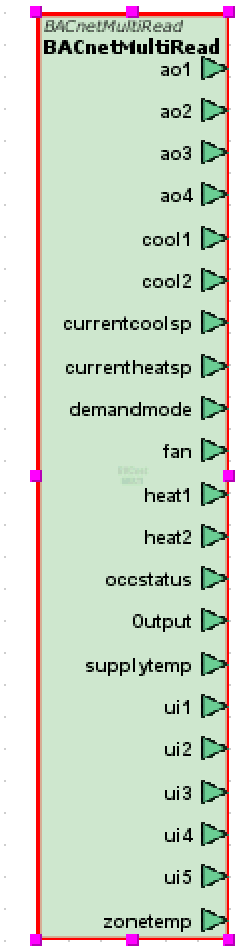
1. From the BACnet category, find the BACnet Multipoint Element.

2. Perform the click and drop action similar to adding any other element onto your Diagram Workspace.

3. You will be prompted to specify which Multipoint file that the element will use. Select the file from the combo box and click OK.



4. The Multipoint element will be generated and displayed on your Diagram Workspace.

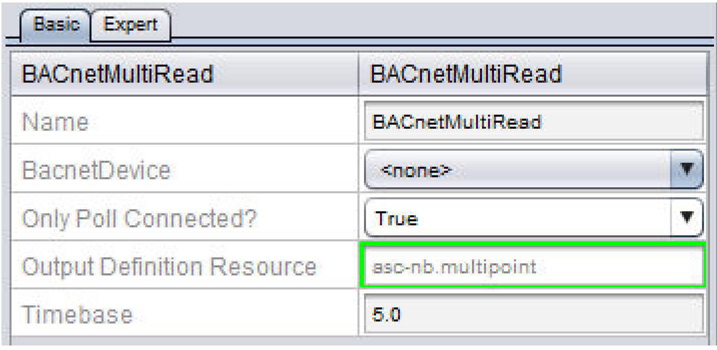


Working with BACnet Multipoint Elements

Working with BACnet Multipoint Elements requires some key information when designing your project. The following sections discuss each item of interest that should be kept in mind.

Basic Properties of the BACnet Multipoint Element

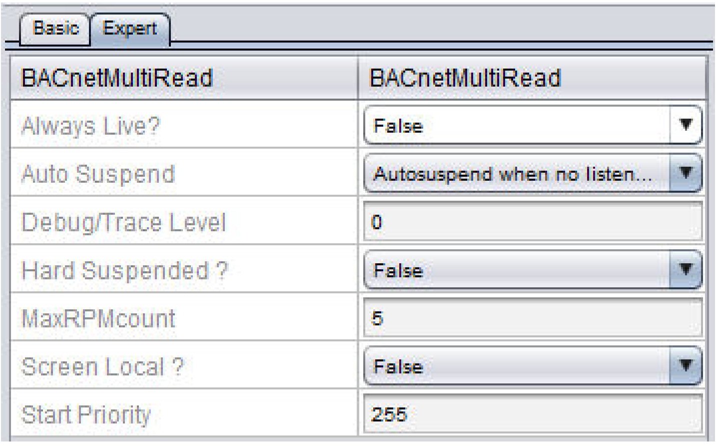
The Basic Properties of the BACnet Multipoint Element contain a few configuration properties.



Property Name	Notes
BacnetDevice	Defines the BACnet Device that the element will fetch data from.
Only Poll Connected?	When set to True, the element will only poll points that have their output pins connected to another source within your designed project. When set for False, all points will be polled regardless of connection status.
Output Definition Resource	Reflects the multipoint design file that the element is bound to. This cannot be changed once the relationship is initially established.
Timebase	Defines the amount of time, in seconds, between read requests.

Expert Properties of the BACnet Multipoint Element

The Expert Properties of the BACnet Multipoint Element contain standard expert properties like other field bus points, but also contains a configuration for the maximum amount of points that should be requested per RPM transaction.



This property, MaxRPMcount, defaults to a value of 5. This value is optimal for applications involving NB-ASC(e) products. Should your application involve NB-GPC products and/or Matrix-BBC products, this value can be increased to a maximum of 10 for more properties in a single transaction.

NOTE - Attempting to request more properties than documented in the introduction of this section can either result in wasted bandwidth, or errors in obtaining the data should you requests more information that a device can adequately support. Please use caution when doing adjusting this parameter.

PUP (for Existing Aspect v1.x Projects)

PUP Overview

The following chapter discusses Aspect and its inter connectivity with PUP. Aspect targets are capable of communicating to PUP devices and equipment manufactured by American Auto-Matrix. Aspect products support the following media layers of PUP:

- PUP over RS-485
- PUP over IP (used to communicate to other PUP devices connected directly to a Matrix Area Controller)

Before configuring a project to communicate PUP, you must first configure the communication ports of your Matrix Area Controller. For information on how to do this, please read the following topics below:

- PUP Port Configuration
- PUP Peer List
- PUP Network Properties

PUP support within Aspect provides full support for communicating with PUP devices, including support for most to all data types defined within the system. Most notable, Aspect supports automatic data routing of PUP information to the IP level, allowing users to service American Auto-Matrix PUP devices using software engineering tools.

More Information

Defining FTNet Devices

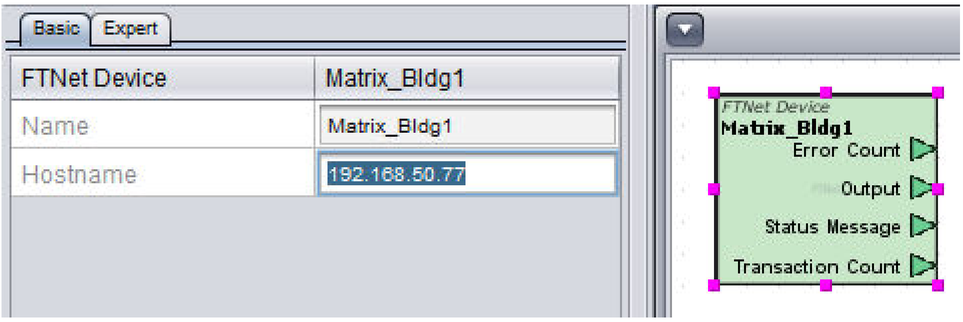
Adding the PUP Driver

PUP Communication Setup

Defining FTNet Devices

Prior to adding any PUP elements onto your Diagram, you must first define your target, which is the device that will take on the project you are configuring. For each target, an FTNet Device must be present and defined. A project may have more than one FTNet Device referenced - for situations where you may need to communicate to a PUP network on a remote Aspect platform.

Simply click and drop an FTNet Device element onto a Diagram page. Configure the FTNet Device element with the IP address or resolvable name (e.g. matrix.mysite.com) of the target. For ease of programming, associating a descriptive name to the FTNet Device element is recommended, especially for projects that involve communicating with multiple Aspect targets.

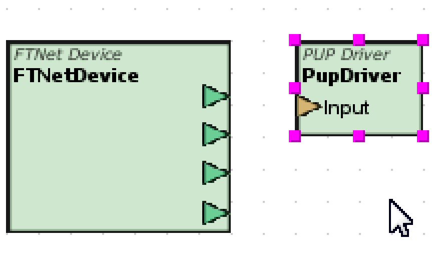


Adding the PUP Driver

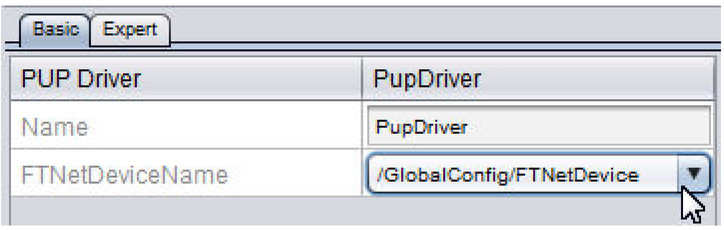
To add the PUP driver, perform the following steps:

1. In Diagram Mode, select the PUP category from your palette. Locate the PUP Driver, which is the first icon to the immediate left side.

2. Click and drop the PUP Driver element onto your Diagram page.



3. With the PUP Driver selected, simply configure the FTNet Device Name property to focus on your configured driver.



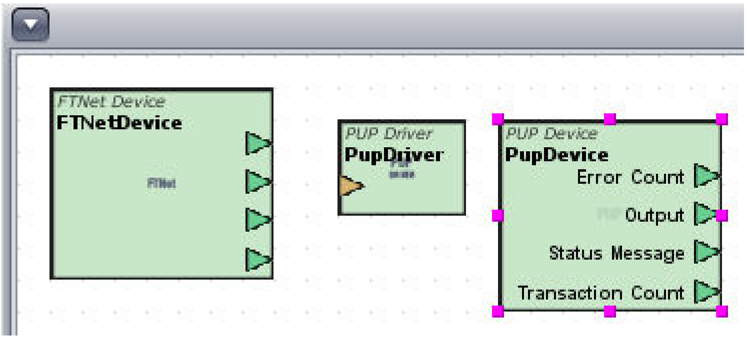
Working with PUP Devices

Adding PUP Devices

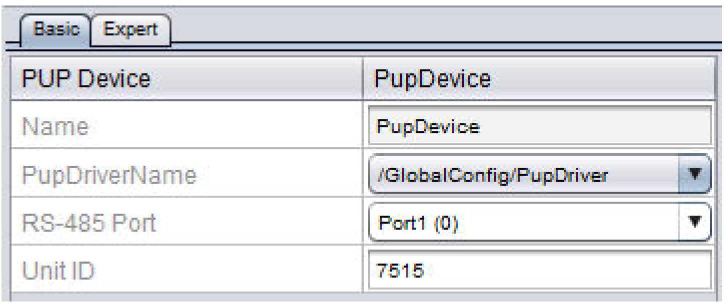
To add a PUP Device, perform the following steps:

1. In Diagram Mode, select the PUP category from your palette. Locate the PUP Device.

2. Click and drop the PUP Device element onto your Diagram page.



3. With the PUP Device selected, configure the PUPDriverName, the RS-485 port on which the PUP Device resides, and Unit ID of the PUP Device you are addressing.



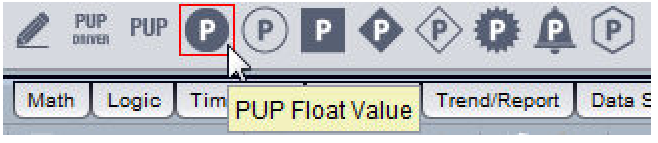
Working with PUP Point Attributes

Addressing PUP Point Attributes

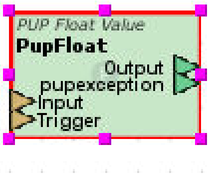
Data from PUP is normalized into elements. Any of the PUP elements (based on data type) can refer back to a point-attribute, which is a defined channel and two-letter attribute assignment. Because PUP is a data type sensitive protocol, it is important that addressed data uses the correct data type. The PUP elements do provide good coercion protection in the event a data type element is not chosen correctly. For example, a float can be represented as an integer - but will not have control over the floating decimal places.

To address point attributes, perform the following steps:

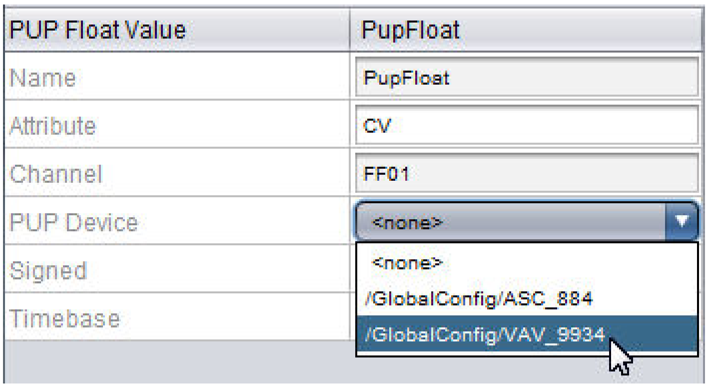
1. In Diagram Mode, select a PUP point element from your palette.



2. Click and drop the element onto your Diagram page.



3. Configure the basic properties of the point element. You should first start by associating the device to the point. Do this by selecting the Device from the Device Name property. Once complete, you can then address the channel and attribute.



NOTE - When addressing attributes, please remember that attributes are case sensitive. For example, “CV” and “cv” is considered as separate attributes within an object. In most cases, attributes are always upper-case unless you are communicating with attributes of custom programs in SOLO and SBC controllers that may be authored in a manner where attributes could be lower-case.

More Information

PUP Bitmask

PUP Date

PUP Time

PUP Float

PUP Int

PUP String

PUP Alarm Server

Working with Multipoint Elements

PUP Multipoint Element Overview

Beginning in Aspect v1.08.00, projects can now be designed with multipoint elements. A multipoint element is a single element block that can be defined to address several object properties from a single device. This element is useful in situations where you wish to have one element that reads multiple points from a device for situations such as graphics, trending, and other program scenarios.

While this element provides a single element solution for reading multiple pieces of data, the element can also be leveraged for reducing the amount of bandwidth that is necessary to retrieve data. Bandwidth is reduced through the Multipoint element's ability to perform Read Attribute Multiple (RAM) transactions in PUP. Read Attribute Multiple uses a single requests to obtain multiple values from a single controller.

The following products in AAM's SBC Product Line support Read Attribute Multiple:

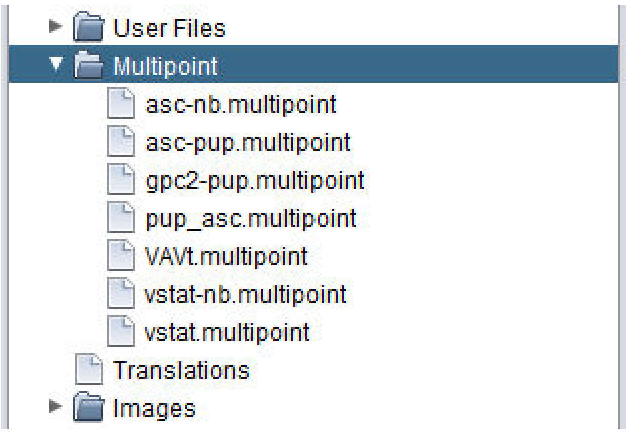
- SBC-GPC Product Family (v2.00 or later)
- - Maximum amount of properties per RAM - 16
- Matrix-PNC Product Family (v1.00 or later)
- - Maximum amount of properties per RAM - 16

NOTE - Multipoint Elements cannot be used to obtain multiple properties from multiple controllers. Currently, the PUP standard does not provide a service or transport to perform such transactions.

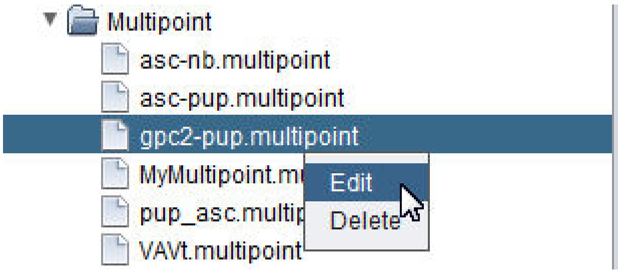
Designing Multipoint Files for PUP Multipoint Elements

Prior to using Multipoint elements within your project, you must first design a corresponding file to use with the element. The file includes information relative to the channel and attribute for each value you wish to obtain from a device.

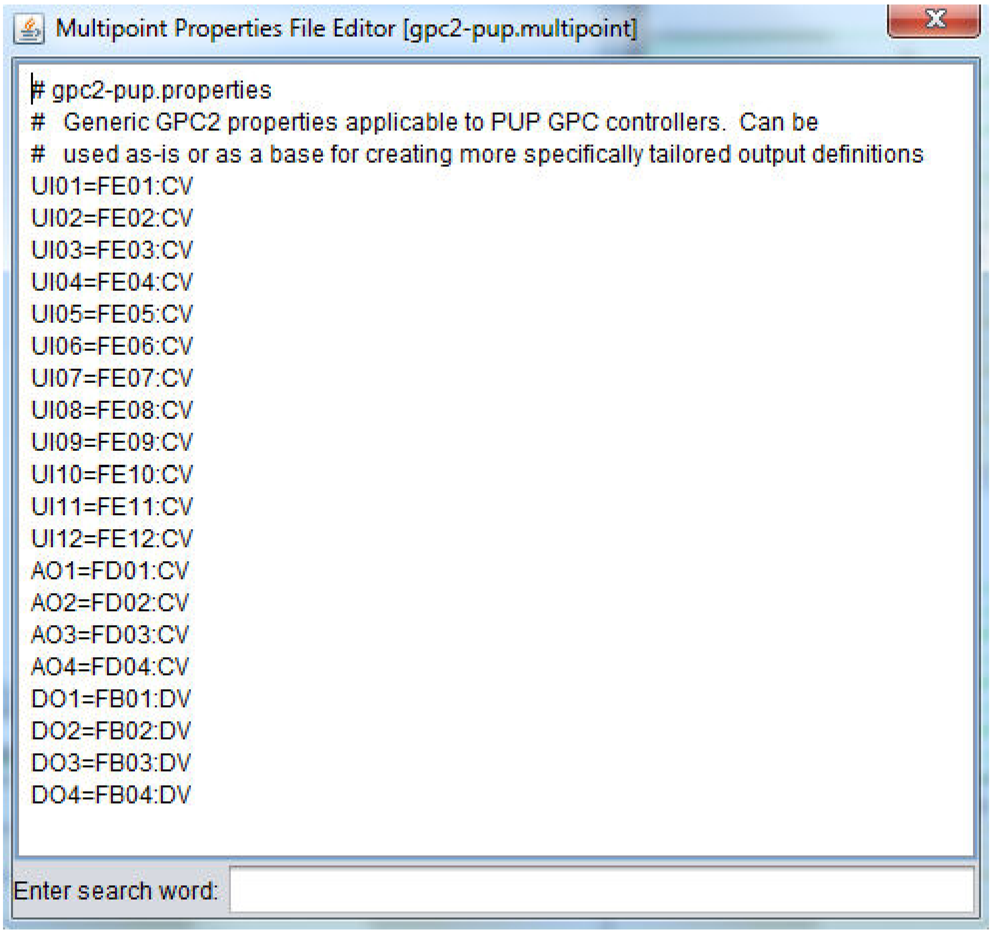
The files for Multipoint elements are stored in a brand on the project tree called Multipoint. By default, newly created Aspect projects (as well as previously designed projects opened in v1.08 or later) will contain template files that can be referenced for designing your own multipoint files.



To open one of the sample multipoint files, open the Multipoint folder. Then, right-click on the file and select Edit.



The Multipoint Editor will appear displaying the contents of the file.



The Format of the File

For PUP Multipoint files, each line is entered in the format of Name=x:y, where:

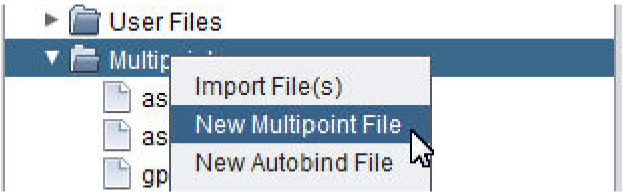
- Name - Short, descriptive name for the point
- x - PUP Channel
- y - PUP Attribute

Colons must be used to delimit between the channel and the attribute.

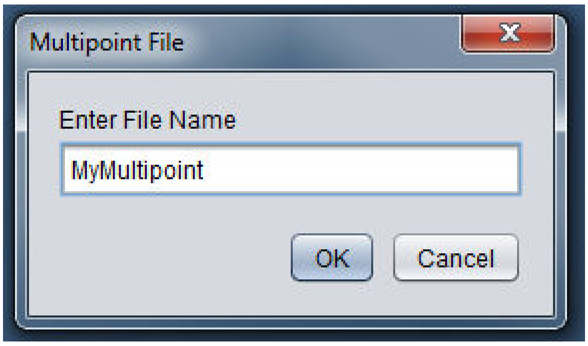
Creating a New Multipoint File

To add a new multipoint .PROPERTIES file to your project:

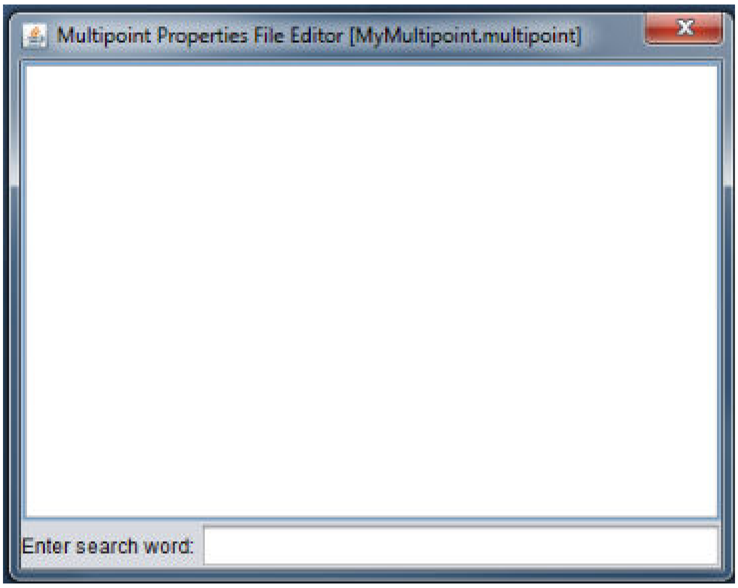
1. Right-click the Multipoint branch of your Project Tree and Select New File from the shortcut menu.



2. Enter a valid name into the Enter File Name dialog. Click OK when finished.



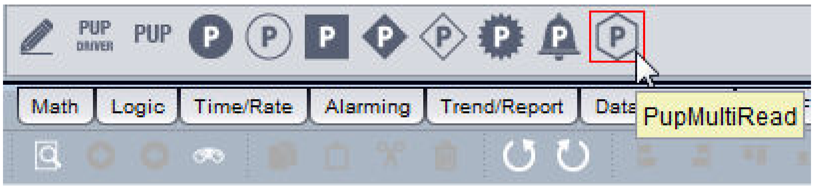
3. A new file will then be created under the Multipoint folder, and the editor will automatically open for the file.



Adding PUP Multi Read Elements into a Project

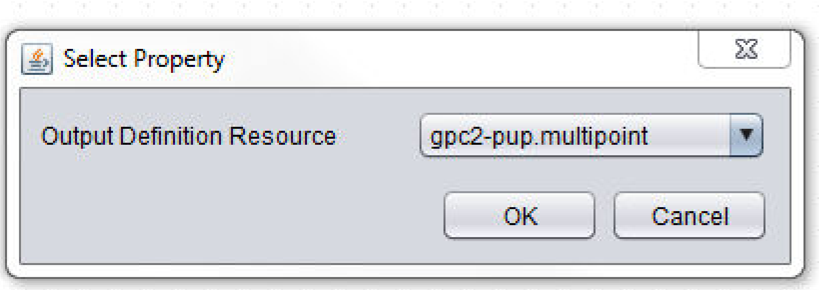
Once you have created your multipoint file(s), you may then begin to add multipoint elements into your project. For PUP, an element for multipoint can be located in the PUP category of your design palette. To add it, perform the following steps:

1. From the PUP category, find the PUP Multi Read Element.

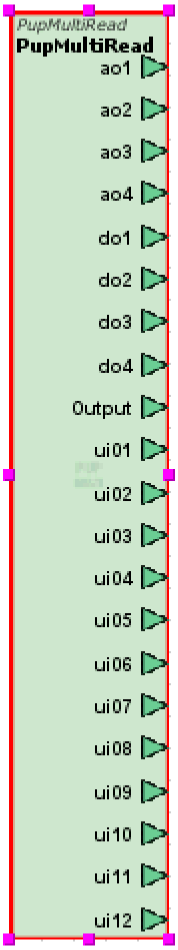


2. Perform the click and drop action similar to adding any other element onto your Diagram Workspace.

3. You will be prompted to specify which Multipoint file that the element will use. Select the file from the combo box and click OK.



4. The Multipoint element will be generated and displayed on your Diagram Workspace.

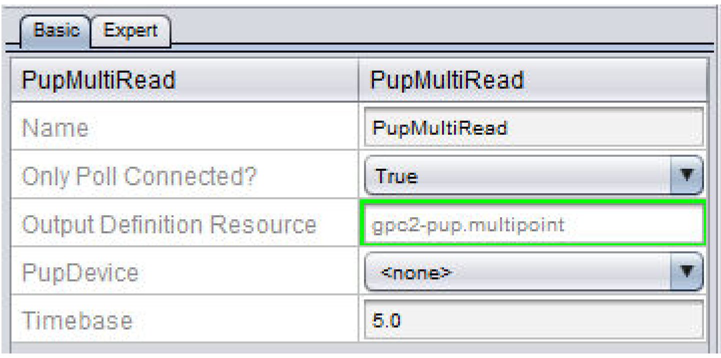


Working with PUP Multipoint Elements

Working with PUP Multipoint Elements requires some key information when designing your project. The following sections discuss each item of interest that should be kept in mind.

Basic Properties of the PUP Multipoint Element

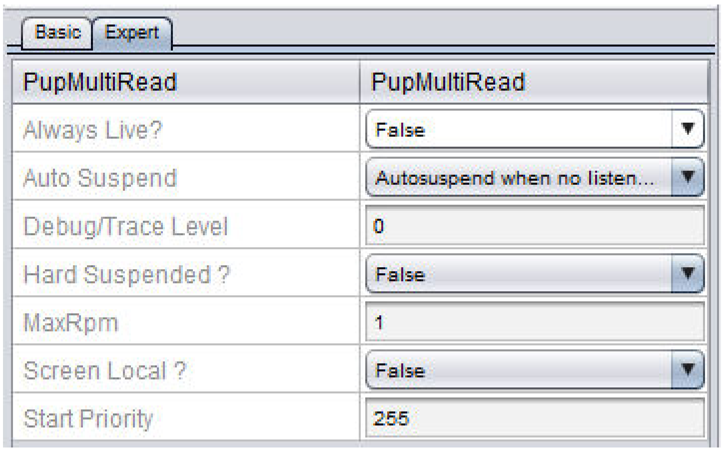
The Basic Properties of the PUP Multipoint Element contain a few configuration properties.



Property Name	Notes
PupDevice	Defines the PUP Device that the element will fetch data from.
Only Poll Connected?	When set to True, the element will only poll points that have their output pins connected to another source within your designed project. When set for False, all points will be polled regardless of connection status.
Output Definition Resource	Reflects the multipoint design file that the element is bound to. This cannot be changed once the relationship is initially established.
Timebase	Defines the amount of time, in seconds, between read requests.

Expert Properties of the PUP Multipoint Element

The Expert Properties of the PUP Multipoint Element contain standard expert properties like other field bus points, but also contains a configuration for the maximum amount of points that should be requested per RAM transaction.



This property, MaxRPMcount, defaults to a value of 1. This value is optimal for applications where legacy PUP devices are connected to an Aspect target.

NOTE - Attempting to request more properties than documented in the introduction of this section can either result in wasted bandwidth, or errors in obtaining the data should you requests more information that a device can adequately support. Please use caution when doing adjusting this parameter.

Modbus

Modbus Overview

The following section provides information on project configuration steps for using Modbus. The Aspect product family supports the following data layers of Modbus:

- Modbus RTU over RS-485
- Modbus TCP over IP

NOTE - Modbus is based on generic serial protocol implementations. As of the currently release of Aspect, the Modbus protocol currently does not support data routing, therefore, LIVE communications to Modbus RTU products cannot be performed through Aspect-Studio at this time. Aspect-Studio can communicate to Modbus TCP devices directly, thus both SIM and LIVE modes are supported.

More Information

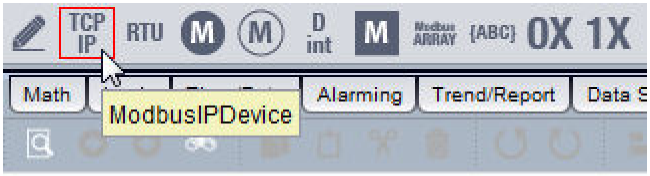
[Adding a Modbus Device]
[Modbus Device Addressing]

Communication Setup

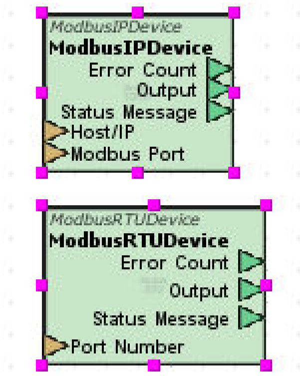
Adding a Modbus Device

To add a Modbus Device, perform the following steps:

1. In Diagram Mode, select the Modbus category from your palette. Locate the Modbus Devices. One can be used for RTU communications, whereas the other is used for TCP communications.



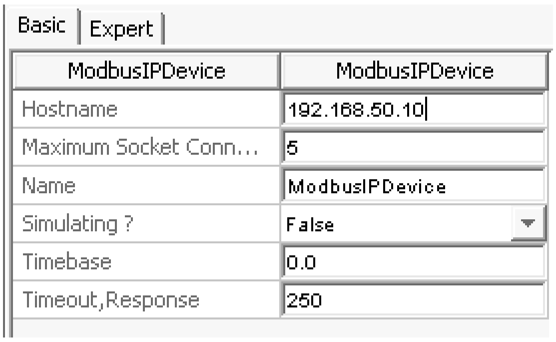
2. Click and drop the element onto your Diagram page.

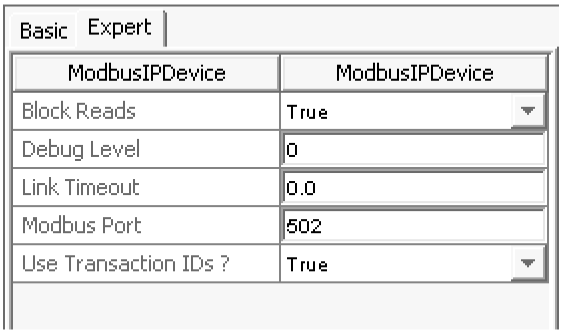


Modbus Device Addressing

Modbus TCP

Modbus TCP devices are generally addressed by an IP address, and Port number. By default, most Modbus TCP devices will communicate using Port 502. This port can be changed in some devices, therefore, Aspect provides the ability to change this port as well. A Modbus TCP device also includes a Slave Node Address, which is required for each register you reference in Aspect.





Properties of the Modbus TCP element provide settings for all of these parameters.

Modbus RTU

Modbus RTU devices are generally addressed by referencing the COM Port and Baud Rate settings for the network. A Modbus RTU device also includes a Slave Node Address, which is required for each register you reference in Aspect.

Basic | Expert

ModbusRTUDevice	ModbusRTUDevice0
Baud Rate	9600
Flow Control	None
Name	ModbusRTUDevice0
Parity	Odd
Port Number	COM1
Simulating ?	False
Stop Bits	1
Timebase	0.0
Timeout,Response	250

Properties of the Modbus RTU element provide settings for all of these parameters.

Element Reads and Element Writes

To reduce the amount of unnecessary network traffic on a Modbus network, Aspect supports the ability to perform element Reads of Modbus data, as well as perform element Writes of Modbus data. While most modern Modbus devices support the ability to process bulk information, there is a chance that some crude implementations may only support portions of element services.

In this case, there are two properties (element Reads and element Writes) on each Modbus Device element within Aspect, indicating whether Aspect should read information in element format, as well as write information in element format.

Block Reads	False
Block Writes	False
Debug Level	0

When the corresponding property value is set to False, Aspect will attempt to read/write registers one at a time in a singular manner. When set to True, Aspect will attempt to read/write registers in multiples to reduce network bandwidth. These properties should only be modified if you are experiencing issues with reading/writing of values and have verified your data type configuration and Modbus device addressing.

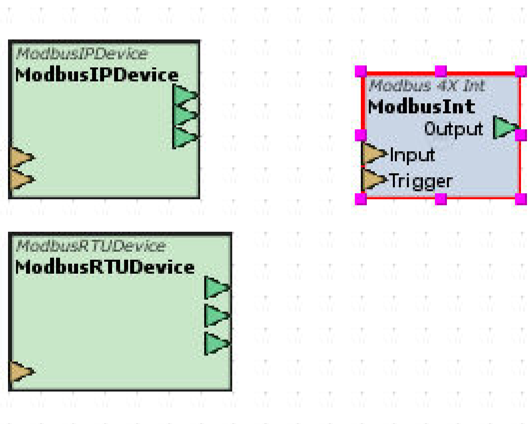
Working with Registers

Addressing Registers

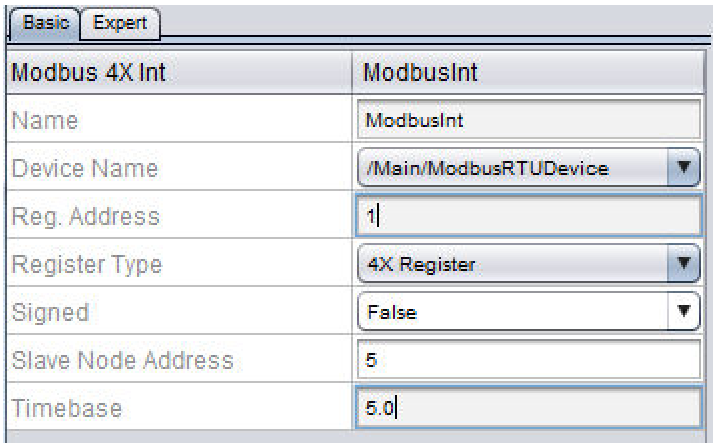
The following elements are used to address single register addresses in Modbus:

- Int
- Dint
- Float
- String
- 0X
- 1X

To address a single point, simply click and drop an element that corresponds to the register data type onto your Diagram View.



Then, configure the properties of the element for the Slave Address of the Modbus device, along with the register offset and device link. Registers are addressed by the Register Type and address. For example, if you wish to reference Register 40031, you would set the Register Type for 4x Register and the Reg. Address property to 31.



More Information

[Modbus Int]
[Modbus DInt]
[Modbus Float]
[Modbus String]
[Modbus Array]
[Modbus String Array]
[Modbus 0x Server]
[Modbus 1x Server]

SDP

SDP Overview

Aspect Server targets (such as Aspect Facility and Aspect Enterprise) are capable of communicating to SageMAX Area Controllers using SDP Protocol over IP, running the IP v1.9 Operating System. The SDP Driver functionality of Aspect is quite simple to use and is an effective client for replacing previous generation AAM front-ends such as Auto-Pilot.

Driver Level Support Information

The SDP Driver interface provides users with assisted database discovery of SageMAX systems to reduce engineering and creation time. The driver supports the following Sage fundamental types:

- PT - Points
- PG - Programs
- VR - Variables

The driver does not support the following fundamental types:

- MS - MSTP
- BN - BACnet/IP
- GL - Globals

The driver does not support the ability to retrieve or view historical data native to the Sage (such as trends, alarm messages, calendars, etc.). Trend and alarms must be re-created using Aspect's trending and alarming capabilities.

NOTE - The Global fundamental type was designed to allow SageMAX products to share data amongst each other. Because of the resource intensiveness of Global communication traffic on SageMAX products, the SDP Driver does not support this fundamental type.

NOTE - To communicate with BACnet products residing on MS/TP or IP, you must use Aspect's native BACnet capabilities.

More Information

[Defining FTNet Devices](#)

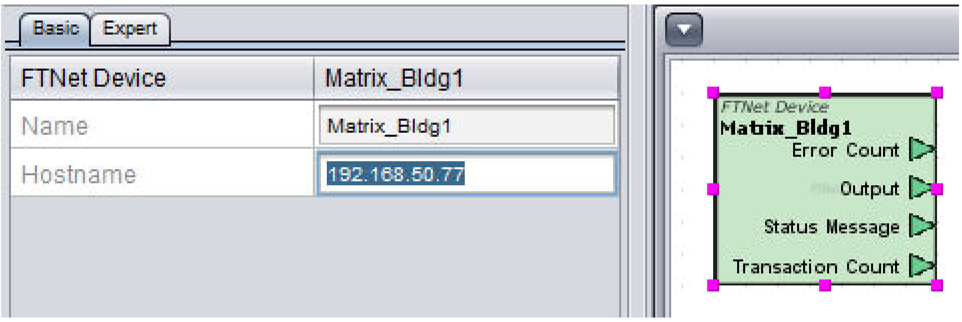
[Adding the SDP Driver](#)

SDP Communication Setup

Defining FTNet Devices

Prior to adding any SDP elements onto your Diagram, you must first define your target, which is the device that will take on the project you are configuring. For each target, an FTNet Device must be present and defined. A project may have more than one FTNet Device referenced - for situations where you may need to communicate to a BACnet network on a remote Aspect platform.

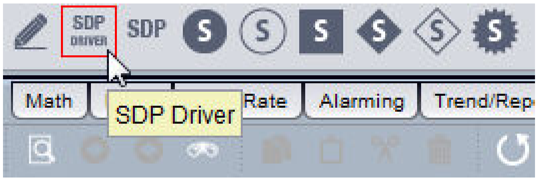
Simply click and drop an FTNet Device element onto a Diagram page. Configure the FTNet Device element with the IP address or resolvable name (e.g. facserver.mysite.com) of the target. For ease of programming, associating a descriptive name to the FTNet Device element is recommended, especially for projects that involve communicating with multiple Aspect targets.



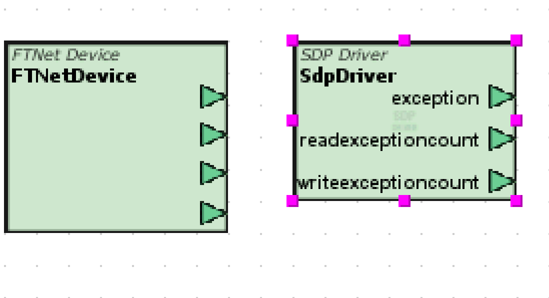
Adding the SDP Driver

To add the SDP driver, perform the following steps:

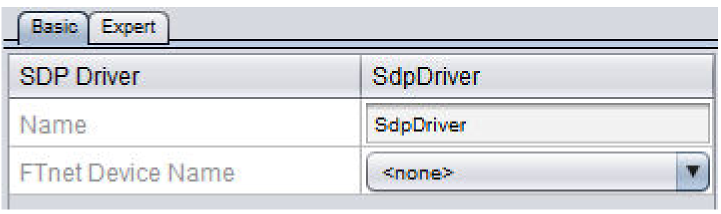
1. In Diagram Mode, select the SDP category from your palette. Locate the SDP Driver, which is the first icon to the immediate left side.



2. Click and drop the SDP Driver element onto your Diagram page.



3. With the SDP Driver selected, simply configure the FTNet Device Name property to focus on your configured driver.



Working with Devices

Working with SDP Devices

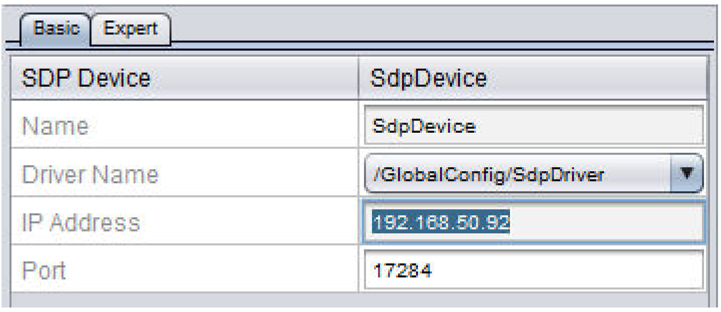
SDP Devices are simply SageMAX Area Controllers. An SDP Device is defined by its IP address and the port on which it communicates (Port 17284).

To add and reference an SDP device, perform the following steps:

1. With the SDP category selected on your palette, locate the SDP Device element.

2. Click and drop the SDP Device element onto your Diagram page. This will create a SDP Device element, used to address a SageMAX Area Controller.

3. Configure the properties of the SDP device. If you are configuring the device in an offline manner, you can manually enter the IP address, and IP port. The IP port will always be 17284.



Working with Fundamental Types

Working with Fundamental Types Overview

Data from SDP is normalized into SDP elements. Any of the SDP elements (based on data type) can refer back to a point-attribute, variable, or program-attribute from the SageMAX. In the SDP category of the palette, there are several elements that correspond to a specific data type within SDP. Because SDP is a data type sensitive protocol, it is important that addressed data uses the correct data type. The SDP elements do provide good coercion protection in the event a data type element is not chosen correctly. For example, a float can be represented as an integer - but will not have control over the floating decimal places.

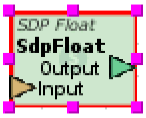
More Information

Addressing Data Using Discovery Assist
Addressing Data Offline
Timebase Considerations

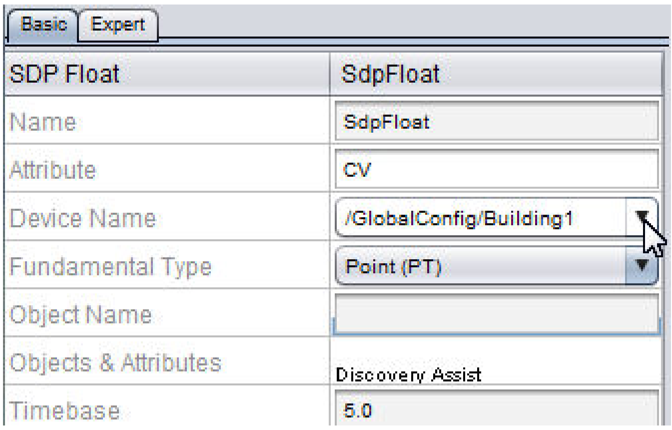
Addressing Data Using Discovery Assist

To address data from an SDP device, perform the following steps:

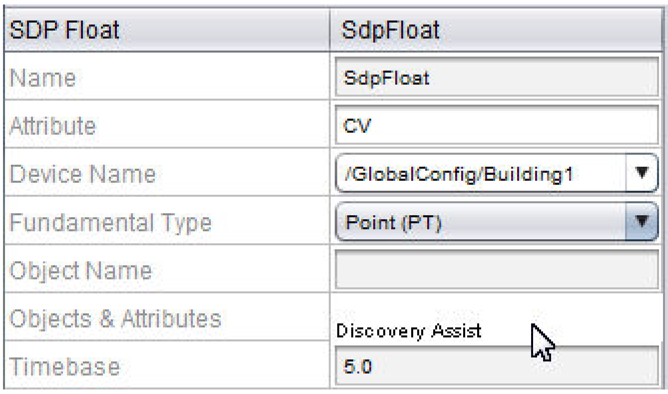
1. From the SDP category, select an SDP point data type element from the palette that corresponds to the object/property you are working with. Click and drop it onto the Diagram workspace.



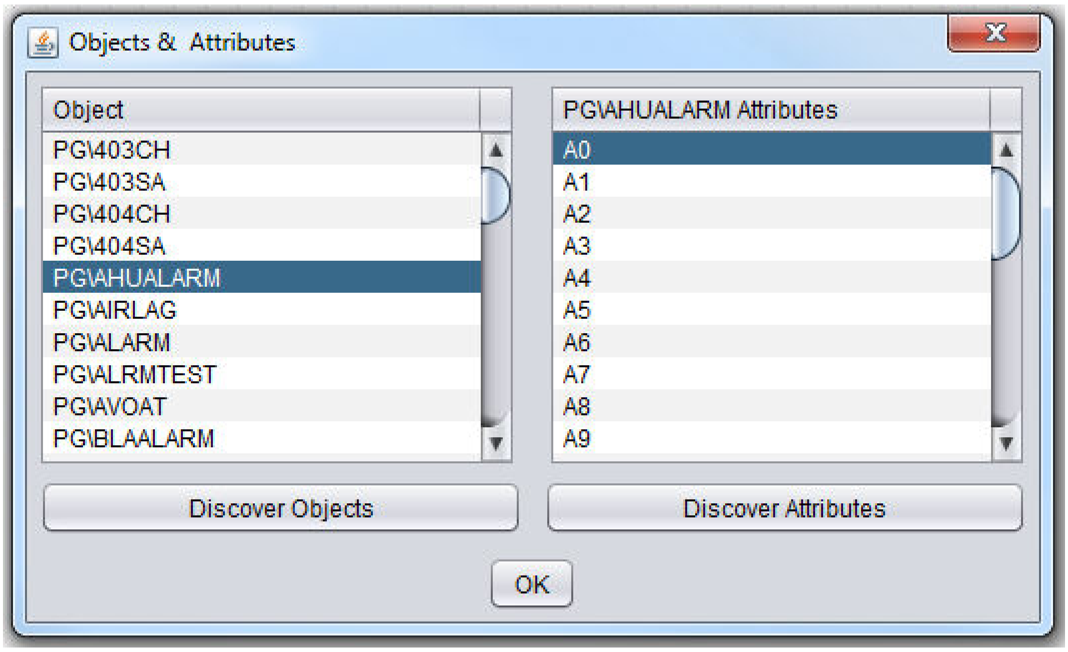
2. Configure the basic properties of the point element. You should first start by associating the device to the point. Do this by selecting the Device from the Device Name property.



3. You may then address the object property. This is done through the use of Discovery Assist. Double-click on the Discovery Assist value to perform a database discover of the SageMAX.



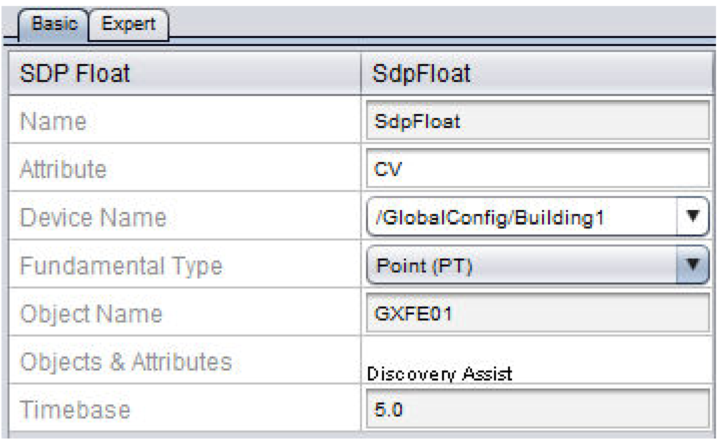
4. In Discovery Assist, you have the ability to perform a database discovery, provided that your computer is connected to the same network as the SageMAX. To discover the object database, click the Discover Objects button. As the database is discovered, all supported fundamental types will be displayed in the scroll box. The Discover Objects button will remain unavailable (grayed out) until the entire database has been discovered. Depending on how many objects have been programmed into the database, this could take several minutes. Once the database has been discovered, you may select any point from the object list and click the Discover Attributes button to retrieve all known attributes.



5. When you have found the point you wish to reference, simply select the attribute from the Attributes list and click OK.

Addressing Data Offline

For situations where you will be generating a project offline, you can manually enter object and attribute information into properties available on SDP data elements within Aspect-Studio. You can also expose these properties as pins, allowing them to be modified programmatically within an application, when creating components, etc.



NOTE - Attributes, please remember that attributes are case sensitive. For example, “CV” and “cv” is considered as separate attributes within an object. In most cases, attributes are always upper-case unless you are communicating with attributes of custom programs in SOLO and SBC controllers that may be authored in a manner where attributes were lower-case.

More Information

SDP Int

SDP Float

SDP String

SDP Date

SDP Time

SDP Bit String

Timebase Considerations

Timebases on each SDP data point are configurable based on how often you wish to update data form the system. By default, each timebase is configured for 5.0 (seconds). This value is considered optimal, but may need changed in some cases.

Older legacy protocols supported by the SageMAX, such as XAMP (eXtended Automation Network Protocol) and PEERnet, were used to provide connectivity to AI2100 Series products such as STARs, RCUs, and other models of this family.

It is important to note that these protocols typically use longer response time-outs than the PUP Protocol. Polling for points on 5.0 second timebases that reside on unhealthy XAMP or PEERnet networks could resulted in longer response time out factors for network messages than compared to PUP or BACnet.

NOTE - Using timebases lower than 5.0 seconds can not only utilize additional resource and process time of an Aspect Server, but can use additional ITM (Intertask Messages) within the SageMAX during normal communications. Because the SageMAX utilizes older hardware technology with less CPU performance and RAM than current-generation technology, AAM recommends polling for points no faster than 5.0 seconds.

Database Storage

Data Storage Overview

Arguably, one of the most powerful features that Aspect utilizes is its flexibility relative to the storage and archiving of historic data and other information. In its most primitive form, data storage is used to archive traditional building automation functions such as trends, alarms, and other important data.

Aspect supports multiple methods of storing information. These methods are derived from the basis of which database technology you wish to store data to. Aspect natively supports MySQL, as well as SQLite (used on Aspect Matrix Area Controller hardware platforms).

About MySQL

MySQL is one of the most popular database management systems used across multiple industries. Managed by the Oracle Corporation, MySQL is an open-sourced database system that provides excellent handling of large amounts of data.

MySQL is an industry standard database format, known world-wide for its capabilities of storing large amounts of data. Many popular web sites and industry companies use MySQL as their database backbone. Among these include are Facebook, Google, and others.

About SQLite

SQLite (pronounced as es queue el-lite) is a light-weight, non-networked, SQL database, which is used to provide a Matrix Area Controller with local storage. To use SQLite, your Matrix Area Controller must be licensed to do so. Additionally, storage of data requires the use of a USB Flash Drive connected to one of the USB ports located underneath the Ethernet port of the Matrix Area Controller.

SQLite is a popular database format used in embedded system projects. One of the most notable projects that utilizes SQLite is Google's Android mobile phone operating system.

MySQL

MySQL Overview

The MySQL database support in ASPECT is designed to provid e flexible network storage capabilities to all ASPECT targets. MySQL is fully net-workable - providing users with the ability to allow lower level devices such as a MATRIX Series Area Controller to write trend, alarm, and other data over the network to an ASPECT Server (which contains an integrated MySQL Server), or to a third-party administrated MySQL Server.

MySQL provides superior capabilities for storing data. However, it is also important to understand how MySQL should be used in a large net-worked architecture. Items to keep in mind include the following:

- Prior to implementing a database solution, carefully review the considerations for your installation. If you are using a stand-alone MATRIX Series Area Controller, SQLite may be a better option for data storage, as it is local to the device itself and does not require additional hardware (such as a PC) to run a database on.
- If the project you are creating may grow in size later, MySQL may be useful to ensure that re-engineering of database storage is not necessary later on.

More Information

Adding MySQL Into Your Project

Configuring MySQL Connectivity

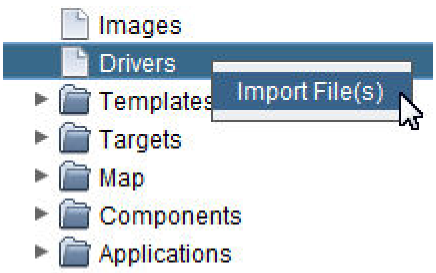
Changing the Default phpMyAdmin/MySQL Credentials

Configuring MySQL Without a DNS Server

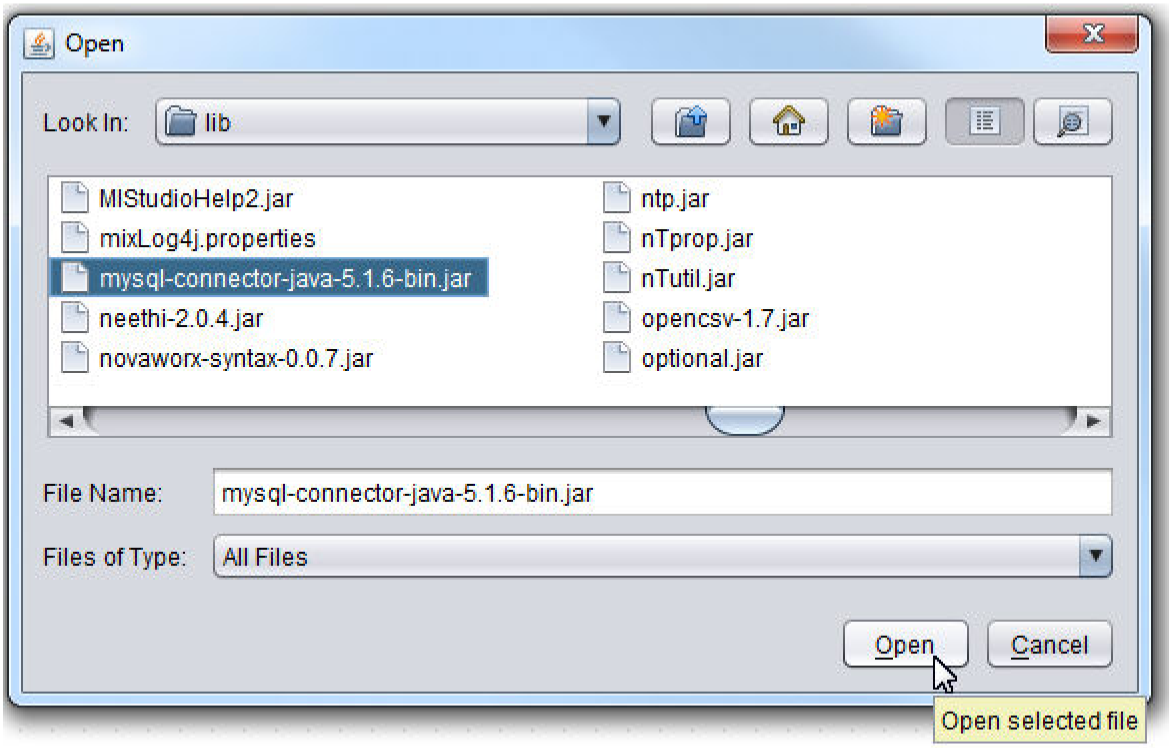
Implementing MySQL Into Your Project

To use MySQL in your project, you must add the MySQL driver and configure at least one MySQL Connection Manager in your project. To add the MySQL driver into your project, perform the following steps:

1. With a project opened in Aspect-Studio, go to the Project Tree. Right-click the Drivers node and select Add File.



2. Browse to C:\American Auto-Matrix\AspectStudio\bin\lib. Select the mysql-connector-java-5.1.6-bin.jar file. Click Open to add the driver to your project.

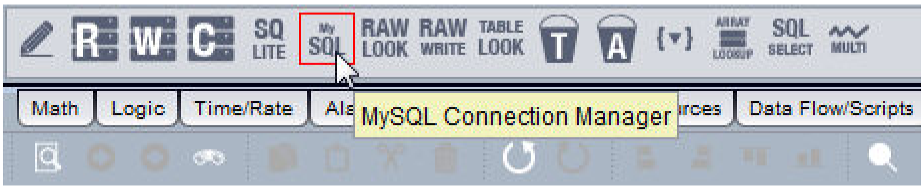


3. Once you have added the driver, a mysql-connector-java-5.1.6-bin.jar entry should appear under the Drivers node.

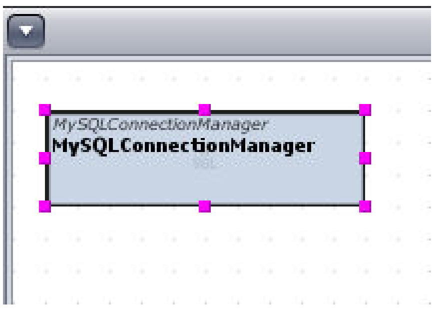
Configuring MySQL Connectivity

To configure the MySQL Connection Manager, you must first add the corresponding element to the Diagram page of a new or existing application within your project. Perform the following steps:

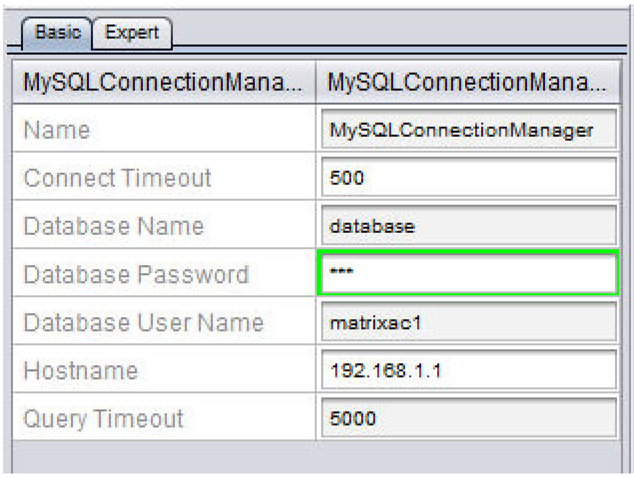
1. From the Database category, select a MySQL Connection Manager element from the palette.



2. Click and drop it onto your Diagram page.



3. With the MySQL Connection Manager selected, configure the properties associated for the element. Please note that the database name you associate with the connection manager must be created by the administrator of the MySQL database you are connecting to in order for data to be stored.



> **Note**: A remote MySQL server can be used for your historical data. This may be hosted by a third party, or simply downloaded to a machine on your network (Download MySQL Server version 5.7, run as a service on your machine, and create the schema you wish to use).
> To use it, set the MySQL connection manager Hostname parameter to the IP address and port of the remote MySQL server, and specify the username, password and database that are configured on the remote server.

Upon following these steps, the database connection option will become available for you to use with alarms, trends, and other database elements available within ASPECT-Studio.

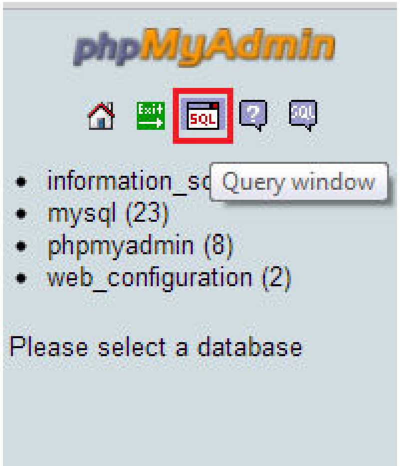
Changing the Default phpMyAdmin/MySQL Credentials

It is HIGHLY recommended to change the default credentials for phpMyAdmin/MySQL, especially for sites exposed to the internet.

Use the following process to change the default username and/or password:

1. Navigate to the MySQL Administration of the Aspect Device

2. To open the Query Window, click the Query Window button.



3. If only changing the default password skip to Step 4, otherwise modify the following queries to change the username:

NOTE: Replace username with the desired new username.

RENAME USER 'matrixac1'@'localhost' TO 'username'@'localhost';

RENAME USER 'matrixac1'@'%' TO 'username'@'%';

FLUSH PRIVILEGES ;

4. Modify the following queries to change the default password:

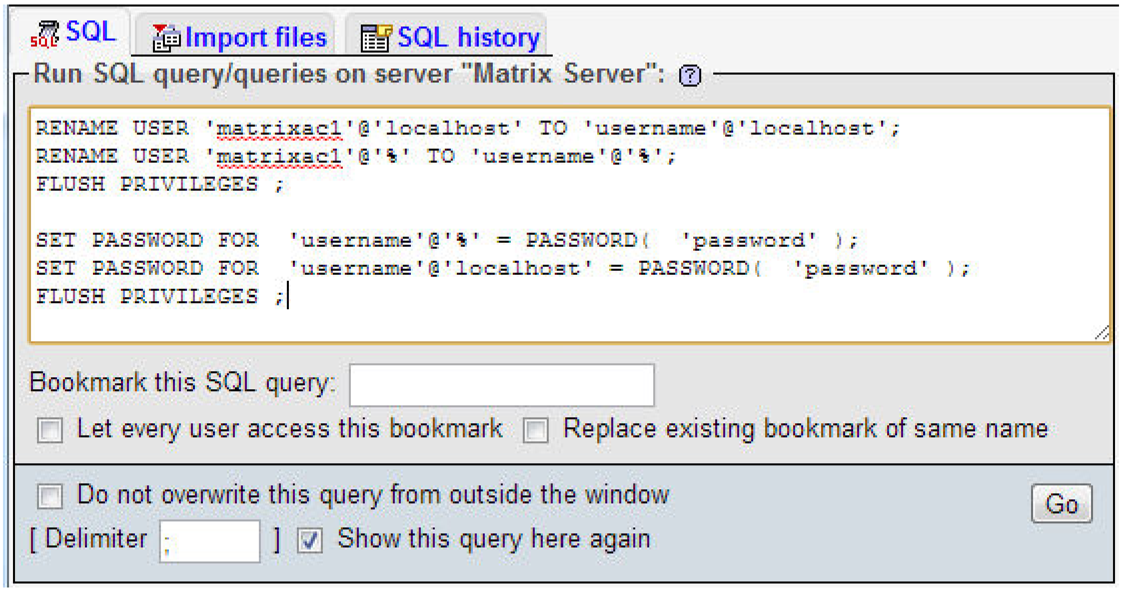
NOTE: Replace matrixac1 with the new username and password with the desired new password.

SET PASSWORD FOR 'matrixac1'@'%' = PASSWORD('password');

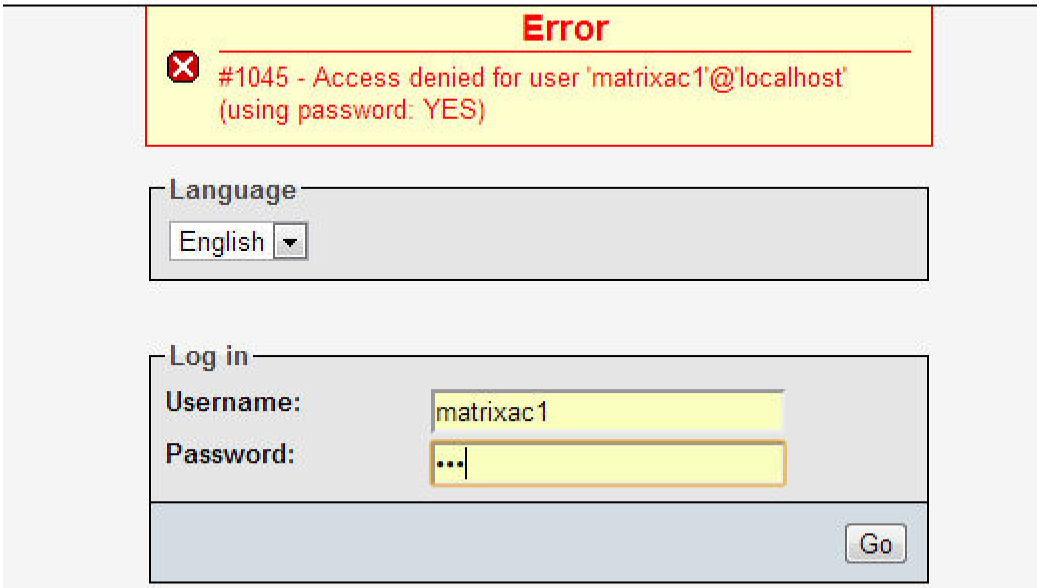
SET PASSWORD FOR 'matrixac1'@'localhost' = PASSWORD('password');

FLUSH PRIVILEGES ;

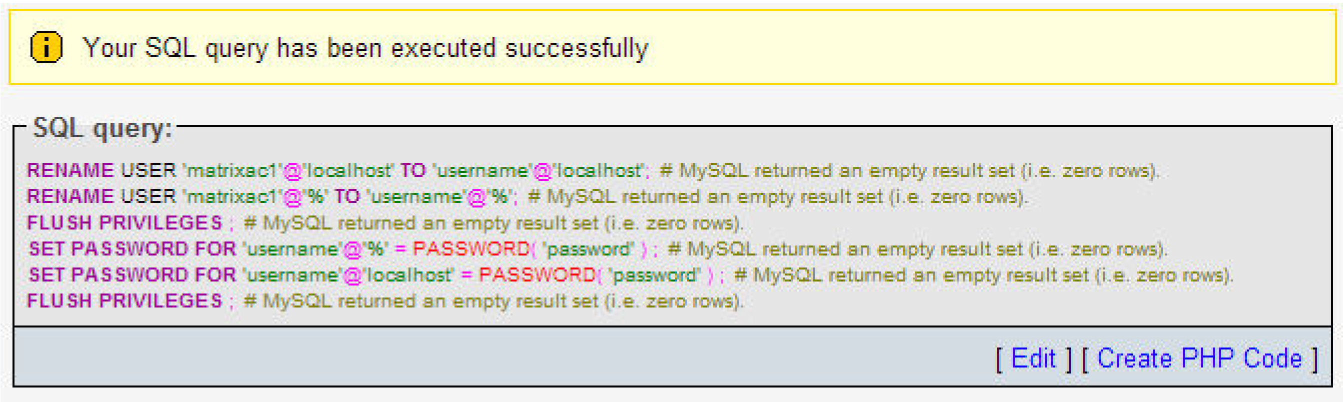
5. Next, copy the queries into the SQL Query window and press 'GO'



6. The query window should give you a login prompt, close that window.



7. You should see a similar message on the Main window that the query has been executed successfully, if not check the query for errors:



8. Finally, Click the Exit Icon to log out of phpMyAdmin and test the new username and password.

More Information

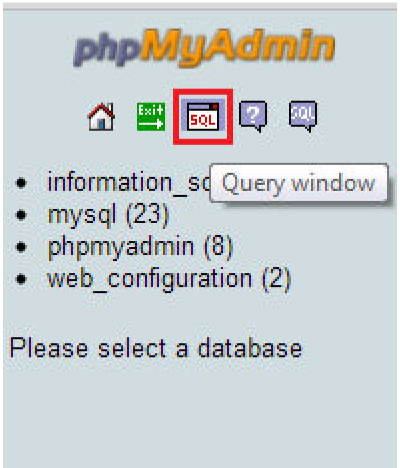
[MySQL Overview](#)

Configuring MySQL Without a DNS Server

Aspect devices that host projects using a MySQL database without a DNS server set up must be configured in a way that the DNS server is not needed. The following steps will configure the Aspect project to eliminate the need for a DNS server.

1. Navigate to the MySQL Administration of the Aspect Device

2. To open the Query Window, click the Query Window button.



3. A user needs to be created to look at the MySQL database on the local Aspect Device.

NOTE: If the username and password has been previously changed, alter matrixac1 and aam in the code below to reflect those changes.

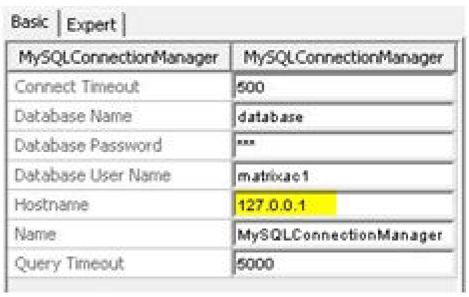
Enter the following SQL statement to generate a user named “matrixac1” and press GO:

CREATE USER 'matrixac1'@'127.0.0.1' IDENTIFIED BY 'aam';

GRANT ALL PRIVILEGES ON * . * TO 'matrixac1'@'127.0.0.1' IDENTIFIED BY 'aam' WITH GRANT OPTION MAX_QUERIES_PER_HOUR 0 MAX_CONNECTIONS_PER_HOUR 0 MAX_UPDATES_PER_HOUR 0 MAX_USER_CONNECTIONS 0 ;

GRANT ALL PRIVILEGES ON `matrixac1\_%` . * TO 'matrixac1'@'127.0.0.1';

4. Next, the MySQL Connection Manager needs to be configured to look at the local Aspect Device.



More Information

MySQL Overview

Changing the Default phpMyAdmin/MySQL Credentials

Aspect Server MySQL Database Administration

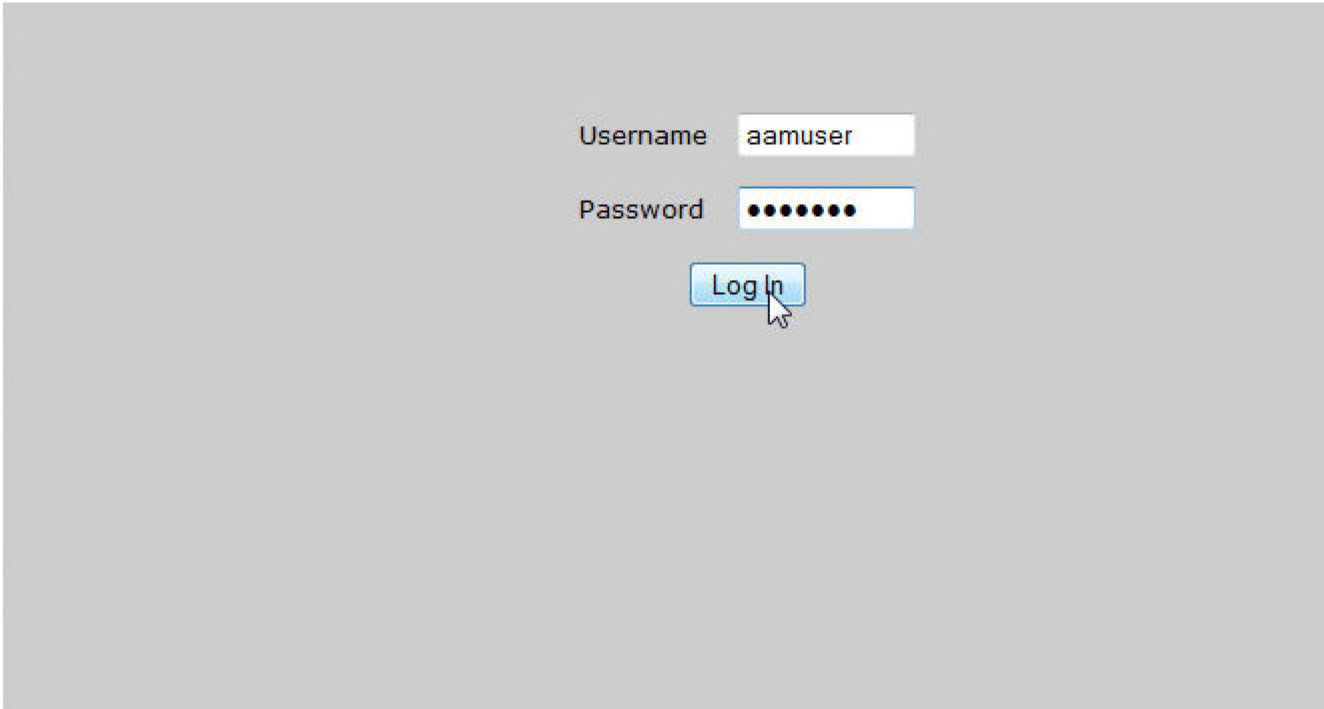
Aspect Targets - MySQL Server Overview

Aspect-Facility, Aspect-Nexus, and Aspect-Enterprise targets contain an embedded MySQL database server. Unlike some traditional MySQL servers, Aspect Server's MySQL database infrastructure provides a completely accessible browser-based interface for database management functions. Through it, you can create database, delete databases, and manage many elements such as permissions.

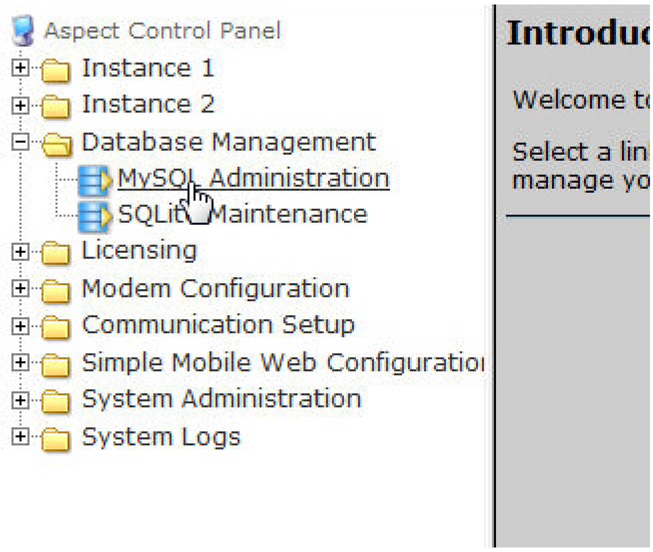
Accessing the Embedded MySQL Server

The embedded MySQL database server can be access through the Aspect Control Panel using any standard web browser. To access this portion of the system, perform the following steps:

1. Using your web browser, enter the IP address or resolvable name of your Aspect Server device. Log into the system with the administrative user name and password (default username = aamuser ; default password = default).

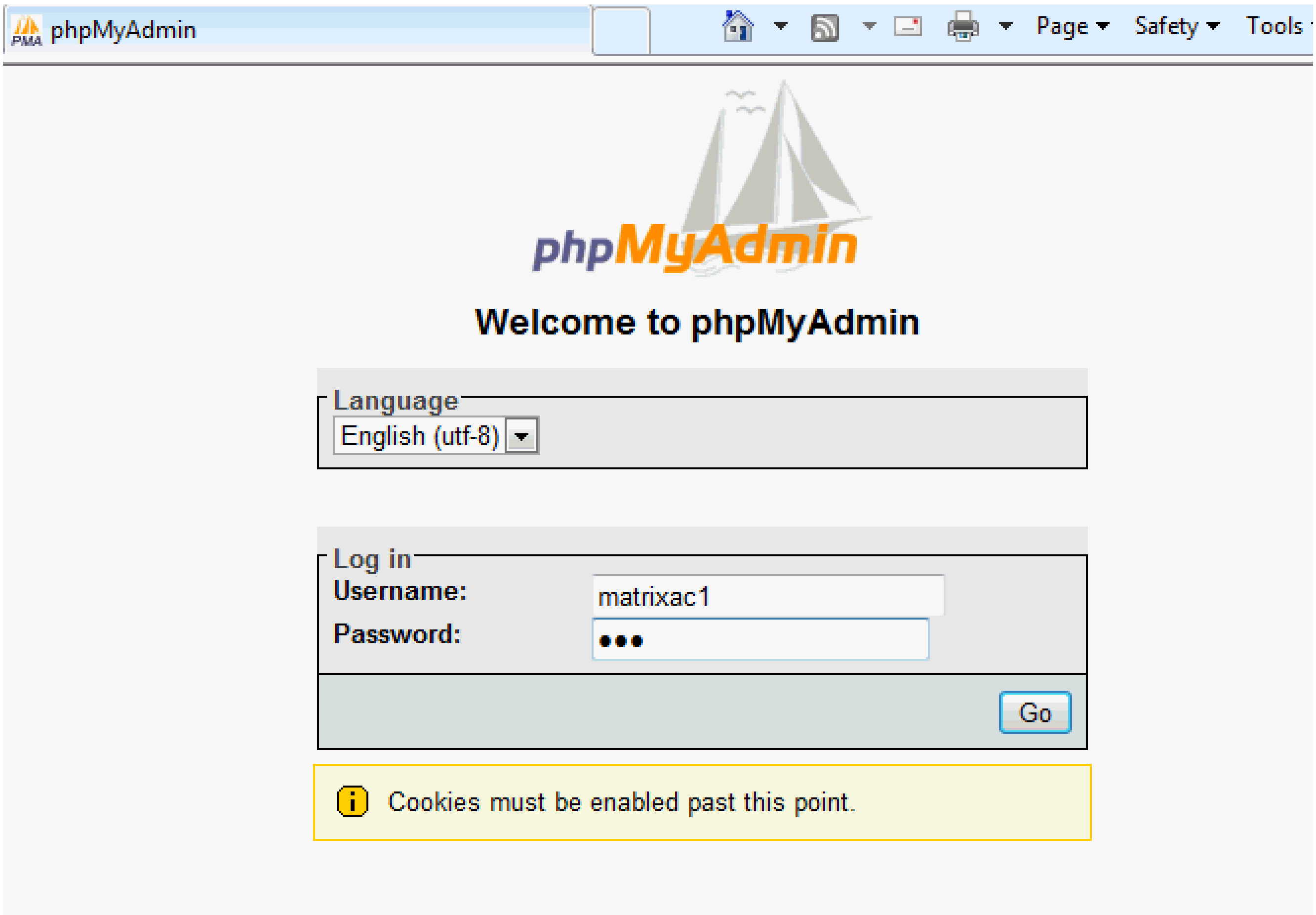


2. Once logged in, open the Database Management branch and click MySQL Administration.

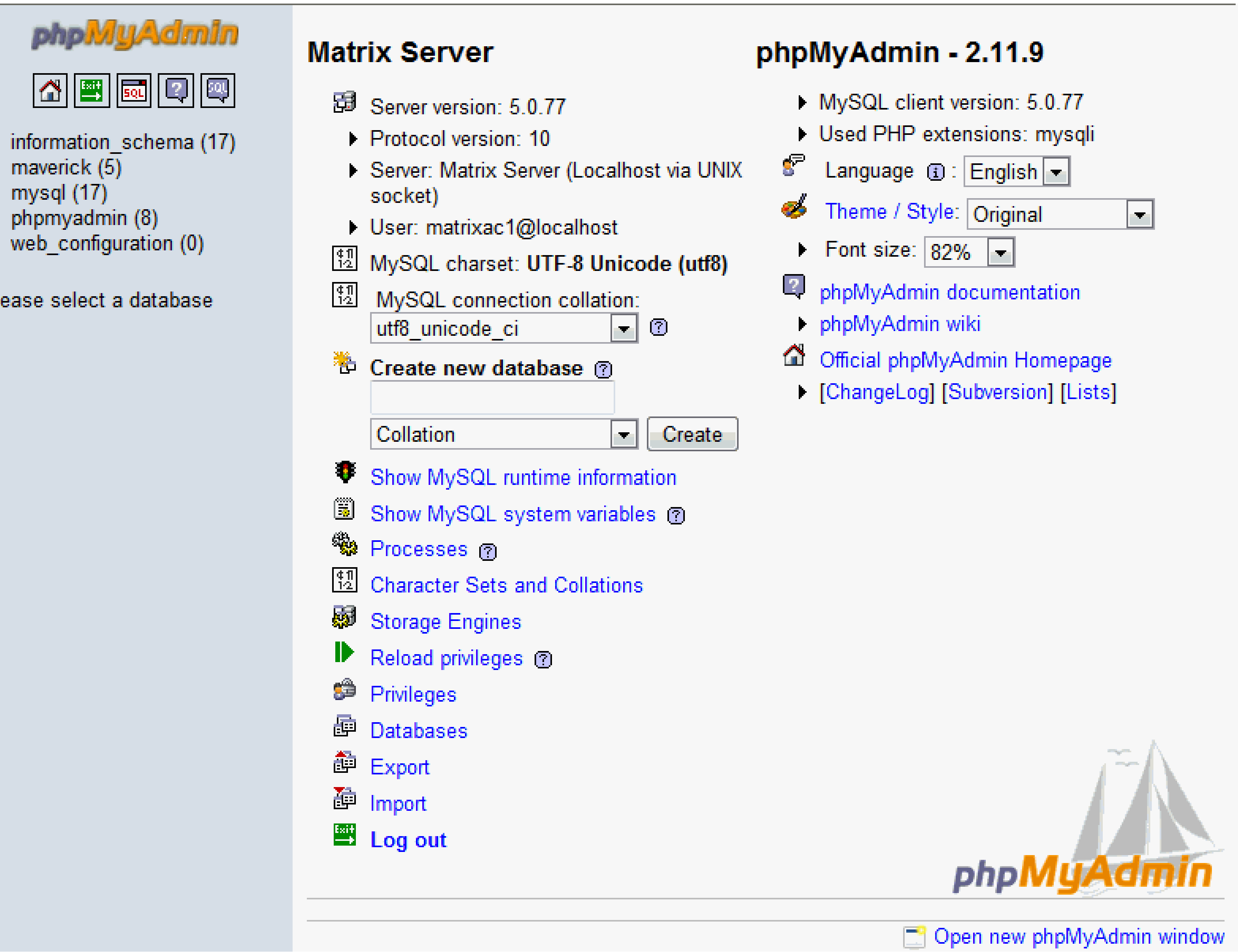


3. You will be taken to the phpMyAdmin login page. To access the MySQL server, you must enter the administrative username and password for the MySQL Server   The default case-sensitive username is matrixac1. The default case-sensitive password is aam.

Note: It is HIGHLY recommended that the default credentials be changed for sites exposed to the internet. Use the link in the More Information section below for this process.



4. Once finished, you will then be taken to the main user interface for the MySQL Server.



More Information

[Changing the Default phpMyAdmin/MySQL Credentials](#)

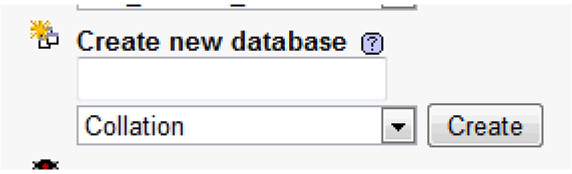
[Configuring MySQL Without a DNS Server](#)

Creating a New Database

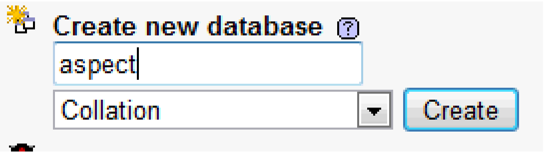
By default, the MySQL server contains no default databases that will allow Aspect to create and manage tables. Prior to beginning any type of engineering that involves trending, alarming, or other database-centric features, you must first create a database. The database will retain all tables and information that is processed by Aspect.

To create a new database, perform the following steps:

1. At the MySQL Server main interface, find the Create New Database area on the main form (shown below)



2. Once located, enter a descriptive name for the database. Make sure the drop-box below the name field is always set to Collation.



3. When finished, click Create. This will create the new database container where data can be stored.

SQLite

SQLite Overview

The SQLite database support in Aspect is designed to provide lightweight local storage capabilities to the Matrix Area Controller. Unlike the MySQL Server present in Aspect Server targets (Facility and Enterprise), data stored at the Matrix Area Controller will remain local to the unit and cannot be off-loaded to any other server. SQLite is designed for small systems that do not utilize an Aspect Server target for mass storage.

While SQLite offers excellent performance, it is important to consider some of the limitations of the platform upon which SQLite databases are deployed. For example, the Matrix Area Controller can support vast amounts of expansion storage via the USB interface, and SQLite databases may grow to the maximum file size of 2GB support by the file system. However, in doing so, a number of items should be considered:

1. SQLite is not intended to be a replacement for the MySQL Connection Manager. It is designed solely to provide local storage for small systems or to locally store small amounts of data when used as part of a large system.
2. As the database grows, insert speed does not change.
3. The length of time it takes to complete a query may increases with the size of the database.
4. The larger your database files are, the longer they may take to backup when downloading from a target.

Using SQLite involves the following steps:

- Licensing SQLite
- Configuring the USB Flash Drive
- Configuring SQLite Connectivity
- SQLite Backup and Restore

Licensing SQLite

In order to use SQLite, your Matrix Area Controller must contain the proper license feature. When your Matrix Area Controller has been licensed to take advantage of local storage, an SQLite line will be displayed in your license file that shows the status of your SQLite license.

SQLite is enabled by default on MatrixMax, Facility and Enterprise servers as well as enabled within Aspect-Studio for testing purposes.

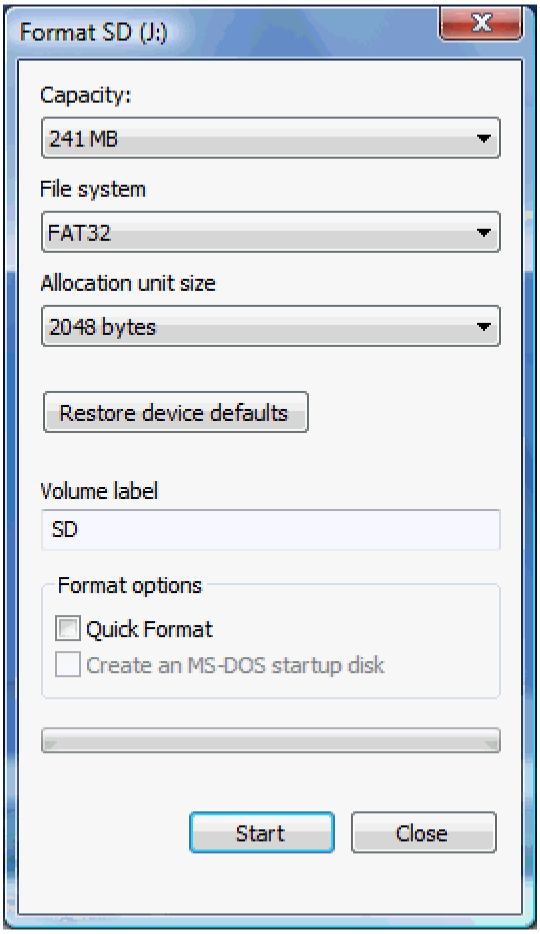
```
ModbusIPDeviceEnabled = True
ModbusIPDeviceMax = 128

#FTNet
FTNetDeviceEnabled = True
FTNetDeviceMax = 9

#SQLite
SQLiteEngineEnabled = True
```

Configuring the USB Flash Drive

A standard USB Flash Drive must be connected to one of the USB ports of your Matrix Area Controller. Prior to connecting the drive to your Matrix, you must first format the USB Flash Drive using your PC to use a FAT32 file system, and create a database directory on the drive.

To format your USB Flash Drive, perform the following steps:

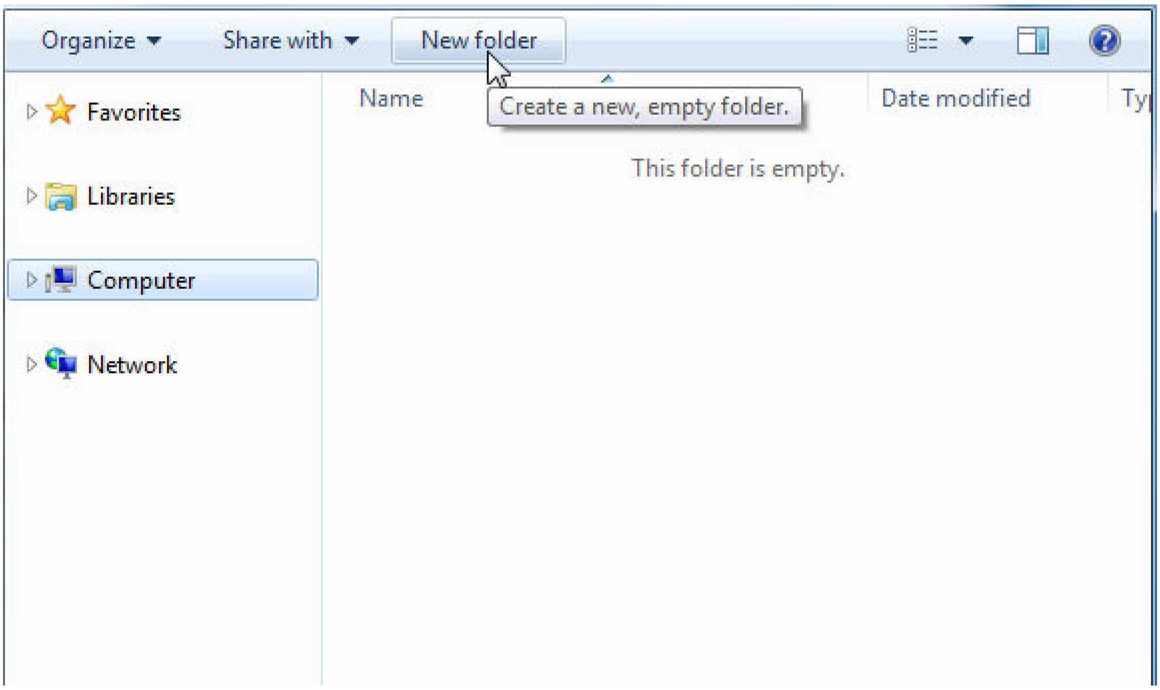
1. Connect your USB Flash Drive to an available USB port of your personal computer or laptop. Allow Windows to detect the drive and add it to your system for use.
2. Open My Computer. Find the USB Flash Drive.
3. Right-click on the USB Flash Drive, select Format.
4. At the format dialog box, select FAT32 as your File System option. Then, click Start to begin the format process.



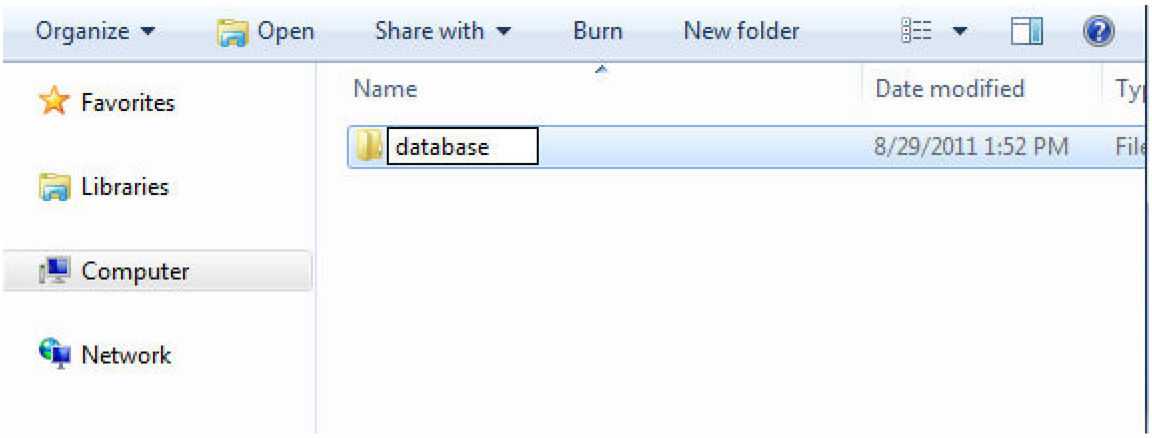
Creating a Database Folder/Directory

Once the drive has successfully been formatted, you must create a folder called "database" on the root of the drive. Perform the following steps with the drive connected to your Windows computer:

1. Click the "New folder" shortcut, or right-click in the drive window and select New>Folder.



2. When prompted for a name for the folder, name it database. This name is case sensitive and must be all lowercase letters.



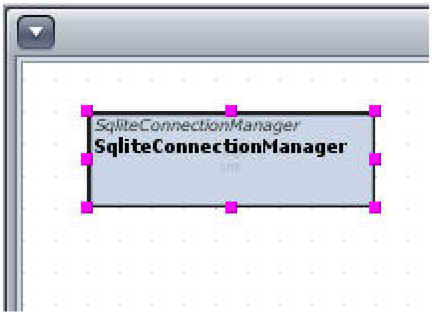
3. Your drive is now ready for use with Aspect-Matrix Area Controller and SQLite applications!

Configuring SQLite Connectivity

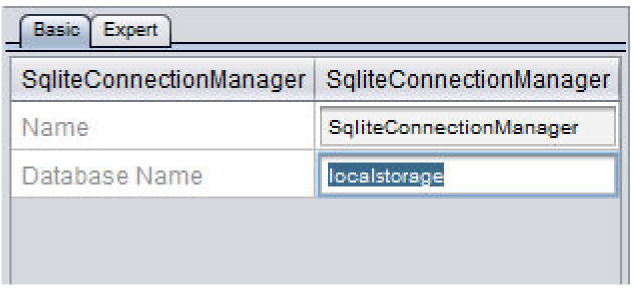
To configure the SQLite Connection Manager, you must first add the corresponding element to the Diagram page of a new or existing application within your project. Perform the following steps:

1. From the Database category, select an SQLite Connection Manager element from the palette.

2. Click and drop it onto your Diagram page.



3. With the SQLite Connection Manager selected, configure your name for the element, along with a database name. The name of the database can be as many as 30 characters and should not include any wildcard characters.



4. Upon following these steps, the database connection option will become available for you to use with alarms, trends, and other

database elements available within Aspect-Studio.

ASPECT® Alarm Subsystem

Alarming Overview

The Alarming subsystem of ASPECT allows alarm and event notifications from the area controller interface to be annunciated. It also accommodates specific field bus protocols and extends support to protocol-specific alarm and event services.

The following sections discuss each component of the ASPECT's alarm subsystem and describes basic functionality and how each piece and part connects together.

More Information

About Alarm Managers

About Alarm Manipulators

Alarming Overview

Alarm Managers

About Alarm Managers

Alarm Managers are used to categorize, store, and archive alarm and event notifications within Aspect. Within a given project, you can define a single Alarm Manager for all of your alarm definitions. If your application requires categorization of alarm information in separate groups (e.g. - separating alarms that are based on routine maintenance, general warnings, or critical equipment control), you can implement multiple Alarm Managers within your project to keep information separated.

Keep in mind that even if you have separate Alarm Managers, you can route all of the alarms back to a single point of presentation, or multiple points of presentation if deemed necessary.

Prior to creating and defining alarm managers and alarm extensions within Aspect, you must have a valid database storage method configured. Please reference the following topics:

- MySQL Overview
- SQLite Overview

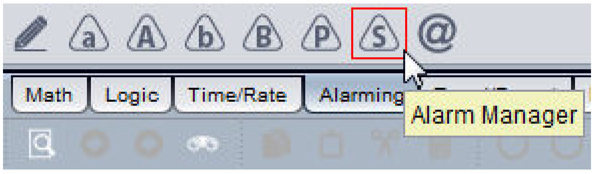
More Information

[Adding the Alarm Manager Element]

Adding the Alarm Manager Element

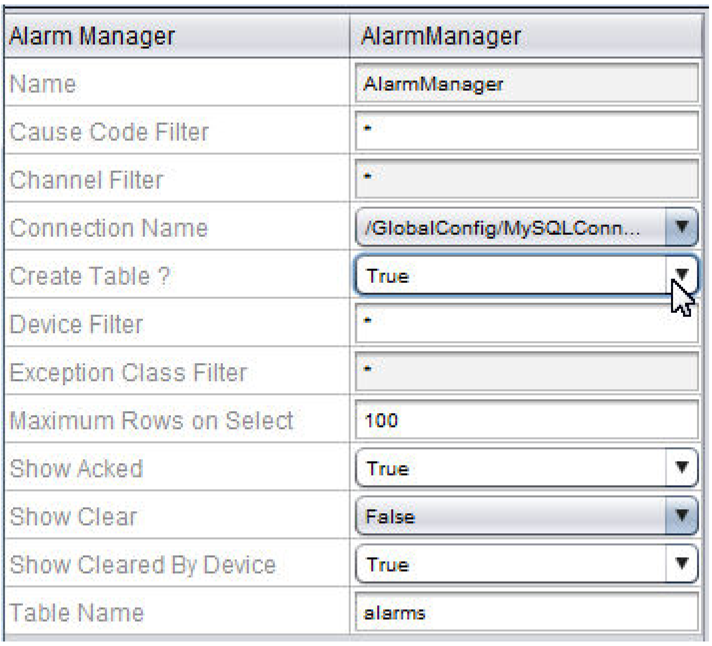
To add an Alarm Manager element, perform the following steps:

1. From the Alarming category, select the Alarm Manager element from the palette.



2. Click and drop it onto your Diagram page.

3. Configure general properties for the Alarm Manager. These properties include:



- Connection Name - Specifies the database connection to where data will be stored and retrieved. If you have multiple database connections programmed into your project, they will be displayed in the combo-box.
- Create Table - Should always be set to Yes.

- Table Name - Specifies a unique name for the alarm category. If you intend to have multiple Alarm Managers, you may wish to change the Table Name for each Alarm Manager.

NOTE - When assigning a Table Name, it is important to ensure that you exclude the use of any special characters (such as hyphens, plus, minus, and other wild card characters). Having these as part of a table name can cause reporting and read/write errors when deployed.

4. Assign a valid name to the Alarm Manager to a description of the types of alarms that will be stored.

Alarm Manipulators

About Alarm Manipulators

Alarm Manipulators are elements that define conditions in which an alarm condition is considered within Aspect. Within the Alarming palette, there are four different alarm manipulators that can be used to annunciate an alarm-able event.

- Alarm Analog Manipulator - annunciates an alarm or event when the input value is within the band defined by the Bottom of Band and Top of Band properties.
- Advanced Alarm Analog Manipulator - annunciates an alarm or event based on the type configured by the user (which can be Out of Range, In Range, High Limit, or Low Limit).
- Alarm Boolean Manipulator - annunciates an alarm or event for boolean-type inputs (logical 0 or 1).
- Advanced Alarm Boolean Manipulator - annunciates an alarm or event based on the type configured by the user (which can be low, high, or change of state).

In most cases, the Advanced type of alarm manipulators should be used. Advanced Alarm Manipulators will have the word "Advanced" in their element name description.

More Information

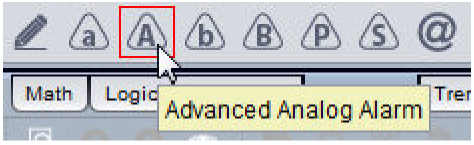
Adding Alarm Manipulators

Linking System Data to Alarm Manipulators

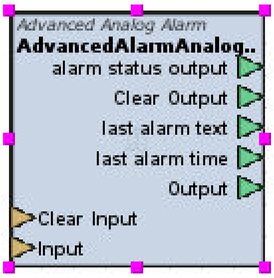
Adding Alarm Manipulators

To add an Alarm Manipulator element, perform the following steps:

1. From the Alarming category, select an Alarm Manipulator from the palette.



2. Click and drop it onto your Diagram page.



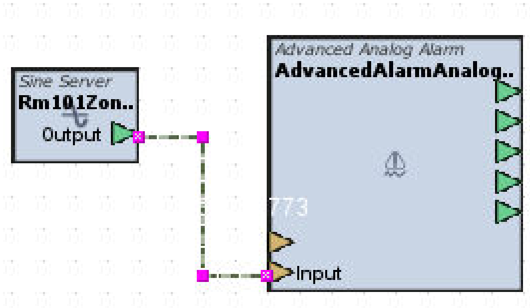
3. Dependent on the type of Alarm Manipulator you have added to your workspace, you will then need to configure the associated properties.

More Information

- Analog Alarm Manipulator
- Advanced Analog Alarm Manipulator
- Boolean Alarm Manipulator
- Advanced Boolean Alarm Manipulator

Linking System Data to Alarm Manipulators

Similar to all other logic within Aspect, system data is linked to an Alarm Element by making a connection from the Output pin of the system data to the Input pin of the Alarm Element.



Alarm Presentation

Outputting Results to an Alarm Table

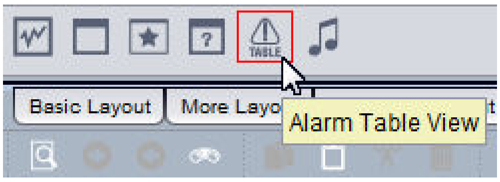
In order to view, acknowledge, and clear alarm and event information from the system, Aspect provides a graphical element that is used to display alarm information. This element, called the Alarm Table View, is located under the H.A.T category of the Design palette.

The element is added, and linked to the output of one or multiple Alarm Managers.

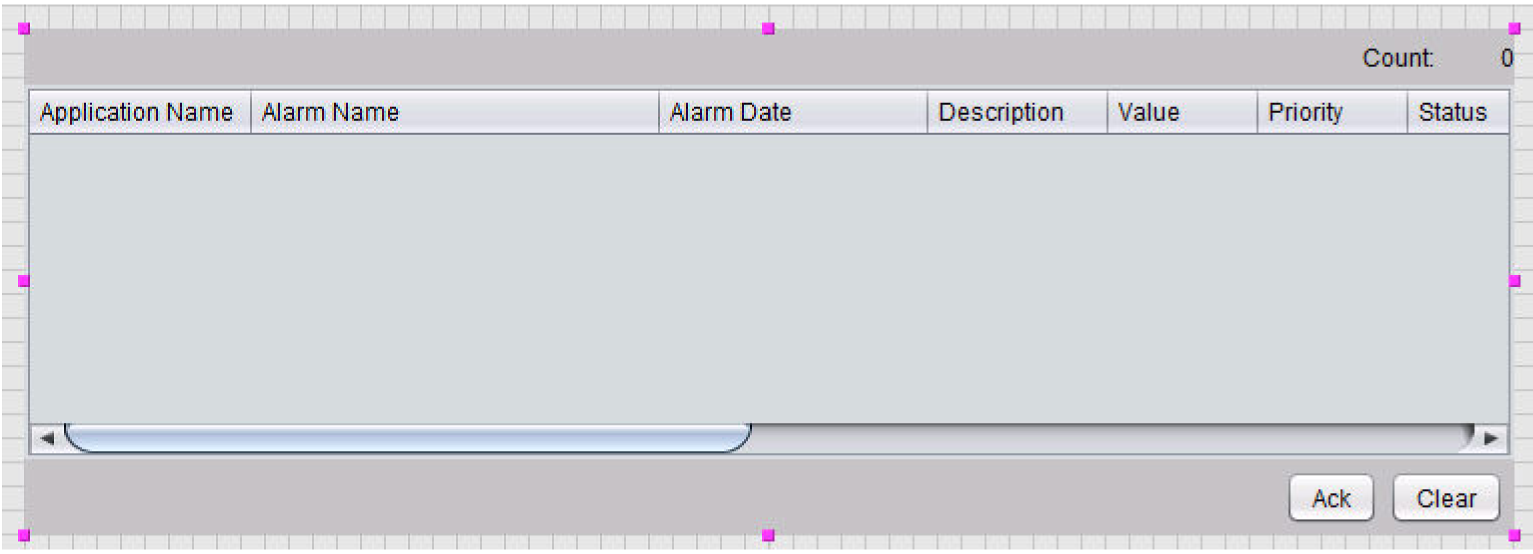
Adding the Alarm Table View

To add the Alarm Table View, perform the following steps:

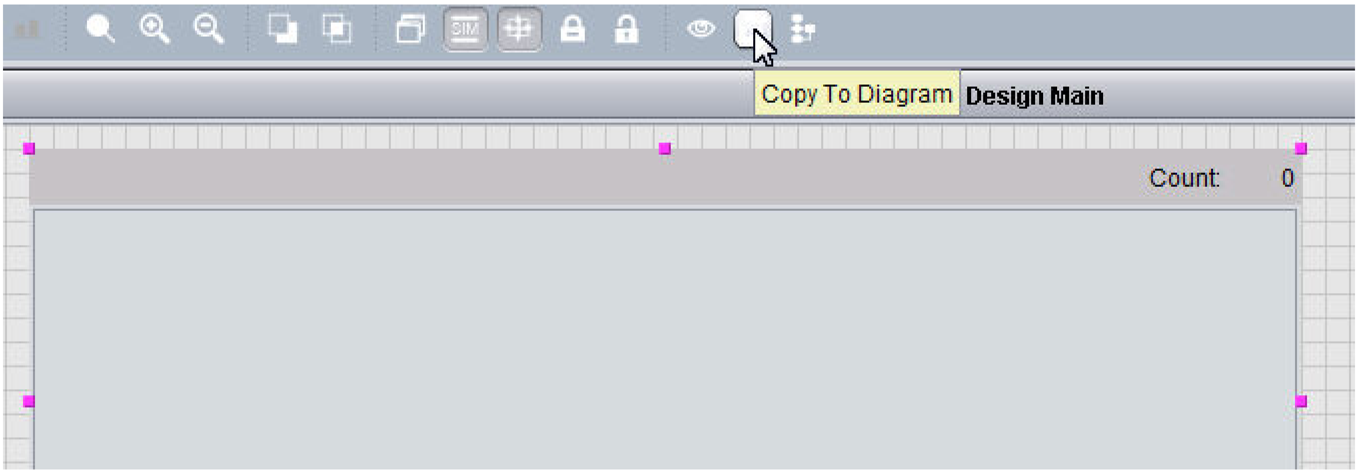
1. From the H.A.T category, select the Alarm Table View element from the palette.



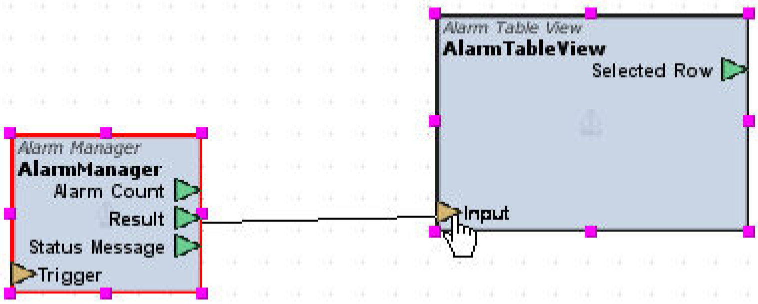
2. Click and drop it onto your Design page workspace.



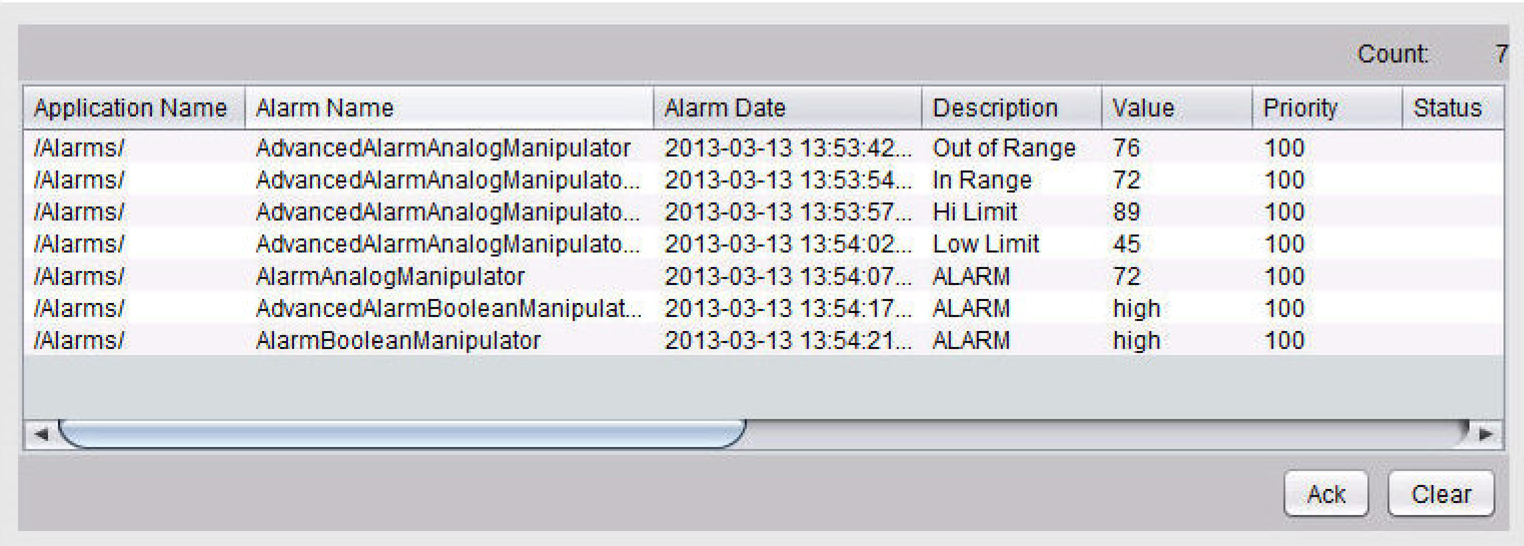
3. Click to select the image of the Alarm Table View. Then, select the Copy to Diagram icon from the Standard Toolbar.



4. A block representation of the Alarm Table View will be added to your Diagram workspace. To deliver information between Alarm Manager(s) and the Alarm Table View, connect the Table Output pin of the Alarm Manager to the Input pin of the Alarm Table View.



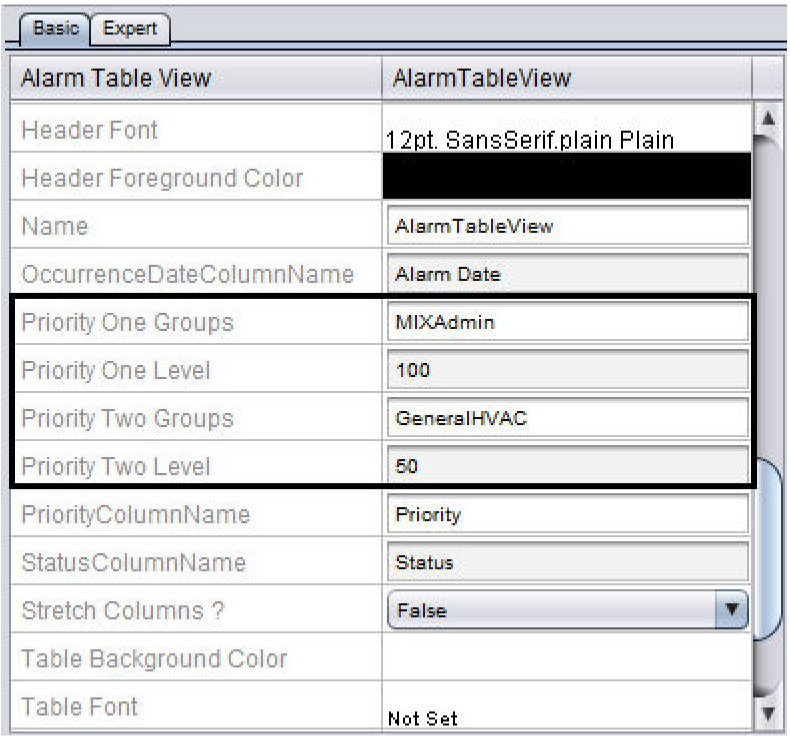
5. If the database connection is successful, column information will be displayed in the Alarm Table View. In some cases, a continuous trigger may need to be connected to the Trigger input of the Alarm Manager element to ensure timely updated between the database and the Alarm Table View GUI element.



Application Name	Alarm Name	Alarm Date	Description	Value	Priority	Status
/Alarms/	AdvancedAlarmAnalogManipulator	2013-03-13 13:53:42...	Out of Range	76	100	
/Alarms/	AdvancedAlarmAnalogManipulato...	2013-03-13 13:53:54...	In Range	72	100	
/Alarms/	AdvancedAlarmAnalogManipulato...	2013-03-13 13:53:57...	Hi Limit	89	100	
/Alarms/	AdvancedAlarmAnalogManipulato...	2013-03-13 13:54:02...	Low Limit	45	100	
/Alarms/	AlarmAnalogManipulator	2013-03-13 13:54:07...	ALARM	72	100	
/Alarms/	AdvancedAlarmBooleanManipulat...	2013-03-13 13:54:17...	ALARM	high	100	
/Alarms/	AlarmBooleanManipulator	2013-03-13 13:54:21...	ALARM	high	100	

Securing the Alarm Table

The Alarm Table View can be configured to ensure that specified groups are capable of acknowledging and clearing alarms from the Alarm Table View when logged into the system. Securing the Alarm Table involves configuring a set of available Basic properties from within the Alarm Table View shown below.



The Alarm Table View offers two priority groups for controlling how alarms are handled. The Level indicates which alarm priority level can be acknowledged/cleared by members of the corresponding Priority Group. By default, all alarm elements within Aspect use Priority 100. To adjust the priority of a alarm, you must edit the alarm annunciator itself.

In the example above, the MIXAdmin group has the ability to acknowledge and clear alarms with a priority assignment of 100. The GeneralHVAC group has the ability to acknowledge and clear alarms with a priority assignment of 50. If the Groups field is left blank, any member of any group will have the ability to acknowledge and clear alarms from the alarm table.

E-Mailing Alarms

When a system alarm is generated, it can be e-mailed to anyone using the Emailer element, located in the Alarming category of your Diagram palette. To use this element, the following requirements must be met:

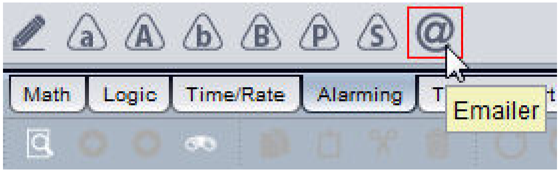
- Your Aspect device (Matrix Area Controller, Aspect Server, etc.) must be connected to a network where a valid e-mail server is present.
- You must define the port that the mail server is communication on (specified in the Port property of the Emailer element).

- A valid e-mail account must be available for your Aspect device to utilize. This typically includes an e-mail address, along with an assigned Username and Password.

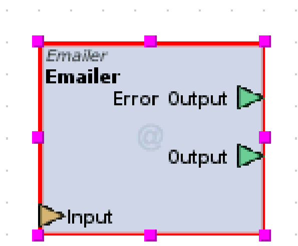
Adding the Emailer Element

To add the Emailer element, perform the following steps:

1. From the Alarming category, select the Emailer element from the palette.

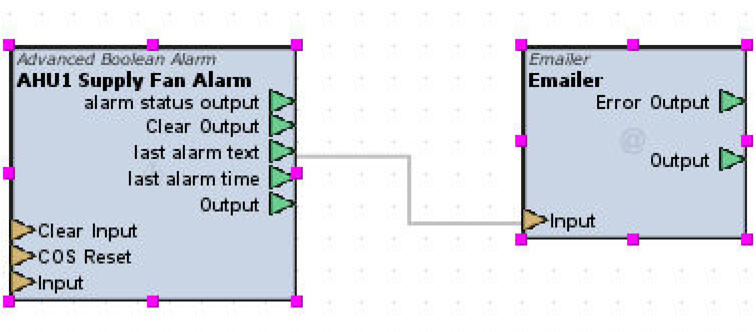


2. Click and drop it onto your Diagram page workspace.



Choosing Information to Send

If you have designed your alarms using Advanced Alarm elements (as suggested), each of these elements has different output pins, which contain information that can be e-mailed to users to provide descriptive information regarding alarms.



The following pins can be outputted to the Input pin of the Emailer:

- Last Alarm Text - sends the message configured in the Description property of the Alarm element.
- Last Alarm Time - sends the time at which the element entered into an alarm condition.
- Output - sends the original value that caused the alarm condition to occur.

If desired, one or multiple pins can be combined using the Combine Strings element to provide detailed information.

Once you have chosen the information you wish to send (whether it is a single pin, or multiple information combined using Combine Strings), connect it to the Input pin of the Emailer.

E-Mailing Alarms to Mobile Devices

Most mobile phone carriers can provide an e-mail address that allows an e-mail to be sent to a mobile phone via text messaging or SMS (carrier dependent). All you need to know if you mobile device's e-mail address.

Most carriers have SMS gateways which take e-mail messages from the Internet and deliver them to their customer's cell phones as SMS text messages. To do this, you must know what carrier the recipients phone is on -- it is not enough to know their phone number only. This is due to the fact that the carrier determines what the e-mail address of the receiving phone is going to be.

The following are some the most common e-mail address strings provided by North American mobile service providers.

- Alltel -phonenumber@message.alltel.com
- AT&T Mobility - phonenumber@txt.att.net
- Boost Mobile - phonenumber@myboostmobile.com
- Nextel - phonenumber@messaging.nextel.com
- Sprint - phonenumber@messaging.sprintpcs.com
- T-Mobile - phonenumber@tmomail.net
- Verizon - phonenumber@vtext.com
- Virgin Mobile - phonenumber@vmobl.com

If your carrier is not listed above, please contact your service carrier directly for address assistance.

Trending and Reporting

Configuring ASPECT Trends

Trending allows users to collect data on periodic triggered intervals for the purpose of energy monitoring, as well as to assist with troubleshooting problem areas and identifying critical operating trends within a system.

Any product powered by Aspect allows users to sample data values from any accessible data point. Using ViPR, values are sampled in records that are typically logged to the target's local or remote MySQL database for storage and can later be viewed, printed, and exported. Through use of many available tools, you can customize the setup and report configurations of Trend data through report tables, plot graphs, and other available functions for historical review.

Trend samples are collected through use of the Triggered Historical element. This element will collect data samples based on any type of triggered event. The most common form of trend sampling occurs through timed intervals. Trending in this manner is accomplished through use of the Synchronized Clock Tick element. However, you are not limited to just time-based trending.

More Information

Adding the Triggered Historical Element

Trend Presentation Overview

Formatted Reports Overview

Converting Trend Tables for Map Trending

Trend Creation

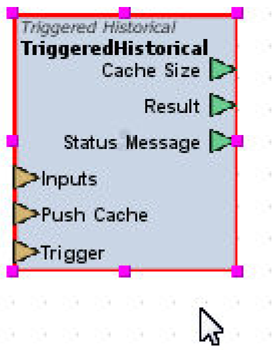
Adding the Triggered Historical Element

The Triggered Historical element is used to perform trend collection within Aspect. Samples can be collected a timed interval using a connected Synchronized Clock Tick, by a change of value driven within Diagram logic, or even through a button click from a graphic.

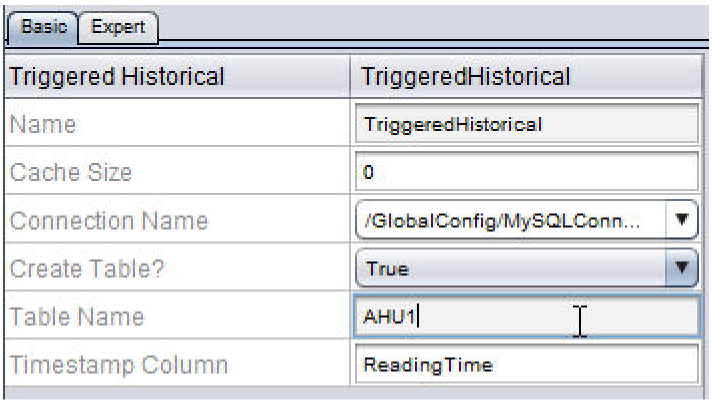
To add the Triggered Historical element, perform the following steps:

1. From the Trend/Report category, select the Triggered Historical element from the palette.

2. Click and drop it onto your Diagram page.



3. Configure the properties for the Triggered Historical element. These properties include:



- Connection Name - Specifies the database connection to where data will be stored. If you have multiple database connections programmed into your project, they will be displayed in the combo-box.

- Create Table - Should always be set to Yes.
- Table Name - Specifies a unique name for the trend.

NOTE - When assigning a Table Name, it is important to ensure that you exclude the use of any special characters (such as hyphens, plus, minus, and other wild card characters). Having these as part of a table name can cause reporting and read/write errors when deployed.

- Timestamp Column - Specifies the column name for timestamp readings.

Using the Triggered Historical Element

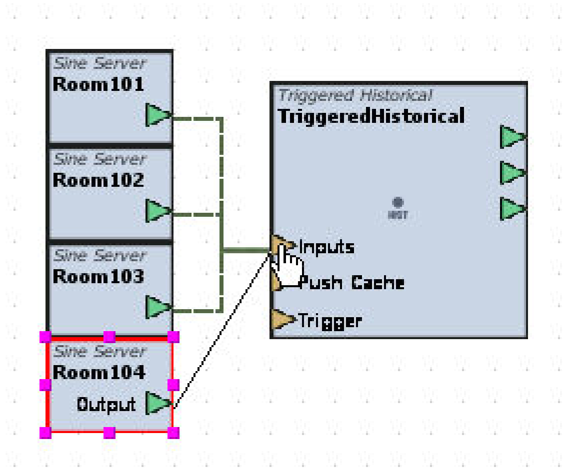
To perform trending, you must establish the relationship relative to what pieces of system data will be collected by the Triggered Historical element. To do this, you make connections from the outputs of system data elements to the Input pin of the Triggered Historical element.

You may choose to have a specific element collect one or multiple system data points. For ease of configuration relative to reporting and comparing system data points against each other, it is typically a good idea to collect samples from multiple system data points using one Triggered Historical element.

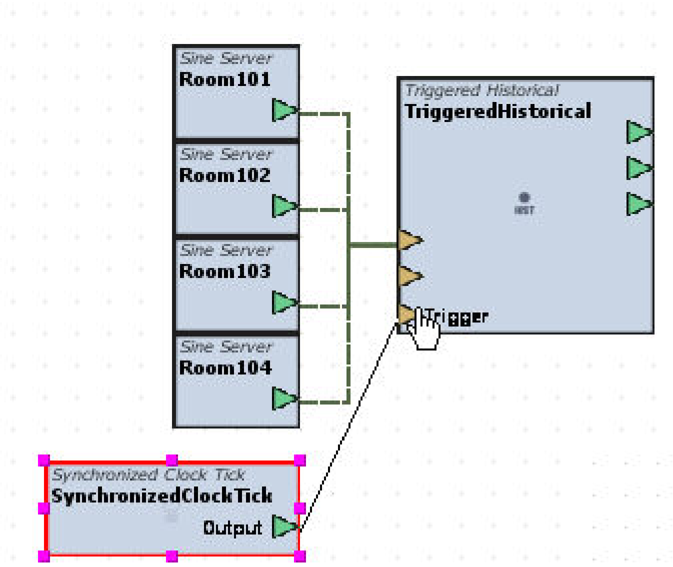
There is technically no limit to how many pieces of system data may be sampled by a single Triggered Historical element. For ease of record keeping and sorting, AAM recommends no more than 10.

To use the Triggered Historical element, perform the following steps:

1. Connect the output pin of the data point(s) you wish to trend to the Input pin of the Triggered Historical element. Repeat this step for each system data point you wish to have sampled or collected.



2. Connect a trigger method to the Trigger input pin of the Triggered Historical element. In the example below, we are using a Synchronized Clock Tick to collect samples at a specific time interval.

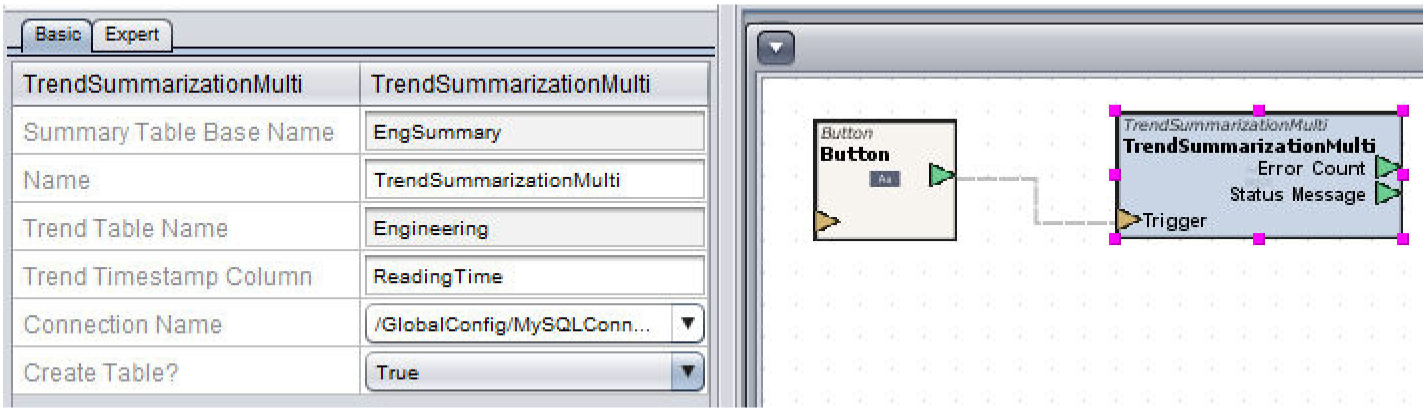


Trend Rollup using Trend Summarization Multi

When trending large amounts of data, it can be necessary to summarize large amounts of data. Outside of Aspect, there are many commercially available database mining tools that provide this capability in a transparent format. However, if your project requires roll up and summarization of trended data to be provided to the user through the web-based graphical user interface, the Trend Summarization Multi element can be used to do so.

The Trend Summarization Multi element focuses on a specific trend record. Based on the total collected amount of data within the trend, the element will formulate and create tables to summarize trended data based on the following time lines:

- Hourly Summary
- Daily Summary
- Weekly Summary
- Monthly Summary
- Yearly Summary



When initially triggered, the Trend Summarization Multi element will create five tables, each containing a table that summarizes one of the five supported summary lengths listed above. In order for data to be summarized, the source trend must have collected data for each period above. If the trend has yet to collect enough data for a monthly or yearly determination, a summarization report will not be available until enough data has been collected by the source trend.

Given large amounts of data can be summarized by this element, it is recommended that this action be driven manually, or triggered once per day.

To use the element, simply fill in the data required by the Summarization element. Once defined, a trigger input is required to initially create tables and populate them with data. Once tables have been created, trigger actions occurring thereafter will simply execute the element to update the summarization tables.

NOTE - When assigning a Table Name, it is important to ensure that you exclude the use of any special characters (such as hyphens, plus, minus, and other wild card characters). Having these as part of a table name can cause reporting and read/write errors when deployed.

Converting Trend Tables for Map Trending

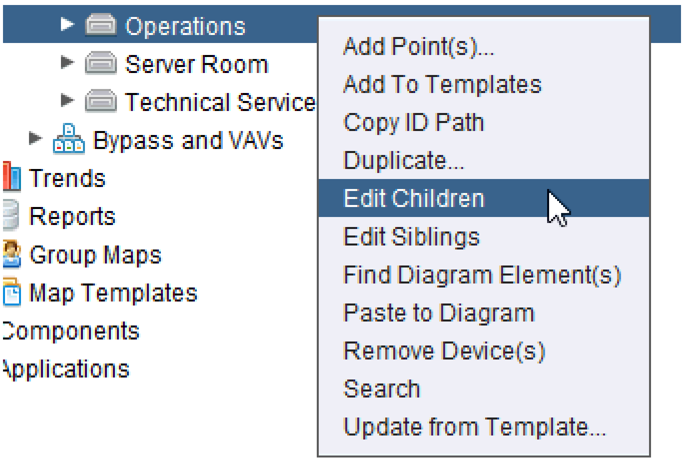
Aspect-Studio 2.0 introduces a new way of trending information from devices or Aspect Applications using the Map Topology Property TrendOverrideId.

In order to utilize trend tables previously created with the Triggered Historical element, the database tables will need modified to match the datatypes and names of the Map points being trended.

In this tutorial, we will be using the a device created from the Map Template, NB-ASC Heatpump.

Use the following steps to convert the previously created trend tables to work with the new Map Trending:

1. First, you will need to define the map points that you wish to trend by right-clicking on the device and selecting Edit Children:



2. Examine your previously created table and enable Trending for each of previously trended points:

←T→	ReadingTime ▲	SupplyTemp	ZoneTemp	OutsideAirTemp
	2012-11-17 05:00:00	58.2999992370605	69.8000030517578	29.7000007629395
	2012-11-17 05:01:00	58.4000015258789	69.9000015258789	30
	2012-11-17 05:02:00	58.4000015258789	69.8000030517578	30.1000003814697

Basic | Expert

Reference Name	Network Property	Data Type	Units	Trending Enable	Number Format	Poll Inte
OutsideAirTemp	0;9;85	Float (2)	°F	Enabled	##.0	Standar
Supply	0;8;85	Float (2)	°F	Enabled	##.0	Standar
ZoneTemp	0;0;85	Float (2)	°F	Enabled	##.0	Standar
AdjDefTime	4;2;16748	Float (2)		Disabled	##.0	Standar
AO1	1;1;85	Float (2)		Disabled	##.0	Standar
AO2	1;2;85	Float (2)		Disabled	##.0	Standar
AO3	1;3;85	Float (2)		Disabled	##.0	Standar
AO4	1;4;85	Float (2)		Disabled	##.0	Standar
AuxHeat	4;5;85	Integer (1)		Disabled	##.0	Standar
AuxHeatRunHours	4;5;16966	Float (2)		Disabled	##.0	Standar
AuxHeatSetpt	133;3;16995	Float (2)	°F	Disabled	##.0	Standar
Compressor1	4;3;85	Integer (1)		Disabled	##.0	Standar
Comp1RunHours	4;3;16966	Float (2)		Disabled	##.0	Standar
Compressor2	4;4;85	Integer (1)		Disabled	##.0	Standar

3. Next, you will need to modify the table structure to match the names and datatypes of the points being trended.

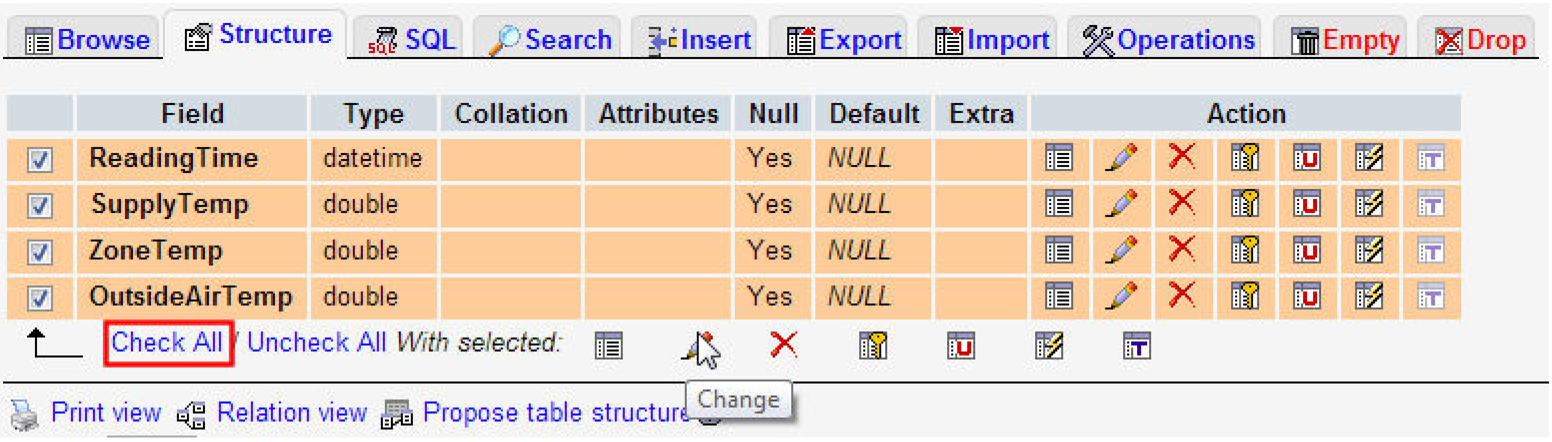
   In phpMyAdmin, select the table, and Click the Structure tab:

Browse | Structure | SQL | Search | Insert | Export | Import | Operations | Empty | Drop

	Field	Type	Collation	Attributes	Null	Default	Extra	Action
	ReadingTime	datetime			Yes	*NULL*		
	SupplyTemp	double			Yes	*NULL*		
	ZoneTemp	double			Yes	*NULL*		
	OutsideAirTemp	double			Yes	*NULL*		

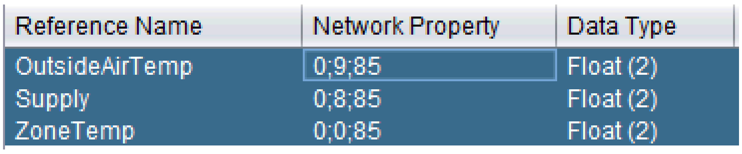
Check All / Uncheck All *With selected:*

4. Select the Check All link, and click the Change icon:

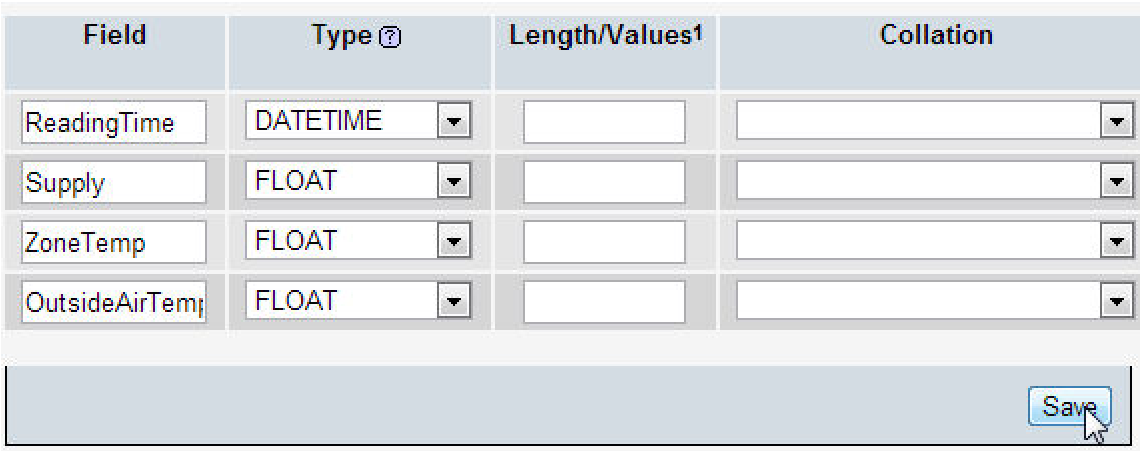


5. Edit the Field Name and Type to match the Reference Name and Data Type for each point and click Save:

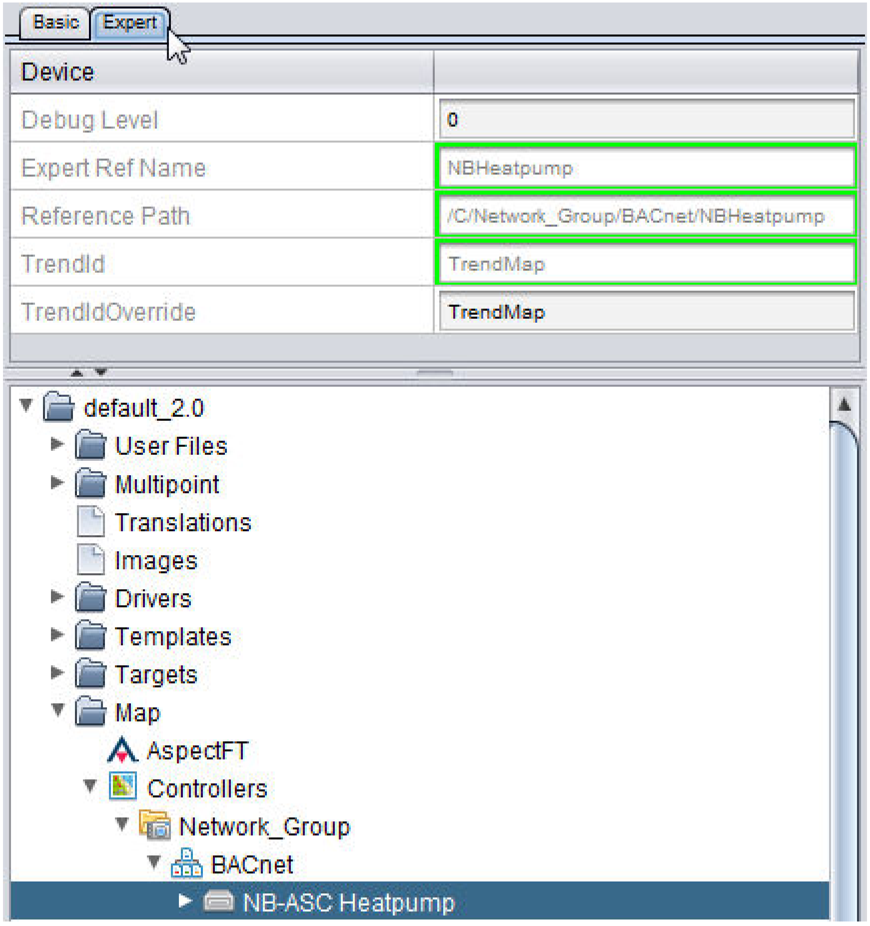
Note: Do NOT modify the ReadingTime field.



Reference Name	Network Property	Data Type
OutsideAirTemp	0;9;85	Float (2)
Supply	0;8;85	Float (2)
ZoneTemp	0;0;85	Float (2)



6. In Aspect-Studio, select the device being trended and click the Expert Tab of the Properties Pane:



7. Finally in the TrendIdOverride property, enter the name of the Table as it appears in phpMyAdmin.

At this point, you may deploy the project. The Map trending will update the previously created table with new values generated from the Map Tree. You may also turn Trending on for other points and they will be added to the table automatically.

More Information

[Trending Overview](#)

Trend Data Presentation

Trend Data Presentation Overview

Aspect provides several options for the presentation and display of trend data. Trend information can be displayed in graph format, thought spreadsheet-like format, or both simultaneously. Presentation of the data is at the discretion of the system programmer.

Aspect includes many tools and features for creating effective presentation of data to an end-user. In the following topics, you will learn about using the following elements:

- Historical Database Server - which is used to query information from a database and present it.
- Trend Chart - used to display trend information in graph format.
- Table Report - used to display trend information in table, spreadsheet-like format.

More Information

[Using the Historical Database Server]

[Configuring the Historical Database Server]

[Triggering the Historical Database Server]

[Outputting Results to a Table Report]

[Outputting Results to a Trend Chart]

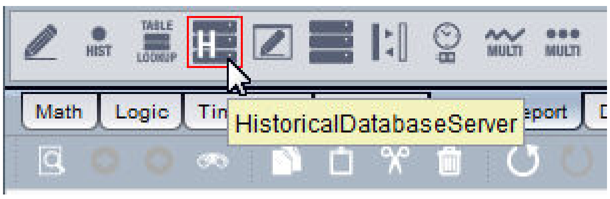
Using the Historical Database Server

Using the Historical Database Server

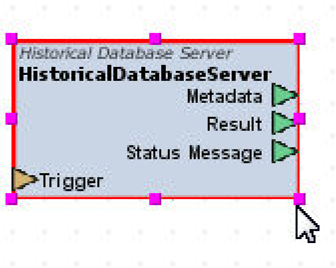
The Historical Database Server element is the main element used to fetch trend data from a connected database. This element can be found under the Trend/Report category of the Diagram palette.

To add this element to your workspace, perform the following steps:

1. From the Trend/Report category, select the Historical Database Server element from the palette.



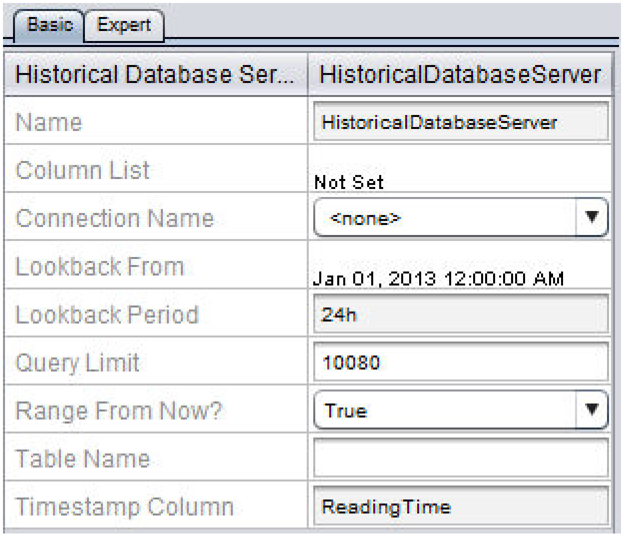
2. Click and drop it onto your Diagram page.



Configuring the Historical Database Server

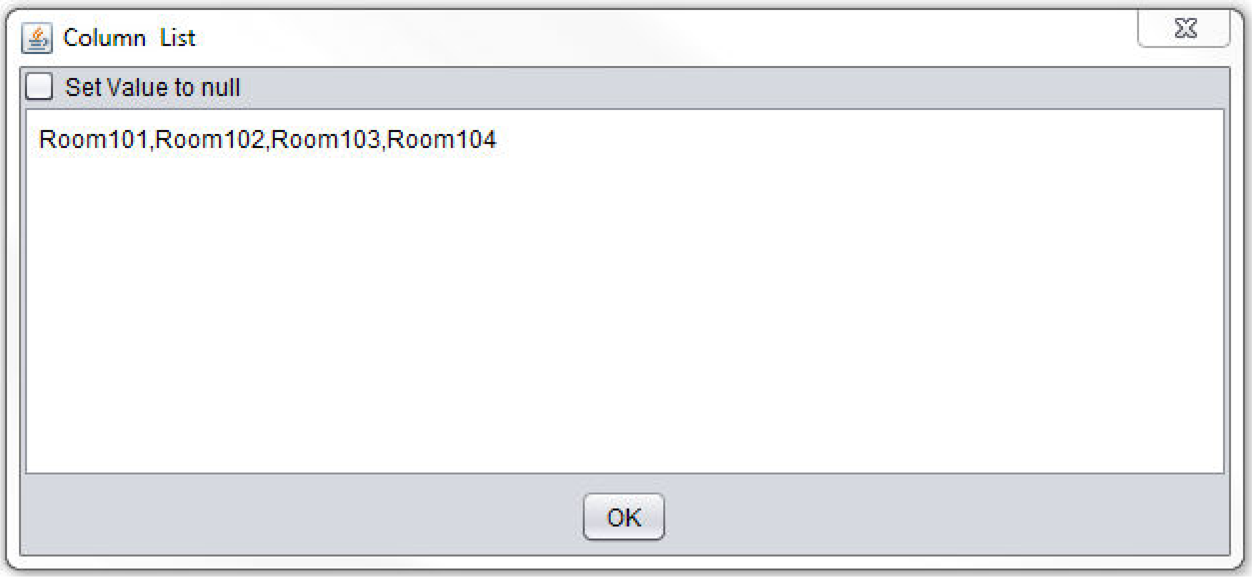
General Element Configuration

The Historical Database Server element requires some base information. In this case example, we will use the trend setup performed in Using the Triggered Historical Element document.



Historical Database Ser...	HistoricalDatabaseServer
Name	HistoricalDatabaseServer
Column List	Not Set
Connection Name	<none>
Lookback From	Jan 01, 2013 12:00:00 AM
Lookback Period	24h
Query Limit	10080
Range From Now?	True
Table Name	
Timestamp Column	ReadingTime

1. Connection Name - This property specifies a configured database connection. A database connection should already exist for configuration of trend collection.
2. Table Name - This property specifies what table you will retrieve trend data information from. Only one table may be focused upon at a given time.
3. Column List - This property specifies which data points you wish to retrieve. Data points are specified in a comma delimited manner. To define information, double-click on the property value of the Column List property. This will invoke the editor. The system point names are case-sensitive. In our example, our Triggered Historical element is sampling four system data points. The column list configuration would appear as such:



Configuring Look backs

Lookbacks can be used to pre-determine a time range of information returned and displayed to the user. There are two parameters that determine this (Lookback Period and Lookback From).

Lookback Period

The Lookback Period property specifies how much information will be returned. The Lookback Period property requires specific syntax to fetch specific information. For example, if you want to look back 5 days, a value of 5d would be entered in this property.

When the Historical Database Server is triggered, 5 days worth of inform-ation will be returned.

The Lookback Period function can retrieve information prior to today's date in the following time formats:

- Minutes - coded as m (e.g 5 minutes = 5m)
- Hours - coded as h(e.g. 5 hours = 5h)

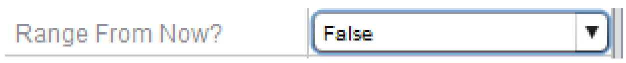
- Days - coded as d (e.g. 5 days = 5d)
- Weeks - coded as w (e.g. 5 weeks = 5w)

Lookback From

The Lookback From property specifies a "from" date. For example, if you set the Lookback From period to April 1st, 2010 and your Lookback Period is set for 1w, one week worth of information up to April 1st, 2010 will be returned.

Range from Now

The Range From Now property can also affect the behavior of how information is returned.



If this property is set to False, information will be returned as explained in the functionality defined in the Lookback From section above.

If this property is set to True, information will be returned based on today's current date, plus the setting of the Lookback Period. For example, if you specified 1win the Lookback Period property, information from 1 week before today's current date will be returned.

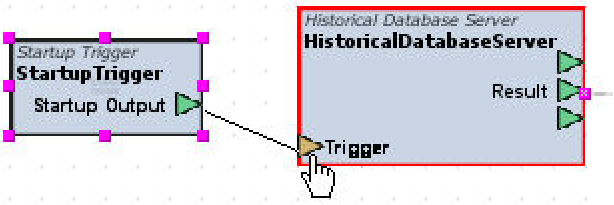
Triggering the Historical Database Server

To command the Historical Database Server to retrieve information from the database, you must trigger the element to do so. There are a few common methods that can be used to trigger the action to occur. However, the trigger input also provides enhanced reporting functionality, reviewing in this section.

Triggering on The Load of a Graphic

In most cases, trend information should be automatically displayed when a user navigates to the containing graphical user interface screen via their web-browser. This is accomplished through use of the Startup Trigger element.

The Startup Trigger element is designed as a trigger source that "fires" when an application is loaded. Simply add a Startup Trigger element to your workspace and connect its output to the Trigger input of the Historical Database Server.



Be sure the Startup Trigger element has the following properties configured accordingly.

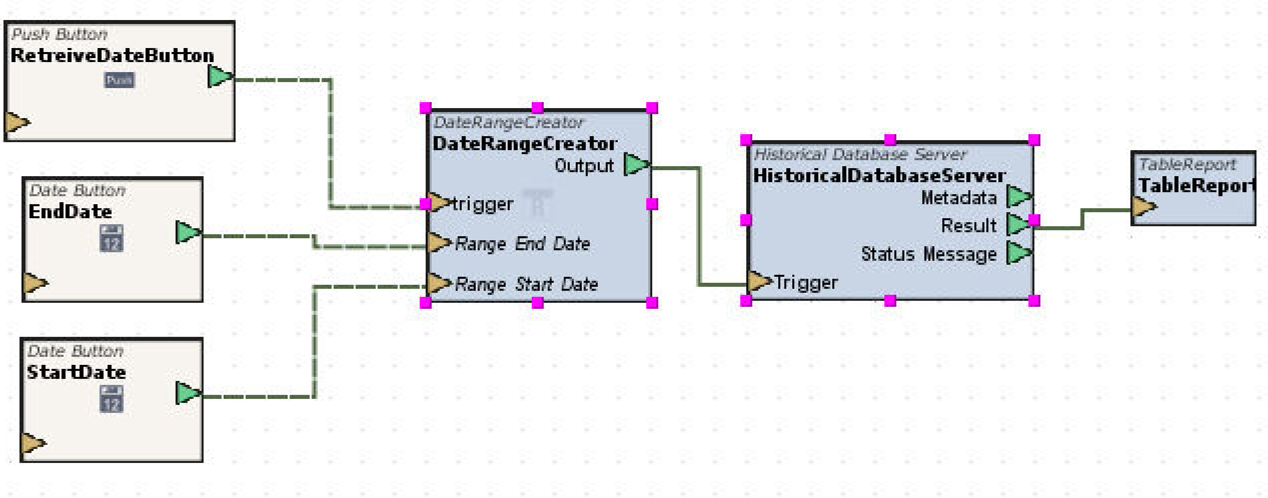
Property	Basic or Expert	Value
Trigger Value	Basic	1
Fire Late	Expert	True
Screen Local	Expert	True

Triggering Using a Date Range

The Trigger input provides support to define a date range. When a date range input is sent to the trigger input, the Historical Database Server not only returns data, but returns the data based on Date Range you have specified (regardless of Lookback Period and Lookback From property configuration).

Date Ranges can be based on a defined range, or a relative range. Aspect provides two Diagram elements that can be used to generate either (Date Range Creator and Relative Date Range Creator)

Choose the Date Range type you wish to incorporate, and connect the output of the date range type element to the Trigger input of the Historical Database Server.



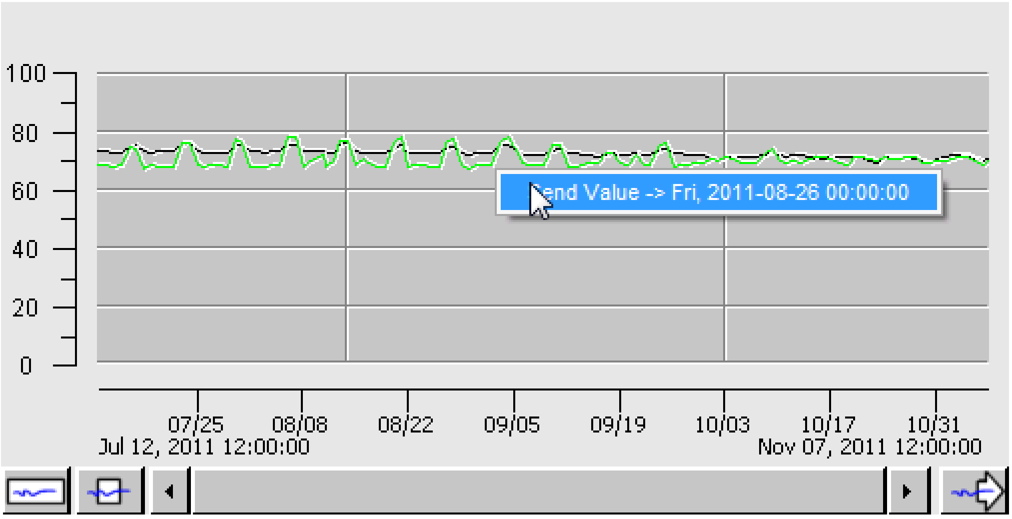
As shown above, a Date Range Creator element has been used. The Range End Date and Range Start Date properties have been exposed and are edited by Date Buttons on a graphic. a standard Button is used to trigger a range output to the Historical Database Server. When the created date range is received by Historical Database Server element's trigger Input, data will be queried from the connected database and finally delivered to the Table Report.

NOTE - When a Date Range Trigger method is used, Lookback From and Lookback Period settings of the Historical Database Server will be ignored.

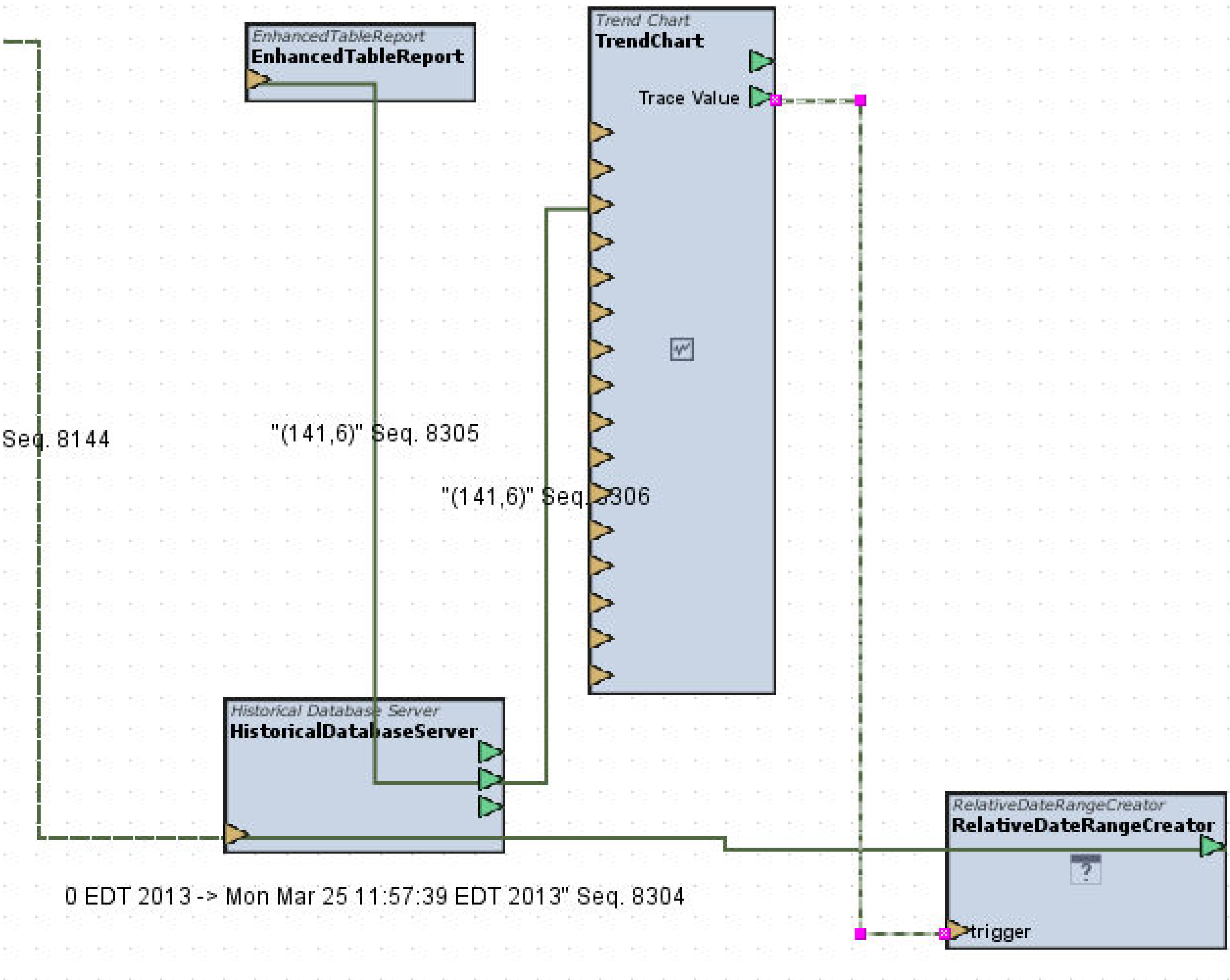
Triggering Based on Right-Click from Trend Chart and Relative Date Range Creator

The Trend Chart supports the ability to right-click the chart and output an EPOCH format value for the purpose of triggering filtered information through the Relative Date Range Creator and onto the Historical

Database Server to update either a Trend Chart or a Table Report element.



The Trace Value output is connected to the trigger input of the Relative Date Range Creator element. When a right-click has been invoked and selected at the Trend Chart, data is sent which then links back to the Historical Database Server's own trigger input, effectively updating the Trend Chart.



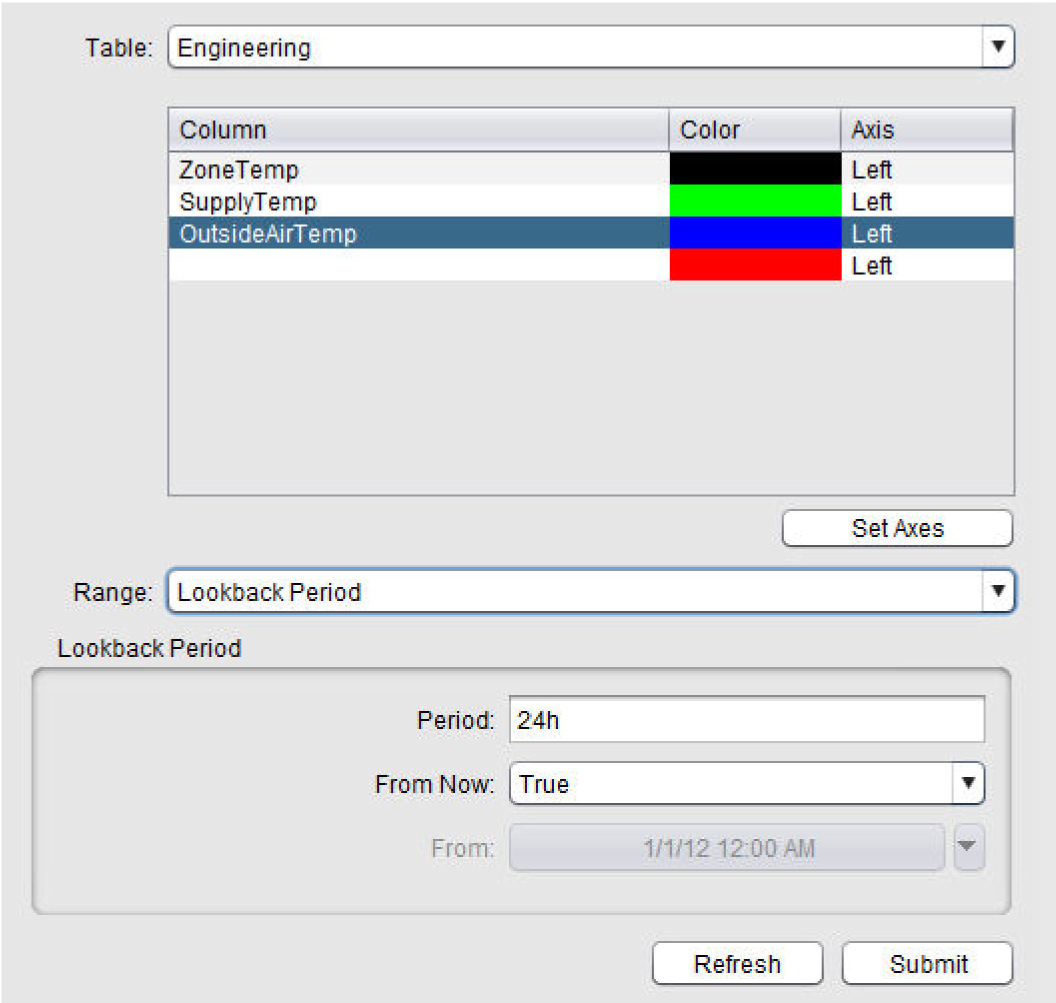
Using the Dynamic Table View

Dynamic Table View Overview

The Dynamic Table View is a powerful graphical design element. It is used to streamline the steps required by technicians and end-users alike to view historic trend data collected by Aspect. The intent of the Dynamic Table View is to provide an easy to use interface enabling end-users to select a specific trend log (table), collected points (columns), and view data based on the lookback period defined through this Dynamic Table View.

To adjust the presentation of fetched data, a Set Axis button is provided to adjust the min and max configuration settings for axis lines shown on a Trend Chart. When using these elements, the Trend Chart will support a left axis, and a right axis for reviewing and interpreting trend data.

To use this element, the Trend Chart and the Historical Database Server design element must be used in conjunction with the Dynamic Table View to successfully present data to a user. The following sections discuss programming the Dynamic Table View, as well as general usage guidelines for operation of the Dynamic Table View.



More Information

Dynamic Table View Element Reference

Programming the Dynamic Table View

Programming the Dynamic Table View

To use the Dynamic Table View to allow general browsing and retrieval of data, you must configure an application to use the following elements:

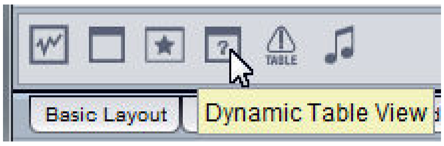
- Dynamic Table View
- Trend Chart
- Historical Database Server

Adding the Dynamic Table View Widget

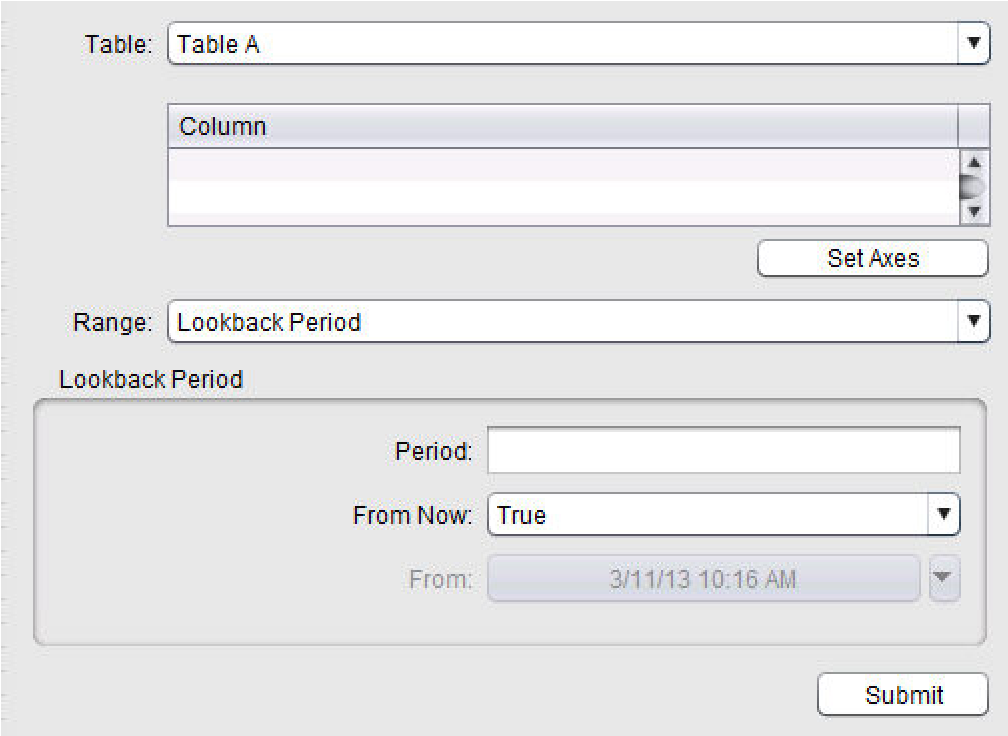
From Design View of your application, perform the following steps:

1. Select the H.A.T category of the Design palette.

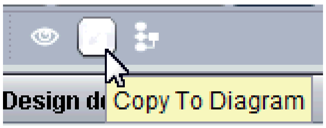
2. Find the Dynamic Table View Element. Single click the element to select.



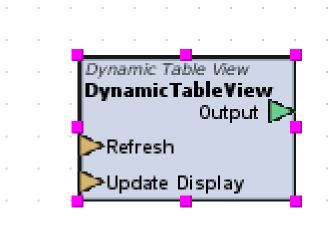
3. Single click an area of your Design workspace to drop the element.



4. Click to select the Dynamic Table View on your Design workspace. With the Dynamic Table View selected, click the Copy to Diagram icon in the tool bar.



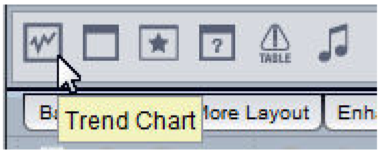
5. The Dynamic Table View will then be copied to the Diagram workspace of your application as a block representation to send and receive data.



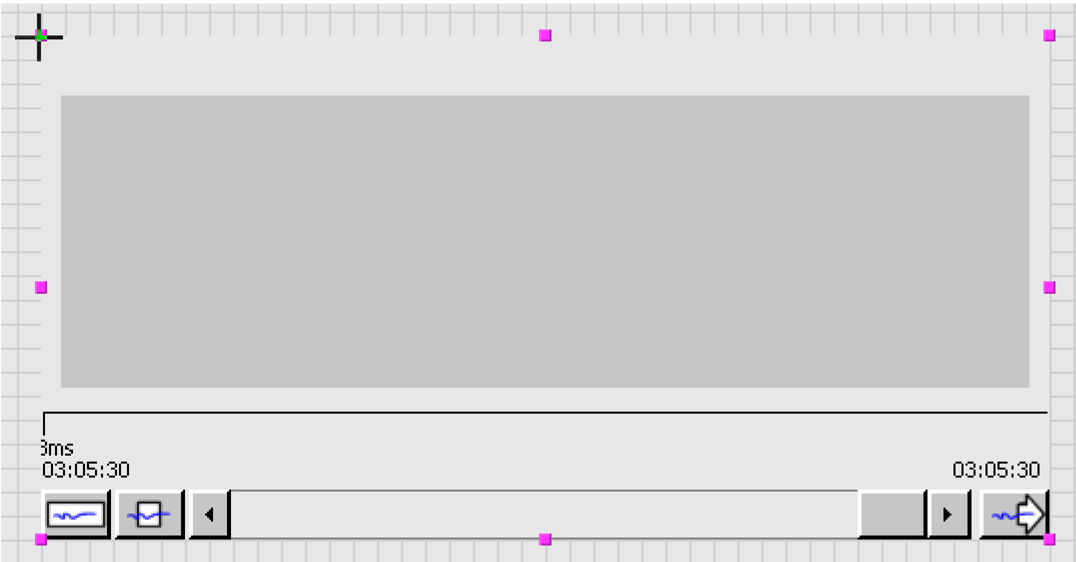
Adding a Trend Chart

Perform the following steps to also add a Trend Chart:

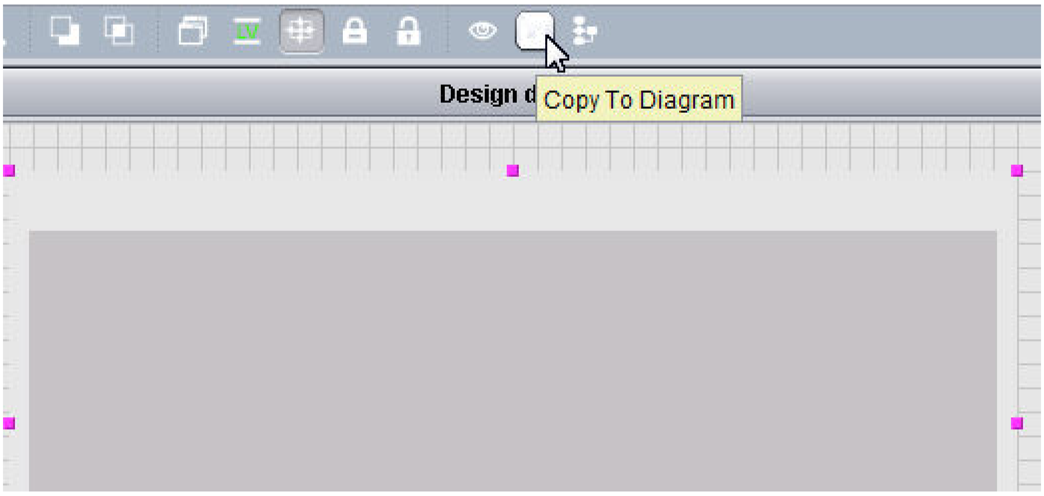
1. From the H.A.T category, select the Trend Chart element from the palette.



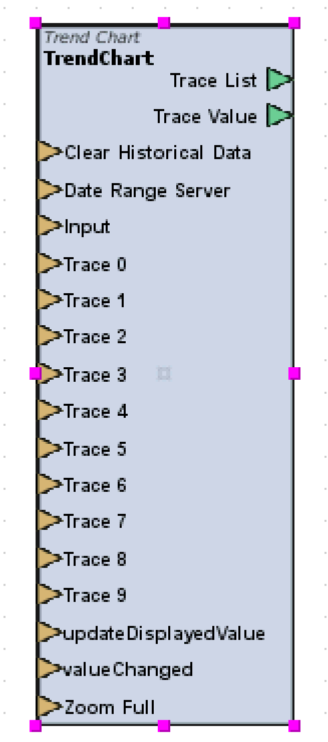
2. Click and drop the element onto your Design workspace.



3. Click to select the placeholder image of the Trend Chart. Then, select the Copy to Diagram icon from the Standard Toolbar.



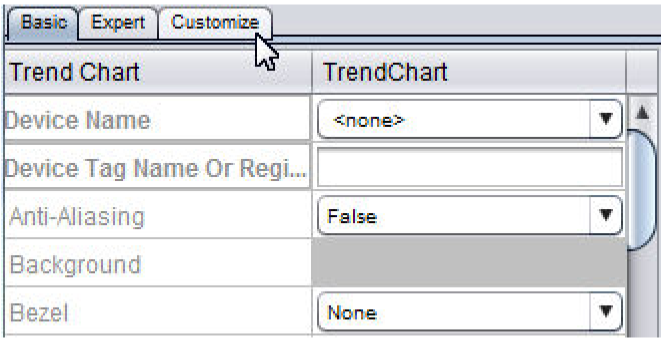
4. The Dynamic Table View will be copied the Diagram view of your application as a block representation to send and receive data.



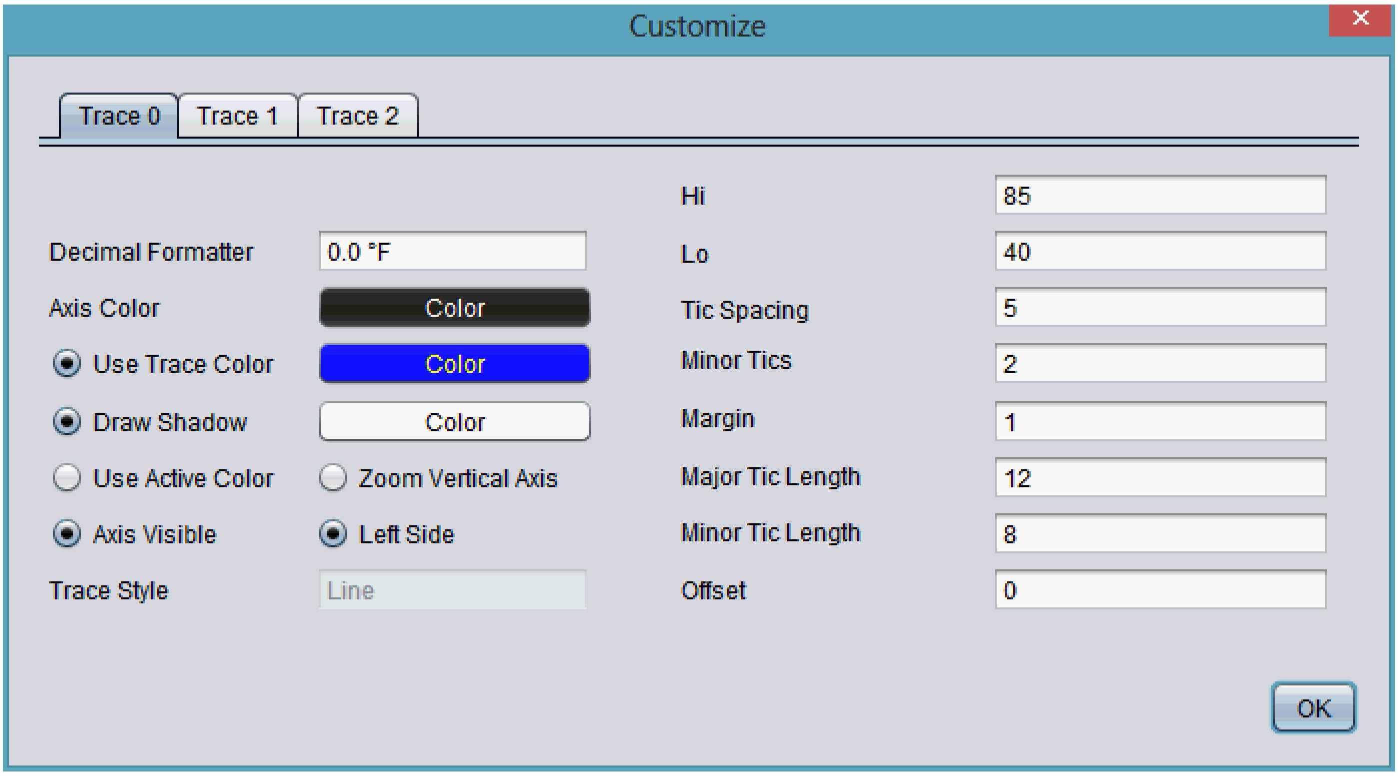
Configuring Trend Chart Trace Lines

In order to display the data that you will retrieve onto the Trend Chart, you must configure traces for the Trend Chart. Perform the following steps:

1. With the Trend Chart selected, access the Properties Pane and single click the Customize tab located in the Properties Pane when the Trend Chart is selected.

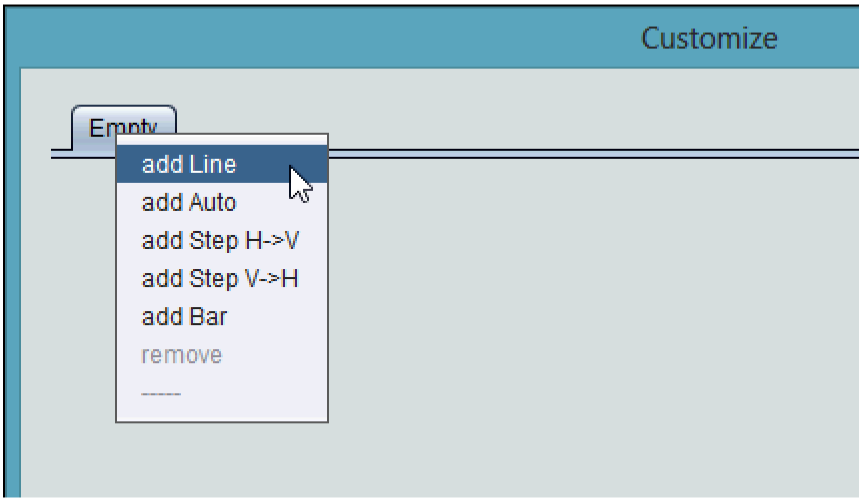


2. Clicking this tab will invoke the Customize dialog box. If you have an application with a previously configured Trend Chart, data may already appear.



3. If you are using a default Trend Chart, no traces are configured. To add a trace, perform a single right mouse-click anywhere in the Customize dialog and select a trace option. For each data point that

you intend to display, a trace must be added to successfully display data.



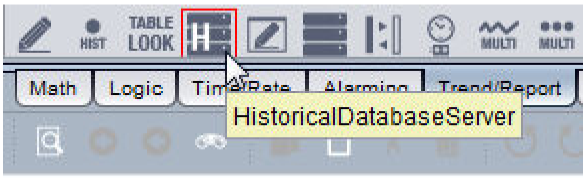
4. Each trace supports a number of configuration properties. The key items which must be configured for each trace are the Axis Color information. The Trace Color is used to not only define the trace line for presented historical data, but also defines the color for the axis. This can be set to any color desired, but cannot be set or changed after the project has been deployed or during live viewing. Therefore, consideration must be given relative to electing a color scheme to follow throughout your project.

NOTE - While the Trend Chart is capable of supporting the display of multiple axis information on the widget, the Trend Chart will be limited to displaying two visible Axis when used in conjunction with the Dynamic Table View. By default, The color of the left Axis will always be derived from configuration set in Trace 0. The right Axis will always be derived from configuration set in Trace 1. While the color assignment static for each Trace, the configuration of the tic spacing and high/low values can be adjusted during runtime.

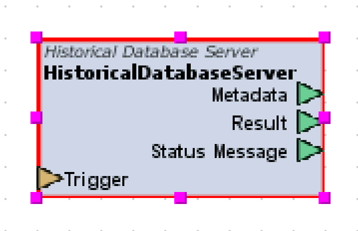
Adding a Historical Database Server Element

Perform the following steps to add the Historical Database Server Element:

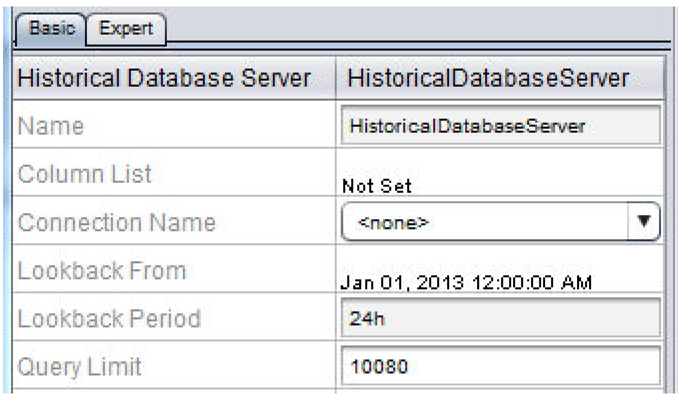
1. From the Diagram View of your application, select the Trend/Report category from your palette, and then select the Historical Database Server element.



2. Click and drop the Historical Database Server element onto your Diagram workspace.



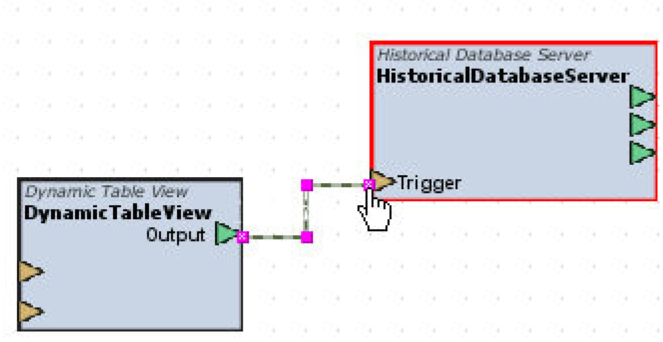
3. Two key properties must be configured in order to allow efficient reporting of historic data. These properties include:
   - Connection Name - Defines a configured database connection in which data will be fetched from.
   - Query Limit - Defines the maximum amount of records that will be fetched from the database. By default, this value is set to 10080 and is optimal for fetching up to seven (7) days of trend data sampled on one (1) minute intervals. This value can be adjusted for larger limits if desired. NOTE - Using extremely large values for this property may/can result in system resource performance when data is requested. Use caution when adjusting this value when necessary within configured and designed applications.



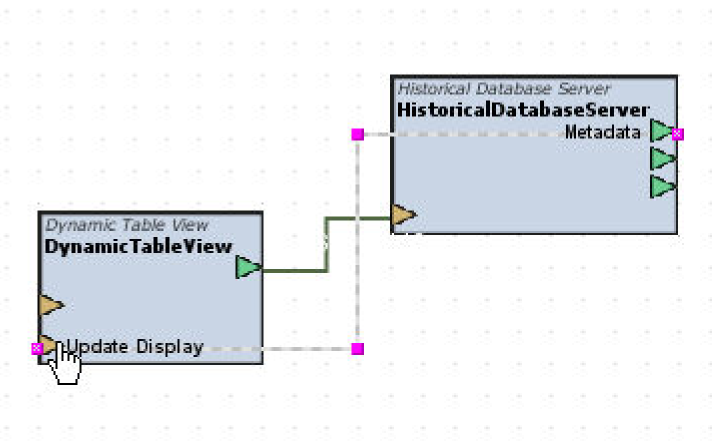
Connecting the Blocks Together

In order for the Dynamic Table View to operate and send data to the proper places, you must connect the elements together in a specific manner. The following details the connections that must be made.

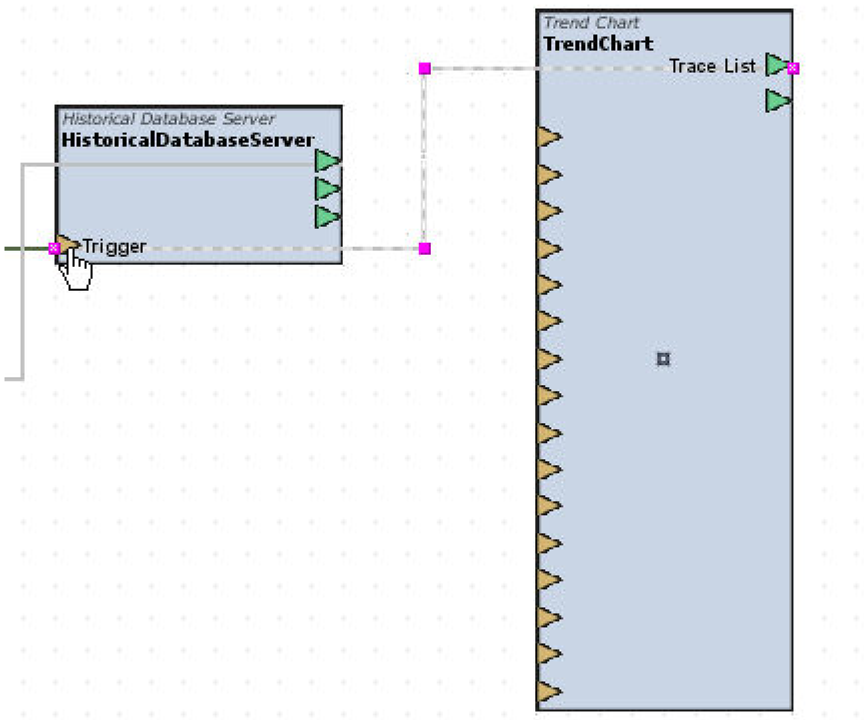
1. Connect the Output pin of the Dynamic Table View to the Input pin of the Historical Database Server.



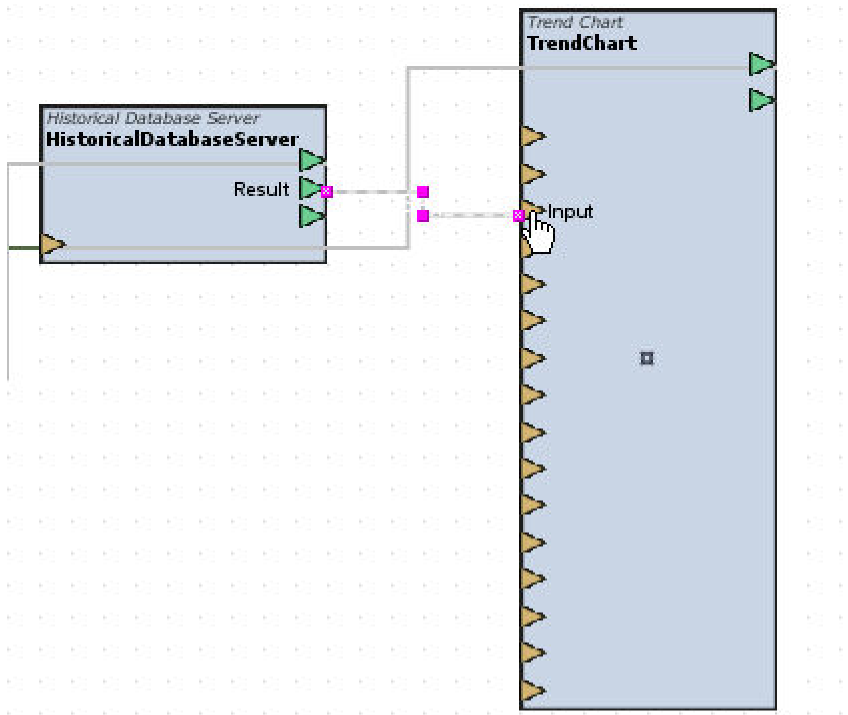
2. Connect the Metadata pin of the Historical Database Server to the Update Display pin of the Dynamic Table View.



3. Connect the Trace List pin of the Trend Chart to the Trigger pin of the Historical Database Server.



4. Finally, connect the Result pin of the Historical Database server to the Input of the Trend Chart, as well as any other widgets you have configured to display data.

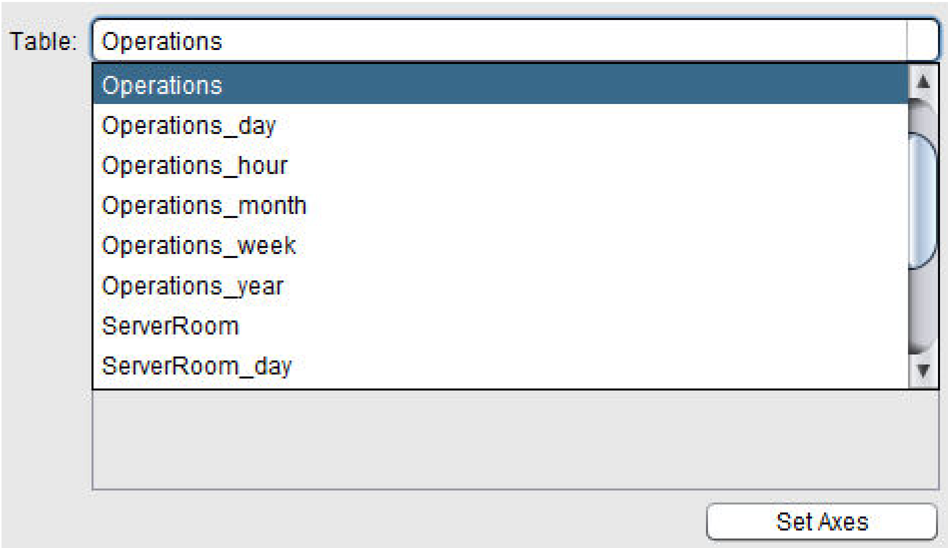


Using the Dynamic Table View

The Dynamic Table View system, when programmed as explained, can be used to explore tables and view information from a programmed database. When deployed or viewed via LIVE method in Aspect-Studio, database table information will auto-populate in the Table combo box.

Selecting a Table to Retrieve Data From

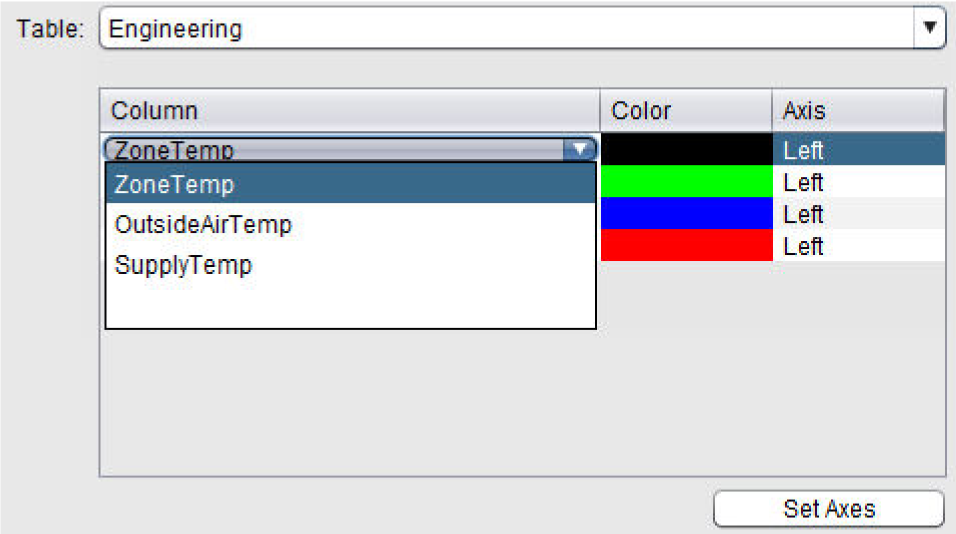
A single table can be selected through use of the Tables combo box show at the top of the Dynamic Table View. Simply click the combo box drop-down arrow listed to scroll through the list of tables available from the database you have connected to. A single table can be selected.



NOTE - Please be aware that all tables will be returned unless you have elected to use filtering operations associated with the Dynamic Table View within logic. Some tables, such as alarm tables, audit trail tables, and other custom tables may not necessarily be viewable through a Trend Chart.

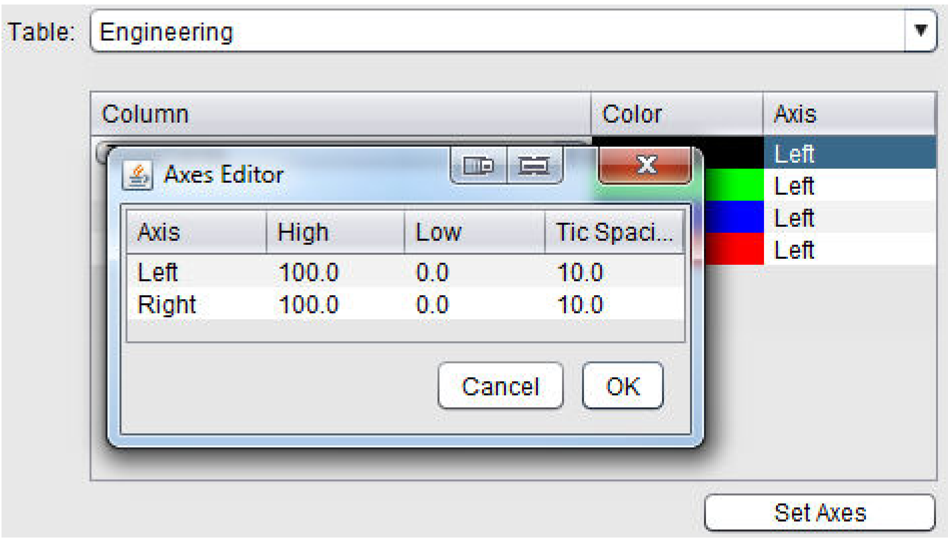
Selecting Columns/Points

The area below the Table selector enables columns/points to be selected. To select a point, click a blank box to invoke the selector. Each column (with the exception of the Reading Time column) will be available for selection. Each column selection line will correspond to the trace color configuration of the connected Trend Chart, as well as Axis positioning. While the color cannot be changed at runtime, the Axis position can be selected to show a single left and right axis for a corresponding column/point.



Setting the Axis Configuration

A Set Axis option is also available to configure the axis low/high boundary values, as well as Tic spacing. To invoke the Axis Editor, click the Set Axis button below the column/point selector.



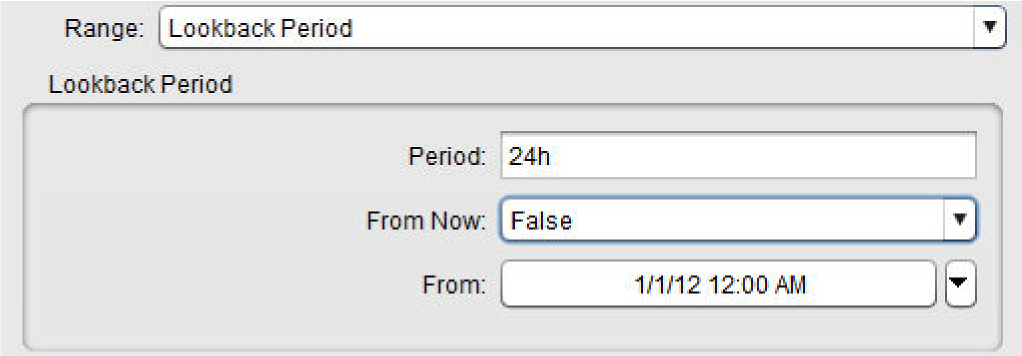
When the Axis Editor appears, all values are initially "grayed out" to avoid the potential of an accidental edit to the Axis. To edit a specific variable, double-click the value field to enable editing. Each value can be edited using your keyboard. Once you have configured the field value, press ENTER on your keyboard to make the change effective. Upon pressing ENTER on your keyboard, the field will revert to a "grayed out" appearance.

Once you have made the appropriate changes to each Axis property, click OK to close the Axis Editor. Clicking Cancel will discard any changes and revert back to the previous Axis configuration.

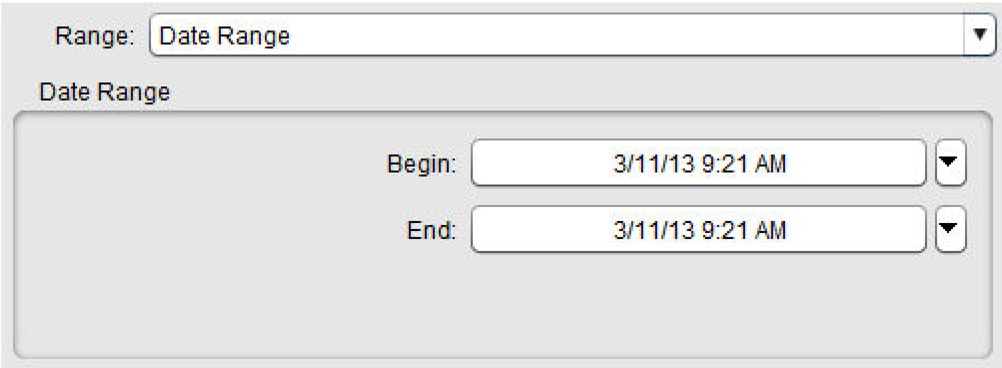
Setting the Range

For sorting through data based on date, a Date Filter is included within the Dynamic Table View. Three filtering options are available:

- Lookback Period - Lookback Period allows a free-form period to be entered, as well as whether data displayed will range from today's current date and time.
-
    - Period Format - Periods are generally entered in text and is best used for hourly period filtering. By default, the period is set for 24h (24 hours). This can be modified for additional hours is desired.
    -
        - Other formats that are valid for the Period Format include
        -
            - Minutes - coded as m (e.g 5 minutes = 5m)
            - Hours - coded as h(e.g. 5 hours = 5h)
            - Days - coded as d (e.g. 5 days = 5d)
            - Weeks - coded as w (e.g. 5 weeks = 5w)
    - From Now - This option defines if data retrieved will range from today's current date, or a pre-set date configured in the Historical Database Server element.
    - From - If you have configured From Now = False, this editor will become available for selecting a From date and time. Choosing this selection will result in data being returned from the period prior to this date.

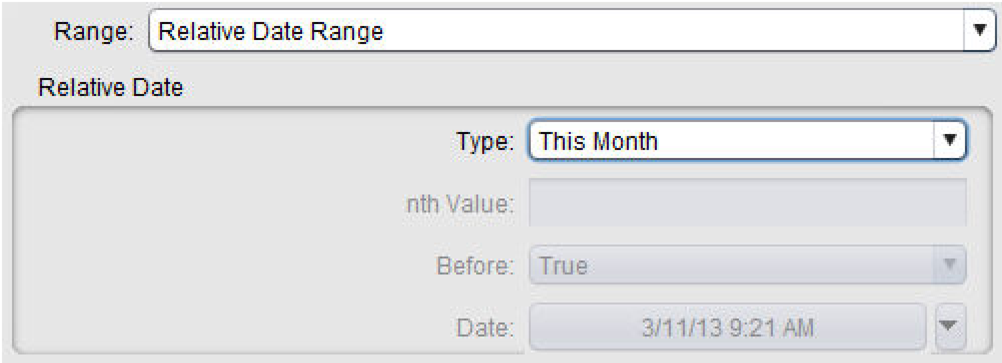


- Date Range - Date Range allows a Begin and End Date to request data for. Click the down arrow shown to the right of each field to edit of each item.

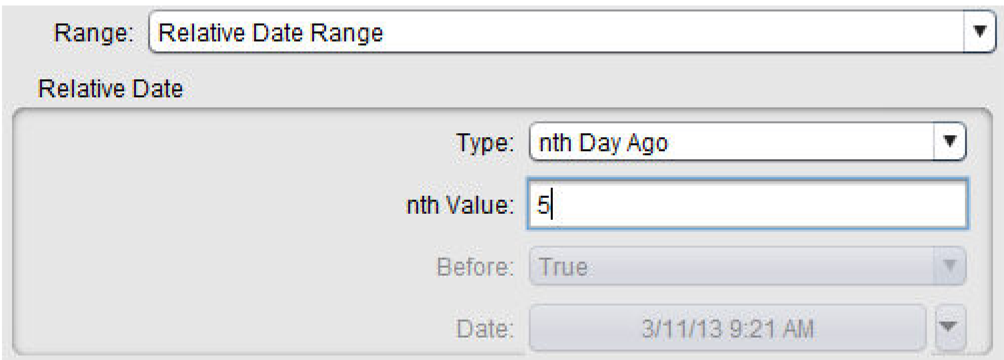


- Relative Date Range - Relative Date Range permits data to be retrieved in various relative formats - such as primitive formats, nTh formats, and free form formats.
-
    - Primitive formats include the following:
    -
        - Today - returns logged information for the current day.
        - This Week - returns logged information based on the current calendar week.
        - This Month - returns logged information based on the current calendar month.
        - This Year - returns logged information based on the current calendar year.
        - Yesterday - returns logged information from the prior day.
        - Last Week - returns logged information from the prior calendar week.
        - Last Month - returns logged information from the prior calendar month.

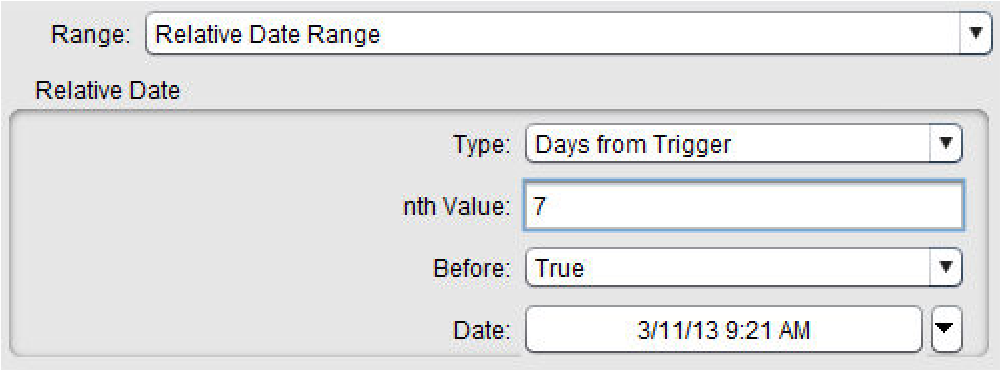
- Last Year - returns logged information from the prior calendar year.



- nTh formats are useful for retrieving data from previous events based on specifying a valid value in the nth Value property. For example, if today is November 8th, and you wish to see information from two days ago, configure nth Value = nth Days Ago, and nTh value = 2 to see information from November 6th. Selections include the following:
  - nth Day Ago - returns logged information from nth days ago (based on nth value property configuration)
  - nth Week Ago - returns logged information from nth weeks ago (based on nth value property configuration)
  - nth Month Ago - returns logged information from nth months ago (based on nth value property configuration)
  - nth Year Ago - returns logged information from nth years ago (based on nth value property configuration)

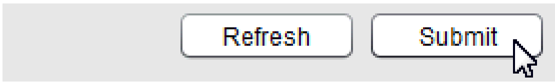


- Free Form Formats permit retrieving data similar to nTh formats, but use a specified date to trigger from for returning data before or after the period.



Submitting to Retrieve Data

Once you have completed selection of the various items above, click the Submit button. Note that the Submit button text can be modified to state any specific text based on configuration of the Dynamic Table View through properties.



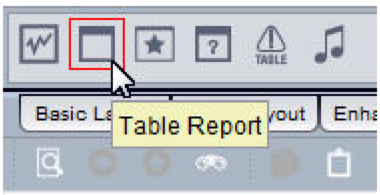
Presenting Data

Outputting Results to a Table Report

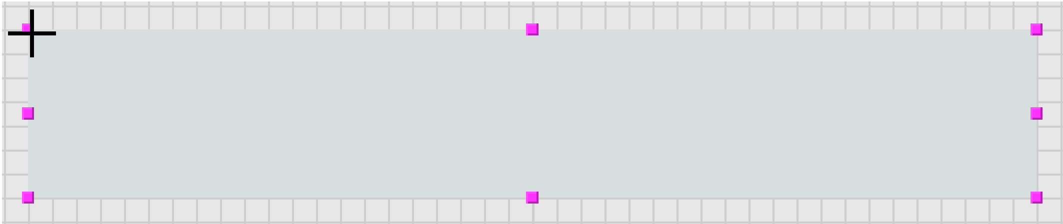
The Table Report element, available from the H.A.T category of your Design palette, is used to display information returned from the database in a spreadsheet-like format. You must first add the element to your Design workspace, then copy it to the Diagram workspace.

To add the Table Report element onto your Design workspace, perform the following steps:

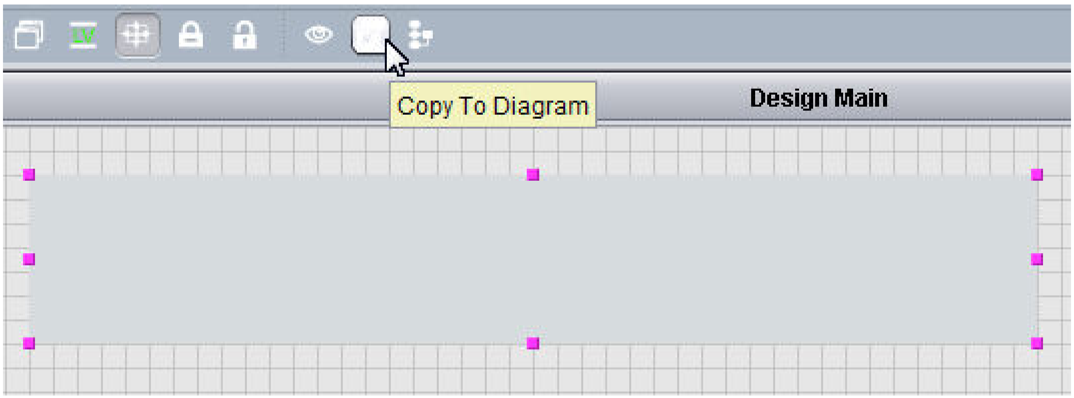
1. From the H.A.T category, select the Table Report element from the palette.



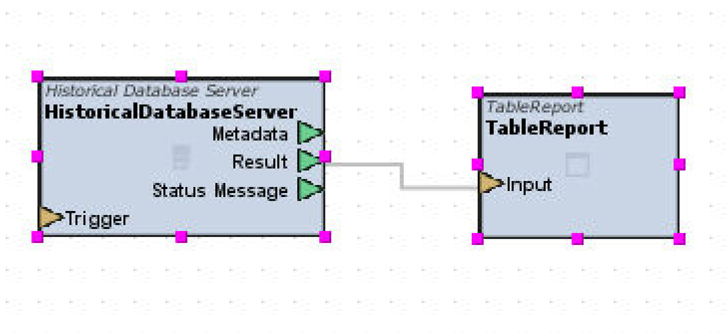
2. Click and drop the element onto your Design workspace.



3. Click to select the placeholder image of the Table Report. Then, select the Copy to Diagram icon from the Standard Toolbar.



4. A element representation of the Table Report will be added to your Diagram workspace. Connect the Result output pin of the Historical Database Server to the Input pin of the Table Report.

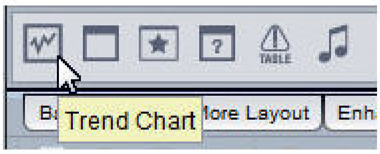


Outputting Results to a Trend Chart

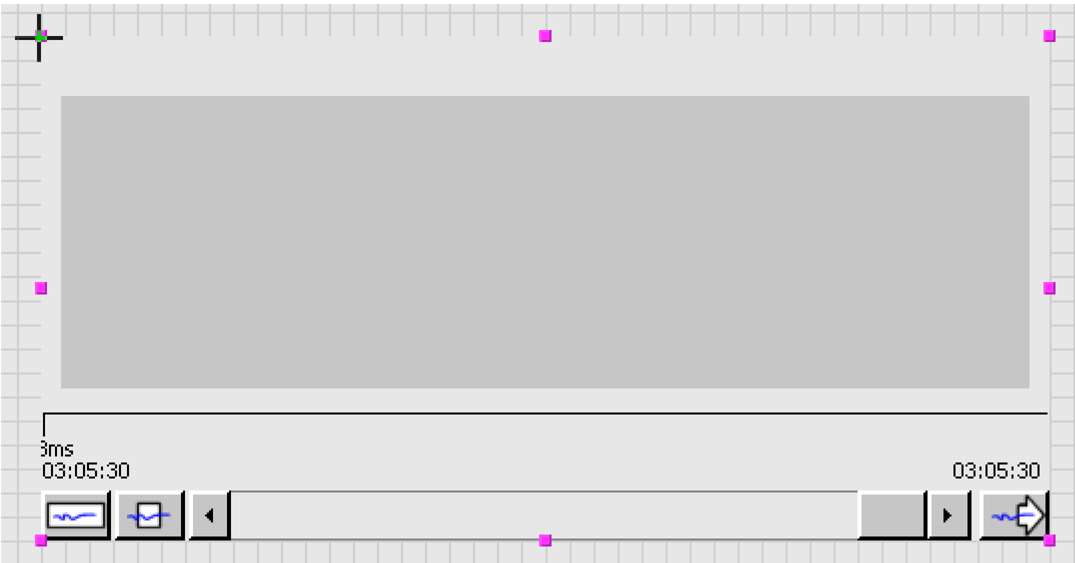
The Trend Chart element, available from the H.A.T category of your Design palette, is used to display information returned from the database in a chart format using plot lines, bars, etc. You must first add the element to your Design workspace, then copy it to the Diagram workspace.

To add the Trend Chart element onto your Design workspace, perform the following steps:

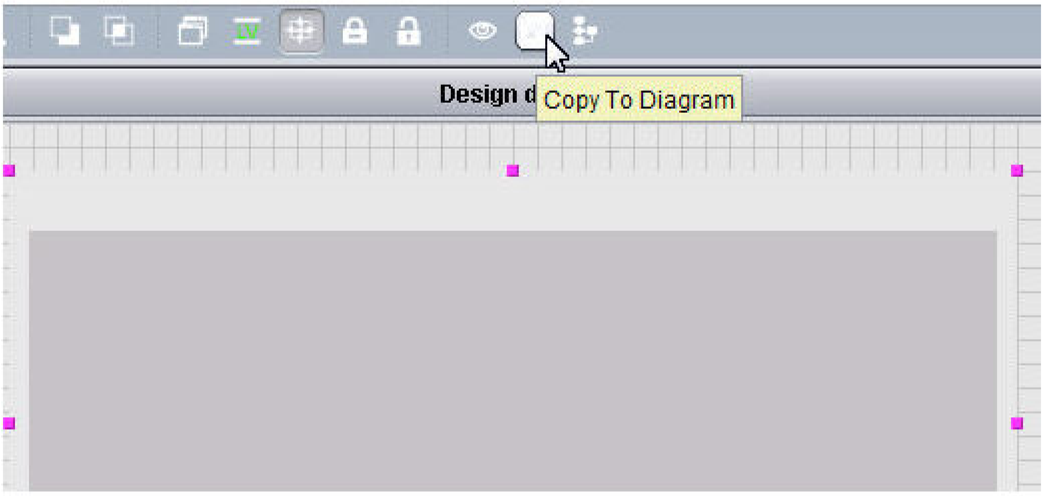
1. From the H.A.T category, select the Trend Chart element from the palette.



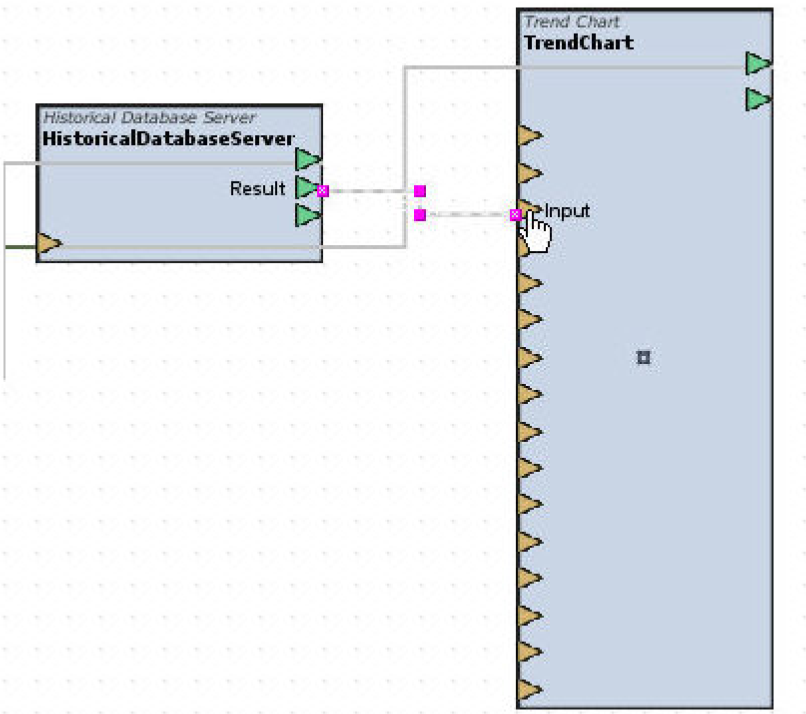
2. Click and drop the element onto your Design workspace.



3. Click to select the placeholder image of the Trend Chart. Then, select the Copy to Diagram icon from the Standard Toolbar.



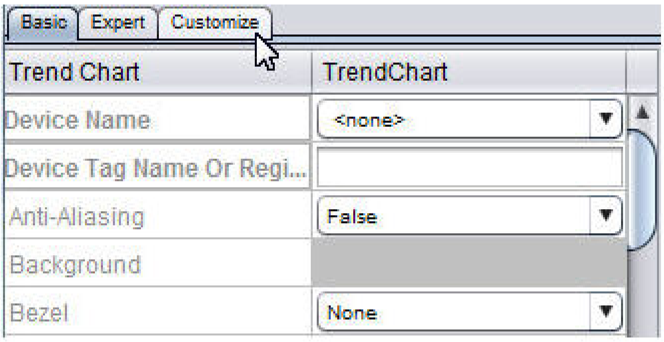
4. A element representation of the Trend Chart will be added to your Diagram workspace. Connect the Result output pin of the Historical Database Server to the Input pin of the Trend Chart.



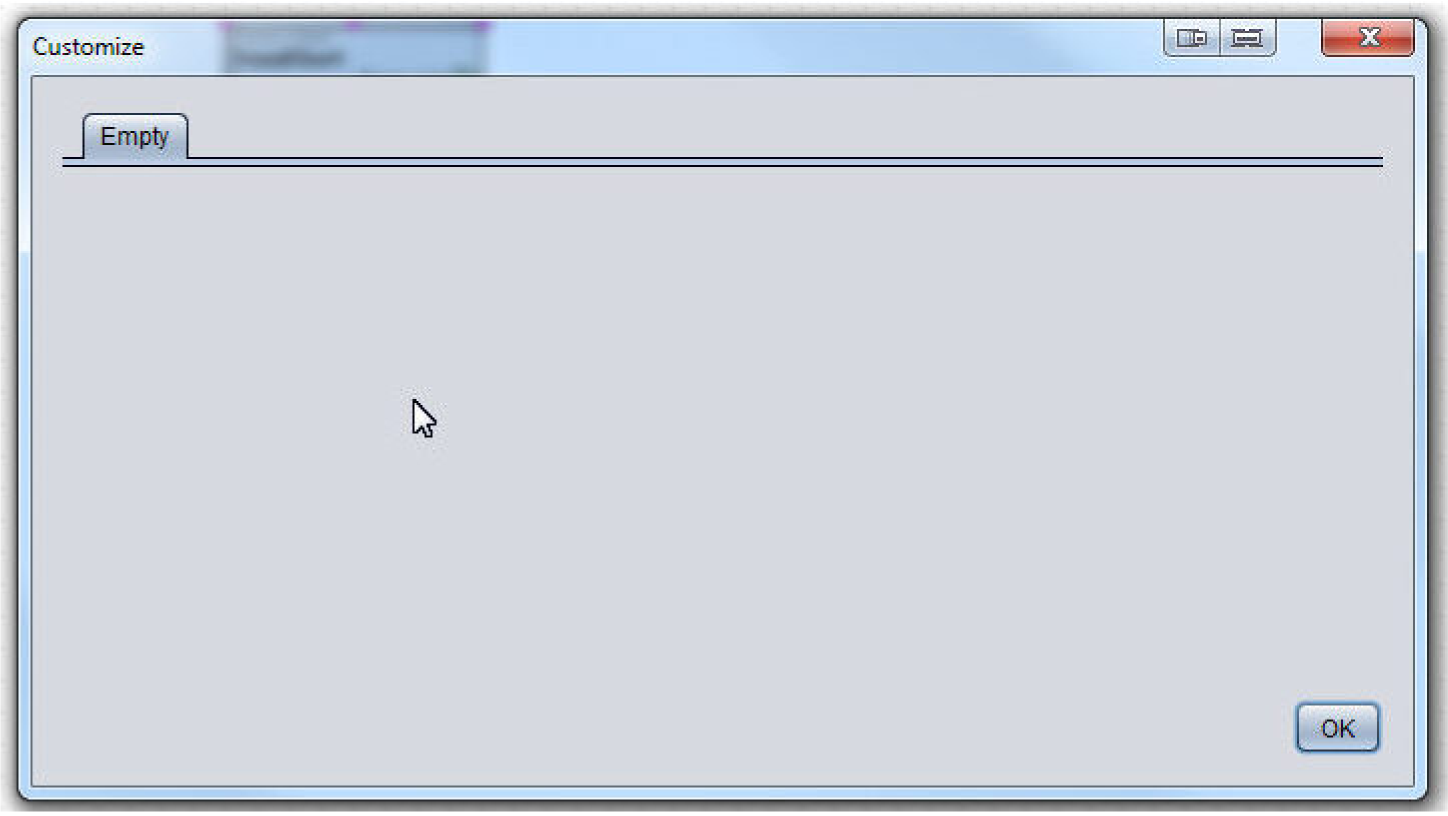
Configuring Trend Traces

In order to display lines or bars on your Trend Chart, you must properly configure the Traces of the Trend Chart. To do this, perform the following steps:

1. With the Trend Chart selected, access the Properties Pane and single click the Customize tab located in the Properties Pane when the Trend Chart is selected.

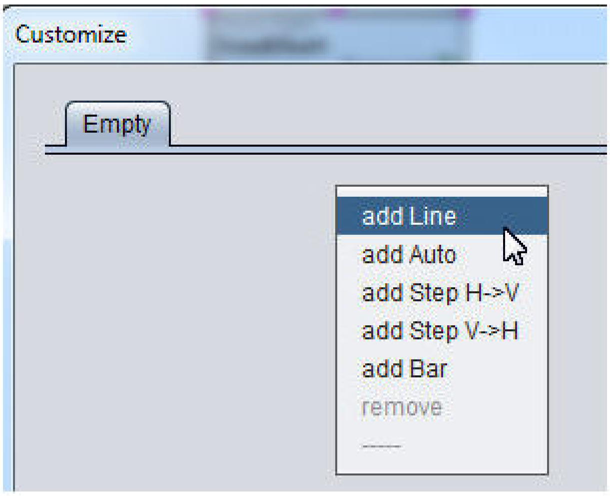


2. Clicking this tab will invoke the Customize dialog box.



3. By default, no traces are configured. To add a trace, perform a single right mouse-click anywhere in the Customize dialog and

select a trace option. For each data point that you intend to display, a trace must be added to successfully display data.



4. Configure the properties for the number of traces that the chart will display by adding lines, steps, etc..

Using Formatted Reports

Formatted Reports Overview

ASPECT can generate reports based on information from the Historical Database Server. Available as a **Diagram** element, Formatted Report can receive information from a configured **Historical Database Server** and generate a report to one of multiple formats, including:

- PDF (NEXUS Series / ASPECT-Enterprise only)
- XLS
- Generic Text
- CSV
- HTML

> **Note**: PDF format is not supported on MATRIX Series devices.

Reports generated by ASPECT can be stored locally on an ASPECT target, or e-mailed as an attachment to a user through use of the Emailer element.

More Information

Importing the Template File

Adding the Formatted Report

Connecting Data to the Formatted Report

E-Mailing Reports

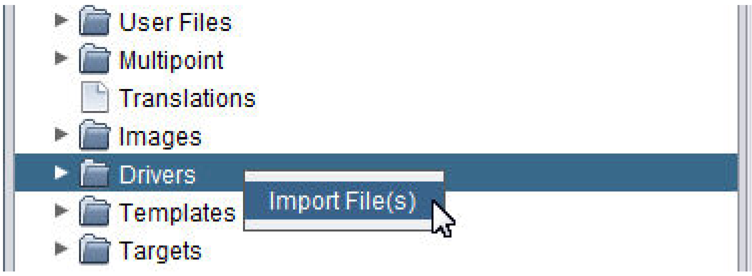
Downloading Reports from the Browser

Importing the Template File

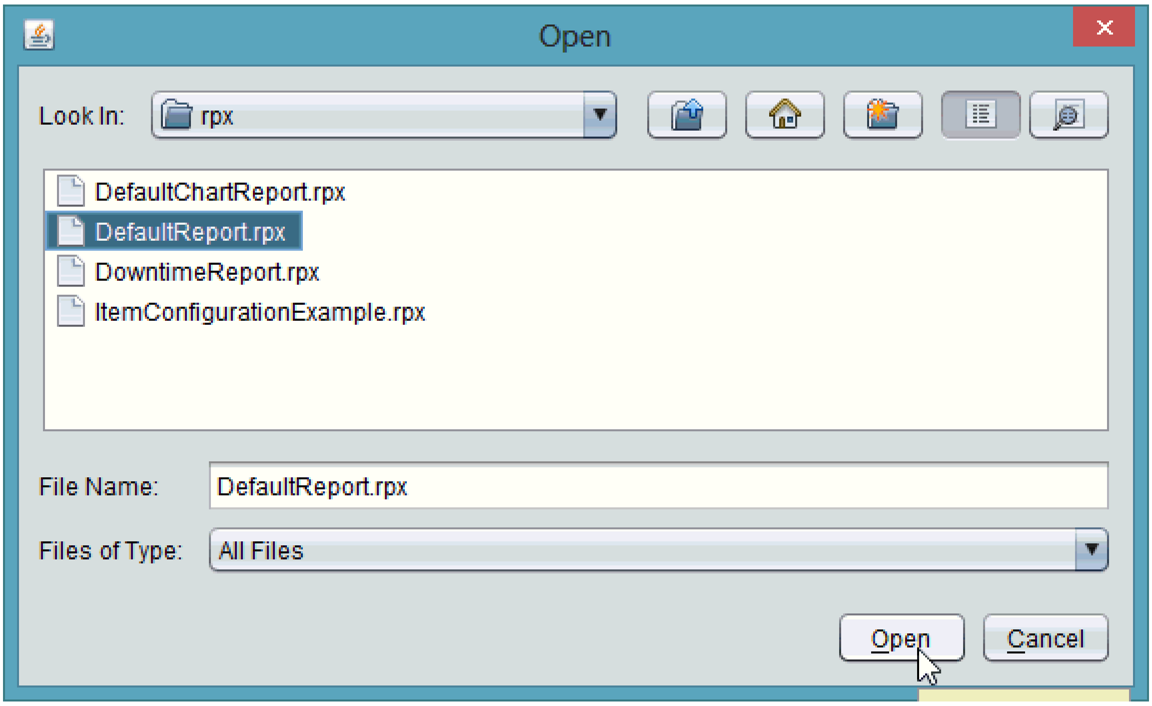
Prior to using the Formatted Report element, you must first import the template .rpx file into the Drivers node of your Project Tree. The template file is used as a style sheet to format and order information that is inputted to the element.

To add the template file to your project, perform the following steps:

1. From the Project Tree, right click the Drivers node and select Add File.



2. Browse your PC's file system to C:\American Auto-Matrix\Aspect-Studio<version>. Access the rpx folder. Select the DefaultReport.rpx and click Open.



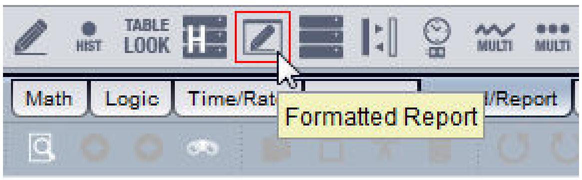
NOTE - Other included .rpx files are placeholders for future functionality and cannot be used with the Formatted Report element at this time.

Adding the Formatted Report

The Formatted Report is a Diagram element and generally accepts information sent by the Historical Database Server element.

To add Formatted Report to your workspace, perform the following steps:

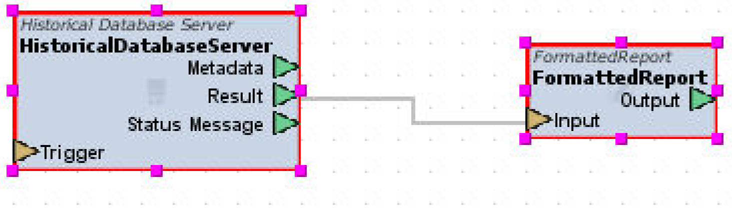
1. From the Trend/Report category, select the Formatted Report element.



2. Click and drop the element onto your Diagram workspace.

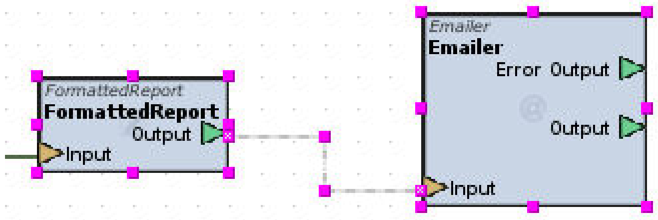
Connecting Data to the Formatted Report

Data retrieved from a database element such as the Historical Database Server is simply connected to the input of the Formatted Report as shown below.



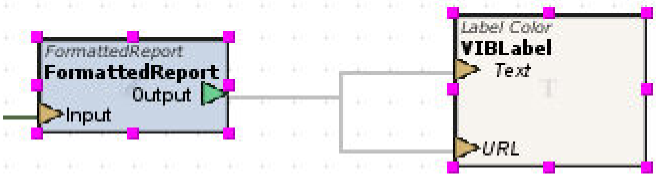
E-Mailing Reports

The Emailer element can send reports generated by the Formatted Report element. Simply connect the Output of the Formatted Report to the Input of a configured Emailer. Reports are sent as attachments of an e-mail. The format of the report is controlled through various properties of the Formatted Report element.



Downloading Reports from the Browser

Using Design elements within Aspect-Studio, reports can be downloaded directly through a web-browser if necessary. In the example shown below, the output of the Formatted Report is linked to the URL Link property of a Label. When the report is successfully generated, a hyper link will be displayed - allowing the user to perform a click to download the report.



In this scenario, the output is linked to both the Text input and URL inputs. When linked to the Text input, the text of the label will automatically update to display a readable hyper link relative to the location of the report itself.

The URL pin is used to stream in the hyper link for downloading. By default, you will need to double-click the label when displayed on a web browser. The number of clicks and how the report is retrieved is controlled through the Click Action and Click Count properties - addressable from the Expert properties tab of the Label element.

iCalendar Scheduling

iCalendar Overview

ASPECT supports the **iCalendar** standard to perform dynamic host scheduling, as well as other programmatic value scheduling.

iCalendar is a file format which allows Internet users to schedule events. Files are commonly stored on the Internet on a webserver, but can also be published to a WebDAV server for referencing by other iCalendar clients. iCalendar is used and supported by a large number of products, including Google Calendar, Apple iCal, IBM Lotus Notes, Microsoft Outlook (beginning in 2007), Mozilla Thunderbird, and others.

This section of Online Help discusses the use of iCalendar technology within Aspect.

More Information

"Holiday Mode" on page 783
"Four Mode Scheduling" on the facing page
"Two Mode Scheduling" on page 769
"Time Value Scheduling" on page 770

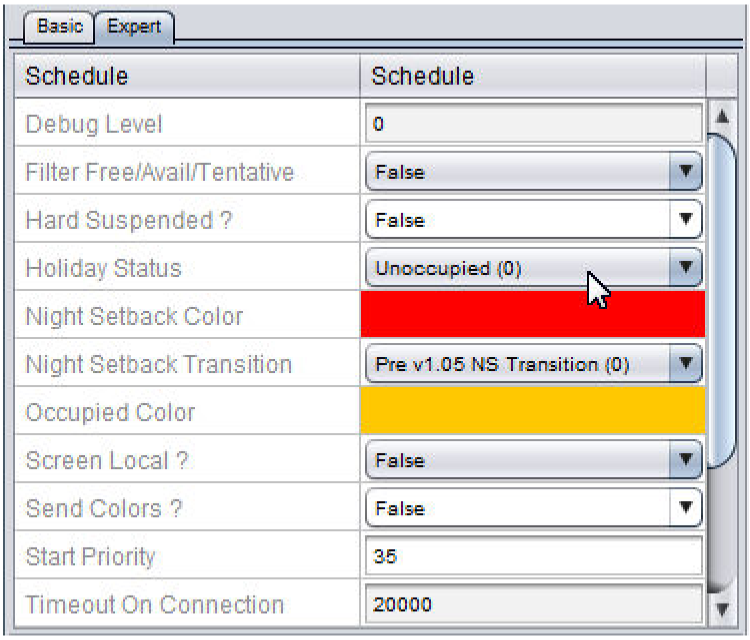
[The Concept of Busy Time](#)

[Schedule Element Overview](#)

Scheduling Basics

Holiday Mode

Schedule elements can be placed into Holiday mode by sending any non-zero value to the Holiday input pin. When any non-zero value is received, the Schedule will operate in Holiday mode. The Output of the Schedule will be set to Unoccupied by default. However, this can be altered based on your preferences by adjusting the Holiday Status property of the Schedule element. This property is available in the Expert Property tab.



Four Mode Scheduling

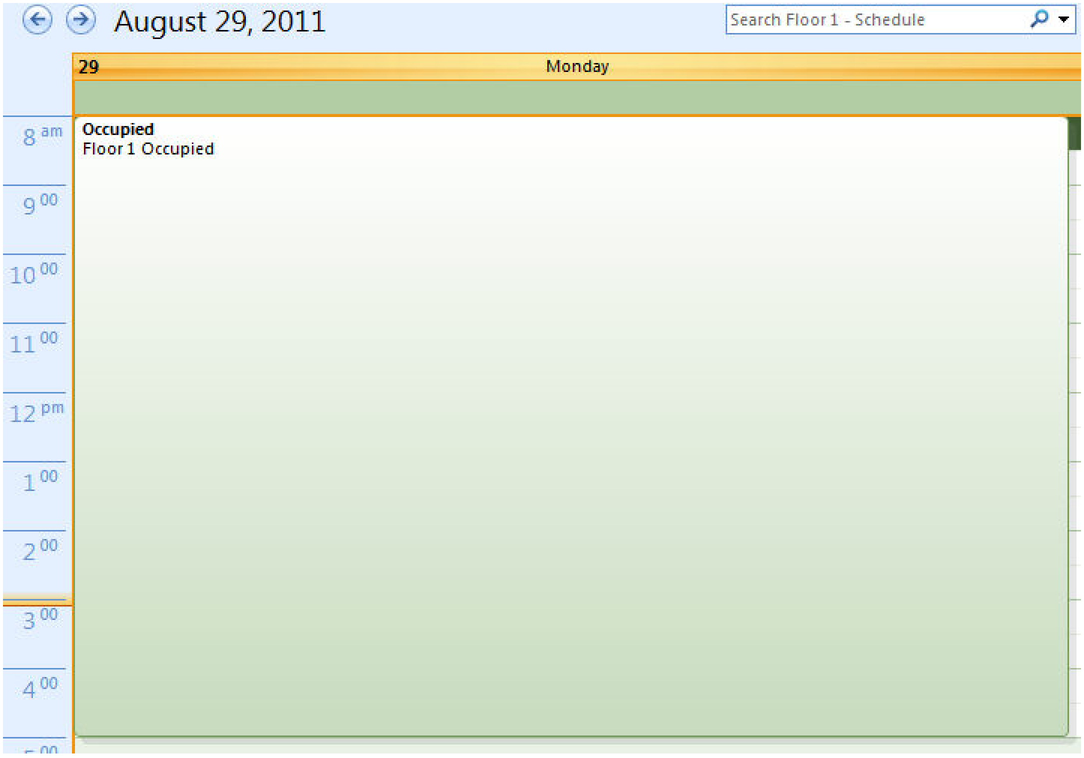
iCalendar can be used to perform host-based scheduling involving AAM's traditional four-mode routine. In this routine, there are four schedule events:

- Unoccupied
- Warmup
- Occupied
- Night Setback

Within AAM PUP and BACnet devices, each event may corresponds to equipment turning on and off, setback values for setpoints, and other control factors. If your system utilizes the traditional four mode routine, iCalendar can be leveraged to perform host-scheduling of these states.

Application Example

In the example shown below, an event is schedule for 8:00am to 10:00am. This event period is considered as Occupied time when interpreted by the Schedule element. All unscheduled space is considered as unoccupied time.



Because the iCalendar standard has no concept of multiple HVAC schedule modes, the Schedule element utilizes time offsets to determine when Warmup and Night Setback modes occur. These time offsets are defined in the Night Setback minutes and Warmup minutes properties.

Warmup Transition

If the Warmup minutes property is set for a value of 60, the Schedule will enter Warmup mode 60 minutes prior to the defined event in your iCalendar. In the example above, warm-up mode will begin at 7:00am and end at 8:00am (where Occupied mode begins).

Night Setback Transition

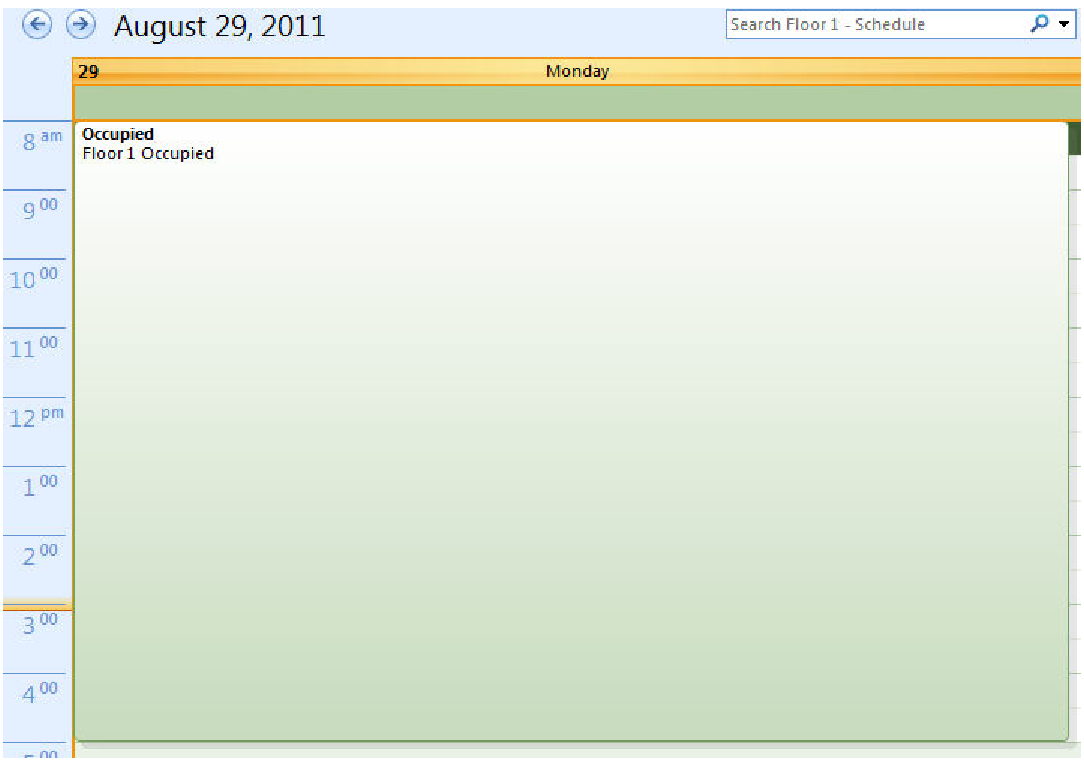
If the Night Setback minutes property is set for value of 60, the Schedule will enter Night Setback mode 60 minutes after the defined event ends in your iCalendar. In the example above, Night Setback mode will begin at 11:00am and continue on until the next event transition occurs (which could be the same day or event the next day/week/month, etc.)

Two Mode Scheduling

iCalendar can be used to perform simple Occupied/Unoccupied scheduling routines.

Application Example

In the example shown below, an event is schedule for 8:00am to 10:00am. This event period is considered as Occupied time when interpreted by the Schedule element. All unscheduled space is considered as unoccupied time. To ensure that your Schedule element does not attempt to enter Warmup or Night Setback modes, the corresponding properties for Warmup and Night Setback minutes must be set to a value of zero (0).



Time Value Scheduling

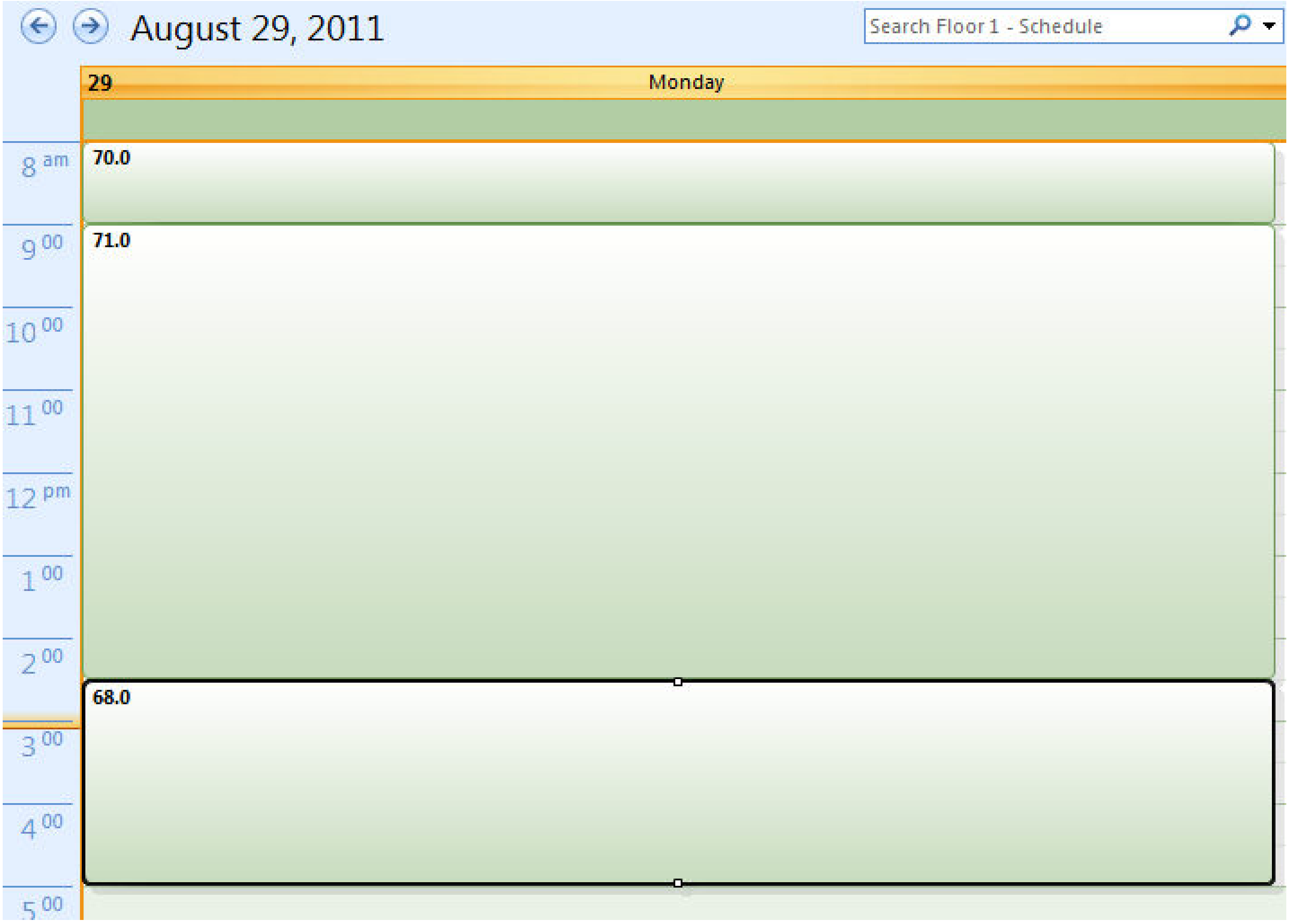
Time Value Scheduling is perhaps the most powerful form of scheduling when using iCalendar scheduling within Aspect. Rather than relying on occupancy event transitions, the actual event scheduled event name is taken from the iCalendar file and is outputted through the Occupancy Event Writer output pin.

Through Time Value Scheduling, users can schedule setpoints, equipment statuses, and many other dynamic scheduling mechanisms.

NOTE - In order to use Time Value Scheduling, the entire 24-hour period of each schedule day must have events assigned to it.

Application Example

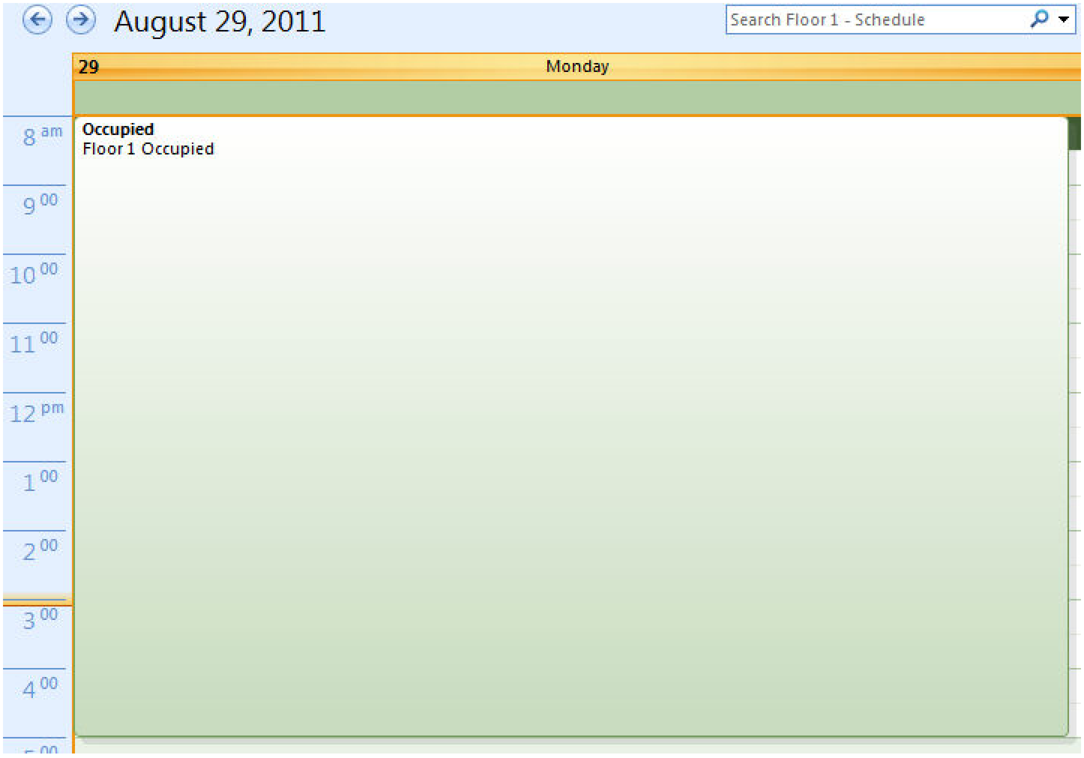
In the example shown below, multiple events are scheduled. The actual event name itself must be the value you wish to schedule.



The Concept of Busy Time

The iCalendar standard uses the concept of busy time to determine when events may occur. Shown below is an example of a scheduled event in Outlook. From 8:00am to 5:00pm, an event is scheduled. This event is considered as busy time by iCalendar. Within Aspect, busy time is interpreted as an occupied event. Therefore, when you perform scheduling through any iCalendar based system, busy time will be considered Occupied.

Areas falling outside of events entered into an iCalendar file is considered free time. Within Aspect, free time is interpreted as an unoccupied event.



Scheduling 24-Hour Periods

The iCalendar methodology of scheduling supports the ability to schedule 24-hour periods for full occupied modes. When scheduling a complete 24-hour periods with an event, the 24-hour even will be treated as busy time, meaning that the output you can expect from the Schedule will be an Occupied period (value of 2 for Occupied). Additionally, the isOccupied pin will output a true value indicating that busy time is occurring for this period.

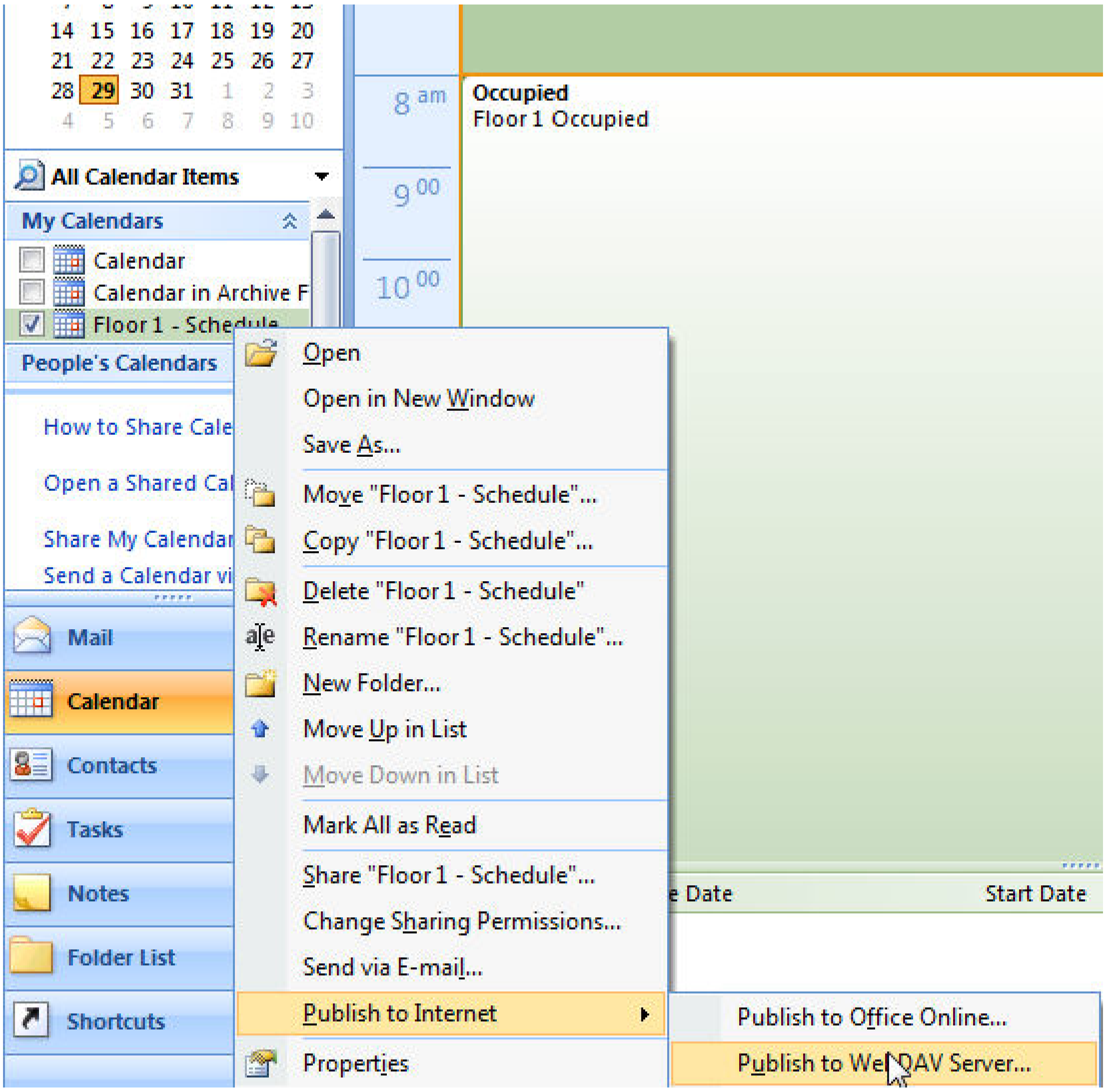
Publishing Calendars to Aspect Targets

Publish iCalendars are directly published onto an Aspect target from a calendar client. Publishing calendars to an Aspect target involves a minimal set of steps discussed in this area. Once published, the Schedule element is later configured to read the published calendar from the Aspect target and pass on data to the building automation system. An example of how to publish an iCalendar file is given below using Microsoft Outlook. For information on other clients, please refer to appropriate documentation for the software you are using.

iCalendar Publishing Example using Outlook

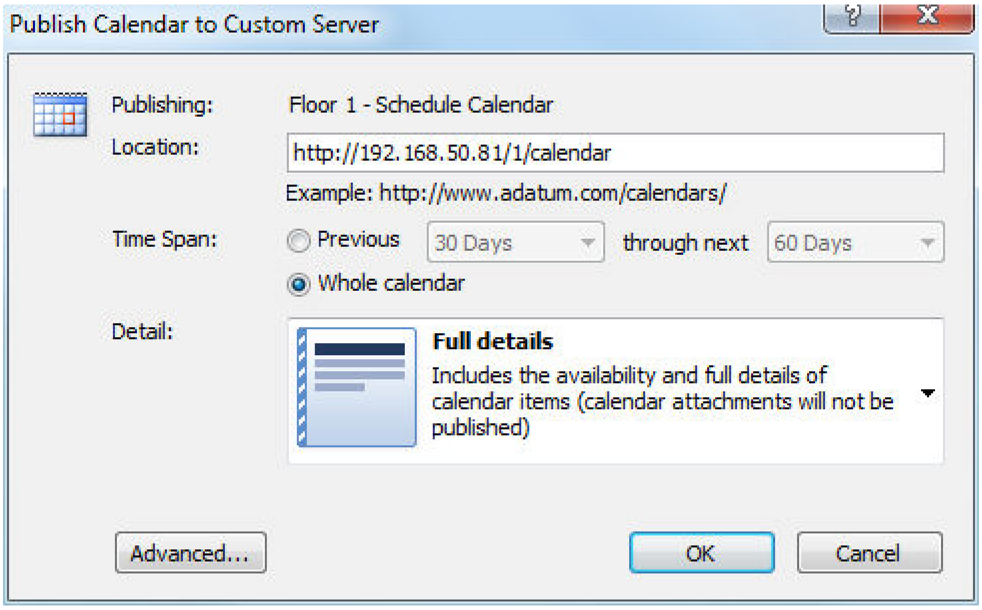
To publish an iCalendar to an Aspect target using Outlook, perform the following steps:

1. With a Calendar configured for your scheduling situation, right click the Calendar listing from Outlook and select Publish to Internet> Publish to WebDAV Server

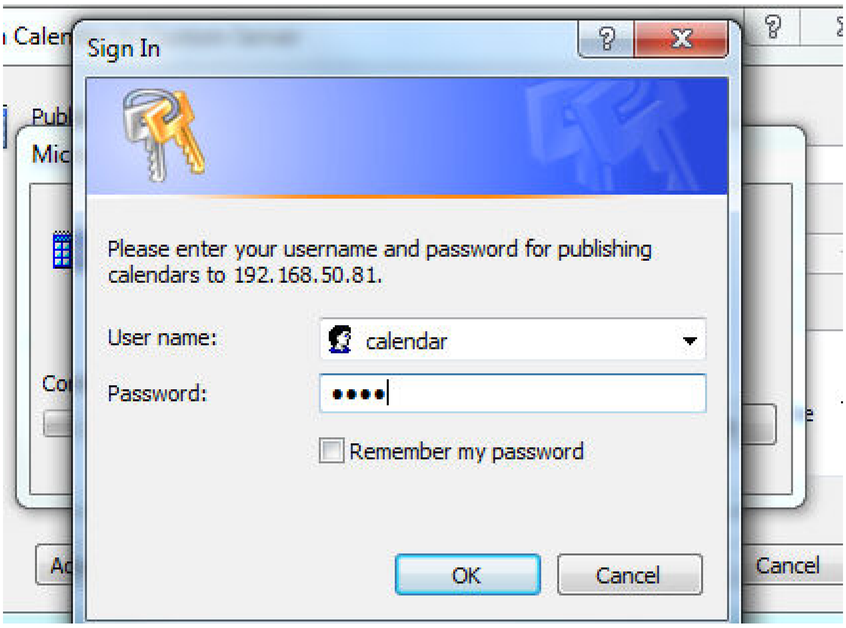


2. The "Publish Calendar to Custom Server" dialog will appear, prompting a location. The location field must be the path where iCalendar files are published on an Aspect target. For Aspect-Matrix Area Controller, the format is http://address/#/calendar - where address is the IP address or resolvable name of your Aspect target, # is the instance number of Aspect, and calendar is the directory in which the files will be stored. Ensure that the "Whole Calendar" radio button is

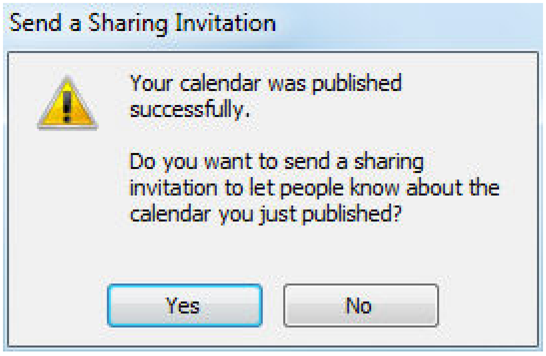
selected. NOTE - Even though Aspect-Matrix Area Controller does not support multiple instances of Aspect, the instance number will always be a value of 1 for this system. For Facility, Nexus, and Enterprise variants, the instance will depend on where you will deploy the project to. The system does permit users to publish calendars in one instance and have multi-instance hosts look at once instance for all calendar information if desired.



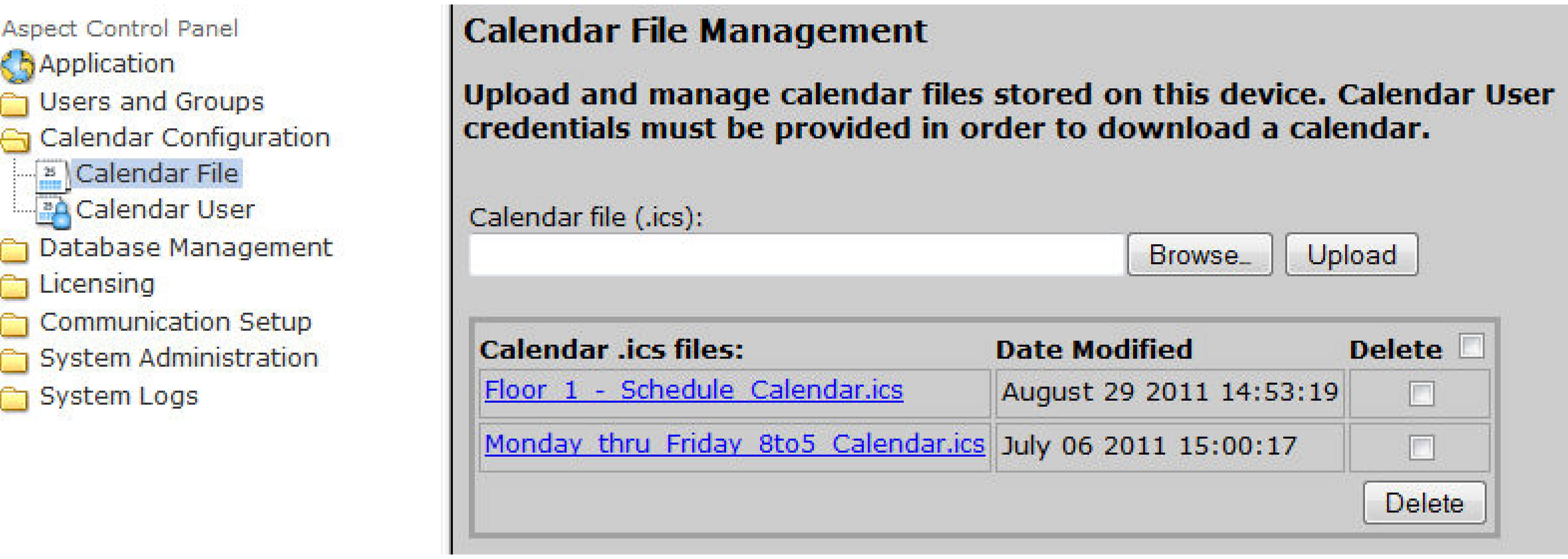
3. Click OK. Provided you have correctly entered the location address, you will be prompted to enter a Username and Password for publishing. The default credentials for calendar publishing are Username: calendar Password: user. NOTE - If you wish to change the default password for calendar publishing, please reference the [Calendar User] page for more information.



4. Click OK to publish the calendar. When successful, you will receive a confirmation that the calendar has been published successfully. You may share this information with other users if you wish by clicking Yes and following additional instructions from Microsoft Outlook.



5. You can verify iCalendar file publishing by accessing the Control Panel of your Aspect target and visiting the Calendar File page. As shown below, the Floor 1 - Schedule file was successfully published to the target. NOTE - Microsoft Outlook appends an additional string onto the end of a published calendar (_Calendar) as shown below.

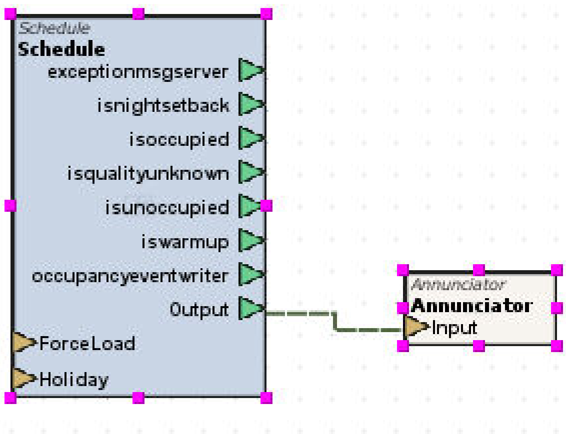


Using the Schedule Element

Schedule Element Overview

The Schedule element within Aspect-Studio is used to read and interpret iCalendar data published either to an Aspect's WebDAV server, or from a hosted solution such as Google Calendar. The element provides the ability to perform:

- AAM's traditional four-mode scheduling routine (Unoccupied, Warm-up, Occupied, Night-Setback)
- Traditional Occupied/Unoccupied scheduling
- Time/Value scheduling (for scheduling setpoints, equipment, etc.)



Schedule Inputs

The Schedule element contains two standard input pins.

- ForceLoad - is a triggered-based input that commands the element to manually load iCalendar data.
- Holiday - used to trigger holiday mode. Holidays can be triggered by manual action, or through use of referencing an additional iCalendar file that defines holidays for a particular site.

Schedule Outputs

The Schedule output contains eight standard output pins.

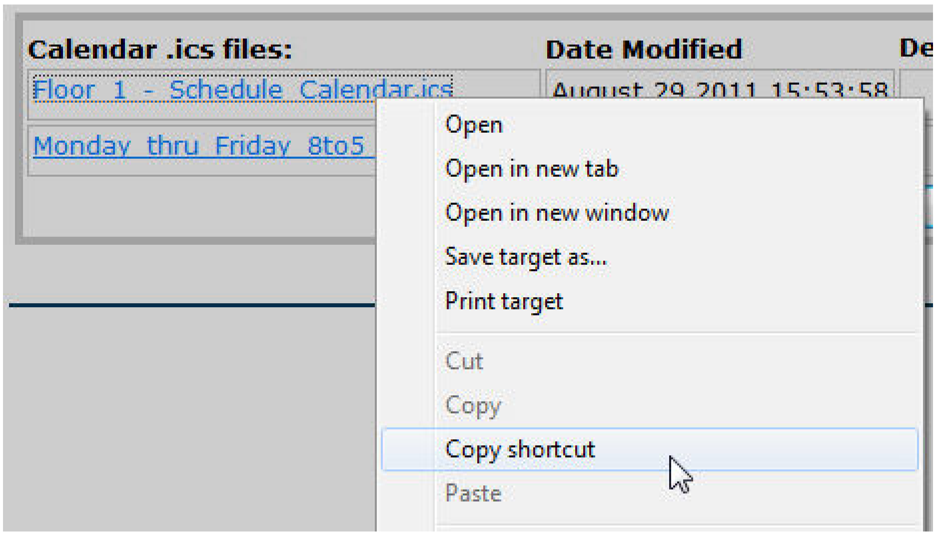
- ExceptionMsgServer - provides exception/error report messages in the event of a problem.
- IsNightSetback - indicates if the Schedule is in Night Setback mode (0 = No, 1 = Yes).
- IsOccupied - indicates if the Schedule is in Occupied mode (0 = No, 1 = Yes).
- IsQualityUnknown - indicates if the value quality of the schedule is known or not.
- IsUnoccupied - indicates if the Schedule is in Unoccupied mode (0 = No, 1 = Yes).
- IsWarmup - indicates if the Schedule is in Warmup mode (0 = No, 1 = Yes).
- OccupancyEventWriter - Outputs the actual event name - used for time/value scheduling.
- Output - Outputs the enumerated value for traditional four-mode scheduling (0 = Unoccupied, 1 = Warmup, 2 = Occupied, 3 = Night Setback).

Configuring Schedule Element Properties

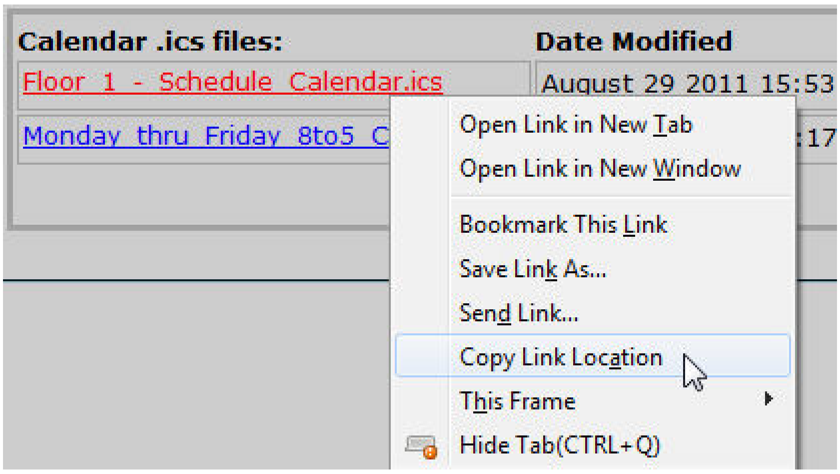
The Schedule element contains several properties, which are used to control specific items with how iCalendar data is loaded, interpreted, and processed. To link a Schedule element to a published iCalendar file, perform the following steps:

1. With the Schedule element added to your Diagram workspace, select the element for property configuration.
2. In the Properties pane, first configure the WebDAV URL. This is the location where an iCalendar file has been published (either directly to a target using a client such as Outlook, or a remote iCalendar file on a service such as Google Calendar)
3. For published iCalendar files on an Aspect target, access the Calendar File page in the target's WebUI using your web browser.

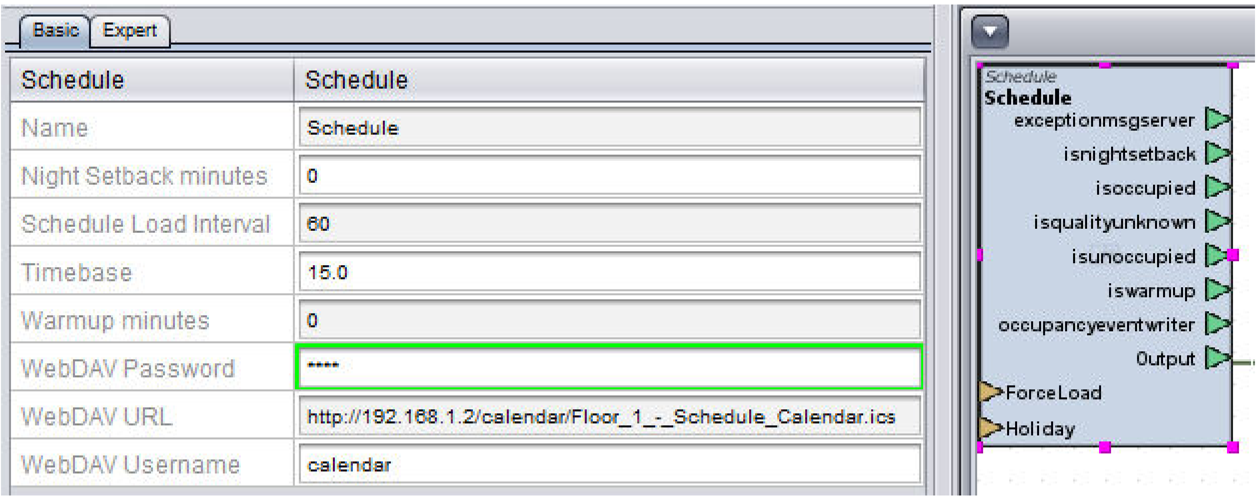
4. For Windows Internet Explorer users, right-click the listing link and select the Copy Shortcut command.



5. For Firefox users, right-click the listing link and select the Copy Link Location command.



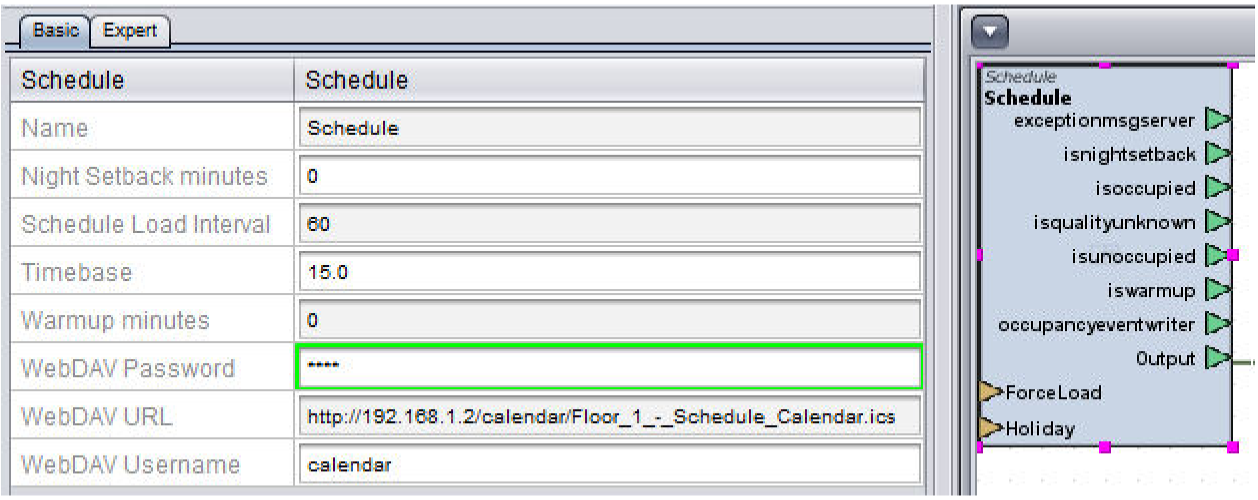
6. For other browsers, please consult the appropriate help information for the browser you are using for assistance with copying links.
7. Paste the copied information into the WebDAV URL Location property. This can be done by clicking in the property, and pressing CTRL + V on your keyboard.



NOTE - AAM strongly recommends using the above method for entering the WebDAV URL location for published calendars. Depending on the client you are using to publish Calendars, published file names could contain special characters such as underscores and others that a client may use in the place of a space character.

Basic Property Information for the Schedule Element

The Schedule element contains several properties which are used to control interaction between a deployed Aspect project and the iCalendar file. Detailed notes are provided below on each property and its function.

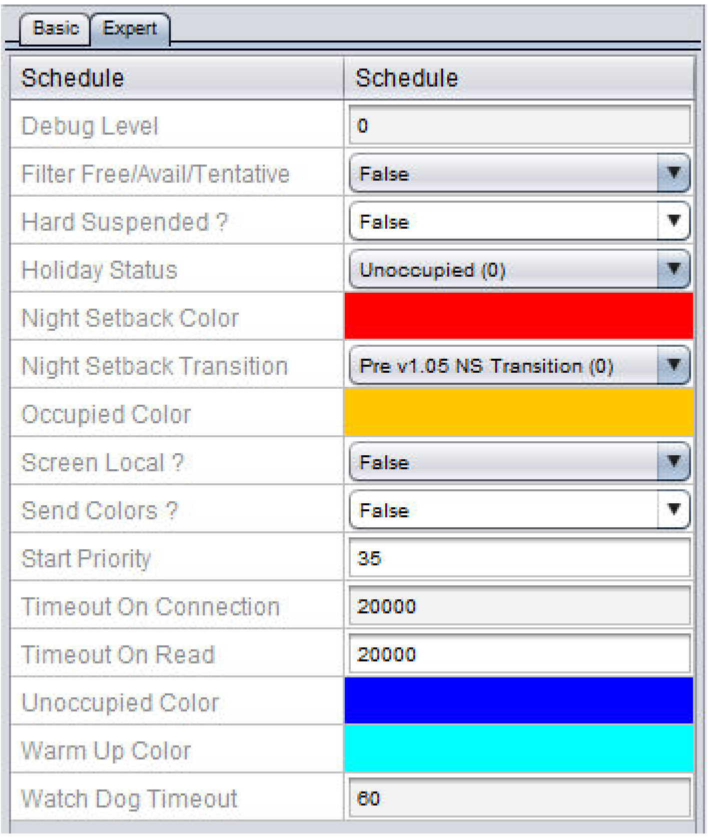


Property Name	Notes
Night Setback Minutes	Defines the amount of time, in minutes, before/after "busy" time that the Schedule

	enters Night Setback mode. Before/After is determined based on the configuration of the Night Setback transition property located in the Expert Tab of the Schedule element.
Schedule Load Interval	Defines how often, in seconds) the element will load iCalendar information (from a .ics file) from the defined WebDAV URL path. By default, schedules will be loaded every 60 seconds. Aspect will verify checksum information of the iCalendar file to see if any information has changed since the last load. If the checksum has been updated, meaning that someone has made a change the Calendar, Aspect will load the calendar and process information. If the checksum has not changed, Aspect will assume (by virtue of the iCalendar standard) that no change has been made and not load the information. This is done to save processing time.
Timebase	Defines how often, in seconds, the element will read the loaded iCalendar information to determine the current schedule status and process as needed. By default, this will occur ever 15 seconds.
Warm-up Minutes	Defines the amount of time, in minutes, before "busy" time that the Schedule enters Warm-up mode.
WebDAV URL	Specifies the WebDAV URL location of where an iCalendar File has been published, as demonstrated in the section above.
WebDAV Username	Specifies the Username for accessing iCalendar information from the WebDAV URL. By default, this parameter is defaulted to the "calendar" user credential pre-programmed into all Aspect targets. If you are obtaining iCalendar information from a remote service such as Google Calendar, a valid Google Username may be needed to access the calendar information.
WebDAV Password	Specifies the password for accessing iCalendar information from the WebDAV URL. By default,

	this parameter is default to the value of "user", which is the pre-programmed default password for the calendar user credential in all Aspect targets. If you are obtaining iCalendar information from a remote service such as Google Calendar, a valid password corresponding to the Google Username may be needed to access the calendar information.

Expert Properties



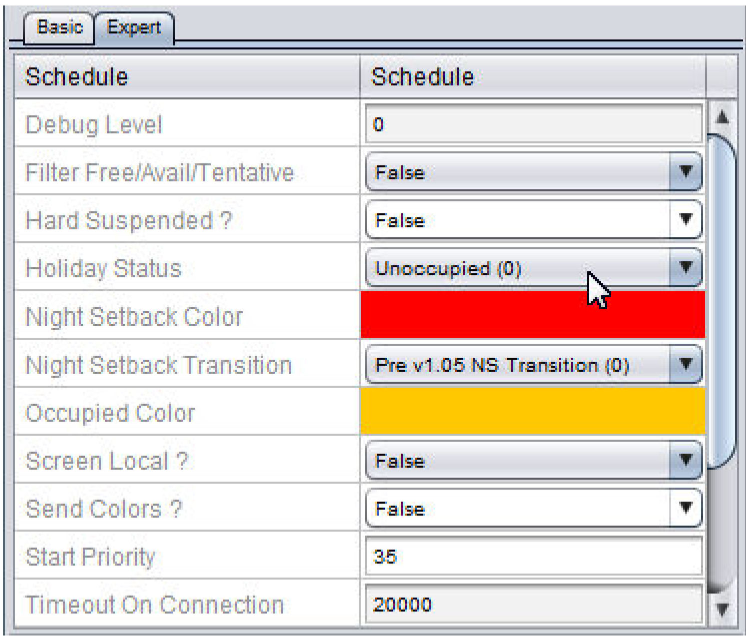
Property Name	Notes
Debug Level	Defines the level for viewing debug messages through the local console or the Aspect Control Engine log on a target. • A value greater than 25 will cause iCalendar

	load times to be displayed. • A value greater than 50 will cause iCalendar load times + load monitoring and filtering to be displayed. • A value greater than 75 will cause iCalendar load times + load monitoring and filtering + all Schedule parsing to be displayed. • A value greater than 100 will cause all information listed above, plus licensing details to be displayed.
Filter Free/Avail/Tent-ative	Defines if all free/available time periods within an iCalendar will be processed or not.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Holiday Status	Defines the Output value when the Holiday input pin receives a non-zero value.
Night Setback Color	Defines the color to be passed to color changing elements when the current schedule state is Night Setback.
Night Setback Trans-ition	Defines if Night Setback should follow Unoc-cupied mode, or precede Unoccupied mode. In versions of Aspect prior to v1.05, Night Setback occurred immediately after Occupied mode. This mode is available for sites that have configured their scheduling routines in such a manner, or wish Night Setback to follow Occupied mode.
Occupied Color	Defines the color to be passed to color changing elements when the current schedule state in Occupied.
Screen Local	Defines if results sent the graphical user inter-face are shared among users, or if they are sep-arate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the ele-ment.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Timeout On Con-	Defines the Connection time out for iCal Cal-

nection	endar URL requests in milliseconds.
Timeout on Read	Defines the Read time out for iCal Calendar URL requests in milliseconds.
Unoccupied Color	Defines the color to be passed to color changing elements when the current schedule state is Unoccupied.
Warm-up Color	Defines the color to be passed to color changing elements when the current schedule state is Warm-up.
Watch Dog Timeout	Defines the watchdog counter used by Aspect and its scheduling mechanism to determine if a failure in loading iCalendar information exceeds a certain time parameter (in seconds). If this time out is exceeded, Aspect will be restarted.

Holiday Mode

Schedule elements can be placed into Holiday mode by sending any non-zero value to the Holiday input pin. When any non-zero value is received, the Schedule will operate in Holiday mode. The Output of the Schedule will be set to Unoccupied by default. However, this can be altered based on your preferences by adjusting the Holiday Status property of the Schedule element. This property is available in the Expert Property tab.



MS Exchange Scheduling

Configuring Aspect Calendar support with Microsoft Exchange

The ASPECT Calendar support in both the Calendar block as well as the "invisible" calendars inside the Map engine have been extened to support Microsoft Exchange Free/Busy information in addition to the iCalendar support that has always existed.

In order to leverage this support, the site must be using a version of **Microsoft Exchange** that utilized the EWS (Exchange Web Services). At this time, this includes Exchange 2007 and up as well as **Office 365**/**Exchange Online** accounts. Exchange 2003 is not supported.

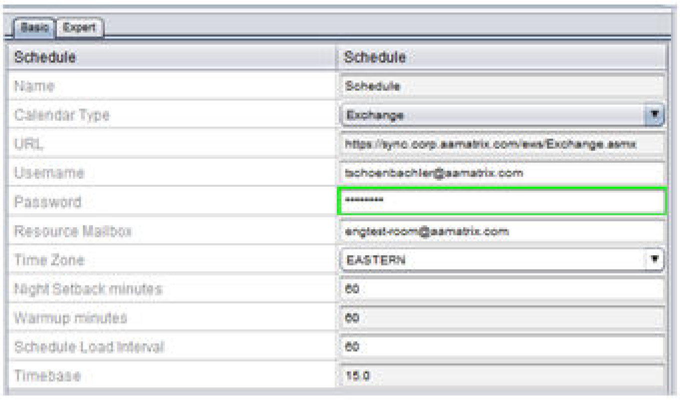
In order to use the **Exchange** calendar connector, the user must have the following:

1. The **URL** to the **Exchange** EWS application on the **Exchange** or **Outlook** Web Access server
2. A username and password with valid credentials to obtain the free busy information on the requested mailbox. The username will need to be formatted as `user@domainname.tld`, rather than `DOMAIN\user`
3. The mailbox user ID (called **Resource Mailbox**)

The default **URL** for a locally hosted **Exchange** EWS url is: `https://OWA-SERVER-NAME/EWS/Exchange.asmx` however, this can be customized by the **Exchange** administrator.

It is expected that the Exchange Schedule will be most often used with either **resource mailboxes** or **room mailboxes** (these are special, limited function mailboxes in **Exchange**), but they can be used against a "normal" end-user mailbox, with one caveat – the Free/Busy information will be derived from the user's default schedule on the **Exchange** server, and not any additional user-created calendars.

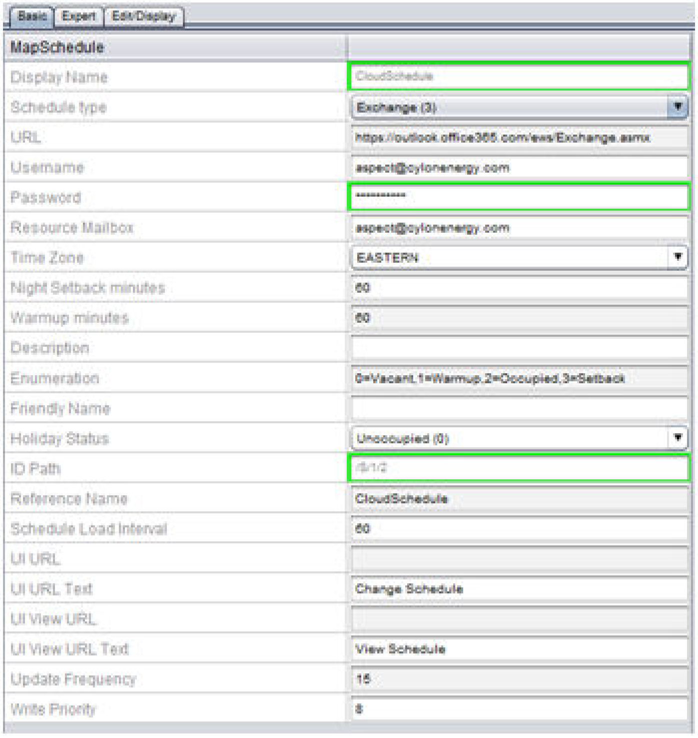
Here is an example of the Extended Schedule block with **Exchange** options provided:



Note: it is important to set the **Time Zone** in which you wish to evaluate the results, not the **Time Zone** in which the **Exchange** server is located. Typically, this will be the **Time Zone** where the ASPECT target is located, but if the ASPECT schedule output is driving a controller in another **Time Zone** , it may be desirable to use the **Time Zone** where the CONTROLLER is located.

Note: In the example above, the Username is different from the Resource Mailbox. The tschoenbachler@aamatrix.com user is given **calendar approval** permissions in the **Exchange** server on the engtest-room@aamatrix.com **Room Mailbox**. This is a very typical scenario where one or more users have the ability to manage the booking of conference rooms, equipment, etc.

Here is an example of a Map Schedule configured for **Exchange Online**/**Office 365** (note that https://outlook.office365.com/ews/Exchange.asmx is in the URL field):



More Information

[Working in the Schedule Node - Overview](#)

[Adding a Schedule Group](#)

Configuring OAuth2 for Office 365 Exchange Servers

> *As of **13th October, 2020**, **Microsoft** are discontinuing support for **Basic Authentication** (using a username and password) for **Office 365**. Therefore, **OAuth2** will need to be used to connect to **Office 365** servers. This does not apply to older versions of **Outlook**/**Exchange**.*

There are 2 major steps in setting up OAuth2 for **Office 365 Exchange** Servers:

1. Register an application in your **Office 365** account (via **Azure** Portal)
2. Configure your **Schedule** in ASPECT-Studio with the credentials required to access your **Exchange** calendar using **OAuth2**

Step 1: Register an application in your Office 365 account (via Azure Portal)

In order for ASPECT to read a remote calendar on an **Office 365 Exchange** server, that server must be aware that an application requires permission to read that information.

To tell the server about your ASPECT project, you must register an app via your **Azure** Portal as follows (further information is available from Microsoft).

1. Sign in to your **Azure** Portal at https://portal.azure.com/ You can use your email address and password which may be the same as your main corporate credentials (e.g. your **Windows** login).
2. Select Manage Azure Active Directory.
3. Select App Registrations from the menu on the left.
4. Select New Registration.
5. Type whatever name you wish. In this example, we'll call the registration Aspect BMS.
6. Under Supported Account Types, select the first option Accounts in this organizational directory only.
7. Click Register at the bottom of the page. A page should be displayed showing your new registered app Aspect BMS.
8. Select Certificates and Secrets on the left.
9. Select New Client Secret. Set the Description to AspectSecret (for example) and Expires to Never.
10. **Important**: Click the small "Copy" icon to the right of your new client secret. Paste this somewhere for use in "Step 2: Configure your Schedule in Aspect Studio" on the facing page below. *You will not be able to retrieve the client secret after leaving this page* (though you could make a new one if necessary).
11. Select API permissions on the left. This is where we will configure the resources that the Aspect BMS application is allowed to access.
12. Select Add a permission. A menu should appear on the right.
13. Select Exchange at the bottom of the menu to view **Exchange**-related (email) permissions.
14. Select Application Permissions
15. Tick full_access_as_app
16. Under Calendars, tick Calendars.Read
17. Click Add permissions at the bottom. You should now see your new permissions in the list (along with one or more default ones, which you can leave there).
18. Click Grant Admin Consent for... and follow the directions to grant consent. This is a one-off admin consent that permanently allows our Aspect BMS application to read user calendars data from the **Exchange** server.

> **Note:** If this button is disabled, you will need to ask your IT/ **Azure** administrator to either:
>
> a. grant you the Application Administrator role or
> b. log in to Azure themselves and consent to the permissions for your application.
>
> For either option, follow the instructions here: https://docs.microsoft.com/en-us/azure/active-directory/manage-apps/grant-admin-consent#grant-admin-consent-in-app-registrations .
> In option b., if the admin cannot see your app in App Registrations, the procedure on the linked docs for Enterprise Applications should show a complete list of all apps.

Step 2: Configure your Schedule in Aspect Studio

The following properties are required to configure in your **Map Schedule** in ASPECT-Studio (in the Expert tab).

> **Note**: the Ext Sched Password is not required for **OAuth2** access. The Client Secret fulfills this role for **OAuth2**.

Schedule Type (Basic Tab) - Exchange (3)

Ext Sched URL - https://outlook.office365.com/ews/Exchange.asmx for Cloud-based **Office 365**. Otherwise, your **Exchange** administrator should be able to provide this.

Ext Sched Username - Your Exchange username (email address)

Exchange Time Zone - "Lisbon". This is also the timezone for **Ireland/UK**. Choose the timezone that best matches your location.

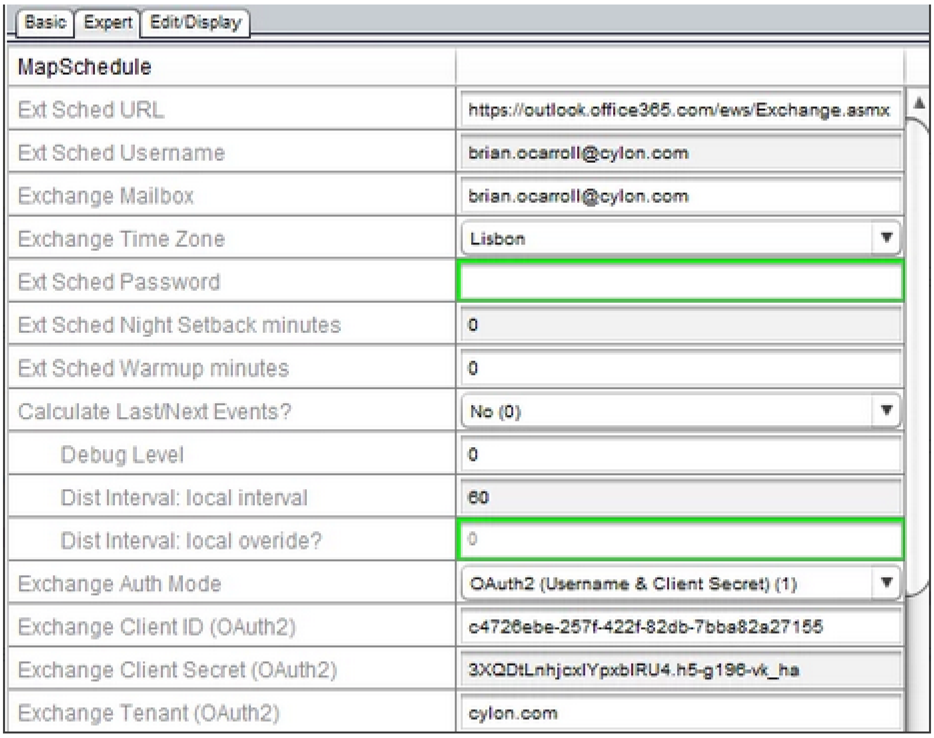
Exchange Mailbox - The mailbox (user) which contains the calendar you are trying to read. This can be a regular user's calendar but for a typical scenario, where one or more users have the ability to manage the booking of conference rooms, equipment, etc., it is recommended that your use a dedicated mailbox for the calendar used to control this ASPECT schedule.

Exchange Auth Mode - Set this to OAuth2 (essential for Office 365 after October 2020)

Exchange Client ID - This is also known as the **Application ID**. You can retrieve it from the app registration page for your application in **Azure** Portal ("Step 1: Register an application in your Office 365 account (via Azure Portal)" on page 787).

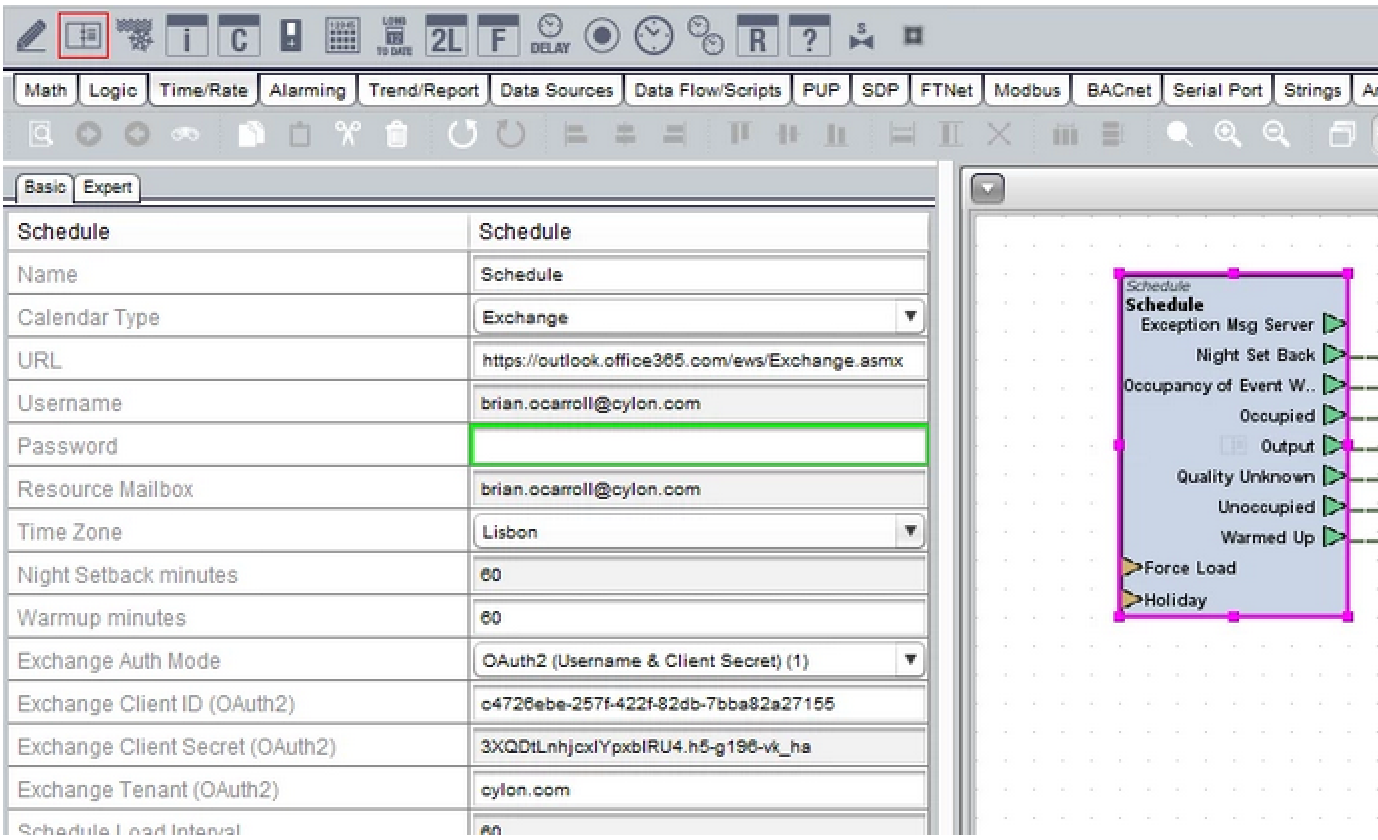
Exchange Client Secret - This is effectively a password for accessing the app we registered in "Step 1: Register an application in your Office 365 account (via Azure Portal)" on page 787. You should have saved this in "Step 1: Register an application in your Office 365 account (via Azure Portal)" on page 787. If not, you can easily create a new one.

Exchange Tenant - This is the Primary domain shown on the **Azure Active Directory** "Overview" page. It is most likely the domain part of your email address (i.e. the part after the @ symbol)



Alternative Configuration using a Schedule element/block in diagram view

An alternative way to configure a schedule is using the Schedule element in Diagram View of an application. In this case, the properties are similar to MapSchedule above but in this case, they can be found in the Basic tab.



Security and Audit Trailing

Security Overview

ASPECT provides a comprehensive security and audit trailing solution, allowing a project to be effectively locked down and secured. This section discusses the core elements used to implement effective security strategies within ASPECT.

More Information

Using the MIX Security Manager

Implementing an Authorization Button

Using the Audit Trail Element

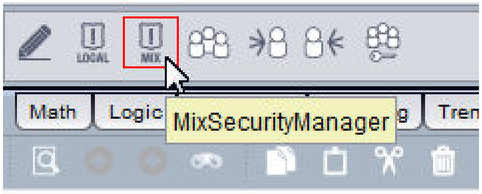
Tracking Login and Logout Events Using the Login Event Receiver

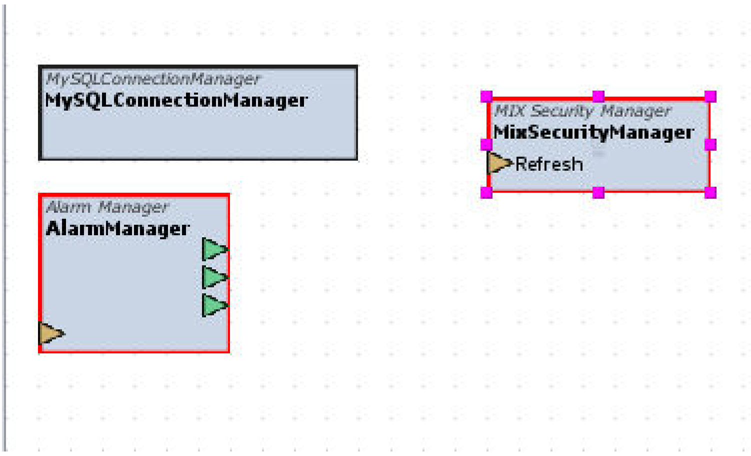
Using Security Aware UI Elements

Connecting Audit Trail Information

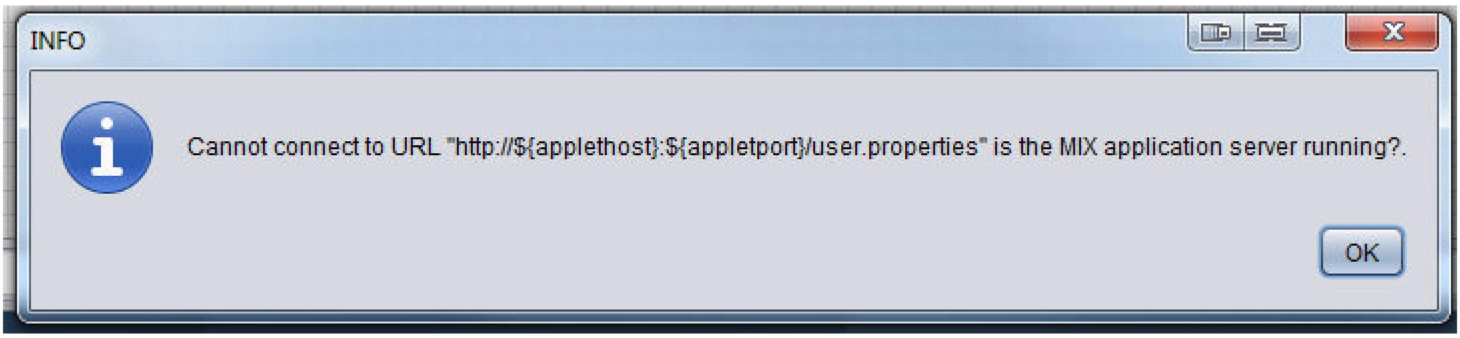
Using the MIX Security Manager

The MIX Security Manager element, located in the Security category of your Diagram palette, is the core component that links a project to the configured users and groups of an Aspect device. To implement the MIX Security Manager, simply click and drop the element onto any application within your project. The element is located under the Security category of your Diagram palette.





When you initially click and drop this element, you may see the following error message below. This message is a diagnostic message informing you that the MIX Security Manager cannot connect to your Aspect device, as the connection is made only when the application is deployed and viewed using your web-browser. During design time, this message is commonly and does not indicate any form of error or system failure. Click OK to continue.

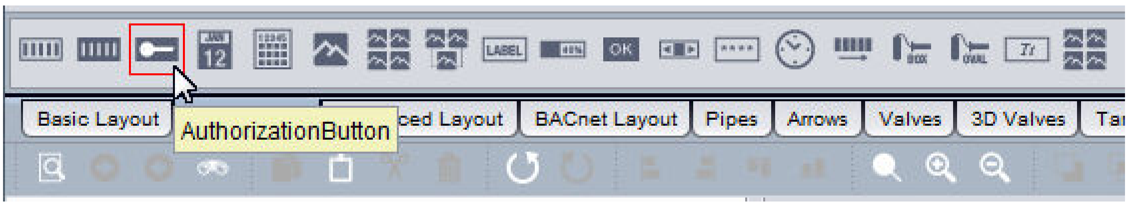


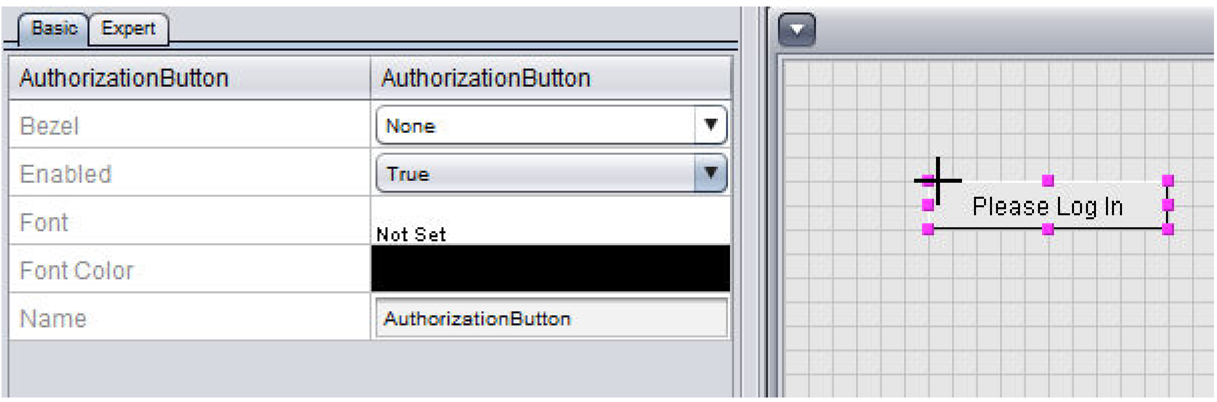
A project designed in Aspect-Studio needs only one MIX Security Manager element to be present in order to allow authentication to be established between the project and the User/Group manager of the target. Therefore, click and drop only one of these elements into the system.

Implementing an Authorization Button

While a standard Username and Password are initially required to log into the system and view the graphical user interface portion of the system, Aspect's strict security requires a secondary sign-in action to make changes to values within the graphical user interface. Depending on your security strategy, you may allow users to have a single set of permissions that allow system log-in, as well as sign-in to perform value changes, or you may configure a secondary set of user/groups for each interaction.

After initial log-in to the system, the ability to sign-in to perform value changes requires the use of an Authorization Button on one or more graphical user interface screens. This element is located in the More Layout category of the Design Palette. Simply click and drop the element to add it to one or more graphical user interface pages as desired throughout your project.

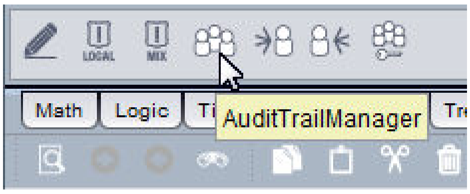


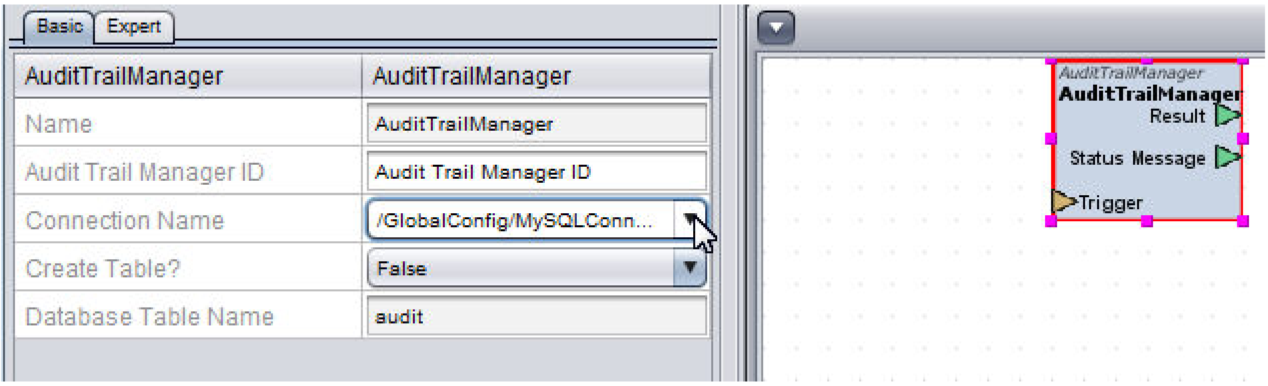


Using the Audit Trail Manager Element

The Audit Trail Manager , available from the Security category of your Diagram palette, is used to write and store trail information to a connected database (such as MySQL, etc.). Essentially, the Audit Trail Manager element is flexible and can be used as many times as you wish to categorize actions and change events down to the lowest level possible (including equipment specific events). As each application or component essentially refers back to a particular piece of equipment, an Audit Trail element can be included in each one to categorize any writes attempts or changes to any read/write values included on the graphic.

To use the Audit Trail Manager element, simply click and drop it onto your application and configure the properties accordingly.





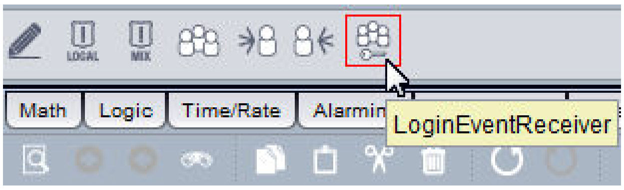
The Audit Trail Manager element includes a Trigger input, which is used to accept Audit Trail output details from Security Aware UI Elements, which is discussed in the next section.

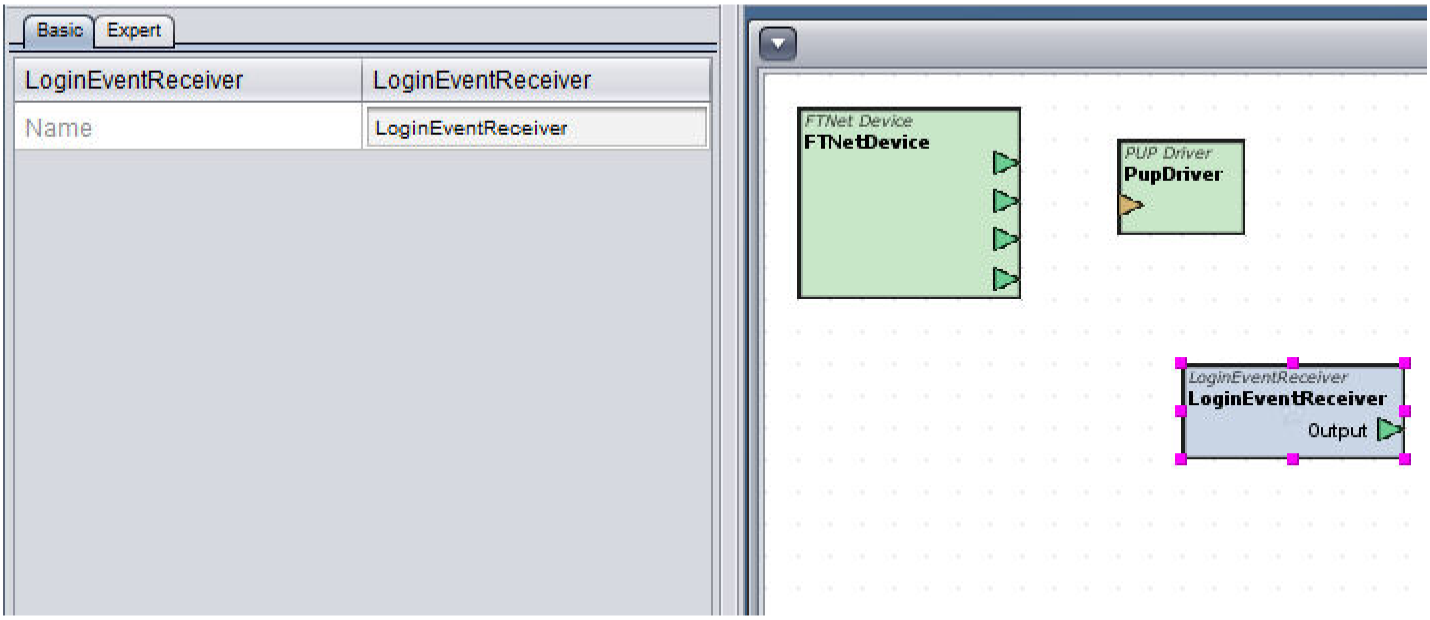
NOTE - When assigning a Table Name, it is important to ensure that you exclude the use of any special characters (such as hyphens, plus, minus, and other wild card characters). Having these as part of a table name can cause reporting and read/write errors when deployed.

Tracking Login and Logout Events Using the Login Event Receiver

As part of any standard audit trail system, it is essential to track the login/logout activity of users. To do this, the Security category contains a Login Event Receiver element. This element, used in conjunction with the Audit Trail Manager, can be used to record and archive login/logout events as they occur within Aspect. Similar to the MIX Security Manager, only a single Login Event Receiver is needed to track and record all login/-logout events within a project.

To add the Login Event Receiver to your project, simply click and drop the element from the Security category of your Diagram palette.

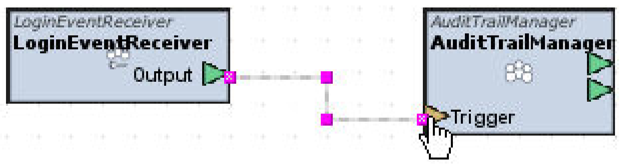




Configuring the Login Event Receiver

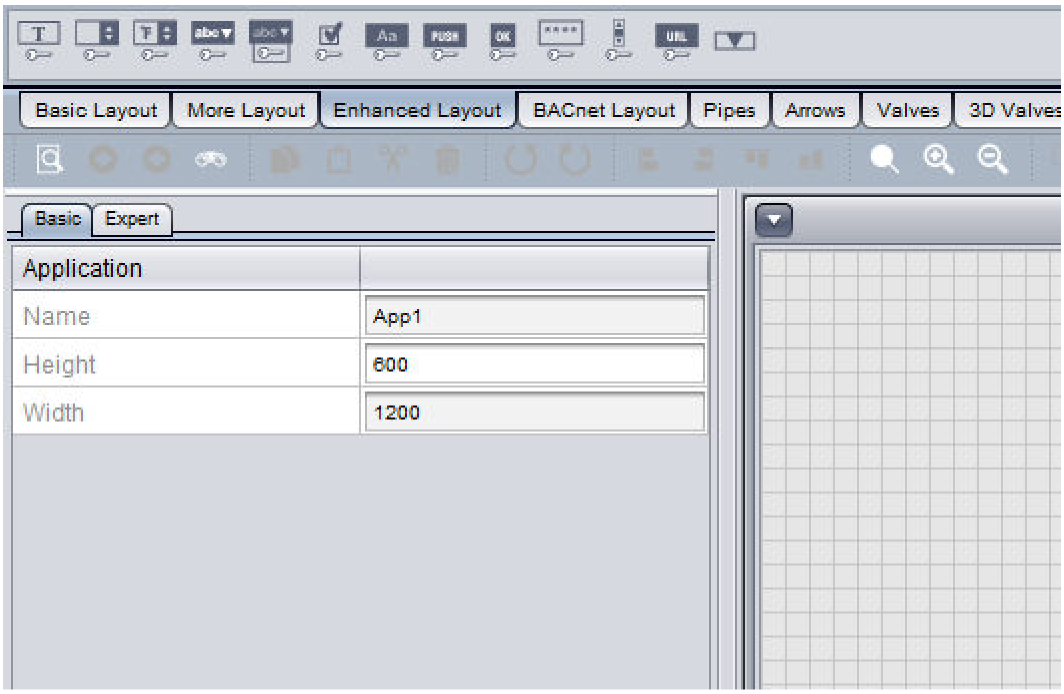
The Login Event Receiver includes some Expert Properties, which can be configured to customize login/logout event records stored to the connected database. For a complete description of each Expert Property, click here.

Once you have configured the Expert Properties of the Login Event Receiver, you must then connect the output of the Login Event Receiver to the Audit Trail Manager. To do this, simply establish a connection between the Output pin of the Login Event Receiver, and the Trigger input pin of the Audit Trail Manager. Please note that if the design of your project entails the elements being located on different applications, you must use the Managed Connections feature of Aspect-Studio to establish the connection between the two pins. For more information on using the Managed Connections feature, click here.



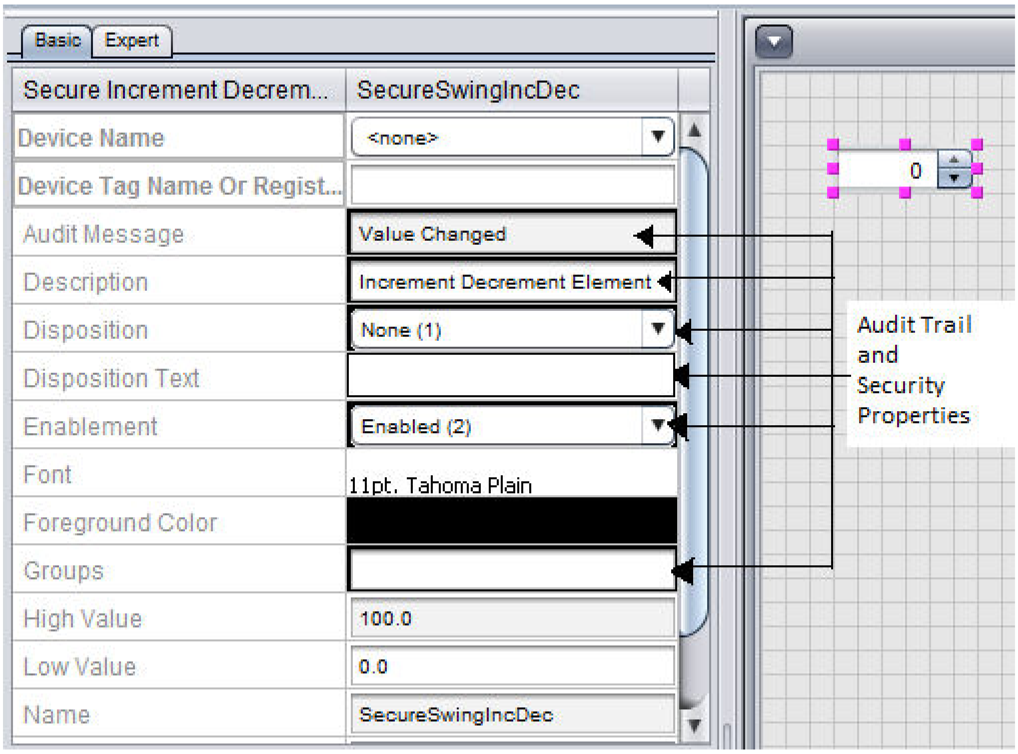
Using Security Aware UI Elements

When designing graphical user interface elements, a special category is designed to allow you to setup audit trailing through UI elements. These elements are simply new versions of existing UI elements used to adjust system values through a graphical user interface. These security-aware elements are part of the Enhanced Layout category, available in the Design palette.



Configurable Audit Trail Properties

Similar the standard UI elements, the Security Aware UI elements include additional configuration properties which are used to provide information for audit trailing purposes, as well as setup additional features relative to values changes when a user logs into the system and attempts to make a value change.



Enablement

The Enablement property specifies how the UI element will be enabled when it is viewed by a user through a web browser. There are three possible options available for this element, including:

- Disabled - disabled the UI element from permitting any value entry.
- Enabled - enabled the UI element for all users for value entry.
- Enabled with Access Control - enables the UI element for users that are members of groups specified in the Groups property. Once the user logs in, the element will then display as enabled for value editing.

Audit Message

The Audit Message property specifies a descriptive message that is logged to the database. This descriptive message should include information about the system data point that is being modified. For example, if the UI element is used to adjust the Heating Setpoint for Room 100, then configure the Audit Message to state “Heating Setpoint for Room 100 value changed”.

Disposition

The disposition property specifies what type of feedback information is required from the user when a value change is requested. There are three possible options available for this element, including:

- None - permits values changes with no user feedback.
- Free Form - requires the user to manually enter a reason for why a value change has been submitted to the system.
- Selection - requires the user to select a valid reason (configured in the Disposition Text property) prior to submit the value change.

Disposition Text

The Disposition Text property defines text displayed in the feedback box when a user is logged in and Free Form-based disposition is enabled, or, defines the selectable options that appear when Selection-based Disposition is enabled.

For Free Form Disposition, you may enter a default string that may appear in the value change prompt when the user submits a value change request to the system.

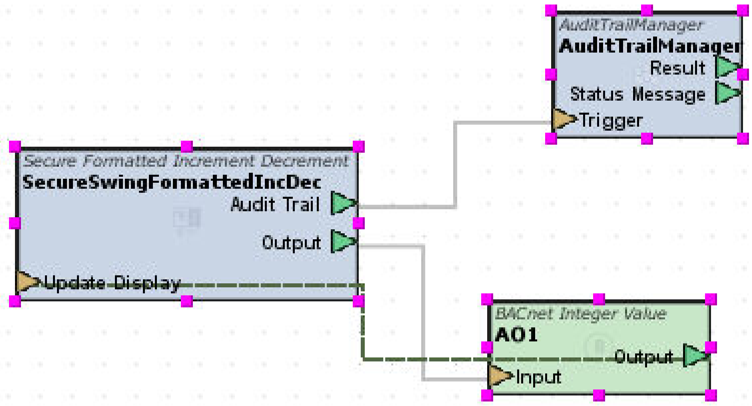
For Selection Disposition, enter comma delimited reasons for a value change.

Groups

The Groups property specifies which groups have access to perform value changes to system data connected to the UI element.

Connecting Audit Trail Information

In order to successfully log audit trail information, audit details from security aware UI elements must be fed back to the audit trail manager. To do this process, simply connect the Audit Trail output pin from the UI element to the Trigger input of the Audit Trail Manager.



As shown above, a Security Swing Increment Decrement element is connected to a point representing Analog Output 1 on a BACnet device. The Audit Trail pin is then connected to the trigger input of the Audit Trail Manager.

e-Signature - Edit Authenticate, Edit Audit and Dispositions

The e-sig feature in ASPECT offers the ability to control "write access" to data elements through configurable properties. e-sig could also be called "re-auth" with an optional free form or enumerated disposition audit trail. This prevents unauthorized modification of **alarms**, **schedules** and **point** values while auditing with all modifications with an optional disposition.

When e-sig is enabled for a data element the ngAdmin end user will be prompted with a username/password popup with an optional disposition when modifying a data element and the modification will also appear in the ASPECT audit logs.

There are two specific properties or concepts involved in this feature:

1. "**Edit Authenticate**" - A feature whereby editing a certain item in ASPECT requires authentication (username and password), even if a user is already logged in to ngAdmin. This is like online banking where you have to re-authenticate to perform certain sensitive operation

2. "**Disposition**" and "**Edit Audit**"
   A **disposition** is a message that a user must provide to explain why they are editing an item.
   Edit Audit is a property of an item that determines whether or not an edit to that item is added to the **Audit Trail** (ngAdmin > Event History > Audit Trail).
   Note: Prior to v3.05 Some ASPECT operations already included a **disposition** option (point editing, bulk editing) and some operations were always added to the audit trail, so that adding this option was not necessary (point editing, schedule editing, bulk editing). However, these Audit Trail features have been expanded to other operations (alarm ack/clear) and existing features have been enhanced. For example, point Disposition Type and Disposition Config can now be configured globally for all points or individually.

Configuring e-signature

Authorized edits can be configured in ASPECT for **Alarms**, **Schedules** and **Point** values.

e-signature for Alarms

To configure e-sig for acknowledgement and clearing of alarms select Map / Services / Alarm Subsystem. From the Edit/Display tab, configure the following properties:

Disposition Type:Type of disposition (explanatory message) required when acknowledging/clearing alarms (requires Edit Audit to be enabled)

Valid Options

- None(3)
- Enumerated(1)
- Free From(2)

Disposition Config: For enumerated disposition, a list of comma separated selections

Valid Options:

- Sample: First,Second,Third

Edit Authenticate: Determines if acknowledging/clearing an alarm requires the user to re-authenticate

Valid Options:

- No(0)
- Yes(1)

Edit Audit: Determines if acknowledging/clearing an alarm will always be added to the audit trail (even if disposition and re-authentication are not required)

Valid Options

- No(0)
- Yes(1)

Edit Authenticate Timeout: The amount of time (seconds) an 'EditAuthenticate' re-authentication lasts before the user is prompted for credentials again (0 = re-auth required for each edit)

Valid Options:

- Time i.e. number of seconds before forcing a new login

e-signature for Scheduling

To configure e-sig for acknowledgement and clearing of alarms select Map / Services / Schedule Subsystem, in the Edit/Display tab:

Disposition Type: Type of disposition (explanatory message) required when editing schedule items (added to audit entry)

Valid Options:

- None(3)
- Enumerated(1)
- Free From(2)

Disposition Config: For enumerated disposition, a list of comma separated selections

Valid Options

- Sample: First,Second,Third

Edit Authenticate: Determines if editing schedule items requires the user to re-authenticate Valid Options:

- No(0)
- Yes(1)

Edit Authenticate Timeout: The amount of time (seconds) an 'EditAuthenticate' re-authentication lasts before the user is prompted for credentials again (0 = re-auth required for each edit)

Valid Options:

- Time i.e. number of seconds before forcing a new login

> **Note**: “Edit Audit” is not included because schedule updates are always added to the audit trail.

e-signature for global configuration of Point Values

To configure e-sig for global modification of point values select Map / Services / Point Subsystem. Edit/Display tab:

Disposition Type

Type of disposition (explanatory message) required when editing point value items (added to audit entry)

Valid Options:

- None(3)
- Enumerated(1)
- Free From(2)

Disposition Config

For enumerated disposition, a list of comma separated selections

Valid Options:

- Sample: First,Second,Third

Edit Authenticate: Determines if editing point items requires the user to re-authenticate

Valid Options:

None(3)

- Enumerated(1)
- Free Form(2)

Edit Authenticate Timeout: The amount of time (seconds) an 'EditAuthenticate' re-authentication lasts before the user is prompted for credentials again (0 = re-auth required for each edit)

Valid Options:

- Time i.e. number of seconds before forcing a new login

> **Note**: “Edit Audit” is not included because point value updates are always added to the audit trail.

e-signature for configuration of specific Point Values

To configure e-sig for modification of individual point values select Map > Controllers > [any network group] > [any network] > [any device] > [any point] > Edit/Display tab:

Edit Authenticate: This property has values “Use Global” (default), Yes, No. The idea is that the “Edit Authenticate” value in Point Subsystem is the global setting but individual points can override that to determine if re-auth is required for editing.

Valid Options:

- Use Global(0)
- None(3)
- Enumerated(1)
- Free Form(2)

Existing option now includes “Global” as the default option

Valid Options:

- Use Global (0)
- None(3)
- Enumerated(1)
- Free From(2)

Disposition Config: Existing option now includes “Global” as the default option

Valid Options:

Sample: First,Second,Third

> **Note**: “Edit Authenticate Timeout” is not configured for individual points as this would be overkill and very hard to implement/test alongside a global timeout for points. “Edit Audit” is not included because point value updates are always added to the audit trail.

Twitter Integration

Twitter Overview

Twitter is a web-site which offers social networking and micro-blogging services, enabling users to send messages called tweets. Tweets are text-based posts of up to 140 characters displayed on a user's profile page. Tweets are commonly visible by default, but can be privatized for corporate use.

Tweet messages can be received in many ways, including:

- Portal site
- Smart phone
- SMS

Twitter and Aspect

Aspect leverages Twitter, allowing users to tweet building automation system data to a Twitter account. For example, a building may want to publish how much energy they saving in their building, or publish the current temperature and weather data for their location. Through use of carefully designed elements and other elements within Aspect, users can configure Aspect to publish Tweets. Data provided through the Tweet can be customized by the user in any way they wish.

Requirements

The following are system requirements in order to allow Aspect to perform Tweets:

- Sign up for a user account at http://www.twitter.com
- Active Internet connection from the PC running Aspect-Studio
- - Required to request Access and Token codes for initial setup and configuration of authentication.
- Provide the Aspect target performing Tweets with access to the Internet to post to Twitter's web-site.
- - This commonly requires access to Port 80 (HTTP) through a secure network.

More Information

Tweet Element Overview

Twitter Configuration Notes

Working with Tweet Elements

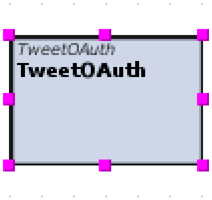
Tweet Element Overview

Aspect utilizes three main elements to perform Tweets. Each element is discussed below.

Tweet OAuth

The Tweet OAuth element is used to authenticate an external source with Twitter.com for the purpose of posting tweets to its web-site. Beginning September 1, 2010, Twitter.com discontinued basic authentication (text-based username and password) for applications requesting access to any

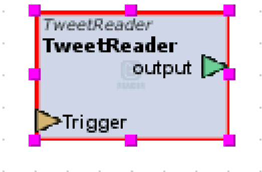
Twitter user account. In order to configure Aspect to read and write Tweets, you will be required to setup and configure a Tweet OAuth element.



This element will allow Aspect to gain access to a Twitter account by registering your project as an "Approved" application. Once an application is approved, it will be granted a consumer key that is used to generate access tokens that are now used in lieu of username/password credentials that were used previously.

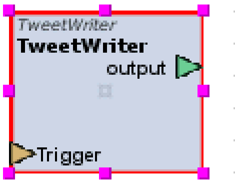
Tweet Reader

The Tweet Reader element is used to read a Tweet from a Twitter account.



Tweet Writer

The Tweet Writer element is used to write and post a Tweet to a Twitter account.



Configuring Tweet OAuth

Tweet OAuth Element Overview

The Tweet OAuth element is used to authenticate an external source with Twitter.com for the purpose of posting tweets to its web-site. Before Aspect can begin to read or write Tweet messages, this element must first be configured.

This element will allow Aspect to gain access to a Twitter account by registering your project as an "Approved" application. Once an application is approved, it will be granted a consumer key that is used to generate access tokens that are now used in lieu of user-name/password credentials that were used previously.

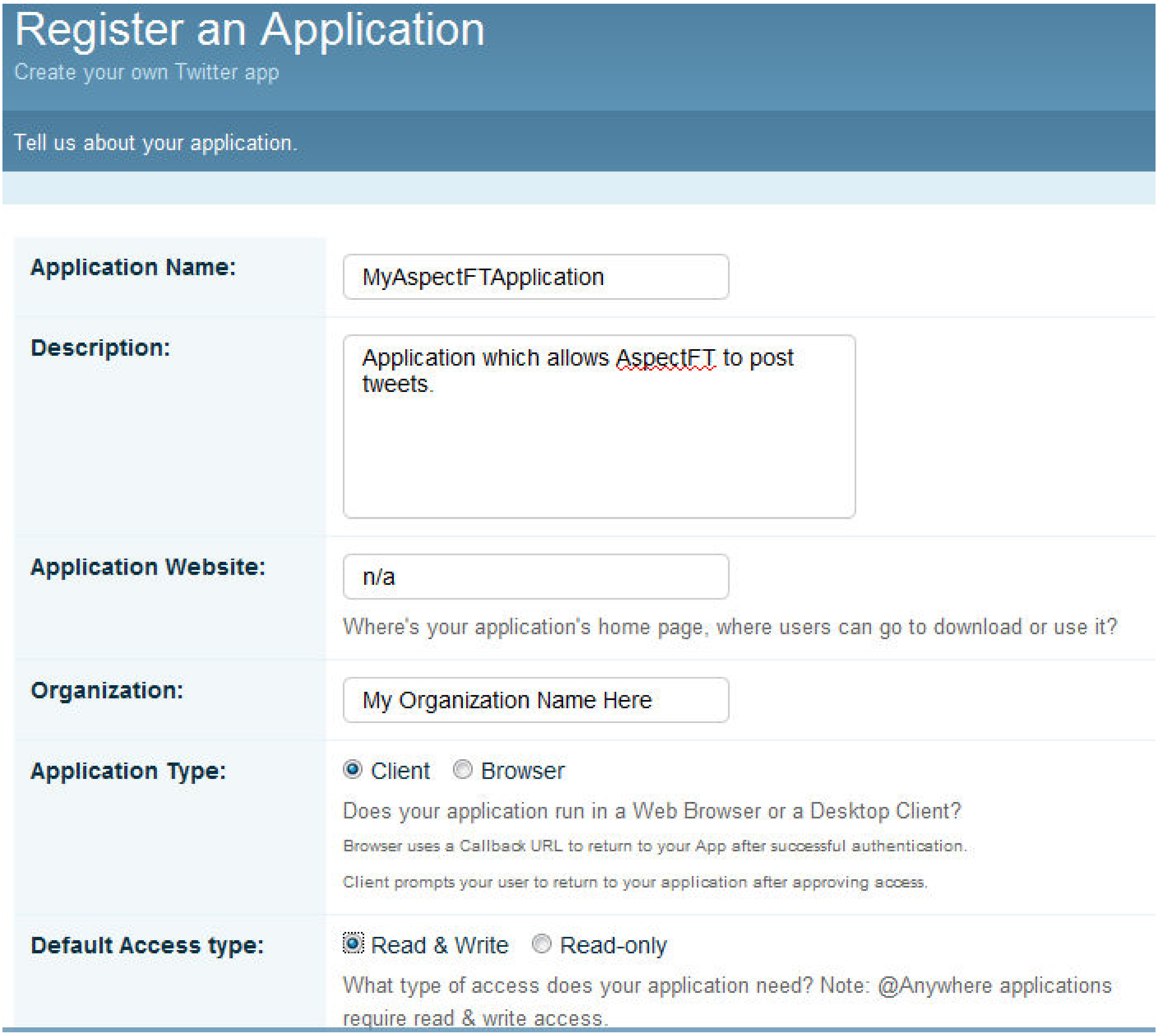
NOTE - AAM strongly recommends that it is considered good practice to log out of your Twitter account before requesting a PIN, especially if you are configuring an Aspect project to use multiple Twitter user accounts. Although not recommended by AAM, application authorizations can be shared between Twitter user accounts which could lead to mis-configured of your Tweet OAuth element if you are unknowingly logged into the wrong account in a web browser session when requesting a PIN.

Registering Your Application with Twitter

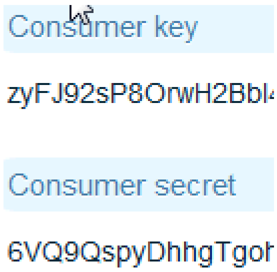
To register your application with Twitter, you must first log into the Twitter user account you wish to access via Aspect. Once you are logged in, access Twitter/Home and click on Settings, then Connections. Look for the Developers section and look for the option to edit the registration settings for applications.

If you cannot find this link, you can access the page directly by going to http://twitter.com/apps/new, or go to http://dev.twitter/com/start to register a new application.

Upon clicking the Register Your Own Twitter Application link, you will be provided with a form that you must fill out. Complete all of the steps requested by Twitter.com.



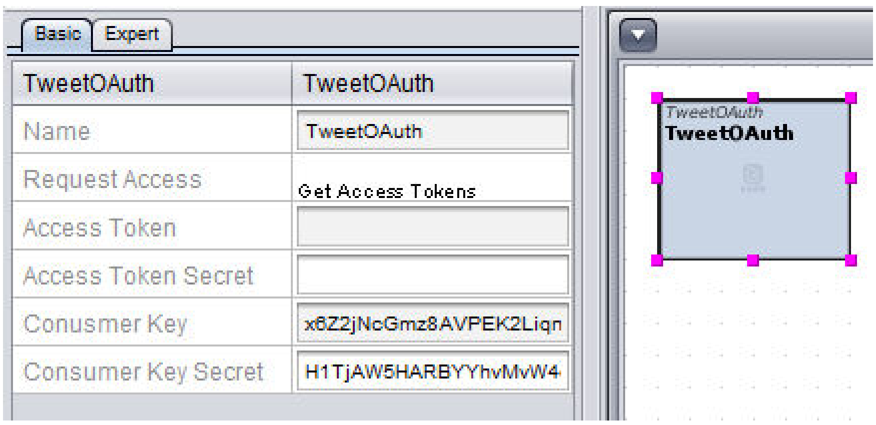
Once you have submitted this information, you will be given a Consumer Key, and Consumer Key Secret code that must be copied and pasted into the corresponding properties within the Tweet OAuth element.



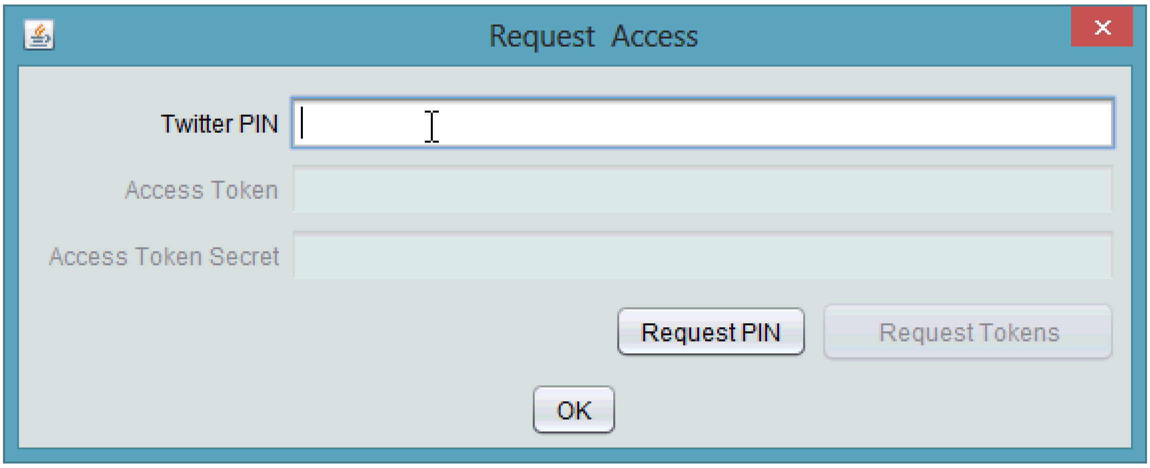
Requesting Access

Once you have registered your application, you must then request access to Twitter using the Request Access form. This step provides Aspect with the ability to request a PIN - which is required to obtain your Access Token and Access Token Secret keys for reading/writing Tweets. Perform the following steps as shown:

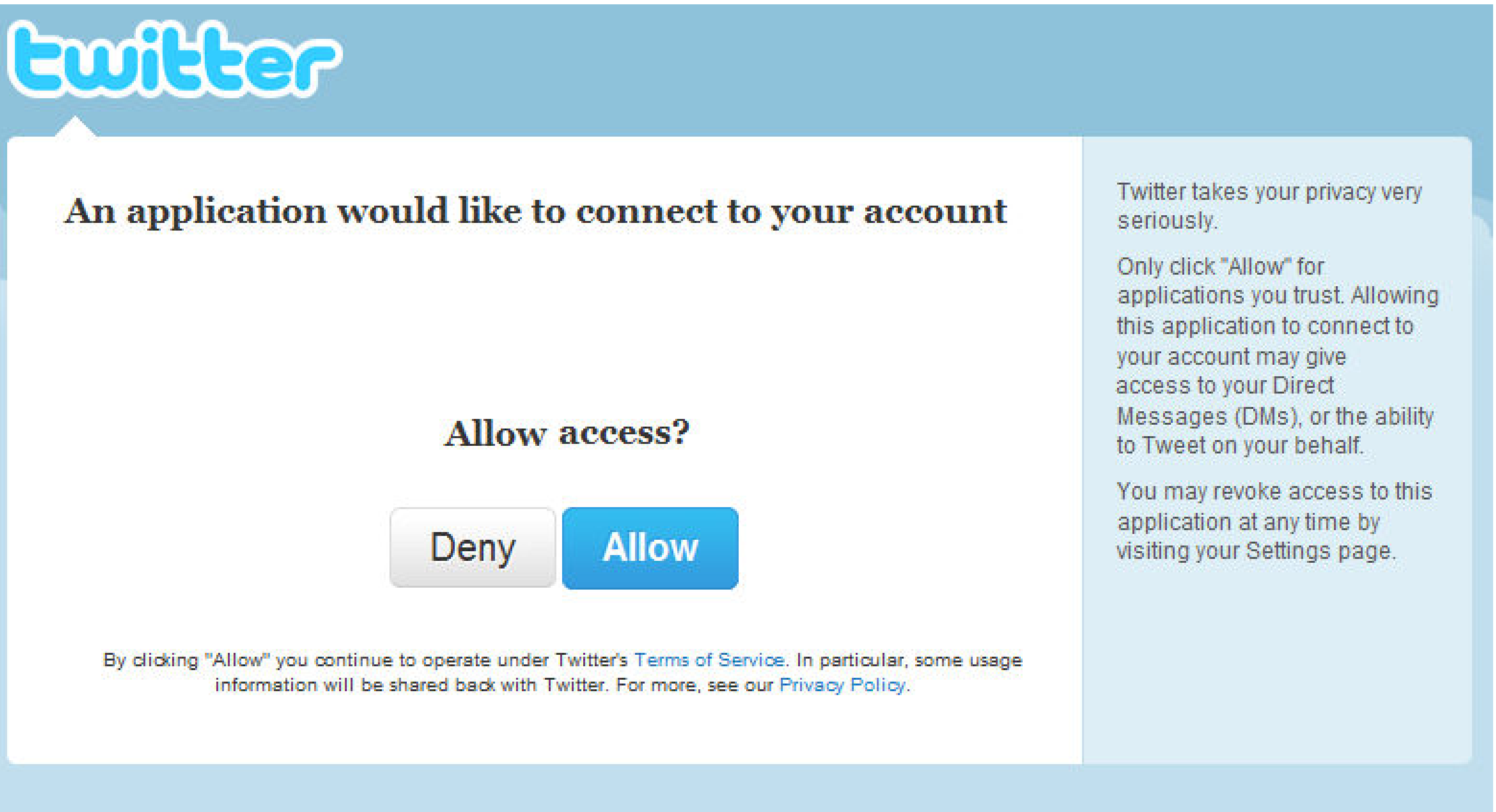
1. Once you have obtained your Consumer Key and Consumer Key Secret codes, copy and paste the codes into the corresponding properties within the Tweet OAuth element.



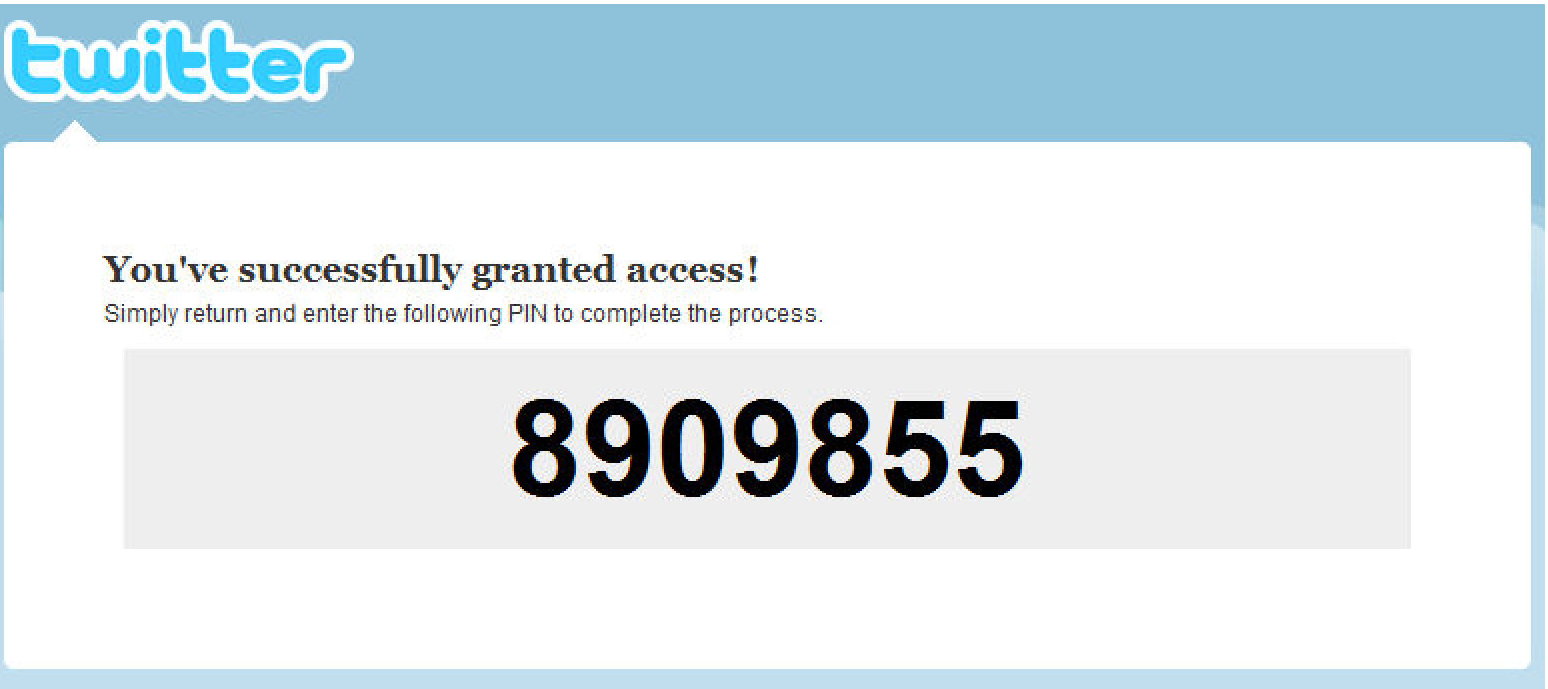
2. You must now request access. To do so, double-click the Request Access property value. This will invoke the access form.



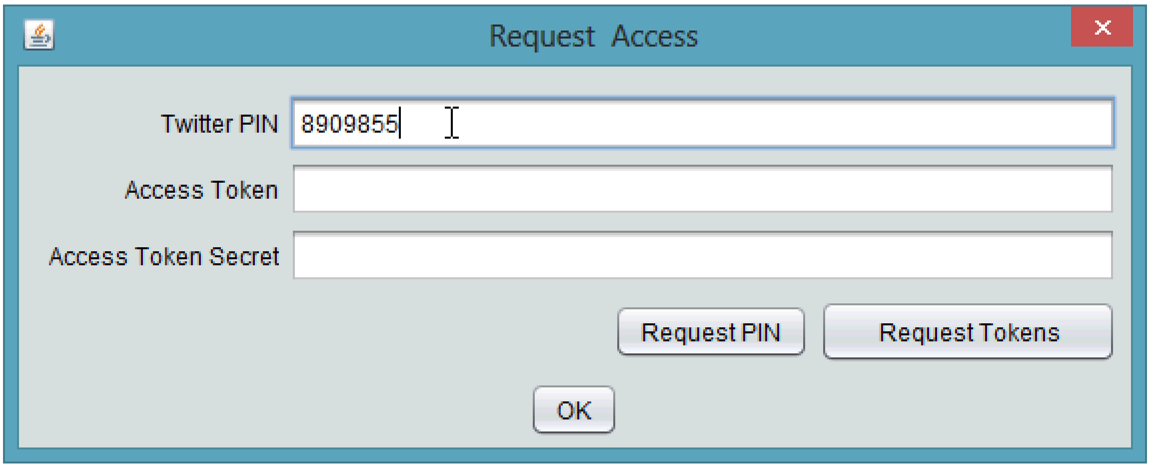
3. Click the Request PIN button. This will take you to Twitter's web-site, allowing you to request a PIN, which is necessary to gain your Access Token and Access Token Secret keys. At the web-page provided by Twitter, you must confirm/allow that you wish to allow access. Click Allow.



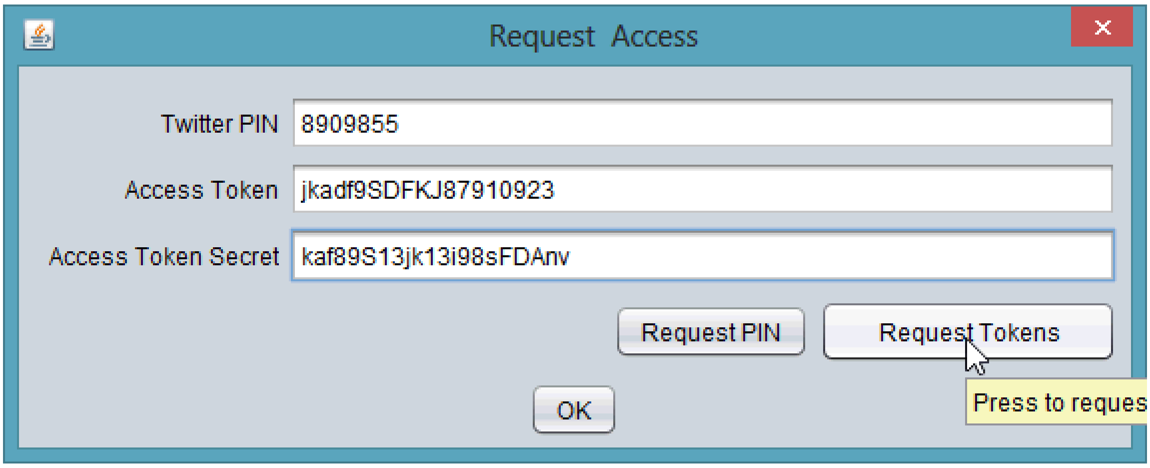
4. By clicking Allow, you will be provided with your PIN.



5. Type the PIN number into the PIN value field on the Access form.



6. Once you have entered your PIN, the Request Tokens button will then be available. Simply click the button to obtain your Access Token and Access Token Secret codes. When complete, click OK. The tokens requested will automatically be filled into the corresponding properties.



7. If you have received all of the access tokens and codes, Aspect is then ready to be configured to read/write Tweet messages using Tweet Reader and Tweet Writer elements

Twitter Configuration Notes

The following are common configuration notes to keep in mind while you are configuring Aspect for Twitter integration.

Upgrading Existing Projects prior to v1.05.00

If you are upgrading an existing project that uses Tweet readers and writers you will have to upgrade the Twitter driver jar file that was previously stored in the project driver folder. The new jar file is jtwitter-1.7.jar and is included in the /lib folder in your Aspect-Studio installation.

Access Token/Secret Pair Time Sensitivity

Each access token/secret pair is time sensitive. So it remembers the timestamp of the previous Tweet Reader or Tweet Writer request relative to any unique access token set. Be careful about the current time setting on the target server relative to the current time settings of other servers where you are deploying and the current time on the development computer that is running Aspect-Studio. If any of these time settings are out of sync, and an old time stamp is sent in a packet to Twitter.com a 401 unauthorized error will be returned.

Frequency of Tweet Read/Write Requests

Be careful to engineer your Tweet readers and writers so that you do not request more than 350 reads and/or writes in any one hour or you will be denied access.

Working with XPath

XPath Overview

XPath, also known as XML Path Language, is a query language routine used for selecting nodes and properties from an XML document. XPath is commonly used to retrieve information available in XML-based format and use it on web sites and other conventional routines.

The XPath language is based on a tree representation of an XML document and can be used to navigate around the tree by addressing XML nodes. XPath is an approved format of the World Wide Web Consortium (W3C), an international standard committee for the World Wide Web.

Within Aspect, XPath is supported as a means to retrieve and use data from open sources found on the Internet.

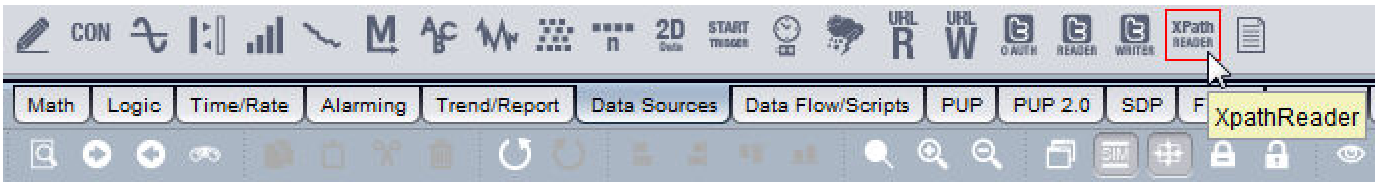
More Information

[The XPath Reader Element](#)

The XPath Reader Element

The XPath Reader Element

The XPath Reader element provides access to read information from XML documents using the XPath language. This element can be found under the Data Sources category of your Diagram palette.



To add the element to your workspace, perform the following steps:

1. From the Data Sources category, select the XPath Reader element from the palette.

2. Click and drop it onto your Diagram page.

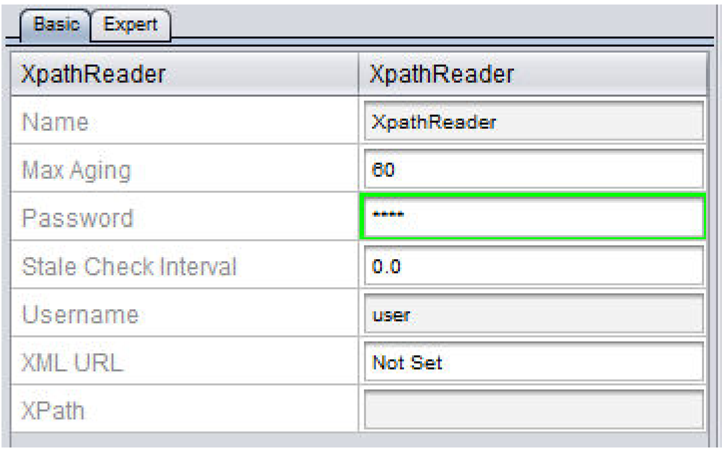
About the Output Pins

The XPath Reader element contains three output pins.

- Output - Sends the value retrieved by the XPath query.
- Retrieved XML - Sends the entire XML document and is helpful for debugging purposes.
- Status Message - Sends any error message for invalid XPath query syntax, URL timeouts, etc.

XPath Reader Properties

The XPath Reader element has several properties which are used to setup and configure the ability to read information from a published XML document. While a reference of these properties is available in the ViPR Reference, detailed information regarding core configuration is reviewed in this topic.



XPath Reader - Core Configuration Properties

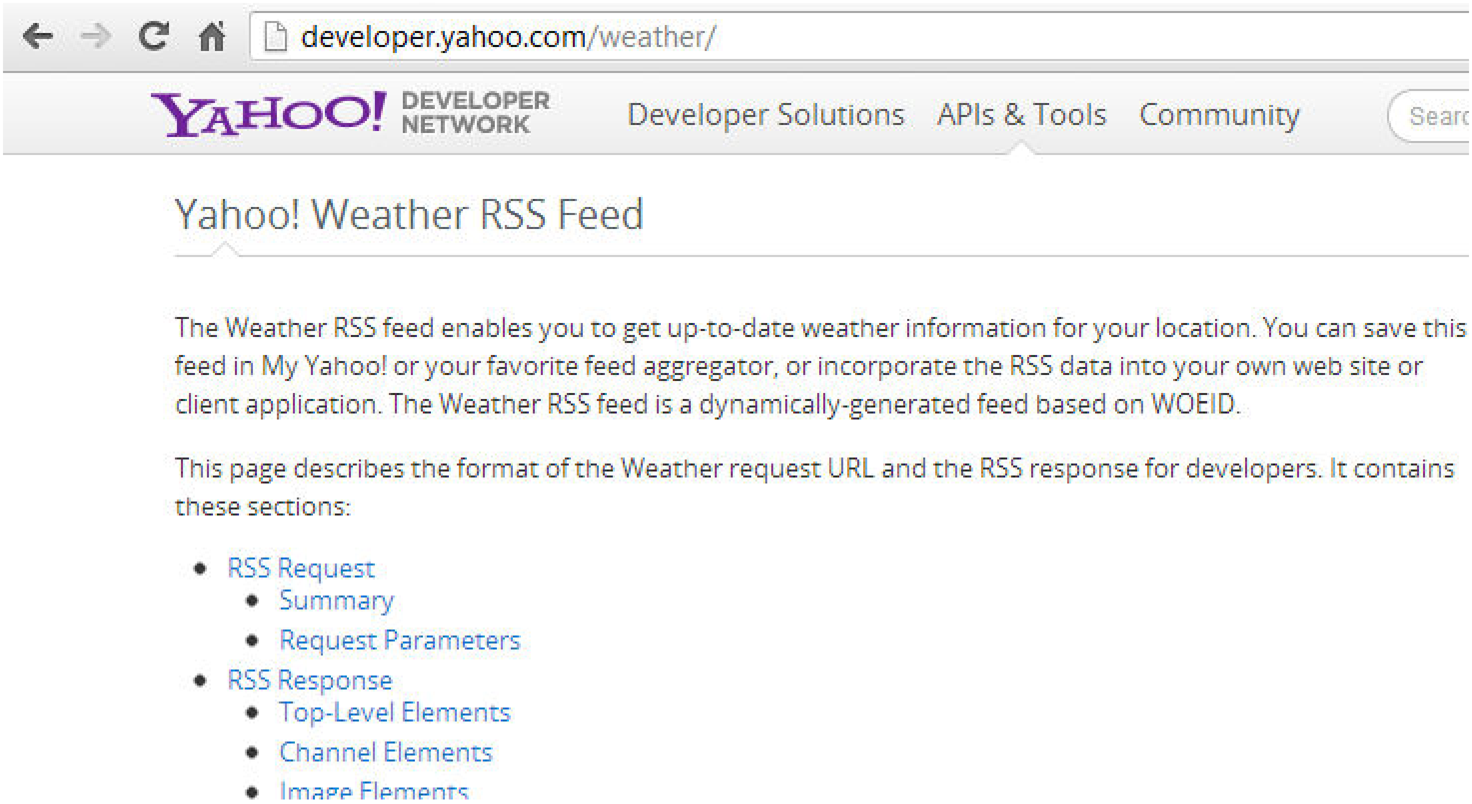
- XML URL - This property defines the location of the XML document, whether it be locally published on an Intranet, or publicly available on the Internet. The entire path (including "http://") must be provided and defined.
- XPath - This property defines the XPath query request that will be applied against the defined XML URL.

Example Usage of the XPath Reader

Example Site - Yahoo! Weather

A good working example and case usage of how XPath can be applied is through use of Yahoo! Weather, which provides an extensive API for retrieving weather data for any application you may have.

Detailed information regarding Yahoo! Weather API can be found at the following location - http://developer.yahoo.com/weather/. Complete details are provided on what URL to visit to find localized weather information.



Information

The Yahoo! Weather site provides information in the form of RSS Feeds. Because Yahoo! Weather's API for RSS feeds use XML technology, the XPath Reader element can be used to extract forecasted information.

The extracted information can then be later used in your project for any purpose - whether it be displaying it on a graphic screen, or using data such as Sunrise and Sunset times to enable and disable outdoor lighting for a particular site.

Getting Information from Yahoo Weather

As explained on the developer site for Yahoo Weather, information is obtained though the use of a determine XPath URL, in addition to a unique identifier number (known as a WOEID) that correlated to your location.

The XPath URL for obtaining data from Yahoo Weather is:

http://weather.yahooapis.com/forecastrss?w=location

The location portion of the XPath URL is your WOEID number. To determine your WOEID, visit the main weather page at http://weather.yahoo.com and enter your location into the Search field. When you select your city, you will be navigated to the weather forecast for your location. In your URL bar of your web browser, notice that a numeric ID will be displayed.

In the example shown below, the WOEID is 2401102. This value will be appended as the location for the base URL as mentioned above. Therefore, your complete base URL will be http://weather.yahooapis.com/forecastrss?w=2401102. This address will be inserted into the XPath URL property of the XPath Reader Element

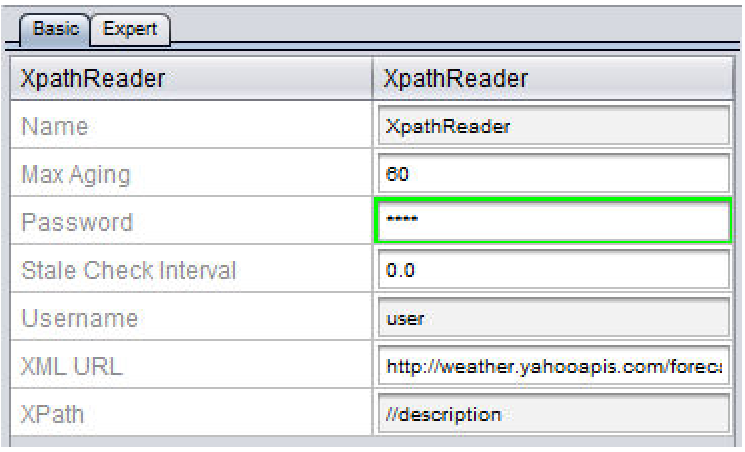
Example XML Document - Yahoo! Weather

The following screen shot provides an example XML document that is published by Yahoo! Weather.

```
:itle>Yahoo! Weather - Export, PA</title>
.ink>http://us.rd.yahoo.com/dailynews/rss/weather/Export__PA/*http://weather.yahoo.com/forecast/USP
lescription>Yahoo! Weather for Export, PA</description>
.anguage>en-us</language>
.astBuildDate>Fri, 07 May 2010 8:50 am EDT</lastBuildDate>
:tl>60</ttl>
weather:location city="Export" region="PA"   country="United States"/>
weather:units temperature="F" distance="mi" pressure="in" speed="mph"/>
weather:wind chill="54"   direction="0"   speed="0" />
weather:atmosphere humidity="72"  visibility=""  pressure="30.05"  rising="0" />
weather:astronomy sunrise="6:10 am"   sunset="8:18 pm"/>
.mage>
:itle>Yahoo! Weather</title>
ridth>142</width>
ieight>18</height>
.ink>http://weather.yahoo.com</link>
ırl>http://l.yimg.com/a/i/us/nws/th/main_142b.gif</url>
'image>
.tem>
:itle>Conditions for Export, PA at 8:50 am EDT</title>
jeo:lat>40.42</geo:lat>
jeo:long>-79.62</geo:long>
.ink>http://us.rd.yahoo.com/dailynews/rss/weather/Export__PA/*http://weather.yahoo.com/forecast/USP
oubDate>Fri, 07 May 2010 8:50 am EDT</pubDate>
weather:condition  text="Mostly Cloudy"  code="28"  temp="54"  date="Fri, 07 May 2010 8:50 am EDT"
```


Pulling Node Information

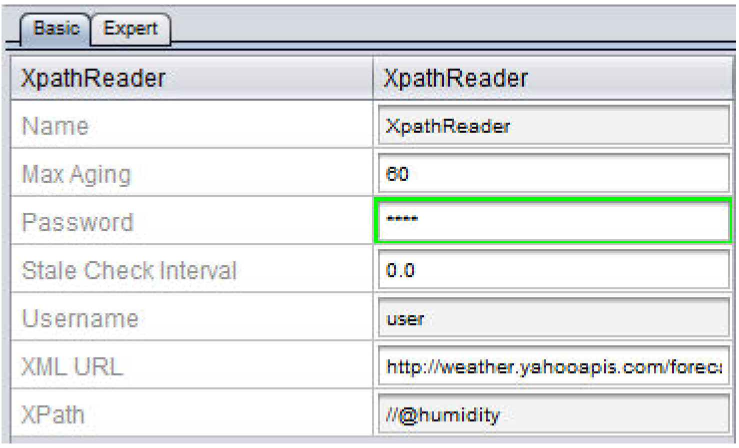
Nodes are purple in the above document.. Nodes are main header information within an XML document. For example, if I wish to pull the <description> node and display the text in Aspect, my XPath would be defined as //description.



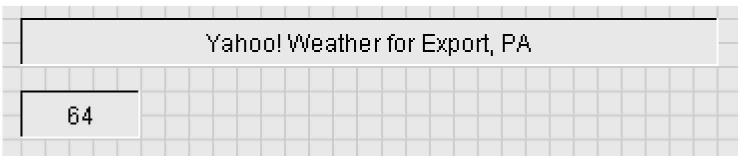
The result in Aspect-Studio:

Pulling Element Information

Elements are in bold black in the document. Properties are lower denominators of main nodes and typically provide detailed information. For example, if I wanted to pull in the current humidity, my XPath would be defined as //@humidity.



The result in Aspect-Studio:



Working with vSTAT

Working with vSTAT Overview

vSTAT is a mobile application designed to operate on iOS and Android smart phone platforms. This application enables mobile smart phone users the ability to monitor a zone, adjust temperature setpoints, and other custom functions. Prior to being able to use the app, an Aspect project must be designed/modified to allow vSTAT access.

This section of the online documentation discusses how to enable this capability. Information regarding the use of vSTAT for v1.x projects has been included, as well as information on how to perform rapid vSTAT configuration using v2.0 or later.

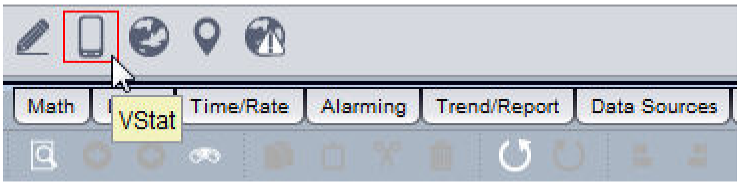
More Information

Overview of the vSTAT Element

Implementing Custom vSTAT Applications

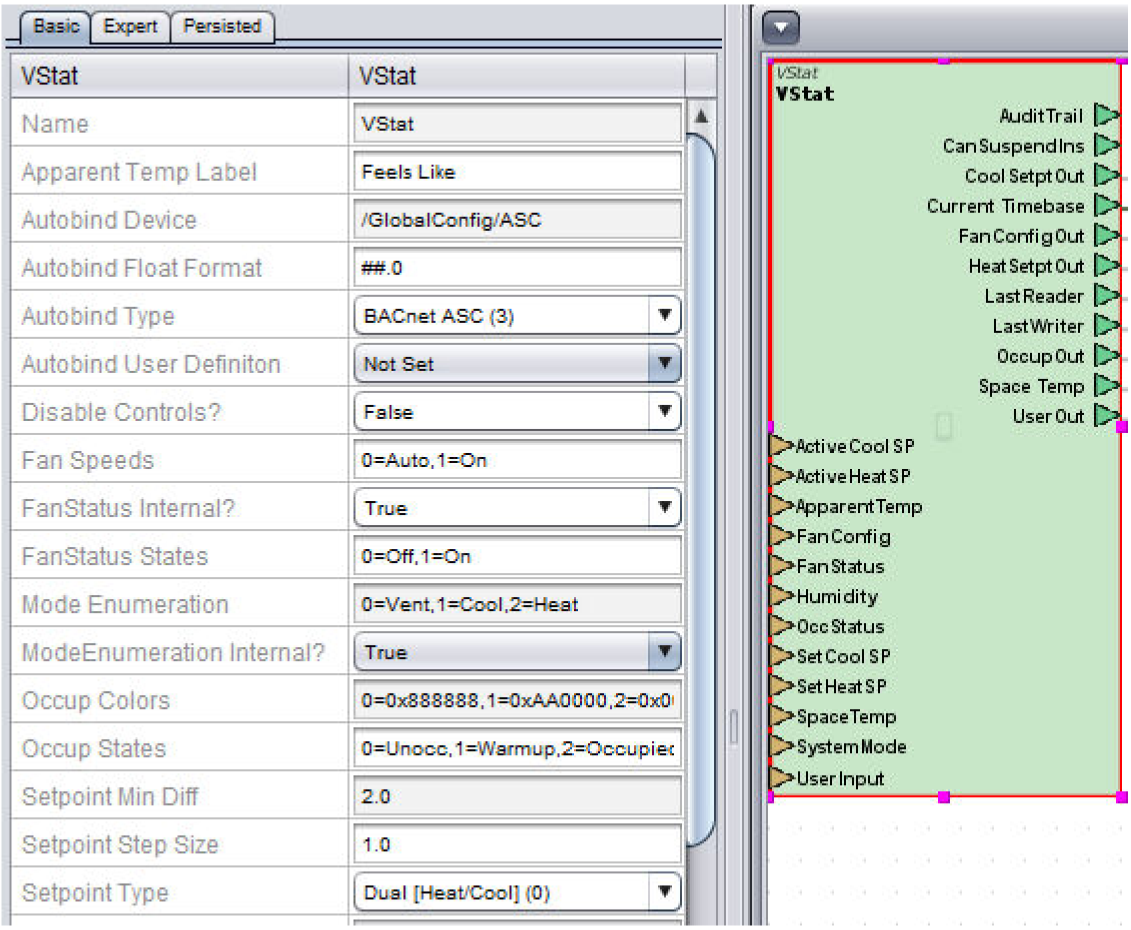
Overview of the vSTAT Element

To enable access into Aspect using the vSTAT mobile app, vSTAT elements must be created and programmed within your Aspect project. The vSTAT element is a single element located in the Mobile/Map category of the Diagram Palette.



Adding the vSTAT Element

To add a vSTAT element to your Diagram logic, simply click and drop the element onto your Diagram workspace.



The vSTAT element contains several input and output pins. These pins correspond to specific items that can be displayed to mobile users of the vSTAT application. Specific details regarding each input and output pin can be found in the Element Reference area of this help document, or by clicking here.

The very first step of configuring any vSTAT is to determine the setpoint type for configuration. By default, vSTATs are programmed as dual control (heating and cooling). This is done through the Setpoint Type property. Options are present for single setpoint (heating only/cooling only applications) as well as setpoint offset.

If your application involves using a single setpoint, the single setpoint value is commonly connected to corresponding cooling setpoint pins of the vSTAT element (regardless of whether the application is heating only or cooling only).

Implementing Custom vSTAT Applications for v1.x Projects

Implementing Custom vSTAT Applications Overview

While AAM provides several packaged components that reduce the amount of time necessary to create initial vSTAT programming, situations may occur that require alternative programming that may not fit into the configuration provided with bundles components. The following chapter discusses custom programming vSTAT elements to fit your application requirements.

Programming specific functions have been broken into individual topics and are ordered to assist with engineering while reading this document.

More Information

Connecting Zone Temperature

Connecting Schedule Status

Programming Dynamic Timebases for Continually Monitored Zone Information

Working with Heating and Cooling Setpoints

Working with Fan Configuration and Status

Connecting the Current Mode

Connecting Humidity

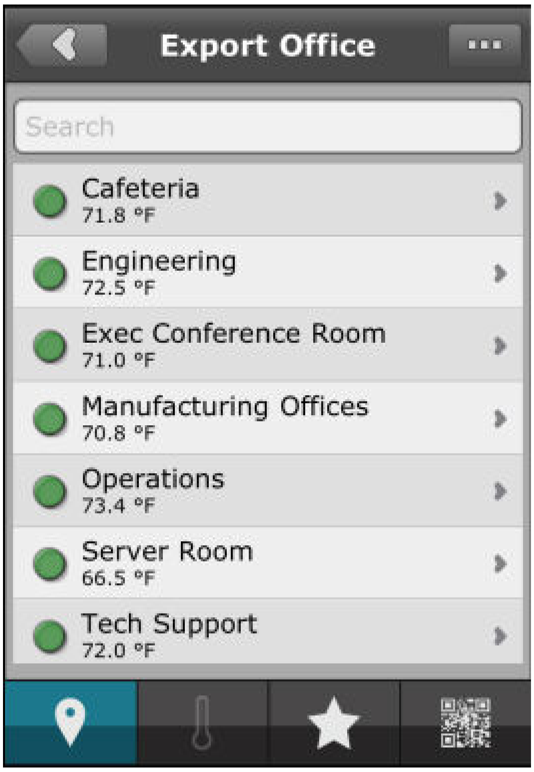
Working with Zone Temperature and Occupancy

Working with Zone Temperature and Occupancy Overview

When programming a custom vSTAT application, there are two specific items of data that are required to be polled on some continual basis. These two items are:

1. Zone Temperature/Space Temperature
2. Occupancy Status

These two parameters are continually monitored on some periodic basis to ensure that users visiting the location directory receive data from the server that is not stale, or aggressively polled (shown below).



Programming for these two parameters includes the following steps:

Connecting Zone Temperature

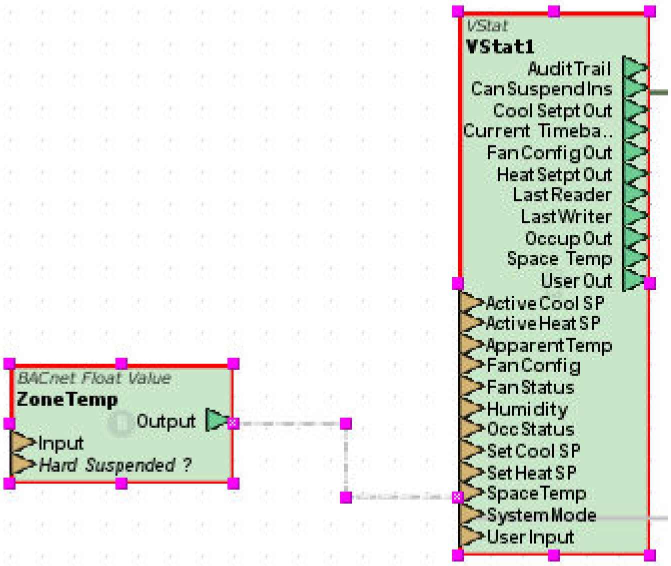
Connecting Schedule Status

Programming Dynamic Timebases for Continually Monitored Zone Information

Connecting Zone Temperature

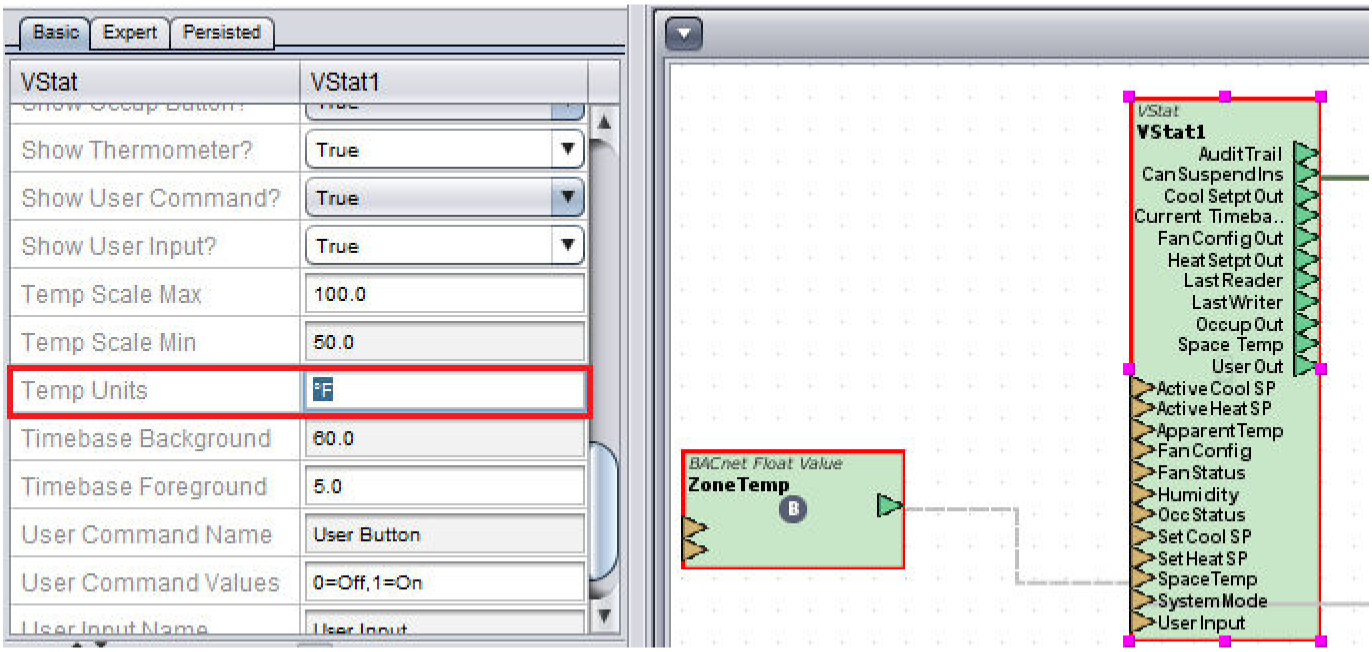
To connect the Zone Temperature for remote monitoring, connect the programmed output for Zone Temperature to the SpaceTemp input of the vSTAT element.

- For NB-ASCe Applications - BACnet Float programmed for AI0;-present-value
- For SBC-ASCe Applications - PUP Float programmed for FE00;ZT



Assigning the Proper Engineering Unit

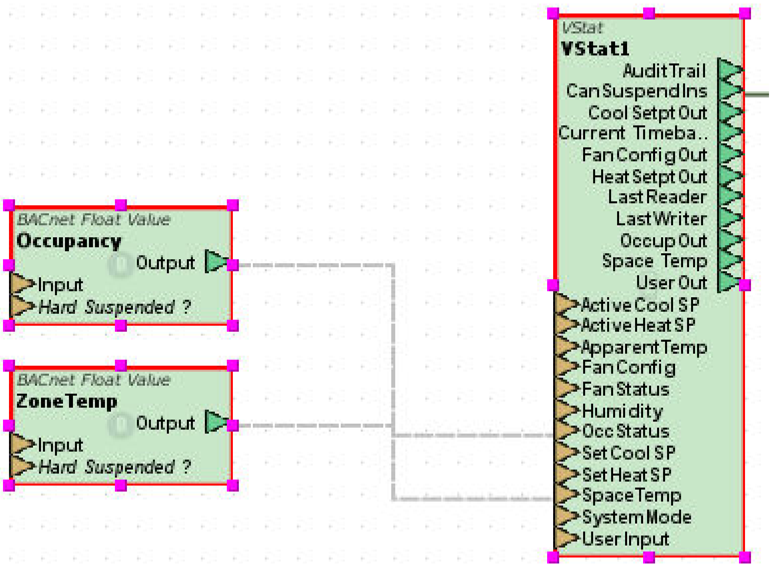
To reflect temperature engineering units, configure the Temp Units property. By default, a degree symbol is already present. Simply add the appropriate measurement unit type (e.g. Enter 'F' for Fahrenheit, or 'C' for Celsius) as shown below.



Connecting Schedule Status

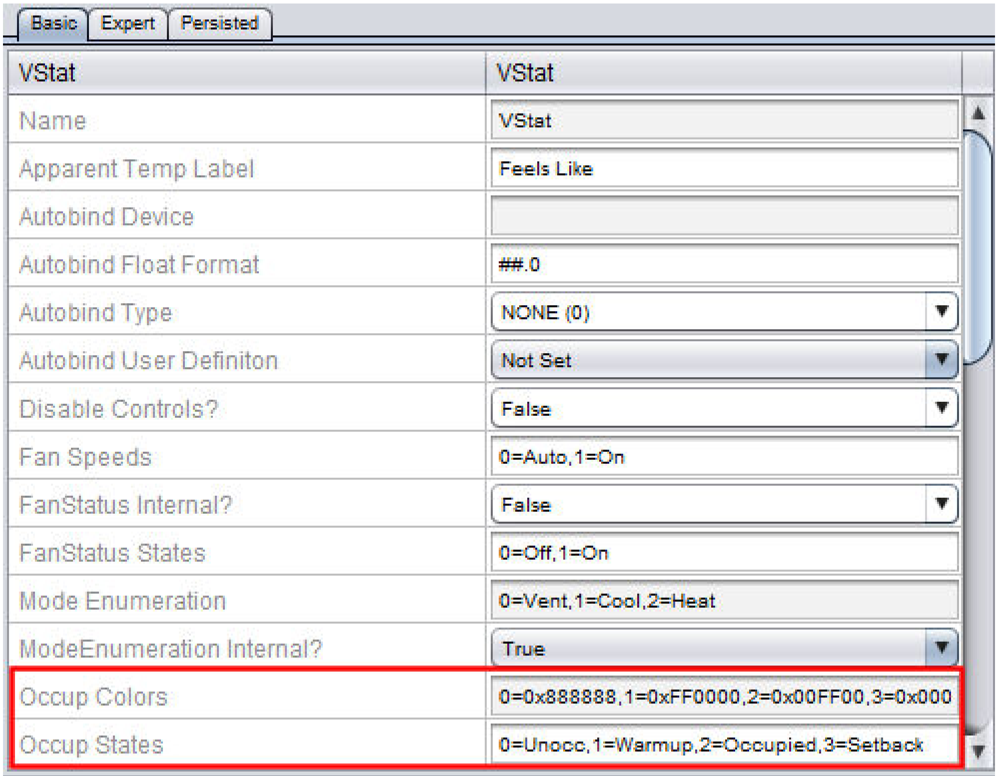
The vSTAT element includes an input for reflecting the current occupancy status of a zone. In most AAM products, this reflects the current value of the local Schedule (regardless of whether or not the device is operating based on a local Schedule or Host Override).

- For NB-ASCe Applications - BACnet Int programmed for AI0;PO
- For SBC-ASCe Applications - PUP Int programmed for F900;CV



Converting Value to Text

When connecting the field-bus point to the input, the Occup States property reflects displayed text to vSTAT users indicating the current schedule status. This text entry is a comma separated value string reflecting value to text. For example, AAM's four-mode schedule convention uses key values to indicate the occupancy status. By default, these values can be adjusted as needed for your application.



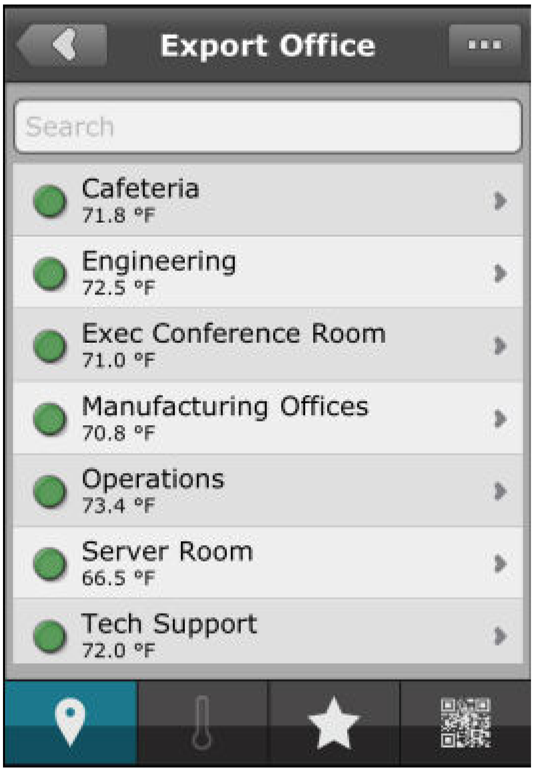
The Occup Colors property utilizes RGB Hex encoding values for assigning a color to each occupancy status. Using this method, users have over a million different color combinations that can be chosen for their application. By default, this property has been configured to show the following default colors:

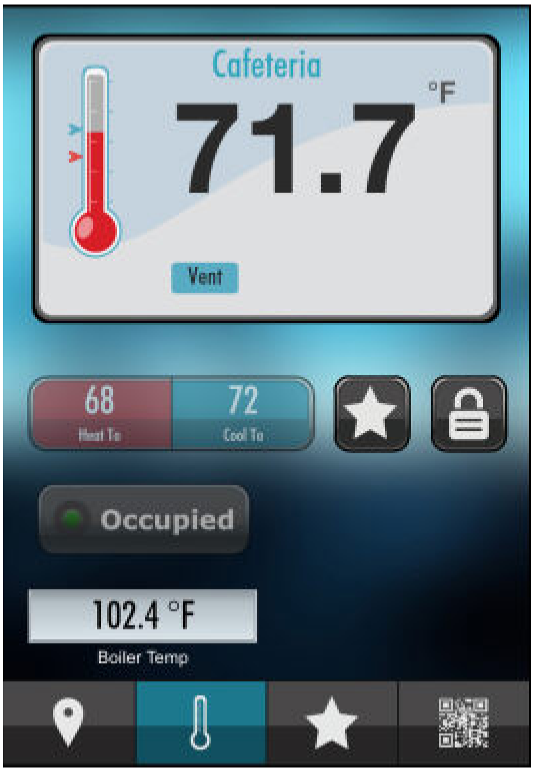
- Unoccupied (value of 0) = 0=0x888888
- Warmup (value of 1) = 1=0xFF0000
- Occupied (value of 2) = 2=0x00FF00
- Night Setback (value of 3) = 3=0x0000FF

Default Occup Colors: 0=0x888888,-
,1=0xFF0000,2=0x00FF00,3=0x0000FF

RGB Hex encoding values can be found here: [http://www.-colorschemer.com/online.html](http://www.colorschemer.com/online.html). Use the 6-digit Hex value and add 0x to the beginning of the value.

The colored orb is displayed in the directory listing of vSTATs for a location, as well as in the Occupancy Button of the main vSTAT interface itself.



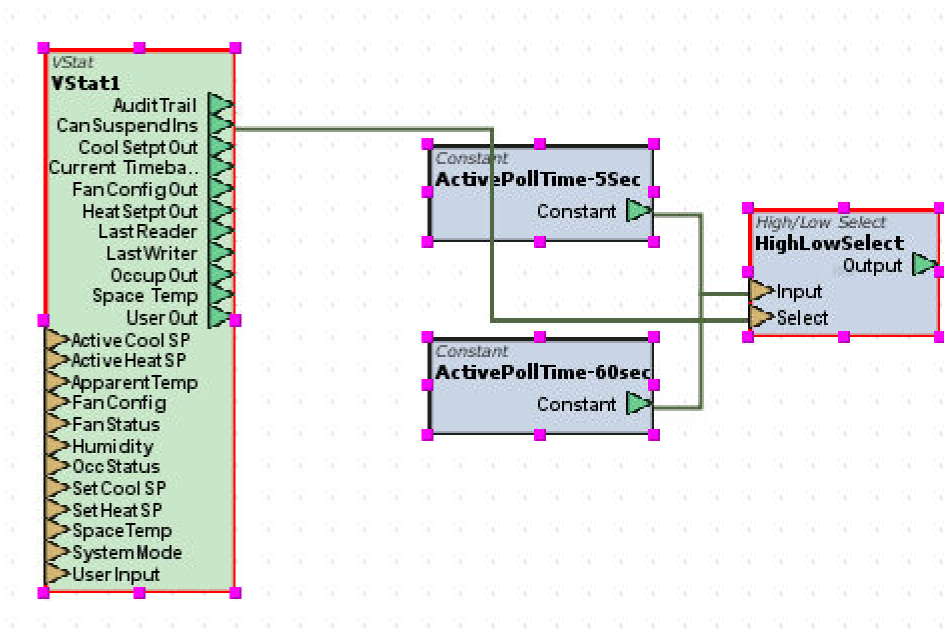


Programming Dynamic Timebases for Continually Monitored Zone Information

Because these two parameters must be polled periodically, it is recommended that the Timebases be adjusted in situations where a vSTAT is/isn't monitoring the zone. To perform this, logic must be established to switch between two different Timebases. Based on the output information of the CanSuspendIns output, the timebase can be set accordingly.

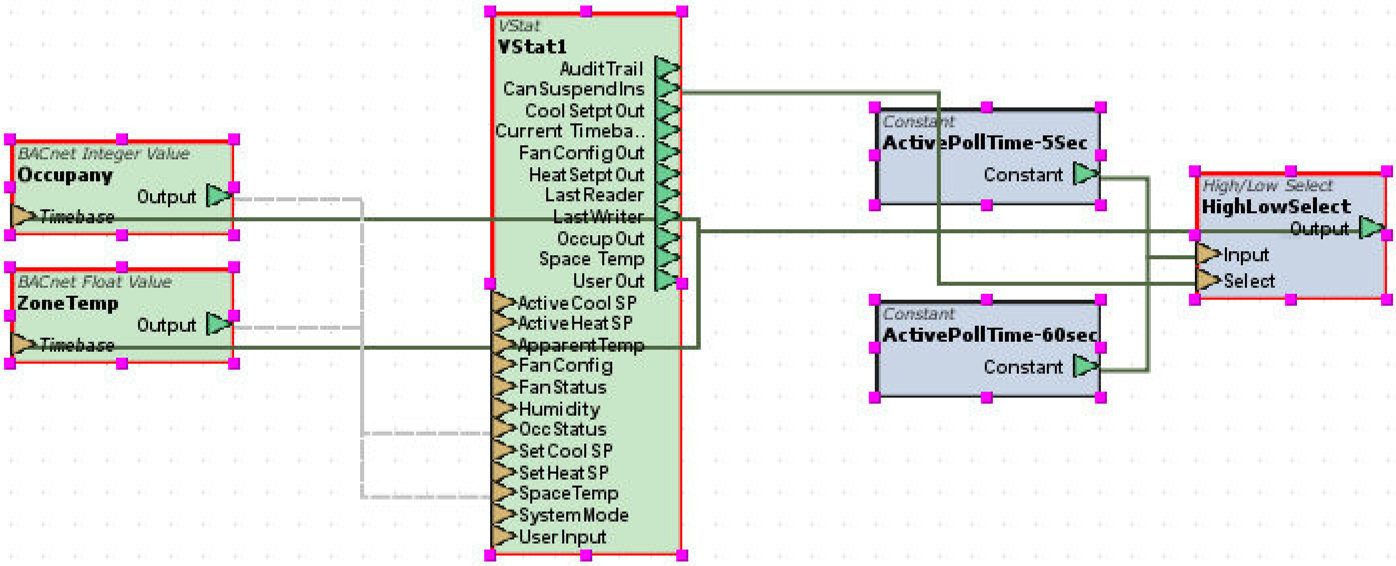
Creating Logic to Switch Between Timebases

Using custom logic available within Diagram mode, you may create logic to use a specific timebase interval. The following is an example of logic that uses two constants (one for active time set for 5.0, and another for inactive time set for 60.0). Both of these values are connected to the input of the High Low Select element. The CanSuspendIns output of the vSTAT element is then connected to the Select input of the High Low Select element.



In this logic sequence, a vSTAT user actively viewing a vSTAT zone will change the timebases of Zone Temp and Occupancy to 5.0 seconds, else, 60.0 seconds.

To complete the programming, you must expose the Timebase property for the Zone Temp and Occupancy field bus points using the Expose Property feature (right-click element, select Expose Property from shortcut menu). Once exposed, connect the output of the High Low Select to the newly exposed Timebase input pin.



Working with Heating and Cooling Setpoints

Working with Heating and Cooling Setpoints

Using vSTAT, users can not only monitor their current heating and cooling setpoints, but also modify said parameters. The vSTAT element contains four inputs that are used to link calculated setpoints based on schedule mode, as well as the direct setpoints for occupied mode.

Connecting Calculated Setpoints

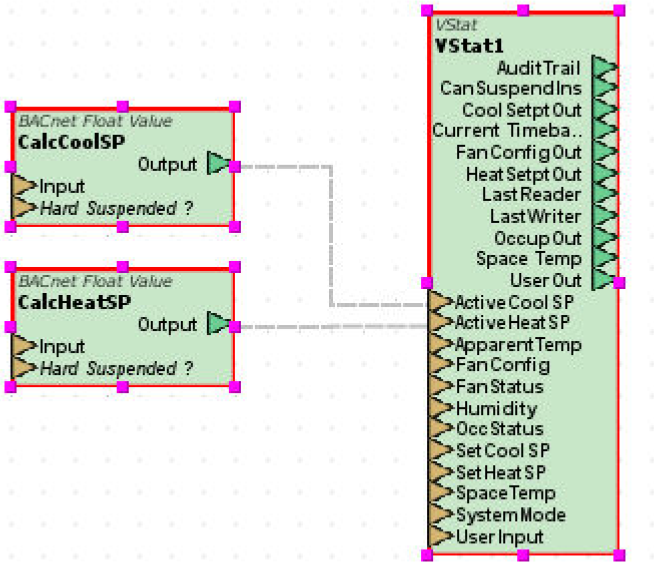
To connect the calculated setpoints for remote monitoring, connect the output of the programmed element for your Calculated Heating and Cooling Setpoints to the Active Heat SP and Active Cool inputs of the vSTAT element respectively.

For NB-ASCe Applications - BACnet Float programmed for:

- AI0;CC (Zone Temperature; CC - Calculated Cooling Setpoint)
- AI0;CH (Zone Temperature; CH - Calculated Heating Setpoint)

For SBC-ASCe Applications - PUP Float programmed for:

- FE00;CC (Calculated Cooling Setpoint)
- FE00;CH (Calculated Heating Setpoint)



Connecting Occupied Setpoints

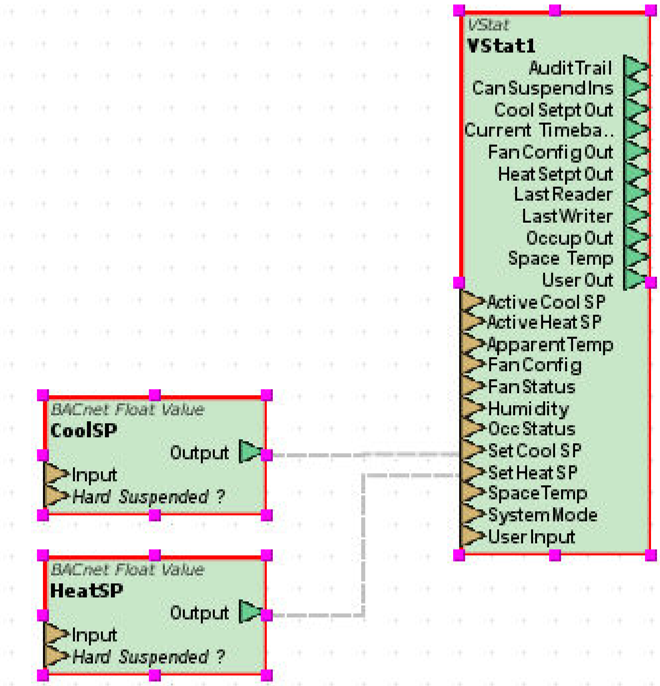
To connect the occupied setpoints for read/write, connect the output of the programmed element for your Occupied Heating and Cooling Setpoints to the Set Heat SP and Set Cool SP inputs of the vSTAT element respectively.

For NB-ASCe Applications - BACnet Float programmed for:

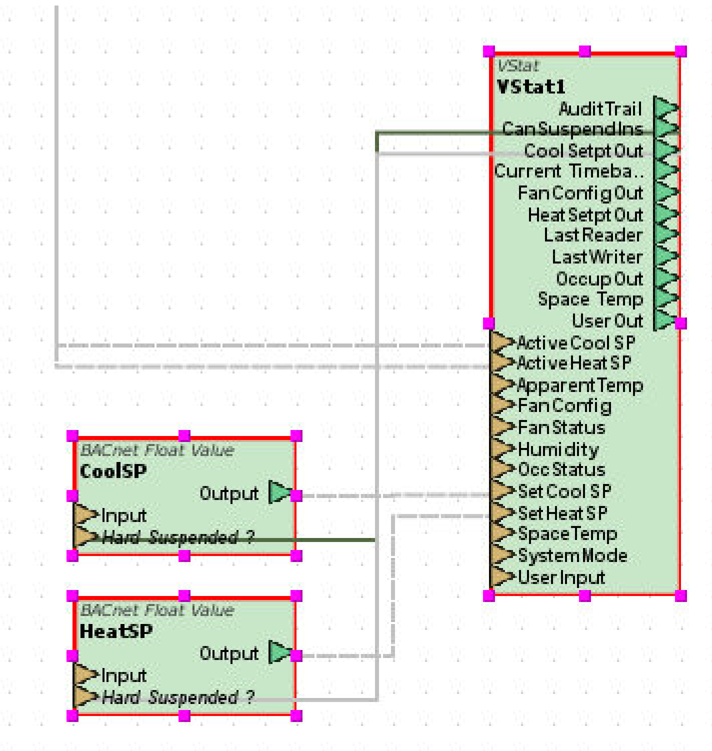
- AV1;present-value (Cool Setpoint; present-value)
- AI3;present-value (Heat Setpoint; present-value)

For SBC-ASCe Applications - PUP Float programmed for:

- FE00;SC (Occupied Cooling Setpoint)
- FE00;SH (Occupied Heating Setpoint)

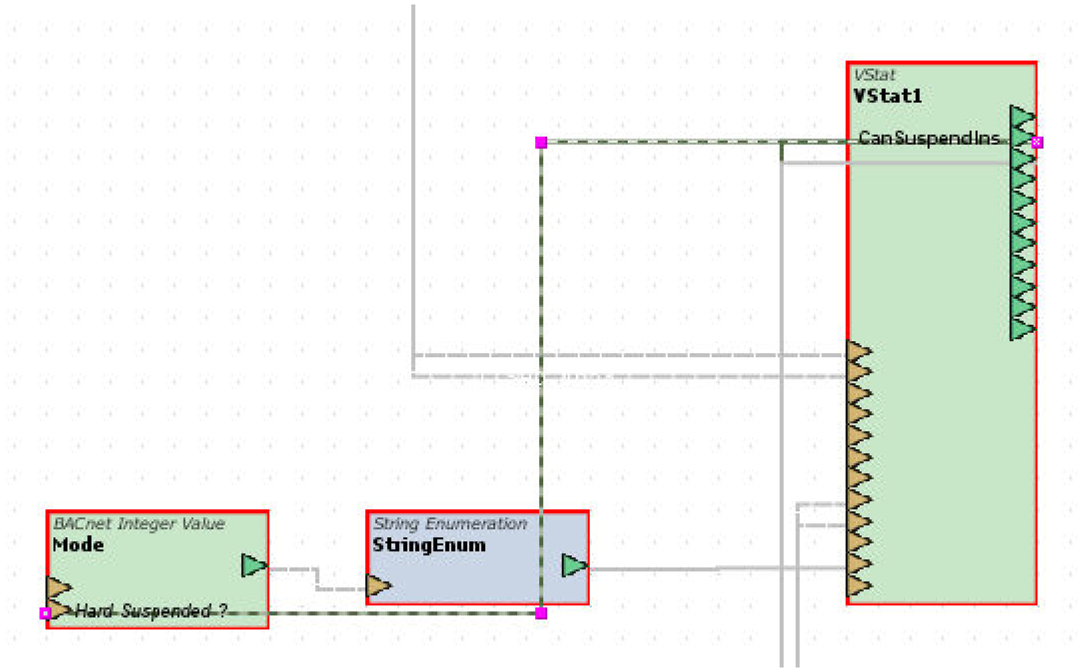


In order for setpoints to be adjusted by a vSTAT user, connect the Cool Setpt Out and Heat Setpt Out pins from the vSTAT element to the inputs of the cooling and heating setpoint field bus points respectively.



Effectively Hard Suspending the Setpoints

The setpoints need polled only when a vSTAT users actively monitors the zone. Therefore, the field bus points should be hard suspended when no users are monitoring the zone. To hard suspend the elements, expose the Hard Suspend element from the field bus points. Then, connect the CanSuspendIns output to the Hard Suspend input of the field bus points.



Working with Fan Configuration and Status

Working with Fan Configuration and Status

The vSTAT element includes inputs for reflecting the current equipment status of the fan, as well as its configuration (schedule operation mode, or fan speed).

The Fan Status input reflects whether or not the fan is on or off.

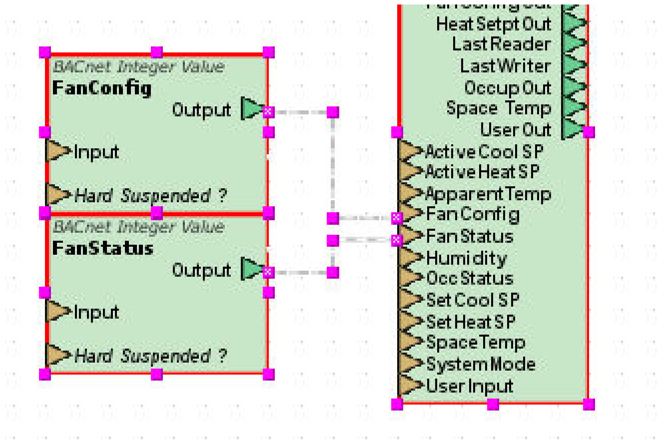
The Fan Config input reflects the operation of the fan. In VAV, Rooftop, and Heatpump applications, this may or may not be used depending on your application scenario. For three speed Fancoil applications, this would be used to reflect the speed setting of the fan (Off, Low, Med, High).

For VAV, Rooftop, and Heatpump Applications, the Fan Status should be programmed for:

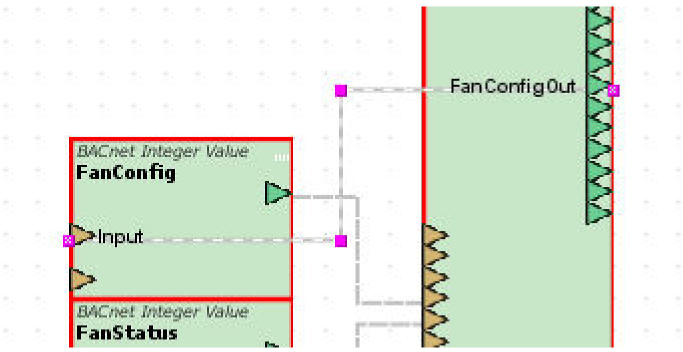
- For NB Applications - BACnet Enum programmed for BO1;present-value
- For SBC Applications - PUP Int programmed for FB01;CV

The Fan Config should be programmed for:

- For NB Applications - BACnet Enum programmed for BO1;FO (Occupied Mode)
- For SBC Applications - PUP Int programmed for FB01;FO

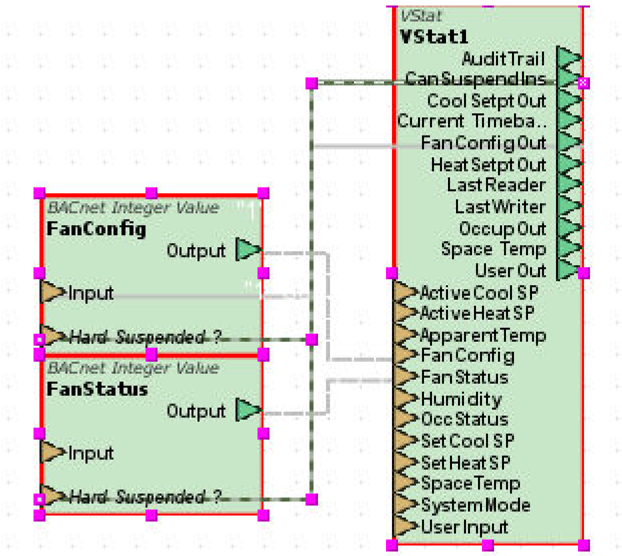


If you elect to allow users to adjust the Fan Config, connect the Fan Config Out pin from the vSTAT element and connect it to the input of the Fan Config field bus point.



Effectively Hard Suspending the Fan Status and Configuration

The mode needs polled only when a vSTAT users actively monitors the zone. Therefore, the field bus point should be hard suspended when no users are monitoring the zone. To hard suspend the elements, expose the Hard Suspend element from the field bus point. Then, connect the CanSuspendIns output to the Hard Suspend input of the field bus element.



Working with Other vSTAT Values

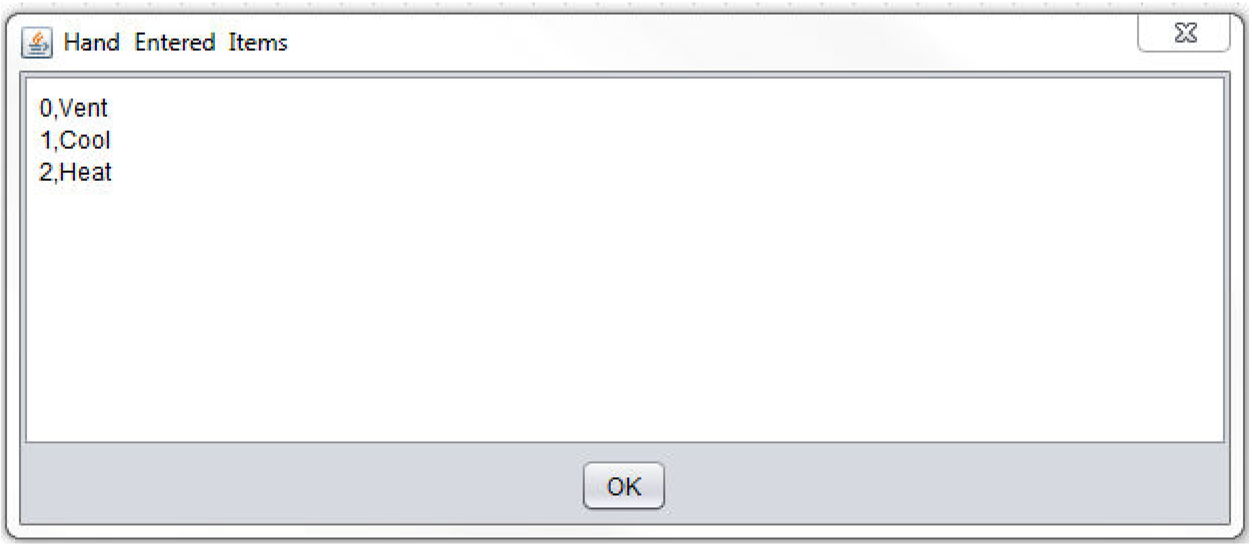
Connecting the Current Mode

The vSTAT element includes an input for reflecting the current operational mode of a zone. In most AAM-based ASC products, this reflects whether the zone is in Heating mode, Cooling mode, or Vent mode.

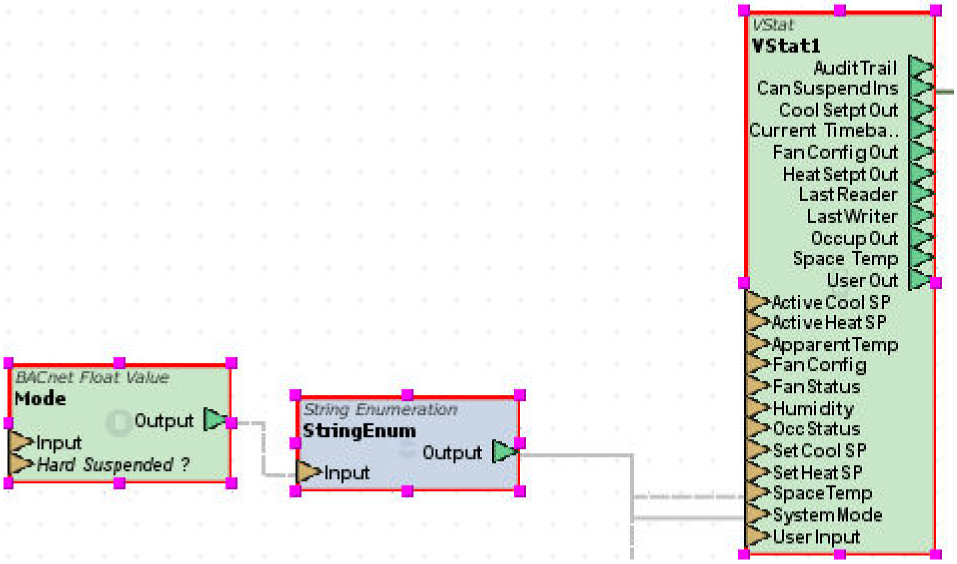
- For NB-ASCe Applications - BACnet Int programmed for AI0;DM
- For SBC-ASCe Applications - PUP Int programmed for FE00;DM

Using String to Enum for Text Conversion

When connecting the field-bus point to the input, a numeric value will be displayed on vSTAT. You can show text rather than a numeric value by using a String Enum element between the field-bus point and the SystemMode input. Configure the Hand Entered Properties of the String Enum as shown below.



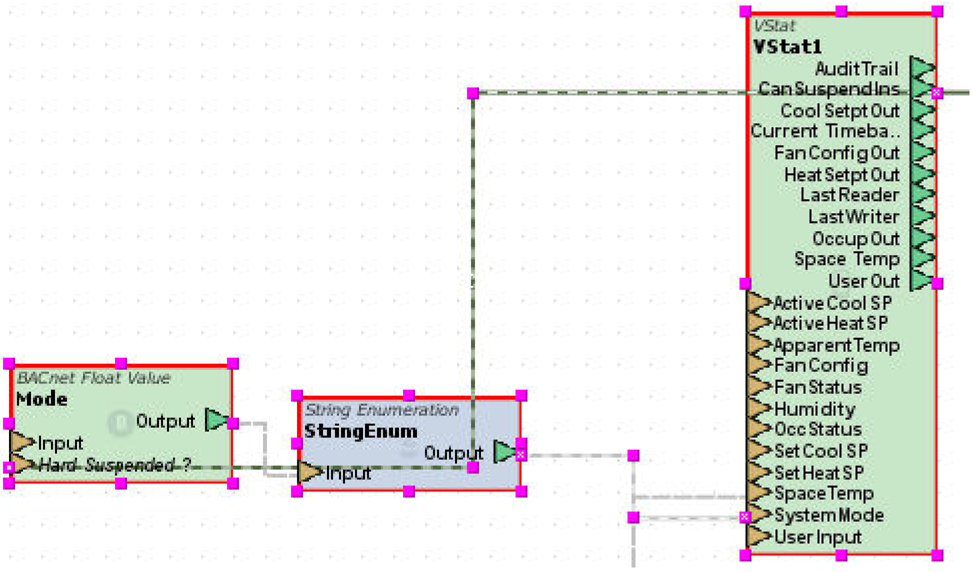
Then, inter-connect it between the field-bus point and the SystemMode input.



Effectively Hard Suspending the Mode

The mode needs polled only when a vSTAT user actively monitors the zone. Therefore, the field bus point should be hard suspended when no users are monitoring the zone. To hard suspend the elements, expose the Hard Suspend element from the field bus point. Then, connect the

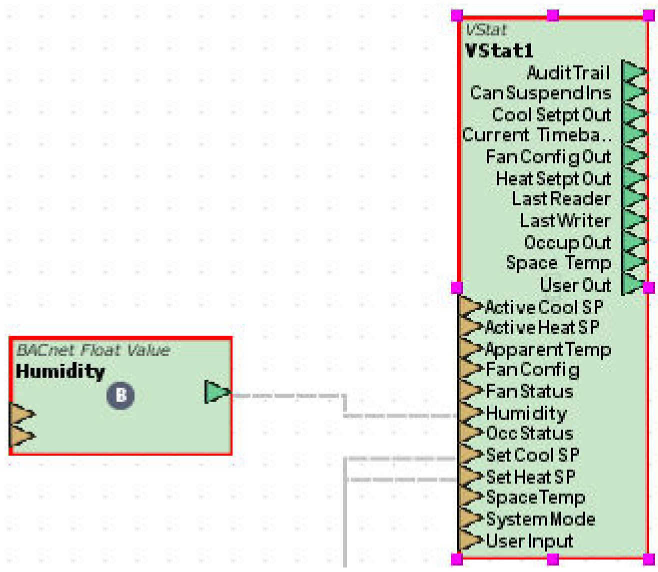
CanSuspendIns output to the Hard Suspend input of the field bus element.



Connecting Humidity

The vSTAT element includes an input for reflecting relative humidity of a zone. Humidity may be displayed if an NB-ASCe (Rooftop and Heatpump only) has a single SBC-RHT thermostat connected. In this scenario:

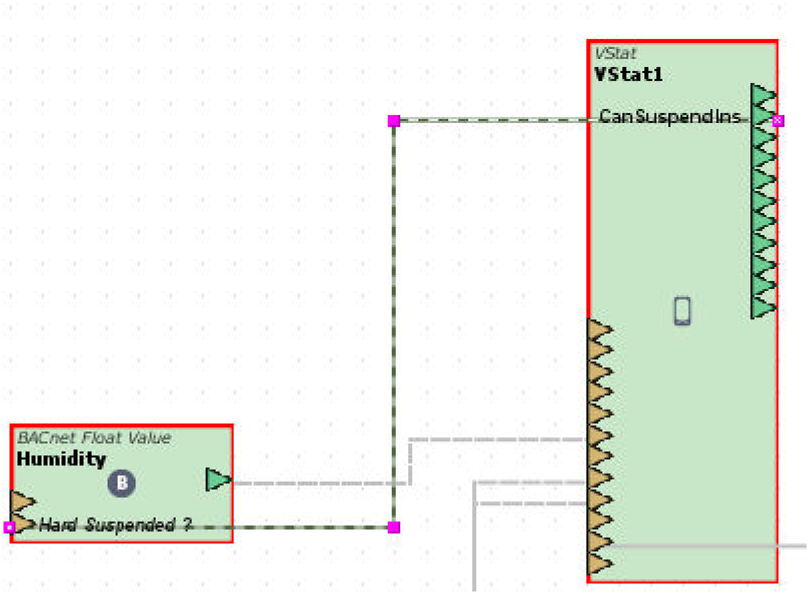
- For NB-ASCe Applications - BACnet Float programmed for AI10;-present-value
- For SBC-ASCe Applications - PUP Float programmed for FE00;RH



If you are using a third-party humidity sensor, it may be connected to a Universal Input. Consult your controller programming for more information on which input to reference.

Effectively Hard Suspending Humidity

The mode needs polled only when a vSTAT user actively monitors the zone. Therefore, the field bus point should be hard suspended when no users are monitoring the zone. To hard suspend the elements, expose the Hard Suspend element from the field bus point. Then, connect the CanSuspendIns output to the Hard Suspend input of the field bus element.



Implementing Custom vSTAT Applications using AutoBind

vSTAT Autobind Overview

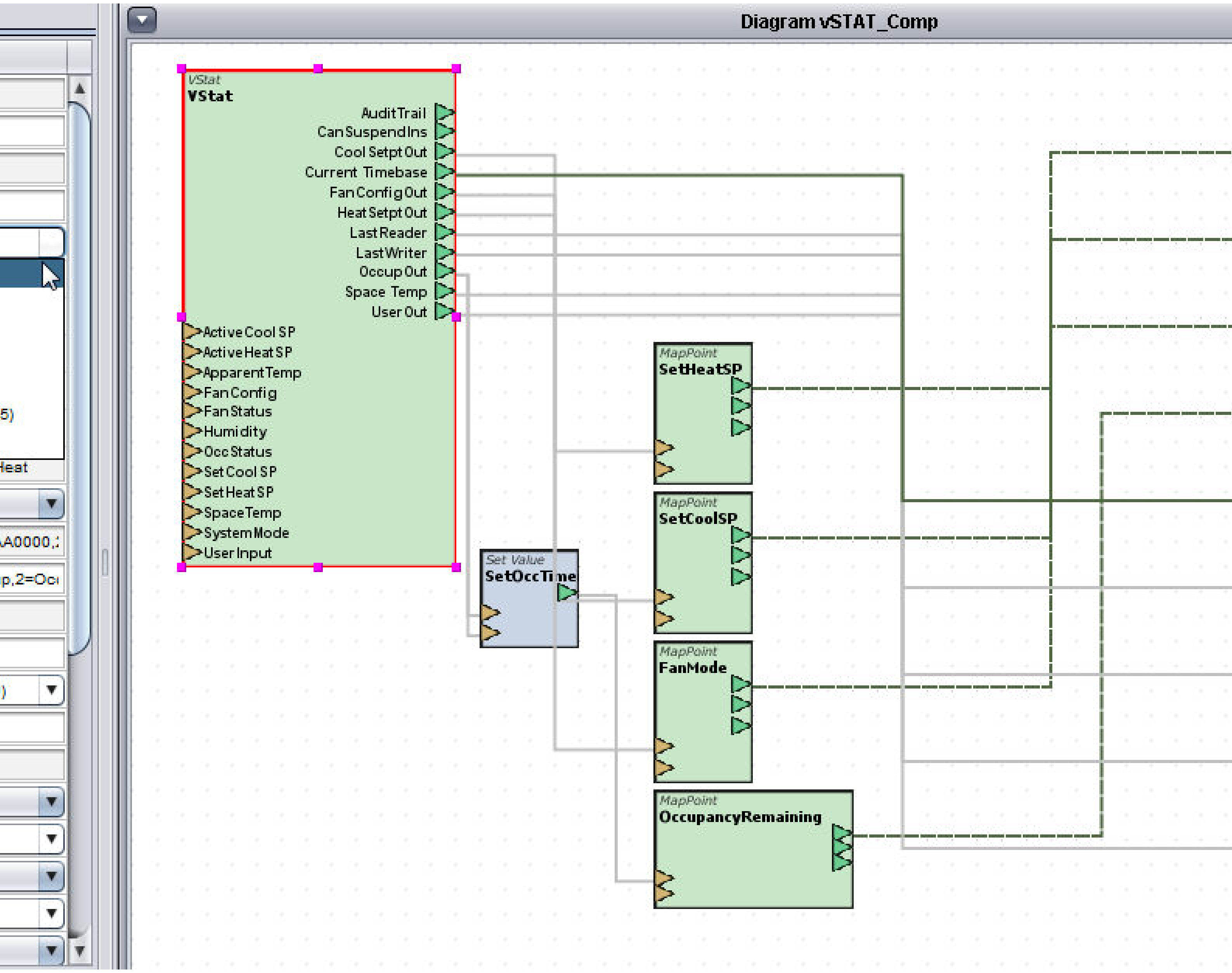
With the release of Aspect-Studio 2.0, the vSTAT element now supports the ability to "autobind" to a device. Autobind capabilities are supported with projects programmed using the previous methodology of device blocks, or through the use of streamlined Map configuration.

Autobind allows you to configure a vSTAT element with pre-configured inputs, eliminating the need to make several diagram connections between points and the vSTAT element.

There are six Autobind types:

Autobind Type	Description	Autobind Device Property Example
PUP ASC (1)	Uses a PUP Device element with a pre-configured autobind file shipped with Aspect-Studio	/GlobalConfig/SBC_ASC41
PUP USER (2)	Uses a PUP Device element with a user-configured autobind file designed by field technicians.	/GlobalConfig/SBC_ASC41
BACnet ASC (3)	Uses a BACnet Device element with a pre-configured autobind file shipped with Aspect-Studio.	/GlobalConfig/NB_ASC87
BACnet USER (4)	Uses a BACnet Device element with a user-configured autobind file designed by field technicians.	/GlobalConfig/NB_ASC87
Map ASC (5)	Uses a Map Device with a pre-configured autobind file shipped with Aspect-Studio	/C/3/3/149
Map USER (6)	Uses a Map Device with a user-configured autobind file designed by field technicians.	/C/3/3/149

PUP and BACnet Autobind types use the device path to reference a PUP or BACnet element. Map Autobind types use the ID Path of the Map device to reference the Map device.



More Information

[Creating an Autobind File]()

[Importing an Autobind File]()

[PUP ASC]()

[PUP USER]()

[BACnet ASC]()

[BACnet USER]()

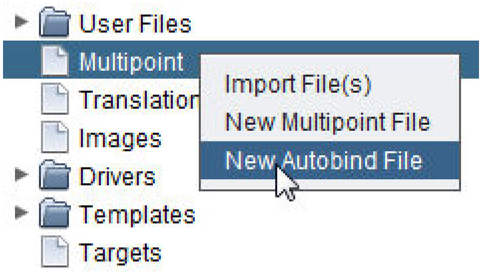
[Map ASC]()

[Map USER]()

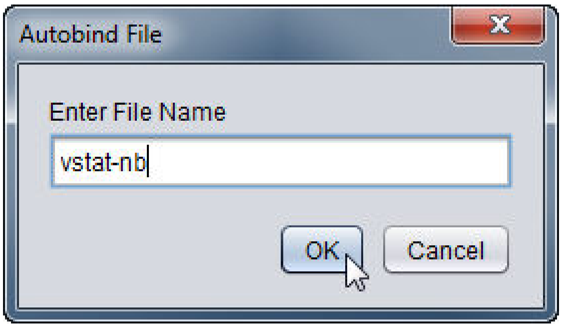
Creating a vSTAT Autobind File

To create an autobind file, perform the following steps:

1. From the Project Tree, Right click the Multipoint object and select "New Autobind File"

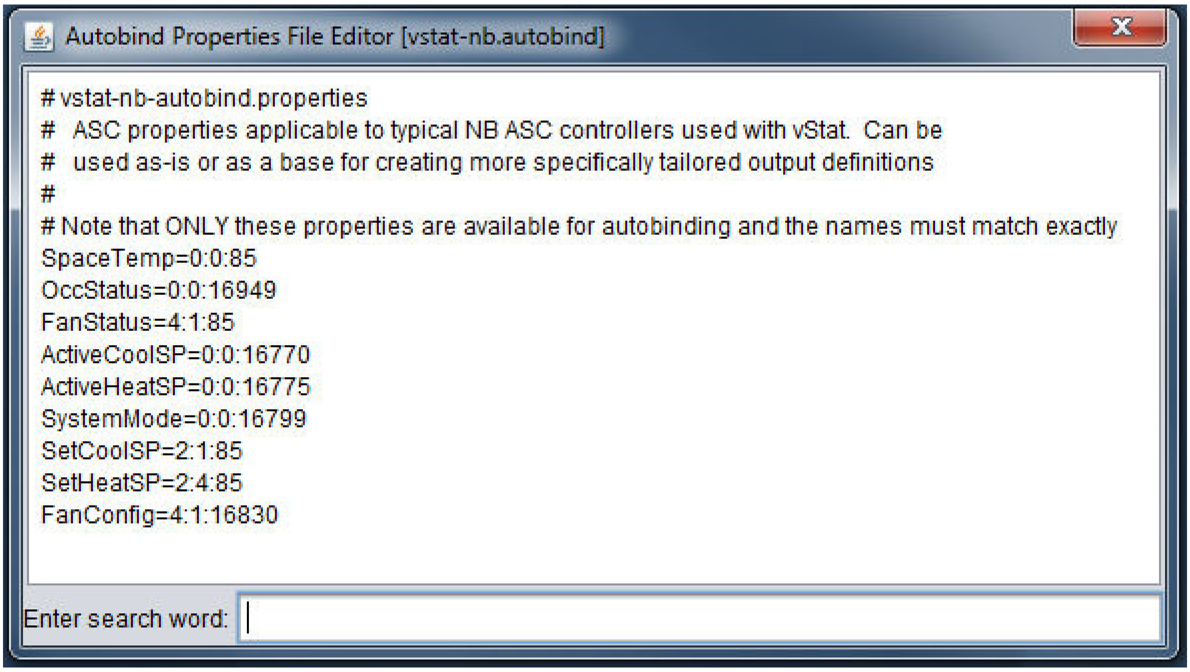


2. Choose a name for the autobind file and click OK:



3. The property names in the autobind file must not be changed. However, the properties can be changed to reference any point.

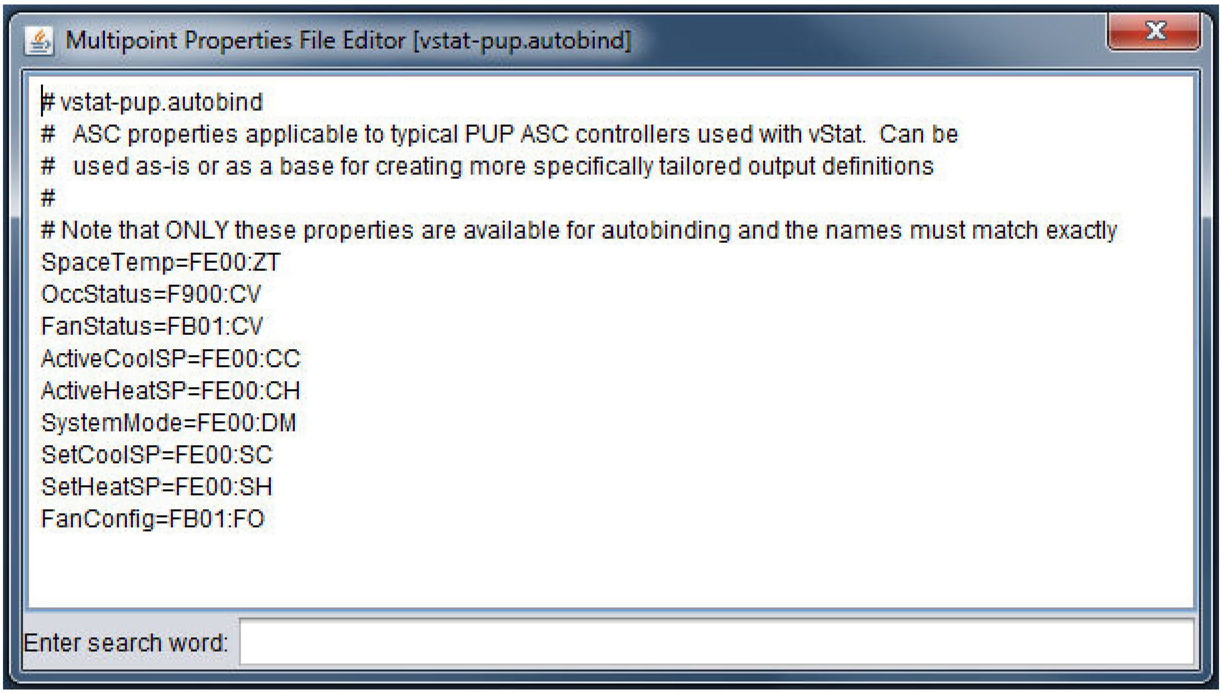
   The following graphics demonstrate typical examples of both NB-ASC and SBC-ASC Autobind configurations.



Autobind Properties File Editor [vstat-nb.autobind]

```
# vstat-nb-autobind.properties
#  ASC properties applicable to typical NB ASC controllers used with vStat.  Can be
#  used as-is or as a base for creating more specifically tailored output definitions
#
# Note that ONLY these properties are available for autobinding and the names must match exactly
SpaceTemp=0:0:85
OccStatus=0:0:16949
FanStatus=4:1:85
ActiveCoolSP=0:0:16770
ActiveHeatSP=0:0:16775
SystemMode=0:0:16799
SetCoolSP=2:1:85
SetHeatSP=2:4:85
FanConfig=4:1:16830
```

Enter search word:



Multipoint Properties File Editor [vstat-pup.autobind]

```
# vstat-pup.autobind
#  ASC properties applicable to typical PUP ASC controllers used with vStat.  Can be
#  used as-is or as a base for creating more specifically tailored output definitions
#
# Note that ONLY these properties are available for autobinding and the names must match exactly
SpaceTemp=FE00:ZT
OccStatus=F900:CV
FanStatus=FB01:CV
ActiveCoolSP=FE00:CC
ActiveHeatSP=FE00:CH
SystemMode=FE00:DM
SetCoolSP=FE00:SC
SetHeatSP=FE00:SH
FanConfig=FB01:FO
```

Enter search word:

The two example files above are included in the Multipoint folder of the Aspect-Studio installation. (C:\Program Files\American Auto-Matrix\Aspect-Studio-2.00.00\Multipoint\ )

More Information

vSTAT Autobind Overview

Importing an Autobind File

PUP ASC

PUP USER

BACnet ASC

BACnet USER

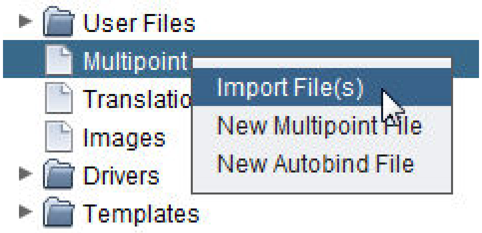
Map ASC

Map USER

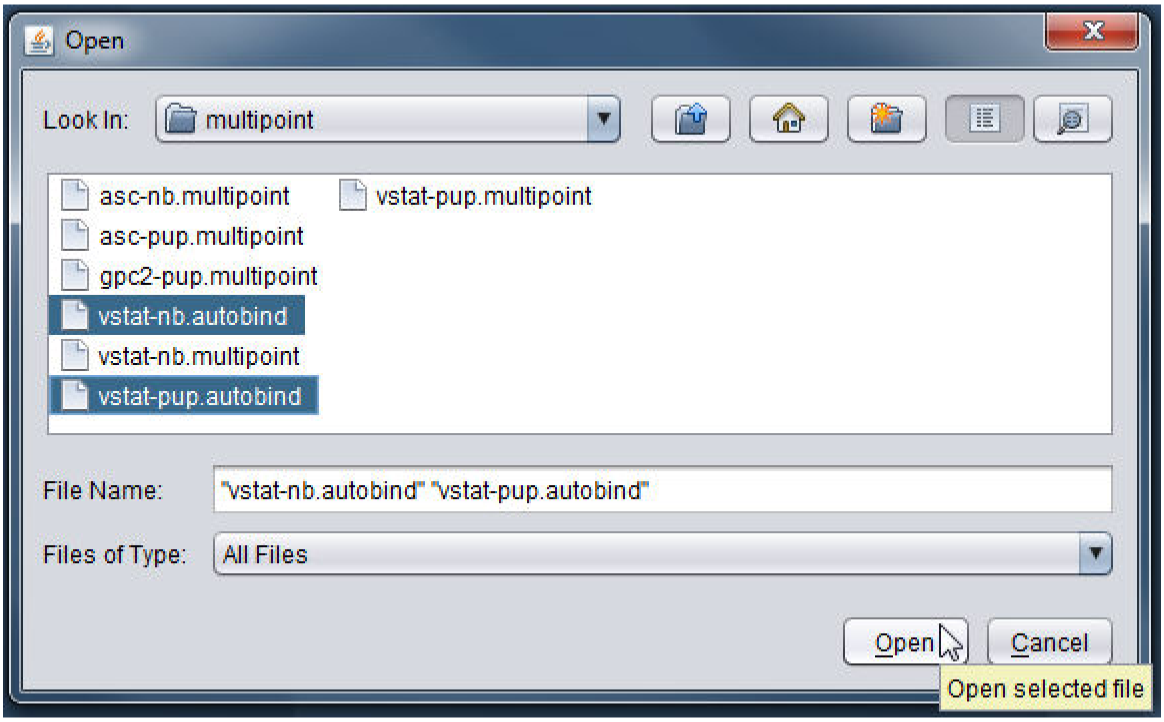
Importing a vSTAT Autobind File

To import an autobind file, perform the following steps:

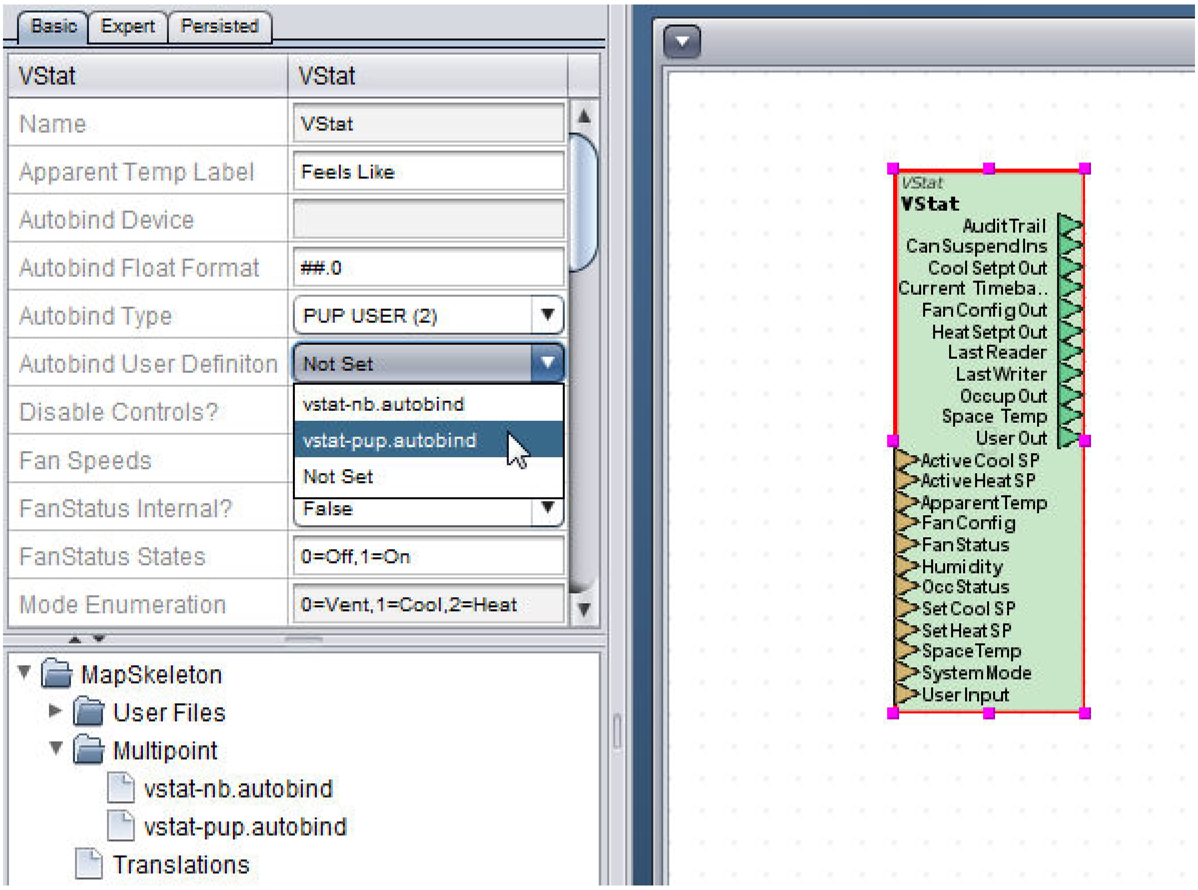
1. From the Project Tree, Right click the Multipoint object and select "Import File(s)"



2. Navigate to the directory containing the autobind file. Select the autobind file and click Open. (Hint: Hold the CTRL key to select multiple files.)



3. The autobind files will appear under the Multipoint directory and will be available for use in the vSTAT Element by selecting the file from the Autobind User Definition drop-down menu.



More Information

[vSTAT Autobind Overview]

[Creating an Autobind File]

[PUP ASC]

[PUP USER]

[BACnet ASC]

[BACnet USER]

[Map ASC]

[Map USER]

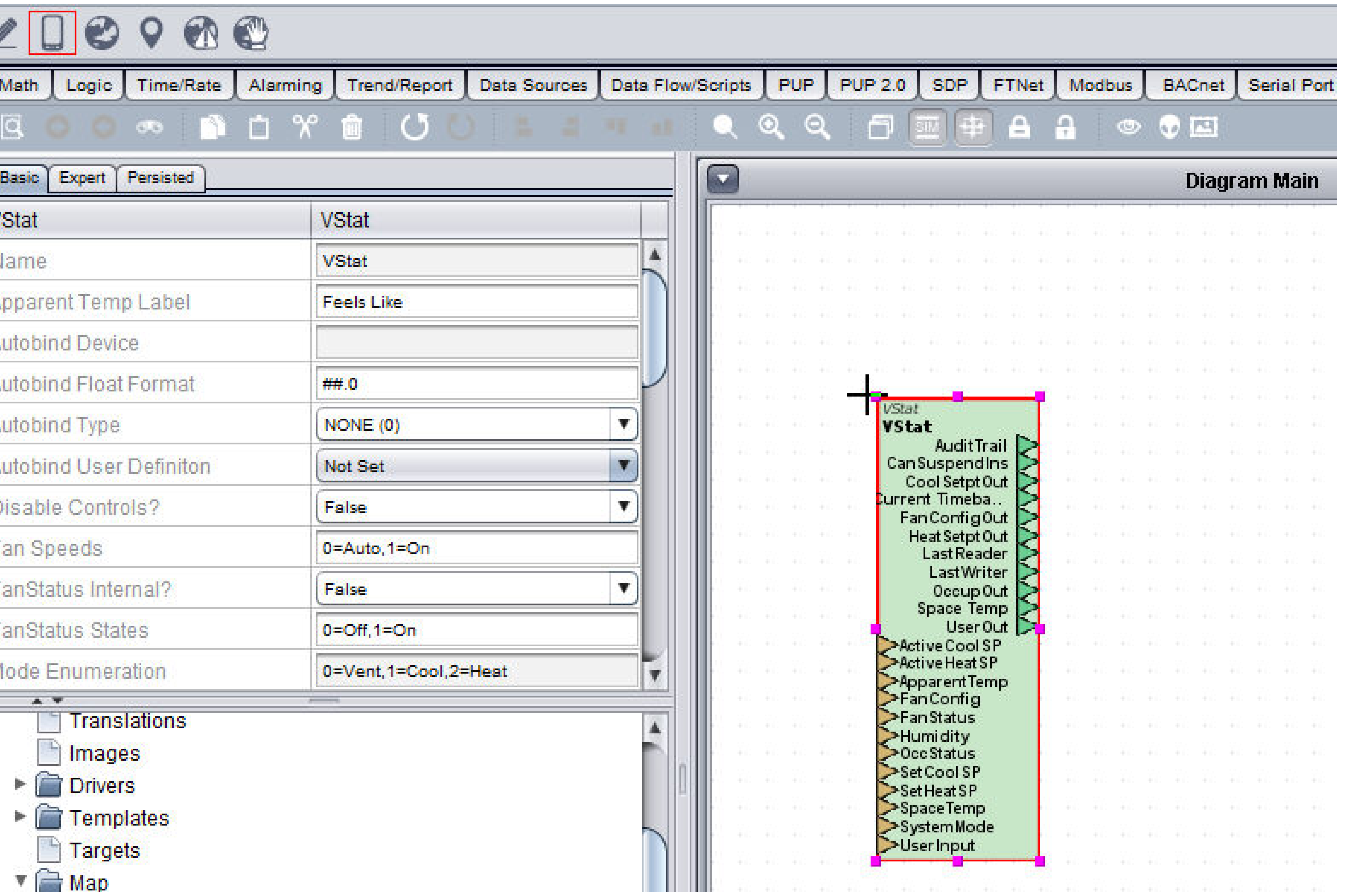
Configuring Autobind Types

Configuring a PUP ASC vSTAT

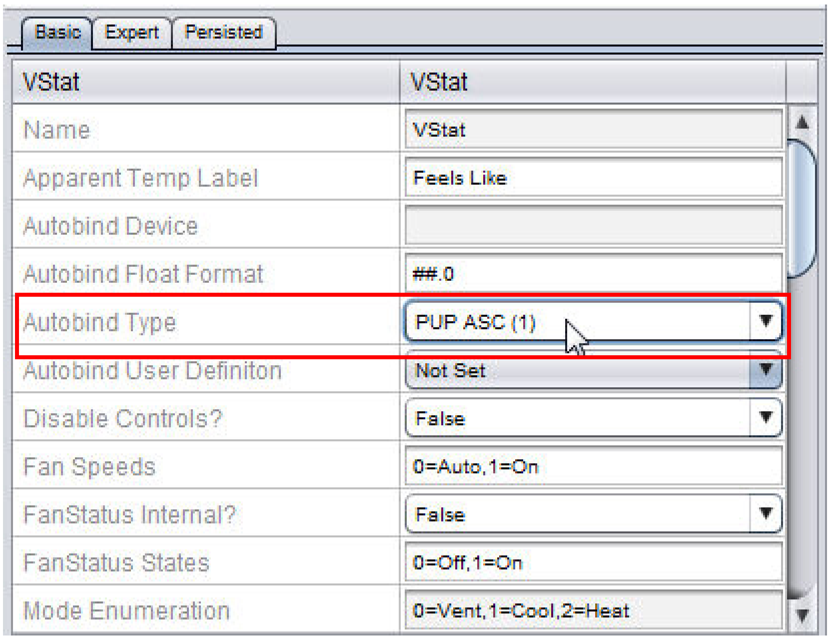
The PUP ASC autobind type allows the vSTAT element to use a PUP device that already exists in a project using the pre-configured inputs.

To configure the vSTAT Element to use a PUP ASC, perform the following steps:

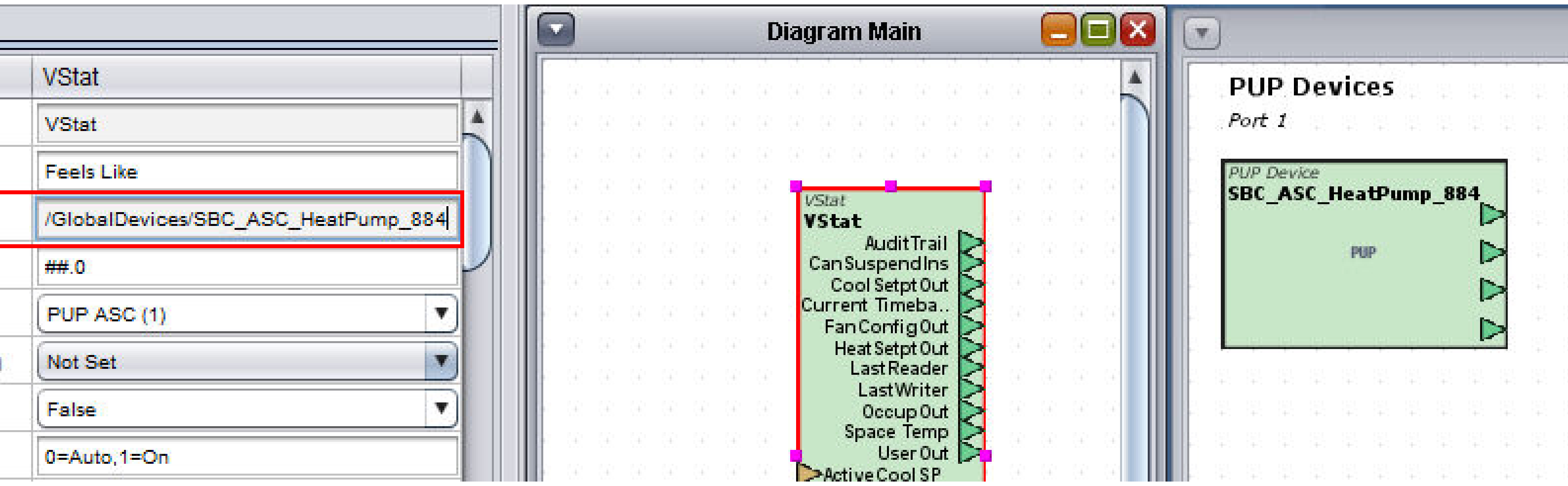
1. From Diagram View of an application, select the vSTAT element from the Mobile/Map group and copy it to the application:



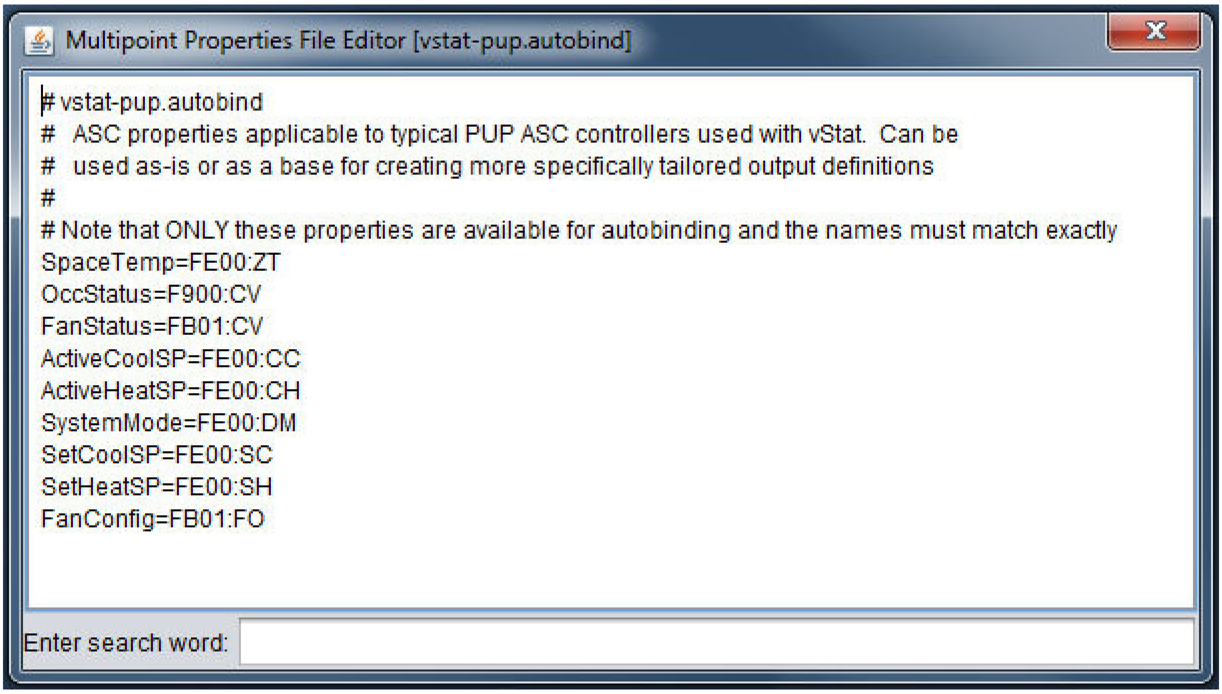
2. Select the vSTAT element and change the Autobind type to PUP ASC (1):



3. Next, add the full Device Name in the format of: /ApplicationName/DeviceName to the Autobind Device Property:



4. The pre-configured inputs for the PUP ASC Autobind type are as follows:

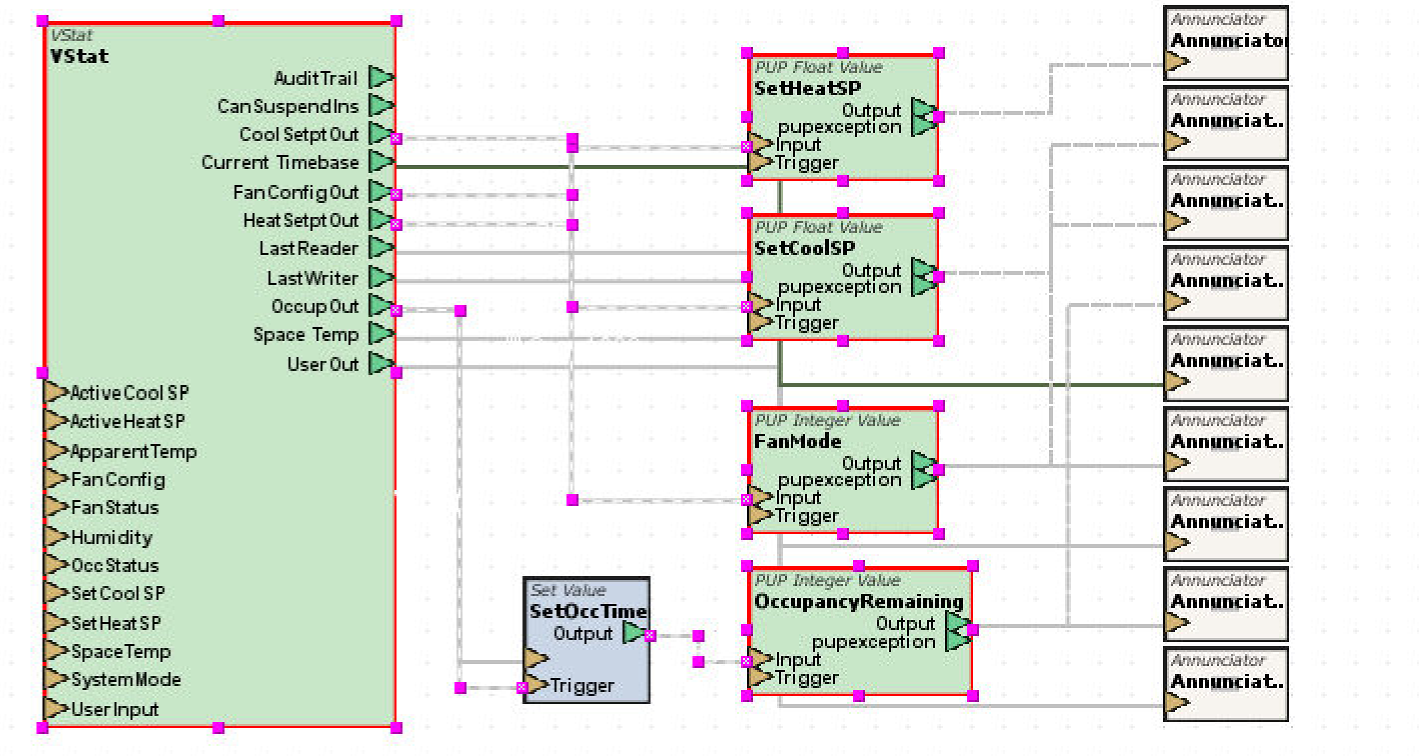


5. Next, you will need to configure the vSTAT element's outputs to write back to the controller for settings such as Setpoints and Occupancy.

   In this example, we have created PUP Float elements for the points (FE00;SC and FE00;SH), and connected them to the Cool and Heat SetptOut output pins.

   PUP Integer points were created for Fan Mode (FB01;FO) Occupancy Remaining (FE00;ER), and are connected to the FanConfigOut and OccupOut output pins.

   If using a User button, a PUP point will need created and connected to the UserOut output pin.



6. The vSTAT element is now configured for PUP ASC Autobind. You may now adjust the other settings in the vSTAT element to your liking.

More Information

vSTAT Autobind Overview

Creating an Autobind File

Importing an Autobind File

PUP USER

BACnet ASC

BACnet USER

Map ASC

Map USER

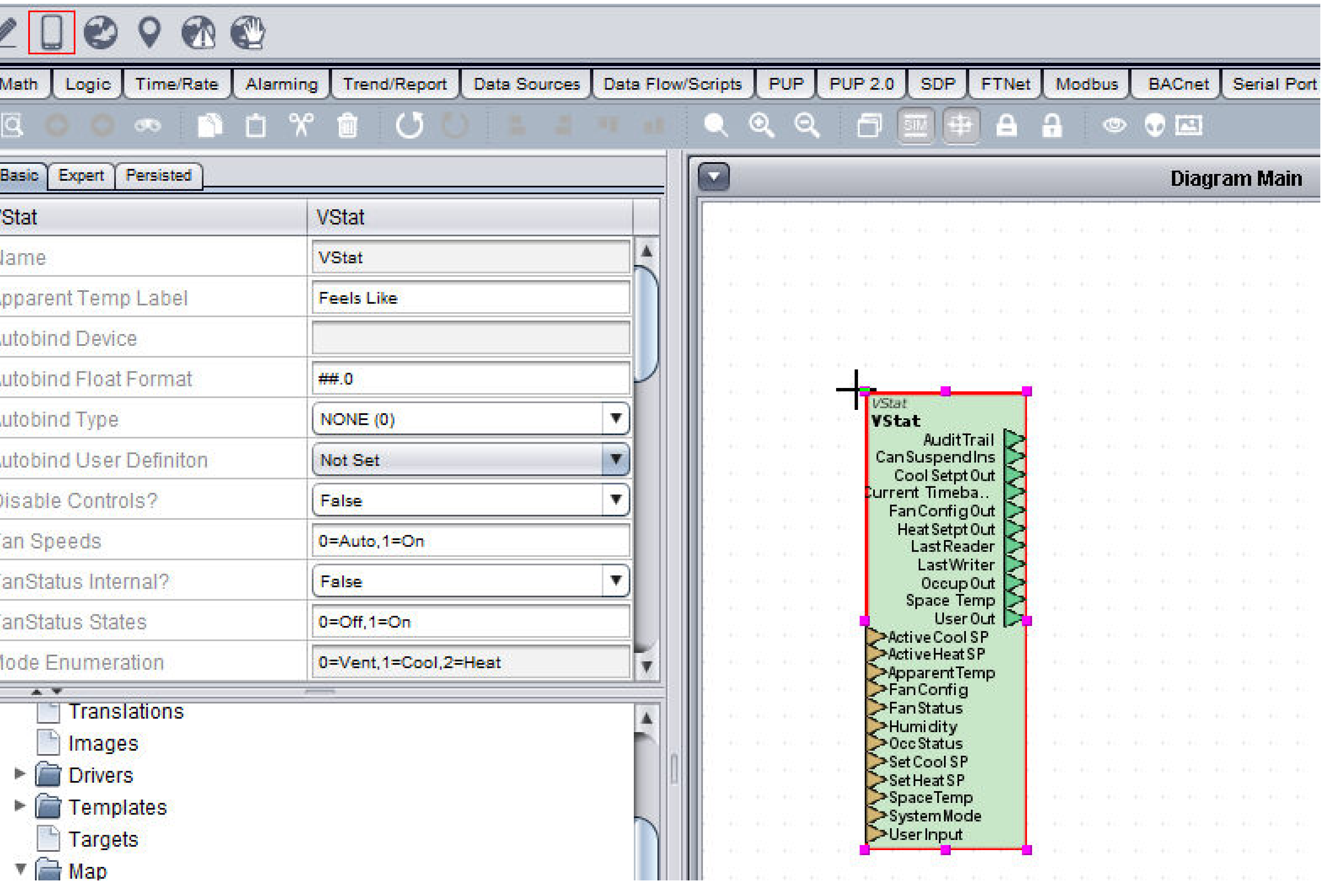
Configuring a PUP USER vSTAT

The PUP USER autobind type allows the vSTAT element to use a PUP device that already exists in a project using a user-configured autobind file.

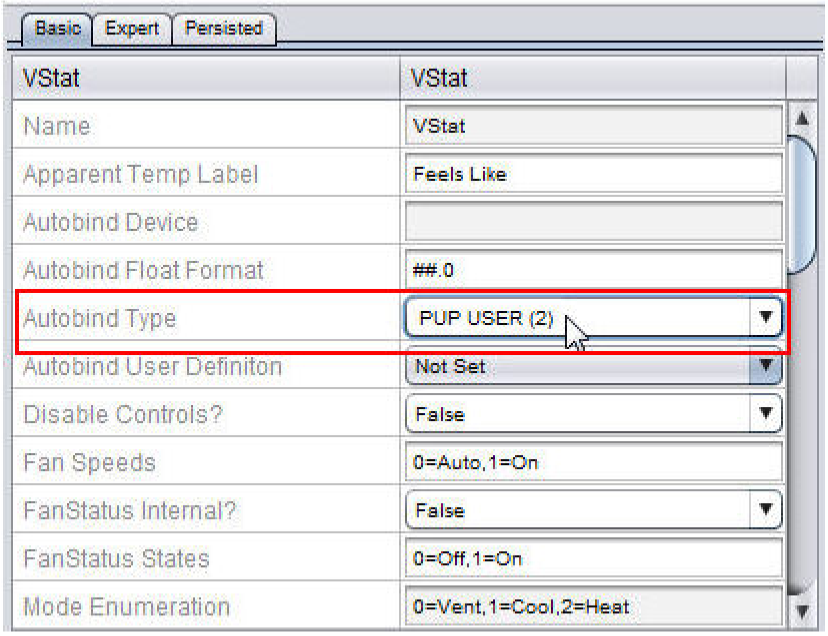
Prior to setting up a PUP USER vSTAT, you will need to Create or Import an Autobind File.

To configure the vSTAT Element to use a PUP USER, perform the following steps:

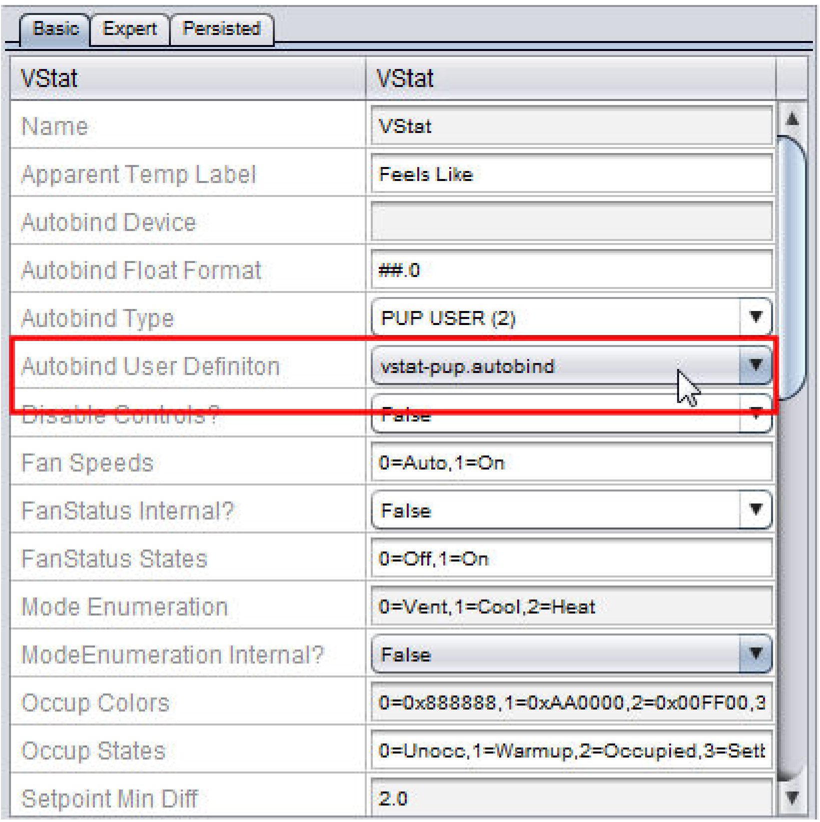
1. From Diagram View of an application, select the vSTAT element from the Mobile/Map group and copy it to the application:



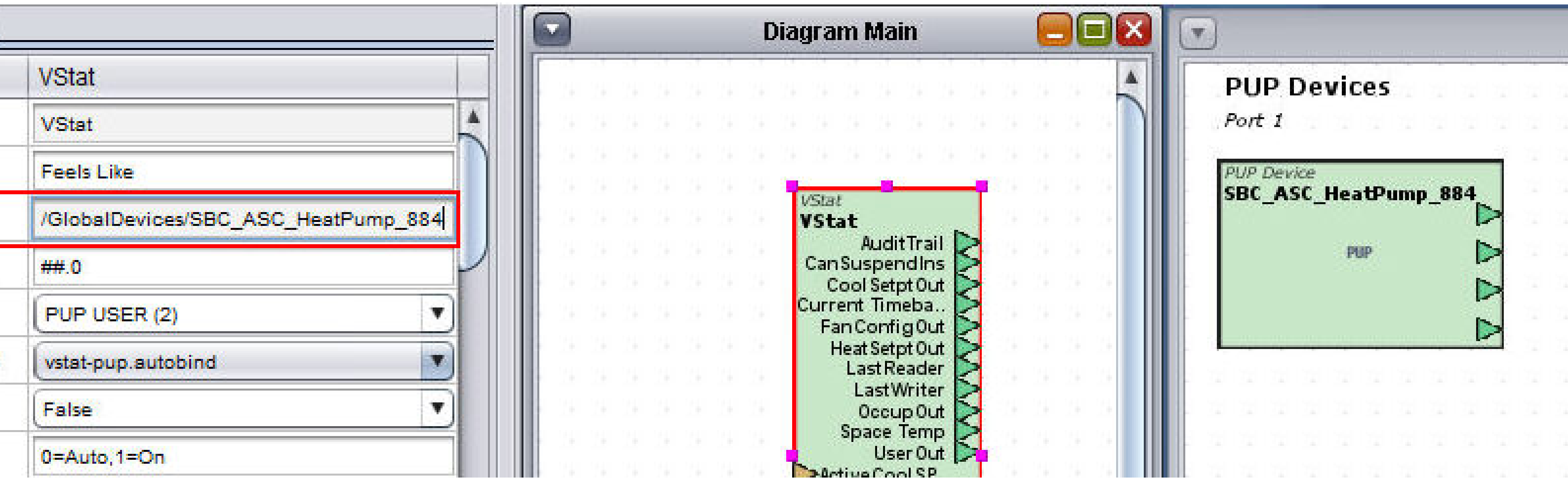
2. Select the vSTAT element and change the Autobind type to PUP USER (2):



3. Select the user defined autobind file from the Autobind User Definition drop-down Menu:



4. Next, add the full Device Name in the format of: /ApplicationName/DeviceName to the Autobind Device Property:

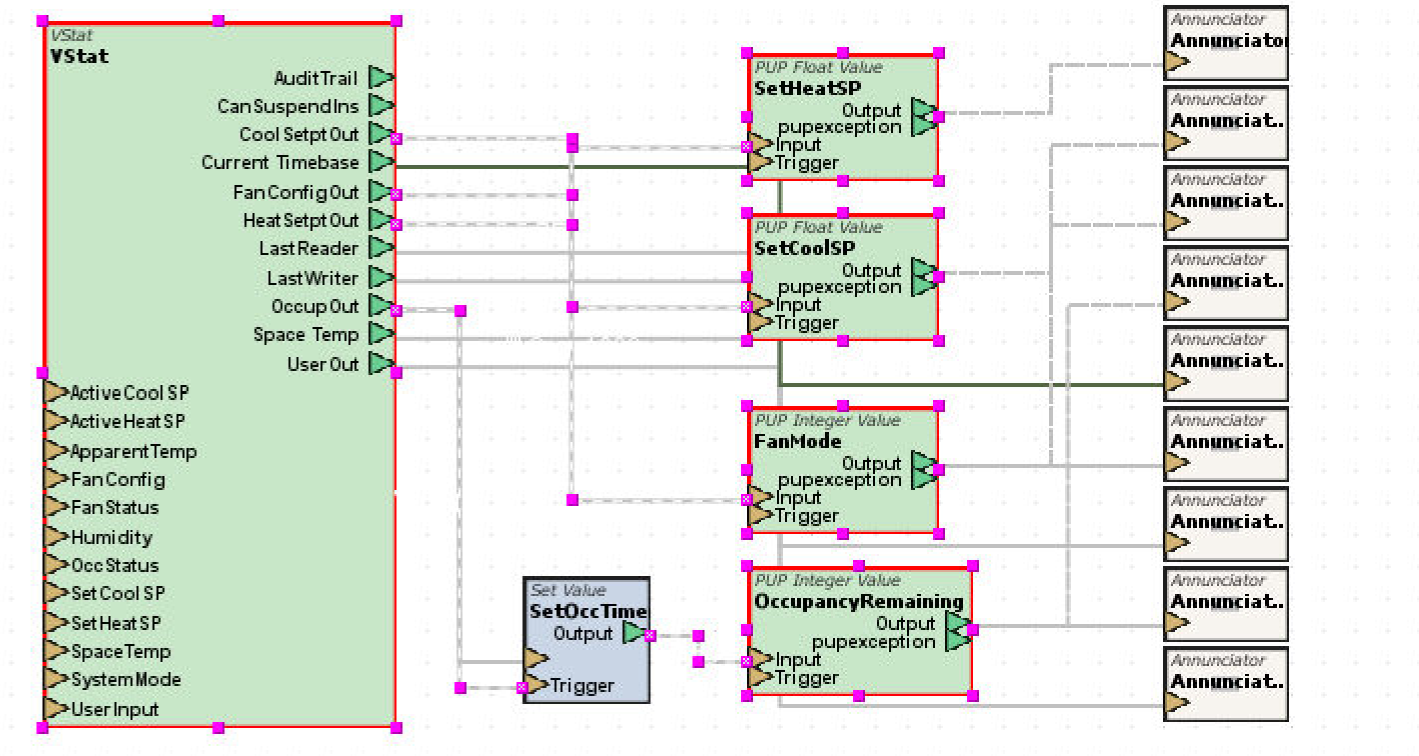


5. Next, you will need to configure the vSTAT element's outputs to write back to the controller for settings such as Setpoints and Occupancy.

In this example, we have created PUP Float elements for the points (FE00;SC and FE00;SH), and connected them to the Cool and Heat SetptOut output pins.

PUP Integer points were created for Fan Mode (FB01;FO) Occupancy Remaining (FE00;ER), and are connected to the FanConfigOut and OccupOut output pins.

If using a User button, a PUP point will need created and connected to the UserOut output pin.



6. The vSTAT element is now configured for PUP USER Autobind. You may now adjust the other settings in the vSTAT element to your liking.

More Information

vSTAT Autobind Overview

Creating an Autobind File

Importing an Autobind File

PUP ASC

BACnet ASC

BACnet USER

Map ASC

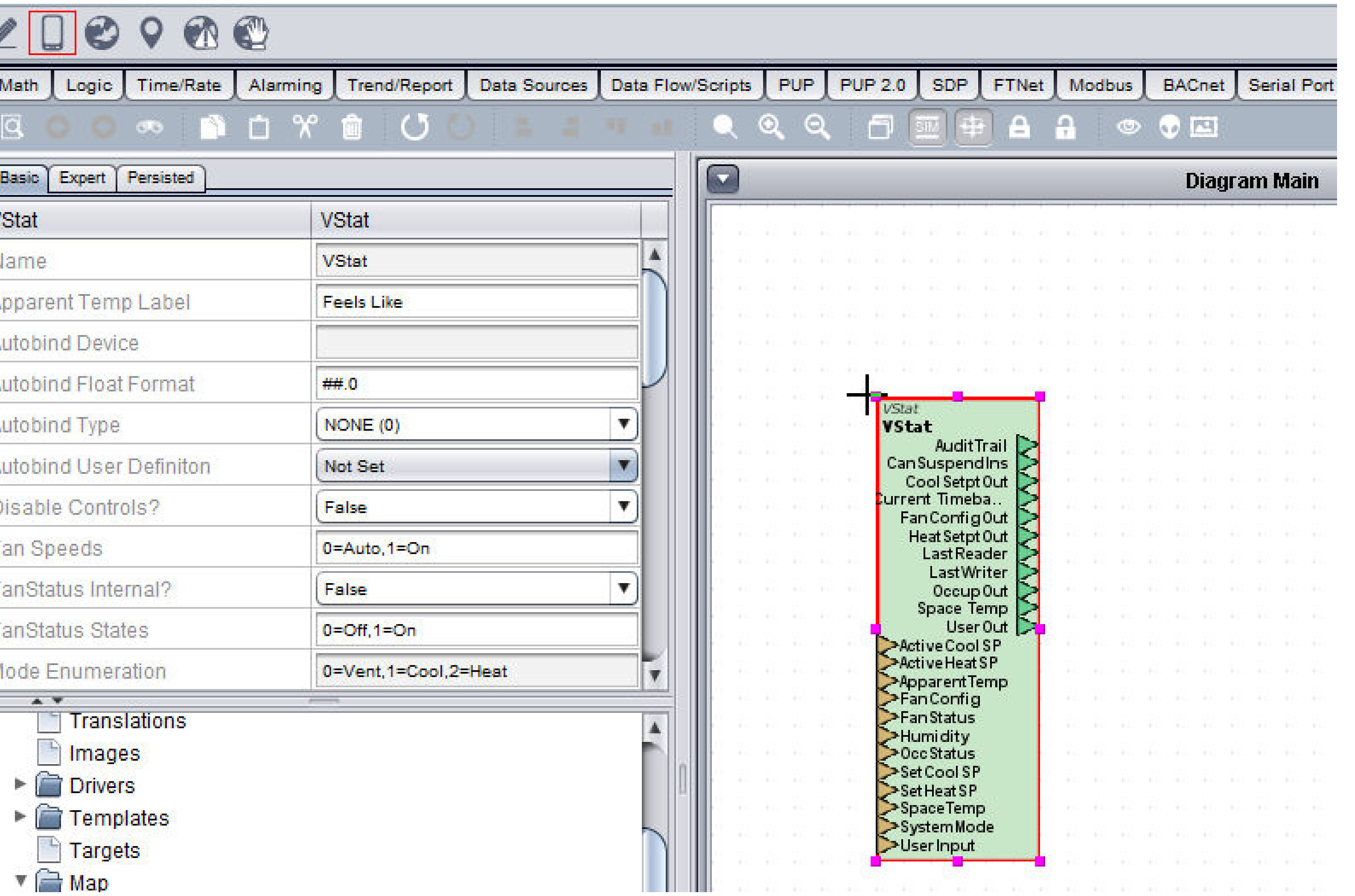
Map USER

Configuring a BACnet ASC vSTAT

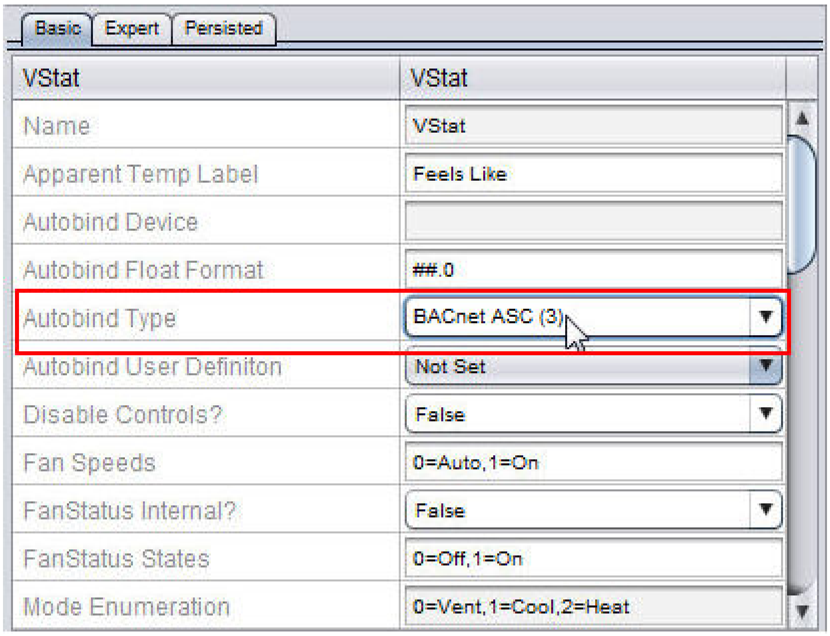
The BACnet ASC autobind type allows the vSTAT element to use a BACnet device that already exists in a project using the pre-configured inputs.

To configure the vSTAT Element to use a BACnet ASC, perform the following steps:

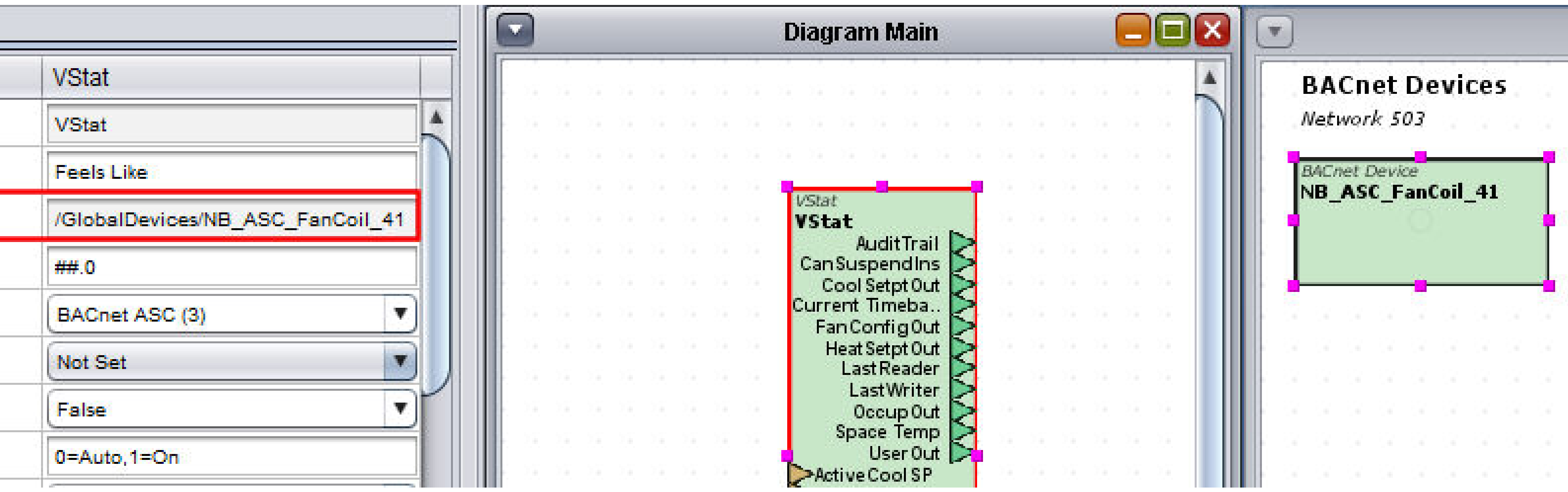
1. From Diagram View of an application, select the vSTAT element from the Mobile/Map group and copy it to the application:



2. Select the vSTAT element and change the Autobind type to BACnet ASC (3):

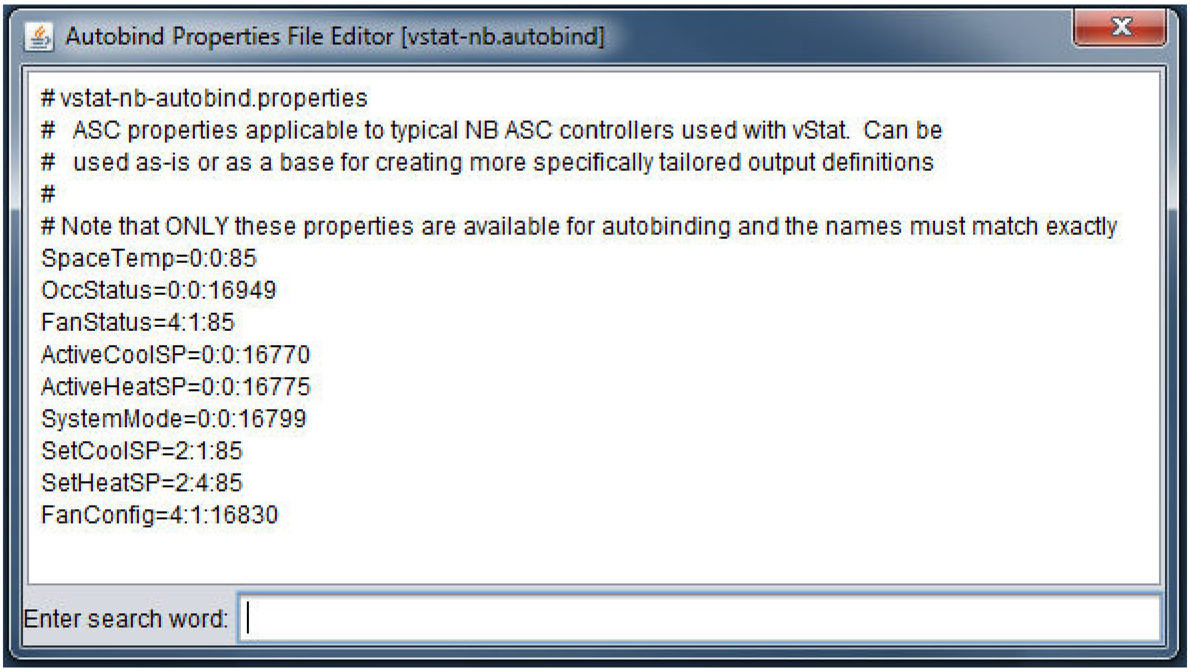


3. Next, add the full Device Name in the format of: /ApplicationName/DeviceName to the Autobind Device Property:



4. The pre-configured inputs for the BACnet ASC Autobind type are as

follows:

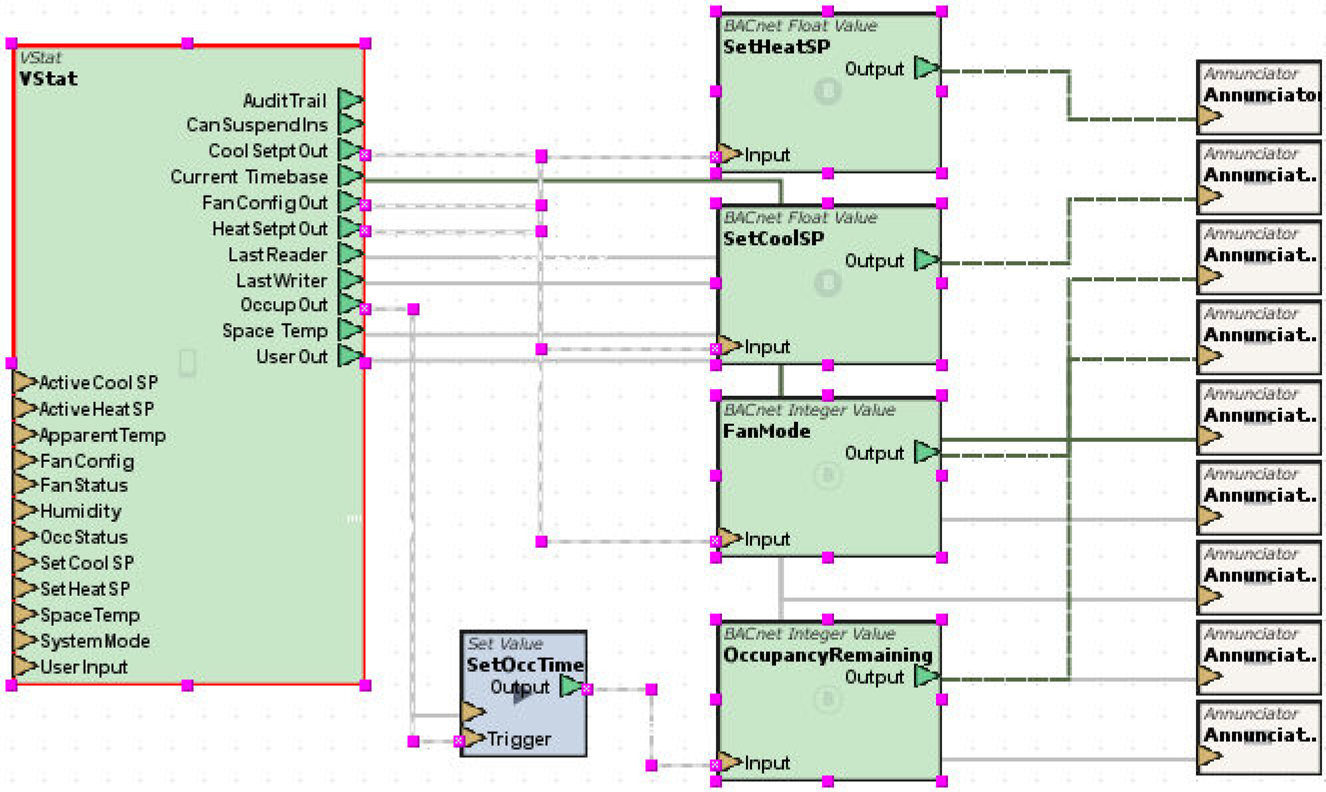


5. Next, you will need to configure the vSTAT element's outputs to write back to the controller for settings such as Setpoints and Occupancy.

In this example, we have created BACnet Float elements for the points (0;0;16770 and 0;0;16775), and connected them to the Cool and Heat SetptOut output pins.

BACnet Integer points were created for Fan Mode (4;1;16830) Occupancy Remaining (0;0;16816), and are connected to the FanConfigOut and OccupOut output pins.

If using a User button, a BACnet point will need created and connected to the UserOut output pin.



6. The vSTAT element is now configured for BACnet ASC Autobind. You may now adjust the other settings in the vSTAT element to your liking.

More Information

vSTAT Autobind Overview

Creating an Autobind File

Importing an Autobind File

PUP ASC

PUP USER

BACnet USER

Map ASC

Map USER

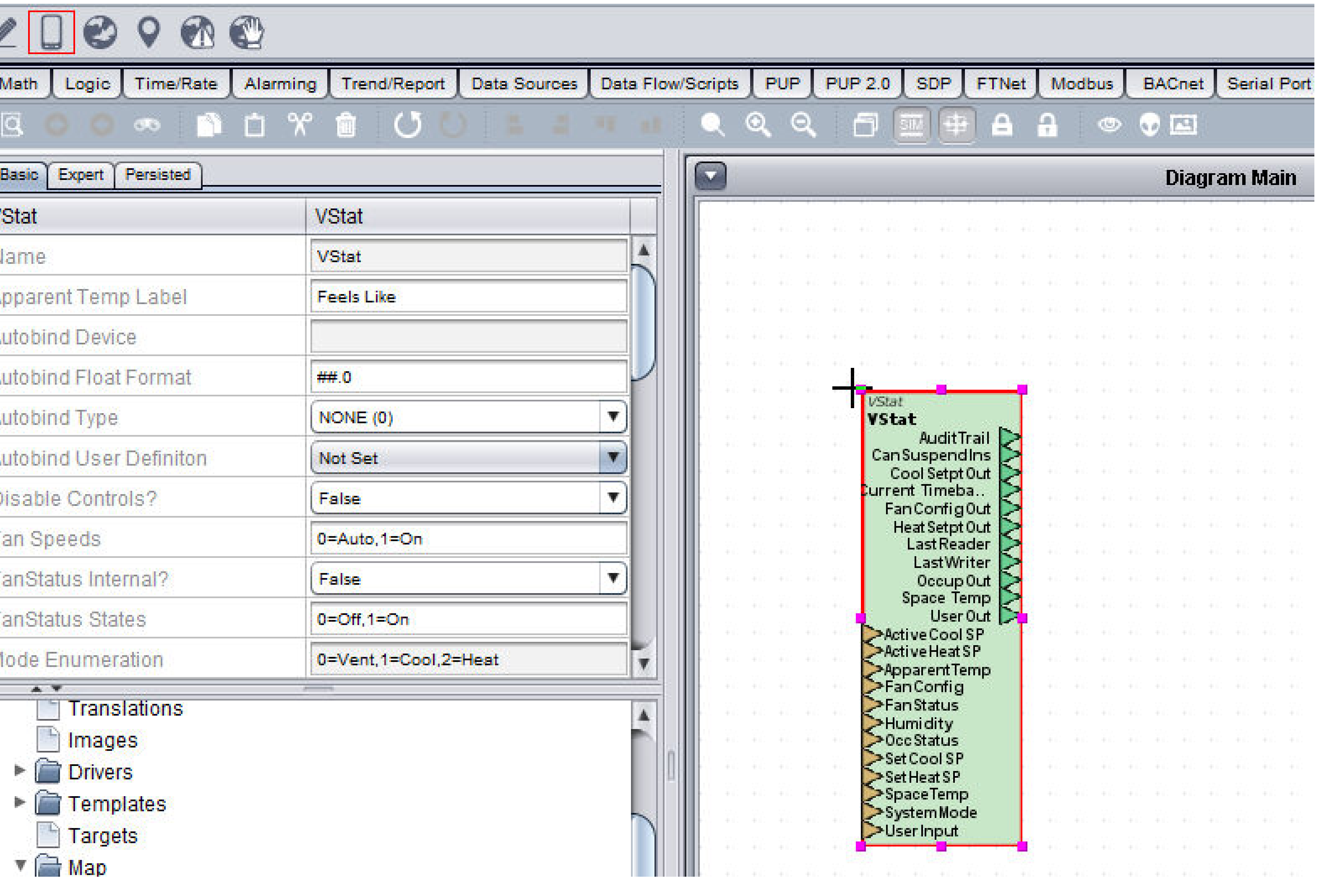
Configuring a BACnet USER vSTAT

The BACnet USER autobind type allows the vSTAT element to use a BACnet device that already exists in a project using a user-configured autobind file.

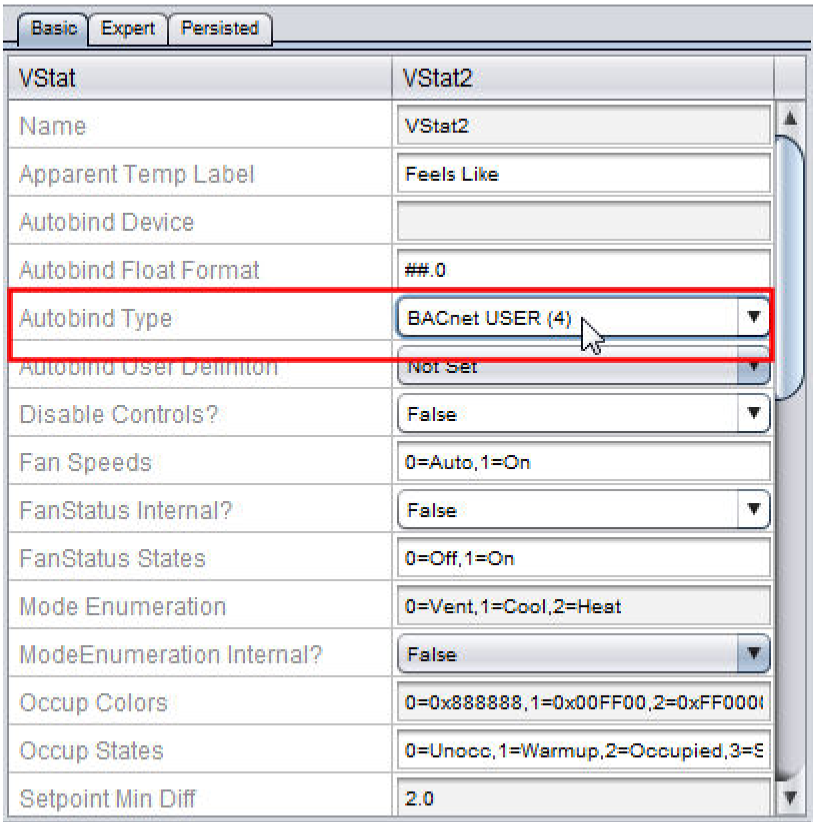
Prior to setting up a BACnet USER vSTAT, you will need to Create or Import an Autobind File.

To configure the vSTAT Element to use a BACnet USER, perform the following steps:

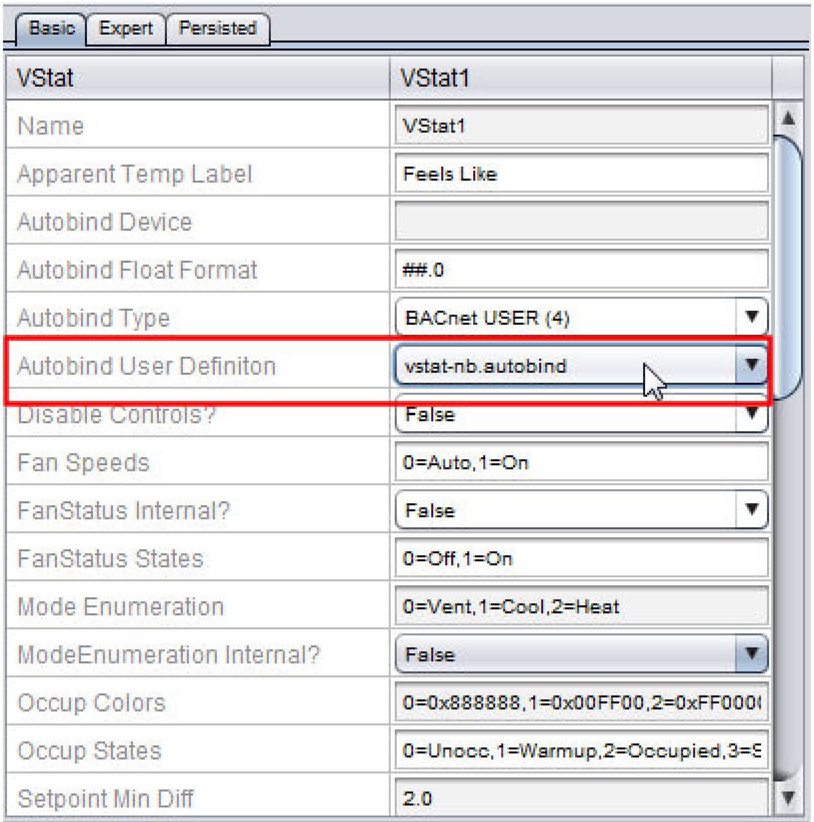
1. From Diagram View of an application, select the vSTAT element from the Mobile/Map group and copy it to the application:



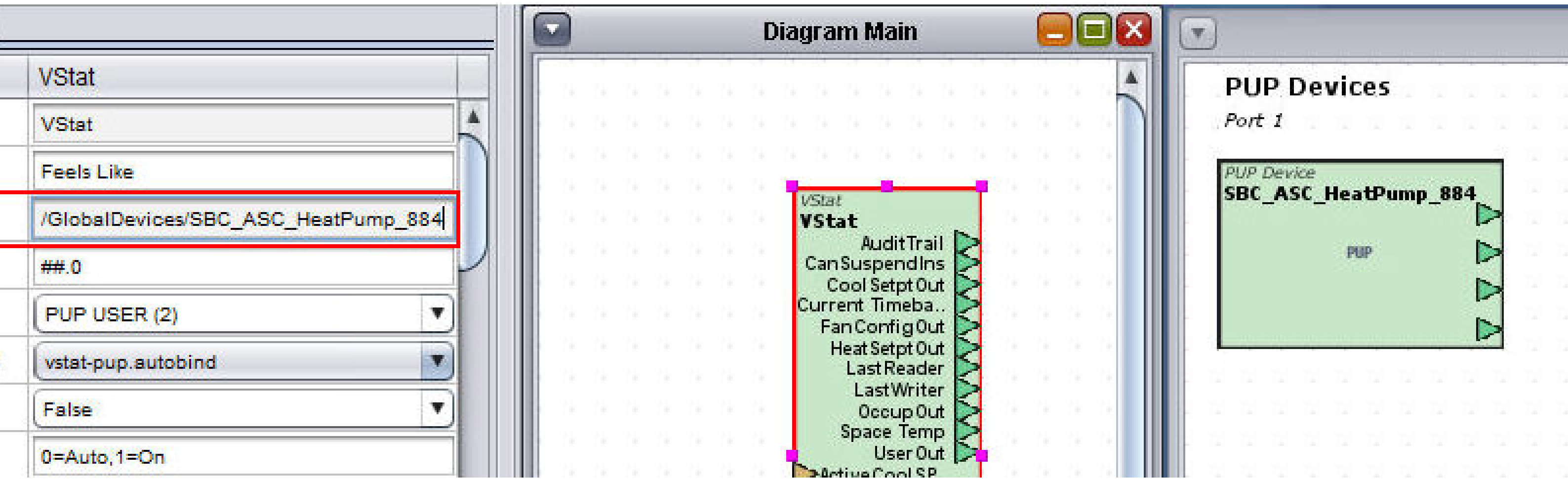
2. Select the vSTAT element and change the Autobind type to BACnet USER (4):



3. Select the user defined autobind file from the Autobind User Definition drop-down Menu:



4. Next, add the full Device Name in the format of: /ApplicationName/DeviceName to the Autobind Device Property:



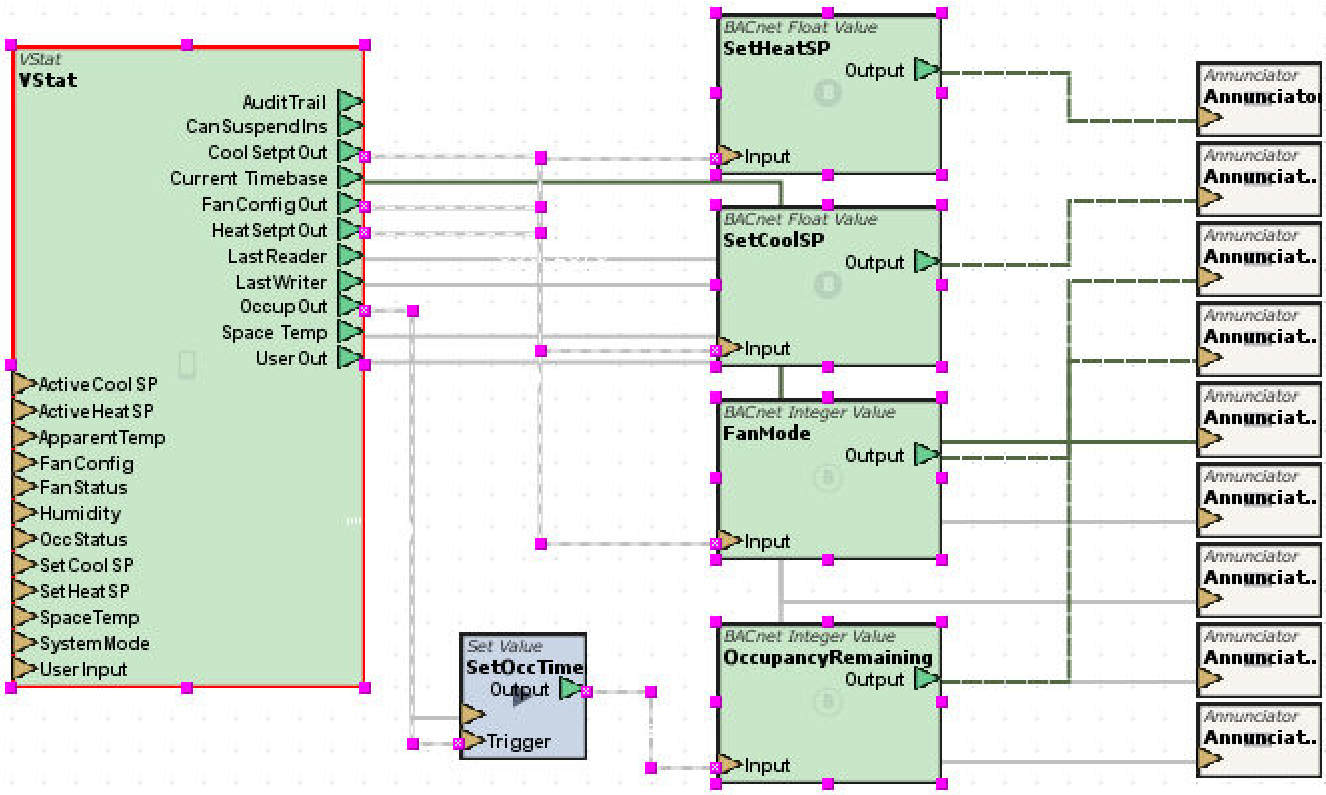
5. Next, you will need to configure the vSTAT element's outputs to write back to the controller for settings such as Setpoints and

Occupancy.

In this example, we have created BACnet Float elements for the points (0;0;16770 and 0;0;16775), and connected them to the Cool and Heat SetptOut output pins.

BACnet Integer points were created for Fan Mode (4;1;16830) Occupancy Remaining (0;0;16816), and are connected to the FanConfigOut and OccupOut output pins.

If using a User button, a BACnet point will need created and connected to the UserOut output pin.



6. The vSTAT element is now configured for BACnet USER Autobind. You may now adjust the other settings in the vSTAT element to your liking.

More Information

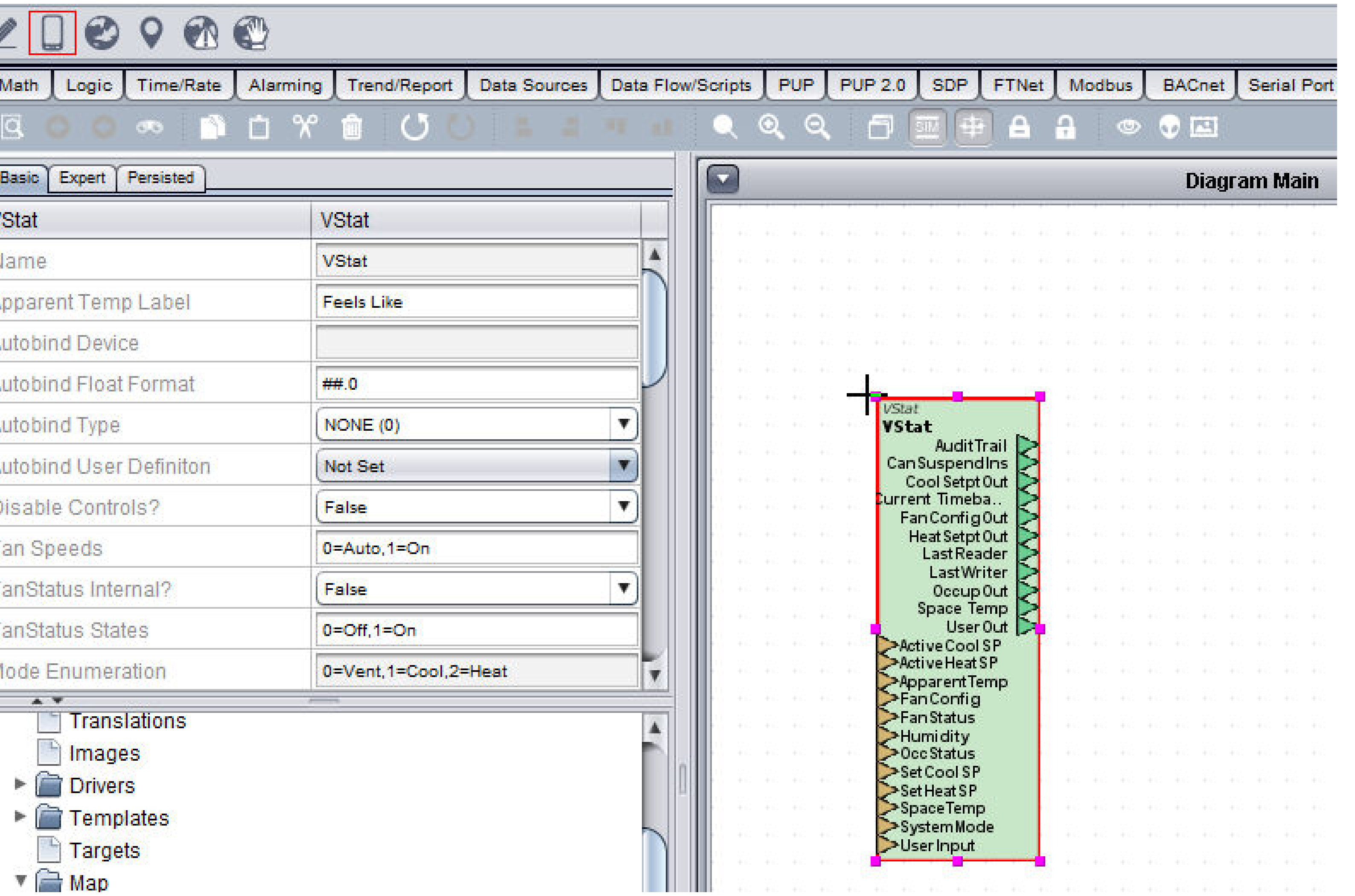
[vSTAT Autobind Overview]
[Creating an Autobind File]
[Importing an Autobind File]
[PUP ASC]
[PUP USER]
[BACnet ASC]
[Map ASC]
[Map USER]

Configuring a Map ASC vSTAT

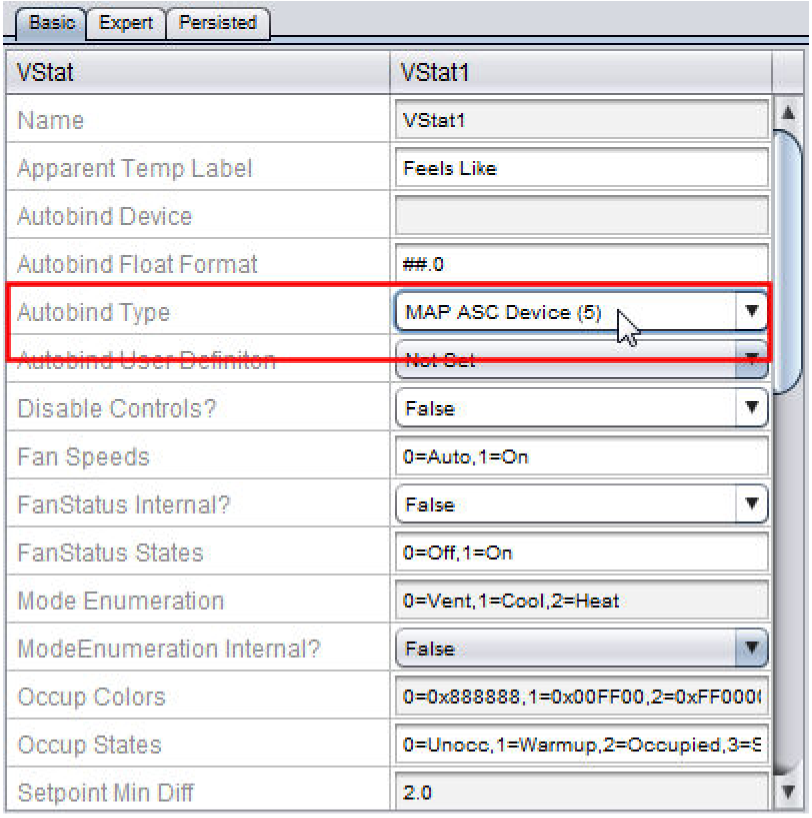
The Map ASC autobind type allows the vSTAT element to use Map device using the pre-configured inputs.

To configure the vSTAT Element to use a Map ASC, perform the following steps:

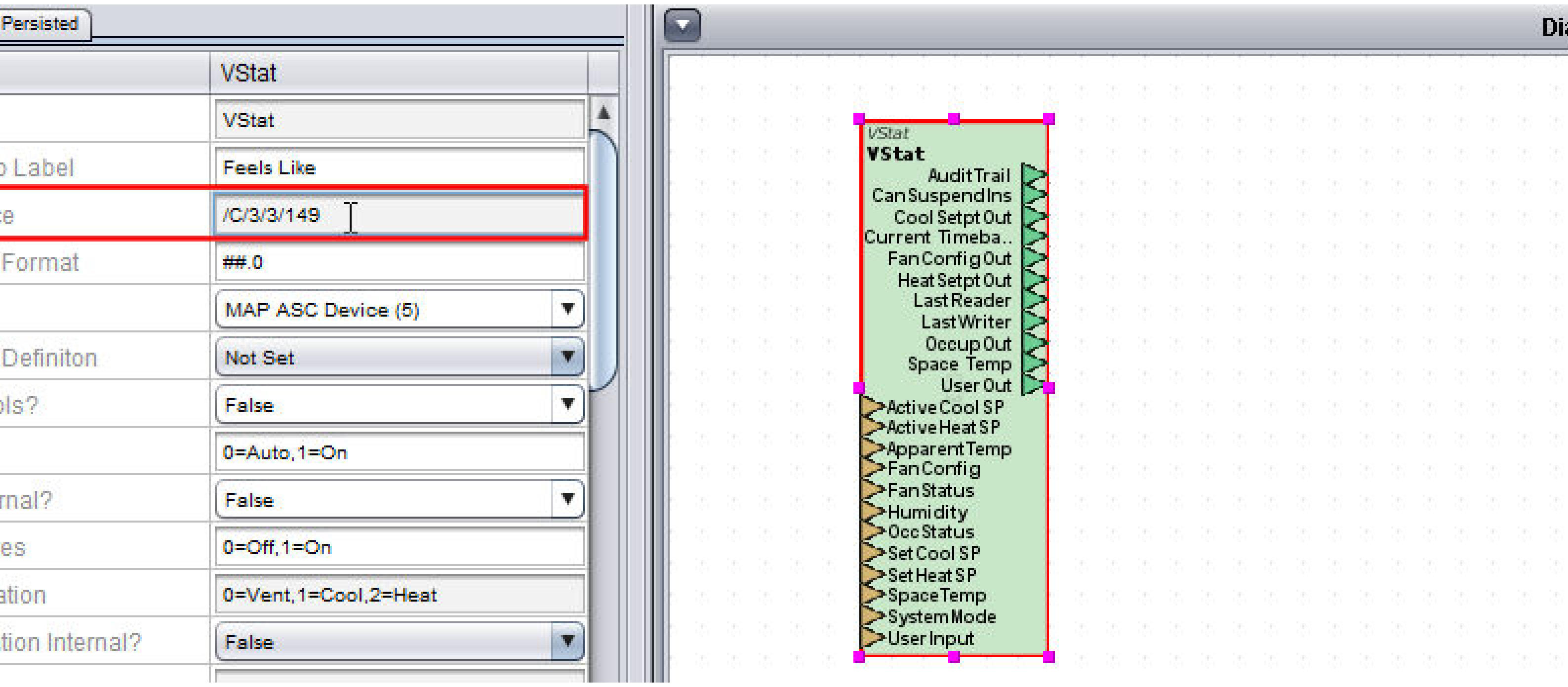
1. From Diagram View of an application, select the vSTAT element from the Mobile/Map group and copy it to the application:



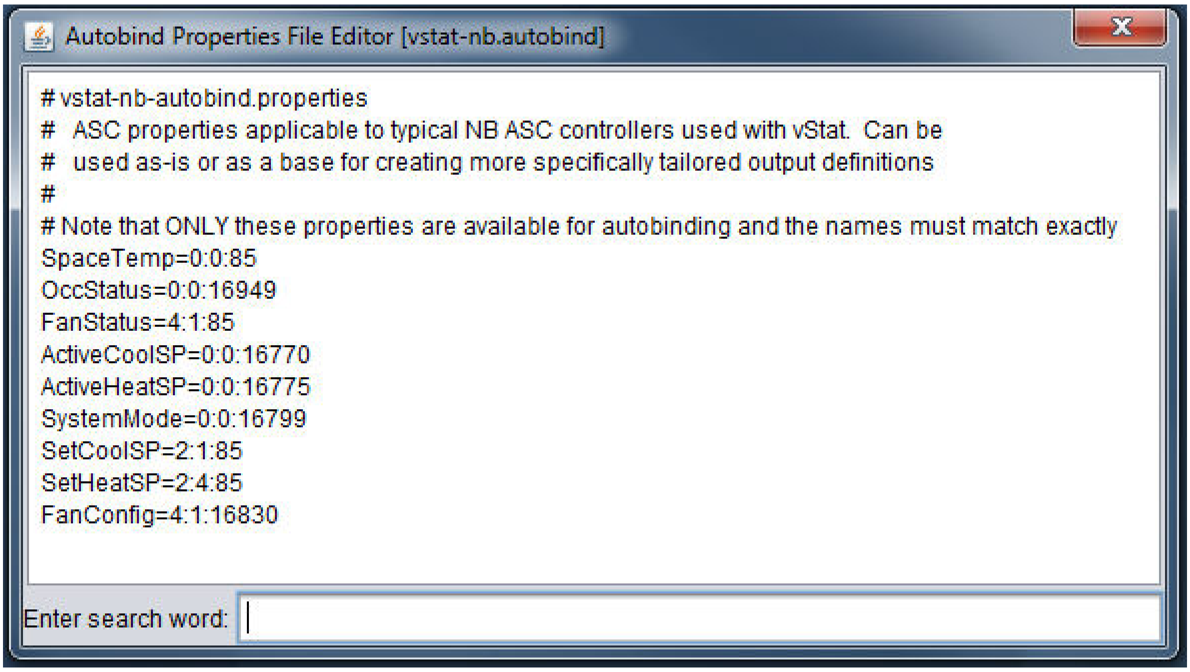
2. Select the vSTAT element and change the Autobind type to Map ASC (5):



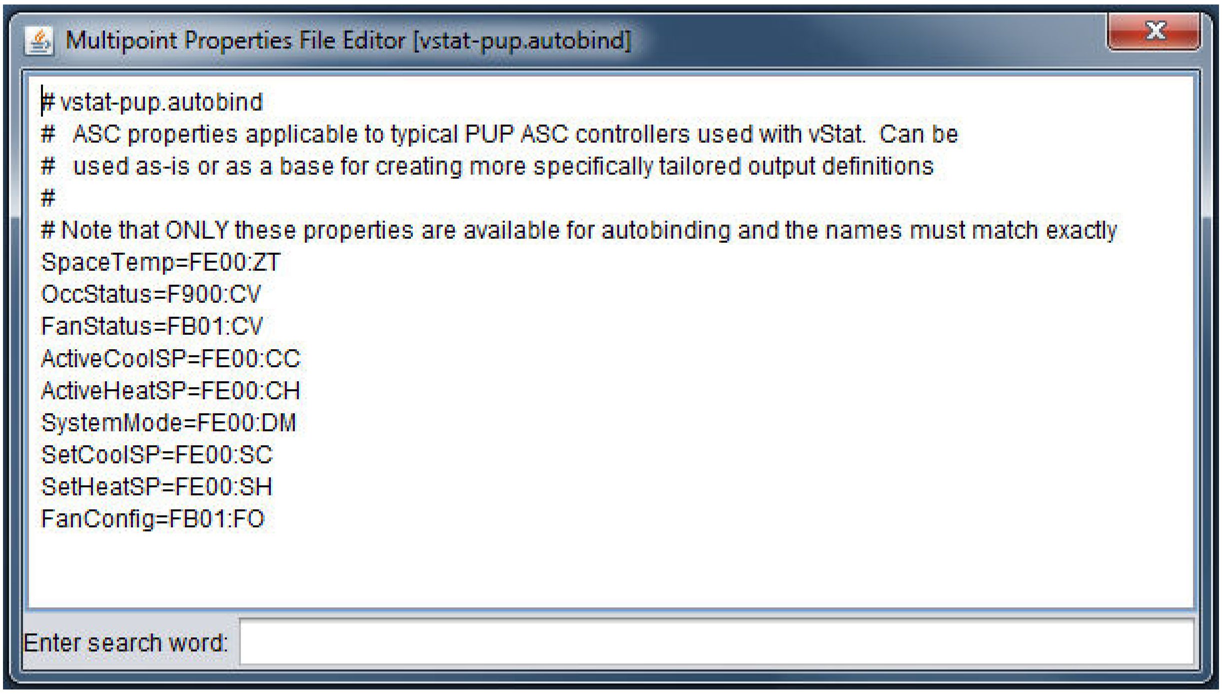
3. Next, right click the Map device, select Copy ID Path and paste it to the Autobind Device Property:



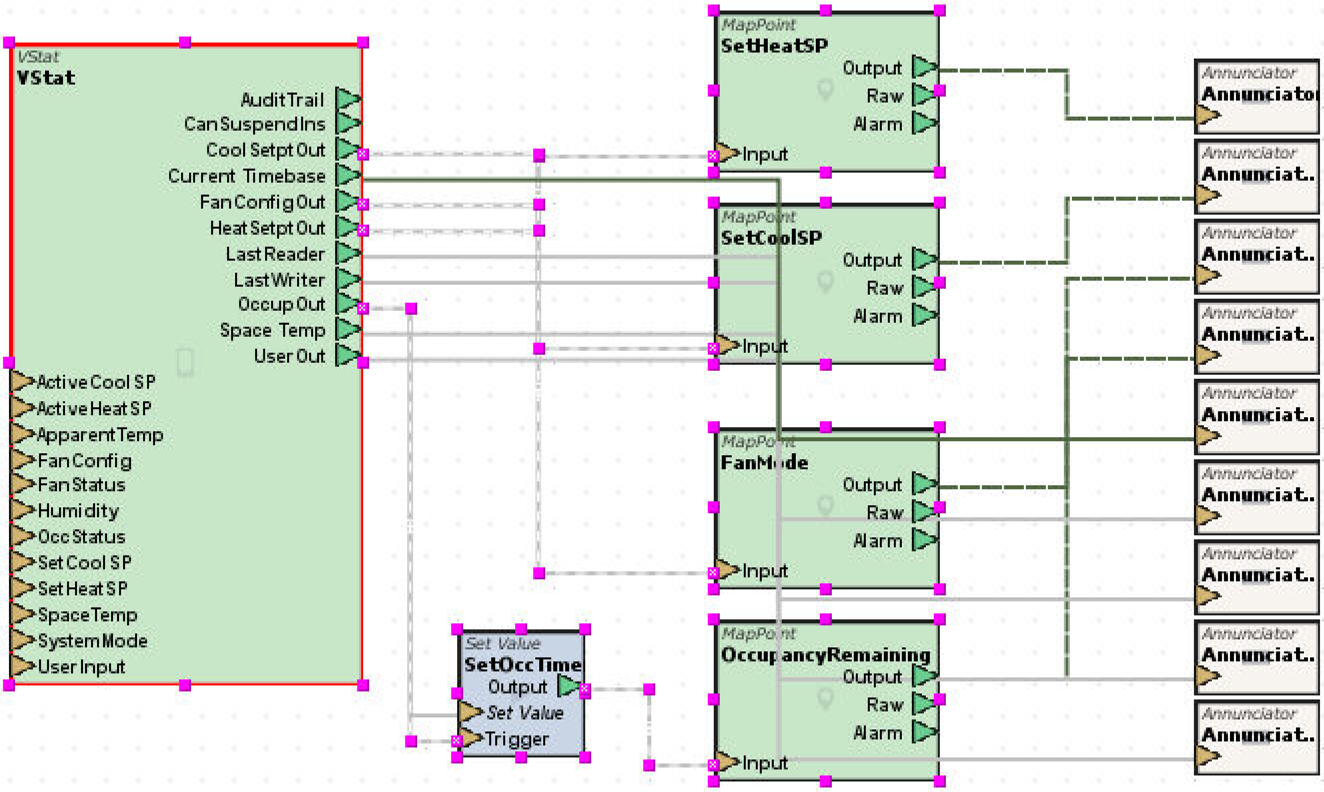
4. The pre-configured inputs for the Map ASC Autobind type are as follows:
   - BACnet Devices:



   - PUP Devices:



5. Next, you will need to configure the vSTAT element's outputs to write back to the controller for settings such as Setpoints and Occupancy.
 In this example, we have used the Paste to Diagram option to paste Map Points from the Project Tree and connected them to the Cool and Heat SetptOut output pins. Map points were also created for Fan Mode and Occupancy Remaining, and are connected to the FanConfigOut and OccupOut output pins. If using a User button, a Map point will need created and connected to the UserOut output pin.



The vSTAT element is now configured for Map ASC Autobind. You may now adjust the other settings in the vSTAT element to your liking.

More Information

vSTAT Autobind Overview

Creating an Autobind File

Importing an Autobind File

PUP ASC

PUP USER

[BACnet ASC](#)
[BACnet USER](#)
[Map USER](#)

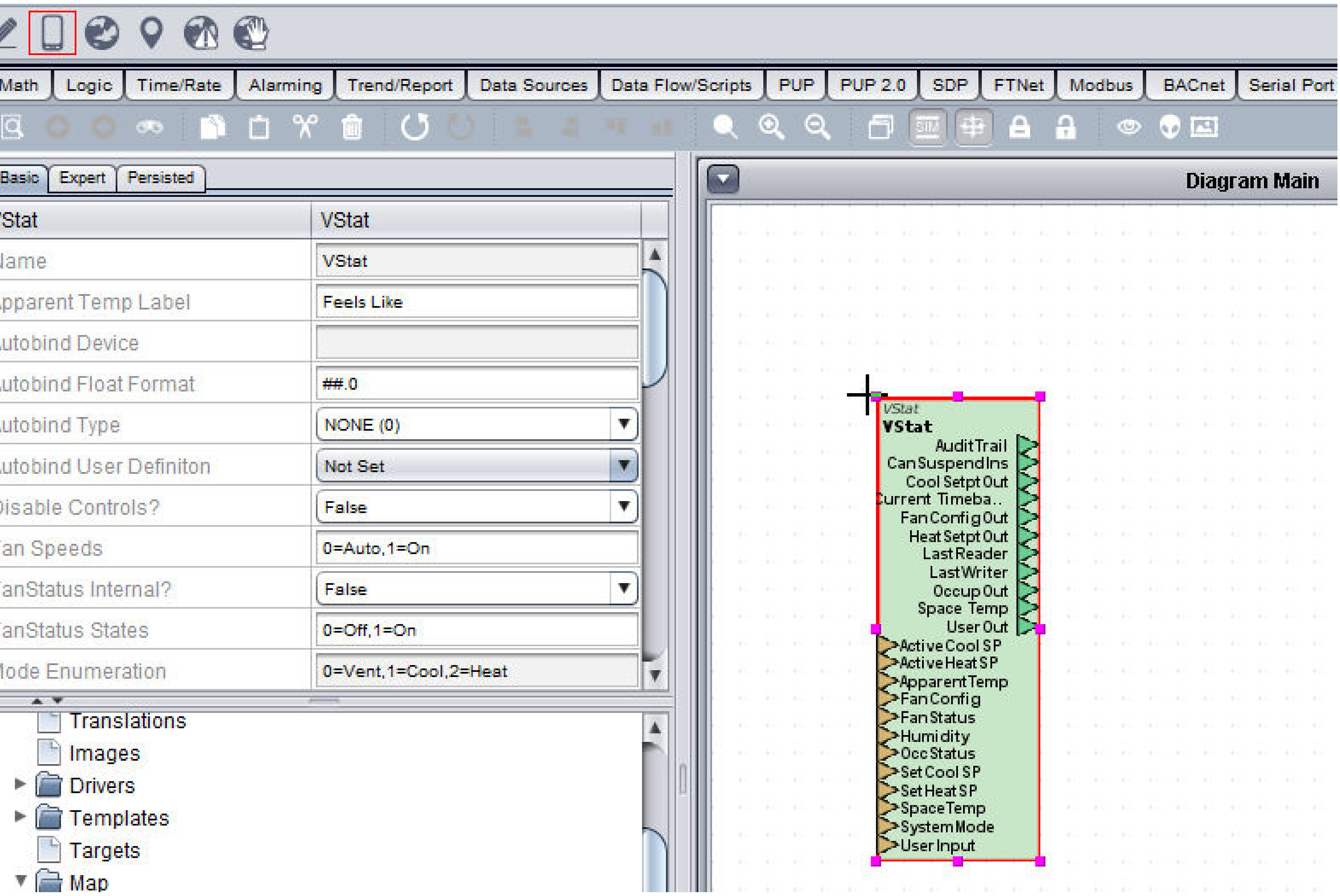
Configuring a Map USER vSTAT

The Map USER autobind type allows the vSTAT element to use a Map device using a user-configured autobind file.

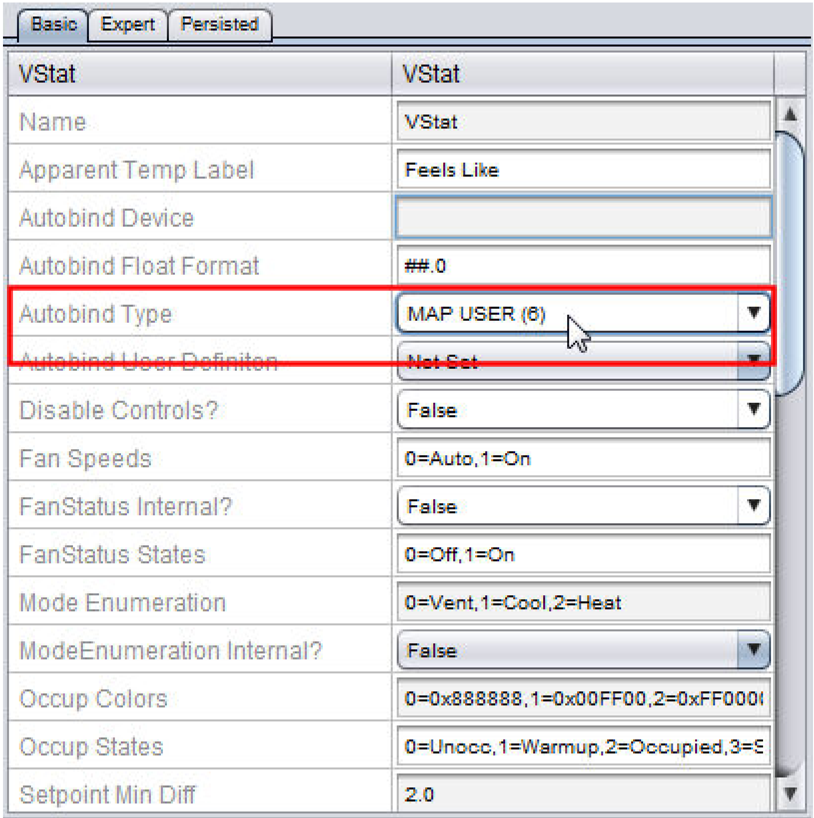
Prior to setting up a Map USER vSTAT, you will need to Create or Import an Autobind File.

To configure the vSTAT Element to use a Map USER, perform the following steps:

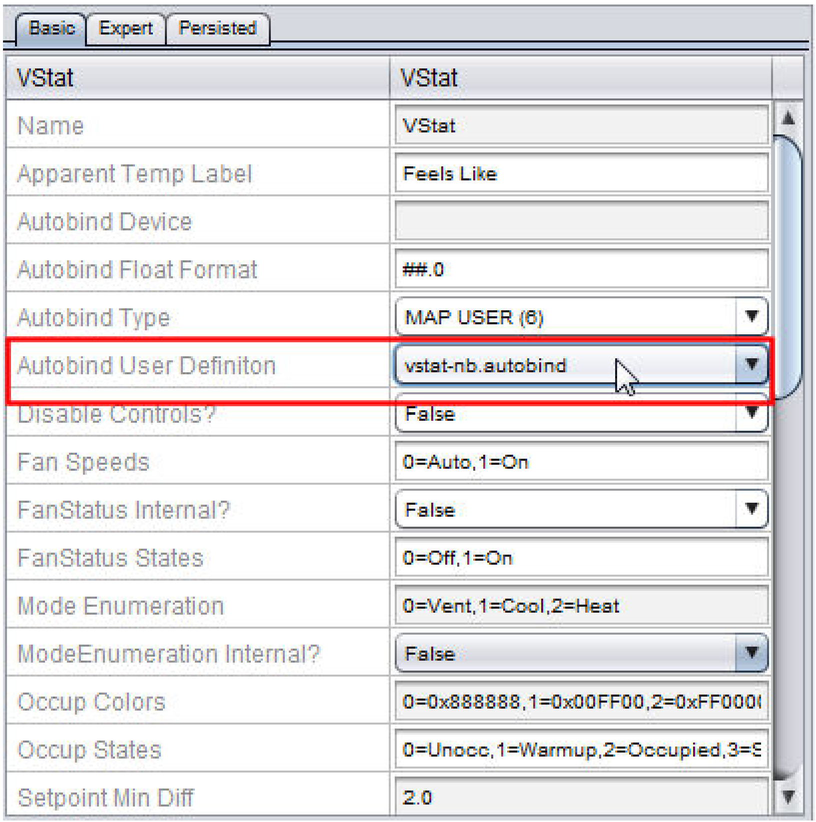
1. From Diagram View of an application, select the vSTAT element from the Mobile/Map group and copy it to the application:



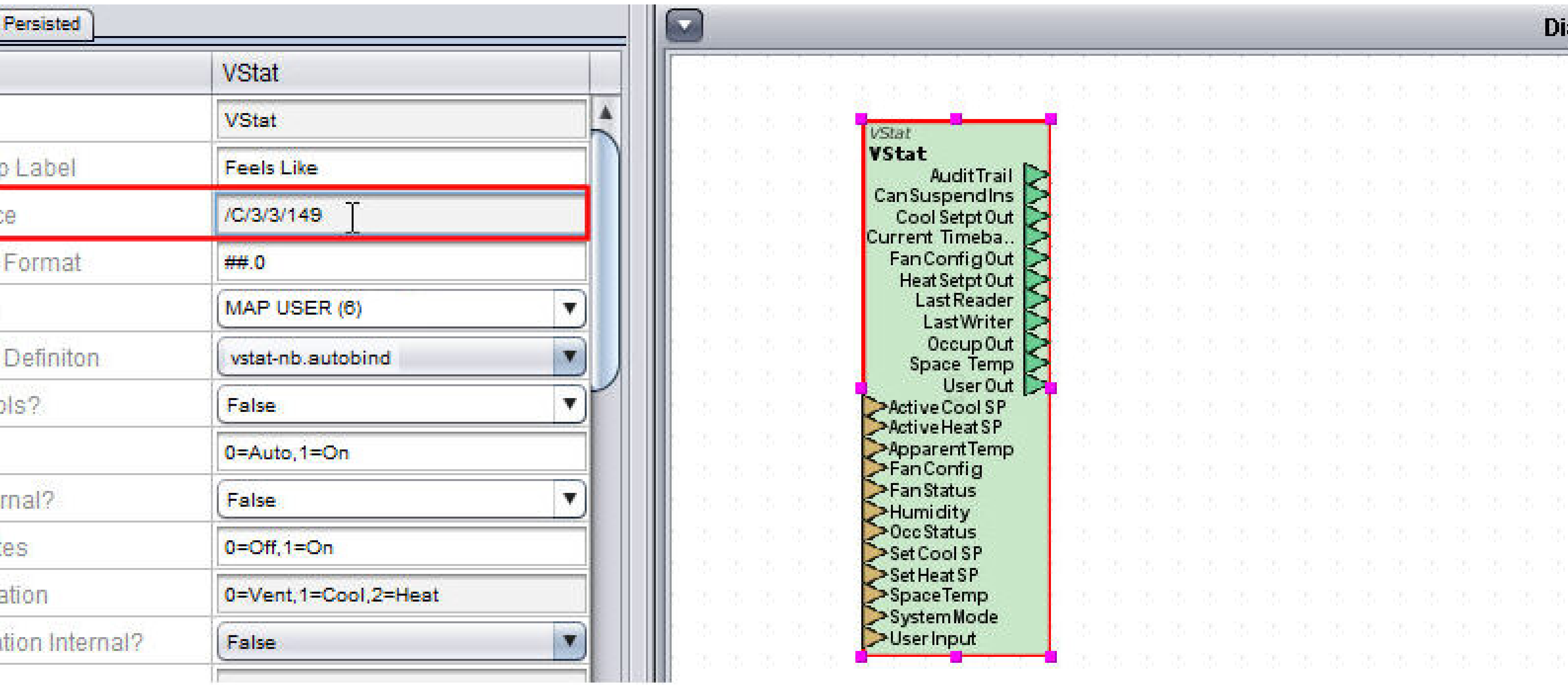
2. Select the vSTAT element and change the Autobind type to MAP USER (6):



3. Select the user defined autobind file from the Autobind User Defin-ition drop-down Menu:



4. Next, right click the Map device, select Copy ID Path and paste it to the Autobind Device Property:

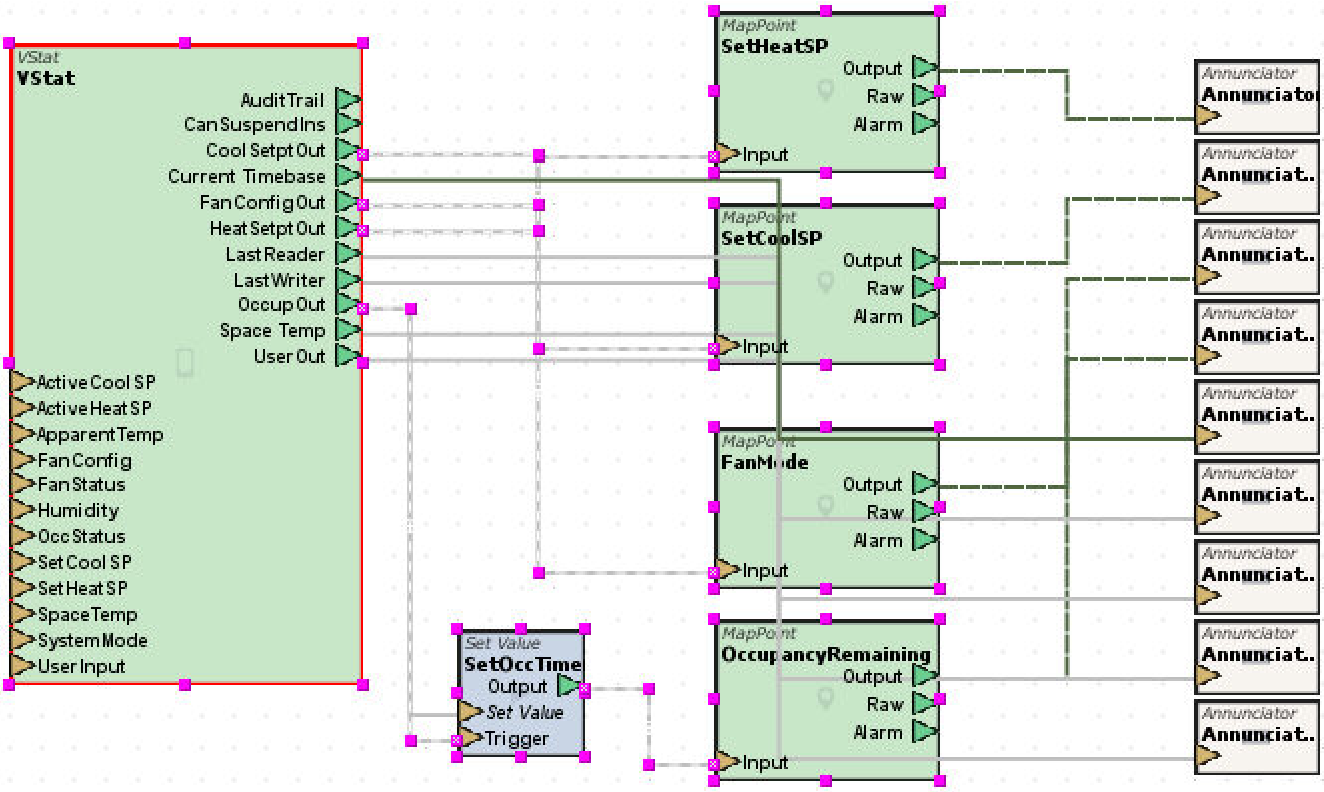


5. Next, you will need to configure the vSTAT element's outputs to write back to the controller for settings such as Setpoints and Occupancy.

   In this example, we have used the Paste to Diagram option, to paste Map Points from the Project Tree and connected them to the Cool and Heat SetptOut output pins.

   Map points were also created for Fan Mode and Occupancy Remaining, and are connected to the FanConfigOut and OccupOut output pins.

   If using a User button, a Map point will need created and connected to the UserOut output pin.



6. The vSTAT element is now configured for Map USER Autobind. You may now adjust the other settings in the vSTAT element to your liking.

More Information

vSTAT Autobind Overview

Creating an Autobind File

Importing an Autobind File

PUP ASC

PUP USER

BACnet ASC

BACnet USER

Map ASC

vSTAT Administration

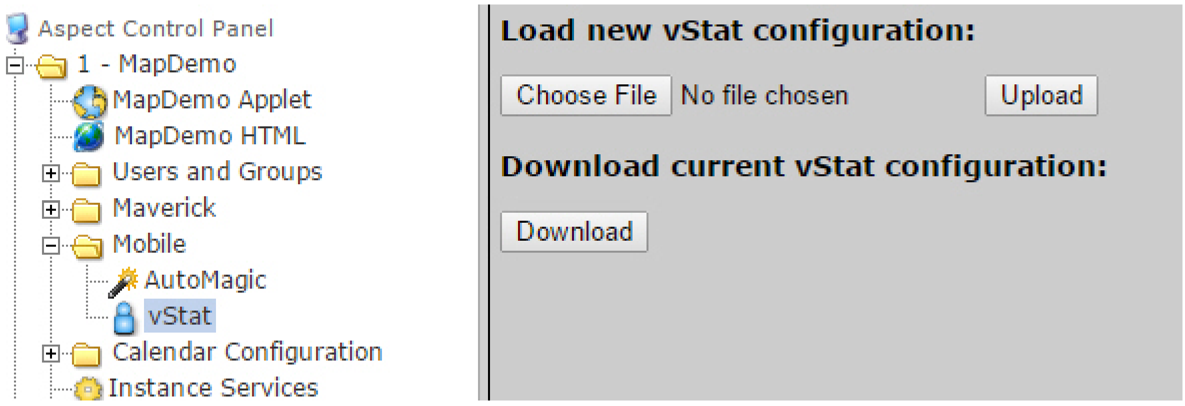
vSTAT Administration Overview

Once a project has been created and deployed, user and accessibility permissions can be managed externally from an Aspect project through the Aspect Control Panel of a target. This sub-chapter discusses the administration of vSTAT mobile application users from the Aspect Control Panel.

- Retrieving vSTAT Information from the Aspect Control Panel
- Managing the CSV File
- Applying Changes to the System

Retrieving vSTAT Information from the Aspect Control Panel

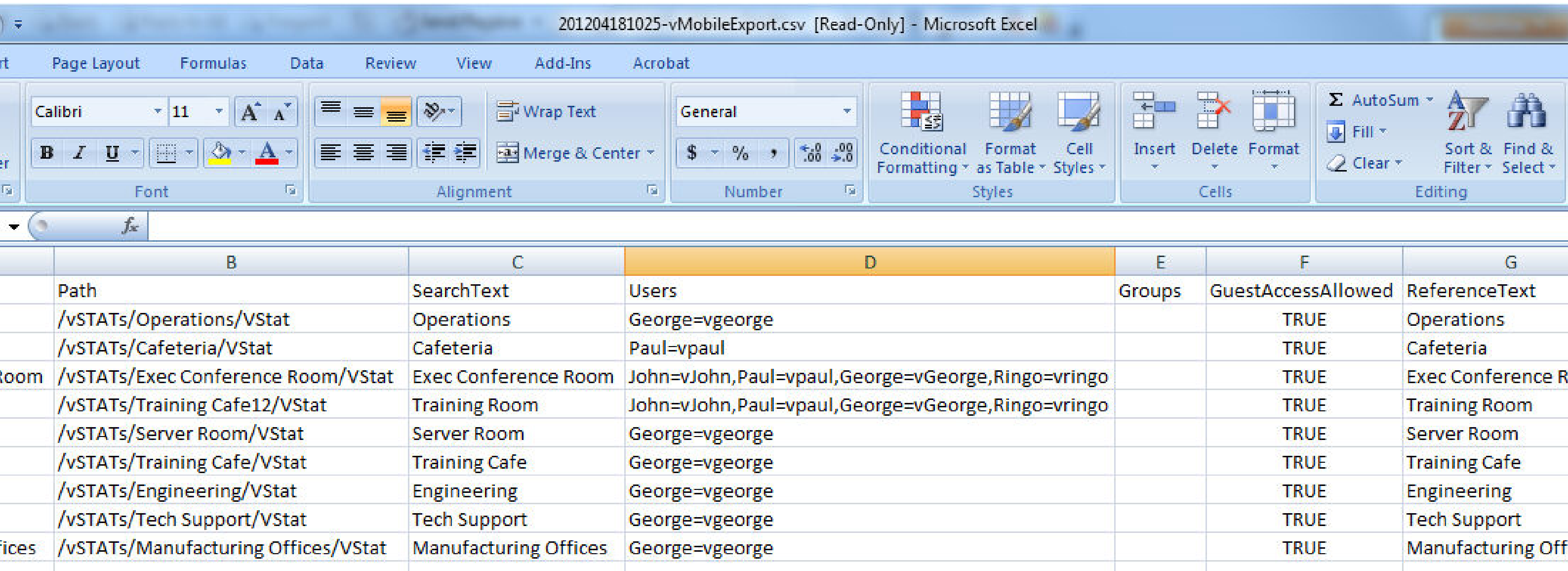
Administration of vSTAT users is accomplished through the Aspect Control Panel (WebUI) of an Aspect target. When logging in as an administrative user, a Mobile folder is present under each licensed instance of Aspect. The page provides the ability to download the current vSTAT configuration.



vSTAT configuration is downloaded as a .CSV file, which can be edited with any standard spreadsheet program such as Microsoft Excel, or even a text editor. To download the current configuration, click the download button and follow your browser's prompts to save the file locally to your PC.

Managing the CSV File

The CSV file provides an easy method to editing common information such as the Display Name, Search Text, Users, Groups, Guest Access, Reference Text, and PIN Numbers. Information contained within this file is persisted within the Aspect target, and must be managed as such once the file has been modified.



B	C	D	E	F	G
Path	SearchText	Users	Groups	GuestAccessAllowed	ReferenceText
/vSTATs/Operations/VStat	Operations	George=vgeorge		TRUE	Operations
/vSTATs/Cafeteria/VStat	Cafeteria	Paul=vpaul		TRUE	Cafeteria
/vSTATs/Exec Conference Room/VStat	Exec Conference Room	John=vJohn,Paul=vpaul,George=vGeorge,Ringo=vringo		TRUE	Exec Conference R
/vSTATs/Training Cafe12/VStat	Training Room	John=vJohn,Paul=vpaul,George=vGeorge,Ringo=vringo		TRUE	Training Room
/vSTATs/Server Room/VStat	Server Room	George=vgeorge		TRUE	Server Room
/vSTATs/Training Cafe/VStat	Training Cafe	George=vgeorge		TRUE	Training Cafe
/vSTATs/Engineering/VStat	Engineering	George=vgeorge		TRUE	Engineering
/vSTATs/Tech Support/VStat	Tech Support	George=vgeorge		TRUE	Tech Support
/vSTATs/Manufacturing Offices/VStat	Manufacturing Offices	George=vgeorge		TRUE	Manufacturing Off

Item	Notes
Display Name	Defines the name for the zone that vSTAT users will see in their application.
Path	Defines the path location of the vSTAT element. In most cases, the information displayed here should never be modified.
Search Text	Defines text tokens or keywords that can be assigned to a specific zone for searching through a site consisting of multiple vSTATs.
Users	Defines the users and passwords that have permissions to change zone setpoints, perform overrides, etc. Users can be added or deleted at any time using this field. The format used to define users is username=password (no space characters). These credentials are case sensitive, therefore, use caution when creating and providing credentials to users, as case sensitivity is a common cause of accessibility problems.
Groups	Defines Aspect user groups permitted to access the vSTAT. When left blank, no Aspect users are permitted to access a vSTAT, rather only accounts defined in the Users index of this file have the ability to access vSTATs from their mobile application.
Guest Access Allowed	Defines whether or not guests are permitted to see and view a particular vSTAT. When set to

	TRUE, any user accessing the site will have read/view-only access to the corresponding vSTAT. When set to FALSE, only defined users in the User index for the corresponding vSTAT will have access to the zone. TRUE/FALSE must be entered in all uppercase letters.
Reference Text	Defines reference text, searchable from the mobile application.
Pin	Defines a four-digit PIN number that can be used to access a particular vSTAT when the vSTAT mobile application is configured for Favorite and QR mode. AAM strongly recommends using all four digits. In cases where you wish to have less than four-digits for a PIN, leading zeros must be entered by the vSTAT mobile application user to access the zone. For example: • A PIN assignment of 1 will require a user to enter the PIN as 0001. • A PIN assignment of 23 will require the user to enter the PIN as 0023. • A PIN assignment of 168 will require the user to enter the PIN as 0168.

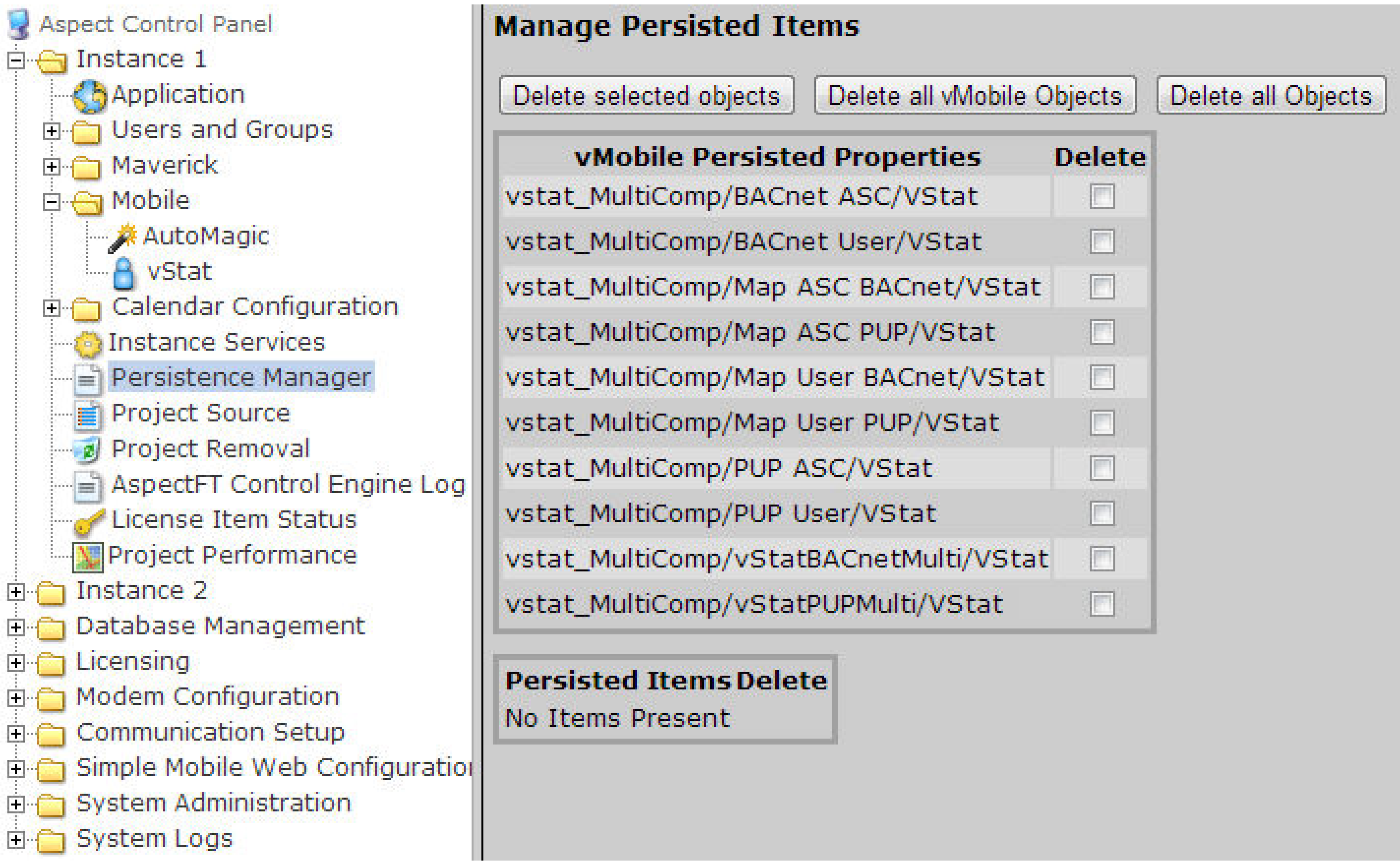
Applying Changes to the System

Applying changes to the system involves two steps:

- Managing Persisted Data
- Uploading the CSV File

Managing Persisted Data

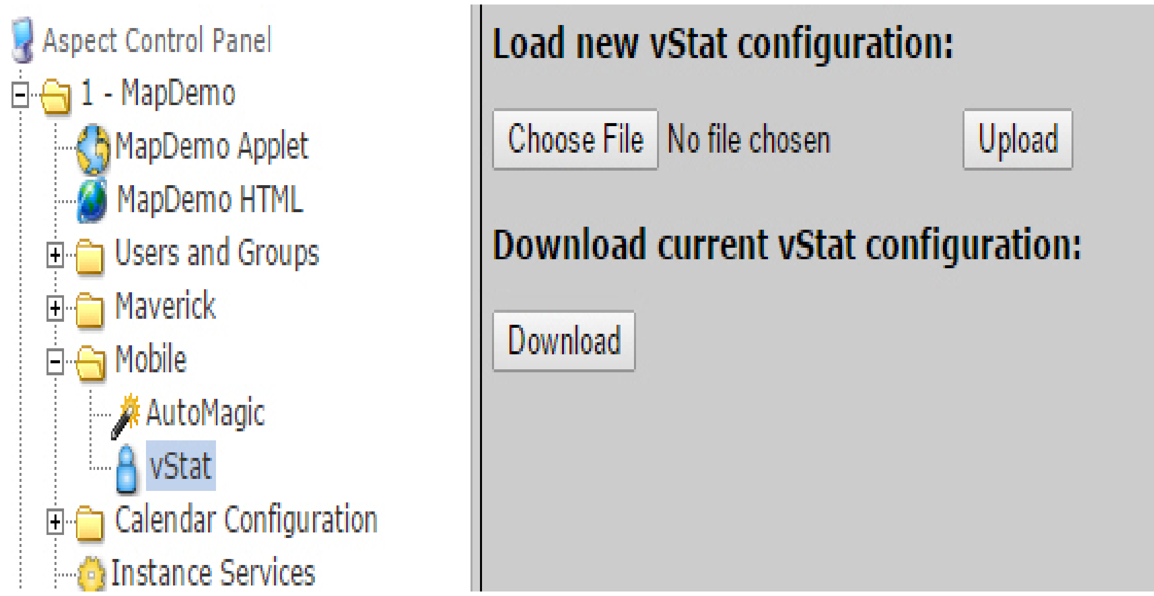
At any time that information has been modified by way of CSV file, you must manage the persisted data before uploading and applying the changes. To do this, access the Persistence Manager of the Aspect target. The Persistence Manager provides a dedicated section for managing vSTAT data. When you make a change to one or more vSTATs through the CSV file, you must first delete the persisted data for the corresponding vSTAT. Use the editor provided to do so. You may delete in a singular manner if you have updated information for a single vSTAT, or you can delete all persisted data for all vSTATs by clicking the Delete All vMobile Objects button.



Uploading the CSV File

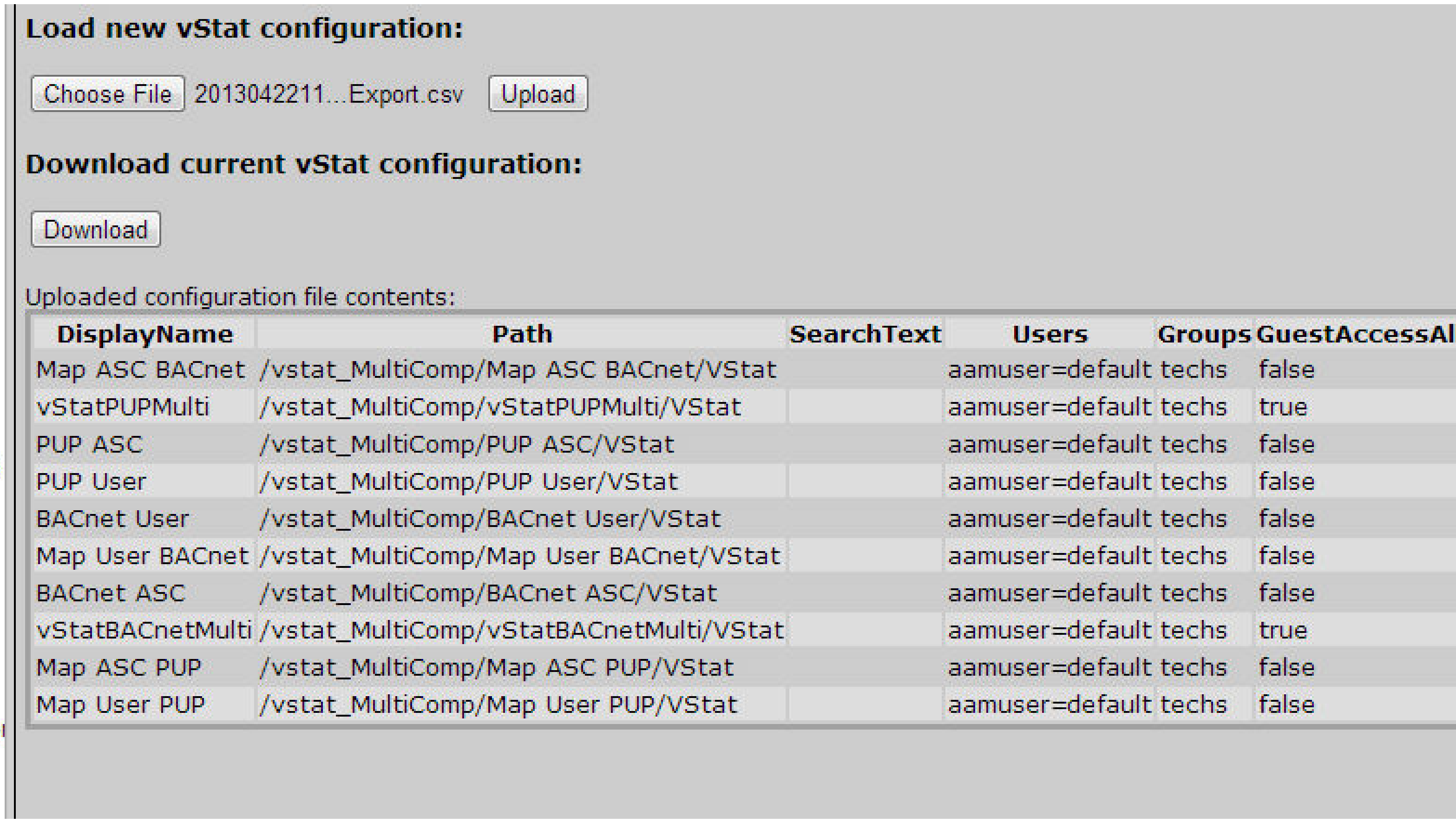
Once you have properly managed your persisted data, you may then upload the edited CSV file back into the Aspect target. Perform the following steps:

1. Access the vSTAT page under the Mobile folder in the Aspect Control Panel of your target.



2. Click Browse and locate the updated CSV file on your PC. Once found, click Upload.

3. When the upload has completed, you will see a representation of the edited file in the web page reflecting all changes that have been made.



DisplayName	Path	SearchText	Users	Groups	GuestAccessAl
Map ASC BACnet	/vstat_MultiComp/Map ASC BACnet/VStat		aamuser=default	techs	false
vStatPUPMulti	/vstat_MultiComp/vStatPUPMulti/VStat		aamuser=default	techs	true
PUP ASC	/vstat_MultiComp/PUP ASC/VStat		aamuser=default	techs	false
PUP User	/vstat_MultiComp/PUP User/VStat		aamuser=default	techs	false
BACnet User	/vstat_MultiComp/BACnet User/VStat		aamuser=default	techs	false
Map User BACnet	/vstat_MultiComp/Map User BACnet/VStat		aamuser=default	techs	false
BACnet ASC	/vstat_MultiComp/BACnet ASC/VStat		aamuser=default	techs	false
vStatBACnetMulti	/vstat_MultiComp/vStatBACnetMulti/VStat		aamuser=default	techs	true
Map ASC PUP	/vstat_MultiComp/Map ASC PUP/VStat		aamuser=default	techs	false
Map User PUP	/vstat_MultiComp/Map User PUP/VStat		aamuser=default	techs	false

Creating QR Codes

Creating QR Codes

Once a project has been designed and deployed to your Aspect target, QR codes can then be generated for use with the vSTAT Mobile Application. In order to generate QR codes, you must first Retrieving vSTAT Information from the Aspect Control Panel. Once you have retrieved the .CSV file from the Control Panel, you may then use the QR Code Generator tool within Aspect-Studio.

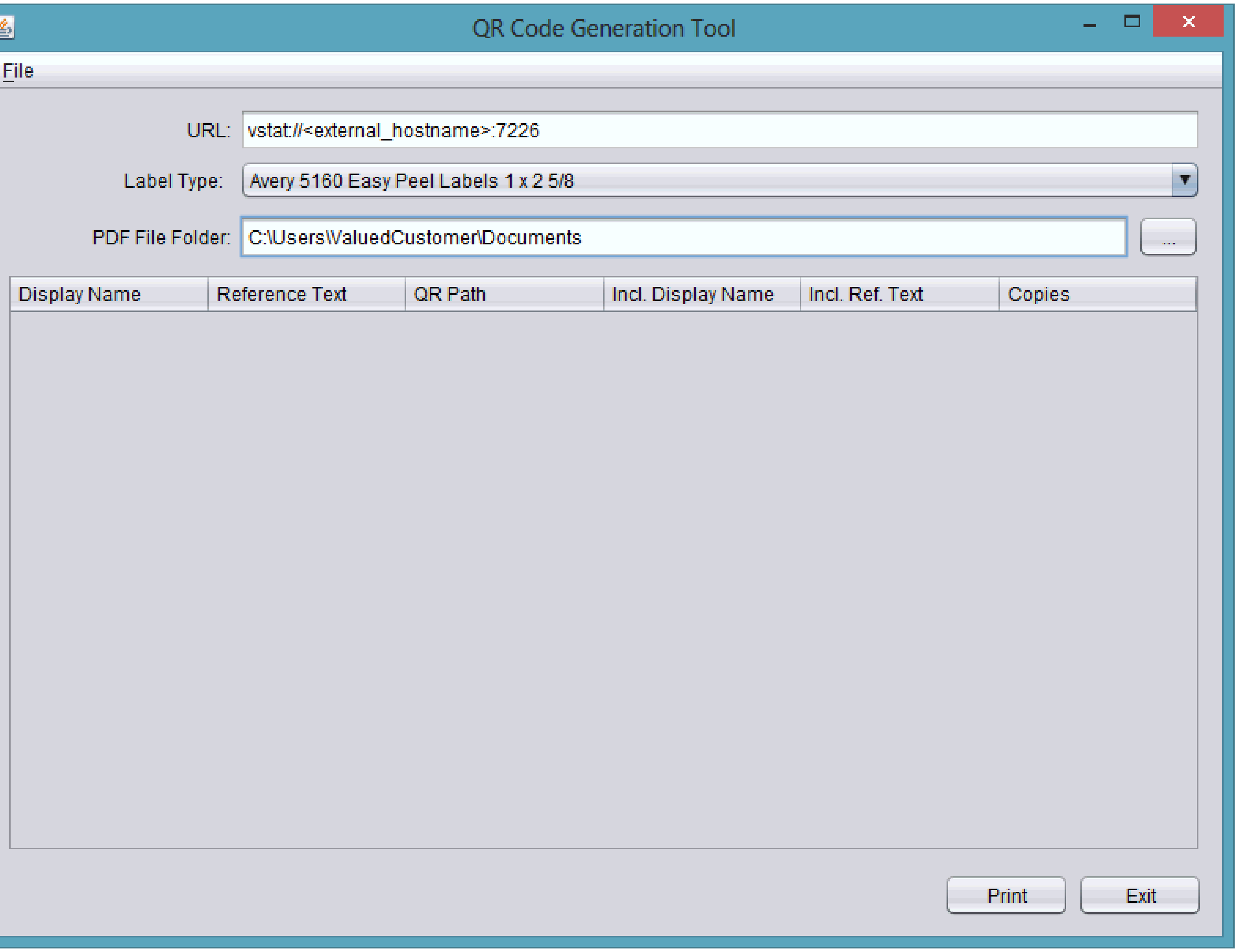
More Information

Retrieving vSTAT Information from the Aspect Control Panel

Using the QR Code Generator

Using the QR Code Generator

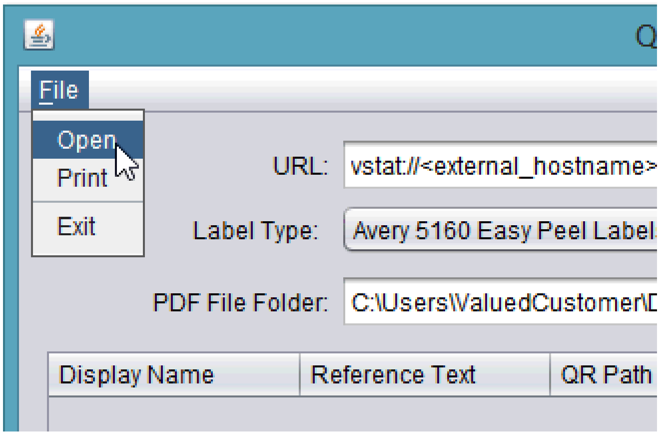
The QR Code Generator can be launched by selecting Tools>QR Code Generator menu. Alternatively, you can type CTRL+SHIFT=Q to launch it.



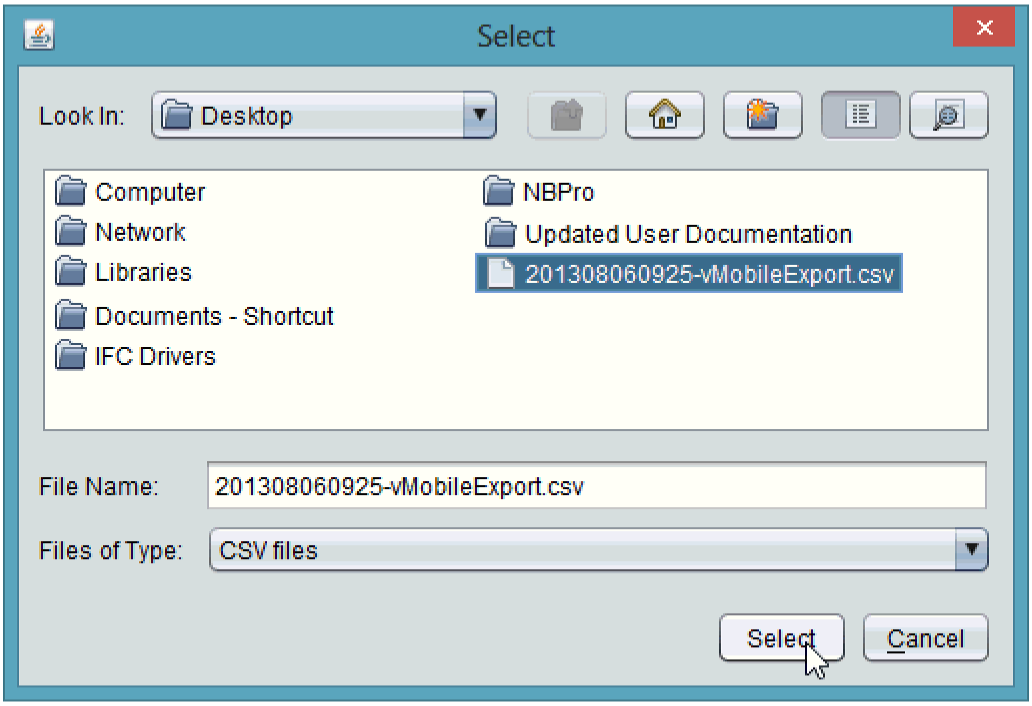
Loading vSTAT Information Into the QR Code Generator

To use the QR Generator, you must load the downloaded .CSV file into the tool. Perform the following steps:

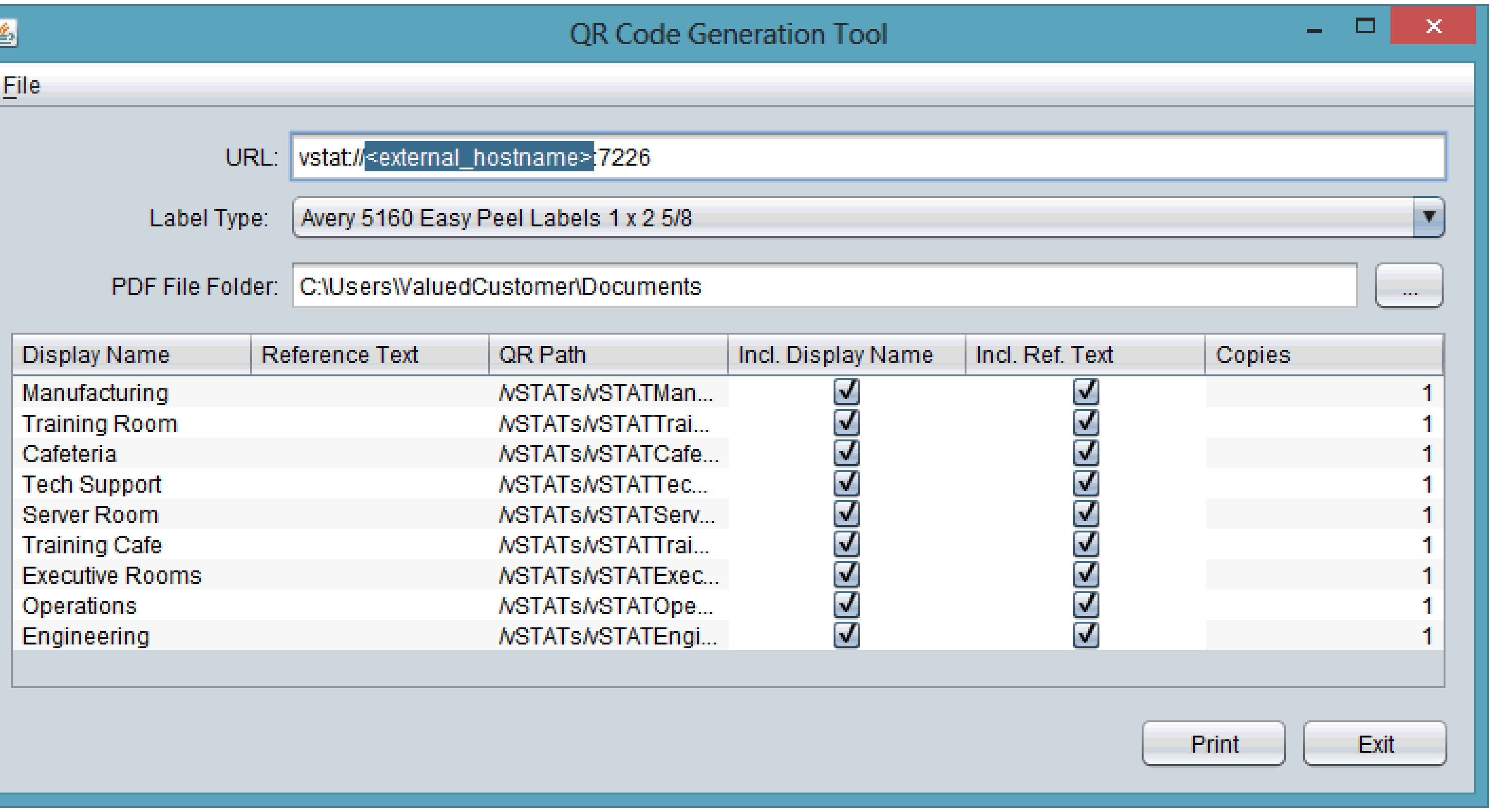
1. Select File>Open from the QR Code Generator.



2. Locate the .CSV file downloaded to your computer from the Aspect Control Panel. Click Select to load the file.

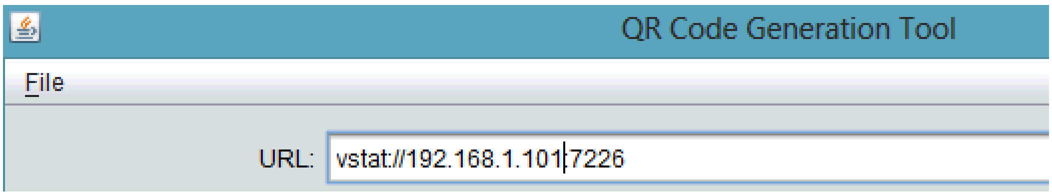


3. Once loaded, you will see all vSTAT zones loaded into the grid of the QR Code Generator.



Configuring the vSTAT URL

To ensure that the vSTAT Mobile Application can navigate to a zone properly, you must first configure the URL for your vSTAT. This is done through the URL field. By default, all information with the exception of the external host name or IP address is configured. Using your keyboard and mouse, select the <external_hostname portion of the address and replace it with the resolvable name or IP address that is used to access the Aspect target.



NOTE - Ensure that the less than and greater then symbols are not present once you have entered addressing information. Failure to do so will output QR codes with invalid addresses.

NOTE - If you have exposed your Aspect target for Internet access, ensure that you are using the externally resolvable address if you wish for users outside of a building to have QR Code scanning capabilities.

Configuring Label Types for Printing

The QR Code Generator supports the following label formats:

- Avery 5262 Easy Peel Labels 1 1/3 x 4
- Avery 5160 Easy Peel Labels 1 x 2 5/8
- Avery 8160 Easy Peel Labels 1 x 2 5/8
- Avery 8161 Easy Peel Labels 1 x 4

The QR Code Generator will print QR labels to a PDF format file structured for the selected label type. To print the QR codes, your printer must support the ability to print labels, and you must use the make and type of label defined.

Printing the QR Codes

To print labels, click the Print button. The QR Code Generator will always initially print QR Codes to a PDF file for the label output type you define in the QR Code Generator. Print output is stored in the location defined in the PDF File Folder property of the QR Code Generator.

Integrating Cylon BACnet and Unitron devices

Overview

Aspect® Matrix MAX devices can communicate with devices that use the Unitron protocol, such as Cylon's UC32 Main Plant and UCU unitary field controllers.

In order to integrate with Aspect® , a Unitron Site must have either:

- a Matrix MAX paired with each UC32.netK Comms Controller (i.e. one Matrix MAX per Fieldbus/Trunk on the site) or
- a Nexus unit for up to 4 UC32.netK Comms Controllers

or a combination of both.

Note: Each Comms Controller on the Unitron Site must have a specified IP Address, as Aspect Networks are mapped to Comms Controllers by IP address.

An Aspect® project must be set up for each Fieldbus, using the paired Matrix MAX or Nexus unit as the project's target.

This schema can be configured by importing the Fieldbus's configuration from the Engineering Center as explained in Importing Unitron Devices. Alternatively, the schema can be configured manually as detailed in Manually adding a Unitron Device, if the Engineering Center export file is unavailable.

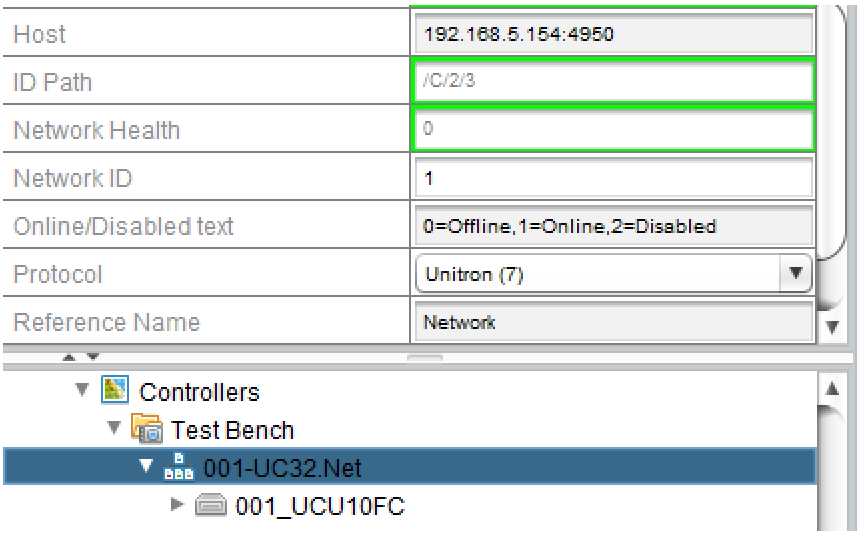
Manually adding a Unitron or Cylon BACnet Device to the ASPECT-Studio Map

If your site includes a fieldbus of Unitron or Cylon BACnett Controllers, paired with a MATRIX Series you can add the controllers to the ASPECT-Studio Map manually, as described below.

> **Note**: If the Unitron or Cylon BACnet Fieldbus has been engineered using the CEC, you can import the full fieldbus using ASPECT-Studio's "Strategy Import" function as described in "Importing Unitron and Cylon BACnet Devices (Strategy Import)" on page 884

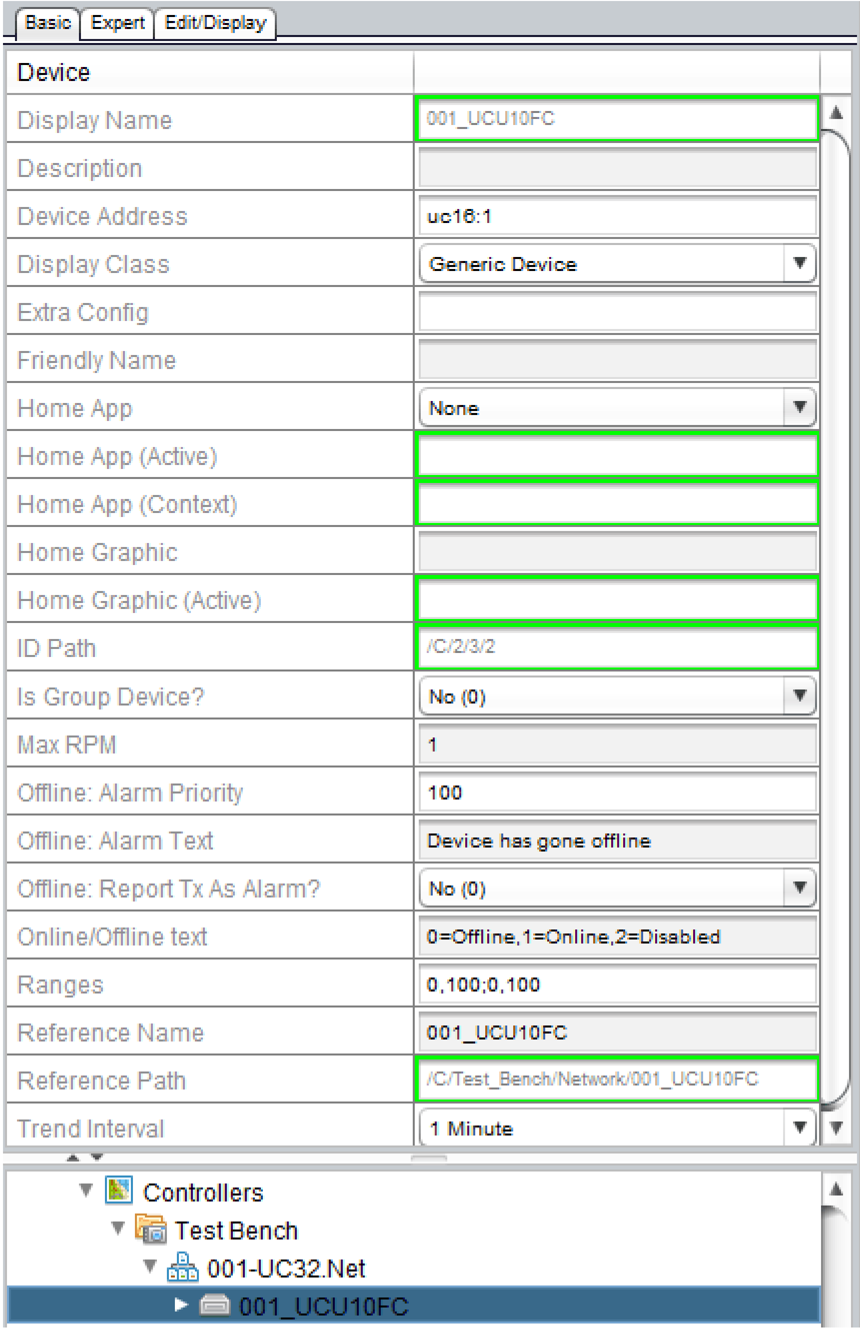
To add a Unitron or Cylon BACnet device manually, first create a **Network**, to represent the fieldbus's **Comms Controller**

1. In the ASPECT-Studio Map, add a Network Group
2. In that Network Group, add a Network (i.e. a Cylon BACnet Comms Controller or Cylon BACnet Router)
3. In the Basic tab of the newly-created **Network**:
   - Enter the Host IP address followed by the port
   - In ID Path enter the Network ID of the network
   - Select Unitron from the Protocol drop-down list



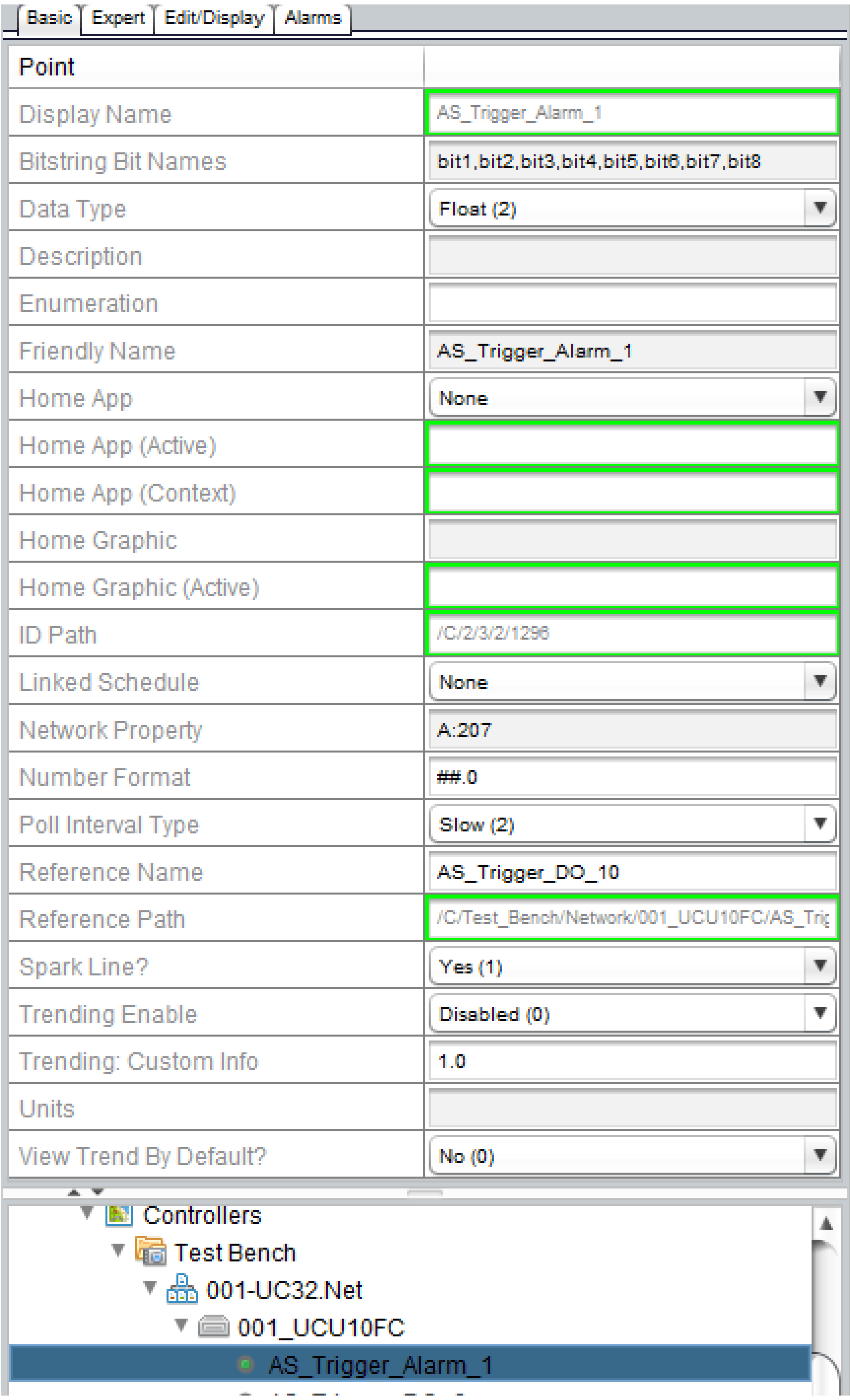
Next, add a **Device** to represent the **Field controller**

1. Right-click on the Network and add a new **Device**.
2. In the newly-created **Device** (i.e. Field / Unitary Controller)
3. In the Basic tab of the **Device**, enter
   1. Device Address, which is the Protocol:Address e.g. uc16:1
   2. Device Name
   3. optionally a Friendly Name which can be used to more easily identify the device



Finally, add any required points within the controller:

1. Right-click on the **Device** and add a new **Point**
2. In the Basic tab of the Point enter
   1. the Data Type,
   2. Reference Name,
   3. Network Property as point type:point number, e.g. D:200 (Digital Virtual no. 200), or AH:1 (Analog Hardware point no. 1)



Importing Unitron and Cylon BACnet Devices (Strategy Import)

If your site integrates a fieldbus of Unitron or Cylon BACnet Controllers, engineered using CEC or CXpro^{HD} and supervised by a MATRIX Series controller, you can import the full fieldbus using ASPECT-Studio's "Strategy Import" function.

If a Unitron Fieldbus has not been engineered with CEC, you can add the controllers to the ASPECT-Studio Map manually, as described in Adding a Unitron Device

Note: After the **Map** has been imported - either from CXpro^HD or manually - you must select the points that will be polled (by default all points will be set to 'on-demand network points'). However, after selecting Polled points you must check the Network Load on each Network (by right-clicking on the Network and selecting Estimated Network Load) to ensure that the polling estimate is less than 10 points/second.

Note: Each imported point is automatically assigned a Display Class, as outlined below. If Points do not appear on a Context Page as expected, set the Display Class on the Context page to "Everything".

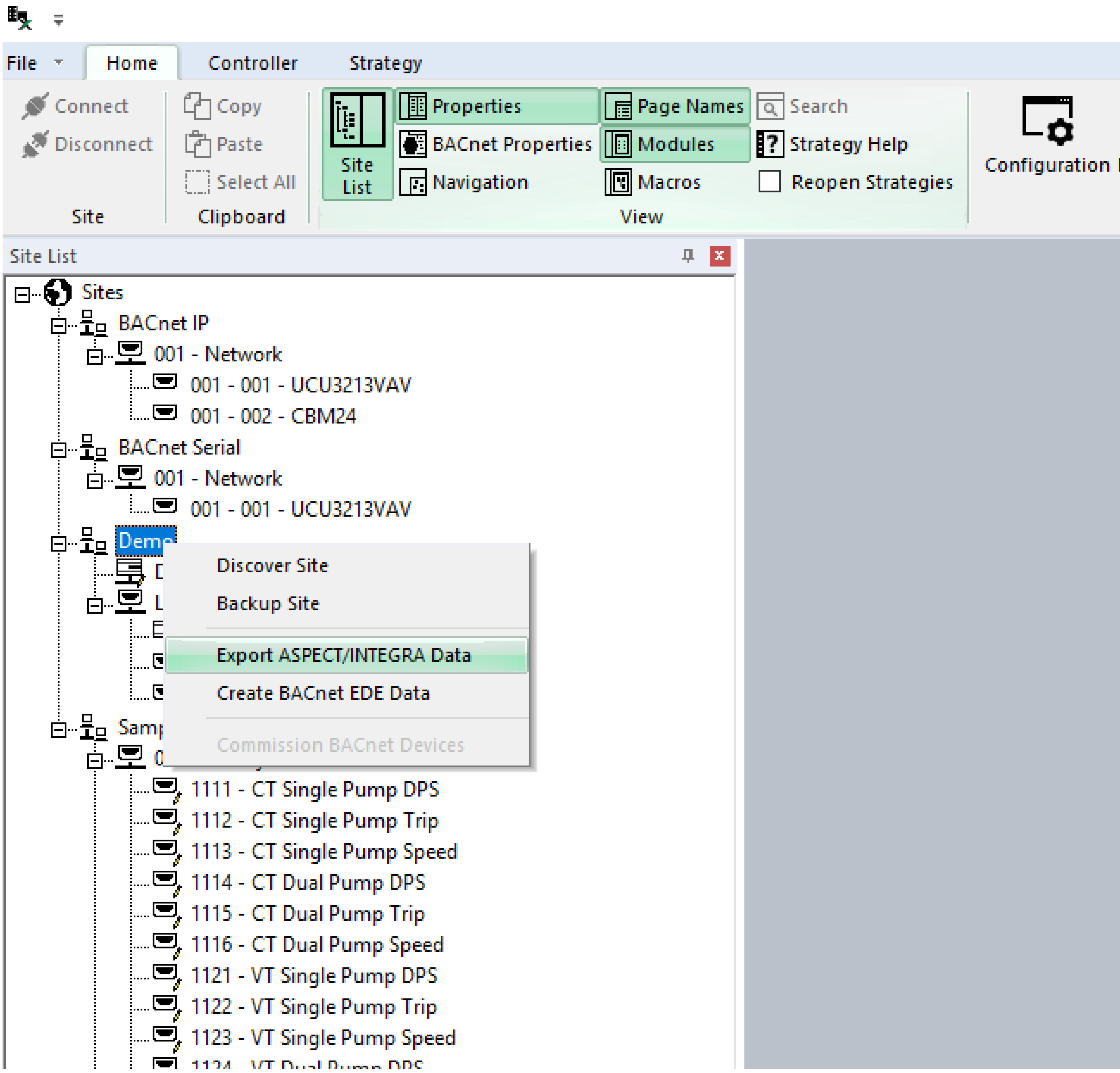
- **BACnet** Hardware Points are assigned a Display Class of "**Normal**" (10)
- **BACnet** non-Hardware points are assigned a Display Class of "**Detail**" (50)
- Unitron Hardware Points, Unitron Points associated with Alarms and Unitron Points associated with Logs are assigned a Display Class of "**Normal**" (10)
- All other Unitron points are assigned a Display Class of "**Detail**" (50)

Create Import File in CXpro^HD

To import using the "Strategy Import" function, first create the "**Strategy Transfer file**" from within CXpro^HD as follows:

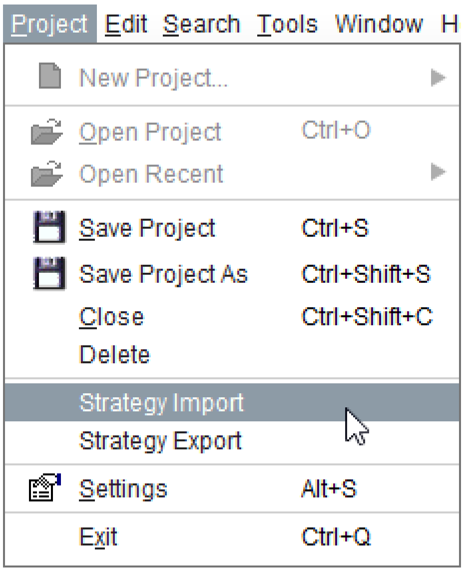
1. In theCXpro^HD Site Tree, right-click on the **site** or **controller** you wish to export and select Export Aspect/Integra Data

2. Select the location to export the file to and click OK

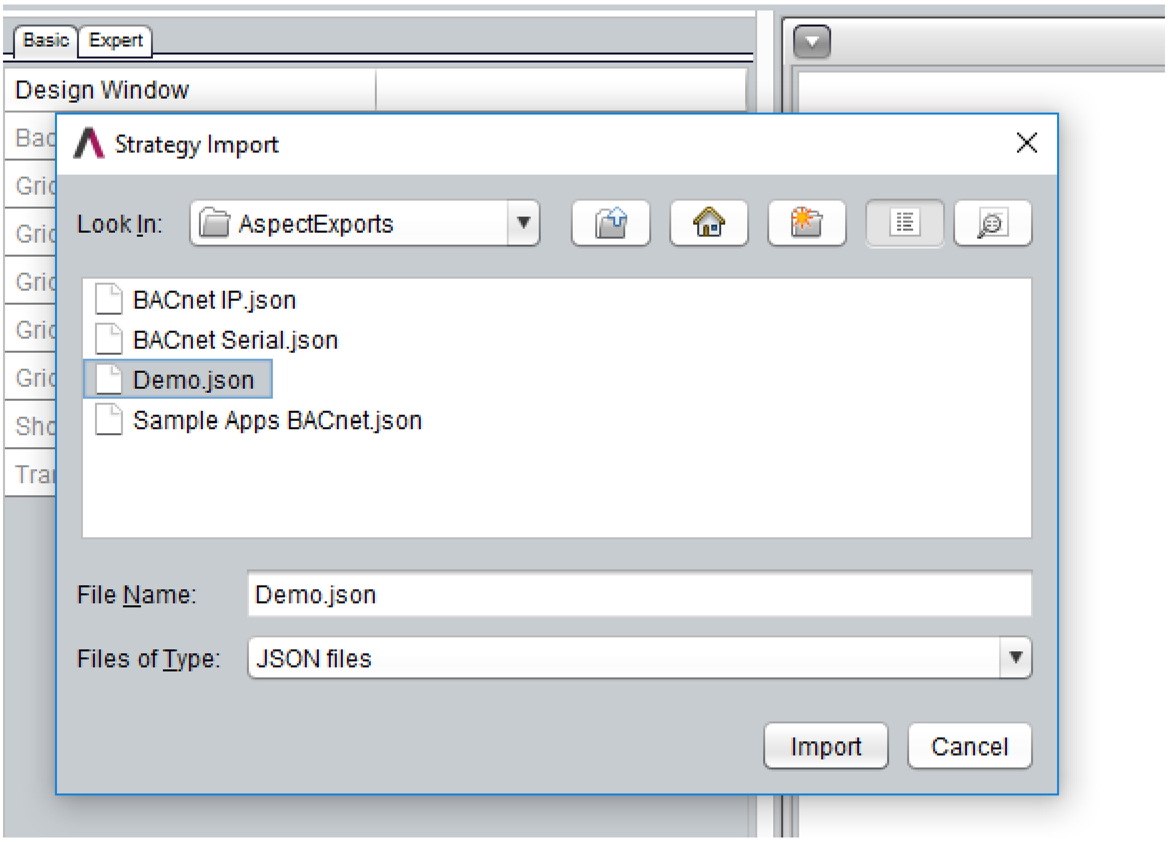


Import into ASPECT-Studio

1. In ASPECT-Studio, open or create a **Project**, and then select Strategy Import from the Project menu:



2. Select the "Strategy Transfer File" `.json` that was exported from CXpro^HD, and click Import.

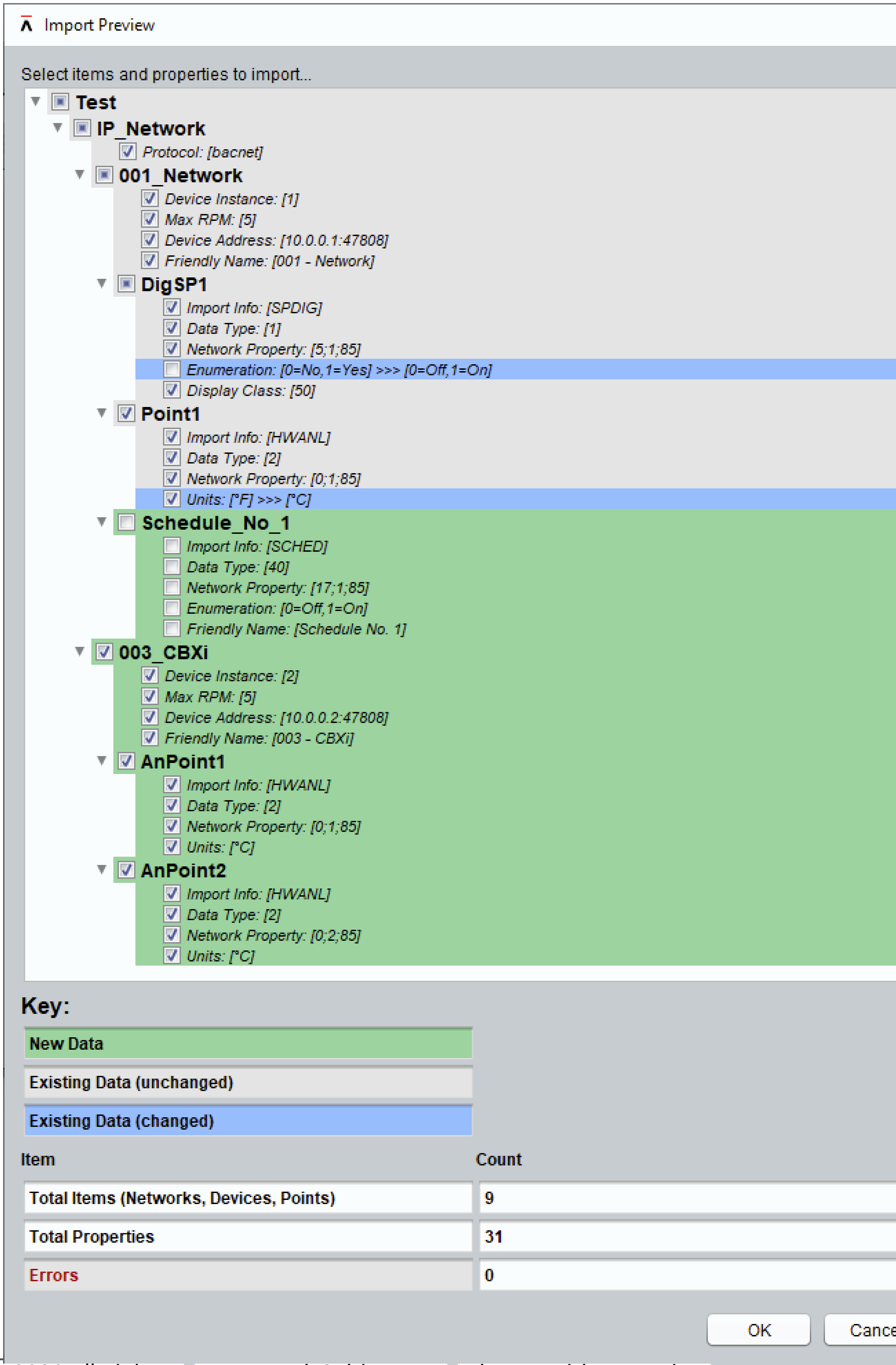


The items to be imported and their properties will be displayed in the Import Preview window as shown below.

In this example, some of the data already exists in the **Project** (e.g. from a previous import).

- Existing data is shown in light grey.
- Changes to existing data are shown in blue and

- New data to be imported is shown in green.


Import Preview
Select items and properties to import...
Test
IP_Network
Protocol: [bacnet]
001_Network
Device Instance: [1]
Max RPM: [5]
Device Address: [10.0.0.1:47808]
Friendly Name: [001 - Network]
DigSP1
Import Info: [SPDIG]
Data Type: [1]
Network Property: [5;1;85]
Enumeration: [0=No,1=Yes] >>> [0=Off,1=On]
Display Class: [50]
Point1
Import Info: [HWANL]
Data Type: [2]
Network Property: [0;1;85]
Units: [°F] >>> [°C]
Schedule_No_1
Import Info: [SCHED]
Data Type: [40]
Network Property: [17;1;85]
Enumeration: [0=Off,1=On]
Friendly Name: [Schedule No. 1]
003_CBXi
Device Instance: [2]
Max RPM: [5]
Device Address: [10.0.0.2:47808]
Friendly Name: [003 - CBXi]
AnPoint1
Import Info: [HWANL]
Data Type: [2]
Network Property: [0;1;85]
Units: [°C]
AnPoint2
Import Info: [HWANL]
Data Type: [2]
Network Property: [0;2;85]
Units: [°C]
Key:
New Data
Existing Data (unchanged)
Existing Data (changed)
Item
Count
Total Items (Networks, Devices, Points)
9
Total Properties
31
Errors
0
OK

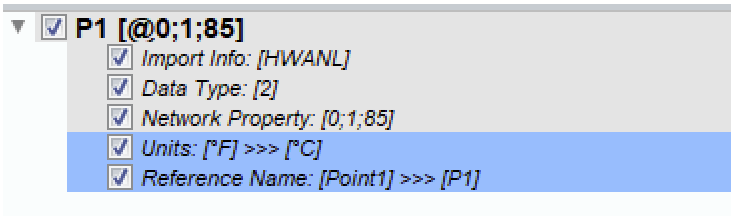
- All items and properties will be ticked by default. If there are items or properties that are to be excluded from the import, clear the checkboxes beside those items.
  In example above, the property Enumeration would be changed from "0=No,1=Yes" to "0=Off,1=On" as part of the import. However, this change is unticked, and so it will not be applied.
- Existing unchanged data (shown in grey) will not have any affect if it is ticked and re-imported - i.e. it will not be duplicated.

3. Click OK to apply the import to your project. A brief summary message will be shown and your project's **Map** will be refreshed to show the changes.

Network Property Matching

Typically when importing, the **Reference Path** is the key/identifier that is used to match an item in the **JSON** with an existing item in your **Project** (if the item already exists). In some cases the **Reference Name** of a point in the **Project** will have changed or might be different to the values in the **JSON** import file. In that case, ASPECT-Studio will attempt to match to other points under the same device using the "**Network Property**" (unique **BACnet** property). This type of alternative matching only applies to **points**, not **networks** or **devices**.

Here is an example of a point that was matched using the **Network Property** "0;1;85".



The @ tag after the point's name indicates that it was identified by matching the **Network Property**.

The **Reference Name** in this case will be updated from Point1 to P1 as part of the import. If this is not required, clear the checkbox beside the point name to leave the Reference Name as Point1.

Notes on Imported Strategies

Unitron **Alarm** blocks are imported into ASPECT as **Proxied Alarms**, and ASPECT **Alarm** conditions can also be set manually on the imported

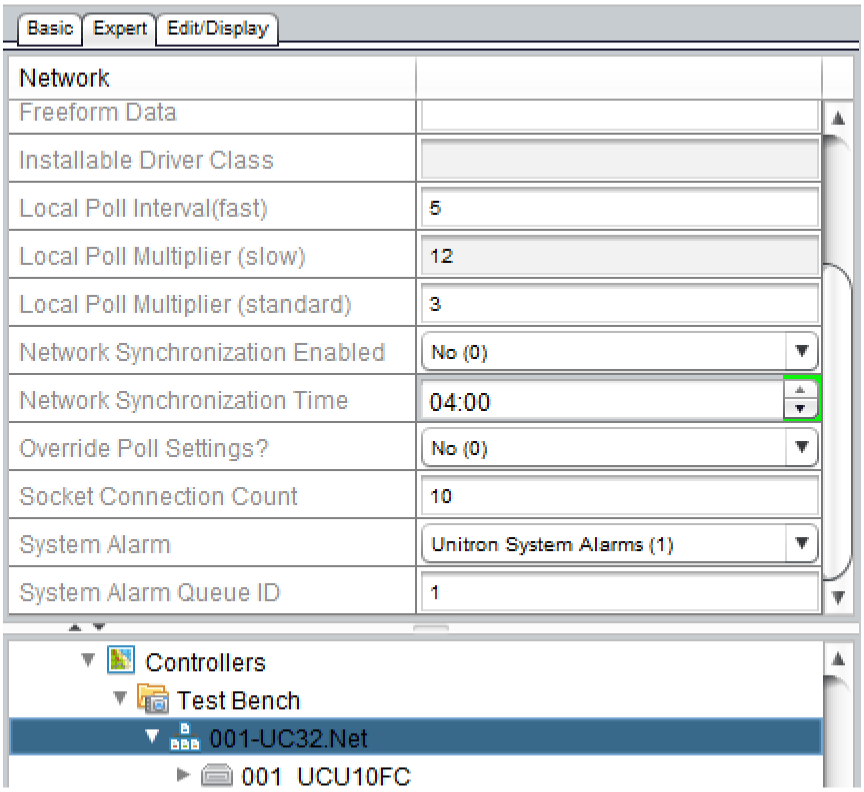
Network. See Configuring Alarms on an Imported Unitron Site for more details.

Trendlogs from the Unitron site are imported into ASPECT as **Proxied Trendlogs**. See Using Proxied Trends for more details.

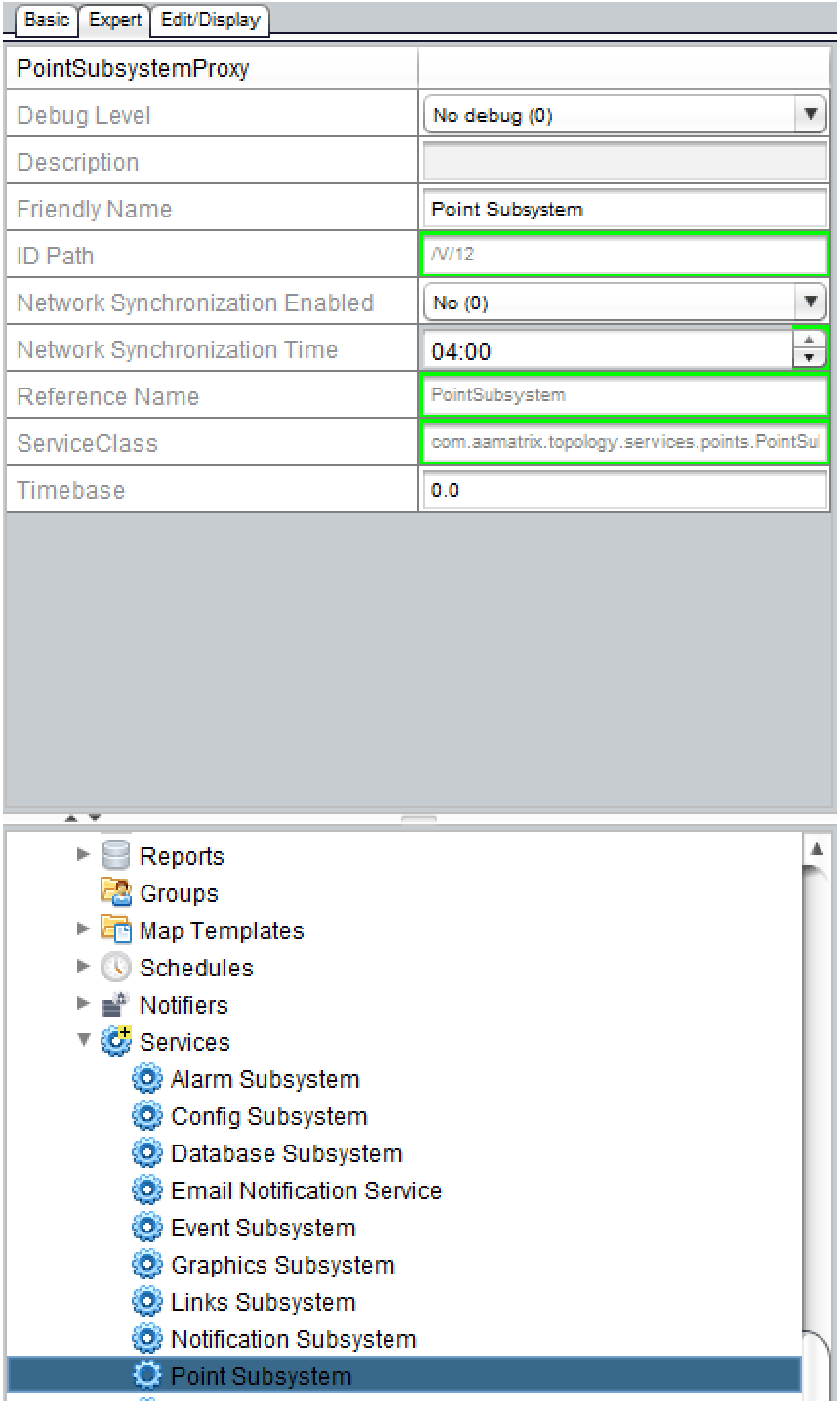
It is possible to synchronise the times on the Unitron site's **Comms Controllers** with the time used by the ASPECT supervisor. This is done by sending the ASPECT time to the Unitron system once every 24 hours. You can set the time at which this happens in either the Expert tab of the Network node in the map, or in the Expert tab of the Point Subsystem node under the Services node in the map

> **Note**: ASPECT disables the Daylight Savings Time (DST) flag in the Unitron Comms Controller each time the ASPECT time is sent.

- Network node:



- Point Subsystem node

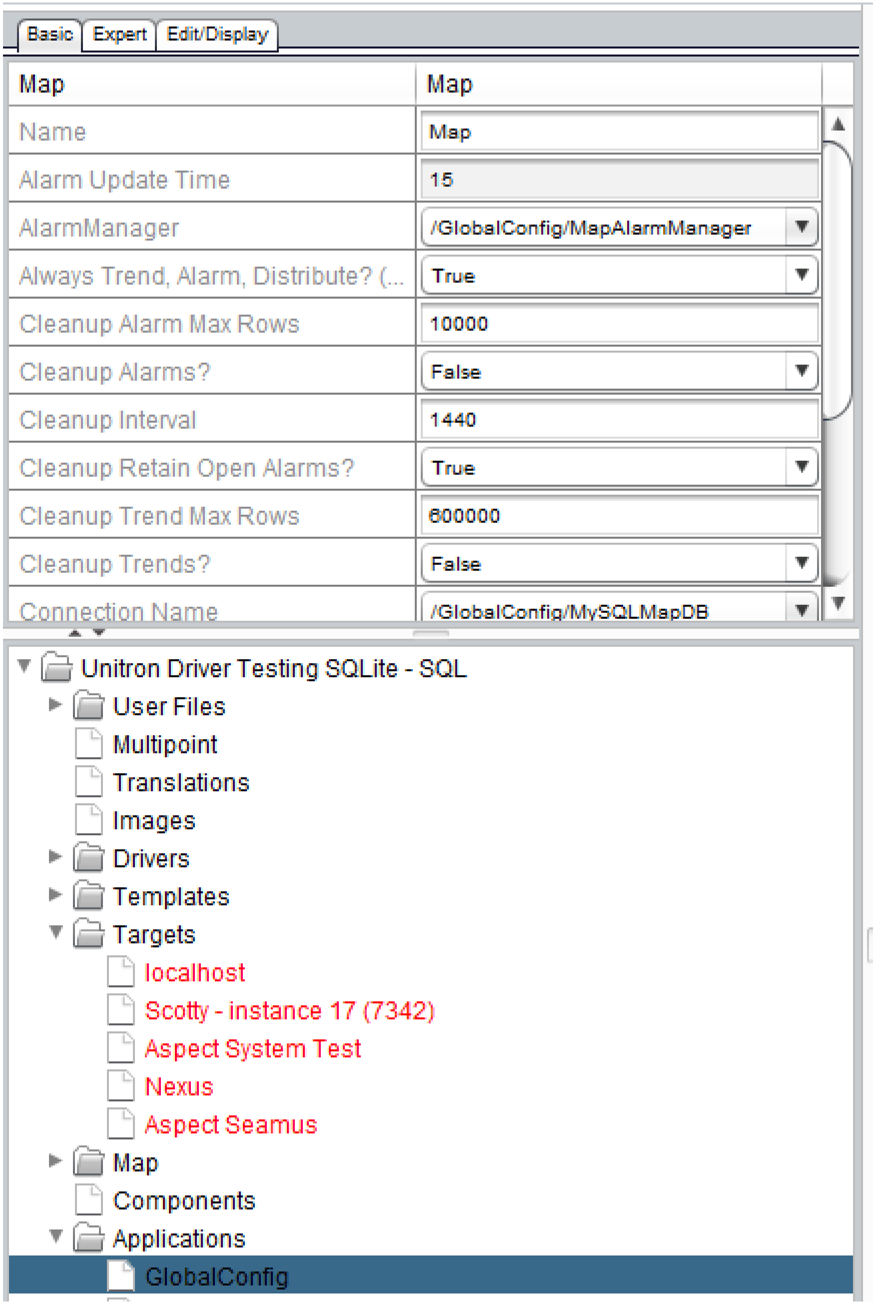


- By default, synchronization is enabled at the Subsystem level
- If synchronization is enabled at the Subsystem level, synchronization will be active for all Networks that are not marked as Disabled.
- If synchronization is enabled at the Subsystem level, not disabled at the Network level, and "Use Global Setting" is selected, then Subsystem-HH:MM will apply

- If it is enabled at the Subsystem level, not disabled at the Network level, and "Use Global Setting" is NOT selected then Network-HH:MM will apply.
- If synchronization is disabled at the Subsystem level, synchronization will only be active for Networks that are marked as "Use Network Setting" - in which case the Network-HH:MM will be use as the time. (Choosing "Use Global Setting" won't activate synchronization because it is disabled at the Subsystem level).

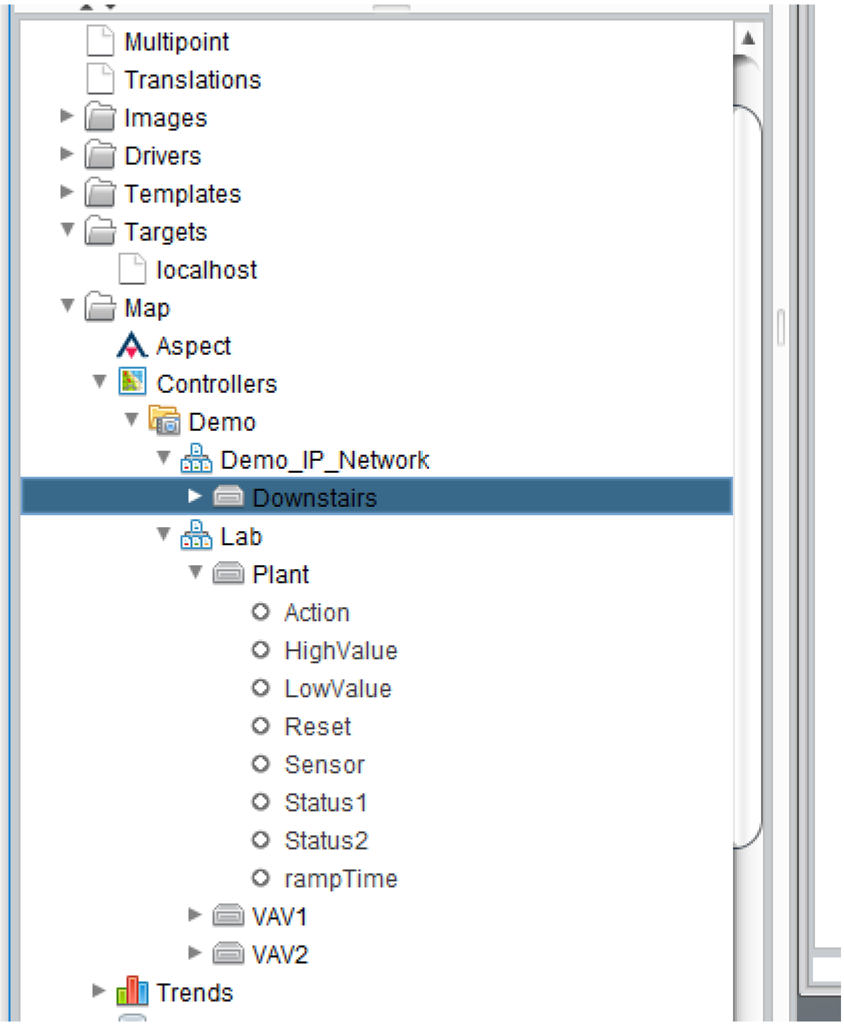
If values aren't appearing ...

Ensure Always Trend is enabled in Applications > GlobalConfig > Basic tab.

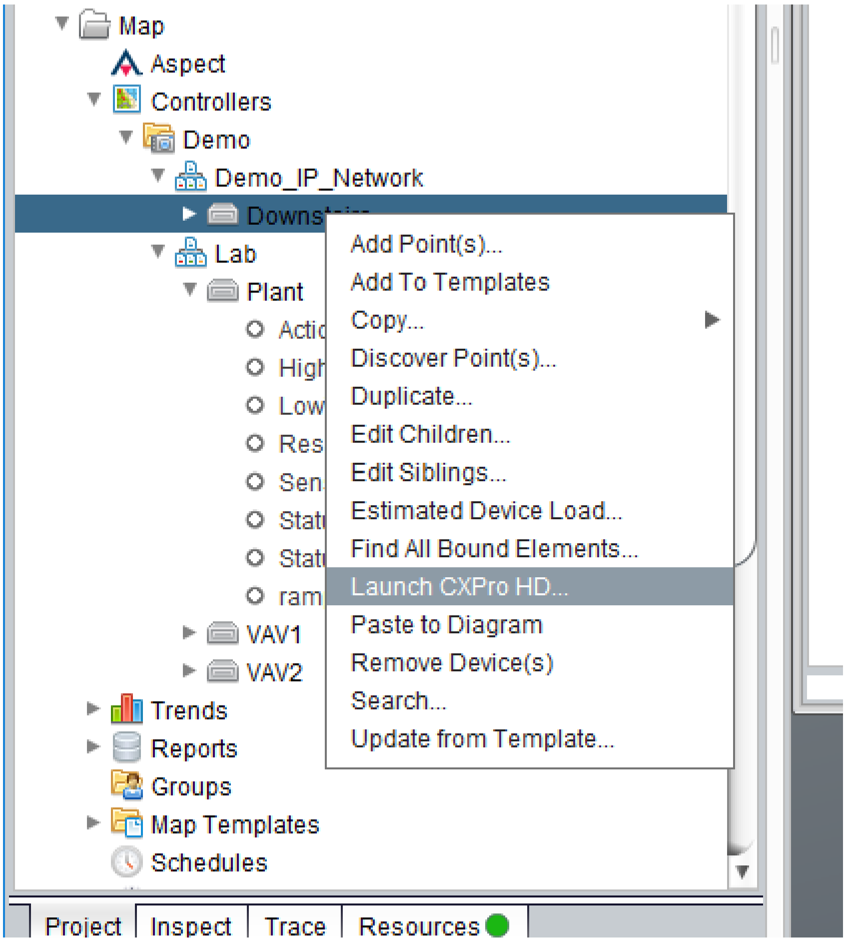


Launching CXpro^{HD} from the ASPECT-Studio Map

Once a CXpro^{HD} Site has been imported using the same process as "Importing Unitron and Cylon BACnet Devices (Strategy Import)" on page 884, it is reflected in the ASPECT-Studio Map as follows:



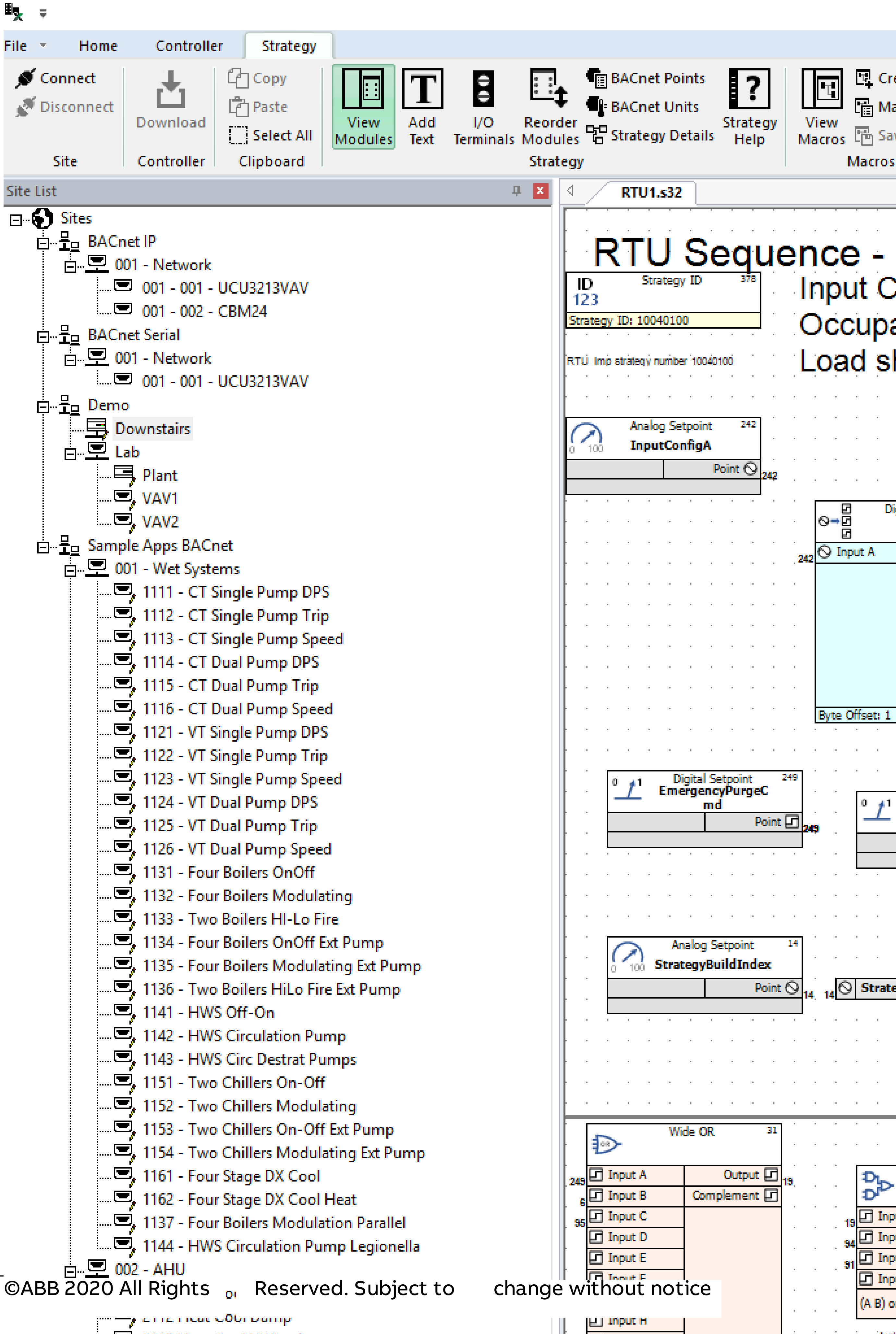
Launching CXPro HD from the ASPECT-Studio Map



CXpro^{HD} can now be launched from any **Device** or Point in the imported "Site" map.

When CXpro^{HD} is launched the targeted Device will automatically be displayed in the Strategy Editor.

:


File
Home
Controller
Strategy
Connect
Disconnect
Site
Download
Controller
Copy
Paste
Select All
Clipboard
View Modules
Add Text
I/O Terminals
Reorder Modules
BACnet Points
BACnet Units
Strategy Details
Strategy
Strategy Help
View Macros
Macros
Site List
RTU1.s32
Sites
BACnet IP
001 - Network
001 - 001 - UCU3213VAV
001 - 002 - CBM24
BACnet Serial
001 - Network
001 - 001 - UCU3213VAV
Demo
Downstairs
Lab
Plant
VAV1
VAV2
Sample Apps BACnet
001 - Wet Systems
1111 - CT Single Pump DPS
1112 - CT Single Pump Trip
1113 - CT Single Pump Speed
1114 - CT Dual Pump DPS
1115 - CT Dual Pump Trip
1116 - CT Dual Pump Speed
1121 - VT Single Pump DPS
1122 - VT Single Pump Trip
1123 - VT Single Pump Speed
1124 - VT Dual Pump DPS
1125 - VT Dual Pump Trip
1126 - VT Dual Pump Speed
1131 - Four Boilers OnOff
1132 - Four Boilers Modulating
1133 - Two Boilers HI-Lo Fire
1134 - Four Boilers OnOff Ext Pump
1135 - Four Boilers Modulating Ext Pump
1136 - Two Boilers HiLo Fire Ext Pump
1141 - HWS Off-On
1142 - HWS Circulation Pump
1143 - HWS Circ Destrat Pumps
1151 - Two Chillers On-Off
1152 - Two Chillers Modulating
1153 - Two Chillers On-Off Ext Pump
1154 - Two Chillers Modulating Ext Pump
1161 - Four Stage DX Cool
1162 - Four Stage DX Cool Heat
1137 - Four Boilers Modulation Parallel
1144 - HWS Circulation Pump Legionella
002 - AHU
RTU Sequence -
Input C
Occupa
Load sl
ID
123
Strategy ID
378
Strategy ID: 10040100
RTU Imp strategy number 10040100
Analog Setpoint
242
InputConfigA
Point
Input A
Byte Offset: 1
Digital Setpoint
249
EmergencyPurgeCmd
Analog Setpoint
14
StrategyBuildIndex
Wide OR
31
Input A
Input B
Input C
Input D
Input E
Input H
Output
Complement

Trending Unitron or Cylon BACnet Data

When a Unitron or Cylon BACnet site is imported, any **Datalogs** that were set up on the site will be available in ASPECT as **Proxied Trends**. By default the data from these **Trends** are read by ASPECT only when specifically requested ("on demand").

In order to keep data from **Proxied Trends** up to date, ASPECT can be set to continuously query the **Proxied Trends**, as described in Configuring Proxied Trends below.

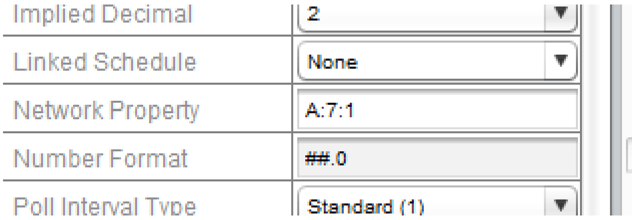
It is also possible to set up standard ASPECT **Trends** for any point on the imported site, including datalogged points - see Adding Aspect Trends below.

> **Note**: When viewing a specific Proxied Trend for the first time, data may not be visible for up to 20 seconds. See Viewing Proxied Trends below.

Proxied Trend Points

A **Proxied Trend** is represented in ASPECT as a Point, which is mapped to a Unitron **Datalog**. This mapping is automatically created by the import process, and can be seen in the Basic tab for that point, in the Network Property field.

e.g. A:7:1 represents analog (virtual) point 7 and datalog 1



Note: Any Datalog point should have "Enable On-demand proxy trend" set in the Expert tab.

Configuring Proxied Trends

Proxied Trends gather point data and store it within the Unitron controllers. ASPECT can copy the data from a **Proxied Trend** into its own database at regular intervals, or it can copy the data only when the user views the trend in the deployed ASPECT UI (ngAdmin).

The options for copying at regular intervals includes a set of prefined intervals with are applied only to one Trend (see Trend Read Interval), or

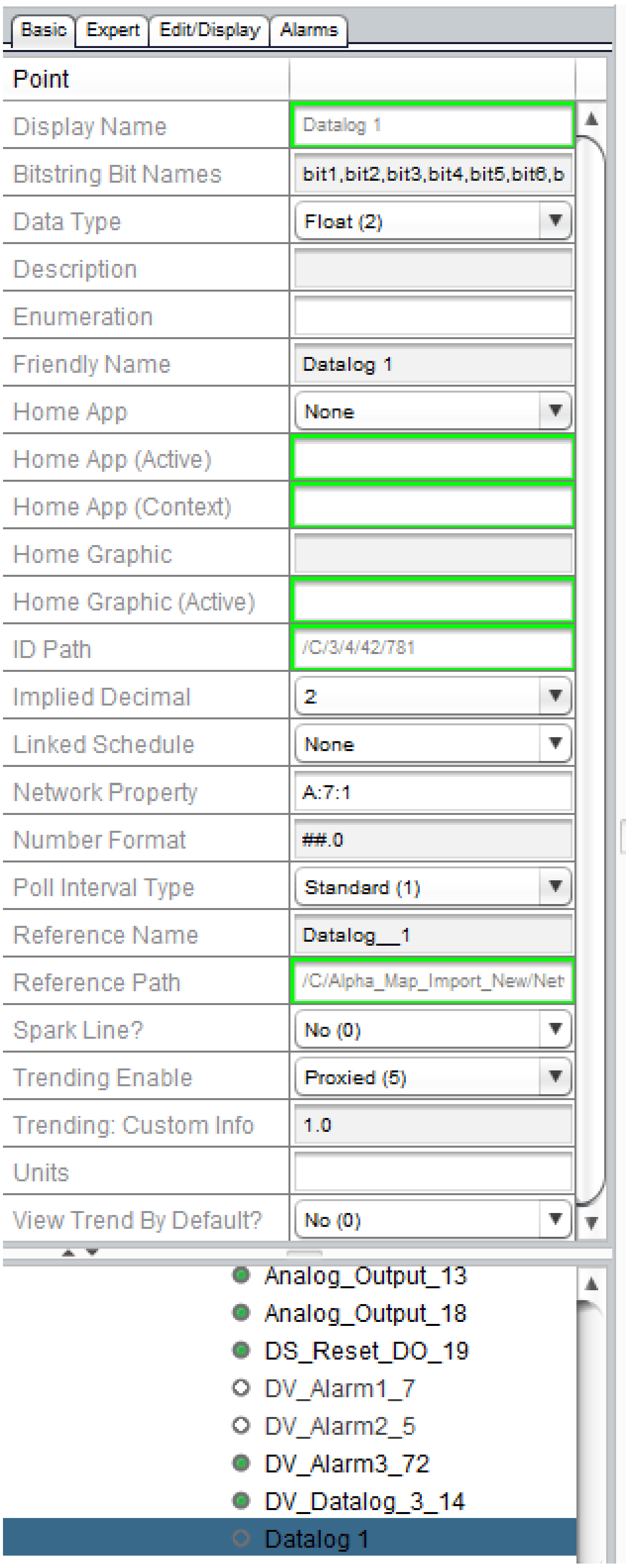
"Use device setting" which allows all Trends in a device to be read at the same interval (see Device Read Interval).

There is also an option to use Global Fixed Time, which allows **Trends** to be copied to the Aspect database at a fixed time of day every 24 hours. This can be used to ensure the traffic cause by **Trend** reading can be kept off the network during peak times. See Global Fixed Time below for more details.

A "collected" Proxied Trend can be viewed in the ASPECT UI (ngAdmin) in the same way as standard ASPECT Trends. To view an "On Demand" Proxied Trend, go to the On Demand tab of Ad Hoc Trends.

> **Note**: When viewing an "On Demand" Proxied Trend the graph is not drawn until all values have been read from the **Network** - which can take up to 20 seconds. See Viewing Proxied Trends below.

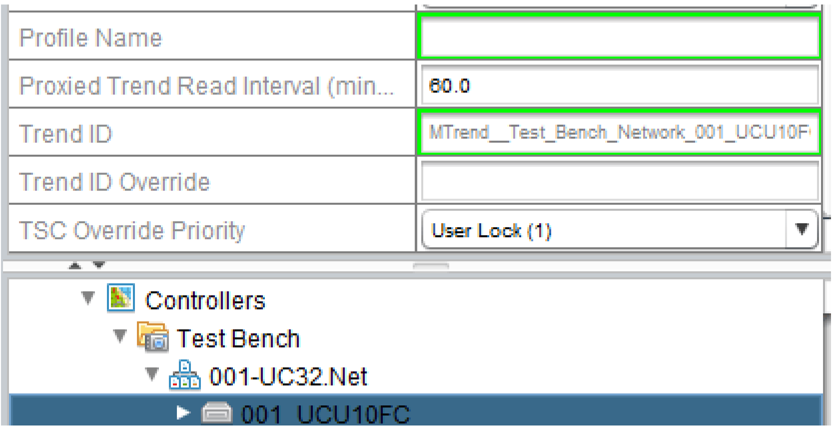
To set each **Trend** read time, first select the **Point** on which the **Proxied Trend** is configured, and in the Basic tab, set Trending Enable to Proxied (5)



Device Read Interval

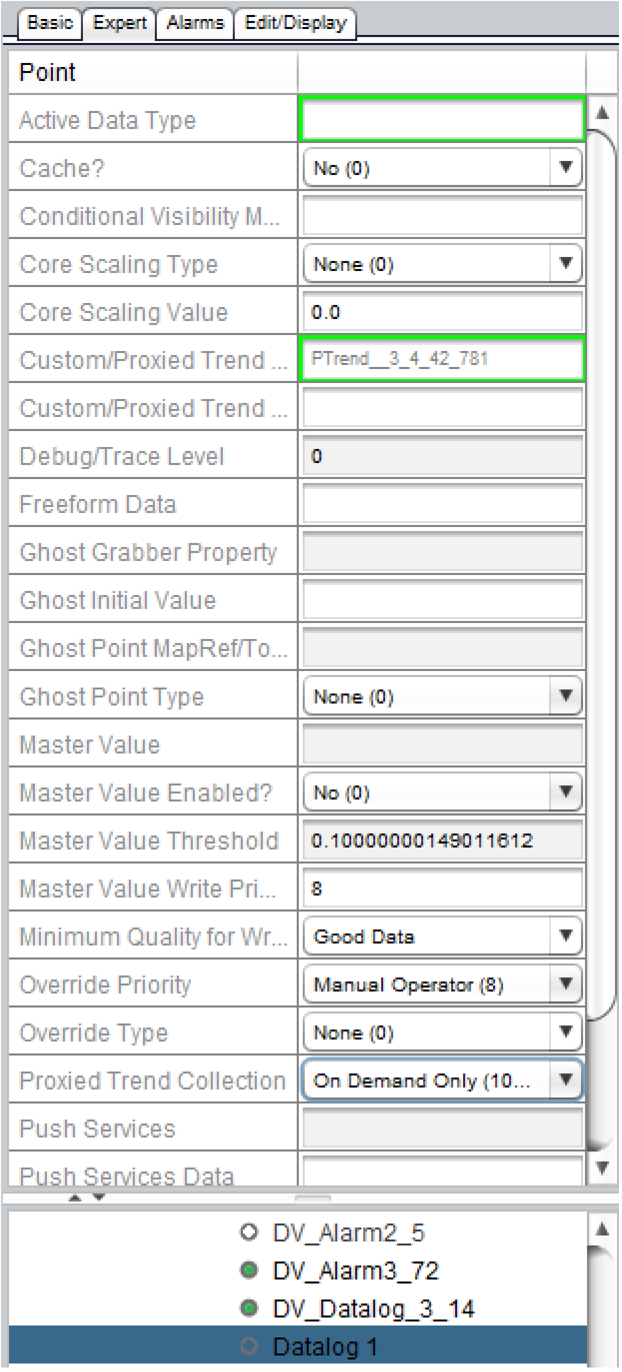
Select the **Device** that contains the **Datalog** whose **Proxied Trend** you want to configure.

Set the Proxied Trend Read Interval (Minutes) for the device. This value will be used for all **Trends** within this device that are set to "Use device setting"



Trend Read Interval

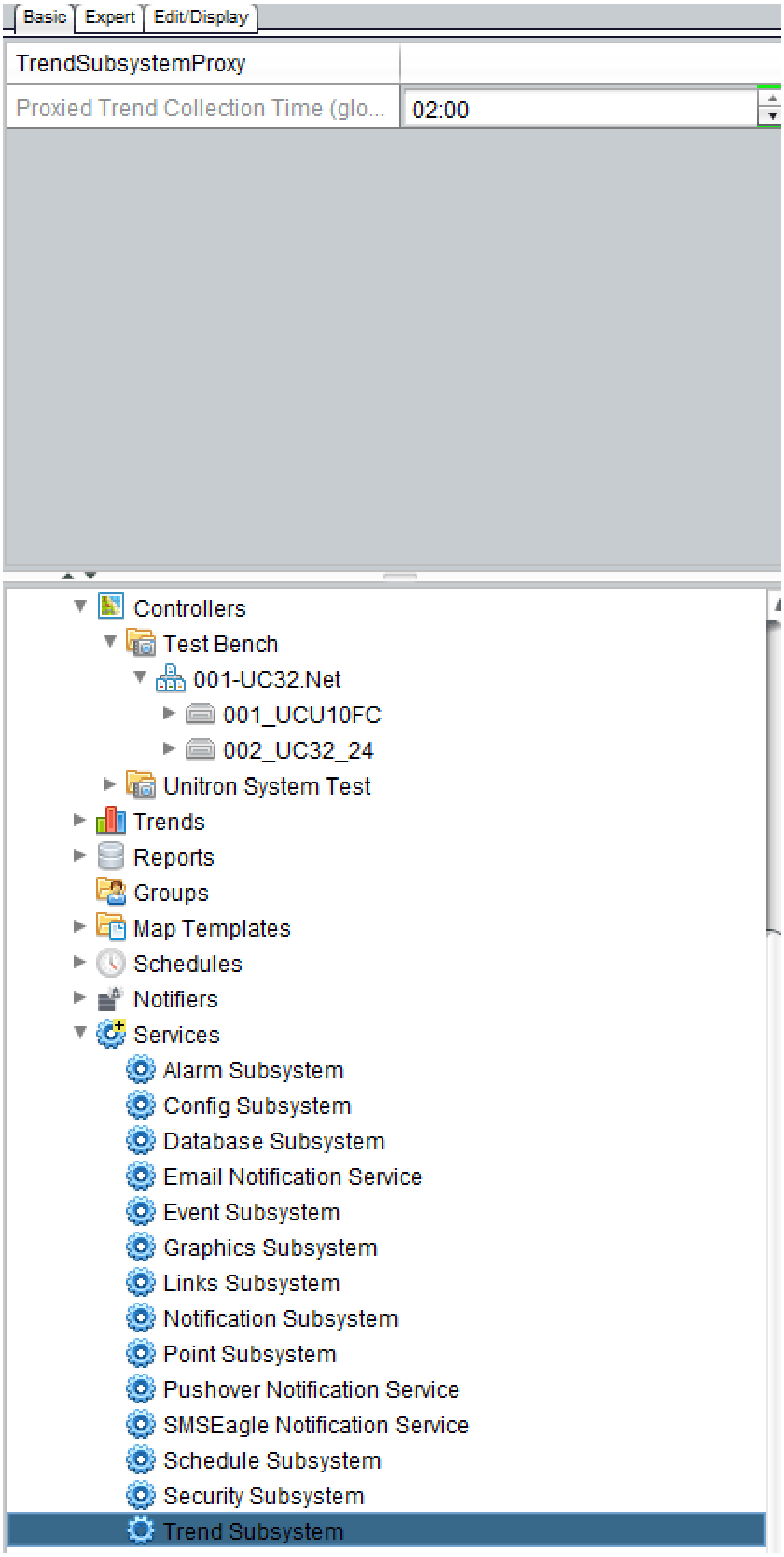
In the Expert tab, change Proxied Trend Collection from On Demand Only (10) to Use Device Setting (0) or a fixed period e.g. 3 hours



Global Fixed Time

In Services > Trend Subsystem, set Proxied Trend Collection Time (global) to the required time of day (24 hour clock).

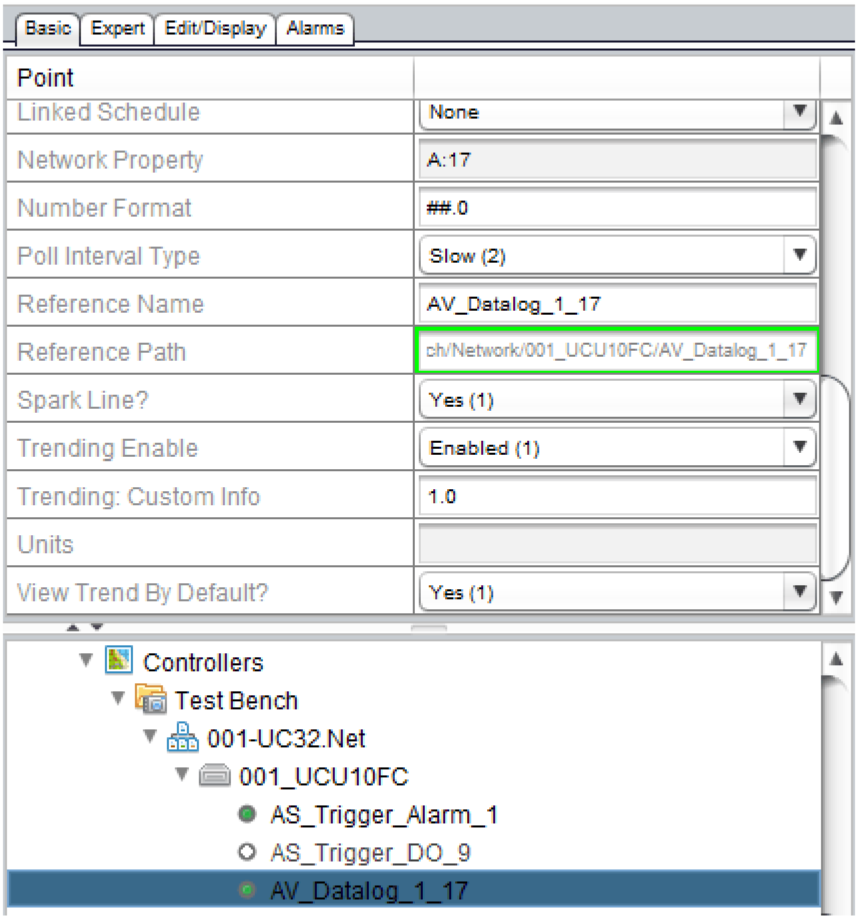
This will collect all **Trends** in the Project (i.e. all **Datalogs** on the Unitron site) at that time every 24 hours.



Adding ASPECT Trends

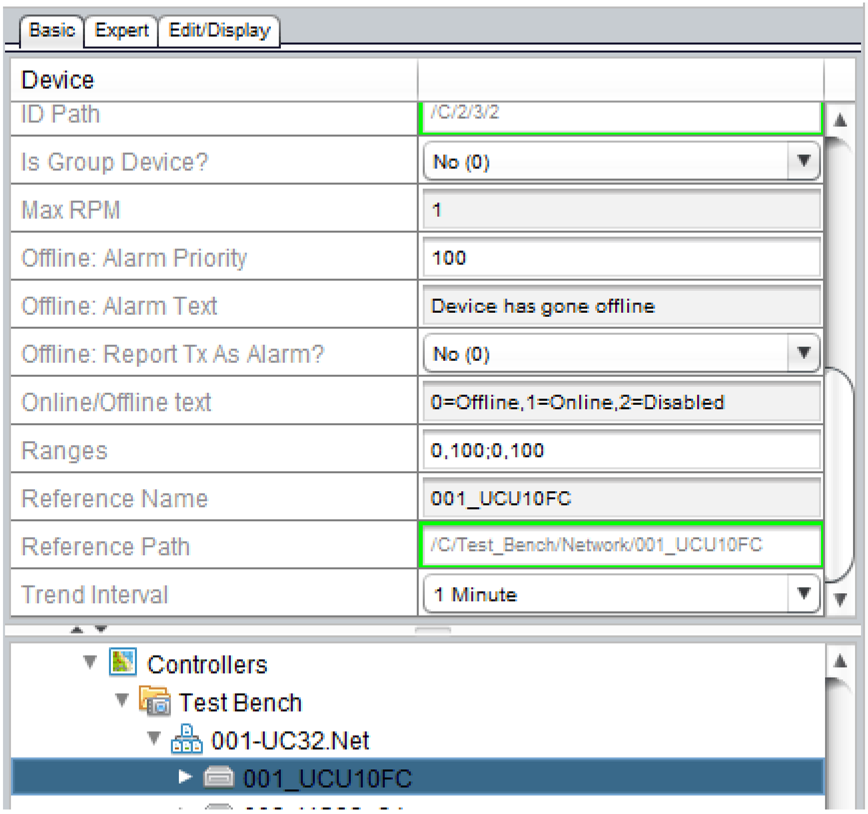
ASPECT can **Trend** any point on the imported project, whether or not it was set to be logged on the Unitron site.

1. In the Basic tab of the Point in question, select Enabled (1) from the Trending Enable drop-down list.



2. In the Basic tab of the Device, set the Trend Interval (frequency at which

the point will be read and stored in the database)



Viewing Proxied Trends

Collected trends are those (ASPECT or proxied) that have been collected by the System - i.e. their data has been stored in the ASPECT database. Data from "On Demand" **Proxied Trends** is not stored in the ASPECT Database. As a result:

- When viewing a "**Collected**" **Proxied Trend**, the graph is drawn immediately, in the same way as a Aspect **Trend**.
- When viewing an "**On Demand**" **Proxied Trend**, the graph is not drawn until all have been read from the Network - which can take up to 20 seconds.

However, for "**Collected**" proxy trends with no data (i.e. on that has just been set up and has not yet been collected), it is worth noting that "**Proxy Trend Housekeeping**" may apply - i.e. If a collected trend requires more than two transactions to collect the data (which depends on the size of the datalog, and the controller type in which the datalog is hosted), then the collection will be deferred until the **Global Trend Time**.

> **Note**: If a trend always requires more than two transactions to collect the data, then the collection interval should be reconsidered.

You can view **Proxy Trend Housekeeping** in the ASPECT UI (ngAdmin) in the Utilities > System Information section. This details the device and point (target) that has had a deferred proxy trend, the time of the most recent deferral, the number of times it has been deferred, and the time that "housekeeping" will be done, i.e. when the proxy trend will be collected.

Configuring Alarms on an imported Unitron or Cylon BACnetSite

When a Unitron site is imported (see Importing Unitron Devices), any **Control Alarms** that were set up on the site will be available in ASPECT as **Proxied Alarms**. This means that the point whose value is required to trigger the alarm is linked to a digital point on which an **Alarm** is set.

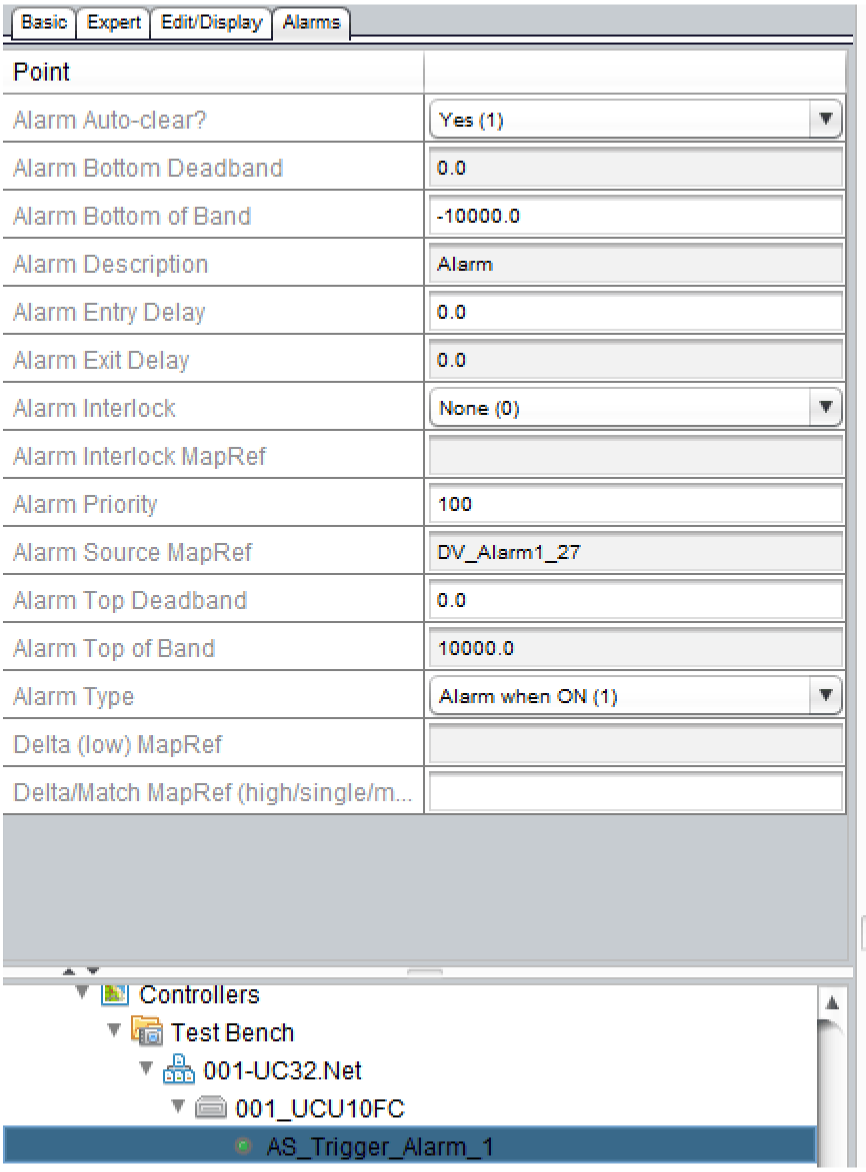
> **Note**: If an Alarm block has an analog value point associated with it the this point is exported. Otherwise the digital point is exported.

ASPECT will also poll Unitron **System Alarms**, at regular intervals. The polling frequency can be adjusted - see Configuring System Alarms

It is also possible to set up standard ASPECT **Alarms** for any point on the imported site - see Adding Aspect Alarms to a Unitron Site below.

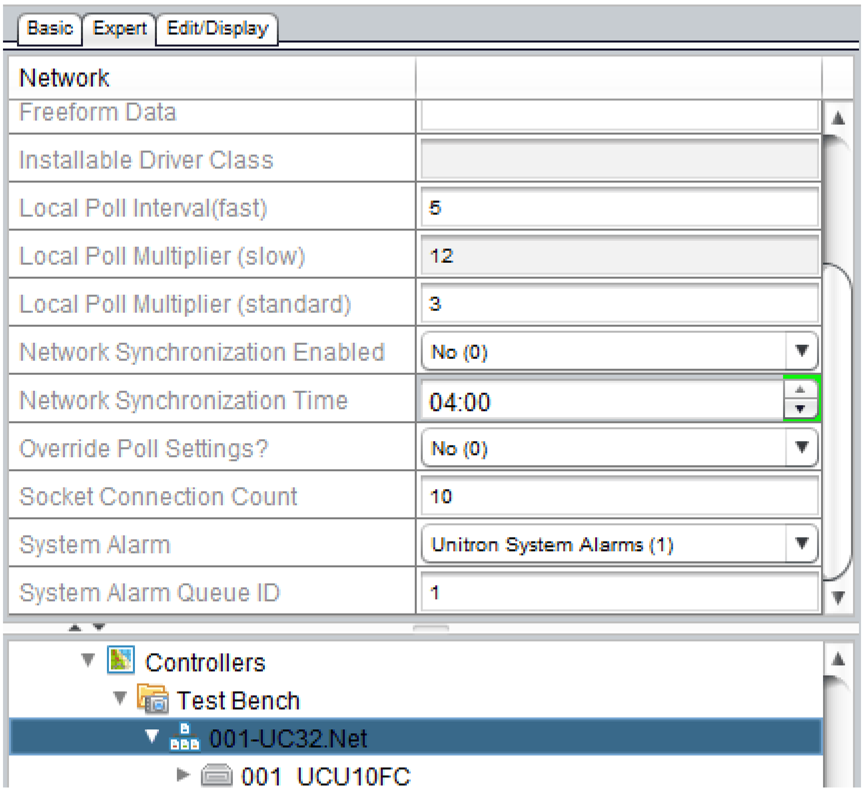
Adding ASPECT Alarms to a Unitron Site

It is possible to set up standard ASPECT **Alarms** for any point on the imported site:

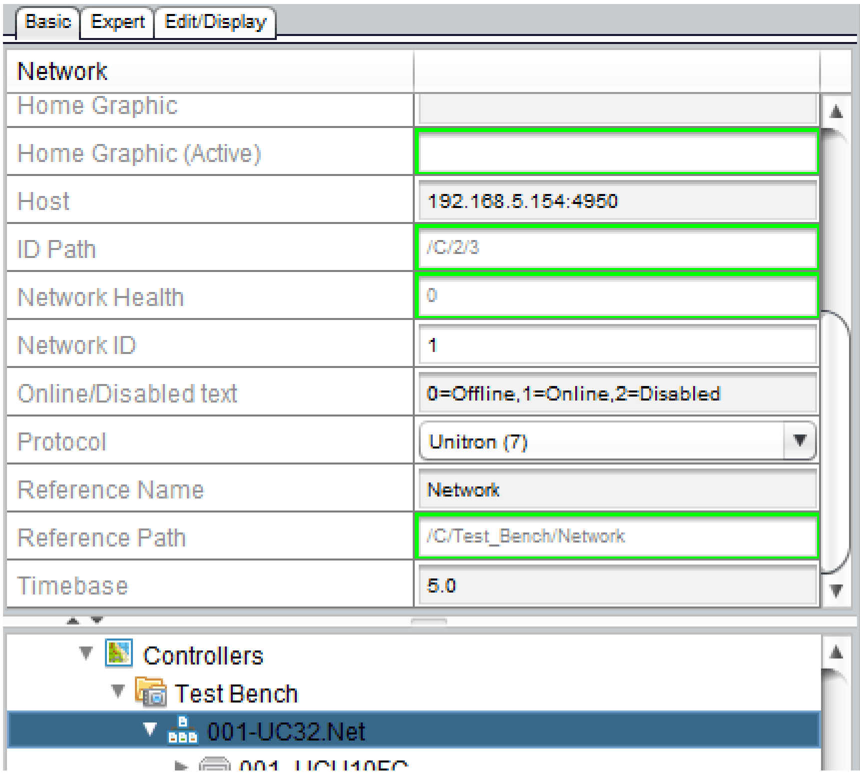


Configuring System Alarms

1. In the ASPECT map, elect the **Network** (Unitron Comms Controller) that holds the system alarms.
2. In the Expert tab set System Alarm to Unitron System Alarms (1).
3. In the System Alarm Queue ID field enter the ID of the Comms Controller system alarm queue that will be polled



4. In the Basic tab of the Network, set the Timebase - i.e. the polling frequency in seconds.



Migrating Teletrol TSC to ASPECT

Adding TSC devices to ASPECT

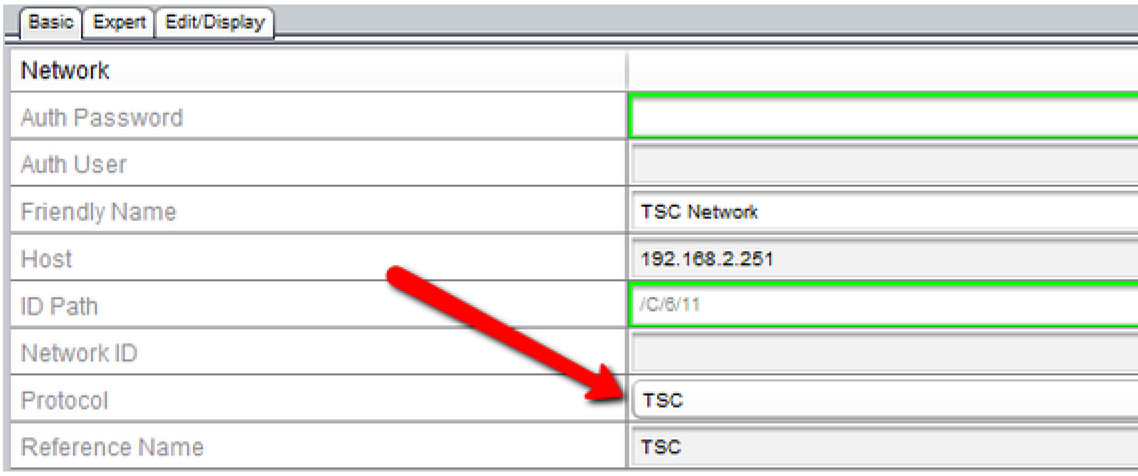
This tutorial gives a quick overview of how to add a TSC device into an ASPECT project utilizing a MATRIX Series device.

> **Note**: The **Teletrol** TSC driver designed to work with MATRIX Series devices only. Please refer to the MATRIX Series datasheet for device limits.

Before adding an existing TSC network to an ASPECT network, it is advisable to first *"Evaluate the existing TSC network" on page 928*

Adding a TSC network:

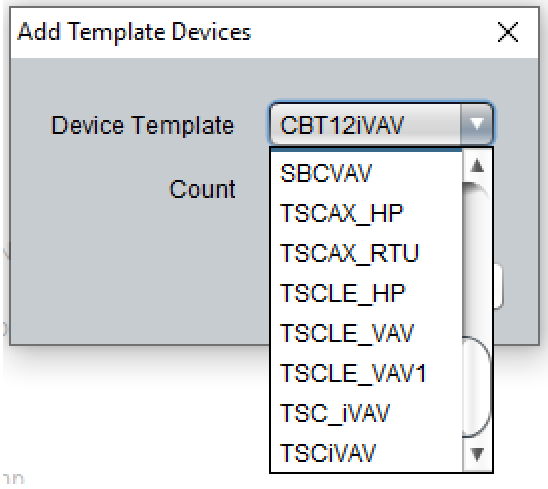
1. In your ASPECT project file, create the following:
   a. Create a **network group** by right-clicking Controllers and selecting Add network group(s). Provide a friendly name for this **group**.
   b. Under the new **group**, create a new **network** by right-clicking the name of the newly created group and select Add Network(s).
   c. Under the Basic tab of the new **network** define the following parameters:
      1. Host: This is the IP address of the **ACE** (i.e. MATRIX Series device).
      2. Network ID: This is the port of the MATRIX Series device to which the TSC network is connected.
         - -Use 0 for port 1
         - -Use 1 for port 2
      3. Protocol: TSC must be selected from the drop-down menu.



Adding a TSC device from template:

ASPECT-Studio v3.03.04 and later includes pre-built TSC templates for factory **VAV**, **HP** and **RTU** applications. If you are adding any **BlocPro** TSCs, the devices and points lists must be manually created, based on the custom control **strategy** within the device.

1. Under the new network, create a new TSC device by right-clicking on the network name and selecting Add Template Device(s).
   A. In the dialog box, use the drop-down arrow, scroll through the available device templates and select the TSC device you wish to create.

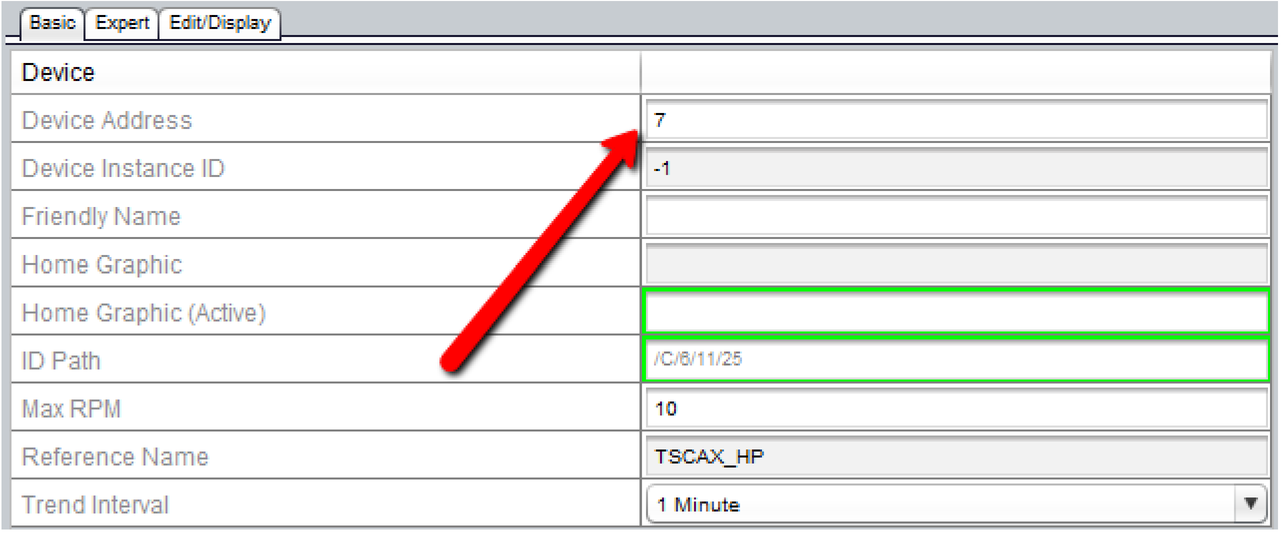


   B. The Count is the number of this device type you would like to create.
   C. Select OK. The device(s) are now created and added under the Network Tree.

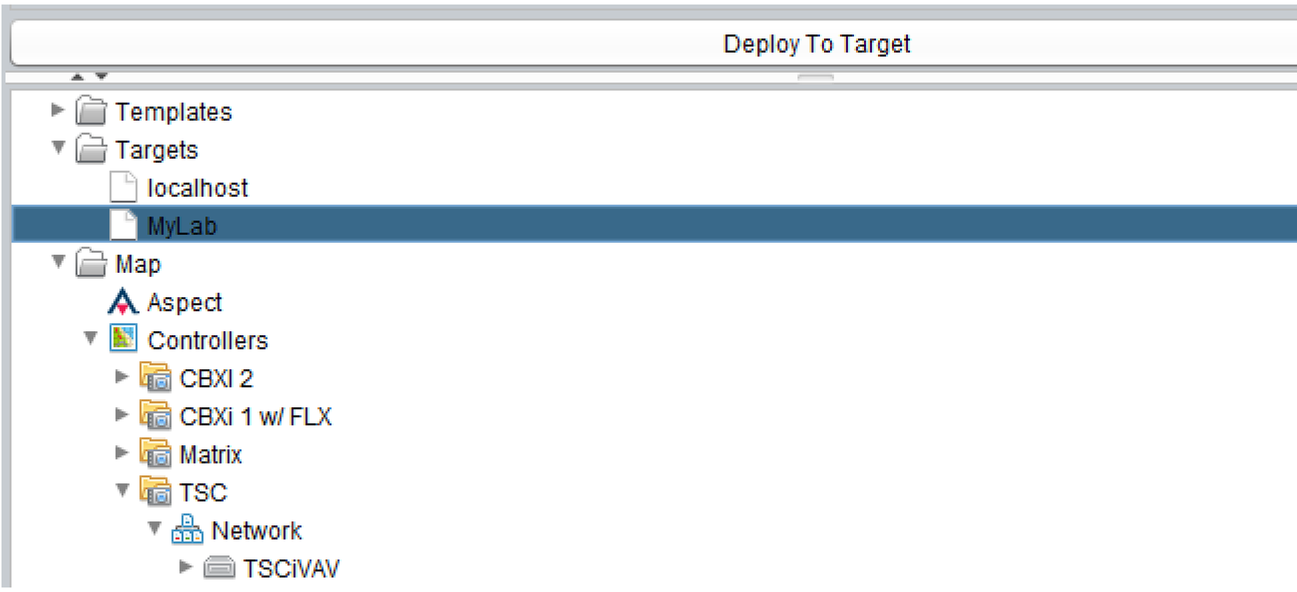
Addressing the newly created devices

Before deploying the project and testing, the newly created devices must be addressed properly so that the MATRIX Series-TSC driver can communicate.

1. While selected on the device, under the Basic tab and while viewing the property detail level of Low, you can set the address for each TSC and assign a meaningful and friendly name.

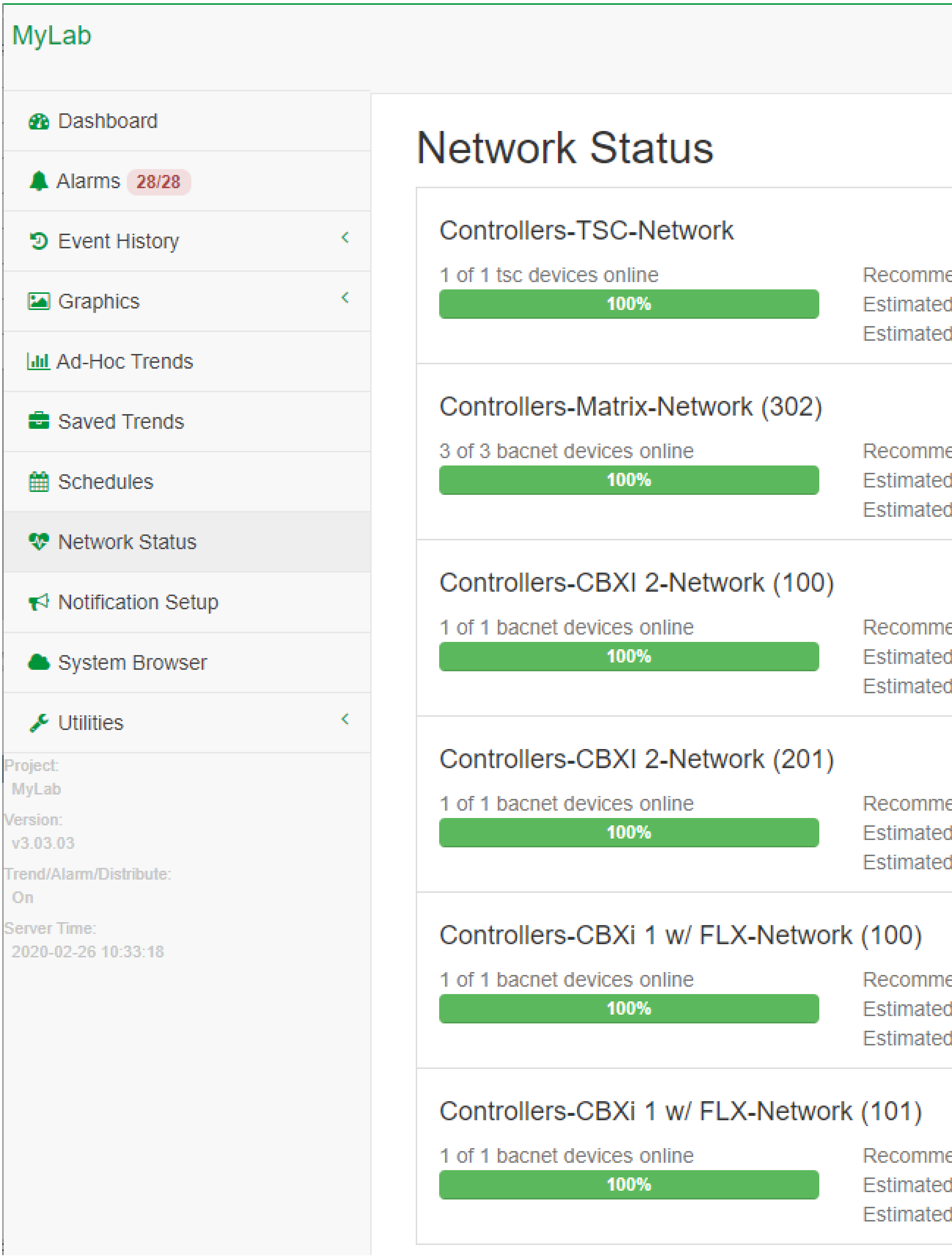


2. Once all of the TSCs are addressed and assigned names, you can then go back up to the target level and deploy the entire project by selecting the `Deploy To Target` button.



3. Navigate to the HTML 5 page for the MATRIX Series with which you are working and navigate to the `Network Status` page. Your device(s) should be online shortly after the network finishes loading in the

background.


MyLab
Dashboard
Alarms 28/28
Event History
Graphics
Ad-Hoc Trends
Saved Trends
Schedules
Network Status
Notification Setup
System Browser
Utilities
Project:
MyLab
Version:
v3.03.03
Trend/Alarm/Distribute:
On
Server Time:
2020-02-26 10:33:18
Network Status
Controllers-TSC-Network
1 of 1 tsc devices online
100%
Controllers-Matrix-Network (302)
3 of 3 bacnet devices online
100%
Controllers-CBXI 2-Network (100)
1 of 1 bacnet devices online
100%
Controllers-CBXI 2-Network (201)
1 of 1 bacnet devices online
100%
Controllers-CBXi 1 w/ FLX-Network (100)
1 of 1 bacnet devices online
100%
Controllers-CBXi 1 w/ FLX-Network (101)
1 of 1 bacnet devices online
100%

Tuning:

The performance of a TSC project is dependent on the appropriate configuration of fast, standard, and slow poll rates on the "**Always Poll**" points in the project.

Typically, you can expect to get 5 register reads per second on a 19,200 baud TSC device. When reading consecutive registers this rate goes up relative to the number of contiguous registers in an **RPM** (Read Oroperty Multiple). With the TSC driver, per device will collect all of the always polled points, sort them and attempt to read them as an **RPM** up to the RPM max configured on the **TSC** Device. We recommend an RPM Max setting of 5 to 10 but testing is required because every network configuration is unique.

For more information on network performance tuning in ASPECT see: *"TSC Integration : Tuning Network Polling Rates" on page 920*.

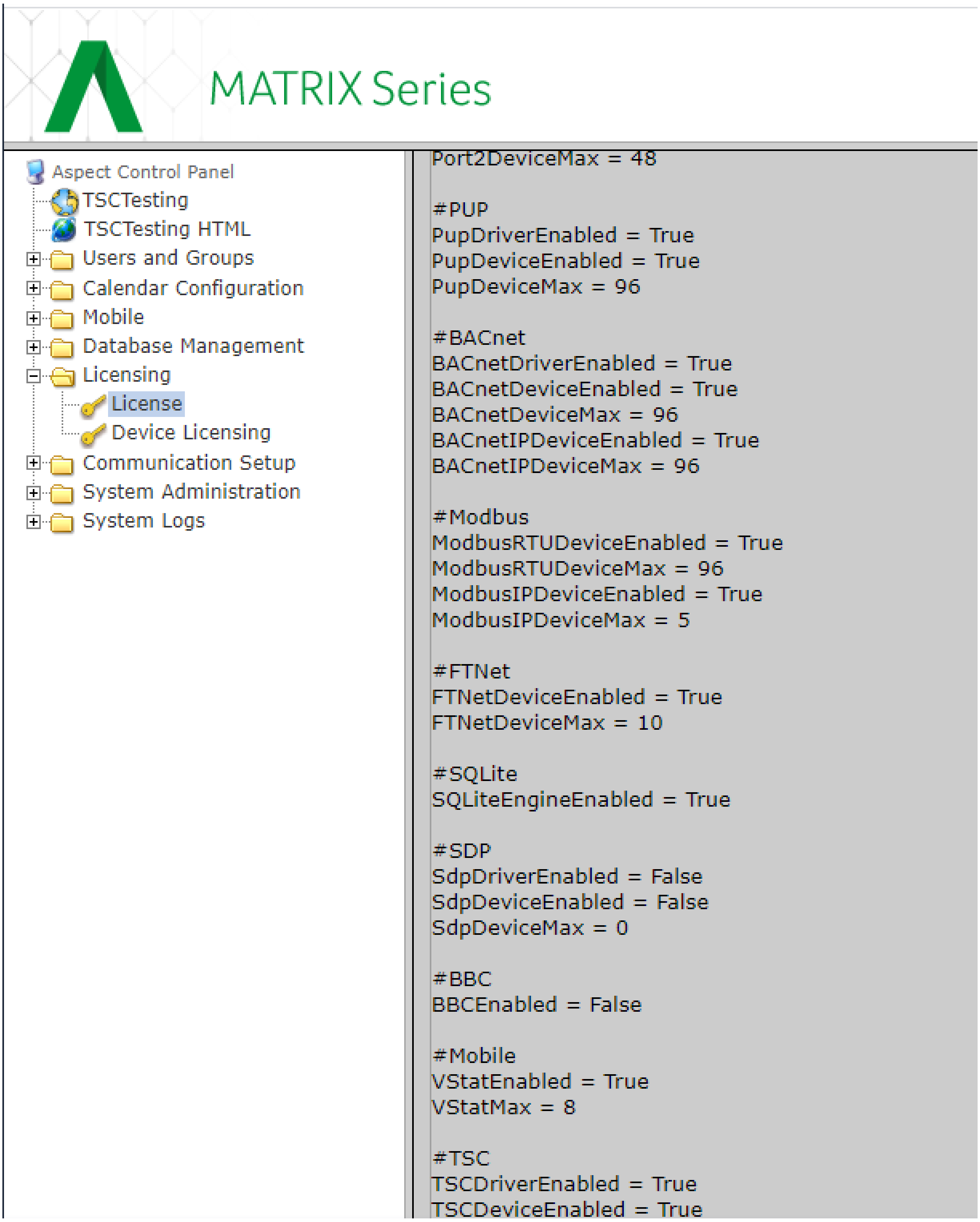
> **Note**: As of ASPECTv3.03.04, the TSC driver runs on MATRIX Series hardware only. The driver has not been ported to the NEXUS Series platform due to hardware compatibility issues with the data encoding methods employed in the TSC protocol on the **RS485** serial port.

Licensing:

In order to do any configuration for the TSC protocol, it must be licensed.

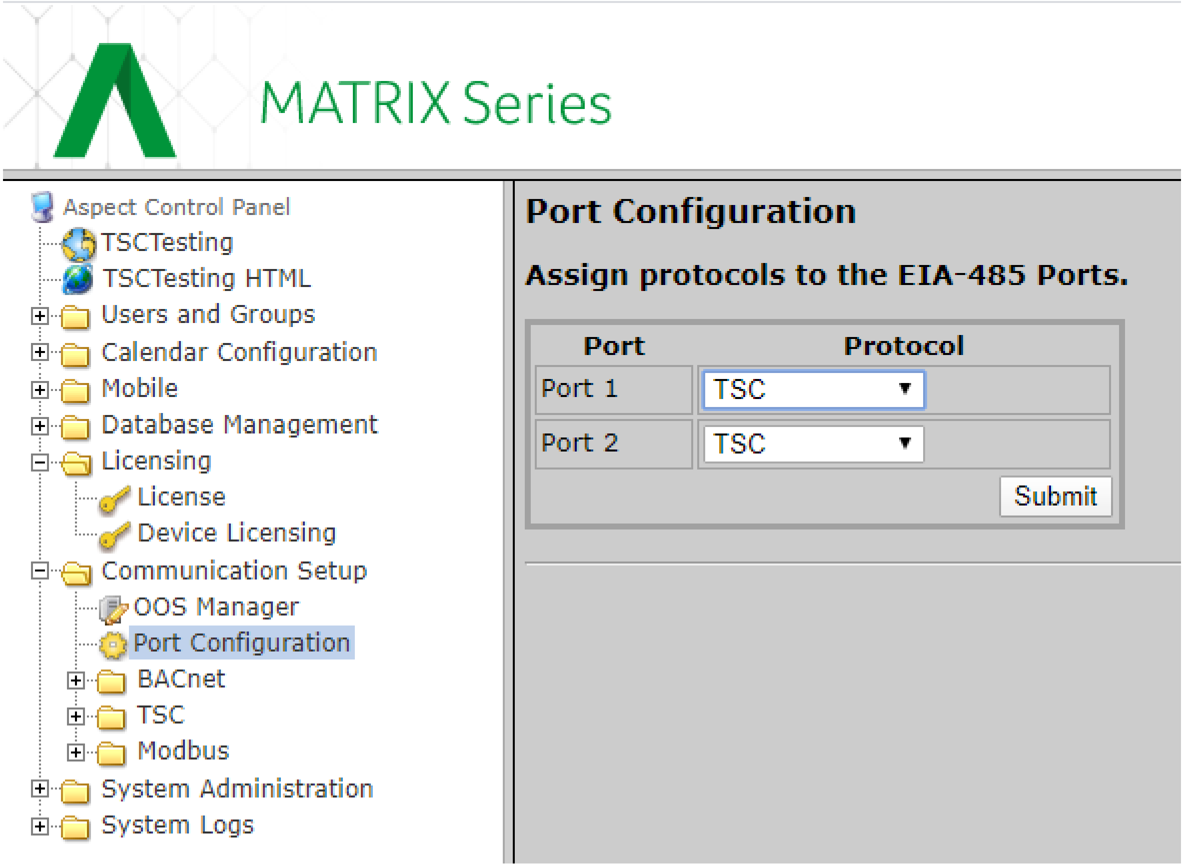
If this is a new install, you would be installing a device with an ASPECT Version 2 license which enables this TSC by default on the MATRIX Series platform.

If you are adding this protocol to an existing device check the license for the `TSCDriver` tokens as they are may not be present in an ASPECT Version 1 license. If you are configuring a MATRIX Series device and there are no configuration options for TSC you probably have a version 1 license without TSC tokens. Contact sales for an updated license.



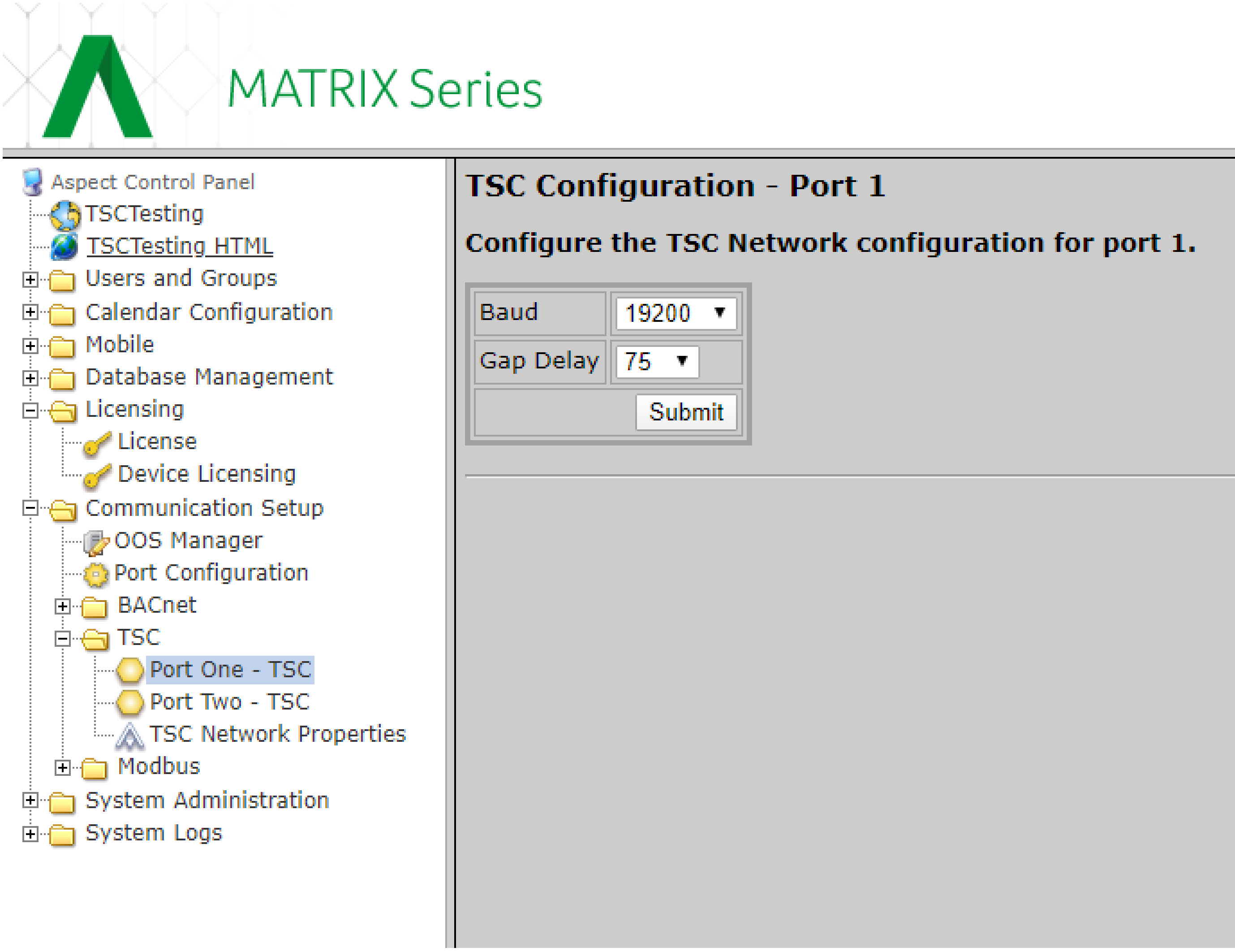
Communication Setup:

Port Configuration: If licensing is correct, there will be drop list menu options for TSC on available ports.



<u>TSC Port Configuration:</u>

Choose the Baud rate and Gap Delay. The specification will not allow gap delays of less than 75 ms so setting this to anything less than that will have zero effect. Gap Delays of greater than 75 ms will work under some conditions but will slow an already slow protocol down even further. We do not recommend changing this value, because little positive effect will be seen.

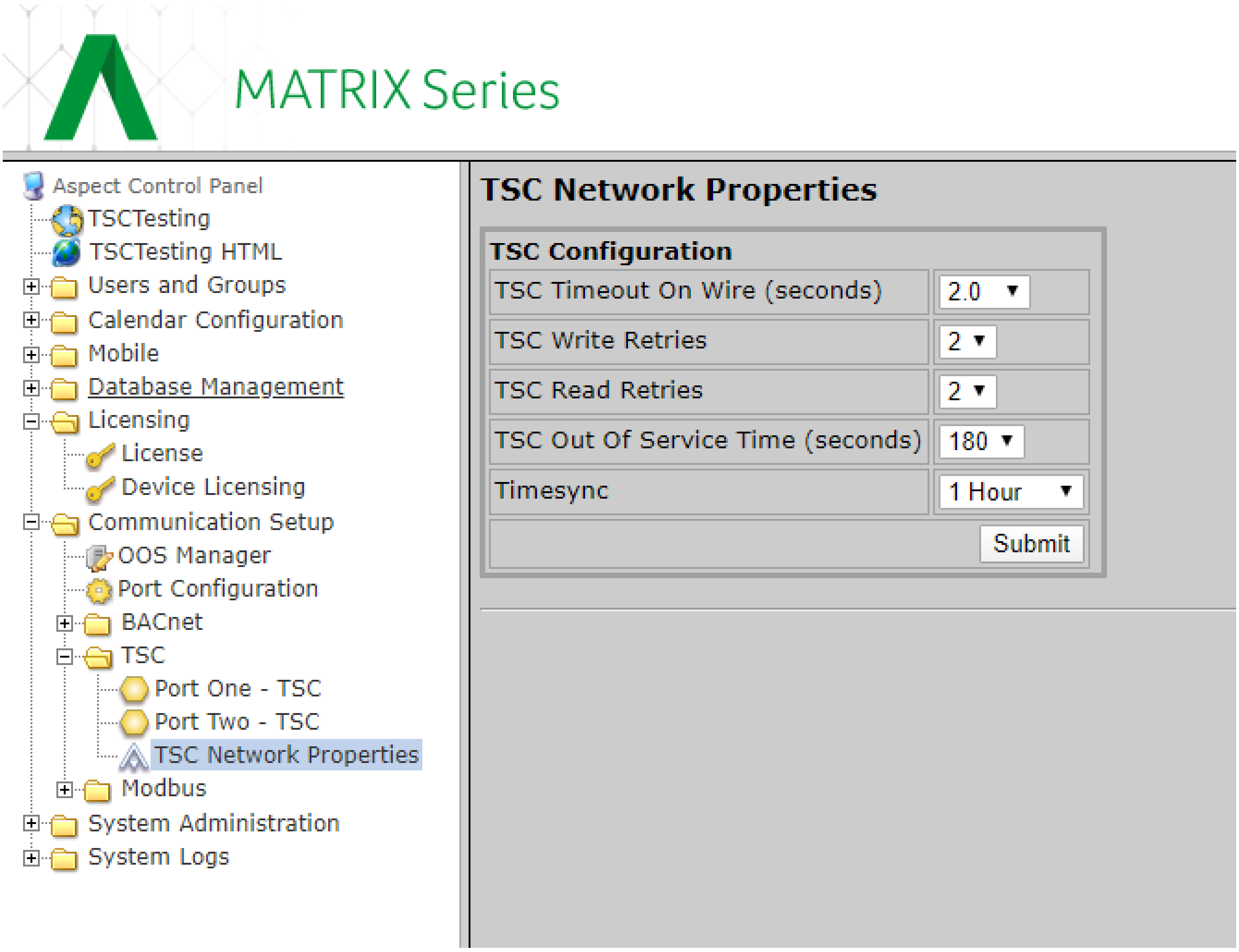


TSC Network Properties:

These recommendations are the default starting point for any TSC related project. Some additional tuning may be required using these available properties.

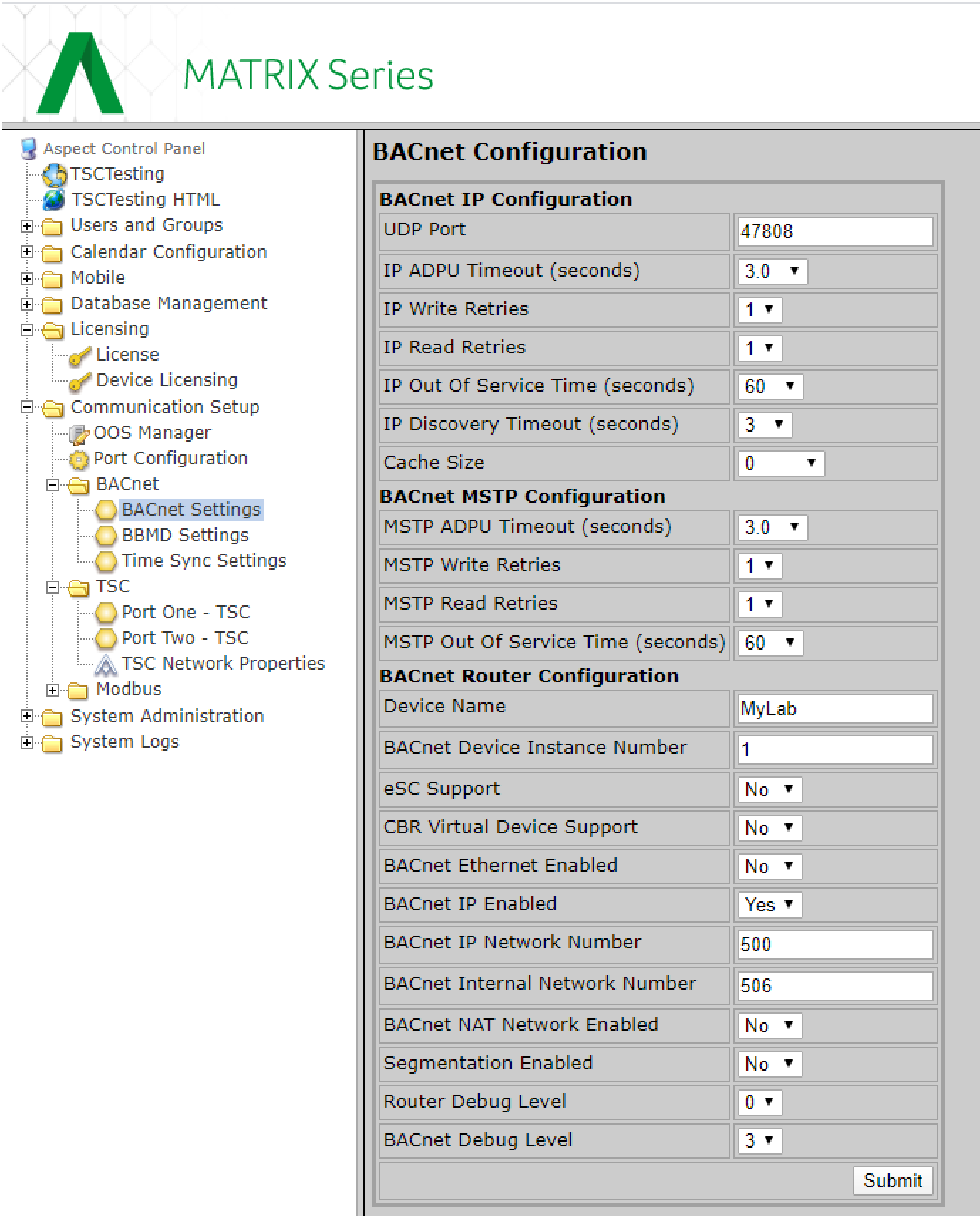
- TSC Timeout On Wire: Indicates the amount of time in seconds that the target should wait for a response to a message before declaring the transaction to be timed out. This value should be between 1 and 2 seconds. We recommend leaning towards the 1 second side of configuration on larger networks.
- TSC Write Retries: Indicates to amount of retires that the target will attempt to perform a write request in the event of a time out. If your project does many writes, it may be prudent to set this value to 2.
- TSC Read Retries: Indicates the amount of retries that the target will attempt to perform a read request in the event of a time out. The recommended value for this parameter is 2.

- TSC Out Of Service Time: Indicates the amount of time in seconds that the target will wait after a device is deemed to be offline. This should be higher if the network has known devices that are not accessible for extended periods of time. The recommended value for this parameter is 60.
- Timesync: Indicates the frequency of when a time synchronization message is sent to the TSC networks. 1 Hour is reasonable on most networks.



TSC Protocol Debugging:

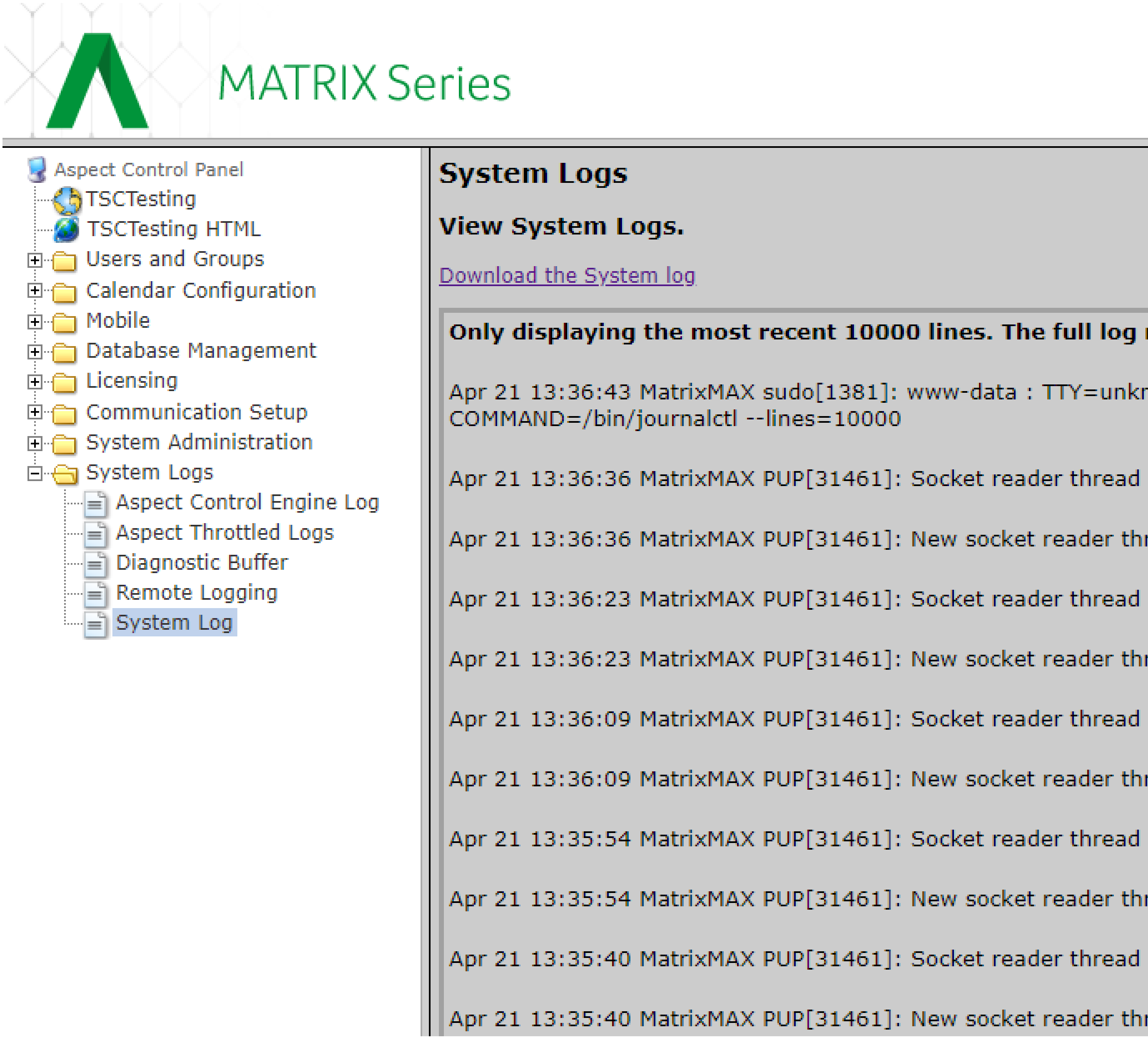
This protocol has debug settings to allow monitoring of protocol-level error codes and full RX / TX dumps from the driver (i.e. ft-com) to aid in debugging errors and performance tuning of TSC networks. The configuration option to enable/disable error and protocol dumps are “piggy-backed” from the BACnet Configuration Settings page.



To enable TSC Error logging, set the BACnet Debug Level to 3. To enable TSC **Error and Protocol Dump** options, set the BACnet Debug Level to 4.

Accessing TSC Debug Information:

All debug information is logged to the journal log within the MATRIX Series device. To download this log, select System Logs / System log option from the WebUI and click the Download the System Log link. This will download a file named `journalctl` that contains relevant system information along with protocol error and dump data. Open this with your favorite Windows text editor - e.g. notepad++.



Interpreting TSC Debug Information:

Open the journalctl file with any editor, preferably one with advanced search features.

Sample Errors:

Retry after timeout:

The following shows log shows a 13 byte TX packet going to device 36 - this is the packet sent to the device.

You can see that it timed out after waiting one second. After a 75ms gap delay, it transmitted again (`retryCnt=2`) and this time received a good **RX** response packet with a 5-byte header and a 16-byte payload.

> **Notes**: The **retry count** counts down until zero and then the driver takes the device out of service - `DOOS`. Adjust retries and timeout values for maximum throughput, decreasing the timeout as low as possible while keeping the **retries** at a minimum - i.e. if you see many **retries** it could be more efficient to increase the **timeout** slightly.

So, generally speaking, never timing out / retrying at a timeout 1.5 seconds is probably better than a timeout of 1.0 second with many retries.

```
Apr 18 18:44:14.968444 MatrixMAX ft-com[16557]: txTscPk dev=36 TX pk
00 24 ff fa 0d 7e 77 01 00 01 00 01 22 bytes written 13
Apr 18 18:44:15.972331 MatrixMAX ft-com[16557]: rxTscPk dev=36 -
error timeout after waiting 1000ms for 5 byte tsc header
Apr 18 18:44:15.972381 MatrixMAX ft-com[16557]: txTscPk dev=36 -
retrying after 75ms sleep line=0 retryCnt=2
Apr 18 18:44:16.055391 MatrixMAX ft-com[16557]: txTscPk dev=36 TX pk
00 24 ff fa 0d 7e 77 01 00 01 00 01 22 bytes written 13
Apr 18 18:44:16.317023 MatrixMAX ft-com[16557]: rxTscPk dev=36 RX pk
[ff fa 00 24 10] header - total bytes 5
Apr 18 18:44:16.323323 MatrixMAX ft-com[16557]: rxTscPk dev=36 RX pk
[ff fa 00 24 10 26 7e 01 00 01 00 01 00 00 00 d4 00 00 f3 00 00 00 02
d0 ab 00 01 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 f6 00 00 ]
payload - total bytes 16
```

Line Restart:

Occasionally, a device will address errant data to the **RX buffer** of the driver due to timing or networking issues and it is necessary to flush the buffer. When this happens you will see a restartLine error in the journalctl log file.

In this case, we see the 13 byte transmit packet to device 31 and we immediately receive a bad header with an invalid packet size.

The driver then flushes the line of 4 bytes for 22ms and retries the TX request successfully.

If there are many restartLine errors on a device, you may try increasing the TSC Time on the wire. Do this carefully as it can slow down a network.

```
Apr 18 18:39:12.948417 MatrixMAX ft-com[16557]: txTscPk dev=31 TX pk
00 1f ff fa 0d 7e 77 01 00 01 00 01 1d bytes written 13
Apr 18 18:39:13.093888 MatrixMAX ft-com[16557]: rxTscPk dev=31 -
error - bad header size=1, bytes read = 5, header contents 08 00 01
00 01
Apr 18 18:39:13.116436 MatrixMAX ft-com[16557]: restartLine dev=31
line=0 cause=2 complete, elapsedTime=22ms flushed=4 bytes
Apr 18 18:39:13.116480 MatrixMAX ft-com[16557]: txTscPk dev=31 -
retrying after 75ms sleep line=0 retryCnt=2
Apr 18 18:39:13.199375 MatrixMAX ft-com[16557]: txTscPk dev=31 TX pk
00 1f ff fa 0d 7e 77 01 00 01 00 01 1d bytes written 13
Apr 18 18:39:13.329938 MatrixMAX ft-com[16557]: rxTscPk dev=31 RX pk
[ff fa 00 1f 10] header - total bytes 5
Apr 18 18:39:13.336297 MatrixMAX ft-com[16557]: rxTscPk dev=31 RX pk
[ff fa 00 1f 10 26 7e 01 00 01 00 01 00 ff 09 d7 27 10 00 00 01 00 00
00 00 27 10 79 08 ca 9d 00 00 00 00 01 00 00 00 00 00 11 db 00 00 ]
payload - total bytes 16
```

TSC Integration : Tuning Network Polling Rates

It is important to understand network polling rates in ASPECT and know how to tune them to prevent overloading of data, which would create a slow responding network.

The following applies to **BACnet TCP/IP**, **BACnet MSTP**, **Teletrol** TSC, **Modbus**, Unitron, and PUP.

When configuring the **Map** in ASPECT to poll larger **RS485** serial network segments, you can modify polling interval configurations to increase the number of devices you can reliably poll. If polling is too aggressive, ASPECT can overload the serial network, causing devices to time out and ultimately go offline.

Driver Configuration / Timeouts, Retries and Out of Service

The **BACnet**, PUP, Teletrol TSC and **Modbus** drivers provide configuration pages similar to the page below, allowing configuration of **Timeout**, **Retry** and **Out Of Service** times.

> **Note**: All Unitron configuration is handled within the ASPECT **Map**, and so no configuration pages exist for this on an ASPECT target.

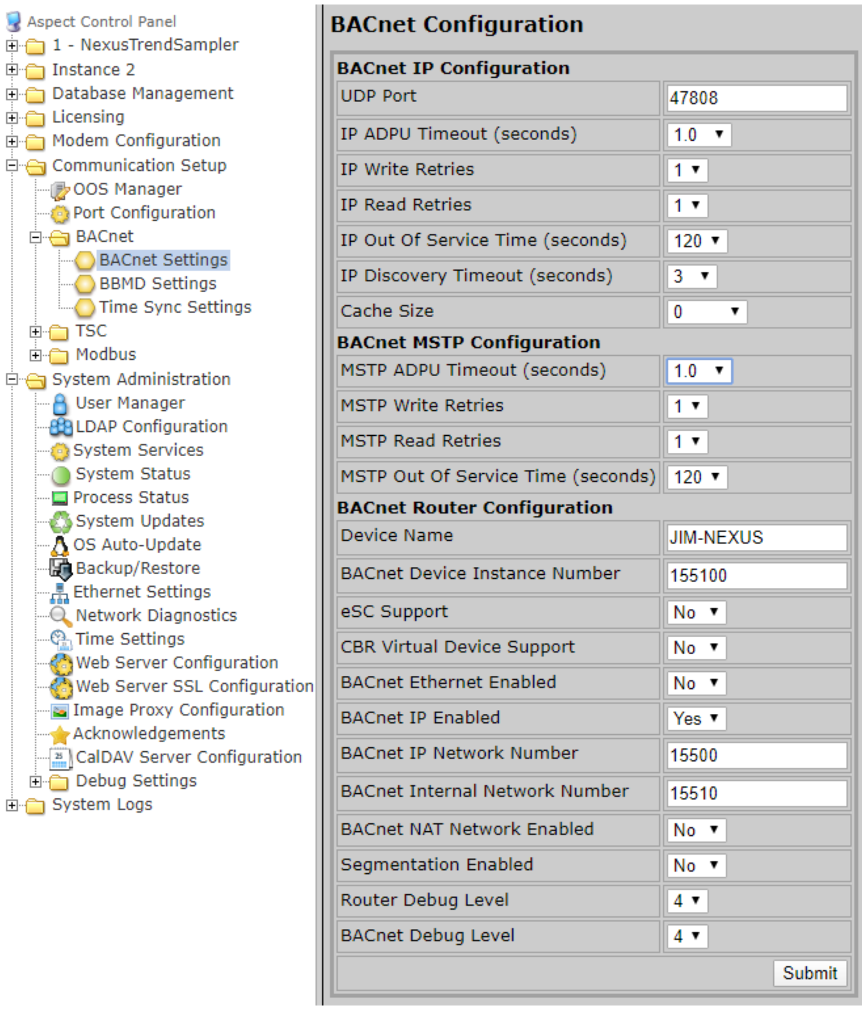
Each protocol has a **Timeout** value, which indicates how long the driver will wait for a response from a device after a read or write request. Up to 2 retries can be specified for both write and read requests.

Out Of Service time indicates how long a device will remain off-line after a timed out request before another attempt will be made to communicate with the device.

Discover Timeout is specific to **BACnet**, since that is the only protocol that supports **Discovery**.

Cache size, which is not supported on all protocols, determines the number of point values that will be stored in short-term memory reducing the number of requests that are sent down to the serial network.

> **Note**: excluding PUP Debug levels for all protocols are set on the `BACnet Configuration` page - as `BACnet Debug Level`.



Notes on Timeouts:

1. When a device initially times out, the **FT-com** driver will throw the device into off-line status for a configurable amount of time. This time window can be set under the Communications Setup option on the WebUI per-protocol labeled as Out of Service Time (Seconds) with valid settings from 10 to 600 for individual protocols.
2. When devices go off-line, if they tend to stay offline then setting the value to a higher number will reduce expensive pings that can slow down a serial network.
3. ADPU Time Out, Write Retries, Read Retries and Gap Delay (some protocols) are related parameters that can be set in the configuration sections for each protocol. These parameters determine how long it takes before the driver responds to ASPECT with a timeout error in the event that a **device** is unreachable.

Aspect Network Configuration Performance Tuning

As mentioned above, ASPECT gives Project Engineers the ability to tune the polling load on serial networks by setting polling rates. The topology of the ASPECT **Map** includes **Networks**, **Devices**, and **Points** among other things. Each point in a device is either On Demand or Always Polled. ASPECT **Points** are On Demand by default but will become Always Polled based on various configuration options. For example, if a point had an associated **Alarm** or **Trend** it will always be polled. Other conditions that cause a point to automatically include a reference in a expression in another point or if it was simply set to Cached".

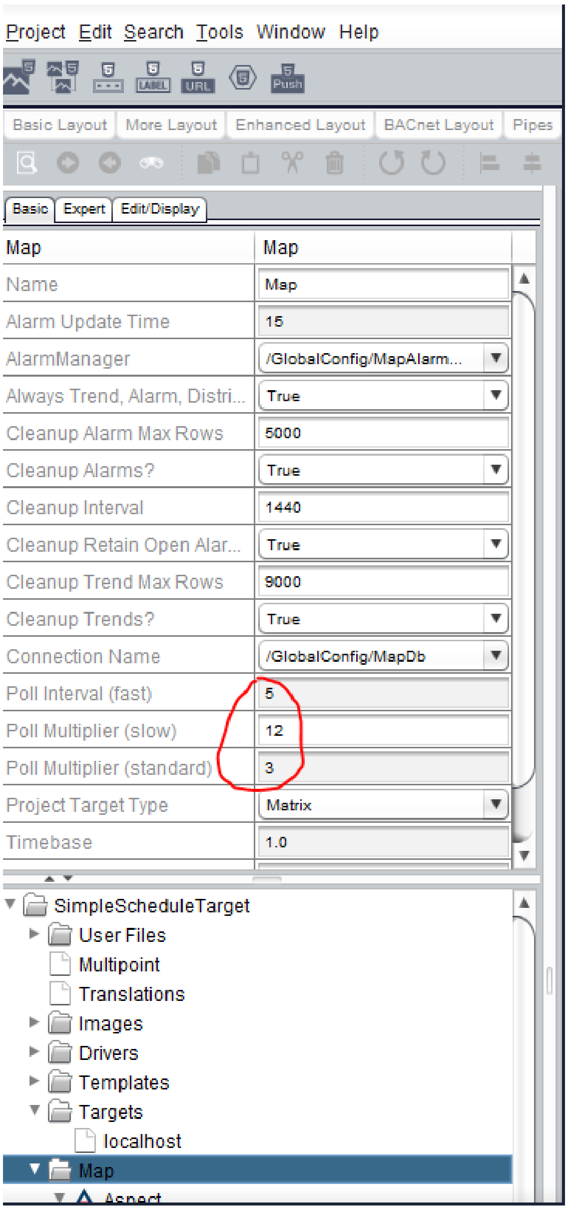
Once ASPECT has determined that a point is to be polled, it will look to a **Poll Rate** configuration parameter to determine how often to send a read request to the **FT-com** driver to be fulfilled. There are three poll rate options: Fast, Standard and Slow. These are configured with a time interval for the Fast poll rate and multipliers at the Standard and Slow parameters. Typically, a project will be set to a Fast poll rate of 5 seconds with a Standard multiplier of 3 and a Slow multiplier of 12. This will configure a Fast poll of 5 seconds and a Standard poll of 15 seconds and a Slow Poll of 1 minute.

> **Note**: some of our protocols support reading more than one property at a time, and this should be enabled when available. The upper limit on reading multile properties as once is determined by the implementing device. Please consult device-specific documentation for further information.

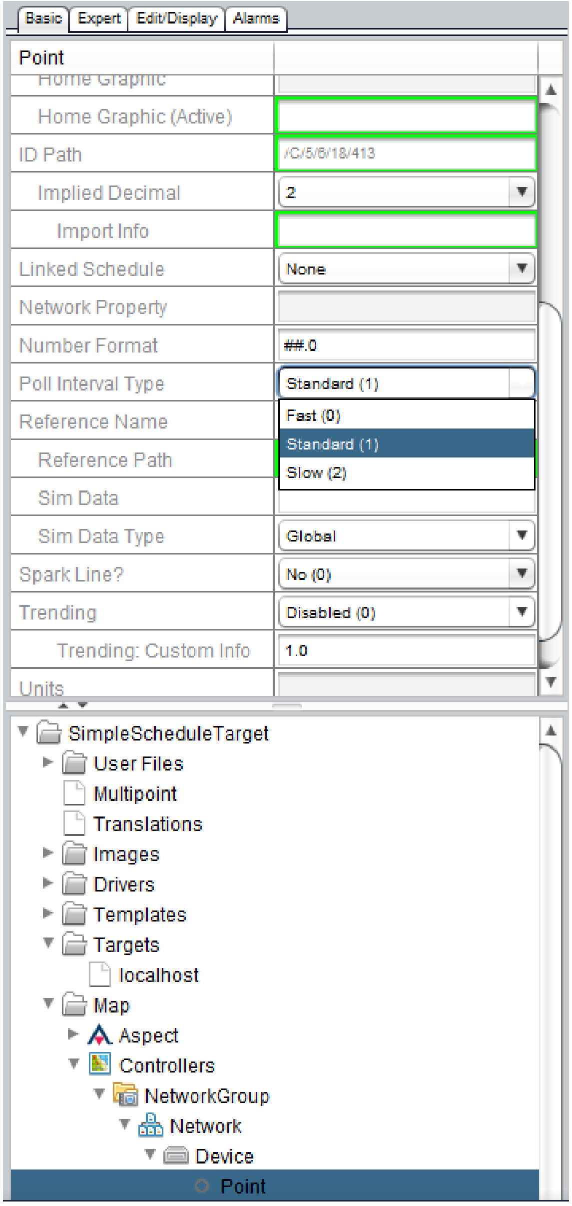
Both TSC and **Modbus** will both do a non-standard **RPM**, in that ASPECT will sort all registers on a poll request and if they are contiguous will send the request down as an **RPM** with the upper limit determined by the **RPM** count configuration option on the device. **BACnet** will do a standard RPM request, again limited by the implementing device. ASPECT defaults this value to 10. Also, the Unitron protocol will look at a poll request and determine if a collection of points is In the Same Neighborhood" and read the points as a block. It will subsequently pick the relevant points out of the response to speed read requests.

Polling Interval Configuration

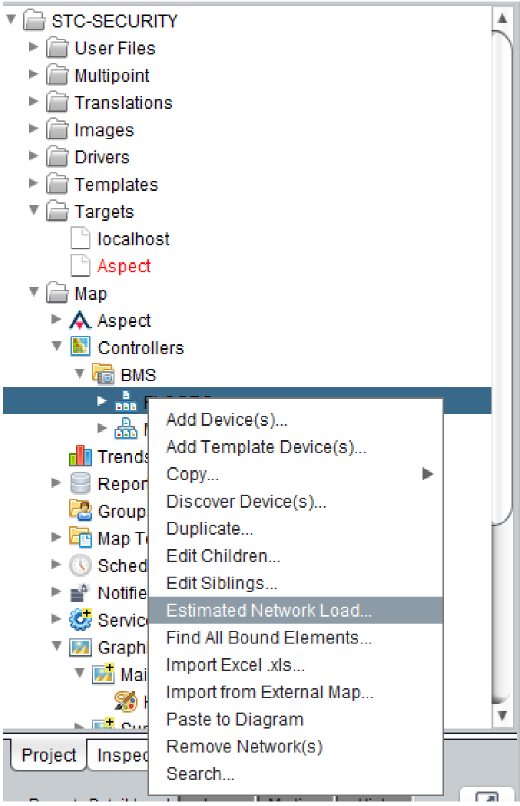
The Poll rates shown here may be configured for the entire **Map**, an individual **Network**, or for each **Device**.


Project Edit Search Tools Window Help
Basic Layout
More Layout
Enhanced Layout
BACnet Layout
Pipes
Basic
Expert
Edit/Display
Map
Map
Name
Map
Alarm Update Time
15
AlarmManager
/GlobalConfig/MapAlarm...
Always Trend, Alarm, Distri...
True
Cleanup Alarm Max Rows
5000
Cleanup Alarms?
True
Cleanup Interval
1440
Cleanup Retain Open Alar...
True
Cleanup Trend Max Rows
9000
Cleanup Trends?
True
Connection Name
/GlobalConfig/MapDb
Poll Interval (fast)
5
Poll Multiplier (slow)
12
Poll Multiplier (standard)
3
Project Target Type
Matrix
Timebase
1.0
SimpleScheduleTarget
User Files
Multipoint
Translations
Images
Drivers
Templates
Targets
localhost
Map

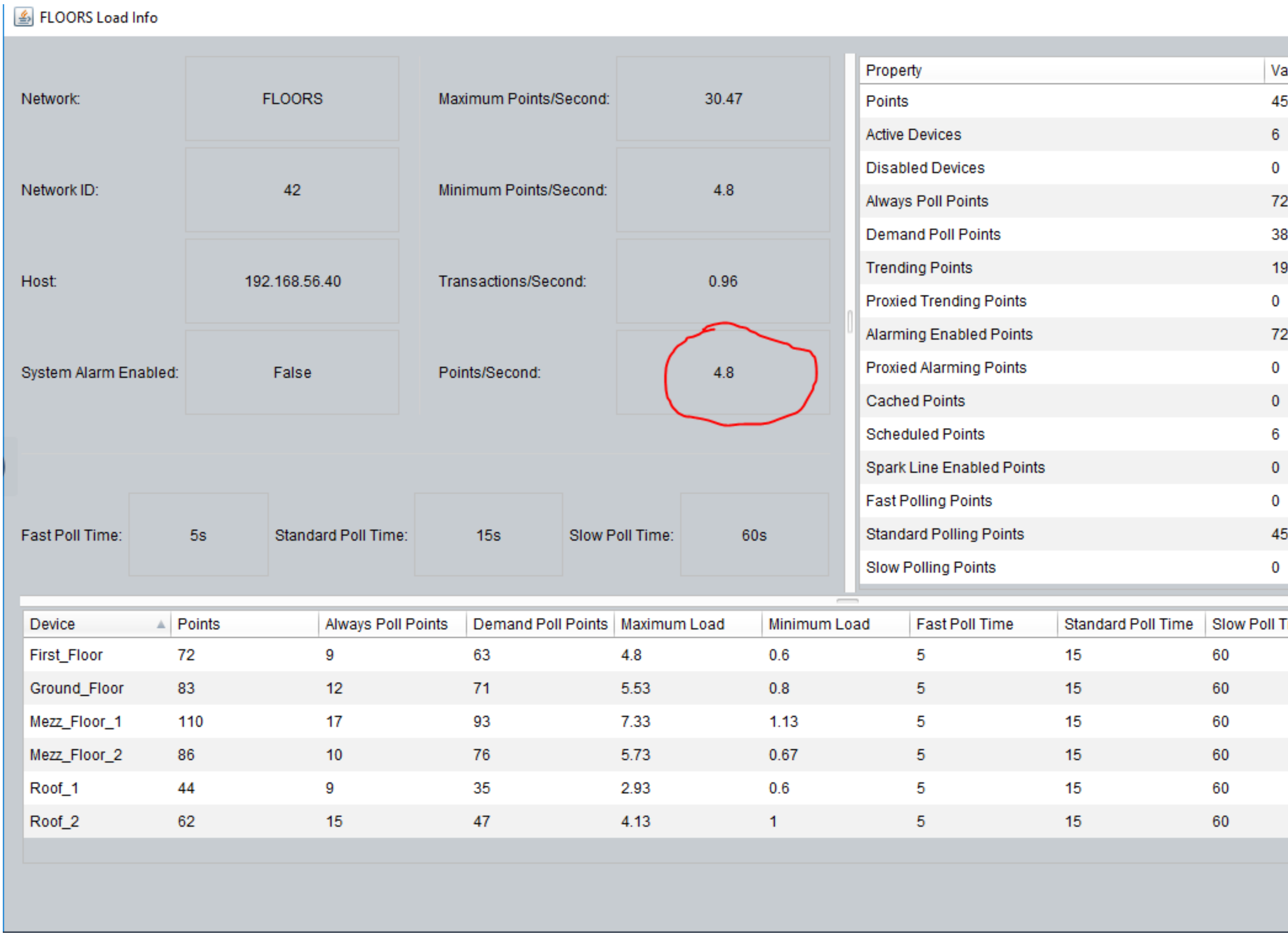
Point Polling Configuration



Estimating Network Load



In this case, we have a very light load of 4.8 points per second when polling with no on-demand poll requests active. Healthy Points Per Second" settings vary depending on baud rates, device speed, line quality, etc but anything under 10 is usually considered good. In some of the slower devices with no RPM capabilities, this may need to be lower.



Verifying Resource Limits

Resource limits are determined according to the target platform.

- Green is healthy
- Yellow indicates you are approaching limits in one or more areas
- Red indicates resource overload.

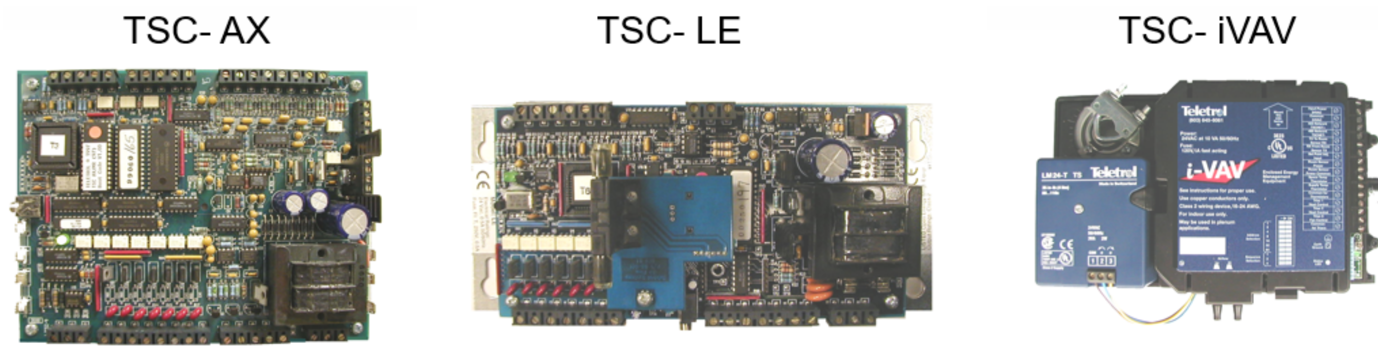
This information is also available from the ngAdmin interface on an ASPECT target platform.

Name	Count	Max	Saturation	Status
Total Points	457	2500	18.28%	●
Background Points	72	1000	7.2%	●
Alarm Points	72	250	28.8%	●
Trend Tables	6	200	3%	●
Map Graphics	36	100	36%	●
Point Containers	7	100	7%	●

Values represent resource limits not target license limits

Project | Inspect | Trace | Resources ●

Evaluate the existing TSC network



Before adding a TSC network to ASPECT, the existing physical TSC network must be evaluated for suitablility.

It is essential to ensure that the existing system meets all of the necessary requirements to ensure an easy and trouble-free migration. Use the following guidelines to take inventory of the existing network architecture and create a network diagram and/or spreadsheet.

Device Inventory:

- How many TSCs of each type are there in total on the existing network?
  - of which device types?
    - TSC-AX
    - TSC-LE
    - TSC-iVAV
  - of which control strategies?
    - Blue sticker on CPU - Heat Pump
    - Red sticker on CPU - Roof Top

    - Green sticker on CPU - iVAV
    - Orange sticker on CPU - BlocPro
  - of which firmware revisions?
    - Examples; Heat Pump 1.50, iVAV 3.30, Roof Top 3.00, etc.
  - What is the network address for each TSC?
- Are there other devices on the same network? e.g.
  - Network repeaters
  - Integration boxes such as the PX2000 or Field Server
  - **IsoNet** and surge protection
- Across how many subnet networks are the TSCs divided?
  - How many TSCs per subnet?

Device Status:

Before starting any migration, the current health and status of the existing network must be assessed. Be sure to note any devices that are offline or malfunctioning, and if possible, also note the reason for each deficiency so that a replacement / upgrade plan can be devised.

- How many TSCs are offline vs online?
- Note any input / output devices or sensors that may not be working properly.
- What is the overall health of the entire system?
  - Slow or sluggish?
  - All devices staying online at the same time?
  - Regular TSC error messages within the Integrator or eBuilding controller trace logs?

Sequence of Operations:

The TSC devices have self contained applications and could function as a stand alone device with no user interface. The exception to this is that TSCs do not have internal clocks or on-board crystals so they would run 24/7. Before migrating a TSC from an existing Teletrol system into ASPECT, the following items need to be understood and documented.

- What points need to be exposed at the user interface level and are they read only or read/write?
  - Control setpoints.
  - Sensor and control points; inputs and outputs.
  - Modes; Occupancy / Heating / Cooling, etc..
- Trending / data logs. What values need to be captured and stored in the database for historical purposes?
- Scheduling
  - What is the current building schedule and which TSC points do you need to tie them into?

- Other global control values. Does the existing configuration have any other external control values being written to the TSC required for proper operation? Examples are:
  - Outdoor temperature / humidity values.
  - Outdoor photo sensors.
  - Winter / summer calculations.
  - Emergency shutdown / demand limiting.
  - Others...

Device and Network Wiring:

One of the most important aspects of a TSC migration to consider is the existing network wiring methods and cabling used. Meeting these wiring requirements ensures that ASPECT-TSC driver will provide a seamless and trouble-free migration.

Cabling Requirements:

The original recommended networking cable for TSCs was Belden 88723 (Plenum) or **Belden 8723** (PVC). eBuilding, a **BACnet** compliant control system with multiple protocol support was introduced in early 2000. At that time, the wire specification for TSCs was then updated to one that also met the requirements for **BACnet RS-485 MS/TP** communications in an attempt to keep wiring for both networks within a site consistent. Below you will find the specification for both cabling types.

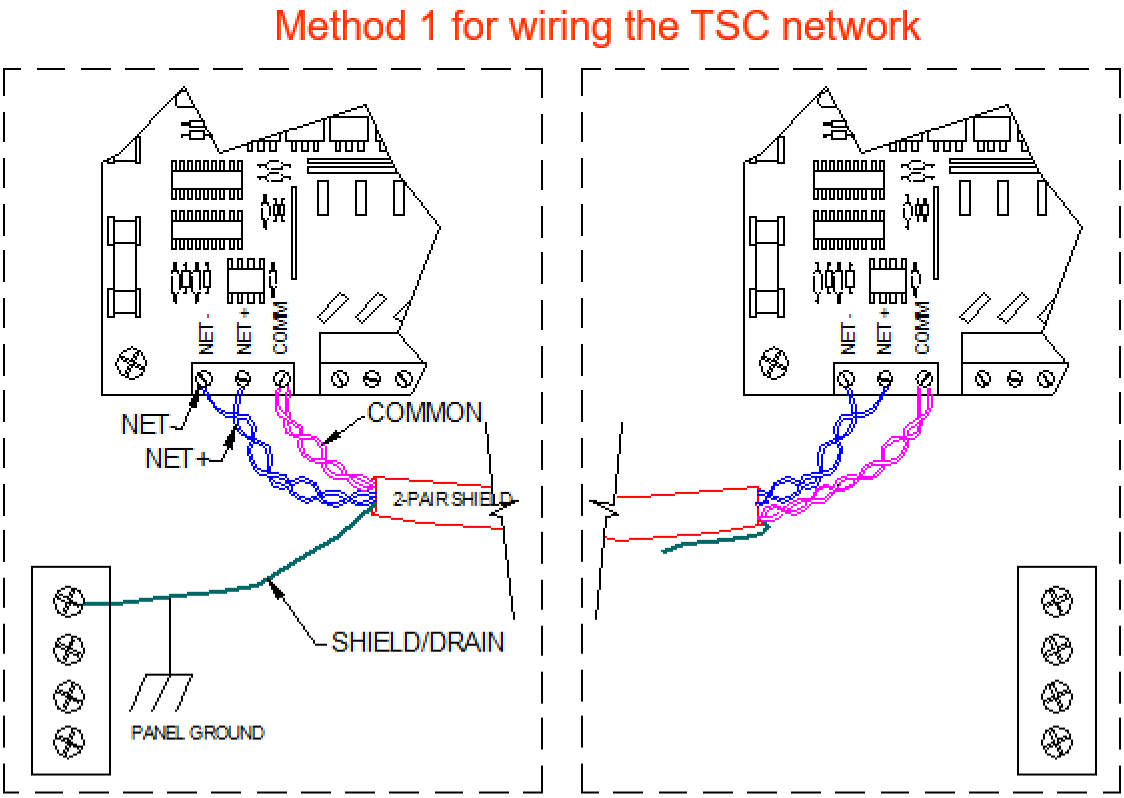
Approved BACnet cabling for TSC use

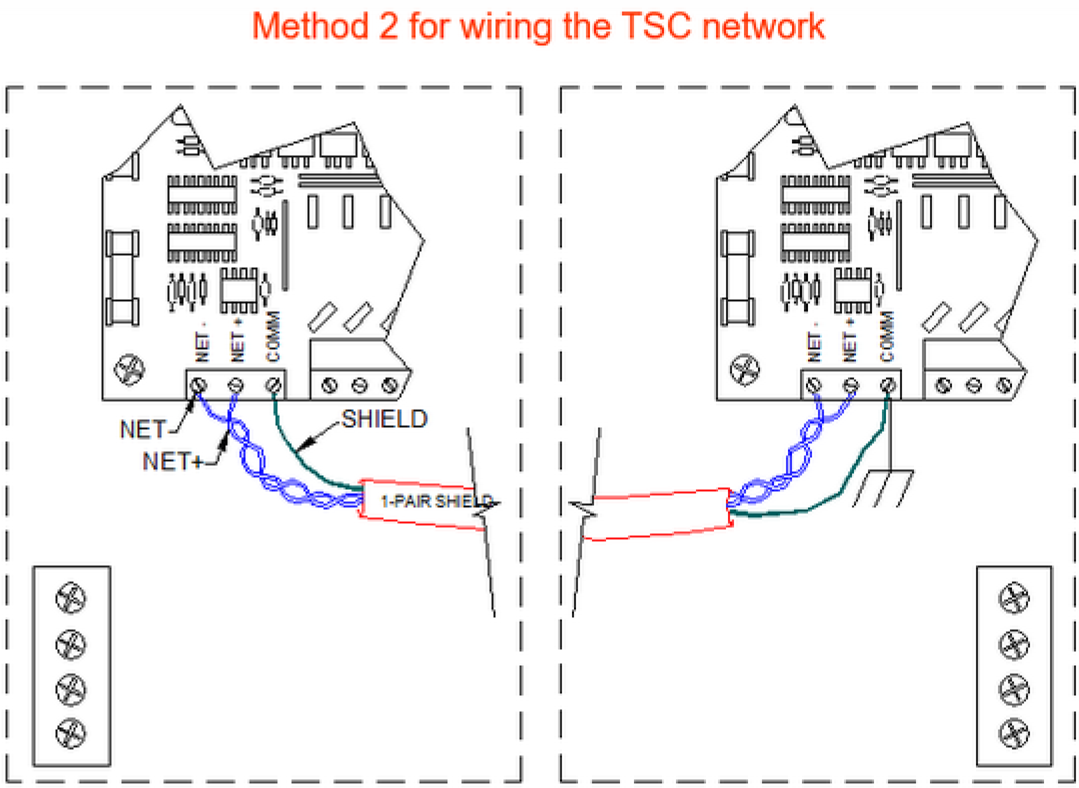
- Manhattan M3993 / Belden 9841 / Belden 82841 Plenum Rated
  - 18 **AWG** Shielded twisted pair
  - Foiled or braided shields are acceptable
  - Characteristic Impedance between 100-130 ohms (30 pF per foot)
  - Distributed capacitance less than 200 pF per meter, or 60 pF per foot
  - PVC or polyethelene insulation (except for in plenum applications)
  - Maximum recommended length of 12,000 feet or 4,000 feet per segment

Approved specific TSC cabling to use

- Belden 88723 Plenum or Belden 8723 PVC
  - 22-24 **AWG** shielded single pair
  - Foiled or braided shields acceptable
  - Characteristic impedance between 100-120 ohms
  - Distributed capacitance of 13 pF per foot
  - PVC or polyethylene insulation (except for plenum applications)
  - Maximum recommended length of 12,000 feet or 4,000 feet per segment
- The TSC network can only be wired in a daisy chain manner.
- The TSC network must be terminated at each end with a 100...120 ohm, 1/2 watt resistor. In most cases, the eSC or MATRIX Series are the first devices on the network and they already have built in termination at one end.
- The TSC network can not be in a star configuration unless a TSC network repeater is used.
- The TSC network can not be in a 'T' configuration at any time.
- A TSC network can not be more than 32 nodes unless a network repeater is used.
- The maximum size of a TSC network is two repeaters, 12,000 feet or 96 addresses.

Wiring configurations



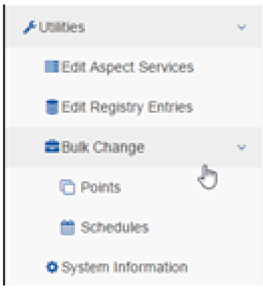


Bulk Change and Bulk Copy

Overview

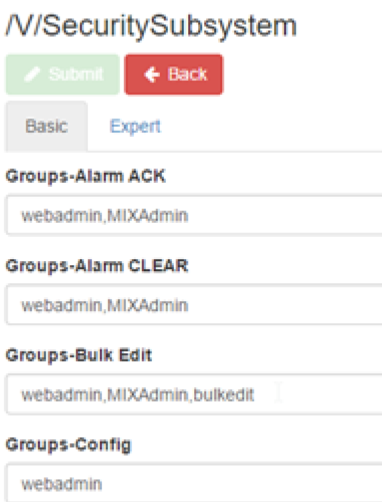
The Bulk Change > **Schedules** and **Bulk Change**>**Points** applications within **ngAdmin** offer experienced system operators a means of finding and updating point values or schedules quickly and efficiently.

The Bulk Change applications are located in the **Utilities** menu in the HTML5 UI and only appear for users with the appropriate security settings.



Security Settings

Due to the advanced nature of the **Bulk Change**applications, these applications are reserved for **Groups**in with Bulk Edit privilege in **Utilites**>**Edit Aspect Services** > **Security Subsystem**

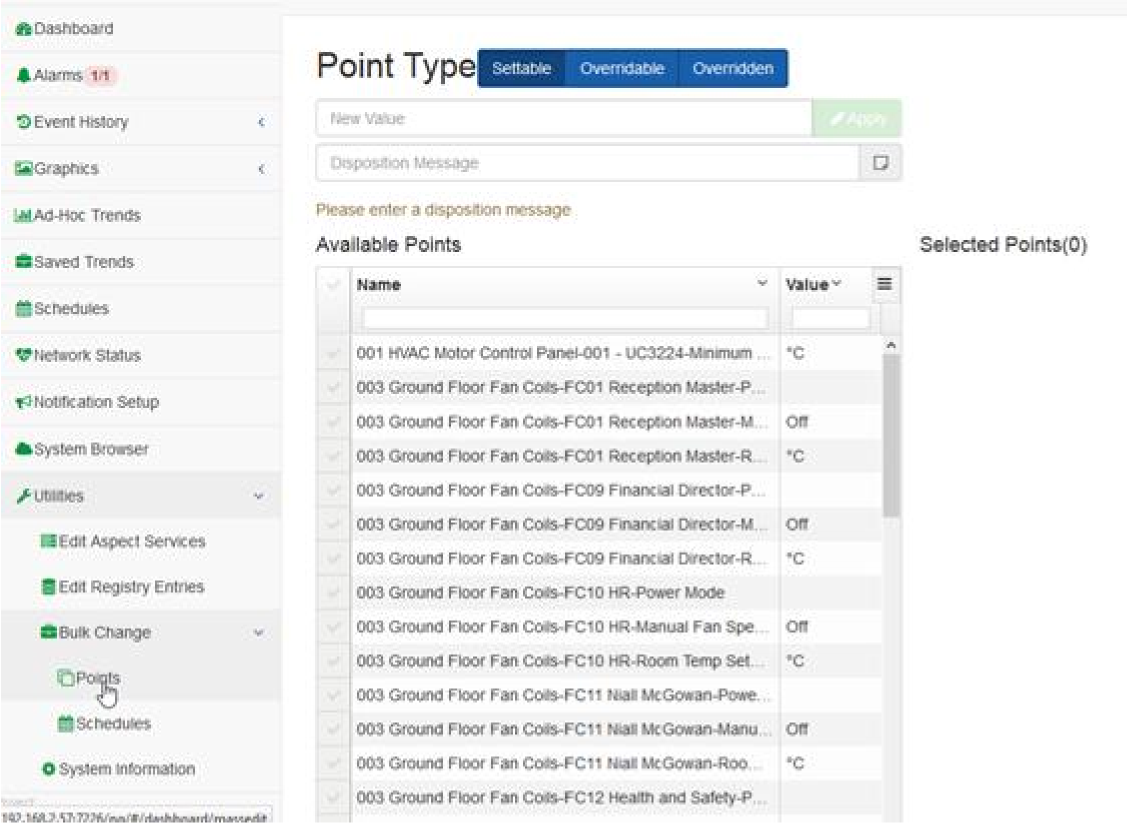


Groupsincluded in the**Bulk Edit** permission are still subject to the write and configuration permissions on the objects being changed within the application.

For instance, the group bulkeditshown above can access theBulk Change > **Points**application, but can ONLY perform bulk change operations on points that are configured to be **writable** by thebulkedit group.

Bulk Change > Points

Selecting Utilities > **Bulk Change**>**Points**opens the**Bulk Change Points** screen:



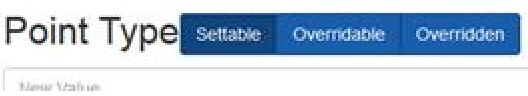
This page contins

· 2 text-entry fields – **New Value**and**Disposition Message**,

· 2 lists of Available Points and **Selected Points**, and

· an Apply button (beside the **New Value**Input).

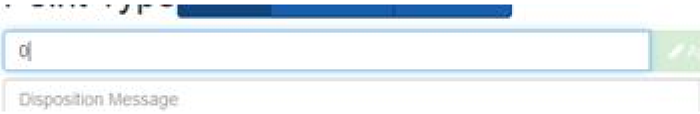
The Available Points list can show **Settable**Points,**Overridable**points, or points that have beenOverridden, and this can be changed using the **Point Type** buttons at the top of the page just above the **New Value**input.



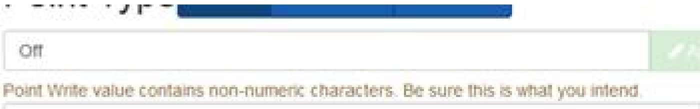
Multiple points can be selected in the **Available Points**list, and when the**Apply**button is pressed the value in theNew Value input will be sent to all of those selected points.

New Value Input

The New Value input is intended primarily for use with numeric values. When writing enumerated values, it is required to send the underlying integer value and not the user-facing string value (e.g. 0instead ofOFF).



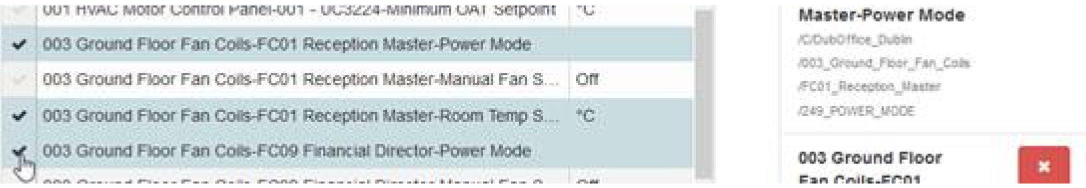
Writing string values to numeric points may have adverse side-effects and will generate a warning, but is permitted.



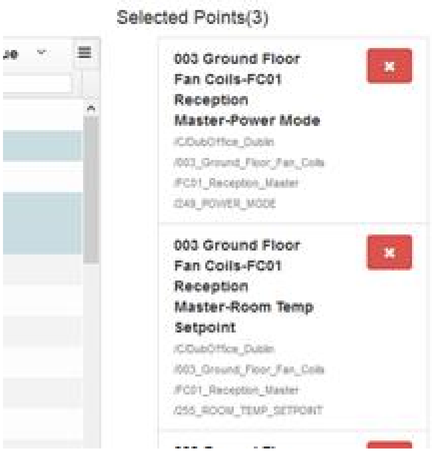
Available Points List

The Available Points list may be filtered using the text areas beneath the Name and/or **Value**column headings.

To select an item to participate in the value copy, check the checkbox column on the left of that item in the **Available Points**list.



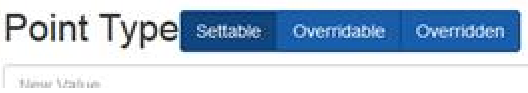
Once selected, the points participating in the **Bulk Change**operation are added to the Selected Points list.



To remove a selected point, either click the **Delete**button of the point in the Selected Points list, or uncheck the checkbox in the **Available Points** list.

· Settable Points

When the Bulk Change > **Point**application is selected, the Available Points list will be populated with all points in the Aspect project that are writable by the current user. These are called **Settable Pointsand the** **Point Type**buttons will indicate that they are currently displayed:



If the value is **background polled**, then it will be displayed in the Value column, otherwise the Value column will be empty.

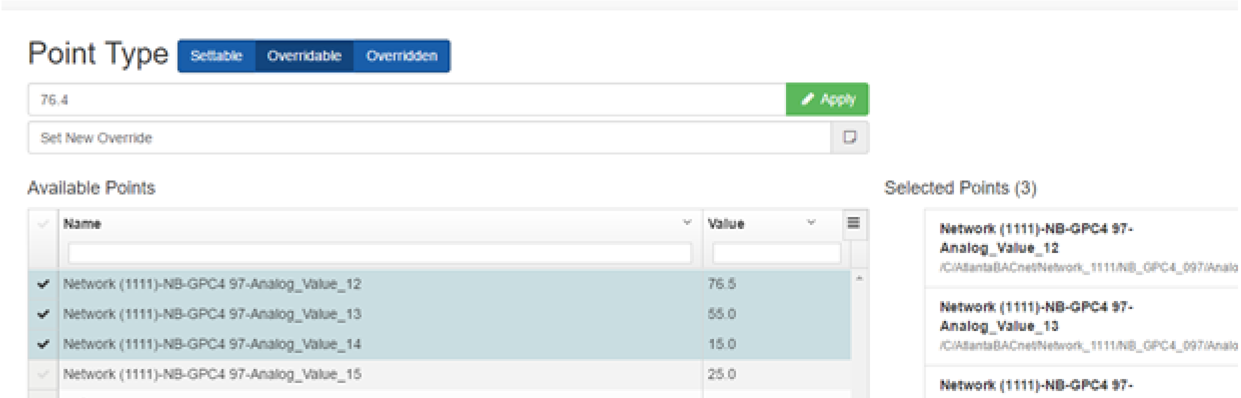
· Overridable Points

The behavior of **Overridable Points** is very similar to the behavior of **Settable Points** within the Bulk Change>Points application. The key difference is that only Points that are capable of one of the **Aspect Override** behaviors will be present in this list.

Conversely, **Overridable Points** do not appear in the **Settable Points** list.

Selection, value change, and **Apply** behavior remains the same.

> **Note**: **Overridable points** Applying an override to these points will replace the existing override with the new value. with an active override value will appear in this list as well.

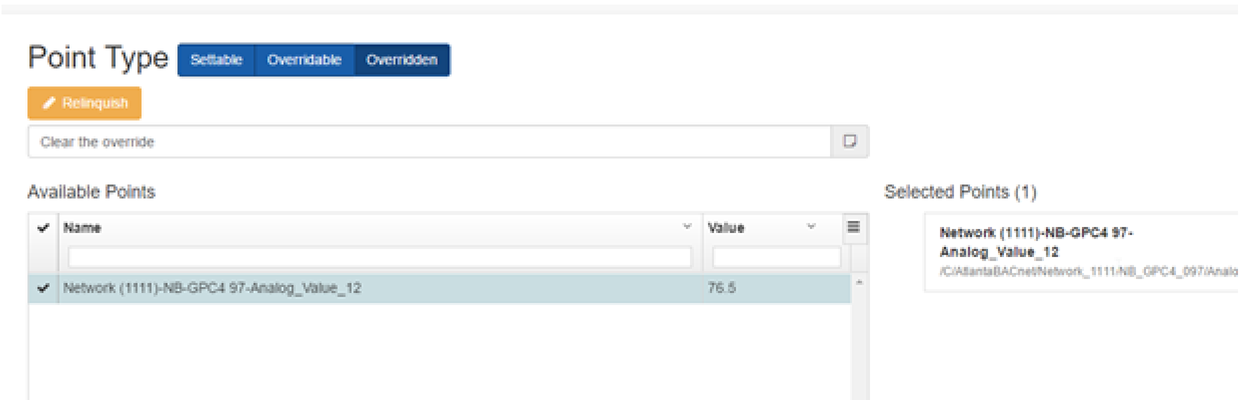


· Overridden Points

Overridden Points will show **Overridable Points** that have an active override state.

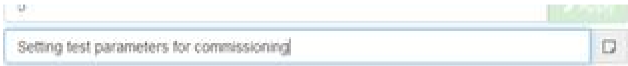
Use the Relinqush option to relinquish active overrides and return the values to the defaults.

> **Note**: A disposition message is rquired to relinquish.



Disposition Message

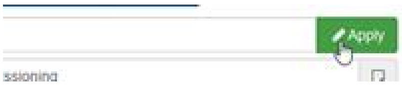
When the selection process is complete, enter an optional **Disposition Message** to indicate why the change is being made.



This is recommended, because it is useful for troubleshooting and also helps with implementing validated systems.

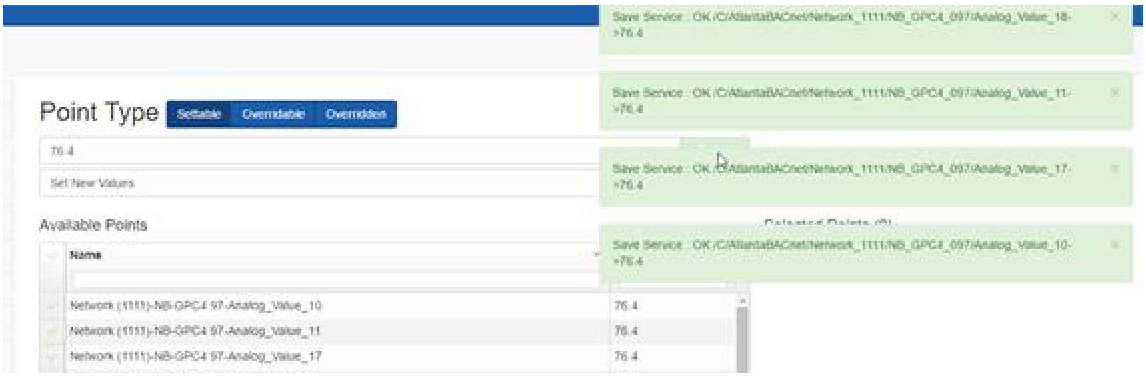
Running the Point Change Process

Click the Apply button to begin the **Bulk Change** process.



Each item will in the list will be processed sequentially and will provide either a confirmation message or an error message.

> **Note**: Do not navigate away from the Bulk Change Points page while the operation is in progress or the remaining points will **not** be processed.



Bulk Change > Schedules

The Bulk Change > Schedules ("Bulk Copy) application is similar to the Bulk Change>Points application, but with a few key differences:

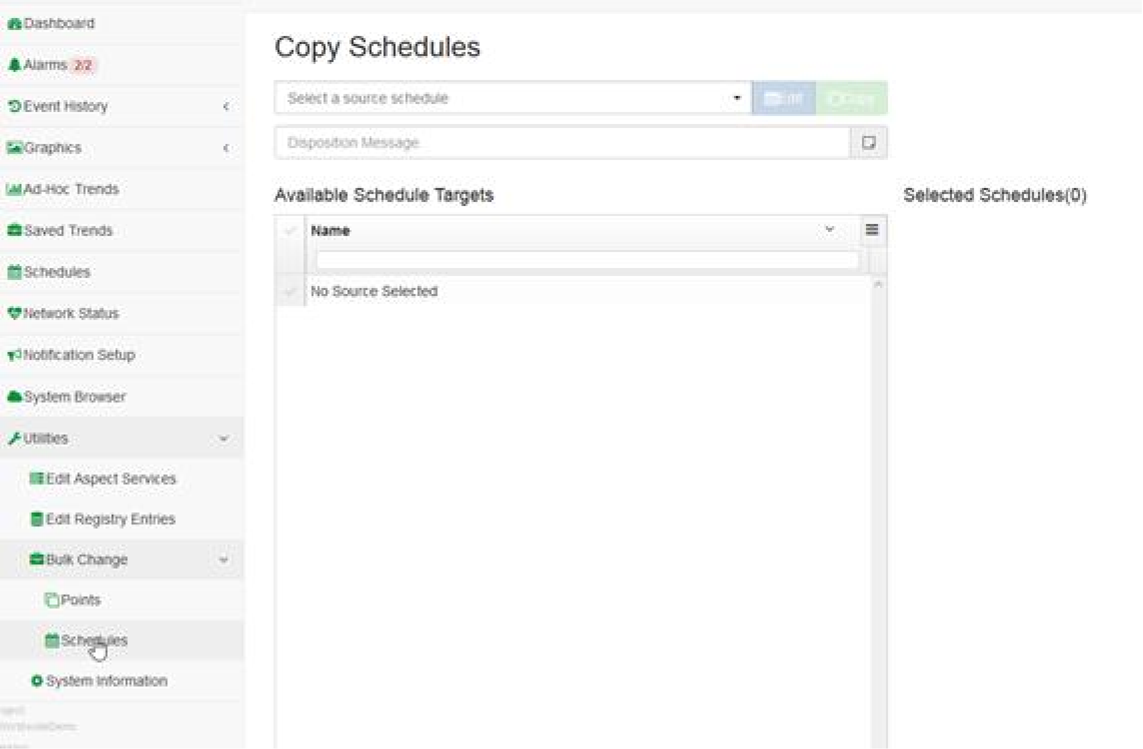
·**Schedules** are complex objects - You must select a source **Schedule** to be copied to the targets, rather than a single value.

·A**Schedule**must be designated as a **Bulk Copy Source** before it can be used as a source for a **Bulk Copy** operation.

·**Schedules** can only be copied to identical types (e.g. an **Aspect Basic schedule** can only be copied to a set of **Aspect Basic Schedules**).

· The **Map Schedule**of the target. **configuration data** within the schedule is copied to the **configuration data** The itself is not copied. **object**

Selecting Utilities > Bulk Change >Schedules opens the Bulk Copy Schedules screen:



This contains

· a selection list to **Select a source schedule,**

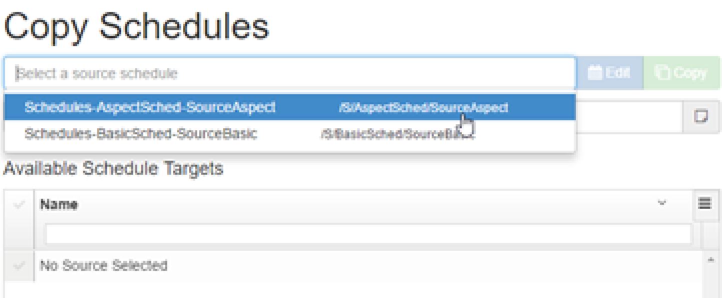
· a list of Available Schedule Targets

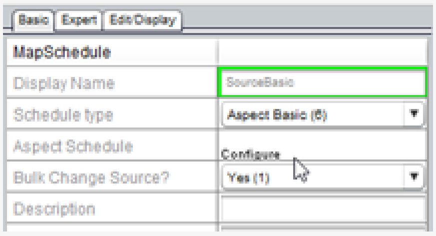
· a list of Selected Schedules

· text entry for a Disposition Message

Select a source schedule

The schedules that have Bulk Change Source? Property set to Yes will appear in the selection box.



> **Note**: To set this property, in ASPECT-Studio set the property `Bulk Change Source?` on the `Basic` tab of the **Schedule's** property pane to Yes (1).
>
> 
>

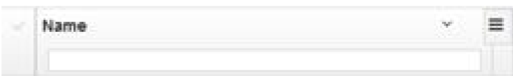
Once the source **Schedule** is selected and verified, valid destinations for the source **Schedule's** type will populate the `Available Schedule Targets` grid.

The `Edit` button is provided as a shortcut to edit the selected **Schedule** .

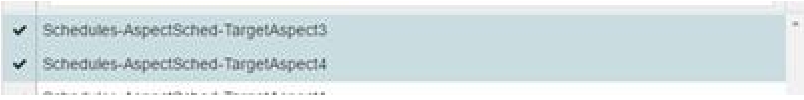
> **Note**: Editing the source Schedule will exit the `Bulk Copy Schedules` page and discard any selections.

Available Schedule Targets

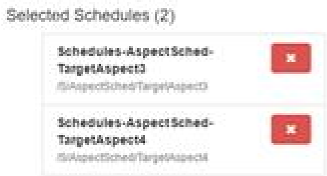
The `Available Schedule Target`list may be filtered using the text areas beneath the**Name**column headings.



To select a target to participate in the **Bulk Copy Schedule**process, check the checkbox column to the left of that schedule in the**Available Schedule Targets** list.



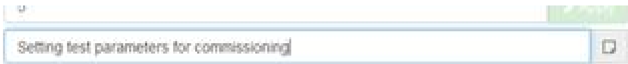
Once selected, the **Schedules** participating in the Bulk Copy Schedule operation are added to the Selected Schedules list.



To remove a selected **Schedule**, either click the Delete button of the point in the Selected Schedules list, or uncheck the checkbox in the Available Schedue Targets list.

Disposition Message

When the selection process is complete, enter an optional Disposition Message to indicate why the change is being made.



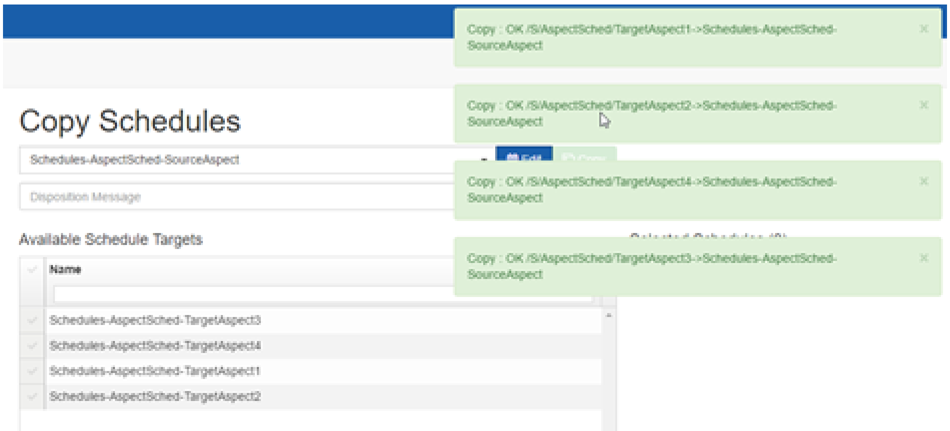
This is recommended, because it is useful for troubleshooting and also helps with implementing validated systems.

Running the Copy Schedule Process

Click the Copy button to begin the **Bulk Change** process.

Each **Schedule** will in the list will be processed sequentially and will provide either a confirmation message or an error message.

> **Note**: Do not navigate away from the Bulk Copy Schedules page while the operation is in progress or the remaining points will **not** be processed.



> **Note**: **Schedules** are substantially more complex objects than **Point** Values and take somewhat longer for the confirmation or failure messages to return.

Partial Bulk Schedule Distribution

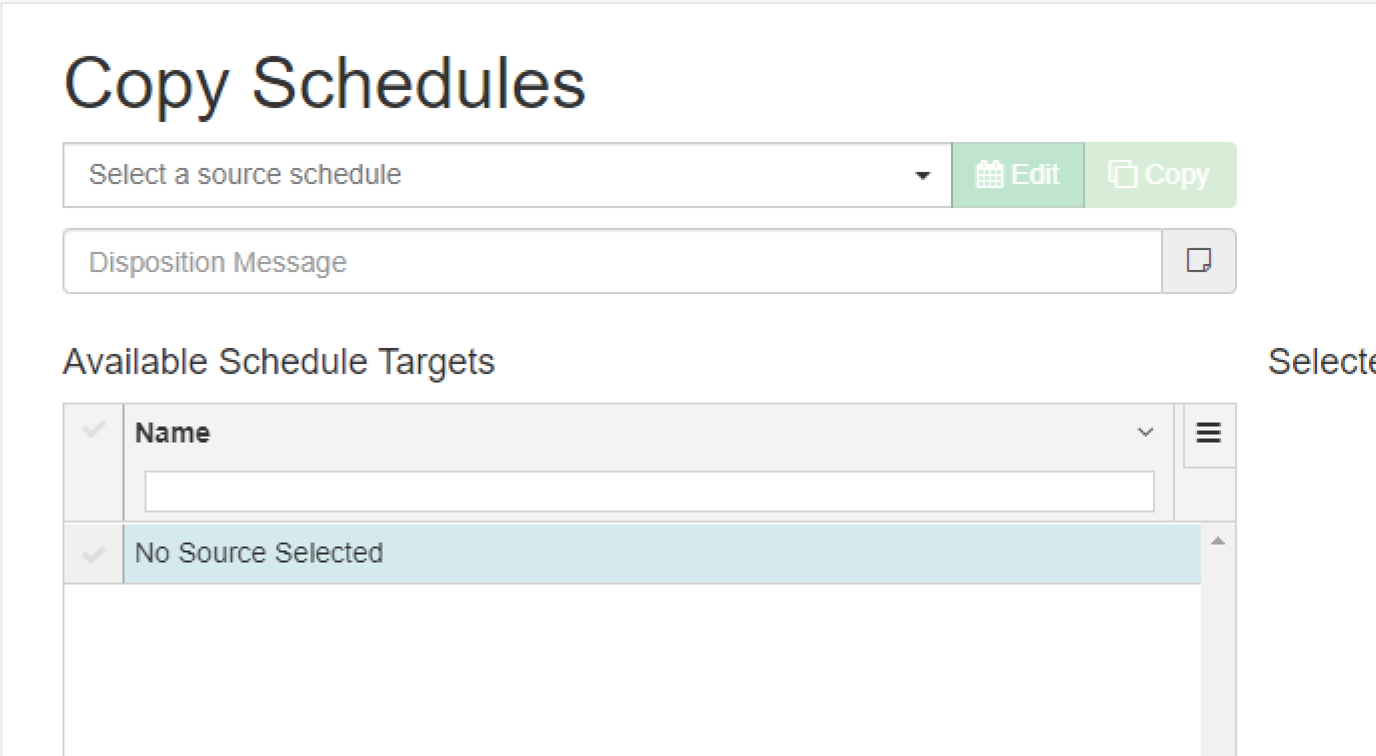
Since v3.04.00

Aspect will allow partial bulk schedule distribution of schedules of type “Aspect Combo Schedule”. This would typically be used in an configuration where schedules need to be distributed to multiple remote devices from a Supervisory Aspect target to Aspect edge devices and subsequently relayed to BACnet device schedule objects.

This allows an ng-admin user with appropriate permissions the option to distribute a schedule exception List to multiple schedule targets without disturbing the standard Week Schedule configuration or to distribute a weekly schedule without changing any exception events in a schedule. For example, holiday exception lists could be distributed to multiple schedules that may have different weekly schedule events that should not be modified.

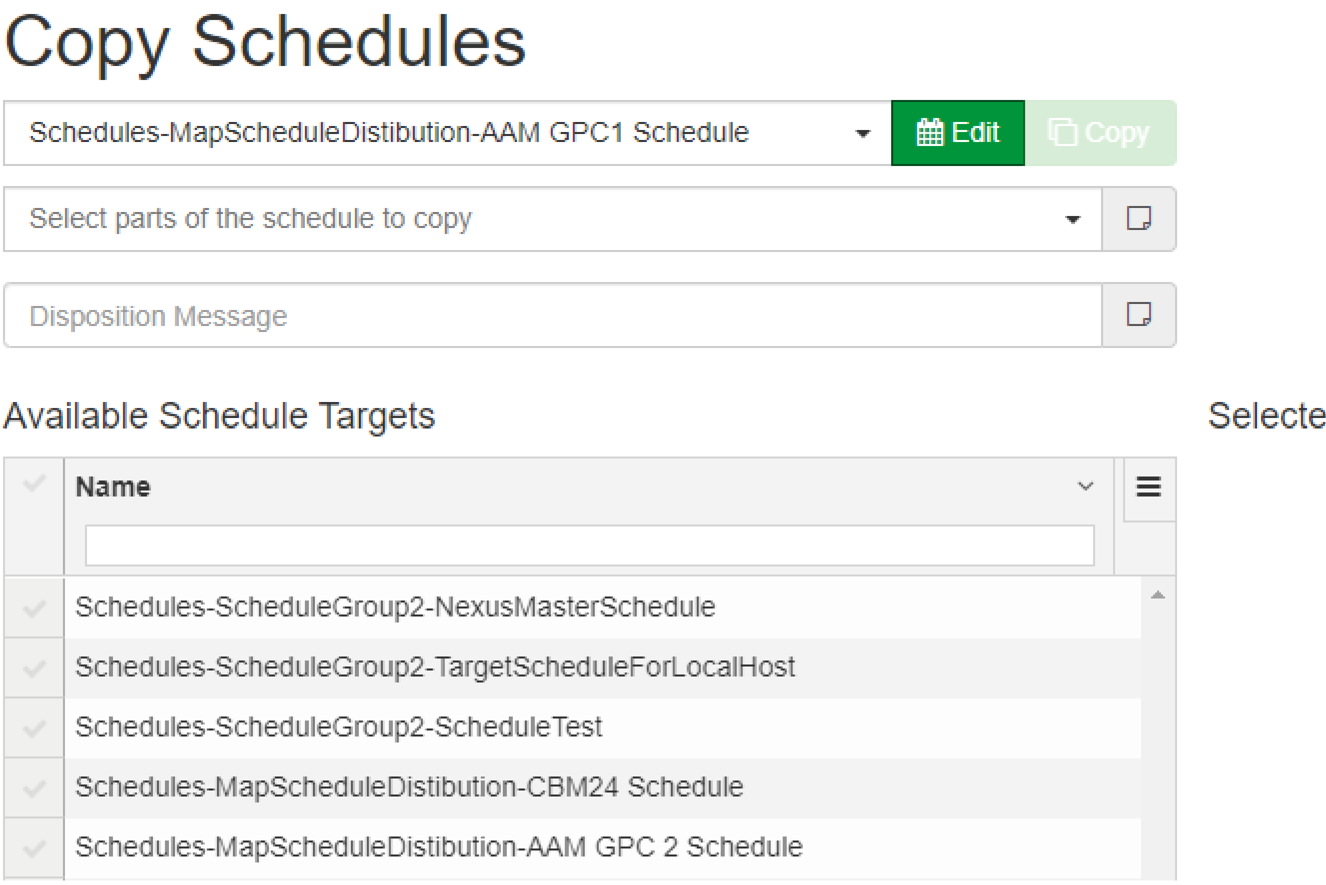
Select A Source Schedule

When selecting a source schedule only “Aspect Combo” type schedules will allow partial event bulk distribution.



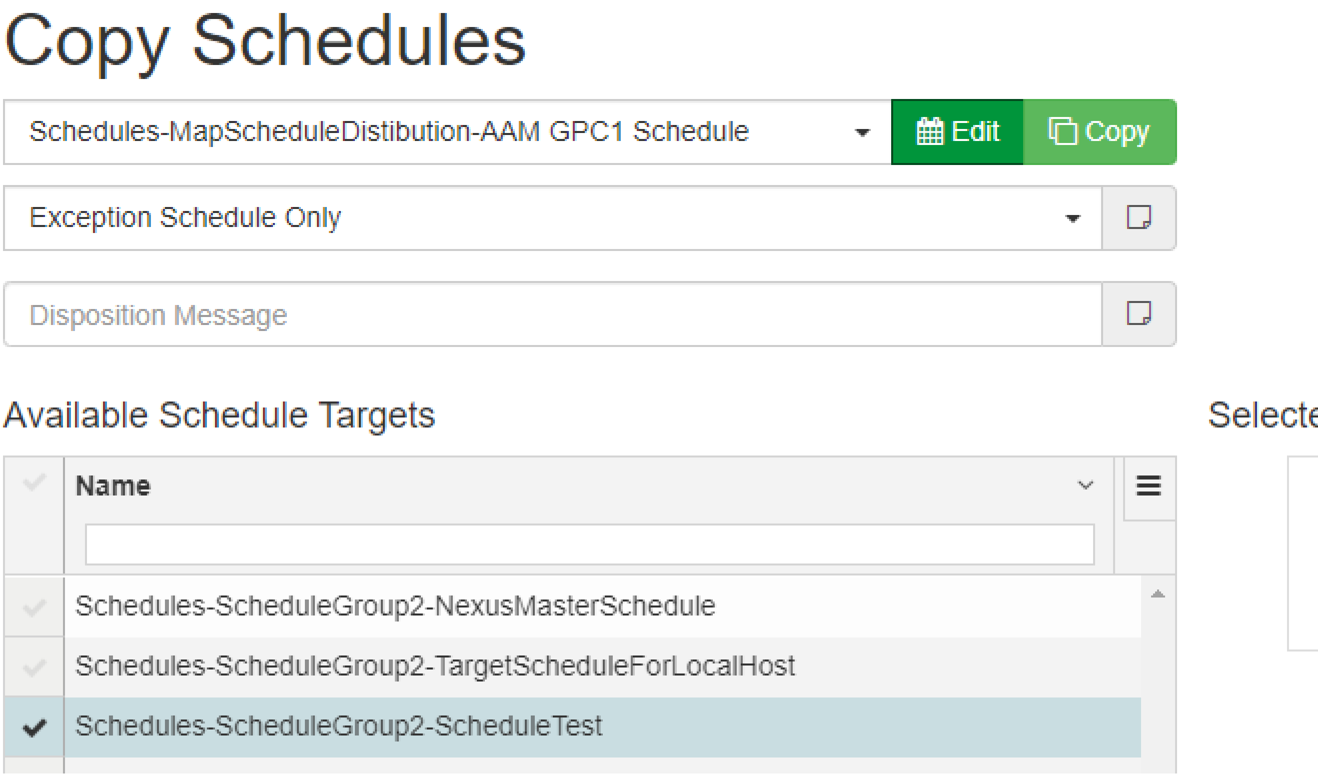
After selecting the correct type of schedule the user is presented with drop list to select which parts of the schedule to be distributed:

- Full
- Weekly
- Exception



Bulk Distribution

Once the parts of the schedule to copy and the schedule targets are selected the copy button will be enabled. Click the copy button to distribute all selected schedules. After each schedule is distributed, a conformation message will be displayed communicating success or failure of the distribution.


Copy Schedules
Schedules-MapScheduleDistibution-AAM GPC1 Schedule
Edit
Copy
Exception Schedule Only
Disposition Message
Available Schedule Targets
Selecte
Name
Schedules-ScheduleGroup2-NexusMasterSchedule
Schedules-ScheduleGroup2-TargetScheduleForLocalHost
Schedules-ScheduleGroup2-ScheduleTest

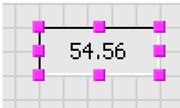
Element Reference

Design Elements

Basic Layout

Annunciator

Used to display any raw value within the system, whether it be numerical, text, etc..



Standard Inputs

Pin	Notes
Input	Accepts a single input value and is used to update a current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

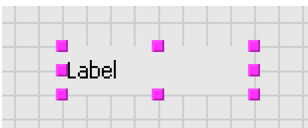
Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Color Action	Defines how the Sent Color from the value input will be used.
Fill Color	Defines how the Sent Color will be filled into the widget.
Font	Defines the font, size, and style of displayed information.
Label Horizontal Alignment	Defines the text alignment for horizontal information.
Label Vertical Alignment	Defines the text alignment for vertical information.
Number Format	Defines the format for numbers displayed.
Text Color	Defines the text color.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

T *Label Color*

Used to display static information such as screen titles, point labels, etc.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Text	Defines the text value to display.
Bezel	Places a bezel around the graphical widget.
Fill Color	Defines how the Sent Color will be filled into the widget.
Font	Defines the font, size, and style of displayed information.
HAlignment	Defines the text alignment for horizontal inform-ation.
Label Color	Defines the text color.
VAlignment	Defines the text alignment for vertical inform-ation.

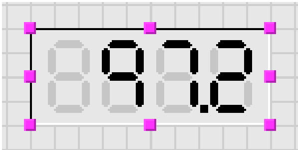
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Color Action	Defines how the Sent Color from the value input will be used.
Cursor	Defines the cursor icon to display during mouse hover.
Formatter	Defines the format for numbers displayed.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be dis-played on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indic-	Defines the quality of data that will indicate warn-

ator	ing.

Seven Segment

Used to display segment information for instrumentation panels.



Standard Inputs

Pin	Notes
Input	Accepts a single input value and is used to update a current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Color for Lit Segment	Defines the display color for illuminated segments
Color for Unlit Segments	Defines the display color for unlit segments.
Margin	Defines the margin space.
Number of Decimals	Defines the amount of decimals.
Number of Digits	Defines the amount of digits (left of decimal).
Segment Width	Defines the space width for each segment.
Use Color?	Defines how the Sent Color from the value input will be used.

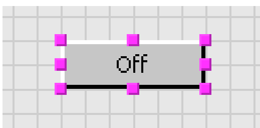
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.

Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Color Action	Defines how the Sent Color from the value input will be used.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Button

Used to command values, provide a trigger point, or represent boolean values.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value for On/Off based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Color Action	Defines how the Sent Color from the value input will be used.
Color Off	Defines the color displayed when the input value if off (0).
Color On	Defines the color displayed when the input value is on (1).
Draw Label	Defines if a label should be displayed.
Image Off Name	Defines an image that can be displayed on the button when the input value is off (0).
Image On Name	Defines an image that can be displayed on the button when the input value is on (1).
Label Color	Defines the text color.
Label Font	Defines the font, size, and style of the label.
Label for Off	Defines a label to display when the input value is off (0).
Label for On	Defines a label to display when the input value is on (1).
Trigger Duration	Defines the amount of time, in milliseconds, a trigger value will be sent upon a button press.
Trigger Type	Defines the trigger type.
Value for Off	Defines the value to be sent for Off action.
Value for On	Defines the value to be sent for On action.

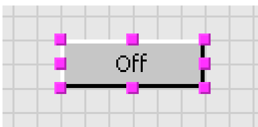
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.

Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Depth	Defines the pixel depth for the button.
Draw 3D	Defines if the button should be drawn in 3D.
Enabled	Defines if the element is enabled.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Resource Bundle Name	Defines the Resource Bundle to be used.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Push Button

Used to command values, provide a trigger point, or represent boolean values.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value for On/Off based

	on Basic Properties configuration.

Basic Properties

Property Name	Notes
Color Action	Defines how the Sent Color from the value input will be used.
Color Off	Defines the color displayed when the input value if off (0).
Color On	Defines the color displayed when the input value is on (1).
Draw Label	Defines if a label should be displayed.
Image Off Name	Defines an image that can be displayed on the button when the input value is off (0).
Image On Name	Defines an image that can be displayed on the button when the input value is on (1).
Label Color	Defines the text color.
Label Font	Defines the font, size, and style of the label.
Label for Off	Defines a label to display when the input value is off (0).
Label for On	Defines a label to display when the input value is on (1).
Value for Off	Defines the value to be sent for Off action.
Value for On	Defines the value to be sent for On action.

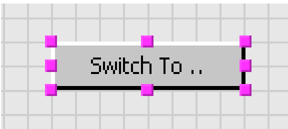
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Depth	Defines the pixel depth for the button.

Draw 3D	Defines if the button should be drawn in 3D.
Enabled	Defines if the element is enabled.
Image Resizes?	Defines if the image should be resized to fit within the expanded bounds.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Resource Bundle Name	Defines the Resource Bundle to be used.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

URL Button

Used to provide screen to screen navigation.



Standard Inputs

Pin	Notes
URL Target	Accepts a URL. When received, a secondary webpage will be opened in a browser displaying the contents of the URL.

Standard Outputs

Pin	Notes
Output	Outputs a value of 1 when the button is pressed.

Basic Properties

Property Name	Notes
Click Action	Defines an action when the widget is clicked.
Color	Defines the color for the URL Button.

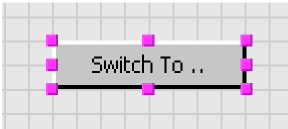
Draw Label	Defines if a label should be displayed.
Image	Defines an image to be displayed on the button.
Label	Defines a text label displayed on the button.
Label Color	Defines the text color.
Label Font	Defines the font, size, and style of the label.
Transfer Context	Defines the comma delimited string used to transfer context between applications.
Value for Off	Defines the value to be sent for Off action.
Value for On	Defines the value to be sent for On action.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Depth	Defines the pixel depth for the button.
Draw 3D	Defines if the button should be drawn in 3D.
Enabled	Defines if the element is enabled.
Image Resizes?	Defines if the image should be resized to fit within the expanded bounds.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Resource Bundle Name	Defines the Resource Bundle to be used.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Enhanced URL Button

Used to provide screen to screen navigation, and provides feedback to the user when clicked.



Standard Inputs

Pin	Notes
URL Target	Accepts a URL. When received, a secondary web-page will be opened in a browser displaying the contents of the URL.

Standard Outputs

Pin	Notes
Output	Outputs a value of 1 when the button is pressed.

Basic Properties

Property Name	Notes
Click Action	Defines an action when the widget is clicked.
Color	Defines the color for the URL Button.
Color on Mouse Over	Defines the color the button will be on mouse over.
Color when Clicked	Defines the color the button will be when clicked.
Draw Label	Defines if a label should be displayed.
Image	Defines an image to be displayed on the button.
Image on Mouse Over	Defines an image to be displayed on mouse over.
Image when Clicked	Defines an image to be displayed when clicked.
Label	Defines a text label displayed on the button.
Label Color	Defines the text color.
Label Font	Defines the font, size, and style of the label.
Transfer Context	Defines the comma delimited string used to transfer context between applications.
Value for Off	Defines the value to be sent for Off action.

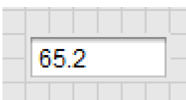
Value for On	Defines the value to be sent for On action.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Depth	Defines the pixel depth for the button.
Draw 3D	Defines if the button should be drawn in 3D.
Enabled	Defines if the element is enabled.
Image Resizes?	Defines if the image should be resized to fit within the expanded bounds.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Resource Bundle Name	Defines the Resource Bundle to be used.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Enhanced Swing Text Field

Used to provide an edit box for any type of system data..



Standard Inputs

Pin	Notes

Update Display	Accepts a single input value and is used to update a current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs a user entered value.

Basic Properties

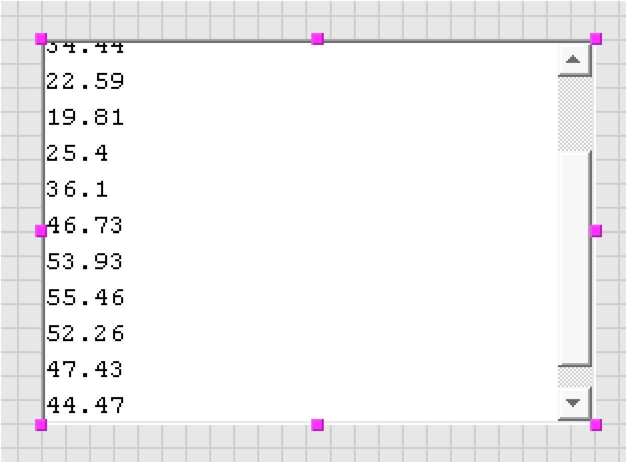
Property Name	Notes
Cursor Color	Defines the color of the cursor when selected.
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of the label.
Formatter	Defines the format for numbers displayed.
Horizontal Alignment	Defines the text alignment for horizontal inform-ation.
Selected Text Color	Defines the color for selected text.
Selection Color	Defines the color for a selection.
Text Color	Defines the text color.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Editable	Defines if the value in the field can be edited.
Ignore Focus Lost?	Defines whether or not to ignore a value when focus is lost.
Stale Quality	Defines if the stale quality indicator will be dis-played on the client side if the value is stale.
Visible?	Defines if the element if visible.

Swing Text Area

Used to provide a scroll-able area for displaying text.



Standard Inputs

Pin	Notes
Clear Data Connection	Accepts a single input value. When a value of 1 is received, contents of the widget are cleared.
Update Display	Accepts a single input value and is used to update a current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

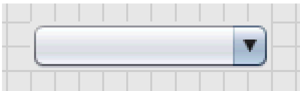
Property Name	Notes
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of the label.
Foreground Color	Defines the color of the foreground.
Formatter	Defines the format for numbers displayed.
High Value	Defines the high value for the graphic.
Low Value	Defines the low value for the graphic.
Max Cache Size	Defines the max cache memory size.
Maximum Characters	Defines the maximum amount of characters that can be held.
Overlap	Defines the number of characters to remove when the cache limit has been reached.
Resume When Cache is Full	Defines if new information is to be appended when the cache is full.
Wrap Text	Defines if text should be wrapped.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Click Action	Defines an action when the widget is clicked.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

Swing Combo Box

Provides a drop-down widget for value selection based on a label and value. This is used for sequenced value (beginning with zero and incrementing with no skips).



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update a current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs a user selected value based on Basic Properties configuration.

Basic Properties

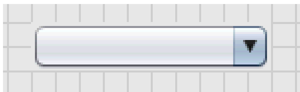
Property Name	Notes
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of the label.
Foreground Color	Defines the color of the foreground.
Hand Entered Items	Defines label,value selection criteria.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

 *Swing Enumerated Combo Box*

Provides a drop-down widget for value selection based on a label and value. This is used for enumerated values which may have logical skips in value order.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update a current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs a user selected value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of the label.
Foreground Color	Defines the color of the foreground.
Hand Entered Items	Defines label,value selection criteria.
Output Index?	Defines if the index number should be outputted.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

Swing Check Box

Provides a check-box for boolean or on/off value commands.

Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update a current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs a value of 0 when unchecked, or 1 when checked.

Basic Properties

Property Name	Notes
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of the label.
Foreground Color	Defines the color of the foreground.
Label	Defines a label to place next to the check box.

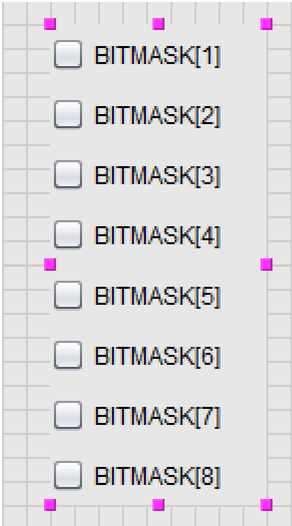
Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.

Visible?	Defines if the element if visible.

Swing Check Box Panel

Provides a panel of check boxes for working with bit string values.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update a current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs an unsigned value based on packet bit array math.

Basic Properties

Property Name	Notes
Checkbox Count	Defines how many check boxes to display.
Checkbox Label List	Defines labels for each check box.
Checkbox Orientation	Defines the orientation for each check box.
Font	Defines the font, size, and style of the label.
Grid Columns	Defines the number of columns.
Grid Rows	Defines the number of rows.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Enabled	Defines if the element is enabled.
Foreground Color	Defines the color of the foreground.
Visible?	Defines if the element if visible.

Displaying and Editing Bitstrings

Increment Decrement

Used to adjust numeric values in a stepped manner up or down.

Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update a current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs a user set value from the widget.

Basic Properties

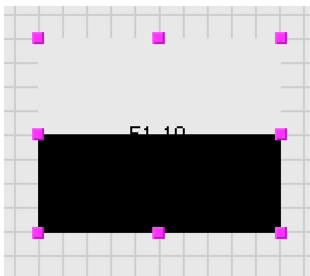
Property Name	Notes
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of displayed information.
Foreground Color	Defines the color of the foreground.
High Value	Defines the highest value that can be entered into the element.
Low Value	Defines the lowest value that can be entered into the element.
Step Size	Defines the value step for increment/decrement.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

 *Box*

Provides a box shaped animated graphic supporting color actions and fill actions.



Standard Inputs

Pin	Notes
Input	Accepts a single input value for widget animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Color Action	Defines how the Sent Color from the value input will be used.
Fill Color	Defines how the Sent Color will be filled into the widget.
Fill Direction	Defines color fill direction within the shape.
Font	Defines the font, size, and style of displayed

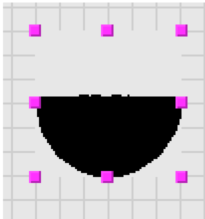
	information.
High Value	Defines the highest bound value used for fill action.
Label Format	Defines the format for numbers displayed.
Label Horizontal Alignment	Defines the text alignment for horizontal information.
Label Vertical Alignment	Defines the text alignment for vertical information.
Low Value	Defines the lowest bound value used for fill action.
Show Label	Defines is the label value is displayed.
Unfilled Color	Defines the color used to represent unfilled area.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Label Color	Defines the color for label values.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Use Label Color?	Defines if the Label color or Fill color is used for the label. If false, the Fill Color is used. If true, the Label Color is used.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

 *Circle*

Provides a circle shaped animated graphic supporting color actions and fill actions.



Standard Inputs

Pin	Notes
Input	Accepts a single input value for widget animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Background	Defines the background color.
Bezel	Places a bezel around the graphical widget.
Color Action	Defines how the Sent Color from the value input will be used.
Fill Color	Defines how the Sent Color will be filled into the widget.
Fill Direction	Defines color fill direction within the shape.
Font	Defines the font, size, and style of displayed information.
High Value	Defines the highest bound value used for fill action.
Label Format	Defines the format for numbers displayed.
Label Horizontal Alignment	Defines the text alignment for horizontal information.
Label Vertical Alignment	Defines the text alignment for vertical information.

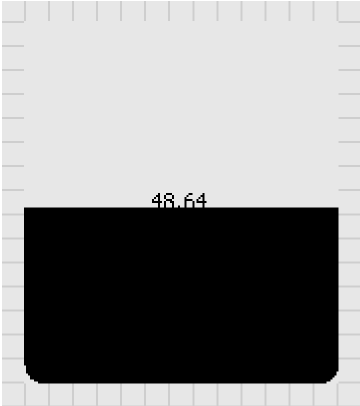
Low Value	Defines the lowest bound value used for fill action.
Show Label	Defines is the label value is displayed.
Unfilled Color	Defines the color used to represent unfilled area.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Label Color	Defines the color for label values.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Use Label Color?	Defines if the Label color or Fill color is used for the label. If false, the Fill Color is used. If true, the Label Color is used.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Rounded Box

Provides a rounded box shaped animated graphic supporting color actions and fill actions.



Standard Inputs

Pin	Notes
Input	Accepts a single input value for widget animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Arc Height	Defines the arc height sizing.
Arc Width	Defines the arc width sizing.
Bezel	Places a bezel around the graphical widget.
Color Action	Defines how the Sent Color from the value input will be used.
Fill Color	Defines how the Sent Color will be filled into the widget.
Fill Direction	Defines color fill direction within the shape.
Font	Defines the font, size, and style of displayed information.
High Value	Defines the highest bound value used for fill action.
Label Format	Defines the format for numbers displayed.
Label Horizontal Alignment	Defines the text alignment for horizontal information.
Label Vertical Alignment	Defines the text alignment for vertical information.

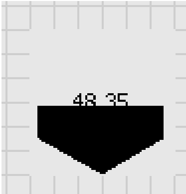
Low Value	Defines the lowest bound value used for fill action.
Show Label	Defines is the label value is displayed.
Unfilled Color	Defines the color used to represent unfilled area.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Label Color	Defines the color for label values.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Use Label Color?	Defines if the Label color or Fill color is used for the label. If false, the Fill Color is used. If true, the Label Color is used.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Polygon

Provides a polygon shaped animated graphic supporting color actions and fill actions.



Standard Inputs

Pin	Notes
Input	Accepts a single input value for widget animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

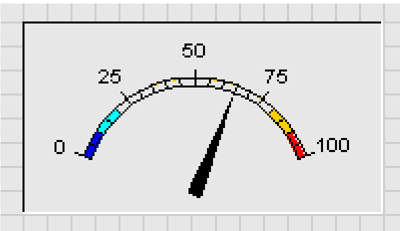
Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Color Action	Defines how the Sent Color from the value input will be used.
Fill Color	Defines how the Sent Color will be filled into the widget.
Fill Direction	Defines color fill direction within the shape.
Font	Defines the font, size, and style of displayed information.
High Value	Defines the highest bound value used for fill action.
Label Format	Defines the format for numbers displayed.
Label Horizontal Alignment	Defines the text alignment for horizontal information.
Label Vertical Alignment	Defines the text alignment for vertical information.
Low Value	Defines the lowest bound value used for fill action.
Number of Sides	Defines the number of sides for the polygon.
Show Label	Defines is the label value is displayed.
Starting Angle	Defines the starting angle of rotation for the polygon.
Unfilled Color	Defines the color used to represent unfilled area.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Label Color	Defines the color for label values.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Use Label Color?	Defines if the Label color or Fill color is used for the label. If false, the Fill Color is used. If true, the Label Color is used.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

 *Meter*

Provides a standard instrumentation meter.



Standard Inputs

Pin	Notes
Input	Accepts a single input value for widget animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Angle Ending	Defines the angle ending coordinate.
Angle Starting	Defines the angle start coordinate.
Bezel	Places a bezel around the graphical widget.
Center X Percent	Defines the percent coordinate for the X Axis
Center Y Percent	Defines the percent coordinate for the Y Axis
Draw Long Needle	Defines if the animated needle should be drawn long.
Font	Defines the font, size, and style of displayed information.
High Color	Defines the color for high values.
High Level	Defines the level for high values.
High Value	Defines the starting input value for high values.
High	Defines the color for high high values.
High	Defines the level for high high values.
Low Color	Defines the color for low values.
Low Level	Defines the level for low values.
Low Value	Defines the starting input value for low values.
Low	Defines the color for low low values.
Low	Defines the level for low low values.
Needle Color	Defines the color for the needle.
Needle Thickness	Defines the thickness of the animated needle.
Normal Range Color	Defines the color for normal ranges.
Radius Percentage	Defines the radius percentage for the meter.
Show Warning on Peg	Defines if a warning area should be displayed.
Tic Format String	Defines the format string for tics.
Tic Length	Defines the length for tics.

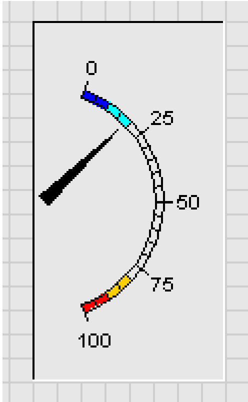
Tic Mark Color	Defines tic mark colors.
Tic Spacing	Defines spacing between tics.
Tics Per Label	Defines how many tics per label.
Use Color?	Defines if coloring should be used.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Meter Vertical

Provides a standard instrumentation meter in vertical orientation.



Standard Inputs

Pin	Notes
Input	Accepts a single input value for widget anim-ation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Angle Ending	Defines the angle ending coordinate.
Angle Starting	Defines the angle start coordinate.
Bezel	Places a bezel around the graphical widget.
Center X Percent	Defines the percent coordinate for the X Axis
Center Y Percent	Defines the percent coordinate for the Y Axis
Draw Long Needle	Defines if the animated needle should be drawn long.
Font	Defines the font, size, and style of displayed information.
High Color	Defines the color for high values.
High Level	Defines the level for high values.
High Value	Defines the starting input value for high values.
High	Defines the color for high high values.
High	Defines the level for high high values.
Low Color	Defines the color for low values.
Low Level	Defines the level for low values.

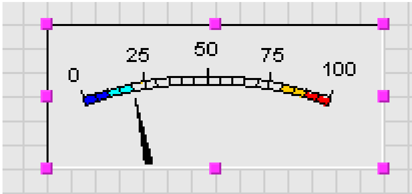
Low Value	Defines the starting input value for low values.
Low	Defines the color for low low values.
Low	Defines the level for low low values.
Needle Color	Defines the color for the needle.
Needle Thickness	Defines the thickness of the animated needle.
Normal Range Color	Defines the color for normal ranges.
Radius Percentage	Defines the radius percentage for the meter.
Show Warning on Peg	Defines if a warning area should be displayed.
Tic Format String	Defines the format string for tics.
Tic Length	Defines the length for tics.
Tic Mark Color	Defines tic mark colors.
Tic Spacing	Defines spacing between tics.
Tics Per Label	Defines how many tics per label.
Use Color?	Defines if coloring should be used.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Meter Flat

Provides a standard instrumentation meter in a flat graphical orientation.



Standard Inputs

Pin	Notes
Input	Accepts a single input value for widget animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Angle Ending	Defines the angle ending coordinate.
Angle Starting	Defines the angle start coordinate.
Bezel	Places a bezel around the graphical widget.
Center X Percent	Defines the percent coordinate for the X Axis
Center Y Percent	Defines the percent coordinate for the Y Axis
Draw Long Needle	Defines if the animated needle should be drawn long.
Font	Defines the font, size, and style of displayed information.
High Color	Defines the color for high values.
High Level	Defines the level for high values.
High Value	Defines the starting input value for high values.
High	Defines the color for high high values.
High	Defines the level for high high values.
Low Color	Defines the color for low values.
Low Level	Defines the level for low values.
Low Value	Defines the starting input value for low values.

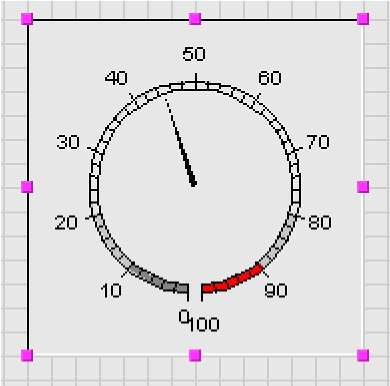
Low	Defines the color for low low values.
Low	Defines the level for low low values.
Needle Color	Defines the color for the needle.
Needle Thickness	Defines the thickness of the animated needle.
Normal Range Color	Defines the color for normal ranges.
Radius Percentage	Defines the radius percentage for the meter.
Show Warning on Peg	Defines if a warning area should be displayed.
Tic Format String	Defines the format string for tics.
Tic Length	Defines the length for tics.
Tic Mark Color	Defines tic mark colors.
Tic Spacing	Defines spacing between tics.
Tics Per Label	Defines how many tics per label.
Use Color?	Defines if coloring should be used.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

 *Meter Round*

Provides a standard instrumentation meter in flat round orientation.



Standard Inputs

Pin	Notes
Input	Accepts a single input value for widget anim-ation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Angle Ending	Defines the angle ending coordinate.
Angle Starting	Defines the angle start coordinate.
Bezel	Places a bezel around the graphical widget.
Center X Percent	Defines the percent coordinate for the X Axis
Center Y Percent	Defines the percent coordinate for the Y Axis
Draw Long Needle	Defines if the animated needle should be drawn long.
Font	Defines the font, size, and style of displayed information.
High Color	Defines the color for high values.
High Level	Defines the level for high values.
High Value	Defines the starting input value for high values.

High	Defines the color for high high values.
High	Defines the level for high high values.
Low Color	Defines the color for low values.
Low Level	Defines the level for low values.
Low Value	Defines the starting input value for low values.
Low	Defines the color for low low values.
Low	Defines the level for low low values.
Needle Color	Defines the color for the needle.
Needle Thickness	Defines the thickness of the animated needle.
Normal Range Color	Defines the color for normal ranges.
Radius Percentage	Defines the radius percentage for the meter.
Show Warning on Peg	Defines if a warning area should be displayed.
Tic Format String	Defines the format string for tics.
Tic Length	Defines the length for tics.
Tic Mark Color	Defines tic mark colors.
Tic Spacing	Defines spacing between tics.
Tics Per Label	Defines how many tics per label.
Use Color?	Defines if coloring should be used.

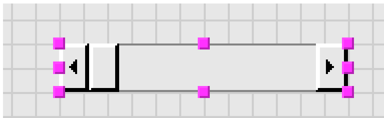
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.

Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

 *Slider*

Provides a standard slider bar with increment/decrement buttons for value adjustments or representation.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Enabled	Defines if the element is enabled.
High Value	Defines the highest value that can be entered into the element.
Low Value	Defines the lowest value that can be entered into the element.
Orientation	Defines the orientation for the slider (horizontal or vertical).
Size for Slider Knob	Defines the pixel size for the slider knob.
Sizes as Percent	Defines if the sizes for the slider knob are percent scaled.
Snap to Value	Defines if values are snapped onto with no float-

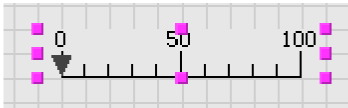
	ing point.
Use Color?	Defines how the Sent Color from the value input will be used.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Block Increment	Defines the increment when the increase or decrease element if clicked.
Cursor	Defines the cursor icon to display during mouse hover.
End Gap Size	Defines the end gaps on each side of the slider.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Size for Decrease Button	Defines the pixel size for the decrease button.
Size for Increase Button	Defines the pixel size for the increase button.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Unit Increment	Defines the unit increment for each button press.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

1 *Slider - Single Scale*

Provides a line animated slider bar for value adjustments or representation.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Color for Pointer	Defines the color for the slider pointer.
Color for Scale	Defines the color for the scale.
Enabled	Defines if the element is enabled.
Flip Scale	Defines whether or not the scale is flipped for orientation.
Font	Defines the font, size, and style of displayed information.
Gap Above Scale	Defines the pixel gap above the scale.
Gap Below Axis	Defines the pixel gap below the axis.
High Value	Defines the highest value that can be entered into the element.
Label Format	Defines the format for numbers displayed.
Low Value	Defines the lowest value that can be entered into the element.
Number of Tics	Defines the number of tics for the scale.
Number of Tics per Label	Defines the number of tics per label.
Orientation	Defines the orientation for the slider (horizontal or vertical).
Size for Slider Knob	Defines the pixel size for the slider knob.

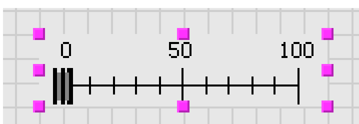
Sizes as Percent	Defines if the sizes for the slider knob are percent scaled.
Snap to Value	Defines if values are snapped onto with no floating point.
Use Color?	Defines how the Sent Color from the value input will be used.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Block Increment	Defines the increment when the increase or decrease element if clicked.
Cursor	Defines the cursor icon to display during mouse hover.
End Gap Size	Defines the end gaps on each side of the slider.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

 *Slider - Double Scale*

Provides a double line animated slider bar for value adjustments or representation.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Color for Knob Highlight	Defines the color for the knob highlight.
Color for Knob Shadow	Defines the color for the knob shadow.
Color for Scale	Defines the color for the scale.
Enabled	Defines if the element is enabled.
Flip Side of Label	Defines whether or not to flip the position of the label.
Font	Defines the font, size, and style of displayed information.
High Value	Defines the highest value that can be entered into the element.
Label Format	Defines the format for numbers displayed.
Low Value	Defines the lowest value that can be entered into the element.
Number of Tics	Defines the number of tics for the scale.
Number of Tics per Label	Defines the number of tics per label.
Orientation	Defines the orientation for the slider (horizontal or vertical).
Size for Slider Knob	Defines the pixel size for the slider knob.
Sizes as Percent	Defines if the sizes for the slider knob are percent scaled.
Snap to Value	Defines if values are snapped onto with no floating point.

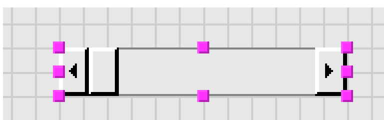
Use Color?	Defines how the Sent Color from the value input will be used.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Block Increment	Defines the increment when the increase or decrease element if clicked.
Cursor	Defines the cursor icon to display during mouse hover.
End Gap Size	Defines the end gaps on each side of the slider.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Slider Image

Provides a standard slider bar with increment/decrement buttons for value adjustments or representation.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to

	update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

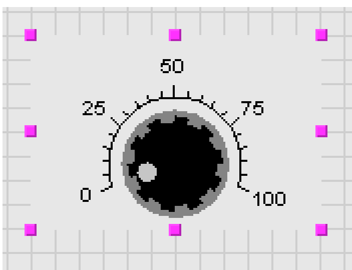
Property Name	Notes
Draw 3D Outline	Defines if 3D outlines are drawn.
Enabled	Defines if the element is enabled.
High Value	Defines the highest value that can be entered into the element.
Image for + Side of Track	Defines an image to display for the right side of the scale.
Image for - Side of Track	Defines an image to display for the left side of the scale.
Image for Decrement Button	Defines an image to display for the decrement button.
Image for Entire Track Area	Defines an image to display for the entire track area.
Image for Increment Button	Defines an image to display for the increment button.
Image for Slider Knob	Defines an image to display for the slider knob.
Image Resizes	Defines if images are resized
Low Value	Defines the lowest value that can be entered into the element.
Orientation	Defines the orientation for the slider (horizontal or vertical).
Size for Slider Knob	Defines the pixel size for the slider knob.
Sizes as Percent	Defines if the sizes for the slider knob are percent scaled.
Snap to Value	Defines if values are snapped onto with no floating point.
Use Color?	Defines how the Sent Color from the value input will be used.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Block Increment	Defines the increment when the increase or decrease element if clicked.
Cursor	Defines the cursor icon to display during mouse hover.
End Gap Size	Defines the end gaps on each side of the slider.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Size for Decrease Button	Defines the pixel size for the decrease button.
Size for Increase Button	Defines the pixel size for the increase button.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Unit Increment	Defines the unit increment for each button press.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Knob

Provides a turnable knob/dial.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Angle Ending	Defines the angle ending coordinate.
Angle Starting	Defines the angle start coordinate.
Bezel	Places a bezel around the graphical widget.
Center X Percent	Defines the percent coordinate for the X Axis
Center Y Percent	Defines the percent coordinate for the Y Axis
Color for Knob	Defines the color for the base knob.
Color for Pointer	Defines the color for the knob pointer.
Color for Ring	Defines the color for the ring, around the knob.
Color for Tic Marks	Defines the color for the Tic Marks.
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of displayed information.
High Value	Defines the starting output value for high values.
Low Value	Defines the starting output value for low values.
Nub Size	Defines the size of the nub.
Nubs, Number of	Defines the number of displayed nubs.
Pointer Distance	Defines the distance between the pointer and nubs.
Pointer Radius	Defines the radius of the pointer.
Radius	Defines the radius of the knob.
Snap To	Defines the snap ratio for the knob.
Tic Format String	Defines the format string for tics.
Tic Length	Defines the length for tics.

Tic Spacing	Defines spacing between tics.
Tics Per Label	Defines how many tics per label.
Use Color?	Defines if coloring should be used.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

More Layout

 *Indicator*

Provides an indicator widget with two configurable lines, used for numeric values.

Standard Inputs

Pin	Notes

Input	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bottom Font	Defines the font used for the second text line.
Color Top	Defines the color for the top portion of the element.
Color Top Text	Defines the text color for the first text line.
Text Color	Defines the value text color.
Top Font	Defines the font used for the first line text.
Top Text First	Defines the text string for the first line.
Top Text Second	Defines the text string for the second line.
Use Color	Defines how the Sent Color from the value input will be used.

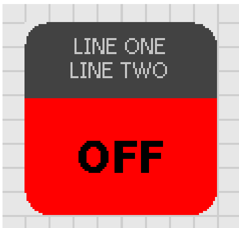
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Arc Height	Defines the arc height.
Arc Width	Defines the arc width.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Color	Defines the indicator color to use.
Cursor	Defines the cursor icon to display during mouse

	hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Split Percent	Defines a percentage split.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Indicator Button

Provides an indicator widget with two configurable lines, used for boolean values. This widget can be clicked to change value as well.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Bottom Font	Defines the font used for the second text line.

Text Color	Defines the value text color.
Top Font	Defines the font used for the first line text.
Top Text First	Defines the text string for the first line.
Top Text Second	Defines the text string for the second line.
Use Color	Defines how the Sent Color from the value input will be used.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Arc Height	Defines the arc height.
Arc Width	Defines the arc width.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Color For Off	Defines the color to use for the Off position.
Color For On	Defines the color to use for the On position.
Color Top	Defines the color to use for the Top position.
Color Top Text	Defines the text color for the Top Text.
Cursor	Defines the cursor icon to display during mouse hover.
Enabled	Defines if the element is enabled.
Label for Off	Defines a text string displayed for a false value (0).
Label for On	Defines a text string displayed for a true value (1).
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Split Percent	Defines a percentage split.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Authorization Button

Provides a button used to log into the user/group sub-system for security authorization.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of displayed information.
Font Color	Defines the font color.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

Date Button

Used to edit dates and times within Aspect, as well as values found in devices other than BACnet.

Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Date Format	Defines the string format for date/time when placed into MySQL.
Font	Defines the font, size, and style of displayed information.
Foreground Color	Defines the foreground color.
Output Format	Defines the data type for the output value. This can be in EPOCH format (commonly used for field devices), and String (for logic applications).
Style	Defines the output style - either Date and Time, Date, and Time.

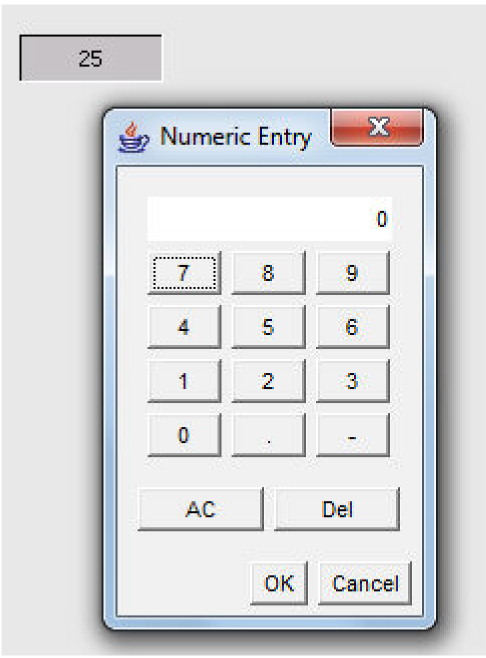
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when

	drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Enabled	Defines if the element is enabled.
EPOCH Time Output	Defines if the time output should follow the current time zone or UTC time.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Number Pad Entry

Provides a click button that invokes a standard number pad for value entry.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Color Action	Defines how the Sent Color from the value input will be used. • 0 - Not Used • 1 - Fill Color • 2 - UnFilled Color • 3 - Label Color
Formatter	Defines the value format for displaying values.
Label Font	Defines the font, size, and style of displayed information.
Popup X Offset	Defines the X pixel coordinate for landing and display of the number pad.
Popup Y Offset	Defines the Y pixel coordinate for landing and display of the number pad.
Text Color	Defines the text color.

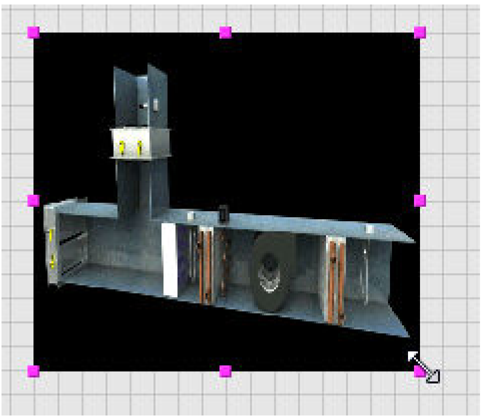
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.

Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Enabled	Defines if the element is enabled.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Image

Used to display a static image, such as a background, logo, or other graphic file.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes

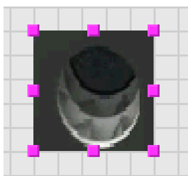
Bezel	Places a bezel around the graphical widget.
Image Name	Defines an image file imported to the Images node of the Project Tree.
Image Resizes	Defines if the image should be resized to fit within the expanded bounds.

Expert Properties

Property Name	Notes
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

Multi Image

Used to display multiple images (static or animated GIFs) based on an input value.



Standard Inputs

Pin	Notes
Input	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

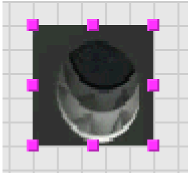
Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Image File List (.prop-erties)	Defines the .properties file referenced for cycling through images. The .properties file must be imported into the User Files node of the Project Tree.
Image Resizes	Defines if the image should be resized to fit within the expanded bounds.

Expert Properties

Property Name	Notes
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be dis-played on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indic-ator	Defines the quality of data that will indicate warn-ing.

Ranged Multi Image

Used to display multiple images (static or animated GIFs) based on an input value range.



Standard Inputs

Pin	Notes
Input	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Image File List (.properties)	Defines the .properties file referenced for cycling through images. The .properties file must be imported into the User Files node of the Project Tree.
Image Resizes	Defines if the image should be resized to fit within the expanded bounds.

Expert Properties

Property Name	Notes
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.

Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Swing Label

Produces a JAVA Swing label when viewed in a browser.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Font	Defines the font, size, and style of displayed information.
Horizontal Alignment	Defines the text alignment for horizontal information.
Text	Defines the text value to display.
Text Color	Defines the text color.
Transparent?	Defines if the element is transparent.
Vertical Alignment	Defines the text alignment for vertical information.

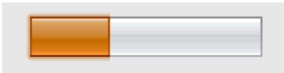
Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Click Action	Defines an action when the widget is clicked.
Horizontal Text Pos-	Defines the position for text in a horizontal man-

ition	ner.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

Swing Progress Bar

Produces an animated progress bar based on a low and high value input.



Standard Inputs

Pin	Notes
Input	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bar Color	Defines the color of the bar when animated.
Font	Defines the font, size, and style of displayed information.
High Value	Defines the highest value for full bar animation.
Low Value	Defines the lowest value to not animate the bar.
Orientation	Defines vertical or horizontal orientation for the bar.
Show Percent?	Defines if a percentage value is shown based on the low and high value.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.

Click Action	Defines an action when the widget is clicked.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

Swing Button

Produces a JAVA Swing button.

Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

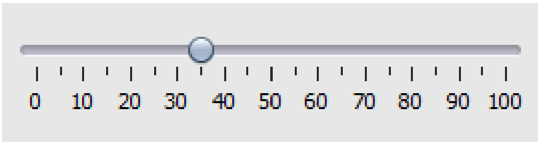
Property Name	Notes
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of displayed information.
Foreground Color	Defines the foreground color.
High Value	Defines the highest value for full bar animation.
Low Value	Defines the lowest value to not animate the bar.
Off Label	Defines a label to display when the input value is off (Low Value).
On Label	Defines a label to display when the input value is on (High Value).

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

Swing Slider

Produces a JAVA Swing Slider.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Background Color	Defines the background color
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of displayed information.
Foreground Color	Defines the foreground color.
High Value	Defines the highest value for full bar animation.
Inverted	Defines it the slider is inverted.

Low Value	Defines the lowest value to not animate the bar.
Major Tic Spacing	Defines pixel spacing between major tics.
Minor Tic Spacing	Defines pixel spacing between minor tics.
Orientation	Defines the orientation for the slider.
Show Labels?	Defines if labels are displayed.
Show Tics?	Defines if tics are displayed.
Show Track?	Defines if the track is displayed
Snap to Tics?	Defines if the slider snaps to values.

Expert Properties

Property Name	Notes
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

Swing Password Field

Produces a JAVA Swing Password Field.

Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Cursor Color	Defines the color of the flashing input cursor.

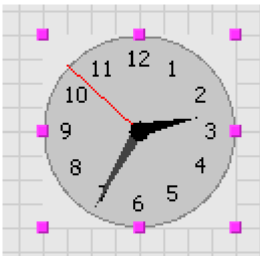
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of displayed information.
Selected Text Color	Defines color for selected text.
Selection Color	Defines color for selection.
Text Color	Defines text color.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Ignore Focus Lost?	Defines whether or not to ignore a value when focus is lost.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

 *Clock*

Produces an animated clock, commonly linked to the Current Time element to display time.



Standard Inputs

Pin	Notes
Input	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Border Circle Color	Defines the color for the border circle.
Border Circle Distance	Defines the width of the border circle from the center.
Border Circle Draw?	Defines if the border circle outline is visible
Border Circle Thickness	Defines the thickness of the border circle outline.
Clock Face Color	Defines the color of the clock face background.
Dots Color	Defines the color of the dots if Dots, Draw is enabled.
Dots, Distance	Defines the distance from the center, the dots will position.
Dots, Draw	Defines if dots should be shown instead of numbers.
Dots, Thickness	Defines the thickness of the dots if Dots, Draw is enabled.
Hour Hand Color	Defines the color of hour hand.
Hour Hand Size	Defines the size of the hour hand.
Hour Hand Thickness	Defines the thickness of the hour hand.
Inside Circle Color	Defines the color of the Inside Circle.
Inside Circle Size	Defines the size of the Inside Circle.
Minute Hand Color	Defines the color of the minute hand.
Minute Hand Size	Defines the size of the minute hand.
Minute Hand Thickness	Defines the thickness of the minute hand.
Numbers, Color	Defines the color of the numbers.
Numbers, Distance	Defines the distance from the center, the numbers will position.
Numbers, Draw	Defines if numbers are visible.
Numbers, Font	Defines the font used for the numbers.
Numbers, Mayor Only	Defines if only major numbers are visible. If true only 3, 6, 9, and 12 are on the clock.
Round To Seconds	Defines if the clock rounds to seconds
Second Hand Color	Defines the color of the second hand.
Second Hand Size	Defines the size of the second hand.
Second Hand Thickness	Defines the thickness of the second hand.
Use Color	Defines how the Sent Color from the value input will be used.

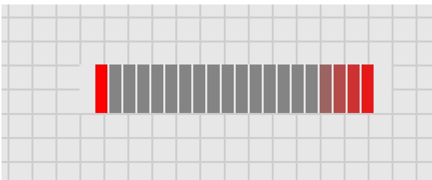
Zone Time	Defines the time zone used for the clock.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Chaser

Provides an animated chaser bar when a value input is connected. The chaser animation can be programmed based on a low/high value, as well as other definable characteristics.



Standard Inputs

Pin	Notes

Input	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Color Active	Defines the chaser color when an active value is connected to the input.
Color Non-Active	Defines the chaser color when an inactive value is connected to the input.
Direction	Defines the animation direction for the chaser.
High Value	Defines the highest maximum input value for chaser animation.
Low Value	Defines the lowest minimum input value for chaser animation.
Number of Segments	Defines the number of segments for the chaser.
Orientation	Defines the orientation for the chaser.
Shaded Segments	Defines how many segments to be shaded for active input values.
Spaces Between Segments	Defines the number of spaces between each chaser segment.
Use Color?	Defines if colors can be received.

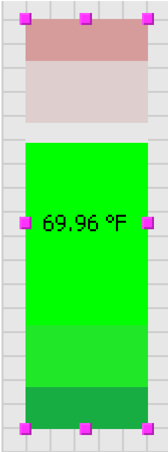
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Arc Height, Rounded Rectangles	Defines the arch height for each chaser segment.
Arc Width, Rounded Rectangles	Defines the arc height for each chaser segment.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.

Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Clear Active When Stopped	Defines if the chaser should be cleared when animation is forced to stop.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Margin Bottom	Defines bottom margin space.
Margin Left	Defines left margin space.
Margin Right	Defines right margin space.
Margin Top	Defines top margin space.
Max Speed	Defines the max speed for animation.
Min Speed	Defines the min speed for animation.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Segment Style	Defines the style for each chaser segment.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Stop at Minimum Speed	Defines if the chaser animation should stop at minimum speed.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Color Changing Box

Provides a box shaped animated graphic supporting multiple levels of color transition, label display, and different fill actions.



Standard Inputs

Pin	Notes
Input	Accepts a single input value and is used to update the current value displayed by the wid-get.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Change Color with Value	Defines if the color should change with value.
Color Action	Defines how the Sent Color from the value input will be used.
Fill Color	Defines how the Sent Color will be filled into the widget.
Fill Direction	Defines color fill direction within the shape.
Font	Defines the font, size, and style of displayed information.
High Color	Defines the color that corresponds with High Level
High Level	Defines the highest value level displayed on the element.
High Value	Defines the highest bound value used for fill

	action.
High High Color	Defines the color that corresponds with High High Level
High High Level	Defines the level value for extreme high value color filling.
Label Format	Defines the format for numbers displayed.
Label Horizontal Alignment	Defines the text alignment for horizontal information.
Label Vertical Alignment	Defines the text alignment for vertical information.
Low Color	Defines the color that corresponds with Low Level.
Low Level	Defines the value for Low Color filling.
Low Low Color	Defines the color that corresponds with Low Low Level
Low Low Level	Defines the value for Low Low Color filling.
Low Value	Defines the lowest bound value used for fill action.
Show Label	Defines is the label value is displayed.
Show Warning Areas?	Defines if waning areas should be displayed on the element.
Unfilled Color	Defines the color used to represent unfilled area.

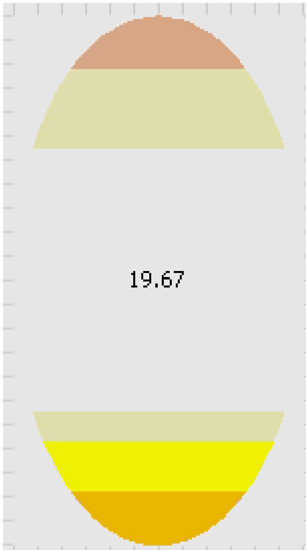
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Label Color	Defines the color for label values.
Predrawn Smoothing	Defines if inactive areas should be smoothed

	when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Color Changing Oval

Provides an oval shaped animated graphic supporting multiple levels of color transition, label display, and different fill actions.



Standard Inputs

Pin	Notes
Input	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Change Color with	Defines if the color should change with value.

Value	
Color Action	Defines how the Sent Color from the value input will be used.
Fill Color	Defines how the Sent Color will be filled into the widget.
Fill Direction	Defines color fill direction within the shape.
Font	Defines the font, size, and style of displayed information.
High Color	Defines the color that corresponds with High Level
High Level	Defines the highest value level displayed on the element.
High Value	Defines the highest bound value used for fill action.
High High Color	Defines the color that corresponds with High High Level
High High Level	Defines the level value for extreme high value color filling.
Label Format	Defines the format for numbers displayed.
Label Horizontal Alignment	Defines the text alignment for horizontal information.
Label Vertical Alignment	Defines the text alignment for vertical information.
Low Color	Defines the color that corresponds with Low Level.
Low Level	Defines the value for Low Color filling.
Low Low Color	Defines the color that corresponds with Low Low Level
Low Low Level	Defines the value for Low Low Color filling.
Low Value	Defines the lowest bound value used for fill action.
Show Label	Defines is the label value is displayed.
Show Warning Areas?	Defines if waning areas should be displayed on the element.
Unfilled Color	Defines the color used to represent unfilled area.

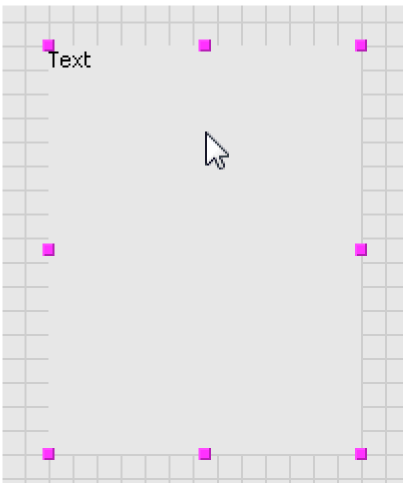
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when

	drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Label Color	Defines the color for label values.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Swing Formatted Label

Produces a formatted label supporting character wrap and other features.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

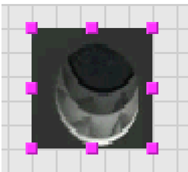
Property Name	Notes
Enabled	Defines if the element is enabled.
Font	Defines the font, size, and style of displayed information.
Foreground Color	Defines the foreground color for the element.
Maximum Characters	Defines the maximum amount of characters that can be displayed.
Text	Defines the text value to display.
Wrap Text	Defines if text should be wrapped.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Transparent Background	Defines if the background is transparent.
Visible?	Defines if the element if visible.

Swing Multi Image

Used to display multiple images (static or animated GIFs) based on an input value. Produces a JAVA Swing image when viewed in a browser.



Standard Inputs

Pin	Notes
Input	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Font	Defines the font, size, and style of displayed information.
Image File List (.properties)	Defines the .properties file referenced for cycling through images. The .properties file must be imported into the User Files node of the Project Tree.
Image Resizes	Defines if the image should be resized to fit within the expanded bounds.

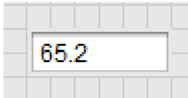
Expert Properties

Property Name	Notes
Background Color	Defines the color for the background
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cache Images	Defines if images are cached.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Enhanced Layout

Secure Enhanced Swing Text Field

Used to provide an edit box for any type of system data with system security integration.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Cursor Color	Defines the color of the cursor when selected.
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Enablement	Defines the security enablement for the element.
Font	Defines the font, size, and style of the label.
Formatter	Defines the format for numbers displayed.
Groups	Defines groups permitted to control this element.
Horizontal Alignment	Defines the text alignment for horizontal information.
Priority	Defines the priority level for assignment.

Selected Text Color	Defines the color for selected text.
Selection Color	Defines the color for a selection.
Text Color	Defines the text color.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Editable	Defines if the value in the field can be edited.
Ignore Focus Lost?	Defines whether or not to ignore a value when focus is lost.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

More Information

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[Using Security Aware UI Elements](#)

 *Secure Increment Decrement*

Used to adjust numeric values in a stepped manner up or down with system security integration.

Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.

Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Enablement	Defines the security enablement for the element.
Font	Defines the font, size, and style of displayed information.
Groups	Defines groups permitted to control this element.
High Value	Defines the highest value that can be entered into the element.
Low Value	Defines the lowest value that can be entered into the element.
Priority	Defines the priority level for assignment.
Step Size	Defines the value step for increment/decrement.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

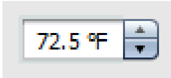
More Information

Security Overview

Using Security Aware UI Elements

 *Secure Formatted Increment Decrement*

Provides a formatted increment/decrement element with formatted engineering unit - used to adjust numeric values in a stepped manner up or down with system security integration.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Enablement	Defines the security enablement for the element.
Font	Defines the font, size, and style of displayed information.
Foreground Color	Defines the color of the foreground.
Formatter	Defines the number format. Note that engineering units may be displaying by placing the value within single quotation marks (e.g. ##.## 'CFM').
Groups	Defines groups permitted to control this element.
High Value	Defines the highest value that can be entered into the element.
Low Value	Defines the lowest value that can be entered into the element.
Priority	Defines the priority level for assignment.
Step Size	Defines the value step for increment/decrement.

Units	Defines a default selection of engineering units commonly used in BAS, and is provided as a courtesy.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

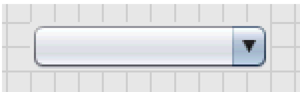
More Information

[Security Overview]

[Using Security Aware UI Elements]

Security Swing Combo Box

Provides a drop-down widget for value selection based on a label and value. This is used for sequenced value (beginning with zero and incrementing with no skips) with system security integration.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Enablement	Defines the security enablement for the element.
Font	Defines the font, size, and style of the label.
Foreground Color	Defines the color of the foreground.
Groups	Defines groups permitted to control this element.
Hand Entered Items	Defines label,value selection criteria.
Priority	Defines the priority level for assignment.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

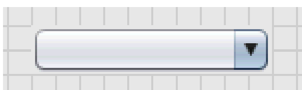
More Information

[Security Overview]

[Using Security Aware UI Elements]

 *Secure Swing Enumerated Combo Box*

Provides a drop-down widget for value selection based on a label and value. This is used for enumerated values which may have logical skips in value order with secure system integration.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to

	update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Enablement	Defines the security enablement for the element.
Font	Defines the font, size, and style of the label.
Foreground Color	Defines the color of the foreground.
Groups	Defines groups permitted to control this element.
Hand Entered Items	Defines label,value selection criteria.
Output Index?	Defines if the index number should be outputted.
Priority	Defines the priority level for assignment.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

More Information

Security Overview

Using Security Aware UI Elements

Secure Swing Check Box

Provides a check-box for boolean or on/off value commands with secure system integration.

Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Enablement	Defines the security enablement for the element.
Font	Defines the font, size, and style of the label.
Foreground Color	Defines the color of the foreground.
Groups	Defines groups permitted to control this element.
Label	Defines a label to place next to the check box.
Priority	Defines the priority level for assignment.

Expert Properties

Property Name	Notes

Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

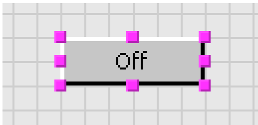
More Information

[Security Overview](#)

[Using Security Aware UI Elements](#)

Secure Button

Used to command values, provide a trigger point, or represent boolean values with secure system integration.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Color Action	Defines how the Sent Color from the value input will be used.
Color Off	Defines the color displayed when the input value if off (0).

Color On	Defines the color displayed when the input value is on (1).
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Draw Label	Defines if a label should be displayed.
Enable Access Control?	Defines the type of security enablement for the element.
Groups	Defines groups permitted to control this element.
Image Off Name	Defines an image that can be displayed on the button when the input value is off (0).
Image On Name	Defines an image that can be displayed on the button when the input value is on (1).
Label Color	Defines the text color.
Label Font	Defines the font, size, and style of the label.
Label for Off	Defines a label to display when the input value is off (0).
Label for On	Defines a label to display when the input value is on (1).
Priority	Defines the priority level for assignment.
Trigger Duration	Defines the amount of time, in milliseconds, a trigger value will be sent upon a button press.
Trigger Type	Defines the trigger type.
Value for Off	Defines the value to be sent for Off action.
Value for On	Defines the value to be sent for On action.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.

Depth	Defines the pixel depth for the button.
Draw 3D	Defines if the button should be drawn in 3D.
Image Resizes?	Defines if the image should be resized to fit within the expanded bounds.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Resource Bundle Name	Defines the Resource Bundle to be used.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

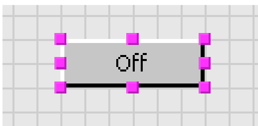
More Information

[Security Overview](#)

[Using Security Aware UI Elements](#)

Secure Pushbutton

Used to command values, provide a trigger point, or represent boolean values with secure system integration.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.

Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Color Action	Defines how the Sent Color from the value input will be used.
Color Off	Defines the color displayed when the input value if off (0).
Color On	Defines the color displayed when the input value is on (1).
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Draw Label	Defines if a label should be displayed.
Enable Access Control?	Defines the type of security enablement for the element.
Groups	Defines groups permitted to control this element.
Image Off Name	Defines an image that can be displayed on the button when the input value is off (0).
Image On Name	Defines an image that can be displayed on the button when the input value is on (1).
Label Color	Defines the text color.
Label Font	Defines the font, size, and style of the label.
Label for Off	Defines a label to display when the input value is off (0).
Label for On	Defines a label to display when the input value is on (1).
Priority	Defines the priority level for assignment.
Value for Off	Defines the value to be sent for Off action.
Value for On	Defines the value to be sent for On action.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.

Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Depth	Defines the pixel depth for the button.
Draw 3D	Defines if the button should be drawn in 3D.
Image Resizes?	Defines if the image should be resized to fit within the expanded bounds.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Resource Bundle Name	Defines the Resource Bundle to be used.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

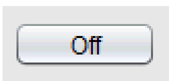
More Information

[Security Overview]

[Using Security Aware UI Elements]

Secure Swing Button

Produces a JAVA Swing button with secure system integration.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Enablement	Defines the security enablement for the element.
Font	Defines the font, size, and style of displayed information.
Foreground Color	Defines the foreground color.
Groups	Defines groups permitted to control this element.
High Value	Defines the highest value for full bar animation.
Low Value	Defines the lowest value to not animate the bar.
Off Label	Defines a label to display when the input value is off (Low Value).
On Label	Defines a label to display when the input value is on (High Value).
Priority	Defines the priority level for assignment.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

More Information

Security Overview

Using Security Aware UI Elements

Secure Swing Password Field

Produces a JAVA Swing Password Field with secure system integration.

Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Cursor Color	Defines the color of the flashing input cursor.
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Enablement	Defines the security enablement for the element.
Font	Defines the font, size, and style of displayed information.
Groups	Defines groups permitted to control this element.
Priority	Defines the priority level for assignment.
Selected Text Color	Defines color for selected text.
Selection Color	Defines color for selection.
Text Color	Defines text color.

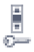
Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Ignore Focus Lost?	Defines whether or not to ignore a value when focus is lost.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

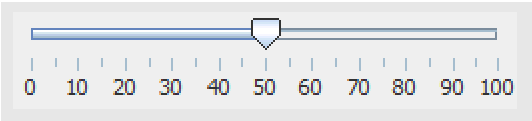
More Information

Security Overview

Using Security Aware UI Elements

 *Secure Swing Slider*

Produces a JAVA Swing Slider with secure system integration.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes

Audit Message	Defines the message for audit trail insertion.
Background Color	Defines the background color
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Enablement	Defines the security enablement for the element.
Font	Defines the font, size, and style of displayed information.
Foreground Color	Defines the foreground color.
Groups	Defines groups permitted to control this element.
High Value	Defines the highest value for full bar animation.
Inverted	Defines it the slider is inverted.
Low Value	Defines the lowest value to not animate the bar.
Major Tic Spacing	Defines pixel spacing between major tics.
Minor Tic Spacing	Defines pixel spacing between minor tics.
Orientation	Defines the orientation for the slider.
Priority	Defines the priority level for assignment.
Show Labels?	Defines if labels are displayed.
Show Tics?	Defines if tics are displayed.
Show Track?	Defines if the track is displayed
Snap to Tics?	Defines if the slider snaps to values.

Expert Properties

Property Name	Notes
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

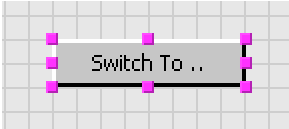
More Information

Security Overview

Using Security Aware UI Elements

Secure Enhanced URL Button

Used to provide screen to screen navigation, and provides feedback to the user when clicked secure system integration.



Standard Inputs

Pin	Notes
URL Target	Accepts a URL. When received, a secondary web-page will be opened in a browser displaying the contents of the URL.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Audit Message	Defines the message for audit trail insertion.
Click Action	Defines an action when the widget is clicked.
Color	Defines the color for the URL Button.
Color on Mouse Over	Defines the color the button will be on mouse over.
Color when Clicked	Defines the color the button will be when clicked.
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Draw Label	Defines if a label should be displayed.
Enable Access Control?	Defines the security enablement for the element.
Groups	Defines groups permitted to control this element.
Image	Defines an image to be displayed on the button.
Image on Mouse Over	Defines an image to be displayed on mouse over.
Image when Clicked	Defines an image to be displayed when clicked.
Label	Defines a text label displayed on the button.
Label Color	Defines the text color.
Label Font	Defines the font, size, and style of the label.

Priority	Defines the priority level for assignment.
Value for Off	Defines the value to be sent for Off action.
Value for On	Defines the value to be sent for On action.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Depth	Defines the pixel depth for the button.
Draw 3D	Defines if the button should be drawn in 3D.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Resource Bundle Name	Defines the Resource Bundle to be used.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

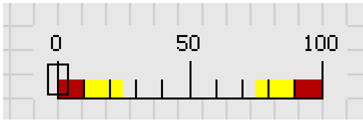
More Information

Security Overview

Using Security Aware UI Elements

Point Meter

Provides a user interface element capable of showing multi-color and value indication.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Access Control	Defines the behavior of the element when logged in or out of Aspect.
Always Disabled?	Defines if the element is disabled from user interaction.
Audit Message	Defines the message for audit trail insertion.
Audit Trail Description	Defines an audit trail description for the element.
Color for Scale	Defines the color for the scale.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Flip Scale	Defines if the numeric scale should be flipped.
Font	Defines the font, size, and style of the label.
Gap Above Scale	Defines the size gap above the scale.
Gap Above Axis	Defines the size gap above the axis.
Groups	Defines groups permitted to control this element.
High Color	Defines the color that corresponds with High Level
High High Color	Defines the color that corresponds with High High Level

High High Level	Defines the level value for extreme high value color filling.
High Level	Defines the highest value level displayed on the element.
High Value	Defines the highest bound value used for fill action.
Label Format	Defines the format for numbers displayed.
Low Color	Defines the color that corresponds with Low Level.
Low Level	Defines the value for Low Color filling.
Low Low Color	Defines the color that corresponds with Low Low Level
Low Low Level	Defines the value for Low Low Color filling.
Low Value	Defines the lowest bound value used for fill action.
Number of Tics	Defines the number of tics in the meter.
Number of Tics per Label	Defines the number of tics per label.
Orientation	Defines the orientation for displaying the element.
Pointer Image	Defines an image for the pointer.
Priority	Defines the priority assignment for the element.
Snap to Value	Defines if the pointer should snap to the closest whole value.
Use Color?	Defines if colors should be displayed.
Warning Areas?	Defines if warning areas should be displayed.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Block Increment	Defines the increment when the increase or decrease element if clicked.

Cursor	Defines the cursor icon to display during mouse hover.
End Gap Size	Defines the size of the end gap.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

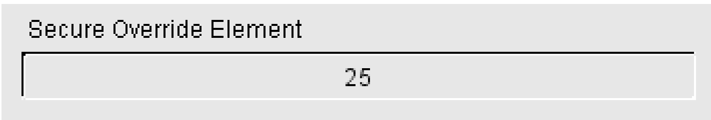
More Information

[Security Overview](#)

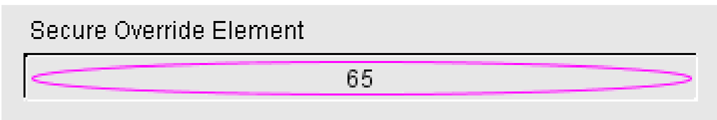
[Using Security Aware UI Elements](#)

Secure Swing Override

Provides a widget for value overrides based on a drop down, increment-decrement, or free form text. This is used for doing point overrides in secure manor when using map based elements.



Secure Override in Normal Status



Secure Override in Overridden Status

Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.
Override Status	Accepts the Status of the MapDirectPoint that refers to the present value at the override pri-

	ority.

Standard Outputs

Pin	Notes
Audit Trail	Outputs audit trail details, intended to be connected to the Audit Trail Manager.
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Combo Box Model	When selected to use the combo box EditorType this allows you to enumerate the drop down list.
Description	Defines a description for the element.
Disposition	Defines disposition type for audit trailing.
Disposition Text	Defines disposition text for audit trailing.
Editor Type	Determines what type of editor will be used. Types include Spinner(Increment/Decrement Box), Combo Box and Text Field.
Enablement	Defines the security enablement for the element.
Font	Defines the font, size, and style of the label.
Formatter	Defines the format for numbers displayed.
Groups	Defines groups permitted to control this element.
High Value	Defines the highest value that can be entered into the element.
Low Value	Defines the lowest value that can be entered into the element.
Output Index?	Defines if the index number should be outputted.
Override Audit Message	Defines the message for audit trail insertion.
Override Cleared Audit Message	Defines the message for audit trail return.
Priority	Defines the priority level for assignment.
Step Size	Defines the value step for increment/decrement.
Text Color	Defines the text color.

Expert Properties

Property Name	Notes
Background Color	Defines the background color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

More Information

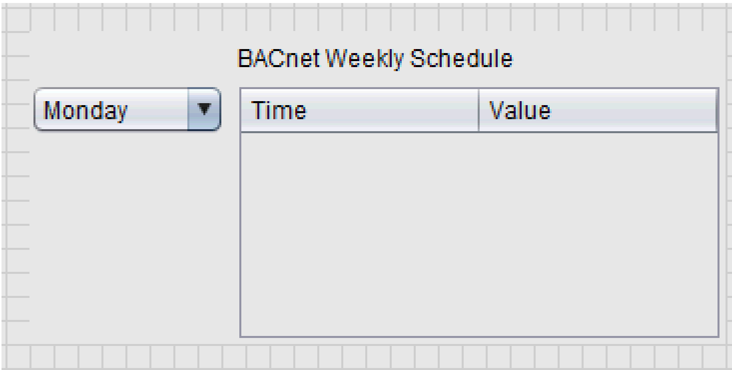
[Security Overview]

[Using Security Aware UI Elements]

BACnet Layout

 *BACnet Weekly Schedule Editor*

Used to display weekly-schedule property data from a BACnet Schedule object.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Font	Defines the font, size, and style of displayed information.
Title	Defines a title for the editor.
Title Font	Defines the font, size, and style of the label.
Title HAlignment	Defines the text alignment for horizontal inform-ation.

Expert Properties

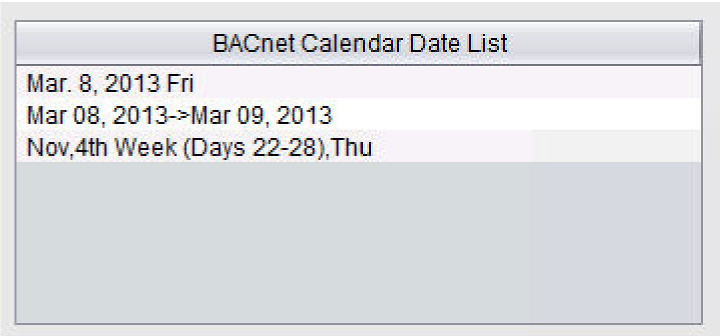
Property Name	Notes
Background Color	Defines the background color.
Enabled	Defines if the element is enabled.
Foreground Color	Defines the foreground color.
Stale Quality	Defines if the stale quality indicator will be dis-played on the client side if the value is stale.
Value Type	Defines the data type of the value output.
Visible?	Defines if the element if visible.

More Information

[Schedule and Calendar Object Overview]

BACnet Calendar Editor

Used to edit date-list information from a BACnet Calendar object.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to

	update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Title	Defines a title for the editor.
Title Font	Defines the font, size, and style of the label.
Title HAlignment	Defines the text alignment for horizontal information.

Expert Properties

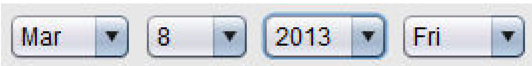
Property Name	Notes
Background Color	Defines the background color.
Enabled	Defines if the element is enabled.
Foreground Color	Defines the foreground color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

More Information

[Schedule and Calendar Object Overview]

BACnet Date Editor

Used to edit BACnet properties with a date data type.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to

	update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Font	Defines the font, size, and style of the label.

Expert Properties

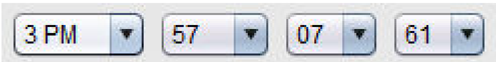
Property Name	Notes
Background Color	Defines the background color.
Enabled	Defines if the element is enabled.
Foreground Color	Defines the foreground color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

More Information

[BACnet Date](#)

BACnet Time Editor

Used to edit BACnet properties with a time data type.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Font	Defines the font, size, and style of the label.

Expert Properties

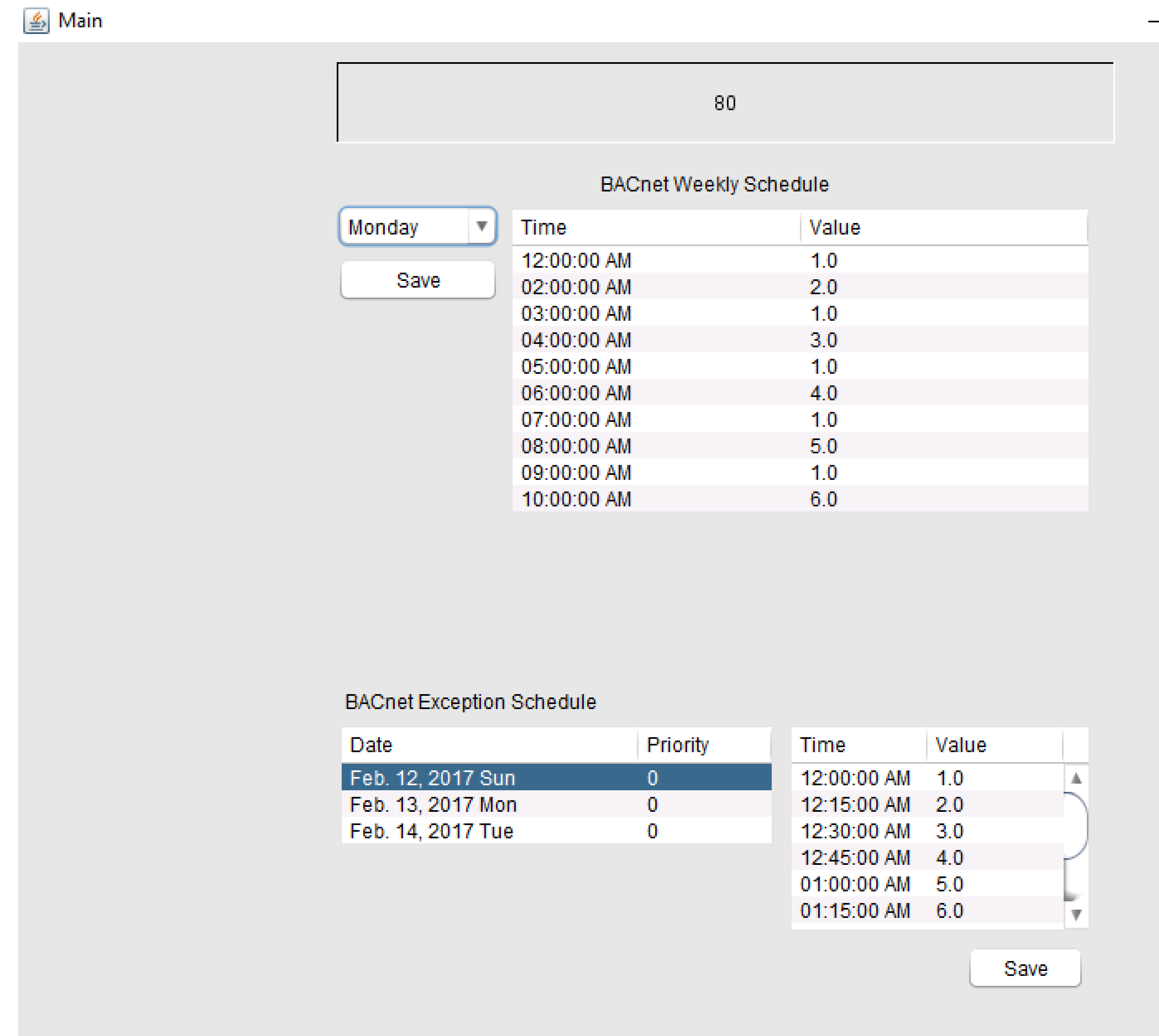
Property Name	Notes
Background Color	Defines the background color.
Enabled	Defines if the element is enabled.
Foreground Color	Defines the foreground color.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.

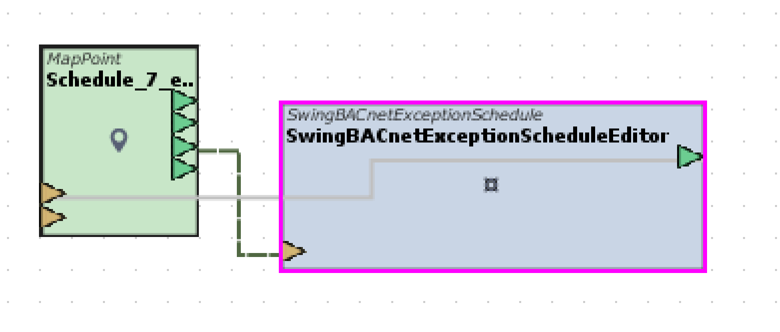
More Information

[BACnet Time](#)

BACnet Exception Schedule Editor

This element displays exception-schedule property data. Unlike the BACnet Weekly Schedule Editor, the BACnet Exception Schedule Editor is not confined to showing events on a weekly basis. The element displays the date, priority, time, and value. Below shows this element from the Design Main's perspective.





The data displayed in Figure 1 is an example and was created with the schedule distribution tool.

Standard Inputs

Pin	Notes
Update Dis-play	Accepts a single input value and is used to update the cur-rent value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value.

Basic Properties

Property Name	Notes
Font	Defines the font, size, and style of displayed information.
Name	Defines the name for the editor element.

Expert Properties

Property Name	Notes
Background Color	Defines the background color
Enabled	Defines if the element is enabled
Foreground Colot	Defines the foreground color
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale
Value Type	Defines the data type of the value output.
Visible	Defines if the element if visible

More Information

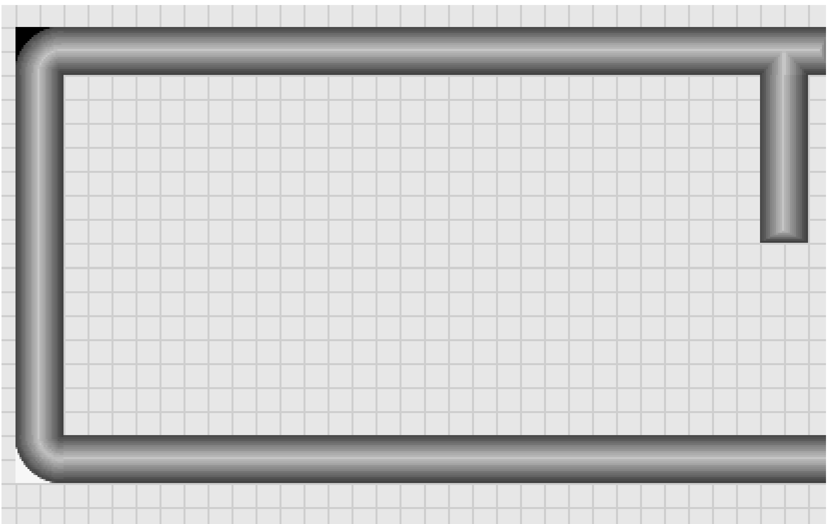
[Schedule and Calendar Object Overview](#)

Pipes

Pipes

Aspect-Studio contains a complete animated pipe user interface, allowing users to create simple or complex piping systems with animated colors to distinguish water flow, and other animated characteristics. The Pipes category provides stretchable vertical and horizontal pipes, tees, bends, caps, and other piping tools.

While each pipe may provide a different direction, all of the pipe elements contain the same basic and expert properties for creating an effective pipe strategy on your graphical user interface screens.



Standard Inputs

Pin	Notes
Input	Accepts a single input connection for pipe animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Color Bottom	Defines a color for the bottom of the pipe element.
Color for Flowing Pipe	Defines a color to display for flowing animation.
Color for Static Pipe	Defines a color to display for static pipes.
Color Top	Defines a color for the top of the pipe.
Use Color?	Defines is the element should receive colors from other elements.

Expert Properties

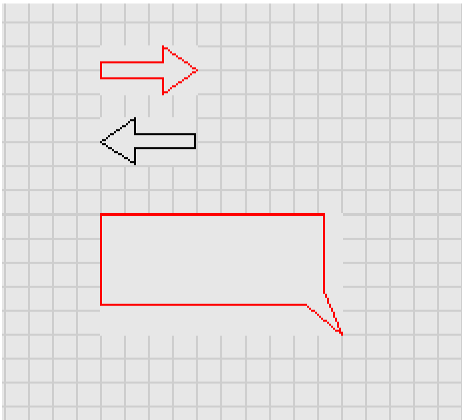
Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Color Detail Level	Defines the level at which colors are detailed
Cursor	Defines the cursor icon to display during mouse hover.
Percent Bottom	Defines percentage of color for the top of the pipe.
Percent Top	Defines percentage of color for the bottom of the pipe.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indic-	Defines the quality of data that will indicate warn-

ator	ing.

Arrows

Arrows

Aspect-Studio contains arrow shapes that can be used to animate directional elements (such as flow, water, etc.), as well as call outs to indicate a specific feature on a graphic. Arrows provide simple animation for web-user interface screens.



Standard Inputs

Pin	Notes
Input	Accepts a single input connection for pipe animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes

Alert Color	Defines the animated color when an active value is connected.
Foreground	Defines the foreground color of the element.
High Value	Defines the high value for animation.
Low Value	Defines the low value for animation.
Mirror	Defines if the image should be reflec-ted/reversed.

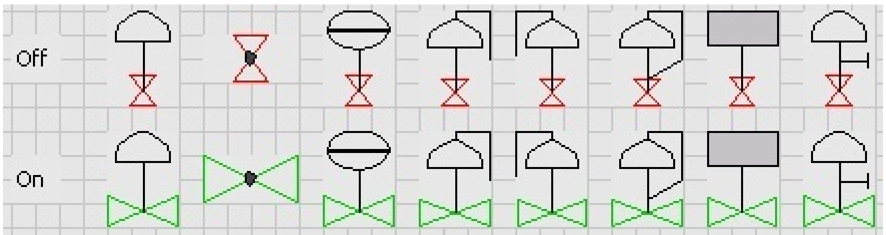
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indic-ator	Defines the quality of data that will indicate warn-ing.

Valves

Valves

Aspect-Studio contains simple, animation valves that can be used on web-user interface screens.



Standard Inputs

Pin	Notes
Input	Accepts a single input connection for pipe animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Animate	Defines if the element will be static or animated.
Change Colors	Defines if the valve changes colors during animation.
Closed Color	Defines the color displayed for an closed-state valve.
Foreground	Defines the foreground color for the valve.
High Value	Defines the high value for animation.
Low Value	Defines the low value for animation.
Mirror	Defines if the image should be reflected/reversed.
Open Color	Defines the color displayed for an open-state valve.
Reverse	Defines if the animation action of the valve should be reversed.
Rotate	Defines the degrees of rotation for the valve.
Shadow Color	Defines the shadow color for the valve.
Valve Color	Defines the color of the valve.

Expert Properties

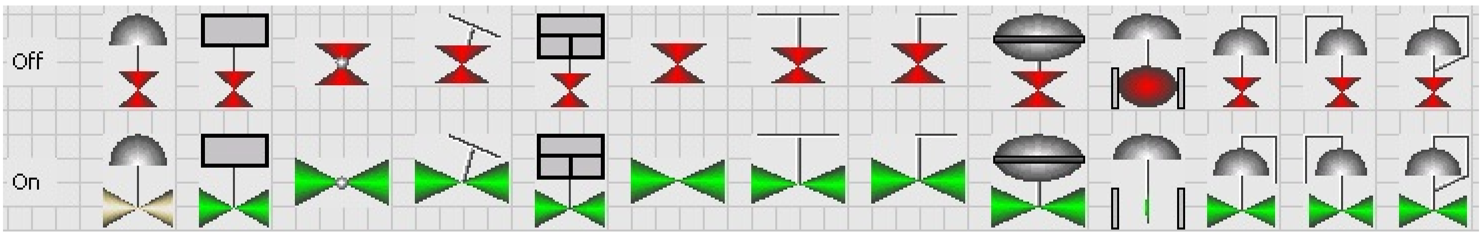
Property Name	Notes

Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

3D Valves

3D Valves

Aspect-Studio contains simple, animation 3D valves that can be used on web-user interface screens.



Standard Inputs

Pin	Notes
Input	Accepts a single input connection for pipe animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Animate	Defines if the element will be static or animated.
Change Colors	Defines if the valve changes colors during animation.
Closed Color	Defines the color displayed for an closed-state valve.
Foreground	Defines the foreground color for the valve.
High Value	Defines the high value for animation.
Low Value	Defines the low value for animation.
Mirror	Defines if the image should be reflected/reversed.
Open Color	Defines the color displayed for an open-state valve.
Reverse	Defines if the animation action of the valve should be reversed.
Rotate	Defines the degrees of rotation for the valve.
Shadow Color	Defines the shadow color for the valve.
Valve Color	Defines the color of the valve.

Expert Properties

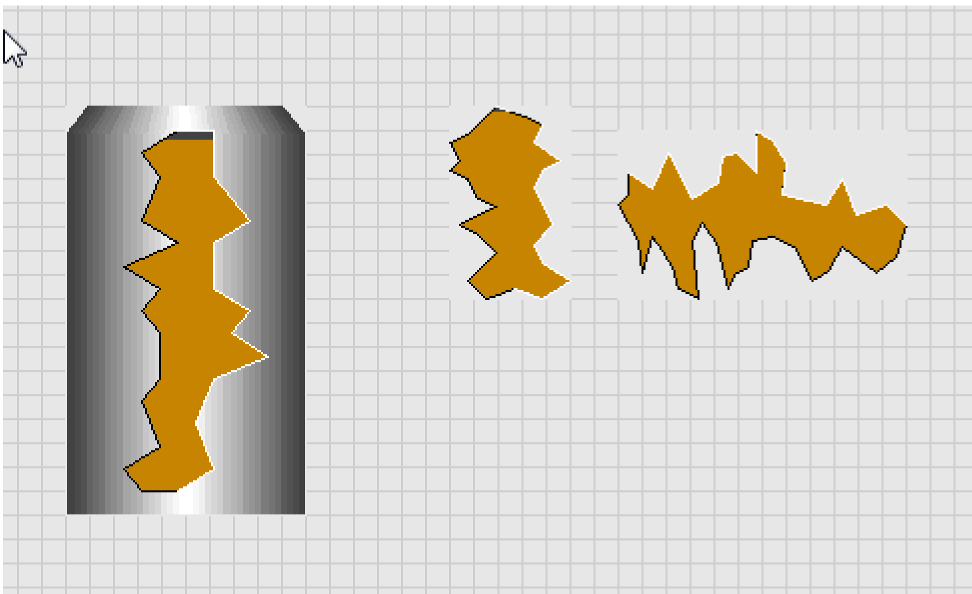
Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.

Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Tanks

Tanks

Aspect-Studio contains simple, animation tanks that can be used on web-user interface screens. This category contains both tanks, cut a ways to overlay on tanks, and animated tank outlines.



Standard Inputs

Pin	Notes
Input	Accepts a single input connection for pipe animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Animate	Defines if the element will be static or animated.
Change Colors	Defines if the valve changes colors during animation.
Fill Color	Defines the color for fill action.
Foreground	Defines the foreground color for the valve.
High Value	Defines the high value for animation.
Low Value	Defines the low value for animation.
Mirror	Defines if the image should be reflected/reversed.
Open Color	Defines the color displayed for an open-state valve.
Reverse	Defines if the animation action of the valve should be reversed.
Rotate	Defines the degrees of rotation for the valve.
Shadow Color	Defines the shadow color for the valve.
Valve Color	Defines the color of the valve.
Unfilled Color	Defines the color to use to represent unfilled area.

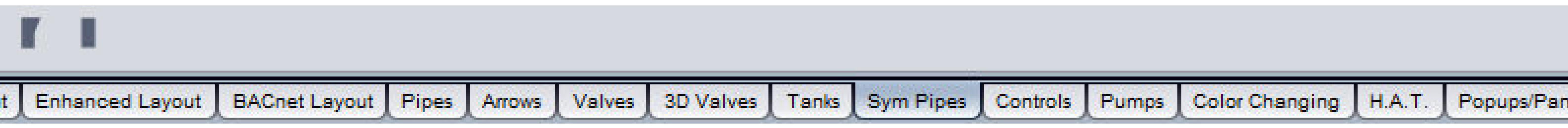
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.

Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

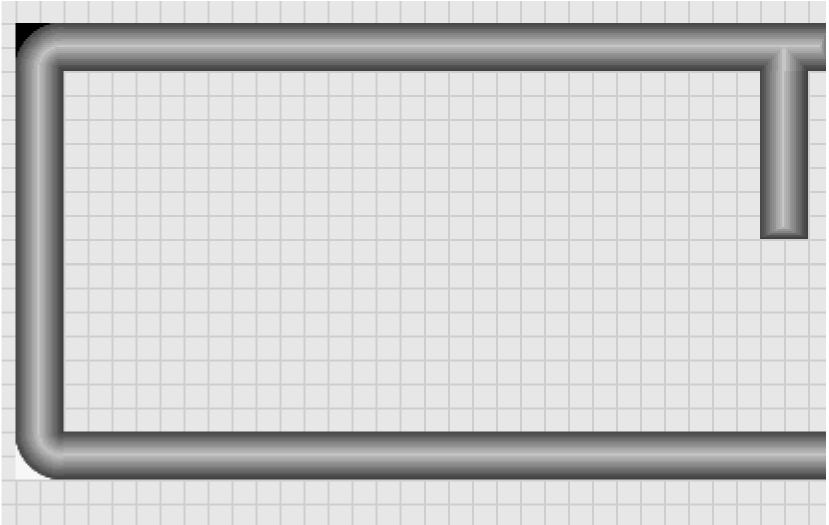
Sym Pipes

Sym Pipes



Aspect-Studio contains a complete symbol pipe user interface, allowing users to create simple or complex piping systems with animated colors to distinguish water flow, and other animated characteristics. The Pipes category provides stretchable vertical and horizontal pipes, bends, and other piping tools.

While each pipe may provide a different direction, all of the pipe elements contain the same basic and expert properties for creating an effective pipe strategy on your graphical user interface screens.



Standard Inputs

Pin	Notes
Input	Accepts a single input connection for pipe animation.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Bezel	Places a bezel around the graphical widget.
Color Bottom	Defines a color for the bottom of the pipe element.
Color for Flowing Pipe	Defines a color to display for flowing animation.
Color for Static Pipe	Defines a color to display for static pipes.
Color Top	Defines a color for the top of the pipe.
Use Color?	Defines is the element should receive colors from other elements.

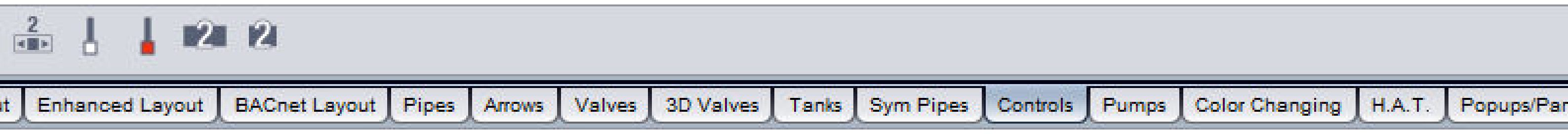
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator	Defines the quality of data that will indicate bad

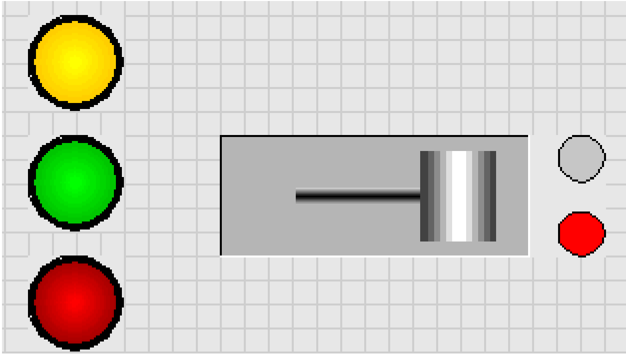
At	quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Color Detail Level	Defines the level at which colors are detailed
Cursor	Defines the cursor icon to display during mouse hover.
Percent Bottom	Defines percentage of color for the top of the pipe.
Percent Top	Defines percentage of color for the bottom of the pipe.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Controls

Controls



Aspect-Studio Control elements which can be used to differentiate color status, and animated actions by users. This includes knobs, buttons, color-buttons, etc. Each element has its own characteristic and property.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

Pin	Notes
Output	Outputs the appropriate value based on Basic Properties configuration.

Expert Properties

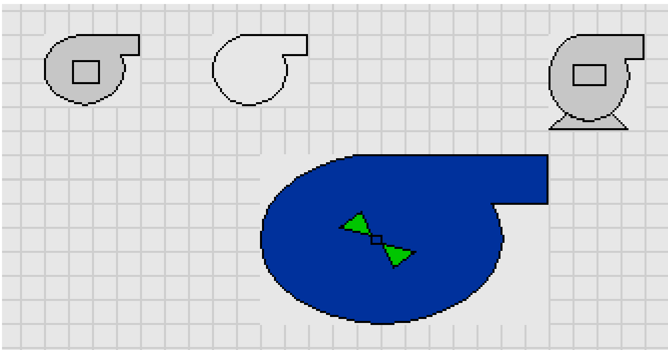
Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Color Detail Level	Defines the level at which colors are detailed
Cursor	Defines the cursor icon to display during mouse hover.
Percent Bottom	Defines percentage of color for the top of the pipe.

Percent Top	Defines percentage of color for the bottom of the pipe.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Pumps

Pumps

Aspect-Studio contains generic pump elements for web-user interface graphics. These pump elements can be used in conjunction with Pipes, Sym Pipes, and other packaged elements within Aspect-Studio.



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

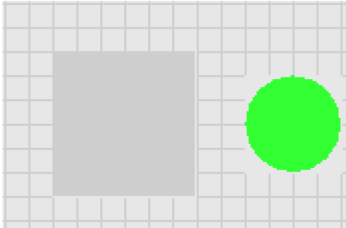
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Color Detail Level	Defines the level at which colors are detailed
Cursor	Defines the cursor icon to display during mouse hover.
Percent Bottom	Defines percentage of color for the top of the pipe.
Percent Top	Defines percentage of color for the bottom of the pipe.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Color Changing

Color Changing

Aspect-Studio contains color changing shapes which can be used within your web-user interface graphics. Included within this category are boxes, ovals, lines, etc..



Standard Inputs

Pin	Notes
Update Display	Accepts a single input value and is used to update the current value displayed by the widget.

Standard Outputs

No standard outputs exist for this element.

Expert Properties

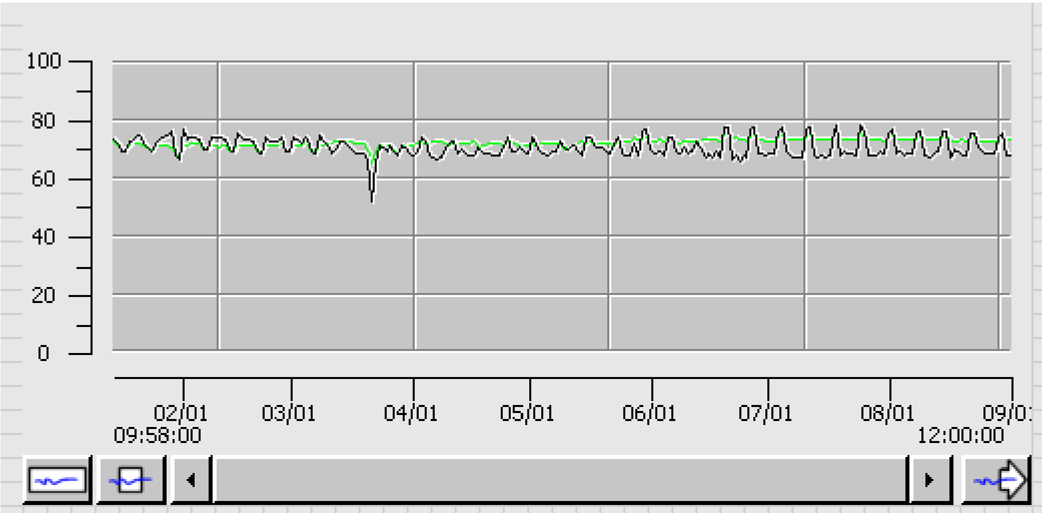
Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Color Detail Level	Defines the level at which colors are detailed
Cursor	Defines the cursor icon to display during mouse hover.
Percent Bottom	Defines percentage of color for the top of the pipe.
Percent Top	Defines percentage of color for the bottom of the pipe.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.

Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

H.A.T

Trend Chart

The Trend Chart element is used to deliver and display historical trend data in a graphed format with trend lines. The Trend Chart supports display of up to 10 trace lines at a given time. Complete with custom defined X/Y axis, backgrounds, and other features, the Trend Chart can be embedded on virtually any screen.



Information displayed in the Trend Chart is commonly delivered to it through use of the Historical Database Server element, available from the Trend/Report category of your Diagram palette. Complete details on the general setup and usage of this element can be found in the Trending section of this help system.

Standard Inputs

Pin	Notes
Clear Historical Data	Accepts a single input value and is used to clear the current chart display. Any value change will clear the display.
Date Range Server	Accepts a single input value for scaling the date range.
Input	Accepts a single input - commonly from the His-

	torical Database Server element to display historic data.
Trace 0	Accepts a single input - commonly used for live trends when a user is viewing a screen. Data sent to this input will not be stored historically.
Trace 1	Accepts a single input - commonly used for live trends when a user is viewing a screen. Data sent to this input will not be stored historically.
Trace 2	Accepts a single input - commonly used for live trends when a user is viewing a screen. Data sent to this input will not be stored historically.
Trace 3	Accepts a single input - commonly used for live trends when a user is viewing a screen. Data sent to this input will not be stored historically.
Trace 4	Accepts a single input - commonly used for live trends when a user is viewing a screen. Data sent to this input will not be stored historically.
Trace 5	Accepts a single input - commonly used for live trends when a user is viewing a screen. Data sent to this input will not be stored historically.
Trace 6	Accepts a single input - commonly used for live trends when a user is viewing a screen. Data sent to this input will not be stored historically.
Trace 7	Accepts a single input - commonly used for live trends when a user is viewing a screen. Data sent to this input will not be stored historically.
Trace 8	Accepts a single input - commonly used for live trends when a user is viewing a screen. Data sent to this input will not be stored historically.
Trace 9	Accepts a single input - commonly used for live trends when a user is viewing a screen. Data sent to this input will not be stored historically.
Update Displayed Value	Accepts a single input and is used to refresh the displayed data.
Value Changed	Accepts a single input and is used to change metadata displayed on the chart (advanced applications only).
Zoom Full	Accepts a single input connection. When a value of 1 is received, a full zoom will be performed on the trend chart.

Standard Outputs

Pin	Notes
Trace List	Outputs information used to trigger the Historical Database server in a Dynamic Trend View setup.
Trace Value	Outputs the long data type form of the timestamp sent by right clicking the trend chart and choosing send value.

Basic Properties

Property Name	Notes
Anti-Aliasing	Defines if anti-aliasing is enabled or disabled.
Background	Defines the background color of the chart.
Bezel	Defines the bezel to place around the trend chart.
Color Action	Defines if the chart shall receive colors from other elements.
Controls Displayed	Defines if zoom controls, scroll controls, etc. are displayed.
Default Zoom	Defines the amount of time zoom when data is first presented.
Flood Fill	Defines if information if filled in flood mode.
Foreground	Defines the foreground color of the chart.
Grid Background	Defines the grid background color of the chart.
Grid Color	Defines the chart's grid color.
Grid Display	Defines if the grid is displayed or hidden.
Grid Shadow	Defines the grid shadow color.
Grid Shadow Drawn	Defines is a grid shadow should be drawn for user interface consideration.
Grid Space Vertical	Defines the vertical spacing for the grid.
Image Name Inside	Not yet implemented - for future implementation.
Image Name Outside	Not yet implemented - for future implementation.
Label, Bottom	Defines the text label to display at the bottom of the trend chart.
Line Color Hi	Not yet implemented - for future imple-

	mentation.
Line Color Hi Hi	Not yet implemented - for future implementation.
Line Color Lo	Not yet implemented - for future implementation.
Line Color Lo Lo	Not yet implemented - for future implementation.
Line Hi	Not yet implemented - for future implementation.
Line Hi Hi	Not yet implemented - for future implementation.
Line Lo	Not yet implemented - for future implementation.
Line Lo Lo	Not yet implemented - for future implementation.
Max Tics	Defines the maximum amount of tics to display on the chart.
Max Time	Defines the maximum amount of space time on the chart.
Output Date Format	Defines the format in which date output information is displayed.
Time Axis Date Format String	Defines the string format for displaying time on the axis. By default, this is configured for hh:mm:
Time Axis Margin	Defines the margin size for the time axis.
Time Axis Tic Size	Defines the tic size for the time axis.
Timebase	Defines the time base for user interface updates.
Tool Tip Color	Defines the color of the tool tip when mouse hovering over trace lines on the chart.
Tool Tip Date Formatter	Defines the date format for the tool tip when mouse hovering over trace lines on the chart.
Tool Tip Decimal Formatter	Defines the decimal format for the tool tip when mouse hovering over trace lines on the chart.
Transparent	Defines if the trend chart utilizes transparency.
Use Color	Not yet implemented - for future implementation.
Zoom Horizontal Axis Only?	Defines if horizontal access zooming is enabled.

Expert Properties

Property Name	Notes
Active Smoothing	Defines the background color.
Axis Font	Defines if the value in the field can be edited.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bar Chart Font	Defines if the element if visible.
Bezel Color	Defines the bezel color
Bezel Inside Color	Defines the inside color of the bezel.
Bezel Thickness	Defines the thickness of the bezel.
Button Labels Color	Defines label colors for control buttons.
Buttons Color	Defines the color of the control buttons.
Clear All Traces	Defines whether all traces are cleared when a trigger input is received by the Clear Historical Data input pin, when exposed.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.
Date Output Format	Defines the data format outputted by the Trace Value output upon a right-click and select action on the Trend Chart.
Hi	Defines the maximum level of this graphic.
Lo	Defines the minimum level of this graphic.
Popup Menu Label	Defines the text shown upon a right-click in the trend chart area.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation for the chart.
Show Current Button	Defines if the Show Current button is present.
Show Next Button	Defines if the Show Next button is present.
Show Previous Button	Defines if the Show Previous button is present.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Synchronize Dates	Defines if dates are synchronizes on axis.
Visible?	Defines if the element is visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

More Information

[Trending Overview]

[Trend Presentation Overview]

[Outputting Results to a Trend Chart]

Table Report

The Table Report element is used to deliver and display historical trend data in a table format with columns and lines. Unlike the Trend Chart, the Table Report can display several columns of data from a stored database.

ReadingTime	BACnetInt	PupFloat
6 Feb 13 11:18:10	63.00	74.00
6 Feb 13 11:18:15	63.00	74.00
6 Feb 13 11:18:20	63.00	74.00
6 Feb 13 11:19:00	63.00	74.00
6 Feb 13 11:19:05	63.00	74.00
6 Feb 13 11:19:11	63.00	74.00
6 Feb 13 11:19:12	63.00	74.00
6 Feb 13 11:19:13	63.00	74.00
6 Feb 13 11:19:14	63.00	74.00
6 Feb 13 11:19:15	63.00	74.00
6 Feb 13 11:19:16	63.00	74.00
6 Feb 13 11:19:17	63.00	74.00
6 Feb 13 11:19:18	63.00	74.00
6 Feb 13 11:19:19	63.00	74.00

Information displayed in the Table Report is commonly delivered to it through use of the Historical Database Server element, available from the Trend/Report category of your Diagram palette. Complete details on the general setup and usage of this element can be found in the Trending section of this help system.

Standard Inputs

Pin	Notes
Input	Accepts a single input connection, commonly from a Database element or the Historical Database Server element to display historic data.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Column Sizes	Defines the sizes of each column. This is auto-generated when information is initially delivered from a report to the Table Report element.
Date Format	Defines the format in which dates are displayed. For example, MMM d yyyy will display dates as shown above.
Error Background	Defines a color to display in the background, if there is an error in obtaining data from the Historical Database Server.
Error Foreground	Defines a color to display in the foreground, if there is an error in obtaining data from the Historical Database Server.
Header Alignment	Defines the alignment for the header labels.
Header Background	Defines a color to display in the background of the header.
Header Font	Defines the font information for the header.
Header Height	Defines the height of the header.
Include Reading Time?	Defines if the Reading Time is displayed in the report.
Normal Background	Defines the background color for normal data.
Normal Foreground	Defines the foreground color for normal data.
Number Formatter	Defines the format in which numbers are displayed in the table report.
Row Height	Defines the row height
Table Font	Defines the font for displayed information within the table.

Expert Properties

Property Name	Notes
Value Object Color Behavior	Defines the object color for received colors from other elements.

More Information

[Trend Presentation Overview]

[Outputting Results to a Table Report]

Enhanced Table Report

The Enhanced Table Report element is used to deliver and display historical trend data in a table format with columns and lines. Unlike the Trend Chart, the Table Report can display several columns of data from a stored database. This element also provides better control over items such as static column sizing, and other items.

ReadingTime	BACnetInt	PupFloat
6 Feb 13 11:18:10	63.00	74.00
6 Feb 13 11:18:15	63.00	74.00
6 Feb 13 11:18:20	63.00	74.00
6 Feb 13 11:19:00	63.00	74.00
6 Feb 13 11:19:05	63.00	74.00
6 Feb 13 11:19:11	63.00	74.00
6 Feb 13 11:19:12	63.00	74.00
6 Feb 13 11:19:13	63.00	74.00
6 Feb 13 11:19:14	63.00	74.00
6 Feb 13 11:19:15	63.00	74.00
6 Feb 13 11:19:16	63.00	74.00
6 Feb 13 11:19:17	63.00	74.00
6 Feb 13 11:19:18	63.00	74.00
6 Feb 13 11:19:19	63.00	74.00

Information displayed in the Table Report is commonly delivered to it through use of the Historical Database Server element, available from the Trend/Report category of your Diagram palette. Complete details on the general setup and usage of this element can be found in the Trending section of this help system.

Standard Inputs

Pin	Notes
Input	Accepts a single input connection, commonly from a Database element or the Historical Database Server element to display historic data.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Anti Alias	Defines if anti-aliasing is enabled or disabled.
Column Names	Defines the names of each column. This is auto-generated when information is initially delivered from a report to the Table Report element, but can be modified with specific names if desired.
Column Sizes	Defines the sizes of each column. This is auto-generated when information is initially delivered from a report to the Table Report element, but can be modified to static sizes if desired.
Date Format	Defines the format in which dates are displayed. For example, MMM d yyyy will display dates as shown above.
Error Background	Defines a color to display if there is an error in obtaining data from the Historical Database Server.
Error Foreground	Defines a color to display if there is an error in obtaining data from the Historical Database Server.
Header Alignment	Defines alignment for header display.
Header Background	Defines alignment background color for header display.
Header Font	Defines the font information for the header display.
Header Foreground	Defines the foreground color for the header display.
Header Height	Defines the height of the header.
Include Reading Time?	Defines if the Reading Time is displayed in the report.
Normal Background	Defines the background color for normal data.
Normal Foreground	Defines the foreground color for normal data.
Number Formatter	Defines the format in which numbers are displayed in the table report.
Row Height	Defines the row height
Table Font	Defines the font for displayed information within

	the table.

Expert Properties

Property Name	Notes
Value Object Color Behavior	Defines the object color for received colors from other elements.

More Information

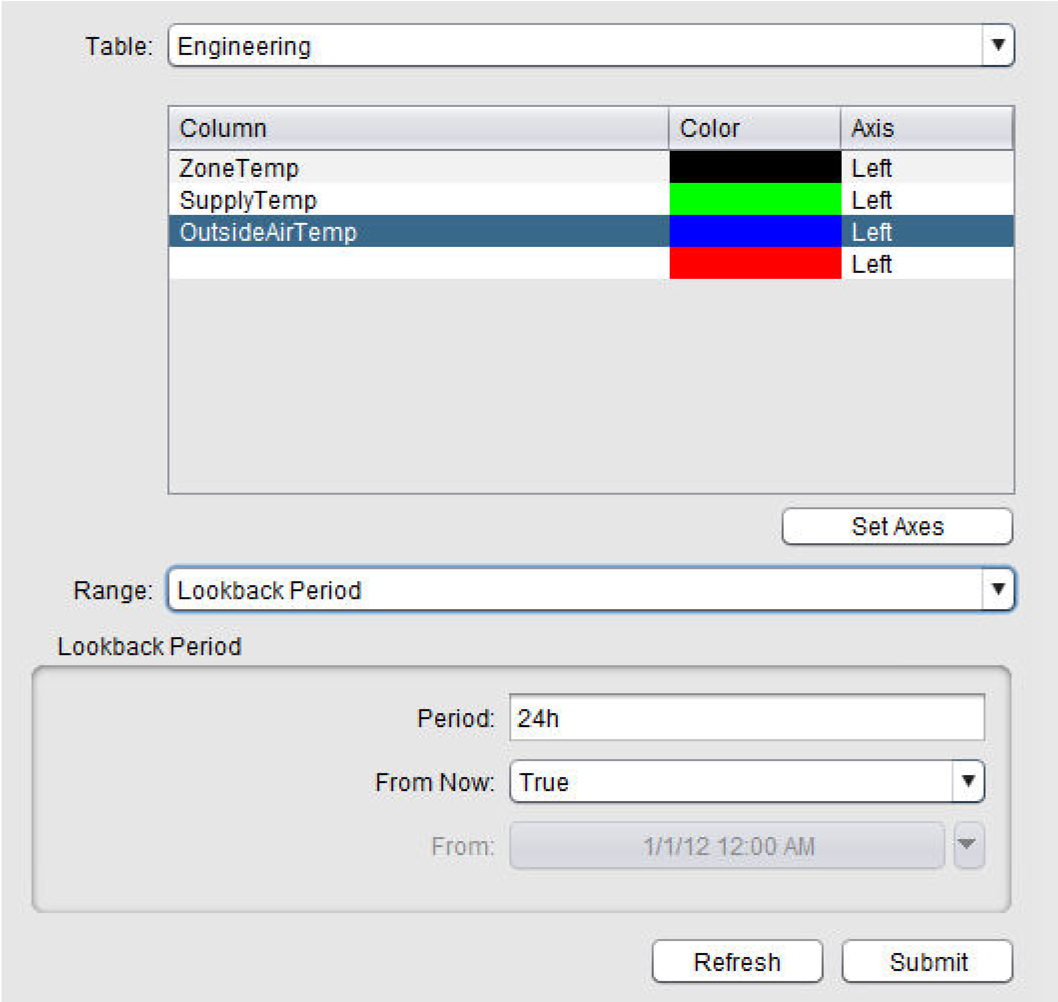
Trend Presentation Overview

Outputting Results to a Table Report

Dynamic Table View

The Dynamic Table View element is used in conjunction with the Historical Database Server and Trend Chart to provide a streamlined method of choosing a specific table and points to display historic data within a deployed project. Through use of these elements, graphical user interface pages can be created to allow users to pick and choose the following:

- Table - Commonly a unique trend log record or table in a connected database.
- Columns - Allows users to select trend points, as well as color and axis position.
- Range - Allows users to define the filter method for displaying data. This can be based on a number of hours, a date range, or relative date range.



Standard Inputs

Pin	Notes
Refresh	Accepts a single trigger input and is used to refresh the entire user interface.
Update Display	Accepts Metadata output information from the Historical Database Server element and is used to populate data.

Standard Outputs

Pin	Notes
Output	Outputs configuration information to the Trigger input of the Historical Database Server element.

Basic Properties

Property Name	Notes
Background Color	Defines the background color for the element.
Foreground Color	Defines the foreground color for the element.
Text Background Color	Defines the color of text displayed by the element.
Font	Defines font configuration for the element.
Submit Label	Defines text shown on the default Submit button.
Table Name Filter	Defines inclusive filter text used to omit tables that may not necessarily be graph-able. For example, if you have numerous trend records for each several VAV controllers on a project, where the name of the record has VAV in its name, enter *VAV* (with asterisk included) to only display trend tables that have VAV in their name.

Expert Properties

Property Name	Notes
Column Count	Defines the number of column fields displayed in the column selector portion of the Dynamic Table View. This value can be increased or decreased based on the maximum number of trended values that may be selected for display.
Enabled	By default, the Dynamic Table View is enabled for user interaction. Should you wish to disable the Dynamic Table View for user interaction, the property can be set to false, or be switched to false through expert logic.
Refresh Button	Defines if the Refresh Button to populate table data is displayed.
Visible?	Defines if the Dynamic Table View is visible for users to see.

More Information

[Trend Presentation Overview]

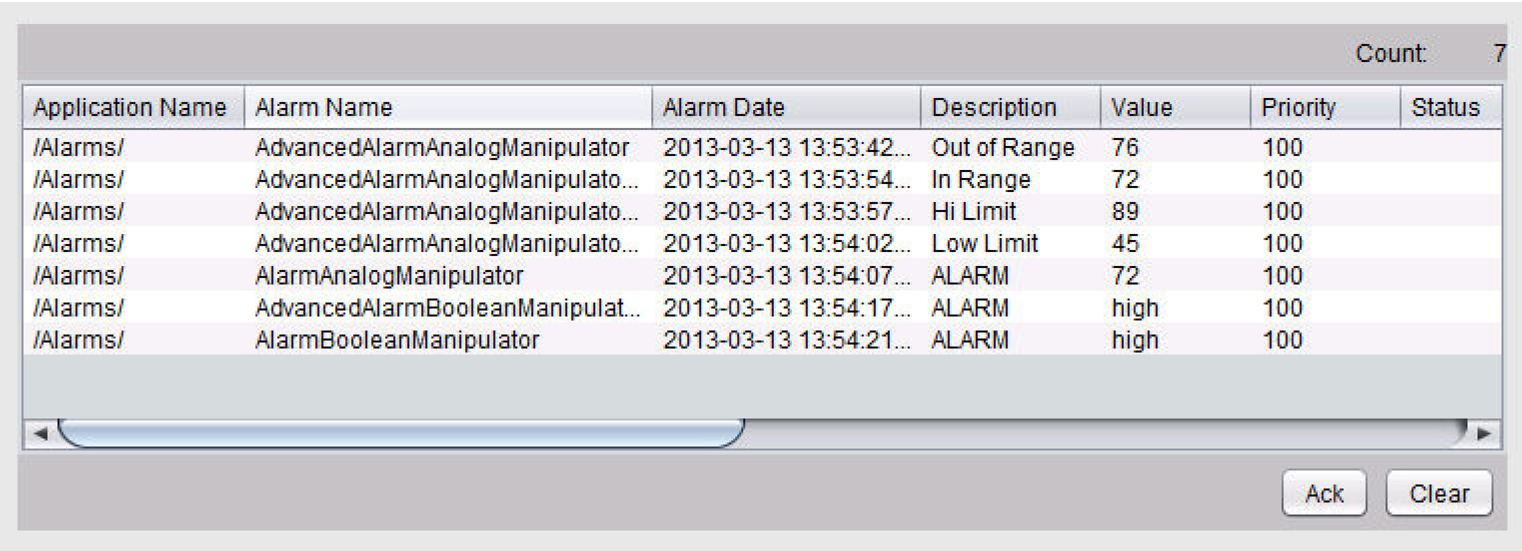
[Dynamic Table View Overview]

[Programming the Dynamic Table View]

[Using the Dynamic Table View]

Alarm Table View

The Alarm Table View element is used to display information delivered by a connected Alarm Manager. One or several Alarm Managers may be connected to a single Alarm Table view if desired.



Application Name	Alarm Name	Alarm Date	Description	Value	Priority	Status
/Alarms/	AdvancedAlarmAnalogManipulator	2013-03-13 13:53:42...	Out of Range	76	100	
/Alarms/	AdvancedAlarmAnalogManipulato...	2013-03-13 13:53:54...	In Range	72	100	
/Alarms/	AdvancedAlarmAnalogManipulato...	2013-03-13 13:53:57...	Hi Limit	89	100	
/Alarms/	AdvancedAlarmAnalogManipulato...	2013-03-13 13:54:02...	Low Limit	45	100	
/Alarms/	AlarmAnalogManipulator	2013-03-13 13:54:07...	ALARM	72	100	
/Alarms/	AdvancedAlarmBooleanManipulat...	2013-03-13 13:54:17...	ALARM	high	100	
/Alarms/	AlarmBooleanManipulator	2013-03-13 13:54:21...	ALARM	high	100	

Standard Inputs

Pin	Notes
Input	Accepts a single input connection, commonly from the Alarm Manager element.

Standard Outputs

Pin	Notes
Selected Row	Outputs the database location of a selected row of data from the Alarm database.

Basic Properties

Property Name	Notes
Ack String	Defines the label of the Ack button.
Ack Date Column Name	Defines the label for the Ack Date column.

Ack Who Column Name	Defines the label for the Ack Who column.
Alarm Name Column Name	Defines the label for the Alarm Name column.
Allow Insertion?	Defines if new alarms should be added as they come in.;
Application Name Column Name	Defines the label for the Application Name column.
Background Color	Defines the background color for the table.
Border Color	Defines the border color for the table.
Button Color	Defines the color of the control buttons.
Button Foreground	Defines the foreground color for the button.
Clear Date Column Name	Defines the label for the Clear Date column.
Clear String	Defines the label for the Clear button.
Clear Who Column Name	Defines the label for the Clear Who column.
Column Sizes	Defines column sizes, which are automatically generated as information is delivered or the columns are adjusted by the user.
Comment Column Name	Defines the label for the Comment column.
Count String	Defines the label for the Alarm count displayed in the table.
Description Column Name	Defines the label for the Description column.
Display Ack Button	Defines if the Ack button is displayed.
Display Clear Button	Defines if the Clear button is displayed.
Display Count	Defines if the alarm count is displayed.
Display Title	Defines if the title of the Alarm Table is displayed.
Foreground Color	Defines the foreground color of the table.
Header Color	Defines the header color of the table.
Header Font	Defines the header font of the table.
Header Foreground Color	Defines the header foreground color of the table.
Occurrence Date Column Name	Defines the label for the Occurrence Date column.
Priority One Groups	Defines Aspect User Groups for alarm acknowledgment.
Priority One Level	Defines priorities permitted for Ack and clear by

	Priority One Groups.
Priority Two Groups	Defines Aspect User Groups for alarm acknowledgment.
Priority Two Level	Defines priorities permitted for Ack and clear by Priority Two Groups.
Priority Column Name	Defines the label for the Priority column.
Status Column Name	Defines the label for the Status column.
Stretch Columns?	Defines if columns should be auto stretched.
Table Background Color	Defines the background color of the table.
Table Font	Defines the font for information displayed within the table.
Title	Defines a displayed title for the Alarm Table.
Title Row Font	Defines the font for the title.
Title Row Foreground	Defines the foreground color for the title area.
Value Column Name	Defines the label for the Value column.

Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Cursor	Defines the cursor icon to display during mouse hover.
Rotation	Defines the rotation placement of the element.
Show Acked Columns	Defines if the Show Acked and Acked By columns are displayed in the table.
Show Cleared Columns	Defines if the Show Cleared and Cleared By columns are displayed in the table.
Show Priority Columns	Defines if the Priority column is displayed in the table.
Stale Quality	Defines if the stale quality indicator will be displayed on the client side if the value is stale.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

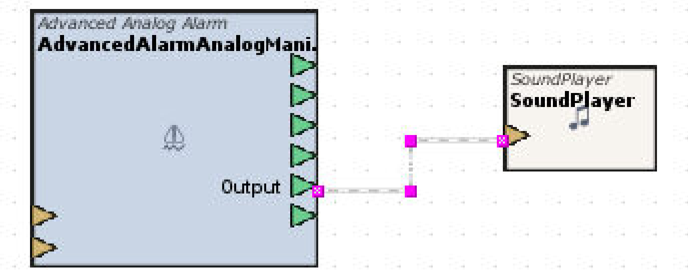
More Information

[Alarming Overview](#)

[Outputting Results to an Alarm Table](#)

Sound Player

The Sound Player is an invisible element used to play sound on a specific graphical user interface page.



Standard Inputs

Pin	Notes
valueInput	Accepts a single input connection. A value of 1 will trigger sound to be played within the browser.

Standard Outputs

No standard outputs exist for this element.

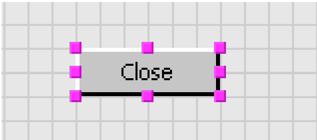
Basic Properties

Property Name	Notes
Sound File	Defines the imported .wav file to play.
Visible?	Defines if the element if visible.

Popups/Panels

Popup Close Button

The Popup Close Button is utilized on pop-up graphics to properly destroy the pop-up graphic when a user is finished viewing the popup.



Basic Properties

Property Name	Notes
Color	Defines the color of the button.
Draw Label	Defines if the Label is drawn.
Image	Defines an image to display on the button.
Label	Defines the text label on the button.
Label Color	Defines the color of the label.
Label Font	Defines the font for the Button label.
Value for Off	Defines a value for off, when clicked.
Value for On	Defines a value for on, when clicked.

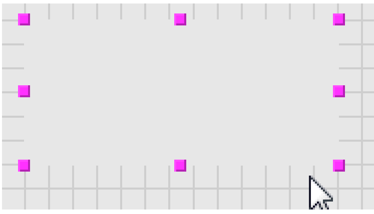
Expert Properties

Property Name	Notes
Active Smoothing?	Defines if active areas should be smoothed when drawn.
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Cursor	Defines the cursor icon to display during mouse hover.
Depth	Defines the pixel depth for the button.
Draw 3D	Defines if the button should be drawn in 3D.

Enabled	Defines if the element is enabled.
Predrawn Smoothing	Defines if inactive areas should be smoothed when drawn.
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Onscreen Popup

The Onscreen Popup is used to provide a panel to display a pop-up embedded to a screen.



Basic Properties

Property Name	Notes
Bezel	Defines the bezel to place around the popup panel.

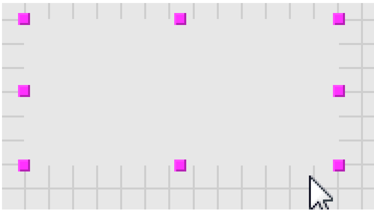
Expert Properties

Property Name	Notes
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.

Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Popup Launcher

The Popup Launcher is used to launch a pop-up from a label or other type of text display.



Basic Properties

Property Name	Notes
Bezel	Defines the bezel to place around the popup panel.
Font	Defines the font for the label.
Label	Defines the text of the label.
Label Color	Defines the label color.

Expert Properties

Property Name	Notes
Bad Quality Indicator At	Defines the quality of data that will indicate bad quality.
Bezel	Places a bezel around the graphical widget.
Bezel Color	Defines the color for the bezel.
Bezel Inside Color	Defines the inside color for the bezel.
Bezel Thickness	Defines the line thickness for the bezel.
Click Action	Defines an action when the widget is clicked.
Click Count	Defines how many clicks must be used to initiate Click Action.
Cursor	Defines the cursor icon to display during mouse hover.

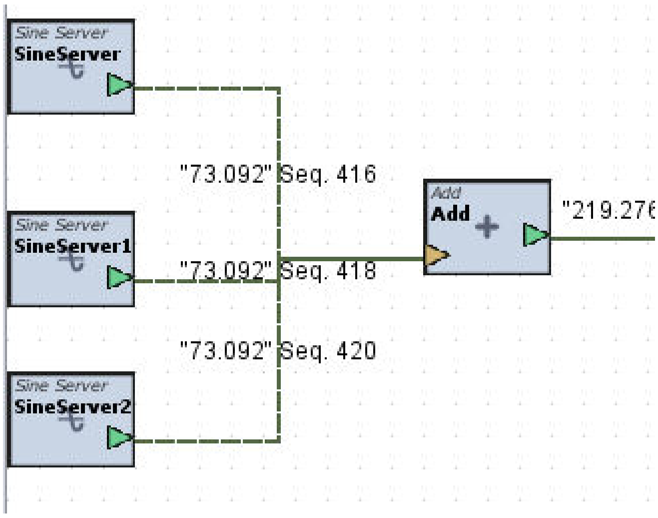
Rotation	Defines the rotation placement of the element.
Visible?	Defines if the element if visible.
Warning Quality Indicator	Defines the quality of data that will indicate warning.

Diagram Elements

Math

Add

Add the values of all connected inputs. The output is the result of this math operation.



Standard Inputs

Pin	Notes
Input	Accepts two or more inputs. Input values can be any numeric form, or string form coercible into a numeric format.

Standard Outputs

Pin	Notes
Output	Outputs the result of all input values added together using standard math addition.

Basic Properties

No basic properties exist for this element.

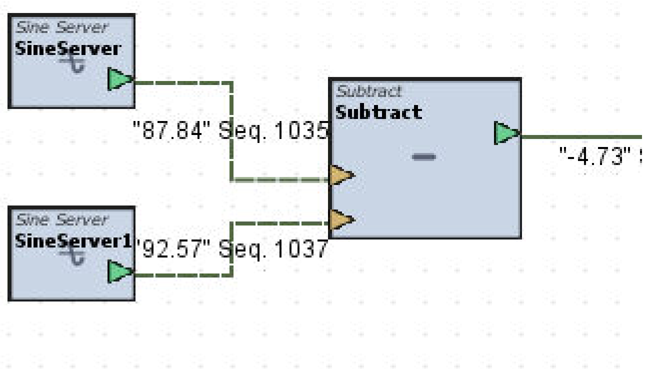
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are sep-

	arate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Subtract

Subtracts the value of the input using the Subtract Input value. The output is the result of this calculation.



Standard Inputs

Pin	Notes
Input	Accepts a single numeric input value.
Subtract Input	Accepts a single numeric input value defining what value shall be subtracted from Input.

Standard Outputs

Pin	Notes
Output	Outputs the result.

Basic Properties

No basic properties exist for this element.

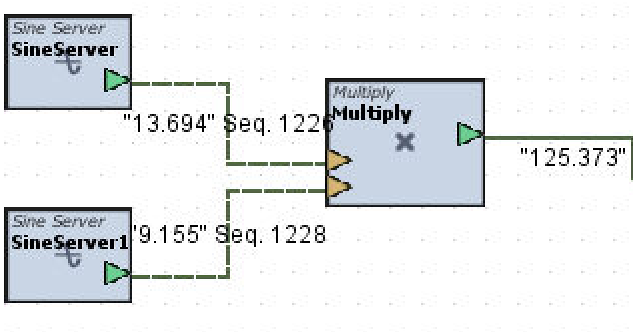
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements

	that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Multiply

Multiplies two values. The output is the result of this calculation.



Standard Inputs

Pin	Notes
First Input	Accepts a single numeric input value.
Second Input	Accepts a single numeric input value.

Standard Outputs

Pin	Notes
Output	Outputs the result.

Basic Properties

No basic properties exist for this element.

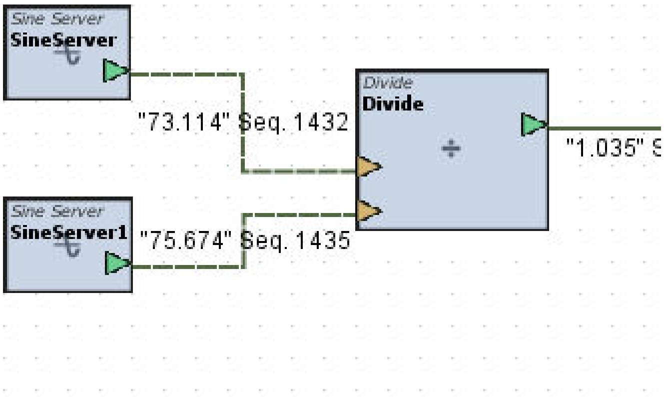
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi

	property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

÷ *Divide*

Divides the input value by the specified divisor input. The output is the result of this function.



Standard Inputs

Pin	Notes
Divisor Input	Accepts a single numeric input value defining the divisor to apply against Input.
Input	Accepts a single numeric input value.

Standard Outputs

Pin	Notes
Output	Outputs the result.

Basic Properties

No basic properties exist for this element.

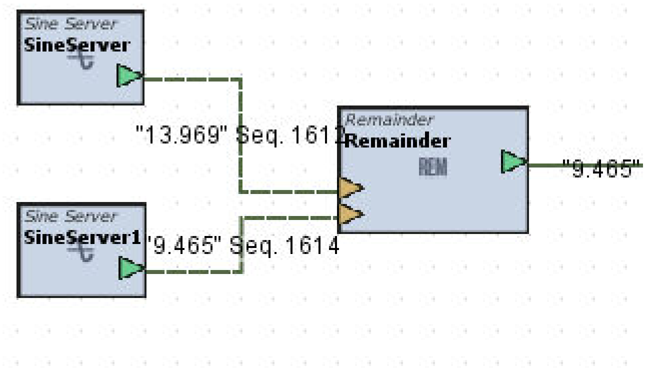
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input.

	• Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

REM *Remainder*

Divides the input by the specified divisor input. The output is the remainder value of the applied division.



Standard Inputs

Pin	Notes
Divisor Value Input	Accepts a single numeric input value defining the divisor to apply against Input.
Input	Accepts a single numeric input value.

Standard Outputs

Pin	Notes
Output	Outputs the result.

Basic Properties

No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the ele-

	ment will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.

Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

ABS *Absolute*

Returns the absolute value of the input value. The output is the result of this function.

Standard Inputs

Pin	Notes
Input	Accepts a single numeric input.

Standard Outputs

Pin	Notes
Output	Outputs the absolute value of the connected input value.

Basic Properties

No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

	• Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in

	Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Reverse Sign

Multiplies the input value by -1 to change the sign value of the input. The output is the result of this function.

Standard Inputs

Pin	Notes
Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs a mirrored result with the sign reversed.

Basic Properties

No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

	• Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in

	Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

0.00 *Round*

Rounds the input value up or down to produce a whole number.

Standard Inputs

Pin	Notes
Input	Accepts a single input value.

Standard Outputs

Pin	Notes
Output	Outputs the rounded result of the input. If the fraction of the input is less than 0.5, the element will round the value down to the next whole number, else, rounds up to the next whole number. This same theory applies for negative values, however, if the fraction of the input is less than 0.5, the value is rounded up towards positive territory.

Basic Properties

No basic properties exist for this element.

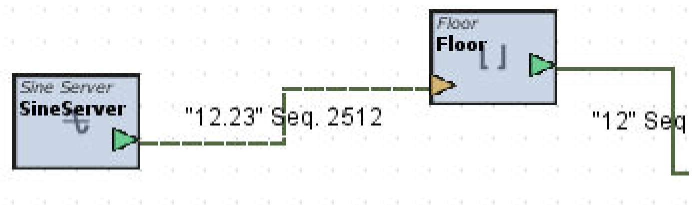
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the ele-

	ment.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Floor

Rounds the input value down regardless of the fraction of the input.



Standard Inputs

Pin	Notes
Input	Accepts a single input value.

Standard Outputs

Pin	Notes
Output	Outputs a rounded down value of the input.

Basic Properties

No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the ele-

	ment.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Ceiling

Rounds the input value up regardless of the fraction of the input.

Standard Inputs

Pin	Notes
Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs a rounded up value of the input.

Basic Properties

No basic properties exist for this element.

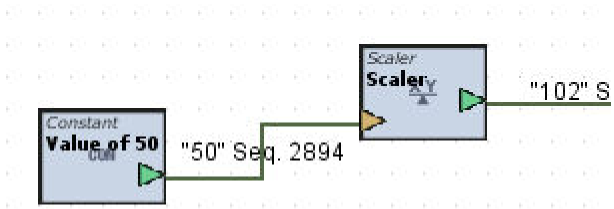
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the ele-

	ment.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Scaler

Scales the input by applying a multiplier and a constant add factor - e.g. ((input x multiplier) + added factor). In the example below, a value of 50 is connected to the Scaler that has an Added Factor of 2.0 and a Multiplier of 2.0.



Standard Inputs

Pin	Notes
Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the scale operation based on configured Basic Properties.

Basic Properties

Property Name	Notes
Added Factor	Defines the value to add, post multiplication.
Multiplier	Defines the value to multiply the input against.

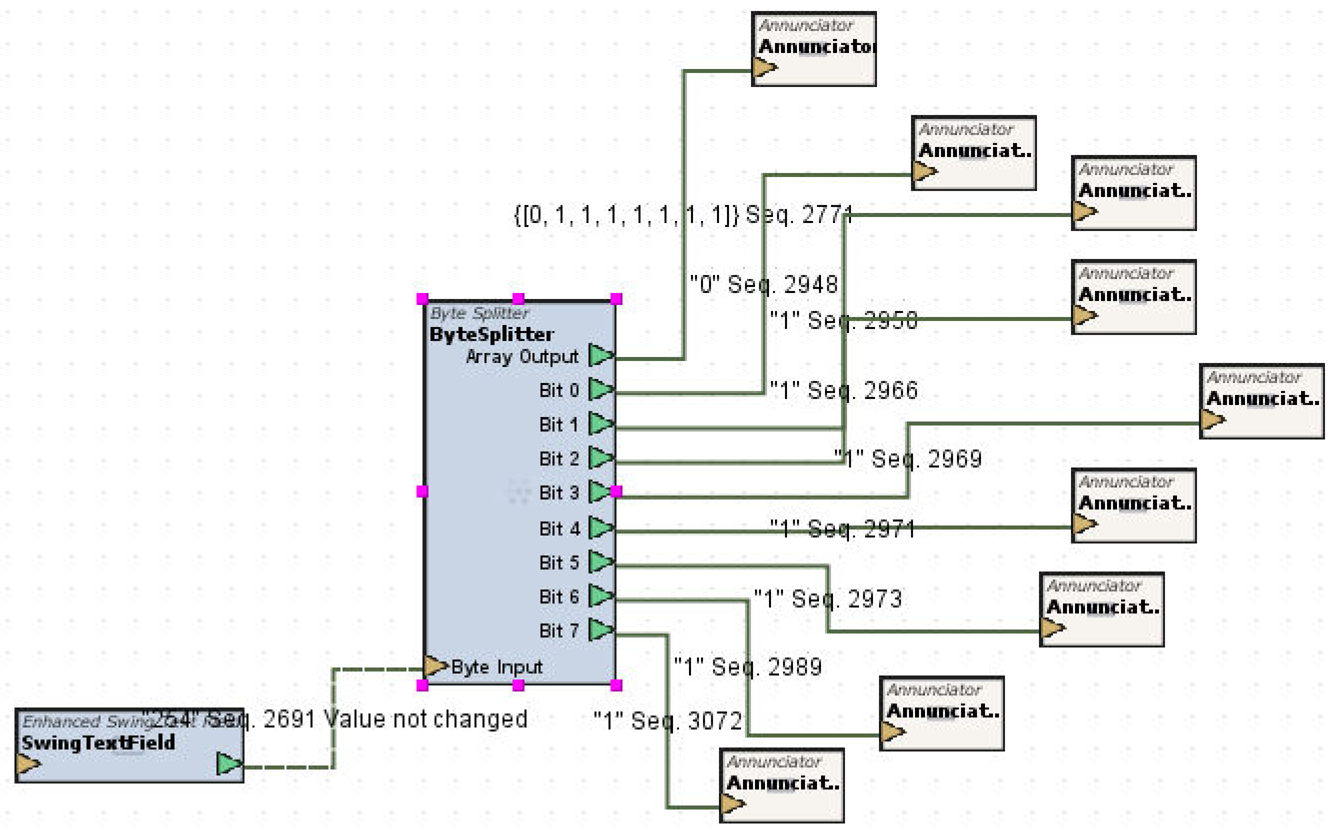
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).

Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Byte Splitter

Accepts an unsigned value and converts it to its 8-bit binary value. For input values above 255, the element will provide the result of the lower 8 bits of the binary value. An arrayed output value is also provided.



Standard Inputs

Pin	Notes
Byte Input	Accepts any numeric unsigned value.

Standard Outputs

Pin	Notes
Array Output	Outputs an array data value of all 8 bytes.
Bit 0	Outputs bit position 0's value.
Bit 1	Outputs bit position 1's value.
Bit 2	Outputs bit position 2's value.
Bit 3	Outputs bit position 3's value.
Bit 4	Outputs bit position 4's value.
Bit 5	Outputs bit position 5's value.
Bit 6	Outputs bit position 6's value.
Bit 7	Outputs bit position 7's value.

Basic Properties

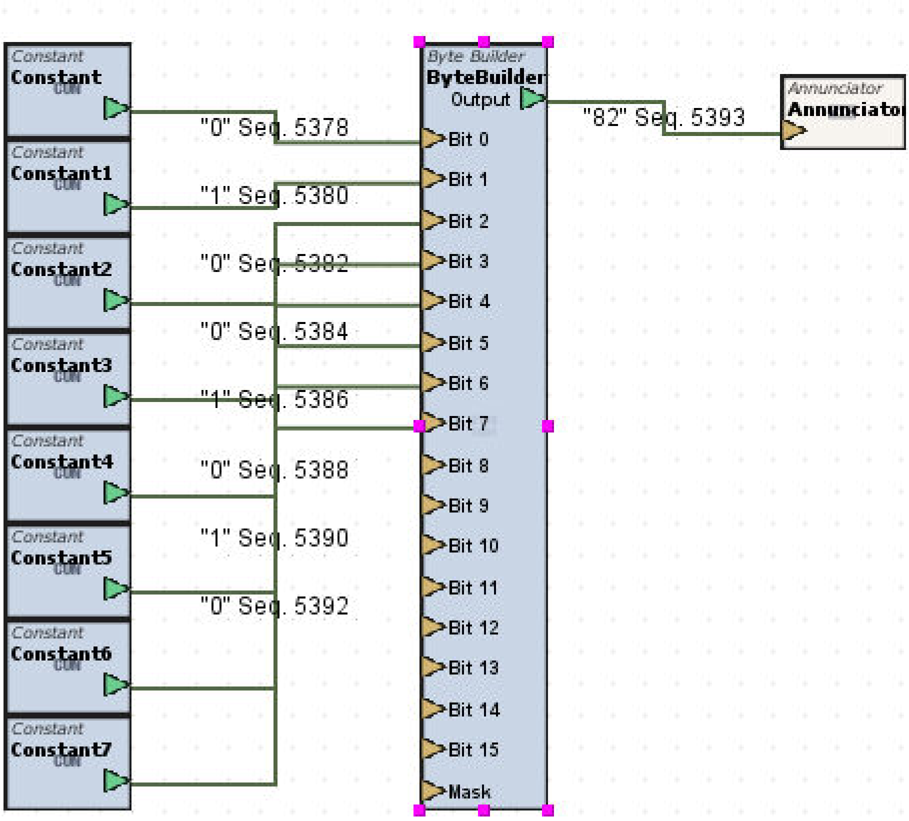
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Byte Builder

Provides 16 bit-position inputs and outputs its numeric 16-bit value.



Standard Inputs

Pin	Notes
Bit 0	Accepts a bit-based value.
Bit 1	Accepts a bit-based value.
Bit 2	Accepts a bit-based value.
Bit 3	Accepts a bit-based value.
Bit 4	Accepts a bit-based value.
Bit 5	Accepts a bit-based value.
Bit 6	Accepts a bit-based value.
Bit 7	Accepts a bit-based value.
Bit 8	Accepts a bit-based value.
Bit 9	Accepts a bit-based value.
Bit 10	Accepts a bit-based value.
Bit 11	Accepts a bit-based value.

Bit 12	Accepts a bit-based value.
Bit 13	Accepts a bit-based value.
Bit 14	Accepts a bit-based value.
Bit 15	Accepts a bit-based value.
Mask	Currently Unknown

Standard Outputs

Pin	Notes
Output	Outputs a integer-based value based on all connected Bit inputs.

Basic Properties

No basic properties exist for this element.

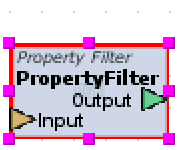
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.

Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Property Filter

The Property Filter element is used to replace the color and/or quality of an input value. For arrays, only the overall quality and color will be changed as the individual values contained in an array will not be affected. For example, the color output of any object (such as the Advanced Alarm Manipulators) can be changed using this element if desired (even though the element permits a change to the colors directly.



Standard Inputs

Pin	Notes
Input	Accepts a single input value that will be examined by the Property Filter.

Standard Outputs

Pin	Notes
Output	Outputs a connection carrying all modified parameters based on Basic Property configuration.

Basic Properties

Property Name	Notes
Change Time?	Specifies if the current timestamp from the input should be set to the current system time.
New Color	Specifies a new color to output and pass onto other elements in RGB form (e.g. 128,128,0).

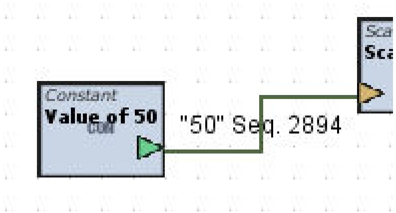
New Quality	Specifies the new quality that will be passed onto other elements via the output.
Send on Property Change?	Specifies if output updates should only be sent when any of the configurable basic properties change configuration.
Time Offset	Specifies a change in time based on milliseconds if the time is being changed via Change Time? property option.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

CON *Constant*

Used to produce a constant value using any of the data types supported by Aspect. Additionally supports the ability to defined PI (3.141592653589793) and KE (2.718287).



The Constant element can be used to initially send a value at start-up when needed. If you intend to use the Constant element as a screen local element, ensure that the start priority of the Constant element initialized after other elements that have been started via Start Priority.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs the constant value based on configuration of Basic Properties.

Basic Properties

Property Name	Notes
Constant Type	Defines the type of constant value. PI, KE, or Custom.
Constant Value	Defines the output value (when Constant Type = Custom)
Value Type	Defines the data type of the value output.

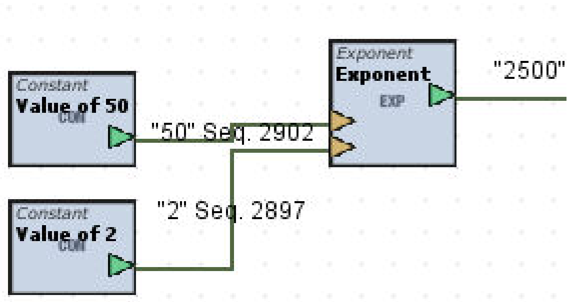
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin.

	• Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Fire Late?	Defines if the element should begin execution after Aspect has fully started. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Initial Quality	Defines the quality of data when sent.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Color	Defines the color to send onto color receiving elements.

Exponent

Raises the base input value to the defined power input. The output is the result of this calculation.



Standard Inputs

Pin	Notes
Base	Accepts a single numeric value defining the base value for the equation.
Power	Accepts a single numeric value defining the power being applied to the Base input value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the scale operation based on configured Basic Properties.

Basic Properties

No basic properties exist for this element.

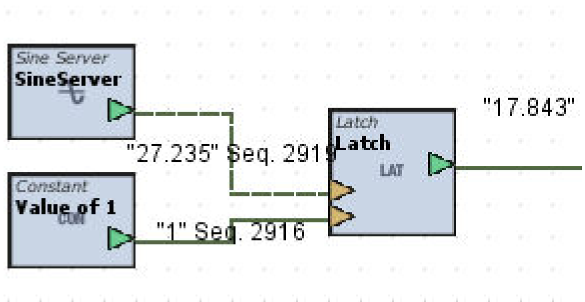
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will

	execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

LAT *Latch*

Permits updates between input and output on when the latch input is off (value of 0). When the latch input is on (value of 1), the output is frozen with its last known value until the latch is turned off.



Standard Inputs

Pin	Notes
Input	Accepts a single numeric value.
Latch	Accepts a single input or binary value for latching action.

Standard Outputs

Pin	Notes
Output	When the latch input = 0, Output will send all val-

	ues received by the input. Else, the last sent value will be outputted until the Latch input is a non-zero value.

Basic Properties

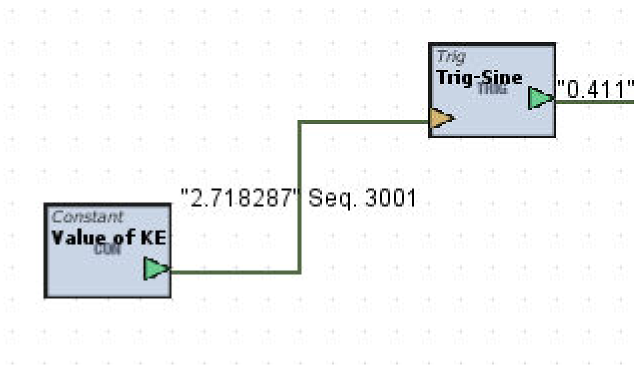
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

TRIG *Trig*

Performs a selected trigonometry function against the input value.



Standard Inputs

Pin	Notes
Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the operation based on configured Basic Properties.

Basic Properties

Property Name	Notes
Function Type	Defines the trig function to apply against the input value. Available selections include: • Sine (1) • Arcsine (2) • Cosine (3) • Arccosine (4) • Tangent (5) • Arctangent (6)

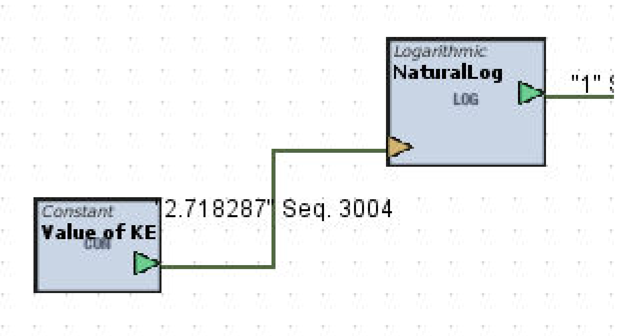
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no con-

	nection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

LOG *Logarithmic*

Applies Log or Natural Log against the input value. The output is the result of this function.



Standard Inputs

Pin	Notes
Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the operation based on configured Basic Properties.

Basic Properties

Property Name	Notes
Logarithmic Type	Defines the Logarithmic function to apply against the input value. Available selections include: • Log (1) • Natural Log (2)

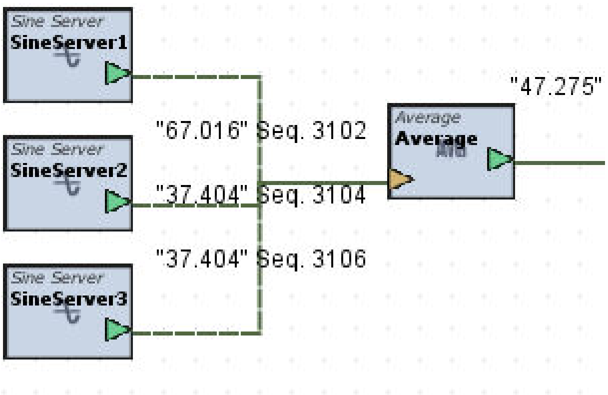
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 255.

AVG *Average*

Determines the average of all connected inputs. The output is the result of this operation.



Standard Inputs

Pin	Notes
Input	Accepts two or more inputs. Input values can be any numeric form, or string form coercible into a numeric format.

Standard Outputs

Pin	Notes
Output	Outputs the average of all connected input values.

Basic Properties

No basic properties exist for this element.

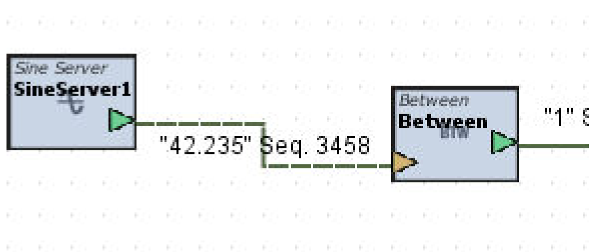
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element

	- depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the elements to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Between

Determines if an input value is between user defined lower and upper limits. The output is the result of this operation. If the input value is greater than the defined lower bound and less than the defined upper bound, the output will be true (1), else false (0).



Standard Inputs

Pin	Notes
Input	Accepts a single input value for examination.

Standard Outputs

Pin	Notes
Output	Outputs a binary condition based on whether or not the connected input meets Between criteria based on configuration of Basic Properties.

Basic Properties

Property Name	Notes
Lower Bound	Defines the lower bound for the between operation.
Upper Bound	Defines the upper bound for the between operation.

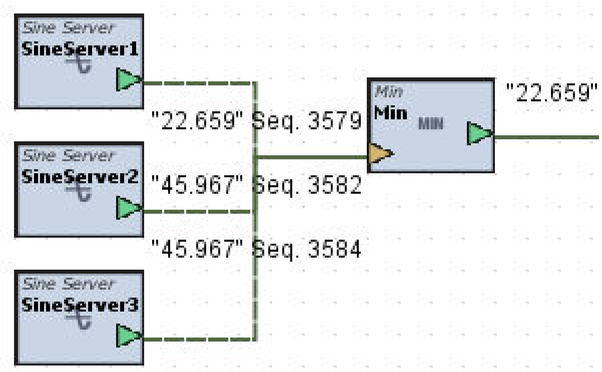
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).

Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

MIN *Min*

Outputs the minimum value of all connected inputs. The output is the result of this operation.



Standard Inputs

Pin	Notes
Input	Accepts two or more inputs. Input values can be any numeric form, or string form coercible into a numeric format.

Standard Outputs

Pin	Notes
Output	Outputs the minimum input value of all connected input values.

Basic Properties

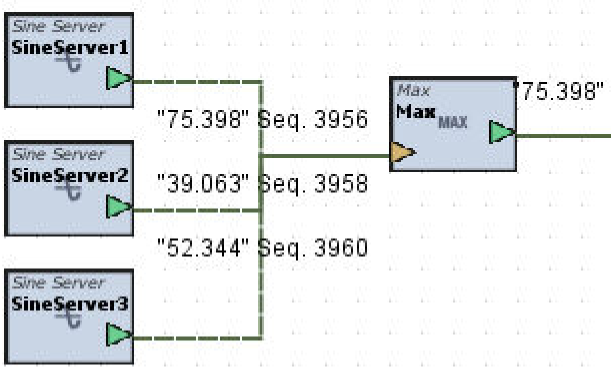
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Max

Outputs the maximum value of all connected inputs. The output is the result of this operation.



Standard Inputs

Pin	Notes
Input	Accepts two or more inputs. Input values can be any numeric form, or string form coercible into a numeric format.

Standard Outputs

Pin	Notes
Output	Outputs the maximum input value of all connected input values.

Basic Properties

No basic properties exist for this element.

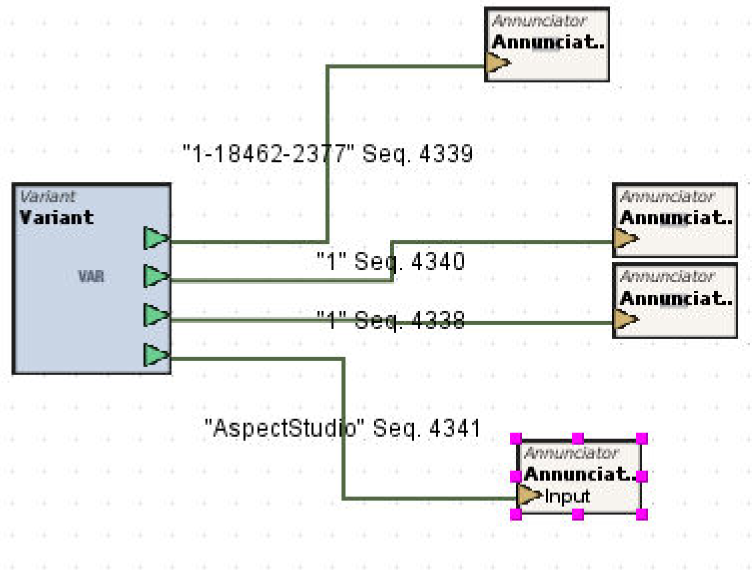
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input.

	• Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

VAR *Variant*

Allows users to output Aspect target identification details including the Hardware ID, Instance ID, Platform Type, and other items.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Hardware ID	Outputs the hardware ID of the target.
Instance ID	Outputs the instance of Aspect that the element exists within.
Output	Outputs an enumeration of the platform type, where: • 1 = Aspect-Studio • 2 = Aspect-Facility • 3 = Aspect-Enterprise • 4 = Aspect-Matrix Area Controller • 5 = Aspect-Nexus
Variant Name	Outputs the actual variant name corresponding to the Output.

Basic Properties

No basic properties exist for this element.

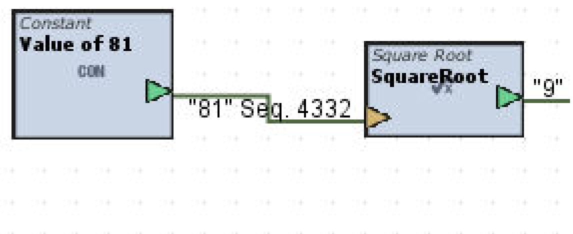
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 255.
Timebase	Defines how often, in seconds, the element will execute and update its value.

Square Root

Performs square root math against the input. The output is the result of this math operation.



Standard Inputs

Pin	Notes
Input	Accepts a single numeric input for examination.

Standard Outputs

Pin	Notes
Output	Outputs the square root value of the connected input.

Basic Properties

No basic properties exist for this element.

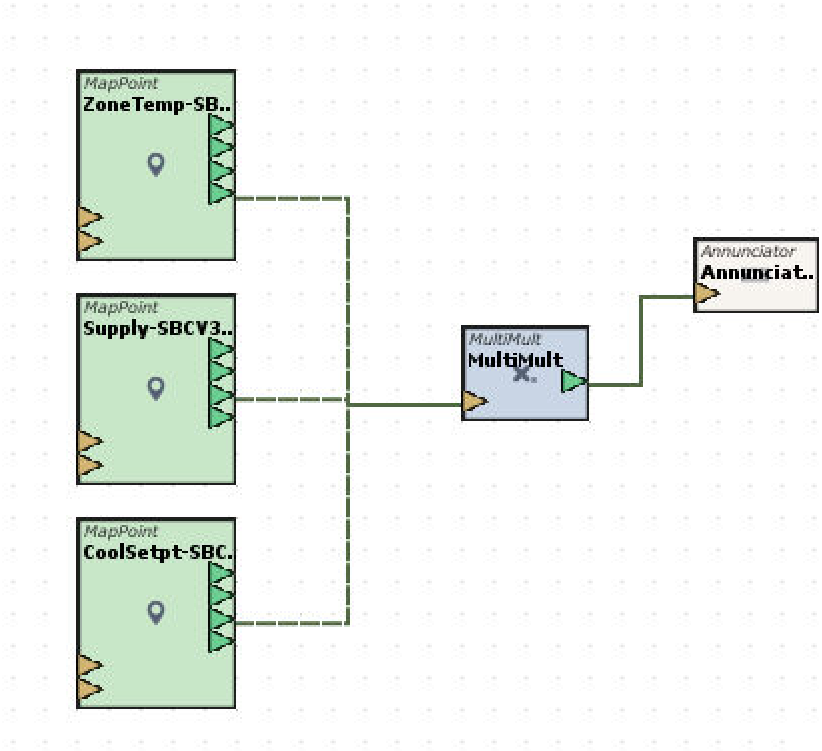
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no con-

	nection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

 *MultiMult*

Multiplies many values. The output is the result of this calculation.



Standard Inputs

Pin	Notes
Input	Accepts an array of numeric input values.

Standard Outputs

Pin	Notes
Output	Outputs the result.

Basic Properties

Property Name	Notes
Constant Value	Defines the value to multiply when Include Constant Value is true.
Include Constant Value	Defines if the connected elements should multiply against a constant value.

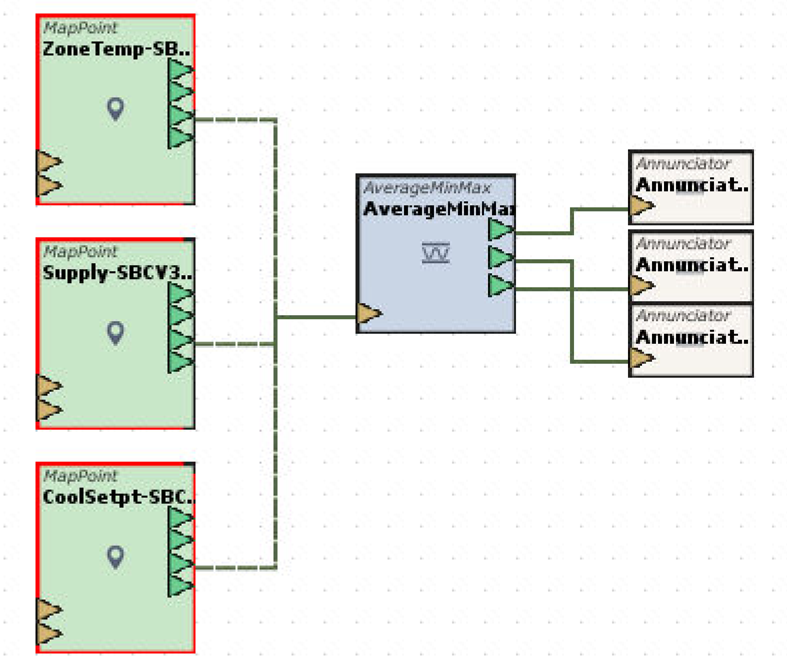
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the ele-

	ment.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

AverageMinMax

This element takes multiple inputs and provides the Average, Minimum, and Maximum values and can also perform the logic with an included constant value.



Standard Inputs

Pin	Notes

Input	Accepts an array of numeric input values.

Standard Outputs

Pin	Notes
Avg	Outputs the average value.
Min	Outputs the minimum value.
Max	Outputs the maximum value.

Basic Properties

Property Name	Notes
Constant Value	Defines the value to multiply when Include Constant Value is true.
Include Constant Value	Defines if the connected elements should multiply against a constant value.

Expert Properties

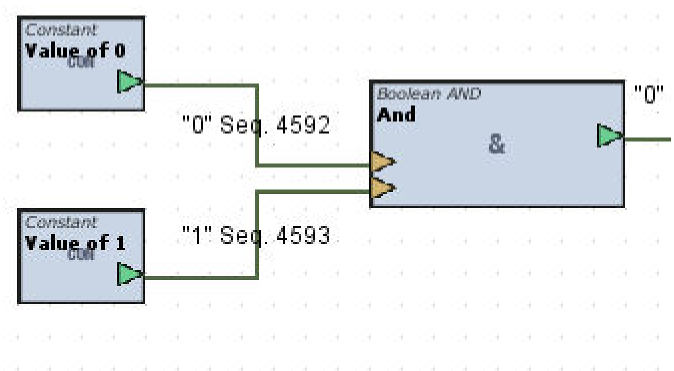
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user inter-

	face are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Logic

& And

Accepts two logically binary inputs. If both inputs are on, the output will be true (1). If either input is off, the output will be false (0).



Standard Inputs

Pin	Notes
First Boolean Input	Accepts a single boolean input value.
Second Boolean Input	Accepts a single boolean input value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the AND operation.

Basic Properties

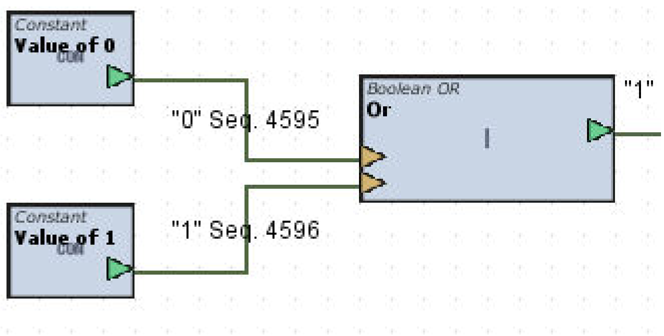
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Or

Accepts two logically binary values. If either of the two inputs are on, the output will be true (1). If neither of the two inputs are on, the output will be false (0).



Standard Inputs

Pin	Notes
First Boolean Input	Accepts a single boolean input value.
Second Boolean Input	Accepts a single boolean input value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the OR operation.

Basic Properties

No basic properties exist for this element.

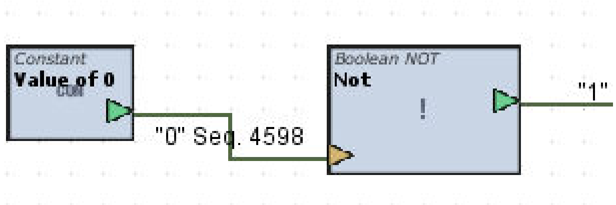
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin.

	• Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

! *Not*

Produces an opposite of the input. For example, if the output if false (0), then the output will be true (1).



Standard Inputs

Pin	Notes
Boolean Input	Accepts a single boolean input value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the OR operation.

Basic Properties

No basic properties exist for this element.

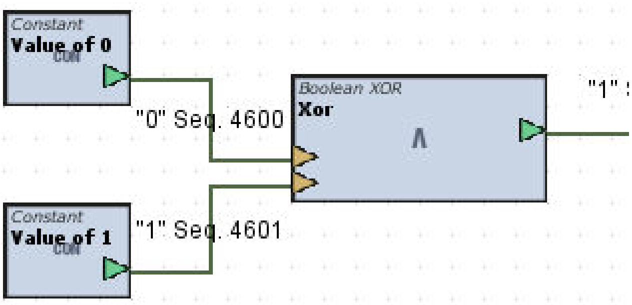
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True

Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

∧ Xor

Performs an Exclusive Or. If either of the two inputs are true (but not both simultaneously), the output if true (1). If none of the inputs are true, or if both of the inputs are true, then the output will be false (0).



Standard Inputs

Pin	Notes
First Boolean Input	Accepts a single boolean input value.
Second Boolean Input	Accepts a single boolean input value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the XOR operation.

Basic Properties

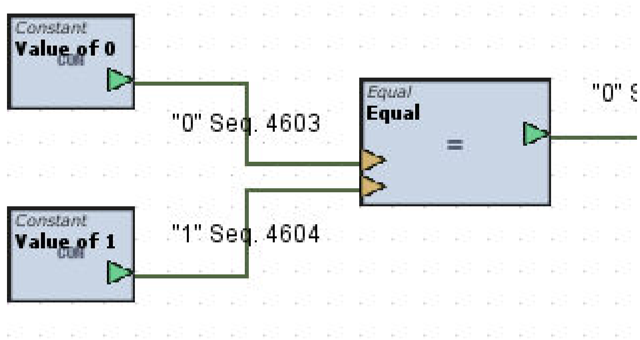
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

= Equal

Accepts two inputs for a left side/right side compare. If both inputs are the same value, the output will be true (1).



Standard Inputs

Pin	Notes
Left Side Input	Accepts a single numeric value.
Right Side Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the EQUAL operation.

Basic Properties

No basic properties exist for this element.

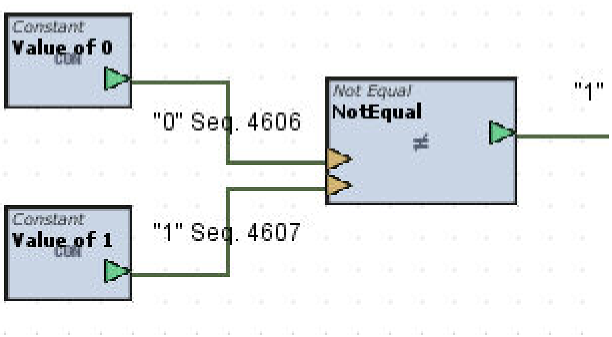
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin.

	• Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

≠ *Not Equal*

Accepts two inputs for a left side/right side compare. If both inputs are the not same value, the output will be true (1).



Standard Inputs

Pin	Notes
Left Side Input	Accepts a single numeric value.
Right Side Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the NOT EQUAL operation.

Basic Properties

No basic properties exist for this element.

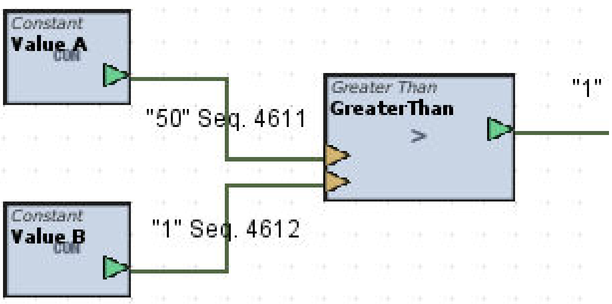
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the pre-

	ferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

> *Greater Than*

Accepts two inputs for a left side/right side comparison. If the left side input value exceeds the right side’s value, the output will be true (1).



Standard Inputs

Pin	Notes

Left Side Input	Accepts a single numeric value.
Right Side Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the GREATER THAN operation.

Basic Properties

No basic properties exist for this element.

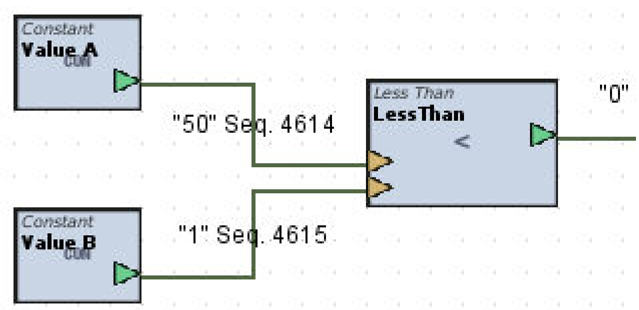
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is

	enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

< *Less Than*

Accepts two inputs for a left side/right side comparison. If the left side input value is lower than the right side's value, the output will be true (1).



Standard Inputs

Pin	Notes
Left Side Input	Accepts a single numeric value.
Right Side Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the LESS THAN operation.

Basic Properties

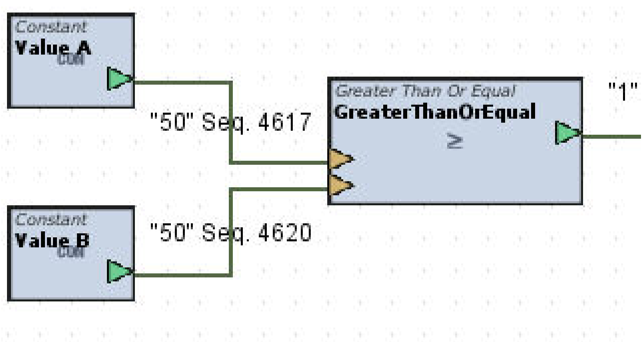
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

≥ *Greater Than Or Equal*

Accepts two inputs for a left side/right side comparison. If the left side input value exceeds or is equal to the right side's value, the output will be true (1).



Standard Inputs

Pin	Notes
Left Side Input	Accepts a single numeric value.
Right Side Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the GREATER THAN EQUAL operation.

Basic Properties

No basic properties exist for this element.

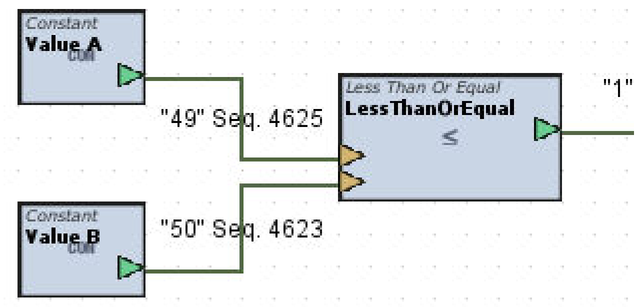
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no con-

	nection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

≤ *Less Than Or Equal*

Accepts two inputs for a left side/right side comparison. If the left side input value is lower than to equal to the right side’s value, the output will be true (1).



Standard Inputs

Pin	Notes
Left Side Input	Accepts a single numeric value.
Right Side Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the LESS THAN EQUAL operation.

Basic Properties

No basic properties exist for this element.

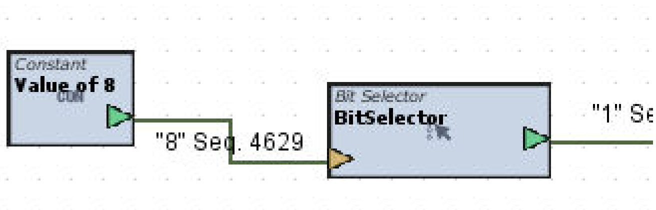
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the pre-

	ferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Bit Selector

Used to select a specific bit position from a bit string value. In the example below, an integer value of 8 is connected to the Input. The Bit property is set for a value of 3, indicating logical position 3). The result is 1, as this position reflects a value of 8.



Standard Inputs

Pin	Notes
First Boolean Input	Accepts a numeric or bit-string value for exam-

	ination.

Standard Outputs

Pin	Notes
Output	Outputs the value of the focused bit based on configuration of Basic Properties.

Basic Properties

Property Name	Notes
Bit	Defines the bit position to focus upon.

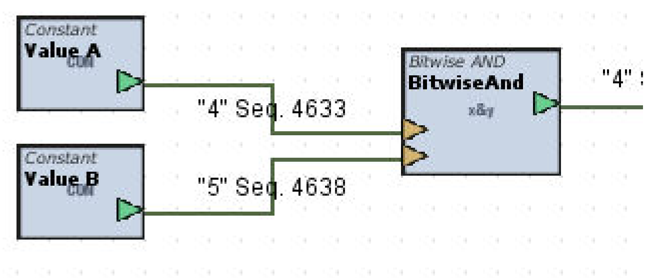
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is

	enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

x&y *Bitwise And*

Performs an AND operation based on bit wise logic utilizing integer-based input values.



Standard Inputs

Pin	Notes
First Input	Accepts a single numeric value.
Second Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the BITWISE AND operation.

Basic Properties

No basic properties exist for this element.

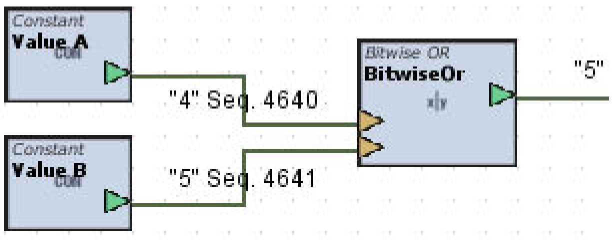
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are sep-

	arate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

x|y *Bitwise Or*

Performs an OR operation based on bit wise logic utilizing integer-based input values.



Standard Inputs

Pin	Notes
First Input	Accepts a single numeric value.
Second Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes

Output	Outputs the result of the operation.

Basic Properties

No basic properties exist for this element.

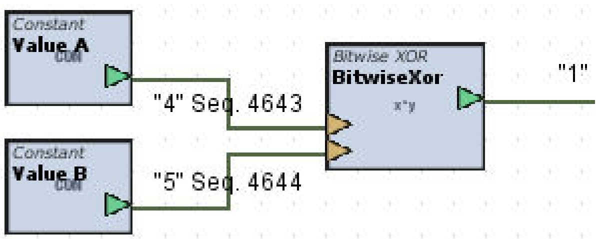
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is

	enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

x^y *Bitwise Xor*

Performs an XOR operation based on bit wise logic utilizing integer-based input values.



Standard Inputs

Pin	Notes
First Input	Accepts a single numeric value.
Second Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the operation.

Basic Properties

No basic properties exist for this element.

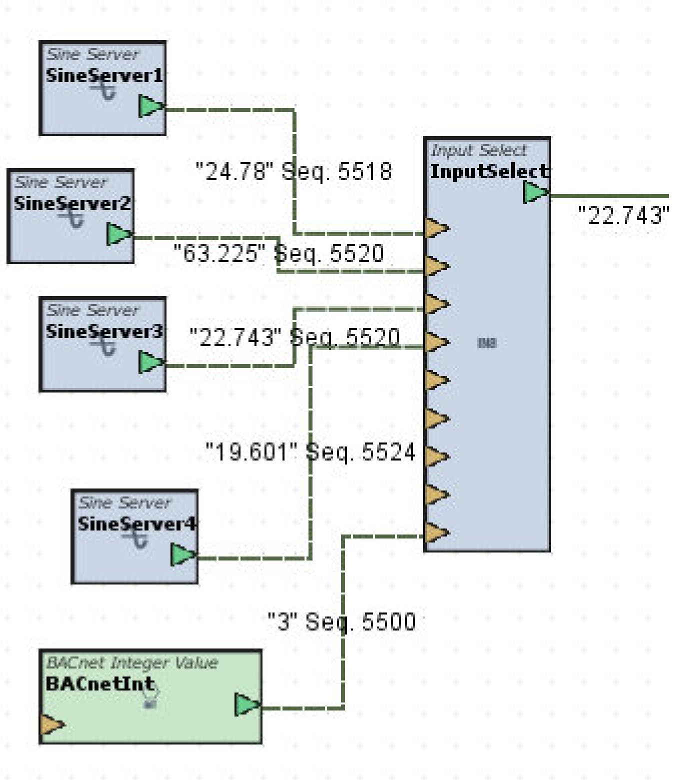
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays

	colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Input Select

Accepts up to eight (8) inputs. The output is the result is based on the Select Value property, which outputs a corresponding input value.



Standard Inputs

Pin	Notes
Input 1	Accepts a single value.
Input 2	Accepts a single value.
Input 3	Accepts a single value.
Input 4	Accepts a single value.
Input 5	Accepts a single value.
Input 6	Accepts a single value.
Input 7	Accepts a single value.
Input 8	Accepts a single value.
Select	Defines which input value shall be sent to the Output. The value sent to this input should correspond to the Input number. For example, a value of 3 sent to this pin will result in Input 3's value being outputted.

Standard Outputs

Pin	Notes
Output	Outputs the selected input based on the Select

	Value property value.

Basic Properties

Property Name	Notes
Min Select Quality	Defines the minimum quality required on the Select pin in order to initiate a selection.
Type	Defines the data type to use for the output.
Use Zero-based Index?	When true, a Select Input value of 0 will output the value connected to Input 1, and so on. When false, a Select Input value of 1 will output the value collected to Input 1, and so on. Values that exceed below or above the index range will result in bad quality output by this element.

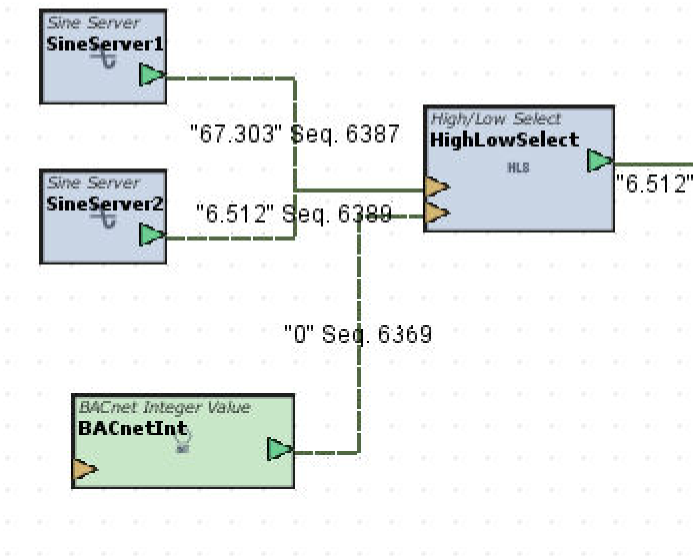
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are sep-

	arate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

HLS *High Low Select*

Accepts multiple inputs and is used to select the highest value or lowest value based on the Select input.



Standard Inputs

Pin	Notes
Input	Accepts two or more input values for operation.
Select	Accepts a binary or boolean value to select between the highest or lowest value. A value of 0 will force the element to output the lowest value of all connected inputs, where as a non-zero will force the element to output the highest value of all connected inputs.

Standard Outputs

Pin	Notes

Output	Outputs the result of the High Low Select operation based on connected inputs and the Select input toggle.

Basic Properties

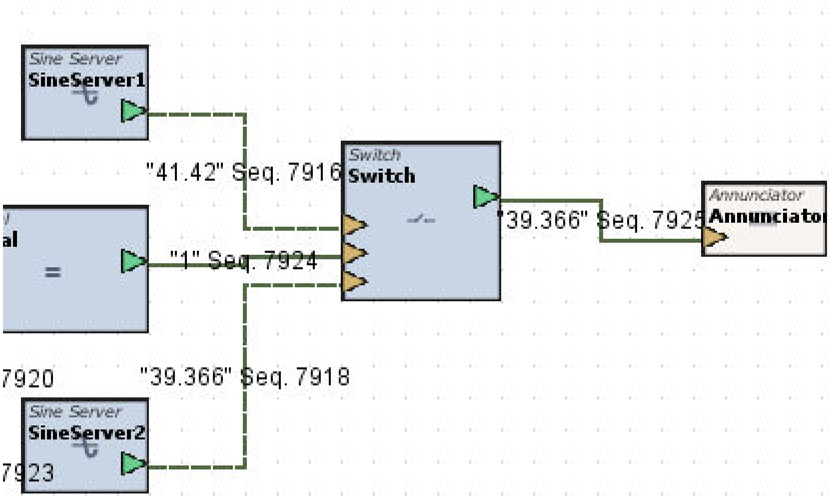
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

 *Switch*

Accepts two inputs. Outputs the first or second input based on the switch value received.



Standard Inputs

Pin	Notes
False Input	Accepts a single numeric value.
Switch Value	If the switch value input is false (0), the value connected to the False Input will be the output result. If the switch value input is true (1) or a non-zero value, the value connected to the True Input will be the output result.
True Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the operation.

Basic Properties

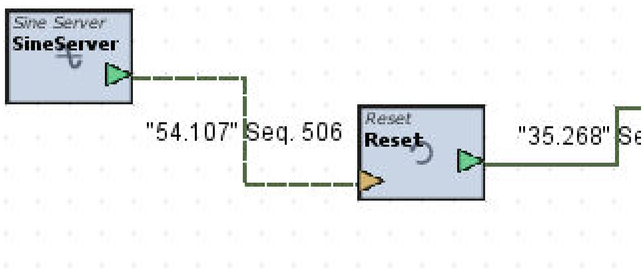
Property Name	Notes
Type	Defines the Data Type that the output should pass onto other logic.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Reset

Performs a basic reset routine against a single connected input. The result of the output is based on the configuration of the high and low input/output properties.



Standard Inputs

Pin	Notes
Input	Accepts a single numeric value.

Standard Outputs

Pin	Notes
Output	Outputs the result of the reset routine.

Basic Properties

Property Name	Notes
Input High	Specifies the highest input value for the reset routine.
Input Low	Specifies the lowest input value for the reset routine.
Output High	Specifies the highest output value for the reset routine.
Output Low	Specifies the lowest output value for the reset routine.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listen-

	ers - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Passthrough

Used in design to exposed information from a Component into an Application, or used to re-direct information to visually "clean-up" application logic. The result of the output is a direct mirror of the input value.

Standard Inputs

Pin	Notes
Input	Accepts any connected value.

Standard Outputs

Pin	Notes
Output	Outputs the value accepted from the Input.

Basic Properties

No basic properties exist for this element.

Expert Properties

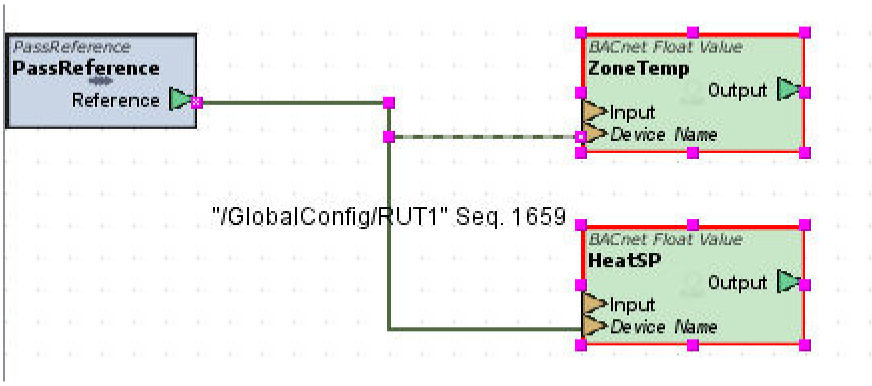
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Quality Override	Defines the quality to set to this value when a Passthrough value is received. This property provides a useful way of forcing the quality value to something other than the received value for testing and diagnostic purposes.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Pass Reference

Commonly leveraged when developing components (re-usable applications). This element is typically used to pass on a connection setting to other elements within diagram logic. The Pass Reference element can pass one of the following:

- Alarm Manager Reference
- BACnet Device Reference
- Database Manager Reference
- FTNet Device Reference
- PUP Device Reference
- SDP Device Reference
- Modbus Device Reference

A Pass Reference element may only pass one reference type at a time. Should you wish to pass more than one connection reference type, simply use another Pass Reference element.



Standard Inputs

No standard inputs exist for this property. However, in order to effectively use this element in applications, a Reference must be exposed using the Expose Properties feature of Aspect-Studio.

Standard Outputs

Pin	Notes
Output	Outputs a selected device or connection reference.

Basic Properties

Property Name	Notes
AlarmManagerValue	Used to reference any configured Alarm Manager within a project.
BacnetDeviceValue	Used to reference any configured BACnet Device within a project.
DatabaseManagerValue	Used to reference any configured Database Manager (SQL, SQLite, etc..) within a project.
FTNetDeviceValue	Used to reference any configured FTNet Device within a project.
ModbusDeviceValue	Used to reference any configured Modbus Device within a project.
MultipointValue	Used to reference any configured Multipoint elements within a project.
PupDeviceValue	Used to reference any configured PUP Device within a project.
SdpDeviceValue	Used to reference any configured SDP Device within a project.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Fire Late?	Defines if the element should begin execution after Aspect has fully started. This defaults to

	False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Multi Logic

Provides the ability to connect more than two input values and perform the following logic functions:

- AND
- NAND
- OR
- NOR
- XOR (commonly uses two inputs)
- XNOR (commonly uses two inputs)

Example Truth Tables

The following provides an example of truth tables relative to examples of input values and the output result expected.

Input Values			Expected Output Result			
INPUT 1	INPUT 2	INPUT 3	AND	NAND	OR	NOR
0	0	0	0	1	0	1
0	0	1	0	1	1	0

0	1	0	0	1	1	0
0	1	1	0	1	1	0
1	0	0	0	1	1	0
1	0	1	0	1	1	0
1	1	0	0	1	1	0
1	1	1	1	0	1	0

Input Values		Expected Output Result	
INPUT 1	**INPUT 2**	**XOR**	XNOR
0	0	0	1
0	1	1	0
1	0	1	0
1	1	0	1

Standard Inputs

Pin	Notes
Input	Accepts two or more inputs for comparative logic.

Standard Outputs

Pin	Notes
Output	Outputs the result of the logic operation based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Operation Mode	Defines the logic operation performed by the element. Operations that this element can perform include the following: • AND (enumeration value of 0) • NAND (enumeration value of 1) • OR (enumeration value of 2)

	• NOR (enumeration value of 3) • XOR (enumeration value of 4) • XNOR (enumeration value of 5)

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Time Rate

Schedule

Provides host schedule functionality through the use leveraging the iCalendar standard. Using this element, Aspect can retrieve scheduled data published to a target’s built-in WebDAV server (which stores published .ics files) from tools such as Microsoft Outlook 2007 (or later), or can communicate to Internet-based scheduling tools that support .

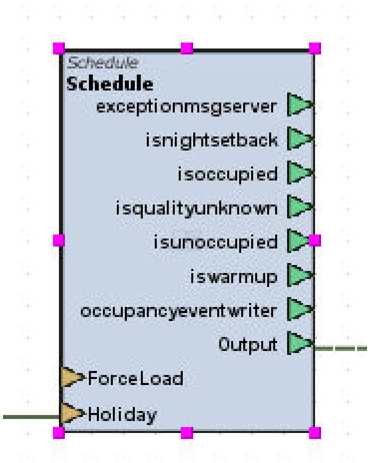
The element’s standard output uses the AAM traditional schedule approach, where:

- 0 = Unoccupied
- 1 = Warmup
- 2 = Occupied
- 3 = Night Setback

The Output pin can be linked to the Host Override (F900;HO) attribute of PUP devices, where as select Native Series devices utilize contain host override functionality within the Schedule object (Schedule;HO), and most Native BACnet devices with un-configured weekly-schedule and exception-schedules can receive this value at Schedule;schedule-default.

Unoccupied periods are calculated based upon time periods where an event is not “busy”.

The element also provides the ability to pass event data onto field-bus devices or other logic. When an event is created in an iCalendar, events are assigned a name. The name can be used to store a set point or other control value (e.g. at 14:00, Event Named 72.0).



CAUTION - Because .ics files can be large in size when events are recurring, the Schedule Load Interval should NEVER be smaller than your Timebase. For good practice, if your Schedule does not change often, AAM recommends programming the Schedule Load Interval to be longer than the default 60.0 seconds.

CAUTION - AAM recommends that a Matrix Area Controller contain no more than 10 Schedule elements. If your site requires additional scheduling past these 10, an Aspect Server-based product should be used on your site.

Standard Inputs

Pin	Notes
Force Load	Forces a load of .ical data from the server defined in Basic Properties configuration.
Holiday	Defines whether or not the Schedule/Calendar should be overridden and placed into Holiday mode.

Standard Outputs

Pin	Notes
Exception Msg Server	Outputs any error messages that may occur when loading or processing the calendar.
Is Night Setback	Outputs a binary logical value (0 = False, 1 = True) if the Schedule is currently in Night Setback mode.
Is Occupied	Outputs a binary logical value (0 = False, 1 = True) if the Schedule is currently in Occupied mode.
Is Quality Unknown	Outputs a status if the quality of the schedule cannot be resolved by Aspect.
Is Unoccupied	Outputs a binary logical value (0 = False, 1 = True) if the Schedule is currently in Unoccupied mode.
Is Warmup	Outputs a binary logical value (0 = False, 1 = True) if the Schedule is currently in Warmup mode.
Occupancy Event	Outputs the event value programmed within iCal-

Writer	endar.
Output	Outputs the following: 1. • 0 = Unoccupied • 1 = Warmup • 2 = Occupied • 3 = Night Setback

Basic Properties

Property Name	Notes
Night Setback Minutes	Defines the amount of time, in minutes, before/after "busy" time that the Schedule enters Night Setback mode. Before/After is determined based on the configuration of the Night Setback transition property.
Schedule Load Interval	Defines how often, in seconds) the element will load iCalendar information (from a .ics file) from the defined WebDAV server path.
Timebase	Defines how often, in seconds, the element will read the loaded iCalendar information to determine the current schedule status.
Warm-up Minutes	Defines the amount of time, in minutes, before "busy" time that the Schedule enters Warm-up mode.
WebDAV Password	Specifies the password for accessing iCalendar information from the WebDAV URL
WebDAV Username	Specifies the Username for accessing iCalendar information from the WebDAV URL
WebDAV URL	Specifies the WebDAV URL location of the iCalendar information.

Expert Properties

Property Name	Notes
Debug Level	Defines the level for viewing debug messages through the local console or the Aspect Control Engine log on a target. • A value greater than 25 will cause iCalendar load times to be displayed. • A value greater than 50 will cause iCalendar

	load times + load monitoring and filtering to be displayed. • A value greater than 75 will cause iCalendar load times + load monitoring and filtering + all Schedule parsing to be displayed. • A value greater than 100 will cause all information listed above, plus licensing details to be displayed.
Filter Free/Avail/Tentative	Defines if all free/available time periods within an iCalendar will be processed or not.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Holiday Status	Defines the Output value when the Holiday input pin receives a non-zero value.
Night Setback Color	Defines the color to be passed to color changing elements when the current schedule state is Night Setback.
Night Setback Transition	Defines if Night Setback should follow Unoccupied mode, or precede Unoccupied mode. In versions of Aspect prior to v1.05, Night Setback occurred immediately after Occupied mode. This mode is available for sites that have configured their scheduling routines in such a manner, or wish Night Setback to follow Occupied mode.
Occupied Color	Defines the color to be passed to color changing elements when the current schedule state in Occupied.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Timeout On Connection	Defines the Connection Timeout for iCal Calendar URL requests in milliseconds.
Timeout On Read	Defines the Read Timeout for iCal Calendar URL

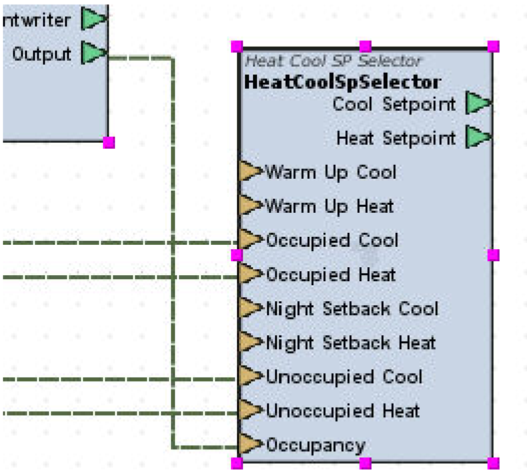
	requests in milliseconds.
Unoccupied Color	Defines the color to be passed to color changing elements when the current schedule state is Unoccupied.
Warm-up Color	Defines the color to be passed to color changing elements when the current schedule state is Warm-up.
Watch Dog Timeout	Defines the watchdog counter used by Aspect and its scheduling mechanism to determine if a failure in loading iCalendar information exceeds a certain time parameter (in seconds). If this time out is exceeded, the Aspect control engine will be restarted to prevent stalling of logic.

More Information

iCalendar Overview
Schedule Element Overview
Schedule Element Properties
Configuring an Exchange Calendar

Heat Cool Setpoint Selector

This element provides users with the ability to output a single Heating Setpoint or Cooling Setpoint based on Schedule status. Setpoints for each schedule period (Warmup, Occupied, Unoccupied, Night Setback) can be defined as either input connections or statically through Basic Properties configuration. The Occupancy input is commonly the output of the Schedule element, or other schedule mechanism following AAM's four-mode topology).



Standard Inputs

Pin	Notes
Warm Up Cool	Accepts a single input value and defines the warm up cooling setpoint.
Warm Up Heat	Accepts a single input value and defines the warm up heating setpoint.
Occupied Cool	Accepts a single input value and defines the occupied cooling setpoint.
Occupied Heat	Accepts a single input value and defines the occupied cooling setpoint.
Night Setback Cool	Accepts a single input value and defines the night setback cooling setpoint.
Night Setback Heat	Accepts a single input value and defines the night setback cooling setpoint.
Unoccupied Cool	Accepts a single input value and defines the unoccupied cooling setpoint.
Unoccupied Heat	Accepts a single input value and defines the unoccupied cooling setpoint.
Occupancy	Accepts a single input value and defines the current schedule mode. The following values will output the following setpoints: • 0 = Unoccupied setpoints • 1 = Warmup setpoints • 2 = Occupied setpoints • 3 = Night Setback setpoints

Standard Outputs

Pin	Notes
Cooling Setpoint	Outputs the effective cooling setpoint for the current schedule mode received by the Occupancy input.
Heating Setpoint	Outputs the effective heating setpoint for the current schedule mode received by the Occupancy input.

Basic Properties

Property Name	Notes
Warm Up Cool	Statically defines the warm up cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Warm Up Heat	Statically defines the warm up heating setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Occupied Cool	Statically defines the occupied cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Occupied Heat	Statically defines the occupied cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Night Setback Cool	Statically defines the night setback cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Night Setback Heat	Statically defines the night setback cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Unoccupied Cool	Statically defines the unoccupied cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Unoccupied Heat	Statically defines the unoccupied cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this

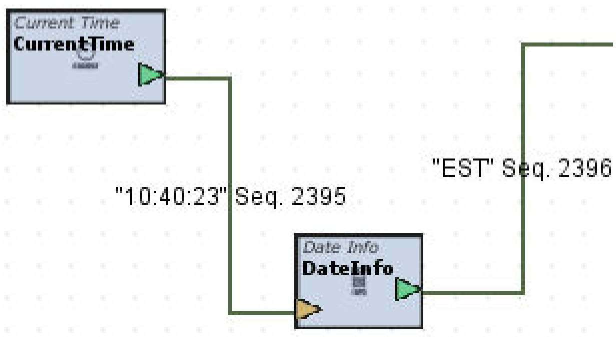
	property.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Date Info

Outputs specific information or sliced information regarding the current time and date. For example, this element can be used to output the current day in numeric form. Several options for output are available by configuring the Format Info property. The functionality of this element requires a Current Time element to be used as the input.



Standard Inputs

Pin	Notes
Input	Accepts a single input value of a time or date. Common applications would involve the use of the Current Time element, but times derived from other sources such as databases are also valid.

Standard Outputs

Pin	Notes
Output	Outputs the result based on configuration of Basic Properties.

Basic Properties

Property Name	Notes
Format Info	Defines the date information to be outputted. Options include: • Local Time - The current time • Year(4) - The current four-digit year • Month(#) - The current month digit • Day of Month - The current day digit • Hour(24) - Hours in time in military format • Minute - Minutes in current time. • Seconds - Seconds in current time • Year(2) - The current two digit year • Month (3) - The current month in three character abbreviation • Month - The name of the current month

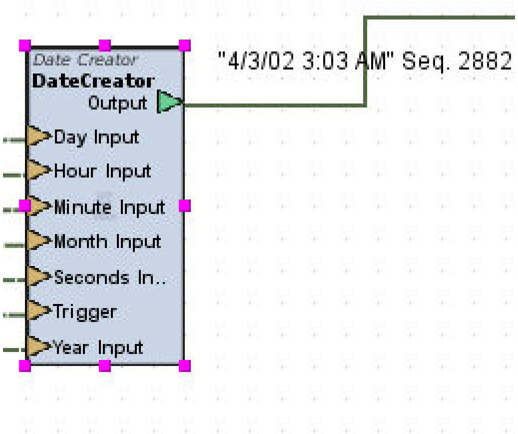
	- Day of Week (3) - The current day of the week in three character abbreviation - Day of Week - The current day of the week - Day of Week (#) The current day of week by enumeration. - Hour(12) - Hours in time in standard format - AM/PM - AM or PM time mode - Milliseconds - The current milliseconds in time - Timezone - The current

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. - Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. - Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. - Never Auto-Suspend - the element will execute its logic on a continual basis. - Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Date Creator

Provides a method to build and create date information based on numeric information from field-bus protocols such as Modbus.



Standard Inputs

Pin	Notes
Day Input	Accepts a single numeric value indicating the day of the month.
Hour Input	Accepts a single numeric value indicating hours of time.
Minute Input	Accepts a single numeric value indicating minutes of time.
Month Input	Accepts a single numeric value indicating the month of year.
Seconds Input	Accepts a single numeric value indicating seconds of time.
Trigger	Accepts any value, which updated the Output to send the latest created date.
Year Input	Accepts a single numeric value indicating the year of date.

Standard Outputs

Pin	Notes
Output	Outputs the result of the date creator.

Basic Properties

Property Name	Notes
January is One	Defines if a value of 1 send to the Month Input indicates January. When set for False, a value of 0 will indicate January. When set for True, a value of 1 will indicate January.

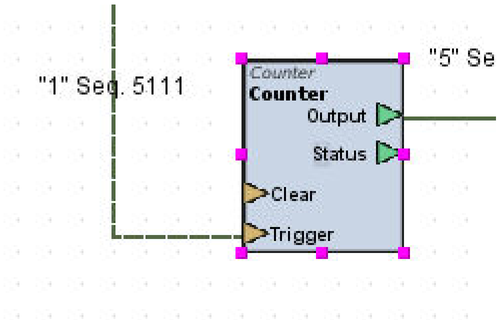
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Counter

Used to perform logical counting for logical applications (either up or down). The element includes minimum and maximum boundaries for counting, as well as start value, increment amount, and the ability to auto-reset counting.

Counting action occurs when the trigger input receives a value change of any type (boolean, numeric, etc..)



Standard Inputs

Pin	Notes
Clear	Clears the counter output back to the Start Value defined in Basic Properties.
Trigger	Accepts any trigger input. When a value change is received, the output will count up or down based on configuration of Basic Properties.

Standard Outputs

Pin	Notes
Output	Outputs the current count value.
Status	Outputs the current status of the counter. When the counter has run to its maximum value, a status value of 1 will indicate a true condition, else a value of 0 will indicate a false condition that counting has yet to expire.

Basic Properties

Property Name	Notes
Auto Reset?	Defines if the counter should automatically reset once the value reaches the maximum defines value.
Count Up?	Defines whether the counter should count up or count down.
Increment Amount	Defines the value amount to count up or down.
Maximum	Defines the maximum value the count will not exceed.
Minimum	Defines the minimum value the count will not exceed.
Start Value	Defines the count value when the counter is first triggered.

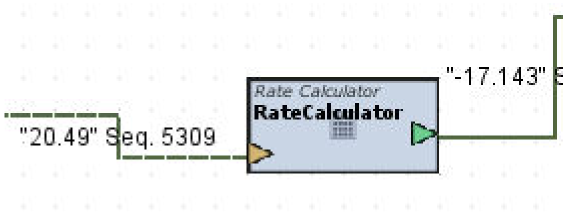
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property

Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

 *Rate Calculator*

Used to calculate processing rates for PLC. This element is typically not used in HVAC, but necessary for standard work rate calculation in PLC environments that Modbus may connect to.



Standard Inputs

Pin	Notes
Input	Accepts a single numeric value for rate process calculation.

Standard Outputs

Pin	Notes
Output	Outputs the result of the rate calculation.

Basic Properties

No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements

	that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Long to Date

Used to convert a date stored in a long data type and convert it to a formal date value.

Standard Inputs

Pin	Notes
Input	Accepts a long data value for calculation, which can be in the form of EPOCH or generic data type access.

Standard Outputs

Pin	Notes
Output	Outputs the calculated Date.

Basic Properties

Property Name	Notes
Multiplier	Defines an added multiplier to offset the time calculation against.
Offset	Defines an offset post multiplication to offset the time against.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will

	execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

2L *Date to Long*

Converts traditional date information to a Long value.

Standard Inputs

Pin	Notes
Input	Accepts a time/date input value.

Standard Outputs

Pin	Notes
Output	Outputs the long data type form of the date inputted.

Basic Properties

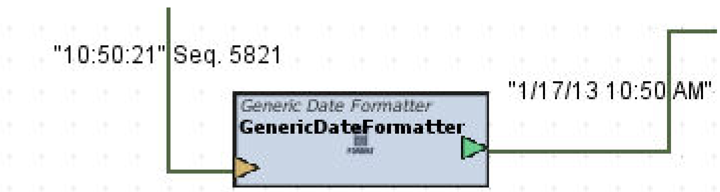
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

F *Generic Date Formatter*

Used to display dates in different system formats through use of the Format Info property. By default, LOCAL will output the current date and time in Java “Simple Date Format” to match the viewer’s region. Other token formats can be combined to format the display as needed.



Standard Inputs

Pin	Notes
Input	Accepts a time/date value.

Standard Outputs

Pin	Notes
Output	Outputs the reformatted date for LOCAL.

Basic Properties

<table>
<tr><th>Property Name</th><th>Notes</th></tr>
<tr><td>Format Info</td><td>Defines the format in which to process the Date/Time information. The following Letters can be used in any combination with any other letters. However, LOCAL cannot be used with other formats.
<table>
<tr><th>Letter</th><th>Description</th><th>Examples</th></tr>
<tr><td>G</td><td>Era designator</td><td>AD</td></tr>
<tr><td>y, yyyy</td><td>Year</td><td>96,1996</td></tr>
<tr><td>M,MMM,MMMM</td><td>Month in year</td><td>7, Jul, July</td></tr>
<tr><td>w</td><td>Week in year</td><td>27</td></tr>
<tr><td>W</td><td>Week in month</td><td>2</td></tr>
<tr><td>D</td><td>Day in year</td><td>189</td></tr>
<tr><td>d</td><td>Day in month</td><td>10</td></tr>
<tr><td>F</td><td>Day of week in month</td><td>2</td></tr>
<tr><td>E, EEEE</td><td>Day in week</td><td>Tue, Tuesday</td></tr>
<tr><td>a</td><td>AM/PM Marker</td><td>PM</td></tr>
<tr><td>H</td><td>Hour in day (0-23)</td><td>0</td></tr>
<tr><td>k</td><td>Hour in day (1-24)</td><td>24</td></tr>
<tr><td>K</td><td>Hour in am/pm (0-11)</td><td>0</td></tr>
<tr><td>h</td><td>Hour in am/pm</td><td>12</td></tr>
</table></td></tr>
</table>

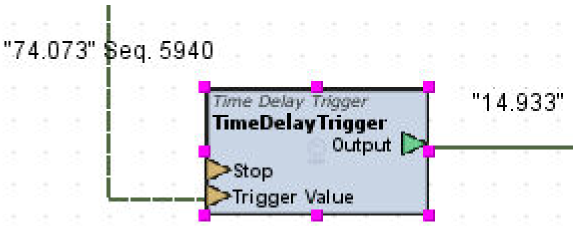
	(1-12)	
m	Minute in hour	30
s	Second in minute	55
S	Millisecond	978
z,zzzz	Time zone	PST, Pacific Standard Time
Z	Time zone	-800
LOCAL	Local Time	12/25/2020 12:00 AM

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Time Delay Trigger

Used to write a value with an inherent time delay. For example, if my Trigger Value updates, the time delay will then execute. Once expired, Trigger Value's input value will be outputted. An input pin is available to programmatically stop the time delay from expiring.



Standard Inputs

Pin	Notes
Stop	Accepts a logical boolean value. When a logical true value (1) is received during a time delay, no output will occur.
Trigger Value	Accepts any input type, and is outputted once the time delay defined in Basic Properties has expired.

Standard Outputs

Pin	Notes
Output	Outputs the delayed value.

Basic Properties

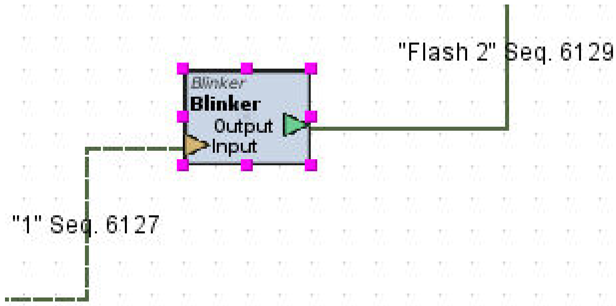
Property Name	Notes
Time Delay	Defines the amount of time, in seconds, that must elapse before the input value is passed to the output.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

 *Blinker*

Outputs two different values on a timebase and is driven by a trigger method. When the trigger input is true (1), the output will variate between the property values defined for Flashing Value One and Flashing Value Two. The rate of variation is determined by the configured Timebase.



Standard Inputs

Pin	Notes
Input	Accepts any logical binary value. When a true value has been received, the output of the Blinker will flash between the values defined in Basic Properties.

Standard Outputs

Pin	Notes
Output	Outputs action based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Flashing Value One	Defines the first value to variate.
Flashing Value Two	Defines the second value to variate.
Timebase	Defines the rate of variation, in seconds, between Flashing Value One and Flashing Value Two.
Value for Off	Defines the output value when the trigger input if false (0).

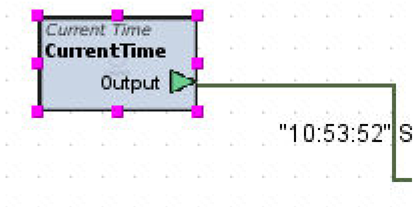
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

	• Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Current Time

Used to output the current system time, as well as provide a base foundation for use with other date formatters from the Time Rate category.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs the target's current system time.

Basic Properties

Pin	Notes
Timebase	Defines the amount of time, in seconds, that a value refresh will be sent.

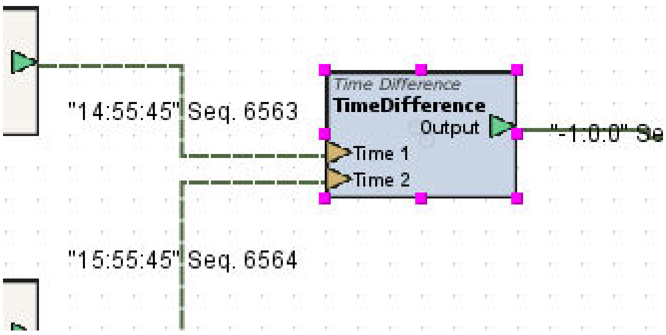
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Fire Late?	Defines if the element should begin execution after Aspect has fully started. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Initial Quality	Defines the quality of data when sent.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value

	Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Timebase	Defines how often, in seconds, the element will execute and update its value.
Value Color	Defines the color to send onto color receiving elements.

Time Difference

Outputs the difference between two time values.



Standard Inputs

Pin	Notes
Time 1	Accepts a time formatted as a string data type.
Time 2	Accepts a time formatted as a string data type.

Standard Outputs

Pin	Notes
Output	Outputs the difference in time between Time 1 and Time 2.

Basic Properties

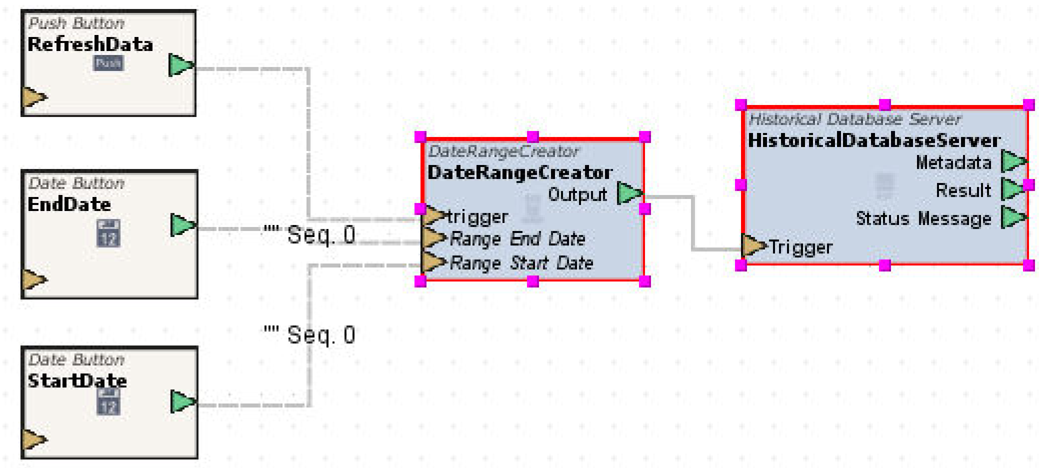
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Date Range Creator

Creates a date-based range for reporting and filtering. The Date Range Creator is commonly used in conjunction with the Historical Database Server element to retrieve trend data on a date range basis. The output of the Date Range Creator is commonly connected to the Trigger input of the Historical Database Server   This method of connection both delivers the date range filter, as well as the trigger action to retrieve the data from the connected database. The element can be pre-configured for a specific range, or can have its Range Start Date and Range End Date properties modified using a Date Button for each.



Standard Inputs

Pin	Notes
Trigger	Accepts any logical binary value. When a true value has been received, the output of the element will generate a date range that can be passed onto a Historical Database Server element.

NOTE - For optimal applications, the Range Start Date and Range End Date are commonly exposed using the Expose Property feature. For information regarding these two properties, reference the Basic Properties section below.

Standard Outputs

Pin	Notes
Output	Outputs a generated date range.

Basic Properties

Property Name	Notes
Range End Date	Defines the ending date (and time) of the date range.
Range Start Date	Defines the starting date (and time) of the date

	range.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

More Information

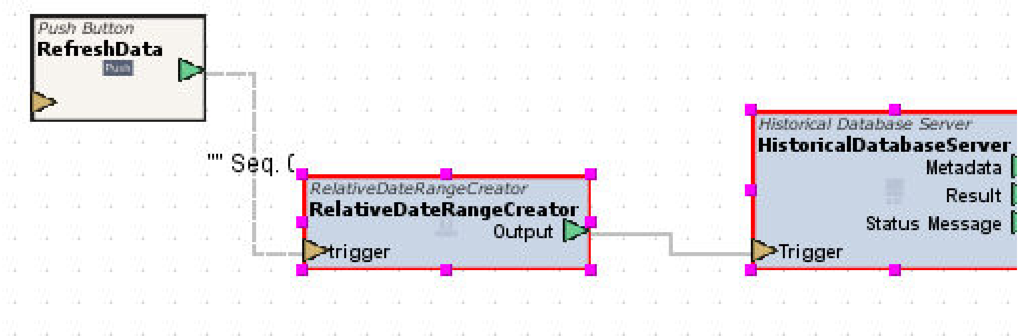
Configuring the Historical Database Server

Triggering the Historical Database Server

Relative Date Range Creator

Used to filter historic data by a specific time range, or by a "Nth" range basis. The Relative Date Range Creator is commonly used in conjunction with the Historical Database Server element to retrieve trend data on a date range basis. The output of the Relative Date Range Creator is commonly connected to the Trigger input of the Historical Database Server

The element can be pre-configured for a specific relative range which changes based on a specific time period, or can be modified via Design graphics.



The Range Type provides the ability to retrieve data with the Historical Database Server element by specific time periods, such as the following cases:

- Today - returns logged information for the current day.
- This Week - returns logged information based on the current calendar week.
- This Month - returns logged information based on the current calendar month.
- This Year - returns logged information based on the current calendar year.
- Yesterday - returns logged information from the prior day.
- Last Week - returns logged information from the prior calendar week.
- Last Month - returns logged information from the prior calendar month.
- Last Year - returns logged information from the prior calendar year.

The element also supports the ability to programmatically retrieve data from previous events based on specifying a valid value in the nth Value property.

For example, if today is November 8th, and you wish to see information from two days ago, configure nth Value = nth Days Ago, and nTh value = 2 to see information from November 6th.

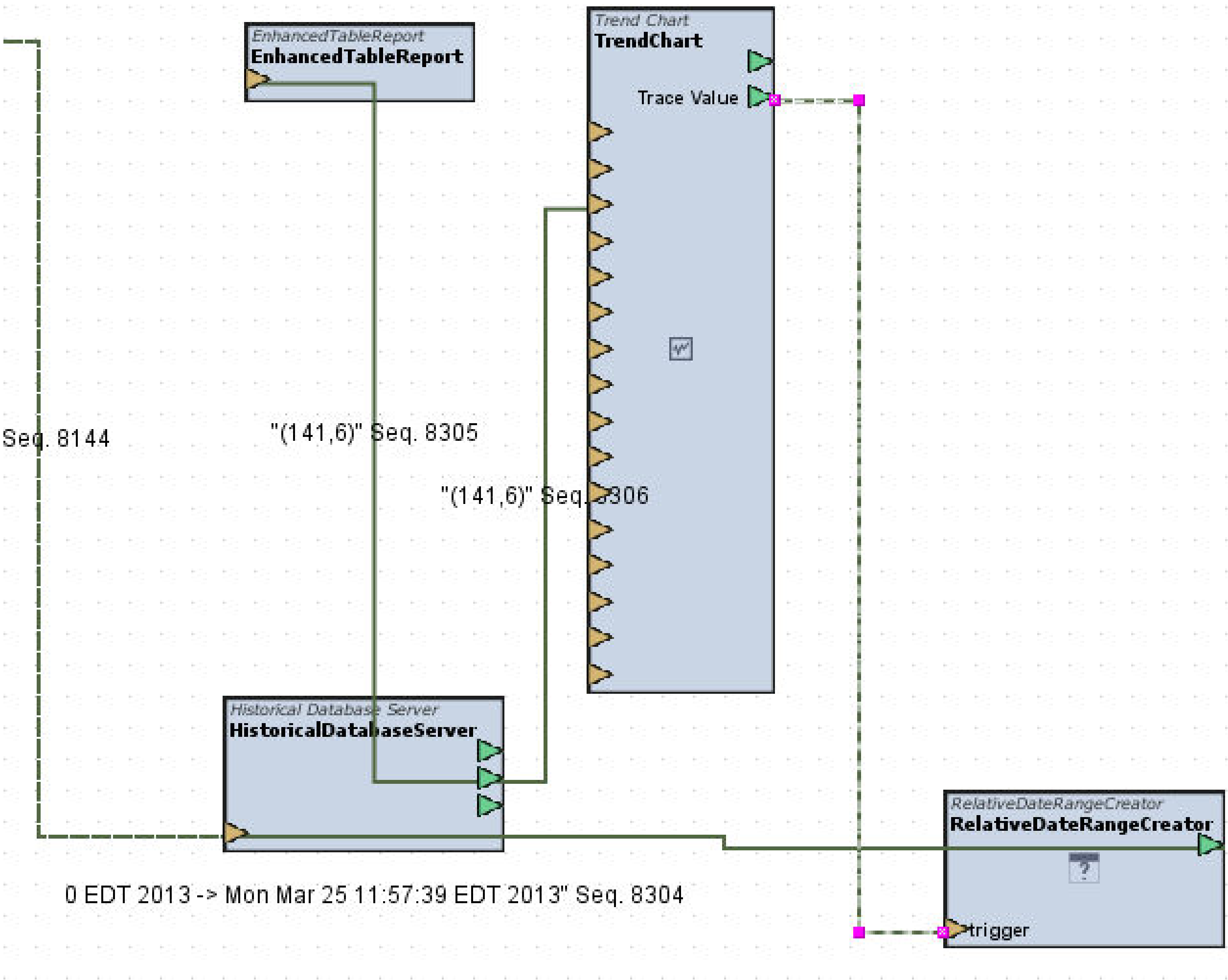
- nth Day Ago - returns logged information from nth days ago (based on nth value property configuration)
- nth Week Ago - returns logged information from nth weeks ago (based on nth value property configuration)

- nth Month Ago - returns logged information from nth months ago (based on nth value property configuration)
- nth Year Ago - returns logged information from nth years ago (based on nth value property configuration)

The element support the ability to receive a trigger output from a configured Trend Chart element. The Trend Chart element contains a Trace Value output. When the output is connected to the trigger input of the Relative Date Range Creator, the creator can receive a specific date/time stamp to retrieve data from. If you wish to retrieve data prior to the trigger value, ensure that the Range Before Trigger property is set to True. When set to false, information will be retrieved from data proceeding. Information returnable includes:

- Days from Trigger - returns information from a specific number of days before/after based on nTh Value property configuration, Range Before Trigger property configuration, as well as the value received by the Trend Chart's Trace Value output pin.
- Weeks from Trigger - returns information from a specific number of weeks before/after based on nTh Value property configuration, Range Before Trigger property configuration, as well as the value received by the Trend Chart's Trace Value output pin.
- Months from Trigger - returns information from a specific number of months before/after based on nTh Value property configuration, Range Before Trigger property configuration, as well as the value received by the Trend Chart's Trace Value output pin.
- Years from Trigger - returns information from a specific number of years before/after based on nTh Value property configuration, Range Before Trigger property configuration, as well as the value received by the Trend Chart's Trace Value output pin.

The following displays a Diagram Logic example of how this may be performed and configured.



Standard Inputs

Pin	Notes
Trigger	Accepts any logical binary value. When a true value has been received, the output of the element will generate a date range that can be passed onto a Historical Database Server element.

NOTE - For optimal applications, many Basic Properties may be exposed for this application. Please reference the Basic Properties section below.

Standard Outputs

Pin	Notes
Output	Outputs a relative range based on Basic Prop-

	erties configuration.

Basic Properties

Property Name	Notes
nth Value	Defines a numeric value to apply against a select "nth' range from Range Type property configuration. This value is ignored for non "nth" range types.
Range Before Trigger?	Defines if information from the database should be returned based on time before the trigger received, or after. When True, data before the trigger date will be returned (and includes current period information). When False, data after the trigger date will be returned (and includes current period information).
Range Type	Defines a specific range period type. Choices include: • Today (enumeration = 0) • This Week (enumeration = 1) • This Month (enumeration = 2) • This Year (enumeration = 3) • Yesterday (enumeration = 100) • Last Week (enumeration = 101) • Last Month (enumeration = 102) • Last Year (enumeration = 103) • nth Day Ago (enumeration = 200) • nth Week Ago (enumeration = 201) • nth Month Ago (enumeration = 202) • nth Year Ago (enumeration = 203) • Days from Trigger (enumeration = 300) • Weeks from Trigger (enumeration = 301) • Months from Trigger (enumeration = 302) • Years from Trigger (enumeration = 303)

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

	• Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

More Information

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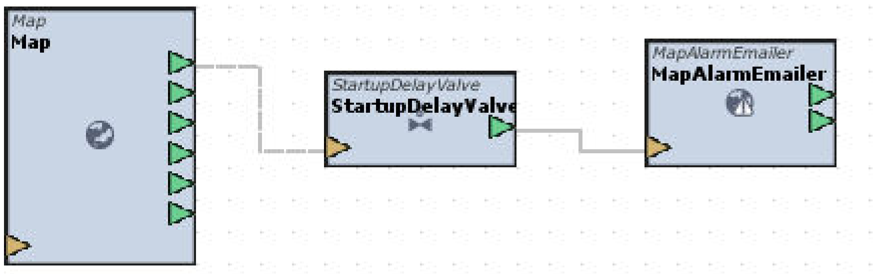
Startup Delay Valve

The Startup Delay Valve provides a mechanism to gate a value until a predetermined amount of time passes after the Aspect Control Engine starts. That is, it will prevent values passing through while the engine is starting and allow values after the timer has expired. It provides a simple way to do on/off data flow control while your project starts.



Standard Inputs

Pin	Notes
Input	Accepts a single data value.

Standard Outputs

Pin	Notes
Output	Outputs the commanded gated value only after the startup timer expires.

Basic Properties

Property Name	Notes
Valve Open Delay	Defines the amount of time in seconds which the valve will remain closed durring startup.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis.

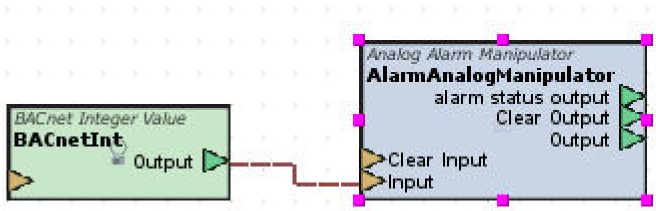
	• Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Alarming

Analog Alarm Manipulator

Monitors numeric values for alarm conditions. An input value is considered to be in alarm whenever the value is within the Bottom of Band and Top of Band properties. The occurrence of an alarm is registered whenever the input value enters this band.

A generic output is provided to inform users of the value that triggered the alarm condition. An alarm status output provides a boolean status of whether the condition is normal (0) or in alarm (1).



Standard Inputs

Pin	Notes
Clear Input	Clears the current input value for arrival of a new monitored value.
Input	Accepts any numeric value for alarm criteria check.

Standard Outputs

Pin	Notes
Alarm Status Output	Outputs a numeric condition of the current alarm state where: • 0 = Normal • 1 = In Alarm
Clear Output	Currently provides no feature capability and is reserved for future functionality.
Output	Outputs the current value received by the Input that generated an alarm condition.

Basic Properties

Property Name	Notes
Alarm Manager Name	Defines a configured Alarm Manager that the alarm will be routed to.
Alarm on Invalid Number	Defines whether alarm conditions should be considered for invalid numbers (such as garbage information).
Bottom of Band	Defines the bottom of the alarm band threshold.
Clear on Return	Defines if an alarm should be cleared if it returns from an alarm state to normal.
Description	Defines a string description that is inserted into the Alarm Manager database.
Formatter	Defines the appearance of values are they are inserted into the Alarm Manager's database.
Good Quality Only ?	Defines if the element accepts only value objects that have good quality.
Priority	Defines a priority for the alarm.
Remove Cleared Alarms	Defines whether or not the alarm can be automatically removed from display if the Alarm Manager is configured to not show Clear Alarms.
Timebase	Defines the amount of time, in seconds, to check for alarms.
Top of Band	Defines the top of the alarm band threshold.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

More Information

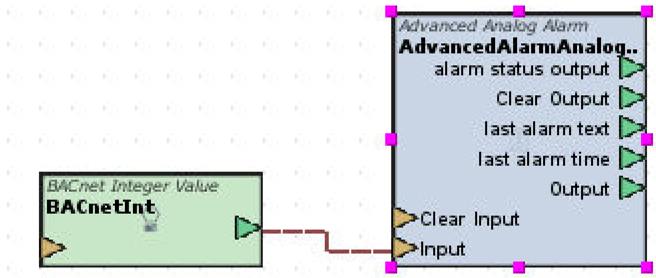
Alarming Overview

About Alarm Manipulators

Advanced Analog Alarm Manipulator

Monitors numeric values for alarm conditions. An input value is considered to be in alarm whenever the value is within the Bottom of Band and Top of Band properties. The occurrence of an alarm is registered whenever the input value enters this band. Also provides different alarm applications include Low Limit, High Limit, and Threshold Alarming (Low and High Limit Alarming).

A generic output is provided to inform users of the value that triggered the alarm condition. An alarm status output provides a status of whether the condition is normal (0), in alarm (1), delay entry(2), and delay exit(3). Other outputs provide also include last alarm text, last alarm time, and others to assist with e-mailing alarms.



Standard Inputs

Pin	Notes
Clear Input	Clears the current input value for arrival of a new monitored value.
Input	Accepts any numeric value for alarm criteria check.

Standard Outputs

Pin	Notes
Alarm Status Output	Outputs a numeric condition of the current alarm state where: 1. • 0 = Normal • 1 = In Alarm • 2 = Delay Entry • 3 = Delay Exit
Clear Output	Currently provides no feature capability and is reserved for future functionality.
Last Alarm Text	Outputs the last alarm text message generated by the element based on Basic Properties configuration.
Last Alarm Time	Outputs the last time when an alarm occurred.
Output	Outputs the current value received by the Input that generated an alarm condition.

Basic Properties

Property Name	Notes
Alarm Manager Name	Defines a configured Alarm Manager that the alarm will be routed to.
Alarm On Invalid Number	Defines whether alarm conditions should be considered for invalid numbers (such as garbage information).
Alarm Type	Defines the alarm application, encompassing: • High Limit (1) • Low Limit (2) • In Range (3) • Out of Range (4)
Bottom of Band	Defines the bottom of the alarm band threshold.
Clear On Return	Defines if an alarm should be cleared if it returns from an alarm state to normal.
Control Only?	Defines if the alarm element will be used to perform database reporting of events, or if the alarm element will be used for control purposes (such as a generic TSTAT, or logic-based alarm monitor). When set for True, no event information will be logged to a connected database, nor is a valid Alarm Manager Name required for control.
Deadband Bottom	Defines the alarm deadband for bottom limit alarms. The alarm manipulator will come out of alarm when the value crosses theBottom of Band + or -
Deadband Top	Defines the alarm deadband for bottom limit alarms. The alarm manipulator will come out of alarm when the value crosses theTop of Band + or -
Description	Defines a string description that is inserted into the Alarm Manager database.
Formatter	Defines the appearance of values are they are inserted into the Alarm Manager's database.
Good Quality Only ?	Defines if the element accepts only value objects that have good quality.
Priority	Defines a priority for the alarm.
Remove Cleared Alarms	Defines whether or not the alarm can be automatically removed from display if the Alarm Man-

	ager is configured to not show Clear Alarms.
Time Delay Entry	Defines the amount of time, in seconds, the alarm must be in condition before an entry is routed to the Alarm Manager.
Time Delay Exit	Defines the amount of time, in seconds, the alarm must be out of condition before an entry is routed to the Alarm Manager.
Timebase	Defines the amount of time, in seconds, to check for alarms.
Top of Band	Defines the top of the alarm band threshold.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Status Colors	Defines if sending colors defined in Status Color Alarm, Status Color Entry Dly, Status Color Exit
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Status Color Alarm	Defines the color sent to the Alarm Status Output pin when the element is in Alarm mode.
Status Color Entry Dly	Defines the color sent to the Alarm Status Output pin when the element is in Entry Delay mode.
Status Color Exit Dly	Defines the color sent to the Alarm Status Output pin when the element is in Entry Delay mode.
Status Color Normal	Defines the color sent to the Alarm Status Output pin when the element is in Normal mode.
Status Qual from DB	Defines the status quality that should be outputted if the database connection is degraded.

More Information

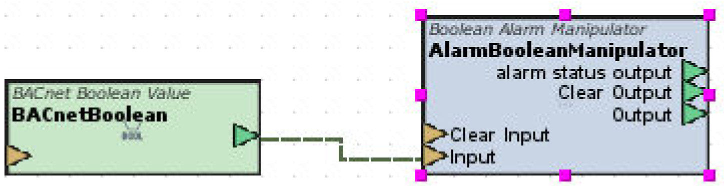
Alarming Overview

About Alarm Manipulators

Boolean Alarm Manipulator

Monitors values for boolean alarm conditions (true/false-based) values for alarm conditions. An input value is considered to be in alarm based on the Alarm High property. If Alarm High is set to true, a value of 1 will be considered as in alarm. If Alarm High is set to false, a value of 0 will be considered as in alarm.

A generic output is provided to inform users of the value that triggered the alarm condition. An alarm status output provides a boolean status of whether the condition is normal (0) or in alarm (1).



Standard Inputs

Pin	Notes
Clear Input	Clears the current input value for arrival of a new monitored value.
Input	Accepts any logical boolean value (0 or 1) for alarm criteria check.

Standard Outputs

Pin	Notes
Alarm Status Output	Outputs a numeric condition of the current alarm state where: • 0 = Normal • 1 = In Alarm
Clear Output	Currently provides no feature capability and is reserved for future functionality.
Output	Outputs the current value received by the Input that generated an alarm condition.

Basic Properties

Property Name	Notes
Alarm High	Defines in an alarm should be generated if the input value is true (1).
Alarm Manager Name	Defines a configured Alarm Manager that the alarm will be routed to.
Clear on Return	Defines if an alarm should be cleared if it returns from an alarm state to normal.
Description	Defines a string description that is inserted into the Alarm Manager database.
Good Quality Only ?	Defines if the element accepts only value objects that have good quality.
High Name	Defines a name for true-based values that is inserted into the Alarm Manger's database.
Low Name	Defines a name for false-based values that is inserted into the Alarm Manager's database.
Priority	Defines a priority for the alarm.
Remove Cleared Alarms	Defines whether or not the alarm can be automatically removed from display if the Alarm Manager is configured to not show Clear Alarms.
Timebase	Defines the amount of time, in seconds, to check for alarms.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

More Information

[Alarming Overview]

[About Alarm Manipulators]

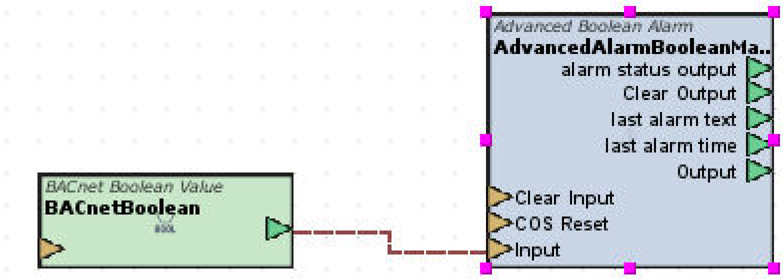
Advanced Boolean Alarm Manipulator

This element provides advanced alarm monitoring for boolean type data. The Alarm Type property, when set, determines the input value that will trigger an alarm or event. If set to "On", then a non-zero value (typically a value of 1) will trigger an alarm. If set to "Off", a zero value will trigger an alarm. If set to "Change of State", then a change of any value will trigger an alarm.

This alarm manipulator also supports change of state alarming. After initial start/reboot/deployment, going from a null state to the current state will NOT trigger a Change of State Alarm. The next change of state received after the first initialization will trigger an alarm. No further change of state alarm/event notifications will occur until the COS Reset input pin receives a trigger.

If you want to alarm on every change of state, you can tie the input and the change of state reset to the same source through use of the Manage Connections feature. When doing this, you must make sure to order the trigger so that it fires the input first and the COS Reset second.

A generic output is provided to inform users of the value that triggered the alarm condition. An alarm status output provides a status of whether the condition is normal (0), in alarm (1), delay entry(2), and delay exit(3). Other outputs provide also include last alarm text, last alarm time, and others to assist with e-mailing alarms.



Standard Inputs

Pin	Notes
Clear Input	Clears the current input value for arrival of a new monitored value.
COS Reset	Accepts a trigger input to clear Change of State alarm events.
Input	Accepts any logical boolean value (0 or 1) for alarm criteria check.

Standard Outputs

Pin	Notes

Alarm Status Output	• Outputs a numeric condition of the current alarm state where: • 0 = Normal • 1 = In Alarm • 2 = Delay Entry • 3 = Delay Exit
Clear Output	Currently provides no feature capability and is reserved for future functionality.
Last Alarm Text	Outputs the last alarm text message generated by the element based on Basic Properties configuration.
Last Alarm Time	Outputs the last time when an alarm occurred.
Output	Outputs the current value received by the Input that generated an alarm condition.

Basic Properties

Property Name	Notes
Alarm Manager Name	Defines a configured Alarm Manager that the alarm will be routed to.
Alarm On Invalid Number	Defines whether alarm conditions should be considered for invalid numbers (such as garbage information).
Alarm Type	Defines the alarm application, encompassing: • On • Off • Change of State
Clear On Return	Defines if an alarm should be cleared if it returns from an alarm state to normal.
Control Only?	Defines if the alarm element will be used to perform database reporting of events, or if the alarm element will be used for control purposes (such as a generic boolean monitor, or logic-based alarm monitor). When set for True, no event information will be logged to a connected database, nor is a valid Alarm Manager Name required for control.
COS Reset	Displays the current enumerated value of the COS Input pin.
Description	Defines a string description that is inserted into

	the Alarm Manager database.
Formatter	Defines the appearance of values are they are inserted into the Alarm Manager's database.
Good Quality Only ?	Defines if the element accepts only value objects that have good quality.
High Name	Defines a name for true-based values that is inserted into the Alarm Manger's database.
Low Name	Defines a name for false-based values that is inserted into the Alarm Manager's database.
Priority	Defines a priority for the alarm.
Remove Cleared Alarms	Defines whether or not the alarm can be automatically removed from display if the Alarm Manager is configured to not show Clear Alarms.
Time Delay Entry	Defines the amount of time, in seconds, the alarm must be in condition before an entry is routed to the Alarm Manager.
Time Delay Exit	Defines the amount of time, in seconds, the alarm must be out of condition before an entry is routed to the Alarm Manager.
Timebase	Defines the amount of time, in seconds, to check for alarms.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.

Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Status Colors	Defines if sending colors defined in Status Color Alarm, Status Color Entry Dly, Status Color Exit
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Status Color Alarm	Defines the color sent to the Alarm Stauts Output pin when the element is in Alarm mode.
Status Color Entry Dly	Defines the color sent to the Alarm Status Output pin when the element is in Entry Delay mode.
Status Color Exit Dly	Defines the color sent to the Alarm Status Output pin when the element is in Entry Delay mode.
Status Color Normal	Defines the color sent to the Alarm Status Output pin when the element is in Normal mode.
Status Qual from DB	Defines the status quality that should be outputted if the database connection is degraded.

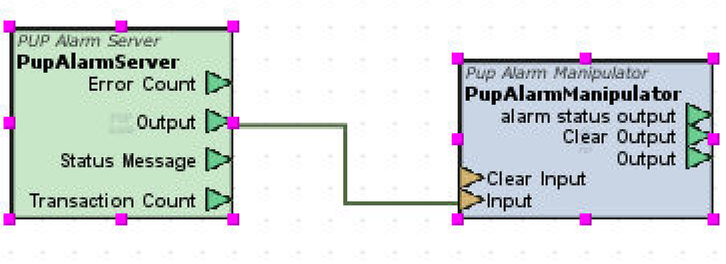
More Information

[Alarming Overview]

[About Alarm Manipulators]

PUP Alarm Manipulator

Used to deliver alarms polled from a PUP network to a PUP Alarm Manager and ultimately to the alarm database.



Standard Inputs

Pin	Notes
Clear Input	Clears the current input value for arrival of a new monitored value.
Input	Accepts connections from the Output of the PUP Alarm Server element.

Standard Outputs

Pin	Notes
Alarm Status Output	Outputs a numeric condition of the current alarm state where: • 0 = Normal • 1 = In Alarm
Clear Output	Currently provides no feature capability and is reserved for future functionality.
Output	Outputs the current value received by the Input that generated an alarm condition.

Basic Properties

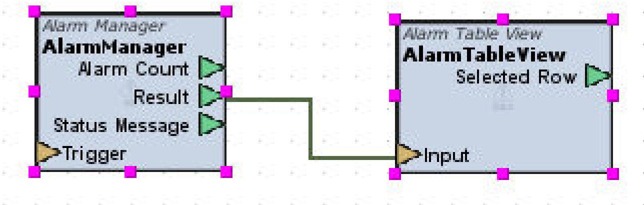
Property Name	Notes
Alarm Manager Name	Defines a configured Alarm Manager that the alarm will be routed to.
Clear on Return	Defines if an alarm should be cleared if it returns from an alarm state to normal.
Description	Defines a string description that is inserted into the Alarm Manager database.
Good Quality Only ?	Defines if the element accepts only value objects that have good quality.
Priority	Defines a priority for the alarm.
Remove Cleared Alarms	Defines whether or not the alarm can be automatically removed from display if the Alarm Manager is configured to not show Clear Alarms.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Alarm Manager

Used to categorize and route alarms to implemented alarm tables. Also is used to route and store alarms to a connected database.



Standard Inputs

Pin	Notes
Trigger	Accepts any trigger based value. When triggered, the Alarm Manager will output the latest alarm information from the database to the Table Output.

Standard Outputs

Pin	Notes
Alarm Count	Outputs the current count of active alarms
Result	Outputs all alarm database information to the Alarm Table View widget's Input.
Status Message	Provides diagnostic feedback for troubleshooting purposes.

Basic Properties

Property Name	Notes
Cause Code Filter	Defines PUP cause codes that should be omitted from the database.
Channel Filter	Defines PUP channels that should be omitted from the database.
Connection Name	Defines a configured database connection where alarms will be routed and stored.
Create Table	Defines if a table should be created in the event that one is not present.
Device Filter	Defines PUP Devices by Unit ID that should be omitted from the database.
Exception Class Filter	Defines PUP Exception Classes that should be omitted from the database.
Maximum Rows on Select	Defines the maximum amount of rows to display on a table output.
Show Acked	Defines whether or not acknowledged alarms should be displayed as part of the table output.
Show Clear	Defines whether or not cleared alarms should be displayed as part of the table output.
Show Cleared By	Defines whether or not cleared by device alarms

Device	should be displayed as part of the table output.
Table Name	Defines the table name for alarm storage in the connected database. NOTE - When assigning a Table Name, it is important to ensure that you exclude the use of any special characters (such as hyphens, plus, minus, and other wild card characters). Having these as part of a table name can cause reporting and read/write errors when deployed.

Expert Properties

Property Name	Notes
Always Live?	Defines if the Alarm Manager will stay live regardless of being in SIM/Live mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if database information regarding routed alarms should be reported to the Aspect Control Engine Log or local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 255.
Synchronize Connection	Defines if the database connection should be synchronized.
Throw on Null Response	Defines whether or not the Status Message pin will indicate an error if no data is read from the database

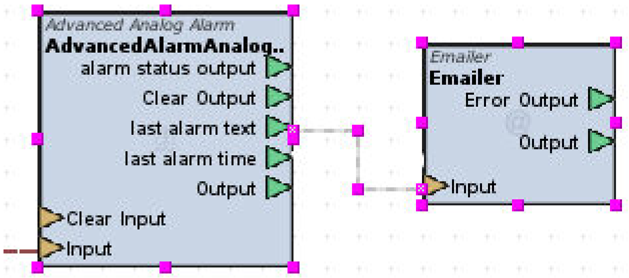
More Information

[Alarming Overview]

[About Alarm Managers]

Emailer

Used to e-mail values changes that are inputted into the input trigger property. This element is primarily used to e-mail alarm information to users, but can be implemented in other ways to e-mail additional data from Aspect to users of the building automation system.



Standard Inputs

Pin	Notes
Input	Accepts any generated value within Aspect. Any value update received by this pin will generate an e-mail to recipients.

Standard Outputs

Pin	Notes
Error Output	Outputs diagnostic details regarding send failures from the connected e-mail server.
Output	Outputs data quality for graphical user interface

	monitoring.

Basic Properties

Property Name	Notes
Date Formatter	Defines the format for date information included within mail messages.
From Address	Defines the from-address for the e-mail account.
Mail as Attachment	Defines if messages should be sent as attachments.
Message	Defines a message to append in the body of the e-mail message.
Password	Defines the password for mail server authentication.
Port	Defines the TCP port that is used to communicate to the SMTP Host. The default value is 25, but could be different based on your e-mail provider. Please contact your provider for assistance with port addressing. Gmail uses port 587.
Send Date?	Defines if the current date should be included in the body of the e-mail message.
Send Properties?	Defines if property information should be included in the body of the e-mail message.
Send Tag?	Defines if property information should be included in the body of the e-mail message.
Send Value?	Defines if the current value that triggered the alarm should be included in the body of the e-mail message.
SMTP Host	Defines the SMTP server address.
Subject	Defines subject text for the e-mail message.
To Address	Defines whom the e-mail should be sent to.
User Name	Defines the user name for mail server authentication.

Expert Properties

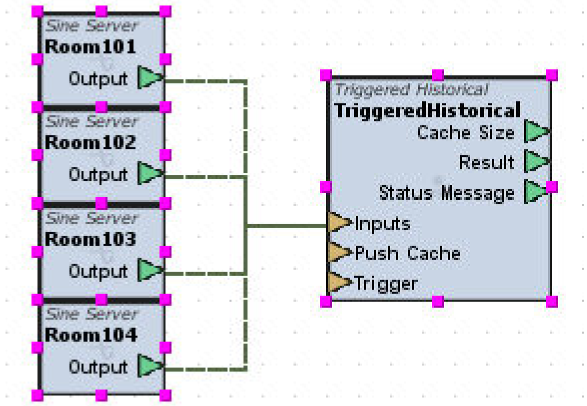
Property Name	Notes
Always Live?	Defines if the Emailer will send emails regardless of being in SIM/Live mode.

Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Enabled	Defines if the Emailer element is enabled or not. If true, the Emailer will attempt to send emails.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Start TTLS	Defines if the mailer should use TLS authentication.

Trend / Report

Triggered Historical

Used to collect and log trend data, and requires a defined database connection, and a trigger method (such as a Synchronized Clock Tick, Extreme Server, or other logical based trigger method).



Standard Inputs

Pin	Notes
Inputs	Accepts one or more data inputs that will be collected for trend sampling.
Push Cache	Accepts a trigger value. When cache collection has been enabled in Basic and Expert Properties, a trigger received at this input will push all collected cache to the connected database.
Trigger	Accepts a single trigger method. When a value change has been received, trend collection will occur.

Standard Outputs

Pin	Notes
Cache Size	Reports the current size of cache held by the element.
Result	Reports the current condition of the trend element. A value of 1 indicates successful collection, whereas a value of 0 will report an error condition which is described by the Status Message output.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Cache Size	Defines how many samples of data will be held in resident memory prior to being pushed by the Push Cache trigger input. By default, this value is 0, and trend samples will be pushed to the connected database immediately.
Connection Name	Defines the connected database to where trend data will be stored.
Create Table?	Defines if the table will be automatically created by Aspect in the event it is not present. In most cases, this should be set to True.
Table Name	Defines the database table name or trend record name. NOTE - When assigning a Table Name, it is important to ensure that you exclude the use of any special characters (such as hyphens, plus, minus, and other wild card characters). Having these as part of a table name can cause reporting and read/write errors when deployed.
Timestamp Column	Defines the name that the timestamp column will be created as. By default, this value is Reading Time.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic

	when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Cache Full Behavior	Defines the behavior of the element when the Cache Size is full. Samples stored in cache can either be: • Reject New Values • Delete Oldest Values • Ignore New Values
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Save Quality Better Than or Equal To	Defines if values will be stored as nulls if lower than chosen setting.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize Connection	Defines if the database connection should be synchronized.

More Information

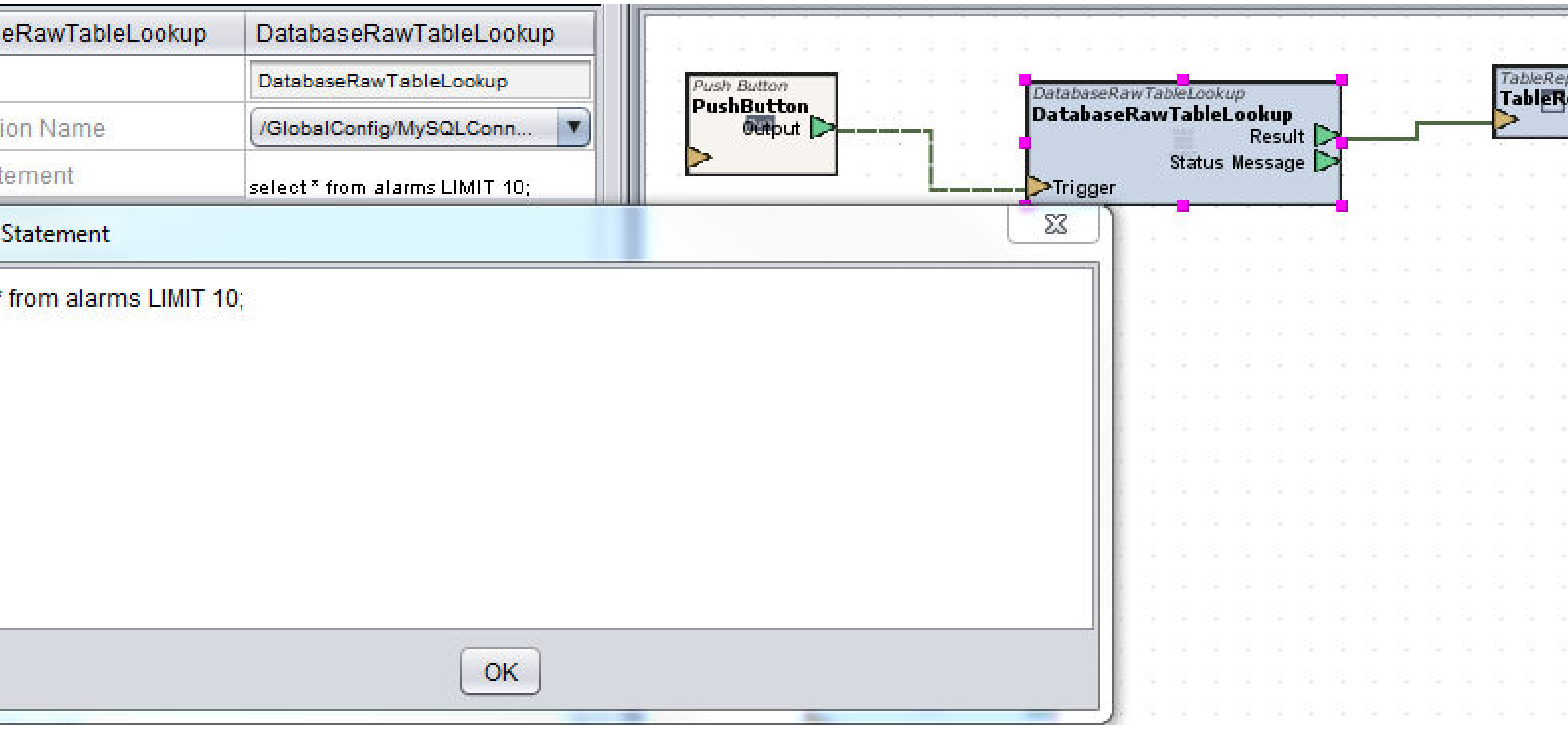
[Trending Overview]

[Adding the Triggered Historical Element]

[Using the Triggered Historical Element]

TABLE LOOK *Database Raw Table Lookup*

Used to return an entire database table for report and presentation purposes. This element would typically be used as the Input to a XY Chart, or a Simple Report.



Standard Inputs

Pin	Notes
Trigger	Accepts a single trigger method. When a value change has been received, the table lookup process will occur.

Standard Outputs

Pin	Notes
Result	Outputs the result of the lookup.
Status Message	Reports any database connection errors should they occur.

Basic Properties

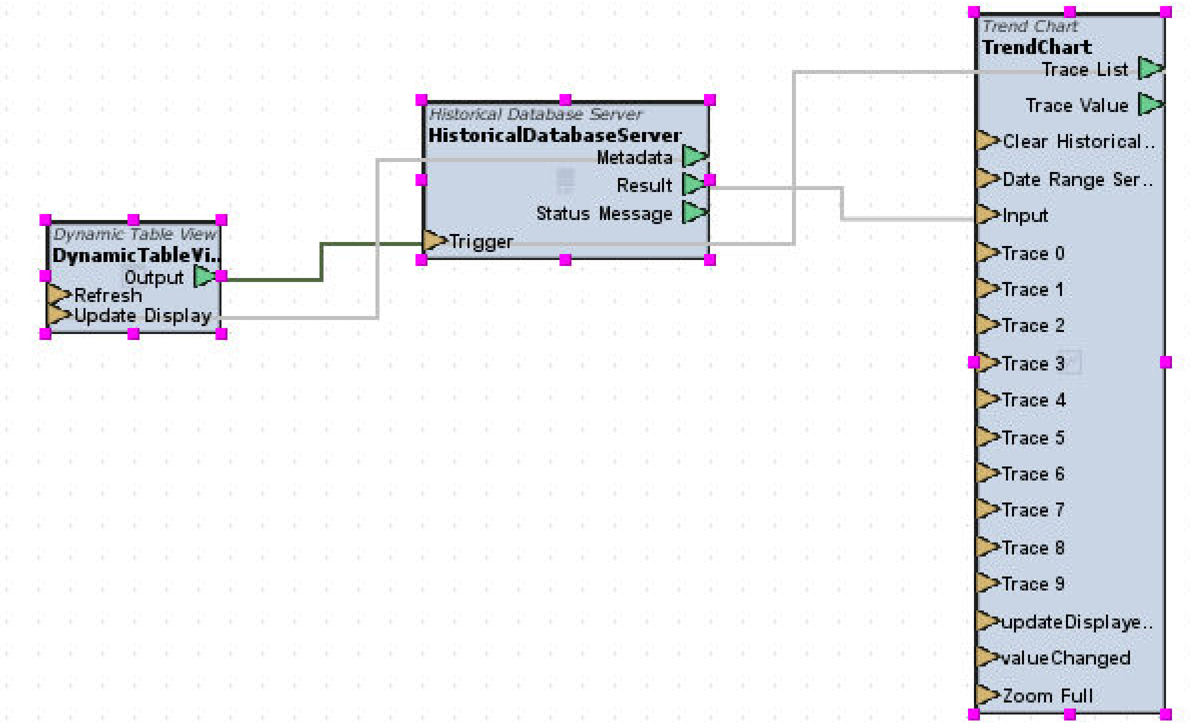
Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.
SQL Statement	Defines the SQL Statement to apply to retrieve table information.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize Connection	Defines if the database connection should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

Historical Database Server

Used to query data from a connected database for presentation of data within Trend Graphs, Table Reports, Formatted Reports, Dynamic Trend View, and many other elements within the system.



Standard Inputs

Pin	Notes
Trigger	Accepts a single trigger method. When a value change has been received, the lookup process will occur.

Standard Outputs

Pin	Notes
Metadata	Outputs Metadata, which is connected solely to the Update input pin of the Dynamic Table View element.
Result	Outputs the result of the lookup.
Status Message	Reports any database connection errors should they occur.

Basic Properties

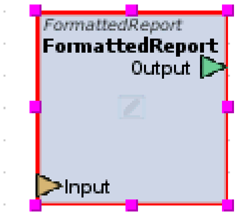
Property Name	Notes
Column List	Defines the table columns in comma delimited fashion that will be retrieved as part of the historical lookup process.
Connection Name	Defines the connected database to where trend data will be retrieved.
Lookback From	Defines the date and time reference to use as the end of date if Range from Now is set to True.
Lookback Period	Defines how much data (in defined time span) will be retrieved from the database. Examples of valid lookback periods include: • 1m = 1 minutes • 1h = 1 hour • 1d = 1 day
Query Limit	Defines the maximum amount of records that will be fetched from the database. By default, this value is set to 10080 and is optimal for fetching up to seven (7) days of trend data sampled on one (1) minute intervals. This value can be adjusted for larger limits if desired. NOTE - Using extremely large values for this property may/can result in system resource performance when data is requested. Use caution when adjusting this value when necessary within configured and designed applications.
Range from Now	If true, the end of date range will be the current system time, else it will be the value programmed in the Lookback From property within this element.
Table Name	Defines the table name where data will be fetched from.
Timestamp Column	Defines the name of the timestamp column from the database. This is set by default for "ReadingTime" and is considered an optimal configuration.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize Connection	Defines if the database connection should be synchronized.

Formatted Report

Used to generate reports based on information queried and delivered by the Historical Database Server element. This element includes a .rpx style sheet which can be edited to customize reports. Several configuration properties are available from this element - allowing customizing of report titles, headers, footers, and delivery format.



Standard Inputs

Pin	Notes
Input	Receives information from database connected elements from their Output.

Standard Outputs

Pin	Notes
Output	Outputs either an HTML link for downloading a report from a target, or provides a report attachment when connected to an Emailer element.

Basic Properties

Property Name	Notes
Background Color	Defines the background color shown for data.
Date Format	Defines the format in which the date is displayed in the report.
Hostname	Defines the hostname that the report is stored on (for linking reports through Design graphics viewed by end-users).
Intercolumn Gap	Defines the character space between columns.
Label Font	Defines the font for labels.
Maximum Report Age	Defines the maximum age for a report. If an older report exists on the Aspect target, it will be interrogated for age. If the report is older than the age specified, it will be automatically

	deleted.
Number Format	Defines the format for which numbers are displayed.
Orientation	Defines the page orientation for the report.
Outline Color	Defines the outline color for grid lines for the report.
Output Format	Defines the file format that will be outputted. Valid options include: • PDF (value of 0 for Enumerated Swing Boxes) • HTML (value of 1 for Enumerated Swing Boxes) • CSV (value of 2 for Enumerated Swing Boxes) • Excel (value of 3 for Enumerated Swing Boxes) • Text (value of 4 for Enumerated Swing Boxes)
Page Footer	Defines the page footer text.
Page Header	Defines the page header text.
Paper Size	Defines the size of paper for the report.
Report Footer	Defines the report footer text.
Report Header	Defines the report header text.
Report Name	Defines the report name text.
Row Height	Defines the height of each row in the report.
Table Font	Defines the font used for the entire table.

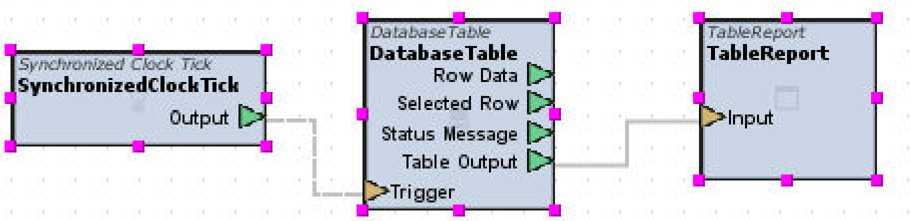
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic

	when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Debug Level	Defines whether or not status info is sent to the Aspect Control Engine Log when a Report is generated. A value of greater than 0 will enabled logging.
File Name Date Format	Defines the format used by the Simple Report element to name reports as they are stored on a target.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Report Definition File	Defines the report definition file used to generate the report. By default, this element always uses the DefaultReport.rpx file, which must be imported into the Drivers node of your Project Tree.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Database Table

Used to return an XML representation of the entire table to its target in a read/write format when triggered.



Standard Inputs

Pin	Notes
Trigger	Accepts a single trigger method. When a value change has been received, the table lookup process will occur.

Standard Outputs

Pin	Notes
Row Data	Provides XML row data for all alarm information and is reserved for future functionality.
Selected Row	Provides selected row data information and is reserved for future functionality.
Status Message	Reports any database connection errors should they occur.
Table Output	Outputs the result of the lookup.

Basic Properties

Property Name	Notes
Column Names	Defines a comma delimited list of columns to output.
Connection Name	Defines the connected database to where trend data will be stored.
Table Name	Defines the table name to be looked up in the query.
Where clause	Defines the Where clause of the SQL Statement to apply to retrieve table information.

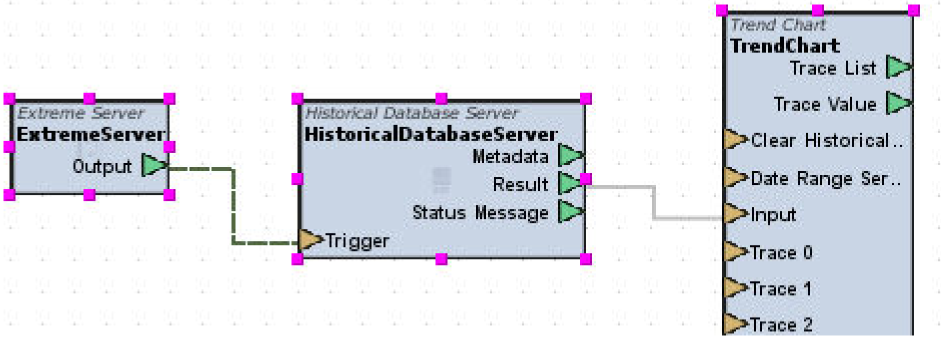
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

	• Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize Connection	Defines if the database connection should be synchronized.

 *Extreme Server*

Used to provide simulated data. The element produces an alternating pulse or alternating between 0 and 1. Extreme Servers are commonly used to trigger actions on a defined timebase period. Note that the Extreme Server does not align itself with real time and works off its own time base as started. An Extreme Server may be used as a trigger method for reports, trends, etc.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs a trigger pulse based on the configurations of Basic Properties.

Basic Properties

Property Name	Notes
Timebase	Defines the amount of time, in seconds, a simulated value will be generated and outputted.

Expert Properties

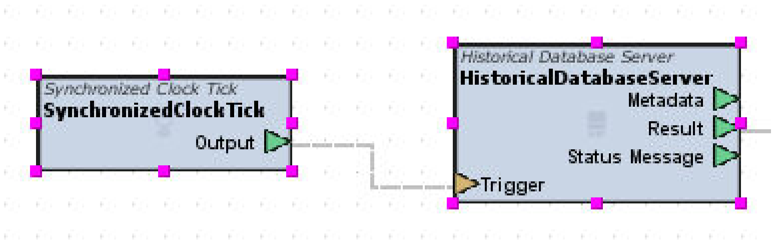
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the pre-

	ferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the output = False
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the output = True
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Synchronized Clock Tick

Used to produce a trigger based on even timebase intervals. For example, if the timebase is set to 60 (seconds), the first tick will occur at xx:xx:00 (an exact minute interval, with 00 seconds). If the timebase is set to 300 (5 minutes), the ticks will occur at even 5 minute intervals (0 seconds), such as xx:05:00, xx:10:00, etc.

This element is most commonly used with the Triggered Historical element to collect trend samples on a fixed time interval.



Standard Outputs

Pin	Notes
Output	Outputs a trigger pulse based on the configurations of Basic Properties.

Basic Properties

Property Name	Notes
Timebase	Defines the amount of time, in seconds, a trigger signal will be generated and outputted.

Expert Properties

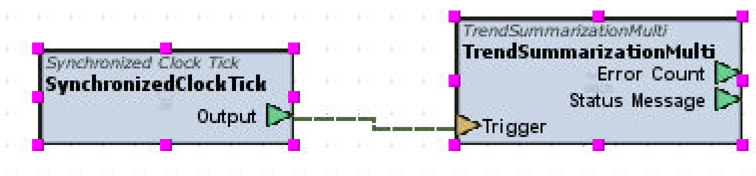
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the output = False

Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the output = True
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Trend Summarization Multi

The Trend Summarization Multi element is used to perform roll-up trend data reporting. The element allows users to define an existing source trend which has collected mass amounts of data. When triggered, The Trend Summarization Multi element will auto-create summarization tables, providing the following data based on days, hours, week, month, and year:

- Minimum sample value
- Average sample value
- Max Sample Value
- Sum of all samples values
- Delta change of sample values
- Total amount of samples



This element is useful for situations where a user may want to know the average temperature of a space for a given day, week, month. etc.

In order to calculate the data listed above, the source trend must have collected data for the specific time period in order to proper math determinations to be made.

Standard Inputs

Pin	Notes
Trigger	Accepts any trigger based value. When a change of value is received, summarization capabilities are ran against a table.

Standard Outputs

Pin	Notes
Error Count	Only writes when there is an error with data summarization routines, and it is written with the total number of errors detected since the last Aspect Control Engine restart. This means that you won't ever see an output of 0; it will always start with a value of 1 with the first error occurrence. This output can be used to attach an e-mailer or other widget or notification element without having to inhibit the first firing of the value on start-up. NOTE - This Error Count will only increment errors during the summarization calculation process (such as calculation errors, and connectivity errors during the calculation process), and will not count upon an error in basic configuration of the element. For basic configuration errors, refer to the Status Message output for configuration details.
Status Message	Reports any database connection errors should they occur.

Basic Properties

Property Name	Notes
Summary Table Base Name	Defines the summary table base name. When the Trend Summarization Multi element is triggered, summarization tables will be created for: • SummaryBaseTableName_day - day summarization • SummaryBaseTableName_hour - hourly summarization • SummaryBaseTableName_week - week summarization • SummaryBaseTableName_month - month summarization • SummaryBaseTableName_year - year summarization NOTE - When assigning a Table Name, it is important to ensure that you exclude the use of any special characters (such as hyphens, plus, minus, and other wild card characters). Having these as part of a table name can cause reporting and read/write errors when deployed.
Trend Table Name	Defines the source trend on which summarization will be performed.
Trend Timestamp Column	Defines the column name for the Timestamp column.
Connection Name	Defines the connected database to where trend data will be stored. Note that the source trend must also exist in this database in order for summarization to occur.
Create Table?	Defines if the table will be automatically created by Aspect in the event it is not present. In most cases, this should be set to True.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even

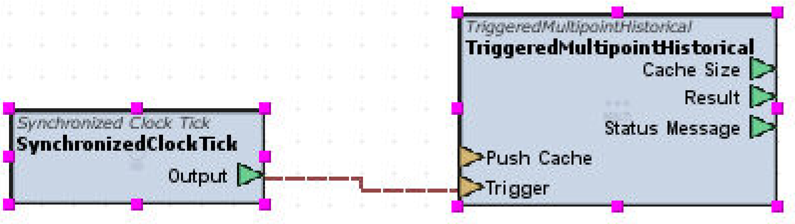
	if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Debug Level	Defines whether or not status info is sent to the Aspect Control Engine Log when the Trend Summarization tables are generated. A value of greater than 0 will enabled logging.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize Connection	Defines if the database connection should be synchronized.
Throw on Null Response	Defines whether or not the Status Message pin will indicate an error if no data is read from the database

More Information

Trend Rollup using Trend Summarization Multi

Triggered Multipoint Historical

The Triggered Multipoint Historical element is used to perform easy trend creation against multipoint elements. Rather than connect multiple inputs, users can simply select the multipoint element they wish to obtain data from. When triggered, this element will connect information in a manner that is similar to the Triggered Historical element.



Standard Inputs

Pin	Notes
Push Cache	Accepts a trigger value. When cache collection has been enabled in Basic and Expert Properties, a trigger received at this input will push all collected cache to the connected database.
Trigger	Accepts any trigger based value. When a change of value is received, summarization capabilities are ran against a table.

Standard Outputs

Pin	Notes
Cache Size	Reports the current size of cache held by the element.
Result	Reports the current condition of the trend element. A value of 1 indicates successful collection, whereas a value of 0 will report an error condition which is described by the Status Message output.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Cache Size	Defines how many samples of data will be held in resident memory prior to being pushed by the Push Cache trigger input. By default, this value is 0, and trend samples will be pushed to the connected database immediately.
Connection Name	Defines the connected database to where trend data will be stored.
Create Table?	Defines if the table will be automatically created by Aspect in the event it is not present. In most cases, this should be set to True.
Multipoint Target	Defines the configured multipoint element to collect data from.
Table Name	Defines the database table name or trend record name. NOTE - When assigning a Table Name, it is important to ensure that you exclude the use of any special characters (such as hyphens, plus, minus, and other wild card characters). Having these as part of a table name can cause reporting and read/write errors when deployed.
Timestamp Column	Defines the name that the timestamp column will be created as. By default, this value is Reading Time.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listen-

	ers - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Cache Full Behavior	Defines the behavior of the element when the Cache Size is full. Samples stored in cache can either be: • Reject New Values • Delete Oldest Values • Ignore New Values
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Save Quality Better Than or Equal To	Defines if values will be stored as nulls if lower than chosen setting.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize Connection	Defines if the database connection should be synchronized.

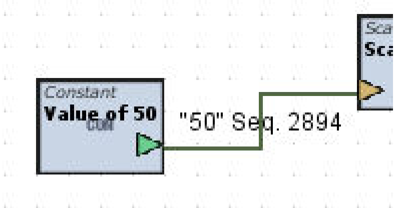
More Information

Trend Rollup using Trend Summarization Multi

Data Sources

CON *Constant*

Used to produce a constant value using any of the data types supported by Aspect. Additionally supports the ability to defined PI (3.141592653589793) and KE (2.718287).



The Constant element can be used to initially send a value at start-up when needed. If you intend to use the Constant element as a screen local element, ensure that the start priority of the Constant element initialized after other elements that have been started via Start Priority.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs the constant value based on configuration of Basic Properties.

Basic Properties

Property Name	Notes
Constant Type	Defines the type of constant value. PI, KE, or Custom.
Constant Value	Defines the output value (when Constant Type = Custom)
Value Type	Defines the data type of the value output.

Expert Properties

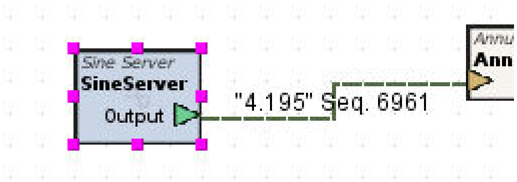
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin.

	• Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Fire Late?	Defines if the element should begin execution after Aspect has fully started. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Initial Quality	Defines the quality of data when sent.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Timebase	Defines how often, in seconds, the element will execute and update its value.
Value Color	Defines the color to send onto color receiving elements.

Sine Server

Used to provide simulated data and produces a composite sine/cosine wave. The formula used to calculate the output is: sin(x*fm)*(

where fm is a frequency multiplier,



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs a generated sine signal based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Force Quality To	Defines the type of quality the output is forced to. If Force Quality is true, then the selected value is the output quality.
Force Quality?	Defines if the output is forced to be the selected quality.
Freq Factor	Defines the maximum amplitude. The output is symmetrical around this amplitude, meaning if the Amplitude Offset is 0, it will produce negative and positive numbers with the Amplitude Maximum as the maximum negative or positive value. This defaults to 50
Max Amp	Defines how often the wave pattern repeats. This defaults to 1.0. A larger number will cause the wave pattern to repeat more frequently in the same amount of time.
Offset	Defines an offset that is added to the amplitude to shift it in the positive or negative direction. This defaults to 50 so that when added to the unmodified amplitude, all output values are between 0 and 100.
Time Offset	Defines a value that causes a shift of the wave

	output in the time axis. This defaults to 0 seconds.
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

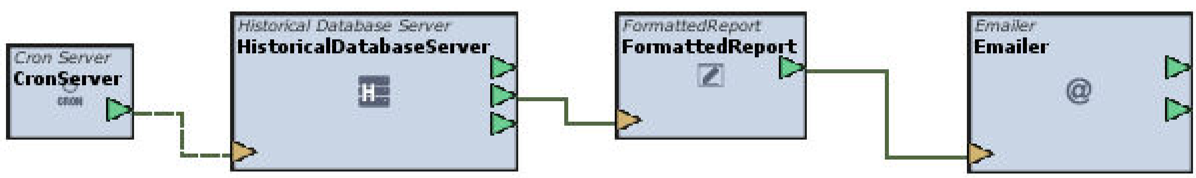
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.

Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Cron Server

Used to trigger an output at specified times. The output will contain a formatted date time string. Cron Server is useful for scheduling maintenance or report generation at complex intervals.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs the system DateTime as formatted by a the Date Format property string.

Basic Properties

<table>
<tr><th>Property Name</th><th>Notes</th></tr>
<tr><td>Cron String</td><td>Valid cron format string (see examples)</td></tr>
<tr><td>Date Format</td><td>Defines the format in which to process the Date/Time information.
<table>
<tr><td>Letter</td><td>Description</td><td>Examples</td></tr>
<tr><td>G</td><td>Era designator</td><td>AD</td></tr>
<tr><td>y,yyyy</td><td>Year</td><td>96,1996</td></tr>
<tr><td>M,MMM,MMMM</td><td>Month in year</td><td>7,Jul,July</td></tr>
<tr><td>w</td><td>Week in year</td><td>27</td></tr>
<tr><td>W</td><td>Week in month</td><td>2</td></tr>
<tr><td>D</td><td>Day in year</td><td>189</td></tr>
<tr><td>d</td><td>Day in month</td><td>10</td></tr>
<tr><td>F</td><td>Day of week in month</td><td>2</td></tr>
<tr><td>E,EEEE</td><td>Day in week</td><td>Tue, Tuesday</td></tr>
<tr><td>a</td><td>AM/PM Marker</td><td>PM</td></tr>
<tr><td>h</td><td>Hour in day (0-23)</td><td>0</td></tr>
<tr><td>k</td><td>Hour in day (1-24)</td><td>24</td></tr>
<tr><td>K</td><td>Hour in am/pm (0-11)</td><td>0</td></tr>
<tr><td>h</td><td>Hour in am/pm (1-12)</td><td>12</td></tr>
<tr><td>m</td><td>Minute in hour</td><td>30</td></tr>
<tr><td>s</td><td>Second in minute</td><td>55</td></tr>
<tr><td>S</td><td>Millisecond</td><td>978</td></tr>
<tr><td>z,zzzz</td><td>Time zone</td><td>PST, Pacific Standard Time</td></tr>
<tr><td>Z</td><td>Time zone</td><td>-800</td></tr>
</table>
</td></tr>
</table>

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the output = False
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the output = True
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Job Group	String to assign to the job scheduler trigger group
Job Name	String to assign to the job scheduler task name
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.

Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Introduction to Cron String Formatting

Cron Server uses "cron expressions", which are able to create firing schedules such as: "At 8:00am every Monday through Friday" or "At 1:30am every last Friday of the month". The default string “*/30 * * * * * ?” fires every second of every minute that is evenly divisible by 30 (so, the 30th and 60th seconds).

Format

A cron expression is a string comprised of 6 or 7 fields separated by white space. Fields can contain any of the allowed values, along with various combinations of the allowed special characters for that field. The fields are as follows:

Field Name	Mandatory	Allowed Values	Allowed Special Characters
Seconds	YES	0-59	, - * /
Minutes	YES	0-59	, - * /
Hours	YES	0-23	, - * /
Day of month	YES	1-31	, - * / L W
Month	YES	1-12 or JAN-DEC	, - * /
Day of week	YES	1-7 or SUN-SAT	, - * /L #
Year	NO	empty, 1970-2099	, - * /

So cron expressions can be as simple as this: * * * * ? * or more complex, like this: 0/5 14,18,3-39,52 * ? JAN,MAR,SEP MON-FRI 2002-2010

Special Characters

• * ("all values") - used to select all values within a field. For example, "" in the minute field means *"every minute".

• ? ("no specific value") - useful when you need to specify something in one of the two fields in which the character is allowed, but not the other.

For example, if I want my trigger to fire on a particular day of the month (say, the 10th), but don't care what day of the week that happens to be, I would put "10" in the day-of-month field, and "?" in the day-of-week field. See the examples below for clarification.

• - - used to specify ranges. For example, "10-12" in the hour field means "the hours 10, 11 and 12".

• , - used to specify additional values. For example, "MON,WED,FRI" in the day-of-week field means "the days Monday, Wednesday, and Friday".

• / - used to specify increments. For example, "0/15" in the seconds field means "the seconds 0, 15, 30, and 45". And "5/15" in the seconds field means "the seconds 5, 20, 35, and 50". You can also specify '/' after the " character - in this case " is equivalent to having '0' before the '/'. '1/3' in the day-of-month field means "fire every 3 days starting on the first day of the month".

• L ("last") - has different meaning in each of the two fields in which it is allowed. For example, the value "L" in the day-of-month field means "the last day of the month" - day 31 for January, day 28 for February on non-leap years. If used in the day-of-week field by itself, it simply means "7" or "SAT". But if used in the day-of-week field after another value, it means "the last xxx day of the month" - for example "6L" means "the last friday of the month". When using the 'L' option, it is important not to specify lists, or ranges of values, as you'll get confusing results.

• W ("weekday") - used to specify the weekday (Monday-Friday) nearest the given day. As an example, if you were to specify "15W" as the value for the day-of-month field, the meaning is: "the nearest weekday to the 15th of the month". So if the 15th is a Saturday, the trigger will fire on Friday the 14th. If the 15th is a Sunday, the trigger will fire on Monday the 16th. If the 15th is a Tuesday, then it will fire on Tuesday the 15th. However if you specify "1W" as the value for day-of-month, and the 1st is a Saturday, the trigger will fire on Monday the 3rd, as it will not 'jump' over the boundary of a month's days. The 'W' character can only be specified when the day-of-month is a single day, not a range or list of days.

The 'L' and 'W' characters can also be combined in the day-of-month field to yield 'LW', which translates to *"last weekday of the month"*.

• # - used to specify "the nth" XXX day of the month. For example, the value of "6#3" in the day-of-week field means"the third Friday of the month" (day 6 = Friday and "#3" = the 3rd one in the month). Other examples: "2#1" = the first Monday of the month and "4#5" = the fifth Wednesday of the month. Note that if you specify "#5" and there is not 5 of the given day-of-week in the month, then no firing will occur that month.

The legal characters and the names of months and days of the week are not case sensitive. MON is the same as mon.

Examples

Expression	Meaning
0 0 12 * * ?	Fire at 12pm (noon) every day
0 15 10 ? * *	Fire at 10:15am every day
0 15 10 * * ?	Fire at 10:15am every day
0 15 10 * * ? *	Fire at 10:15am every day
0 15 10 * * ? 2005	Fire at 10:15am every day during the year 2005
0 * 14 * * ?	Fire every minute starting at 2pm and ending at 2:59pm, every day
0 0/5 14 * * ?	Fire every 5 minutes starting at 2pm and ending at 2:55pm, every day
0 0/5 14,18 * * ?	Fire every 5 minutes starting at 2pm and ending at 2:55pm, AND fire every 5 minutes starting at 6pm and ending at 6:55pm, every day
0 0-5 14 * * ?	Fire every minute starting at 2pm and ending at 2:05pm, every day
0 10,44 14 ? 3 WED	Fire at 2:10pm and at 2:44pm every Wednesday in the month of March.
0 15 10 ? * MON-FRI	Fire at 10:15am every Monday, Tuesday, Wednesday, Thursday and Friday
0 15 10 15 * ?	Fire at 10:15am on the 15th day of every month
0 15 10 L *	Fire at 10:15am on the last

?	day of every month
0 15 10 ? * 6L	Fire at 10:15am on the last Friday of every month
0 15 10 ? * 6L	Fire at 10:15am on the last Friday of every month
0 15 10 ? * 6L 2002-2005	Fire at 10:15am on every last friday of every month during the years 2002, 2003, 2004 and 2005
0 15 10 ? * 6#3	Fire at 10:15am on the third Friday of every month
0 0 12 1/5 * ?	Fire at 12pm (noon) every 5 days every month, starting on the first day of the month.
0 11 11 11 11 ?	Fire every November 11th at 11:11am.

Pay attention to the effects of '?' and '*' in the day-of-week and day-of-month fields!

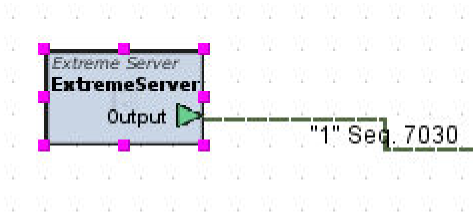
Notes

• Support for specifying both a day-of-week and a day-of-month value is not complete (you must currently use the '?' character in one of these fields).

• Be careful when setting fire times between mid-night and 1:00 AM - "day-light savings" can cause a skip or a repeat depending on whether the time moves back or jumps forward.

Extreme Server

Used to provide simulated data. The element produces an alternating pulse or alternating between 0 and 1. Extreme Servers are commonly used to trigger actions on a defined timebase period. Note that the Extreme Server does not align itself with real time and works off its own time base as started. An Extreme Server may be used as a trigger method for reports, trends, etc.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs a trigger pulse based on the configurations of Basic Properties.

Basic Properties

Property Name	Notes
Timebase	Defines the amount of time, in seconds, a simulated value will be generated and outputted.

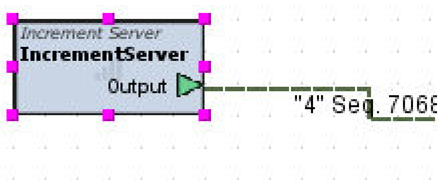
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements

	that support the ability to receive and displays colors. This color corresponds to the output = False
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the output = True
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Increment Server

Outputs an incremental value by a constant amount every timebase tick. By default it starts at 0 and counts to 100 by 1 every second, then restarts. It can also be set to decrement.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs incremented values based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Increment	Defines the step value. For negative outputs, define a negative value.
Min Value	Defines the lowest value generated for the output.
Max Value	Defines the highest value for the generated output.
Timebase	Defines how often, in seconds, the element will execute and update its value.

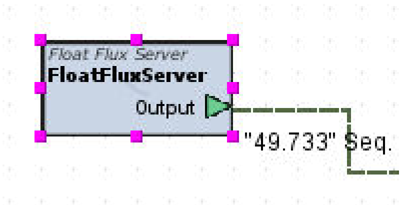
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements

	that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Float Flux Server

Used to produce a fluctuating numeric output that approaches a target value from a starting value, then fluctuates around the target value (until a new target is set). This gradually reaches a target or set point level. The rate at which it reaches this level from a starting point is dependent on the rate. The randomness of the data is dependent on the max fluctuation factor.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs values based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Level	Defines the final set point value in which the output fluctuates.
Max Fluctuation	Defines the value from the current value that the output is allowed to deviate for the next calculated value.
Rate	Defines a rate factor that is used to approach the Target Level, used only used when the server calculation is not at the Target Level. The higher the rate factor, the faster the current value will reach the Target Level.
Start Level	Defines initial output of the server. From this point, the server output will approach the Target Level at a rate dependent on the Change Factor.
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

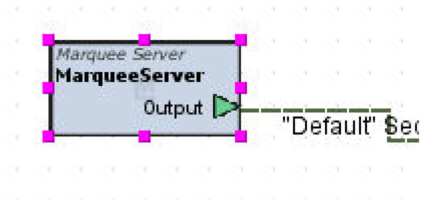
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.

Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Marquee Server

Used for simulation data and sends a string value defined in the Label String property once the defined timebase has expired. The characters of the String wrap in a marquee fashion each time it is updated.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs values based on Basic Properties configuration.

Basic Properties

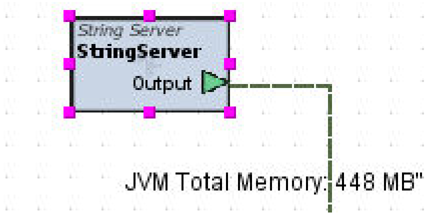
Property Name	Notes
Label String	Defines the string value to output as part of the routine.
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

String Server

Used for simulation data and sends up to six different values for simulation testing upon each timebase tick. Information sent from this property includes platform details (such as OS, memory, etc.)



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs values based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

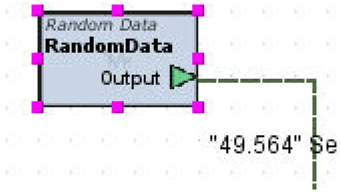
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic

	when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Random Data

Used for simulation data and outputs completely random numeric data.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs values based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Max	Defines the maximum output value.
Min	Defines the minimum output value.
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property

Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Random Boolean

Used for simulation data and outputs random boolean values.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs values based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

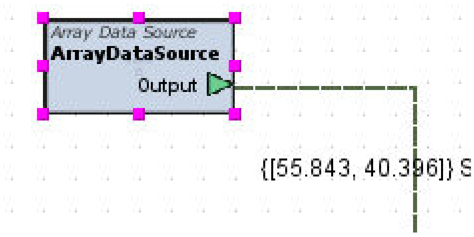
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.

Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Array Data Source

The Array Data Source element produces array value objects for testing logic. A new Array Value Object will be created every timebase tick. It will be composed of an array of Double Value Objects with a simulated timestamp (so each has a different incremented timestamp with a time difference set by the "Time Spacing" parameter). This is useful for testing an array input to the Trend Chart.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs random array data values based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Boolean Output	Defines whether or not the array will only contain Boolean values.
Elements	Defines the number of element that should be generated.
Integer Output	Defines whether or not the array will only contain

	Integer values.
Max Value	Defines the maximum value of any array element.
Min Value	Defines the minimum value of any array element.
Time Spacing	Defines the time padding of updates for each array element.
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.
Zero Based Time	Defines if time stamps should be zero-based with no odd timing.

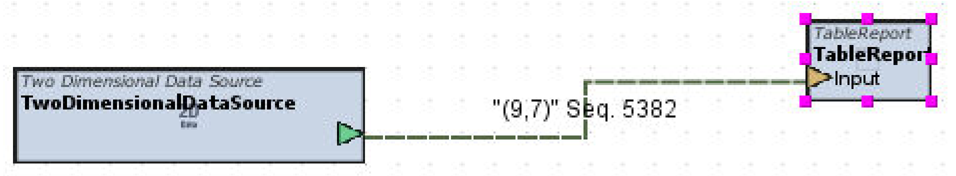
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 255.

Two Dimensional Data Source

The Two Dimensional Data Source element produces randomized data based on the number of boolean, double, integer, and string columns configured and can output the data to a Table Report.



ReadingTime	X Data	Y Data 1	Y Data 2	Y Data 3	Y Data 4	Y Data 5	Y Data 6	Y Data 7	Y Data 8
0 Mar 13 14:46:44	86.00	396.00	310.00	426.31	367.29	.00	.00	new red c...	round purp...
0 Mar 13 14:47:44	72.00	461.00	438.00	469.13	408.41	.00	.00	new violet...	new brown...
0 Mar 13 14:48:44	89.00	450.00	431.00	480.91	331.81	1.00	.00	rough red...	spotted yell...
0 Mar 13 14:52:44	16.00	359.00	450.00	445.34	303.64	1.00	.00	tiny yellow...	new orang...
0 Mar 13 14:53:44	82.00	453.00	376.00	361.75	498.67	1.00	.00	bright bla...	smooth or...
0 Mar 13 14:54:44	36.00	358.00	402.00	474.65	330.38	1.00	.00	fuzzy pink ...	tiny black c...
0 Mar 13 14:49:44	15.00	450.00	448.00	375.08	371.51	1.00	1.00	shiny whit...	new green ...
0 Mar 13 14:50:44	83.00	353.00	448.00	320.17	497.16	1.00	1.00	fuzzy blac...	fuzzy red bird
0 Mar 13 14:51:44	38.00	345.00	394.00	476.59	474.26	1.00	1.00	fuzzy oran...	round gree...

Basic Properties

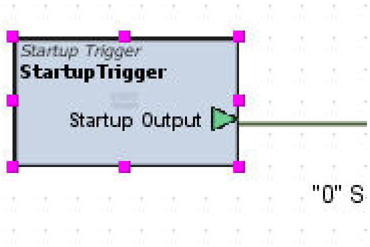
Pin	Notes
Boolean Columns	Amount of Boolean Columns to output
Double Columns	Amount of Double Columns to output
Integer Columns	Amount of Integer Columns to output
Random X ?	Enable or disable generation of random X values
Rows	Amount of rows to output
String Columns	Amount of string columns to output
Time Interval	Timestamp interval (seconds)
Timebase	Seconds between readings
X Data Type	Choose which data type for column X
X Max	Maximum value for the X column
X Min	Minimum value for the X column
Y Max	Maximum value for the Y column
Y Min	Minimum value for the Y column

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Startup Trigger

The Startup Trigger element is used to store a constant value that is sent to its listeners after the logic in the application has been started ("fired late"). This data source is fired exactly one time.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Startup Output	Outputs the trigger value based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Trigger Value	Defines the value to be sent when the element is triggered.
Value Type	Defines the data type for the trigger value.

Expert Properties

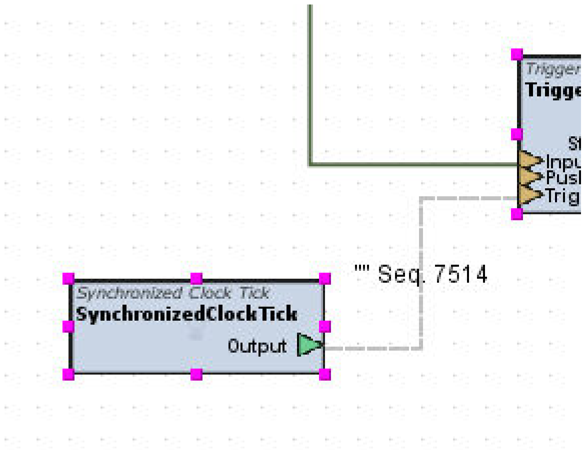
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the pre-

	ferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Fire Late?	Defines if the element should begin execution after Aspect has fully started. This defaults to False.
Initial Quality	Defines the quality of data when sent.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Timebase	Defines how often, in seconds, the element will execute and update its value.
Value Color	Defines the color to send onto color receiving elements.

Synchronized Clock Tick

Used to produce a trigger based on even timebase intervals. For example, if the timebase is set to 60 (seconds), the first tick will occur at xx:xx:00 (an exact minute interval, with 00 seconds). If the timebase is set to 300 (5 minutes), the ticks will occur at even 5 minute intervals (0 seconds), such as xx:05:00, xx:10:00, etc.

This element is most commonly used with the Triggered Historical element to collect trend samples on a fixed time interval.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs a trigger pulse based on the configurations of Basic Properties.

Basic Properties

Property Name	Notes
Timebase	Defines the amount of time, in seconds, a trigger signal will be generated and outputted.

Expert Properties

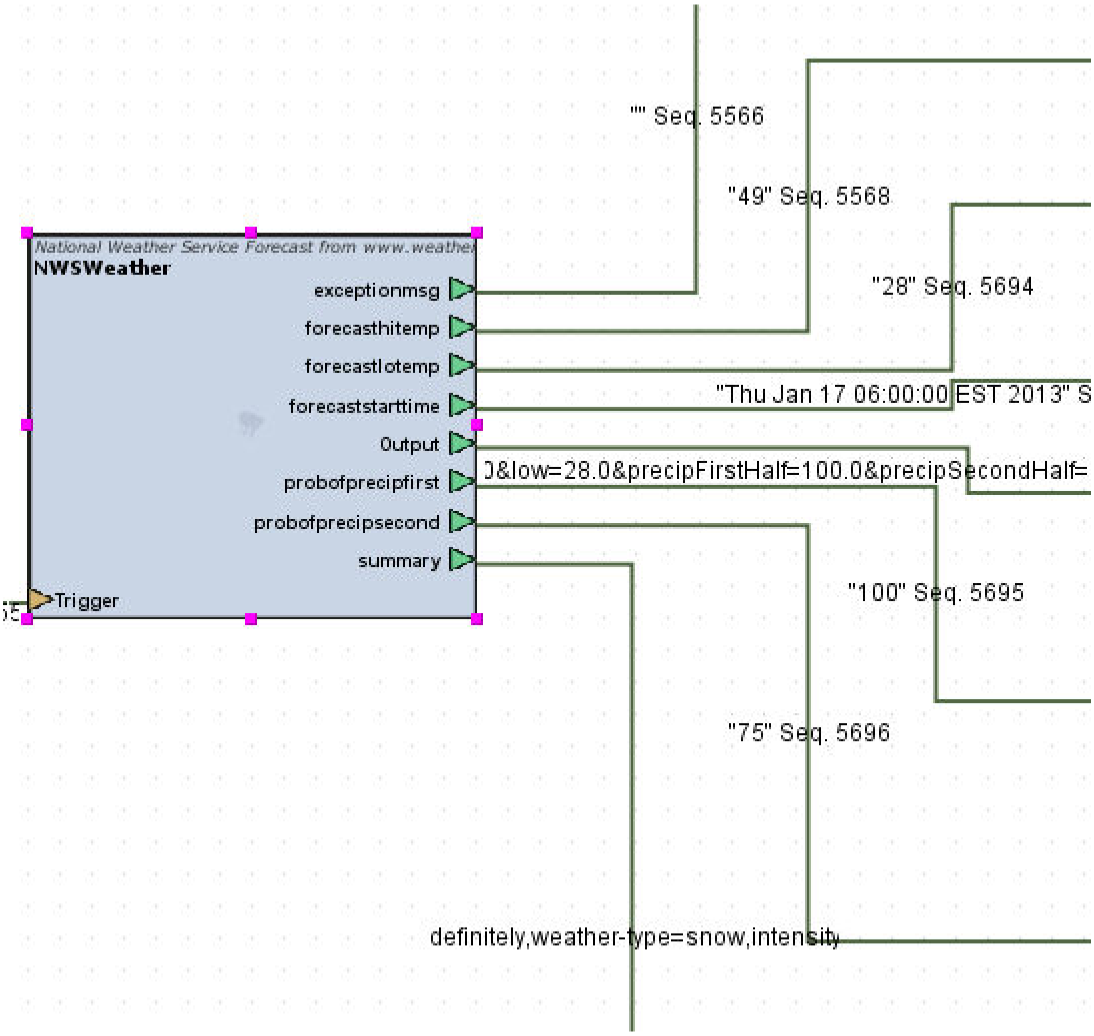
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input.

	• Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the output = False
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the output = True
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

NWS Forecast

The NWS Weather element leverages Web Services to obtain forecast weather data from

Forecast data can be obtained for local areas by providing longitude and latitude coordinates. To find your exact coordinates, visit www.weather.govand enter your City and State information. Information relative to the closest weather provider will be shown, along with longitude and latitude data that can be entered into the element. Future days (up to 7 days) can be obtained by entering the appropriate day entry.



To locate your longitude and latitude for configuration, please visit http://www.weather.gov. At the main page, enter your city and state and click Go.

At the next page, find the Current Conditions area. This will provide you with the longitude and latitude for the closest weather provision in your area.

Standard Inputs

Pin	Notes
Trigger	Accepts any trigger based input. Upon change of value, new data will be fetched from NWS.

Standard Outputs

Pin	Notes
Exception Msg	Outputs error messages related to connectivity to NWS.
Forecast Hi Temp	Outputs the forecasted high temperature for the configured day.
Forecast Lo Temp	Outputs the forecasted low temperature for the configured day.
Forecast Start Time	Outputs the effective time of the forecast from NWS.
Output	Outputs the current status of data fetching.
Prob of	Outputs a percentage of probability for pre-cipitation for the first half of the configured day.
Prob of	Outputs a percentage of probability for pre-cipitation for the second half of the configured day.
Summary	Provides complete summary data for all of the output properties.

Basic Properties

Property Name	Notes
Day	Defines the day number relative to forecast information. 0 = Today 1 = Tomorrow 2 = Day 2 3 = Day 3 4 = Day 4 5 = Day 5 6 = Day 6 7 = Day 7
Longitude	Defines the longitude for weather forecast information for your area.
Latitude	Defines the latitude for weather forecast information for your area.

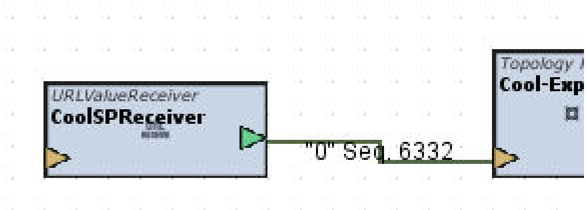
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Base URL	Defines the Base URL used to fetch forecast from the National Weather Service.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect

	start-up. Lower values get higher priority. This defaults to 255.

URL Value Receiver

The URL Value Receiver element is used to take any value posted via the ValueWriteServlet or URL Value Writer element and make it available to other elements as its output.



Standard Inputs

Pin	Notes
Input	Accepts any value that will be sent to a URL within the value servlets.

Standard Outputs

Pin	Notes
Output	Outputs the current status of value reception.

Basic Properties

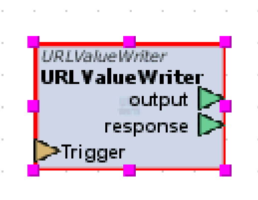
Property Name	Notes
Max Aging	Defines the time, in seconds, after which data will be considered stale if an update has not been received.
Stale Check Interval	Defines the time, in seconds, between checks for stale data.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

URL Value Writer

The URL Value Writer utilizes the ValueWriteServlet to write values to application objects on external Aspect targets, or even within (if desired).



Standard Inputs

Pin	Notes
Trigger	Accepts any data value, and writes it to the URL in the servlets.

Standard Outputs

Pin	Notes
Output	Outputs the current status of the write.
Response	Outputs the response from the servlet for success or failure.

Basic Properties

Property Name	Notes
Base URL	Defines the base URL, or location of the Aspect target.
Max Aging	Defines the time, in seconds, after which data will be considered stale if an update has not been received.
Object Path	Defines the complete application name and object that will be affected by the URL Value Writer
Password	Defines the Aspect password used to access application information. This should be the administrative user name and password for the target.
Stale Check Interval	Defines the time, in seconds, between checks for stale data.
Username	Defines the Aspect user name used to access application information. This should be the administrative user name and password for the target.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even

	if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Tweet OAuth

The Tweet OAuth element is used to configure Aspect to permit reading and writing to Tweet messages from Twitter. Twitter requires Open Authentication in order to allow access to its servers. The setup of this element requires users to visit the development section of Twitter to register a new client application at http://www.twitter.com/apps/new. Once you sign up, Twitter will provide users with a Consumer Key and Consumer Key Secret code that must be entered into the corresponding properties of the Tweet OAuth element. Once entered, access can then be requested using the Request Access property. By doing this, Aspect will then be assigned a Twitter PIN, which will be used to gain Access Tokens.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Request Access	Used to request a PIN, along with Access Token and Access Secret Token.
Access Token	Assigned by Twitter once you request a Twitter PIN and access codes.
Access Token Secret	Assigned by Twitter once you request a Twitter PIN and access codes.
Consumer Key	Assigned by Twitter's web site when you sign-up to register an application initially.
Consumer Secret Key	Assigned by Twitter's web site when you sign-up to register an application initially.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis.

	• Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

More Information

[Twitter Overview]

[Tweet Element Overview]

[Tweet OAuth Element]

Tweet Reader

Used to read the most recently Tweet made to a Tweet-based server (such as Twitter). To read a Tweet message, simply connect a trigger method to the Trigger input pin.

Standard Inputs

Pin	Notes
Trigger	Accepts a single trigger input, and is used to read the latest micro-blog from Twitter.

Standard Outputs

Pin	Notes
Output	Outputs the latest micro-blog retrieved from

	Twitter when triggered.

Basic Properties

Property Name	Notes
Authorization Block	Defines a configured Tweet OAuth element - allowing the Tweet Reader to read information from a configured Twitter account.
Max Aging	Defines the time, in seconds, after which data will be considered stale if an update has not been received.
Stale Check Interval	Defines the time, in seconds, between checks for stale data.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

More Information

[Twitter Overview](#)

[Tweet Element Overview](#)

Tweet Writer

Used to write system data to a Tweet-based server (such as Twitter). To write data, simply connect the data you wish to write to the Trigger input pin of the Tweet Writer element. When the connected value changes, a Tweet write will be sent to Twitter.

Standard Inputs

Pin	Notes
Trigger	Accepts a single data value and is written as a micro-blog to Twitter.

Standard Outputs

Pin	Notes
Output	Outputs the current status of writing a micro-blog to Twitter.

Basic Properties

Property Name	Notes
Authorization Block	Defines a configured Tweet OAuth element - allowing the Tweet Writer to perform Tweets.
Max Aging	Defines the time, in seconds, after which data will be considered stale if an update has not been received.
Stale Check Interval	Defines the time, in seconds, between checks for stale data.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

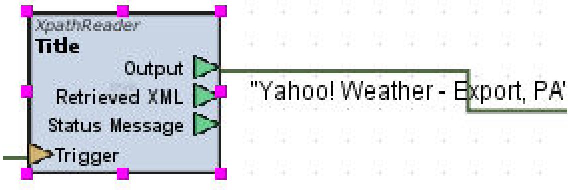
More Information

Twitter Overview

Tweet Element Overview

XPATH Reader

The XPATH Reader element is used as a primary means to read and display data from arbitrary XML documents. Many data providers, such as weather and stock sites, provide users with the ability to retrieve data using XML-based service calls.



Standard Inputs

Pin	Notes
Trigger	Accepts a single trigger input, and is used to read the specified XPath token defined in Basic Properties.

Standard Outputs

Pin	Notes
Output	Outputs the value of read XML.
Retrieved XML	Outputs all XML read from the source XML URL.
Status Message	Outputs the current status of reading XML data from the configured URL.

Basic Properties

Property Name	Notes
Max Aging	Defines the time, in seconds, after which data will be considered stale if an update has not been received.
Password	Defines the password for the user account required to read information from the XML URL (if required).
Stale Check Interval	Defines the time, in seconds, between checks for stale data.
Username	Defines the user name for the user account required to read information from the XML URL (if required).
XML URL	Defines the base or extended URL that defines the location of the XML document or source.
XPath	Defines XPath syntax or function code to retrieve the data from XML branches or properties.

Expert Properties

<table>
<tr><th>Property Name</th><th>Notes</th></tr>
<tr><td>Always Live</td><td>Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.</td></tr>
<tr><td>Auto Suspend</td><td>Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.
Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin.
Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input.
Never Auto-Suspend - the element will execute its logic on a continual basis.
Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.</td></tr>
<tr><td>Debug/Trace Level</td><td>Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include:
Greater than 25 - performs a full protocol dump to the Aspect Control Engine Log.
Greater than 50 - performs a full protocol dump + raw information to the Aspect Control Engine Log.</td></tr>
<tr><td>Hard Suspend</td><td>Defines if the element's logic execution is enabled or disabled (hard suspended).</td></tr>
<tr><td>Start Priority</td><td>Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.</td></tr>
</table>

More Information

XPath Overview

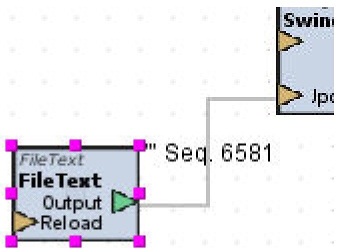
The XPath Reader Element

XPath Reader Properties

File Text

The File Text element supports the ability to output the text of referenced files that have been imported into the User Files node of the Project Tree. By specifying file names in the File Names property of the element, the File Text element will output the textual data contained within specified files when the Reload input has been triggered.

The File Text element can be used to output generic text based on changes to the File Names property for simple applications such as displaying room numbers programmatically or for advanced use case scenarios such as outputting derived JavaScript libraries to the JavaScript element.



Standard Inputs

Pin	Notes
Reload	Accepts a single trigger input, and is used to reload specified files which will be outputted.

Standard Outputs

Pin	Notes
Output	Outputs contents from files defined in Basic Properties.

Basic Properties

Property Name	Notes
File Names	Defines one or more .txt files that have been imported into the User Files node of the Project Tree. To reference more than one text file, the

	file names with their extension must be comma delimited. File names must be entered in a case sensitive format with no spaces between commas (e.g. File1.txt,File2.txt).

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

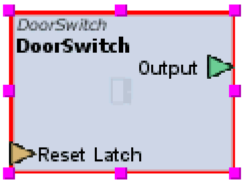
More Information

[JavaScript]

[Project Tree Nodes]

Door Switch

This element is used to determine the current state of the cover of Aspect Nexus Devices. It also includes a tamper switch so that the output will indicate that the door is open until someone resets the switch. This will ensure that the door being opened can be logged or managed appropriately.



Standard Inputs

Pin	Notes
Reset Latch	This pin will allow you to reset the latch after the tamper condition occurs.

Standard Outputs

Pin	Notes
Output	Outputs the current door status except in the event that the door is using a latch. In this case it may or may not indicate the actual state if the door was tampered with and the latch reset was not triggered.

Basic Properties

Property Name	Notes
Name	Defines the name of the Element
Latch	Defines if the element should work in latch mode. When in latch mode the output will indicate open after a tamper event until the latch is reset. Otherwise it will output the current state of the door open switch.
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

Expert Properties

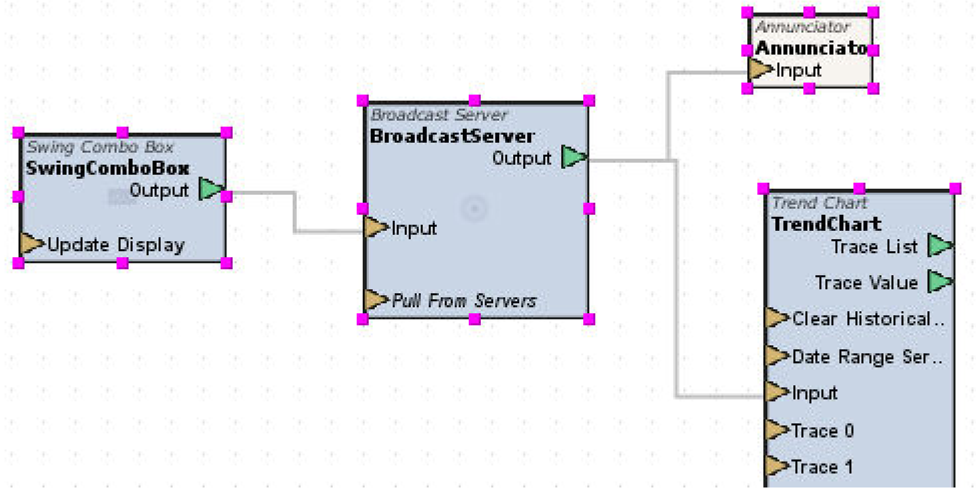
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no con-

	nection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Toggle Sleep Time	Defines the amount of time to sleep in milliseconds between the latch toggle request messages used to reset the latch

Data Flow/Scripts

Broadcast Server

The Broadcast Server element is a multipurpose logic component for connecting data flow between data sources and targets of this data. It is commonly used in pop-ups to connect data flow between the Design and Diagram Windows, and between active controls and other graphics. Any value that is received by it will be forwarded to any listeners of this component.



Standard Inputs

Pin	Notes
Input	Accepts any value connection which is then forwarded onto receivers.
Pull from Servers (Hidden by Default)	Enabled from Expose Properties. Recommended way of doing a connector change at runtime when working with Popups. For more information on this pin and how it is used to construct a Popup, please reference Building Popups - Quick Start for more information.

Standard Outputs

Pin	Notes
Output	Outputs the received value connection.

Basic Properties

No basic properties exist for this element.

Expert Properties

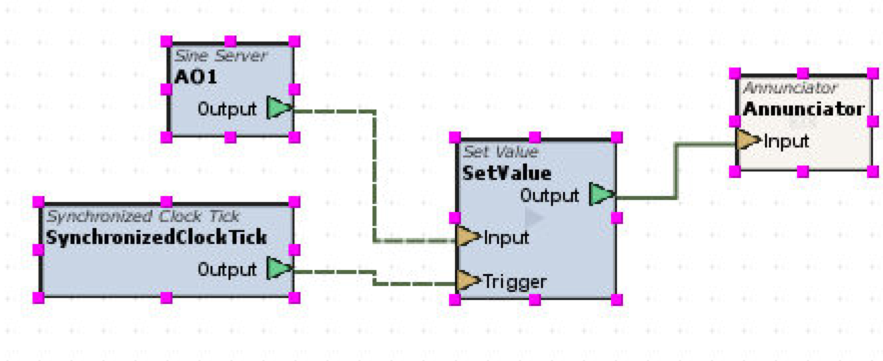
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

	• Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in

	Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Set Value

The Set Value element will send its current value whenever it is triggered, and works like a software latch. There are two ways to sent the current value The first way is to use a constant (pre-set) at development time, provided by the Set Value property. The other way is to connect a data source to the Input of the component. Note that there is a minor conflict here, and the last value set will be the value sent, whether the property or the input from the Input pin. In other words, expect the pre-set constant to be overwritten every time a new value is sent into the Input port. No value will be sent out to the Output until a new value is received by the Trigger input.



Standard Inputs

Pin	Notes
Input	Accepts a single data input which can be used in lieu of the Set Value property from Basic Properties.
Trigger	Accepts a trigger input which is used to output the current Input value.

Standard Outputs

Pin	Notes
Output	Outputs the current Input when triggered.

Basic Properties

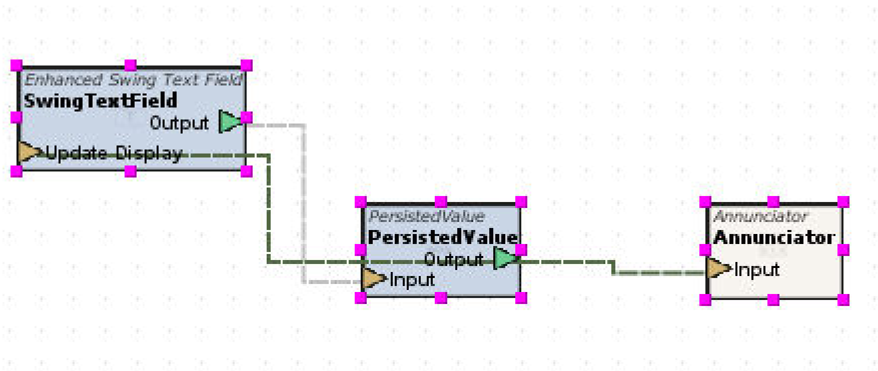
Property Name	Notes
Set Value	Defines the value to output when a trigger input is fired.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Persisted Value

The Persisted Value element is commonly used to store data within the system. Data held within the system is saved to FLASH memory in the event of a restart or power cycle.



Standard Inputs

Pin	Notes
Input	Accepts a single input value which is persisted into memory.

Standard Outputs

Pin	Notes
Output	Outputs the persisted value based on Basic Properties configuration.

Basic Properties

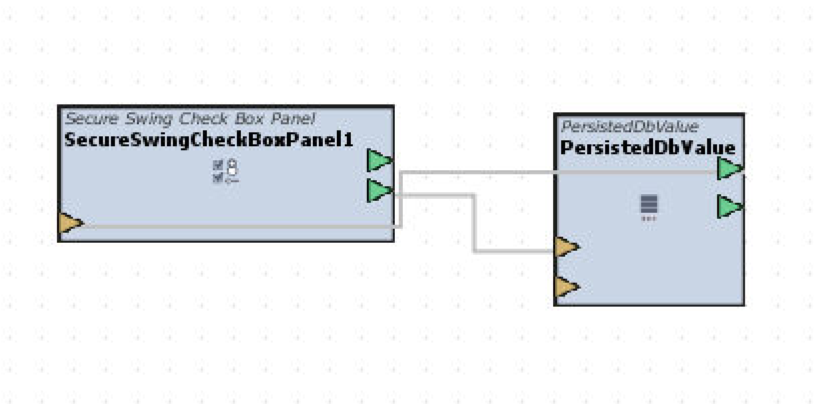
Property Name	Notes
Output Persisted Value	Defines if the last persisted value stored in FLASH should be outputted.
Set Initial Value	Defines the initial value of the element, stored in FLASH.
Throttle Value	Defines how often, in seconds, values are stored to FLASH.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Debug Level	Defines the debug level used to troubleshoot the operation of this element. A value of 76 or greater will output debug information to the Aspect Control Engine Log or local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Validation Type	Defines if data type validation should occur with any incoming value received by the Persisted Value. If set to a value other than "Any Type", the element will insert an error into the Aspect Control Engine Log should incoming data not match the type selected from this property.

Persisted DB Value

The Persisted DB Value element is commonly used to store data within the a database. Data held within the system is saved to disk in the event of a restart or power cycle.



Standard Inputs

Pin	Notes
Input	Accepts a single input value which is persisted to the database.
Trigger	Accepts a single input and is used to trigger a write to the database.

Standard Outputs

Pin	Notes
Result	Outputs the persisted value based on Basic Properties configuration.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Active Key	The database key actively being used by this instance. (Read Only)
Connection Name	Defines the connected database to where trend

	data will be stored.
Create Table	When set to true the table will be created automatically.
Database Table Name	Defines the database table name to read data from.
Default Value	Value to be used if the database cannot be connected to or the key could not be found.
Key (ID)	Defines the key/row name to read data from.
Timebase	The amount of seconds between updates.

Expert Properties

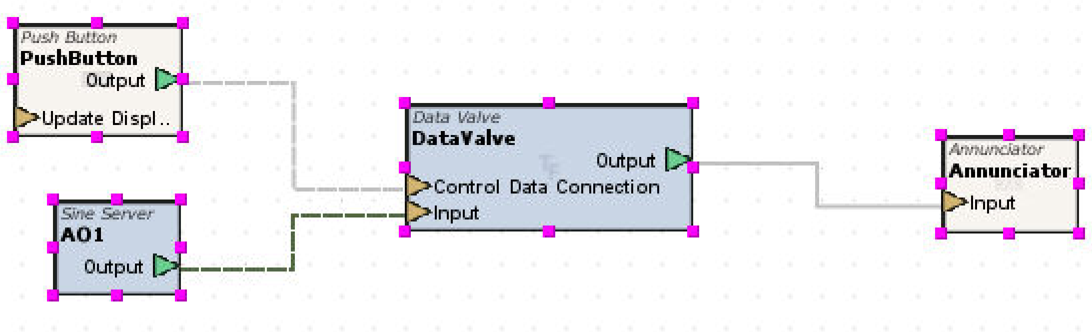
Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect

	start-up. Lower values get higher priority. This defaults to 255.
Syncronize Connection	Defines if the connection to the database should be synchronized.

Data Valve

The Data Valve provides a mechanism to gate a value. That is, it will prevent values passing through while disabled and allow values when enabled. It provides a simple way to do on/off data flow control.

The Control Server is an input data source that provides a way to control the flow through the manipulator. If a value of true is sent to the Control Server then the values will pass, if a value of false is sent to the control server then no values will pass through the manipulator. In other words, the control is enabled (value pass) when the control server is true and disabled (value do not pass) when the control is false.



Standard Inputs

Pin	Notes
Control Data Connection	Accepts a single trigger input, and is used gate information.
Input	Accepts a single data value. Constant data is gated when the Control Data Connection input is a logical true value (1). When the Control Data Connection input is logical false (0), the last value gated will continue to be outputted.

Standard Outputs

Pin	Notes
Output	Outputs the commanded gated value.

Basic Properties

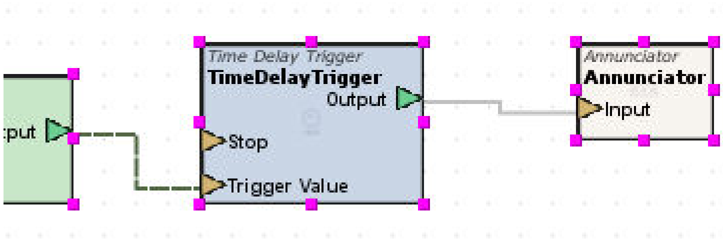
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

DELAY *Time Delay Trigger*

Used to write a value with an inherent time delay. For example, if my Trigger Value updates, the time delay will then execute. Once expires, Trigger Value's input value will be outputted. An input pin is available to programmatically stop the time delay from expiring.



Standard Inputs

Pin	Notes
Stop	Accepts a logical boolean value. When a logical true value (1) is received during a time delay, no output will occur.
Trigger Value	Accepts any input type, and is outputted once the time delay defined in Basic Properties has expired.

Standard Outputs

Pin	Notes
Output	Outputs the delayed value.

Basic Properties

Property Name	Notes
Time Delay	Defines the amount of time, in seconds, that must elapse before the input value is passed to the output.

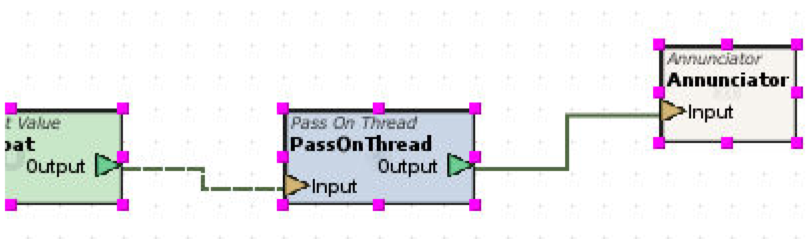
Expert Properties

Property Name	Notes

Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Pass On Thread

The Pass On Thread element simply passes any value from the input to the output. However, the output is passed on a different thread from the input. This means that passing a value into the input will take almost no time and that the execution of the logic on the output side will be performed at a later time in a separate thread of execution.



Standard Inputs

Pin	Notes
Input	Accepts a single data value, which is passed to the output

Standard Outputs

Pin	Notes
Output	Outputs the value on a new thread.

Basic Properties

No Basic Properties exist for this element.

Expert Properties

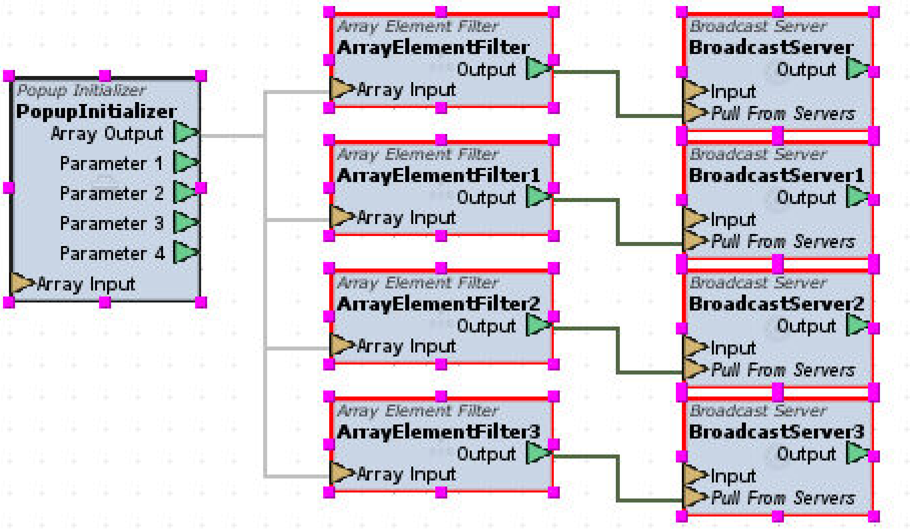
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect

	start-up. Lower values get higher priority. This defaults to 255.

Popup Initializer

The Popup Initializer element s used in a component to initialize the values when it is used as a pop-up (either as a Popup or on-screen panel). The Initialization String set by the Click Action Panel for the graphic using the component as a pop-up will be sent to this manipulator. The Array Output will generate an Array Value containing the elements of the Initialization String.

The values sent to the Popup Initializer can be used in two ways. First, when you enter the number of parameters (to match the number of initialization constants sent to the component) you will get one output for each initialization value sent to the component (one for each of the number of parameters entered in the comma separated list of the Initialization property of the Click Action panel of the component invoking the Popup). Secondly, the Array Output can be used to send the information in the form of an array.



Standard Inputs

Pin	Notes
Array Input	Accepts an array input value for pop-up initialization of on-screen pop-ups.

Standard Outputs

Pin	Notes
Output	Outputs the arrayed data from a click action and is filtered using Array Element filters.
Parameter #	Outputs the parameter for each array element (provided that Number of Parameters in Basic Properties is configured as such). The number of Parameter outputs will follow the configuration of this Basic Property.

NOTE - If Number of Parameters has been configured for a value other than -1, array element outputs will be created for each array slot that is outputted by this element.

Basic Properties

Property Name	Notes
Number of Parameters	Defines the number of parameters that will be passed through by an initialization string. By default, this value can remain at -1, and be parsed using Array Element Filters (as shown above)

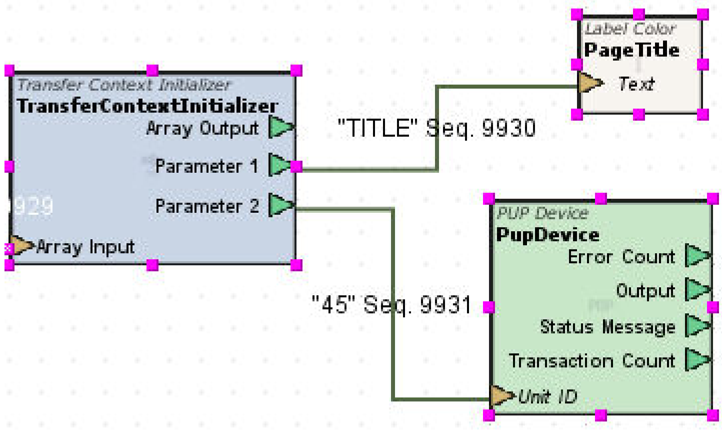
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.

Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Transfer Context Initializer

The Transfer Context Initializer element is used to receive transferred context from URL buttons, or from other click-action based item and pass the data onto connected elements.



Standard Inputs

Pin	Notes
Array Input	Accepts an array input. This input commonly has NO connection made to it, as transfer context is received from a page navigation. In nearly all applications, no connection should be made to this input.

Standard Outputs

Pin	Notes
Array Output	Outputs context data in an arrayed format.
Parameter #	Outputs the parameter for each array element (provided that Number of Parameters in Basic

	Properties is configured as such). The number of Parameter outputs will follow the configuration of this Basic Property.

Basic Properties

Property Name	Notes
Number of Parameters	Defines the number of contextual parameters being passed into the application by a URL button or other click-action based item.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

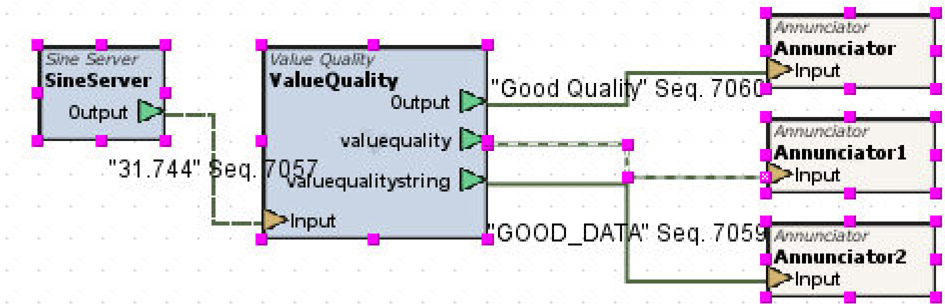
More Information

Transfer with Context Overview

Configuring an Application to Transfer Context

Value Quality

The Value Quality element is used as a diagnostic tool to determine the quality of data received from the Aspect Control Engine. This element is designed to provide users with the ability to determine quality and programmatically fall back or into other routines as deemed necessary by the application developer.



Standard Inputs

Pin	Notes
Input	Accepts a single data value of any type.

Standard Outputs

Pin	Notes
Output	Outputs the quality type of plain English text.
Value Quality	Outputs the numeric quality indicator.
Value Quality String	Outputs the quality string.

Basic Properties

Property Name	Notes
Minimum Quality	Defines the quality type required for minimum quality.
Output Bad Quality	Defines a string value that will be passed if the data quality if bad.
Output Good Quality	Defines a string value that will be passed if the data quality is good.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

PUP

PUP Driver

The PUP Driver element represents the base communication driver used to communicate to PUP devices on any Aspect target. Using this element, you configure your project to communicate to a Matrix Area Controller.

Prior to attempting to configure the PUP Driver, an FTNet Device element must be present in your application that defines the IP address of the Matrix Area Controller or target that you will perform PUP communications with. In order to perform any type of PUP communications, an FTNet Device element must be present in application logic.

Standard Inputs

Pin	Notes
Input	This input carries no functionality and should have no connections made to it in all applications.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
FTNet Device Name	Defines the configured FTNet Device that references an Aspect target that is connected to a PUP network.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.

Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Maximum Socket Connections	Defines the maximum number of sockets that the driver will use for IP-based connections.
Port Number	Defines the UDP Port used by the PUP Driver to perform peer-to-peer communications across Ethernet.
PUP Version	Defines the version of the PUP Driver used.
Response Timeout	Defines the maximum amount of time, in milliseconds, that the driver wait for no response before a time out condition is considered.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 20.
Timebase	Defines how often, in seconds, the element will execute and update its value.

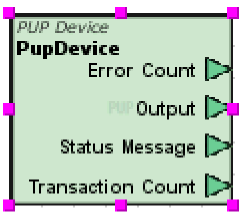
More Information

[PUP Overview]

[Adding the PUP Driver]

PUP *PUP Device*

The PUP Device element represents a network addressed PUP device connected to an RS-485 port of an Aspect target. This element is used to define PUP devices for network communications within a project.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Error Count	Outputs the number of transaction errors that have occurred against this device during normal communications from Aspect.
Output	Outputs the current device network status for this device.
Status Message	Outputs the current device network status message for this device.
Transaction Count	Outputs the number of transactions currently outstanding for this device.

Basic Properties

Property Name	Notes
PUP Driver Name	Defines a configured PUP Driver element.
RS-485 Port	Defines the RS-485 port of a Matrix Area Controller or other Aspect target on which the PUP device resides on.
Unit ID	Defines the Unit ID address of the PUP device being referenced.

Expert Properties

Property Name	Notes
Debug Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.

Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 30.

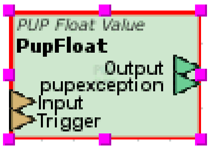
More Information

PUP Overview

Adding PUP Devices

PUP Float

The PUP Float element is used to read and write to attributes with a floating point datatype.



Standard Inputs

Pin	Notes
Input	Accepts float data types and is used to write data to the defined channel attribute.
Trigger	Accepts a single trigger value and is used to perform a triggered write to the defined channel attribute independent of the Input pin.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed channel attribute.
PUP Exception	Outputs any exception message returned by the device when attempting to read the channel attribute.

Basic Properties

Property Name	Notes
Attribute	Defines the addressed attribute for read/write services.
Channel	Defines the hexadecimal channel for read/write services.
PUP Device	Defines a configured PUP Device to access.
Signed	Defines if the value is a signed integer or unsigned integer.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays

	colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

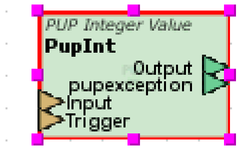
More Information

[PUP Overview]

[Addressing Point Attributes]

PUP Int

The PUP Int element is used to read and write to attributes with an integer (signed or unsigned) data type.



Standard Inputs

Pin	Notes
Input	Accepts integer data types and is used to write data to the defined channel attribute.
Trigger	Accepts a single trigger value and is used to manually trigger a read request for the channel attribute.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed channel attribute.
PUP Exception	Outputs any exception message returned by the device when attempting to read the channel attribute.

Basic Properties

Property Name	Notes
Attribute	Defines the addressed attribute for read/write services.
Channel	Defines the hexadecimal channel for read/write

	services.
PUP Device	Defines a configured PUP Device to access.
Signed	Defines if the value is a signed integer or unsigned integer.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property

Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

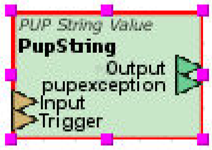
More Information

[PUP Overview]

[Addressing Point Attributes]

PUP String

The PUP String element is used to read and write to attributes with a string datatype.



Standard Inputs

Pin	Notes
Input	Accepts string data types and is used to write data to the defined channel attribute.
Trigger	Accepts a single trigger value and is used to perform a triggered write to the defined channel attribute independent of the Input pin.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed channel attribute.
PUP Exception	Outputs any exception message returned by the device when attempting to read the channel attribute.

Basic Properties

Property Name	Notes
Attribute	Defines the addressed attribute for read/write services.
Channel	Defines the hexadecimal channel for read/write services.
PUP Device	Defines a configured PUP Device to access.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Write Throttle	Defines the value in milliseconds to wait between

	writes of the same value.

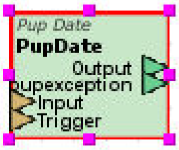
More Information

[PUP Overview](#)

[Addressing Point Attributes](#)

PUP Date

The PUP Date element is used to read and write to attributes with a date data type.



Standard Inputs

Pin	Notes
Input	Accepts date data types and is used to write data to the defined channel attribute.
Trigger	Accepts a single trigger value and is used to perform a triggered write to the defined channel attribute independent of the Input pin.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed channel attribute.
PUP Exception	Outputs any exception message returned by the device when attempting to read the channel attribute.

Basic Properties

Property Name	Notes
Attribute	Defines the addressed attribute for read/write

	services.
Channel	Defines the hexadecimal channel for read/write services.
PUP Device	Defines a configured PUP Device to access.
Signed	Defines if the value is a signed integer or unsigned integer.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays

	colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

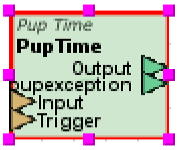
PUP Overview

Addressing Point Attributes

Date Button

PUP Time

The PUP Time element is used to read and write to attributes with a time data type.



Standard Inputs

Pin	Notes
Input	Accepts time data types and is used to write data to the defined channel attribute.
Trigger	Accepts a single trigger value and is used to perform a triggered write to the defined channel attribute independent of the Input pin.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed channel attribute.
PUP Exception	Outputs any exception message returned by the device when attempting to read the channel attribute.

Basic Properties

Property Name	Notes
Attribute	Defines the addressed attribute for read/write services.
Channel	Defines the hexadecimal channel for read/write services.
PUP Device	Defines a configured PUP Device to access.
Signed	Defines if the value is a signed integer or unsigned integer.

Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol

	dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

PUP Overview

Addressing Point Attributes

Date Button

PUP Bit Mask

The PUP Bit Mask element is used to read and write to attributes with a bit string data type.

Standard Inputs

Pin	Notes
Input	Accepts bit string data types and is used to write data to the defined channel attribute.
Trigger	Accepts a single trigger value and is used to perform a triggered write to the defined channel attribute independent of the Input pin.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed channel attribute.
PUP Exception	Outputs any exception message returned by the device when attempting to read the channel attribute.

Basic Properties

Property Name	Notes
Attribute	Defines the addressed attribute for read/write services.
Channel	Defines the hexadecimal channel for read/write services.
PUP Device	Defines a configured PUP Device to access.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

	• Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

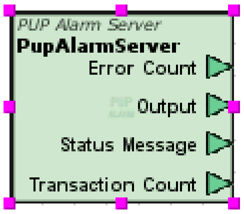
PUP Overview

Addressing Point Attributes

Working with Bit Strings

PUP Alarm Server

The PUP Alarm Server element is used to enable polling of controller-based alarms from a PUP device. This entails referencing a configured PUP Driver and port. The output of this element is typically connected using a connection wire to the input of a PUP Alarm Manipulator, which controls the delivery of alarm information to a configured Alarm Manager.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Error Count	Outputs the number of transaction errors that have occurred against this device during normal communications from Aspect.
Output	Outputs polled alarms to the PUP Alarm Manipulator.
Status Message	Outputs the current device network status message for this device.
Transaction Count	Outputs the number of transactions currently outstanding for this device.

Basic Properties

Property Name	Notes
Network ID	Defines the Port to poll alarms for.
PUP Driver Name	Defines a configured PUP Driver.

Expert Properties

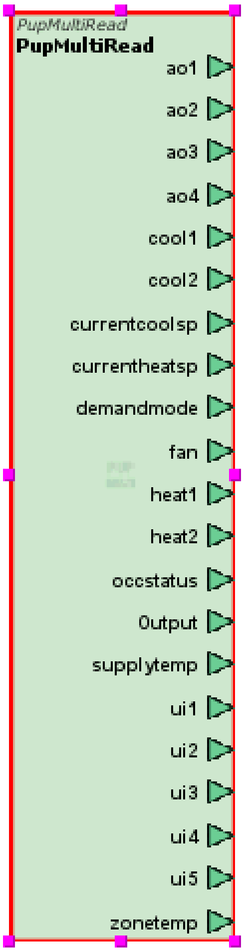
Property Name	Notes
Block Writes	Define
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Simulating	Defines if values are simulated when Aspect-Studio is in SIM mode.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.

More Information

PUP Overview

PUP Multi Read

The PUP Multi Read element is used to read multiple channel attributes from a single PUP device. This element is useful for situations where multiple points from a field device need to be read and displayed on a graphical user interface page. The element can also be used for trending multiple points, in conjunction with the Triggered Multipoint Historical, from a device without the need to click and drop singular field bus elements.



Standard Inputs

This element has no standard inputs.

Standard Outputs

Pin	Notes
Output	Reserved for future use and implementation.
Custom	This element will spawn custom outputs based on multipoint property definition.

Basic Properties

Property Name	Notes
Only Poll Connected?	When set to True, only points with connections made to other elements either directly or through managed connections will be polled. Else, all points defined in the related properties

	file will be polled regardless of connection status.
Output Definition Resource	Defines the .properties file that the element is bound to. This property is read-only and cannot be changed once the element has been bound.
PUP Device	Defines the PUP Device that data will be polled from.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Always Live?	When set to True, this element will poll for live data when Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
MaxRPM	Defines how many channel attributes will be

	polled per read. By default, this value is set to 1. NOTE: SBC-GPC Product Family (v2.00 or later) and PNC Product Family (1.00 or later) devices support a maximum RPM Count of 10. Other devices such as ASCe and VAV have a maximum of 1. For more information, click the PUP Multipoint Element Overview link below.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.

More Information

[PUP Multipoint Element Overview]

[Designing Multipoint Files for PUP Multipoint Elements]

[Adding PUP Multipoint Elements into a Project]

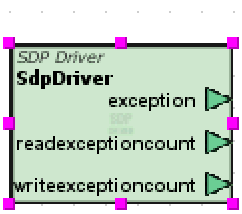
[Working with PUP Multipoint Elements]

SDP

SDP Driver

The SDP Driver element represents the base communication driver used to communicate to SDP devices on any Aspect target. This driver can only be used on Aspect Server products (Facility, Enterprise, etc.)

Prior to attempting to configure the SDP Driver, an FTNet Device element must be present in your application that defines the IP address of the Aspect Server target.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Exception	Outputs the last received exception interpreted by the SDP Driver.
Read Exception Count	Outputs the total number of read errors encountered by the SDP Driver.
Write Exception Count	Outputs the total number of write errors encountered by the SDP Driver.

Basic Properties

Property Name	Notes
FTNet Device Name	Defines the configured FTNet Device that references an Aspect target that is connected to a PUP network.

Expert Properties

Property Name	Notes
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Device OOS Timeout	Defines the amount of time, in minutes, that must elapse within Aspect before the system will attempt communications with a device that was previously marked offline.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Maximum Socket Connections	Defines the maximum number of sockets that the driver will use for IP-based connections.
Port	Defines the internal port number used to trans-

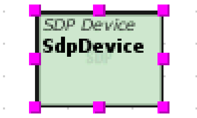
	mit traffic within Aspect.
Response Timeout	Defines the maximum amount of time, in milliseconds, that the driver wait for no response before a time out condition is considered.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 20.

More Information

SDP Overview

SDP Device

The SDP Device element represents a network addressed SDP device connected on the IP network.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Driver Name	Defines a configured SDP Driver element.
IP Address	Defines the IP address of the SDP Device intended to be communicated with.
Port	Defines the UDP Port number used by the SDP Device (this always defaults to 17284).

Expert Properties

Property Name	Notes
Debug Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 20.

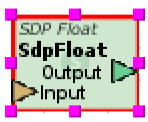
More Information

[SDP Overview]

[Adding the SDP Driver]

SDP Float

The SDP Float element is used to read and write to attributes with a floating point datatype.



Standard Inputs

Pin	Notes
Input	Accepts float data types and is used to write data to the defined object attribute.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed object attribute

Basic Properties

Property Name	Notes
Attribute	Defines the object attribute.
Device Name	Defines a configured SDP Device.
Fundamental Type	Defines the type of information to be accessed • PT - Points • VR - Variables • PG - Programs
Object Name	Defines the referenced database object name.
Objects and Attributes	Double-click to invoke automated upload of the SageMAX database.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated

	by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in

	Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

[SDP Overview]

[Working with Fundamental Types Overview]

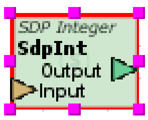
[Addressing Data Using Discovery Assist]

[Addressing Data Offline]

[Timebase Considerations]

SDP Int

The SDP Int element is used to read and write to attributes with an integer (signed or unsigned) data type.



Standard Inputs

Pin	Notes
Input	Accepts integer data types and is used to write data to the defined object attribute

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed object attribute.

Basic Properties

Property Name	Notes
Attribute	Defines the object attribute.
Device Name	Defines a configured SDP Device.
Fundamental Type	Defines the type of information to be accessed • PT - Points • VR - Variables • PG - Programs
Object Name	Defines the referenced database object name.
Objects and Attributes	Double-click to invoke automated upload of the SageMAX database.
Signed	Defines whether or not the defined point is a signed integer.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays

	colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

[SDP Overview](#)

[Working with Fundamental Types Overview](#)

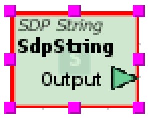
[Addressing Data Using Discovery Assist](#)

[Addressing Data Offline](#)

[Timebase Considerations](#)

SDP String

The SDP String element is used to read and write to attributes with a string data type.



Standard Inputs

Pin	Notes
Input	Accepts string data types and is used to write data to the defined object attribute.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed object attribute

Basic Properties

Property Name	Notes
Attribute	Defines the object attribute.
Device Name	Defines a configured SDP Device.
Fundamental Type	Defines the type of information to be accessed

	• PT - Points • VR - Variables • PG - Programs
Object Name	Defines the referenced database object name.
Objects and Attributes	Double-click to invoke automated upload of the SageMAX database.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays

	colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

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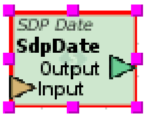
SDP Date

The SDP Date element is used to read and write to attributes with a date data type.



Standard Inputs

Pin	Notes
Input	Accepts date data types and is used to write data to the defined object attribute.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed object attribute

Basic Properties

Property Name	Notes
Attribute	Defines the object attribute.
Device Name	Defines a configured SDP Device.
Fundamental Type	Defines the type of information to be accessed • PT - Points • VR - Variables • PG - Programs
Object Name	Defines the referenced database object name.
Objects and Attributes	Double-click to invoke automated upload of the SageMAX database.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Con-

	trol Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

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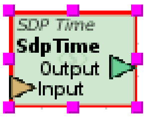
SDP Time

The SDP Time element is used to read and write to attributes with a time data type.



Standard Inputs

Pin	Notes
Input	Accepts time data types and is used to write data to the defined object attribute.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed object attribute

Basic Properties

Property Name	Notes
Attribute	Defines the object attribute.
Device Name	Defines a configured SDP Device.
Fundamental Type	Defines the type of information to be accessed • PT - Points • VR - Variables • PG - Programs
Object Name	Defines the referenced database object name.
Objects and Attributes	Double-click to invoke automated upload of the SageMAX database.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the ele-

	ment will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value

	Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

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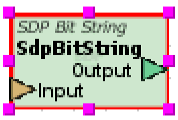
SDP Bit String

The SDP Bit element is used to read and write to attributes with a bit string data type.



Standard Inputs

Pin	Notes
Input	Accepts bit string data types and is used to write data to the defined object attribute.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed object attribute

Basic Properties

Property Name	Notes
Attribute	Defines the object attribute.
Device Name	Defines a configured SDP Device.
Fundamental Type	Defines the type of information to be accessed • PT - Points • VR - Variables • PG - Programs
Object Name	Defines the referenced database object name.
Objects and Attributes	Double-click to invoke automated upload of the SageMAX database.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output

	OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

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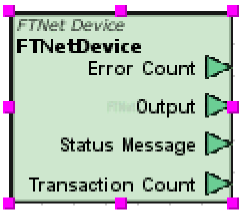
FTNet

FTNet Device

The FTNet Device element is the first element that is added to any project that will utilize PUP, BACnet, or SDP communications. The FTNet Device element references the Aspect target you are either deploying to, or communicating with across a network.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Error Count	Outputs the number of transaction errors that have occurred against this device during normal communications from Aspect.
Output	Outputs the current device network status for this device.
Status Message	Outputs the current device network status message for this device.
Transaction Count	Outputs the number of transactions currently outstanding for this device.

Basic Properties

Property Name	Notes
Hostname	Defines the IP address or resolvable name of an Aspect target.

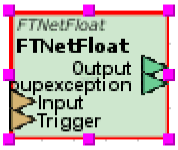
Expert Properties

Property Name	Notes
Port Number	Defines the internal port number used to transmit traffic within Aspect.
Maximum Socket Connections	Defines the maximum number of sockets that the driver will use for IP-based connections.
Response Timeout	Defines the maximum amount of time, in milliseconds, that the driver wait for no response before a time out condition is considered.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Simulating	Defines if values are simulated when Aspect-Studio is in SIM mode.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 10.

FTNet Float

The FTNet Float element is used to read and write to attributes with a floating data type.



Standard Inputs

Pin	Notes
Input	Accepts float data types and is used to write data to the defined value ID.
Trigger	Accepts a single trigger value and is used to manually trigger a read request for the value ID.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed value ID.
PUP Exception	Outputs any exception message returned by the device when attempting to read the value ID.

Basic Properties

Property Name	Notes
Channel	Defines the hexadecimal channel for read/write services.
FTNet Device Name	Defines a referenced FTNet Device
Signed	Defines if the value is a signed integer or unsigned integer.
Timebase	Defines how often (in seconds) the point will be

	polled.
Value ID	Defines the referenced ID for retrieval of values. Maximum of two alphanumeric characters. Note: Value IDs are case-sensitive i.e. cv, cV, Cv, CV are all different points.

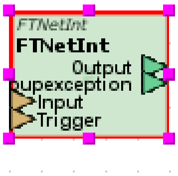
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low

	level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

FTNet Int

The FTNet Int element is used to read and write to attributes with a integer data type.



Standard Inputs

Pin	Notes
Input	Accepts integer data types and is used to write data to the defined value ID.
Trigger	Accepts a single trigger value and is used to manually trigger a read request for the value ID.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed value ID.
PUP Exception	Outputs any exception message returned by the device when attempting to read the value ID.

Basic Properties

Property Name	Notes
Channel	Defines the hexadecimal channel for read/write services.
FTNet Device Name	Defines a referenced FTNet Device
Signed	Defines if the value is a signed integer or unsigned integer.
Timebase	Defines how often (in seconds) the point will be polled.
Value ID	Defines the referenced ID for retrieval of values. Maximum of two alphanumeric characters. Note: Value IDs are case-sensitive i.e. cv, cV, Cv, CV are all different points.

Expert Properties

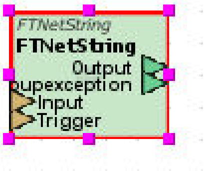
Property Name	Notes

Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).

Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

F *FTNet String*

The FTNet String element is used to read and write to attributes with a string data type.



Standard Inputs

Pin	Notes
Input	Accepts string data types and is used to write data to the defined value ID.
Trigger	Accepts a single trigger value and is used to

	manually trigger a read request for the value ID.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed value ID.
PUP Exception	Outputs any exception message returned by the device when attempting to read the value ID.

Basic Properties

Property Name	Notes
Channel	Defines the hexadecimal channel for read/write services.
FTNet Device Name	Defines a referenced FTNet Device
Timebase	Defines how often (in seconds) the point will be polled.
Value ID	Defines the referenced ID for retrieval of values. Maximum of two alphanumeric characters. Note: Value IDs are case-sensitive i.e. cv, cV,

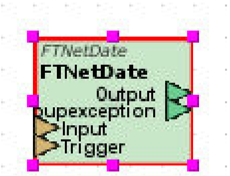
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.

Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

FTNet Date

The FTNet Date element is used to read and write to attributes with a date datatype.



Standard Inputs

Pin	Notes
Input	Accepts date data types and is used to write

	data to the defined value ID.
Trigger	Accepts a single trigger value and is used to manually trigger a read request for the value ID.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed value ID.
PUP Exception	Outputs any exception message returned by the device when attempting to read the value ID.

Basic Properties

Property Name	Notes
Channel	Defines the hexadecimal channel for read/write services.
FTNet Device Name	Defines a referenced FTNet Device
Signed	Defines if the value is a signed integer or unsigned integer.
Timebase	Defines how often (in seconds) the point will be polled.
Value ID	Defines the referenced ID for retrieval of values. Maximum of two alphanumeric characters. Note: Value IDs are case-sensitive i.e. cv, cV, Cv, CV are all different points.

Expert Properties

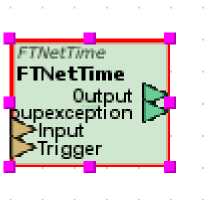
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output

	OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

FTNet Time

The FTNet Time element is used to read and write to attributes with a time data type.



Standard Inputs

Pin	Notes
Input	Accepts time data types and is used to write data to the defined value ID.
Trigger	Accepts a single trigger value and is used to manually trigger a read request for the value ID.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed value ID.
PUP Exception	Outputs any exception message returned by the

	device when attempting to read the value ID.

Basic Properties

Property Name	Notes
Channel	Defines the hexadecimal channel for read/write services.
FTNet Device Name	Defines a referenced FTNet Device
Signed	Defines if the value is a signed integer or unsigned integer.
Timebase	Defines how often (in seconds) the point will be polled.
Value ID	Defines the referenced ID for retrieval of values. Maximum of two alphanumeric characters. Note: Value IDs are case-sensitive i.e. cv, cV, Cv, CV are all different points.

Expert Properties

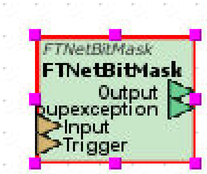
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements

	that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in

	Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

FTNet Bitmask

The FTNet Bit Mask element is used to read and write to attributes with a bit mask data type.



Standard Inputs

Pin	Notes
Input	Accepts bit string data types and is used to write data to the defined value ID.
Trigger	Accepts a single trigger value and is used to manually trigger a read request for the value ID.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed value ID.
PUP Exception	Outputs any exception message returned by the device when attempting to read the value ID.

Basic Properties

Property Name	Notes
Channel	Defines the hexadecimal channel for read/write services.
FTNet Device Name	Defines a referenced FTNet Device
Timebase	Defines how often (in seconds) the point will be

	polled.
Value ID	Defines the referenced ID for retrieval of values. Maximum of two alphanumeric characters. Note: Value IDs are case-sensitive i.e. cv, cV, Cv, CV are all different points.

Expert Properties

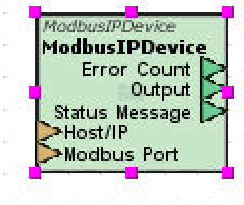
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.

Trigger on Thread	Defines if the value should be updated based on thread execution.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

Modbus

Modbus IP Device

The Modbus TCP Device Server element is the server (driver) for communicating with Modbus devices over TCP. It is required for all applications using Modbus TCP. You do not make any connections from this component to the Modbus Server components, but it must be present in the application logic.



Standard Inputs

Pin	Notes
Host IP	Accepts a single data input and can be used to set the addressed device's IP address.
Modbus Port	Accepts a single data input and can be used to set the TCP port for the addressed device.

Standard Outputs

Pin	Notes
Error Count	Outputs the current amount of transaction errors encountered with the addressed device.
Output	Outputs the current value of the addressed value ID.
Status Message	Outputs the current status message for the Modbus device.

Basic Properties

Property Name	Notes
Hostname	Defines the IP address or resolvable host name for the Modbus TCP device.
Maximum Socket Connections	Defines how many maximum socket connections can be made at a given time to the Modbus TCP device.
Simulating?	Defines whether or not data should be simulated in Aspect-Studio.
Timebase	Defines the amount of time a device is checked to be online.
Timeout, Response	Defines how much time, in milliseconds, must elapse before a time out is considered.

Expert Properties

Property Name	Notes
Block Reads	Defines how Modbus data is retrieved. When set to True, Aspect will attempt to read all registers from a device using one command, thereby consuming less network bandwidth. When set to False, Aspect will read registers singularly (one at a time).
Block Writes	Defines how Modbus data is written. When set to True, Aspect will attempt to write all registers from a device using one command, thereby consuming less network bandwidth. When set to False, Aspect will write registers singularly (one at a time).
Debug Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Link Timeout	Defines the link time out, in seconds.
Modbus Port	Defines the TCP port to use for Modbus TCP communications.

Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Simulation Mode	Defines if Simulation Mode is enabled. Simulation mode allows simulation of modbus transactions when no devices are available - returns all zeros on reads.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 30.
Use Transaction IDs	Defines if transaction IDs should be used during network communications.

More Information

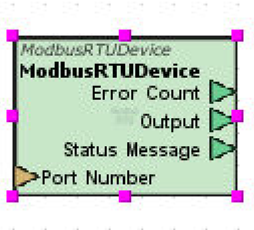
Modbus Overview

Adding a Modbus Device

Modbus Device Addressing

RTU *Modbus RTU Device*

The Modbus RTU Device Server element is the server (driver) for communicating with Modbus devices over Serial RTU. It is required for all applications using Modbus RTU. You do not make any connections from this component to the Modbus Server components, but it must be present in the application logic.



Standard Inputs

Pin	Notes
Port Number	Accepts a single numeric input and can be used to set the COM port on which the Modbus RTU device exists.

Standard Outputs

Pin	Notes
Error Count	Outputs the current amount of transaction errors encountered with the addressed device.
Output	Outputs the current value of the addressed value ID.
Status Message	Outputs the current status message for the Modbus device.

Basic Properties

Property Name	Notes
Baud Rate	Defines the network baud rate.
Flow Control	Specifies the flow control method for the RS-485 network.
Parity	Specifies the network parity for the RS-485 network.
Port Number	Specifies the COM port used on a Matrix for Modbus RTU communications.
Simulating	Specifies whether or not data should be simulated in Aspect-Studio.
Stop Bits	Specifies the number of stop bits for the RS-485 network.
Timebase	Defines the amount of time a device is checked to be online.
Timeout, Response	Defines how much time, in milliseconds, must elapse before a time out is considered.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic

	when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Block Writes	Defines how Modbus data is written. When set to True, Aspect will attempt to write all registers from a device using one command, thereby consuming less network bandwidth. When set to False, Aspect will write registers singularly (one at a time).
Debug Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Maximum Block Offset	Defines the element offset used to read multiple registers. If you cannot communicate to a Modbus device and have ensured network communication wiring is sane, set this value to zero (0).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Simulation Mode	Defines if Simulation Mode is enabled. Simulation mode allows simulation of modbus transactions when no devices are available - returns all zeros on reads.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 30.

More Information

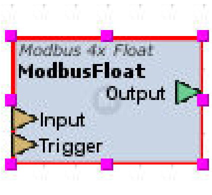
[Modbus Overview](#)

[Adding a Modbus Device](#)

[Modbus Device Addressing](#)

Modbus Float

The Modbus Float element is used to read and write to registers with a floating point data type.



Standard Inputs

Pin	Notes
Input	Accepts a single value used to write data to the addressed register.
Trigger	Accepts a single trigger input used to manually request a read of the addressed register.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed register.

Basic Properties

Property Name	Notes
Device Name	Defines a configured Modbus device.
Reg. Address	Defines the register offset address for the point you wish to monitor.
Register Type	Defines the register type for monitoring (3x Range, or 4x Range)

Slave Node Address	Defines the Modbus node address.
Swap Style	This determines how the Float is stored in the Modbus register. The default is Word Swap. The other choices are No Swap, Byte Swap, and Both Swap. For No Swap the bytes are delivered in the normal order which is two adjacent 16 bit words. For Word Swap the high word (16 bit) and the low word are swapped. For Byte Swap the high and low bytes of each word are swapped. For Both Swap, both the high and low bytes and the high and low words are swapped. This has the effect of reversing the byte order in the value. The default is "Word Swap" which is the native Modicon format.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi

	property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Optimize Reading	Defines if the data type should be optimized for full normalization within the control environment
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

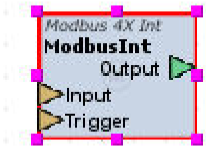
More Information

Modbus Overview

Addressing Registers

Modbus Int

The Modbus Int element is used to read and write to registers with an integer data type



Standard Inputs

Pin	Notes
Input	Accepts a single value used to write data to the addressed register.
Trigger	Accepts a single trigger input used to manually request a read of the addressed register.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed register.

Basic Properties

Property Name	Notes
Device Name	Defines a configured Modbus device.
Reg. Address	Defines the register offset address for the point you wish to monitor.
Register Type	Defines the register type for monitoring (3x Range, or 4x Range).
Signed	Defines if the value is a signed integer.
Slave Node Address	Defines the Modbus node address.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Optimize Reading	Defines if the data type should be optimized for full normalization within the control environment
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.

Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

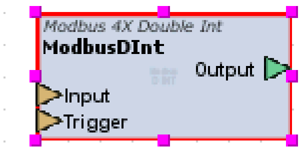
More Information

[Modbus Overview]

[Addressing Registers]

D int *Modbus DInt*

The Modbus DInt element is used to read and write to registers with a double integer data type.



Standard Inputs

Pin	Notes
Input	Accepts a single value used to write data to the addressed register.
Trigger	Accepts a single trigger input used to manually request a read of the addressed register.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed register.

Basic Properties

Property Name	Notes
Device Name	Defines a configured Modbus device.
Reg. Address	Defines the register offset address for the point you wish to monitor.
Register Type	Defines the register type for monitoring (3x Range, or 4x Range)
Signed	Defines if the value is a signed integer.
Slave Node Address	Defines the Modbus node address.
Swap Style	This determines how the Double Integer is stored in the Modbus register. The default is Word Swap. The other choices are No Swap, Byte Swap, and Both Swap. For No Swap the bytes are delivered in the normal order which is two adjacent 16 bit words. For Word Swap the high word (16 bit) and the low word are swapped. For Byte Swap the high and low bytes of each word are swapped. For Both Swap, both the high and low bytes and the high and low words are swapped. This has the effect of reversing the byte order in the value. The default is Word Swap which is the native Modicon format.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

	• Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Optimize Reading	Defines if the data type should be optimized for full normalization within the control environment
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 255.
Trigger on Thread	Defines if the value should be updated based on thread execution.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

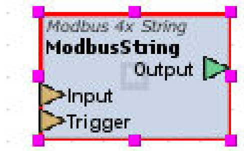
More Information

[Modbus Overview](#)

[Addressing Registers](#)

Modbus String

The Modbus String element is used to read and write to registers with a string data type.



Standard Inputs

Pin	Notes
Input	Accepts a single value used to write data to the addressed register.
Trigger	Accepts a single trigger input used to manually request a read of the addressed register.

Standard Outputs

Pin	Notes

Output	Outputs the current value of the addressed register.

Basic Properties

Property Name	Notes
Byte Swap	Defines whether or not to byte swap the characters in the string.
Device Name	Defines a configured Modbus device.
Reg. Address	Defines the register offset address for the point you wish to monitor.
Register Type	Defines the register type for monitoring (3x Range, or 4x Range)
Slave Node Address	Defines the Modbus node address.
String Length	Defines the length of the string that will be read (the total number of registers to be read).
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).

Optimize Reading	Defines if the data type should be optimized for full normalization within the control environment
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Trigger on Thread	Defines if the value should be updated based on thread execution.

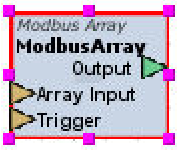
More Information

Modbus Overview

Addressing Registers

Modbus Array

The Modbus Array element is used to read and write to registers with an array data type.



Standard Inputs

Pin	Notes
Array Input	Accepts a single value used to write data to the addressed register.
Trigger	Accepts a single trigger input used to manually request a read of the addressed register.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed register.

Basic Properties

Property Name	Notes
Device Name	Defines a configured Modbus device.
Register Count	Defines how many registers to read, starting with the Start Address.
Register Type	Defines the register type for monitoring (3x Range, or 4x Range)
Slave Node Address	Defines the Modbus node address.
Start Register	Defines the starting register address for the read/write request.
Swap Style	This determines how the Array is stored in the Modbus register. The default is "Word Swap". The other choices are "No Swap", "Byte Swap", and "Both Swap". For "No Swap" the bytes are delivered in the normal order which is two adjacent 16 bit words. For "Word Swap" the high word (16 bit) and the low word are swapped. For "Byte Swap" the high and low bytes of each word are swapped. For "Both Swap", both the high and low bytes and the high and low words are swapped. This has the effect of reversing the byte order in the value. The default is "Word Swap" which is the native Modicon format.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input.

	• Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

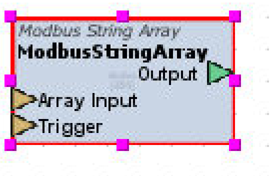
More Information

Modbus Overview

Addressing Registers

{ABC} *Modbus String Array*

The Modbus String Array element is used to read and write to arrays containing string data types.



Standard Inputs

Pin	Notes
Array Input	Accepts a single value used to write data to the addressed register.
Trigger	Accepts a single trigger input used to manually request a read of the addressed register.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed register.

Basic Properties

Property Name	Notes
Byte Swap String	Specifies if the register swaps bytes to store stringed array data.
Device Name	Defines a configured Modbus device.
Length	Defines the total length to read/write.
Register Count	Defines how many registers to read, starting with the Start Address.
Slave Node Address	Defines the Modbus node address.
Start Register	Defines the starting register address for the read/write request.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.

Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

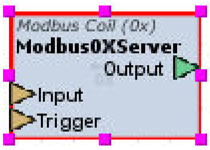
More Information

[Modbus Overview]

[Addressing Registers]

0X *Modbus 0x Server*

The Modbus0x Server element is used to read or write Coil (0X register) data.



Standard Inputs

Pin	Notes
Input	Accepts a single value used to write data to the addressed register.
Trigger	Accepts a single trigger input used to manually request a read of the addressed register.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed register.

Basic Properties

Property Name	Notes
Device Name	Defines a configured Modbus device.
Reg. Address	Defines the register offset address for the point you wish to monitor.
Slave Node Address	Defines the Modbus node address.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Optimize Reading	Defines if the data type should be optimized for full normalization within the control environment
Screen Local	Defines if results sent the graphical user inter-

	face are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Trigger on Thread	Defines if the value should be updated based on thread execution.

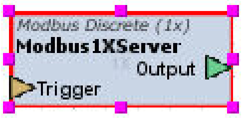
More Information

Modbus Overview

Addressing Registers

1X *Modbus 1x Server*

The Modbus 1x element is used to read Discrete (1X register) data.



Standard Inputs

Pin	Notes
Trigger	Accepts a single trigger input used to manually request a read of the addressed register.

Standard Outputs

Pin	Notes
Output	Outputs the current value of the addressed register.

Basic Properties

Property Name	Notes
Device Name	Defines a configured Modbus device.
Reg. Address	Defines the register offset address for the point you wish to monitor.
Slave Node Address	Defines the Modbus node address.
Timebase	Defines how often (in seconds) the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color False	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result if False.
Color True	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color is sent when the output result is True
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Optimize Reading	Defines if the data type should be optimized for full normalization within the control environment
Screen Local	Defines if results sent the graphical user inter-

	face are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Trigger on Thread	Defines if the value should be updated based on thread execution.

More Information

[Modbus Overview](#)

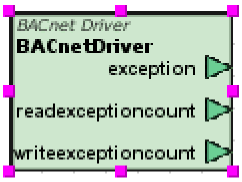
[Addressing Registers](#)

BACnet

BACnet Driver

The BACnet Driver element represents the base communication driver used to communicate to BACnet devices on any Aspect target. To perform BACnet communications of any type, this element must be present in a project application.

Prior to attempting to configure the BACnet Driver, an FTNet Device must be present and configured in your project's application, which defines the IP address of the Aspect target that is configured to perform BACnet communications.



Standard Inputs

This element has no standard inputs.

Standard Outputs

Pin	Notes
Exception	Outputs the last received exception interpreted by the BACnet Driver.
Read Exception Count	Outputs the total number of read errors encountered by the BACnet Driver.
Write Exception Count	Outputs the total number of write errors encountered by the BACnet Driver.

Basic Properties

Property Name	Notes
Device List	Used to perform automated device discovery.
FTNet Device Name	Defines the configured FTNet Device that references an Aspect target that is connected to a PUP network.

Expert Properties

Property Name	Notes
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Maximum Socket Connections	Defines the maximum number of sockets that the driver will use for IP-based connections.
Port Number	Defines the internal port number used to transmit traffic within Aspect.
Response Timeout	Defines the maximum amount of time, in milliseconds, that the driver wait for no response before a time out condition is considered.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are sep-

	arate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 20.

More Information

BACnet Overview

Adding the BACnet Driver

BACnet Device

The BACnet Device element represents a BACnet MS/TP device connected to physical EIA-485 port of a Matrix Area Controller or other BACnet routing device.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Device	Defines a selected device discovered by the BACnet Driver.
Driver Name	Defines a configured BACnet Driver.
Network ID	Defines the network number the referenced device resides on.
Unit ID	Defines the Unit ID/MAC Address of the MS/TP device.
Unit ID Destination Length	Defines the length of the MAC Address.

Expert Properties

Property Name	Notes
Debug Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 30.

More Information

BACnet Overview

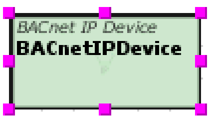
Working with Devices Overview

Discovering Devices

Working with BACnet MS/TP Devices

BACnet IP Device

The BACnet IP Device element represents a BACnet IP device. This element is used exclusively for BACnet IP devices that do not act as a network layer router.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Device	Defines a selected device discovered by the BACnet Driver.
Driver Name	Defines a configured BACnet Driver.
IP Address	Defines the IP address for the BACnet/IP Device.
IP Port	Defines the UDP Port that the BACnet IP device communicates across. The default value is 47808 (BAC0)
Network ID	Defines the network number the referenced device resides on.

Expert Properties

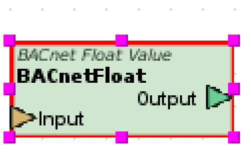
Property Name	Notes
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 20.

More Information

[BACnet Overview]
[Working with Devices Overview]
[Discovering Devices]
[Working with BACnet/IP Devices]

BACnet Float

The BACnet Float element is used to address a specify BACnet device's object-property that utilizes the BACnet floating point data type, also known as Real.



Standard Inputs

Pin	Notes
Input	Accepts a single float data type and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.

Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.
Write Priority	Defines the write priority level used to write values to the device.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property

Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Null Value	Defines what value is outputted when a BACnetNull value has been read from the driver.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

[BACnet Overview](#)

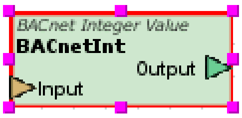
[Working with Object Properties Overview](#)

[Addressing an Object Property](#)

[Working with Commandable Objects](#)

BACnet Integer

The BACnet Integer element is used to address a specific BACnet device's object-property that utilizes a Integer data type.



Standard Inputs

Pin	Notes
Input	Accepts a single integer data type and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for mon-itoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.

Signed	Defines if the value is a signed integer or unsigned integer.
Timebase	Defines how often, in second, the point will be polled.
Write Priority	Defines the write priority level used to write values to the device.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property

Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Null Value	Defines what value is outputted when a BACnetNull value has been read from the driver.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

BACnet Overview

Working with Object Properties Overview

Addressing an Object Property

Working with Commandable Objects

B BACnet String

The BACnet String element is used to address a specific BACnet device's object-property that utilizes a Character String data type.

Standard Inputs

Pin	Notes
Input	Accepts a single string data type and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for mon-itoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Con-

	trol Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

[BACnet Overview]

[Working with Object Properties Overview]

[Addressing an Object Property]

[Working with Commandable Objects]

BACnet Date

The BACnet Date element is used to address a specific BACnet device's object-property that utilizes a Date data type.

Standard Inputs

Pin	Notes
Input	Accepts a single date data type and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listen-

	ers - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is

	instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

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[Working with Commandable Objects]
[BACnet Date Value Editor]

BACnet Time

The BACnet Time element is used to address a specific BACnet device's object-property that utilizes a Time data type.

Standard Inputs

Pin	Notes
Input	Accepts a single time data type and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated

	by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in

	Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

[BACnet Overview]

[Working with Object Properties Overview]

[Addressing an Object Property]

[Working with Commandable Objects]

[BACnet Time Value Editor]

BACnet BitString

The BACnet Bit String element is used to address a specific BACnet device's object-property that utilizes a Bitstring data type.

Standard Inputs

Pin	Notes
Input	Accepts a single bit string data type and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.
Number of Bits	Defines the number of relevant bits in the bit string.
Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.

Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

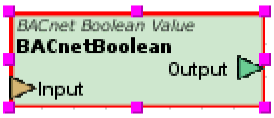
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

[BACnet Overview]
[Working with Object Properties Overview]
[Addressing an Object Property]
[Working with Commandable Objects]

BACnet Boolean

The BACnet Boolean element is used to address a specific BACnet device's object-property that utilizes a Boolean data type.



Standard Inputs

Pin	Notes
Input	Accepts a single boolean data type and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.

Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays

	colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

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En BACnet Enum

The BACnet Enum element is used to address a specific BACnet device's object-property that utilizes a Enumerated data type. There are many BACnet object properties that utilize an enumerated data type as opposed to a boolean or integer data type.

Standard Inputs

Pin	Notes
Input	Accepts a single enumerated or unsigned integer data type and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be

	polled.
Write Priority	Defines the write priority level used to write values to the device.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include:

	• Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Null Value	Defines what value is outputted when a BACnetNull value has been read from the driver.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

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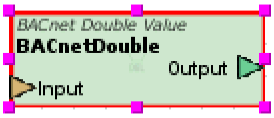
BACnet Double

The BACnet Double element is used to address a specific BACnet device's object-property that utilizes a Double data type.



Standard Inputs

Pin	Notes
Input	Accepts a single double precision floating point value data type and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Con-

	trol Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

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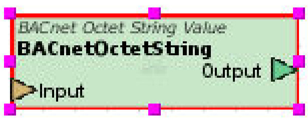
Oc *BACnet Octet String*

The BACnet Octet String element is used to address a specific BACnet device's object-property that utilizes a Character String data type.



Standard Inputs

Pin	Notes
Input	Accepts a single octet string data type and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listen-

	ers - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is

	instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

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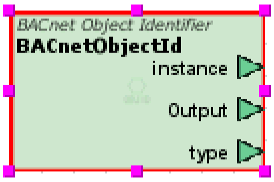
Ob *BACnet Object ID*

The BACnet Object ID element is used to read the object-identifier property of a referenced point, as well as other properties of objects that may utilize the Object ID data type.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes

Instance	Outputs the instance number for the addressed object property.
Output	Outputs the raw object ID for the addressed object property.
Type	Outputs the object type for addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated

	by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in

	Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

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[Working with Commandable Objects]

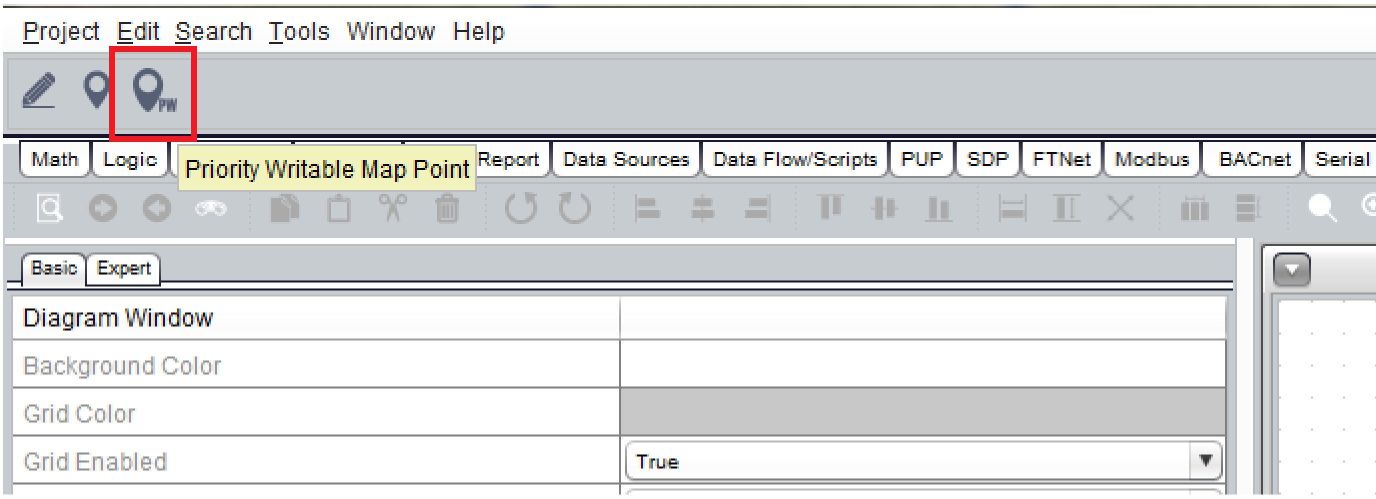
[Object/Property Enumeration Table]


BACnet priority writing and clearing

The **BACnet** priority writing and clearing diagram element (Priority Writer)makes writing and clearing **BACnet** priority arrays simple. It is similar to the " Map Point" on page 1576 element.

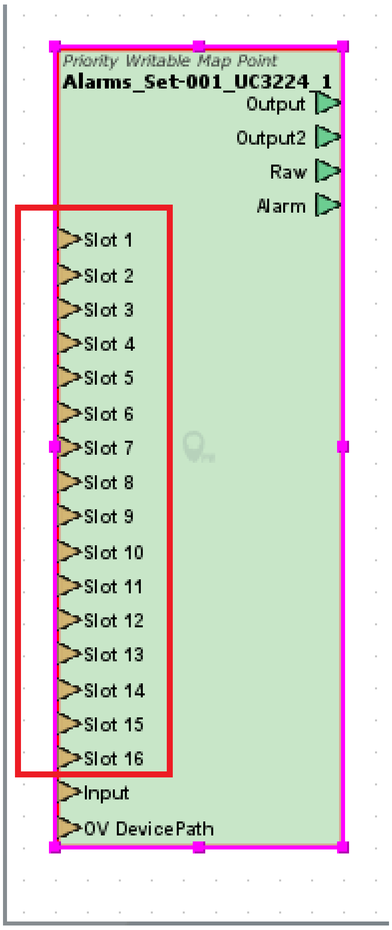
To add a Priority Writable Map Point

1. In Diagram Mode, select the “Map DnD” category from your palette. Locate the “Priority Writable Map Point”



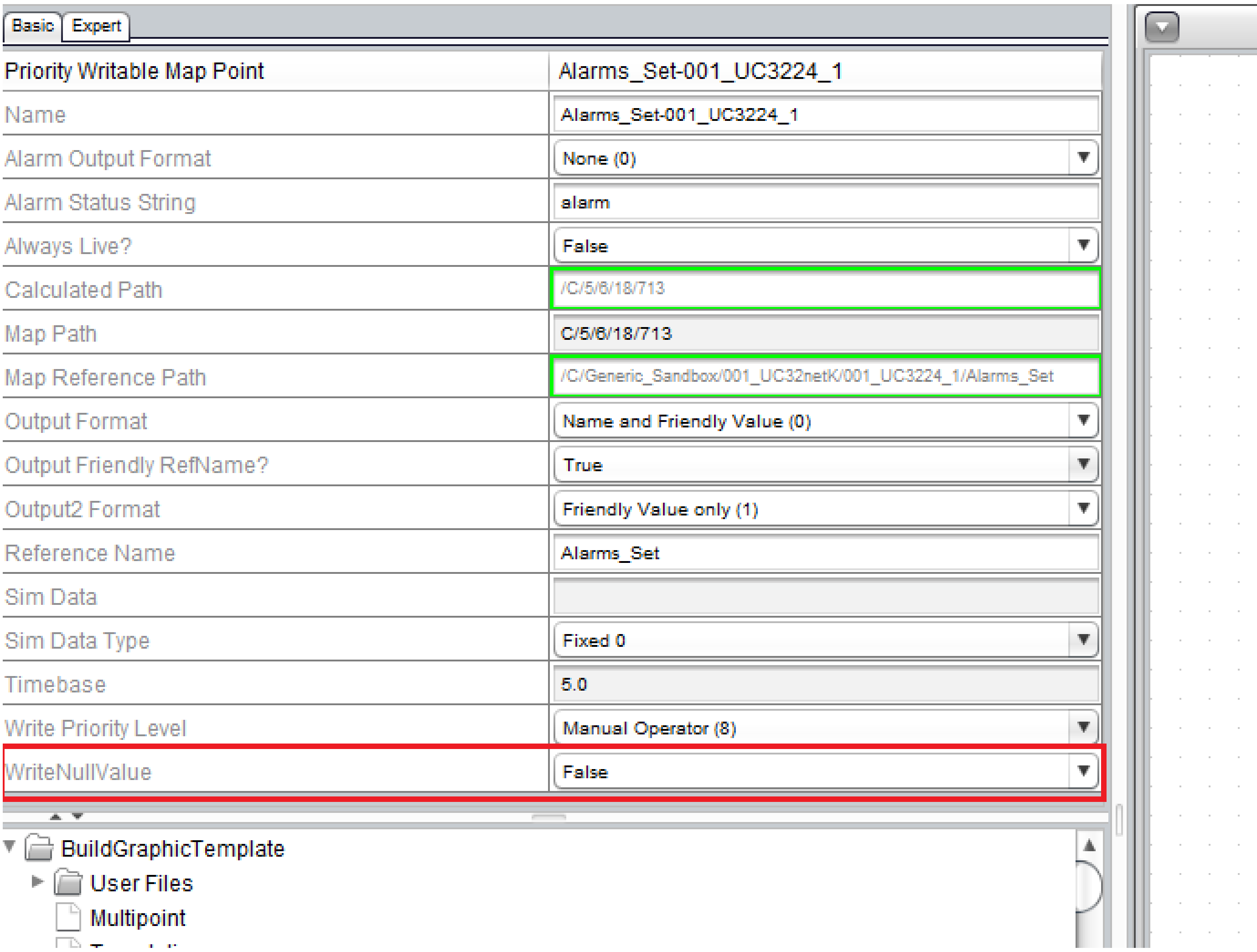
2. Click “Priority Writable Map Point”, then drag the BACnet point from the **Map** onto the diagram pane (as per " Map Point" on page 1576)

There are sixteen slot inputs to the block, for each slot in the BACnet priority array. These can be wired so that the inputs are driven by another point and/or by logic.



There is an attribute of the “Priority Writable Map Point” which will write a null value for slot that is written to irrespective of the value that is written.

Writing a null value to a slot in the BACnet priority array clears the value in that slot.



Priority Writable Map Point

Standard Inputs

Pin	Notes
Slot 1	Accepts a value to write to slot 1 in the BACnet priority array for the associated point
Slot 2	Accepts a value to write to slot 2 in the BACnet priority array for the associated point
Slot 3	Accepts a value to write to slot 3 in the BACnet priority array for the associated point
Slot 4	Accepts a value to write to slot 4 in the BACnet priority array for the associated point
Slot 5	Accepts a value to write to slot 5 in the BACnet priority array for the associated point

Slot 6	Accepts a value to write to slot 6 in the BACnet priority array for the associated point
Slot 7	Accepts a value to write to slot 7 in the BACnet priority array for the associated point
Slot 8	Accepts a value to write to slot 8 in the BACnet priority array for the associated point
Slot 9	Accepts a value to write to slot 9 in the BACnet priority array for the associated point
Slot 10	Accepts a value to write to slot 10 in the BACnet priority array for the associated point
Slot 11	Accepts a value to write to slot 12 in the BACnet priority array for the associated point
Slot 12	Accepts a value to write to slot 12 in the BACnet priority array for the associated point
Slot 13	Accepts a value to write to slot 13 in the BACnet priority array for the associated point
Slot 14	Accepts a value to write to slot 14 in the BACnet priority array for the associated point
Slot 15	Accepts a value to write to slot 15 in the BACnet priority array for the associated point
Slot 16	Accepts a value to write to slot 16 in the BACnet priority array for the associated point
Input	Accepts a value and is used to write to the addressed object property.
OV Device Path	Accepts context data in application scenarios where transfer with context is used for graphical user interface environments.

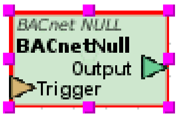
See " Map Point" on page 1576 for Standard Outputs, Basic Properties and Expert Properties, with the addition of the basic properties, listed below.

Basic Properties

Property Name	Notes
Write Null Value	Defines whether or not to interpret all values written to input pins Slot 1 through Slot 16 as null

Nu BACnet NULL

The BACnet NULL element is used to read and write NULL values within Aspect.



Standard Inputs

Pin	Notes
Trigger	Accepts any trigger value is used to write a NULL value to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Array Index	Defines the array index to read, if the property being referenced is a BACnetArray type. For non BACnetArray properties, this should be set to -1.
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Signed	Defines if the value is a signed integer or

	unsigned integer.
Timebase	Defines how often, in second, the point will be polled.
Write Priority	Defines the write priority level used to write values to the device.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low

	level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

BACnet Overview

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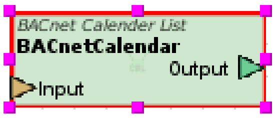
Working with Commandable Objects

Ca *BACnet Calendar List*

The BACnet Calendar element is used exclusively to interact with the datelist of a BACnet Calendar object. While this element provides the same subset of object-property configuration as other elements, its intended use is solely to work with the datelist.



Standard Inputs

Pin	Notes
Input	Accepts the input of the BACnet Calendar editor and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Con-

	trol Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

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Schedule and Calendar Object Overview

Addressing Calendar - Datelist

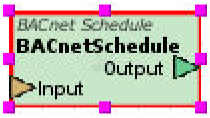
Configuring the Calendar Editor

Viewing and Modifying Calendar Data

BACnet Calendar Editor

Sc *BACnet Schedule*

The BACnet Schedule element is used exclusively to interact with the weekly-schedule of a BACnet Schedule object. While this element provides the same subset of object-property configuration as other elements, its intended use is solely to work with the weekly-schedule.



Standard Inputs

Pin	Notes
Input	Accepts the BACnet Weekly Schedule editor's output and is used to write to the addressed object property.

Standard Outputs

Pin	Notes
Output	Outputs the current value read from the addressed object property.

Basic Properties

Property Name	Notes
Device Name	Defines a configured BACnet Device.
Object Instance	Defines the object instance number for monitoring.
Object Property	Defines the object property for monitor.
Object Type	Defines the object type for monitoring.
Property Lookup	Used to visually address an object-property using drop-downs and discovered objects.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

	- Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. - Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. - Never Auto-Suspend - the element will execute its logic on a continual basis. - Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: - Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. - Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.

Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

More Information

BACnet Overview

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Schedule and Calendar Object Overview

Addressing Schedule - Weekly Schedule

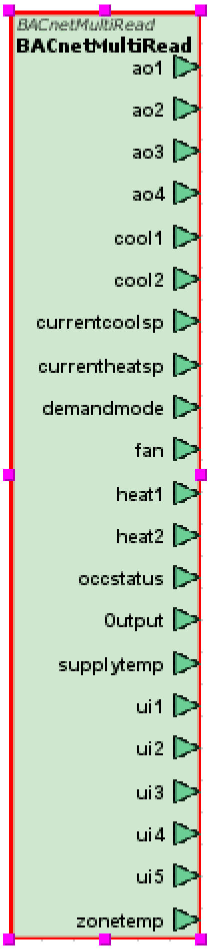
Configuring the Weekly Schedule Editor

Viewing and Modifying Schedule Data

BACnet Weekly Schedule Editor

Mr *BACnet Multi Read*

The BACnet Multi Read element is used to read multiple object properties from a single BACnet device. This element is useful for situations where multiple points from a field device need to be read and displayed on a graphical user interface page. The element can also be used for trending multiple points, in conjunction with the Triggered Multipoint Historical, from a device without the need to click and drop singular field bus elements.



Standard Inputs

This element has no standard inputs.

Standard Outputs

Pin	Notes
Output	Reserved for future use and implementation.
Custom	This element will spawn custom outputs based on multipoint property definition.

Basic Properties

Property Name	Notes
BACnet Device	Defines BACnet Device that data will be polled from.
Only Poll Connected?	When set to True, only points with connections made to other elements either directly or

	through managed connections will be polled. Else, all points defined in the related properties file will be polled regardless of connection status.
Output Definition Resource	Defines the .properties file that the element is bound to. This property is read-only and cannot be changed once the element has been bound.
Timebase	Defines how often, in second, the point will be polled.

Expert Properties

Property Name	Notes
Always Live?	When set to True, this element will poll for live data when Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Max RPM Count	Defines how many object properties are reques-

	ted within a single Read Property Multiple request. This value defaults to 5, which is optimal for NB-ASC applications. For applications involving NB-GPC or Matrix-BBC, this value can be as high as 10. For more information, click the BACnet Multipoint Element Overview link below.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.

More Information

BACnet Multipoint Element Overview

Designing Multipoint Files for BACnet Multipoint Elements

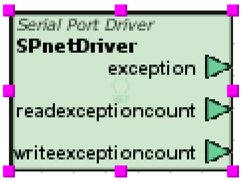
Adding BACnet Multipoint Elements into a Project

Working with BACnet Multipoint Elements

Serial Port

Dr *Serial Port Driver*

The Serial Port Driver element represents the base communication driver used to communicate to Serial Port devices on any Aspect target. To perform Serial Port communications of any type, this element must be present in a project application.



Standard Inputs

This element has no standard inputs.

Standard Outputs

Pin	Notes
Exception	Outputs the last received exception interpreted by the Serial Port Driver.
Read Exception Count	Outputs the total number of read errors encountered by the Serial Port Driver.
Write Exception Count	Outputs the total number of write errors encountered by the Serial Port Driver.

Basic Properties

Property Name	Notes
Baud Rate	Defines the Baud Rate to use to communicate with devices
Com Port	Defines the Com Port to use to communicate with devices
Flow Control	Defines the type of Flow Control to use. Default is None.
Parity	Defines the Parity for communications.
Stop Bits	Defines the number of Stop Bits to use.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.

Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 20.

More Information

BACnet Overview

Adding the BACnet Driver

Wr *Serial Port Writer*

The Serial Port Writer element outputs a value to a configured Serial Port driver.

Standard Inputs

Pin	Notes
Input	Accepts a value to be written to a Serial Port device.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Pin	Notes
Driver Name	Defines a configured Serial Port Driver element.

Expert Properties

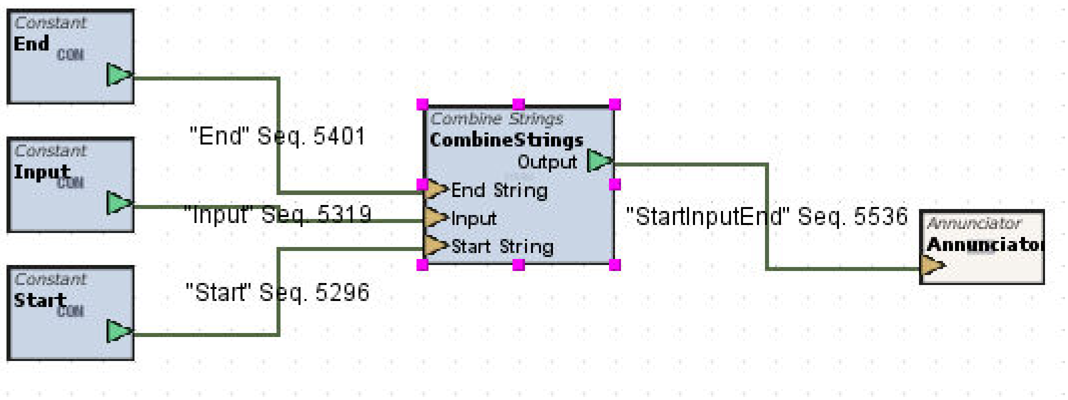
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections

	are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Debug/Trace Level	Defines the Debug Level setting used for low level troubleshooting of network communications. Valid value settings include: • Greater than 50 - performs a full protocol dump to the Aspect Control Engine Log. • Greater than 75 - performs a full protocol dump + raw information to the Aspect Control Engine Log.
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 40.
Write Throttle	Defines the value in milliseconds to wait between writes of the same value.

Strings

Combine Strings

The Combine Strings element will output the Start String + Input + End String. Neither the Start String or End String are required to be set to initialize the element. If neither is set the output will be the same as the input. A change at any input will update the output.



Standard Inputs

Pin	Notes
End String	Accepts a single string input used as the end of the string combination.
Input	Accepts a single string input used in the middle of the string combination.
Start String	Accepts a single string input used as the beginning of the string combination.

Standard Outputs

Pin	Notes
Output	Outputs the combination of all connected values.

Basic Properties

Property Name	Notes
Default End String	Defines the default End String input value.
Default Start String	Defines the default Start String input value.

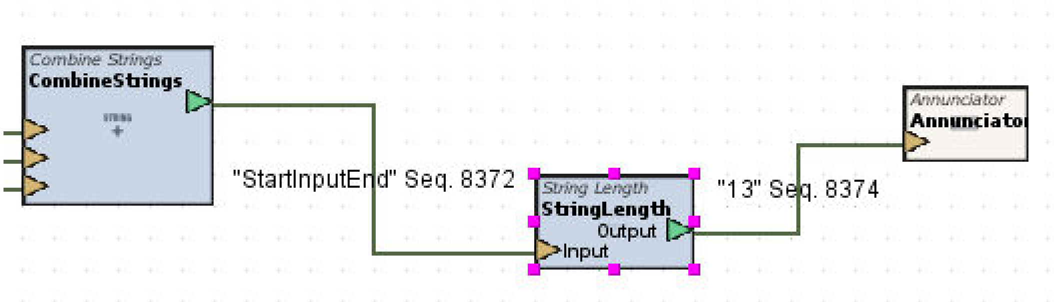
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the ele-

	ment will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

String Length

The String Length element returns the number of characters (including spaces) from the input string value.



Standard Inputs

Pin	Notes
Input	Accepts a single string value input.

Standard Outputs

Pin	Notes
Output	Outputs the numeric count of all characters in the string.

Basic Properties

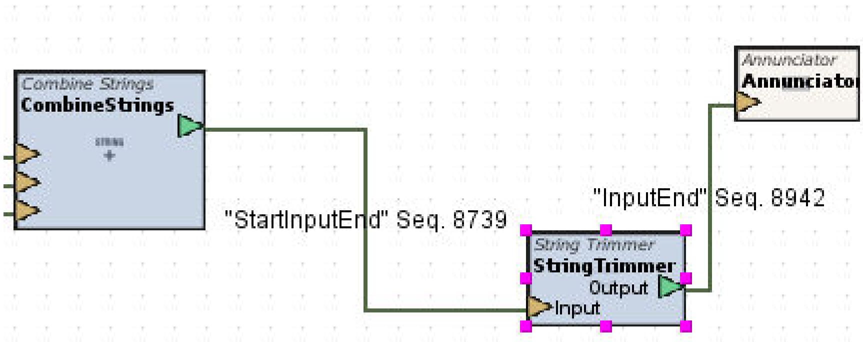
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

String Trimmer

The String Trimmer element takes an input string and removes one or more characters from the beginning and/or the end of the String to trim it. This can be used to extract a substring from the input string.



Standard Inputs

Pin	Notes
Input	Accepts a single string input.

Standard Outputs

Pin	Notes
Output	Outputs the modified trimmed string value.

Basic Properties

Property Name	Notes
End Remove	Defines how many characters to remove from the input value end.
Start Remove	Defines how many characters to remove from the input value start.

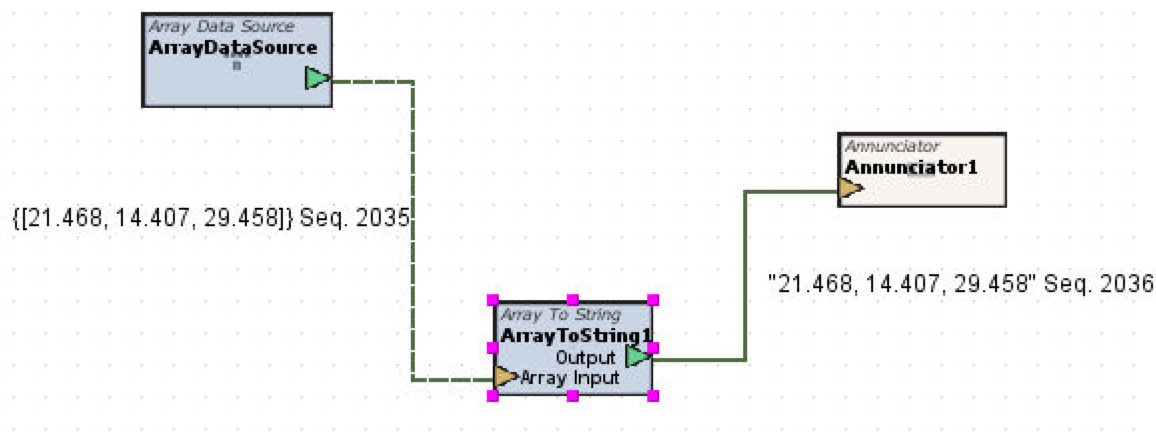
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections

	are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Array to String

The Array To String element is used to change the elements of an Array Value into a String, with optional time stamps.



Standard Inputs

Pin	Notes
Array Input	Accepts a single array input value.

Standard Outputs

Pin	Notes
Output	Outputs the array value as a single string value.

Basic Properties

Property Name	Notes
Delimiter	Defines the characters to use for the separator between elements. This defaults to a comma, but you could also use <p> to paragraph format the information, leaving carriage returns between each array element.
Include Timestamp	Defines whether or not timestamps are displayed next to each array element as the information is updated from the array source.
Timestamp Format	Defines the timestamp format displayed next to array elements when Include Timestamps is set to True.

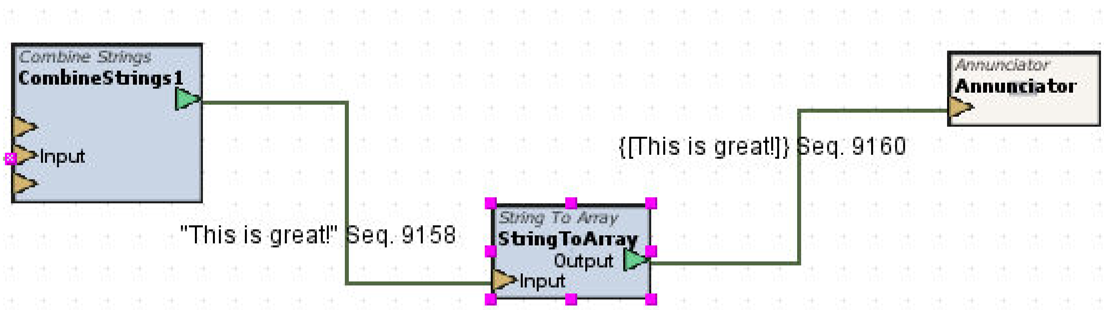
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will

	execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

String to Array

The String To Array element is used to change the comma separated elements of a string into an array. Commas must be present in the string in order for multiple array elements to be created.



Standard Inputs

Pin	Notes
Input	Accepts a single string input for conversion.

Standard Outputs

Pin	Notes
Output	Outputs the string input as an array output.

Basic Properties

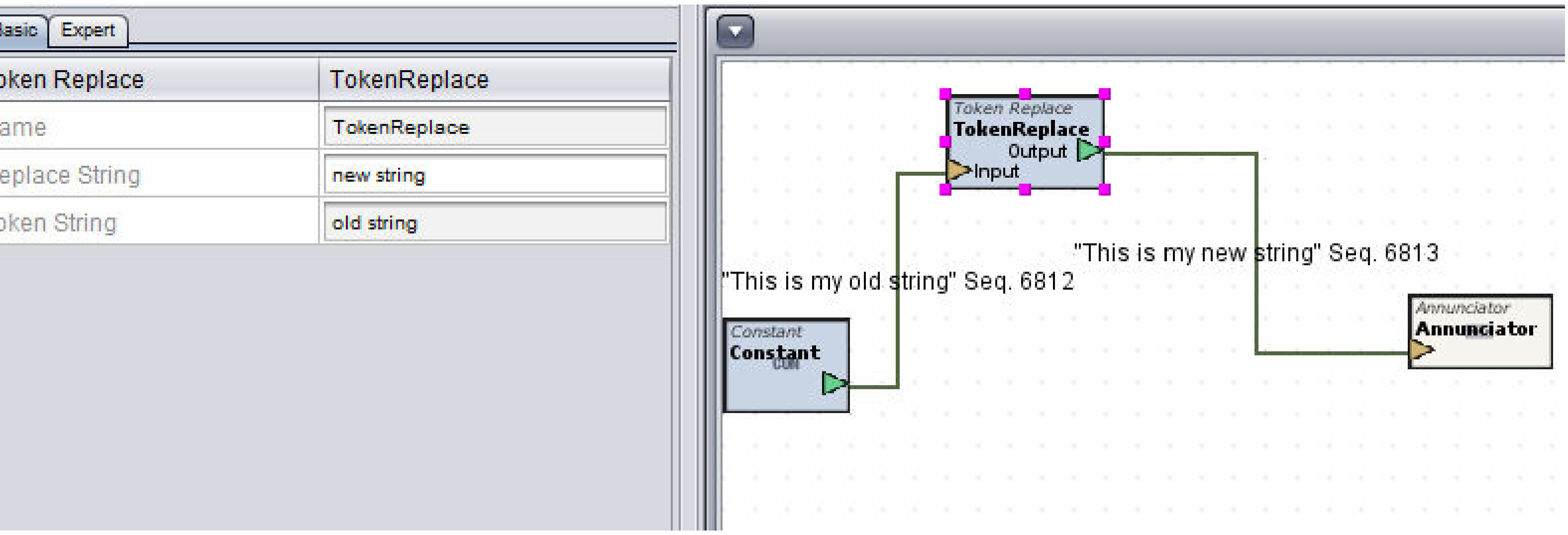
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Token Replace

The Token Replace element is used to replace a token, or exact set of string characters, with a replacement set of string characters. Within the element, you must define the Token String, which is the string token that will be search for. When a valid match is found on the input, the string will then be replaced with the string defined in the Replace String property.



Standard Inputs

Pin	Notes
Input	Accepts a single string input used for examination.

Standard Outputs

Pin	Notes
Output	Outputs the modified string.

Basic Properties

Property Name	Notes
Replace String	Defines the string value to replace the token string for.
Token String	Defines the token value to look for.

Expert Properties

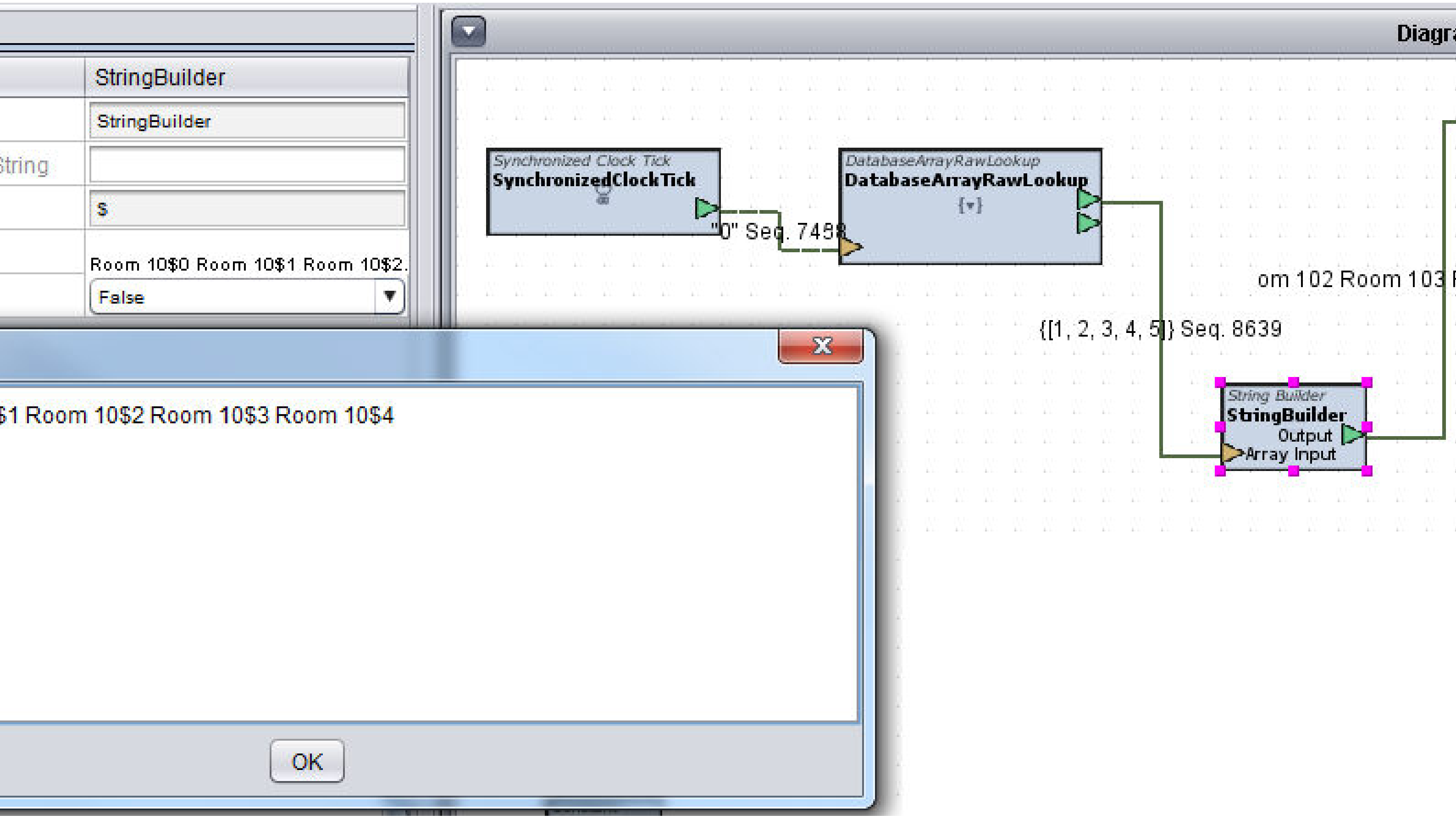
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no con-

	nection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

String Builder

The String Builder element creates an output String Value Object by substituting tokens in the template with indexed values from an array.

In the example below a SQL query is used to pull in an array of {1,2,3,4,5}. The string builder uses the template and replaces the $0 with the array in position 0, $1 with the array in position 1, and so on. Below the image is the result.



Standard Inputs

Pin	Notes
Input	Accepts a single array input for examination.

Standard Outputs

Pin	Notes
Output	Outputs the array input as a string value.

Basic Properties

Property Name	Notes
Default Replacement String	Defines the string value to replace each array value with.

Marker String	Defines a wildcard value for array marking.
Template	Defines the string template for the operation.
Use Default	Defines if the default parameters should be used.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

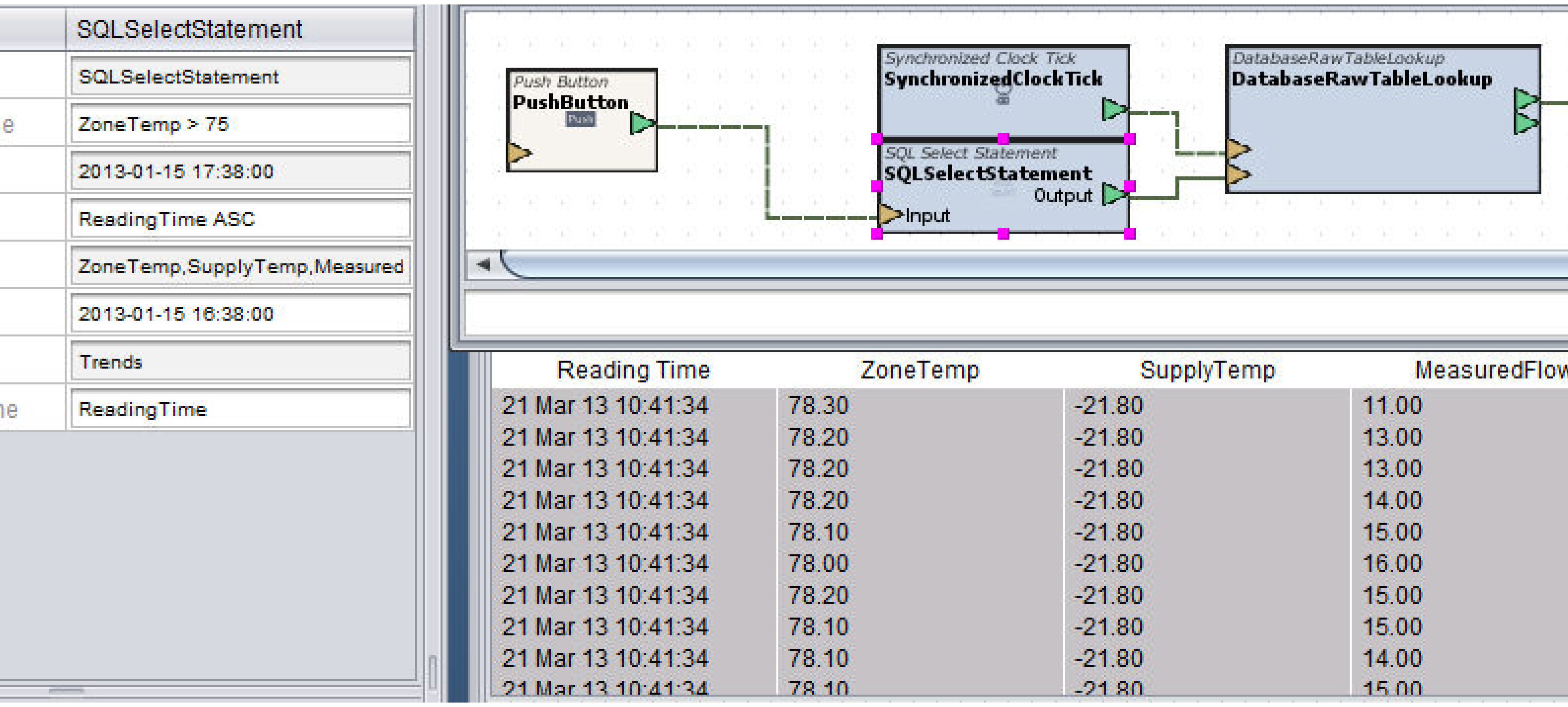
SQL Select Statement

The SQL Select Statement element builds a SQL Statement String that can be used to Output a SQL Select to the SQL Statement input pin of the Historical/Database components. Example of the SELECT statement may be:

SELECT * FROM historical WHERE value1 > 51.5

-or-

SELECT readingtime,value1,value2 from status where readingtime >= 2005-04-01 AND readingtime<=2005-05-30 ORDER BY readingtime DESC



Standard Inputs

Pin	Notes
Input	Accepts a single input connection and is used to trigger the SELECT statement.

Standard Outputs

Pin	Notes
Output	Reports the results of the SELECT statement.

Basic Properties

Property Name	Notes
Additional WHERE Clause	Defines the query's WHERE clause. Do not include AND or WHERE at the beginning. Ex: "ZoneTemp

	> 78"
End Time	Defines the End Time for the query in the Time format YYYY-MM-DD or hh:mm:ss
Order By Clause	Defines the column to order the statement by. Ex: "Value1 DESC" or "ReadingTime ASC"
Select Columns	Defines the column list to output. Use a comma separated list of columns or * for all (required)
Start Time	Defines the Start Time for the query in the Time format YYYY-MM-DD or hh:mm:ss
Table Name	Defines the Table name the query is executed on. Ex: Trends
Timestamp Column Name	Defines the Column name containing timestamp information (required for time based select) Ex: "ReadingTime"

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 255.

String Splitter

The String Splitter element uses regular expressions to split (or tokenize) a string into one or more components. These substring parts are used to create an array value output. This element is useful for parsing an input String for values that may be needed as separate entities.

To split a string value into individual tokens separated by white space (which can be tabs, spaces, carriage returns, etc..), use the "[:space:]" expression.

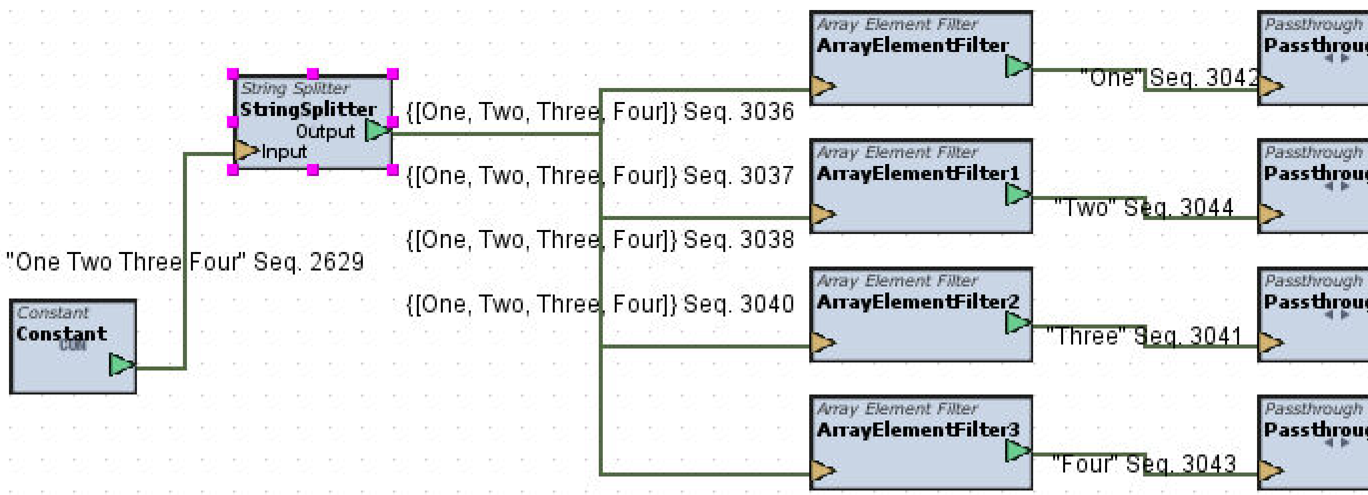
For example, using [:space:] against a string input of "One Two Three Four" will split the string value into four tokens: One,Two,Three,Four, - creating an array output with each token as an element where:

element 1 - One

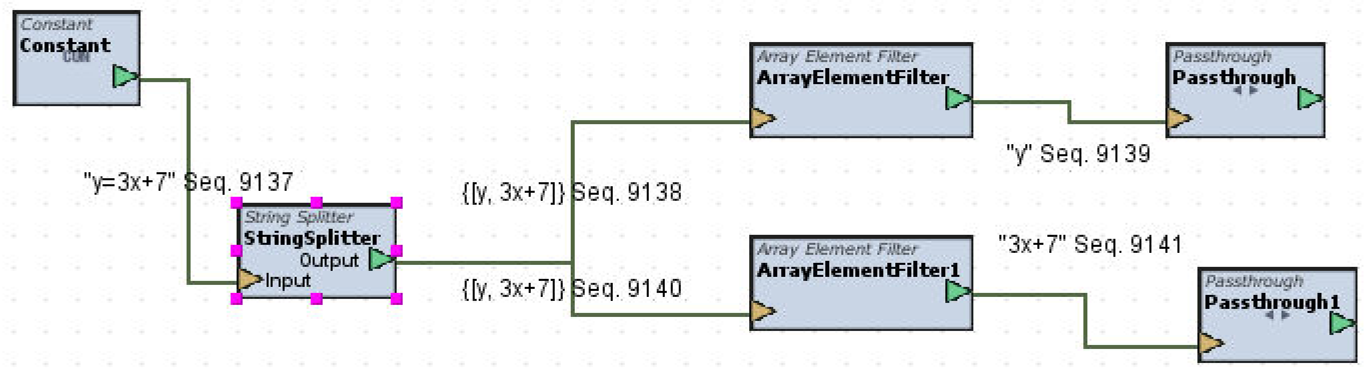
element 2 - Two

element 3 - Three

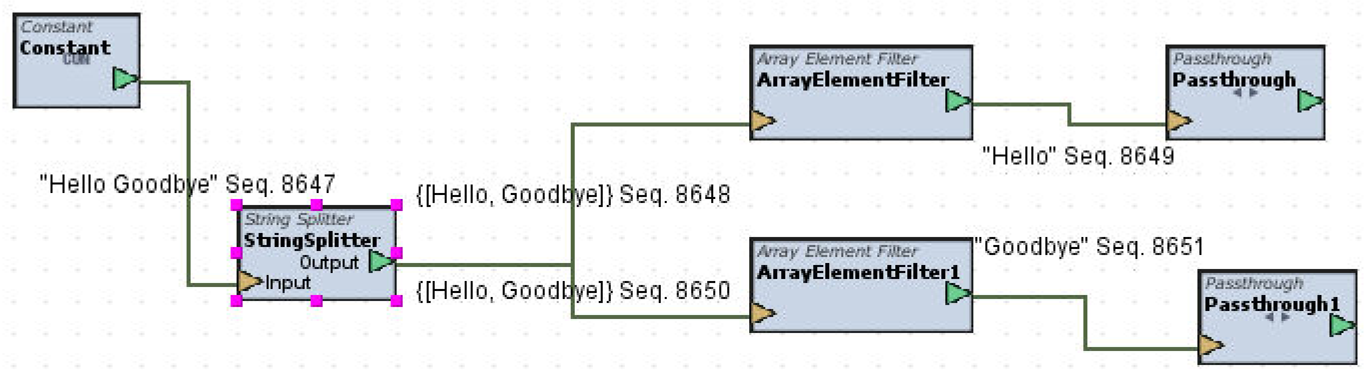
element 4 - Four



Using an Expression of "=" will separate this equation such as y = 3x + 7 into two separate parts: [y,3x+7].



For an expression of "[:blank:]" you can parse blanks in the input, where a string has a space between each string token. For example "Hello Good-bye".



To combine different expression tokens, use the OR construct, which is used in the example above (it is the | symbol). For example, "[:blank:]|=" says to delimit on a "blank" OR on an equal sign (=).

More complex expressions can be used. Consult a reference for regular expressions for more ideas on splitting a String into tokens.

Another example that may be useful is "[( )][(+)]". This means that the sep-aration of tokens must be more than one space. Single spaces are not used to delimit the tokens.

Advanced Expectation Table Examples

Expression: [:blank:]|=

Input Value	Array Output
blue=255 green=128 red=0	[blue,255,green,128,red,0]
Temperature1 = 491.3	[Temperature1,491.3]

Expression: [()][(+)]

Input Value	Array Output
Red Apples Green Apples Orange Oranges	[Red Apples, Green Apples, Orange Oranges]

Expression: [()][(+)]=

Input Value	Array Output
OutsideTemp = 76.5	[OutsideTemp,76.5,

Standard Inputs

Pin	Notes
Input	Accepts a single array input for examination.

Standard Outputs

Pin	Notes
Output	Outputs the modified string result.

Basic Properties

Property Name	Notes
Expression	Defines the expression for string tokenization.

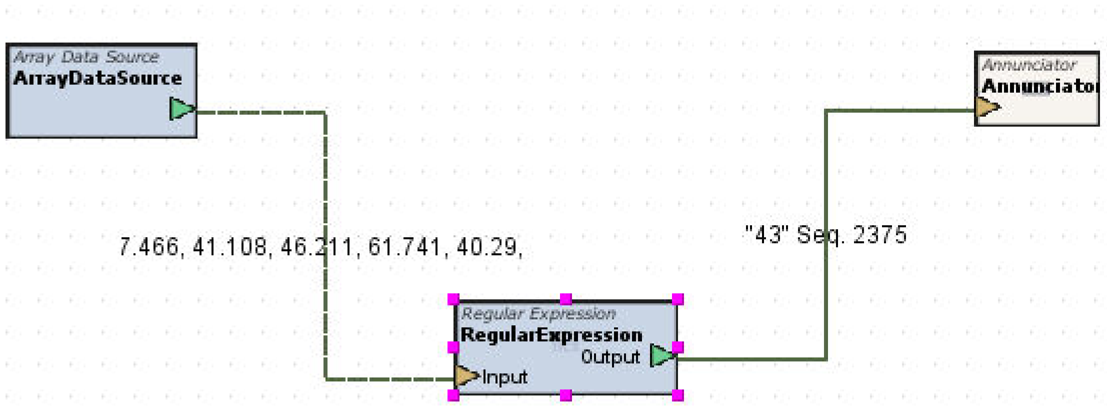
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the ele-

	ment will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Unicode Offset	Defines a unicode character that is not used in the input string. It is used only as an internal replacement token. There is usually no need to modify this property unless this

REx *Regular Expression*

The Regular Expression element provides the ability to perform string manipulation using simple algebra.



Standard Inputs

Pin	Notes
Input	Accepts a single string input for examination.

Standard Outputs

Pin	Notes
Output	Outputs the result.

Basic Properties

Property Name	Notes
End Expression	Defines the expression for removing ending characters.
Main Expression	Defines the main math expression for altering the value.
Start Expression	Defines the expression for removing starting characters.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own

	thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Convert to Hex

The Convert To Hex element takes any integer input and converts it to its hexadecimal equivalent (as a String output).

Standard Inputs

Pin	Notes
Input	Accepts a single value for conversion.

Standard Outputs

Pin	Notes
Output	Outputs the hexadecimal value for the input.

Basic Properties

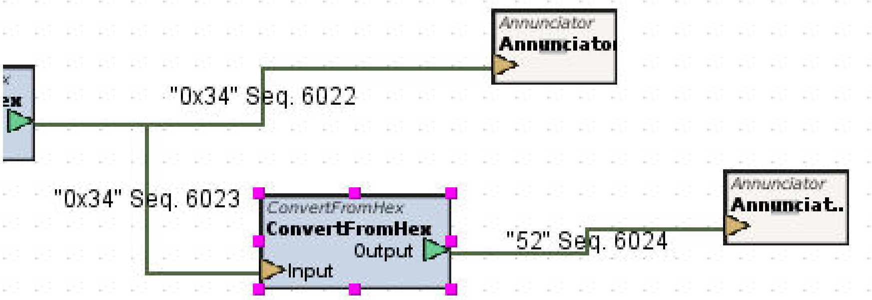
Property Name	Notes
Pad Small Numbers	Defines if small numbers with decimal places should be padded.
Prefix String	Defines the string prefix preceding the hex value.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Convert From Hex

The Convert From Hex element converts a hexadecimal input to an integer.



Standard Inputs

Pin	Notes
Input	Accepts a single hexadecimal input value.

Standard Outputs

Pin	Notes
Output	Converts the hexadecimal value to integer.

Basic Properties

No basic properties exist for this element.

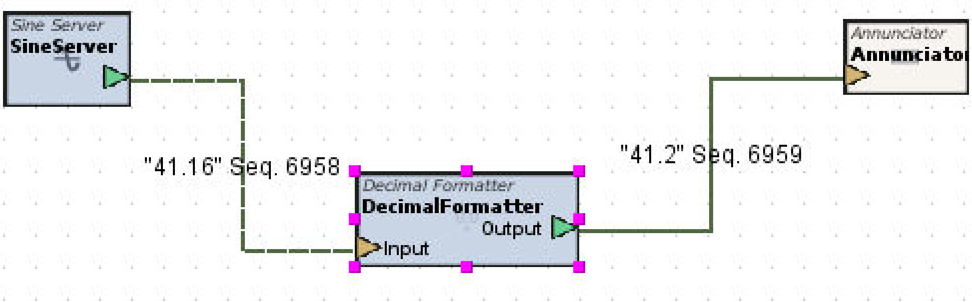
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated

	by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Decimal Formatter

The Decimal Formatter element is an external source used to format floating point data from protocols that do not correctly format the data in a logical manner - some Modbus device implementations may require the use of a decimal formatters prior to displaying the value in an annunciator or other design element.



The Formatter property can be formatted to display a fixed number of decimals, no decimals, padded zeros, etc. using a number formatter. Number formatters take specific character sequences (tokens), as shown below, to form a pattern for the display. More information can be obtained from the Java 2 API for java.text.DecimalFormat.

If you do not want a String (String Value Object) to be converted to a number, do not use a decimal formatter. Delete the default "#.##" so that there is a blank in the decimal formatter (or number formatter) property.

The following applies to any bean property that uses a formatter to specify how numeric labels are displayed. Examples will be given to demonstrate some possibilities of formatting numbers:

Example Format String	Meaning	Result
#.##	Format with fixed decimal places, up to two decimals	13 ->>13 5.008 ->>5.01 (US) 5,01 (Germany)
0.000	Format with exactly three decimal places, always pad with 0's	13->>13.000 (US) 13,000 (Germany) .36 ->> 0.360 (US) 0,360 (Germany)
#.0 kg	Format one decimal place, padded with 0, and add units (kg)	22.83->> 22.8 kg (US) 22,8 kg (Germany)
#.0 'kg'	equivalent to above	71->> 71.0 kg (US) 71,0 kg (Germany)
0.###E0	Format in Scientific Notation	12345 ->>1.234E4 (US) 1,234E4 (Germany)
#.#%	Format as a percent	0.4437 ->> 44.4% (US) 44,4% (Germany)
#.00 '%'	Display number with a % as a unit indicator (but do not convert to percent)	54.3 ->> 54.3 % (US) 54,3 % (Germany)

Standard Inputs

Pin	Notes
Input	Accepts a single numeric input for examination.

Standard Outputs

Pin	Notes
Output	Outputs the new formatted numeric value.

Basic Properties

Property Name	Notes
Formatter	Defines how many decimal places will be displayed from the input.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

 *String Enumeration*

The String Enumeration element provides users with the ability to display a string value based on a numeric input. This functionality is similar to what is provided by the Swing Enumerated Combo Box, but is intended for situations where a read-only string needs to be displayed without the combo box editor. Entries made into the Hand Entered Items property list are done so in a comma delimited format (value, label) such as:

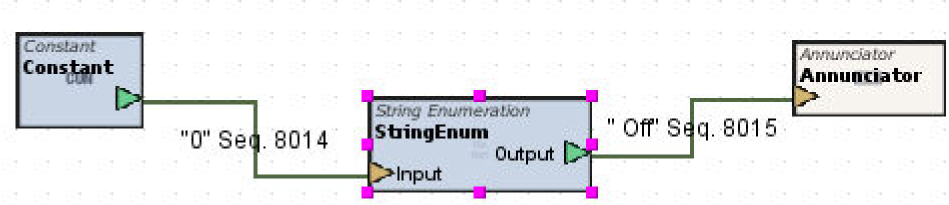
0,Off

1,Low

2,Medium

3,High

Using the example above, when a numeric value of 0 is received from the input pin, the string value of “Off” is outputted by the element. Values can be of any resolvable data type.



Standard Inputs

Pin	Notes
Input	Accepts a single numeric value for examination. Valid numbers should be integer, or enumerated.

Standard Outputs

Pin	Notes
Output	Outputs the string equivalent for the enumeration based on configuration of Basic Properties.

Basic Properties

Property Name	Notes
Hand Entered Items	Defines the enumeration, text conversion map.

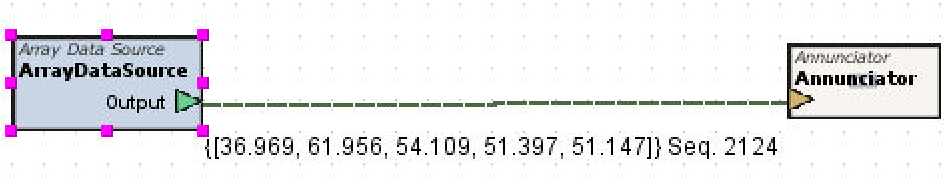
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Arrays

Array Data Source

The Array Data Source element produces array value objects for testing logic. A new Array Value Object will be created every timebase tick. It will be composed of an array of Double Value Objects with a simulated timestamp (so each has a different incremented timestamp with a time difference set by the "Time Spacing" parameter). This is useful for testing an array input to the Trend Chart.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs random array data values based on Basic Properties configuration.

Basic Properties

Property Name	Notes
Boolean Output	Defines if all the array entries should be boolean values (0's and 1's).
Elements	Defines how many elements in length the array should be.
Integer Output	Defines if the array elements will have whole numbers.
Max Value	Defines the maximum value for any array element.
Min Value	Defines the minimum value for any array element.
Time Spacing	Defines the timestamp interval in seconds.
Timebase	Defines how often the array value should update and generate a new simulation value.
Zero Based Time	Defines if time update stamps should be the current time or start with 0.

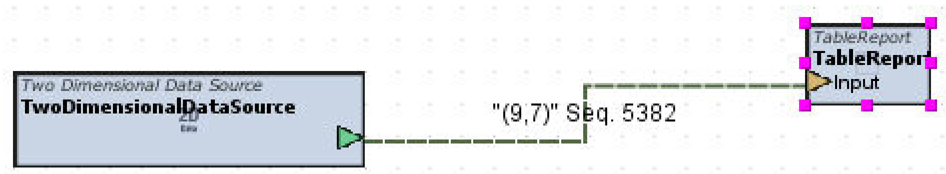
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element

	- depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Two Dimensional Data Source

The Two Dimensional Data Source element produces randomized data based on the number of boolean, double, integer, and string columns configured and can output the data to a Table Report.



ReadingTime	X Data	Y Data 1	Y Data 2	Y Data 3	Y Data 4	Y Data 5	Y Data 6	Y Data 7	Y Data 8
0 Mar 13 14:46:44	86.00	396.00	310.00	426.31	367.29	.00	.00	new red c...	round purp...
0 Mar 13 14:47:44	72.00	461.00	438.00	469.13	408.41	.00	.00	new violet...	new brown...
0 Mar 13 14:48:44	89.00	450.00	431.00	480.91	331.81	1.00	.00	rough red...	spotted yell...
0 Mar 13 14:52:44	16.00	359.00	450.00	445.34	303.64	1.00	.00	tiny yellow...	new orang...
0 Mar 13 14:53:44	82.00	453.00	376.00	361.75	498.67	1.00	.00	bright bla...	smooth or...
0 Mar 13 14:54:44	36.00	358.00	402.00	474.65	330.38	1.00	.00	fuzzy pink ...	tiny black c...
0 Mar 13 14:49:44	15.00	450.00	448.00	375.08	371.51	1.00	1.00	shiny whit...	new green ...
0 Mar 13 14:50:44	83.00	353.00	448.00	320.17	497.16	1.00	1.00	fuzzy blac...	fuzzy red bird
0 Mar 13 14:51:44	38.00	345.00	394.00	476.59	474.26	1.00	1.00	fuzzy oran...	round gree...

Basic Properties

Pin	Notes
Boolean Columns	Amount of Boolean Columns to output
Double Columns	Amount of Double Columns to output
Integer Columns	Amount of Integer Columns to output
Random X ?	Enable or disable generation of random X values
Rows	Amount of rows to output
String Columns	Amount of string columns to output
Time Interval	Timestamp interval (seconds)
Timebase	Seconds between readings
X Data Type	Choose which data type for column X
X Max	Maximum value for the X column
X Min	Minimum value for the X column
Y Max	Maximum value for the Y column
Y Min	Minimum value for the Y column

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will

	execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Database Array Raw Lookup

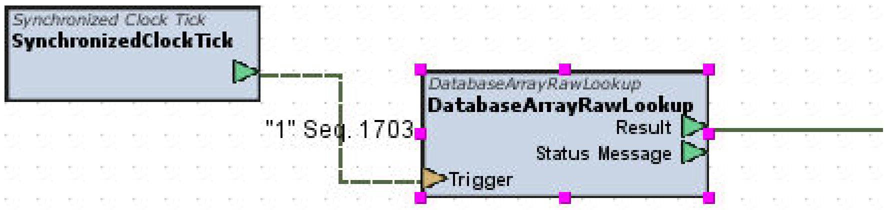
The Database Array Raw Lookup element is used to read a column of data from a database, and is achieved through use of an SQL SELECT statement.

The SELECT statement used for the Database Array Raw Lookup should be appropriate to return data from a specific column of the database. For example:

SELECT value1 from table where readingtime > '2004-09-01' order by readingtime DESC

As a special case, the timestamp column of a Triggered Historical database may be used to set the timestamps of the Value Objects in the array value result. To use the timestamp column, use a SQL statement such as:

SELECT value1,readingtime from table where readingtime > '2004-09-01' order by readingtime desc



Standard Inputs

Pin	Notes
Trigger	Accepts a single input connection and is used to write information into the connected database configured in Basic Properties.

Standard Outputs

Pin	Notes
Result	Reports the status of operation. A value of 1 indicates successful collection, whereas a value of 0 will report an error condition which is described by the Status Message output.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.
SQL Statement	Defines the SQL Statement for value fetching.

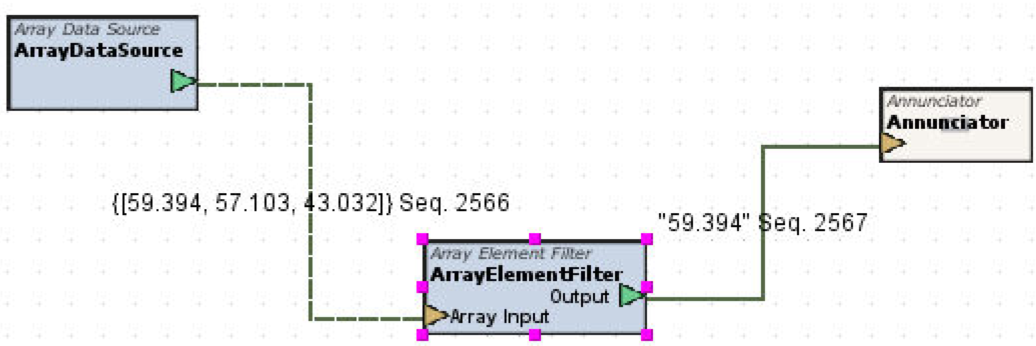
Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.

Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize on Connect	Defines if the connection to the database should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

Array Element Filter

The Array Element Filter element takes an Array Value input and outputs the Value Object that is the specified element of the array.



Standard Inputs

Pin	Notes
Array Input	Accepts a single input and is used to read an entire array for interpretation.

Standard Outputs

Pin	Notes
Output	Outputs a chosen array element based on Basic Properties configuration

Basic Properties

Property Name	Notes
Default Value	Defines the default output value when no array value has been received.
Index	Defines the array index to focus upon.

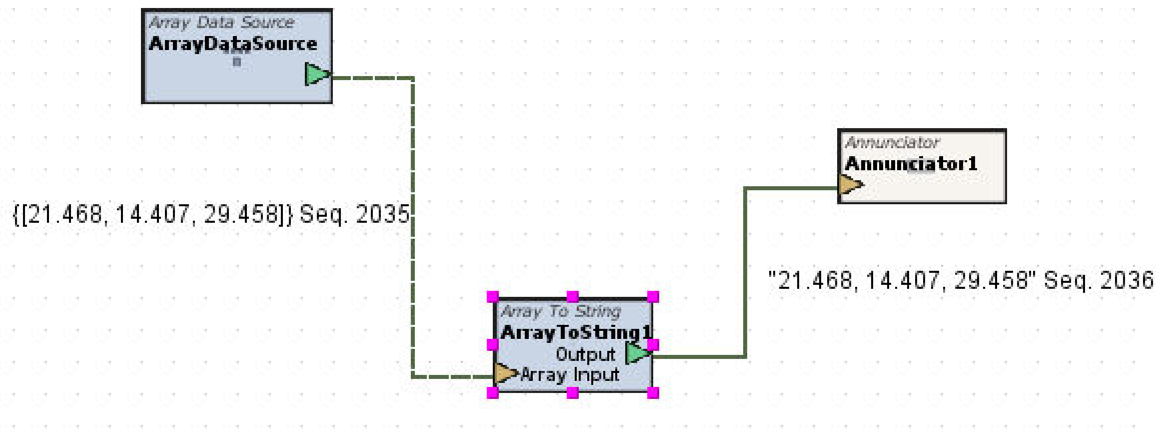
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output

	OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Array to String

The Array To String element is used to change the elements of an Array Value into a String, with optional time stamps.



Standard Inputs

Pin	Notes
Array Input	Accepts a single array input value.

Standard Outputs

Pin	Notes
Output	Outputs the array value as a single string value.

Basic Properties

Property Name	Notes
Delimiter	Defines the characters to use for the separator between elements. This defaults to a comma, but you could also use <p> to paragraph format the information, leaving carriage returns between each array element.
Include Timestamp	Defines whether or not timestamps are displayed next to each array element as the information is updated from the array source.
Timestamp Format	Defines the timestamp format displayed next to array elements when Include Timestamps is set to True.

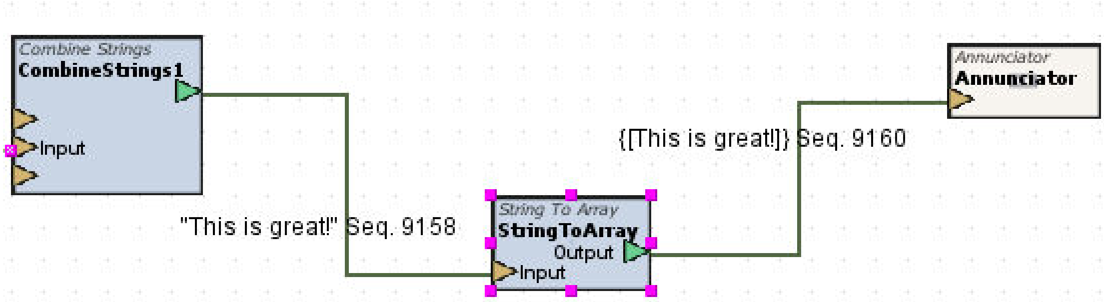
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).

Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

String to Array

The String To Array element is used to change the comma separated elements of a string into an array. Commas must be present in the string in order for multiple array elements to be created.



Standard Inputs

Pin	Notes
Input	Accepts a single string input for conversion.

Standard Outputs

Pin	Notes
Output	Outputs the string input as an array output.

Basic Properties

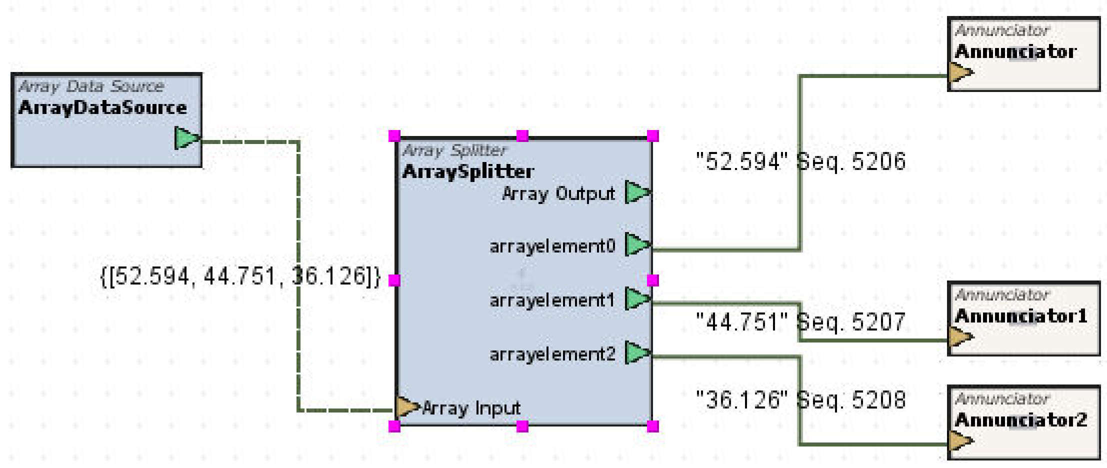
No basic properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

 *Array Splitter*

The Array Splitter element is used to extract elements of an array into individual outputs.



Pin	Notes
Array Input	Accepts a single input connection of array data for splitting.

Standard Outputs

Pin	Notes
Array Output	Passes the entire array received from the Array Input pin.
Array Element #	One or many are generated based on the Number of Elements configuration in Basic Properties. If the array has 8 elements, and the Number of Elements has been configured for 8, each element output will send the value for the designated array index.

Basic Properties

Property Name	Notes
Number of Elements	Defines the number of array elements that will be split.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections

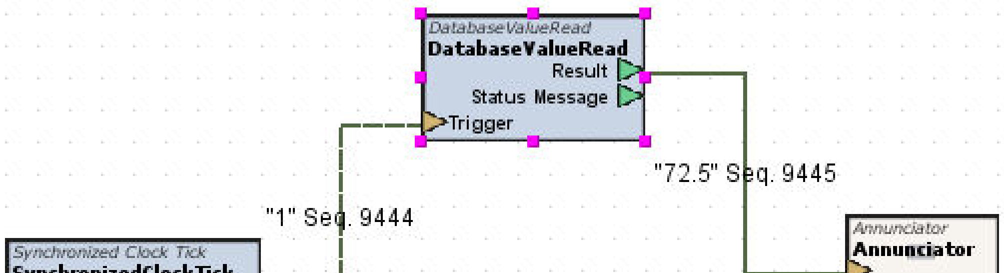
	are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Database

Database Value Read

Used to read a single piece of data (single row) of information stored into a database table. This is commonly used to read information written by another source that used the Database Value Write element. Information is read by a trigger method.

DatabaseValueRead	DatabaseValueRead
Name	DatabaseValueRead
Connection Name	/GlobalConfig/MySQLConn...
Database Table Name	mobile
DbKey	Cafeteria Zone Temp



←T→			ID	Value	Permission
☑	✎	✕	Cafeteria Zone Temp	72.5	RW

Standard Inputs

Pin	Notes
Trigger	Accepts a single input and is used to trigger a read from the database.

Standard Outputs

Pin	Notes
Result	Outputs the value read from the database as configured in Basic Properties
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.
Database Table Name	Defines the database table name to read data from.
DBKey	Defines the key/row name to read data from.

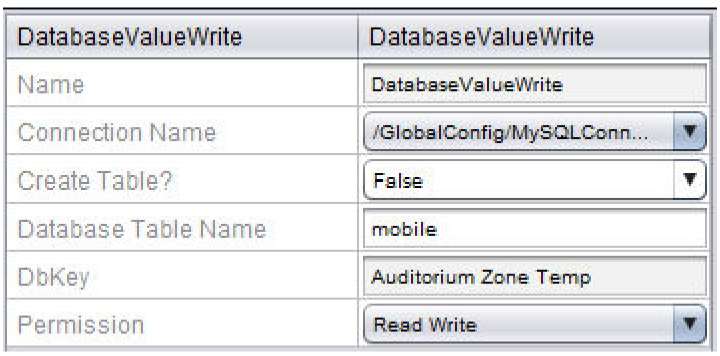
Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listen-

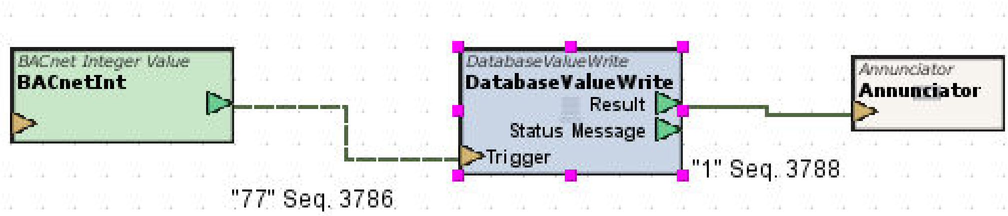
	ers - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize on Connect	Defines if the connection to the database should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

Database Value Write

Used to write a single piece/row of data into a database table.



DatabaseValueWrite	DatabaseValueWrite
Name	DatabaseValueWrite
Connection Name	/GlobalConfig/MySQLConn...
Create Table?	False
Database Table Name	mobile
DbKey	Auditorium Zone Temp
Permission	Read Write



The result of the write would be the second entry in the table:

←T→			ID	Value	Permission
			Cafeteria Zone Temp	72.5	RW
			Auditorium Zone Temp	77	RW

Standard Inputs

Pin	Notes
Trigger	Accepts a single input connection and is used to write information into the connected database configured in Basic Properties.

Standard Outputs

Pin	Notes
Result	Reports the status of operation. A value of 1 indicates successful collection, whereas a value of 0 will report an error condition which is described by the Status Message output.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.
Create Table?	Defines if the table will be automatically created by Aspect in the event it is not present. In most cases, this should be set to True.
Database Table Name	Defines the database table name to read data from.
DBKey	Defines the key/row name to read data from.
Permission	Defines the read/write permission when the row is created.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize on Connect	Defines if the connection to the database should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

Database Connection Manager

The Database Connection Manager element is used to maintain database connections to database types that do not use their own dedicated element (such as MySQL and SQLite). Essentially, it represents a database to be used by your project. One Database Connection Manager is required for each database connection. Each individual database components, such as each Triggered Historical element used in your application, will use a Database Connection Manager to access a table in this database. You can add multiple Database Connection Managers to the project, each configured for a different database.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Database Driver Class Name	Defines the Java class path of the database driver you will be using.
Database Password	Defines the database password.
Database URL	Defines the URL, host name, or IP address of the database.
Database User Name	Defines the user name required to access the referenced database.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
AsyncConnect	Defines if the connection is asynchronous.

Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 5.

SQLite Connection Manager

Used to connect and interact with SQLite Databases, commonly used on a Matrix Area Controller to store local data onto a USB drive.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Database Name	Defines a name for the database that will be created by the connection manager.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
AsyncConnect	Defines if the connection is asynchronous.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 5.

More Information

[SQLite Overview]

[Licensing SQLite]

[Configuring the USB Flash Drive](#)

[Configuring SQLite Connectivity](#)

MySQL Connection Manager

Used to connect and interact with a MySQL-based database server, either local or remote to the Aspect devices. This requires that the latest MySQL driver jar be added to the project's drivers node.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Connect Timeout	specifies how much time (in milliseconds) must elapse after a transaction to consider a con-nection time out to the database.
Database Name	specifies the name of the database in which a connection is being made to.
Database Password	specifies the password required to access the database.
Database User Name	specifies the user name required to access the database.
Hostname	specifies the URL, resolvable name, or IP address location of the database.
Query Timeout	specifies how long, in milliseconds, for the initial connection to the database must elapse before a time out is considered.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will

	attempt to perform data communications even if Aspect-Studio is in SIM mode.
AsyncConnect	Defines if the connection is asynchronous.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 5.

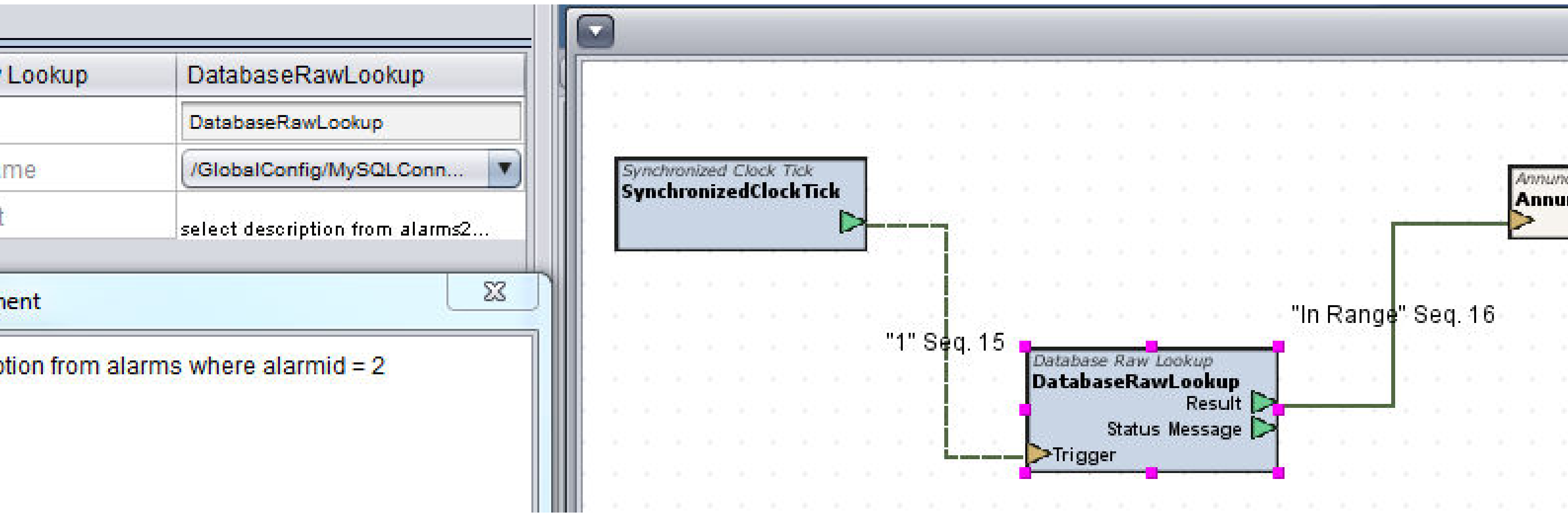
More Information

Adding MySQL Into Your Project

Configuring MySQL Connectivity

RAW LOOK *Database Raw Lookup*

Used to take a custom SQL statement to return a single value from the database. This is typically used to lookup a single piece of data (single row of data).



Standard Inputs

Pin	Notes
Trigger	Accepts a single input connection and is used to trigger the lookup process.

Standard Outputs

Pin	Notes
Result	Outputs the result of the lookup operation.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.
SQL Statement	Defines the SQL Statement used to retrieve data.

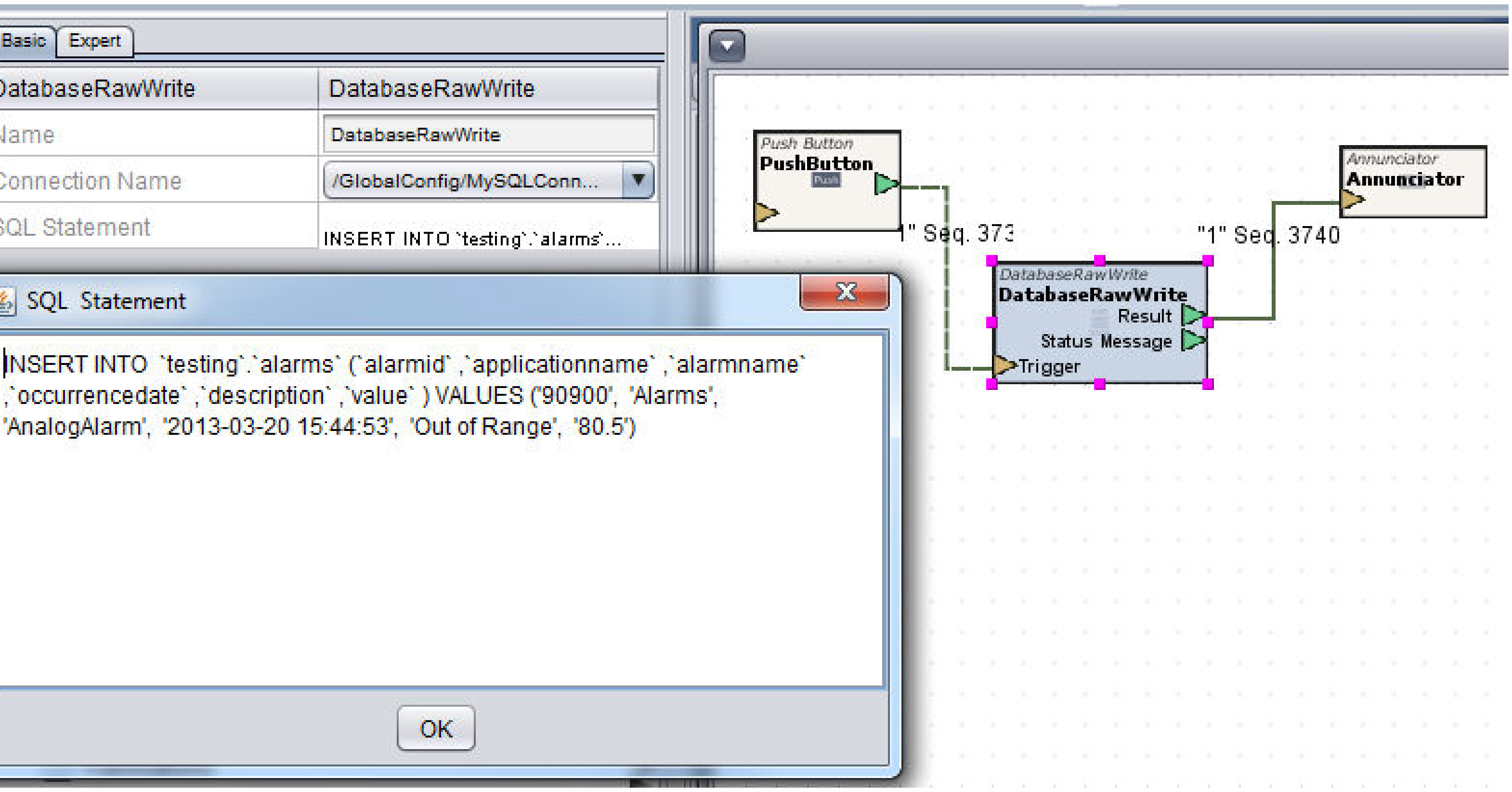
Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element

	- depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize on Connect	Defines if the connection to the database should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

Database Raw Write

Used to take a custom SQL statement to write a single value (single row) to the database table.



Standard Inputs

Pin	Notes
Trigger	Accepts a single input connection and is used to write information into the connected database configured in Basic Properties.

Standard Outputs

Pin	Notes
Result	Reports the status of operation. A value of 1 indicates successful collection, whereas a value of 0 will report an error condition which is described by the Status Message output.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.

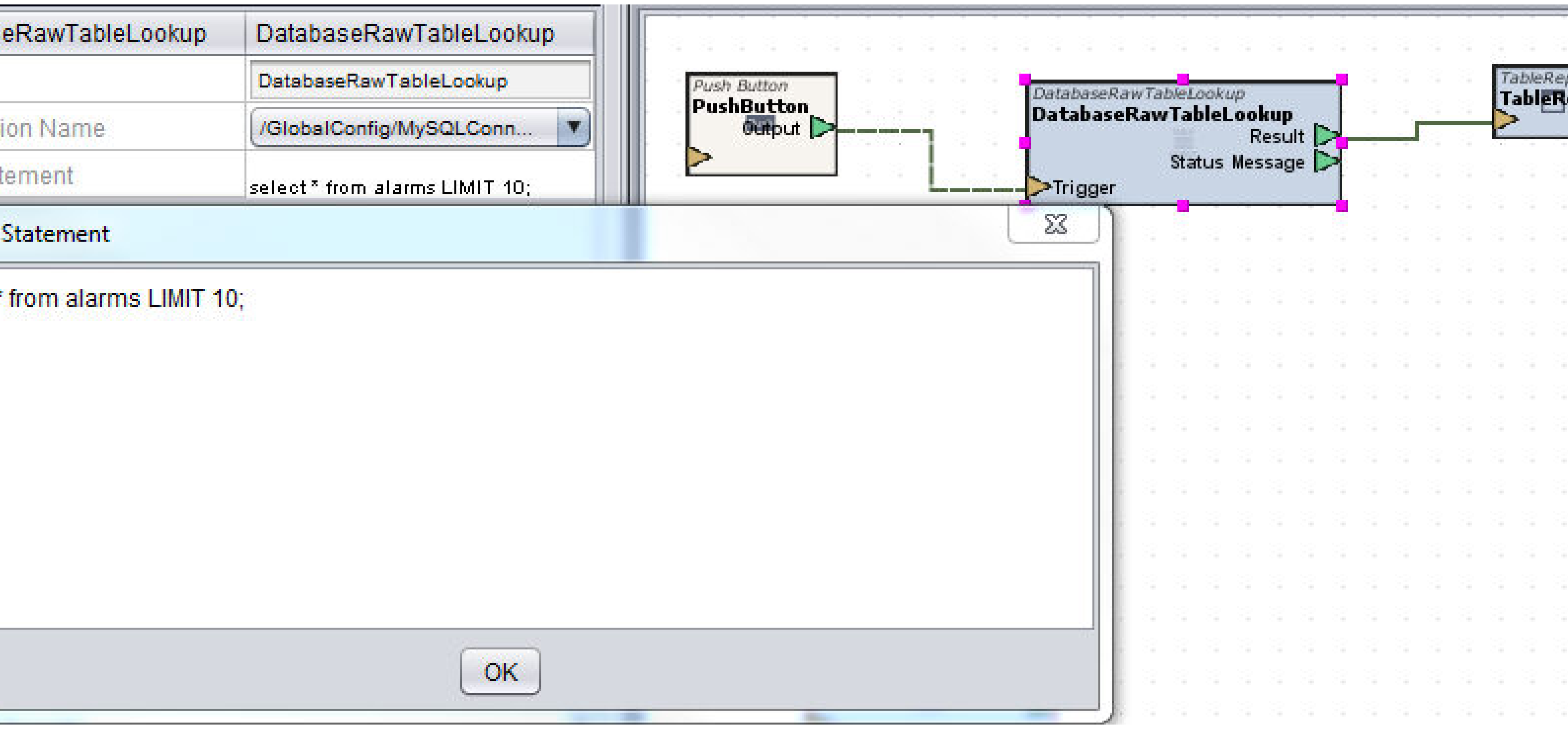
SQL Statement	Defines the SQL Statement used to retrieve data.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize on Connect	Defines if the connection to the database should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

TABLE LOOK *Database Raw Table Lookup*

Used to return an entire database table for report and presentation purposes. This element would typically be used as the Input to a XY Chart, or a Simple Report.



Standard Inputs

Pin	Notes
Trigger	Accepts a single trigger method. When a value change has been received, the table lookup process will occur.

Standard Outputs

Pin	Notes
Result	Outputs the result of the lookup.
Status Message	Reports any database connection errors should they occur.

Basic Properties

Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.
SQL Statement	Defines the SQL Statement to apply to retrieve table information.

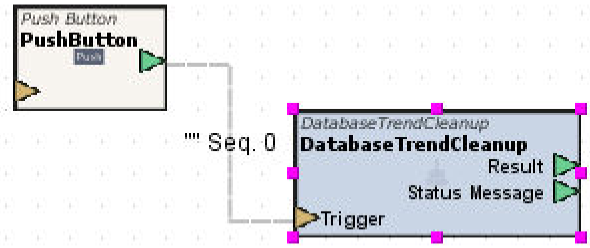
Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 255.
Synchronize Connection	Defines if the database connection should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

Database Trend Cleanup

Used to delete old or unneeded rows of trend sample data from a specific table name (trend). Using this element, you can specify how many rows (samples) or data will be kept after the trigger.



Standard Inputs

Pin	Notes
Trigger	Accepts a single input connection and is used to trigger the cleanup process.

Standard Outputs

Pin	Notes
Result	Reports the status of operation. A value of 1 indicates successful collection, whereas a value of 0 will report an error condition which is described by the Status Message output.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.

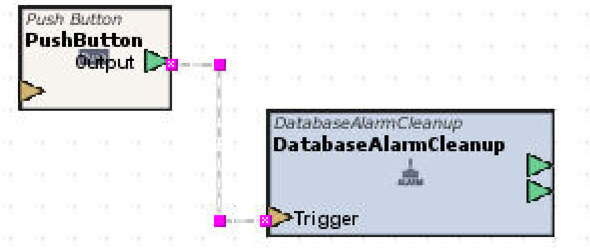
Database Table Name	Defines the SQL Statement used to retrieve data.
Maximum Rows	Defines how many trend samples to retain.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize on Connect	Defines if the connection to the database should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

Database Alarm Cleanup

Used to delete old or unneeded alarm messages (rows) from a specific database.



Standard Inputs

Pin	Notes
Trigger	Accepts a single input connection and is used to trigger the cleanup process.

Standard Outputs

Pin	Notes
Result	Reports the status of operation. A value of 1 indicates successful collection, whereas a value of 0 will report an error condition which is described by the Status Message output.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.
Database Table Name	Defines the SQL Statement used to retrieve data.
Retain Open Alarms	Defines if unacknowledged or un-cleared alarms should be removed as part of the clean process.
Target Row Count	Defines how many alarm message to keep or retain.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize on Connect	Defines if the connection to the database should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

Database Array Raw Lookup

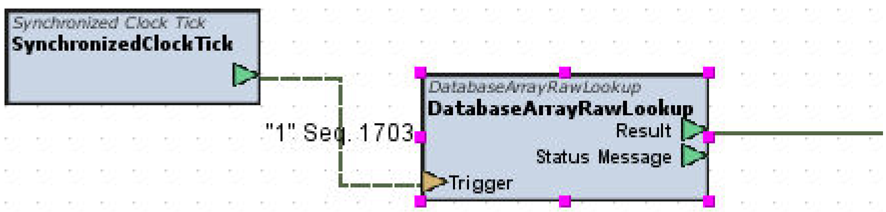
The Database Array Raw Lookup element is used to read a column of data from a database, and is achieved through use of an SQL SELECT statement.

The SELECT statement used for the Database Array Raw Lookup should be appropriate to return data from a specific column of the database. For example:

SELECT value1 from table where readingtime > '2004-09-01' order by readingtime DESC

As a special case, the timestamp column of a Triggered Historical database may be used to set the timestamps of the Value Objects in the array value result. To use the timestamp column, use a SQL statement such as:

SELECT value1,readingtime from table where readingtime > '2004-09-01' order by readingtime desc



Standard Inputs

Pin	Notes
Trigger	Accepts a single input connection and is used to write information into the connected database configured in Basic Properties.

Standard Outputs

Pin	Notes
Result	Reports the status of operation. A value of 1 indicates successful collection, whereas a value of 0 will report an error condition which is

	described by the Status Message output.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.
SQL Statement	Defines the SQL Statement for value fetching.

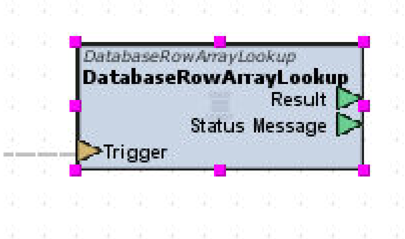
Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect

	start-up. Lower values get higher priority. This defaults to 255.
Synchronize on Connect	Defines if the connection to the database should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

Database Row Array Lookup

The Database Row Array Lookup element is used to return one or more values from a single database row as an Array Value.



Standard Inputs

Pin	Notes
Trigger	Accepts a single input connection and is used to trigger the lookup process.

Standard Outputs

Pin	Notes
Result	Outputs the results of the lookup process.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Connection Name	Defines the connected database to where trend data will be stored.
SQL Statement	Defines the SQL Statement for value fetching.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize on Connect	Defines if the connection to the database should be synchronized.
Throw on NULL Response	Defines if an error is indicated if no information is read from the database.

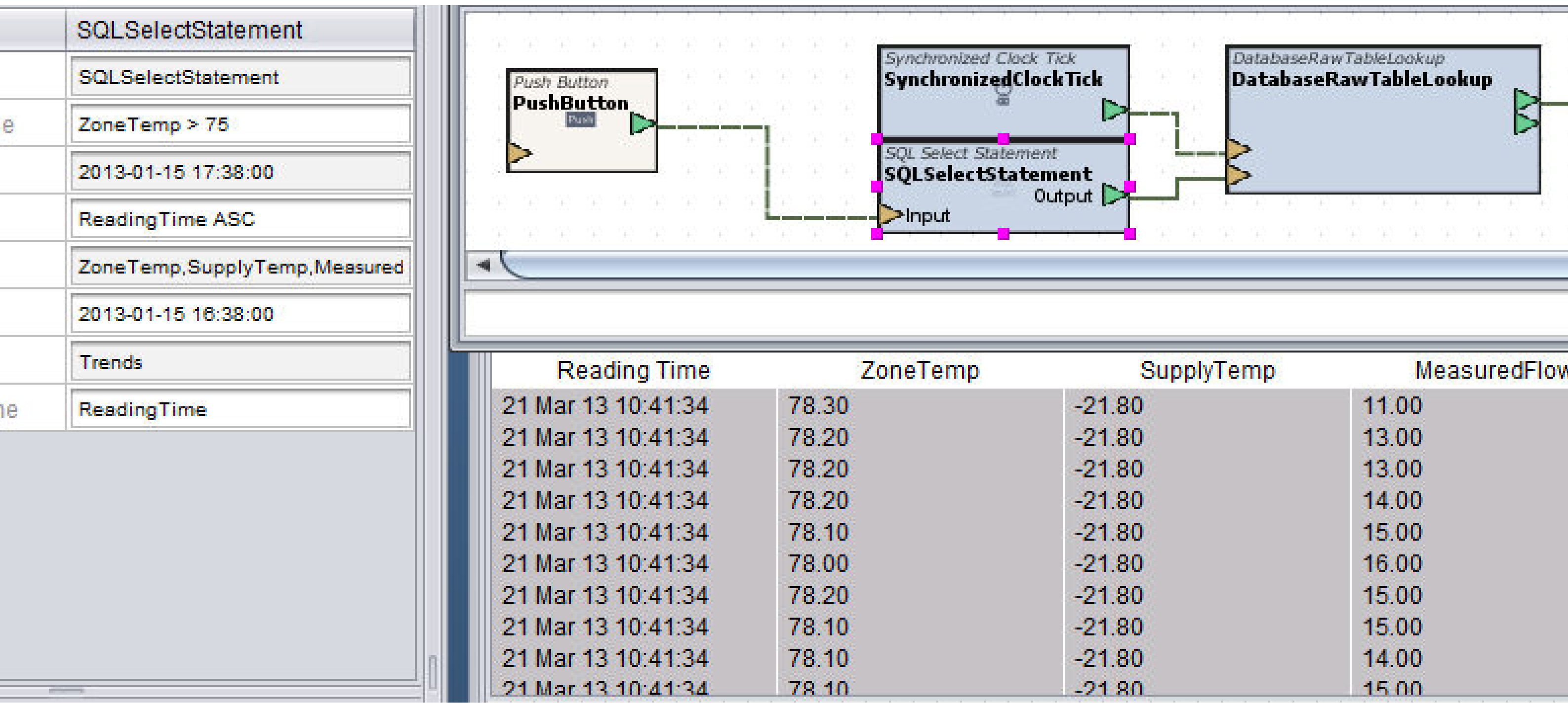
SQL Select Statement

The SQL Select Statement element builds a SQL Statement String that can be used to Output a SQL Select to the SQL Statement input pin of the Historical/Database components. Example of the SELECT statement may be:

SELECT * FROM historical WHERE value1 > 51.5

-or-

SELECT readingtime,value1,value2 from status where readingtime >= 2005-04-01 AND readingtime<=2005-05-30 ORDER BY readingtime DESC



Standard Inputs

Pin	Notes
Input	Accepts a single input connection and is used to trigger the SELECT statement.

Standard Outputs

Pin	Notes
Output	Reports the results of the SELECT statement.

Basic Properties

Property Name	Notes
Additional WHERE Clause	Defines the query's WHERE clause. Do not include AND or WHERE at the beginning. Ex: "ZoneTemp > 78"
End Time	Defines the End Time for the query in the Time format YYYY-MM-DD or hh:mm:ss
Order By Clause	Defines the column to order the statement by. Ex: "Value1 DESC" or "ReadingTime ASC"
Select Columns	Defines the column list to output. Use a comma separated list of columns or * for all (required)
Start Time	Defines the Start Time for the query in the Time format YYYY-MM-DD or hh:mm:ss
Table Name	Defines the Table name the query is executed on. Ex: Trends
Timestamp Column Name	Defines the Column name containing timestamp information (required for time based select) Ex: "ReadingTime"

Expert Properties

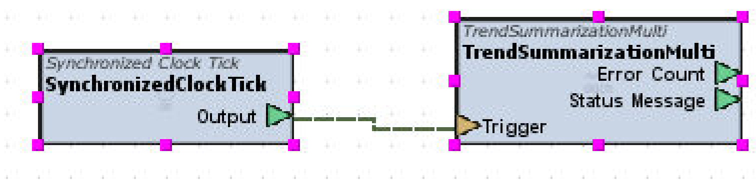
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated

	by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Trend Summarization Multi

The Trend Summarization Multi element is used to perform roll-up trend data reporting. The element allows users to define an existing source trend which has collected mass amounts of data. When triggered, The Trend Summarization Multi element will auto-create summarization tables, providing the following data based on days, hours, week, month, and year:

- Minimum sample value
- Average sample value
- Max Sample Value
- Sum of all samples values
- Delta change of sample values
- Total amount of samples



This element is useful for situations where a user may want to know the average temperature of a space for a given day, week, month. etc.

In order to calculate the data listed above, the source trend must have collected data for the specific time period in order to proper math determinations to be made.

Standard Inputs

Pin	Notes
Trigger	Accepts any trigger based value. When a change of value is received, summarization capabilities are ran against a table.

Standard Outputs

Pin	Notes
Error Count	Only writes when there is an error with data summarization routines, and it is written with the total number of errors detected since the last Aspect Control Engine restart. This means that you won't ever see an output of 0; it will always start with a value of 1 with the first error occurrence. This output can be used to attach an e-mailer or other widget or notification element without having to inhibit the first firing of the value on start-up. NOTE - This Error Count will only increment errors during the summarization calculation process (such as calculation errors, and connectivity errors during the calculation process), and will not count upon an error in basic configuration of the element. For basic configuration errors, refer to the Status Message output for configuration details.
Status Message	Reports any database connection errors should they occur.

Basic Properties

Property Name	Notes
Summary Table Base Name	Defines the summary table base name. When the Trend Summarization Multi element is triggered, summarization tables will be created for: • SummaryBaseTableName_day - day sum-

	marization • SummaryBaseTableName_hour - hourly summarization • SummaryBaseTableName_week - week summarization • SummaryBaseTableName_month - month summarization • SummaryBaseTableName_year - year summarization NOTE - When assigning a Table Name, it is important to ensure that you exclude the use of any special characters (such as hyphens, plus, minus, and other wild card characters). Having these as part of a table name can cause reporting and read/write errors when deployed.
Trend Table Name	Defines the source trend on which summarization will be performed.
Trend Timestamp Column	Defines the column name for the Timestamp column.
Connection Name	Defines the connected database to where trend data will be stored. Note that the source trend must also exist in this database in order for summarization to occur.
Create Table?	Defines if the table will be automatically created by Aspect in the event it is not present. In most cases, this should be set to True.

Expert Properties

Property Name	Notes
Always Live	Defines if the element, when set to True, will attempt to perform data communications even if Aspect-Studio is in SIM mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin.

	• Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Debug Level	Defines whether or not status info is sent to the Aspect Control Engine Log when the Trend Summarization tables are generated. A value of greater than 0 will enabled logging.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize Connection	Defines if the database connection should be synchronized.
Throw on Null Response	Defines whether or not the Status Message pin will indicate an error if no data is read from the database

More Information

Trend Rollup using Trend Summarization Multi

Security

Local Security Manager

Provides localized security interface and is used to create security implementations that do not intertwine with Aspect's built-in security scheme. This manager has been superseded by the MIX Security Manager, which is used to provide integrated security, read/write acces, and audit-trail functionality.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
administrator	Defines the comma separated list in the format of user=password. Enter "administrator" in the connector "Groups" property.
All Users	Defines the comma separated list in the format of user=password.
supervisor	Defines the comma separated list in the format of user=password. Enter "supervisor" in the connector "Groups" property.
user	Defines the comma separated list in the format of user=password. Enter "user" in the connector "Groups" property.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output

	OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

MIX Security Manager

Provides integrated User/Group security within Aspect. To establish read/write security privileges, this element must exist within your project.

Standard Inputs

Pin	Notes
Refresh	Used to perform a manual refresh of the security manager. In most applications though, no manual refresh is required.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

No basic properties exist for this element.

Expert Properties

Property Name	Notes
Groups URL	Defines the path used by the project to connect to the security manager.
Plain Text	Defines if security information utilizes plain text.
Users URL	Defines the path used by the project to connect to the user manager.

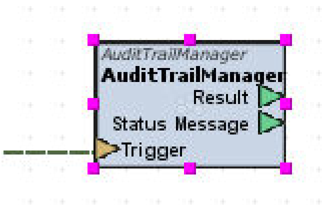
More Information

[Security Overview]

[Using the MIX Security Manager]

Audit Trail Manager

The Audit Trail Manager element provides database connectivity to store audit logs information for secure applications.



Standard Inputs

Pin	Notes
Trigger	Accepts the Audit Trail output from an enhanced design element and stores its audit trail information into the connected database configured in Basic Properties.

Standard Outputs

Pin	Notes
Result	Reports the current condition of the trend element. A value of 1 indicates successful collection, whereas a value of 0 will report an error condition which is described by the Status Message

	output.
Status Message	Reports any database connection errors should they occur in an plain text readable language.

Basic Properties

Property Name	Notes
Audit Trail Manager ID	Defines the name for the Audit Trail Manager ID.
Connection Name	Defines a configured database network.
Create Table?	Defines if the table will be automatically created by Aspect in the event it is not present. In most cases, this should be set to True.
Database Table Name	Defines the database table name where data will be stored/retrieved. NOTE - When assigning a Table Name, it is important to ensure that you exclude the use of any special characters (such as hyphens, plus, minus, and other wild card characters). Having these as part of a table name can cause reporting and read/write errors when deployed.

Expert Properties

Property Name	Notes
Always Live?	Defines if the Alarm Manager will stay live regardless of being in SIM/Live mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the pre-

	ferred auto-suspend behavior as dictated by the Aspect runtime engine.
Console Report	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Synchronize Connection	Defines if the database connection should be synchronized.
Throw on Null Response	Defines whether or not the Status Message pin will indicate an error if no data is read from the database

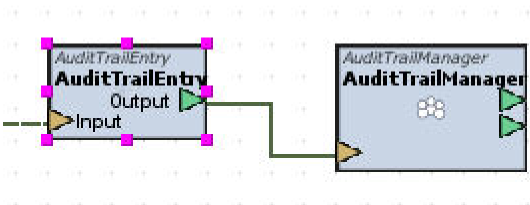
More Information

[Security Overview](#)

[Using the Audit Trail Element](#)

Audit Trail Entry

The Audit Trail Entry element provides the ability to create a custom audit trail entry based on any custom event. When an input value is received by this element, audit information is sent to the Audit Trail Manager (provided that a logic connection is established to said element).



Standard Inputs

Pin	Notes

Inputs	Accepts an input value. When an input value is received, an Audit Trail entry is then sent to the element's output.

Standard Outputs

Pin	Notes
Output	Outputs an Audit Trail message. The output, in most applications, is connected to the input of the Audit Trail Manager.

Basic Properties

Property Name	Notes
Component	Defines a custom value that is inserted into the Component column of the Audit Trail database.
Description	Defines a custom value that is inserted into the Description column of the Audit Trail database.
Disposition	Defines a custom value that is inserted into the Disposition column of the Audit Trail database.
Message	Defines a custom value that is inserted into the Message column of the Audit Trail database.
Priority	Defines a custom priority level value that is inserted into the Priority column of the Audit Trail database.
User	Can be used to define a static user name that is inserted into the User column of the Audit Trail database.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic

	when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

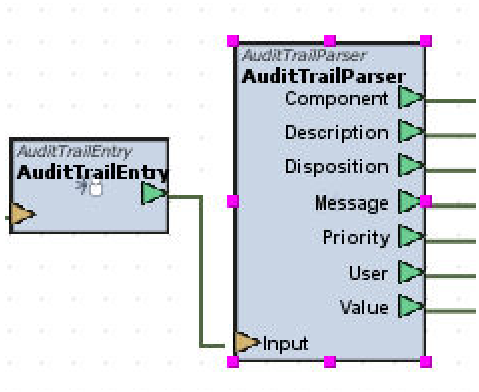
More Information

[Security Overview](#)

[Using the Audit Trail Element](#)

Audit Trail Parser

The Audit Trail Parser element can be used to receive an Audit Trail output connection and split each portion of the message for display in Aspect, vSTAT, or other applications as necessary.



Standard Inputs

Pin	Notes
Input	Accepts the Audit Trail output from an enhanced design element or other Audit Trail output. The message is parsed and passed onto multiple outputs.

Standard Outputs

Pin	Notes
Component	Reports the value of the Component information of the Audit Trail message.
Description	Reports the value of the Description information of the Audit Trail message.
Disposition	Reports the value of the Disposition information of the Audit Trail message.
Message	Reports the value of the Message information of the Audit Trail message.
Priority	Reports the value of the Priority information of the Audit Trail message.
User	Reports the value of the User information of the Audit Trail message.
Value	Reports the value of the Value information of the Audit Trail message.

Basic Properties

No Basic Properties exist for this element.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listen-

	ers - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

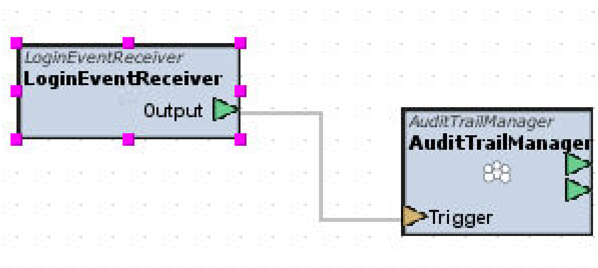
More Information

Security Overview

Using the Audit Trail Element

Login Event Receiver

The Login Event Receiver element provides the ability to send login/-logout event actions to the Audit Trail Manager database. A single Login Event Receiver is needed for a single project and will track any login/-logout event performed within the rich graphical user interface of Aspect.



Standard Inputs

No Standard Inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Sends login/logout information. This output must be connected to the Audit Trail Manager's Input pin to effectively log such transactions.

Basic Properties

No Basic Properties exist for this element.

Expert Properties

Property Name	Notes
Audit Description	Defines a configurable audit trail description which can be sent to the Audit Trail database with each login/logout event.
Audit Message	Defines a configurable audit message which can be sent to the Audit Trail database with each login/logout event.
Audit Priority	Defines a configurable audit priority which can be sent to the Audit Trail database with each login/-logout event.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Start Priority	Defines the priority at which the element is

	instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

More Information

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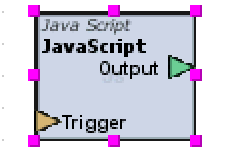
Line by Line

JavaScript

The JavaScript element is used to perform operations using the JavaScript programming language.



Standard Inputs

Pin	Notes
Trigger	Accepts a single input and is used to trigger the execution of the Javascript code.

Standard Outputs

Pin	Notes
Output	Outputs the Javascript code's error message or user-defined variable.

Basic Properties

Property Name	Notes
Script	Defines the Javascript code to execute.

Expert Properties

Property Name	Notes

Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Using JavaScript in Aspect-Studio

JavaScript is a simple, yet powerful language. It is widely used to create dynamic HTML within Web pages, and many of the examples you can find on the Internet address this topic, but this is not specifically of interest to Aspect-Studio applications. For Aspect-Studio, its more useful as a way to interact with the beans within the system to create logic and applications that might be difficult or impossible with wired bean logic. An example where JavaScript can be very useful is for iterations.

For Aspect-Studio applications, you can get access to named servers and manipulators using a "bsf1 lookup". Once you have a reference to the data source you can obtain data values (as Value Objects) from it. To get a server reference (e.g., to a server named "MyServer") you use a "bsf lookup" line such as:

```
server = bsf.lookupBean("MyServer");
```

Note that the name of the element for the lookup is "MyServer" and it is enclosed in quotes; it is also case sensitive. This example also assumes that the bean "MyServer" is in the same screen as the JavaScript bean. If it is not you must precede the name with the screen name to form the "fully qualified" server name; for example, to access a server on the "Main" screen you use:

```
server = bsf.lookupBean("/Main/MyServer");
```

Using Value Objects in Scripts

Now that you have a reference to the server, you can get a value from the server using some simple code. You can get integer (long), floats (doubles), booleans, and Strings from the server. Please make sure that the value converts to the type you intend or you will get a Java exception logged every time the JavaScript element is triggered. For example, String is the safest conversion (everything will convert to a String) but if the server is emitting Strings and you want the integer value of this, you need to make sure the String converts to a number.

Here are some conversion examples:

```
intValue = server.getValueObject().getIntValue();
floatValue = server.getValueObject().getFloatValue();
stringValue = server.getValueObject().getStringValue();
boolValue = server.getValueObject().getBoolValue();
```

You can also get Array Values from the server (if it is generating Array Values) and get any data value from the individual elements of the array or other properties such as the size of the array.

```
array = (ArrayValueObject)(server.getValueObject()).getValues();
```

Arrays are indexed starting at 0, so some of the elements of the array would be:

```
value1 = array.elementAt(0);
```

```
value2 = array.elementAt(1);
```

Here is a small script that accesses a variable element of an input array:

```
//Test Array operations
arraySource = bsf.lookupBean("TestArray");
indexSource = bsf.lookupBean("Index");
array = (ArrayValueObject)(arraySource.getValueObject()).getValues();
index = indexSource.getValueObject().getIntValue();
test = array.elementAt(index);
result = test;
```

In addition, you can get other properties of the Value Object from the element:

```
server = bsf.lookupBean("MyServer");
value = server.getValueObject();
quality = value.getQuality();
color = value.getValueObject().getColor();
date = value.getDate();
longTime = value.getTimeMillis();
```

You can also set Value Object properties using their set methods:

```
value.setIntValue(94);
value.setQuality(ValueObjectInterface.QUALITYBAD);
value.setColor(java.awt.Color(1,0,0.5));
```

Note - To use "setIntValue()" on the value, value must be a Long Value Object. In other words, you cannot use setIntValue() on a Value Object that is a String Value Object; likewise you cannot use setStringValue() on a Double Value Object.

Also Note: Colors in JavaScript are set with doubles in the range of 0.0-1.0 for each of the R, G, and B components of the Color. R= Red, G=Green, and B=Blue.

For example, the getTimeMillis() will access the timestamp of the ValueObject as a long integer. Each property is a specific data type as documented in the JavaDocs. Be sure to end each line of the script with a semicolon (;). Comments can be entered with a double forward slash at the beginning of the line.

Sending Data To Other Value Object Targets

If you generate a value in the JavaScript you may want to send this value to another named manipulator (or Broadcast Server) in your project's application logic. First you need to get a reference by name to the target (the "target" is the manipulator or Broadcast Server that will receive the data). For example, to target a Broadcast Server named "DataInput" in the DataIO application logic you write a line that says:

targetBCS = bsf.lookupBean("/DataIO/DataInput");

If the target is in the same application as this JavaScript bean you do not need to qualify the name with the application name:

localBCS = bsf.lookupBean("DataInput");

The targets expect to receive a "ValueChangedEvent" containing a "ValueObject". The ValueObject contains the data and other properties of the data such as its quality and timestamp.

The next step to sending the value to the target is to create a ValueObject containing the data. In the script line below "value" is a number that has already been calculated in previous lines of the JavaScript.

vo = new IntValueObject(value);

Now create a ValueChangedEvent with this ValueObject:

vce = new ValueChangedEvent(this,vo);

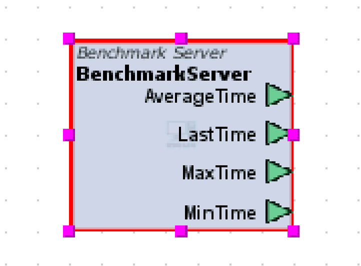
Finally, write the ValueChangedEvent to the input of the target:

localBCS.valueInput(vce);

Diagnostic

Benchmark Server

Used to examine the timing characteristics of an application that the element has been placed into. Through use of this element, information regarding execution of an application can be viewed.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Average Time	Outputs the average amount of time (in milliseconds) application or component processes information, logic, and other associated tasks.
Last Time	Outputs the last amount of time (in milliseconds) application or component processed information, logic, and other associated tasks.
Max Time	Outputs the maximum amount of time (in milliseconds) an application or component processed information, logic, and other associated tasks.
Min Time	Outputs the minimum amount of time (in milliseconds) an application or component took to process information, logic, and other associated tasks.

Basic Properties

Property Name	Notes

Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

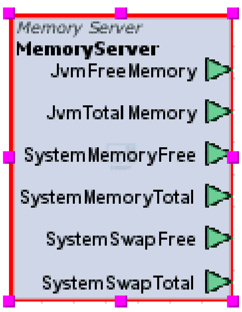
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is

	enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Memory Server

Used to view memory statistics of the target's Java Virtual Machine (JVM), as well as system memory (such as hard drive space and RAM space). In order to gain useful information regarding the memory performance of any target, information must be viewed from a web-browser after the project has been deployed.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
JVM Free Memory	Outputs the amount of free memory available to the target's Java Virtual Machine.
JVM Total Memory	Outputs the total amount of memory available to the target's Java Virtual Machine.
System Memory Free	Outputs the total amount of system memory (RAM) available within the target.
System Memory Total	Outputs the total amount of system memory (RAM) installed within the target.
System Swap Free	Outputs the total amount of system swap memory free within the target.
System Swap Total	Outputs the total amount of system swap memory total available within the target.

Basic Properties

Property Name	Notes
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.

Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

 *Available Disk Space Server*

Used to display the free amount of disk space available on targets. In order to gain useful information regarding available disk space, information must be viewed from a web-browser after the project has been deployed.

Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Available Disk Space	Outputs the total amount of available disk space remaining on a target.

Basic Properties

Property Name	Notes
Mount	Defines the hard drive mount, which the Available Disk Space Server will examine.
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

Expert Properties

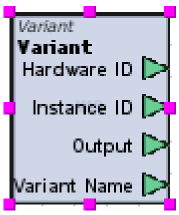
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic

	when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

VAR *Variant*

Allows users to output Aspect target identification details including the Hardware ID and Platform Type. The Platform Type is an enumeration, identifying:

- 1 = Aspect-Studio
- 2 = Aspect Facility
- 3 = Aspect Enterprise
- 4 = Aspect Matrix Area Controller
- 5 = Aspect-Nexus



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Hardware ID	Outputs the hardware ID of the target.
Instance ID	Outputs the instance of Aspect that the element exists within.
Output	Outputs an enumeration of the platform type, where: • 1 = Aspect-Studio • 2 = Aspect-Facility • 3 = Aspect-Enterprise • 4 = Aspect-Matrix Area Controller • 5 = Aspect-Nexus
Variant Name	Outputs the actual variant name corresponding to the Output.

Basic Properties

No basic properties exist for this element.

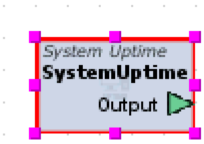
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This

	defaults to 255.
Timebase	Defines how often, in seconds, the element will execute and update its value.

 *System Uptime*

Used to display the uptime of a specific target. Uptime is defined as the amount of time since the target first started. This timer will reset in the event of a reboot, power loss, or other event that results in a full system restart.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs the amount of time, in seconds, that the target has been running for since the last power-up or reboot.

Basic Properties

Property Name	Notes
Timebase	Defines how often, in seconds, the calculation is executed and outputs a result.

Expert Properties

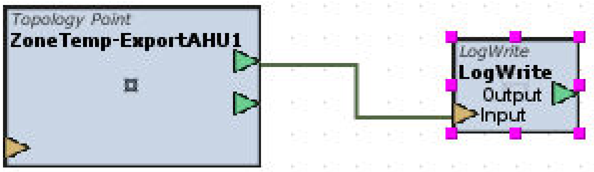
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the ele-

	ment will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Color Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi property.
Color Hi Hi	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Hi Hi property
Color Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo property
Color Lo Lo	Defines a color sent onward to Design elements that support the ability to receive and displays colors. This color corresponds to the Value Lo Lo property
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if value colors (defined using Color/Value Properties) should be sent onward by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Value Hi	Defines the value on which the color defined in Color Hi is sent.
Value Hi Hi	Defines the value on which the color defined in Color Hi Hi is sent.
Value Lo	Defines the value on which the color defined in Color Lo is sent.
Value Lo Lo	Defines the value on which the color defined in Color Lo Lo is sent.

Log Write

Used to insert information into the System Log of the Aspect target. This element provides the ability to generate custom syslog messages for system-wide actions and events that do not fall into the category of standard audit-trailing.



Standard Inputs

Pin	Notes
Input	Accepts a single input connection, used to append a value to a Log Write. Log Writes occur upon a value change received by this pin.

Standard Outputs

Pin	Notes
Output	Outputs a mirrored reflection of the input value, which can be passed onto other elements within Diagram Logic, or to widgets in Design Logic.

Basic Properties

Property Name	Notes
Severity	Defines the severity level of the message when inserted into the syslog.

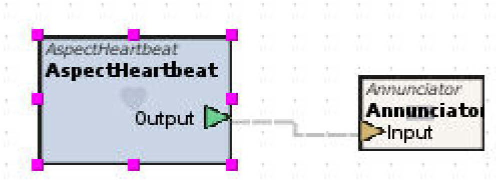
<table>
<tr><td></td><td>Enumeration Value and Property:
<table><tr><td>10000</td><td>DEBUG</td></tr><tr><td>20000</td><td>INFO</td></tr><tr><td>30000</td><td>WARN</td></tr><tr><td>40000</td><td>ERROR</td></tr><tr><td>50000</td><td>FATAL</td></tr></table>
Note: The severity option DEBUG is reserved for specific circumstances with AAM Technical Support when filtering higher error messages is necessary.</td></tr>
<tr><td>Text to Prepend</td><td>Defines a character strings value to append to the severity.</td></tr>
</table>

Expert Properties

Property Name	Notes
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Aspect Heartbeat

Used to verify the online status of an Aspect target defined in the Basic Properties configuration.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs the online/offline status of the unit. When the unit is online, a value of 1 will be outputted. When the unit cannot be reached or is offline, a value of 0 will be reported. If this element is connected to a graphical widget, the output will also report bad quality (yellow circle with X) when the unit cannot be reached or is offline.

Basic Properties

Property Name	Notes
Hostname	Defines the IP address or resolvable name location of the Aspect target being tracked.
Timebase	Defines how often, in seconds, the host/target will be checked for online/offline status.

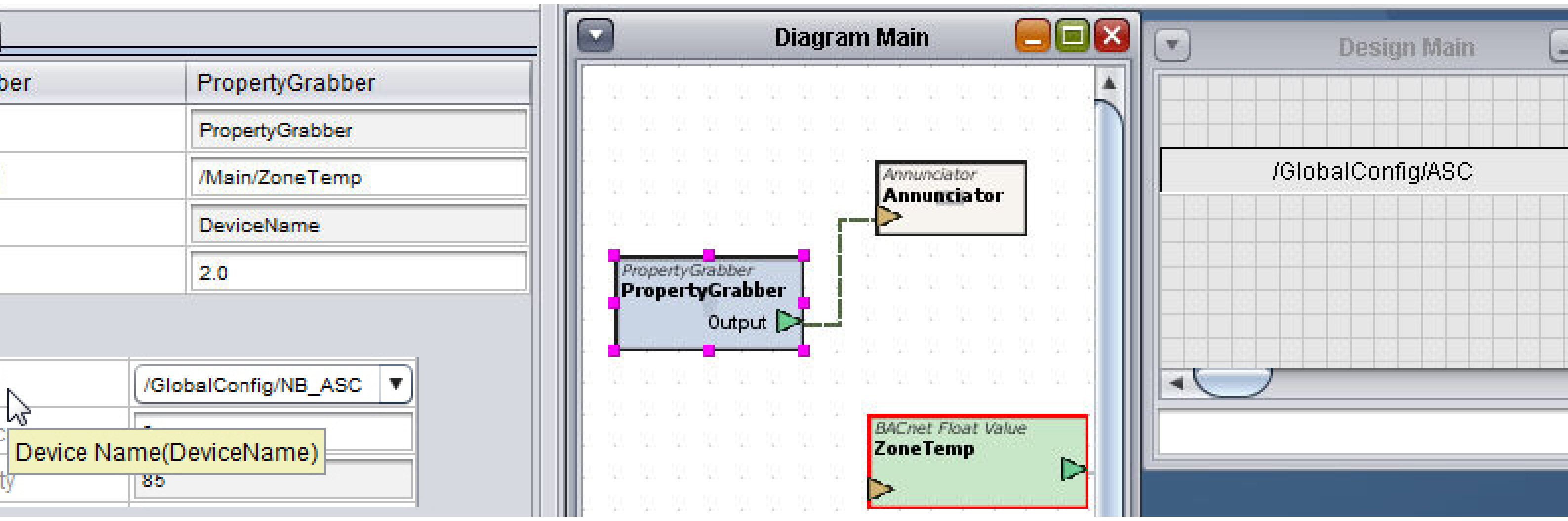
Expert Properties

Property Name	Notes
Aspect Port	Defines the TCP port used by the target to run Aspect.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic

	when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Debug Level	Defines the Debug Level setting used for low level troubleshooting of the element. Valid value settings include: • Greater than 10 - outputs failures to the Aspect Control Engine log. • Greater than 20 - outputs both success and failure responses to the Aspect Control Engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Property Grabber

Used to output a specific element's property information. To find the element's Property name, hover the mouse over the Property and use the name in the parentheses exactly as it appears.



Standard Inputs

Pin	Notes
Context	Receives the output of a Map Point touched by a transfer with context to retrieve Map data for that specific device.
Update	Standard input that allows the value to be changed in real time control algorithms.

Standard Outputs

Pin	Notes
Output	Outputs the string value of the configured Property.

Basic Properties

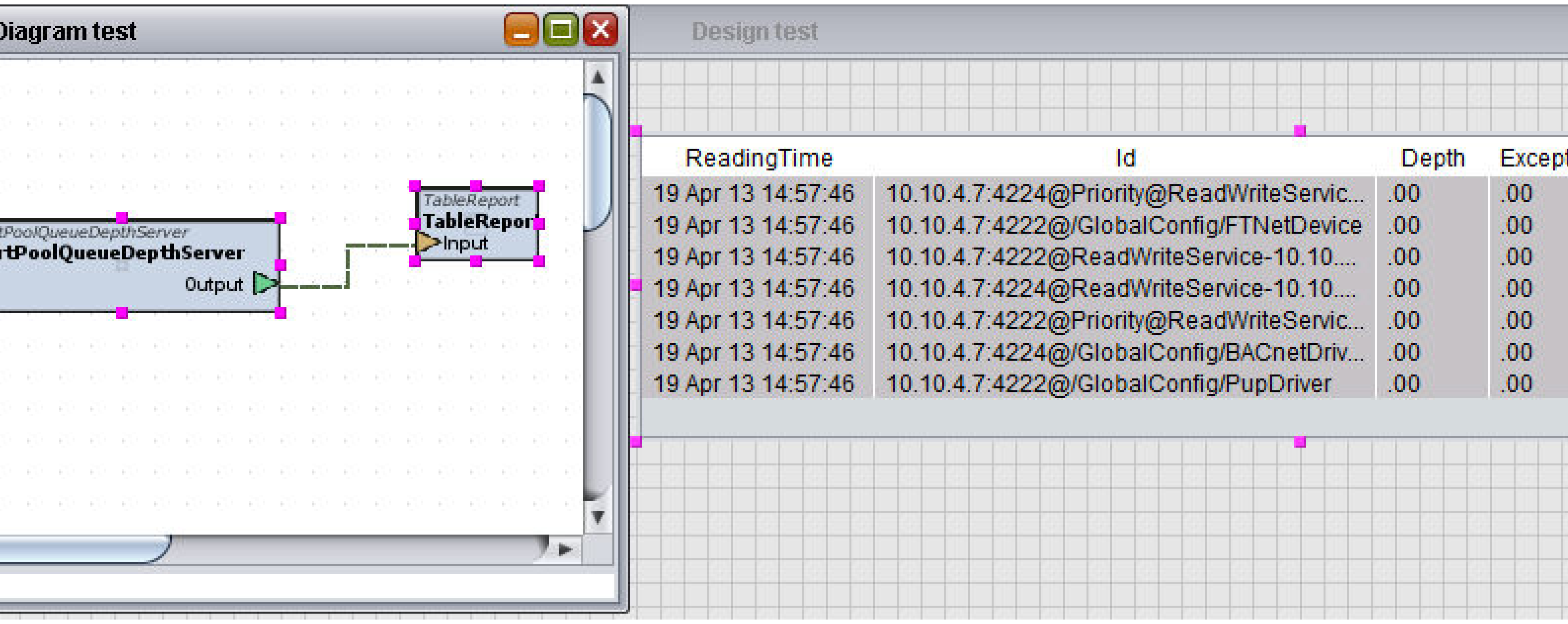
Property Name	Notes
Element Path	Defines the full path to the element containing the property to read.
Property	Defines the name of the property to read. This name is case sensitive and must be an exact match for the internal property name.
Timebase	Defines how often (in seconds) the property will be polled.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Port Pool Queue Depth Server

Used to output diagnostic information in an array format about the currently used ports.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

Pin	Notes
Output	Outputs diagnostic information in an array format about the currently used ports.

Basic Properties

Property Name	Notes
Timebase	Defines how often (in seconds) the property will be polled.

Expert Properties

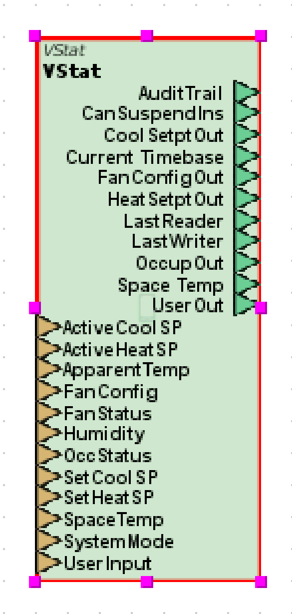
Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listen-

	ers - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Mobile/Map

vSTAT

The vSTAT® element is used to create a virtual thermostat representation, which is then displayed using the vSTAT Mobile App. Several inputs and outputs are used to feed values into the vSTAT representation. Complete documentation on how to implement and use vSTAT can be located under the Aspect Features Chapter of this online help system. The following information below provides overview and details on each input, output, and property within this element.



Standard Inputs

Pin	Notes
Active Cool SP	Accepts a single input value and defines the current calculated cooling setpoint for the monitored zone.
Active Heat SP	Accepts a single input value and defines the current calculated heating setpoint for the monitored zone.
Apparent Temp	Accepts a single input value and defines the "Feels Like" temp that can be optionally displayed on the vSTAT Mobile Application.
Fan Config	Accepts a single input value and defines the current configuration for fan operation - such as Always On/Auto.
Fan Status	Accepts a single input value and defines the current status of the Fan (On/Off).
Humidity	Accepts a single input value and defines the Humidity that can be optionally displayed on the vSTAT Mobile Application.
OccStatus	Accepts a single input value and defines the current Occupancy Status that can be optionally displayed on the vSTAT Mobile Application.
Set Cool SP	Accepts a single input value and is used to adjust the active Cooling Setpoint for the zone.
Set Heat SP	Accepts a single input value and is used to adjust

	the active Heating Setpoint for the zone.
Space Temp	Accepts a single input value and defines the current space temperature/zone temperature monitored in the zone.
System Mode	Accepts a single input value and defines the current system mode (such as vent, heating, cooling, etc..) for the zone.
User Input	Accepts a single input value and can reflect any generic value from the building automation system for display.

Standard Outputs

Pin	Notes
Audit Trail	Outputs an audit trail message, which can be connected to the Audit Trail Manager. This allows for tracking of any changes made to the building automation system by a vSTAT user.
Can Suspend Ins	Outputs a logical 0/1 value. When an output value of 0 is sent, this implies that a vSTAT Mobile App user is actively viewing the requested vSTAT from their mobile device, else, a value of 1 implies that no vSTAT user is monitoring the zone. This output value can be used to hard suspend values connected to the vSTAT element, dramatically reducing the need to continually poll each point and waste network bandwidth.
Cool Setpt Out	Outputs cooling setpoint adjustments made by a vSTAT Mobile App user. This output is commonly sent to a field-bus point representing the occupied cooling setpoint for the zone.
Current Timebase	Outputs the active timebase the vSTAT is using. If a user is viewing the vSTAT it will output the Timebase Foreground setting, otherwise it will output the Timebase Background setting.
Fan Config Out	Outputs the current value of the Fan Speed button. This output is commonly sent to a field-bus point representing the occupied fan mode.

Heat Setpt Out	Outputs heating setpoint adjustments made by a vSTAT Mobile App user. This output is commonly sent to a field-bus point representing the occupied heating setpoint for the zone.
Last Reader	Outputs the last vSTAT user that accessed this vSTAT for monitoring. This output can be sent to an Audit Trail Entry element for creating audit trails based on vSTAT user access.
Last Writer	Outputs the last vSTAT write value that occurred on this zone. This output can be sent to an Audit Trail Entry element for creating audit trails based on vSTAT user access.
Occup Out	Outputs occupancy override changes made by a vSTAT Mobile App user. This output is commonly sent to a field-bus point representing Host Override or Occupancy Override capabilities. Within the confines of AAM equipment, this is commonly the Occupancy Override Time Remaining - which is a writable value in ASC controllers effective in NB-ASC v6.08 or NB-ASC v4.08
Space Temp	Outputs any value change of the space temperature.
User Out	Outputs any value change to the defined user input value.

Basic Properties

Property Name	Notes
Name	Defines the name of the vSTAT element in Studio.
Apparent Temp Label	Defines a label to display on the vSTAT Mobile App for apparent temp. By default, this is used for apparent temperature, but can be used for any other input value as decided by the technician.
Autobind Device	Defines the path to the device that we are autobound to. If a Map device, this is the IdPath, if other, this is the element path to the discreet device.

Autobind Float Format	Defines the format to use for autobound floating point numbers.
Autobind Type	Defines the type of automatic controller binding to use. Select NONE to disable autobinding. Select USER to use a user-created autobind file. Select ASC to use the default input configurations for a ASC controller.
Autobind User Definition	Defines the autobind file used if using one of the USER autobind types, this is the resource that defines the bindings.
Disable Controls?	When set to true, this disables all active control items on the vSTAT Mobile App for this zone, effectively making the zone read only regardless of user permissions.
Fan Speeds	Provides a method to assign enumerated value, text descriptions for the Fan output. By default, this value is set for 0=Auto,1=Auto - and is optimal for VAV, Rooftop, and Heat Pump applications. For three speed Fancoil applications, this value can be set to 0=Off,1=Low,2=Medium,3=High, or any other values desired. Fan speeds are assigned in the format shown above, where: x=Text x = Value for action Text = Text representing action. No spaces should appear between the equal signs, nor should spaces be present between comma separation.
Fan Status Internal?	Defines if the Fan Status States enumeration is used. If true, the value is translated to a string using the Fan Status States enumeration setting. If false, the value is used unmodified.
Fan Status States	Defines the Fan status enumeration to be used if

	the Fan Status Internal is true.
Mode Enumeration	Defines the list of comma-separated values for the system mode in the format value=text, leave blank if you are driving a string value into the SystemMode pin.
Mode Enumeration Internal	Defines if Mode Enumeration is being used. If true, the value is translated to a string using the Mode Enumeration setting. If false, the value is used unmodified.
Occup Colors	Statically defines the occupied cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Occup States	Statically defines the night setback cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Setpoint Min Diff	Statically defines the night setback cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Setpoint Step Size	Statically defines the unoccupied cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Setpoint Type	Statically defines the unoccupied cooling setpoint. Changes can be made based on a connection to the input pin that corresponds to this property.
Setpt Scale Max	Defines the maximum value for the setpoint scale, as defined in Temp Units.
Setpt Scale Min	Defines the minimum value for the setpoint scale, as defined in Temp Units.
Show Apparent Temp?	When set to True, the Apparent Temp label is visible to vSTAT users for interaction. Otherwise, it is invisible/hidden.
Show Fan Button?	When set to True, the Fan Button is visible to vSTAT users for interaction. Otherwise, it is invisible/hidden.
Show Fan Icon?	When set to True, the Fan Icon is visible to vSTAT users. Otherwise, it is invisible/hidden.
Show Humidity Icon?	When set to True, the Humidity Icon is visible to

	vSTAT users. Otherwise, it is invisible/hidden.
Show Occup Button?	When set to True, the Occupancy Button is visible to vSTAT users for interaction. Otherwise, it is invisible/hidden.
Show Thermometer	When set to True, the Thermometer Icon is visible to vSTAT users. Otherwise, it is invisible/hidden.
Show User Command?	When set to True, the User Command Button is visible to vSTAT users for interaction. Otherwise, it is invisible/hidden.
Show User Input?	When set to True, the Use Input label is visible to vSTAT users. Otherwise, it is invisible/hidden.
Temp Scale Max	Defines the maximum value for temperature display scale.
Temp Scale Min	Defines the minimum value for temperature display scale.
Temp Units	Defines the engineering units for temperatures.
Timebase Background	Defines the amount of time, in seconds, between reading updates between the server and the vSTAT element when a user is not currently viewing the vSTAT app.
Timebase Foreground	Defines the amount of time, in seconds, between reading updates between the server and the vSTAT element when a user is currently viewing the vSTAT app.
User Command Name	Defines a name/label to display on the User Button.
User Command Values	Defines enumeration values for the User Button.
User Input Name	Defines a name/label for the User Input value.
User Out Audit Name	Defines the output name to use for the Audit Trail entry when a user makes a change to the User Input/Output button.

Expert Properties

Property Name	Notes
Active Time	Defines the amount of time, in seconds, that the Can Suspend Ins will remain a value of 0 after all read requests have been received.
Audit Priority	Defines the audit trail priority to use for vSTAT

	interaction with the Audit Trail Manager.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Debug Level	Defines debug levels for advanced troubleshooting.
Force Dual Tics	When set to True, both the heating and cooling setpoint are displayed to vSTAT users. If your zone is a heating only or cooling only system, set this value to False.
Hard Suspended ?	Defines if the element's logic execution is enabled or disabled (hard suspended).
Hidden?	Defines if this vSTAT will be displayed in the server directory listing to vSTAT Mobile App users. When set to False (default), the vSTAT will be displayed. Set to True to hide it from all users.
Max RPM	Defines the maximum number of requests to pack into a read property multiple request. Refer to the BACnet/PUP Multiread Overview for limitations.
Mercury Color	Defines the color to display in the temperature scale in the vSTAT mobile app.
Occup Trigger Title	Defines a title to display in the dialog window when a user presses the Occupancy button.
Occup Trigger Values	Defines enumeration,text values for occupancy override.
Setpoint Offset Values	Defines enumeration,text values for vSTATs configured to operate in setpoint offset mode,

	rather than temperature setpoint mode.
Setpoint Label COOL	Defines the label used on the Cooling Setpoint button for vSTAT users.
Setpoint Label HEAT	Defines the label used on the Heating Setpoint button for vSTAT users.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Use Fixed Mercury Color	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Write Throttle Level	Defines write throttling for multiple changes made by vSTAT users to a specific value.

Persisted Properties

Property Name	Notes
Display Name	Defines the name of the zone displayed on the top of the primary view of the vSTAT when viewed by a vSTAT Mobile App user.
Groups	Defines controlling Aspect groups that have permission to view and make changes to the vSTAT.
Guest Access Allowed?	Defines if guest access is permitted for this vSTAT. By default, this property is set to TRUE. Configure for FALSE if you do not want guests to be able to have read-only access to the vSTAT.
PIN	Defines a four digit pin that can be used to access the vSTAT for situations where the vSTAT Mobile App is configured for Favorite and QR Code Only mode.
Reference Text	Defines reference text shown for a particular vSTAT, but is used mostly for identifying zones when printing QR codes.
Search Text	Defines a string of text that can be used to find a zone using the Search feature of the vSTAT Mobile App.
Users	Defines comma separated user=password definitions. These user=password definitions are case-sensitive.

Map Element

Used to configure and enable the Map Tree Node. Must be present in the GlobalConfig application.

Standard Inputs

Pin	Notes
Trigger	Accepts any trigger based value. When triggered, the Map will output the latest information to its Outputs

Standard Outputs

Pin	Notes
Alarms	Outputs a numeric condition of the current alarm state where: 1. • 0 = Normal • 1 = In Alarm • 2 = Delay Entry • 3 = Delay Exit
Audit Trail	Provides an output that sends user activity from the HTML5 Automagic User Interface to a configured [Audit Trail Manager] element.
Loop Status	Displays the time elapsed in the last loop (Poll of all points).
Result	Outputs Map information to be used for troubleshooting purposes.
Status Message	Provides diagnostic feedback for troubleshoot-

	ing purposes.
Trending?	Outputs the current status of trending, where 1 means the target is actively trending and 0 meaning it is not.

Basic Properties

Property	Notes
Name	Defines the name of the Map element. By default, this should remain 'Map'
Alarm Update Time	This property defines the time (in seconds) between alarm updates for Map points.
Alarm Manager	This property defines the Alarm Manager to use for Map points.
Always Trend and Alarm?	This property defines if trend sampling and alarming is enabled in any target regardless of the defined target ID. By default, this should remain at a value ofFalse. However if False, Trending and Alarming will not occur in studio regardless of Sim/Live setting.
Connection Name	This property defines a configured MySQL Database Connection Manager within the project. By default, no database is configured. You must select the configured database from this property.
Map Config Name	This property reflects the name of the map configuration database. By default, this should remain 'mapconfig.db'.
Poll Interval (fast)	This property defines the poll rate (in seconds) for device points added to the project. By default, all points configured with a Fast Interval will poll at 5 seconds.
Poll Multiplier (slow)	This property defines the poll rate multiplier for device points added to the project that are configured for Slow Polling. By default, this value is defined at 12. With default values, slow points will be polled once every 60 seconds (Poll Interval Fast x Poll Multiplier Slow) or (5 x 12=60).
Poll Multiplier (standard)	This property defines the poll rate multiplier for device points added to the project that are configured for Standard Polling. By default, this value

	is defined at 3. With default values, standard points will be polled once every 15 seconds (Poll Interval Fast x Poll Multiplier Standard) or (5 x 3=15).
Timebase	This property defines how much time (in seconds) the 'mapconfig.db' will be read for changes made through the HTML5 user interface. By default, the 'mapconfig.db' will be read every 5 seconds for changes.
Trend/Alarm in Instance	This property defines the Aspect instance that trending/alarming will occur within. By default, all trending/alarming will be performed in Instance 1 when this project is deployed to a target.
Trend/Alarm in Target	This property defines the Hardware ID of the target that trending/alarming will be activated on. By default, no target it set. You must define the target ID here.

Expert Properties

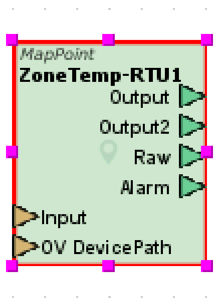
Property Name	Notes
Always Live?	Defines if the Map will provide live values regardless of being in Sim/Live mode.
Aspect Update Time	Defines the time (in seconds) between updates to local Aspect points.
Browser Bar Text	Defines the title text to send to the browser, typically shown in the browser's title bar.
Console Report?	Defines if diagnostic information should be spooled to the Aspect Control Engine Log or the local console.
Debug Level	Defines the Debug Level setting used for low level troubleshooting of the element. Valid value settings include: • Greater than 10 - outputs failures to the Aspect Control Engine log. • Greater than 20 - outputs both success and failure responses to the Aspect Control Engine.
Deep Instrument Devices?	Defines if DEVICE deep instrumentation logging will be used and spooled to the Aspect Control

	Engine log. This should only be enabled when directed to do so by AAM Technical Services.
Deep Instrument?	Defines if deep instrumentation logging will be used and spooled to the Aspect Control Engine log. This should only be enabled when directed to do so by AAM Technical Services.
Event Log Table	Defines the name of the table for automatic logging of Map Events.
Memory Trend Table	Defines the name of the table for automatic logging of memory statistics.
Name of Aspect	Defines the friendly name to display for the Aspect branch on the HTML5 UI.
Name of DB Queries	Defines the friendly name to display for the DB Queries branch on the HTML5 UI.
Name of Physical Map	Defines the friendly name to display for the Physical Map branch on the HTML5 UI.
Name of Trend Groups	Defines the friendly name to display for the Trend Groups branch on the HTML5 UI.
Name of User Map	Defines the friendly name to display for the User Map branch on the HTML5 UI.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 50.
Startup Delay	Defines the number of seconds to wait after initialization before polling begins.
Status Trend Table	Defines the name of the table to be used for trending Map status values.
Title Bar Text	Defines the text to display in the title bar of the web application.

Map Point

Used to create a diagram element of a **Map Point** using the ID Path. This element is primarily used to implement **Map Points** with diagram logic.

> **Note**: a Map Points can also be represented in a diagram by a "BACnet priority writing and clearing" on page 1444, if it is a **BACnet** point



Standard Inputs

Pin	Notes
Input	Accepts a value and is used to write to the addressed object property.
OV DevicePath	Accepts context data in application scenarios where transfer with context is used for graphical user interface environments.

Standard Outputs

Pin	Notes
Output	Outputs the point information based on the Output format setting.
Output2	Outputs secondary information based on the Output2 format setting.
Raw	Outputs the raw value of the element.
Alarm	Outputs a numeric condition of the current alarm state where: 1. • 0 = Normal • 1 = In Alarm • 2 = Delay Entry • 3 = Delay Exit

Basic Properties

Property Name	Notes
Alarm Output Format	Defines how to format any alarm test in the friendly value. "Simple" uses the Alarm Status string, while "Detailed" includes Entry/Exit delay.
Alarm Status String	Defines the string to use to indicate a point is in alarm when including the alarm status in the friendly output.
Always Live?	Defines if the Map Point will stay live regardless of being in Sim/Live mode.
Calculated Path	Displays the path based on any device path or individual field path overrides.
Map Path	Displays the ID Path of the map node referenced by this element.
Map Reference Path	Displays the Reference Path of the map node referenced by this element.
Output Format	Defines the Output Format for this element where: • Name and Friendly Value (0) • Friendly Value only (1) • Name only (2) • Raw Value (3) • Parent Name, Name, and Friendly Value (4) • Parent Name and Friendly Value (5) • User Format [not yet implemented] (100)
Output Friendly RefName?	Defines if the friendly name or referenced name of the referenced item is outputted. If true, outputs friendly name; if false, outputs the reference name.
Output2 Format	Defines the Output2 Format for this element where: • Name and Friendly Value (0) • Friendly Value only (1) • Name only (2) • Raw Value (3) • Parent Name, Name, and Friendly Value (4) • Parent Name and Friendly Value (5) • User Format [not yet implemented] (100)
Sim Data	Defines the comma separated list of values used when Sim Type if User-defined.

Sim Data Type	Defines the type of simulation data to output when in Sim mode.
Timebase	Defines how often, in second, the point will be polled.
Write Priority Level	Defines the write priority level used to write values to the device for BACnet properties, ignored for other protocols.

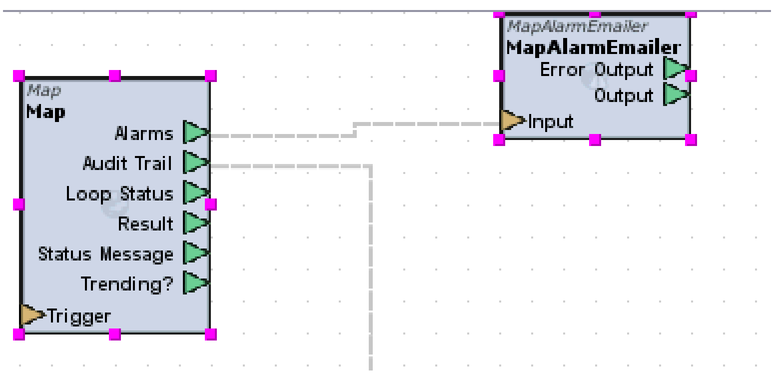
Expert Properties

Property Name	Notes
Alarm Color	Defines the color to send when the point is in alarm from the Output pin.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Override Device	Defines the device to use to override this point. If not blank, this value will override the number in slot 3 of the Map Reference Path. (Device)
Override Device Path	Defines the ID Path to use to override the device path of this point. If non-blank, the device with this ID path is used in place of the original device specified in the Map Path (sets Override Network Group, Network, and Device)

Override NetGroup	Defines the Network Group to use to override this point. If not blank, this value will override the number in slot 1 of the Map Reference Path. (Network Group)
Override Network	Defines the Network to use to override this point. If not blank, this value will override the number in slot 2 of the Map Reference Path. (Network)
Override Point	Defines the point to use to override this point. If not blank, this value will override the number in slot 4 of the Map Reference Path. (Point)
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Send Colors	Defines if the Alarm Color should be sent from the Output pin by the element.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Map Alarm Emailer

Used to e-mail values changes that are inputted into the input trigger property. This element is primarily used to e-mail alarm information to users, but can be implemented in other ways to e-mail additional data from Aspect to users of the building automation system. To use this element, establish a connection from the Alarms output nib of the Map to the Input of the Map Alarm Emailer element.



Standard Inputs

Pin	Notes
Input	Accepts any generated value within Aspect. Any value update received by this pin will generate an e-mail to recipients.

Standard Outputs

Pin	Notes
Error Output	Outputs diagnostic details regarding send failures from the connected e-mail server.
Output	Outputs data quality for graphical user interface monitoring.

Basic Properties

Property Name	Notes
Add Source to subject?	Defines if the alarm source identification information is added to the subject line.
Date Formatter	Defines the format for date information included within mail messages.
Email on return?	Defines if an email is sent on both entry to and return from alarm; if false only alarm entry generates an email.
From Address	Defines the from-address for the e-mail account.
Message	Defines a message to append in the body of the e-mail message.
Password	Defines the password for mail server authentication.
Port	Defines the TCP port that is used to communicate to the SMTP Host. The default value is 25, but could be different based on your e-mail provider. Please contact your provider for assistance with port addressing. Gmail uses port 587.
Priority Limit	Defines the maximum Priority level of alarms to be emailed. Only emails alarms with priorities equal to or high than this value.
Send Date?	Defines if the current date should be included in

	the body of the e-mail message.
SMTP Host	Defines the SMTP server address.
Subject	Defines subject text for the e-mail message.
To Address	Defines whom the e-mail should be sent to.
User Name	Defines the user name for mail server authentication.

Expert Properties

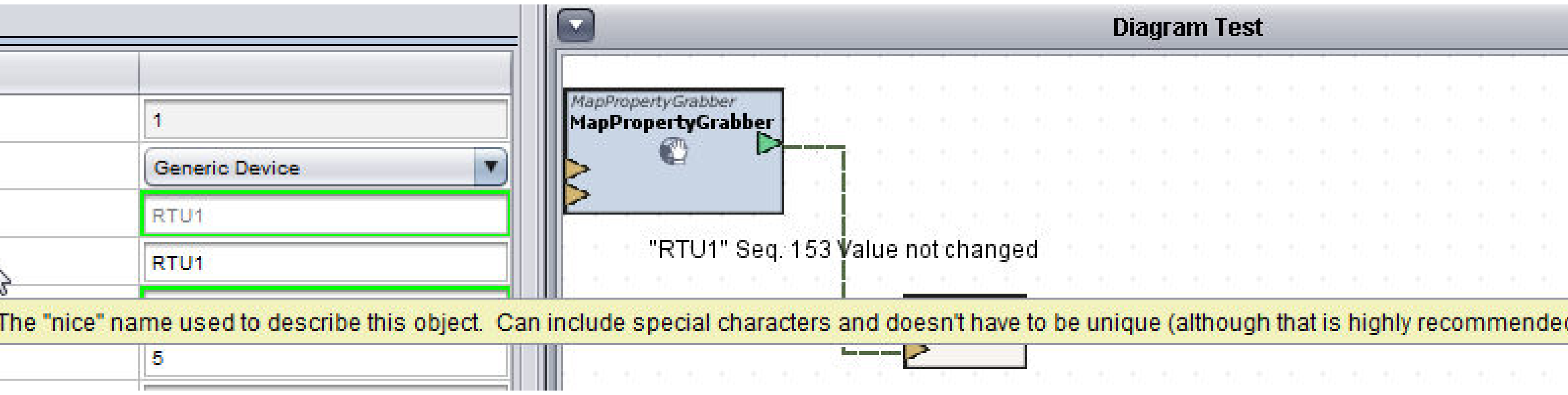
Property Name	Notes
Always Live?	Defines if the Emailer will send emails regardless of being in Sim/Live mode.
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Enabled	Defines if the Emailer element is enabled or not. If true, the Emailer will attempt to send emails.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.
Start TTLS	Defines if the mailer should use TLS authentication.

Map Property Grabber

Used to read and write to a specific Map property value. The Map Property Grabber element can be used to focus on a specific Map Property Path, or can receive context to focus on a Map Property for a specific device when transfer with context is used.

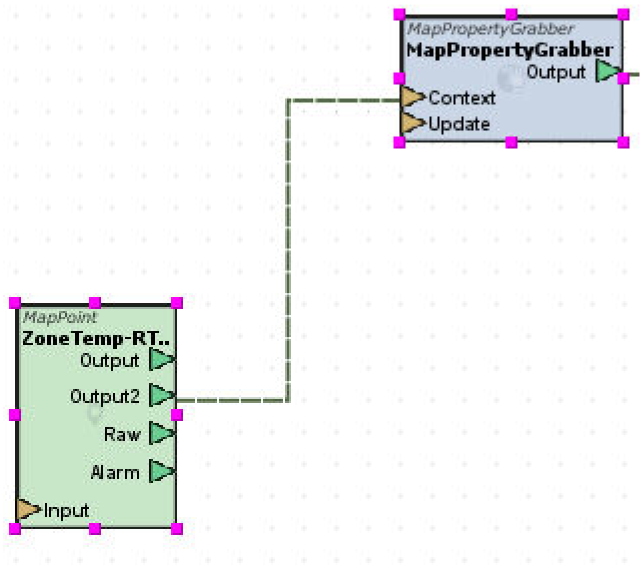
Static Map Property Grabbing

To grab a static Map Property, you must enter a Math Path Override value into the Map Path OV property. Once you have done this, you can then specify the property. The property is located by hovering over the specific property you are referencing and entering the case-sensitive name shown in brackets in the Hover Help Tool Tip of the Property in question.



Map Property Grabbing via Context

In cases where an Application is subject to transfer with context, the Map Property Grabber, supports a Context input. Output 1 or Output 2 of any Map Point subjected to Transfer with Context can and must be connected to the Context input of the Map Property Grabber element.



NOTE - When grabbing a property via context, the Map Path OV property must remain blank at all times!

Standard Inputs

Pin	Notes
Context	Receives the output of a Map Point touched by a transfer with context to retrieve Map data for that specific device.
Update	Used to write data to the specified Map Property.

Standard Outputs

Pin	Notes
Output	Outputs the value of the configured Map Property.

Basic Properties

Property Name	Notes
Map Path OV	Defines the map path of the element containing the property to read.

Property	Defines the name of the property to read. This name is case sensitive and must be an exact match for the internal property name.
Relation	Defines if the Property Grabber will acquire the property information from the configured Map path, the Map Path's Parent, or the Map Path's Grandparent: • Self (0) - References the defined Map Path to lookup the property. • Parent (1) - References the defined Map Path's Parent object to lookup the property. • Grandparent (2) - References the defined Map Path's Grandparent object to lookup the property.
Timebase	Defines how often (in seconds) the property will be polled.
Use Reference Path?	Defines if the Map Path property will allow Reference Paths to be used.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is

	enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

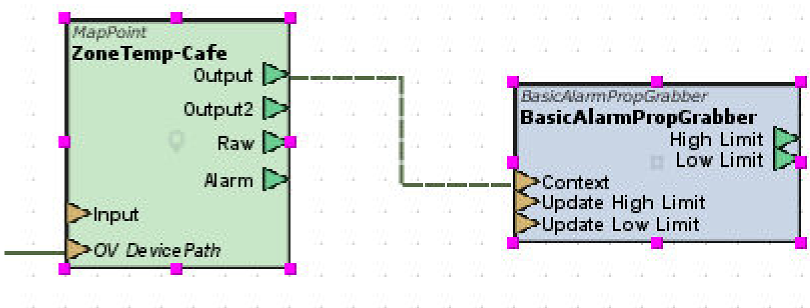
Basic Alarm Property Grabber

Used to retrieve and write to the low and high alarm setpoints from a specific point from the Map. Similar to the Map Property Grabber element, this element can be used to focus on a specific Map Property Path, or can receive context to focus on a Map Property for a specific device when transfer with context is used.

Practical Usage

Simply connect one of the two outputs for a Map Point to the Context input of the Basic Alarm Property Grabber. Similar to the Map Property Grabber, context information is automatically received from the Map Point for proper identification and addressing.

When using Transfer with Context to shift map points for display, context information will updated appropriately to the Basic Alarm Property Grabber when the Map Point calculates its new path.



NOTE - When grabbing a property via context, the Map Path OV property must remain blank at all times!

Standard Inputs

Pin	Notes
Context	Receives the output of a Map Point touched by a transfer with context to retrieve Map data for that specific device.
Update High Limit	Used to write a new value to the High Limit (Top of Band) alarm setpoint property.
Update Low Limit	Used to write a new value to the Low Limit (Bottom of Band) alarm setpoint property.

Standard Outputs

Pin	Notes
High Limit	Outputs the High Limit (Top of Band) setpoint for the referenced context point.
Low Limit	Outputs the Low Limit (Bottom of Band) setpoint for the referenced context point.

Basic Properties

Property Name	Notes
Map Path OV	Defines the map path of the element containing the property to read.
Property	Defines the name of the property to read. This name is case sensitive and must be an exact match for the internal property name.
Timebase	Defines how often (in seconds) the property will be polled.
Use Reference Path?	Defines if the Map Path property will allow Reference Paths to be used.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

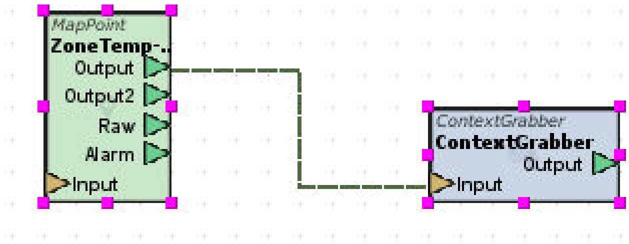
	• Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Context Grabber

Used to retrieve the Map ID of received context information. The element can be configured to grab the actual Map ID (self), Parent, or Grandparent Map ID from which it derives.

Practical Usage

Simply connect one of the two outputs for a Map Point to the input of the Context Grabber.



Standard Inputs

Pin	Notes
Input	Receives the output of a Map Point.

Standard Outputs

Pin	Notes
Output	Outputs the Map ID based on configuration of the Relation property.

Basic Properties

Property Name	Notes
Relation	Defines the Map ID result that should be returned. Valid choices include: • Self (0) - Provides the full Map ID for the connected Map Point • Parent (1) - Provides the Map Point's Parent Map ID • Grandparent (2) - Provides the Map Point's Grandparent Map ID

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output.

	• Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

MapIdXref

Used to cross reference map references with map paths or map paths with map references.

Standard Inputs

Pin	Notes
Path	Accepts a Map Reference or Map Path

Standard Outputs

Pin	Notes
Output	Outputs a Map Path or Map Reference pending what was inputted. If a Map Path was inputted then a Map Reference will be outputted and visa versa.

Basic Properties

Property Name	Notes
Name	Defines the name of the MapIdXref element in Studio.
Path	Accepts a Map Reference or Map Path.

Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is

	instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

 *Map Direct Point*

Used to create a diagram element of a Map Point that does not exist in the Map. This element is primarily used to implement Map points with diagram logic or to create map points without adding them to the Map, these points can be used as transparent Map Points.

Standard Inputs

Pin	Notes
Context	Receives the output of a Map Point touched by a transfer with context to retrieve Map data for that specific device.
Update	Used to write data to the specified Map Property.

Standard Outputs

Pin	Notes
Output	Outputs the point information based on the Output format setting.

Basic Properties

Property Name	Notes
Name	The name of this element.
Always Live?	Defines if the Map Point will stay live regardless of being in Sim/Live mode.

Ignore Blank Input	If true, and blank or empty input strings are ignored
Network Property	Network property to be read/written, which is protocol dependent. (Examples: FE00;CV or 0;0;85)
Relation	Defines the Map ID result that should be returned. Valid choices include: • Self (0) - Provides the full Map ID for the connected Map Point • Parent (1) - Provides the Map Point's Parent Map ID • Grandparent (2) - Provides the Map Point's Grandparent Map ID
SpecifyDebug Level/Data Type	Set to true if you want to specify the debug level and data type in the NetworkProperty (Example: F901;AD:0:BitString)
Timebase	Defines how often, in second, the point will be polled.
Write Priority Level	Defines the write priority level used to write values to the device for BACnet properties, ignored for other protocols.

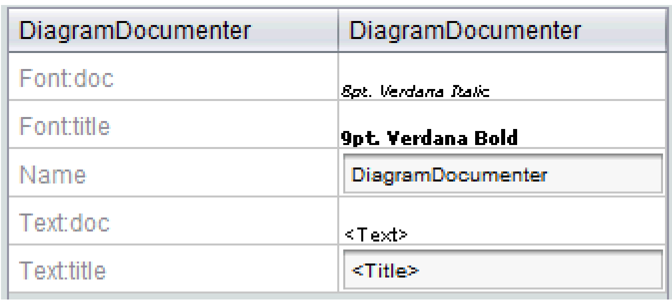
Expert Properties

Property Name	Notes
Auto Suspend	Defines the suspension behavior for the element - depending on whether or not logic connections are made to the input or output. • Auto-Suspend When No Listeners - the element will not execute its logic when no connection is made to the output pin. • Auto-Suspend When No Sources or Listeners - the element will not execute its logic when no connection is made to the output OR input. • Never Auto-Suspend - the element will execute its logic on a continual basis. • Default - defaults the element to the preferred auto-suspend behavior as dictated by the Aspect runtime engine.

Custom Timer	Defines if the element should spool its own thread for timebase ticks. This defaults to False.
Hard Suspend	Defines if the element's logic execution is enabled or disabled (hard suspended).
Screen Local	Defines if results sent the graphical user interface are shared among users, or if they are separate for each user.
Start Priority	Defines the priority at which the element is instantiated, initialized, and started at Aspect start-up. Lower values get higher priority. This defaults to 255.

Diagram Documenter

Used to document elements in the Diagram view by creating labels which to explain design/logic.



Standard Inputs

No standard inputs exist for this element.

Standard Outputs

No standard outputs exist for this element.

Basic Properties

Property Name	Notes
Font:doc	Defines the font used for the doc <Text> line
Font:title	Defines the font used for the <Title> line
Name	Defines the name of the element
Text:doc	Defines the text used for the doc <Text> line
Text:title	Defines the text used for the <Title> line

Expert Properties

No expert properties exist for this element.

Automagic Interface

Working with the Automagic Web User Interface - Overview

The Automagic Web User Interface is a dynamically generated operator environment for use with web browsers on various devices including personal computers, smart phones, tablets, and other smart devices. Powered by HTML5, the interface supports streamlined navigation of a developed building automation system.

This section of the Aspect-Studio help system provides information on:

- Setup and Configuration - reviewing theory and technical setup of the system.
- Using the Automagic Web User Interface - high level instruction on using the system, navigating, and common system actions such as adding points, working with trend data, and adjusting set points.

More Information

Setup and Configuration - Overview

Using the Automagic Interface - Overview

Using the Automagic Web User Interface

Logon to the Automagic Web User Interface

Access to the Automagic Web User Interface can be achieved in one of two ways - dependent on user and group privileges.

End-User Logon

End-Users that wish to logon to the Automagic Web User Interface must visit the following URL (instance dependent)

http://<targetAddress>:<Port>/automagic/

where

- <targetAddress> - The IP address or resolvable name of the Aspect target

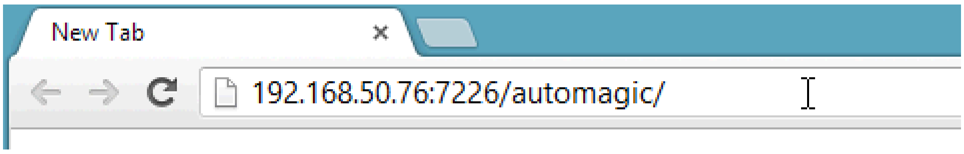
- <Port> - The port number of the instance.

The port number for each instance is provided below. Additional instances supported by license upgrade require you to increment the port by a value of 1 from the previous port.

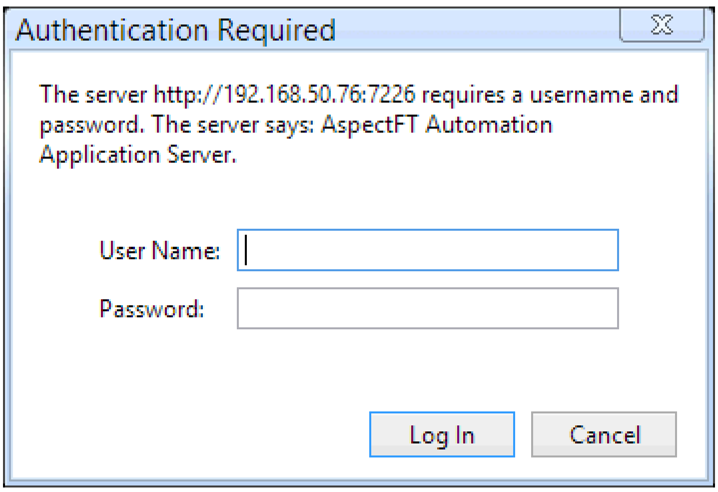
Instance	Port
1	7226
2	7227

For end-user logon, perform the following steps:

1. Using a browser, enter the target's Automagic URL.



2. Browser dependent, a new tab will launch. For security purposes, you will receive a prompt asking for your login credentials. Enter your credentials and click the Log In button. The look and feel of the prompt shown below may contain a different appearance based on whether you are using a PC or smart device.

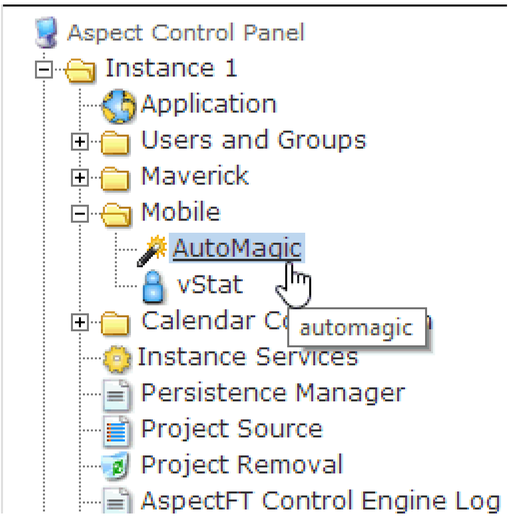


3. Provided you have entered the appropriate credentials, you will be taken to the main page of the Automagic Web User Interface.

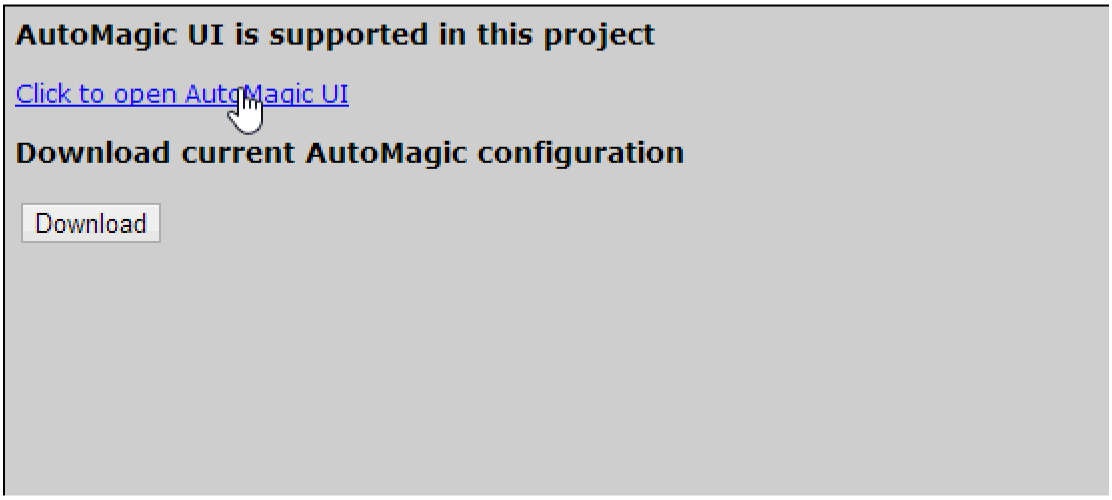
Administration Logon

Administrators of a target can access the Automagic Web User Interface from the Aspect Control Panel. Perform the following steps:

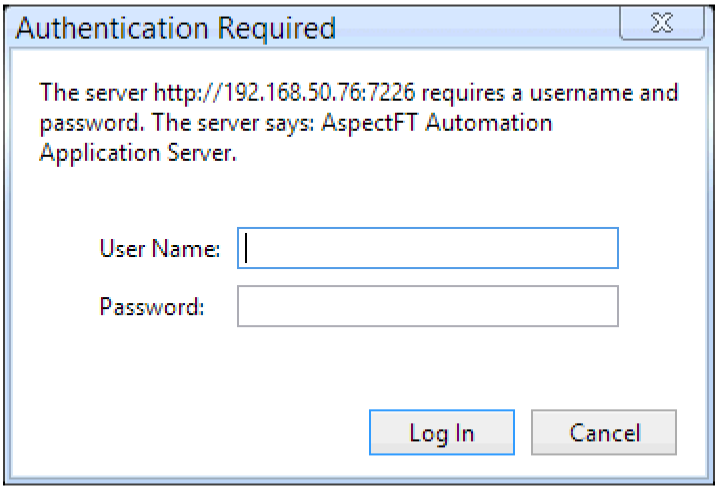
1. From the selected Instance, navigate to Mobile and click the Automagic tree node.



2. Provided that the target is utilizing a v2.00 project using Map technology, you will see a message that the Automagic UI is supported. A hyper link will be provided to open the Automagic UI. Click this link.



3. Browser dependent, a new tab will launch. For security purposes, you will receive a prompt asking for your login credentials. Enter your credentials and click the Log In button. The look and feel of the prompt shown below may contain a different appearance based on whether you are using a PC or smart device.



4. Provided you have entered the appropriate credentials, you will be taken to the main page of the Automagic Web User Interface.

More Information

ngAdmin Highlights

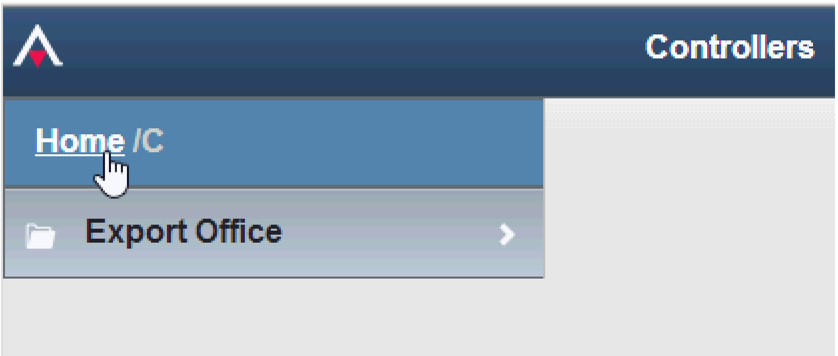
Navigating Through the Automagic Interface

The Automagic Interface supports a streamlined experience for navigation. Because most modern smart devices have fixed screen resolutions, a navigation tree can result in an inefficient user experience. Using branching concepts similar to many popular web programs, the Automagic interface provides a bank of navigation cells.

To navigate to a particular area, simply click or touch the appropriate cell.

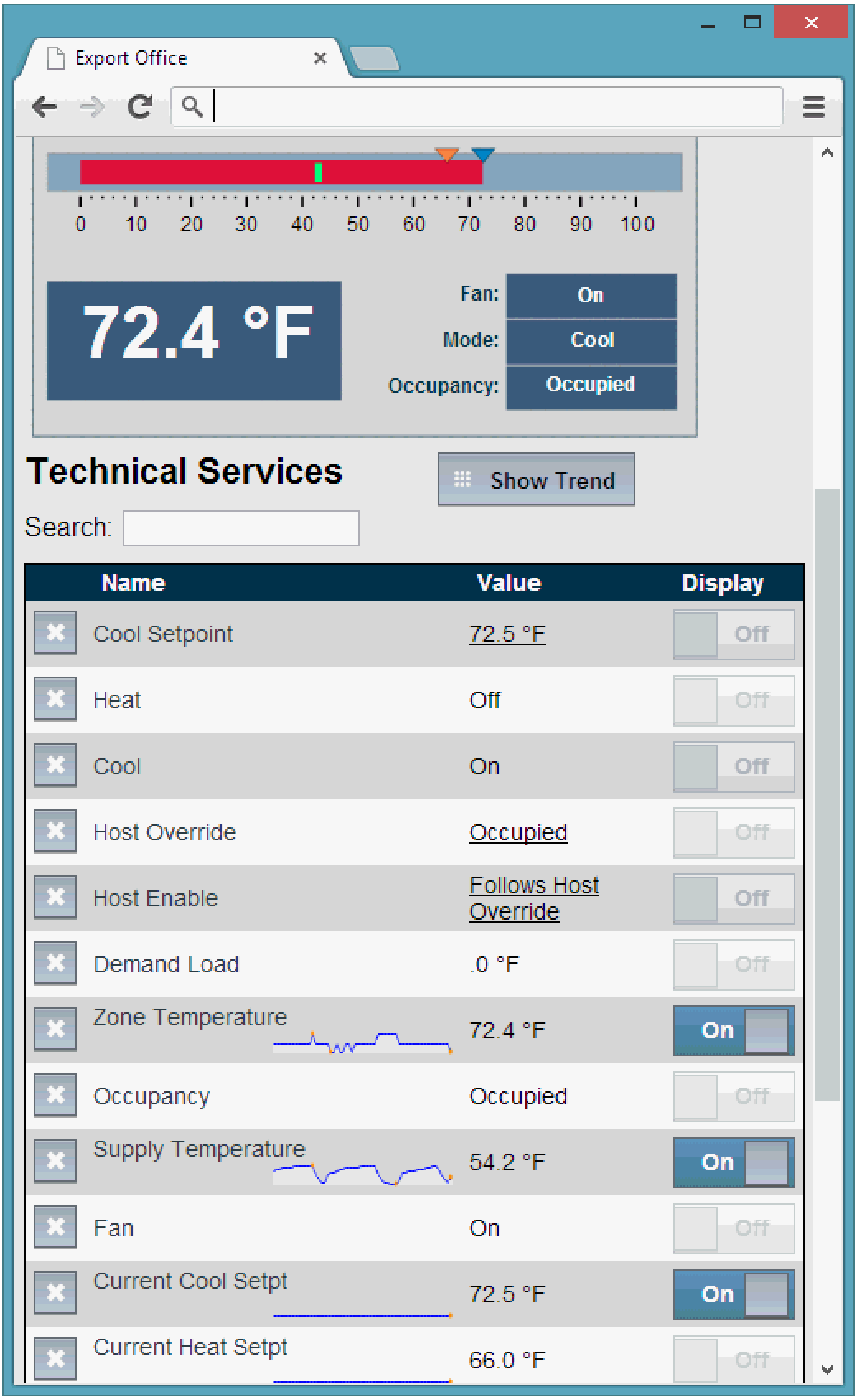
Moving Back and Forth

As you navigate through each area, a "breadcrumb trail" is provided above the bank of navigation cells. Should you need to go back a page, you can touch the previous link on the breadcrumb trail to return to the previous page. Alternatively, you may use the back button on your browser if it is not in a full screen environment.



Understanding Point Data

When viewing a device through the Automagic Web User Interface, a widget (if configured properly and optionally through Aspect-Studio) will be displayed on the top or right hand side of your browser window (screen resolution dependent). Below the widget will appear a Show Trend button, providing quick access to trend data, as well as a grid list of points and their values below.


Export Office
0
10
20
30
40
50
60
70
80
90
100
72.4 °F
Fan:
On
Mode:
Cool
Occupancy:
Occupied
Technical Services
Show Trend
Search:
Name
Value
Display
Cool Setpoint
72.5 °F
Off
Heat
Off
Off
Cool
On
Off
Host Override
Occupied
Off
Host Enable
Follows Host Override
Off
Demand Load
.0 °F
Off
Zone Temperature
72.4 °F
On
Occupancy
Occupied
Off
Supply Temperature
54.2 °F
On
Fan
On
Off
Current Cool Setpt
72.5 °F
On
Current Heat Setpt
66.0 °F
Off

Point values displayed within the grid support a number of features, including color coding to inform users of certain situations. Specific scenarios involving color coding are noted in the table below.

Condition	Notes
Black Label Name and Value	A name and value with black color (as shown above) name indicates that the value being displayed is current and was last polled successfully.
Blue Label Name and Value	A name and value with blue color indicates that the current value displayed is stale (old) in quality and that a request has been made for an updated value.
Green Label Name and Value	A name and value with green color indicates that the value will be polled for the first time and a request has been subsequently made.
Yellow Label Name and Value	A name and value with a yellow color indicates that a request for the current value was not returned.
Red Label Name and Value	A value with red font color indicates that the value is currently in an alarm condition based on point configuration within Aspect.

Writing to Point Values

Users that belong to a group with appropriate permissions can make value adjustments. In the example show below, an authenticated user with permissions to change a point value in the Automagic Web User Interface will have values with under bars beneath them. This under bar indicates that the value can be adjusted bey the user.

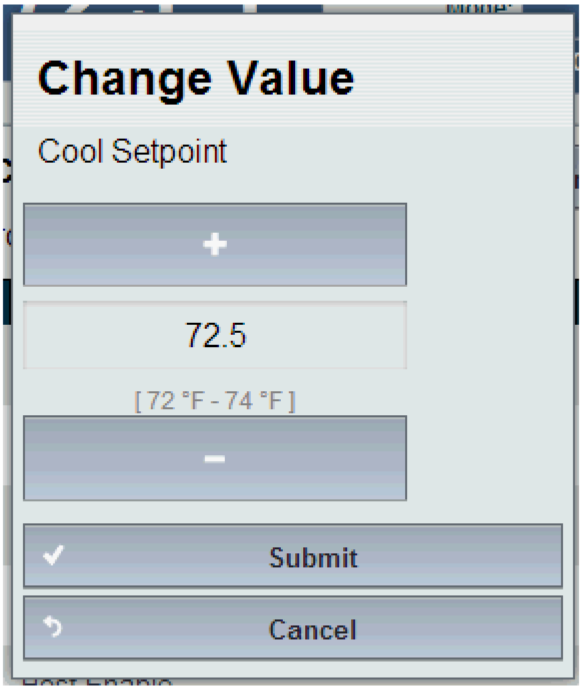
Name	Value	Display
Cool Setpoint	72.5 °F	Off
Heat	Off	Off
Cool	On	Off
Host Override	Occupied	Off

To adjust a value, simply click or touch the value with the under bar to invoke the value change editor. When invoked, a Change Value editor dialog will appear. The look and feel of this Change Value dialog will be in the form of the configuration of the Edit As property for the corresponding point.

Increment/Decrement

The Increment/Decrement dialog will display, providing a user with the point name, the current value, and + and - buttons to increment or decrement the value, respectively. The Step Size for value edits will follow the Step Size property defined by technicians. The lowest and highest permissible ranges for adjusting the value will be displayed within brackets below the value indictor in gray font color.

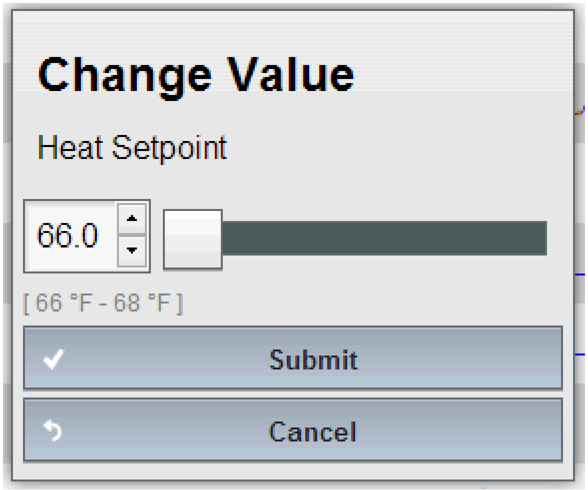
Simply click or touch the + or - buttons to change to the desired value. To initiate the value change, click or touch Submit.



Slider

The Slider dialog provides a slider bar in addition to a value editor that includes increment/decrement capabilities. The Step Size for value edits will follow the Step Size property defined by technicians. The lowest and highest permissible ranges for adjusting the value will be displayed within brackets below the value indictor in gray font color.

Click or touch to hold the slider bar area to slide up or down to adjust the value. You may also use the increment/decrement widget shown within this dialog as well. To initiate the value change, click or touch Submit.

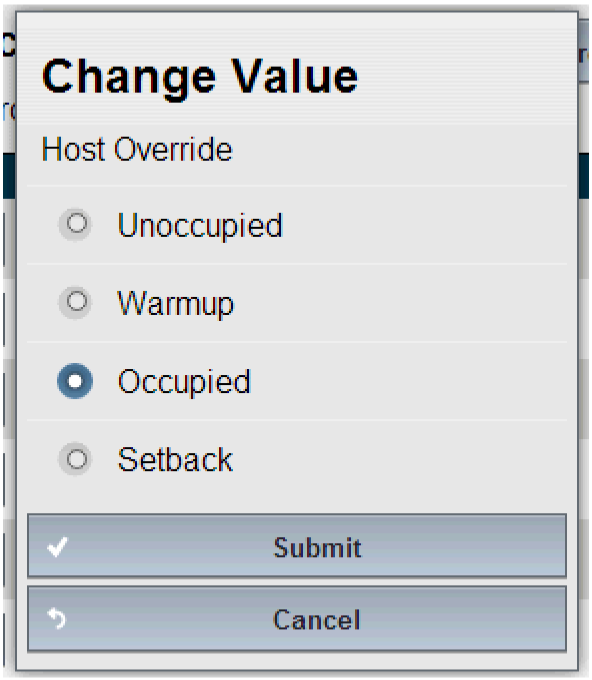


Enum and Blind Enum

The Enum dialog provides radio button selection for an enumerated, multi-state value. This editor is limited to the Enumerations defined for the point itself, or can be superseded by the Edit Enumeration property for the point's HTML5 characteristics.

The Enum option is used for situations where the value being edited is a multi-state value type point with a specific range of values that can be selected. A Blind Enum is used in situations where an numeric-value is being used, but required enumeration options for easy end-user adjustment (e.g. adjusting the Override Remaining time property in an ASC to force Occupancy Override for a set number of minutes).

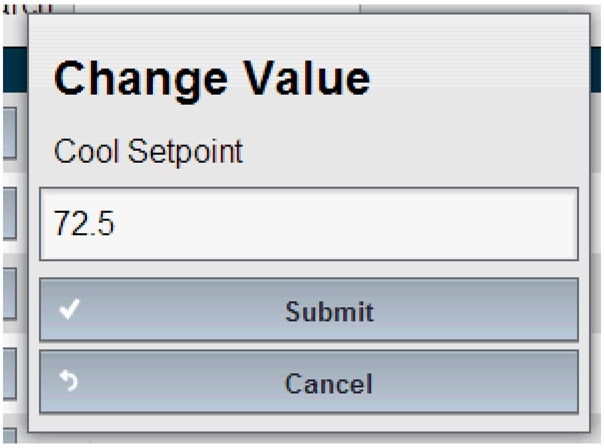
Click or touch a radio button to select the value. To initiate the value change, click or touch Submit.



Raw Text

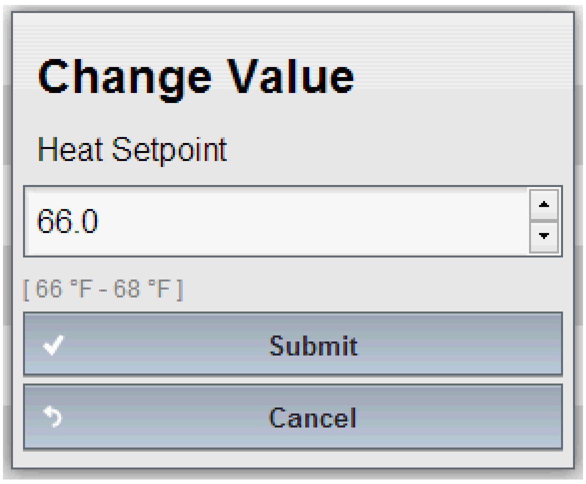
The Raw Text dialog provides a generic text field to enter values. While this dialog does not directly indicate valid ranges for writing, range protection is enforced on the server side of the system to ensure unrealistic high or low values cannot be accepted by the system.

Enter the appropriate value into the text field. To initiate the value change, click or touch Submit.



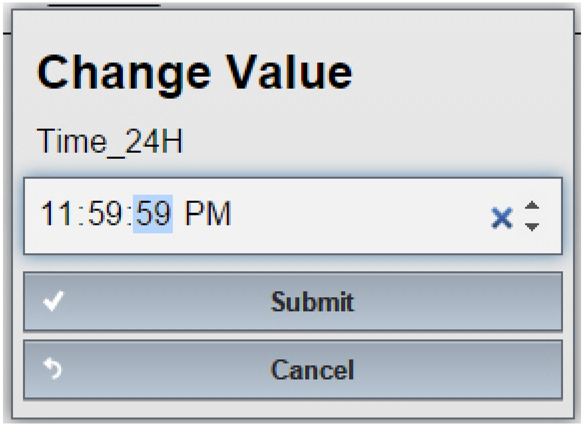
Ranged Number Entry

The Ranged Number Entry dialog provides a specific value range entry enforcement path specifically optimized for smart devices. Using this option, the editor enables number pad style editing of values. On desktop browsers, the dialog operates similarly to a increment/decrement widget. To initiate a value change, click or touch Submit.



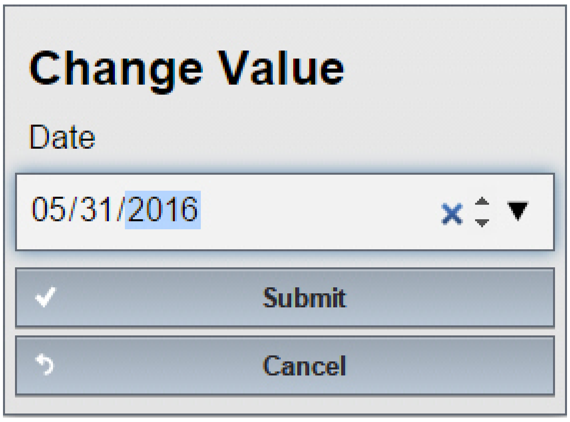
Time (12/24 hour)

The time value editor will edit and validate time values on smart devices and supported desktop browsers using the device's locale specific date formats. For unsupported devices, a normal text entry box will appears.



Date

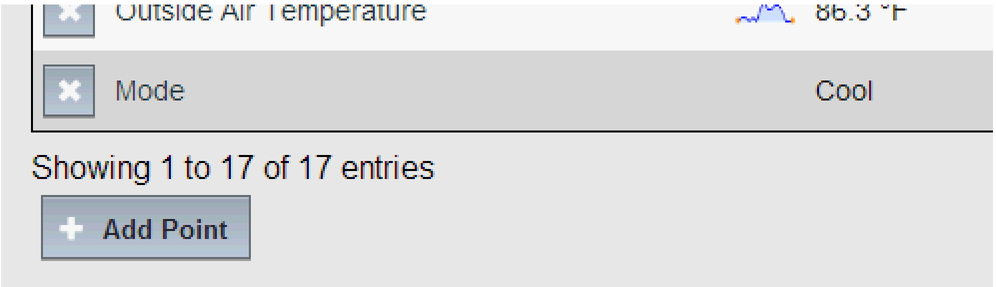
The date editor will edit and validate Date values on smart devices and supported desktop browsers using the device's locale specific date formats. For unsupported devices, a normal text entry box will appears.



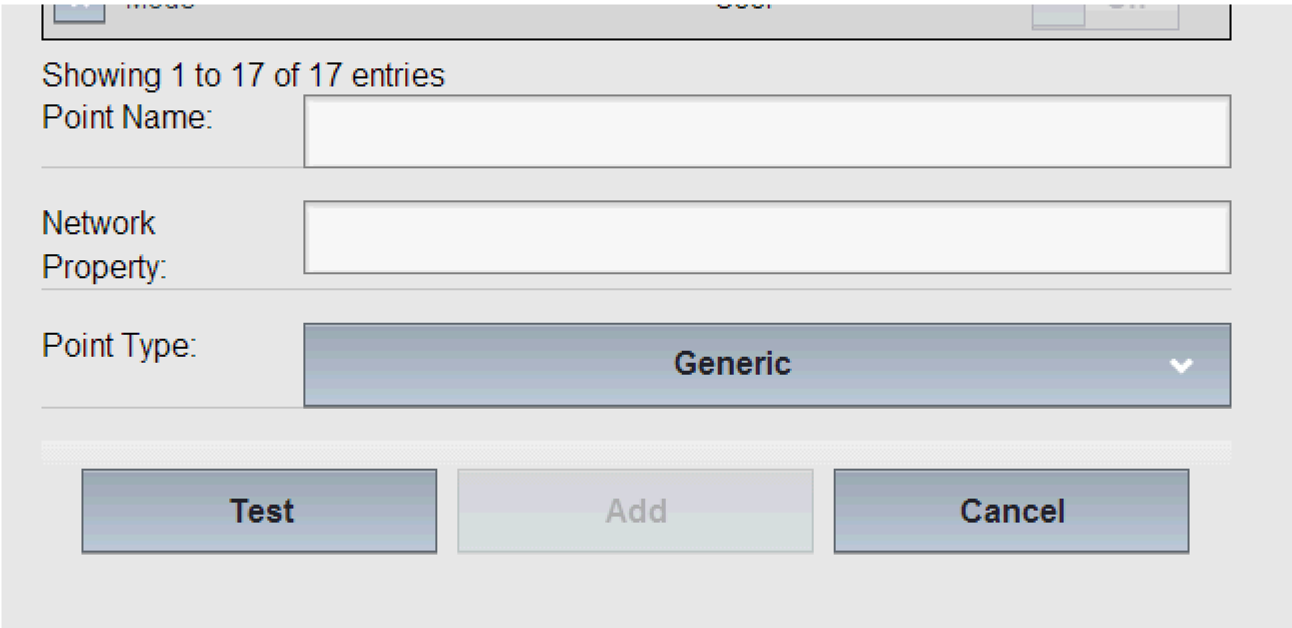
Adding a Point to a Device

Member of the WebAdmin group inherit privileges to add points to the system for monitoring and future purposes of trending. When authenticated by the system, the bottom view of a device will contain an Add Point button. To add a point into the system, perform the following steps:

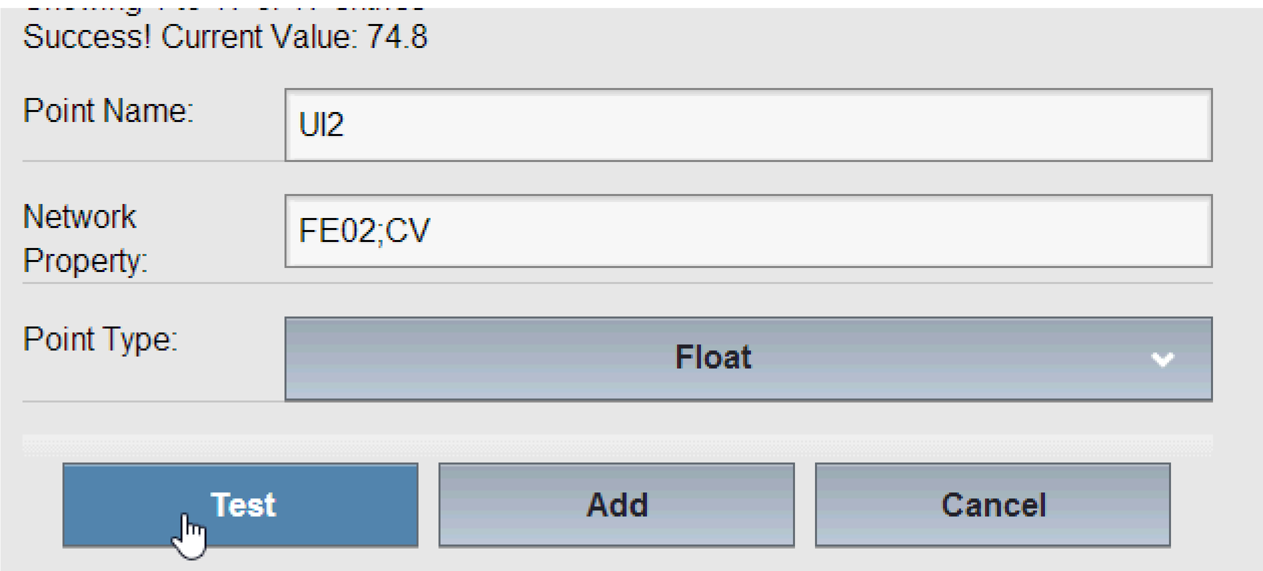
1. Click or touch the Add Point button at the bottom of the Device view.



2. When clicked or touched, the view will expand to display the Point Editor. The Point Editor provides a field for a Point Name, as well as the Network Property (e.g. PUP - FE01;CV / BACnet - 1;1;85 (Analog Input 1; present-value)). To ensure that the point is displayed and interpreted appropriately, you must select the appropriate Point Type - which reflects the data type and a pre-canned engineering unit.



3. In order to add the point to the system, you must click or touch the Test button. The Automagic Web User Interface will only permit points that have been validated to exist and respond to be added. If successful, a message indicating such success will be returned, along with the current value read from the device. Once successful, the Add button will then be available - allowing you to add the point to the system.

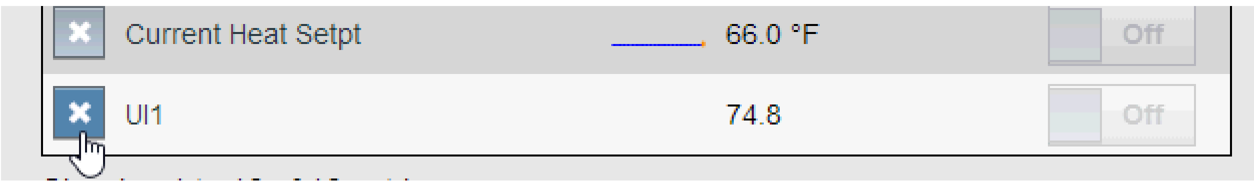


4. To successfully Add the point, click or touch the Add button. You also have the option to Cancel the action.

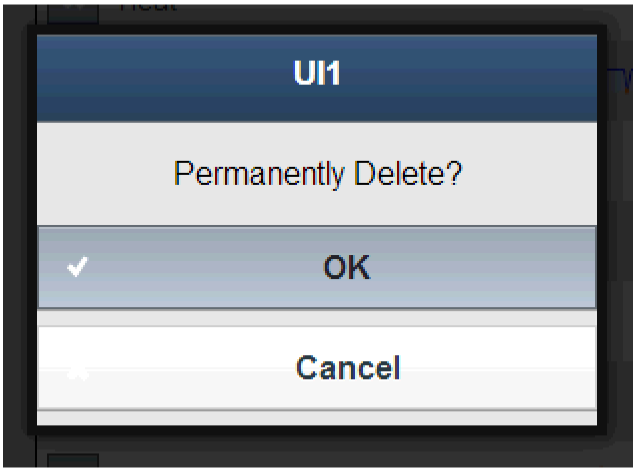
Deleting a Point from a Device

Member of the WebAdmin group inherit privileges to delete points (when deemed necessary) from the system. When authenticated by the system, a box with an X will appear listed next to each point. To delete a point into the system, perform the following steps:

1. Click or touch the X button listed next to the point in question.



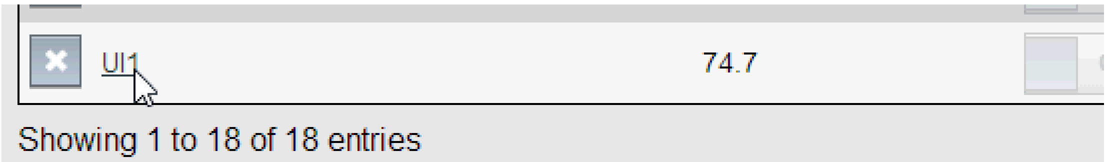
2. You will be prompted with a message as to whether or not you want to delete the point. To delete the point, click or touch OK. You also have the option to Cancel the action.



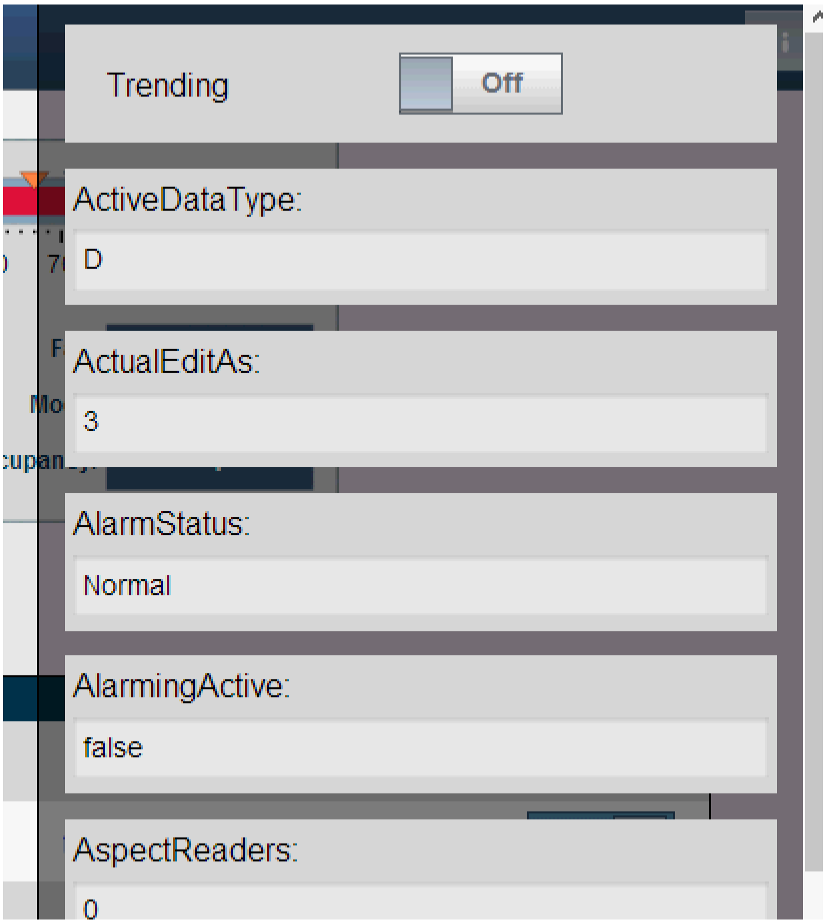
Enable or Disable Trending for a Point

Member of the WebAdmin group inherit privileges to enable or disable active trend collection for a point (when deemed necessary) within the system.   To enable or disable trending for a point, perform the following steps:

1. Click or touch the Point Name label of the point in question.



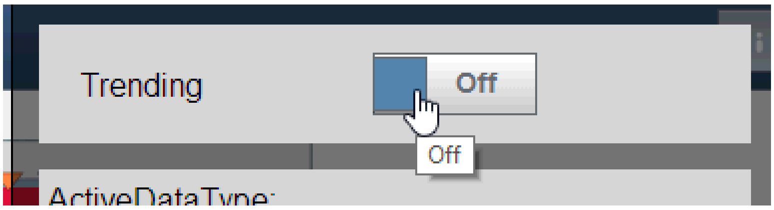
2. A click or touch to the label will invoke the configuration inspector. The Configuration Inspector will slide from the right side of your screen and be made visible.



3. Scroll to the top of the Configuration Inspector to find the Trending slide widget. Dependent on technician configuration, this slider may be:

- Enabled - Trending enabled with the option to Disable.
- Disabled - Trending disabled with the option to Enable.
- Enabled (locked) - Trending enabled with no option to Disable.
- Disabled (locked) - Trending disabled with no option to Enable.

If the control is grayed out, this indicates that the technician has locked the configuration. For more information on locking the configuration of a point being trended, please reference the following section - Configuring Points.



4. Simply touch the control to slide it to the appropriate behavior for trending. To close the Configuration Inspector, click or touch anywhere off the inspector to close it.

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