EcoStruxure™

Geo SCADA Expert

Software for Telemetry & Remote SCADA Solutions

Getting Started Guide

UG-EN-AV001001-00

October 2024

Life Is On | Schneider Electric

Disclaimer

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

You agree not to reproduce, other than for your own personal, noncommercial use, all or part of this document on any medium whatsoever without permission of Schneider Electric, given in writing. You also agree not to establish any hypertext links to this document or its content. Schneider Electric does not grant any right or license for the personal and noncommercial use of the document or its content, except for a non-exclusive license to consult it on an "as is" basis, at your own risk. All other rights are reserved.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

© 2005-2024 AVEVA Group Limited or its subsidiaries. All Rights Reserved.
AVEVA is now a member of the Schneider Electric group. Schneider Electric, Life is On Schneider Electric and EcoStruxure are trademarks and the property of Schneider Electric SE and are being licensed to AVEVA by Schneider Electric.

Contents

Disclaimer ... **ii**

Contents ... **iii**

Welcome to the Geo SCADA Expert Getting Started Guide ... **1**

Welcome to the Geo SCADA Expert Installation Guide ... **3**

- Geo SCADA Expert System Requirements ... 4
  - Geo SCADA Expert Server Requirements ... 5
    - Servers and Desktop Computers ... 6
    - Disk Drives and RAID Arrays ... 7
    - Virtualization and Cloud ... 10
    - Operational Limitations - Geo SCADA Expert Server ... 13
    - Recommended Geo SCADA Expert Server Configurations ... 15
    - Server License Settings - Geo SCADA Expert ... 18
  - Geo SCADA Expert System Performance Guidelines ... 19
  - Client PC Requirements ... 20
    - Client PC Specifications ... 21
    - Operational Limitations - Client ... 22
  - Operating Systems ... 23
    - 32-Bit ... 24
    - 64-Bit ... 25
  - Screen Resolution and Color Depth ... 27
  - Geo SCADA Expert Prerequisite Components ... 28
  - Certificates for Geo SCADA Expert Server and Client Connections ... 31
  - File Locations (Default) ... 33
    - Windows 64-Bit File Locations ... 34
    - Windows 64-bit File Locations – Virtual ViewX Server ... 37
  - Web Browser Support ... 38
- Installing Geo SCADA Expert ... 39
  - Run the Geo SCADA Expert Installer ... 41
  - Installation of Prerequisites ... 42
  - Welcome to the Schneider Electric Geo SCADA Expert Setup Wizard ... 45
  - End-User License Agreement ... 46
  - Customer Information ... 47
  - Database Emulation Configuration ... 48
  - Upgrade ... 51
  - Choose Setup Type ... 52
    - Full Install ... 54
    - Typical Install ... 57
    - Custom Setup ... 60
    - Installation of the Online Help ... 64
  - Clean Installation of Database ... 65
  - Create a Super User Account ... 67
  - Web Server Ports Configuration ... 69
  - Ready to Install ... 71
- Virtual ViewX Server Requirements ... 73
- Virtual ViewX Server Configuration and Performance Guidelines ... 74

Installing the Virtual ViewX Server ... 75
Run the Virtual ViewX Server Installer ... 77
Virtual ViewX Server Prerequisite Components ... 79
Virtual ViewX Server Setup Wizard ... 81
License your Virtual ViewX Installation ... 88
Install OPC Factory Server ... 93
ViewX Client ... 94
Create a New ViewX Client - System Connection ... 96
Run ViewX ... 97
System Security ... 98
Log On to ViewX ... 99
Enroll for Two-Factor Authentication ... 110
Enroll for Two-Factor Authentication from a DMZ-Connected Client ... 112
Log Off from ViewX ... 113
Change your Password ... 115
The ViewX Window ... 118
Virtual ViewX Client ... 119
Differences Between the Virtual ViewX Client and ViewX ... 120
Which Type of Client Should I Use? ... 122
Run a Virtual ViewX Client ... 124
System Security ... 126
Log On to a Virtual ViewX Client ... 127
Example Projects ... 132
Installing the Examples Database ... 133
Importing the Example Projects File ... 136
Enable Example User Accounts ... 138
Making Changes to your Geo SCADA Expert Installation ... 139
Modify your Virtual ViewX Server Installation ... 141
Upgrading Geo SCADA Expert ... 142
Preparing to Upgrade Geo SCADA Expert ... 144
Automatic Database Backup on Upgrade ... 149
Types of Emulation Supported by Geo SCADA Expert ... 152
Upgrade a Geo SCADA Expert Server in a Lone Server Architecture ... 155
Upgrade Geo SCADA Expert Servers in a Multi-Server Architecture ... 158
Upgrade Multi-Server Geo SCADA Expert with No Clients ... 159
Upgrade Multi-Server Geo SCADA Expert with Clients ... 163
Upgrade Your Geo SCADA Expert Clients (Original WebX Excluded) ... 168
Upgrade Your Virtual ViewX Server ... 170
Upgrade Your Original WebX Clients ... 171
Upgrade a License ... 172
Upgrade a License File on a Geo SCADA Expert Server ... 173
Upgrade a Dongle License ... 174
Upgrade a Software Client License ... 176
Deactivate Database Emulation after a Successful Upgrade ... 177
Repairing your Geo SCADA Expert Installation ... 179
Perform a Downgrade after Upgrading Geo SCADA Expert ... 181
Uninstalling Geo SCADA Expert ... 185
Uninstall Geo SCADA Expert - ‘Quick’ Uninstall ... 186

Uninstall Geo SCADA Expert - 'Complete' Uninstall ... 188
Uninstall Virtual ViewX ... 192

Welcome to the Geo SCADA Expert Tutorial ... 195

About the Tutorial ... 198
Restarting your System ... 199
Using the ViewX Interface ... 200
Import the Example Projects ... 202
Log on to your System ... 203
Disable the Alarm Bell ... 205
Explorer Bars ... 206
Document Display Area ... 208
Alarm Banner ... 214
Test Your Knowledge on the ViewX Interface ... 217
Configuration Basics ... 218
Create a New Group ... 219
Rename the 'Default' Mimic in your Group ... 220
Add an Internal Analog Point ... 221
Use Drag and Drop to Display the Point Data on a Mimic ... 226
Put the Mimic into Run Mode ... 229
Hand Control the Internal Analog Point ... 230
Display a Historic Trend for the Internal Analog Point ... 233
Display the Historic List for the Internal Analog Point ... 235
Change the Point Configuration to Trigger an Alarm ... 237
View an Alarm ... 240
Action an Alarm ... 243
Test Your Knowledge on Configuration Basics ... 244
Your First 'Live' Configuration ... 245
Log On to ViewX ... 246
Create a 'Serial Comms' Group and a 'Site' Group ... 247
Create an Advanced Modbus Direct Channel ... 249
Configure an Advanced Modbus Direct Outstation Set ... 253
Configure a SCADAPack Modbus Direct Outstation ... 257
Configure Two SCADAPack Modbus Analog Input Points ... 261
Configure Two SCADAPack Modbus Digital Input Points ... 265
Configure Two SCADAPack Modbus Digital Output Points ... 270
Configure a Mimic to contain Dynamic Data for the Points ... 274
Display a Historic Trend for the 'AI 1' Analog Input Point ... 278
Add an Alarms List to the Mimic ... 279
Filter the Alarms List ... 281
Create a Trend Database Item ... 284
Add the 'AI 1' Point's Historic Values to a Trend ... 285
Edit the X-Axis ... 288
Add the 'DI 1' Point's Historic Values to a Trend ... 290
Copy the Trend Data to Microsoft Excel ... 293
Test Your Knowledge on 'Live' Configuration ... 295
Using a Virtual ViewX Client ... 296
Display the Virtual ViewX Interface and Log On to the System ... 298
Use the Mimic Navigation Tools to Access other Displays ... 300

Display a List of System Alarms via Virtual ViewX 304
Display a List of System Events via Virtual ViewX 308
Display a Queries List via Virtual ViewX 311
Log Off from Virtual ViewX 315
Test Your Knowledge on the Virtual ViewX Interface 316
Using an Original WebX Client 317
Display the WebX Interface 319
Log on to the System via WebX 321
Use the Navigation Tools to Access other Displays 323
Access Database Items via WebX 326
Display a List of System Alarms via WebX 328
Display a List of System Events via WebX 332
Display a Queries List via WebX 335
Log Off from WebX 338
Test Your Knowledge on the WebX Interface 339
Group Templates and Group Instances 340
Log On to ViewX 341
Convert the 'Site' Group into a Group Template 342
Create Two Group Instances that Reference the Group Template 344
Re-configure the Default Mimic in the 'Site' Group Template 349
Configure the Group Template to Allow Additional Property Overrides 351
Test Your Knowledge on Group Templates and Instances 356
Online Help 357

Welcome to the Geo SCADA Expert Getting Started Guide

Intended Audience

This guide provides an introduction to Geo SCADA Expert.

The first part of the guide is designed for use by system administrators who are responsible for setting up and managing the Geo SCADA Expert system.

The second part of the guide is intended for users who are new to Geo SCADA Expert and want to learn about its user interface. This part guides you through how to configure a variety of system features, including Mimics, database points, and connections to SCADA devices.

Document Scope

This guide is in two sections:

- The Installation section explains how to install Geo SCADA Expert on server and client computers.
- The Tutorial takes you through a series of exercises to introduce you to a variety of Geo SCADA Expert features and guide you through your first 'live' configuration.

Welcome to the Geo SCADA Expert Installation Guide

Intended Audience

This guide is designed for use by system administrators who are responsible for setting up and managing the Geo SCADA Expert system.

Document Scope

This guide explains how to install Geo SCADA Expert on server and client computers. In this guide you will find information about:

- Required server and client specifications (*see* Geo SCADA Expert System Requirements)
- Installing Geo SCADA Expert on a server (*see* Installing Geo SCADA Expert)
- Installing Geo SCADA Expert on a client (*see* Installing Geo SCADA Expert)
- The different types of Geo SCADA Expert install (*see* Choose Setup Type)
- Installing the Virtual ViewX Server
- Installing OPC Factory Server software (only required if your system includes OPC clients that communicate with Schneider Electric PLCs)
- The Example Projects database (*see* Example Projects). This is a database that we have created as a demonstration model. You can install it as part of your system so that you can see examples of how a database can be organized and its items configured.
- Making Changes to your Geo SCADA Expert Installation
- Upgrading Geo SCADA Expert
- Repairing your Geo SCADA Expert Installation
- How to Perform a Downgrade after Upgrading Geo SCADA Expert
- Uninstalling Geo SCADA Expert.

CAUTION
SYSTEM WILL NOT FUNCTION CORRECTLY
When you install Geo SCADA Expert and Citect SCADA on the same server / client, conflicts will occur between the two applications.
The applications will cease to function correctly and the loss of data could result in minor or moderate injury.

Geo SCADA Expert System Requirements

Your Geo SCADA Expert DVD contains the components required to install Geo SCADA Expert on a server and a client. But you should only install Geo SCADA Expert on a server or client computer that meets the required specifications.

In the following sections, we describe the required specifications for server and client computers:

- Geo SCADA Expert Server Requirements
- Geo SCADA Expert System Performance Guidelines
- Client PC Requirements
- Operating Systems
- Screen Resolution and Color Depth
- Geo SCADA Expert Prerequisite Components
- File Locations (Default)
- Web Browser Support.

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

While it may be possible to install and run Geo SCADA Expert on computers and networks that do not meet our recommended specifications, this may result in an unstable Geo SCADA Expert system. Geo SCADA Expert is only designed to run on computers that meet the recommended specifications.

Even though you might run Geo SCADA Expert on computers and networks that meet, or operate within, the recommended specifications, it is possible to configure aspects such as data processing and client displays that are detrimental to performance. We recommend that you review the Design Guidelines and Performance Guidelines online on the Schneider Electric Community website.

Further Information
Installing Geo SCADA Expert
Upgrading Geo SCADA Expert.

Geo SCADA Expert Server Requirements

In the following sections, we describe the recommended specifications for servers that are to run Geo SCADA Expert:

- Servers and Desktop Computers
- Disk Drives and RAID Arrays
- Virtualization and Cloud
- Operational Limitations - Geo SCADA Expert Server
- Recommended Geo SCADA Expert Server Configurations.

You should also refer to the following sections, which apply to both Geo SCADA Expert servers and Geo SCADA Expert clients:

- Operating Systems
- Screen Resolution and Color Depth
- Geo SCADA Expert Prerequisite Components
- File Locations (Default)
- Certificates for Geo SCADA Expert Server and Client Connections
- Web Browser Support.

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

Servers and Desktop Computers

There are many factors to consider when purchasing computers for use as Geo SCADA Expert servers, including the expected activity of the system, the amount of historic data required, and the number of database items. While the requirements for each system will vary according to the demands placed on the system, we do make the following recommendations:

- For small stand-alone client-server systems with up to 10,000 database items and 1 to 2 remote clients, desktop class (rather than server class) computers will be sufficient, if the system is not intended to provide access to the database from either Virtual ViewX clients or Geo SCADA Mobile. Systems of this size are regarded as small systems.
- For systems with:
  - 10,000 or more database items
  - historic data storage requirements

  and/or:
  - 3 or more remote clients
  - Virtual ViewX clients
  - intended to provide database access from Geo SCADA Mobile

  server class computers and 64-bit operating systems are required.

  64-bit operating systems are also required to run the Virtual ViewX server.

If you are using Microsoft Windows Remote Desktop Services or Citrix XenApp, you need to use a server class computer with at least 2GB RAM per client session and an appropriate number of processor cores.

When choosing the appropriate type of computers to use, you also need to consider the use of Disk Drives and RAID Arrays.

ATTENTION: Server class computers and virtual machines (VMs) on server class computers should not be used to run ViewX in a day-to-day operational environment; instead, appropriate client machines should be used. Client machines often have a higher graphics hardware specification than server class computers. This higher graphics specification is required to run ViewX in a day-to-day operational environment, within which users might perform graphics-intensive tasks such as viewing complex Mimics, or working with multiple or floating documents (*see* Client PC Specifications).

The standard graphics hardware on server class computers and on VMs on server class computers may only be adequate for running ViewX for administrative purposes (such as performing initial system configuration and user account setup).

Disk Drives and RAID Arrays

For increased performance, you should use high performance physical disks such as:

- RAID arrays, which can provide:
  - Improved performance (for example, via striping)
  - Redundancy, to help protect against disk failure (via mirroring or parity).

  For example:
  - RAID 1 with mirroring
  - RAID 10 (also known as RAID 1+0) striped and with mirroring.
- SSD—Solid State Disks (SSD) are especially suitable for storing historic data.

You should also consider distributing the load across multiple disks, for example, using a 4 disk set:

- One disk to store the operating system and installed applications, including the Geo SCADA Expert application and database
- One disk to store the historic data files
- One disk to store the Event Journal data
- One disk to store the log files.

Distributing the load across disks allows for faster access times, as each disk is dedicated to a single purpose. Regardless of the number of disks, you should ensure that each disk has sufficient capacity for its requirements and that your system is set up so that none of the disks become full or near full. For example, the disks used for storing historic or event data while it remains online should be sufficiently large enough to hold the amount of data that is expected to accumulate during that time, while still retaining sufficient free disk space. If you need to retain event or historic data long-term, your system should be set up to archive that data automatically before it reaches the end of its online retention period.

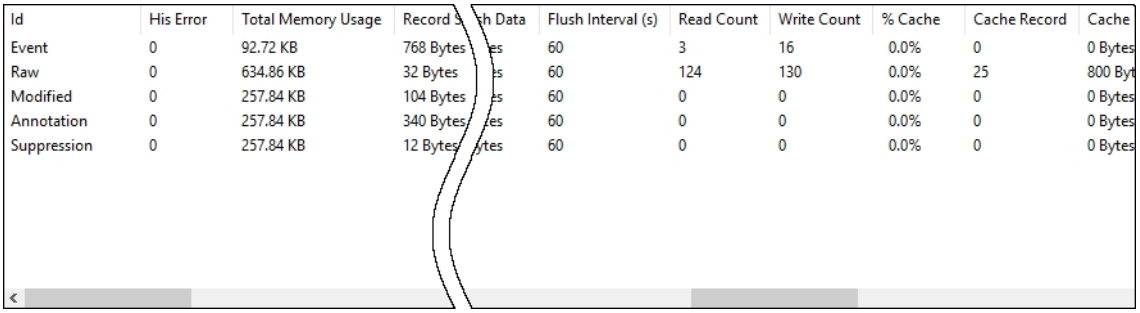
Having sufficient disk capacity—for example, so that disks do not become more that 50% full—also reduces the chances of disk fragmentation.

If your system only has a single disk, you may experience slow performance due to an excessive amount of data needing to be written or read on the disk at the same time. This will depend on the amount of activity on your system and the size of the system as well as the type of disk being used. While partitioning the disk can have some benefits, they are negligible when compared to the effects of adding another physical disk. Partitioning the disk correctly also requires an expert knowledge of partitioning and can be time consuming. Using multiple disks will have a much more noticeable effect on your system performance than partitioning a disk. So if required, you can improve performance by adding separate physical disks. When you have added one or two separate physical disks, you can then move the Historic files and / or Event Journal files to the new disks (see below).

If you can only use a single disk system, you may be able to improve performance by investing in a higher specification disk. For high performance, we recommend Solid State Disks (SSD), rather than mechanical disks.

If your system only has two disks, you need to determine which of the following two directories has the highest level of activity - the Historic directory or the Event Journal directory. To do this:

1. Access the Server Status Tool and display the **Historic>Historian** statistics.



Id	His Error	Total Memory Usage	Record S	h Data	Flush Interval (s)	Read Count	Write Count	% Cache	Cache Record	Cache
Event	0	92.72 KB	768 Bytes	es	60	3	16	0.0%	0	0 Bytes
Raw	0	634.86 KB	32 Bytes	s	60	124	130	0.0%	25	800 Byt
Modified	0	257.84 KB	104 Bytes	s	60	0	0	0.0%	0	0 Bytes
Annotation	0	257.84 KB	340 Bytes	es	60	0	0	0.0%	0	0 Bytes
Suppression	0	257.84 KB	12 Bytes	ytes	60	0	0	0.0%	0	0 Bytes

2. Examine the **Read Count** and **Write Count** entries for the Event data and the Raw data:
   - If the total number of Event data **Read Count** + **Write Count** entries is significantly higher than the total number of Raw data **Read Count** + **Write Count** entries, you should move the Event Journal directory to a separate disk.
   - If the total number of Raw data **Read Count** + **Write Count** entries is significantly higher than the total number of Event data **Read Count** + **Write Count** entries, you should move the Historic data directory to a separate disk.
   - If the total number of Raw data **Read Count** + **Write Count** entries and Event data **Read Count** + **Write Count** entries are not significantly different, you can choose whether you want to move Historic data or Event Journal data to another disk.
3. Change the location of the files by using the **System Configuration>Location** settings on the Server Configuration Tool .

With high performance disks or RAID arrays, a multi-disk architecture becomes even more efficient. However, if you cannot implement a high performance system with high performance disks, you can use the same principles mentioned above to take advantage of your existing hardware. By separating a highly active Historic or Event Journal directory (see above) from the other parts of your system, you should be able to improve the disk access speed (and therefore, system performance).

Some file operations in Geo SCADA Expert use database read and write locks. Disk performance can affect Geo SCADA Expert in these cases. You should take this into account when you specify the disks.

Geo SCADA Expert performs the following file operations using a database write lock:

- Flushing point historic records
- Flushing Event Journal records
- Flushing Configuration Change records
- Flushing Alarm Summary records.

Geo SCADA Expert performs the following file operations using a database read lock:

- Point historic records
- Event Journal records
- Configuration Change records
- Alarm Summary records.

However, for each of the above, Geo SCADA Expert caches records in memory. Therefore, the disk read operation only occurs if the record is not already in the cache.

Database configuration and data file I/O operations occur without any database locking.

You may notice a negative effect on system performance if:

- The disks used by Geo SCADA Expert to store historic data (of all types) have slow read/write performance. In this situation, Geo SCADA Expert may hold the database write lock for longer than usual when it writes records
- The recommended limits for the amount of historic data (of all types) held on your Geo SCADA Expert system have been exceeded. In this situation, Geo SCADA Expert may spend more time flushing updates than is usual.

Virtualization and Cloud

Geo SCADA Expert can run in virtual and cloud environments, with one or more virtual servers running on the same hardware. When using virtualization or cloud platforms, there are several considerations you need to make relating to licensing, hardware and software requirements. The information in this topic applies to both virtual and cloud instances.

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

Licensing

To comply with Geo SCADA Expert licensing terms, you must acquire a license for each copy of Geo SCADA Expert or Virtual ViewX that runs on a virtual server.

If you are using dongles, you need to set up a hardware 'pass-through' for the USB ports. This will allow the hardware's USB ports to be associated with the virtual servers correctly. You also need to ensure that the hardware has a sufficient number of USB ports available (one USB port per copy of Geo SCADA Expert is required).

If you are using license files, you should set up the virtual machine (VM) environment to use a fixed MAC Address for the virtual ethernet card and a fixed ID for the system disk.

Licensing for multiple-server architectures (redundancy) works in the same way as non-virtualized Geo SCADA Expert servers, with a license required for each copy of Geo SCADA Expert. We recommend that the Main server in a multiple-server architecture is located on different hardware to the Standby server(s), as this will allow for redundancy in the event of a hardware failure.

Hardware Requirements

You need to make sure that the hardware that runs the virtual servers has sufficient:

- Disk space
- RAM and processor cores
- Disk performance.

Each virtual server requires the same resources as a non-virtualized Geo SCADA Expert or Virtual ViewX server (*see* Recommended Geo SCADA Expert Server Configurations). So the hardware that is running the virtual servers needs to have sufficient resources for all of the virtual servers combined. For example, if the hardware is running two virtual Geo SCADA Expert servers, one with 10,000 database objects and one with 50,000 database objects, you would need to calculate:

- The requirements for the server with 10,000 database objects. This is the same as a non-virtualized Geo SCADA Expert server (namely 4 cores, 8GB RAM, 25GB free space on high performance disks for configuration, and so on, with a separate 250GB high performance disk system for storing historic data).

- The requirements for the server with 50,000 database objects. Again, this is the same as a non-virtualized Geo SCADA Expert server (namely 4 cores, 8GB RAM, 25GB free space on high performance disks for configuration and so on, with a separate 500GB high performance disk system for storing historic data).

The hardware needs at least the combined total resources required by the virtual servers. So in this example, the hardware requires at least 8 cores, 16GB RAM, 50GB free space on high performance disks for configuration and so on, with a separate 750GB high performance disk system for storing historic data.

NOTE: The minimum requirements defined above are those required by Geo SCADA Expert in a virtual server environment. The minimum requirements for the virtual server technology may exceed the Geo SCADA Expert limits. For more information, please refer to the documentation for your virtual server solution.

When using virtualization, you also need to consider disk access for the virtual servers. Performance can be affected by multiple virtual servers attempting to access the same disk at the same time. So where possible, you should use separate disks to distribute load appropriately.

For ultimate performance, you could use four high performance disks for each virtual server, with one disk for historic, one for logging, one for the event journal, and one for the operating system and Geo SCADA Expert database. However, due to the high cost of such a setup, you may choose to compromise by distributing the load across fewer disks.

Graphics Requirements for Virtual Clients

If you run a ViewX client or Virtual ViewX client inside a virtual machine (VM), you need to consider the graphics requirements.

If you intend using a virtual client in a day-to-day operational environment, use an appropriate client virtualization system, such as Citrix, with appropriate graphics hardware for running desktop applications. This higher graphics specification is required to run ViewX or Virtual ViewX in a day-to-day operational environment, within which users might perform graphics-intensive tasks such as viewing complex Mimics, or working with multiple or floating documents. For more information about client virtualization, *see* Geo SCADA Expert on Citrix and Remote Desktop Services , and *see* Citrix or Remote Desktop Services Client - System Connections .

The standard graphics hardware on server class computers and on VMs on server class computers may only be adequate for running ViewX for administrative purposes (such as performing initial system configuration and user account setup).

Software Requirements

Geo SCADA Expert is supported on mainstream virtualization and cloud platforms.

Recommendations relating to Backing Up a Virtual Machine

If your database is running on a virtual machine (VM), we recommend that you shut down that server in order to perform a backup of that VM. A server shutdown is required as it is not practical to pause Geo SCADA Expert in order to perform a 'snapshot' backup of a VM while that VM is still running. An attempt to perform such a backup without shutting down the server will cause the server and drivers to pause

while the backup of the VM is being performed. Geo SCADA Expert is not designed to operate with such pauses. This might disrupt the real-time behavior and could cause timeouts and other issues.

To perform a backup of a Geo SCADA Expert database, we recommend that you use a Backup database item to perform the backup (see 'Back up the Database' in the Geo SCADA Expert Guide to Server Administration).

Operational Limitations - Geo SCADA Expert Server

We recommend that your Geo SCADA Expert system complies with the following operational limits:

Parameter	Limit	Notes
Maximum number of objects (database items)	2,000,000 Objects	
Maximum burst rate of non-historic updates	10,000 per second	
Maximum burst rate of historic data updates	1,000 per second	
Maximum burst rate of alarms and events	500 per second	
Maximum sustained rate of historic data updates per point	4 per minute	Exceeding these limits will create historic files in excess of 1.3MB (the maximum recommended historic data file size for standard hardware). This limit can be exceeded provided that care is taken when selecting appropriate hardware and communication links.
Maximum sustained rate of events per journal section (256 Objects)	6,825 per hour	Exceeding these limits will create historic files in excess of 5MB (the maximum recommended Event Journal file size for standard hardware). This limit can be exceeded provided that care is taken when selecting appropriate hardware and communication links.
Maximum number of historic data files	50,000,000 files	Also known as 'historic data granules'.
Maximum number of historic data records	30,000,000,000 records	
Maximum size of a Data Table	100MB	If you intend creating a large number of Data Tables, also consider the Data File Cache size and the total size of all of the Data Files.
Maximum number of event records	5,000,000,000 records	
Maximum number of alarms	250,000 alarms	
Maximum number of ViewX clients or Virtual ViewX clients connecting to the same server	50*	*The maximum number of ViewX clients (including Virtual ViewX) that can connect to a Virtual ViewX server is affected by computer resources (*see* Virtual ViewX Server Configuration and Performance Guidelines).
Maximum number of	50	

Parameter	Limit	Notes
Original WebX clients connecting to the same server		
Maximum Geo SCADA Expert server to Geo SCADA Expert server link latency	70ms	Exceeding this limit can result in the Geo SCADA Expert servers being unable to synchronize correctly, server timeouts and can also cause slow performance.
Minimum Geo SCADA Expert server to Geo SCADA Expert server link bandwidth	Symmetrical 2 Mbit per second	This is the minimum Geo SCADA Expert server-to-server bandwidth for a medium sized system, for example one with up to 5,000 points. Larger systems need correspondingly higher bandwidth and will be dependent on data update rates.
Minimum Virtual ViewX server to Geo SCADA Expert server link bandwidth	1 Gbit Ethernet	This limit only applies if the Virtual ViewX server is installed on a separate machine to the Geo SCADA Expert server.

ATTENTION: Server class computers and virtual machines (VMs) on server class computers should not be used to run ViewX in a day-to-day operational environment; instead, appropriate client machines should be used. Client machines often have a higher graphics hardware specification than server class computers. This higher graphics specification is required to run ViewX in a day-to-day operational environment, within which users might perform graphics-intensive tasks such as viewing complex Mimics, or working with multiple or floating documents (*see* Client PC Specifications).

The standard graphics hardware on server class computers and on VMs on server class computers may only be adequate for running ViewX for administrative purposes (such as performing initial system configuration and user account setup).

Further Information

Operational Limitations - Client.
Virtual ViewX Server Requirements.
Virtual ViewX Server Configuration and Performance Guidelines.

Recommended Geo SCADA Expert Server Configurations

The following table lists the recommended Geo SCADA Expert server configurations for a variety of client and server scenarios (with Read performance being one of the most significant requirements).

In the table, the term 'object' refers to a database item whereas 'point' refers to a specific type of database item that stores I/O (a database point). Historic points are database points that have the **Historic** feature enabled.

Application	Server Requirement (minimum configuration)
Small stand-alone client-server with up to 10,000 objects and 1-2 remote clients (with no requirement for data access from either Virtual ViewX or Geo SCADA Mobile)	4 cores, 8GB RAM, 50GB free disk space. Desktop class (rather than server class) hardware and operating system. **NOTE:** For the server installations, use computers that are running a suitable 64-bit operating system (*see* 64-Bit).
Server with 10,000 objects, 5,000 historic points stored for 2 years online, 3 or more clients	4 cores, 8GB RAM, 25GB free space on high performance disks for database configuration, log files, and so on. A separate 250GB high performance disk system for historic data. Server class hardware and 64-bit operating system.
Server with 50,000 objects, 25,000 historic points stored for 2 years online, multiple clients	4 cores, 8GB RAM, 25GB free space on high performance disks for database configuration, log files, and so on. A separate 500GB high performance disk system for historic data. Server class hardware and 64-bit operating system.
Server with 100,000 objects, 75,000 historic points stored for 2 years online, multiple clients	4 cores, 16GB RAM, 50GB free space on high performance disks for database configuration, log files, and so on. A separate 1TB high performance disk system for historic data. Server class hardware and 64-bit operating system.
Server with 175,000 objects, 100,000 historic points stored for 2 years online,	4 cores, 16GB RAM, 50GB free space on high performance disks for database configuration, log files, and so on. A separate 2TB high performance disk system for historic data. Server class hardware and 64-bit operating system.

Application	Server Requirement (minimum configuration)
multiple clients	
Server with 250,000 objects, 150,000 historic points stored for 2 years online, multiple clients	8 cores, 32GB RAM, 100GB free space on high performance disks for database configuration, log files, and so on. A separate 4TB high performance disk system for historic data. Server class hardware and 64-bit operating system.
Server with 450,000 objects, 250,000 historic points stored for 2 years online, multiple clients	8 cores, 48GB RAM, 100GB free space on high performance disks for operating system, installed applications, database configuration, and so on. A separate 50GB high performance disk system for log files. A separate 4TB high performance disk system for Historic data. A separate 4TB high performance disk system for Event Journal data. Server class hardware and 64-bit operating system.
Server with 1,000,000 objects, 500,000 historic points stored for 2 years online, multiple clients	16 cores, 96GB RAM, 100GB free space on high performance disks for operating system, installed applications, database configuration, and so on. A separate 100GB high performance disk system for log files. A separate 8TB high performance disk system for Historic data. A separate 8TB high performance disk system for Event Journal data. Server class hardware and 64-bit operating system.
Server with 1,500,000 objects, 750,000 historic points stored for 2 years online, multiple clients	2 x 18 cores, 128GB RAM, 100GB free space on high performance disks for operating system, installed applications, database configuration, and so on. A separate 100GB high performance disk system for log files. A separate 12TB high performance disk system for Historic data. A separate 12TB high performance disk system for Event Journal data. Server class hardware and 64-bit operating system.

ATTENTION: Server class computers and virtual machines (VMs) on server class computers should not be used to run ViewX in a day-to-day operational environment; instead, appropriate client machines should be used. Client machines often have a higher graphics hardware specification than server class computers. This higher graphics specification is required to run ViewX in a day-to-day operational environment, within which users might perform graphics-intensive tasks such as viewing complex Mimics, or working with multiple or floating documents (*see* Client PC Specifications).

The standard graphics hardware on server class computers and on VMs on server class computers may only be adequate for running ViewX for administrative purposes (such as performing initial system configuration and user account setup).

There are many factors that can affect disk space use, including the amount of historic data your system generates and the overheads and mechanics of the file system. In many cases, you can calculate a suitable disk size by following these steps:

1. Estimate the approximate number of historic and event records that you expect your Geo SCADA Expert system to generate over a year. Each historic record is 32 bytes and each Event

Journal record is 768 bytes.

2. To allow for overheads such as clusters, double the amount you estimated in step 1.
3. For efficient disk usage, double the total from step 2.
4. If you intend using Geo SCADA Expert's Alarm Summary feature, estimate the approximate number of historic alarms that you expect Geo SCADA Expert to log over a year. Add 3300 bytes per alarm.
5. If you intend using Geo SCADA Expert's Configuration Changes Auditing feature, estimate the approximate number of configuration changes that you expect Geo SCADA Expert to log over a year. Add 1300 bytes per Configuration Change record.

This should provide you with an approximate value for the amount of disk space your system requires for a period of one year. Using this information, you can determine what size of disk you need to store a year's-worth of data. If you want to calculate the amount of disk space required to store data for a different length of time, adjust the time period accordingly in your calculations in the steps above.

With regard to the disk space required to store log files, we recommend that you calculate the amount of disk space needed to store at least 72 hours of logging (ideally longer), regardless of the size of your system. The storage required for log files will vary directly with the logging options selected and the duration of log file retention. Take care to ensure that the log files are written to a partition that contains sufficient disk space and does not impact on the space required for other files. We recommend that you review the log file storage requirements regularly during system operation.

For more information on the required desktop and server class operating systems, *see* Virtualization and Cloud.

For information on ViewX client recommendations, *see* Client PC Requirements.

NOTE: The typical point to object ratio is around 1:2. So for a system with 50,000 points, this equates to around 100,000 objects. However, ratios vary per system and this should only be regarded as an estimate. Some ratios may require lower or higher specification computers, depending on the actual configuration.

Further Information

Disk architectures: Disk Drives and RAID Arrays.
Client PC Requirements.
Geo SCADA Expert System Performance Guidelines.
Virtual ViewX Server Requirements.
Virtual ViewX Server Configuration and Performance Guidelines.

Server License Settings - Geo SCADA Expert

Each Geo SCADA Expert system requires a Geo SCADA Expert server license that defines which drivers are available, the number of database points permitted, the number of client commendations permitted, and so on.

Depending on the configuration of your system, each ViewX client might also need a license.

NOTE: If you are using virtualization, you must acquire a separate license for each copy of Geo SCADA Expert that runs on a virtual server (*see* Virtualization and Cloud).

Further Information

License your Virtual ViewX Installation.

License requirements for Geo SCADA Mobile: see the separate Geo SCADA Mobile documentation suite.

Upgrade a License.

Geo SCADA Expert System Performance Guidelines

System performance is affected by many factors. When setting up your Geo SCADA Expert system, you should take into account:

- The Geo SCADA Expert Server Requirements
- The Recommended Geo SCADA Expert Server Configurations.

For optimal system performance, we recommend that you:

- Choose the fastest possible memory bandwidth
- Split the Geo SCADA Expert database across separate physical disks
- Use Solid State Disks (SSD) for storing historic and Event Journal data online (*see* Disk Drives and RAID Arrays)
- Ensure that log files are written to a suitable partition that contains sufficient disk space and does not impact on the space required for other files.

For further guidelines, see the 'Geo SCADA Expert Performance Guidelines' document on the Geo SCADA Knowledge Base website (see https://community.se.com/t5/Geo-SCADA-Knowledge-Base/Technical-Guides/ba-p/278414).

NOTE: When using ViewX with HTTPS and certificates, attempting to run a script that connects to the Geo SCADA Expert Server can cause long delays (of the order of 20 seconds) the first time you run the script after starting ViewX. This is because of the way that certificate revocation lists (CRLs) are downloaded from the Windows update server.

If you encounter this problem, we recommend that you contact your IT department.

NOTE: You can achieve high accuracy time (such as synchronizing time to within an accuracy of 1ms) using W32Time, providing that certain criteria are satisfied. For more information, see https://learn.microsoft.com/en-us/windows-server/networking/windows-time-service/support-boundary. However, if you choose to use another third-party NTP client to maintain accurate time, remember to disable Windows Time (W32Time).

ATTENTION: Server class computers and virtual machines (VMs) on server class computers should not be used to run ViewX in a day-to-day operational environment; instead, appropriate client machines should be used. Client machines often have a higher graphics hardware specification than server class computers. This higher graphics specification is required to run ViewX in a day-to-day operational environment, within which users might perform graphics-intensive tasks such as viewing complex Mimics, or working with multiple or floating documents (*see* Client PC Specifications).

The standard graphics hardware on server class computers and on VMs on server class computers may only be adequate for running ViewX for administrative purposes (such as performing initial system configuration and user account setup).

Client PC Requirements

When purchasing clients for use with Geo SCADA Expert, there are many factors you need to consider, including the operating systems supported by Geo SCADA Expert and the type of displays required.

In the following sections, we describe the recommended specifications for clients that are to use Geo SCADA Expert:

- Client PC Specifications
- Operational Limitations - Client.

You should also refer to the following sections, which apply to both Geo SCADA Expert servers and Geo SCADA Expert clients:

- Operating Systems
- Screen Resolution and Color Depth
- Geo SCADA Expert Prerequisite Components
- File Locations (Default)
- Certificates for Geo SCADA Expert Server and Client Connections
- Web Browser Support.

Client PC Specifications

The minimum PC specifications that we recommend for client computers are:

ViewX Client
2 cores
4GB RAM
1GB free disk space
Desktop class operating system (*see* Operating Systems)
Graphics hardware that is provided as standard on new client PCs available in the last three years is typically suitable to run ViewX in a day-to-day operational environment.
Display that is running in true color (24-bit or 32-bit color depth)

ATTENTION: Server class computers and virtual machines (VMs) on server class computers should not be used to run ViewX in a day-to-day operational environment; instead, appropriate client machines should be used. Client machines often have a higher graphics hardware specification than server class computers. This higher graphics specification is required to run ViewX in a day-to-day operational environment, within which users might perform graphics-intensive tasks such as viewing complex Mimics, or working with multiple or floating documents.

The standard graphics hardware on server class computers and on VMs on server class computers may only be adequate for running ViewX for administrative purposes (such as performing initial system configuration and user account setup).

For information on client-server, and server specifications, please *see* Recommended Geo SCADA Expert Server Configurations.

For information about graphics requirements when running a ViewX client on a VM, *see* Virtualization and Cloud.

Operational Limitations - Client

Geo SCADA Expert has a number of recommended operational limits. Expansion beyond the recommended limits is possible, but may result in a system that is unstable and unreliable. The recommended operational limits for Geo SCADA Expert clients are:

Parameter	Limit	Notes
Minimum ViewX to Geo SCADA Expert server link bandwidth	2 Mbit	Exceeding these limits will cause slow performance in ViewX.
Maximum ViewX to Geo SCADA Expert server link latency	50 ms	Exceeding these limits will cause slow performance in ViewX.
Minimum Virtual ViewX client to Virtual ViewX server link bandwidth	1 Mbit	
Minimum Original WebX client to Geo SCADA Expert server link bandwidth	2 Mbit	

While these are recommended operational limits, we do not guarantee performance even if your system is operating at or under these limits. This is because it is possible to configure aspects such as data processing and client displays that are detrimental to performance. We recommend that you review the Design Guidelines and Performance Guidelines online on the Schneider Electric Community website.

NOTE: You are restricted to having up to a maximum of 5 Geo SCADA Expert displays open simultaneously on a Virtual ViewX client (providing that your User Account provides **Multi Document Interface** access).

Further Information

Server operational limitations: *see* Operational Limitations - Geo SCADA Expert Server.

Operating Systems

Geo SCADA Expert has to be installed on 64-bit computers.

Systems running on server class hardware have to use server operating systems such as Windows Server 2019, or Windows Server 2016. Server operating systems are designed for servicing entire systems rather than individual computers or small networks. For this reason, they are better suited for larger Geo SCADA Expert systems with more than two clients.

ATTENTION: Desktop versions of Windows should not be used for servers with more than two clients. This is for performance reasons.

Small stand-alone client-server systems running on desktop class (rather than server class) hardware need to use operating systems that are appropriate to the computer hardware being used.

To provide database access from Geo SCADA Mobile, the servers have to run on server class hardware.

Likewise, to run Virtual ViewX, the Virtual ViewX server and Geo SCADA Expert server computers have to run on server class hardware (Virtual ViewX client computers should run on desktop class hardware).

For more information, *see* Recommended Geo SCADA Expert Server Configurations.

ATTENTION: Server class computers and virtual machines (VMs) on server class computers should not be used to run ViewX in a day-to-day operational environment; instead, appropriate client machines should be used. Client machines often have a higher graphics hardware specification than server class computers. This higher graphics specification is required to run ViewX in a day-to-day operational environment, within which users might perform graphics-intensive tasks such as viewing complex Mimics, or working with multiple or floating documents (*see* Client PC Specifications).

The standard graphics hardware on server class computers and on VMs on server class computers may only be adequate for running ViewX for administrative purposes (such as performing initial system configuration and user account setup).

32-Bit

Geo SCADA Expert does not support 32-bit operating systems. For server and client installations, you have to use computers that are running a suitable 64-bit operating system (*see* 64-Bit).

64-Bit

ATTENTION: From the May 2023 update of Geo SCADA Expert 2022 (85.8544.1) we have changed the minimum versions of Windows operating systems that Geo SCADA Expert supports. The minimum versions on which you can now install Geo SCADA Expert are Windows 10 (version 1607) or Windows Server 2016. Installation of Geo SCADA Expert on older operating systems is blocked.

Install Geo SCADA Expert server, Geo SCADA Mobile Server, or Virtual ViewX server software on computers that are using one of the following 64-bit operating systems:

Server Hardware

- Windows Server 2022 (Standard and Datacenter editions, 'Desktop Experience' installation option)

  ATTENTION: With Windows Server 2022, the above installation option is only offered during **initial** installation. Take care to select the correct installation option during that installation process.

- Windows Server 2019 (Standard and Datacenter editions, 'Desktop Experience' installation option)

  ATTENTION: With Windows Server 2019, the above installation option is only offered during **initial** installation. Take care to select the correct installation option during that installation process.

- Windows Server 2016 (Standard and Datacenter editions, 'Server with Desktop Experience' installation option).

  ATTENTION: With Windows Server 2016, the above installation option is only offered during **initial** installation. Take care to select the correct installation option during that installation process.

NOTE: When you install Virtual ViewX server on a machine, ViewX is installed on that server. Whenever you connect to that server, ViewX runs on that server machine. As such, that instance of ViewX will make use of the graphical capabilities of that server machine, sharing the load with the CPU.

Desktop Hardware

For server installations, desktop class hardware is only suitable for small stand-alone Geo SCADA Expert client-server systems that are not intended to provide access to the database from either Virtual ViewX or Geo SCADA Mobile.

Use desktop class hardware for client computers, such as those that are running either ViewX, Virtual ViewX, Original WebX, or Data Access software.

The following operating systems are supported:

- Windows 11 (Professional and Enterprise editions, versions that are supported by Microsoft) (Geo SCADA Expert is tested against the latest version of Windows 11 at the point of its release.)
- Windows 10 (version 1607 onwards) (Professional and Enterprise editions, versions that are supported by Microsoft).

(Version 1607 is also known as the 'Windows 10 Anniversary Update'.)
(Geo SCADA Expert is tested against the latest version of Windows 10 at the point of its release.)

ATTENTION: Desktop versions of Windows should not be used for servers with more than two clients. This is for performance reasons.

If you intend to provide access to the database from Geo SCADA Mobile, install the server software on server class computers with 64-bit operating systems.

Likewise, to run Virtual ViewX, the Virtual ViewX server and Geo SCADA Expert server computers have to run on server class hardware with 64-bit operating systems. (Virtual ViewX client computers also have to use 64-bit operating systems. The Virtual ViewX client computers also require an HTML-5 compatible web browser (*see* Web Browser Support).)

(To run only the Original WebX client, client computers require the 32-bit version of Internet Explorer 11. Other browsers are not supported.)

Screen Resolution and Color Depth

The minimum recommended screen resolution for Geo SCADA Expert is 1024x768, with a display that is running in true color (24 bit or 32 bit color depth).

ATTENTION: Server class computers and virtual machines (VMs) on server class computers should not be used to run ViewX in a day-to-day operational environment; instead, appropriate client machines should be used. Client machines often have a higher graphics hardware specification than server class computers. This higher graphics specification is required to run ViewX in a day-to-day operational environment, within which users might perform graphics-intensive tasks such as viewing complex Mimics, or working with multiple or floating documents (*see* Client PC Specifications).

The standard graphics hardware on server class computers and on VMs on server class computers may only be adequate for running ViewX for administrative purposes (such as performing initial system configuration and user account setup).

Geo SCADA Expert Prerequisite Components

The Geo SCADA Expert Installer will offer various prerequisites prior to the main installation activity. Some of these prerequisites are mandatory; others are optional and, when selected, permit additional features to be used. The prerequisite components comprise a combination of the following:
(The actual options that are offered vary, depending on the operating system and whether any of the components are already installed. For example, the Microsoft .NET Framework 4.8 is not offered on operating systems on which that component is already built in.)

- Microsoft .NET Framework 4.8
- Microsoft .NET 6 (x64) - Required for Geo SCADA Expert Server
  - ASP .NET Core Runtime
  - Windows Desktop Runtime
- Local Web Proxy - Required for Geo SCADA Expert Server
  - IIS Setup for Geo SCADA Expert
  - IIS URL Rewrite Module
  - Microsoft Application Request Routing
- Microsoft Visual C++ 2013 Redistributable (x86)
- Microsoft Visual C++ 2013 Redistributable (x64)
- Microsoft Visual C++ 2015-2022 Redistributable (x86)
- Microsoft Visual C++ 2015-2022 Redistributable (x64)
- AVEVA Platform Common Services (PCS)
- AVEVA Operations Control Logger
- AVEVA Adapter for Historic Data Export
- AVEVA Enterprise Licensing
- Safenet Sentinel System Driver
- SAP Crystal Reports Runtime Engine (32-bit) - For ViewX Client
  (Geo SCADA Expert supports SAP Crystal Reports 2016 and SAP Crystal Reports 2020)
- SAP Crystal Reports Runtime Engine (64-bit) - For Geo SCADA Expert Server
  (Geo SCADA Expert supports SAP Crystal Reports 2016 and SAP Crystal Reports 2020)

WARNING

DO NOT UNINSTALL PREREQUISITE COMPONENTS

Uninstalling the prerequisite components may result in Geo SCADA Expert being unable to provide access to certain features, or being unable to run. It could also affect system security. For these reasons, do not uninstall the prerequisite components.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

When you install Geo SCADA Expert, the components that are essential for Geo SCADA Expert to run on your operating system are installed automatically. A prompt is displayed for non-essential components, allowing you to choose the components that are relevant to your system.

We recommend that you only install components that you need for your system. For example, you only need to install:

- Local Web Proxy group of prerequisites on Geo SCADA Expert server installations.
  You have to install this group of prerequisites on a Server, or Server and Clients installation.
  (This installs and configures Microsoft Internet Information Services (IIS) as a reverse proxy for the Geo SCADA Expert server's built-in web server.)
  There is no need to install this group of prerequisites on a client-only installation.
- The AVEVA Platform Common Services (PCS) component if you intend using any of the following:
  - PCS Data Interface
  - OPC UA server
  - User logons using the AVEVA Identity Manager.

  If required, you have to install the prerequisite on each Server, or Server and Clients installation. (There is no need to install it on a client-only installation.)
- The AVEVA Operations Control Logger if you intend using PCS Data Interface, the OPC UA server, AVEVA Identity Manager, or the AVEVA Historic Data Export driver.
- The AVEVA Adapter for Historic Data Export if you intend exporting historic data using the AVEVA Historic Data Export driver, and Geo SCADA Expert is to export the historic data to AVEVA PI Server or AVEVA Data Hub.
- The AVEVA Enterprise Licensing component if your system uses the AVEVA Flex subscription offer and Flex credits for licensing (rather than license files or dongles).

  If required, you have to install the prerequisite on each Server, or Server and Clients installation. (There is no need to install it on a client-only installation.)
- Safenet Sentinel System Driver if your computers are using dongles for licensing (rather than license files, or an AVEVA Enterprise License Server).
- The relevant SAP Crystal Reports Runtime Engine component(s) if your system is using SAP Crystal Reports 2016 or SAP Crystal Reports 2020 (for more information, see the note below).

NOTE: The SAP Crystal Reports runtime components are NOT installed by default. If you intend to install them you must purchase a Crystal Reports runtime license for each server on which these components are to be operational (clients do not need a license to use the runtime components). For servers on which the runtime components are operational, the Crystal Reports runtime license is included with the Geo SCADA Expert Crystal Reports driver license. Please contact your Schneider sales representative for more information.

Install the 64-bit version of the SAP Crystal Reports Runtime Engine on Geo SCADA Expert server installations (to enable generating and exporting of reports). Install the 32-bit version of the SAP Crystal Reports Runtime Engine on ViewX clients and Virtual ViewX servers (to display reports). Please select both if you are to run Server and Clients on the same computer. As the runtime components are prerequisites, you have to select them before you continue further with the Geo SCADA Expert installation (this is handled automatically in the Virtual ViewX installer). For more information about the installation order, see the Installation section of the Geo SCADA Expert Guide to the Crystal Reports Driver.

If you intend using Crystal Reports on your system, you also need to install the Crystal Reports prerequisites and driver on any Permanent Standby servers, in order for the Geo SCADA Expert database to synchronize. However, as the Permanent Standby Geo SCADA Expert servers do not require the Crystal Reports driver to be operational, they do not require a Crystal Reports runtime license. (On the **Modules** tab on the Server Status Tool of such servers, the Crystal Reports driver will show a red 'No License' state due to the lack of runtime license. This is expected on Permanent Standby servers. On all other servers on systems that use Crystal Reports, the Crystal Reports driver and runtime components must be licensed.)

Installing components that are not needed on your system uses up disk space unnecessarily. It also increases the attack surface. For improved system security, you should avoid installing or running components that you do not require on your system.

Be aware that you might need to install other software on the Geo SCADA Expert server or clients in order to use certain drivers in Geo SCADA Expert. This requirement only applies to a few drivers. The driver guides for such drivers should include installation information about such requirements. Check this information before starting to install Geo SCADA Expert as in some cases, the other software might need installing first.

Further Information

Installation of Prerequisites.

Prerequisites for machines on which Virtual ViewX is installed: *see* Virtual ViewX Server Prerequisite Components.

Certificates for Geo SCADA Expert Server and Client Connections

The use of certificates to initiate secure connections and encrypt the data that is transmitted between Geo SCADA Expert servers and clients is supported by Geo SCADA Expert 2020 onwards. From this version of Geo SCADA Expert, two sets of certificates are supported:

- **Server certificates** that the Geo SCADA Expert server provides to the clients, so that the clients can verify that the server is a valid Geo SCADA Expert server.
- **Client certificates** that the clients provide to the Geo SCADA Expert server, so that the server can verify that the clients are valid clients.

  You can optionally require the client certificates to map to a Windows user account.

We strongly recommend that you set up your system to use trusted certificates to initiate secure connections and encrypt the data that is transmitted between Geo SCADA Expert servers and clients. To configure your system to use such certificates:

1. Each server and client machine (if client certificates are required) should have its own unique certificate, which must have a private key associated with it. Obtain the required certificates from a trusted certification authority and load each certificate into the Windows certificate store on the relevant machine. (Store the server certificate on the relevant server machine, and the client certificate on the relevant client machine.) For more information about certificate stores, see the Windows help.
2. On the server machine, set up the required settings in the Server Configuration Tool (see 'Configure the Connection Security Settings' in the Geo SCADA Expert Guide to Server Administration).

   If the server is in a multi-server system, also configure the security settings that apply for outgoing server-to-server connections during which this server acts as a client (see 'Connection Security Tab (for Server-to-Server Communications)' in the Geo SCADA Expert Guide to Server Administration).

   Repeat this step on each server in your system.
3. On each client machine, set up the required client connection security for the client (see 'Configure the Client Connection Security Settings' in the Geo SCADA Expert Guide to Client Administration).

On Geo SCADA Expert systems on which certificates are used:

- If a Geo SCADA Expert server that does not have a valid certificate attempts to communicate with another Geo SCADA Expert server on the system (that requires valid server certificates):
  - The connection will be declined
  - An entry will be logged in the server log file of the server to which the connection attempt was made. The entry will indicate that the other server did not have a valid certificate (or has no certificate at all).
- If server certificates are required and a client attempts to connect to a Geo SCADA Expert server that does not have a valid certificate:
  - The connection will be declined
  - The client log file will indicate that a connection was attempted to a Geo SCADA Expert server that does not have a valid certificate (or has no certificate at all).

- If client certificates are required and a client that does not have a valid certificate attempts to connect to a Geo SCADA Expert server:
  - The connection will be declined
  - An entry will be logged in the server log file to indicate that a connection was attempted by a client that does not have a valid certificate (or has no certificate at all).

WARNING

POTENTIAL SECURITY BREACH

Clients that are running a version of Geo SCADA Expert that is earlier than Geo SCADA Expert 2020 use a different communications protocol and are exempt from requiring valid client certificates. We recommend that you upgrade all of your clients as soon as it is practicable, to ensure that they run a version of Geo SCADA Expert that does support client certificates.

Failure to follow these instructions can result in death, serious injury, or equipment damage. The breach in system security could expose sensitive data and leave the database vulnerable to unauthorized and potentially malicious use.

Clients that are running a version of Geo SCADA Expert that is earlier than Geo SCADA Expert 2020 are exempt from requiring valid client certificates and can still communicate with a server that has been updated to require client certificates.

File Locations (Default)

Geo SCADA Expert installs files in several locations. Some of these files you may need to access during the configuration of your system and so you should familiarize yourself with the default locations.

The following section details the default file locations for Geo SCADA Expert on any of the supported Windows platforms:

- Windows 64-Bit File Locations.

These are the default file locations—the files on your system may be in different locations, depending on how the system has been installed and configured.

If you cannot locate a file at the default location, check the file's location using the Server Administration Tool, or use the Search facility in Windows.

You can change the location of the server files by using the Server Administration Tool.

You can change the location of log files by using the **Move Log Files** wizard.

Virtual ViewX

The following section details the default file locations for Virtual ViewX server on any of the supported Windows platforms:

- Windows 64-bit File Locations – Virtual ViewX Server.

Windows 64-Bit File Locations

The table below gives details of the default file locations for Geo SCADA Expert running on any of the supported Windows platforms.

The default file locations are for clean installations of Geo SCADA Expert 2023 onwards. With systems that have been upgraded from ClearSCADA, different default locations might apply. The locations of the files on your system might differ from the defaults, depending on how your system has been installed and configured (*see* File Locations (Default)).

Data	Default Location	Access Restrictions*
Metadata	C:\ProgramData\Schneider Electric\ClearSCADA\Database	Windows Administrator accounts only
Alarm Summary	C:\ProgramData\Schneider Electric\ClearSCADA\Database\AlarmSummary	Windows Administrator accounts only
Configuration	C:\ProgramData\Schneider Electric\ClearSCADA\Database\Config	Windows Administrator accounts only
Data (Current Data)	C:\ProgramData\Schneider Electric\ClearSCADA\Database\Data	Windows Administrator accounts only
Historic Data	C:\ProgramData\Schneider Electric\ClearSCADA\Database\History	Windows Administrator accounts only
Event Journal	C:\ProgramData\Schneider Electric\ClearSCADA\Database\Journal	Windows Administrator accounts only
Historic Files	C:\ProgramData\Schneider Electric\ClearSCADA\Database\HisFiles	Windows Administrator accounts only
Data Files	C:\ProgramData\Schneider Electric\ClearSCADA\Database\DataFiles	Windows Administrator accounts only
Archive Index	C:\ProgramData\Schneider Electric\ClearSCADA\Database	Windows Administrator accounts only
Configuration Changes	C:\ProgramData\Schneider Electric\ClearSCADA\Database\ConfigChanges	Windows Administrator accounts only

Data	Default Location	Access Restrictions*
Driver Upload and Download Data	C:\ProgramData\Schneider Electric\ClearSCADA\Database These file locations are specific to the DNP3 driver: C:\ProgramData\Schneider Electric\ClearSCADA\Database\Slave	
User Profile Data	C:\Users\<User Name>\AppData\Roaming\Schneider Electric\ClearSCADA	
Automatic Database Backup on Upgrade	C:\ProgramData\Schneider Electric\ClearSCADA\UpgradeDatabaseBackup	
ViewX Cache	This file location is specific to the ViewX file cache: C:\Users\<User Name>\AppData\Local\Schneider Electric\ClearSCADA\SE.ViewXCache This file location is specific to the ViewX Mimic cache: C:\Users\<User Name>\AppData\Local\Schneider Electric\ClearSCADA\ViewXCache	
Alarm Sounds Cache	C:\Users\<User Name>\AppData\Local\Schneider Electric\ClearSCADA\ViewXAlarmSoundCache	
SE.Scada.ViewX.exe .config File	C:\Program Files (x86)\Schneider Electric\ClearSCADA	
ServerLabels.xml File	C:\ProgramData\Schneider Electric\ClearSCADA	
Systems.xml File	C:\ProgramData\Schneider Electric\ClearSCADA	
Startup Configuration File	C:\ProgramData\Schneider Electric\ClearSCADA	
Server Log Files, Server Snapshot Log Files, and Server Startup Log Files	C:\ProgramData\Schneider Electric\ClearSCADA\Logs\DB	Windows Administrator accounts only
Exception and other Server Minidump Files	C:\ProgramData\Schneider Electric\ClearSCADA\Logs\Dumps\System	Windows Administrator accounts only
Driver Log Files	C:\ProgramData\Schneider Electric\ClearSCADA\Logs\Drivers	Windows Administrator accounts only
IO Logs and Comms Logs	C:\ProgramData\Schneider Electric\ClearSCADA\Logs\Drivers	Windows Administrator accounts only

Data	Default Location	Access Restrictions*
ViewX Log Files	C:\ProgramData\Schneider Electric\ClearSCADA\Logs\ViewX	
Exception Minidump files for ViewX and other clients	C:\ProgramData\Schneider Electric\ClearSCADA\Logs\Dumps\User	
Web SSL Certificate (for Original WebX)	C:\ProgramData\Schneider Electric\ClearSCADA\Certificates	Windows Administrator accounts only
Web SSL Private Key (for Original WebX)	C:\ProgramData\Schneider Electric\ClearSCADA\Certificates	Windows Administrator accounts only
Web Style Sheets and Images (for Original WebX)	C:\Program Files\Schneider Electric\ClearSCADA\WWW	
Server-Side Help	C:\Program Files\Schneider Electric\ClearSCADA\WWW\Help The name of the Help folder is appended with the language in which the help is available (the default being Help_en-US).	
Installation Files	C:\Program Files\Schneider Electric\ClearSCADA C:\Program Files (x86)\Schneider Electric\ClearSCADA The installation files for the server and many drivers are installed to the Program Files directory. ViewX and some other drivers are installed to the Program Files (x86) directory.	
Area of Interest Cleaner utility (AOICleaner.exe)	C:\Program Files (x86)\Schneider Electric\ClearSCADA	
Dictionary Files	C:\Program Files\Schneider Electric\ClearSCADA\Dictionary	

* Access restrictions apply to clean installations of Geo SCADA Expert 2019 onwards.

Geo SCADA Expert also adds Geo SCADA Expert Service Manager, ViewX, and Geo SCADA Expert Server Icons to the desktop. Geo SCADA Expert Client Connections is located at:

```
C:\Program Files (x86)\Schneider Electric\ClearSCADA.
```

Further Information

Set access restrictions on file locations after upgrading from ClearSCADA: see 'Use Appropriate Windows User Accounts' in the Geo SCADA Expert Guide to Security.

Windows 64-bit File Locations – Virtual ViewX Server

The table below gives details of the default file locations for Virtual ViewX running on any of the supported Windows platforms.

The default file locations are for clean installations of Geo SCADA Expert 2023 onwards. The locations of the files on your system might differ from the defaults, depending on how your system has been installed and configured (*see* File Locations (Default)).

Data	Default Location	Access Restrictions*
VirtualUI Configuration	C:\ProgramData\Cybele Software\Thinfinity\VirtualUI	
Systems.xml File	C:\ProgramData\Schneider Electric\ClearSCADA	
License Server Log Files	C:\ProgramData\Schneider Electric\ClearSCADA\Logs\	Windows Administrator accounts only
Exception and other Server Minidump Files	C:\ProgramData\Schneider Electric\ClearSCADA\Logs\Dumps\System	Windows Administrator accounts only
Virtual ViewX Exception Minidump Files	C:\ProgramData\Schneider Electric\ClearSCADA\Logs\Dumps\User	
Virtual ViewX Log Files	C:\ProgramData\Schneider Electric\ClearSCADA\Logs\ViewX (the log files are prefixed with the text 'Virtualized_')	
SE.ViewXCache	C:\Users\<User Name>\AppData\Local\Schneider Electric\ClearSCADA\SE.ViewXCache	
ViewX Alarm Sound Cache	C:\Users\<User Name>\AppData\Local\Schneider Electric\ClearSCADA\ViewXAlarmSoundCache	
ViewX Cache	C:\Users\<User Name>\AppData\Local\Schneider Electric\ClearSCADA\ViewXCache	
Installation Files	C:\Program Files\Schneider Electric\Virtual ViewX	
User Profile Data	C:\Users\<User Name>\AppData\Roaming\Schneider Electric\ClearSCADA	

* Access restrictions apply to clean installations of Geo SCADA Expert 2019 onwards.

Web Browser Support

With Geo SCADA Expert's newer web interface, Virtual ViewX, we recommend that you use one of the following HTML5-compatible web browsers to display Geo SCADA Expert data:

- Google Chrome
- Microsoft Edge
- Mozilla Firefox.

The Virtual ViewX server uses a screen virtualization technology to render ViewX content in the web browser. Virtual ViewX is supported by Geo SCADA Expert 2019 onwards, and requires network access in order to obtain the data from the Geo SCADA Expert server.

NOTE: In order to run Virtual ViewX, all Geo SCADA Expert servers must be running Geo SCADA Expert 2019 onwards; they cannot be running older versions of the software, or be set to emulate older versions.

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

The Original WebX server built into the database server of Geo SCADA Expert is still part of the product. Original WebX uses Microsoft's ActiveX Controls technology to display Mimics, Lists, Trends, and so on. ActiveX Controls are only supported by Microsoft Internet Explorer; as such, the Original WebX client requires the 32-bit version of:

- Internet Explorer 11.

Both web servers (Virtual ViewX and Original WebX) can coexist on the same host, but for performance and security reasons we recommend installing them on separate machines.

Installing Geo SCADA Expert

You can install Geo SCADA Expert on any server or client computer that meets the recommended specifications:

- Geo SCADA Expert Server Requirements
- Client PC Requirements.

You can use the Geo SCADA Expert DVD to install Geo SCADA Expert server, Geo SCADA Expert Client, and Data Access components. You will choose which components are to be installed during the installation process.

Be aware that you might need to install other software on the Geo SCADA Expert server or clients in order to use certain drivers in Geo SCADA Expert. This requirement only applies to a few drivers. The driver guides for such drivers should include installation information about such requirements. Check this information before starting to install Geo SCADA Expert as in some cases, the other software might need installing first.

ATTENTION: Geo SCADA Expert 2020 onwards supports the use of certificates to initiate secure connections and encrypt the data that is transmitted between Geo SCADA Expert servers and clients. **We strongly recommend that you obtain certificates from a trusted certification authority for such communications**. With such a setup, you have to store the trusted certificates on the relevant machines before Geo SCADA Expert can be configured to use those certificates (*see* Certificates for Geo SCADA Expert Server and Client Connections).

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

To install Geo SCADA Expert on a server or client computer:

1. Run the Geo SCADA Expert Installer and select the **Install Geo SCADA Expert** option.

   The Installer will then either:

   - Run the Geo SCADA Expert Setup Wizard. The Setup Wizard provides a series of ‘pages’ that guide you through the installation process.

   Or:

   - Install any prerequisite software that is not already installed on your computer. The software is installed from the Geo SCADA Expert DVD. When the prerequisite software is installed, the Setup Wizard will run.
2. Use the various ‘pages’ of the Setup Wizard to make selections relating to the Geo SCADA Expert installation:
   - Welcome to the Schneider Electric Geo SCADA Expert Setup Wizard
   - End-User License Agreement

- Customer Information
- Database Emulation Configuration (upgrades only)
- Upgrade
- Choose Setup Type
- Clean Installation of Database
- Create a Super User Account
- Web Server Ports Configuration
- Ready to Install.

3. If your Geo SCADA Expert system is to include OPC clients that communicate with Schneider Electric PLCs, Install OPC Factory Server on each server that is to operate as a Schneider Electric OPC Server.

Further Information

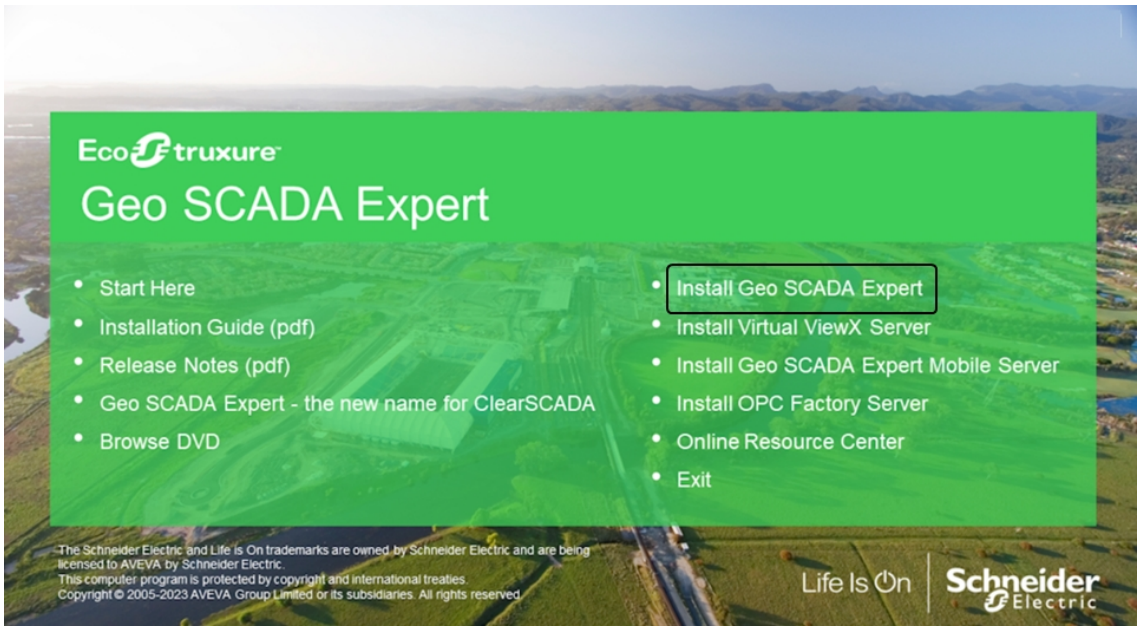
Geo SCADA Expert Prerequisite Components.
Geo SCADA Expert System Requirements.

Run the Geo SCADA Expert Installer

To install Geo SCADA Expert on a client or a server, you need to run the Geo SCADA Expert installer program.

To run the Geo SCADA Expert installer:

1. Insert the Geo SCADA Expert DVD. If Autorun is disabled on your PC, run the DVD manually.
2. When the Geo SCADA Expert screen is displayed, select the **Install Geo SCADA Expert** option.



The Geo SCADA Expert installer runs.

NOTE: When you run the Geo SCADA Expert installer, Windows may ask you if you want Geo SCADA Expert Setup to be able to make changes to your computer. Choose **Yes** to allow the Geo SCADA Expert installation to continue.

When you run the Geo SCADA Expert installer, it checks to see if your PC has the prerequisite components installed.

- If your PC has the prerequisite components, the Welcome 'page' is shown (*see* Welcome to the Schneider Electric Geo SCADA Expert Setup Wizard).
- If your PC does not have the prerequisite components, the Geo SCADA Expert installer will attempt to install them before installing Geo SCADA Expert (*see* Installation of Prerequisites).

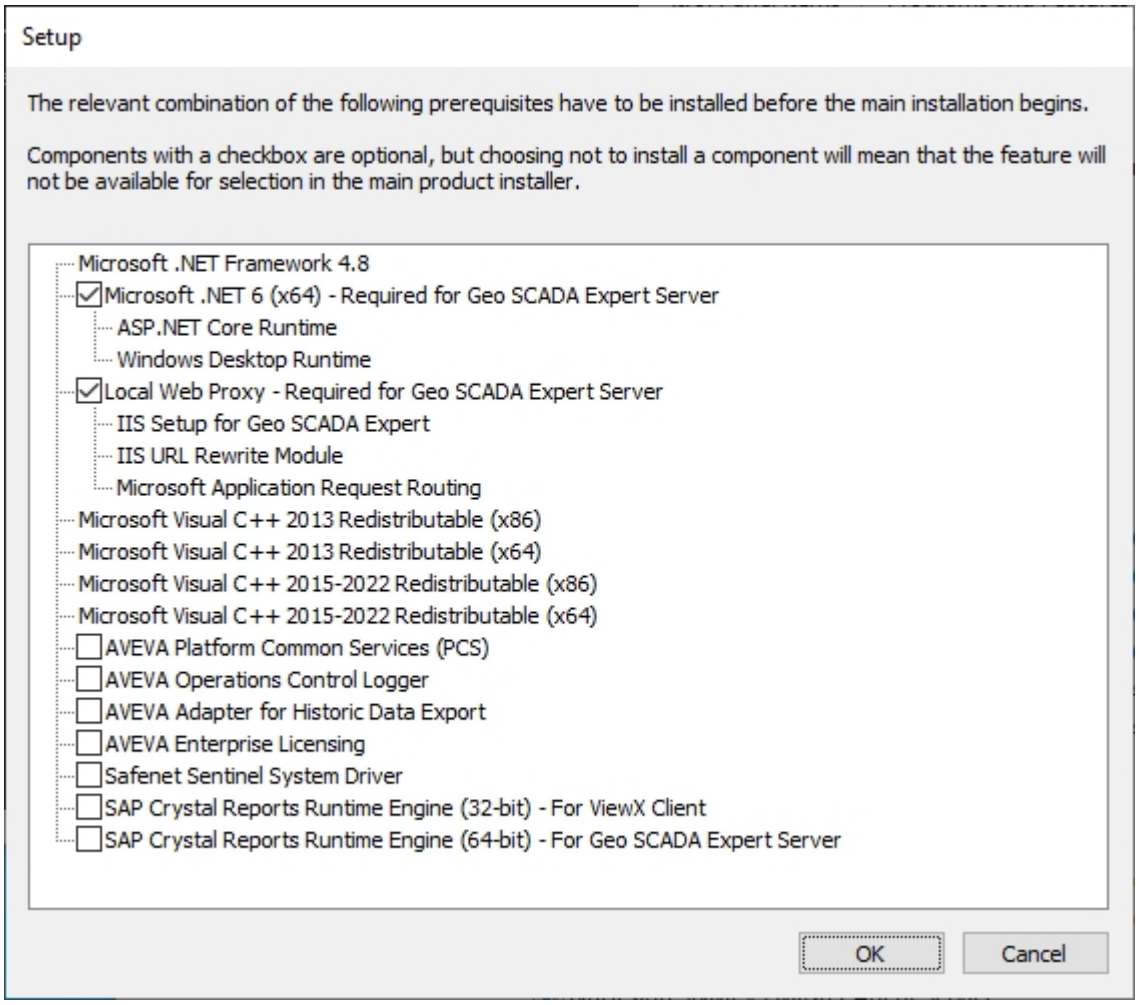
Installation of Prerequisites

Geo SCADA Expert requires certain other software components to be in place before it can be installed successfully.

If your computer has the prerequisite software installed, the Geo SCADA Expert installer will display the Welcome 'page' of the Geo SCADA Expert Installation Wizard (*see* Welcome to the Schneider Electric Geo SCADA Expert Setup Wizard).

If the prerequisite software is missing from your computer, the Geo SCADA Expert installer will attempt to install it. A Setup dialog box provides details about the components that have to be installed (along with those that are optional).

ATTENTION: Aside from these prerequisites: Be aware that you might need to install other software on the Geo SCADA Expert server or clients in order to use certain drivers in Geo SCADA Expert. This requirement only applies to a few drivers. The driver guides for such drivers should include installation information about such requirements. Check this information before starting to install Geo SCADA Expert as in some cases, the other software might need installing first.



When the Setup dialog box appears:

1. Use the check boxes to choose which of the optional components you want to install (in addition to the required components that will be installed).

   For information about which optional prerequisites you should install, *see* Geo SCADA Expert Prerequisite Components.

   To aid your choices, some of the options have a ToolTip that provides further information. Place the cursor over an option to display the ToolTip.

   NOTE: The SAP Crystal Reports runtime components are NOT installed by default. If you intend to install them you must purchase a Crystal Reports runtime license for each server on which these components are to be operational (clients do not need a license to use the runtime components). For servers on which the runtime components are operational, the Crystal Reports runtime license is included with the Geo SCADA Expert Crystal Reports driver license. Please contact your Schneider sales representative for more information.

   Install the 64-bit version of the SAP Crystal Reports Runtime Engine on Geo SCADA Expert server installations (to enable generating and exporting of reports). Install the 32-bit version of the SAP Crystal Reports Runtime Engine on ViewX clients and Virtual ViewX servers (to display reports). Please select both if you are to run Server and Clients on the same computer. As the runtime components are prerequisites, you have to select them before you continue further with the Geo SCADA Expert installation (this is handled automatically in the Virtual ViewX installer). For more information about the installation order, see the Installation section of the Geo SCADA Expert Guide to the Crystal Reports Driver.

   If you intend using Crystal Reports on your system, you also need to install the Crystal Reports prerequisites and driver on any Permanent Standby servers, in order for the Geo SCADA Expert database to synchronize. However, as the Permanent Standby Geo SCADA Expert servers do not require the Crystal Reports driver to be operational, they do not require a Crystal Reports runtime license. (On the **Modules** tab on the Server Status Tool of such servers, the Crystal Reports driver will show a red 'No License' state due to the lack of runtime license. This is expected on Permanent Standby servers. On all other servers on systems that use Crystal Reports, the Crystal Reports driver and runtime components must be licensed.)

2. Select the **OK** button to proceed.
   The prerequisite components are verified and installed. If a reboot is required for the installation process to complete, a dialog box is displayed. Select ***Yes*** *to allow the reboot to take place.*

3. Following the reboot, Windows may ask if you want to allow Geo SCADA Expert Setup to make changes to your computer. Select **Yes**.

4. If you still have further prerequisite components to install:
   - If the Setup dialog box is displayed automatically following the reboot, reselect the remaining components that you require (and clear the check boxes of any that you do not require). Then select the **OK** button to install the remaining prerequisite components that you have selected.
   - If the Geo SCADA Expert installer does not run automatically following the reboot, re-run the installer and select the **Install Geo SCADA Expert** option again (*see* Run the Geo SCADA Expert Installer). Once the Setup dialog box is displayed, reselect the remaining components that you require (and clear the check boxes of any that you do not require). Then select the **OK** button to install the remaining prerequisite components that you have selected.

5. Repeat the above procedure if a further reboot is required in order for the prerequisites installation process to complete.

   NOTE: Windows may ask you if you want to allow Geo SCADA Expert Service Manager to make changes to your computer. Select **Yes** to allow the installation process to continue.

When the prerequisites have been installed, the Geo SCADA Expert Installation wizard runs (*see* Welcome to the Schneider Electric Geo SCADA Expert Setup Wizard).

Further Information

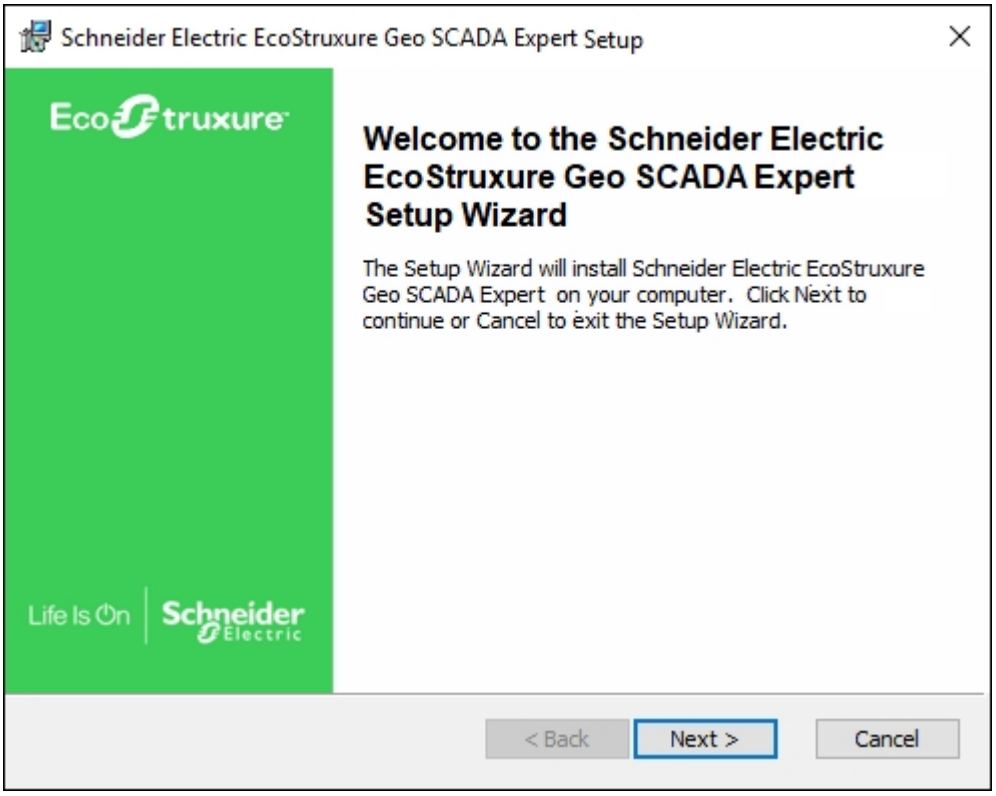
Prerequisites for machines on which the Virtual ViewX server is installed: *see* Virtual ViewX Server Prerequisite Components.

Welcome to the Schneider Electric Geo SCADA Expert Setup Wizard

The Welcome to the Schneider Electric Geo SCADA Expert Setup Wizard page is the first page of the installation wizard. It provides you with information about the version of Geo SCADA Expert you are about to install.

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.



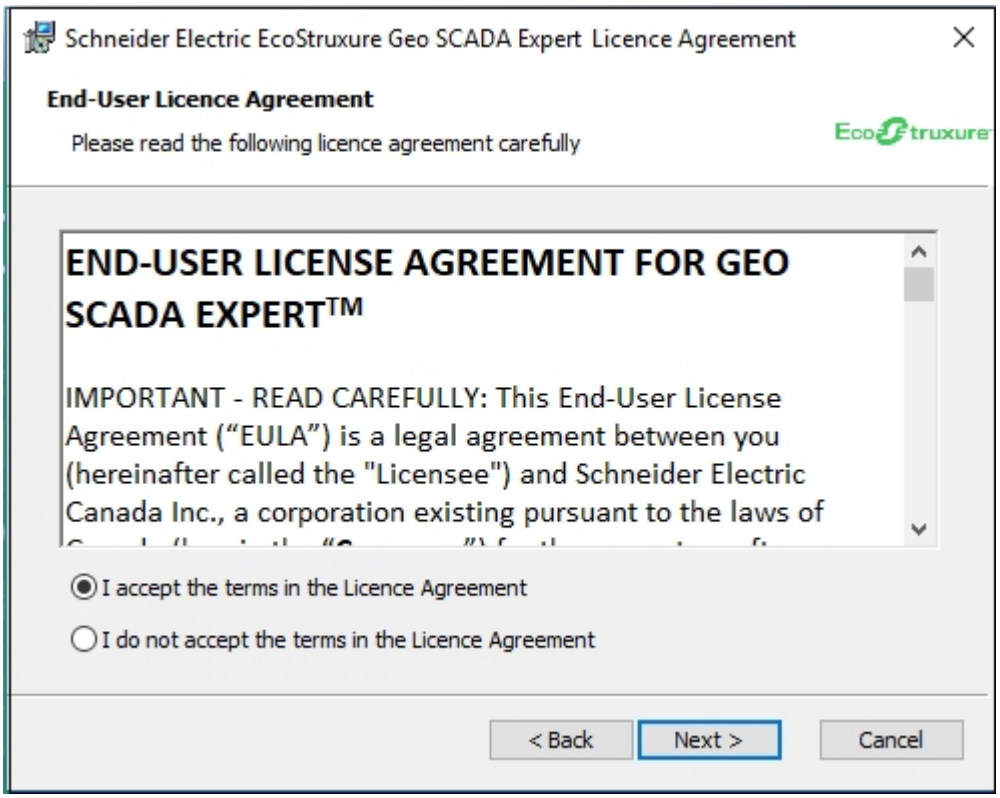
If this is a clean installation of Geo SCADA Expert, select **Next** to proceed to the End-User License Agreement. (A 'clean installation' is an installation of software on a machine on which a previous version of that software is not already installed.)

If you are upgrading an existing installation of Geo SCADA Expert, select **Next** to proceed to Database Emulation Configuration.

End-User License Agreement

NOTE: This page of the Installation Wizard is only displayed when you install Geo SCADA Expert for the first time on a machine.

To install Geo SCADA Expert, you need to review the license agreement and agree to the terms stated.



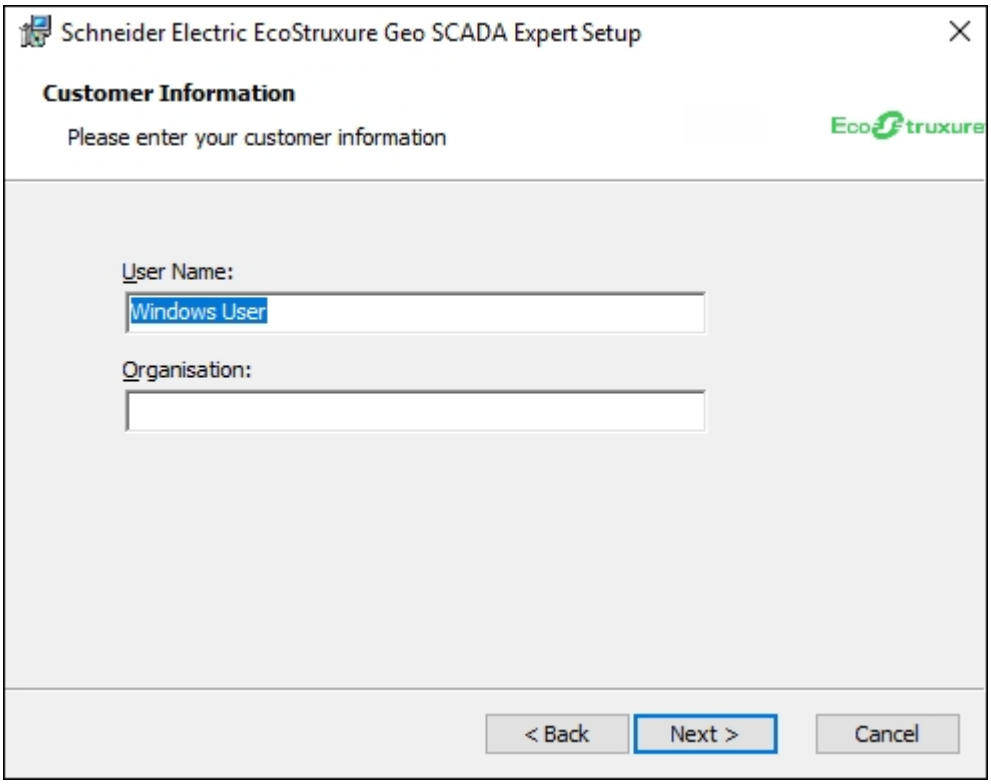
1. Please read the End-User License Agreement and select the **I acknowledge the terms in the License Agreement** option.
2. Select **Next** to proceed to Customer Information.

   NOTE: If you do not agree to the stated terms, select **I do not acknowledge the terms in the License Agreement**. You will be unable to install Geo SCADA Expert and the installation process will end.

Customer Information

NOTE: This page of the Installation Wizard is only displayed when you install Geo SCADA Expert for the first time on a machine.

On the Customer Information page of the Geo SCADA Expert Installer, enter your name and company name in the **User Name** and **Organization** fields.



The **User Name** and **Organization** are only required as part of the installation process and are not used after Geo SCADA Expert has been installed.

Select **Next** to proceed to Choose Setup Type.

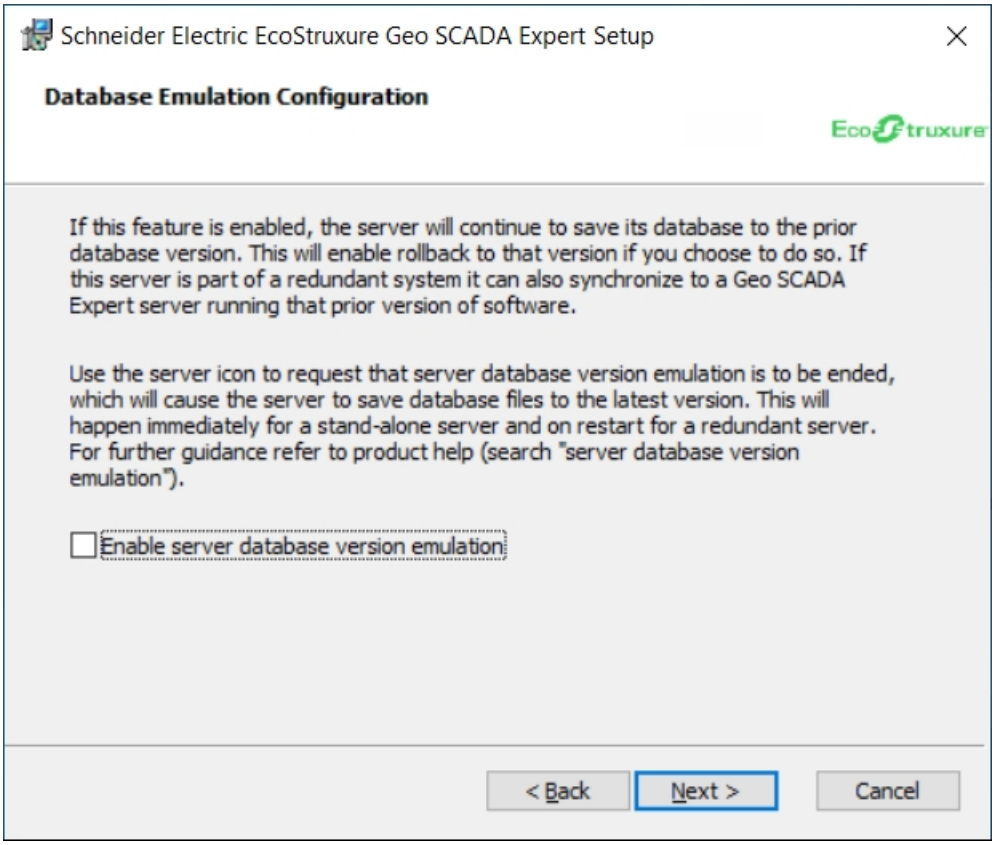
Database Emulation Configuration

NOTE: This page of the Installation Wizard is only displayed if you are upgrading an existing installation of Geo SCADA Expert.

Use the **Database Emulation Configuration** page to specify whether you want the upgraded server to initially emulate the version of Geo SCADA Expert software that it was running prior to this upgrade. While the server is emulating the prior database version, the database files continue to be saved in the format of that earlier database version. Such **Database Emulation** can prove a useful temporary stage while you run checks to ensure that the upgrade has been successful.

You might want to use Database Emulation, for example, if your system includes custom-built DDK drivers and you want to test that those drivers continue to run successfully following the upgrade. Once you have determined that the upgrade has been successful, you should deactivate the Database Emulation (*see* Deactivate Database Emulation after a Successful Upgrade). If, however, you decide that you want to downgrade back to the database version that the server was running prior to the upgrade, leave the Database Emulation activated. You will then be able to downgrade the server while retaining all of the data in that database, including the data that Geo SCADA Expert gathered during its operation with the upgraded software. This will be primarily due to the fact that the database files have continued to be saved in the same format as that prior database version (*see* Perform a Downgrade after Upgrading Geo SCADA Expert).

ATTENTION: Ensure that all of your servers are running the same build of Geo SCADA Expert 2020 or later software before enabling the Database Emulation feature while you upgrade those servers to Geo SCADA Expert 2021 or later software. When enabled, Geo SCADA Expert will only activate the Database Emulation during the upgrade if it detects that you are upgrading from an older version of software to which the database can be emulated (Geo SCADA Expert 2019 onwards). Once you have performed checks to ensure that the upgrade was successful, you should ensure that all of your servers are running the same build of upgraded software before then deactivating the Database Emulation feature.



Either:

- Select the **Enable server database version emulation** check box to enable Database Emulation. The database files continue to be saved in the format of the earlier database version that the server was running prior to this upgrade (the database can be emulated back to Geo SCADA Expert 2019 inclusive). You will be unable to use any new features on new or modified database items and properties that would otherwise be available in the upgraded version of Geo SCADA Expert until the Database Emulation has been deactivated. You should then deactivate the Database Emulation once you have upgraded all of the servers in the system and have determined that the upgrade is successful (*see* Deactivate Database Emulation after a Successful Upgrade). Once Database Emulation is deactivated, the new database items and properties that are only available in the product version to which you have just upgraded the server will become available for use.
- Clear the **Enable server database version emulation** check box if you do not want to enable Database Emulation. New database items and properties that are only available in the product version to which you are upgrading will be available for use once you complete the upgrade. However, should you decide to downgrade back to the earlier database version that the server was running prior to this upgrade, you will have to restore the versioned files of the database that were used prior to the upgrade (*see* Automatic Database Backup on Upgrade). Or, if your system has redundant servers, erase the database on this server and then start this server as a Standby or Permanent Standby to a Main server that is running the database version that this server was running prior to the upgrade. This is because, once upgraded, the database files will get saved in a newer version to that used prior to the upgrade.

NOTE: The setting that you select for the **Enable server database version emulation** check box is stored on the server. That same setting will then be offered as the default the next time that Geo SCADA Expert is upgraded on that server. (If required, you can use the Server Configuration Tool to change this setting (see 'Specify the Default Setting for the Database Emulation Feature' in the Geo SCADA Expert Guide to Server Administration).)

Select **Next** to proceed to Choose Setup Type.

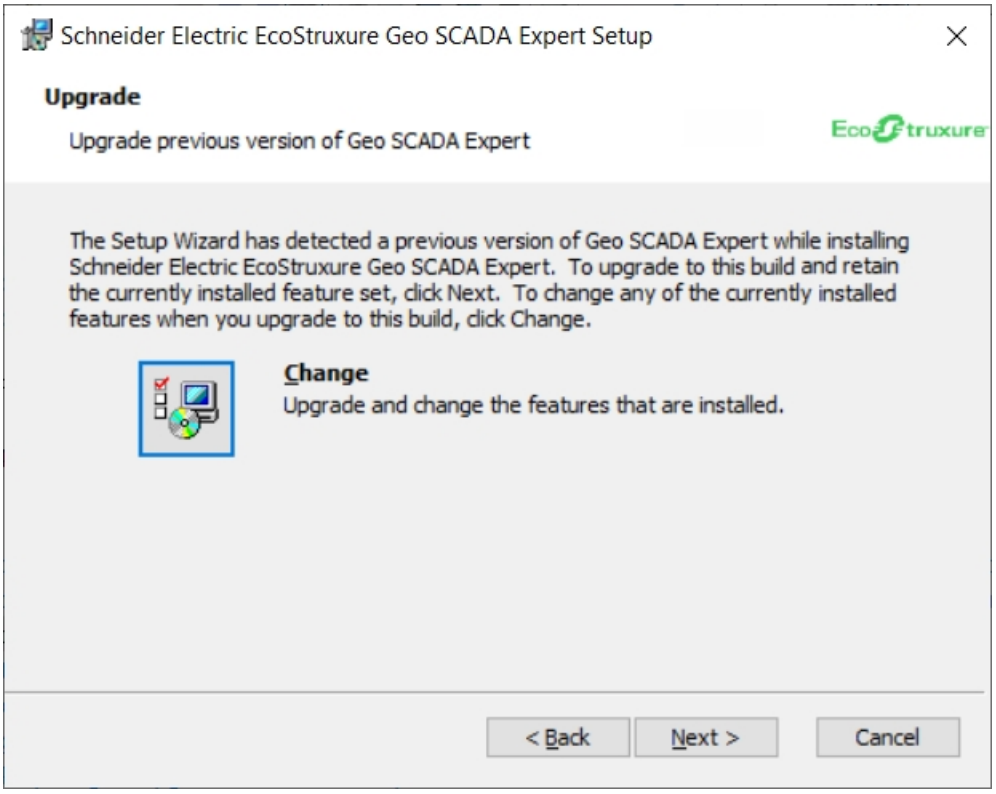
Further Information

Types of Emulation Supported by Geo SCADA Expert.

Upgrade

NOTE: This page of the Installation Wizard is only displayed if you are upgrading an existing installation of Geo SCADA Expert.

On the **Upgrade** page, select the **Change** option if you want to check which components are currently installed and optionally select a different combination of features. This will display the Custom Setup page from which you can specify which components are to be installed (*see* Custom Setup). (Remember that many components - in particular, some driver components - are licensed separately to the core Geo SCADA Expert product. If you opt to install additional features to those that were previously installed, you may have to upgrade your license accordingly (*see* Upgrade a License).)

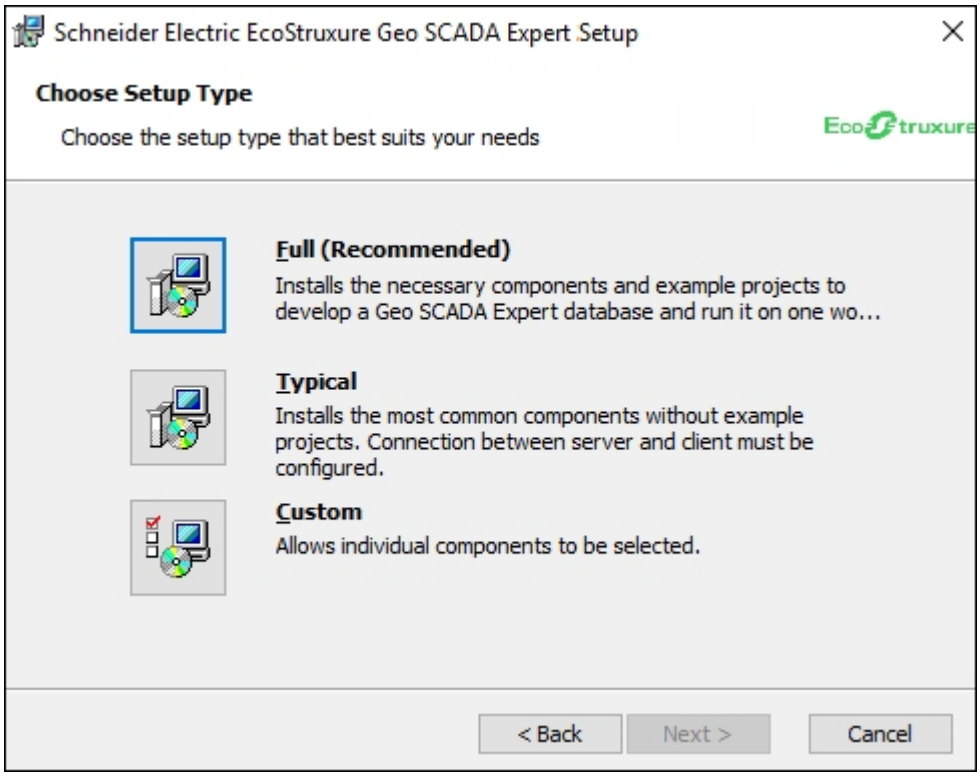


There is no need to select the **Change** option if you want to retain the currently installed feature set.

Once you are ready to move onto the next stage of the installation process, select the **Next** button, to go to Ready to Install.

Choose Setup Type

You can use the Geo SCADA Expert Installer's **Choose Setup Type** page to choose from up to three different types of installation:



ATTENTION: The **Full (Recommended)** option is only offered on Server and Server and Clients installations. Likewise, the **Typical** and **Custom** options only offer server components on Server and Server and Clients installations. With such installations, you have to install the Local Web Proxy group of prerequisites (*see* Geo SCADA Expert Prerequisite Components). If these prerequisites are required, but have not yet been installed, use the **Back** button on the Installation Wizard pages to go back to the **Setup** page and select the required prerequisites from that page.

Full (Recommended)

Select **Full (Recommended)** to install Geo SCADA Expert server, Geo SCADA Expert Client, and Data Access components. The Full installation also includes example projects and many, but not all, of the supported drivers.

You can find out which components are included in Full Install.

Typical

Select **Typical** to install the most commonly used components for:

- A Geo SCADA Expert server and client
- A Geo SCADA Expert client only
- Data Access only (Web, ODBC, OLEDB, OPC, and COM access).

You can make your selection on the **Typical Install** page (*see* Typical Install).

Custom

Select **Custom** if you want to choose which components will be installed. You can make your selections on the Custom Setup page.

You have to use Custom if you want to install different components to those included in the **Full** or **Typical** installations.

Full Install

ATTENTION: The **Full (Recommended)** option is only offered on Server and Server and Clients installations. With such installations, you have to install the Local Web Proxy group of prerequisites (*see* Geo SCADA Expert Prerequisite Components). If these prerequisites are required, but have not yet been installed, use the **Back** button on the Installation Wizard pages to go back to the **Setup** page and select the required prerequisites from that page.

When you select **Full (Recommended)** on the Choose Setup Type page of the Geo SCADA Expert Installer, the following components will be installed:

- ViewX Client
  - ViewX Help
  - Aquis
  - Crystal Reports*
  - SCADAPack x70
- Server
  - Server Side Help
  - Configuration Samples
    - Example Database
    - Symbol Library
    - Password Blocklist
    - Example FloBoss configuration
    - Example ROC Plus configuration
    - Example Totalflow configuration
  - Web Server
  - DNP3
    - SCADAPack E
  - EtherNet/IP
  - IEC 60870-5
  - IEC 61850
  - Kingfisher
  - Modbus - Advanced
    - SCADAPack Modbus
  - Modbus RTU Slave
  - MQTT
    - JSON Schema A
    - Sparkplug

    - Text & JSON
  - NTP Monitor
  - ODBC Client
  - OPC Client - Advanced
  - OPC UA
  - Pager
  - Schneider Electric EcoStruxure Web Services Client - Advanced
  - Schneider Electric SCADAPack 50
  - Schneider Electric SCADAPack x70
    - DNP3 Protocol
  - SNMP Manager
  - SQL Export
  - Trio Diagnostics - Advanced
- Data Access
- Server Management Utilities
- WebX Client
  (for Original WebX).

These components include the Geo SCADA Expert server, ViewX Client, WebX Client (for Original WebX), Data Access (for OPC, ODBC, OLEDB, Web and COM connections), and many of the available drivers. When installed, this will allow Geo SCADA Expert server and one ViewX client to run on the machine.

* The Crystal Reports client component is only included if the SAP Crystal Reports runtime components have been installed.

NOTE: The SAP Crystal Reports runtime components are NOT installed by default. If you intend to install them you must purchase a Crystal Reports runtime license for each server on which these components are to be operational (clients do not need a license to use the runtime components). For servers on which the runtime components are operational, the Crystal Reports runtime license is included with the Geo SCADA Expert Crystal Reports driver license. Please contact your Schneider sales representative for more information.

Install the 64-bit version of the SAP Crystal Reports Runtime Engine on Geo SCADA Expert server installations (to enable generating and exporting of reports). Install the 32-bit version of the SAP Crystal Reports Runtime Engine on ViewX clients and Virtual ViewX servers (to display reports). Please select both if you are to run Server and Clients on the same computer. As the runtime components are prerequisites, you have to select them before you continue further with the Geo SCADA Expert installation (this is handled automatically in the Virtual ViewX installer). For more information about the installation order, see the Installation section of the Geo SCADA Expert Guide to the Crystal Reports Driver.

If you intend using Crystal Reports on your system, you also need to install the Crystal Reports prerequisites and driver on any Permanent Standby servers, in order for the Geo SCADA Expert database to synchronize. However, as the Permanent Standby Geo SCADA Expert servers do not require the Crystal Reports driver to be operational, they do not require a Crystal Reports runtime license. (On the **Modules** tab on the Server Status Tool of such servers, the Crystal Reports driver will show a red 'No License' state due to the lack of runtime license. This is expected on Permanent Standby servers. On all other servers on systems that use Crystal Reports, the Crystal Reports driver and runtime components must be licensed.)

If additional drivers are required, you will need to use the **Custom** install option (*see* Custom Setup).

NOTE: The Area of Interest Cleaner utility is installed as part of the ViewX component.

When you choose the **Full (Recommended)** option, the Geo SCADA Expert Installer proceeds to the Super User Account page automatically (*see* Create a Super User Account).

Further Information

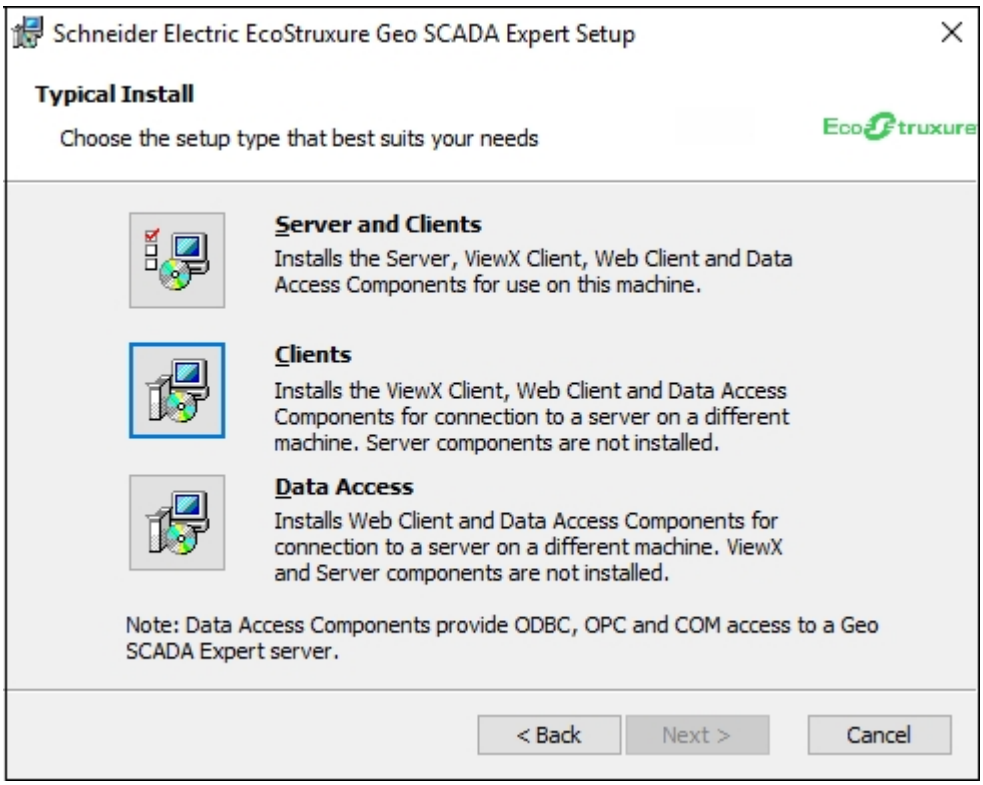
Installation of the Online Help.

Typical Install

The options that are offered on the **Typical Install** page vary, depending on the type of installation.

Server and Server and Clients Installations

If you choose **Typical** on the Choose Setup Type page on a Server or Server and Clients installation, you are presented with three options:



Server and Clients

Select this option to install the most commonly used server and client components. These include Geo SCADA Expert server, ViewX Client, WebX Client (for Original WebX), and Data Access components.

The typical **Server and Clients** installation contains the same components as the Full Install.

> **ATTENTION:** The **Server and Clients** option is only offered on Server and Server and Clients installations. With such installations, you have to install the Local Web Proxy group of prerequisites (*see* Geo SCADA Expert Prerequisite Components). If these prerequisites are required, but have not yet been installed, cancel the current installation and then restart the installation process and select the required prerequisites from the list that is offered.

Clients

Select this option to install the ViewX Client (including the Aquis client, the SCADAPack x70 client, and the Crystal Reports component if the 32-bit Crystal Reports runtime prerequisite has been installed), WebX Client (for Original WebX), and Data Access components. These are the most commonly used client components.

Data Access

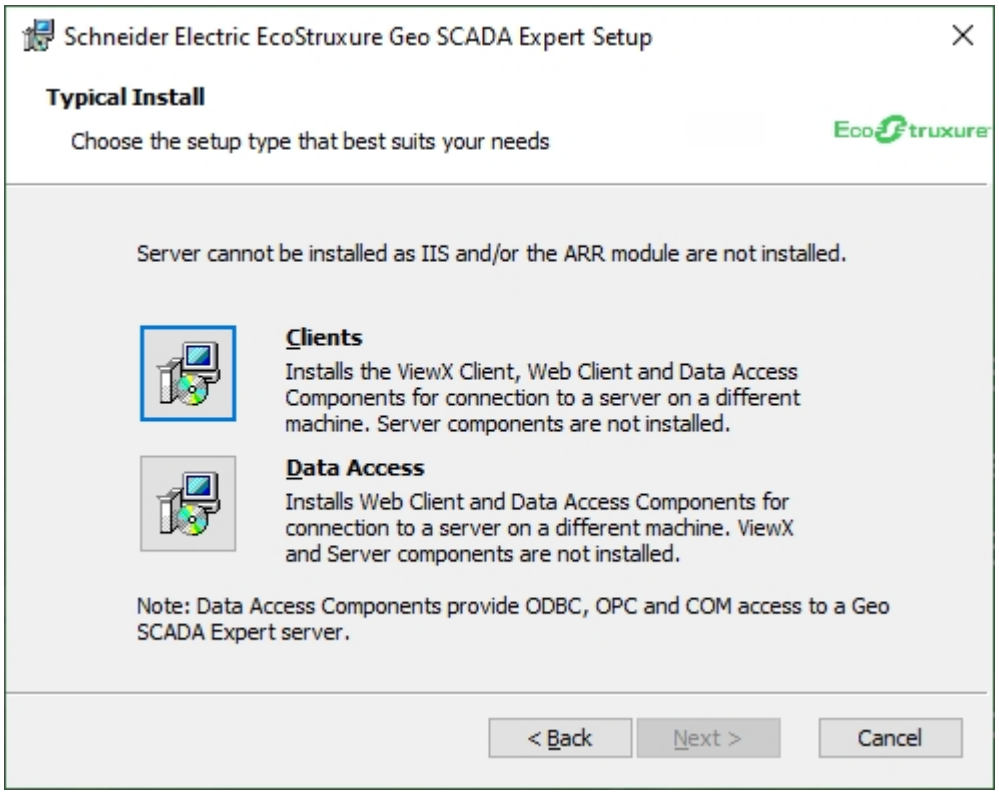
Select this option if you only want to install the WebX client and Data Access components (which allow Web, OPC, OLEDB, ODBC, and COM connections). ViewX and Geo SCADA Expert server components are not installed when you select this option.

If you select **Server and Clients**, the Geo SCADA Expert Installer displays the Custom Setup page (*see* Custom Setup).

If you select **Clients or Data Access**, the Geo SCADA Expert Installer displays the Ready to Install page (*see* Ready to Install).

Client Only Installations

If you choose **Typical** on the Choose Setup Type page on a client-only installation, you are presented with two options:



Clients

Select this option to install the ViewX Client (including the Aquis client, the SCADAPack x70 client, and the Crystal Reports component if the 32-bit Crystal Reports runtime prerequisite has been installed), WebX Client (for Original WebX), and Data Access components. These are the most commonly used client components. Server components are not installed.

Data Access

Select this option if you only want to install the WebX client and Data Access components (which allow Web, OPC, OLEDB, ODBC, and COM connections to a server on a different machine). ViewX and Geo SCADA Expert server components are not installed.

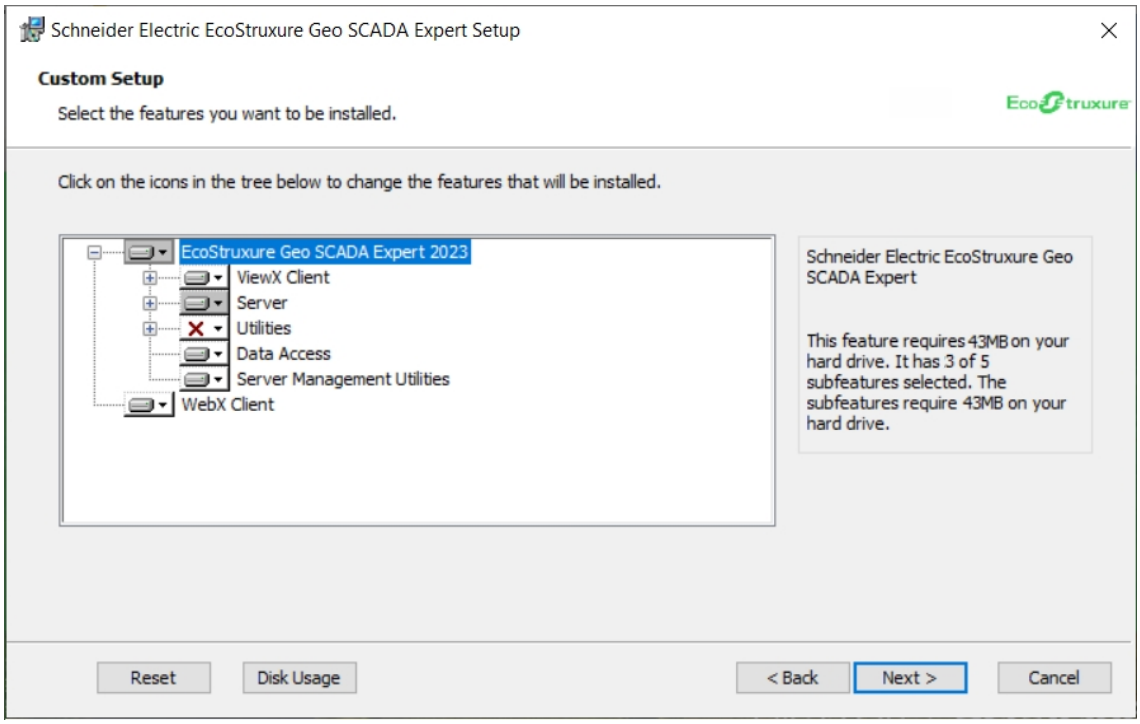
When you select **Clients or Data Access**, the Geo SCADA Expert Installer displays the Ready to Install page (*see* Ready to Install).

NOTE: The Area of Interest Cleaner utility is installed as part of the ViewX component.

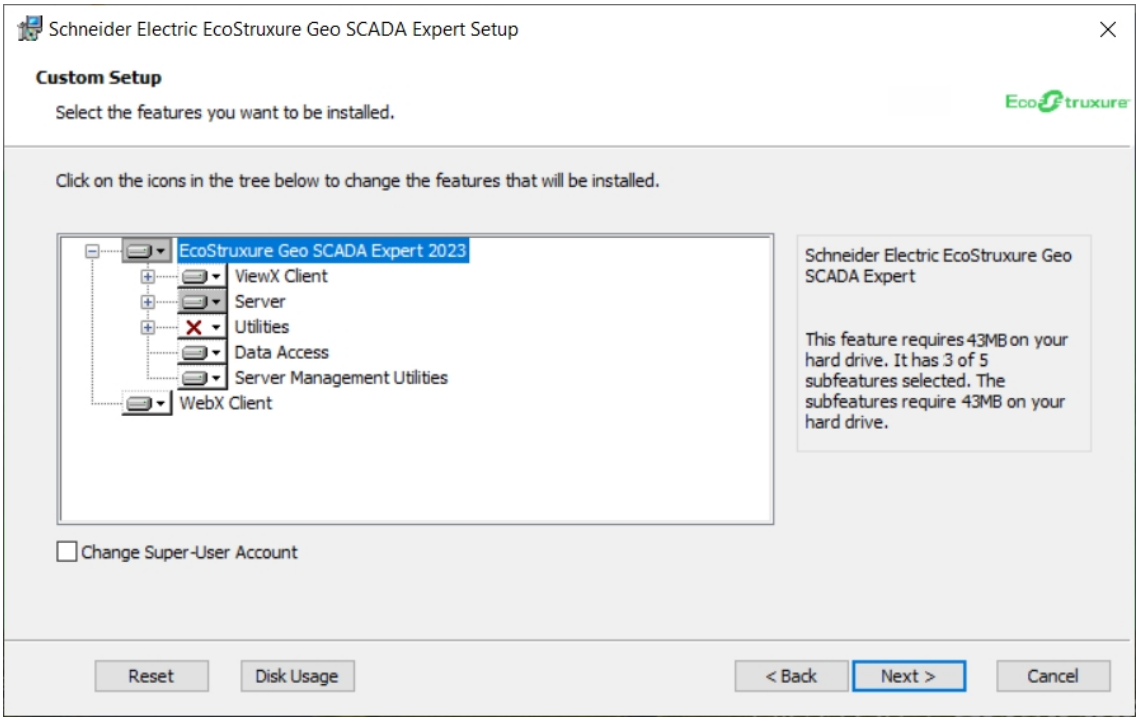
Custom Setup

You can select the components that you want to install on the server and clients on your system; to do this, you use the **Custom Setup** page. On a clean installation, this page is displayed when you choose **Custom** on the Choose Setup Type page. When installing an upgrade of Geo SCADA Expert, this page is displayed if you select the **Change** button on the Upgrade page.

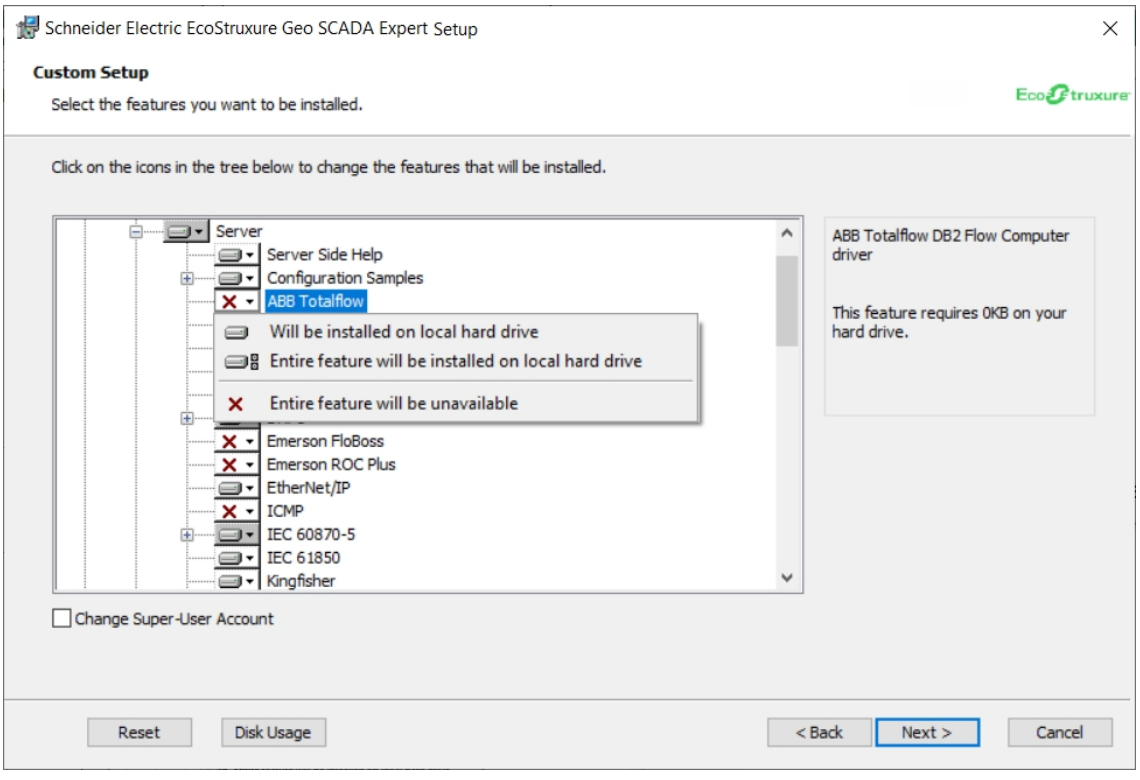
ATTENTION: The **Custom Setup** page only offers server components on Server and Server and Clients installations. With such installations, you have to install the Local Web Proxy group of prerequisites (*see* Geo SCADA Expert Prerequisite Components). If these prerequisites are required, but have not yet been installed, use the **Back** button on the Installation Wizard pages to go back to the **Setup** page and select the required prerequisites from that page.



The **Custom Setup** page is also displayed when you select the **Modify** button in order to make changes to an existing installation, The page layout differs slightly in that case, in that it includes a **Change Super-User Account** check box:



Use the hierarchical tree on the left-hand side of the page to choose which components are installed. The branches that are shaded gray can be expanded to reveal a series of components, which you can then include or exclude from the installation as required.

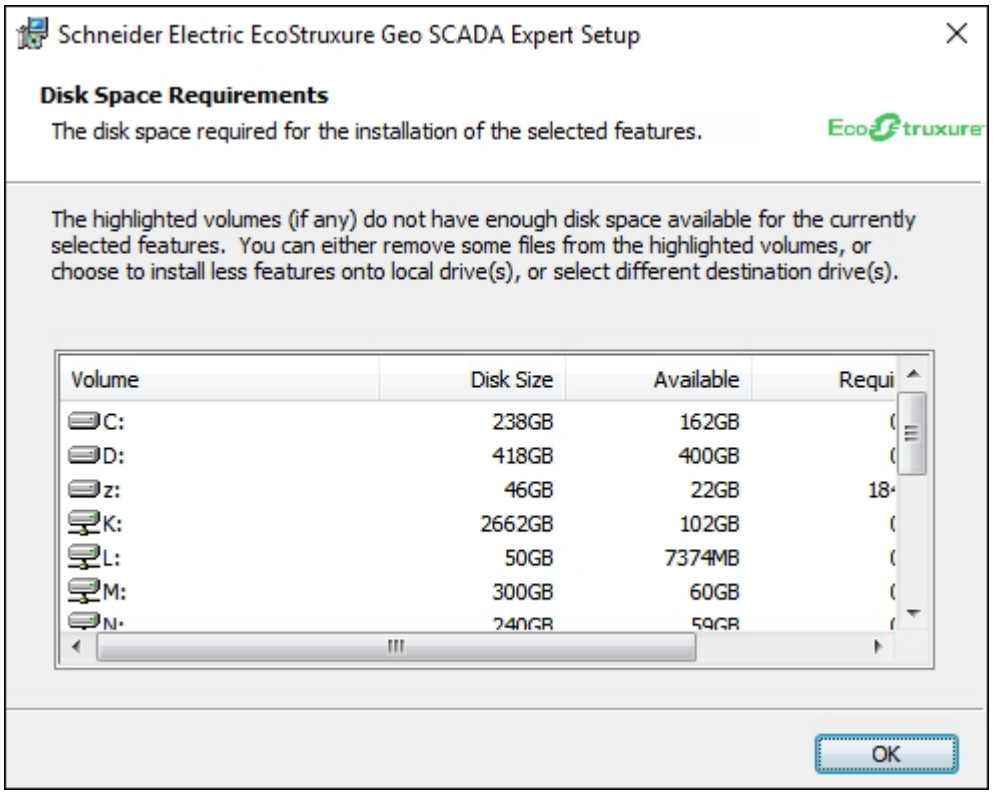


Use the plus and minus icons to expand and collapse the tree as required. To include or exclude a component (or entire collection of components), right-click on the branch or individual component and choose from these options:

- **Will be installed on local hard drive—**The selected component will be installed. If the component has sub-components, only those that are also selected will be installed.
- **Entire feature will be installed on local hard drive—**The selected component and all of its sub-components will be installed.
- **Entire feature will be unavailable—**The component will not be installed.

You can also use the Choose Setup Type page to define where the chosen components will be installed. The 64-bit components are installed to the directory indicated for **Location (x64)** and 32-bit components are installed to the directory shown for **Location (x86)**.

For information on the amount of disk space required for the installation you have chosen, select the **Disk Usage** button. This displays the Disk Space Requirements window, which shows any volumes that have insufficient space available.



When you have selected the components you want to install:

- If this is a clean installation of Geo SCADA Expert, select the **Next** button to proceed to Clean Installation of Database.
- If you are upgrading an existing installation of Geo SCADA Expert, select the **Next** button to proceed to Ready to Install.
- If you are modifying an existing installation of Geo SCADA Expert, and the **Change Super-User Account** check box is left clear, select the **Next** button to proceed to Ready to Install.
- If you are modifying an existing installation of Geo SCADA Expert, and have selected the **Change Super-User Account** check box, select the **Next** button to proceed to the **Super User Account** page. Use that page to set up or modify the Super User account settings.

Further Information

Installation of the Online Help.

Making Changes to your Geo SCADA Expert Installation.

Specify the Geo SCADA Expert installation components that are required to enable access to the Geo SCADA Expert database from mobile devices: see the separate Geo SCADA Mobile documentation suite. (This includes information about the **Mobile Companion** component.)

Installation of the Online Help

By default, the online help is installed both on the Geo SCADA Expert server and locally on each ViewX client. In the Installation Wizard, these installations are represented by the **Server Side Help** component in the **Server** branch and the **ViewX Help** component in the **ViewX Client** branch respectively. You can access the components if you opt to install a **Custom Setup**.

When the online help is installed on both the servers and ViewX clients:

- If you display the online help on a ViewX client, by default Geo SCADA Expert accesses that online help locally, from its installation on that client machine.
- If you display the online help from the Server Configuration Tool, or the Server Status Tool, by default Geo SCADA Expert accesses that online help locally, from its installation on that server machine.

We would usually expect all of the servers and clients across a system to be running the same version and build of Geo SCADA Expert. In which case, the online help will be the same on all of the clients and servers.

During a system upgrade, there might be times when the servers have been upgraded but the clients have not, resulting in the servers and clients temporarily running different builds. In such a situation, the local version of online help on the clients might not be synchronized with updated server-based Geo SCADA Expert database items. If this situation is likely to exist for some time and users require the more up-to-date help about the database items that exists on the upgraded servers, you can set the clients to **Use Server Based Help**. You set this on a per client basis. Once the clients have been upgraded, you would typically turn this setting off again, so that Geo SCADA Expert then accesses the help locally from the client machines. For information about this setting, see 'Miscellaneous Options for ViewX Clients' in the Geo SCADA Expert Guide to Client Administration.

You can run Geo SCADA Expert on remote desktop setups (*see* 'Geo SCADA Expert on Citrix and Remote Desktop Services' in the Geo SCADA Expert Guide to Server Administration). On such a setup, each client might require multiple users to share a common set of help files. You can specify the location at which the help files are unpacked on such a client so that the online help can be shared between users (*see* 'Specify a Different Location for the Online Help' in the Geo SCADA Expert Guide to Client Administration).

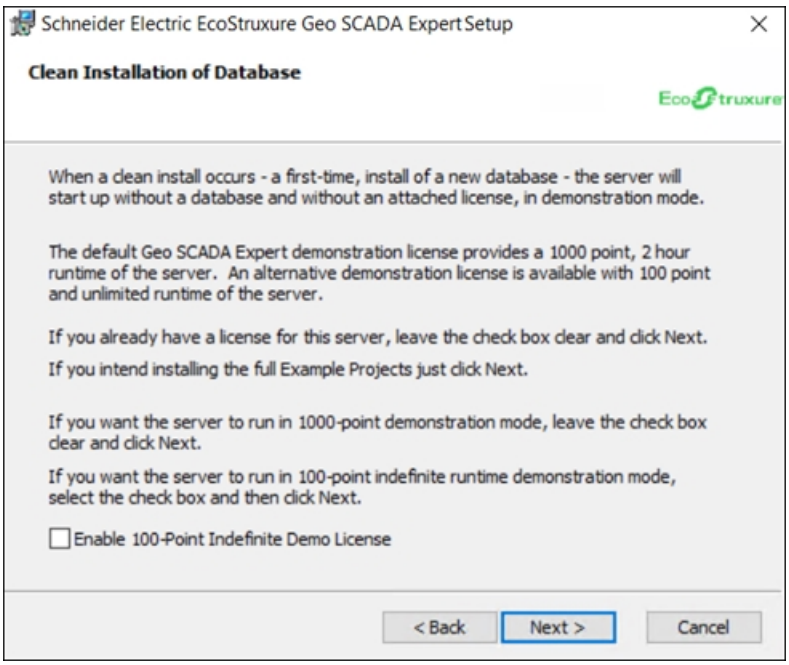
Clean Installation of Database

NOTE: This page of the Installation Wizard is only displayed when you install Geo SCADA Expert for the first time on a machine.

When you install Geo SCADA Expert for the first time on a machine, the server will start in demonstration mode as no license has been attached yet.

If you have a license for the server, or if you intend to use the example projects, you can move directly to the next page of the Installation Wizard. To do this, ensure that the **Enable 100-Point Indefinite Demo License** check box is clear, and click **Next**. Refer to 'Server License Settings - Geo SCADA Expert' in the Server Administration Guide for more information on how you can add a license file for the server.

If you do not have a license for the server, you can use the Geo SCADA Expert Installer's **Clean Installation of Database** window to select the type of demonstration license that you want to use.



There are two types of demonstration licenses that you can opt for:

- The default demonstration license which runs for 2 hours, and restricts your system to a maximum of 1000 configurable database points. With this license, you will have to restart the server every 2 hours.

  Keep the **Enable 100-Point Indefinite Demo License** check box clear, and click **Next**, if you want to use the default 1000-point demo license.

- An alternative demonstration license which runs indefinitely, but restricts your system to a maximum of 100 configurable database points. This option also restricts the ViewX license to be '**Local ViewX Only**'. This means that the license is restricted to just a locally installed ViewX client on the same host as the Geo SCADA Expert server.

  Select the **Enable 100-Point Indefinite Demo License** check box, and click **Next**, if you want to use the 100-point indefinite demo license.

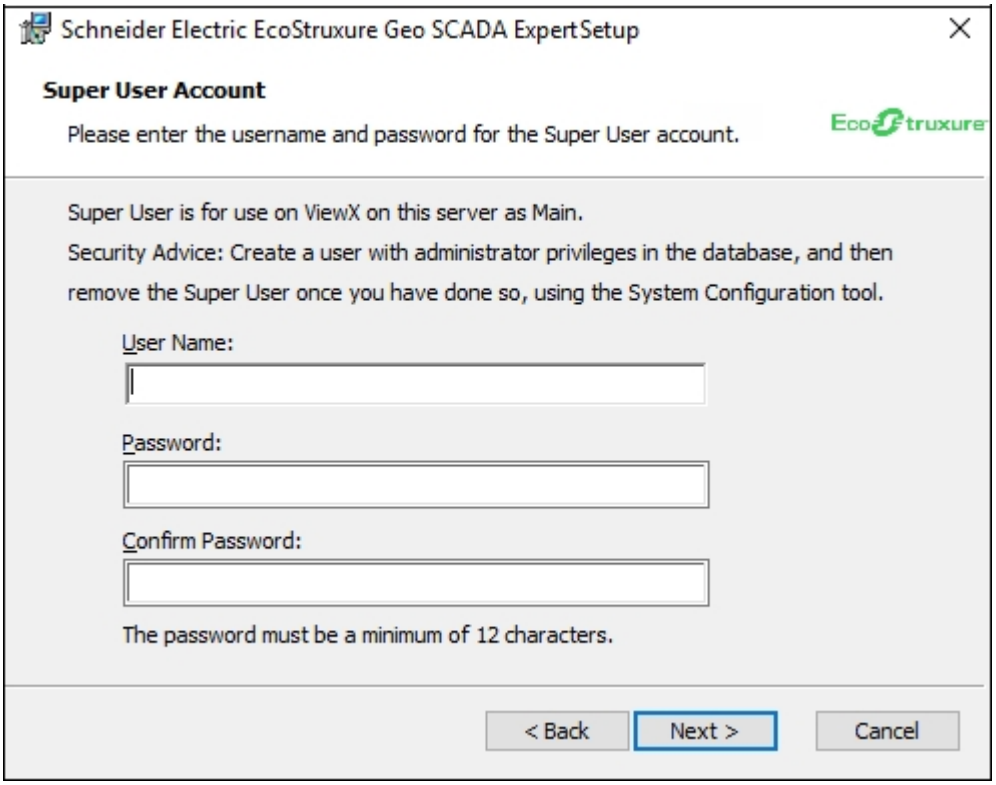
NOTE: While using the 100-point indefinite demo license, if the point count of the database exceeds 100, then the license will revert to the default 1000-point demo license with a 2-hour limit.

Create a Super User Account

NOTE: This page of the Installation Wizard is only displayed when you install Geo SCADA Expert for the first time on a machine, or after you select **Change Super-User Account** on the **Custom Setup** page when modifying an existing installation.

The Super User Account is a special user account that has unlimited access to all Geo SCADA Expert features. It is designed to be used when the initial security features are yet to be set up on a new system, or have been configured incorrectly and are preventing access to your system. With the latter situation, you can use the Super User account to log on to the main server and rectify the security configuration errors. You can change the credentials of the Super User account via the **Security** section of the Server Configuration Tool. Once you have set up your system to include suitably configured Geo SCADA Expert User Accounts for performing administrative functions, we recommend that you disable the Super User account. You do this via the Server Configuration Tool.

On the Super User Account page of the Geo SCADA Expert Installer, you can choose whether you want to enable the Super User account. You can also define the log on details for the Super User. As the Super User account has no restrictions (other than that it only enables access to the local server on which that account exists), you should only allow authorized personnel access to the Super User's user name and password.



1. Enter a **User Name** for the Super User. This will be the exact User Name required to log on to Geo SCADA Expert via the Super User account.
2. Enter a **Password** for the Super User. Again, this will be the exact password required for log on. You have to specify a password that is at least 12 characters long. The password is case-sensitive. It is stored in encrypted format and is designed only to be decrypted by the server on which it was created.

3. Enter the password again in the **Confirm Password** field.
4. If this is a clean installation of Geo SCADA Expert, select **Next** to proceed to Web Server Ports Configuration.

   If you are modifying an existing installation of Geo SCADA Expert, select **Next** to proceed to Ready to Install.

NOTICE

SECURITY THREAT

The Super User account has no restrictions and access to every part of the system, therefore unauthorized use of the account could compromise the security of the system.

You should only allow authorized personnel to have access to the Super User's user name and password.

Failure to follow these instructions can result in equipment damage.

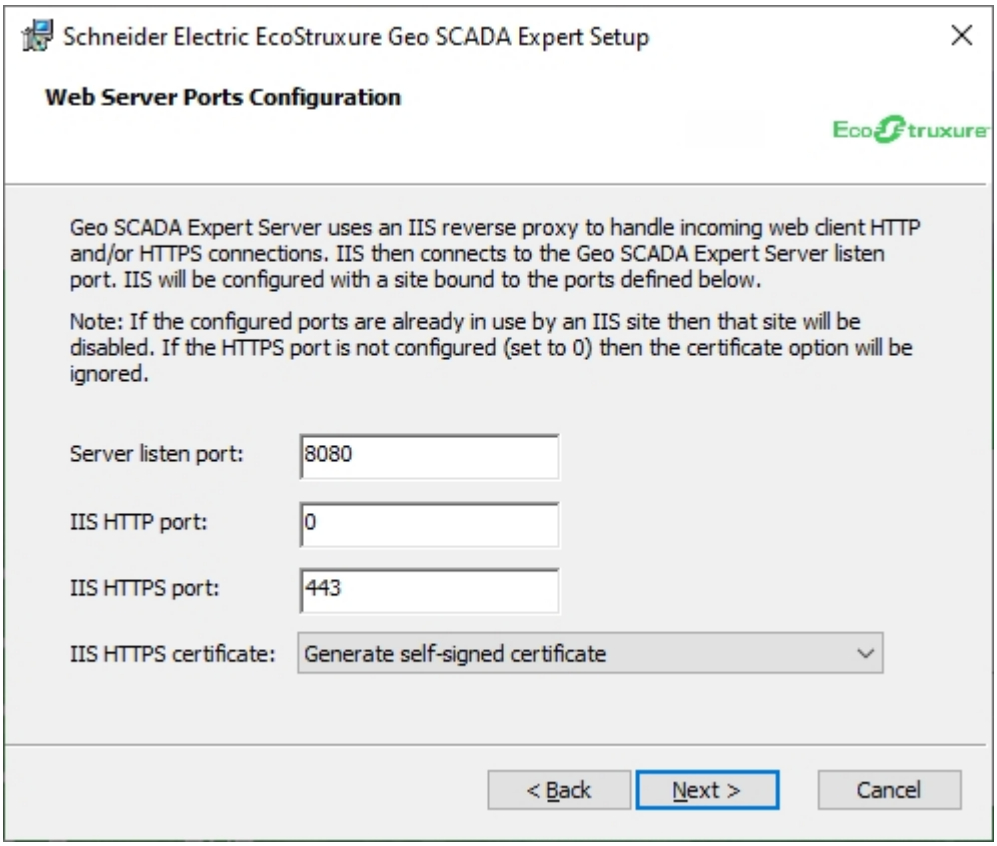
Web Server Ports Configuration

NOTE: This page of the Installation Wizard is only displayed on a Geo SCADA Expert server installation. (It is not displayed on a client-only installation.)

NOTE: This page is not shown when you modify an existing installation. To change the Web Server Port settings on an existing installation, use the IIS Manager application to change the settings and then replicate any changed port settings in the **WebX** section of the Server Configuration Tool.

A local IIS reverse proxy is now installed and configured as part of the Geo SCADA Expert installation when you use the Installation Wizard to install the server components. We recommend that you use this local IIS reverse proxy to perform TLS negotiation on behalf of the Geo SCADA Expert server.

Use the **Web Server Ports Configuration** page to specify Geo SCADA Expert's web server port and the ports that the IIS reverse proxy is to use. Also specify the certificate that the IIS reverse proxy is to use for HTTPS communications. The properties on this page are used to configure the local proxy settings in the Internet Information Services (IIS) Manager application.



- **Server listen port**—Use to specify the port on which the Geo SCADA Expert server should listen for new connections. The default is port 8080. This is the HTTP listen port that is defined in the **WebX** section of the Server Configuration Tool.
- **IIS HTTP port**—Use to specify the port on which the IIS reverse proxy should listen for HTTP connections.

  By default, this port is disabled (represented by the value being set to zero (0)).

When enabled (by specifying a port number other than 0), the IIS reverse proxy accepts non-secure HTTP connections via the specified port number. Ensure that you do not specify a port that is already in use by an IIS site, as that site will be disabled.

- **IIS HTTPS port**—Use to specify the port on which the IIS reverse proxy should listen for secure HTTPS connections. The default is port 443. Ensure that you do not specify a port that is already in use by an IIS site, as that site will be disabled.
- **IIS HTTPS certificate**—Use to specify the certificate that the IIS reverse proxy should provide to web clients. You can select any certificate with a matching private key that exists in the local machine's Personal certificate store. Alternatively you can opt to generate a self-signed certificate if an existing certificate is not available; this is not recommended as web clients will not be able to validate the web server's identity. If the IIS reverse proxy is already configured with a certificate then an additional option to retain the existing certificate is available. If, at a later stage, you want to select a different certificate, do so via the IIS Manager application.

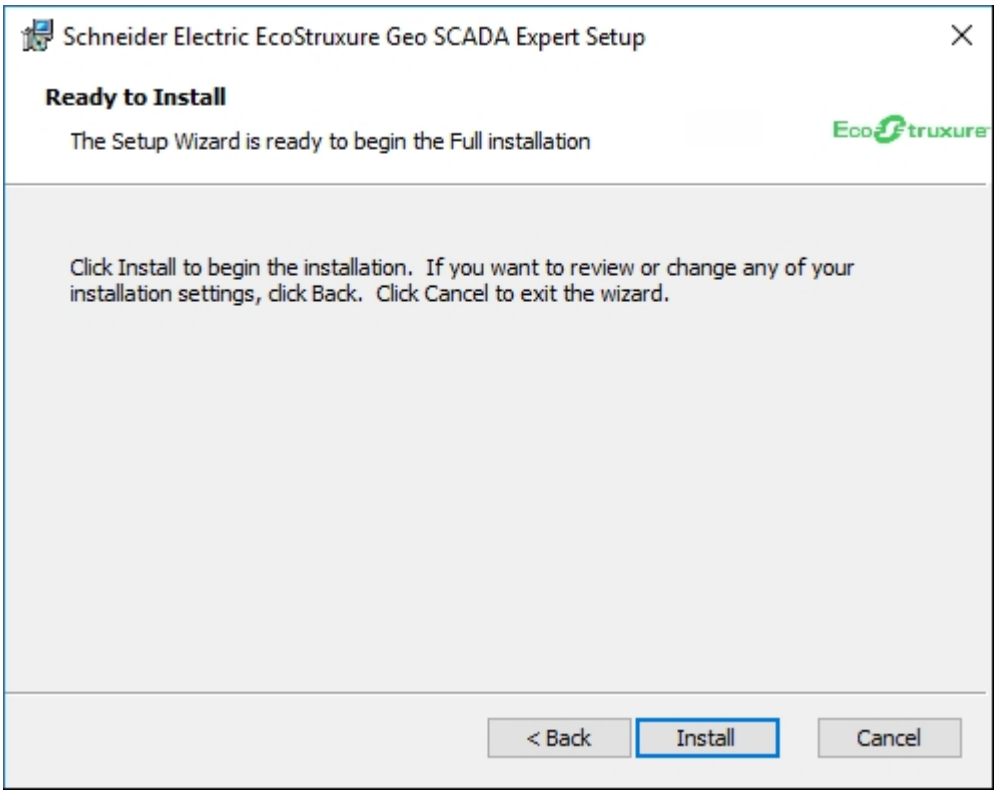
  This setting is ignored if the **IIS HTTPS port** is disabled (set to 0).

ATTENTION: The settings in the **WebX** section of the Server Configuration Tool are used to inform the Geo SCADA Expert server of the current IIS configuration. These are initially set up to use the settings that you specify above. If the settings are later changed in the IIS Manager application, remember to also update the settings in the **WebX** section of the Server Configuration Tool.

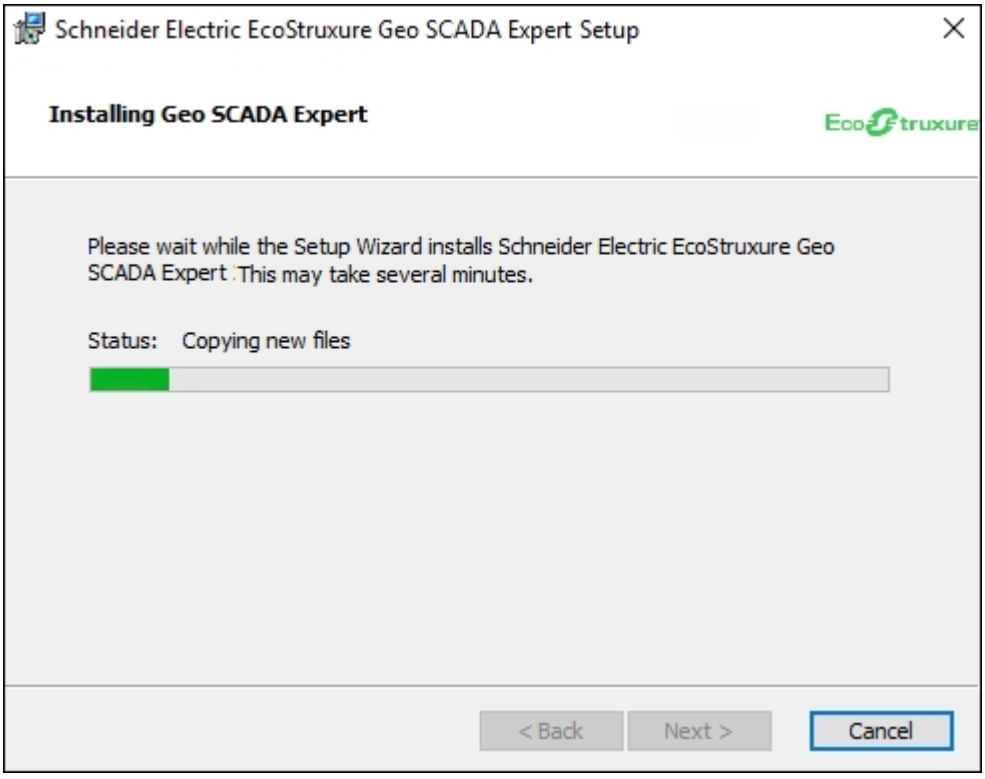
Once you are ready to move onto the next stage of the installation process. select the **Next** button to go to Ready to Install.

Ready to Install

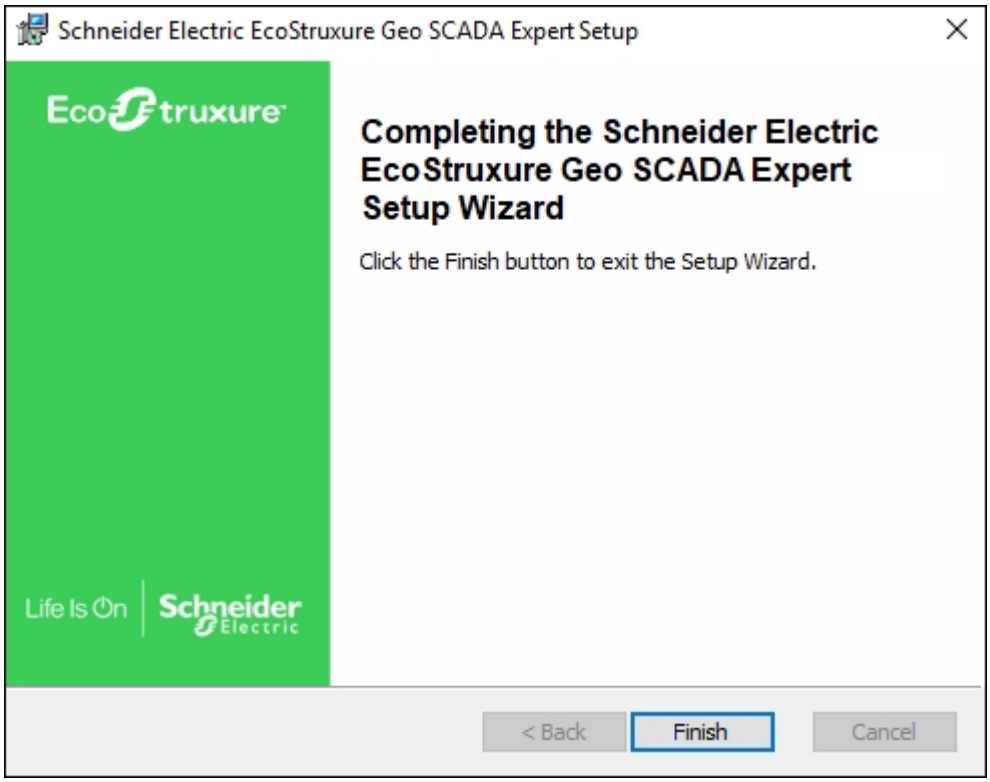
On the Ready to Install page, select the **Install** button to begin the installation process.



When you have selected **Install**, the installation process begins.



When the installation is complete, the Finish page is displayed. If you have chosen to install Geo SCADA Expert server or client software, you may also notice that new icons have been added to your desktop.



Select **Finish** to complete the installation procedure.

NOTE: Having installed Geo SCADA Expert, you will need to set up connections, licenses, and so on.

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

Further Information

For information about configuring a Geo SCADA Expert server, *see* the Geo SCADA Expert Guide to Server Administration.

For information about setting up a Geo SCADA Expert or Data Access client, *see* the Geo SCADA Expert Guide to Client Administration.

For information about licenses, see 'Server License Settings - Geo SCADA Expert' in the Geo SCADA Expert Guide to Server Administration.

For information about setting up the drivers on your system, see the Geo SCADA Expert Guide to Drivers and the relevant driver guides.

Virtual ViewX Server Requirements

The Virtual ViewX server in Geo SCADA Expert uses a screen virtualization technology to render ViewX content on the web browser. Each new Virtual ViewX user is given a private ViewX instance, logged in to their Geo SCADA Expert user account. Consequently, the web server has to have enough resources to run these Virtual ViewX instances for the number of users for which it is licensed, and it may be necessary to distribute Virtual ViewX users differently to Original WebX.

The following is a guide to the resources needed. This is a guide and not a guarantee of performance.

- We recommend that in addition to operating system memory requirements (approximately 3Gb), that you allocate 200 MB RAM per client, or more for complex Mimic displays.
- We recommend one core per two ViewX clients up to 10 ViewX clients, and one core per three ViewX clients beyond 10 ViewX clients, with a minimum of four cores for a Virtual ViewX server.
- We recommend a minimum network connection for the server of 100 Mbps, with 1 Gbps preferred for Virtual ViewX servers that are hosting over 15 clients.
- An SSD drive for the operating system, program files, and log file locations is recommended.
- A modern (2018+) CPU of 2.5GHz or faster is recommended, and there will be a better user experience with greater CPU speed. A server-side graphics accelerator may increase performance.

Performance of Virtual ViewX may be affected by Mimic complexity, user activity, and the number of displays that are open on the client.

A second session for a user (for example, a second tab or browser started on the same client) will count as a separate Virtual ViewX client for performance purposes, although it is included within the license of a single client.

Further Information

Virtual ViewX Server Configuration and Performance Guidelines.

Virtual ViewX Server Configuration and Performance Guidelines

System performance is affected by many factors. When setting up the Virtual ViewX clients and servers on your system, you should take into account the Virtual ViewX related content in the following topics:

- Operational Limitations - Geo SCADA Expert Server
- Virtualization and Cloud
- Supported Operating Systems.

For a table that shows the results of a series of industry-standard system benchmark tests that have been performed on a variety of Virtual ViewX client and server setups, please see the Release Notes for your installation of Geo SCADA Expert.

Before using Virtual ViewX in a 'live' system, we recommend that you perform your own tests using a test system that accurately reflects the real system (including database size and data retrieval frequency). Perform further tests once Virtual ViewX is set up on the real system and whenever further Virtual ViewX clients are added.

You are restricted to having up to a maximum of 5 Geo SCADA Expert displays open simultaneously on a Virtual ViewX client (providing that your User Account provides **Multi Document Interface** access).

Further Information
Virtual ViewX Server Requirements.
Geo SCADA Expert System Performance Guidelines.
Recommended Geo SCADA Expert Server Configurations.

Installing the Virtual ViewX Server

You can install the Virtual ViewX (Web) server on any server computer that meets the recommended specifications; this includes installing the server on a supported 64-bit operating system (*see* 64-Bit).

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

NOTE: In order to run Virtual ViewX, all Geo SCADA Expert servers must be running Geo SCADA Expert 2019 onwards; they cannot be running older versions of the software, or be set to emulate older versions.

You can use the Geo SCADA Expert DVD to install the Virtual ViewX server. You will configure the basic settings that required for IIS during the installation process.

To install the Virtual ViewX server:

1. Run the Geo SCADA Expert Installer and select the **Install Virtual ViewX Server** option. The Virtual ViewX Server Setup Wizard provides a series of 'pages' that guide you through the installation process.
2. Use the various 'pages' of the Setup Wizard to make selections relating to the Virtual ViewX Server installation.
3. License your Virtual ViewX Installation.
4. Check that the automatically created Virtual ViewX accounts in Windows have the required settings (*see* 'User Accounts Created Automatically on the Virtual ViewX Server Machine' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration).
5. Ensure that the settings on the Virtual ViewX Manager application are configured appropriately (*see* 'Working with the Virtual ViewX Manager' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration).
6. Set up connections to your Geo SCADA Expert system (see 'Configure a Virtual ViewX Server Connection to the Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration).

NOTICE

INABILITY TO RUN VIRTUAL VIEWX

Do not delete, or change the password of, the **VVXLocalUser** that is created automatically in Windows when Virtual ViewX is installed on the Virtual ViewX server. This user account is required to run the ViewX processes on that server machine.

Failure to follow these instructions can result in inoperable equipment.

Further Information

Modify your Virtual ViewX Server Installation.

'Troubleshooting a Virtual ViewX Server Installation' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration.

Run the Virtual ViewX Server Installer

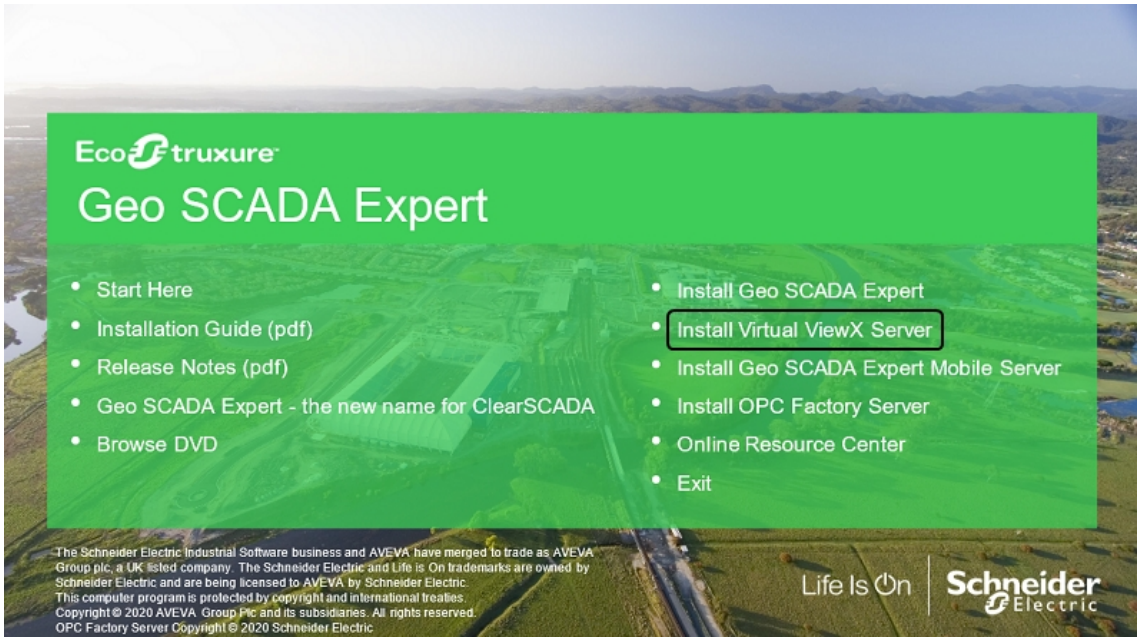
To install the Virtual ViewX (Web) server, you need to run the Geo SCADA Expert installer program.

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

To run the Geo SCADA Expert installer:

1. Insert the Geo SCADA Expert DVD. If Autorun is disabled on your PC, run the DVD manually.
2. When the Geo SCADA Expert screen is displayed, select the **Install Virtual ViewX Server** option.



The Virtual ViewX Server installer runs.

NOTE: When you run the installer, Windows may ask you if you want Virtual ViewX Server Setup to be able to make changes to your computer. Choose **Yes** to allow the installation to continue.

The Welcome 'page' is shown (*see* Virtual ViewX Server Setup Wizard).

If your PC does not have the required prerequisite components installed, the installer will attempt to install them before installing Virtual ViewX (*see* Virtual ViewX Server Prerequisite Components). For example, it will install Thinfinity® VirtualUI™ if it does not exist on the machine already.

NOTICE

INABILITY TO RUN VIRTUAL VIEWX

Do not delete, or change the password of, the **VVXLocalUser** that is created automatically in Windows when Virtual ViewX is installed on the Virtual ViewX server. This user account is required to run the ViewX processes on that server machine.

Failure to follow these instructions can result in inoperable equipment.

Further Information

Prerequisites for machines on which Geo SCADA Expert is installed: *see* Geo SCADA Expert Prerequisite Components.

Virtual ViewX Server Prerequisite Components

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

The Virtual ViewX server is designed to run on a computer that has certain other components installed. The components comprise a combination of the following:

- Visual C++ Redistributable for Visual Studio 2013 Update 5 x86
- Visual C++ Redistributable for Visual Studio 2015-2022 x86
- .NET 4.8 Full Runtime
- IISSetup
- IIS URL Rewrite Module 2
- Microsoft Application Request Routing 3.0
- SAP Crystal Reports runtime engine for .NET Framework (32-bit)
- Sentinel System Driver Installer 7.6.0.

WARNING

DO NOT UNINSTALL PREREQUISITE COMPONENTS

Uninstalling the prerequisite components may result in the Virtual ViewX server being unable to provide access to certain features, or being unable to run. It could also affect system security. For these reasons, do not uninstall the prerequisite components.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

When you install Virtual ViewX, the components that are essential for Virtual ViewX to run on your operating system are installed automatically. A prompt is displayed for non-essential components, allowing you to choose the components that are relevant to your system.

We suggest that you only choose to install components that you need for your system.

Installing components that are not needed on your system uses up disk space unnecessarily.

NOTE: The SAP Crystal Reports runtime components are NOT installed by default. If you intend to install them you must purchase a Crystal Reports runtime license for each server on which these components are to be operational (clients do not need a license to use the runtime components). For servers on which the runtime components are operational, the Crystal Reports runtime license is included with the Geo SCADA Expert Crystal Reports driver license. Please contact your Schneider sales representative for more information.

Install the 64-bit version of the SAP Crystal Reports Runtime Engine on Geo SCADA Expert server installations (to enable generating and exporting of reports). Install the 32-bit version of the SAP Crystal Reports Runtime Engine on ViewX clients and Virtual ViewX servers (to display reports). Please select both if you are to run Server and Clients on the same computer. As the runtime components are prerequisites, you have to select them before you continue further with the Geo SCADA Expert installation (this is handled automatically in the Virtual ViewX installer). For more information about the installation order, see the Installation section of the Geo SCADA Expert Guide to the Crystal Reports Driver.

If you intend using Crystal Reports on your system, you also need to install the Crystal Reports prerequisites and driver on any Permanent Standby servers, in order for the Geo SCADA Expert database to synchronize. However, as the Permanent Standby Geo SCADA Expert servers do not require the Crystal Reports driver to be operational, they do not require a Crystal Reports runtime license. (On the **Modules** tab on the Server Status Tool of such servers, the Crystal Reports driver will show a red 'No License' state due to the lack of runtime license. This is expected on Permanent Standby servers. On all other servers on systems that use Crystal Reports, the Crystal Reports driver and runtime components must be licensed.)

Further Information

Prerequisites for machines on which Geo SCADA Expert is installed: *see* Geo SCADA Expert Prerequisite Components.

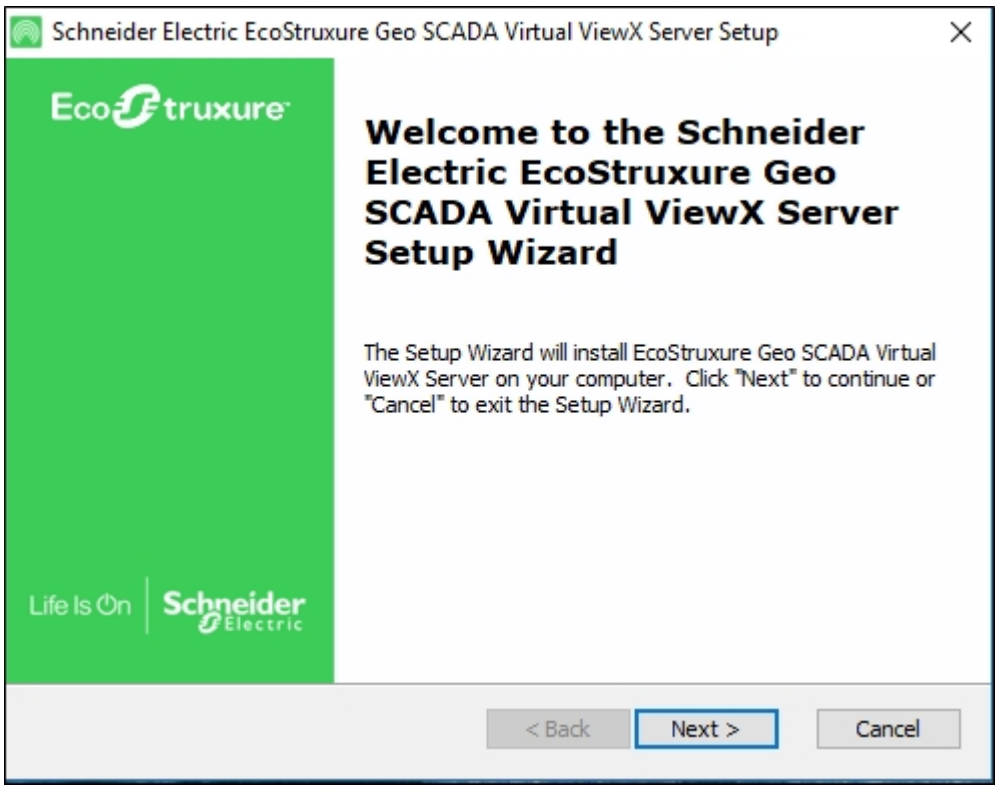
Virtual ViewX Server Setup Wizard

The Welcome page is the first page of the installation wizard. It provides you with information about the version of Virtual ViewX that you are about to install.

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

1. On the Virtual ViewX Setup Wizard page select **Next**, the installation process begins.



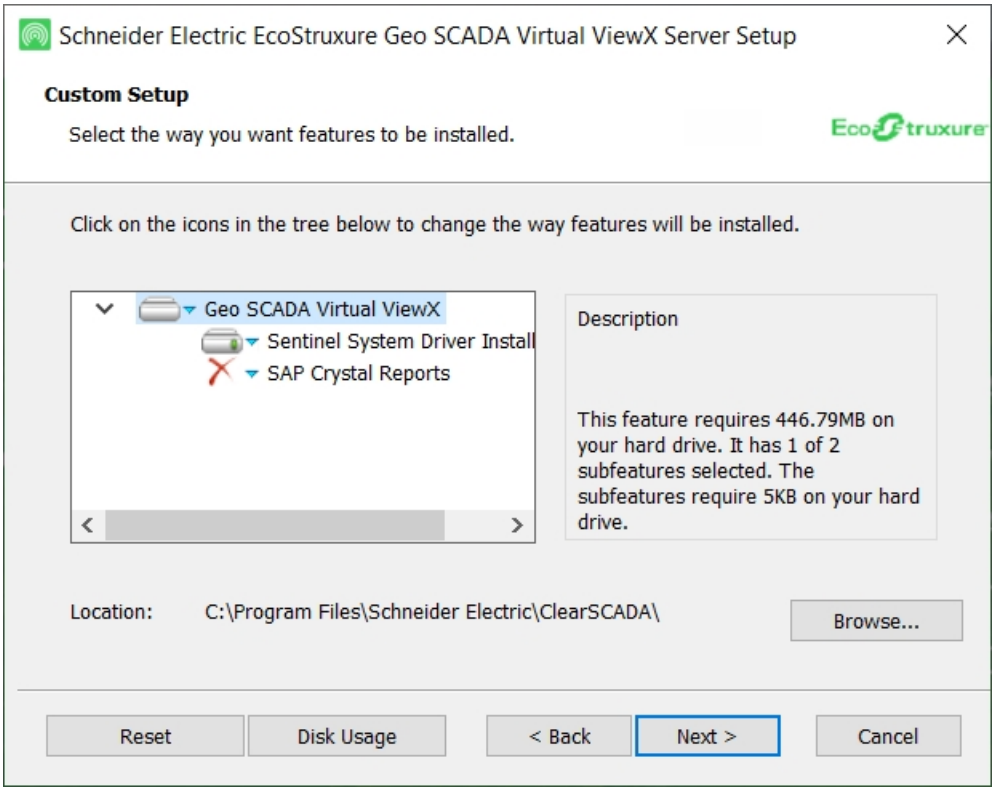
2. To install the Virtual ViewX server, you need to review the license agreement and agree to the terms stated.



3. Please read the End-User License Agreement and select the **I acknowledge the terms in the License Agreement** option.

> **NOTE:** If you do not agree to the stated terms, select **I do not acknowledge the terms in the License Agreement**. You will be unable to install the Virtual ViewX Server features and the installation process will end.

4. Select **Next** to proceed to the Custom Setup page.

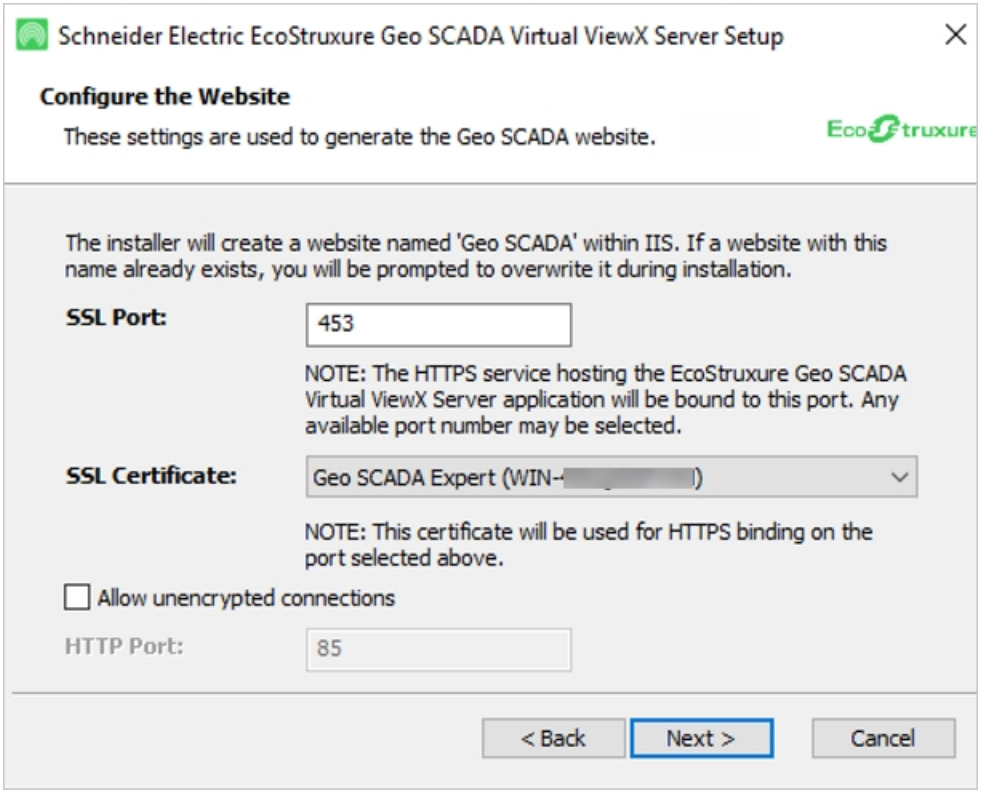


5. Use the drop-down button on the branch or individual component to include or exclude a component (or entire collection of components), and choose from the following options:
   - **Will be installed on local hard drive**—The selected component will be installed. If the component has sub-components, only those that are also selected will be installed.
   - **Entire feature will be installed on local hard drive**—The selected component and all of its sub-components will be installed.
   - **Entire feature will be unavailable**—The component will not be installed.

   NOTE: Some run-time components are not installed by default. If you intend to install any of such components, you must purchase a license for them to be operational. Please contact your Schneider sales representative for more information.

6. Select **Next** to proceed to the Configure the Website page.

   NOTE: The Configure the Website page is only displayed on new Virtual ViewX installations. On upgrades, you are taken directly to the Ready to Install page from the license agreement page.



The Configure the Website page prompts you to configure the SSL settings for the Virtual ViewX website.

SSL Port

Enter the port number that you want to associate with the HTTPS service hosting the Virtual ViewX application. You can enter any port number apart from HTTPS port numbers that are already in use on the Virtual ViewX server machine (for example, web applications, including the Geo SCADA Expert server will often use HTTPS port

443). The default port number is 453.

SSL Certificate

Use the **SSL Certificate** field to specify the publicly signed or self-signed certificate for the SSL port connections. If available, the combo box will offer any public certificates that are installed, or previously generated self-signed keys that exist (for example, from a previous installation of Virtual ViewX, or IIS-hosted WebX). (You will not be offered any Original WebX certificates.) If none of these exist, the installation process will create a new self-signed certificate using the machine name.

We recommend that you obtain a public certificate from a certification authority.

Alternatively, you can either:

- Obtain a public signed certificate from a zero cost provider.
- Create a self-signed certificate.

For more information, see the Geo SCADA Expert Knowledge Base.

Use the 'Manage Computer Certificates' app in the Control Panel to install the certificate, then use IIS Manager's 'Bindings' configuration to configure IIS to use that certificate.

NOTE: If you want to install a Certificate later you need to use the IIS Manager. Refer to your System Administrator for more information about adding Certificates and using IIS Manager.

Allow Unencrypted Connections

When you allow unencrypted connections, clients can connect over an HTTP connection instead of an HTTPS connection.

Clear this check box (the recommended option) if the Virtual ViewX server is not to allow interactions with any client connections that are not encrypted.

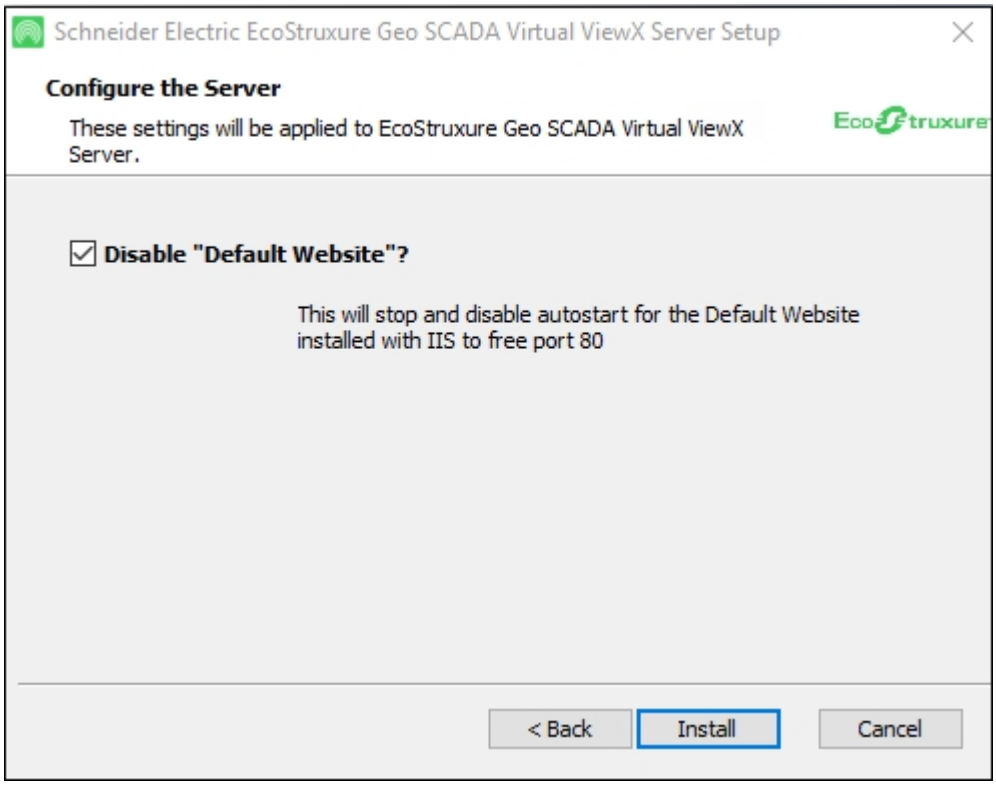
While we do not recommend it, select this check box if the Virtual ViewX server is to allow interactions with unencrypted client connections.

HTTP Port

This field is disabled, by default and is populated with the port number that is associated with the HTTP service that is hosting the Virtual ViewX application. This port number is different from the port numbers that are already in use on the Virtual ViewX server machine (for example, web applications, including the Geo SCADA Expert server will often use HTTP port 80).

7. Select **Next** to proceed to the Configure the Server page.

NOTE: The Configure the Server page is only displayed on new Virtual ViewX installations. On upgrades, you are taken directly to the Ready to Install page from the license agreement page.



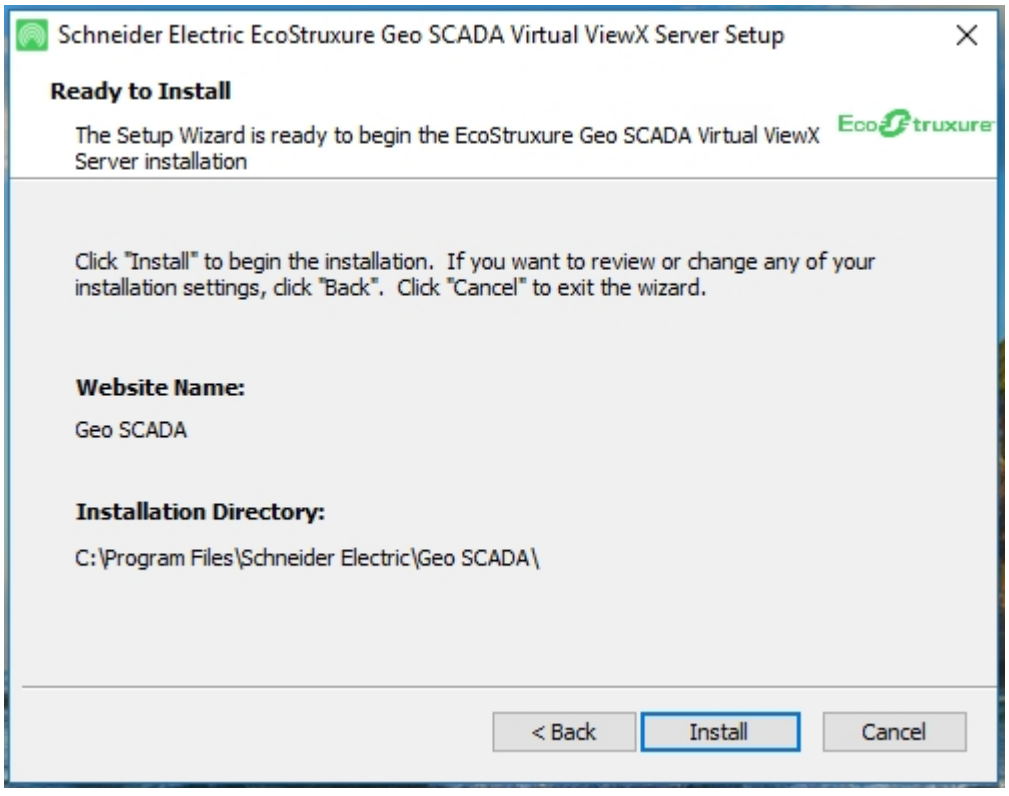
The Configure the Server page allows you to change the default website:

Disable "Default Website"?

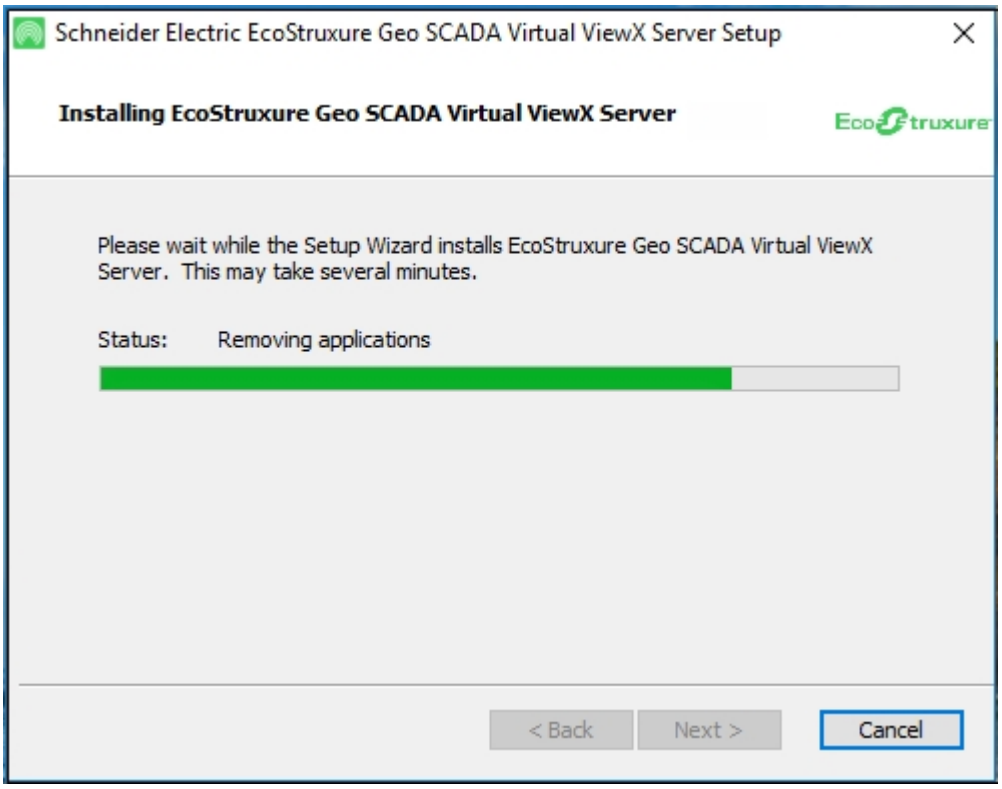
Select the check box to disable the default website installed with IIS to free port 80 for Geo SCADA Expert.

Clear the check box if you require the default website installed with IIS to appear.

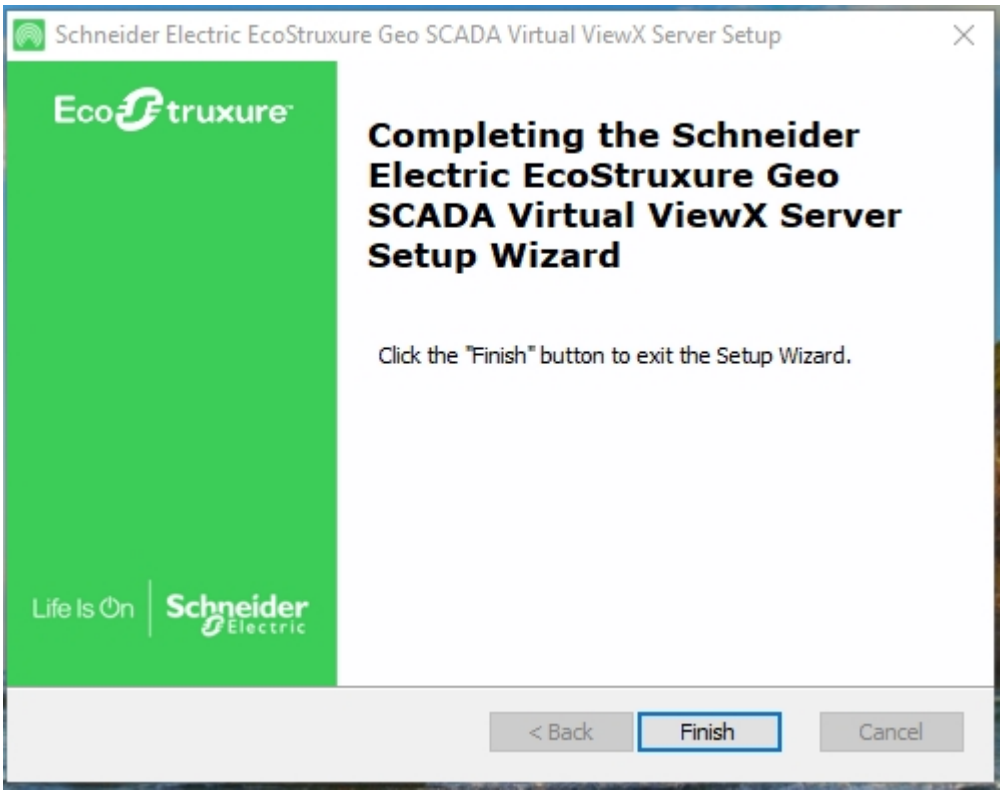
8. Select '**Install**' to proceed to the Ready to Install page.



9. When you have reviewed the settings shown on the Ready to Install page, select the **Install** button to start the installation process.



10. When the installation is complete, the Finish page is displayed.



11. Select **Finish** to complete the installation procedure.

NOTE: Having installed the Virtual ViewX server, you will need to License your Virtual ViewX Installation. You will also need to Configure a Virtual ViewX Server Connection to the Geo SCADA Expert Server. For information on how to do this, see Configure a Virtual ViewX Server Connection to the Geo SCADA Expert Server in the Geo SCADA Expert Guide to Virtual ViewX System Configuration.

NOTICE

INABILITY TO RUN VIRTUAL VIEWX

Do not delete, or change the password of, the **VVXLocalUser** that is created automatically in Windows when Virtual ViewX is installed on the Virtual ViewX server. This user account is required to run the ViewX processes on that server machine.

Failure to follow these instructions can result in inoperable equipment.

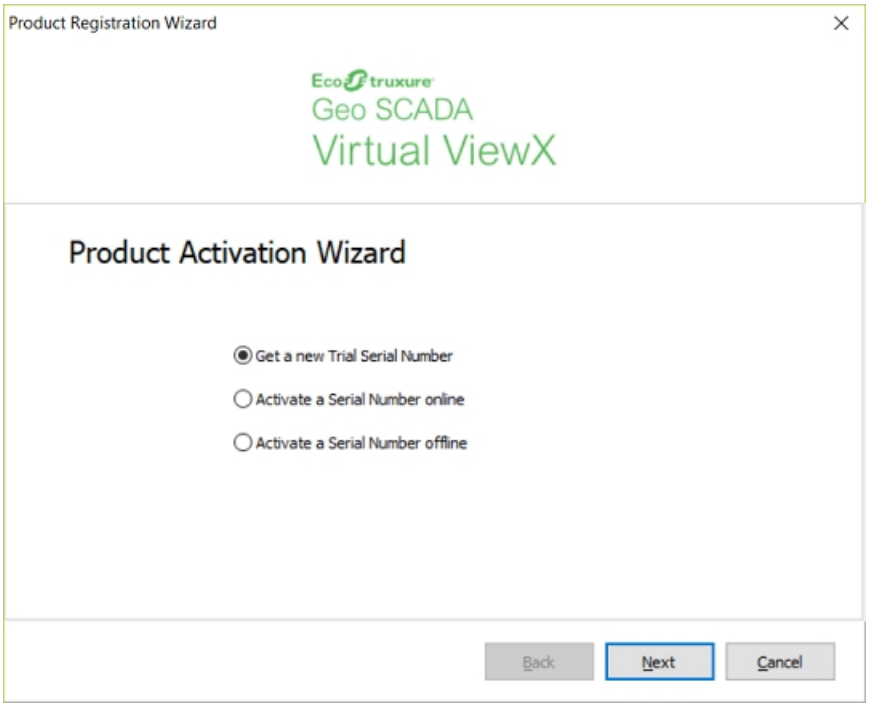
License your Virtual ViewX Installation

Once you have installed Virtual ViewX, you have to activate the product and obtain a valid license for the number of Virtual ViewX clients that are to connect to the Virtual ViewX server. The licensing process for Virtual ViewX differs slightly to that of Geo SCADA Expert. The recommended method is offline activation (see below).

ATTENTION: In addition to Virtual ViewX client licenses, the Virtual ViewX server requires a single **ViewX client** license. The Virtual ViewX server only requires one ViewX client license, regardless of the number of Geo SCADA Expert systems to which it is to connect.

To activate and license Virtual ViewX:

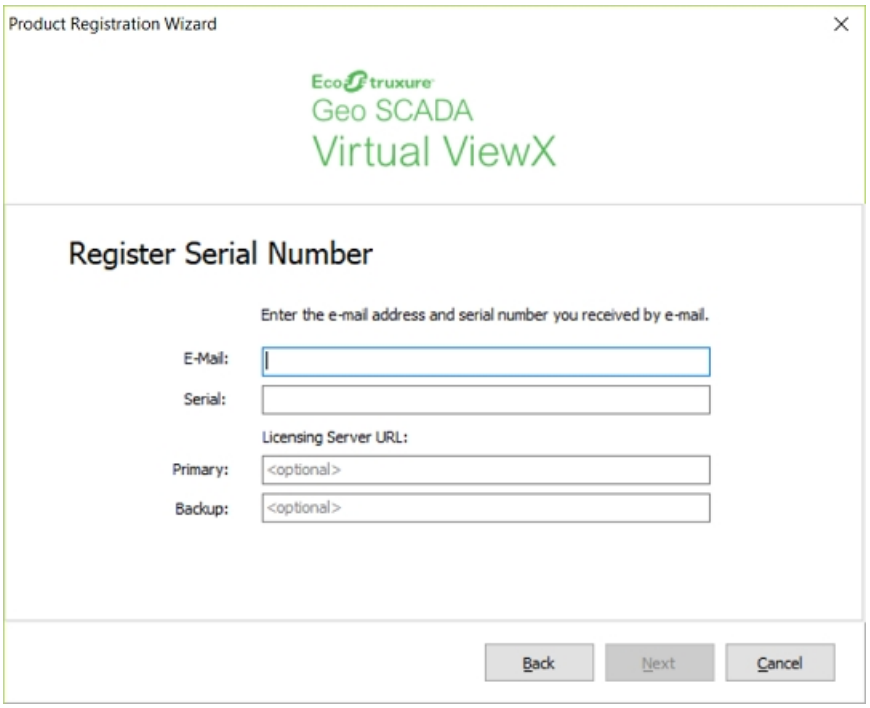
1. In Windows, select the **Start** menu. Scroll down the alphabetical list of installed applications and expand the **EcoStruxure Geo SCADA** folder.
2. Select the **Virtual ViewX Manager** option.
   On new installations, the Product Registration Wizard is displayed.
   (With an installation that has already been activated and licensed, the Server Manager Window is displayed - see step 15.)



3. Choose to either:
   - **Get a new Trial Serial Number** (go to step 4).
   - **Activate a Serial Number online** (go to step 5).
   - **Activate a Serial Number offline** (go to step 9).
     This is the recommended method of licensing your Virtual ViewX installation.
4. If you opt to **Get a new Trial Serial Number**, you will be provided with a 1-month trial for Virtual ViewX. For this option, the Virtual ViewX server has to be internet-connected. You have to enter your name and e-mail address in order to receive the activation details.

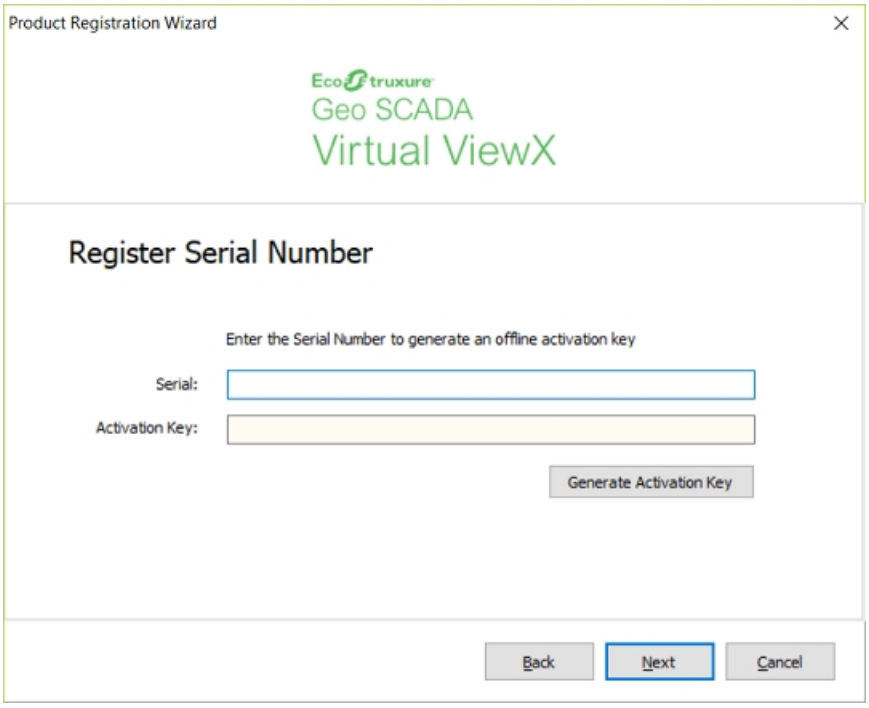
Now go to step 14.

5. If you opt to **Activate a Serial Number online**, the Virtual ViewX server has to be internet-connected. When you select this option, the following display is shown:



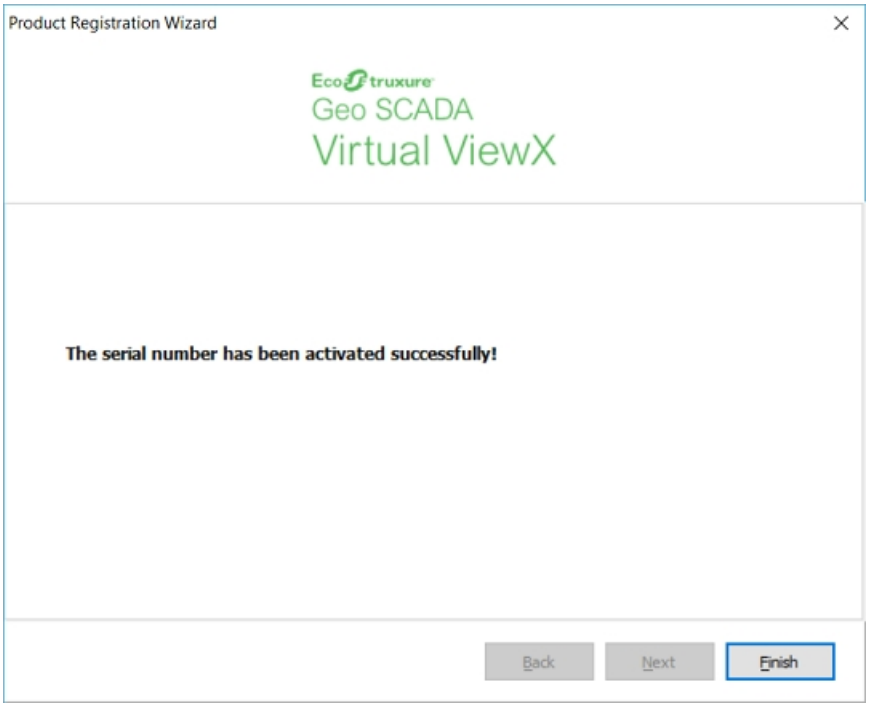
6. For this process, you have to obtain a valid Virtual ViewX serial number from your Schneider Electric sales representative.
7. Enter a valid e-mail address and the serial number in the fields provided.
   Leave the Primary and Backup **Licensing Server URL** fields at their defaults.
8. Select the **Next** button to activate the product registration process.

   Now go to step 14.
9. The **Activate a Serial Number offline** option is the recommended method of activating Virtual ViewX. With this method, the Virtual ViewX server does not need to be internet-connected. When you select this option, the following display is shown:

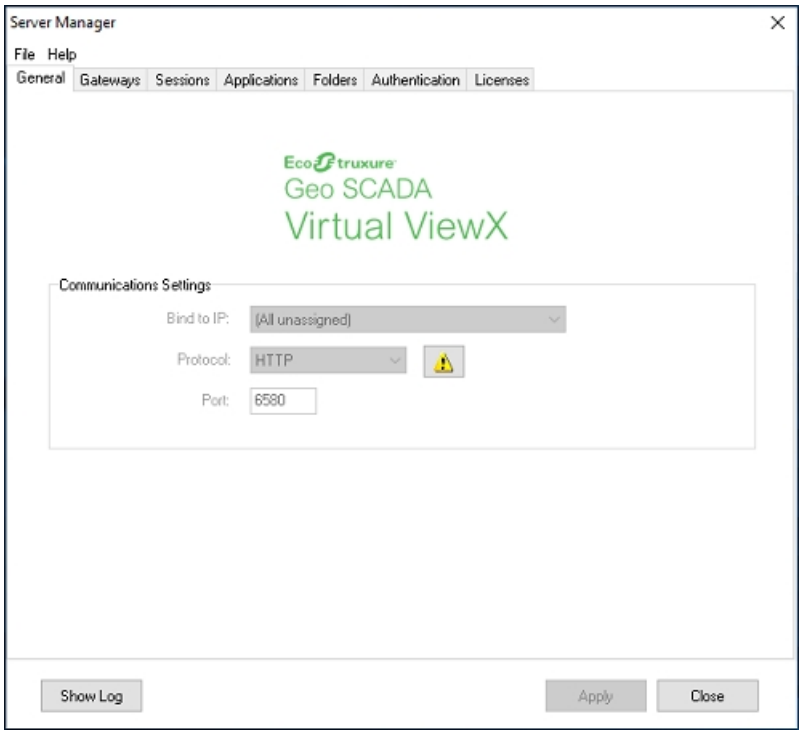


10. For this process, you have to obtain a valid Virtual ViewX serial number from your Schneider Electric sales representative.
11. Enter the serial number in the field provided, then select the **Generate Activation Key** button.
12. E-mail the Activation Key to your Schneider Electric sales representative, who will provide you with a Validation Key.
13. Select the **Next** button and enter the Validation Key into the required field.

    If some time passes between generation of the Activation Key and receipt of the Validation Key, you can close and restart the Virtual ViewX Manager to continue and complete the activation process.
14. A display similar to the following is shown on successful completion of the Virtual ViewX licensing activation and registration process:



15. Select the **Finish** button to complete the activation and licensing process.
The Server Manager window is displayed.



You can view the License details on the **Licenses** tab if required.

16. Select the **Close** button to close the Server Manager window.

Having installed the Virtual ViewX server, you will need to:

- Ensure that the settings on the Server Manager window are configured appropriately (see 'Working with the Virtual ViewXManager' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration).

- Set up a connection between the Virtual ViewX server and the Geo SCADA Expert server. For information on how to do this, see 'Configure a Virtual ViewX Server Connection to the Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration.

Further Information

Modify your Virtual ViewX Server Installation.

'Troubleshooting a Virtual ViewX Server Installation' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration.

Install OPC Factory Server

You only need to follow the instructions in this topic if your system includes OPC clients, and those OPC clients are to access to the features of Schneider Electric PLCs.

In order for OPC clients to connect to Schneider Electric PLCs (such as Modicon Quantum, Premium, M340, Micro, Nano, Momentum, and so on), those clients communicate with the PLCs via a Schneider Electric OPC server. In order for a server machine to function as a Schneider Electric OPC server, it has to be running OPC Factory Server software.

When used with Unity PRO PLCs, the OPC Factory Server software provides a native and direct symbolic access to any located or unallocated variable from the PLC.

To install OPC Factory Server on a Geo SCADA Expert server machine:

1. Log on to the server machine via a Windows user account that has **Administrator** permissions.
2. Use **Programs and Features**, accessed from the Control Panel in Windows®, to check whether an earlier version of OPC Factory Server is already installed. If so, uninstall that version of OPC Factory Server. For more information about how to uninstall an application, see the Windows help.
3. Run the Geo SCADA Expert Installer and select the **Install OPC Factory Server** option.
4. Follow any instructions in the Setup wizard to install the OPC Factory Server software.
5. Repeat this procedure on any other Geo SCADA Expert servers that are to operate as a Schneider Electric OPC server.

ViewX Client

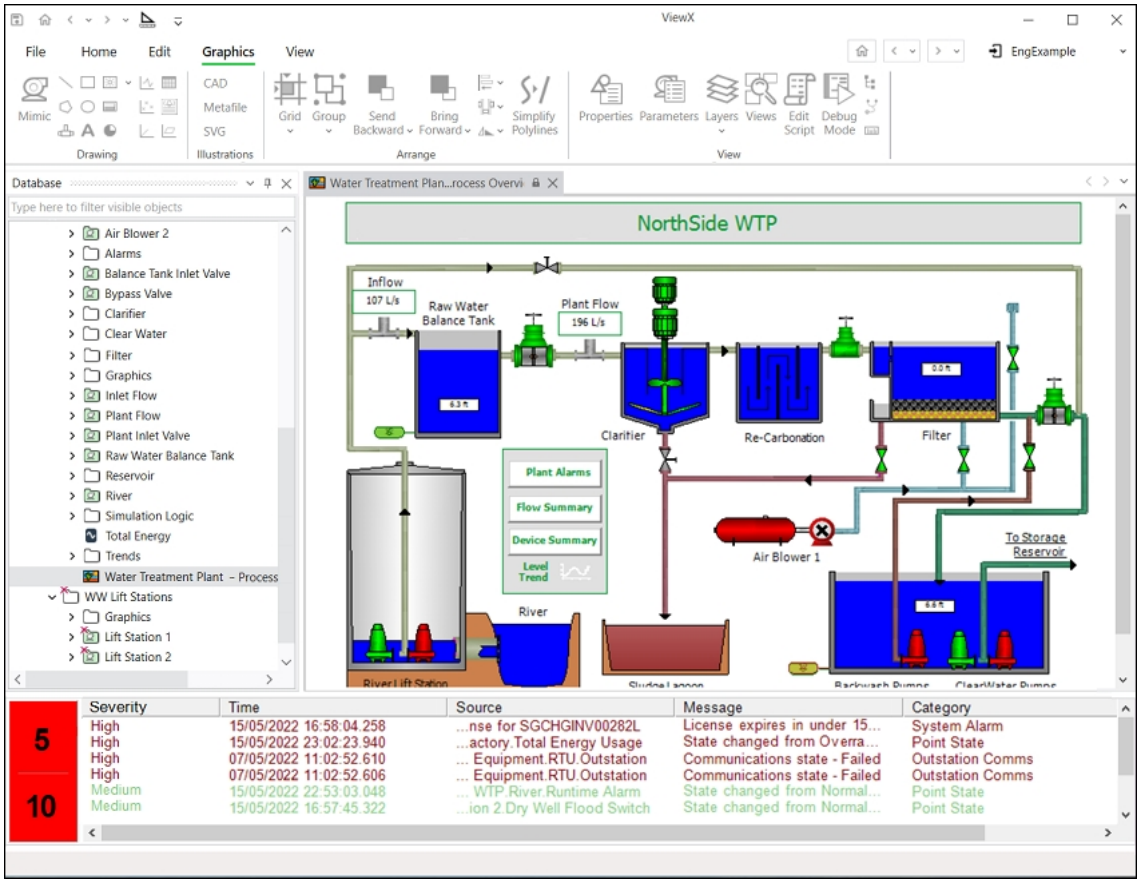
ViewX is a feature-rich Windows application designed to provide you with day-to-day access to your Geo SCADA Expert system. A PC that uses ViewX to connect to Geo SCADA Expert is referred to a ViewX client.

Typically,a Geo SCADA Expert system contains a central Geo SCADA Expert server and multiple ViewX clients. The ViewX clients present users with information from the Geo SCADA Expert database and also send user-defined actions to the Geo SCADA Expert server.

By logging on a ViewX client, you can interact with remote devices via the Geo SCADA Expert server. For example, you could use a ViewX client to issue a control to a device - the control is sent from the ViewX client to the Geo SCADA Expert server, where it is processed and sent to the appropriate device. The Geo SCADA Expert server then updates the database to indicate the outcome of the control attempt.

You can use a ViewX client to perform a wide range of tasks on your Geo SCADA Expert system, including issuing controls, responding to alarms, and configuring the database. However, your user permissions may restrict access to features depending on your duties. For example, operator-level users are often able to use ViewX to monitor a system and respond to alarms, but are denied access to configuration features.

When you log on to a ViewX client, you access the Geo SCADA Expert system via a ViewX window.



As an operator, you will predominantly use ViewX to access:

- **Mimics—**Graphical displays that can provide access to action menus (for alarm management, controls, and so on) and related displays such as other Mimics, Trends, Lists.
- **Alarm displays—**A variety of displays (Alarm Banner, Alarms Lists, and so on) that provide information about the alarms currently raised on your system. You can use these displays to access the alarm management features.
- **Trends—**Displays that show traces of values over a period of time.
- **Queries Lists—**Lists that you can use to view database items of the same type, or with specific property values. For example, the points on a particular site. Queries Lists use SQL Queries to request data from the database.
- **Event Journal—**A record of events on your system. You can use the Event Journal (also referred to as the Events List) to trace the causes and times at which specific events occurred.

Similar displays can also be accessed from a Virtual ViewX client.

On either client, the functions are accessed via drop-down menus, the ViewX ribbon, or context sensitive menus that can be selected with the mouse. You can also use keyboard shortcuts to access many of the features.

Create a New ViewX Client - System Connection

You can use the Geo SCADA Expert Client Applet to create a new ViewX Client - system connection. You need to create a client - system connection for each outgoing ViewX client connection i.e. every connection that the client uses to send signals to the system server(s).

When you have created a new connection, you will need to configure it so that the client can use it to communicate with the system server(s).

Associate a ViewX Client - System Connection with a Client License

The settings for your client license are determined when you purchase Geo SCADA Expert. If you contact the sales representative that sold the product to you, they will be able to provide additional detail about the specific limits of your license.

To associate your client license with a client - system connection:

1. Display the Client Configuration Window.
2. Select the connection with which you want to associate the client license.
3. Select the **Licenses** button on the Client Configuration window to display the Client Licensing Window.
4. Use the browse button next to the License File field to display a browse window.
5. Use the browse window to locate the client license file that was supplied with your system, then select the **OK** button to confirm your selection.
   The client license file is now associated with your client - system connection and its details are shown in the Client Licensing window.
6. Select the **OK** button to close the Client Licensing window.

Run ViewX

To run ViewX:

1. Either:
   - Select **ViewX** from the Windows' **Start** menu group.

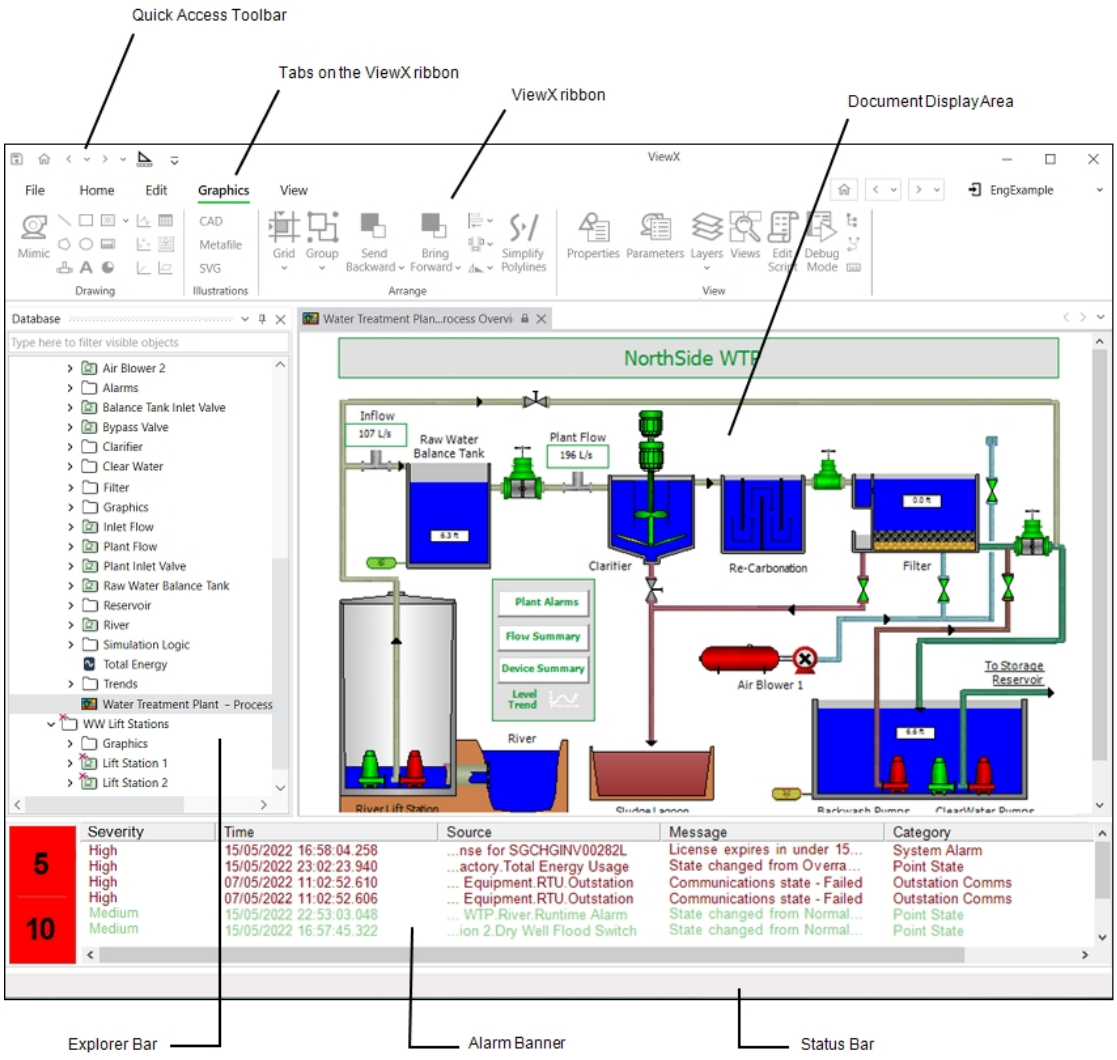
   Or:

   - Select the **ViewX** desktop shortcut

   (If you do not have access to a ViewX desktop shortcut icon, please contact a higher level user.)

   The ViewX Window is displayed.



To access Geo SCADA Expert via ViewX, you typically need to log on to the system (*see* System Security).

System Security

Geo SCADA Expert security helps to protect the SCADA system from unauthorized access. System access requires a password. The actions that you perform as a user are logged by the system.

As a system user, you will be assigned access permissions according to the functions you need to perform, and you will only be able to see the functions that this makes available to you.

You will use a ViewX or Virtual ViewX client that has been configured by a higher level user, which will provide access to the displays and features that you need to carry out your tasks, such as performing actions on database items and managing alarms.

System security allows you to manage access to the client.

Log On to ViewX

Geo SCADA Expert provides three distinct options for logging on to ViewX. Each logon option is designed to provide a secure authentication experience to suit your company's preferences and security requisites. A system administrator will be able to advise you as to which option your system and User Account is set up to use. Based on the system configuration and your User Account's setup, you will log on to ViewX using one of the following options:

- **Standard logon**—This is the traditional way of logging on to ViewX using your User Account. To gain access to the database, you enter a valid user name and password. Standard logon includes Geo SCADA Expert External Authentication with either Active Directory or LDAP. These login types require a password to be entered, which is authenticated with an external system.
- **Two-factor authentication (2FA)**—This is an extension to the standard logon. This logon option requires two steps of verification before you can gain access to the database. In addition to a user name and a password, you must authenticate using a second factor. This comprises a one-time password that you obtain from a third-party authenticator that you have installed on a device such as a smartphone. If your User Account is configured to use two-factor authentication (2FA), you must enroll using a third-party authenticator app (*see* Enroll for Two-Factor Authentication). You then use the authenticator account that gets created to generate each one-time password that you require for authentication along with your username and password each time that you log on thereafter.
- **Single sign-on (SSO)**—This logon option enables you to gain access to Geo SCADA Expert using the same logon credentials that you use to access other AVEVA services via SSO in your company. Unlike the other logon options, with this option you log on by selecting an **SSO** button, rather than by entering a username and password. This logs you onto the database using your existing logon credentials. The SSO logon option is available only when all of the following apply:
  - The PCS framework is installed and configured (see 'Geo SCADA Expert Prerequisite Components' in the Geo SCADA Expert Guide to Installation).
  - The Geo SCADA Expert servers have the **AVEVA Identity Manager token-based authentication** feature enabled (*see* 'Using External Authentication with Geo SCADA Expert' in the Geo SCADA Expert Guide to Security).
  - The ViewX client is configured to use SSO (*see* 'Configure the Client Connection Security Settings' in the Geo SCADA Expert Guide to Client Administration).

  Additionally, for SSO to be functional, a system administrator has to configure ViewX to use Single Sign-on (*see* 'Set Up Geo SCADA Expert to Use Single Sign-On' in the Geo SCADA Expert Guide to Security).

The single sign-on and two-factor authentication logon options are only supported from Geo SCADA Expert 2023 onwards. You cannot use 2FA in conjunction with SSO.

User Accounts in Geo SCADA Expert are designed to be allocated to individual members of staff. User Accounts have:

- **User names and passwords—**If your User Account is not configured to use single sign-on (SSO), to log on to Geo SCADA Expert, you have to enter the user name and password for that account. For extra security, passwords can be time limited so that they have to be changed on a regular basis.

If your User Account is configured to use SSO, you do not need to enter the user name and password to log on. Instead, Geo SCADA Expert uses Windows Integrated Login to log on to ViewX.

- **Permissions—**Each User Account can be allocated permissions, which affect the items and features that are available. For example, your User Account may allow you to view data, but prohibit you from configuring database items.

  A system administrator might update your permissions if access requirements change. If so, the updates to your User Account will come into effect the next time that you log on.

If you do not log on via a User Account, Geo SCADA Expert might log you on as the **Guest** user automatically. The Guest user is a built-in User Account that, if active on your Geo SCADA Expert system, might be configured to provide very limited access to Geo SCADA Expert.

Standard Logon

To log on to the database using just the user name and password of your Geo SCADA Expert User Account:

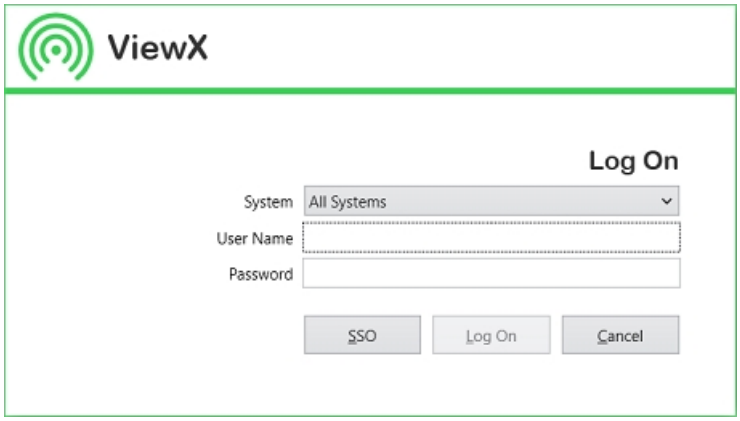
1. Display the Log On window.

   There are several ways of displaying the Log On window:

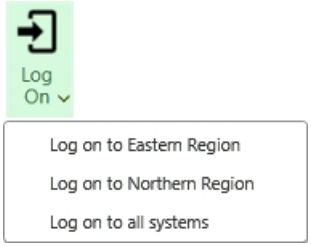
   - Select the **Home** tab on the ViewX ribbon. Select **Log On** from the **Security** command group.

     This displays a Log On window that allows you to log on to one or more systems simultaneously. (You can only log on to one system at a time if you are using 2FA.)

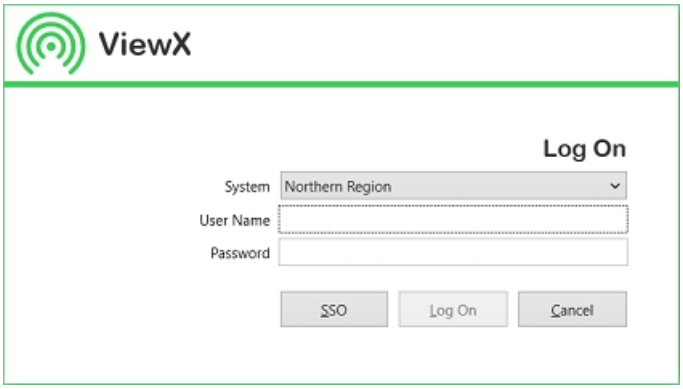
     

     If you are connected to two or more systems, the **Log On** command includes a drop-down menu from which you can select to log on to a particular system, or all systems. (With 2FA you can only log on to one system at a time.)

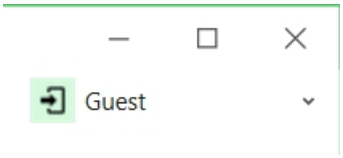
     

     If you use this menu, your selection displays in the **System** field on the Log On window when it appears.

- In the Database Bar, right-click on the system that you want to log on to, and then select the **Log On** option from the context-sensitive menu. This displays the Log On window with the selected system displayed in the **System** field.



- Select the **Log On** command to the right of the ViewX title bar. This displays the Log On window.



- Select the **Log On** option from any other display, for example, from a Mimic that provides a hyperlink to the Log On window for the system.

2. When the Log On window is on display, select the required **System** that you want to access.

   You can choose to log on to one specific system or to log on to **All Systems** simultaneously. The field's drop-down list comprises the Geo SCADA Expert systems (databases) to which the ViewX client has access.

   When logging on to multiple systems, Geo SCADA Expert attempts to log you on to all of the systems (databases) to which it has access, using the same user name and password. If the user name and password are invalid for a system, a diagnostic message is displayed. You will need to log on to that system individually. (You also need to log on to each system separately if you are using 2FA.)

3. Enter your unique **User Name**. This is the user name that has been configured for your User Account.

   If your system is configured to use the **External Authentication** feature, a system administrator will be able to advise you as to whether your user name for ViewX is the same as your Windows or LDAP user name.

4. Enter the **Password** for your User Account. If you are unsure of the password, please contact a system administrator.

   If your system is configured to use the **External Authentication** feature, your password for ViewX will be the same as your Windows or LDAP password.

   If your User Account is managed directly in Geo SCADA Expert and you attempt to log on to multiple systems (databases) simultaneously and use a password that has expired on one or more of the systems, the Change Password window is displayed. You will need to change the password *(see*

Change your Password). The new password is applied to your User Account on all systems on which your User Account exists and to which the ViewX client has access. The password expiry times begin again starting from the time you set the new password.

(If your system is configured to use the **External Authentication** feature and your User Account is associated with a Windows or LDAP User Profile, password changes are managed via the relevant Windows or LDAP server.)

NOTE: On a ViewX workstation on which the **On-Screen Keyboard** feature is enabled, an alphanumeric keyboard is displayed whenever the **User Name** or **Password** fields are selected. You can use either a traditional keyboard or Use the Alphanumeric Touch Screen Keyboard to enter your Username and Password.

5. Select the **Log On** button.
   You should now be successfully logged on to ViewX.

Use Two-factor Authentication to Log On

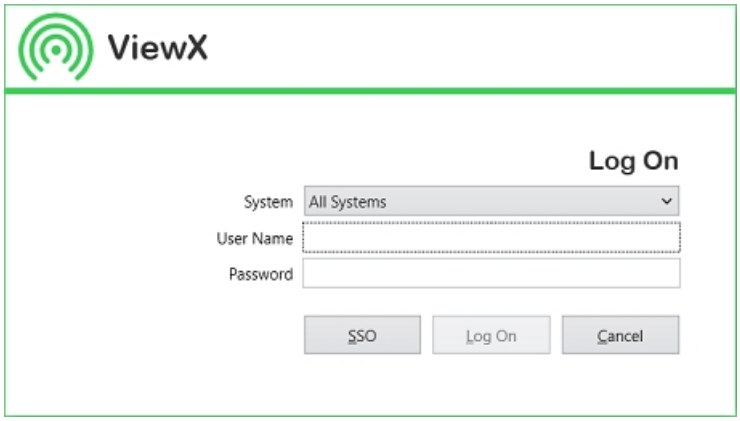
This section applies if the Geo SCADA Expert system and your User Account are configured to use Geo SCADA Expert's TOTP 2FA (two-factor authentication) feature (*see* 'Use Two-Factor Authentication with Geo SCADA Expert' in the Geo SCADA Expert Guide to Security). With a new User Account, or an existing User Account on which this requirement has just been applied, you will need to enroll for two-factor authentication before you can access the database. You will be prompted to do this the next time that you try to log on (*see* Enroll for Two-Factor Authentication).

When 2FA is active against multiple Geo SCADA Expert systems to which you have access, you will need a separate authenticator account for each system. You have to enroll separately on each of those systems.

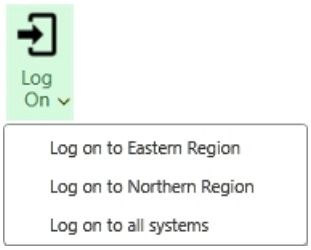
1. Display the Log On window.
   There are several ways of displaying the Log On window:
   - Select the **Home** tab on the ViewX ribbon. Select **Log On** from the **Security** command group.

     This displays a Log On window that allows you to log on to one or more systems simultaneously. (You can only log on to one system at a time if you are using 2FA.)

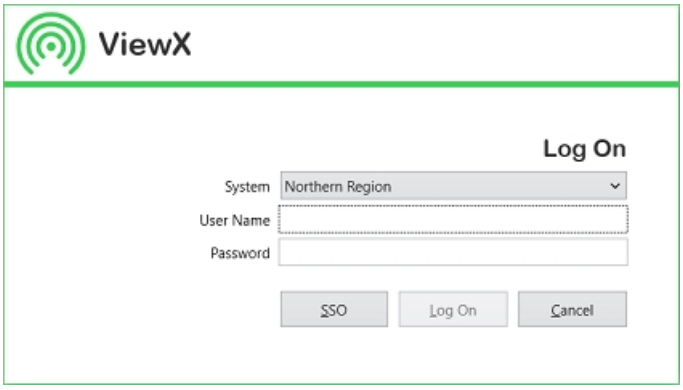


If you are connected to two or more systems, the **Log On** command includes a drop-down menu from which you can select to log on to a particular system, or all systems. (With 2FA you can only log on to one system at a time.)

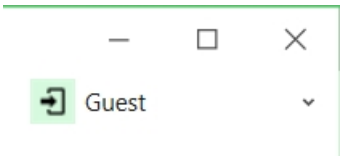


If you use this menu, your selection displays in the **System** field on the Log On window when it appears.

- In the Database Bar, right-click on the system that you want to log on to, and then select the **Log On** option from the context-sensitive menu. This displays the Log On window with the selected system displayed in the **System** field.



- Select the **Log On** command to the right of the ViewX title bar. This displays the Log On window.



- Select the **Log On** option from any other display, for example, from a Mimic that provides a hyperlink to the Log On window for the system.

2. When the Log On window is on display, select the required **System** that you want to access.

   The field's drop-down list comprises the Geo SCADA Expert systems (databases) to which the ViewX client and your User Account have access. When using 2FA, you can only log on to one system at a time; you cannot log on to all systems simultaneously. This is because you require a different authenticator account for each system (database) on which 2FA is deployed.

3. Enter your unique **User Name**. This is the user name that has been configured for your User Account.

   If your system is configured to use the **External Authentication** feature, a system administrator will be able to advise you as to whether your user name for ViewX is the same as your Windows or LDAP user name.

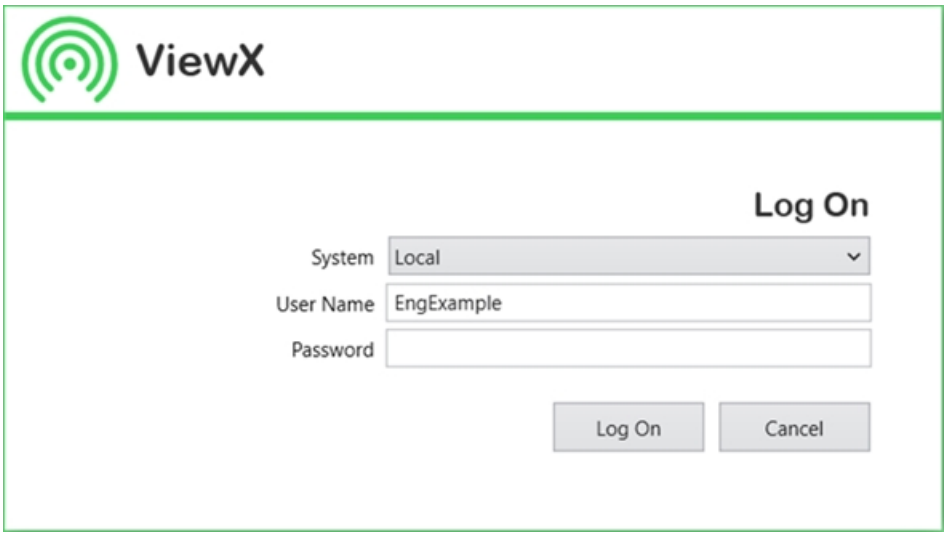
4. Enter the **Password** for your User Account. If you are unsure of the password, please contact a system administrator.

   If your system is configured to use the **External Authentication** feature, a system administrator will be able to advise you as to whether your password for ViewX is the same as your Windows or LDAP password.

   If your User Account is managed directly in Geo SCADA Expert and you attempt to log on to a system and use a password that has expired on that system, the Change Password window is displayed. You will need to change the password (*see* Change your Password). The new password is applied to your User Account. The password expiry times begin again starting from the time you set the new password.

   (If your system is configured to use the **External Authentication** feature and your User Account is associated with a Windows or LDAP User Profile, password changes are managed via the relevant Windows or LDAP server.)

   NOTE: On a ViewX workstation on which the **On-Screen Keyboard** feature is enabled, an alphanumeric keyboard is displayed whenever the **User Name** or **Password** fields are selected. You can use either a traditional keyboard or Use the Alphanumeric Touch Screen Keyboard to enter your Username and Password.



5. Select the **Log On** button.
   The One-Time Password Authentication window is displayed.



6. Use the authenticator app on your device to obtain the one-time password that you need to enter into the window.
7. Enter the one-time password in the **One-Time Password** field in the One-Time Password Authentication window and then select the **Submit** button.
   You should now be successfully logged on to ViewX using two-factor authentication logon.

Use Single Sign-on to Log On

This section applies if your system is configured to use the **External Authentication** feature along with **Other Authentication Providers** to enable logon via single sign-on (SSO). With this setup, an **SSO** button is included on the Log On window.

NOTE: An **SSO** button is only included on the Log On window if your system is set up to enable logon via single sign-on (SSO). You cannot use 2FA in conjunction with SSO.

To log on using single sign-on (SSO):

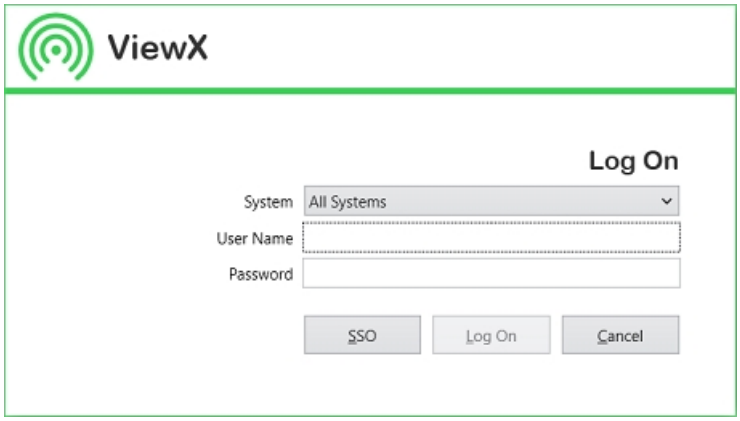
1. Display the Log On window.

   There are several ways of displaying the Log On window:

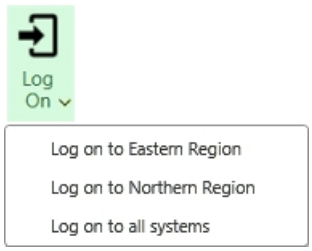
   - Select the **Home** tab on the ViewX ribbon. Select **Log On** from the **Security** command group.

     This displays a Log On window that allows you to log on to one or more systems simultaneously.

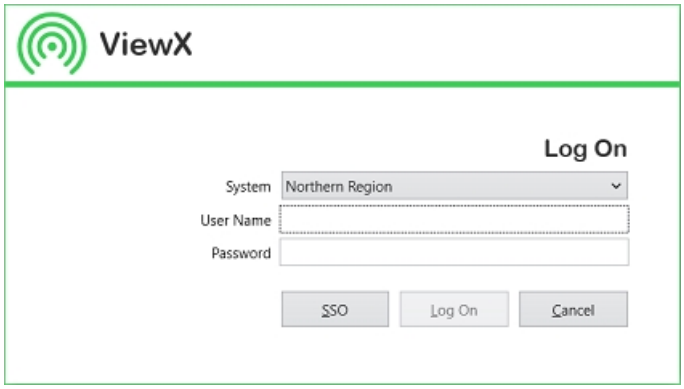


If you are connected to two or more systems, the **Log On** command includes a drop-down menu from which you can select to log on to a particular system, or all systems.

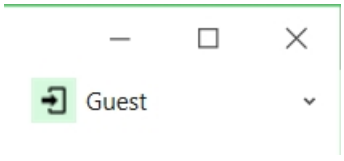


If you use this menu, your selection displays in the **System** field on the Log On window when it appears.

- In the Database Bar, right-click on the system that you want to log on to, and then select the **Log On** option from the context-sensitive menu. This displays the Log On window with the selected system displayed in the **System** field.



- Select the **Log On** command to the right of the ViewX title bar. This displays the Log On window.



- Select the **Log On** option from any other display, for example, from a Mimic that provides a hyperlink to the Log On window for the system.

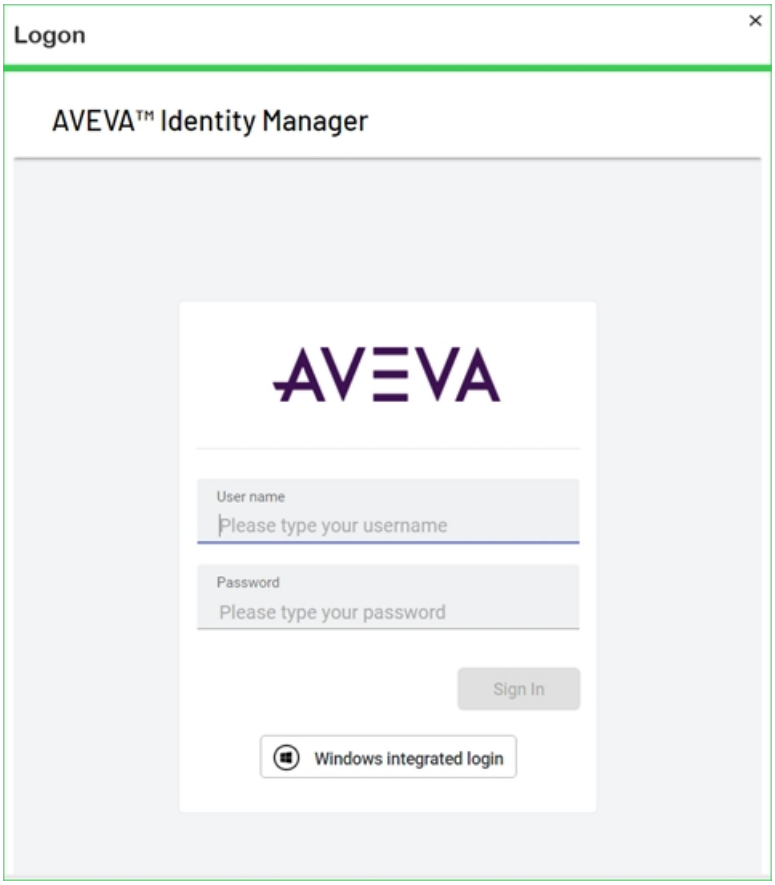
2. When the Log On window is on display, select the required **System** that you want to access.

   You can choose to log on to one specific system or to log on to **All Systems** simultaneously. The field's drop-down list comprises the Geo SCADA Expert systems (databases) to which the ViewX client has access.

   When logging on to multiple systems, Geo SCADA Expert attempts to log you on to all of the systems (databases) to which it has access, using the same log on credentials. When logging on using SSO, you can use the **Log on to all systems** option provided that all of the Geo SCADA Expert servers are running Geo SCADA Expert 2023 or later. If you use the **Log on to all systems** option on a multi-database system in which the servers are running a mixture of older and newer versions of Geo SCADA Expert software, the logon will only partially succeed; this is by design. With such a setup, the **Log on to all systems** option will only log you onto those servers that are running Geo SCADA Expert 2023 or later. To log on to the servers that are running an older version of the software, log on to each of those servers individually.

3. Select the **SSO** button.

   If you are not already logged on to a Geo SCADA Expert system via SSO, the AVEVA Identity Manager window is displayed. Use the window to log on to AVEVA Identity Manager.



   If you are already logged on to a Geo SCADA Expert system using SSO, the AVEVA Identity Manager window is not displayed. Instead, you are logged on to Geo SCADA Expert using your currently active SSO token.

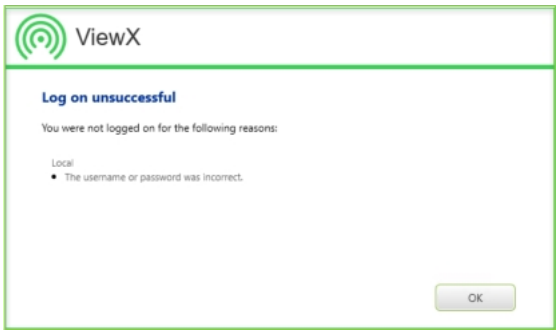
   (The **SSO** button does not appear on the Log On window if all of the Geo SCADA Expert servers to which the ViewX client is able to connect have the SSO feature disabled. Nor does it appear if configured not to do so on the client.)

The **SSO** button will be disabled in certain instances, such as when using a ViewX client client that is configured to use SSO on a multi-database setup on which only some systems are configured to use SSO. The **SSO** button will only be accessible when logging into a system that is configured to use SSO. For other systems, the SSO button will be 'grayed out' and unavailable for use.

Unsuccessful Logon

Provided that you are using valid logon credentials with a valid User Account, your logon attempts should be successful and should log you on to the selected system(s).

If the log on is not successful, the Log On window will display a message explaining the problem that occurred.



If this occurs, take note of the reason(s) given and select **OK** to attempt to log on again.

If the unsuccessful logon is due to a failure to log on using AVEVA Identity Manager and a reattempt does not rectify the situation, talk to your system administrator. If the unsuccessful logon is due to the unavailability of the SMS server, you might be advised to log on using standard logon until access to the SMS server has been rectified.

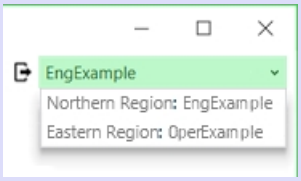
If the unsuccessful logon is due to a failure to log on using two-factor authentication and a reattempt does not rectify the situation, talk to your system administrator.

If you attempt and fail to log on multiple times, the system might disable your User Account temporarily for a specified duration. If the system is configured to limit the number of failed log on attempts your account may become disabled permanently. A system administrator will have to re-enable your User Account if it has been permanently disabled.

The system(s) on to which you are logged are displayed by the Log On Status field to the far right of the ViewX title bar. If you use the same user name to log on to all of the systems offered, the Log On Status displays that user name. (When using 2FA, you have to log into each system separately.) If you use different user names to log on to different systems, the drop-down menu on the Log On Status displays a list of user names and the system to which they apply in the format:

`<System>: <Username>`

Example:



If you are logged in to two or more systems with different non-guest User Accounts, the Log On Status will display "Multiple Users".

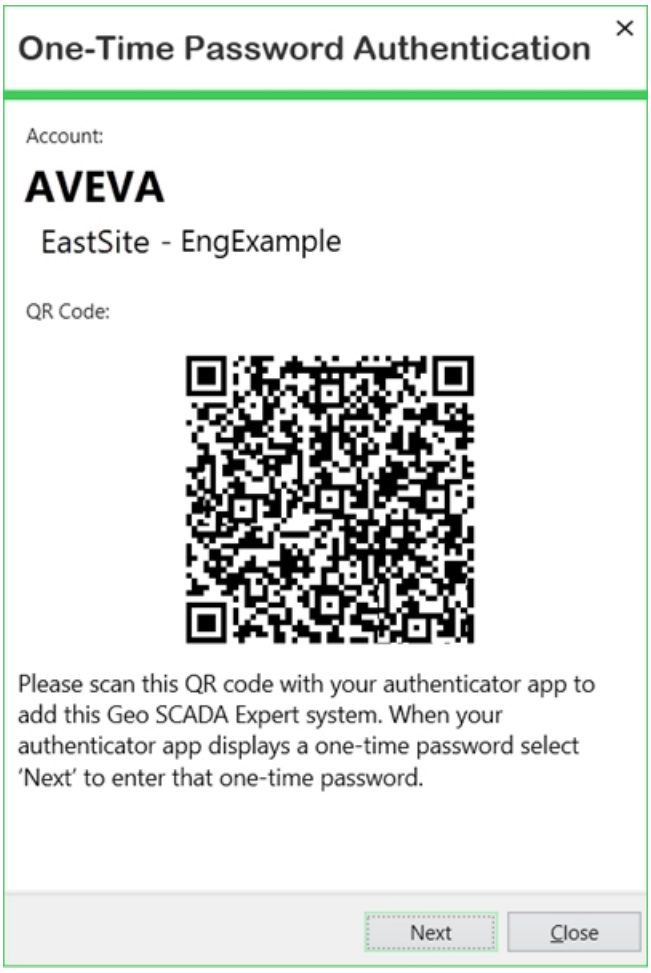
NOTE: In the unlikely event that logging on causes unexpected ViewX behavior, a system administrator might need to reset the profile for your User Account.

Enroll for Two-Factor Authentication

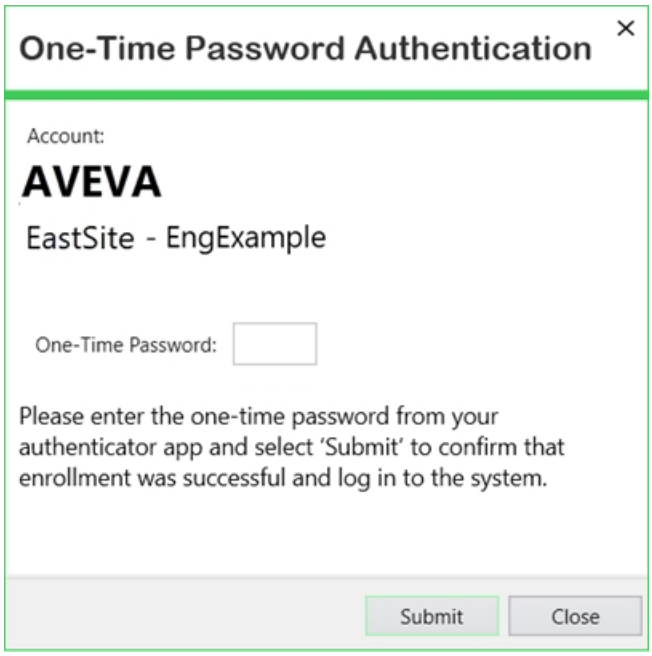
Your User Account might be configured to require you to use two factors of authentication to log on to Geo SCADA Expert. With a new User Account, or an existing User Account, on which this requirement has just been applied, you will need to enroll for two-factor authentication. You will be prompted to do this the next time that you try to log on. You can only enroll from a ViewX client or a Virtual ViewX client that provides access to the relevant Geo SCADA Expert system (the system on which you want to enroll). By design, you cannot enroll for two-factor authentication on other types of client. If you try to log on to Geo SCADA Expert using a client that does not support enrollment, your logon attempt will not succeed. You will be denied access to Geo SCADA Expert until you successfully complete the enrollment process. (The enrollment process differs slightly on a DMZ-connected client (*see* Enroll for Two-Factor Authentication from a DMZ-Connected Client)).

To enroll for two-factor authentication:

1. Enroll with an authenticator app on a suitable device, such as a smartphone. We recommend using an authenticator app that can be locked so that it requires a PIN or biometric to open it, to help prevent unauthorized access. For example, Microsoft Authenticator.
2. On a ViewX client or a Virtual ViewX client, display the Log On window.
3. Enter your user name and password, and select the **Log On** button.
   The One -Time Password Authentication window is displayed.
4. Use your authenticator app to scan the QR code to set up an authenticator account on your device.
   The authenticator app starts to generate one-time passwords.



5. On the One-Time Password Authentication window in Geo SCADA Expert, select **Next**.
6. Enter the one-time password that the authenticator app has generated.



7. Select the **Submit** button.
   Once Geo SCADA Expert has validated the one-time password, the enrollment process is considered successful.

If the one-time password does not validate, you can start again from step 1 to reattempt the enrollment process. You can retry the enrollment until the enrollment period expires. If further attempts are unsuccessful and the enrollment period expires, your User Account will be disabled, and a system administrator will have to re-enable it. A system administrator will also need to reset the two-factor authentication enrollment on your account in order to initiate a new enrollment period.

If your User Account provides access to other Geo SCADA Expert systems (databases) that are also using two-factor authentication, you have to enroll separately for each of those systems. To do so, repeat the above procedure by logging on to each of those systems in turn. You will acquire, and need, a separate authenticator account for each database. Ensure that you are aware as to which authenticator account you need to use to log on to each system (database). The authenticator account details are shown on the One-Time Password Authentication window that gets displayed whenever you log on to Geo SCADA Expert. Use this information to identify the authenticator account that you need to use for that particular system.

Further Information

See 'Use Two-Factor Authentication with Geo SCADA Expert' in the Geo SCADA Expert Guide to Security.

Enroll for Two-Factor Authentication from a DMZ-Connected Client

This section only applies to User Accounts that are configured for two-factor authentication (*see* 'Define Whether the User has to use Two-Factor Authentication' in the Geo SCADA Expert Guide to Security).

The enrollment process for 2FA (two-factor authentication) differs slightly if you attempt that enrollment on a ViewX client that is connected to a DMZ server. The enrollment process requires synchronizations with the Main server.

When you attempt to enroll for 2FA with a DMZ-connected client, the DMZ server transmits the information to the Main server in batched requests. As such, your first attempt to log on to a client that is connected to a DMZ server will be unsuccessful and an event will be logged. The unsuccessful logon attempt initiates the TOTP 2FA enrollment in the Main server. You will then be able to proceed with a TOTP 2FA enrollment from that DMZ-connected client. You should then attempt a subsequent logon, for which you will be prompted to follow the normal enrollment process (*see* Enroll for Two-Factor Authentication). You should aim to start the subsequent logon attempt before the enrollment period expires. Provided that you enter valid logon credentials, including a valid one-time password, this second enrollment attempt should be successful.

If the latter enrollment request to the Main server fails, subsequent logon attempts will require a new enrollment. If this happens, contact a system administrator for assistance.

Log Off from ViewX

When you finish your ViewX session or need to leave your workstation unattended, you should close any ViewX displays (such as Mimics, Trends, or Lists) that are currently open. You should then log off. This will prevent anyone else from accessing the system using your logon credentials once you have moved away from your workstation.

You can log off from all of the Geo SCADA Expert systems (databases) to which you are connected, or just one system.

Your user session might also be configured to time out after a period of user inactivity. If this occurs, you will be prompted to confirm your password when you attempt to access the system.

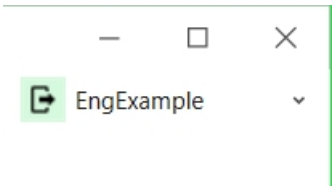
To log off from all systems on to which you are logged, either:

1. Close any ViewX displays that are currently open (such as Mimics, Trends, or Lists).
2. Select the **Home** tab on the ViewX ribbon.
3. Select the **Log Off** command from the relevant command group.

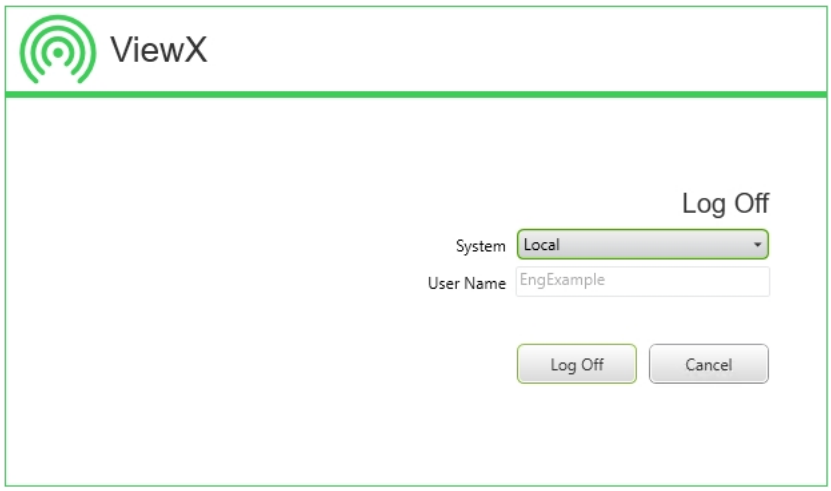


Or:

1. Select the **Log Off** command to the right of the ViewX title bar. This command is only available if a non-guest user is logged on. If this is the case, the command will display a lock icon.

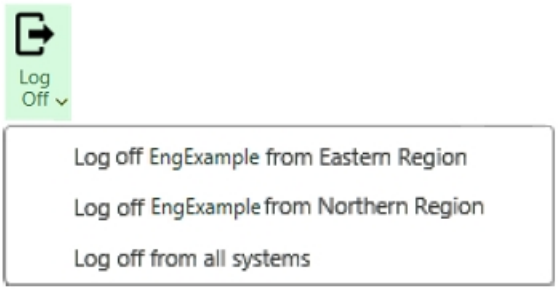


The Log Off window displays, allowing you to log off from one or more systems simultaneously.



To log off from a particular system:

1. Close any ViewX displays that are currently open (such as Mimics, Trends, or Lists).
2. Select the **Home** tab on the ViewX ribbon.
3. In the **Security** command group, select the drop-down menu for the **Log Off** command. The drop-down menu is only available if ViewX is connected to more than one system.



4. From the menu that appears, select the system from which you would like to log off.

Or:

1. Close any ViewX displays that are currently open (such as Mimics, Trends, or Lists).
2. In the Explorer Bar, right-click on the **System Icon** for the system from which you would like to log off.
   A context sensitive menu is displayed.
3. Select the **Log Off** option.

*The Log Off window displays, with the selected system in the **System** field.*

If you have logged on using single sign-on (SSO), the system logs off AVEVA Identity Manager when logging off the last system that is logged on (*see* Log On to ViewX).

Change your Password

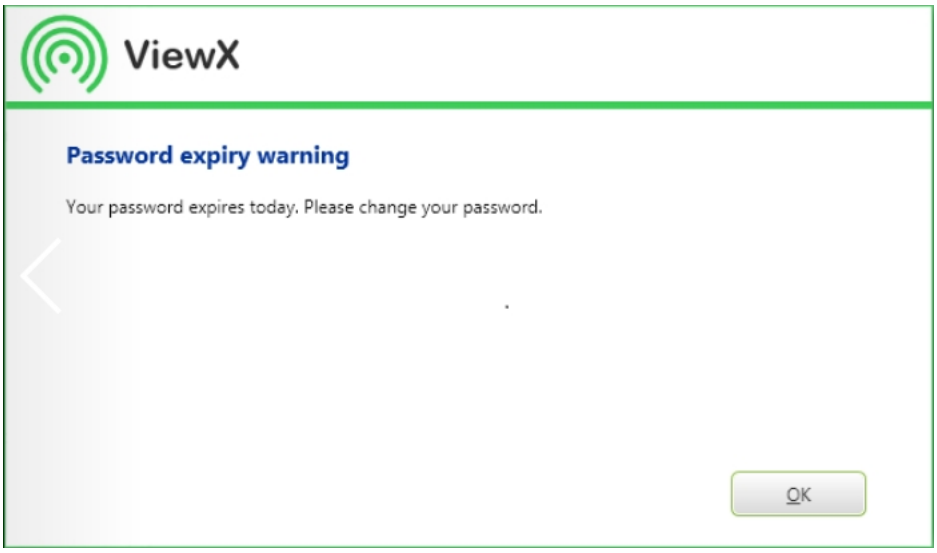
ATTENTION: This section only applies to User Accounts that are managed directly in Geo SCADA Expert. With User Accounts that are associated with Windows or LDAP User Profiles, password management is performed via the relevant Windows domain or LDAP server.

It is important that you keep your password secret. If another user logs in using your user name and password, any actions they perform will be logged against your name. If you think that your password has been compromised, you should change it.

You have to be logged on to Geo SCADA Expert to change your password (*see* Log On to ViewX). You can change your password if your user account has the **Can Change Password** feature enabled and is not authenticated via Windows or LDAP. Check with your system administrator.

Password Expiry

If your system has a password expiry time and the expiry time has been reached, you are notified that the password is due to expire or expired.

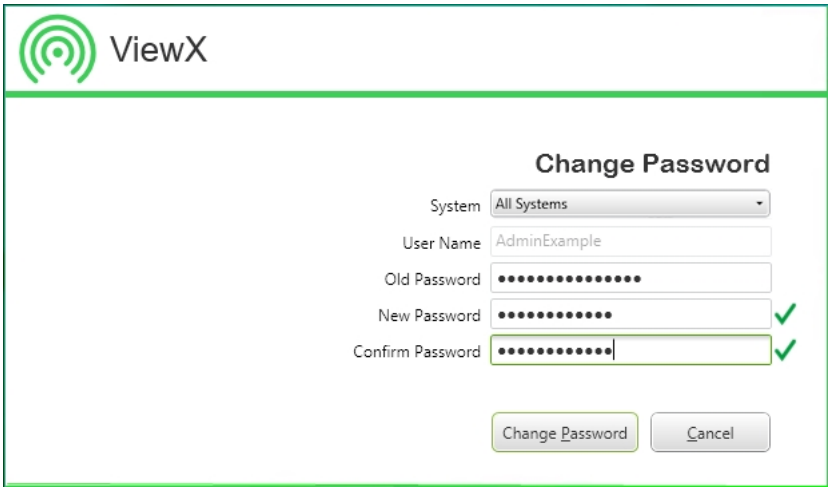


Selecting **OK** displays the Change Password window is displayed and you are prompted to enter a new password the next time you log on. If your password has not yet expired you can select **Cancel** to ignore the procedure and continue to use ViewX. If your password has expired you need to enter a new password before you can continue.

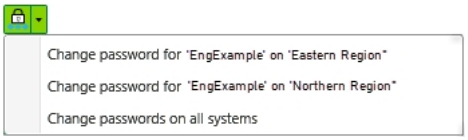
This also applies if your setup has multiple systems (databases) and your password has expired on any of the systems. Any expiry times are re-started from the time you set the password.

To change your user password when you are logged on to Geo SCADA Expert:

1. Select the **Home** tab on the ViewX ribbon.
2. Select the **Change Password** tool command from the relevant command group.
   The Change Password window is displayed.


ViewX
Change Password
System
All Systems
User Name
AdminExample
Old Password
New Password
Confirm Password
Change Password
Cancel

If you are using a ViewX client connected to two or more systems, the **Change Password** command includes a drop-down menu from which you can select to change the password for a particular system, or all systems.

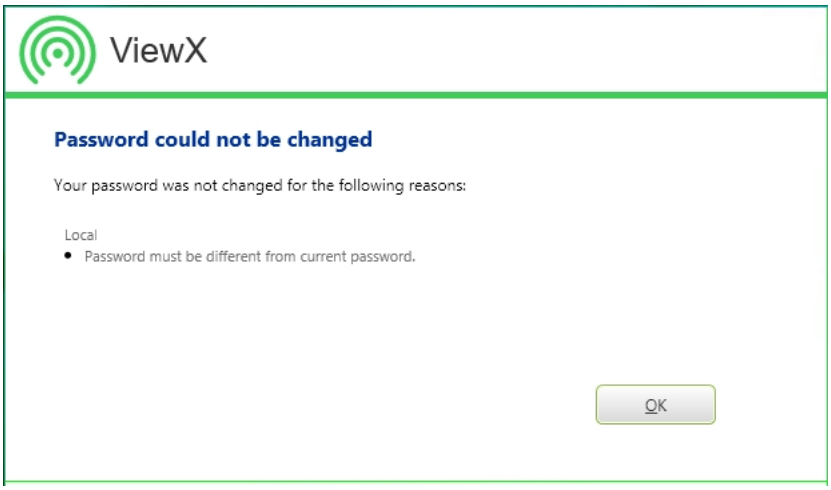


If you use this menu, your selection displays in the **System** field on the Change Password window when it appears.

You can also display the Change Password window by selecting the **Change Password** option from your user account's context sensitive Object Menu. You can display the menu from, for example, your user account's entry in the Database Bar.

3. The **System** field allows you to change your password for one specific system or **All Systems** simultaneously. Choose an option from the field's drop-down list, which comprises the Geo SCADA Expert systems (databases) to which the ViewX client has access.
4. Enter your existing password in the **Old Password** field. This is only required if your user account does not have the **Security** permission for the User item. If your user account does have the **Security** permission for the User item, the **Old Password** field is 'grayed out' and unavailable for use.
5. Enter your new password in the **New Password** field. The field is case-sensitive.
6. Enter the new password again in the **Confirm Password** field.
7. Select the **OK** button to confirm the change.
   If the password change is successful, the Change Password window is closed and the new password is applied to the specified user account.

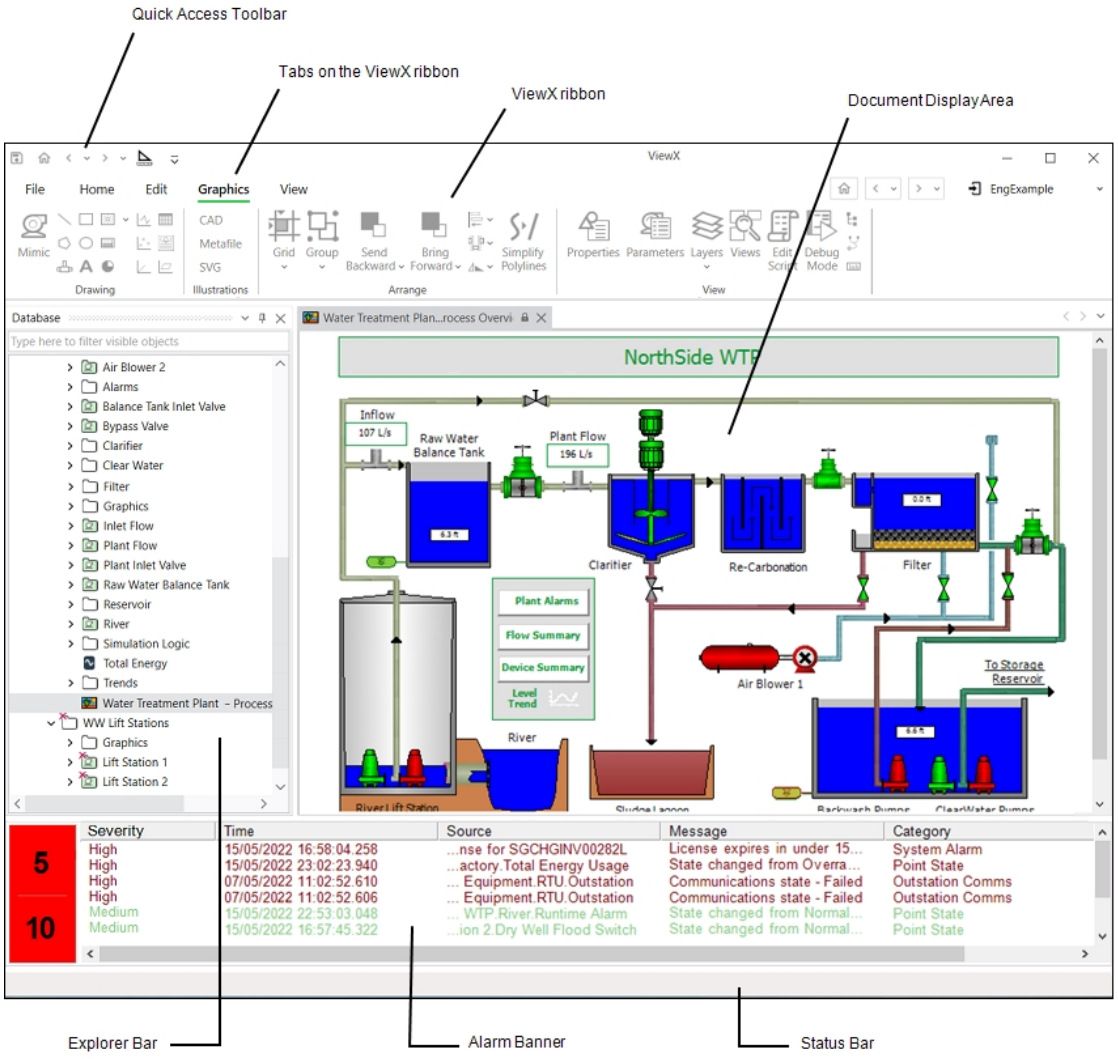
   If the password change is not successful, the Change Password window will display a message explaining the problem that occurred.



*If this occurs, take note of the reason(s) given and select **OK** to attempt to change the password again.*

The ViewX Window

When you run ViewX, the window typically contains the following components:



The Alarm Banner informs you about any existing or recent alarms on the system.

NOTE: The Alarm Banner is hidden by default on a Virtual ViewX client (providing that your User Account enables you to hide the Alarm Banner). This is by design, to provide more display space for viewing other Geo SCADA Expert displays, such as Mimics, Trends, and Queries Lists. (You can display the Alarm Banner by selecting the **Alarm Banner** command from the ViewX ribbon.)

You navigate the system using the ViewX ribbon and Explorer Bar. You view the displays you require in the document display area. The Status Bar provides information on the status of the system and user activity.

Virtual ViewX Client

NOTE: This branch of topic relates to Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS.

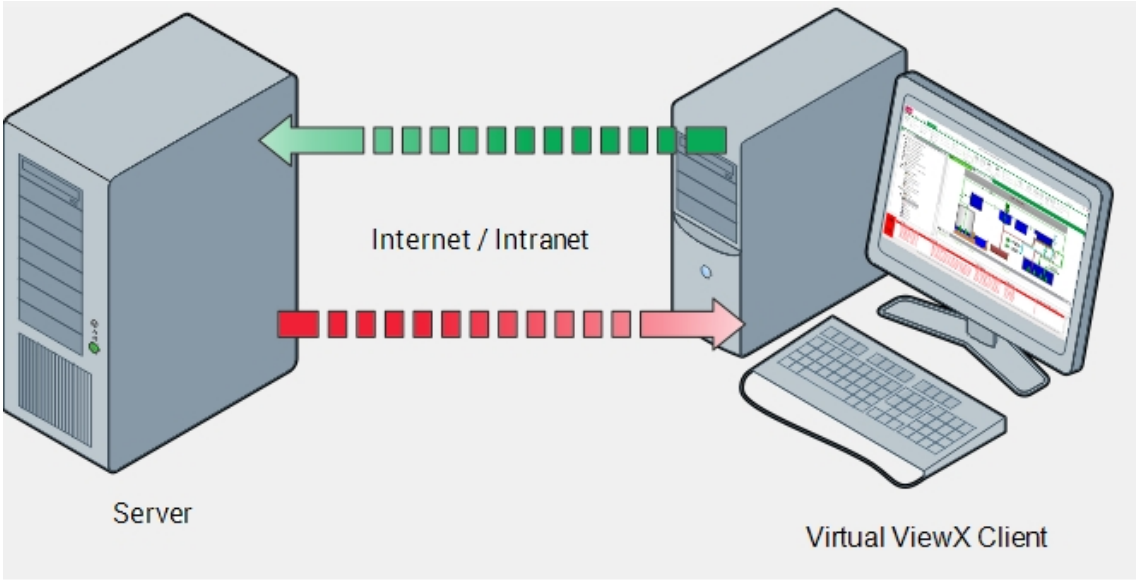
This section only documents those features that differ between a ViewX client and a Virtual ViewX client. For information on features that are not included in this section, see the ViewX Client branch of topics, and the topics in the rest of this guide.

Virtual ViewX clients are computers that connect to your system via an Internet connection (or Intranet connection to your network). Designed to be used remotely, they provide operator-level access to many Geo SCADA Expert features, including alarms. They are ideal for engineers who need to access a Geo SCADA Expert system while working in the field.

Usually, laptop computers are used as Virtual ViewX clients due to their portability. However, desktop PCs can also be used as Virtual ViewX clients as can some tablet devices.

To act as a Virtual ViewX client, a device needs to have:

- An up-to-date version of any of the supported browsers (see Web Browser Support)
- A connection to the Internet or a company Intranet.



A Virtual ViewX client typically provides operator-level access to many of the same features and functions as a ViewX Client. You can only use Virtual ViewX clients to make configuration changes to the Geo SCADA Expert database when the Virtual ViewX server is configured to run in **Full Virtual ViewX** mode (*see* 'Differences Between the Virtual ViewX Client and ViewX' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration).

Differences Between the Virtual ViewX Client and ViewX

Web clients in Geo SCADA Expert are available as either:

- The newer web server, Virtual ViewX, which is hosted using Internet Information Services (IIS) and installed separately from the Geo SCADA Expert server.
- The Original WebX server, built into each Geo SCADA Expert server instance.

This topic describes the differences between Virtual ViewX and ViewX.

Many of the functions and displays that are available from a ViewX client are also available from a Virtual ViewX client:

- Object Menu
- Alarms
- Events
- Mimics
- Lists
- Trends
- Reports
- Status Displays
- Favorites
- Operator Document Stores.

The main differences between a Virtual ViewX client and ViewX are:

- All of the Virtual ViewX clients that run on a Virtual ViewX server use the same mode of operation. This can be either:
  - **Limited Virtual ViewX/Operator** mode (the default). With this mode, each Virtual ViewX client provides operator, rather than configuration access to the system. (Engineers have to use a ViewX client to make any configuration changes.)
  - **Full Virtual ViewX** mode. With this mode, other than the differences listed below, each Virtual ViewX client provides the same level of access as a ViewX client.
- To access the Geo SCADA Expert database from a Virtual ViewX client, you have to log on to the client using a valid Geo SCADA Expert User Account. (Virtual ViewX clients do not support the Guest user or Super User accounts.)
- The ViewX Ribbon is minimized by default on a Virtual ViewX client. You can still use the ribbon while it is minimized, or you can expand the ribbon if required.
- The Alarm Banner is hidden by default on a Virtual ViewX client (providing that your User Account enables you to hide the Alarm Banner). This is by design, to provide more display space for viewing other Geo SCADA Expert displays, such as Mimics, Trends, and Queries Lists.
  (You can display the Alarm Banner by selecting the **Alarm Banner** command from the ViewX ribbon.)
- Audible alarms are not supported on a Virtual ViewX client.

- A Virtual ViewX client limits the display to the confines of the browser window. With a ViewX client you can drag and drop displays outside of the main window.
- You are restricted to having up to a maximum of 5 Geo SCADA Expert displays open simultaneously on a Virtual ViewX client (providing that your User Account provides **Multi Document Interface** access).
- A Virtual ViewX client does not support Startup Configuration files. (With a ViewX client you can use a Startup Configuration file to launch ViewX in a Multi-Monitor setup, or customize Window Container behavior.)
- Copy and paste limitations apply on a Virtual ViewX client (see 'Use Copy and Paste in Virtual ViewX' in the Geo SCADA Expert Guide to ViewX and Virtual ViewX Clients).
- You can export the data from Queries and Trends using the **Export** command on the **Edit** Tab of the ViewX ribbon. This option is available in ViewX. It is also available on Virtual ViewX clients that run in **Full Virtual ViewX** mode. For more information, see 'Queries Lists' in the Geo SCADA Expert Guide to Lists and see 'Copy Trend Data to the Clipboard' in the Geo SCADA Expert Guide to Trends.
- The Status Bar is hidden by default on a Virtual ViewX client. By design, the window is in 'full screen' mode to provide more display space for viewing other Geo SCADA Expert displays.

Which Type of Client Should I Use?

We recommend that you use **ViewX clients** for day-to-day and long-term use in Control rooms. ViewX is the client that also provides administrator- and configuration-level access to Geo SCADA Expert (for User Accounts that are configured to provide such levels of access). Virtual ViewX and Original WebX only provide operator-level access to the database (once you have logged on with a valid Geo SCADA Expert User Account).

Virtual ViewX clients are web-based clients that are intended to provide occasional, operator-level, remote access to the database. The benefits of Virtual ViewX clients compared to ViewX clients include:

- **Quicker installation**—You install the Virtual ViewX software on a web server machine to which your Virtual ViewX clients connect. On each Virtual ViewX client, you merely specify the address of that Virtual ViewX web server in a browser window. Providing that the number of Virtual ViewX clients that are accessing the web server does not exceed the license for that Virtual ViewX server, you should then be able to log on and access the database.
- **Platform-agnostic**—You can use most up-to-date HTML5-compatible web browsers to access Geo SCADA Expert from your Virtual ViewX clients (*see* Web Browser Support).
- **Remote access**—You can launch Virtual ViewX on a desktop or laptop machine wherever you have network access to your Virtual ViewX server. The Virtual ViewX server uses the Microsoft IIS web server as its foundation; this enables you to take advantage of those security features and management tools. The Virtual ViewX server can connect to multiple and redundant Geo SCADA Expert servers.

The benefits of ViewX clients compared to Virtual ViewX clients include:

- **Faster performance**—If speed of opening displays and receiving data updates is critical to your operation, as ViewX clients obtain their data directly from the Geo SCADA Expert server, updates will be marginally quicker on ViewX clients. (Whereas Virtual ViewX clients obtain their data from the Virtual ViewX server, which in turn obtains its data from the Geo SCADA Expert server, so data updates will be marginally slower. Additionally, the screen virtualization used by the ViewX clients has a slightly slower operational speed than the display response time of ViewX clients.)
- **Separate hardware**—You install ViewX software on each ViewX client machine. As such, any hardware failures typically only impact a single machine. (Whereas if hardware fails on a Virtual ViewX server machine, each of the Virtual ViewX clients that are configured to connect to that web server will lose access to the Geo SCADA Expert database.)
- **Customized Display Setup**—You can configure ViewX clients to have a Multi-Monitor or Multiple Instance setup. You can also customize the ViewX interface independently on each ViewX client. (With Virtual ViewX clients, the Virtual ViewX server defines the resolution that is used on those clients.)

Additionally, ViewX clients can provide the following functionality:

- **Administration**—You can typically only create or modify User Accounts from a ViewX client (providing that your User Account has the relevant permissions to do so). Additionally, you can only perform other administrator-level activities (such as start or stop the server) from a ViewX client (providing that your User Account has the relevant permissions to do so).

- **Configuration**—You can typically only configure the database using ViewX (providing that your User Account has the relevant permissions to do so).
- **Audible Alarms**—Providing that the alarm bell has not been configured so that it remains silent, audible alarms are available on ViewX clients on which the Alarm Banner is displayed.
- **Multi-Display**—With ViewX, you can drag and drop displays outside of the main ViewX window, and even drag them over onto other monitors. (With Virtual ViewX clients, you are restricted to moving displays around within the confines of the browser window.)

ATTENTION: You can change the mode of operation of a Virtual ViewX server so that all of the Virtual ViewX clients that are running on that server provide a similar level of access to that of ViewX clients. When a Virtual ViewX server is running in **Full Virtual ViewX** mode, users with the relevant permissions and access can configure the database and create or modify User Accounts from Virtual ViewX. For more information, see 'Mode of Operation of a Virtual ViewX Server' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration.

(Original WebX is the deprecated web client that is supported by this and previous versions of Geo SCADA Expert. Your system might use Original WebX clients if it has been upgraded from an earlier version of the product.)

Run a Virtual ViewX Client

To run a Virtual ViewX client:

1. Either:
   i. Select the **Start** button in Windows.

   The Start menu is displayed.
   ii. Scroll down the list of installed applications.
   iii. Expand the relevant folder, if necessary, and then select the option for the web browser.

   Or:

   - Double-click on the desktop shortcut for the web browser.

   A browser window is displayed.
2. Enter the address of the Virtual ViewX (the newer web server hosted using IIS) web server in the **Address** field, in one of these formats:

   `http://<name_of_server>:<port_number>/`

   `https://<name_of_server>:<port_number>/`

   Where:

   - <name_of_server> is the node name of your web server (you may also use its IP address)
   - <port_number> is the port used by the server.

     NOTE: The default ports for Virtual ViewX are 85 for http and 453 for https. If your web server uses one of these defaults, you have to include the relevant port number in the path. (You can only omit the port number if the web server is configured to use the generic ports for its protocol (80 for http, and 443 for https), rather than the default or other port numbers.)

     Use the 'https' address if your server uses secure http.

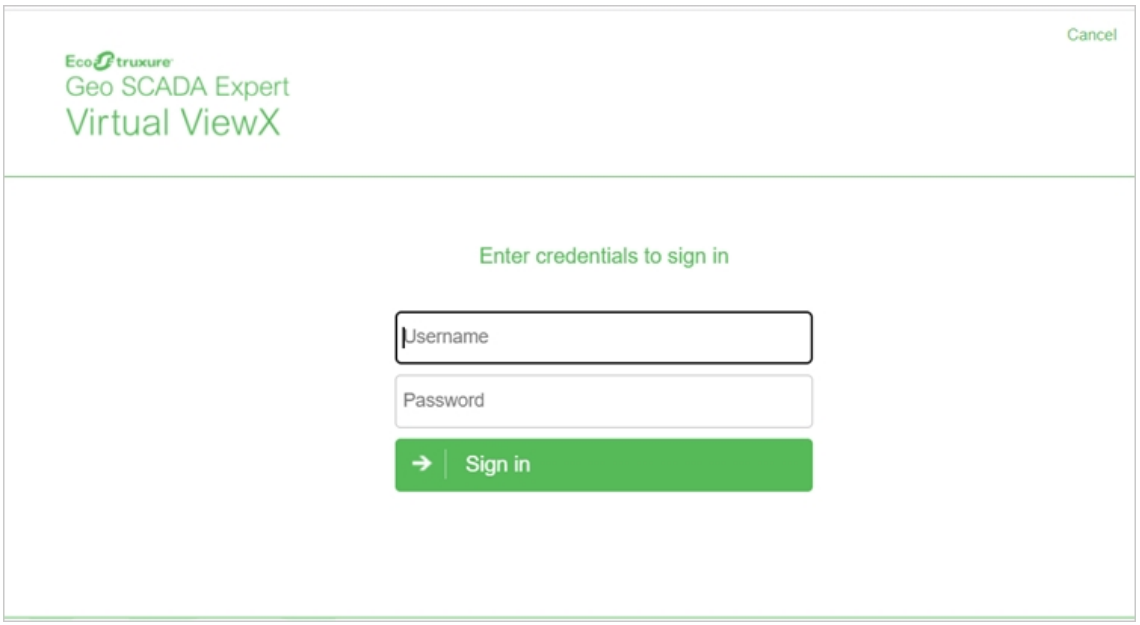
   Your system administrator will be able to provide you with this information.
   (Once you have established the required address, consider saving it as a Favorite in the Web browser.)

If your server uses secure http and you specify the relevant https address:

- If your system is using a trusted certificate, go to step 3.
- If your system is using a non-trusted certificate, you may be presented with a warning in the browser window. This means that your system is using a weaker form of security.

  The warning page allows you to **close the web page** (so you will not be able to use Virtual ViewX) or **continue to the website**. If you select **continue to the website**, you will be able to continue to the Virtual ViewX website, although your access may not be as secure as required.

3. Press the **Enter** key.
   The initial Virtual ViewX page is displayed.



Diagnostic messages appear briefly onscreen, displaying information about:

- The status of the Virtual ViewX client's connection to the web server
- The status of the Geo SCADA Expert server that is hosting the database.

To access Geo SCADA Expert via Virtual ViewX, you have to Log On to a Virtual ViewX Client.

4. The web browser might prompt you to allow the location of the Virtual ViewX client to be monitored. Select the **Allow** button if you wish to do this and then continue with the logon process.

System Security

Geo SCADA Expert security helps to protect the SCADA system from unauthorized access. System access requires a password. The actions that you perform as a user are logged by the system.

As a system user, you will be assigned access permissions according to the functions you need to perform, and you will only be able to see the functions that this makes available to you.

You will use a ViewX or Virtual ViewX client (workstation) that has been configured by a higher level user. The client and your user account should provide access to the displays and features that you need to carry out your tasks, such as performing actions on database items and managing alarms.

System security allows you to manage access to a Virtual ViewX client.

Log On to a Virtual ViewX Client

Geo SCADA Expert provides three distinct options for logging on to a Virtual ViewX client. Each logon option is designed to provide a secure authentication experience to suit your company's preferences and security requisites. A system administrator will be able to advise you as to which option your system and User Account is set up to use. Based on the system configuration and your User Account's setup, you will log on to a Virtual ViewX client using one of the following options:

- **Standard logon**—This is the traditional way of logging on to a Virtual ViewX client using your User Account. To gain access to the database, you enter a valid user name and password. Standard logon includes Geo SCADA Expert External Authentication with either Active Directory or LDAP. These login types require a password to be entered, which is authenticated with an external system.
- **Two-factor authentication (2FA)**—This is an extension to the standard logon. This logon option requires two steps of verification before you can gain access to the database. In addition to a user name and a password, you must authenticate using a second factor. This comprises a one-time password that you obtain from a third-party authenticator that you have installed on a device such as a smartphone. If your User Account is configured to use two-factor authentication (2FA), you must enroll using a third-party authenticator app (*see* Enroll for Two-Factor Authentication). You then use the authenticator account that gets created to generate each one-time password that you require for authentication along with your username and password each time that you log on thereafter.
- **Single sign-on (SSO)**—This logon option enables you to gain access to Geo SCADA Expert using the same logon credentials that you use to access other AVEVA services via SSO in your company. Unlike the other logon options, with this option you log on by selecting an **SSO** button, rather than by entering a username and password. This logs you onto the database using your existing logon credentials. The SSO logon option is available only when all of the following apply:
  - The PCS framework is installed and configured (see 'Geo SCADA Expert Prerequisite Components' in the Geo SCADA Expert Guide to Installation).
  - The Geo SCADA Expert servers have the **AVEVA Identity Manager token-based authentication** feature enabled (*see* 'Using External Authentication with Geo SCADA Expert' in the Geo SCADA Expert Guide to Security).
  - The Virtual ViewX client is configured to use SSO (*see* 'Configure the Client Connection Security Settings' in the Geo SCADA Expert Guide to Client Administration).

  Additionally, for SSO to be functional, a system administrator has to configure Virtual ViewX to use Single Sign-on (see 'Configure your Virtual ViewX clients to use Single Sign-on' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration).

The single sign-on logon option is only supported from Geo SCADA Expert 2023 onwards. You cannot use 2FA in conjunction with SSO.

User Accounts in Geo SCADA Expert are designed to be allocated to individual members of staff. User Accounts have:

- **User names and passwords—**If your User Account is not configured to use single sign-on (SSO), to log on to Geo SCADA Expert, you have to enter the user name and password for that account. For extra security, passwords can be time limited so that they have to be changed on a regular basis.

If your User Account is configured to use SSO, you do not need to enter the user name and password to log on. Instead, Geo SCADA Expert uses Windows Integrated Login to log on to a Virtual ViewX Client.

- **Permissions—**Each User Account can be allocated permissions, which affect the items and features that are available. For example, your User Account may allow you to view data, but prohibit you from configuring database items.

  A system administrator might update your permissions if access requirements change. If so, the updates to your User Account will come into effect the next time that you log on.

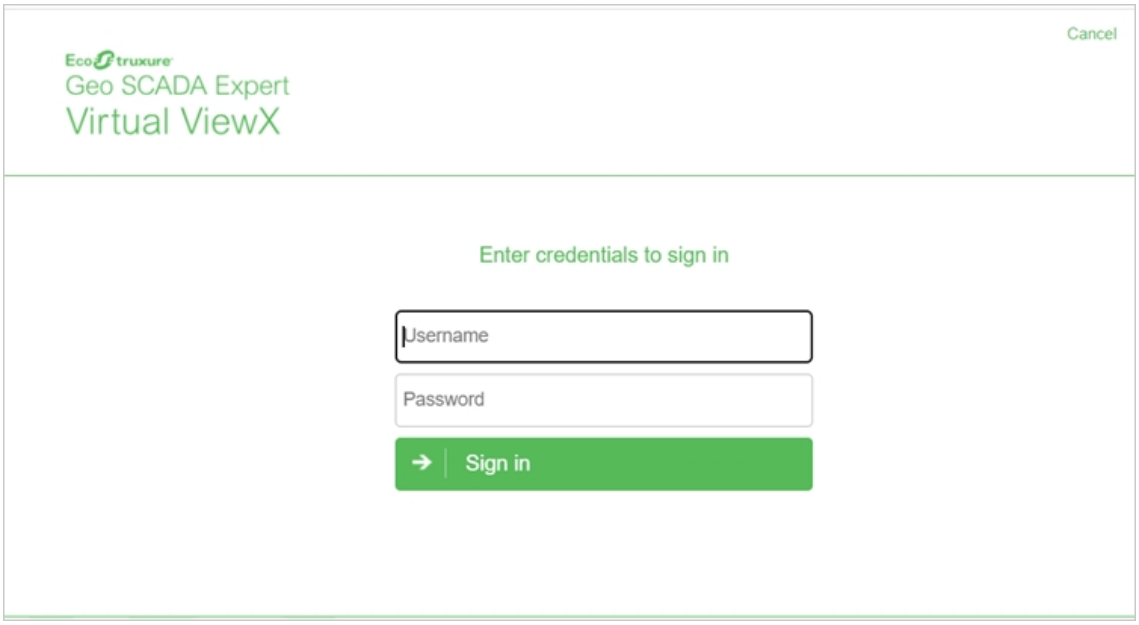
To use a Virtual ViewX client to interact with Geo SCADA Expert, you have to log on via a user account (just like with ViewX clients).

NOTE: You cannot use the built-in Guest or Super User accounts to log on to a Virtual ViewX client.

Standard Logon

To log on to a Virtual ViewX client:

1. Run the Virtual ViewX client in a browser window (*see* Run a Virtual ViewX Client).
2. Press the **Enter** key.
   The initial Virtual ViewX page is displayed.



3. Enter your **Username** and **Password**.

   With a Virtual ViewX client that is configured to connect to just one Geo SCADA Expert database, enter your Username and Password.

   With a Virtual ViewX client that is configured to connect to multiple Geo SCADA Expert databases, perform one of the following:

   - To log on to all the available systems, enter your Username and Password.
   - To log on to one specific system, prefix your Username with `<system name>@` and then enter your Password.

Example:

To log on to all the available systems as user 'Jim', enter the Username:

```
Jim
```

or

To specifically log on to 'WestSystem' as user 'Jim', enter the Username:

```
WestSystem@Jim
```

A special case exists if you use an e-mail address as your username and the username in that e-mail address happens match the name of one of your Geo SCADA Expert systems.

With such a scenario, you have to use the following syntax to log on to a specific system:

```
<system name>@<e-mail address>
```

(Otherwise Geo SCADA Expert will prevent your logon due to the username in the e-mail address being interpreted as the name of a Geo SCADA Expert system. Additionally, the domain part of the e-mail address would be interpreted as not being a valid Geo SCADA Expert username.)

Example:

If your username is 'east' and there is a system called 'east', if you enter:

```
east@org.com
```

the Virtual ViewX client prevents a log on because 'east' is interpreted as a system name and you are therefore attempting to log onto the system 'east' with the invalid username 'org.com'.

To prevent this, you enter the following username, which logs you onto the 'east' system:

```
east@east@org.com
```

4. Select the **Sign in** button.
   The browser might prompt you to allow the location of the Virtual ViewX client to be monitored.
5. Select the **Allow** button if you wish to do this and then continue the log on process.

Following a successful logon, the Log On window is closed and you are logged on to the database.

(If the log on is unsuccessful, 'Unauthorized' will be displayed on the Log On window. Remember that usernames and passwords are case-sensitive. Re-attempt your logon. If you still experience issues, contact your system administrator.)

Once you log on, the Virtual ViewX window refreshes. Depending on your user account's settings, the Virtual ViewX window displays:

- The home page display (typically a Mimic) if a **Home Page** is assigned to your user account
- An empty document display area (if your user account is not assigned a **Home Page**)
- The Database Bar to the left of the document display area
  - The Alarm Banner (typically positioned below the document display area).

Your user account's configuration determines the displays and database items to which you have access.

NOTE: To display the Log On window at other times while using a Virtual ViewX client, select the **Log On** button  in the Security group on the **Home** tab.

Use Two-factor Authentication to Logon

Your system might be configured to use Geo SCADA Expert's TOTP 2FA (two-factor authentication) feature. With a new User Account, or an existing User Account, on which this requirement has just been applied, you will need to enroll for two-factor authentication before you can access the database. You will be prompted to do this the next time that you try to log on (*see* Enroll for Two-Factor Authentication).

Your two-factor authentication will be different on different systems. Even if the username and password match across systems, the one-time password required will be different for each system. If your client connection is configured to log on to multiple systems in the Virtual ViewX `Systems.xml` file and TOTP is enabled on these systems, you must select one system at the web logon prompt. Subsequently, an instance of Virtual ViewX will initiate, facilitating logon to the selected system, including TOTP enrollment or authentication. After this initial logon, you will be able to log on to additional systems from the active Virtual ViewX session. These will be restricted to the systems to which your User Account and the Virtual ViewX client provide access.

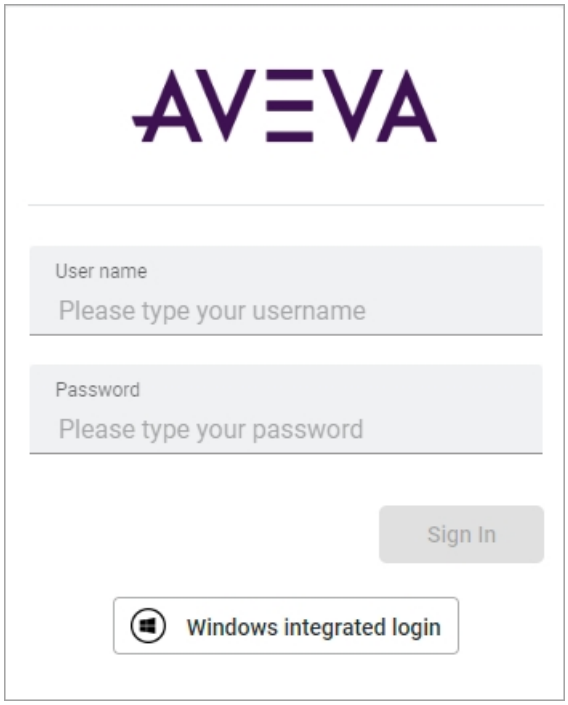
ATTENTION: The two-factor authentication for logins (configured using the Virtual ViewX Manager application) that Geo SCADA Expert has supported since Geo SCADA Expert 2022 is a completely independent feature. It is separate from, and unaffected by, the time-based one-time password (TOTP) 2FA feature.

Logon Using Single Sign-on

This section applies if your system is configured to use the **External Authentication** feature along with **Other Authentication Providers** to enable logon via single sign-on (SSO).

To log on to a Virtual ViewX client using Single Sign On:

1. Run the Virtual ViewX client in a browser window (*see* Run a Virtual ViewX Client).
   The initial Virtual ViewX page is displayed.
2. Select the **SSO** button.
   If you are not already logged on to a Geo SCADA Expert system via SSO, the AVEVA Identity Manager window is displayed. Use the window to log on to AVEVA Identity Manager.



If you are already logged on to a Geo SCADA Expert system using SSO, the AVEVA Identity Manager window is not displayed. Instead, you are logged on to Geo SCADA Expert using your currently active SSO token.

Further Information

Log off from a Virtual ViewX client: *see* Log Off from ViewX.

Change Your Password: *see* Change your Password.

Working with Single and Multiple Databases.

Example Projects

The ‘Example Projects’ database provides an example of how database items can be arranged into organized, logical hierarchies. When you create your own database items, organizing them in a similar way will help users to find items and understand the relationships between points, outstations, channels, displays, and so on.

The Example Projects database is available as part of the installation procedure.

NOTICE

UNEXPECTED BEHAVIOR OF APPLICATION

The Example Projects database can only be installed at Root Group level within a database. It contains security settings, which might affect the configuration of an existing database.

We recommend that the Examples Project database be installed as a standalone server and used only for training and in conjunction with the Tutorial material

Failure to follow these instructions can result in unexpected configuration changes.

The ‘Example Projects’ database contains a collection of items that Schneider Electric have created to imitate how a real, working Geo SCADA Expert database could be configured and is designed to show you how various features can be configured, including:

- Database points
- Mimics
- Trends
- Security
- Groups
- Group Templates and Group Instances.

A Tutorial based around the database is provided.

Installing the Examples Database

The Example Projects database is installed automatically as part of a Full installation or Typical Server and Clients installation.

NOTE: The Example Projects database is automatically imported into your installation if there is no existing database present.

If an existing database is present, then the Example Project database files are copied to your system, but are not imported. You can import the Example Project database at a later date if required.

NOTICE

UNEXPECTED BEHAVIOR OF APPLICATION

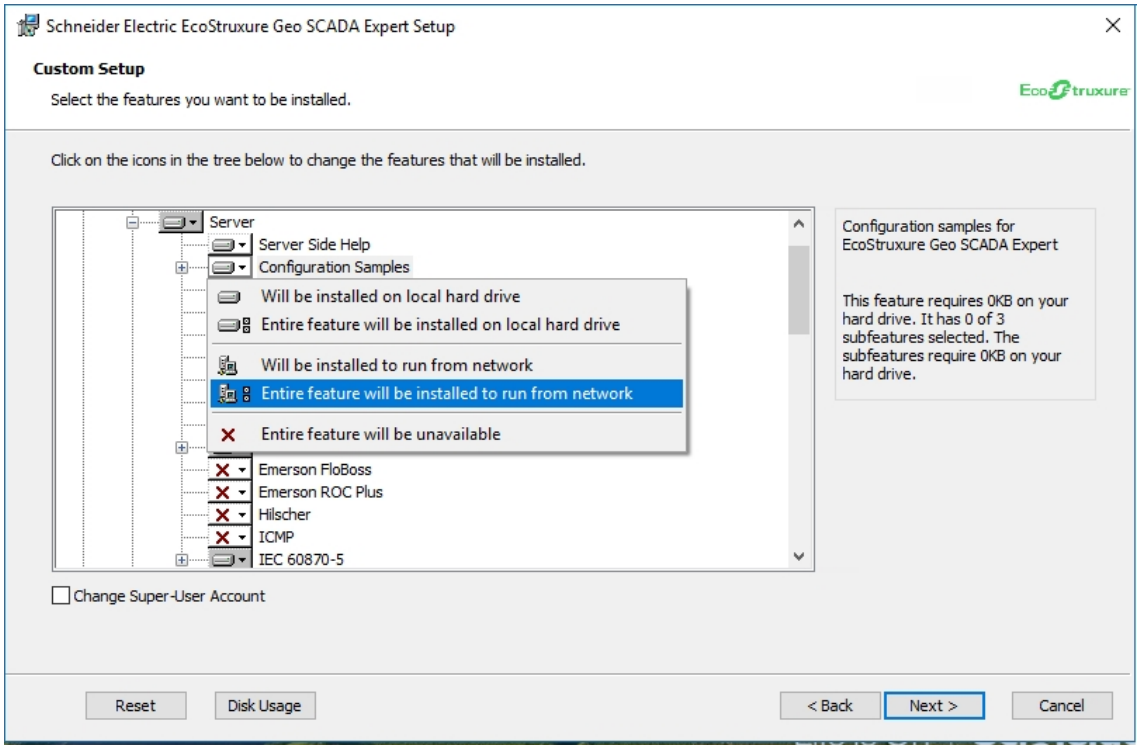
The Example Projects database can only be installed at Root Group level within a database. It contains security settings, which might affect the configuration of an existing database.

We recommend that the Examples Project database be installed as a standalone server and used only for training and in conjunction with the Tutorial material.

Failure to follow these instructions can result in unexpected configuration changes.

If your installation choice for Geo SCADA Expert does NOT include the Examples Projects database as part of the installation you need to select a **Custom** installation (*see* Choose Setup Type) or import the Example Project database when your installation is complete. When you choose **Custom** on the Choose Setup Type 'page', the Custom Setup 'page' is displayed.

Use the 'tree' on the left-hand side of the 'page' to choose and expand the Server branch and locate the Configuration Samples component.



Right-click on the branch and select the **Entire feature will be installed on local hard drive** option. The selected component and all of its sub-components will be installed.

NOTE: The Example Projects database is automatically imported into your installation if there is no existing database present.

If an existing database is present, then the Example Project database files are copied to your system, but are not imported. You can import the Example Project database at a later date if required.

When you have completed the installation of Geo SCADA Expert, (*see* Create a Super User Account), use the following procedure to complete the setup of the Example Projects:

1. Check that the Geo SCADA Expert server is running. To do this, look for the Geo SCADA Expert icon in the Windows taskbar. The Geo SCADA Expert icon should be blue, like this:

   If the Geo SCADA Expert icon is a different color, this indicates a different server state.

   If the Geo SCADA Expert icon is not shown, the Server Icon application may not be running.

   In Windows, select the **Start** menu. Scroll down the alphabetical list of installed applications and expand the **EcoStruxure Geo SCADA** folder. Select the **Server Icon** option.
   The Server icon is displayed in the taskbar in Windows.

2. Right-click on the Server icon and select the **Start Server** option.

3. Once the Server is running, start ViewX:
   - Double-click on the ViewX desktop icon.

     Or:
   - In Windows, select the **Start** menu. Scroll down the alphabetical list of installed applications and expand the **EcoStruxure Geo SCADA** folder. Select the **ViewX** option.
4. Once ViewX has started, log on to ViewX using the Super User account.

   For a new installation this is the only user available, *see* Super User Account.

   You can now Enable Example User Accounts.

Importing the Example Projects File

When the Example Projects database is not included as part of the installation process of Geo SCADA Expert, for example, on to an existing system, you can import the Example Projects database file. The file is copied by default, onto the server during the installation, as an sde (database export) file. You can import this file in order to include the example projects in your database (*see* Importing and Exporting Database Items).

NOTE: You must ensure that the following drivers are also installed for the Example Projects database to operate correctly:

DNP 3 SCADAPack E, Random Generator and Trio Diagnostics.

If you have a license to use Crystal Reports, you can also include the Crystal Reports driver, as there are example reports included in Example Projects database.

To import the Example Projects database items from a Geo SCADA Expert export file use the following procedure:

1. Select the Root Group.

NOTICE

UNEXPECTED BEHAVIOR OF APPLICATION

The Example Projects database can only be installed at Root Group level within a database. It contains security settings, which might affect the configuration of an existing database.

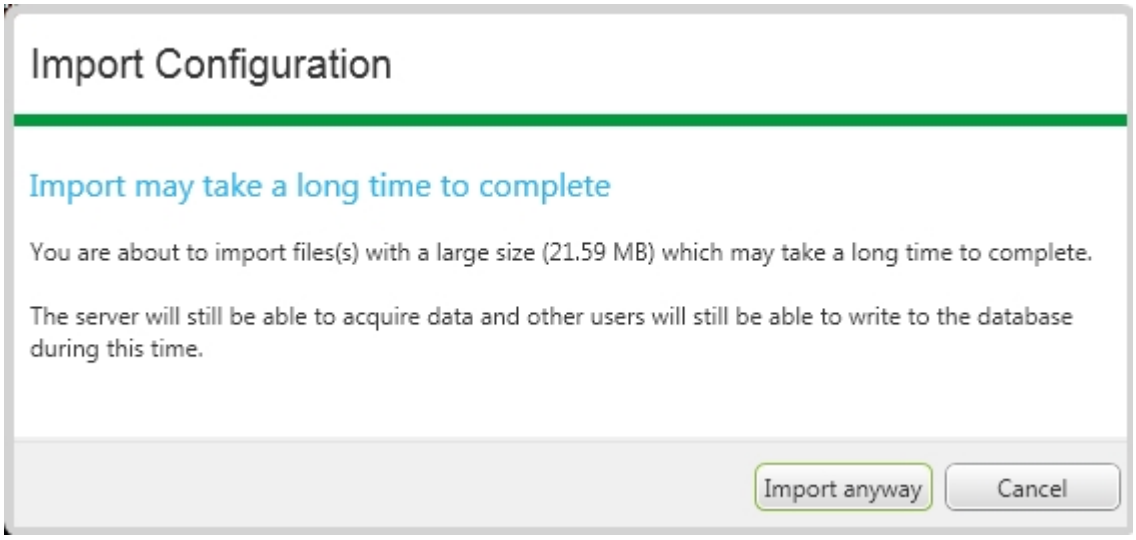
We recommend that the Examples Project database be installed as a standalone server and used only for training and in conjunction with the Tutorial material.

Failure to follow these instructions can result in unexpected configuration changes.

2. Right-click on the Root Group.
   A context-sensitive menu is displayed.
3. Select the **Import** command from the relevant command group.
   The Import From window is displayed (the layout of this window varies, depending on the operating system that you are running).
4. The Example Projects database export file is located in following directory:
   `C:\Program Files\Schneider Electric\ClearSCADA\Samples`

   NOTE: This location is common to all versions of Windows listed in File Locations (Default).
5. Select the Example Projects database file.
6. Select the **Open** button on the Import From window.
   The Import From window is closed and the relevant data is imported and stored in the Root Group.

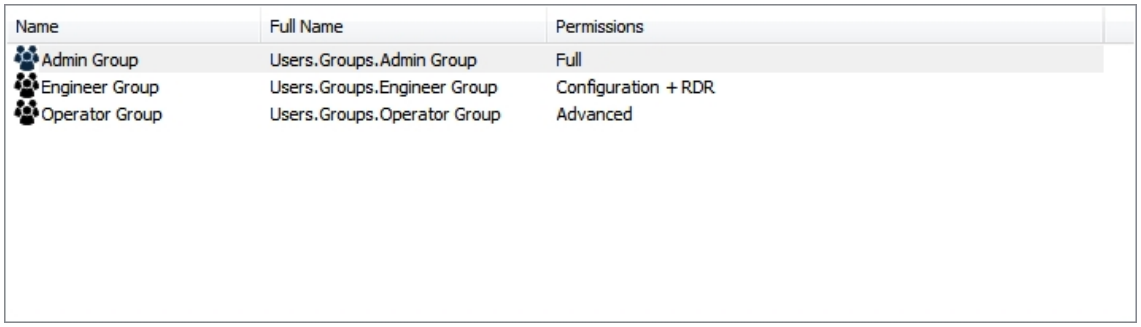
The size of the database causes an Import Configuration message to appear to indicate that the import may take some time.



7. Select **Import anyway** to start the import processes.

   ATTENTION: You cannot cancel or abort an Import action once you have started it. To cancel or abort might leave partially-imported database items unusable.

8. Once Geo SCADA Expert completes the import process you should check that the permission settings (*see* Permissions for Database Items), have been set in the Root Group, they should be similar to those shown below:



Before you can use the Example Projects database you need to Enable Example User Accounts within the database.

Enable Example User Accounts

The default security settings for a new installation require you to logon as the Super User. When you install or import the Example Projects database the security settings have been designed to comply with the default settings for a new installation.

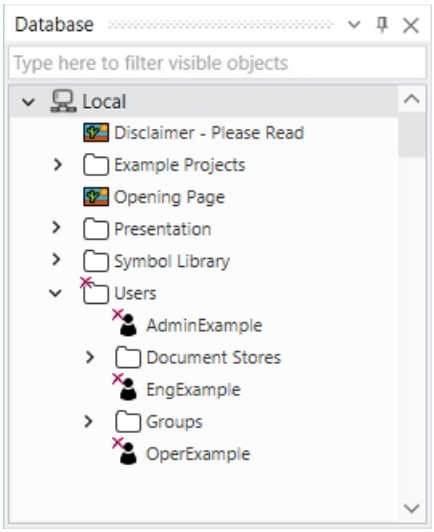
The Example Projects database includes three example User Accounts:

- **AdminExample—**Administrator type account, this user has full access to all features including security.
- **EngExample—**Engineer type account, this user has access to all configuration features.
- **OperExample—**Operator type account, this user has advanced access, but cannot configure any features.

In addition there are three User Groups:

- Admin Group
- Engineer Group
- Operator Group

By default the user accounts are not enabled, before you can use these accounts you must enable them and assign new passwords to each account. If you are working with a new installation you should be logged on as the Super User. If you expand the Database in the database bar to show the user accounts, they will appear similar to that shown below:



Select each User account:

1. Enable the account.
2. Define the password—When you logon with each user account you will be required to enter this password and then change it.
3. Save the configuration.

When you have enabled all the user accounts you can log off and disable the Super User account. You can then use the enabled User accounts to logon to the system.

Making Changes to your Geo SCADA Expert Installation

You can make changes to your Geo SCADA Expert installation by using the Geo SCADA Expert installer. For example, you can install additional drivers (in accordance with your license agreement) or uninstall Geo SCADA Expert components that you do not require.

WARNING

COMPLETE LOSS OF CONFIGURATION

When setting up a main-standby system, make sure that you restart the servers in the correct order if objects are already configured in your database. Make sure that the server with objects already configured is started first and is running as main, then start the partner servers and allow them to synchronize with the main server.

Failure to follow these instructions can result in death, serious injury, or equipment damage. Failure to start the servers in the correct order can result in the complete loss of configuration from the system, requiring recovery from a backup.

To make changes to your Geo SCADA Expert installation:

1. Shut down the Geo SCADA Expert server. (The installation process requires the server to be shut down.) For information on shutting down a server, see 'Stop the Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Server Administration.
2. Run the Geo SCADA Expert installer. To do this, you can either:
   - Insert the Geo SCADA Expert DVD and select the **Install Geo SCADA Expert** option. The Geo SCADA Expert Installation wizard runs.

   Or:

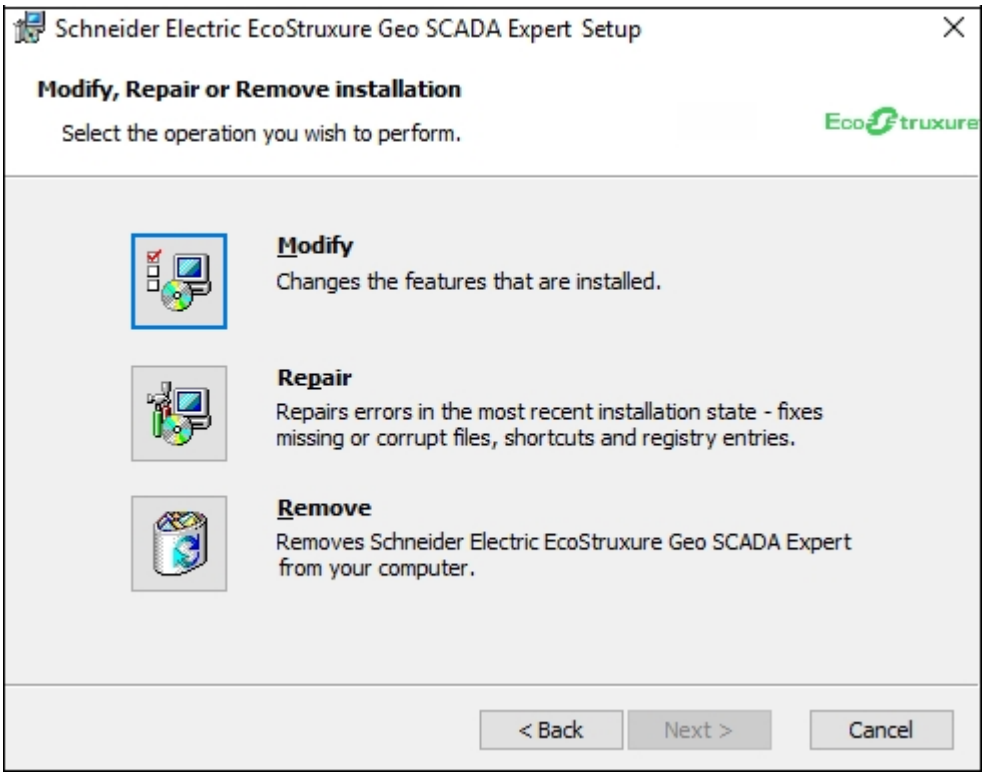
   i. Use the **Uninstall or Change a Program** feature, available from the Control Panel in Windows®. (For information about accessing the Control Panel, please refer to the Windows help.)

   ii. In the Control Panel, select **Programs and Features**.

   iii. Select **Geo SCADA Expert** in the list. You will see that the menu options change and now include Change. Alternatively, you can right-click on Geo SCADA Expert in the list to display a context-sensitive menu that contains a Change option.

   iv. Select **Change** to run the Geo SCADA Expert installation wizard.
3. Select **Next**.

4. Select **Modify**.



5. Use the **Custom Setup** page to specify which components are to be installed or uninstalled. For more information on using the **Custom Setup** page, *see* Custom Setup.
6. Select **Next**.
7. Select **Install**.
   *Geo SCADA Expert adds or removes the relevant components, depending on the selections that you made on the **Custom Setup** page.*

Further Information

Upgrading Geo SCADA Expert.
Upgrade a License.
Uninstalling Geo SCADA Expert.

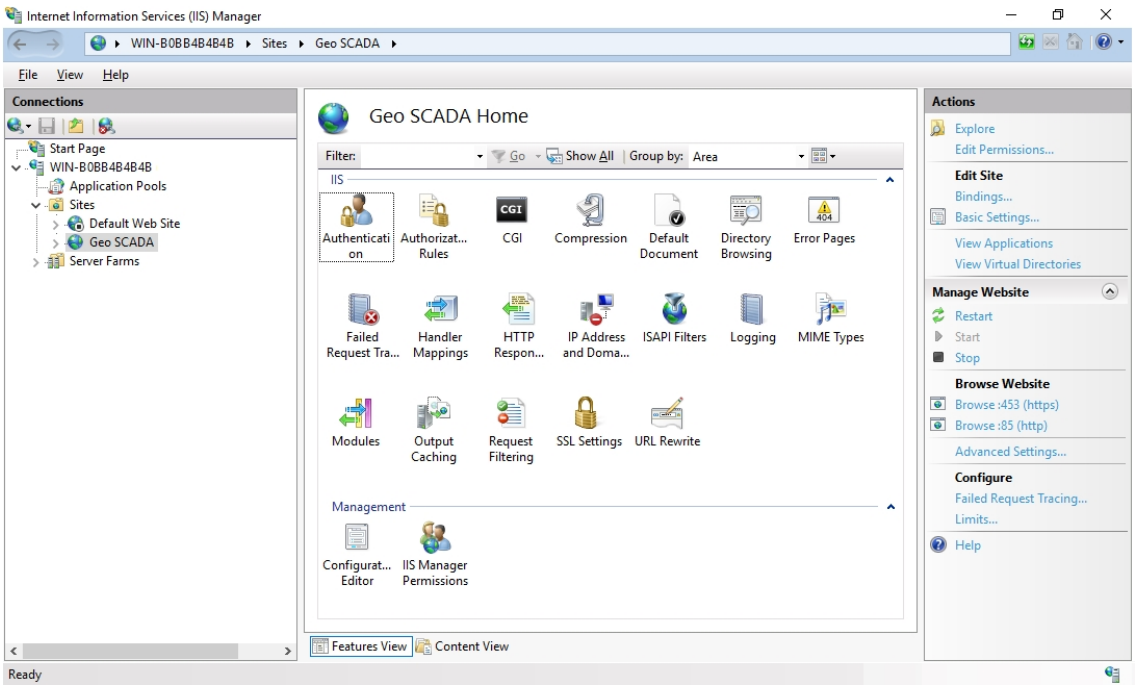
Modify your Virtual ViewX Server Installation

To run Virtual ViewX, the Virtual ViewX server software should be installed on server class hardware that is running one of the supported 64-bit operating systems (*see* 64-Bit). On such computers, the web server for Virtual ViewX is hosted using IIS.

Initial IIS setup is performed automatically as part of the Virtual ViewX Server installation procedure (*see* Virtual ViewX Server Setup Wizard).

IIS Manager is a tool produced by Microsoft® to manage Internet Information Services. If you need to modify your Virtual ViewX server installation, for example, to change the HTTP or SSL ports that were specified during the installation process, or to install an SSL certificate for use by the Virtual ViewX server, use the IIS Manager to do so. You can also use the IIS Manager to access information about the connection status of Virtual ViewX.

To access the IIS Manager application, in the Search box next to the **Start** menu in Windows®, enter the text **IIS** and select the **Internet Information Services (IIS) Manager** app.



Refer to Microsoft® documentation for information about using IIS manager.

ATTENTION: If the Virtual ViewX server software is installed on desktop class hardware, running Windows 10 or Windows 11, IIS is not used; instead, the web service is hosted directly.

Further Information

Understand the Virtual ViewX Manager: see 'Working with the Virtual ViewX Manager' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration.
'Troubleshooting a Virtual ViewX Server Installation' in the Geo SCADA Expert Guide to Virtual ViewX System Configuration.

Upgrading Geo SCADA Expert

To maintain Geo SCADA Expert's position as a leading SCADA solution, we operate a policy of continuous development. This means that, periodically, we release Geo SCADA Expert upgrades and service packs that:

- Add new features
- Improve existing features
- Allow Geo SCADA Expert to interact with a wider range of devices.

If you have been provided with a Geo SCADA Expert update, you will need to install it on your Geo SCADA Expert server(s) and clients. The installation page displays recommended steps that you should take before continuing the upgrade.

NOTICE

INABILITY TO SAVE USER PROFILE DATA ON OLD CLIENTS DURING THE UPGRADE PROCESS

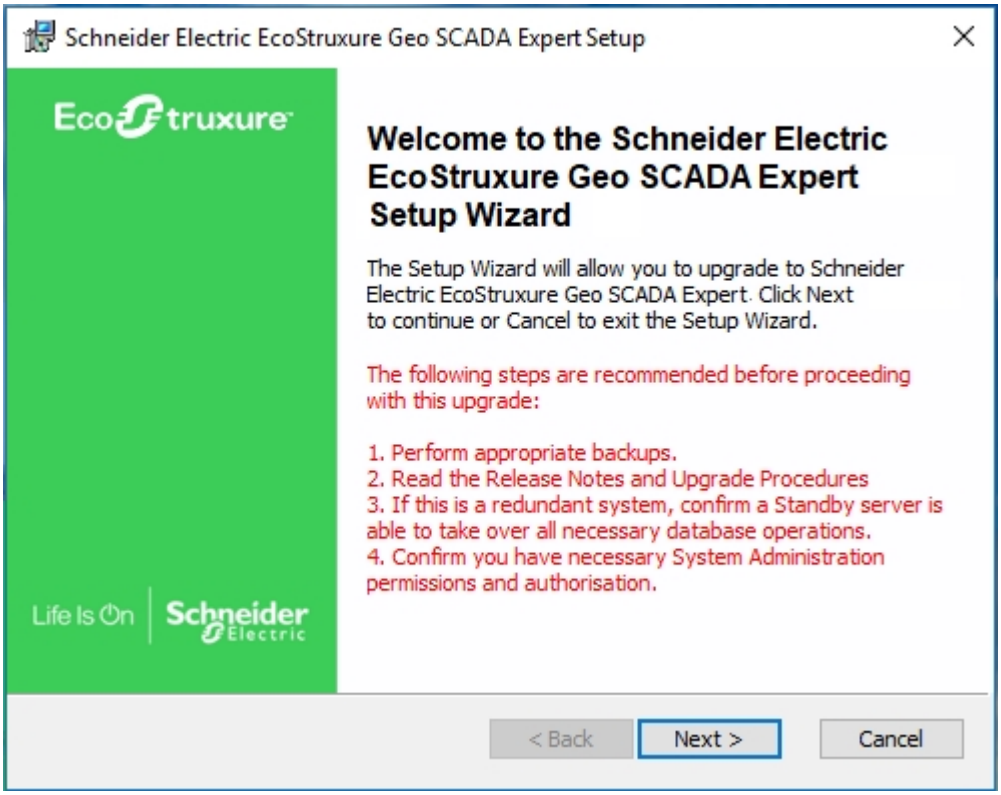
This issue applies during the upgrade process only if you are upgrading from a version of Geo SCADA Expert 2020 (or earlier) prior to the September 2021 Update (builds prior to 83.7929, 81.7929, and 80.7929). When upgrading to Geo SCADA Expert 2021 or later from a version of Geo SCADA Expert or ClearSCADA prior to the above builds, ViewX clients that are still running the older software will be unable to save user profile data on servers that are running the newer software. User profile data includes Favorites and User Registry settings. Ensure that users hold off from performing activities that involve changes to user profile data until the Geo SCADA Expert software has been upgraded on those ViewX clients.

Failure to follow these instructions can result in loss of user profile data

ATTENTION: Geo SCADA Expert 2020 onwards supports the use of certificates to initiate secure connections and encrypt the data that is transmitted between Geo SCADA Expert servers and clients. **We strongly recommend that you obtain certificates from a trusted certification authority for such communications**. With such a setup, you have to store the trusted certificates on the relevant machines before Geo SCADA Expert can be configured to use those certificates (*see* Certificates for Geo SCADA Expert Server and Client Connections).

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.



NOTE: Please read the recommended steps that need to be taken before upgrading your installation.

1. Ensure that there is sufficient disk space to enable Geo SCADA Expert to perform an automatic backup of your database (*see* Automatic Database Backup on Upgrade).
2. Obtain the update files and check the release notes. Determine whether you are likely to want to enable **Database Emulation** until checks have been made to confirm that the upgrade is successful (*see* Preparing to Upgrade Geo SCADA Expert).
3. With a few drivers in Geo SCADA Expert, other software is installed on the Geo SCADA Expert server or clients for use with those drivers. Check the documentation for such drivers to see whether any additional preparation or upgrade steps are required.
4. Refer to the section that describes your server architecture:
   - Upgrade a Geo SCADA Expert Server in a Lone Server Architecture
   - Upgrade Geo SCADA Expert Servers in a Multi-Server Architecture.
5. Upgrade Your Geo SCADA Expert Clients (Original WebX Excluded).
6. If applicable, Upgrade Your Original WebX Clients.
7. If applicable, and installed on a separate machine to the Geo SCADA Expert server, Upgrade Your Virtual ViewX Server.
8. Confirm that the upgrade is successful, then archive the automatic database backup from each server before removing those backups from disk.

Preparing to Upgrade Geo SCADA Expert

Before you upgrade your Geo SCADA Expert system, you will need to obtain the required update files. These include updates for any extensions that you may be using with your Geo SCADA Expert system.

NOTICE

INABILITY TO SAVE USER PROFILE DATA ON OLD CLIENTS DURING THE UPGRADE PROCESS

This issue applies during the upgrade process only if you are upgrading from a version of Geo SCADA Expert 2020 (or earlier) prior to the September 2021 Update (builds prior to 83.7929, 81.7929, and 80.7929). When upgrading to Geo SCADA Expert 2021 or later from a version of Geo SCADA Expert or ClearSCADA prior to the above builds, ViewX clients that are still running the older software will be unable to save user profile data on servers that are running the newer software. User profile data includes Favorites and User Registry settings. Ensure that users hold off from performing activities that involve changes to user profile data until the Geo SCADA Expert software has been upgraded on those ViewX clients.

Failure to follow these instructions can result in loss of user profile data

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

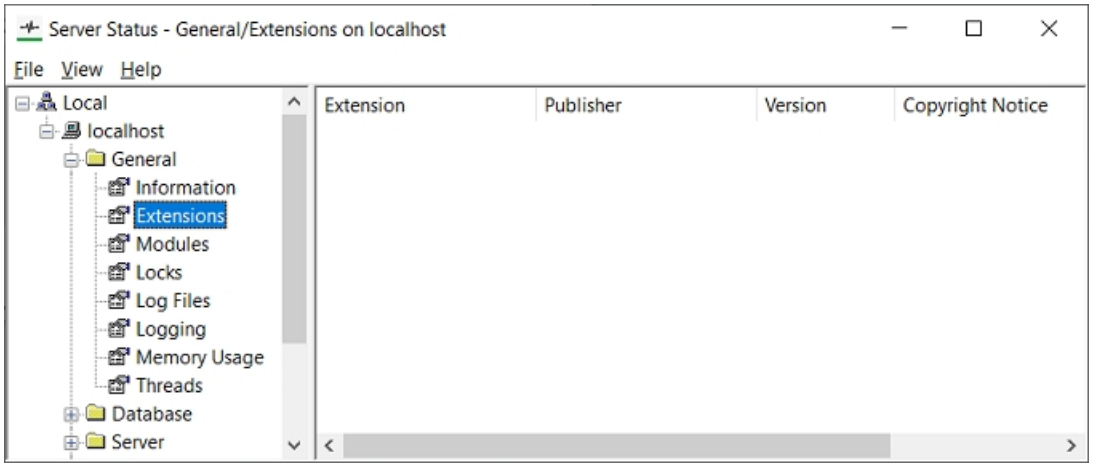
NOTE: In order to run Virtual ViewX, all Geo SCADA Expert servers must be running Geo SCADA Expert 2019 onwards; they cannot be running older versions of the software, or be set to emulate older versions.

1. Ensure that the certificates that are used for server and client communications have not expired, nor are about to expire (*see* Certificates for Geo SCADA Expert Server and Client Connections).
2. Ensure that there is sufficient disk space to enable Geo SCADA Expert to perform an automatic backup of your database. (This is a precautionary measure —you will only need to reinstate the backup if a problem occurs.) For more information, *see* Automatic Database Backup on Upgrade.
3. Get updates for any third-party extensions that you have on your Geo SCADA Expert system. An extension is a collection of installable features, for example, extensions are often collections of related drivers.

   You can use the Server Status Tool to find out which extensions (if any) you have installed on a Geo SCADA Expert server. The installed extensions are listed in the **General**>**Extensions** section. You can also see information about the **Version** and the **Publisher** of each extension (*see* 'Extensions'

in the 'General System Status Information' section of the Geo SCADA Expert Guide to the Server Status Tool).

Typical Extensions View



For information about the extensions that are installed on a ViewX client, select the **File** menu followed by the **Help** option, and then the **About** option. This displays the About window. Select the **Extensions** tab to view a list of the extensions that are installed on the client.

If you right-click on an extension, you may be able to access an **Update Information** option. This option is only available if it has been provided by the **Publisher**, and may provide details and download information about any available updates.

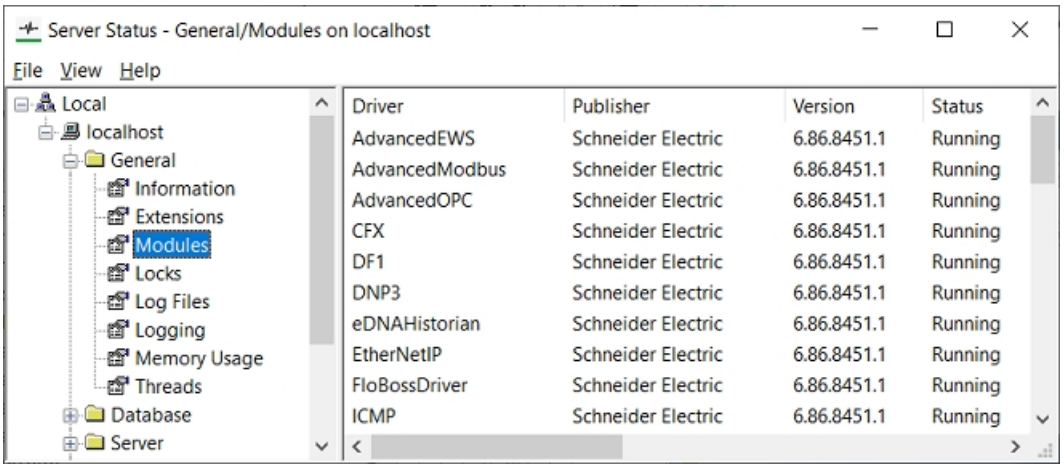
If the **Update Information** option is unavailable, you should contact the **Publisher**. You can access the publisher's contact details by right-clicking on the extension and then selecting **Support** from the context-sensitive menu.

The **Publisher** may provide you with updates for the extension only. Alternatively, the extension may repackage Geo SCADA Expert, in which case both Geo SCADA Expert and the extension are upgraded together.

4. Get updates for any third-party DDK drivers (and SDK drivers) that you use on your Geo SCADA Expert system.

   You can use the Server Status Tool to find out which DDK or SDK drivers (if any) you have installed on a Geo SCADA Expert server. In the **General>Modules** section, look at the **Publisher** details. Those modules that are *not* published by Schneider Electric are third-party drivers which may be from an extension, DDK driver or SDK driver (see 'Modules' in the 'General System Status Information' section of the Geo SCADA Expert Guide to the Server Status Tool).

Typical Modules view



If you right-click on a third-party module, you will be able to access a **Support** option. You may also be able to access an **Update Information** option (this option is only available if it has been provided by the **Publisher**). These two options may provide information that indicates whether the driver is a DDK or SDK driver. If not, they will provide contact details which you can use to get assistance.

5. Get updates for any third-party applications that you use with Geo SCADA Expert (where required).

   There may be significant differences between your current and new versions of Geo SCADA Expert. For example, the new version may include changes to the database schema. These differences can affect any third-party applications that you use with Geo SCADA Expert. So you may need to update your third-party applications to be compatible with the new version of Geo SCADA Expert.

6. Read the Geo SCADA Expert release notes. These may contain important information relating to upgrading the specific version of Geo SCADA Expert that you are currently running.

   You can also find useful upgrading information on the Geo SCADA Expert installation disk. When you insert the disk and the Geo SCADA Expert display is shown, select the **Upgrading** option. This displays a webpage containing upgrading details and a link to the Upgrade Strategy page on the Geo SCADA Knowledge Base website.

7. With a few drivers in Geo SCADA Expert, other software is installed on the Geo SCADA Expert server or clients for use with those drivers. Check the documentation for such drivers to see whether any additional preparation or upgrade steps are required.

8. If you are also upgrading Virtual ViewX, read the release notes for that application. These may contain important information relating to upgrading the specific version of Virtual ViewX that you are currently running.

9. If your system uses Original WebX clients, you need to consider how the latest ActiveX control will be installed.

   If Internet Explorer is configured to allow ActiveX controls to be downloaded, the Original WebX client will get the latest ActiveX control from the Geo SCADA Expert server. This takes place automatically the first time Original WebX client connects to an upgraded Geo SCADA Expert server. However, if Internet Explorer is prohibited from being able to download ActiveX controls, you will need to use the Geo SCADA Expert DVD to upgrade each Original WebX client.

   You need to be aware that an Original WebX client is unable to connect to the system until you have installed the latest ActiveX control.

10. Determine whether you are likely to want to enable **Database Emulation** when you install the Geo SCADA Expert upgrade. When enabled, the upgraded server emulates the version of Geo SCADA Expert software that it was running prior to the upgrade and the database files continue to be saved in the format of that earlier database version. Such Database Emulation can prove a useful temporary stage while you run checks to ensure that the upgrade has been successful. You then deactivate Database Emulation once the checks have been completed. For more information, *see* Types of Emulation Supported by Geo SCADA Expert.

    ATTENTION: Ensure that all of your servers are running the same build of Geo SCADA Expert 2020 or later software before enabling the Database Emulation feature while you upgrade those servers to Geo SCADA Expert 2021 or later software. When enabled, Geo SCADA Expert will only activate the Database Emulation during the upgrade if it detects that you are upgrading from an older version of software to which the database can be emulated (Geo SCADA Expert 2019 onwards). Once you have performed checks to ensure that the upgrade was successful, you should ensure that all of your servers are running the same build of upgraded software before then deactivating the Database Emulation feature.

11. **If you do not intend enabling Database Emulation**, ensure that users are aware that they will be unable to perform configuration-related changes on clients that are on Standby servers until the upgrade has been completed on all of the servers on the system. This is by design, as servers cannot proxy requests to older server versions. Any requests from a Standby server that are proxied to the Main server for processing are rejected while the Main server is running an older version of Geo SCADA Expert software than the Standby server. This includes configuration-related requests. Attempts to proxy such requests will result in a diagnostic message such as:

    ```
    Cannot proxy request to older server version.
    ```

    (This is not an issue if you follow the instructions in step 9 and are able to enable Database Emulation on all of the servers while upgrading. Nor is it an issue when you Upgrade a Geo SCADA Expert Server in a Lone Server Architecture.)

NOTE: Some publishers may re-package Geo SCADA Expert to be part of another package. With these packages, you can use the installer for the package to install updates for Geo SCADA Expert and the other product together.

When you have made the recommended preparation, you can proceed to install your Geo SCADA Expert upgrade. Please refer to the section that describes your system architecture:

1. Upgrade a Geo SCADA Expert Server in a Lone Server Architecture.
2. Upgrade Your Geo SCADA Expert Clients (Original WebX Excluded).
3. If applicable, Upgrade Your Original WebX Clients.
4. If applicable, and installed on a separate machine to the Geo SCADA Expert server, Upgrade Your Virtual ViewX Server.
5. If applicable, Upgrade your Licenses.

Or:

1. Upgrade Geo SCADA Expert Servers in a Multi-Server Architecture.
2. Upgrade Your Geo SCADA Expert Clients (Original WebX Excluded).

3. If applicable, Upgrade Your Original WebX Clients.
4. If applicable, and installed on a separate machine to the Geo SCADA Expert server, Upgrade Your Virtual ViewX Server.
5. If applicable, Upgrade your Licenses.

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

Automatic Database Backup on Upgrade

By default, when you upgrade the version of Geo SCADA Expert software that is running on your Geo SCADA Expert server, an automatic backup is made of your database. The files that are backed up comprise Metadata, Configuration, and Data (or whichever combination of these files exist on your system, depending on the features that have been used). For information about these files and the type of data they include, see 'Locations of the Database Folders' in the Geo SCADA Expert Guide to Server Administration.

NOTE: The automatic backup only includes certain files that contain versioning information. As such, the backup only contains a subset of the files that are stored in the **Database** folder (the name of this folder might differ on your server - see the link above for more information). The backup does not include any historic files.

The automatically-generated backup is stored in an **UpgradeDatabaseBackup** folder on the server. For information about the default location of this folder, *see* File Locations (Default). The files are stored in a format that corresponds to the version of Geo SCADA Expert software that was running on the server just prior to the upgrade.

Each database backup (one per software upgrade) is stored in a folder with a specific naming convention:

<Build Number>_<Date of Backup><Time of Backup>

Example:

```
83.7332_13-FEB-2020112635.282
```

The above folder contains the automatic database backup of a database that ran on Geo SCADA Expert version 83.7332. The database backup occurred on 13th February 2020 at 11:26:35.282 UTC.

NOTICE

LOSS OF FILES

Do not store any other files in the **UpgradeDatabaseBackup** folder, or in any of its subfolders. These folders should be used exclusively for storing automatic database backups during upgrades of the Geo SCADA Expert software.

Failure to follow these instructions could result in the loss of other files.

Be aware that the server will take a little longer to start up when performing the automatic backup following an upgrade.

The Server Startup log file, DBStartup, includes information about the status of the automatic backup that occurs when you upgrade Geo SCADA Expert.

If insufficient disk space is available for the automatic backup to complete successfully, the Server Icon will turn magenta to indicate that it was unable to perform the backup. A partial backup might exist if this occurs. The DBStartup log file will contain information about the status of the automatic backup (or inability to perform the backup).

If you want to, you can roll back the Geo SCADA Expert software following an upgrade. To perform the rollback, you downgrade back to the version of Geo SCADA Expert that was running just before the upgrade. The procedure to roll back differs slightly, depending whether **Database Emulation** was enabled for the upgrade and has continued to remain enabled. If Database Emulation was disabled for the upgrade (or was enabled but has since been disabled), the downgrade procedure requires you to restore the automatically-generated database backup for the version of software that the server was running just prior to the upgrade (*see* Perform a Downgrade after Upgrading Geo SCADA Expert). (There is no need to restore the automatically-generated database backup if Database Emulation has continuously remained enabled since the upgrade. This is because the database files will have continued to have been saved in the format that applied to the version of software that the server was running just prior to the upgrade.)

NOTICE

LOSS OF DATABASE CHANGES

If you downgrade back to a previous version of Geo SCADA Expert and reinstate the automatically-generated backup of the database for that version of software, be aware that you will lose any new data that was retrieved following the upgrade, including any new alarms. You will also lose any configuration changes that were made after that database backup occurred. This might include new database items that were created following the backup, or the reinstatement of obsolete database items that were deleted after the backup occurred. Likewise, you will be unable to make use of any new features or functionality that are only available in the upgraded version of the Geo SCADA Expert software, once you have uninstalled and downgraded the software.

Following these instructions can result in loss of database changes and functionality

Following a successful upgrade, we recommend that you archive the automatic database backup from each server before removing those backups from disk.

NOTE: Database files are stored in a database format that differs slightly per version of Geo SCADA Expert (as the format takes into account any features and functionality that are version-specific). If **Database Emulation** is enabled when you upgrade the version of Geo SCADA Expert software that is running on your Geo SCADA Expert server, the database files will continue to be stored in the same database format as the version of Geo SCADA Expert that the servers were running just prior to the upgrade. As such, this will provide a smoother downgrade path if you decide that you want to downgrade after performing the upgrade as you will not have to restore the automatically-generated database backup (*see* Perform a Downgrade after Upgrading Geo SCADA Expert).

Further Information

Do not confuse automatic database backups on upgrade with manual and scheduled database backups. For information on the latter, see 'Back up the Database' in the Geo SCADA Expert Guide to Server Administration

Change the storage location of automatic database backups: see 'Locations of the Database Folders' in the Geo SCADA Expert Guide to Server Administration.

Perform a Downgrade after Upgrading Geo SCADA Expert.

Disable Automatic Database Backups: see 'Disable Automatic Database Backups on Upgrade' in the Geo SCADA Expert Guide to Server Administration.

Types of Emulation Supported by Geo SCADA Expert

Emulation is the process of enabling one software version to behave like another software version. Geo SCADA Expert supports the following types of emulation:

Database Emulation

This type of emulation is supported by Geo SCADA Expert 2021 onwards.

When you upgrade the version of Geo SCADA Expert that is running on a server, you can opt to **Enable server database version emulation** (*see* Database Emulation Configuration). While activated, the database files continue to be saved in the same format at that of the version of Geo SCADA Expert that the server was running just prior to the upgrade (the database can be emulated back to Geo SCADA Expert 2019 inclusive). You can then check that the upgrade is successful across the system before you deactivate that database emulation (*see* Deactivate Database Emulation after a Successful Upgrade).

If you decide that you want to downgrade back to the version of Geo SCADA Expert that was running prior to the upgrade, you should leave the Database Emulation activated. This will provide a smoother downgrade path, as the format in which the database files have been saved since the upgrade will have remained unchanged from that used by the servers prior to the upgrade (*see* Perform a Downgrade after Upgrading Geo SCADA Expert).

Consider using Database Emulation if, for example, your system includes custom-built DDK drivers and you want to test that those drivers continue to run successfully following the upgrade. Likewise, if your system integrates with other data processing or reporting applications, or includes complex custom functionality that you want to check continues to run successfully following an upgrade of Geo SCADA Expert. Remember to deactivate Database Emulation once you have determined that the upgrade is successful (*see* Deactivate Database Emulation after a Successful Upgrade). Once Database Emulation is deactivated, the database items and properties that are only available in the version of Geo SCADA Expert to which the server has been upgraded will become available for use.

ATTENTION: Ensure that all of your servers are running the same build of Geo SCADA Expert 2020 or later software before enabling the Database Emulation feature while you upgrade those servers to Geo SCADA Expert 2021 or later software. When enabled, Geo SCADA Expert will only activate the Database Emulation during the upgrade if it detects that you are upgrading from an older version of software to which the database can be emulated (Geo SCADA Expert 2019 onwards). Once you have performed checks to ensure that the upgrade was successful, you should ensure that all of your servers are running the same build of upgraded software before then deactivating the Database Emulation feature.

How do I know whether my system is currently emulating a previous version of the database?

While Database Emulation is activated on a system, Geo SCADA Expert provides several indications to indicate that Database Emulation is in force:

- The **Information** category of the Server Status Tool displays a warning message that indicates the **Emulating Database Version**.
- The Server icon indicates the **Emulating Database Version** in its ToolTip.

- The Server Startup log file, DBStartup, includes an entry when Database Emulation is active. This indicates the version of Geo SCADA Expert software that is being emulated.
- When ViewX is launched, the Database Bar includes a notification indicator that shows the version of Geo SCADA Expert software that is currently being emulated. You can opt to clear the message from the Database Bar, but the message will get reinstated when you next log on, until Database Emulation has been deactivated.
- The Messages Window in ViewX includes the same informational message as the Database Bar. If you clear the message from either the Database Bar or the Messages window, that same message will get removed from both displays for your current work session. However, the message will get reinstated when you next log on, until Database Emulation has been deactivated.

All of the above messages no longer appear once Database Emulation has been deactivated (*see* Deactivate Database Emulation after a Successful Upgrade).

What configuration activities can be performed while Database Emulation is activated?

While Database Emulation is activated, the types of database items and properties that are only available in the product version to which you have just upgraded will be unavailable for use in Geo SCADA Expert. You can, however, continue to configure existing properties and create and configure the types of database items that existed in the version of Geo SCADA Expert software that was running just prior to the upgrade.

Once it has been confirmed that the upgrade has been successful, Database Emulation should then be deactivated. With servers that are in a Multi-Server architecture, we recommend that users hold off from making any further configuration changes until the Database Emulation status is identical (that is, activated or deactivated) on each of the servers in your system. For more information, *see* Deactivate Database Emulation after a Successful Upgrade.

Once Database Emulation has been deactivated across your system, the properties and database items that are only available in the product version to which you have upgraded become available for use. You can then go ahead and use these new properties and database items, as the upgrade process is now complete.

How do I Control Whether Database Emulation is Applied by Default When Geo SCADA Expert is Next Upgraded?

You can use the Server Configuration Tool to specify the default setting for the check box on the Database Emulation Configuration page of the Installation Wizard (see 'Specify the Default Setting for the Database Emulation Feature' in the Geo SCADA Expert Guide to Server Administration).

Server Emulation

Server Emulation differs from Database Emulation, and relates to the way that clients connect to the server.

You use **Server Emulation** if your system includes clients that are running a mixture of different versions of Geo SCADA Expert. It enables you to continue to use any of those clients to display and/or edit Mimics, Trends, Logic programs, and so on. This scenario might occur when you are upgrading your system, causing it to temporarily include a mixture of old and new clients. The format in which documents are stored varies slightly with the version of Geo SCADA Expert software (due to each later version supporting additional features and functionality to the previous version of software). Each client can only display documents that have been created and saved using a version of Geo SCADA Expert up to, and

including, the version that the client is currently running. You therefore use Server Emulation to emulate the oldest version of Geo SCADA Expert software that is currently being used by the clients on your system. This will enable you to continue to use any of the clients that are running that version of the software onwards to display and/or edit Mimics, Trends, Logic programs, and so on.

Once you have upgraded the version of Geo SCADA Expert that is running on all of the clients in your system, you can turn Server Emulation off (or, if applicable, change the setting to emulate the oldest version of software that now applies to clients across your entire system). This will enable the documents to be saved in the file format for that version of the software, and the clients will gain access to the features and functionality that are supported by that version of software.

NOTE: If Database Emulation is enabled in addition to Server Emulation, the list of software versions that are offered for Server Emulation will only include versions up to and including the Database Emulation version. Once Database Emulation has been disabled, the list of software versions offered for Server Emulation will extend to include the version of Geo SCADA Expert software that is currently running on the server.

How do I know whether Server Emulation is currently enabled on my system?

You can determine whether Server Emulation is currently enabled on your system by looking at either of the following:

- The **Information** category that is located in the **General** branch of the Server Status Tool. This includes an entry if Server Emulation is enabled. The entry indicates the version of Geo SCADA Expert software that the server is emulating for client connections.
- The Server Startup log file, DBStartup, includes a Server Emulation entry. This indicates whether server emulation is enabled, and if so indicates the version of Geo SCADA Expert software that the server is emulating for client connections.

How to do I know which version of Geo SCADA Expert my clients are running?

You can ascertain the version of Geo SCADA Expert software that is running on the clients that are currently connected to a Geo SCADA Expert server. To do this, you use the Server Status Tool. Log on to the tool, expand the **Server** branch and then select the **Server Links** entry. The version of Geo SCADA Expert software is shown in the **Client Version** column. You can change the sort order of the column so that you can view the entries by Geo SCADA Expert version.

If some clients connect to a different server, repeat the procedure on the other server(s) as required.

Ensure that you also take into account the version of Geo SCADA Expert software that is installed on any clients that form part of your system, but that are currently offline.

What configuration activities can be performed while Server Emulation is enabled?

For information about which configuration activities users can perform while Server Emulation is enabled, see 'Server Emulation' in the Geo SCADA Expert Guide to Server Administration.

Further Information

See 'Server Emulation' in the Geo SCADA Expert Guide to Server Administration.

Upgrade a Geo SCADA Expert Server in a Lone Server Architecture

When you have the appropriate update files for Geo SCADA Expert and any extensions, DDK drivers, and third-party applications, you can upgrade your Geo SCADA Expert system. For more information on obtaining these update files, *see* Preparing to Upgrade Geo SCADA Expert.

ATTENTION: Read the Geo SCADA Expert release notes for your version of Geo SCADA Expert before starting the update process. The release notes may contain important details about installing updates for your specific version of Geo SCADA Expert.

In this section, we explain how to upgrade your Geo SCADA Expert servers using **separate** installers for:

- Geo SCADA Expert
- Extensions
- DDK drivers
- Third-party applications (that target Geo SCADA Expert).

Some publishers may repackage Geo SCADA Expert updates so that you can install all (or some) of the components (above) from a single installer.

To upgrade your lone Geo SCADA Expert server:

1. First, undertake the appropriate preparation (*see* Preparing to Upgrade Geo SCADA Expert).

   With correct preparation, you will:

   - Find out about any version-specific details relating to your current version and the new version of Geo SCADA Expert.
   - Ensure that there is sufficient disk space for Geo SCADA Expert to perform an automatic backup of your database. You can use this to restore your system should an unexpected issue occur.
   - Obtain the required upgrade files so that the upgrade can be completed as efficiently as possible.
   - Check whether any additional preparation or upgrade steps are required for any drivers for which other software is installed on the server or clients for use with those drivers. This requirement only applies to a few drivers. The driver guides for such drivers should mention any such additional requirements.
2. Shut down the Geo SCADA Expert server. (The installation process requires the server to be shut down.) For information on shutting down a server, see 'Stop the Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Server Administration.
3. Install the Geo SCADA Expert update on the Geo SCADA Expert server. To do this, run the Setup.exe file which is part of the Geo SCADA Expert update. When you run Setup.exe, the installer will run and install the correct files for the server's operating system.

   As part of the installation process, you might want to enable **Database Emulation** (*see* Database Emulation Configuration). This enables the database files to continue to be saved in the same

database format as the database version that was running prior to the upgrade. This is intended as a temporary stage until checks have been completed to confirm that the upgrade is successful (*see* Types of Emulation Supported by Geo SCADA Expert).

NOTE: Some publishers may re-package Geo SCADA Expert to be part of another package. With these packages, you can use the installer for the package to install updates for Geo SCADA Expert and the other product together.

4. Install updates for any extensions. (Skip to step 5 if your system does not use extensions).

   To install an extension, run the installer application supplied with the extension upgrade.

   If you do not update all of the extensions, Geo SCADA Expert may not run correctly.

5. Install updates for any DDK drivers. (Skip to step 6 if your system does not use DDK drivers).

   The Geo SCADA Expert update includes the latest version of drivers created by Schneider Electric. However, if your system has DDK drivers created by a third-party organization, you will need to install the appropriate updates. This is because DDK drivers are associated with a specific version of Geo SCADA Expert—when you upgrade Geo SCADA Expert, the DDK drivers need to match the new Geo SCADA Expert version.

   If you do not update all of the DDK drivers, Geo SCADA Expert may not run correctly.

6. Install updates for any third-party applications that are associated with a specific version of Geo SCADA Expert. (Skip to step 7 if your system does not use any third-party applications with Geo SCADA Expert).

   For information on any third-party applications that you use with Geo SCADA Expert, please contact the publisher of the application.

7. If the Virtual ViewX server is installed on the same machine, install the update to the Virtual ViewX server. To do this, run the Virtual ViewX Server.exe file that is part of the Virtual ViewX update. When you run the file, the installer will run and install the correct files for the server's operating system.

8. Restart the Geo SCADA Expert server.

   For information on restarting a server, see Start and Stop the System Server.

9. If your Geo SCADA Expert server is connected to clients that run an older version of Geo SCADA Expert, you should enable **Server Emulation**. This will allow the clients to continue to function as expected while they are awaiting upgrade. Any new features in the Geo SCADA Expert upgrade will be unavailable on the clients until the clients have been upgraded.

   For information on enabling server emulation, *see* Server Emulation.

10. Upgrade your Geo SCADA Expert license (*see* Upgrade a License).

11. Upgrade your Geo SCADA Expert clients:
    - Upgrade Your Geo SCADA Expert Clients (Original WebX Excluded)
    - Upgrade Your Original WebX Clients.

12. If you previously enabled Server Emulation, log on to the Server Configuration Tool and clear the **Present a different server version to clients** check box (**System Configuration>Emulate Server Version**). This disables the server emulation feature.

13. Confirm that the upgrade is successful, then:
    - Deactivate the **Database Emulation** (if this was activated during the upgrade process) (*see* Deactivate Database Emulation after a Successful Upgrade). The new features and functionality that are only available from the product version to which you have just upgraded will become available for use.
    - Archive the automatic database backup from the server before removing that backup from disk.

You have now upgraded your Geo SCADA Expert server and clients.

Upgrade Geo SCADA Expert Servers in a Multi-Server Architecture

When you have the appropriate update files for Geo SCADA Expert and any extensions, DDK drivers, and Third Party applications, you can upgrade your Geo SCADA Expert system. For more information on obtaining these update files, *see* Preparing to Upgrade Geo SCADA Expert.

ATTENTION: Read the Geo SCADA Expert release notes for your version of Geo SCADA Expert before starting the update process. The release notes may contain important details about installing updates for your specific version of Geo SCADA Expert.

In this section, we explain how to upgrade your Geo SCADA Expert servers using **separate** installers for:

- Geo SCADA Expert
- Extensions
- DDK drivers
- Third Party applications (that target Geo SCADA Expert).

Some publishers may repackage Geo SCADA Expert updates so that you can install all (or some) of the components (above) from a single installer.

Irrespective of the type of installer(s) you have, you will need to install updates for Geo SCADA Expert, extensions (if used), DDK drivers (if used) and Third Party applications (if used) on the Standby servers first. You will then need to install the same components on the Main server.

WARNING

COMPLETE LOSS OF CONFIGURATION

When setting up a main-standby system, make sure that you restart the servers in the correct order if objects are already configured in your database. Make sure that the server with objects already configured is started first and is running as main, then start the partner servers and allow them to synchronize with the main server.

Failure to follow these instructions can result in death, serious injury, or equipment damage. Failure to start the servers in the correct order can result in the complete loss of configuration from the system, requiring recovery from a backup.

To upgrade your Geo SCADA Expert servers, please refer to the section that describes your multi-server architecture:

- Upgrade Multi-Server Geo SCADA Expert with No Clients
- Upgrade Multi-Server Geo SCADA Expert with Clients.

Upgrade Multi-Server Geo SCADA Expert with No Clients

To upgrade Geo SCADA Expert servers that have no clients:

1. First, undertake the appropriate preparation (*see* Preparing to Upgrade Geo SCADA Expert).

   With correct preparation, you will:

   - Find out about any version-specific details relating to your current version and the new version of Geo SCADA Expert.
   - Ensure that there is sufficient disk space to enable Geo SCADA Expert to perform an automatic backup of your database. You can use this to restore your system should an unexpected issue occur.
   - Ensure that all of your servers are running the same build of Geo SCADA Expert 2020 or later software if you intend enabling the Database Emulation feature while you upgrade those servers.
   - Know whether users have to refrain from any configuration-related activities while the upgrade is in progress.
   - Obtain the required upgrade files so that the upgrade can be completed as efficiently as possible.
   - Check whether any additional preparation or upgrade steps are required for any drivers for which other software is installed on the server or clients for use with those drivers. This requirement only applies to a few drivers. The driver guides for such drivers should mention any such additional requirements.

2. Shutdown Geo SCADA Expert on your Standby Server.

   You need to shutdown the Standby server first because:

   - The installation process requires the Geo SCADA Expert server to be shutdown.
   - Upgrading the Standby servers before the Main server reduces the number of Changeovers required. As a result, the upgrade process is more efficient. This is especially important with some simple drivers, as there can be a loss of data during the Main-Standby Changeover. By reducing the number of Changeovers, you minimize the amount of potential data loss.

   When you upgrade a multi-server architecture, you will need to stop the Main server so that you can install the upgrade. When you stop the Main server, a Changeover occurs automatically, and one of the Standby servers switches to become Main.

   During the Changeover, the drivers on the new Main server will start-up and begin scanning their devices. On larger systems, it can take a certain amount of time for the drivers to start. This can result in there being a delay before Geo SCADA Expert can resume scanning the devices again.

   By upgrading all of the Standby servers before the Main server, you can apply the upgrades with just one Changeover taking place (or two Changeovers if you enable **Database Emulation** during the upgrade process). This minimizes the amount of time that the drivers are unable to scan their associated devices.

   If you upgraded a Main server before the Standby servers, multiple Changeovers may be required. This is because you would have to shutdown more than one Main server (when you shutdown the first Main server, one of the Standby servers will switch to Main).

For information on shutting down a server, *see* 'Stop the Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Server Administration.

3. Install the Geo SCADA Expert upgrade on the Standby server. To do this, run the Setup.exe file which is part of the Geo SCADA Expert update. When you run Setup.exe, the installer will run and install the correct files for the server's operating system.

   As part of the installation process, you might want to enable **Database Emulation** (*see* Database Emulation Configuration). This enables the database files to continue to be saved in the same database format as the database version that was running prior to the upgrade. This is intended as a temporary stage until checks have been completed to confirm that the upgrade is successful (*see* Types of Emulation Supported by Geo SCADA Expert).

   Ensure that you specify the same Database Emulation setting on every server that you are upgrading in your system.

   If you do not intend enabling Database Emulation, ensure that users are aware that they will be unable to perform configuration-related changes on clients that are on Standby servers until the upgrade has been completed on all of the servers on the system. This is by design, as servers cannot proxy requests to older server versions. Any requests from a Standby server that are proxied to the Main server for processing are rejected while the Main server is running an older version of Geo SCADA Expert software than the Standby server. This includes configuration-related requests. Attempts to proxy such requests will result in a diagnostic message such as:

   ```
   Cannot proxy request to older server version.
   ```

   > **NOTE:** Some publishers may re-package Geo SCADA Expert to be part of another package. With these packages, you can use the installer for the package to install updates for Geo SCADA Expert and the other product together.

4. On the Standby server, install updates for any extensions. (Skip to step 5 if your system does not use extensions).

   To install an extension, run the installer application supplied with the extension upgrade.

   If you do not update all of the extensions, Geo SCADA Expert may not run correctly.

5. On the Standby server, install updates for any DDK drivers. (Skip to step 6 if your system does not use any DDK drivers).

   The Geo SCADA Expert update includes the latest version of drivers created by Schneider Electric. However, if your system has DDK drivers created by a third-party organization, you will need to install the appropriate updates. This is because DDK drivers are associated with a specific version of Geo SCADA Expert—when you upgrade Geo SCADA Expert, the DDK drivers need to match the new Geo SCADA Expert version.

   If you do not update all of the DDK drivers, Geo SCADA Expert may not run correctly.

6. On the Standby server, install updates for any third-party applications that are associated with a specific version of Geo SCADA Expert. (Skip to step 7 if your system does not use any third-party applications with Geo SCADA Expert).

   For information on any third-party applications that you use with Geo SCADA Expert, please contact the publisher of the application.

7. Upgrade the license on the Standby server (*see* Upgrade a License).

8. If the Virtual ViewX server is installed on the same machine, install the update to the Virtual ViewX server. To do this, run the Virtual ViewX Server.exe file that is part of the Virtual ViewX update. When you run the file, the installer will run and install the correct files for the server's operating system.
9. Restart Geo SCADA Expert on the Standby server (for information on restarting a server, *see* Start and Stop the System Server). Wait for the server to fully synchronize with the Main server and go into the Standby state.
10. Perform checks to ensure that the upgrade has been successful.

    If it has been successful, move on to step 11.

    If there appears to be an issue and you decide that you want to downgrade that server back to the previous version of Geo SCADA Expert software, ignore the rest of the steps in this procedure and do not upgrade any other servers. Instead, *see* Perform a Downgrade after Upgrading Geo SCADA Expert.
11. To continue with the upgrade, repeat steps 2-10 inclusive on each of the Standby servers.
12. After completing the upgrades of all of the Standby servers, you should shutdown the Main server. This will cause a Changeover and one of the Standby servers will become the new Main server. As all of the Standby servers have been upgraded, they are able to synchronize with the new Main server (they all run the same version of Geo SCADA Expert).

    The server that was formerly the Main server has now stopped.
13. On the server that was formerly the Main server, install the Geo SCADA Expert update, specify the same Database Emulation setting as the other servers that have just been upgraded, update the extensions, DDK drivers, and third-party applications as required. Likewise, if the Virtual ViewX server is installed on the same machine, install the update to the Virtual ViewX server. (Use the same techniques as when you upgraded the Standby servers).
14. Restart the server that was formerly the Main server. It now runs as a Standby server and it synchronizes with the new Main server.
15. You have now upgraded your Geo SCADA Expert servers. Next, you need to upgrade your Geo SCADA Expert clients:
    - Upgrade Your Geo SCADA Expert Clients (Original WebX Excluded).
    - Upgrade Your Original WebX Clients.
16. Confirm that the upgrade is successful, then archive the automatic database backup from each server before removing those backups from disk.
17. You can ignore this step if you did not enable **Database Emulation** on the servers that you upgraded.

    If **Database Emulation** was activated on the servers that you upgraded, after confirming that the upgrade is successful and that all of your servers are running the same build of upgraded Geo SCADA Expert software, you can now deactivate that Database Emulation. You should do this in a specific order (so that just a single Changeover takes place):

ATTENTION: Ensure that users hold off from making any configuration changes to the database until the Database Emulation status is identical (that is, activated or deactivated) on each of the servers in your system. This is because the file format in which database files are stored differs between versions of the Geo SCADA Expert software. When Database Emulation is deactivated, the database files will be stored in a slightly different file format, and the new features and functionality that are only available from the version of Geo SCADA Expert to which the servers have been upgraded will become available for use.

i. Deactivate Database Emulation on one of the Standby Servers (*see* Deactivate Database Emulation after a Successful Upgrade). This will cause that server to shut down.

ii. Restart that server.

iii. Repeat steps i to ii on the other standby servers that you have just upgraded.

iv. After deactivating Database Emulation on all of the Standby servers, you should shutdown the Main server. This will cause a Changeover and one of the Standby servers will become the new Main server. As all of the Standby servers have been upgraded, they are able to synchronize with the new Main server (they all run the same version of Geo SCADA Expert).

v. On the server that was formerly the Main server, deactvate Database Emulation (*see* Deactivate Database Emulation after a Successful Upgrade).

vi. Restart the server that was formerly the Main server. It now runs as a Standby server and it synchronizes with the new Main server.
All of the upgraded servers will now have access the new database items and properties that are only available from the version of Geo SCADA Expert to which those servers have been upgraded. The database files will be stored in a slightly different format in order to take account of the new features and functionality.

Upgrade Multi-Server Geo SCADA Expert with Clients

If you have a multi-server Geo SCADA Expert system that has clients, we recommend that you use **Server Emulation** during the upgrading process. Server emulation allows clients that are running older versions of Geo SCADA Expert to connect to a server that has been upgraded.

By using server emulation, you can minimize the amount of time that the clients are unable to access the system during upgrading.

To upgrade a multi-server Geo SCADA Expert system:

1. First, undertake the appropriate preparation (*see* Preparing to Upgrade Geo SCADA Expert).

   With correct preparation, you will:

   - Find out about any version-specific details relating to your current version and the new version of Geo SCADA Expert.
   - Ensure that there is sufficient disk space for Geo SCADA Expert to perform an automatic backup of your database. You can use this to restore your system should an unexpected issue occur.
   - Ensure that all of your servers are running the same build of Geo SCADA Expert 2020 or later software if you intend enabling the Database Emulation feature while you upgrade those servers.
   - Know whether users have to refrain from any configuration-related activities while the upgrade is in progress.
   - Obtain the required upgrade files so that the upgrade can be completed as efficiently as possible.
   - Check whether any additional preparation or upgrade steps are required for any drivers for which other software is installed on the server or clients for use with those drivers. This requirement only applies to a few drivers. The driver guides for such drivers should mention any such additional requirements.

2. Shutdown Geo SCADA Expert on your Standby Server.

   You need to shutdown the Standby server first because:

   - The installation process requires the Geo SCADA Expert server to be shutdown.
   - Upgrading the Standby servers before the Main server reduces the number of Changeovers required. As a result, the upgrade process is more efficient. This is especially important with some simple drivers, as there can be a loss of data during the Main-Standby Changeover. By reducing the number of Changeovers, you minimize the amount of potential data loss.

   When you upgrade a multi-server architecture, you will need to stop the Main server so that you can install the upgrade. When you stop the Main server, a Changeover occurs automatically, and one of the Standby servers switches to become Main.

   During the Changeover, the drivers on the new Main server will start-up and begin scanning their devices. On larger systems, it can take a certain amount of time for the drivers to start. This can result in there being a delay before Geo SCADA Expert can resume scanning the devices again.

By upgrading all of the Standby servers before the Main server, you can apply the upgrades with just one Changeover taking place (or two Changeovers if you enable **Database Emulation** during the upgrade process). This minimizes the amount of time that the drivers are unable to scan their associated devices.

If you upgraded a Main server before the Standby servers, multiple Changeovers may be required. This is because you would have to shutdown more than one Main servers (when you shutdown the first Main server, one of the Standby servers will switch to Main).

For information on shutting down a server, *see* 'Stop the Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Server Administration.

3. Install the Geo SCADA Expert upgrade on the Standby server. To do this, run the Setup.exe file which is part of the Geo SCADA Expert update. When you run Setup.exe, the installer will run and install the correct files for the server's operating system.

   As part of the installation process, you might want to enable **Database Emulation** (*see* Database Emulation Configuration). This enables the database files to continue to be saved in the same database format as the database version that was running prior to the upgrade. This is intended as a temporary stage until checks have been completed to confirm that the upgrade is successful (*see* Types of Emulation Supported by Geo SCADA Expert).

   Ensure that you specify the same Database Emulation setting on every server that you are upgrading in your system.

   If you do not intend enabling Database Emulation, ensure that users are aware that they will be unable to perform configuration-related changes on clients that are on Standby servers until the upgrade has been completed on all of the servers on the system. This is by design, as servers cannot proxy requests to older server versions. Any requests from a Standby server that are proxied to the Main server for processing are rejected while the Main server is running an older version of Geo SCADA Expert software than the Standby server. This includes configuration-related requests. Attempts to proxy such requests will result in a diagnostic message such as:

   ```
   Cannot proxy request to older server version.
   ```

   NOTE: Some publishers may re-package Geo SCADA Expert to be part of another package. With these packages, you can use the installer for the package to install updates for Geo SCADA Expert and the other product together.

4. On the Standby server, install updates for any extensions. (Skip to step 5 if your system does not use extensions).

   To install an extension, run the installer application supplied with the extension upgrade.

   If you do not update all of the extensions, Geo SCADA Expert may not run correctly.

5. On the Standby server, install updates for any DDK drivers. (Skip to step 6 if your system does not use any DDK drivers).

   The Geo SCADA Expert update includes the latest version of drivers created by Schneider Electric. However, if your system has DDK drivers created by a third-party organization, you will need to install the appropriate updates. This is because DDK drivers are associated with a specific version of Geo SCADA Expert—when you upgrade Geo SCADA Expert , the DDK drivers need to match the new Geo SCADA Expert version.

   If you do not update all of the DDK drivers, Geo SCADA Expert may not run correctly.

6. On the Standby server, install updates for any third-party applications that are associated with a specific version of Geo SCADA Expert. (Skip to step 7 if your system does not use any third-party applications with Geo SCADA Expert).

   For information on any third-party applications that you use with Geo SCADA Expert, please contact the publisher of the application.

7. Upgrade the license on the Standby server (*see* Upgrade a License).

8. Configure the Standby server to emulate the older version of Geo SCADA Expert that is being used by the clients:

   i. Run the Server Configuration Tool and log on.

   ii. Browse to **System Configuration>Emulate Server Version**

   iii. Select the **Present a Different Server Version to Clients** check box.

   iv. Use the **Version** combo box to choose the version of Geo SCADA Expert that the client PCs run (the older version of Geo SCADA Expert).

   v. In the tree-structure, right-click on the icon for the server, and then select the **Apply Changes** option from the context-sensitive menu.

   This allows the clients to connect to the Standby server, even though they are running an older version of Geo SCADA Expert.

9. If the Virtual ViewX server is installed on the same machine, install the update to the Virtual ViewX server. To do this, run the Virtual ViewX Server.exe file that is part of the Virtual ViewX update. When you run the file, the installer will run and install the correct files for the server's operating system.

10. Restart Geo SCADA Expert on the Standby server (for information on restarting a server, *see* Start and Stop the System Server). Wait for the server to fully synchronize with the Main server and go into the Standby state.

11. Perform checks to ensure that the upgrade has been successful.

    If it has been successful, move on to step 12.

    If there appears to be an issue and you decide that you want to downgrade that server back to the previous version of Geo SCADA Expert software, ignore the rest of the steps in this procedure and do not upgrade any other servers. Instead, *see* Perform a Downgrade after Upgrading Geo SCADA Expert.

12. To continue with the upgrade, repeat steps 2-11 inclusive for each of the other servers in the architecture. You should start with any other Standby servers.

13. After completing the upgrades of all of the Standby servers, you should shutdown the Main server. This will cause a Changeover and one of the Standby servers will become the new Main server. As all of the Standby servers have been upgraded, they are able to synchronize with the new Main server (they all run the same version of Geo SCADA Expert).

    The server that was formerly the Main server has now stopped.

14. On the server that was formerly the Main server, install the Geo SCADA Expert update, specify the same Database Emulation setting as the other servers that have just been upgraded, update the extensions, DDK drivers, and third-party applications as required. Likewise, if the Virtual ViewX

server is installed on the same machine, install the update to the Virtual ViewX server. (Use the same techniques as when you upgraded the Standby servers).

15. Restart the server that was formerly the Main server. It now runs as a Standby server and it synchronizes with the new Main server.
16. When each of the servers have been upgraded, you can upgrade each client in turn:
    - Upgrade Your Geo SCADA Expert Clients (Original WebX Excluded)
    - Upgrade Your Original WebX Clients.
17. When the clients have all been upgraded, you need to disable the server emulation feature on the servers. To do this, repeat step 8 on each server, only this time clear the **Present a Different Server Version to Clients** check box. When you have applied this change to each of the servers, the clients and servers will all use the same version of Geo SCADA Expert.
18. Confirm that the upgrade is successful, then archive the automatic database backup from each server before removing those backups from disk.
19. You can ignore this step if you did not enable **Database Emulation** on the servers that you upgraded.

    If **Database Emulation** was activated on the servers that you upgraded, after confirming that the upgrade is successful and that all of your servers are running the same build of upgraded Geo SCADA Expert software, you can now deactivate that Database Emulation. You should do this in a specific order (so that just a single Changeover takes place):

    ATTENTION: Ensure that users hold off from making any configuration changes to the database until the Database Emulation status is identical (that is, activated or deactivated) on each of the servers in your system. This is because the file format in which database files are stored differs between versions of the Geo SCADA Expert software. When Database Emulation is deactivated, the database files will be stored in a slightly different file format, and the new features and functionality that are only available from the version of Geo SCADA Expert to which the servers have been upgraded will become available for use.

    i. Deactivate Database Emulation on one of the Standby Servers (*see* Deactivate Database Emulation after a Successful Upgrade). This will cause that server to shut down.

    ii. Restart that server.

    iii. Repeat steps i to ii on the other standby servers that you have just upgraded.

    iv. After deactivating Database Emulation on all of the Standby servers, you should shutdown the Main server. This will cause a Changeover and one of the Standby servers will become the new Main server. As all of the Standby servers have been upgraded, they are able to synchronize with the new Main server (they all run the same version of Geo SCADA Expert).

    v. On the server that was formerly the Main server, deactivate Database Emulation (*see* Deactivate Database Emulation after a Successful Upgrade).

    vi. Restart the server that was formerly the Main server. It now runs as a Standby server and it synchronizes with the new Main server.
    All of the upgraded servers will now have access the new database items and properties that are only available from the version of Geo SCADA Expert to which those servers have been

upgraded. The database files will be stored in a slightly different format in order to take account of the new features and functionality.

Upgrade Your Geo SCADA Expert Clients (Original WebX Excluded)

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

In this section, we explain how to upgrade a Geo SCADA Expert client by installing updates for Geo SCADA Expert and any extensions and third-party applications. The details provided are suitable for all types of Geo SCADA Expert client, such as ViewX clients and Data Access clients, with the exception of Original WebX clients. For information on upgrading an Original WebX client, please *see* Upgrade Your Original WebX Clients.

When upgrading your Geo SCADA Expert client(s), please ignore any steps that are inappropriate for your system. For example, if your system does not have any extensions to upgrade, ignore step 5.

NOTE: You should only upgrade your Geo SCADA Expert clients after the server(s) have been suitably upgraded. For more information, please refer to: Upgrade a Geo SCADA Expert Server in a Lone Server Architecture or Upgrade Geo SCADA Expert Servers in a Multi-Server Architecture.

To upgrade your Geo SCADA Expert client:

1. First, undertake the appropriate preparation (*see* Preparing to Upgrade Geo SCADA Expert).

   With correct preparation, you will:

   - Find out about any version-specific details relating to your current version and the new version of Geo SCADA Expert.
   - Obtain the required upgrade files so that the upgrade can be completed as efficiently as possible.
2. On the Geo SCADA Expert client, close all Geo SCADA Expert applications (ViewX, Client Configuration Tool, and so on.)
3. Close any other applications that are accessing Geo SCADA Expert.
4. Install the Geo SCADA Expert upgrade. To do this, run the Setup.exe file which is part of the Geo SCADA Expert update. When you run Setup.exe, the installer will run and install the correct files for the client's operating system.

   NOTE: Some publishers may re-package Geo SCADA Expert to be part of another package. With these packages, you can use the installer for the package to install updates for Geo SCADA Expert and the other product together.
5. Install updates for all extensions. (Skip to step 6 if the client does not use extensions).

   To install an extension, run the installer application supplied with the extension upgrade.

   If you do not update the extensions, Geo SCADA Expert may not run correctly.

6. Install updates for any third-party applications that are associated with a specific version of Geo SCADA Expert. (Skip to step 7 if you do not use third-party applications with Geo SCADA Expert).

   For information on any third-party applications that you use with Geo SCADA Expert, please contact the publisher of the application.
7. Restart your Geo SCADA Expert applications.
8. Restart any third-party applications that use Geo SCADA Expert.
9. Repeat for each Geo SCADA Expert client on your Geo SCADA Expert system.

Upgrade Your Virtual ViewX Server

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

If you use Virtual ViewX clients, you should upgrade the Virtual ViewX server whenever you upgrade your Geo SCADA Expert server. (You will certainly need to do this if both server applications are running on the same machine.)

NOTE: In order to run Virtual ViewX, all Geo SCADA Expert servers must be running Geo SCADA Expert 2019 onwards; they cannot be running older versions of the software, or be set to emulate older versions.

To upgrade Virtual ViewX:

1. Obtain the required upgrade files.
2. Ask users to refrain from using Virtual ViewX clients to access the database until you have finished installing the upgrade.
3. If the Virtual ViewX server is installed on the same machine as the Geo SCADA Expert server, upgrade the Geo SCADA Expert server software first, followed by the Virtual ViewX server update. For information on doing this, refer to the section that describes your system architecture:
   - Upgrade a Geo SCADA Expert Server in a Lone Server Architecture
   - Upgrade Geo SCADA Expert Servers in a Multi-Server Architecture
4. If you have upgraded Geo SCADA Expert in addition to Virtual ViewX:
   i. Upgrade Your Geo SCADA Expert Clients (Original WebX Excluded).
   ii. If applicable, Upgrade Your Original WebX Clients.

Upgrade Your Original WebX Clients

If you use Original WebX clients, you will need to upgrade them after you have upgraded your Geo SCADA Expert server. During the Geo SCADA Expert upgrade process, a new WebX ActiveX control is installed on the server. For Original WebX clients to be able to connect to the server, they must also have the new ActiveX control installed.

If your Original WebX clients are able to download an ActiveX control, the upgrade will take place automatically when they connect to the Geo SCADA Expert server. Each Original WebX client will download the required ActiveX control from the Geo SCADA Expert server and install it. For this to happen, Microsoft Internet Explorer must be configured to have the **Download Signed ActiveX Controls** feature enabled.

If your company security policy prohibits the downloading of ActiveX controls, the Original WebX clients will be unable to download the required ActiveX control from the server. You will need to upgrade the Original WebX clients by using a Geo SCADA Expert software DVD (follow the instructions on each 'page' of the installer and ensure that you install the **WebX** component).

ATTENTION: An Original WebX client can only connect to an upgraded Geo SCADA Expert server if the client has the latest ActiveX control. So if you are installing the new ActiveX control, you need to be aware that your Original WebX clients will be unable to connect until you complete the installation.

Upgrade a License

You need to upgrade your license(s) for Geo SCADA Expert as part of the Geo SCADA Expert upgrade process. The license(s) affect which features, drivers, and so on, are available on your system.

Geo SCADA Expert supports several types of license:

- a dongle license (which is stored on a USB dongle device)
- a software license (which is a file that can be sent to you electronically or downloaded)
- an AVEVA Enterprise License (which uses Flex credits from AVEVA Flex subscription licensing).

The technique that you use to upgrade your Geo SCADA Expert license will vary depending on the type of license you use.

Which Type of License does my Geo SCADA Expert System Use?

Use the License Details window to ascertain which type of license is used on your Geo SCADA Expert system (see 'Display the License Details Window on a Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Server Administration).

In addition to having a license for each Geo SCADA Expert server, your system might also have client licenses (*see* 'Enable or Disable Client Licensing', and *see* 'Associate a ViewX client - System Connection with a Client License'; both are topics in the Geo SCADA Expert Guide to Client Administration).

Licenses for Geo SCADA Mobile

The licensing process for Geo SCADA Mobile differs slightly to that of Geo SCADA Expert.

For further information, see the separate Geo SCADA Mobile documentation suite.

Virtual ViewX Licenses

The licensing process for Virtual ViewX differs slightly to that of Geo SCADA Expert.

The Virtual ViewX server requires a single **ViewX Client** license, regardless of the number of Geo SCADA Expert systems to which it is to connect. This ViewX Client license can be a dongle license, or software license. Additionally, the Virtual ViewX server needs to be licensed for the relevant number of Virtual ViewX client users. This is a separate software processes from that used for Geo SCADA Expert and does not involve dongles or license files (*see* License your Virtual ViewX Installation).

Upgrade a License File on a Geo SCADA Expert Server

If the servers on your system use a license file (also known as a software license), you will need to send the Machine Id and Serial Number details to your Geo SCADA Expert provider. You need to do this for each Geo SCADA Expert server in your system. Your Geo SCADA Expert provider will then provide you with a new, upgraded software license file for each server for which you have requested a license upgrade.

On each server in your system, replace the existing license file with the new license file for that particular server. (Each license file is machine-specific.) For more information, *see* 'Associate a Geo SCADA Expert Server with a License File' in the Geo SCADA Expert Guide to Server Administration.

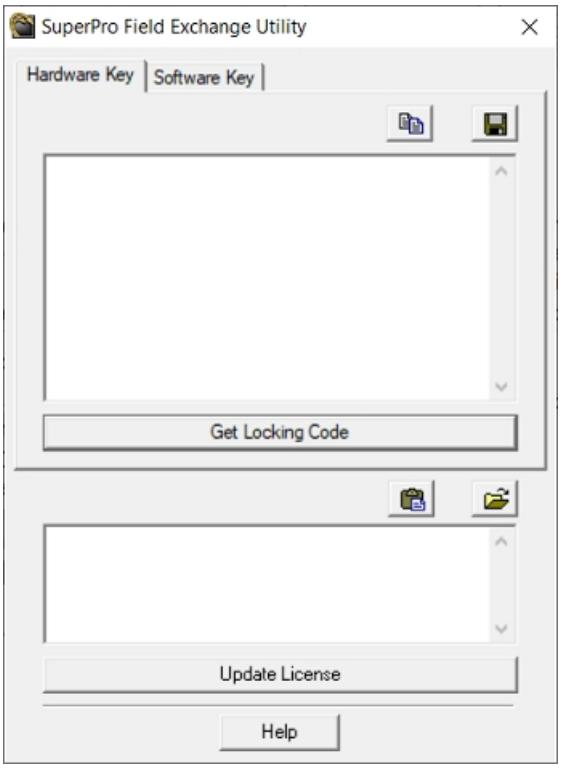
Upgrade a Dongle License

You can use the Geo SCADA Expert Dongle Field Exchange Utility to upgrade a dongle license. The Dongle Field Exchange Utility upgrades the license on your existing dongle, so a new hardware dongle is not required.

NOTE: If you have a valid support agreement, you are entitled to license updates for new features free of charge. If you do not have a valid agreement or wish to expand your license, you should contact your Geo SCADA Expert provider. For example, you will need to contact your provider if you wish to upgrade your license to expand the maximum number of points allowed in your database.

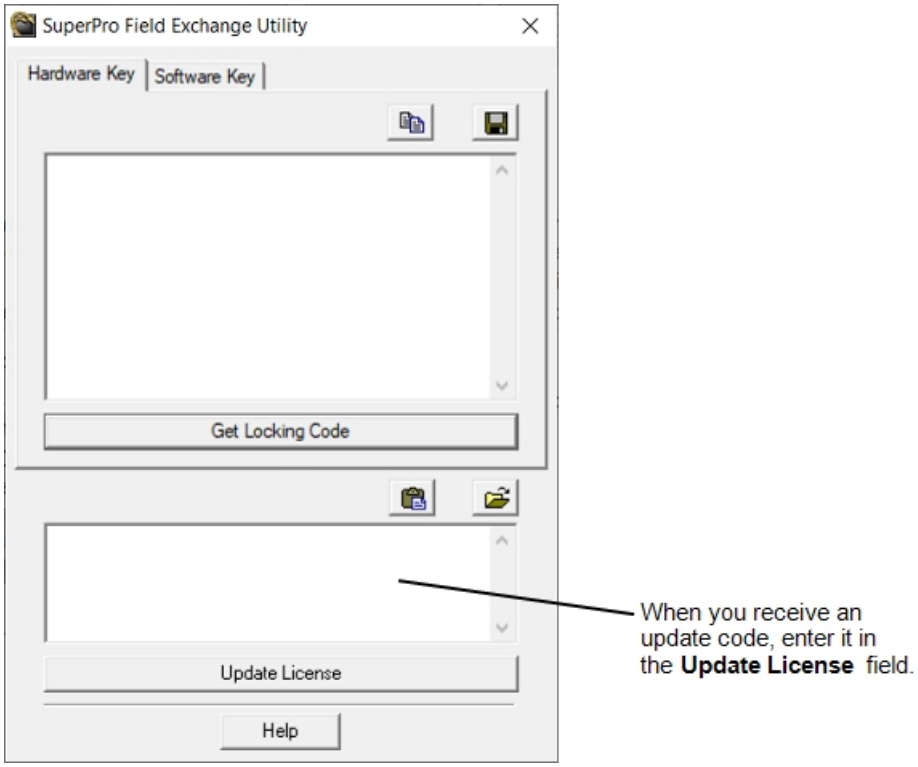
To upgrade a dongle license:

1. In Windows, select the **Start** menu. Scroll down the alphabetical list of installed applications and expand the **EcoStruxure Geo SCADA** folder.
2. Select the **Dongle Field Exchange Utility** option.
   The Dongle Field Exchange Utility runs.



3. Make sure that the Geo SCADA Expert hardware dongle is connected to the computer.
4. Select the **Get Locking Code** button on the Field Exchange Utility.
   A locking code is shown in the field above the Get Locking Code button.
5. Locate the serial number for the dongle. The serial number is located on the back of the DVD case that contained your Geo SCADA Expert installation disk. It is also provided on a sticker attached to the hardware dongle.

6. Send an e-mail to your Geo SCADA Expert license provider. The e-mail needs to contain:
   - The locking code
   - The serial number for your hardware dongle
   - Details of the changes you wish to make to your license.
7. Your Geo SCADA Expert provider will send you an update code. When you receive your update code, enter it in the **Update License** field on the Dongle Field Exchange Utility.



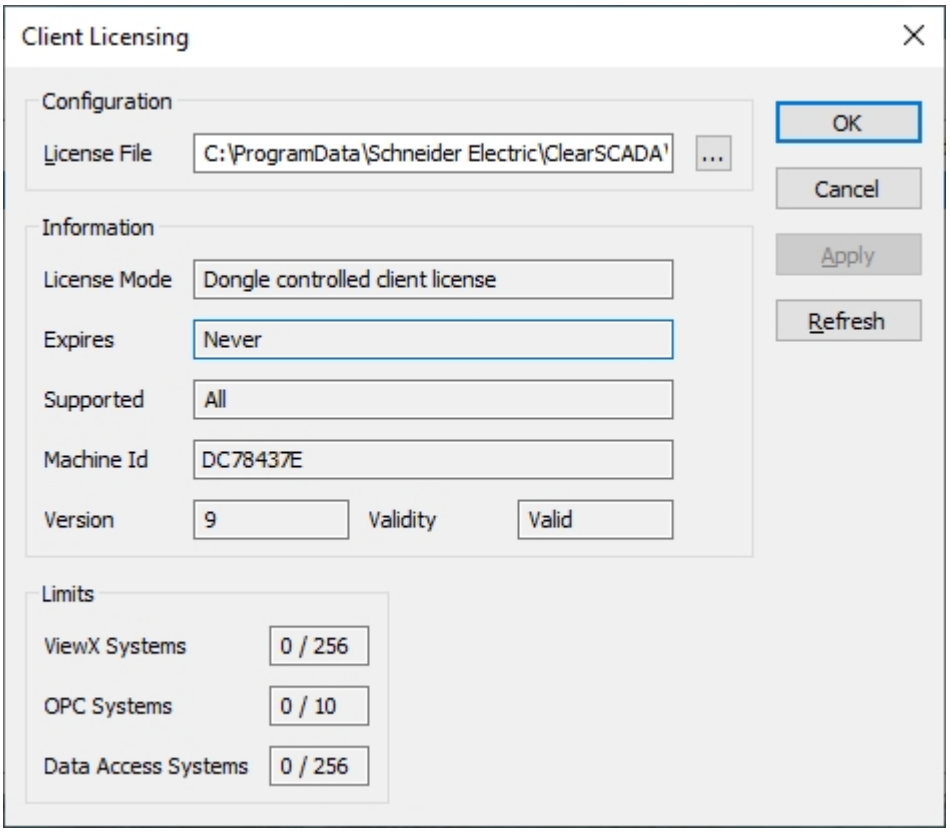
8. Select the **Update License** button.
   The new license settings are stored in your hardware dongle.
9. Close the Dongle Field Exchange Utility.

Upgrade a Software Client License

If the ViewX clients in your system use a software client license, you will need to send the Machine Id and Serial Number details of each ViewX client to your Geo SCADA Expert provider. They will then provide you with a new, upgraded client license file for each ViewX client for which you have requested an upgraded software client license.

On each ViewX client:

1. In Windows, select the **Start** menu. Scroll down the alphabetical list of installed applications and expand the **EcoStruxure Geo SCADA** folder.
2. Select the **Configure Connections** option.
   The Geo SCADA Expert Client Applet runs.
3. Select the **Licensing** button.
   The Client Licensing dialog box is displayed.



4. Copy the entire entry in the **Machine Id** field to the clipboard.
5. In an e-mail program, create a new e-mail and paste the **Machine Id** into it.
6. Locate the Geo SCADA Expert **Serial Number**. This is shown on the DVD case in which your Geo SCADA Expert installation disk was provided.
7. Enter the **Serial Number** into your e-mail.
8. Send the e-mail containing your Geo SCADA Expert **Machine Id** and **serial number** to your Geo SCADA Expert license provider. *The license provider will then send you a new license file and installation instructions*.

Deactivate Database Emulation after a Successful Upgrade

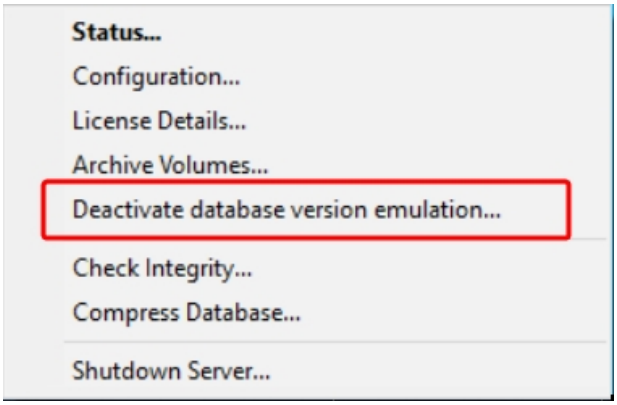
ATTENTION: Do not deactivate Database Emulation if you intend downgrading the version of Geo SCADA Expert software that is currently running on the servers on your system. Instead, if Database Emulation was activated for the upgrade and has remained activated since then, leave that Database Emulation activated while you perform the downgrade (*see* Perform a Downgrade after Upgrading Geo SCADA Expert).

If **Database Emulation** was activated when you upgraded the version of Geo SCADA Expert software that was running on your servers, once you have confirmed that the upgrade is successful on your system, you should deactivate that Database Emulation. You have to do this on each Geo SCADA Expert server on which Database Emulation is enabled. This will cause each server to stop. Therefore in a multi-server architecture, you might want to deactivate Database Emulation on each of the standby servers first, before you shut down and then deactivate it on the Main server. This will result in a single Changeover (rather than multiple changeovers if you deactivated Database Emulation on the Main server first, or partway through deactivating the feature on each of your servers). For detailed steps on how to do this, select the relevant link below:

- Upgrade a Geo SCADA Expert Server in a Lone Server Architecture
- Upgrade Geo SCADA Expert Servers in a Multi-Server Architecture
  - Upgrade Multi-Server Geo SCADA Expert with No Clients
  - Upgrade Multi-Server Geo SCADA Expert with Clients.

To deactivate Database Emulation:

1. Ensure that all of your servers have been upgraded to run the same build of Geo SCADA Expert software.
2. See above for the suggested order in which you should deactivate this feature on the servers on your system.
3. Right-click on the Server icon in the taskbar in Windows.
   A context-sensitive menu is displayed.
4. Select the **Deactivate database version emulation** option. (This option is only available when Database Emulation is currently activated on the server.)
   On a multi-server system, the server will shut down. On a lone server system, the server will remain running. Database Emulation will be deactivated on the server.



5. **With a lone server system**, you can ignore the rest of the steps in this procedure.

   With a multi-server system, restart the server.

6. With a multi-server system, repeat the above steps on the other Geo SCADA Expert servers on which Database Emulation is currently activated.

   (On a triple redundant system, this will enable that system to retain at least dual redundancy throughout this phase of the upgrade process.)

Once Database Emulation has been deactivated:

- The database files will get stored in the database format that is specific to the version of Geo SCADA Expert to which the servers have been upgraded.
- The features and functionality that is only available in Geo SCADA Expert from that upgraded version of software will become available for use.

NOTE: When you upgrade the version of Geo SCADA Expert software that is running on a server, the setting that was specified for Database Emulation in the Installation Wizard gets stored on that server (*see* Database Emulation Configuration). This same setting is then offered by default when the server is next upgraded. Deactivation of Database Emulation via the Server Icon only deactivates that feature on the version of upgraded Geo SCADA Expert software that is currently running on the server; it does not affect the setting used for Database Emulation in the Installation Wizard. (To change the setting that is offered by default when the server is next upgraded, you use the Server Configuration Tool (see 'Specify the Default Setting for the Database Emulation Feature' in the Geo SCADA Expert Guide to Server Administration).)

Further Information

Types of Emulation Supported by Geo SCADA Expert.

'Specify the Default Setting for the Database Emulation Feature' in the Geo SCADA Expert Guide to Server Administration.

Repairing your Geo SCADA Expert Installation

ATTENTION: Virtual ViewX is supported by Geo SCADA Expert 2019 onwards. We strongly recommend that you install the Virtual ViewX server on a different machine to the Geo SCADA Expert server. This is to avoid potential performance issues due to the number of resources that each application uses.

If you do install Geo SCADA Expert and Virtual ViewX on the same machine, both applications must have the same version and build number. This is because the applications share some resources.

You may be able to use the Geo SCADA Expert Installer to repair certain types of installation problem, such as:

- Missing Geo SCADA Expert files, for example, files that have been deleted accidentally
- Geo SCADA Expert files that have become corrupted on disk
- Missing registry settings for Geo SCADA Expert.

The **Repair** feature will attempt to restore the Geo SCADA Expert installation so that it is as close as possible to the default Geo SCADA Expert installation. In many cases, this will resolve installation problems.

To repair your Geo SCADA Expert installation:

1. Shut down the Geo SCADA Expert server. (The installation process requires the server to be shut down.) For information on shutting down a server, see 'Stop the Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Server Administration.
2. Run the Geo SCADA Expert installer. To do this, insert the Geo SCADA Expert DVD and select the **Install Geo SCADA Expert** option.
   The Geo SCADA Expert Installation wizard runs.
3. Select **Next**.
4. Select **Repair**.
5. Select **Repair**.
   The Geo SCADA Expert installation wizard will attempt to repair the installation.
6. Select **Finish** to complete the installation process.

Alternatively, you can use Windows:

1. Use the **Uninstall or Change a Program** feature in the Control Panel in Windows®. (For information about accessing the Control Panel, please refer to the Windows help.)
2. In the Control Panel, select **Programs and Features**.
3. Select Geo SCADA Expert in the list. You will see that the menu options change and now include **Repair**. Alternatively, you can right-click on Geo SCADA Expert in the list to display a context-sensitive menu that contains a **Repair** option.
4. Select **Repair** to repair Geo SCADA Expert. Windows will attempt to use the Geo SCADA Expert installer to repair your Geo SCADA Expert installation.

If the **Repair** feature does not resolve your Geo SCADA Expert installation problem, please contact customer support (details on customer support can be found in the Installation Guide PDF document that is included on the Geo SCADA Expert DVD).

NOTICE

INABILITY TO RUN VIRTUAL VIEWX

Do not delete, or change the password of, the **VVXLocalUser** that is created automatically in Windows when Virtual ViewX is installed on the Virtual ViewX server. This user account is required to run the ViewX processes on that server machine.

Failure to follow these instructions can result in inoperable equipment.

Further Information

Uninstalling Geo SCADA Expert.

Perform a Downgrade after Upgrading Geo SCADA Expert

If you decide that you want to roll back an upgrade of Geo SCADA Expert software, you can downgrade back to the version of Geo SCADA Expert that your servers were running just before that upgrade. The downgrade process will be slightly easier if **Database Emulation** was enabled when the servers were upgraded and has continued to remain enabled on those servers. This is because the database files on the servers will have continued to have been saved in the same format as the earlier database version that was running on those servers just prior to the upgrade.

In this topic, we explain how to downgrade your Geo SCADA Expert servers using **separate** installers for:

- Geo SCADA Expert
- Extensions
- DDK drivers
- Third-party applications (that target Geo SCADA Expert).

Some publishers may repackage Geo SCADA Expert updates so that you can install all (or some) of the components (above) from a single installer.

ATTENTION: This procedure assumes that an automatic backup of the database was generated when you upgraded your servers (*see* Automatic Database Backup on Upgrade).

The Order in Which Servers Should be Downgraded

When you downgrade from one version of Geo SCADA Expert software to another, all of the servers that are running on your system have to be running the same version of Geo SCADA Expert software. (You cannot run some servers with one version, and other servers with another version of Geo SCADA Expert software, during the downgrade process.)

If you have only upgraded your Standby server(s) when you decide to roll back the software, then you only need to downgrade the software on those particular servers. However, if you have upgraded all of your servers before deciding to roll back the software, you will need to decide which of two downgrade options you want to follow:

Option 1

This is the recommended option.

Stop a Standby server, downgrade the Geo SCADA Expert software on that server, then stop all of the other servers (including the Main server) before bringing the single downgraded server back on line. Then downgrade the other servers that you have stopped and then bring them back on line. The impact of this option is that you will lose any data that the Main server has processed while that first Standby server was being downgraded. Additionally, your system will only provide redundancy once you bring a second downgraded server back online.

Option 2

Stop all of the servers while you perform the downgrade. The impact of this option is the amount of downtime of your entire system while the downgrade is performed.

Downgrade a Server

To downgrade a Geo SCADA Expert server:

1. Obtain the installation files for the version of Geo SCADA Expert software that was running on your server just before the upgrade. You might still have these from the previous time that your servers were upgraded, but if not, you should be able to obtain them from your Schneider Electric representative.

   To ascertain the version of Geo SCADA Expert software to which you need to downgrade, locate the latest set of database backup files that should have been generated automatically when the server was upgraded. The software version is included in the name of the backup folder (*see* Automatic Database Backup on Upgrade).

   Also ensure that you have the installers for the previous version of software for any extensions, DDK drivers, and third-party applications that target Geo SCADA Expert.

   > **ATTENTION:** If **Database Emulation** was enabled when the server was upgraded, **leave this feature enabled**, as it will provide a smoother downgrade path. This is due to the database files continuing to be saved in the same database format as the version of Geo SCADA Expert that was running on the server just prior to the upgrade.

2. Shut down the Geo SCADA Expert server. (The installation process requires the server to be shut down.) For information on shutting down a server, see 'Stop the Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Server Administration.
3. Uninstall Geo SCADA Expert. You should perform a 'Complete' uninstall (*see* Uninstall Geo SCADA Expert - 'Complete' Uninstall).

   Also uninstall any extensions, Virtual ViewX server software, DDK driver software, and any third-party applications that target Geo SCADA Expert.
4. Install the version of software that your server was running just before the upgrade. To do this, run the Setup.exe file that is included with the Geo SCADA Expert installation files for that version of the software. When you run Setup.exe, the installer will run and install the correct files for the server's operating system.

   > **NOTE:** Some publishers may re-package Geo SCADA Expert to be part of another package. With these packages, you can use the installer for that package to install Geo SCADA Expert and the other product together.

5. Install the software for any extensions. (Skip to step 6 if your system does not use extensions).

   To install an extension, run the installer application supplied with the extension software.

   If you do not downgrade all of the extensions, Geo SCADA Expert may not run correctly.
6. Install the software for any DDK drivers. (Skip to step 7 if your system does not use DDK drivers).

   The Geo SCADA Expert installer includes the relevant version of drivers created by Schneider Electric. However, if your system has DDK drivers created by a third-party organization, you will need to install the appropriate software. This is because DDK drivers are associated with a specific version of Geo SCADA Expert—when you downgrade Geo SCADA Expert, the DDK drivers need to match the downgraded version of Geo SCADA Expert.

If you do not downgrade all of the DDK drivers, Geo SCADA Expert may not run correctly.

7. Install the software for any third-party applications that are associated with a specific version of Geo SCADA Expert. (Skip to step 8 if your system does not use any third-party applications with Geo SCADA Expert).

   For information on any third-party applications that you use with Geo SCADA Expert, please contact the publisher of the application.

8. If the Virtual ViewX server is installed on the same machine, install the version of software that your Virtual ViewX server was running just before the upgrade. To do this, run the Virtual ViewX Server.exe file that is included with the Virtual ViewX installation files for that version of the software. When you run the file, the installer will run and install the correct files for the server's operating system.

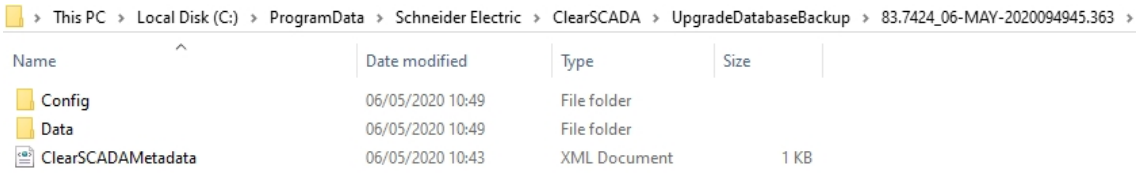
9. **If Database Emulation was enabled during the upgrade and has continued to remain enabled, ignore this step and go straight to step 10**. This is because the database files will have continued to have been saved in the same format as the version of Geo SCADA Expert that the server was running just prior to the upgrade. As such, you can continue to work with your current database following the downgrade.

   If Database Emulation was disabled during the upgrade, or has been disable since the upgrade, you have to revert the server's database back to support the downgraded version of Geo SCADA Expert software. This involves using the latest set of database backup files that is stored in the **UpgradeDatabaseBackup** folder. Perform the following:

   i. Optionally make a copy of the folder that contains the upgraded Geo SCADA Expert database. By default, the files are stored in the **Database** folder (*see* File Locations (Default)).

   ii. Locate the latest set of database backup files that was generated automatically when you upgraded the server. By default, the files are stored in the **UpgradeDatabaseBackup** folder (*see* File Locations (Default)).

   iii. Expand the folder that contains the latest database backup, so that you can see the folders and files within it.



   iv. Copy the folders and files from within that latest database backup folder (in the **UpgradeDatabaseBackup** folder) over to the location where the Geo SCADA Expert database is stored (the **Database** folder).

   When prompted to do so, allow the files in the **Database** folder to be replaced by the folders and files copied from within the latest automatic backup folder in the **UpgradeDatabaseBackup** folder.

   (The automatically generated backup only includes files that contain versioning information. As such, it only includes a subset of the files that are stored in the **Database** folder. (The name of this folder might differ on your server.))

NOTICE

LOSS OF DATABASE CHANGES

If you downgrade back to a previous version of Geo SCADA Expert and reinstate the automatically-generated backup of the database for that version of software, be aware that you will lose any configuration changes that were made after that database backup occurred. This might include new database items that were created following the backup, or the reinstatement of obsolete database items that were deleted after the backup occurred. Likewise, you will be unable to make use of any new features or functionality that are only available in the upgraded version of the Geo SCADA Expert software, once that software has been uninstalled and downgraded.

Following these instructions can result in loss of database changes and functionality

10. Restart the server.
11. If the server is connected to clients that run an even older version of Geo SCADA Expert software, you should enable server emulation. This will enable the clients to continue to function as expected.
12. Repeat the above procedure for any other servers on which you need to downgrade the Geo SCADA Expert software.
13. If applicable, and installed on a separate machine to the Geo SCADA Expert server, downgrade your Virtual ViewX server.
14. Check the compatibility matrix for your version of Geo SCADA Expert software on the Geo SCADA Knowledge Base. If this advises you that there is no need to downgrade any ViewX clients, then these should continue to function correctly with the downgraded servers. However, the ViewX clients will only provide the functionality that is supported by the version of software to which the servers have been downgraded. The same applies to Virtual ViewX and Original WebX clients.

Uninstalling Geo SCADA Expert

There are two different ways of uninstalling Geo SCADA Expert:

- **'Quick' uninstall—**A 'quick' uninstall is mostly automatic, and so does not involve the potential risks of editing the registry settings. It removes most of Geo SCADA Expert's files and components, but there are certain files and registry settings that are left behind. On many systems, this is acceptable, as the files and settings do not have a noticeable effect on the computer.
- **'Complete' uninstall—**A 'complete' uninstall removes all Geo SCADA Expert files and settings from a computer. It should only be performed by a user with experience of modifying registry settings, as incorrect registry settings can cause serious problems relating to the operating system.

To discover which of the uninstall processes is most appropriate for your requirements, answer the questions below:

1. Do you intend to re-install Geo SCADA Expert on the computer at a later date?
2. Do you want a re-installed version of Geo SCADA Expert to use only the default settings (that is, be a 'clean' install)?

If you answered no to any of the questions, we recommend that you use the 'Quick' uninstall process (*see* Uninstall Geo SCADA Expert - 'Quick' Uninstall).

If you answered yes to both of these questions, you should use the 'Complete' uninstall process (*see* Uninstall Geo SCADA Expert - 'Complete' Uninstall). But to do so, you need to have experience of editing registry settings in Windows. This is because incorrect configuration of the registry can cause serious problems with the Windows operating system.

To perform a complete uninstall, you need to also uninstall the Virtual ViewX component, which is installed separately from Geo SCADA Expert, (*see* Uninstall Virtual ViewX).

ATTENTION: To ensure a clean uninstallation of Geo SCADA Expert components, make sure that you uninstall Geo SCADA Expert before you uninstall any IIS components or the Crystal Reports runtime.

Uninstall Geo SCADA Expert - 'Quick' Uninstall

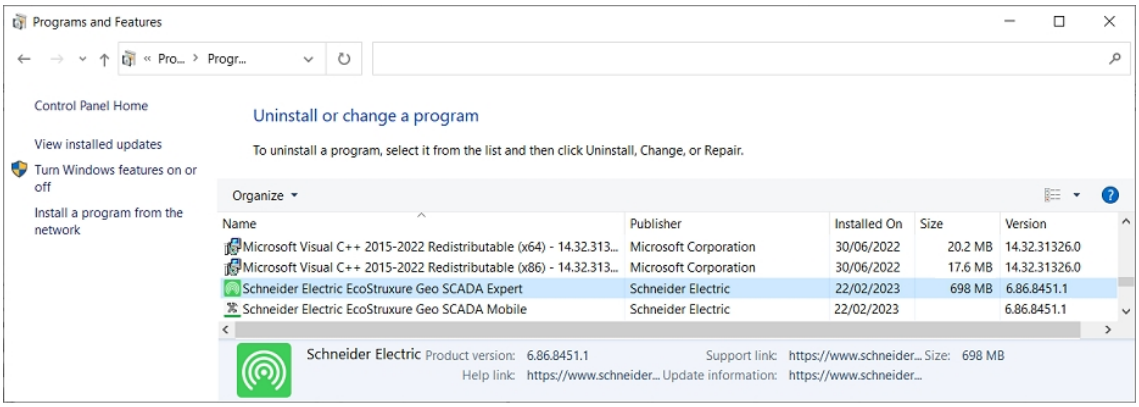
You can use the Control Panel in Windows® to perform a 'quick uninstall' on Geo SCADA Expert. This will remove Geo SCADA Expert from your computer, but will leave behind some registry settings and files. This process works in a similar way to uninstall procedures for other applications that run in Windows.

NOTE: If you intend to re-install Geo SCADA Expert on a computer at a later date, you may prefer to perform a 'complete' uninstall. A 'complete' uninstall removes all Geo SCADA Expert files and registry settings so that when a new version of Geo SCADA Expert is installed, it only uses the built-in default settings.

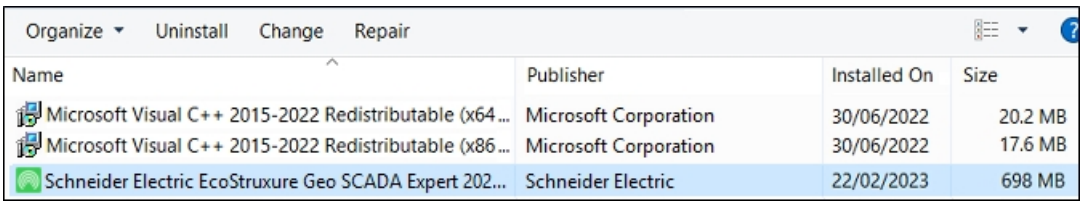
To perform a 'quick' uninstall on Geo SCADA Expert:

ATTENTION: To ensure a clean uninstallation of Geo SCADA Expert components, make sure that you uninstall Geo SCADA Expert before you uninstall any IIS components or the Crystal Reports runtime.

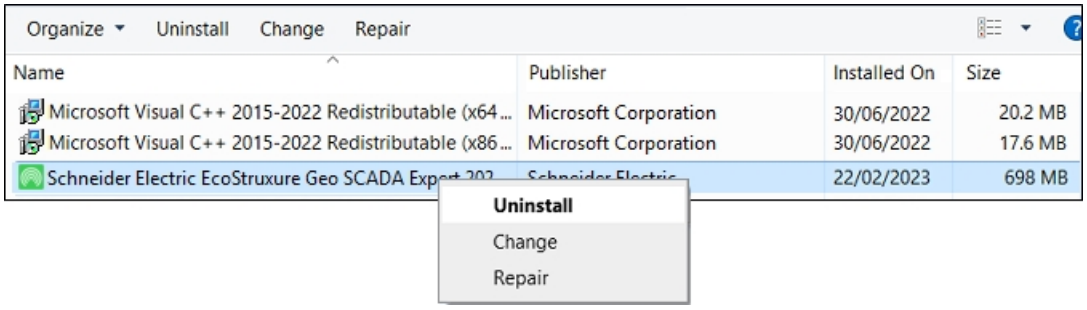
1. Log on to your PC via a Windows user account that has **Administrator** permissions.
2. Ensure that the Geo SCADA Expert server has been shut down. For information on shutting down a server, see 'Stop the Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Server Administration.
3. Use the Control Panel in Windows to access the **Uninstall or Change a Program** window. (For information about accessing the Control Panel, please refer to the Windows help.)
4. In the Control Panel, select **Programs and Features**.



5. Select **Schneider Electric Geo SCADA Expert** in the list of programs.
   *The options in the menu at the top of the list change and now show an **Uninstall** option.*



   Alternatively, you can right-click on Schneider Electric Geo SCADA Expert to display a context-sensitive menu.

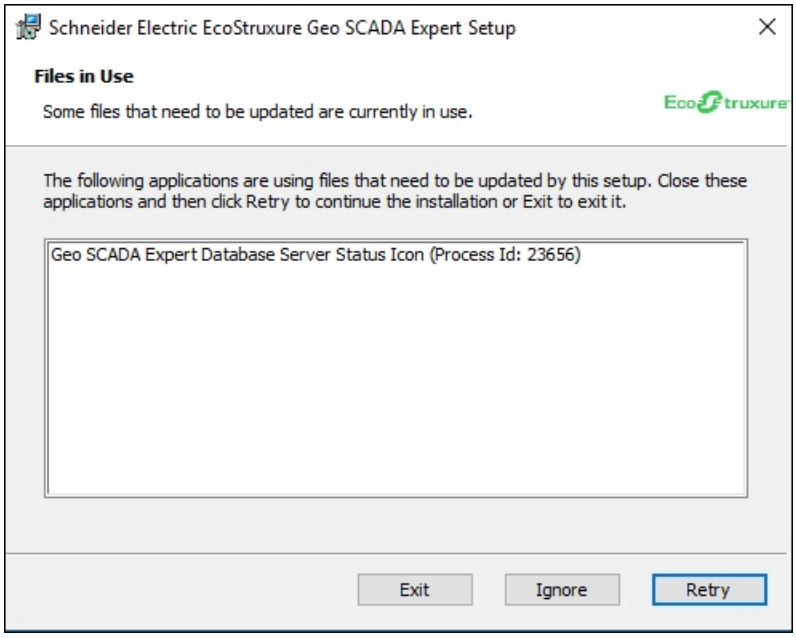


6. Select the **Uninstall** menu option. A prompt asks you if you are sure you want to uninstall Geo SCADA Expert. Select **Yes** to proceed with the uninstall process.

   Also select **Yes** if you are asked if you want Geo SCADA Expert to be able to make changes to your computer.

   The uninstall process begins.

   If there are any programs running that need to be closed for the uninstallation process to continue, a prompt is displayed, like this:



   Choose to close any applications that cannot be running while the uninstall process is underway.

   Geo SCADA Expert is removed from your computer. However, this is a quick uninstall and some Geo SCADA Expert files and settings will remain in place (Server configuration settings).

7. Once you have completed uninstalling Geo SCADA Expert, you can uninstall any other programs or features that are no longer required. Only do this after making sure that they are not used by any other applications on the machine.

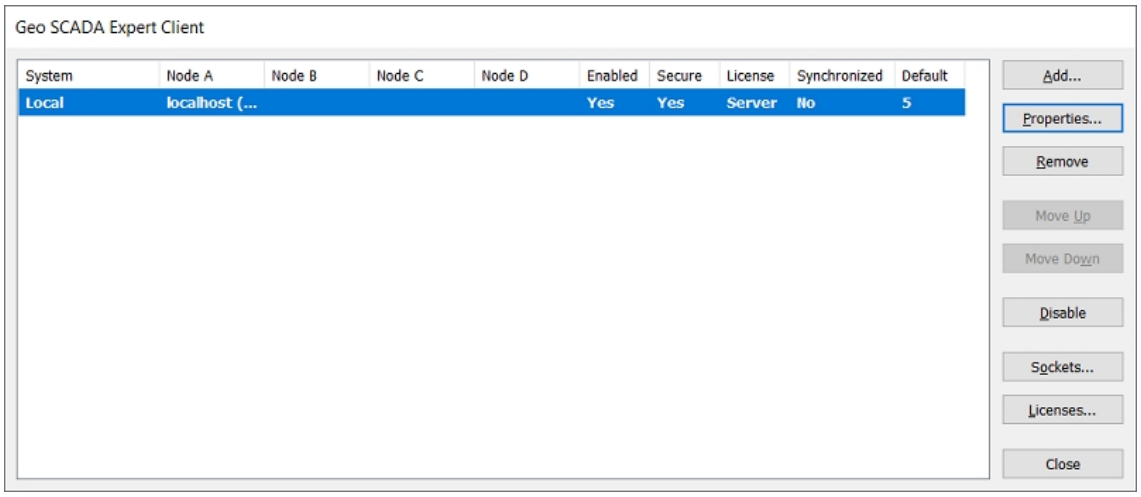
Uninstall Geo SCADA Expert - 'Complete' Uninstall

The quickest way to uninstall Geo SCADA Expert is to uninstall the program from the Windows Control Panel. However, this leaves various Geo SCADA Expert files and settings in place. While these files and settings have very little effect on system resources, you may wish to completely remove Geo SCADA Expert from a PC. To do this, you need to remove connections, DSNs, and registry key settings.

To completely remove Geo SCADA Expert from a computer:

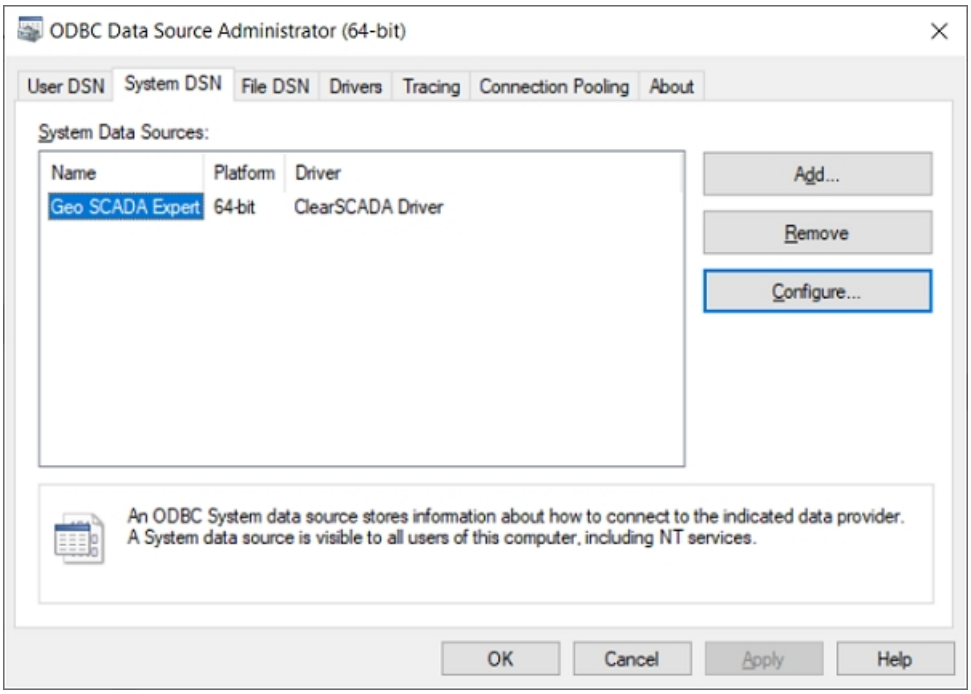
ATTENTION: To ensure a clean uninstallation of Geo SCADA Expert components, make sure that you uninstall Geo SCADA Expert before you uninstall any IIS components or the Crystal Reports runtime.

1. Log on as a Windows user that has **Administrator** level permissions.
2. Ensure that the Geo SCADA Expert server has been shut down. For information on shutting down a server, see 'Stop the Geo SCADA Expert Server' in the Geo SCADA Expert Guide to Server Administration.
3. Remove all ClearSCADA (Geo SCADA Expert) client connection settings.
   i. In Windows, select the **Start** menu. Scroll down the alphabetical list of installed applications and expand the **EcoStruxure Geo SCADA** folder.
   ii. Select the **Configure Connections** option. If you are prompted to allow the Geo SCADA Expert Client Configuration Tool to make changes to your computer, select **Yes**. *The Geo SCADA Expert Client window is displayed.*



   iii. Select a ClearSCADA client from the list, and then use the **Remove** button to delete it.
   iv. Repeat step iii until the Geo SCADA Expert Client window has no clients listed.
   v. Select the **Close** button.
4. Remove all ClearSCADA (Geo SCADA Expert) DSN settings.
   i. Access the **Control Panel** and then select the **Administrative Tools** application in Microsoft Windows.
   ii. When the Administrative Tools window is displayed, double-click on **Data Sources (ODBC) (64-bit)** to display the ODBC Data Source Administrator window.

iii. Select the **System DSN** tab.



iv. Select a ClearSCADA system from the list, and then select the **Remove** button. Confirm that you want to remove the system DSN by selecting **Yes** at the prompt.

v. Repeat the previous step for each ClearSCADA system.

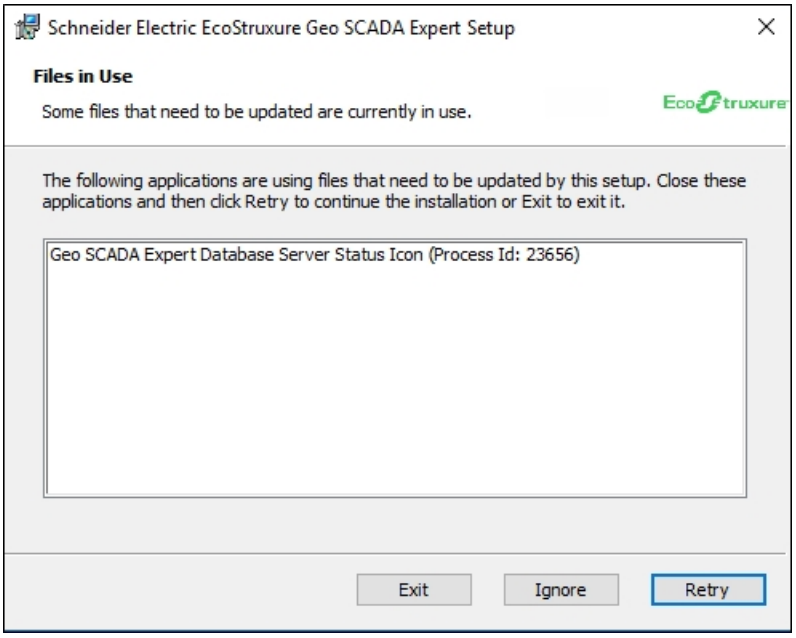
vi. Select the **OK** button when you have removed all of the ClearSCADA system DSNs from the list.

vii. Repeat the above procedure for any ClearSCADA (Geo SCADA Expert) DSN settings that exist for any 32-bit applications.

5. Use Windows Control Panel to access the **Uninstall or Change a Program** window. For more information on how to uninstall a program in Windows, please refer to your Windows documentation.

6. Choose to **Uninstall Geo SCADA Expert**. If you are prompted to allow Geo SCADA Expert to update software on your computer, select **Yes.**
   The Geo SCADA Expert uninstallation process begins.

   If there are any programs running that need to be closed for the uninstallation process to continue, a prompt is displayed, like this:



Close any applications that need to be closed during the uninstall process.

7. When Geo SCADA Expert has been uninstalled, use Windows Explorer to delete the contents of the following directories (default locations are shown here):
   - `C:\Program Files\Schneider Electric\ClearSCADA`
   - `C:\Program Files (x86)\Schneider Electric\ClearSCADA`
   - `C:\ProgramData\Schneider Electric\ClearSCADA`

     This removes the database, logs, caches, and so on.
   - `C:\Users\<UserName>\AppData\Roaming\Schneider Electric\ClearSCADA`

     You need to remove the ViewX settings files for each user that has run ViewX.

NOTE: If your Geo SCADA Expert system was installed into non-default locations, you will need to remove the files from the alternate locations instead.

8. In Windows, run **RegEdit**. (For more details, please refer to your Windows documentation). If prompted to allow RegEdit to make changes on your computer, select **Yes**.

CAUTION
PROBLEMS WITH THE OPERATING SYSTEM
Only experienced Windows administrators should use RegEdit to modify the registry keys. Incorrectly adjusting registry settings could cause serious problems to the operating system, which may require the operating system to be reinstalled. In some instances, registry errors cannot be solved.
Failure to follow these instructions can result in injury or equipment damage.

9. In RegEdit, delete the following keys from the registry:
   - `HKEY_LOCAL_MACHINE\SOFTWARE\Schneider Electric\ClearSCADA`
   - `HKEY_LOCAL_MACHINE\SOFTWARE\Schneider Electric\ClearSCADA-<nnnn>`

     Where `<nnnn>` represents an instance of ClearSCADA (Geo SCADA Expert). This only applies if you have used Database Manager to create multiple registry instances of ClearSCADA. You need to remove each ClearSCADA registry instance.
   - `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Schneider Electric\ClearSCADA`
   - `HKEY_CURRENT_USER\Software\Schneider Electric\ClearSCADA`

     You need to remove this key for each user that has run ClearSCADA (Geo SCADA Expert).

   If prompted to 'Confirm Value Delete', select **Yes** to remove the registry key.

   NOTE: The Geo SCADA Expert uninstaller may remove one or more of the registry keys automatically. You only need to delete the registry keys listed above if they are in place on your computer.

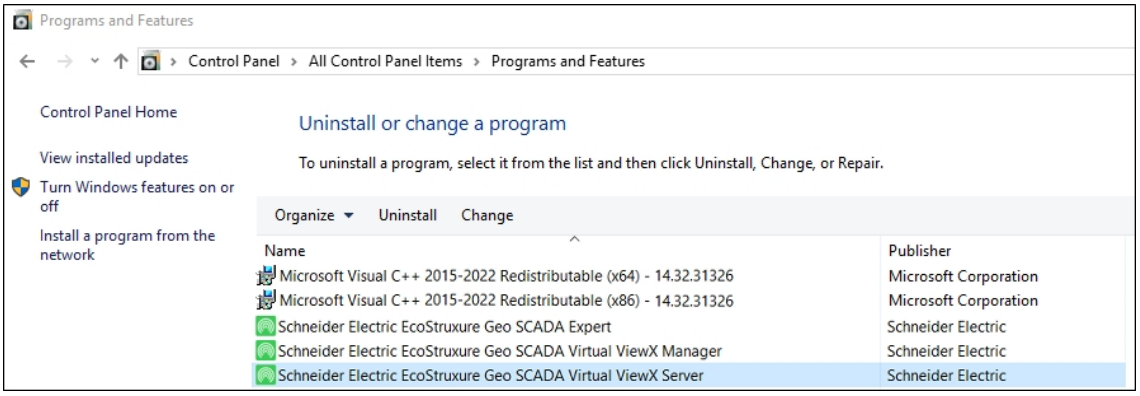
10. Once you have completed uninstalling Geo SCADA Expert, you can uninstall any other programs or features that are no longer required. Only do this after making sure that they are not used by any other applications on the machine.

Uninstall Virtual ViewX

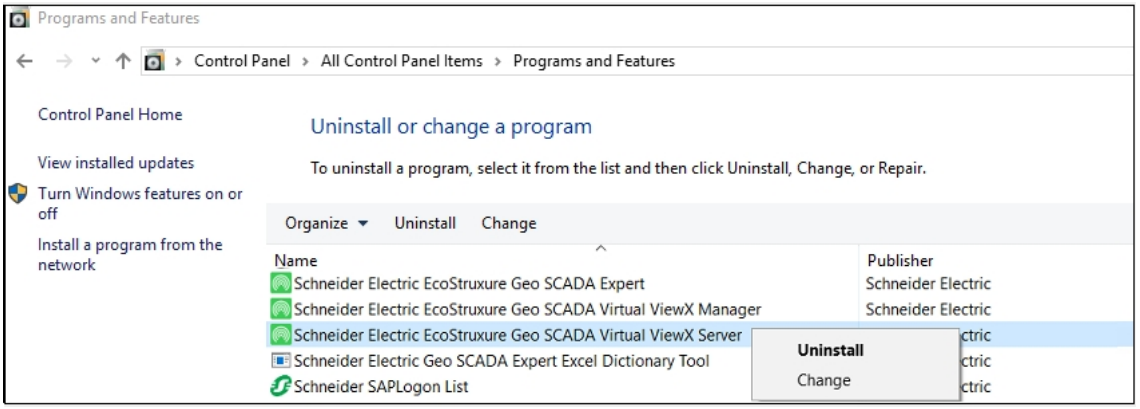
You can use Windows Control Panel to perform a 'quick uninstall' of Virtual ViewX server. This will remove Virtual ViewX server from your computer, but will leave behind some registry settings and files. This process works in a similar way to uninstall procedures for other applications that run in Windows.

To perform a 'quick' uninstall of Virtual ViewX server:

1. Log on to your PC via a Windows user account that has **Administrator** permissions.
2. Use Windows Control Panel to access the **Uninstall or Change a Program** window.
   In Windows 10, use the following procedure:
   i. In the **Search** field in Windows, enter the following search string: `Control Panel`.
   The Control Panel is displayed.
   ii. Within the Control Panel select the **Programs and Features** entry.



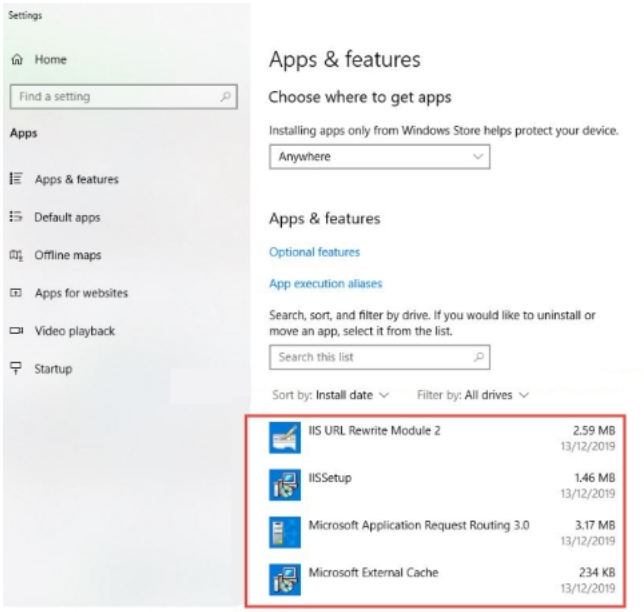
   For information on how to uninstall a program in other versions of Windows, please refer to your Windows documentation.
3. Select **Schneider Electric EcoStruxure Geo SCADA Virtual ViewX Server** in the list of programs.
   *The options in the menu at the top of the list change and now show an **Uninstall** option*.
   Alternatively, you can right-click on the entry to display a context-sensitive menu.



4. Select the **Uninstall** menu option.
   A dialog box is displayed, with options to confirm or abort the uninstall procedure.

5. Select **Yes** to proceed with the uninstall process.
   Virtual ViewX is removed from your computer. However, this is a quick uninstall and some Virtual ViewX files and settings will remain in place unless you also perform step 9.
6. Select **Schneider Electric EcoStruxure Geo SCADA Virtual ViewX Manager** in the list of programs.
   *The options in the menu at the top of the list change and now show an **Uninstall** option.*
   Alternatively, you can right-click on the entry to display a context-sensitive menu.
7. Select the **Uninstall** menu option.
   A prompt asks you if you are sure you want to uninstall Virtual ViewX Manager.
8. Select **Yes** to proceed with the uninstall process.
   Virtual ViewX Manager is removed from your computer. However, this is a quick uninstall and some Virtual ViewX Manager files and settings will remain in place.

   The following files relating to Virtual ViewX remain on the PC even after the uninstallation process is complete. You can leave these files as they do not affect system performance. Alternatively, the 'IISSetup' program can be uninstalled safely. If you are sure that the other files are not used by any other IIS web server applications, you can also uninstall those files.



9. Once both Virtual ViewX applications have been uninstalled, optionally use Windows Explorer to delete the contents of the following directory (the default location is shown here):
   - `C:\ProgramData\Schneider Electric\Virtual ViewX`

   You can also optionally delete the **VVXLocalUser** account that is created in Windows when Virtual ViewX is installed on the Virtual ViewX server machine.

NOTE: Uninstalling the Virtual ViewX and Virtual ViewX Manager applications does not remove the Geo SCADA Expert settings in IIS. Refer to your IIS administrator to remove the settings from IIS.

Welcome to the Geo SCADA Expert Tutorial

Welcome to the Geo SCADA Expert tutorial, where you will learn how to configure a variety of system features, including Mimics, database points, and connections to SCADA devices. Please note that throughout the documentation, Geo SCADA Expert is referred to as Geo SCADA Expert.

NOTE: The Geo SCADA Expert Tutorial uses an Example Projects database that you can install as part of your Geo SCADA Expert installation process. You can also import the database if you have already installed Geo SCADA Expert. The security features built into Geo SCADA Expert require either a Super User or System Administrator to enable the example user accounts. You require these user accounts to follow the tutorial examples, *see* Example Projects in the Geo SCADA Expert Guide to Installation, for information about how the database is installed and the user accounts enabled.

Intended Audience

This tutorial is designed for use by users who are new to Geo SCADA Expert. By following the procedures in this tutorial, users can learn about a variety of Geo SCADA Expert interfaces, concepts and features.

After completing the tutorial, users will be familiar with many of the key aspects of Geo SCADA Expert. They will also have an appreciation of the many benefits a Geo SCADA Expert system offers.

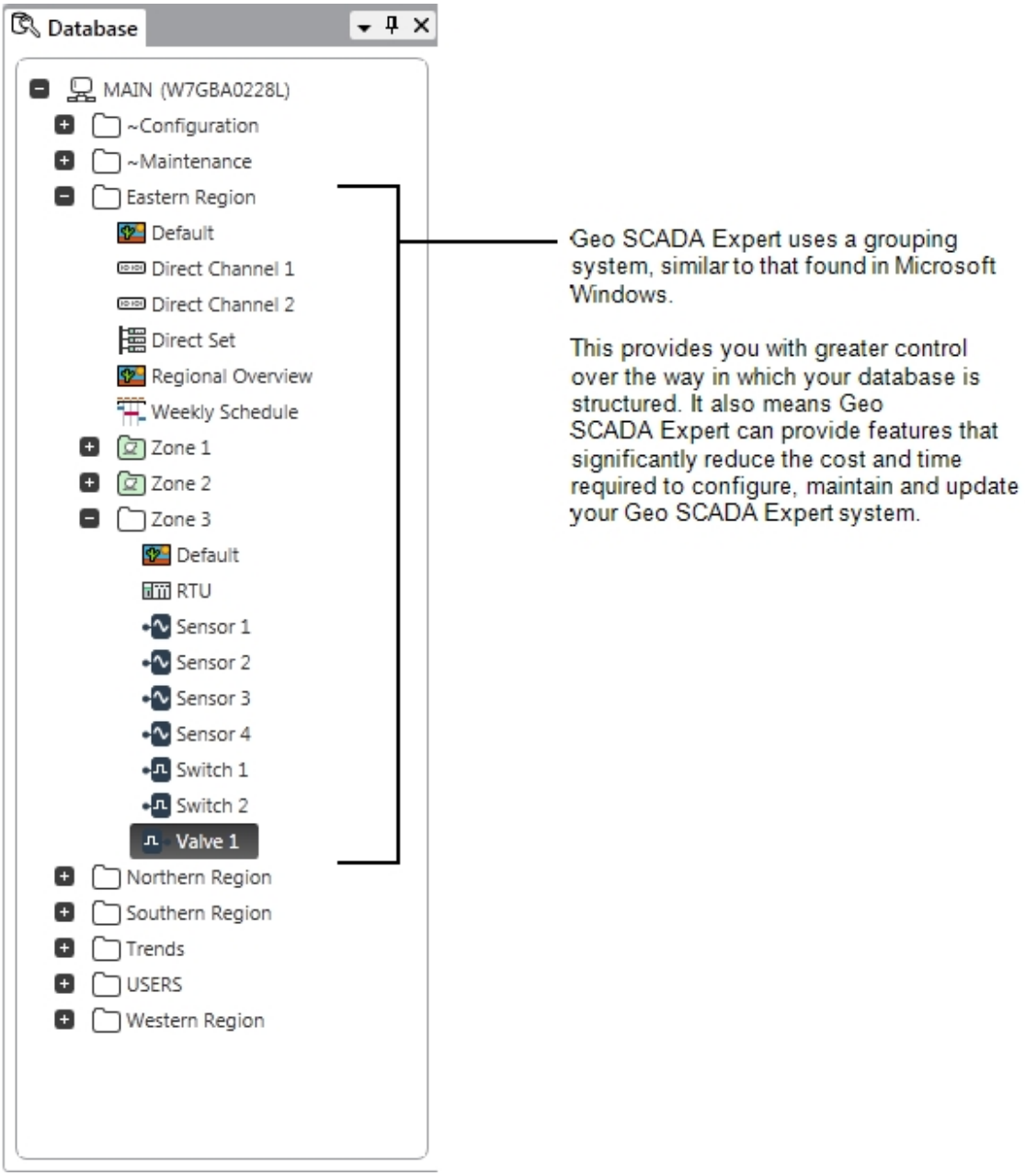
Document Scope

This tutorial provides a brief introduction to a variety of Geo SCADA Expert features, including the Database Bar, Mimics, Trends, and configuration Forms.

When your Geo SCADA Expert demo system first runs, the ViewX client interface is launched automatically. You need to log on using one of the example User accounts provided to access the items within the Example Projects database. ViewX is the full client interface for the Geo SCADA Expert system and it can be used to:

- Access displays with information about database values, both historic and current
- Configure database items, including points and graphical displays such as Mimics
- Respond to alarms
- Create reports
- Configure the Logic programs and schedules so that define your system's behavior.

ViewX is designed to reduce the amount of time and effort required to configure and maintain a SCADA system. To achieve this, it uses an innovative grouping system that works in a similar way to folders in Microsoft® Windows.



The folders system offers many benefits over traditional tag table interfaces:

- Greater control over the structure of your database, as you can organize it according to geographical location, function, or another grouping methodology of your own choosing.
- Reduced time and cost of configuring your database, as Group Templates and Group Instances significantly reduce the amount of configuration work required, no matter how complex your system.
- Simple to reorganize your database—just drag and drop groups and items, just like you would in Microsoft Windows Explorer.
- Create new items and reconfigure database items while your system is online
- Easy to manage security system, with user accounts and permissions to restrict access to system features and database items. Users without a user account use the Guest account which is read-only.

Designed to help first-time Geo SCADA Expert users, this tutorial explains how to use some of the many features of the two main Geo SCADA Expert user interfaces—ViewX and Virtual ViewX. The tutorial is divided into separate sections, each of which contains easy to follow instructions and helpful explanations that show you how to:

- Use the ViewX interface
- Create and configure database items to represent inputs and outputs
- Configure Geo SCADA Expert to connect with communications devices (for the tutorial, the communications device used is a SCADAPack Modbus controller)
- Configure Mimics to display 'live' dynamic data
- Raise and respond to alarms
- Configure Trends
- Use Group Templates and Group Instances to reduce the amount of configuration work required
- Use a Virtual ViewX client
- Access the comprehensive online help documentation system.

We recommend that you read the following topics before you start. In addition you should refer to the Example Projects Database.

- About the Tutorial.
- Restarting your System.

About the Tutorial

The Geo SCADA Expert tutorial is designed to help first-time or inexperienced Geo SCADA Expert users get used to working in ViewX and Virtual ViewX (the two main Geo SCADA Expert user interfaces). Each section of the tutorial contains easy-to-follow instructions with explanations of the effects of your actions. As you work through the tutorial, you will learn about the common configuration procedures, displays, and methods used for accessing features.

Although each section includes instructions and helpful information, the tutorial is only designed to be a guide to Geo SCADA Expert and is not a substitute for the comprehensive online help documentation or a training course. Also, while the tutorial is aimed at first-time users, we recommend that users have a strong background in both programmable logic controllers (PLCs) and personal computers using Windows.

Throughout the tutorial, we have used the following conventions:

- Bold text indicates the name of an option or setting that you can select. For example, Select the **File** menu.
- Italic text indicates an action that takes place as a result of your activity. For example, *An additional context sensitive menu is displayed*.
- Where multiple menu options are required, angle brackets are used. For example, **Create New>Internal>Analog Point** means select the **Create New** option from the context sensitive menu, then select the **Internal** option and then select the **Analog Point** from the further menu. We also use this convention when describing the address of items, if the items are in subgroups (Groups within Groups).
- Angle brackets <> are used to indicate a variable value or property. Unless specifically asked to do so, you should not include the angle brackets in your selections or entries.
- For more detailed explanations of features mentioned in the tutorial, please refer to the online help sections that are listed under the **Further Information** headings.
- At the end of each section, you can see how much you have learned by answering the questions in the Test Your Knowledge section. Each Test Your Knowledge section has questions that relate to the tasks you have performed.

We recommend that you complete each of the tutorial sections in order, but if you wish to skip certain sections, you can do this. However, you may need to import files relating to the sections you have skipped. Instructions on how to import the files are included at the start of the sections.

Finally, if you are working on the tutorial and your system stops running, you will need to restart your server. This is because demo Geo SCADA Expert systems are set to stop running after 2 hours. For information on restarting the Geo SCADA Expert server, *see* Restarting your System.

If you are ready to start the tutorial, proceed to Using the ViewX Interface.

Restarting your System

Demonstration systems are set to turn themselves off every 2 hours. If you are working on the tutorial and your system stops running, you will see that the system icon on the ViewX Database Bar shows a red exclamation mark:



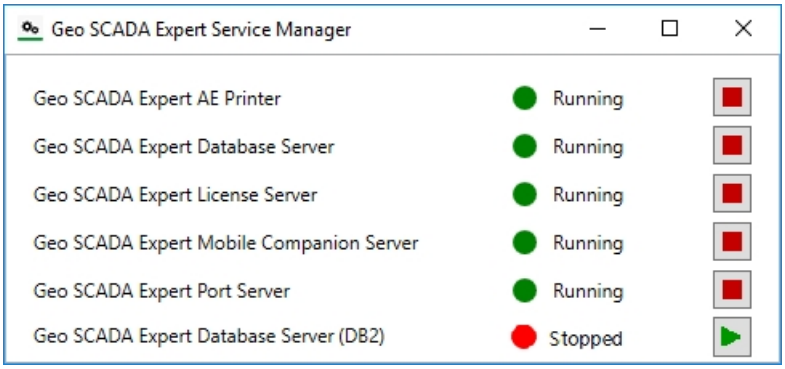
The server icon that runs near the clock on the Windows taskbar will also change color to indicate that the Geo SCADA Expert server has stopped running:



If you are working in Virtual ViewX and Geo SCADA Expert stops running, the Virtual ViewX client will lose its connection to Geo SCADA Expert. To continue working with your system via Virtual ViewX, you will need to restart the Geo SCADA Expert server.

To restart your server:

1. In Windows, select the **Start** menu. Scroll down the alphabetical list of installed applications and expand the **EcoStruxure Geo SCADA** folder.
2. Select the **Service Manager** option.
   The Service Manager window is displayed.



3. Select the **Start** button on the Service Manager window for the required server.
4. Select the **Start** button.
   After a short pause, the Geo SCADA Expert server will start running again and you will be able to resume your work in ViewX or Virtual ViewX.

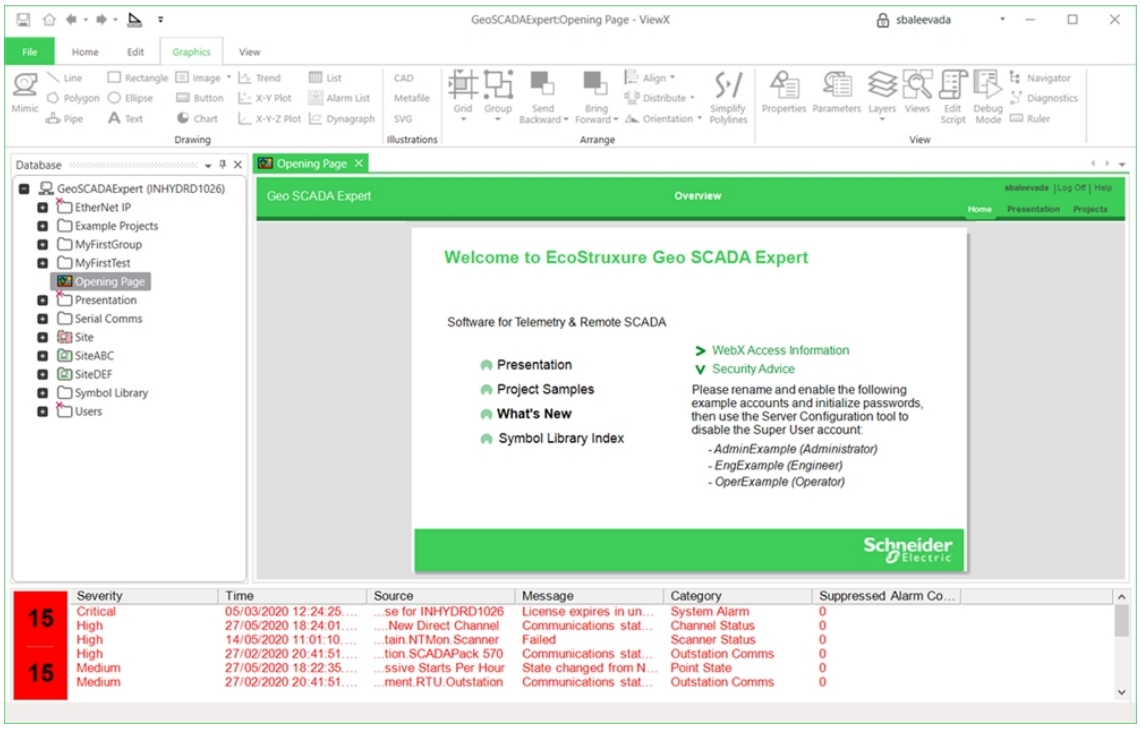
Further Information

Start and Stop the System Server.

Using the ViewX Interface

When you first install the demo system, ViewX runs automatically. To begin with, it displays a Mimic (graphical display), the Database Bar which contains a hierarchy of Groups, Message window that provides feedback and the Alarm Banner which is shown at the bottom of the ViewX interface, similar to that shown below.

Click on the different parts of the image to access more information about how to use each part of the interface



NOTE: The demonstration database provided alongside this tutorial provides you with user permissions to access all the main features within Geo SCADA Expert. For example, to design and configure mimics. When you use an operational system your user permissions may be restricted to certain features.

ViewX is the main Geo SCADA Expert client interface and can provide access to a wide range of features, including:

- A hierarchy of your database that you can browse easily
- Mimics
- Alarm displays
- Trends
- Logic programs
- Queries Lists
- Event Journal
- Configuration Forms and Editors

- OPC current and historic data
- Security settings.

As you progress through the tutorial, you will learn about many of the Geo SCADA Expert ViewX client features and will come to use the configuration and editing displays. But to begin with, we would like you to complete the following steps so that you have a better understanding of the ViewX interface:

1. Import the Example Projects
2. Log on to your System
3. Disable the Alarm Bell
4. Tabs and Ribbons
5. Quick Access Toolbars
6. Explorer Bars
7. Document Display Area
8. Alarm Banner

When you have worked with the various areas of the ViewX interface, you can Test Your Knowledge on the ViewX Interface and see just how much you have learned.

Import the Example Projects

To help you quickly get a feel for how a real Geo SCADA Expert system works, we have included an Example Projects database that you will use throughout this tutorial. On many systems, you'll find that the Example Projects are already loaded and are available to use straight away. However, if your system does not contain the Example Projects database, you are going to need to import the database file provided.

NOTICE

UNEXPECTED BEHAVIOR OF APPLICATION

The Example Projects database can only be installed at Root Group level within a database. It contains security settings, which might affect the configuration of an existing database.

We recommend that the Examples Project database be installed as a standalone server and used only for training and in conjunction with the Tutorial material.

Failure to follow these instructions can result in unexpected configuration changes.

The security features of Geo SCADA Expert require a system administrator to import and configure the Example Projects database to enable you to use it within the Tutorial.

For information about the installation and importing of the Example Projects database, *see* Example Projects in the Geo SCADA Expert Guide to Installation.

Further Information

Importing Data: *see* Importing and Exporting Database Items in the Geo SCADA Expert Guide to Core Configuration.

Log on to your System

To access the Geo SCADA Expert database, you need to log on using a valid user account. User accounts comprise part of the security features that help to prevent unauthorized users from accessing your system. (On some systems, the built-in Guest user account might be enabled. This user account might provide limited or read-only access to features in Geo SCADA Expert, however you will still need to log on via a valid user account in order to issue controls or configure database items.)

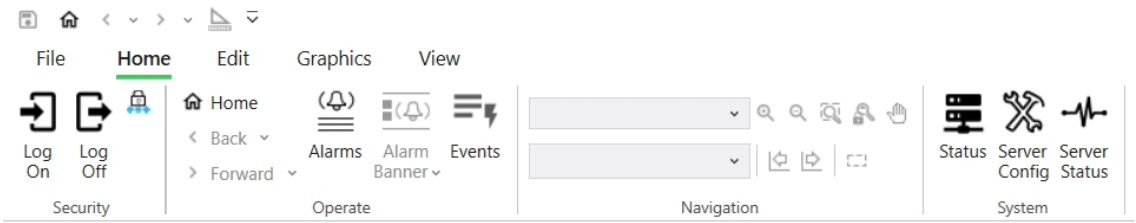
To access the configuration features that form part of this Tutorial, you need to log on via a user account that we have already created for you:

- **EngExample—**This user account provides access to various system features, including configuration settings.

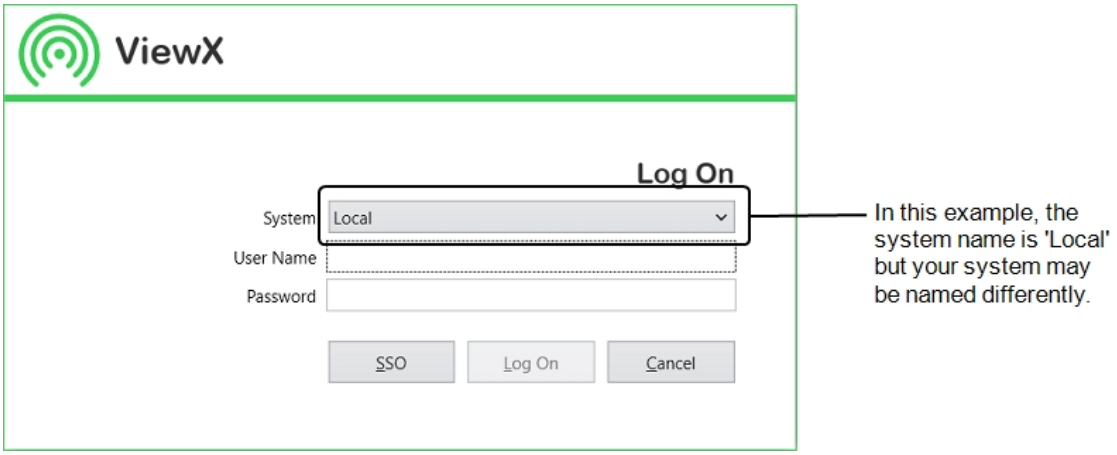
On a 'real' system, you could have individual user accounts for each user, with each user account configured to provide specific access permissions.

To log on as the 'EngExample' user:

1. Select the **Home** tab on the ViewX ribbon.



2. Select the **Log On** command from the relevant command group.
This will cause the Log On window to be displayed.



3. The **System** field allows you to select the system that you want to logon to, if you have more than one system configured.
4. In the **User Name** field on the Log On window, enter the following:

   `EngExample`

   This is the name of the user account that you will use for the majority of the tutorial. It has been pre-configured especially for the tutorial and has suitable security permissions to allow you to perform a wide variety of tasks.

5. In the **Password** field, enter the password for the 'EngExample' user account. (Your system administrator might provide you with a password, or you might be required to set a new password when you first attempt to log on as the 'EngExample' user.)
6. Select the **Log On** button to log on to the system.
   The Log On window is closed and you are logged on to your system as the 'EngExample' user.
7. You should check to see if your system already contains the Example Projects:
   - Select the right arrowhead > next to the System icon to reveal the contents of the System Group. You should see Group folders named Example Projects, Presentation, Symbol Library and Users as well as a single Mimic database item named **Opening Page**. If you cannot see these items, you will need to Import the Example Projects.



Now that you have logged on as the 'EngExample' user, you can begin to learn about the various parts of the ViewX interface.

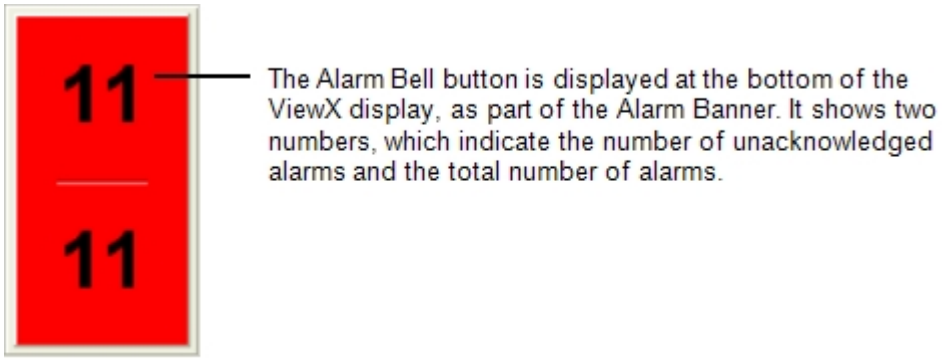
Further Information
Logging On and Off: *see* System Security.
Alarm Banner: *see* Alarm Banner.
User Accounts: *see* Overview of User Account Security.

Disable the Alarm Bell

What is the Alarm Bell? Well, it is a sound that plays when ViewX detects alarm conditions on your system. By default, it makes a 'beep' sound that repeats. If you have the 'Example Projects' already installed and logged on using one of the example user accounts, you will probably be hearing the 'beep' right now. As you'd expect, the sound is designed to attract the attention of users, but if you leave it on during the tutorial, it may become annoying.

If you can hear the Alarm Bell, you can turn it off by taking the following steps:

1. Move the cursor over the Alarm Bell Button at the bottom-left of the ViewX display.



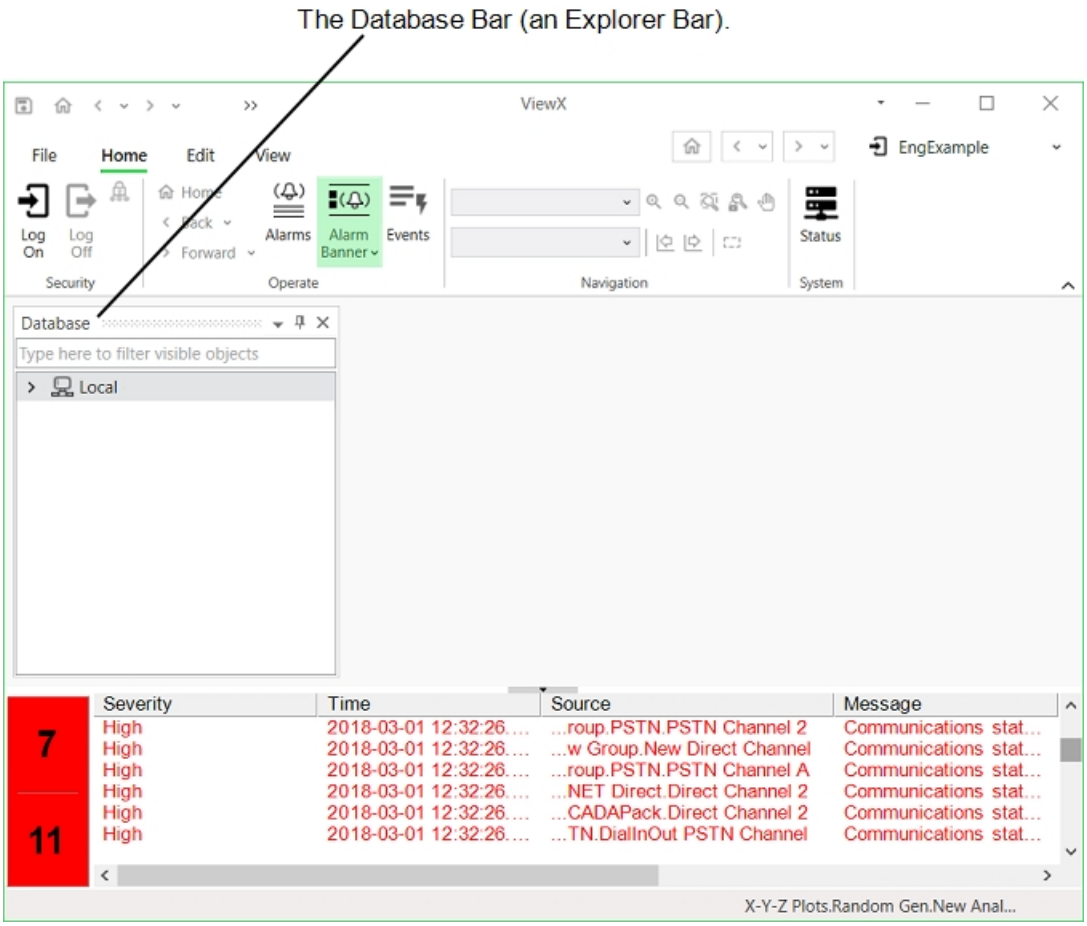
2. Right-click on the Alarm Bell button to display a context sensitive menu.
3. Select the **Disable Bell** option. This turns the audible alarm sound off.

Further Information

Alarm Bell: *see* Audible Alarms.

Explorer Bars

To help you navigate the items and data on your system, ViewX includes an Explorer Bar. This is displayed on the far-left of the ViewX interface by default.



There are several types of Explorer Bar available, but you will use the Database Bar predominantly during the tutorial. The Database Bar contains a hierarchy of the items in your database and allows you to add, create, configure, remove, and organize database items. You can also use it to access status displays and perform actions on individual items.

When you first run ViewX, the **Database Bar** is displayed by default. At the top of the **Database Bar** is a system icon. The system icon represents the server to which your client is connected (there can be multiple system icons).

To help you understand how the **Database Bar** works, we are going to quickly show you how to navigate through a hierarchy of Groups.

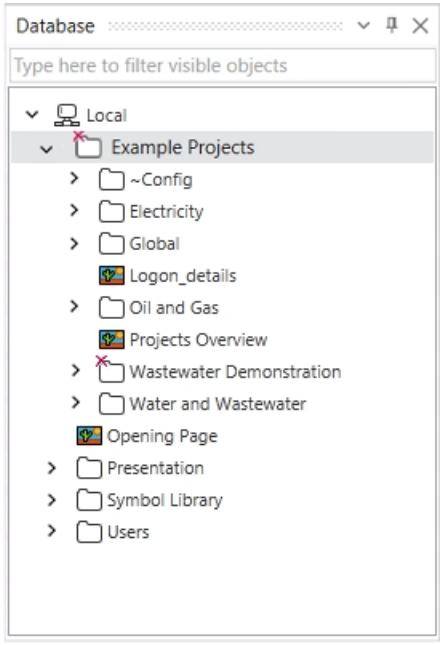
1. Display the Database Bar (see Display an Explorer Bar).
2. Click on the right arrowhead (>) next to the System icon at the top of the Database Bar. This expands the top level 'branch' of the 'tree-structure' to reveal the items on the system.



You will see that your system contains four Groups and a Mimic. The Groups are represented by folder icons, each with right arrowhead symbols which indicate that the Groups contain further items. The 'Opening Pages' Mimic is represented by a picture icon.

The Groups and the Mimic have been preconfigured and were either imported into your system at the start of this tutorial or were included in the installation.

3. Click on the right arrowhead next to the 'Example Projects' Group. This expands the 'Example Projects' Group to reveal its contents — further Groups and Mimics.



4. Click the down arrowhead next to the 'Example Projects' Group to collapse its 'branch' and hide its contents.
5. Take a moment to browse through the various folders in your system. You will see that they contain a variety of items, including Mimics, database points, and custom colors. You will also see a red folder icon and green folder icons—these are special types of Groups called Group Templates and Instances. They can be used to significantly reduce the amount of configuration required on your system. We will look at these in more detail later in the tutorial.

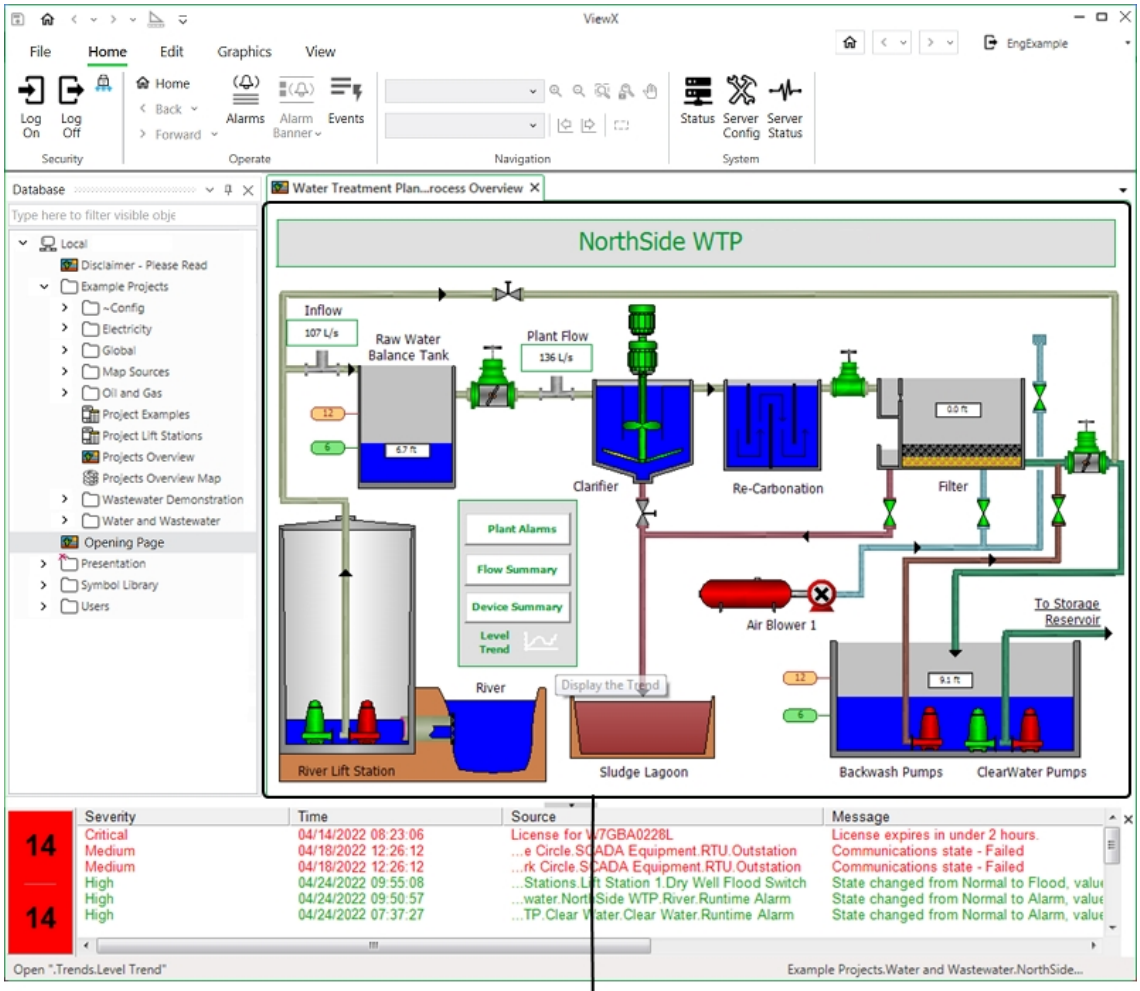
Now that you've learned how to use the right and down arrowhead symbols on the Database Bar, you'll understand how to navigate the other types of Explorer Bar, as they also use the expand and collapse concept.

Further Information

Explorer Bars: *see* Explorer Bars.

Document Display Area

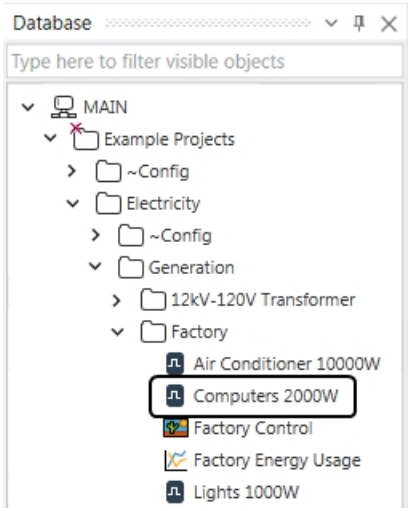
The ViewX Document Display area is the main part of the ViewX display and is shown to the right of the Explorer Bar. You will use the Document Display Area to interact with the various displays in ViewX, including Mimics (graphical displays), Logic programs, Trends, Lists, and configuration Forms. These displays are often referred to as ViewX 'documents'.



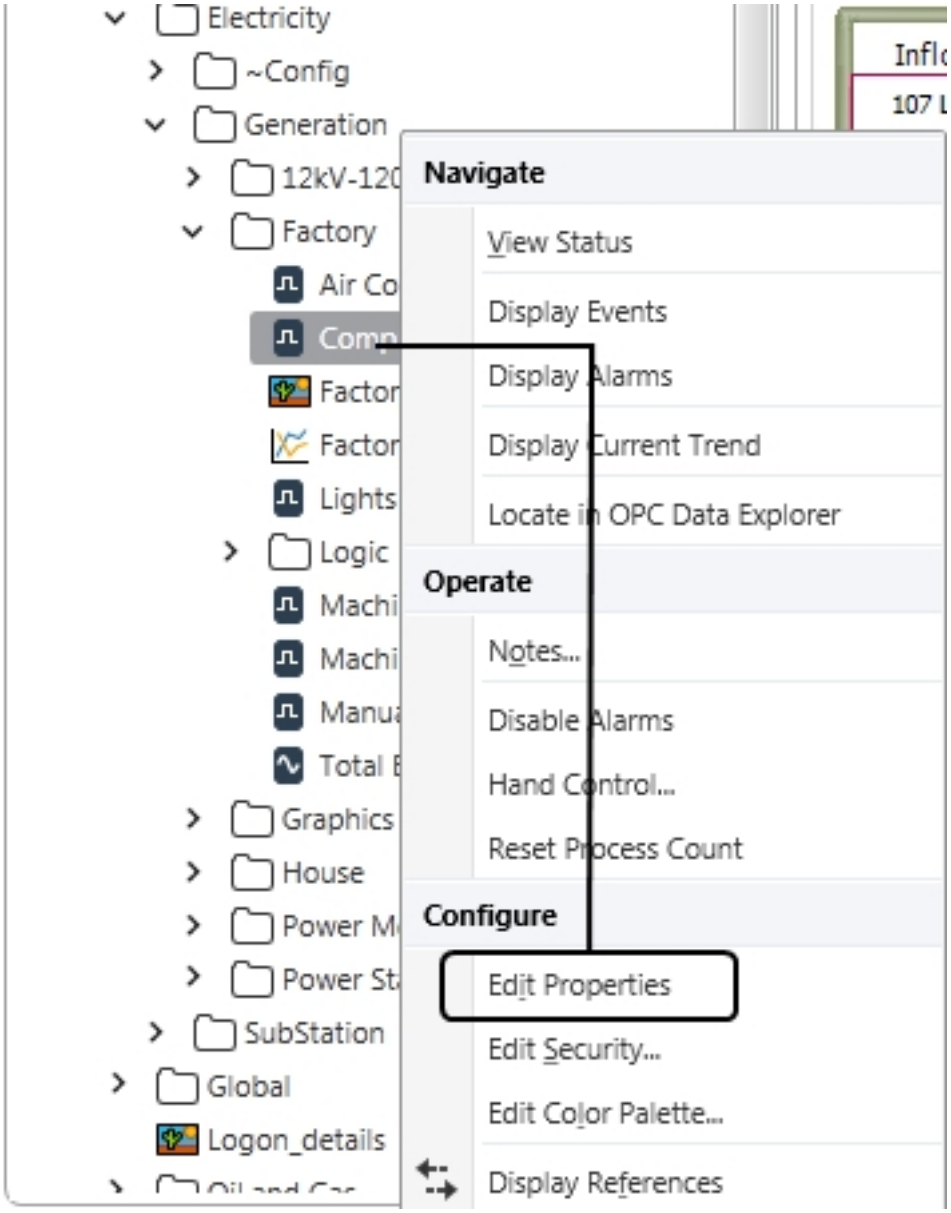
A Mimic displayed in the Document Display Area.

Whenever you choose to display a ViewX 'document', the 'document' is shown in the Document Display Area. To illustrate how this works, we are going to show you how to display the configuration Forms for some of the internal database points that already exist in your database (internal database points are used to represent inputs and outputs that are only used internally; they do not represent 'real' external I/O):

1. Display the Database Bar (see Display an Explorer Bar).
2. Browse to the 'Computers 2000W' internal digital point. It is stored in the following location:

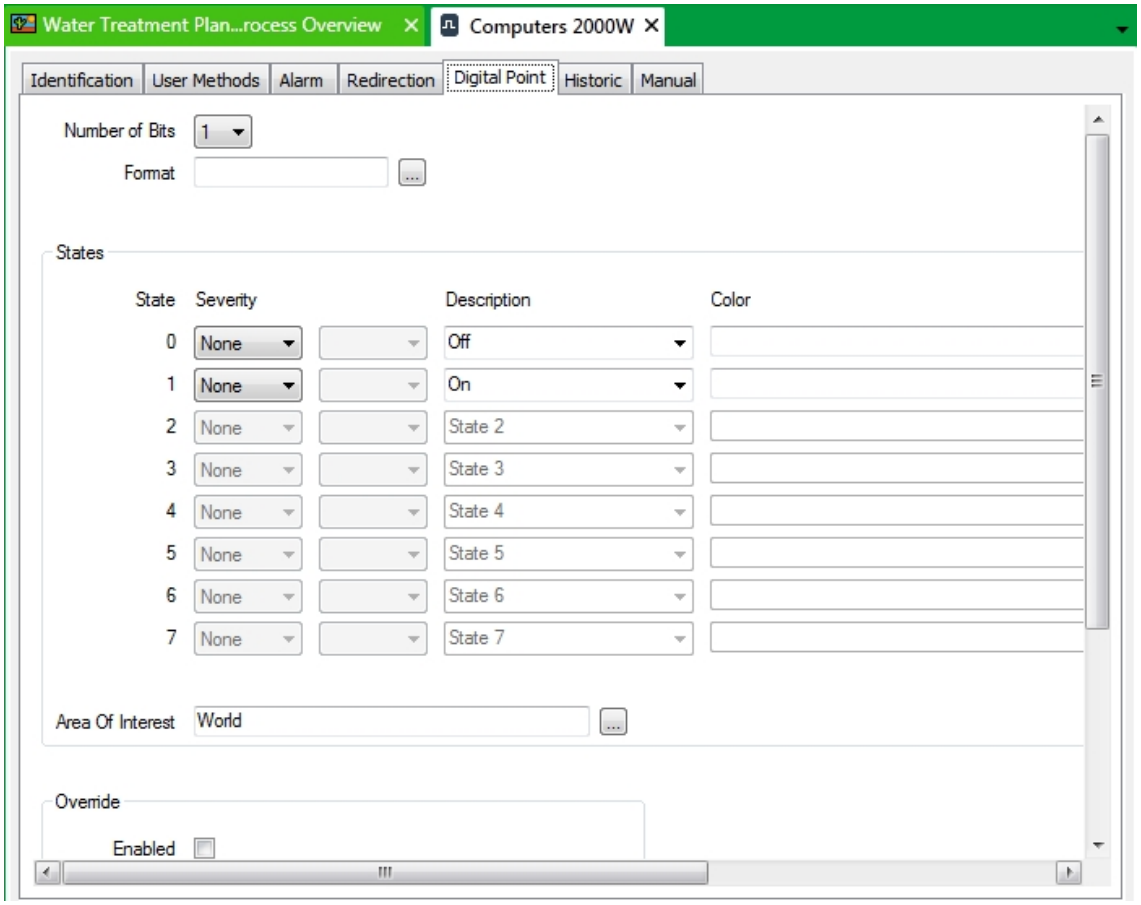


3. Right-click on the internal digital point to display its context sensitive menu. Each database item has its own context sensitive menu which provides access to a variety of display, configuration, and control options (relating to that specific item).

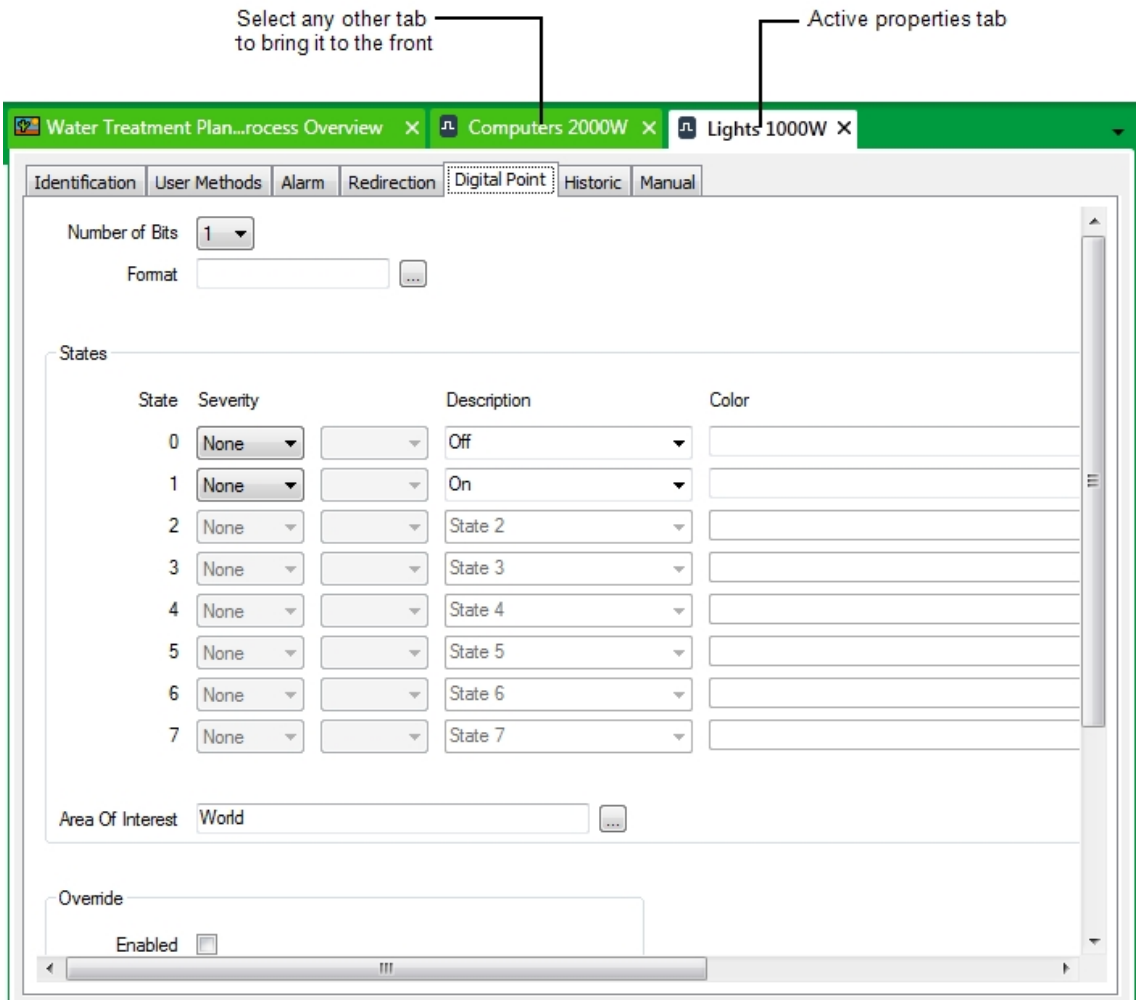


4. Choose the **Edit Properties** option. The **Edit Properties** option provides access to the configuration Form for the point. Many types of database item have an **Edit Properties** option that you can use to access their individual configuration Forms.

   The configuration Form for the internal digital point is displayed in the Document Display Area.

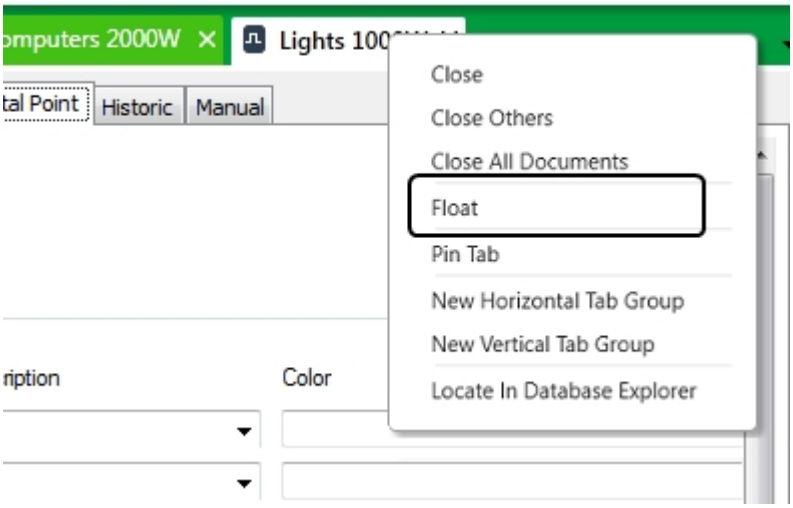


5. On the **Database Bar**, browse to the 'Lights 1000W' internal digital point. It is stored in the same Group as the 'Computers 2000W' digital point.
6. Double-click on the 'Lights 1000W' internal digital point to display its configuration Form. You will see that the 'Lights 1000W' Digital Point Form is displayed in front of the 'Computers 2000W' Digital Point Form in the Document Display Area with its own tab. The 'Lights 1000W' Digital Point Form is active as it is the latest Form to be displayed, but you can make the 'Computers 2000W' Form the active Form by selecting its tab.

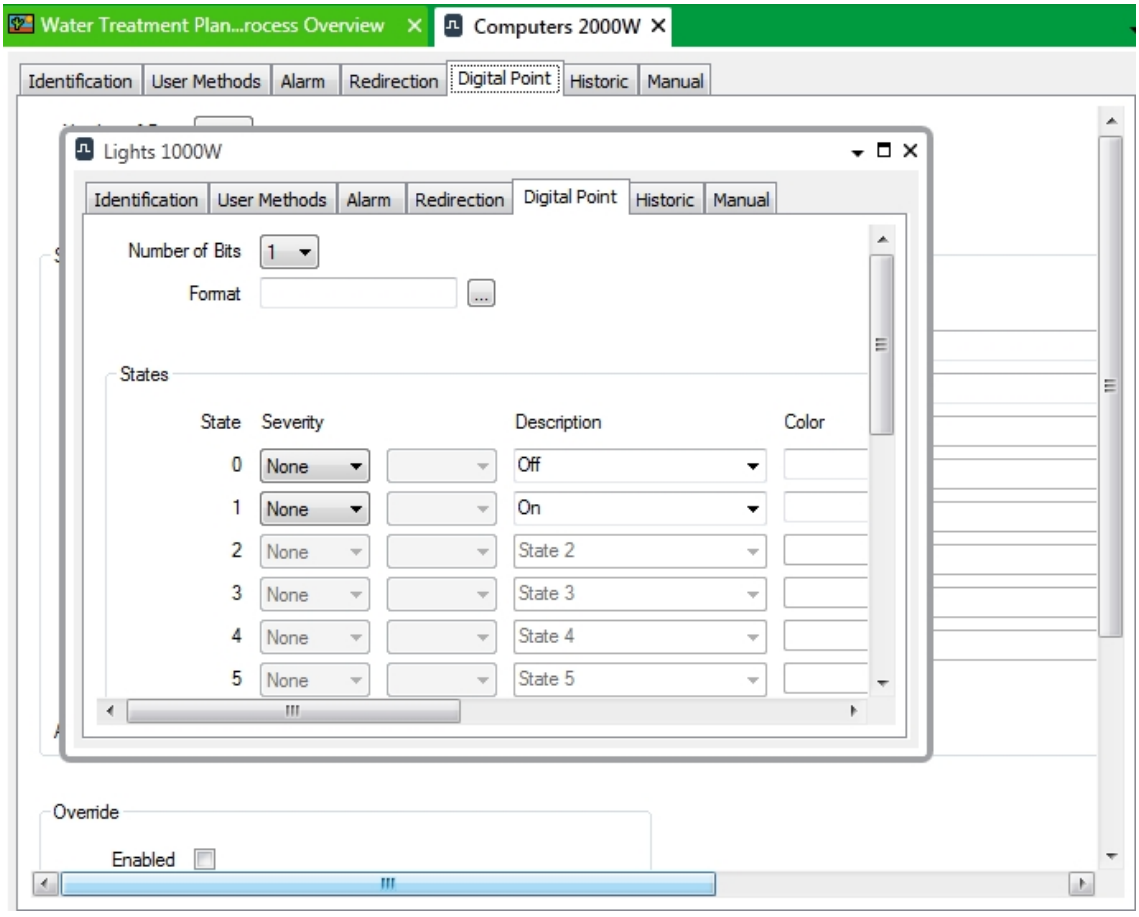


NOTE: You can restrict access to configuration displays such as Forms if required. You can also disable the double-click functionality that allows users to display or edit a document feature. For more information, see Allocating Security Permissions in the Geo SCADA Expert Guide to Security.

7. By default properties tabs are docked within the Document Display area. You can detach and float an item's property document that appears in the Document display area.
   i. To float a document, right-click on the document's tab.
   A context-sensitive menu is displayed.



ii. Select the **Float** option, the document appears in its own window and can be placed anywhere on the screen, see Floating or Docking Windows for more information about this feature.



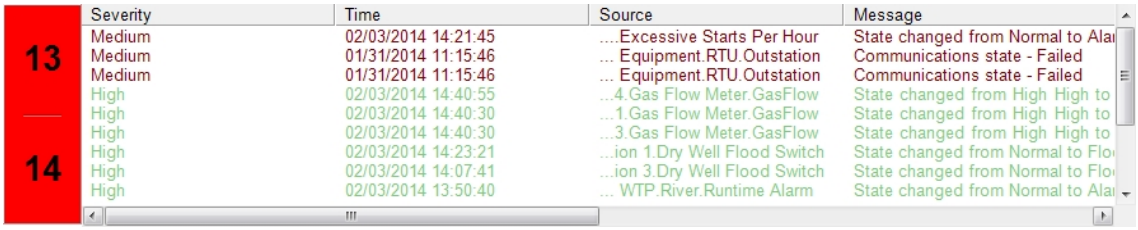
Now that you understand the purpose of the Document Display Area, it's time to look at the Alarm Banner.

Further Information

Document Display Area: *see* Document Display Area.

Alarm Banner

When Geo SCADA Expert detects a problem on your system, it raises an alarm which is shown in the Alarm Banner (and is also included on Alarms Lists). The Alarm Banner provides information about currently active alarms on your system and also provides access to the various alarm response features. It is shown at the bottom of the ViewX display by default (but can be moved or hidden from view if required).



When you imported the Example Projects (*see* Import the Example Projects), some of the imported items caused a number of alarms to be raised. If you look at the Alarm Banner, you will see information about each of these alarms, including:

Severity

The importance of the alarm.

Time

The time at which the alarm was raised ('triggered')

Source

The full address of the database item for which the alarm has been raised. The database item is the source of the alarm.

Message

A brief description of the condition that caused the alarm to be raised.

Category

Indicates the type of alarm, for example, the points that are in alarm on your system have a Category of Point State (as the points' values have caused the points to change state, which has triggered alarms).

Suppressed Alarm Count

Geo SCADA Expert has an alarm suppression feature that allows the alarms of database items to be hidden temporarily. This is useful when you want to create a hierarchy of alarms, with the visibility of alarms on 'child' items being dependent on the alarms of 'parent' items.

The Suppressed Alarm Count information on the Alarm Banner shows the number of alarms that are suppressed on 'children' of the 'parent' item. This only relates to 'By Alarm State' suppression. (This should be 0 at this stage of the tutorial).

For further information on Alarm Suppression, *see* Alarm Suppression.

Area of Interest

Geo SCADA Expert has an Area of Interest feature that allows you to limit the alarms and events that are shown to a user. Typically, the Area of Interest feature is implemented so that users can only see alarms that are relevant to their geographical location or

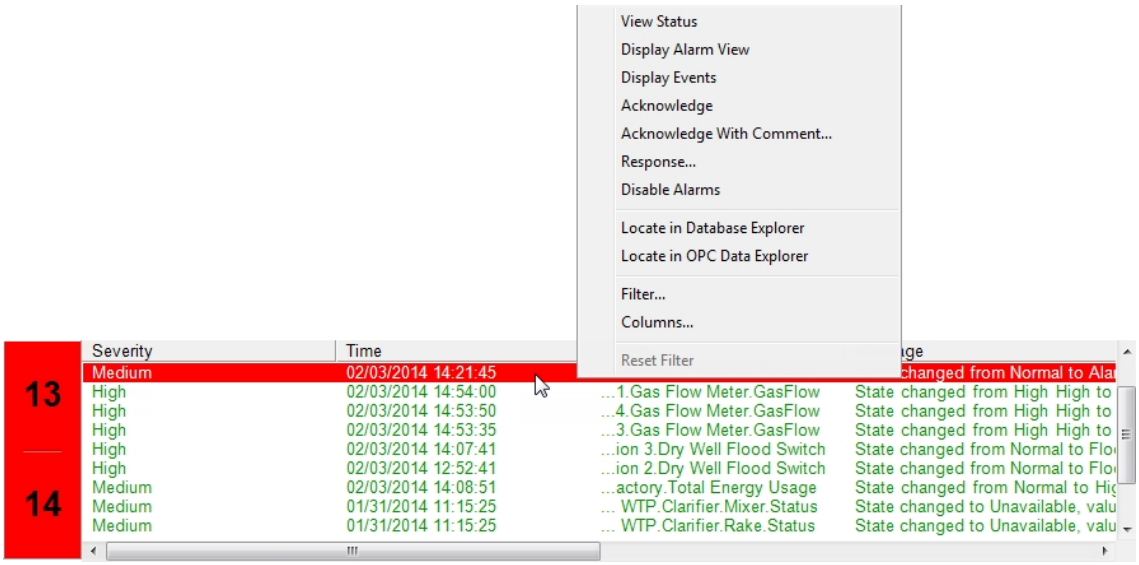
responsibilities.

The Area of Interest information on the Alarm Banner indicates whether an alarm is associated with a defined Area of Interest - it either shows the name of the Area of Interest or World (World means the alarm is not associated with any Areas of Interest, and can be renamed if required).

For more information about Areas of Interest, *see* Restrict Alarm and Event Access to Specific Areas of Interest.

Alarms in Geo SCADA Expert are color coded, and so the alarms are displayed in different colors. The default color scheme is **Red** (flashing) for unacknowledged, uncleared alarms, **Green** (flashing) for unacknowledged cleared alarms, and **Olive-Green** for acknowledged uncleared alarms.

If you right-click on an alarm in the Alarm Banner, a context-sensitive menu for the alarm is displayed. The menu contains options that you can use to respond to alarms, including **Acknowledge** and **Response**



On a 'live' system, operators will use these alarm response options to inform other system users that they are aware of an alarm condition and are trying to resolve the situation.

To show you how easy responding to alarms is, we want you to **Acknowledge** the alarm for the Total Energy Usage point:

1. In the Alarm Banner, use the **Source** column or the **Message** column to identify which alarm relates to the Total Energy Usage point.
2. Right-click on the alarm, then select the **Acknowledge** option from the context sensitive menu. This informs Geo SCADA Expert and other users that you have seen the alarm.

   As the alarm is an Unacknowledged Cleared alarm, as soon as you select the **Acknowledge** option, the alarm will be removed from the Alarm Banner. This is because the cause of the alarm is no longer in effect and so the alarm has already been cleared. The alarm only remained on the system because no user had acknowledged the alarm. Geo SCADA Expert only removes an alarm when the cause of the alarm has been resolved *and* a system user has confirmed that they have seen the alarm (this means alarms are not raised and cleared automatically, which could result in users being unaware of intermittent alarm conditions).

The Alarm Banner is just one of several displays that you can use to access alarm response features. It is also possible to access these features on Alarms Lists, specially configured Mimics, and even on the context sensitive menus for individual items.

Now that you have familiarized yourself with the general layout of the ViewX interface, you can choose to Test Your Knowledge on the ViewX Interface, or you can proceed to the next section of the tutorial: Configuration Basics.

Test Your Knowledge on the ViewX Interface

Do you know your way around the ViewX interface? Can you display Explorer Bars, browse to database items and navigate between ViewX windows with ease? Then put your ViewX skills to the test and see how much you have learned:

1. What is the main display area in ViewX called?
2. How do you expand a Group so that you can see its contents?
3. Group folders are represented by white folder icons, but what do the red and green folder icons represent?
4. If you need to display the configuration Form of a database point, which Explorer Bar would you use to locate the point, and then display its Form?
5. You are viewing a Mimic in the Document Display Area and then choose to display a configuration Form. When it is displayed, the Form fills the available space so that you can't see the Mimic any more. How can you switch ViewX's focus from the Form back to the Mimic?
6. If you wanted to know which database item is associated with an alarm, which two columns of information would you look at on the Alarm Banner?
7. How do you inform Geo SCADA Expert (and other users) that you have seen an alarm and are in the process of investigating its cause?

Configuration Basics

With Geo SCADA Expert, you can configure database items and displays while the system is online, meaning that you can create new items without affecting the running of your system. Many configuration tasks are undertaken in ViewX via a variety of user-friendly configuration displays, including configuration Forms and editors such as the Mimic editor.

So that you get a feel for how the configuration displays look and work, we are going to guide you through some basic configuration tasks. When you have completed these tasks, you will be ready to start working with 'live' I/O (inputs and outputs).

To familiarize yourself with the configuration process in ViewX, you should:

1. Create a New Group
2. Rename the 'Default' Mimic in your Group
3. Add an Internal Analog Point
4. Use Drag and Drop to Display the Point Data on a Mimic
5. Put the Mimic into Run Mode
6. Hand Control the Internal Analog Point
7. Display a Historic Trend for the Internal Analog Point
8. Change the Point Configuration to Trigger an Alarm
9. View an Alarm
10. Action an Alarm.

When you have completed the tasks in this section, you can Test Your Knowledge on Configuration Basics.

Create a New Group

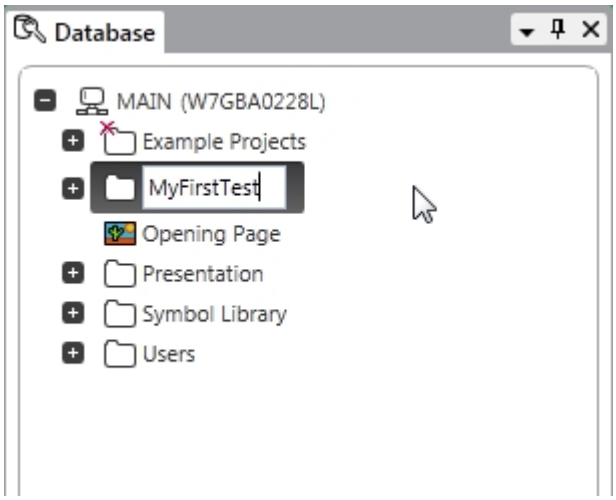
Group folders are used to organize your database so that it is easier for you (and other users) to find whatever items you need. There are three types of Group: 'normal' Group folders, Group Templates, and Group Instances. For the moment, we will focus on 'normal' Groups which are folders that can contain any type of database item, including other Groups. They work in a similar way to folders in Microsoft Windows.

NOTE: To perform the tasks in this step, you have to be logged on as the 'EngExample' user (*see* Log on to your System).

To create a Group:

1. Display the Database Bar (see Display an Explorer Bar).
2. Right-click on the System icon at the top of the Database Bar.
   A context sensitive menu is displayed.
3. Select **Create New > Group**.
   A new Group database item is added to the hierarchy shown in the Database Bar. It is selected automatically, ready for you to define its name.
4. Enter the following as the name for the Group:

   ```
   MyFirstTest
   ```



Now that you have created the 'MyFirstTest' Group, you can proceed to Rename the 'Default' Mimic in your Group.

Further Information

Groups: *see* Groups.

Rename the 'Default' Mimic in your Group

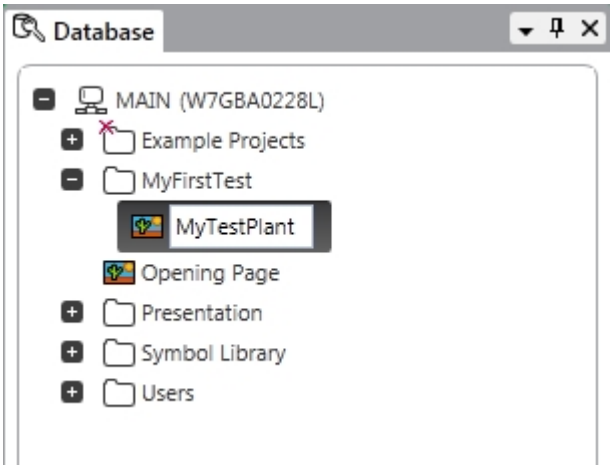
When you create a Group, the Group automatically contains a Mimic which is named 'Default'. This is because many systems designers like to have an overview Mimic in each Group—the Mimic acts as a graphical representation of the items stored in that Group. However, you can leave the 'Default' Mimics blank or delete them from your database if you have no need for them.

As you are going to add some dynamic data to the Mimic, it makes sense to rename it to something more appropriate (dynamic data is data that changes according to the values in your database).

To rename your Mimic:

1. Browse to the 'Default' Mimic in the 'MyFirstTest' Group.
2. Right-click on the 'Default' Mimic to display its context sensitive menu, then select the **Rename** option.
   The name of the 'Default' Mimic is selected, ready for you to make your changes.
3. Enter the following as the new name for the Mimic:

   ```
   MyTestPlant
   ```



4. Press the **Enter** key or select any part of the ViewX interface to confirm your entry.

Now that you've renamed the 'Default' Mimic to 'MyTestPlant', you can proceed to Add an Internal Analog Point.

Add an Internal Analog Point

In Geo SCADA Expert, there are two different categories of database point: internal database points and 'normal' database points. Of course, within these categories there are many different types of point, for example, 'normal' database points include analog and digital points for each different driver.

- 'Normal' database points are used to represent real I/O. For example, database points can represent inputs from and outputs to plant such as sensors, valves, and so on.
- Internal database points are different as they are not used to represent actual I/O from an external source. Instead, they are used to represent and store values that are only used internally within Geo SCADA Expert.

As you are only just starting out with point configuration, we are going to show you how to:

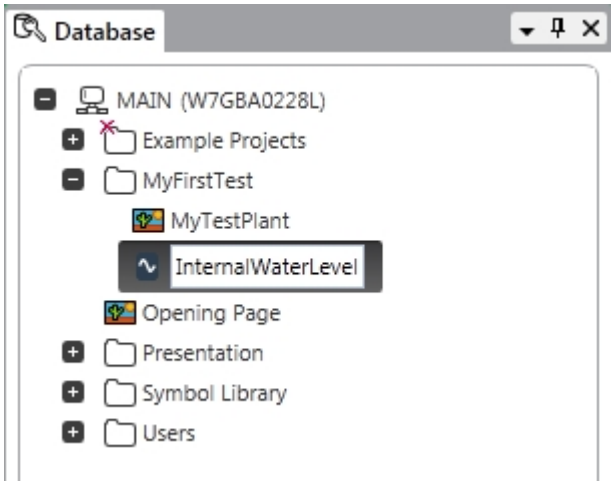
- Create an internal analog point.
- Configure the internal analog point so that it has the **Historic** feature enabled. This means that Geo SCADA Expert will keep a record of the internal point's values.

When you have created the internal analog point, you will learn how to display its value on a Mimic, control its value, and view its values on a Trend. This will help you to understand how items are configured and information can be displayed in Geo SCADA Expert.

To add an internal analog point and enable its **Historic** feature:

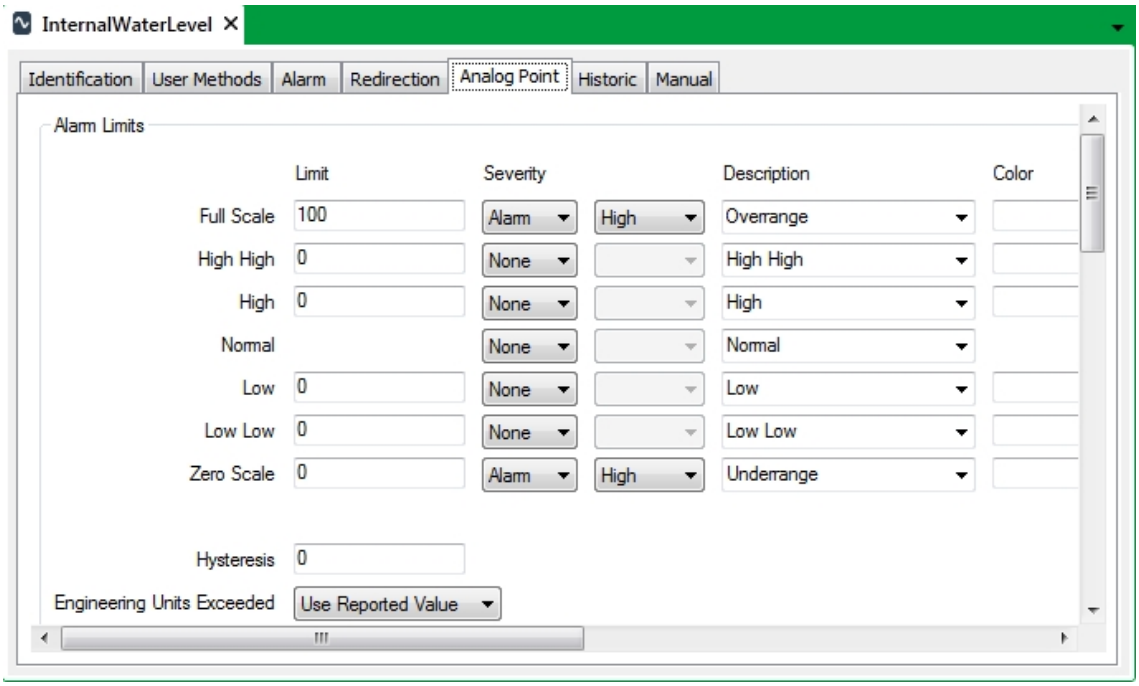
1. Right-click on the 'MyFirstTest' Group and select **Create New>Internal>Analog Point**. This will create a new internal analog point in the 'MyFirstTest' Group. The internal analog point is selected automatically, ready for you to define its name.
2. Name the internal analog point:

   ```
   InternalWaterLevel
   ```

   For this exercise, we are going to use the internal analog point to represent the I/O for an imaginary water level sensor (as used in the water industry). On a 'live' system, a 'normal' analog point would be used and it would represent the I/O from a real water level sensor installed in, for example, a reservoir, or tank.
3. Display the configuration Form for the 'InternalWaterLevel' point by either double-clicking on the point on the Database Bar or by right-clicking on the point and then selecting **Edit Properties** from

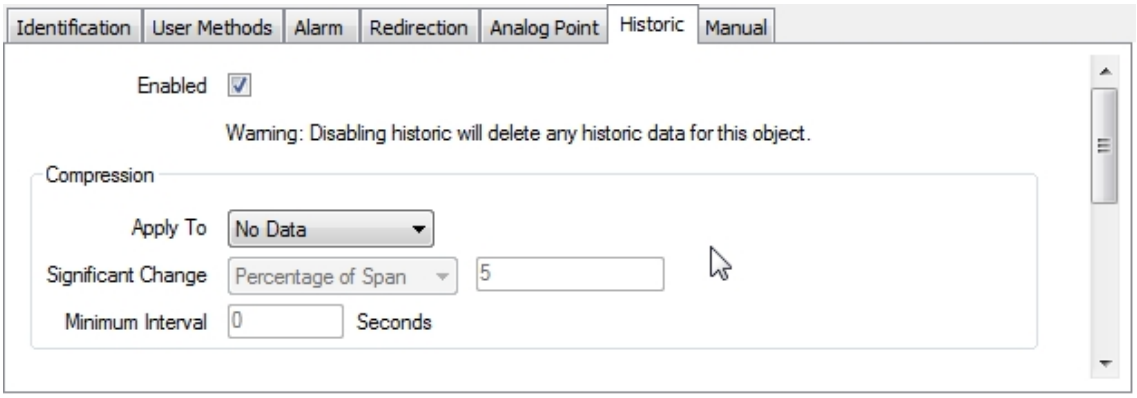
its context sensitive menu.



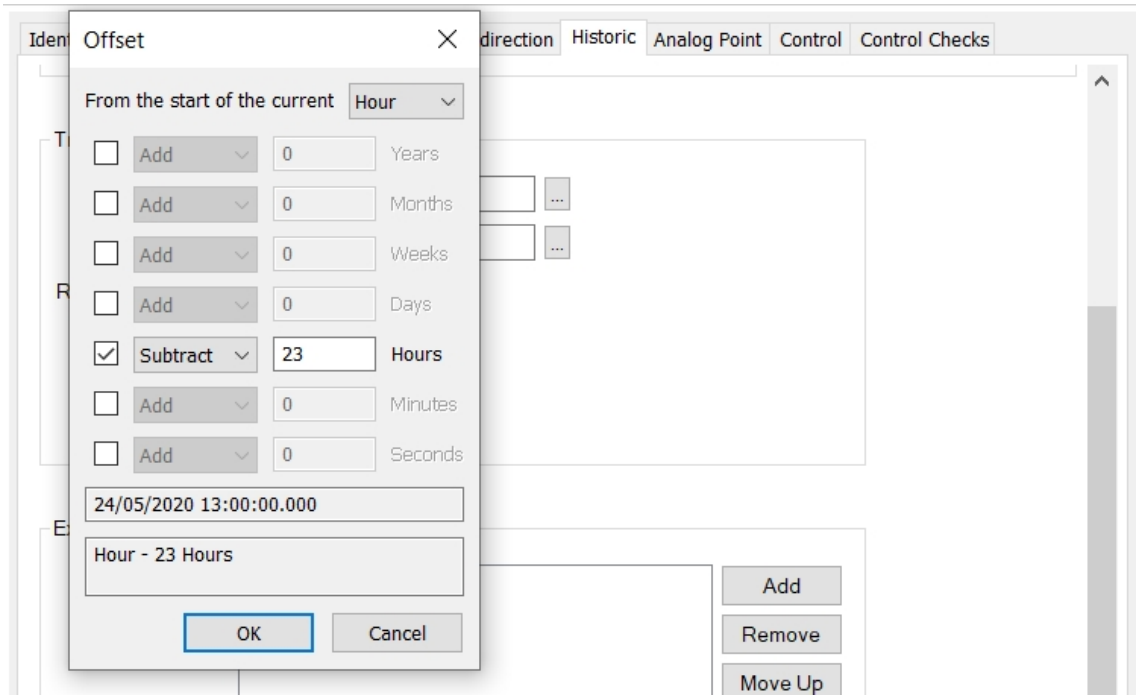
The configuration Form consists of several tabs, each containing a variety of settings. The tabs are shown across the top of the Form, and if you select one, different settings are shown. These tabs are common to many points, but other types of database item have different tabs, for example, a Logic program's configuration Form only has **Identification**, **User Methods** and **Logic** tabs.

Before you proceed with the next step, take a moment to select the different tabs and look at the settings that are available.

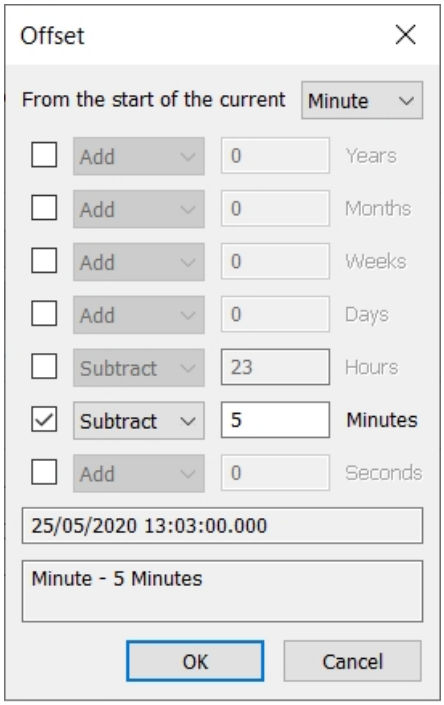
4. Select the **Historic** tab. This tab contains the settings that relate to the internal point's historic data (the record of past values).
5. Select the **Enabled** check box to turn on the historic feature for the internal point. As soon as you save the Form, the values for the internal point will be stored online (for a specific time period). If a point does not have **Historic** enabled, it means that you can only access its current value and state.



6. In the **Trend/List** section, select the browse button next to the **Offset** field. This displays an Offset dialog box.

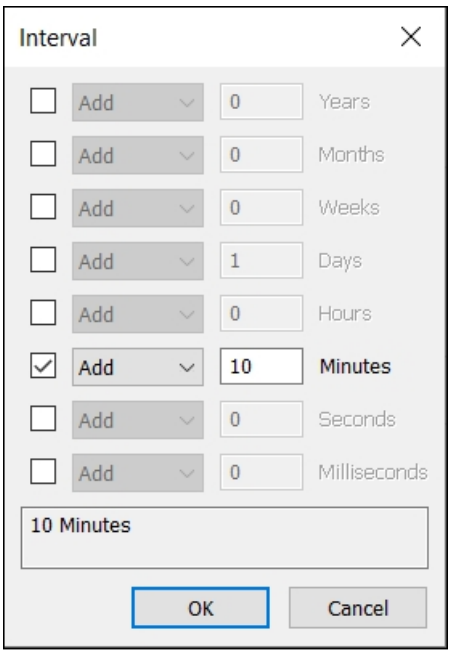


7. Use the Offset dialog box to define the start time of the Interval that will be shown on Historic Trends and Historic Lists for the point. The Interval is the time span that is visible on the X-Axis.
   i. Change the **From the Start of the Current** setting from **Hour** to **Minute**. This instructs Geo SCADA Expert to calculate the Offset from the beginning of the current minute, rather than the beginning of the current hour.
   ii. Clear the check box next to the default setting of **Subtract 23 Hours**. This removes the existing Offset which is in hours.
   iii. Select the check box for the **Minutes** row, and change **Add** to **Subtract** and the **0** to **5**. This means that when you display an ad hoc Historic Trend for the point, the Interval will start 5 minutes before the start of the current minute. So if you displayed the Historic Trace at 10:30:00, the Historic Trace's Interval would begin at 10:25:00.



iv. Select the **OK** button to confirm your choices and close the Offset dialog box.

8. Select the browse button next to the **Interval** field. This displays an Interval dialog box.
9. Use the **Interval** dialog box to define the length of time that is visible on the X-Axis by default. For this tutorial, disable the default setting of **Add 1 Days** and define a setting of **Add 10 Minutes**. This means that when you display an ad hoc Historic Trend for the point, the X-Axis will represent 10 minutes, with the first time shown on the X-Axis being 5 minutes before the start of the current minute (as defined by the **Offset**).



10. Select the **OK** button to confirm your choices and close the **Interval** dialog box.

11. Save the configuration changes. Either:
    i. Select the **File** menu.
    ii. Select **Save** command from the relevant command group.

    Or:

    - Select the **Save** button  on the Quick Access Toolbar.

    Or:

    - Press the **Ctrl** and **S** keys simultaneously.
12. Close the internal analog point's Form.

You've now created an internal analog point, configured it to have historic data and defined the settings for the point's Historic Trend and Historic List. Next, you will Use Drag and Drop to Display the Point Data on a Mimic.

Further Information

Internal Points: *see* Internal Points.

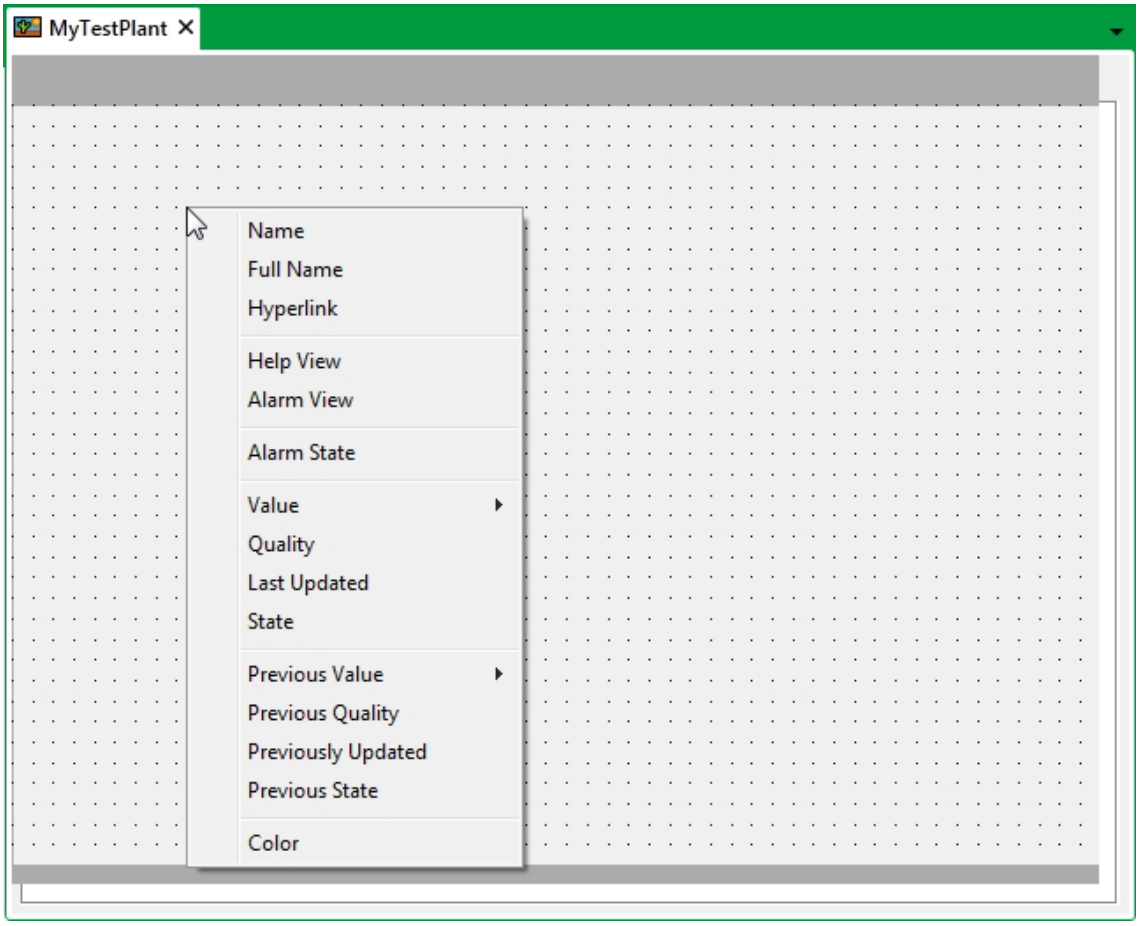
Use Drag and Drop to Display the Point Data on a Mimic

Mimics are displays that allow you to present system information in a graphical format. For example, you can create Mimics that contain a visual representation of the plant with dynamic, animated displays showing values from the database. You can configure a Mimic to represent virtually anything, and can easily add dynamic values to it by using Geo SCADA Expert's drag and drop feature (there are other ways of adding dynamic values and attributes to Mimics, but for the moment we will focus on drag and drop).

As you have created an internal analog point with historic data, we are going to teach you how to use the drag and drop feature to display the point's value graphically and as a number on a Mimic:

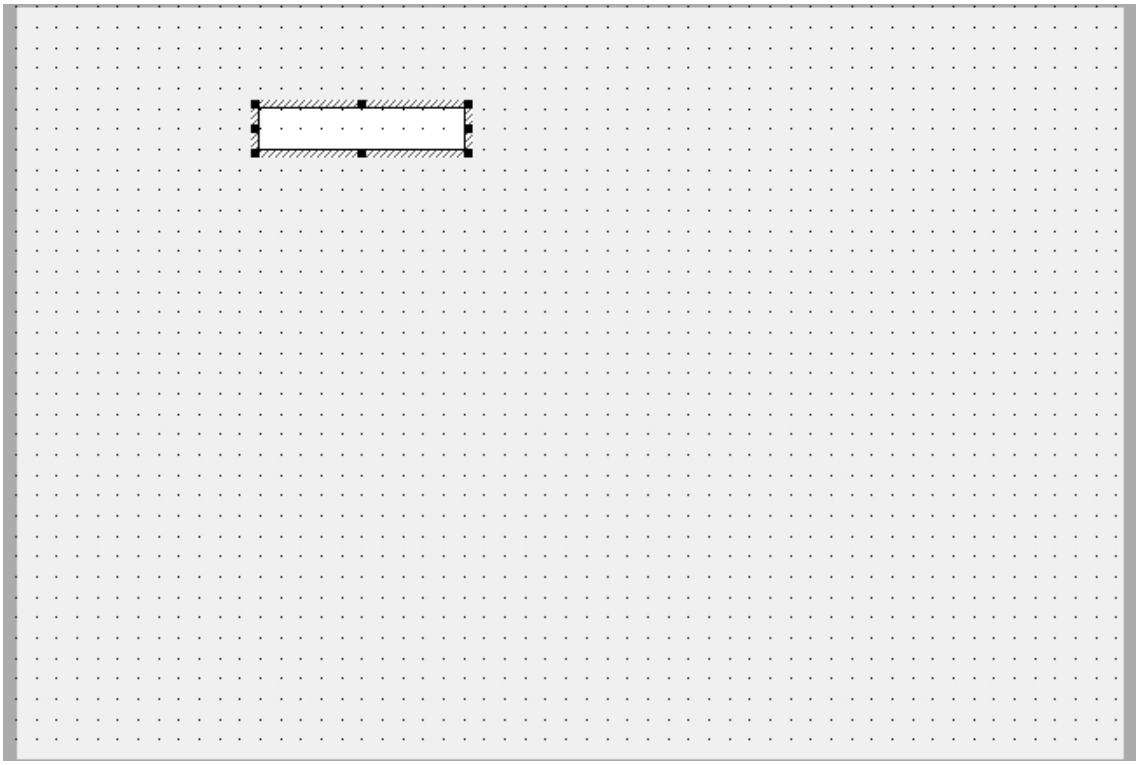
1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, double-click on the 'MyTestPlant' Mimic to open the Mimic in Design Mode. Alternatively, you can right-click on the Mimic and select **Edit** from its context sensitive menu.

   When a Mimic is in Design mode, you can add items to it, configure animations, write scripts, and so on. However, you may not be able to see operational features such as the values of animated items. To view operational elements, you will need to switch the Mimic to Run mode—we will explain how to do this later in the tutorial.
3. With the 'MyTestPlant' Mimic still on display, browse to the 'InternalWaterLevel' point in the Database Bar.
4. Left-click on the 'InternalWaterLevel' point and keep the left-hand mouse button pressed down.
5. Drag the cursor from the Database Bar onto the 'MyTestPlant' Mimic, and then release the mouse button to display a context sensitive menu.

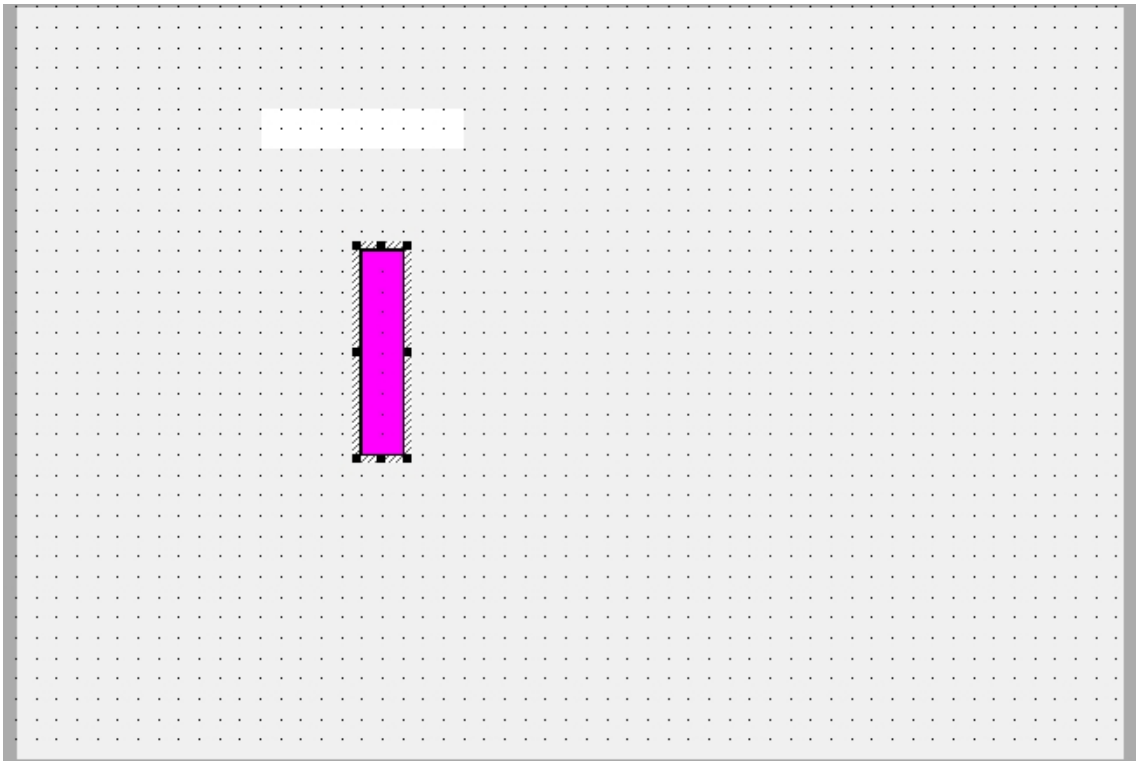


6. Select **Value>Formatted Value** from the menu.

   An animated text box is added to the Mimic. It will appear as an empty white box, but it is actually animated to show the formatted value of the point.



7. Repeat steps 3 to 5 inclusive, only this time select **Value>Vertical Bar>Up** from the context sensitive menu. This will add an animated bar to the Mimic. The value of the internal analog point will affect the size of the bar.



You've now added an animated text box and an animated size bar to your Mimic. The appearance of both animated objects will change according to the value of the internal analog point, but you won't be able to see the changes until you switch the Mimic to Run mode. So let's do that next—proceed to Put the Mimic into Run Mode.

Further Information

Animations: *see* Animations.

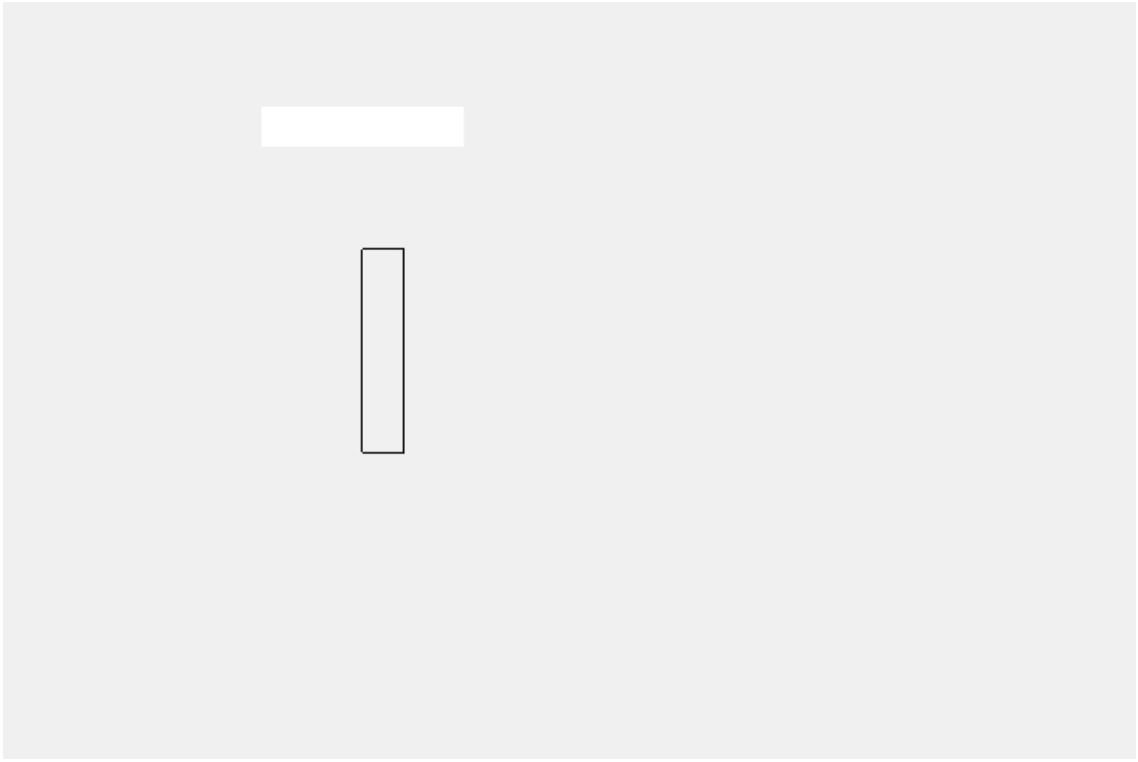
Put the Mimic into Run Mode

To configure a Mimic, you need to display it in Design mode. But to use the Mimic in the same way as an operator level user, you need to display it in Run mode. When a Mimic is in Run mode, it will display the values and animations that have been configured for it and will provide access to any display and control related context sensitive menus. However, you cannot access any configuration features of the Mimic while it is displayed in Run mode.

To display the 'MyTestPlant' Mimic in Run mode:

- Deselect the **Design Mode** button on the Quick Access Toolbar.

  When you have displayed the 'MyTestPlant' Mimic in Run mode, you will see that the dotted lines of the grid disappear. This is because the Grid feature is only available in Design mode (it is enabled by default and is designed to help you align Mimic objects).



  When your Mimic is in Run mode, it should show the black outline of the animated size bar and the white background of the animated text box (as shown above).

With the Mimic in Run mode, you can move on to Hand Control the Internal Analog Point. The control will change the value of the point which will have a noticeable effect on the animated objects on your Mimic.

Further Information

Run Mode and Design Mode: *see* Displaying a Mimic.

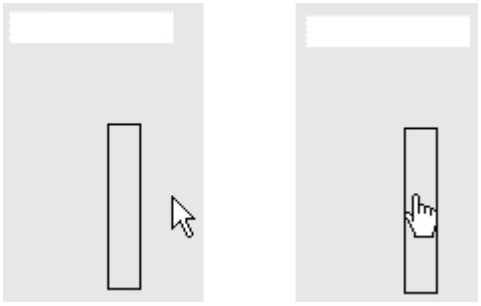
Hand Control the Internal Analog Point

Geo SCADA Expert allows you to send controls to your database points, meaning that you can change their values as required. By performing controls, you can affect the conditions on site. For example, if you have a digital point that represents a valve, you can hand control the point to open or close the valve.

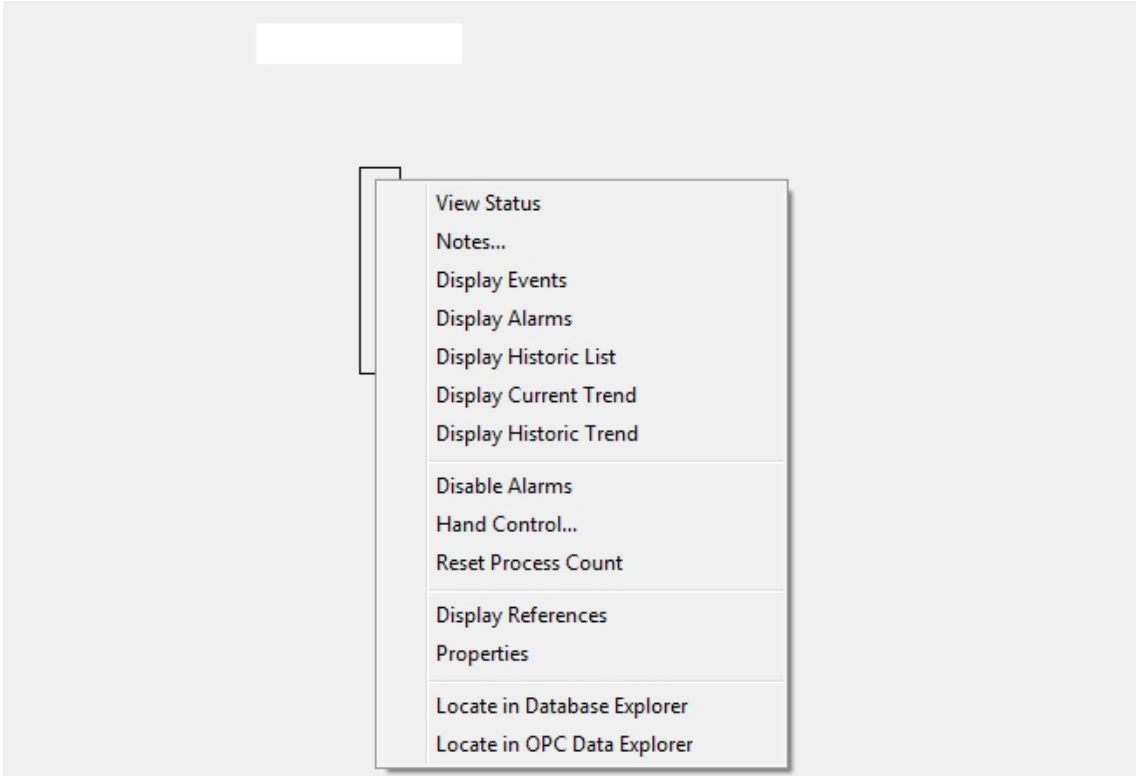
For the tutorial, you are going to perform a series of controls on the internal analog point that you have created. The controls will change the value of the point so that it drops low, then rises in increments. This simulates the dropping and rising of values that could be experienced with a 'normal' database point connected to the I/O of a water level sensor.

To perform a control on the internal analog point:

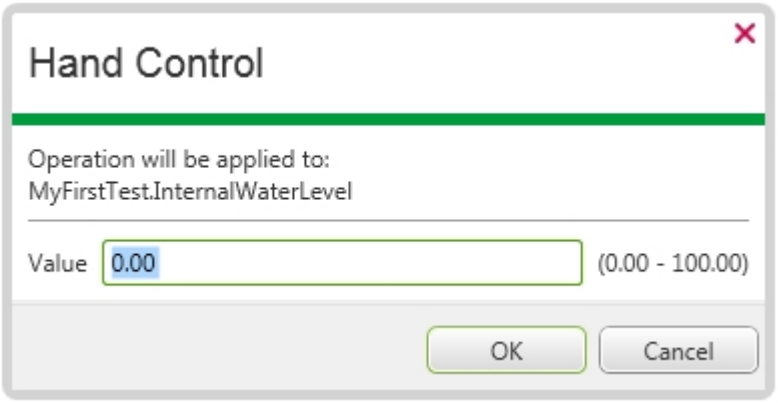
1. On the 'MyTestPlant' Mimic, move the cursor over the animated text box or the animated size bar. You will see that the cursor changes from an arrow to a pointing hand when it is over either of the objects.



2. Press the left-hand mouse button to display a context sensitive menu for the animated object. You will see that it contains many of the same options as the context sensitive menu for the internal analog point (as it is animated by the values of the internal analog point).

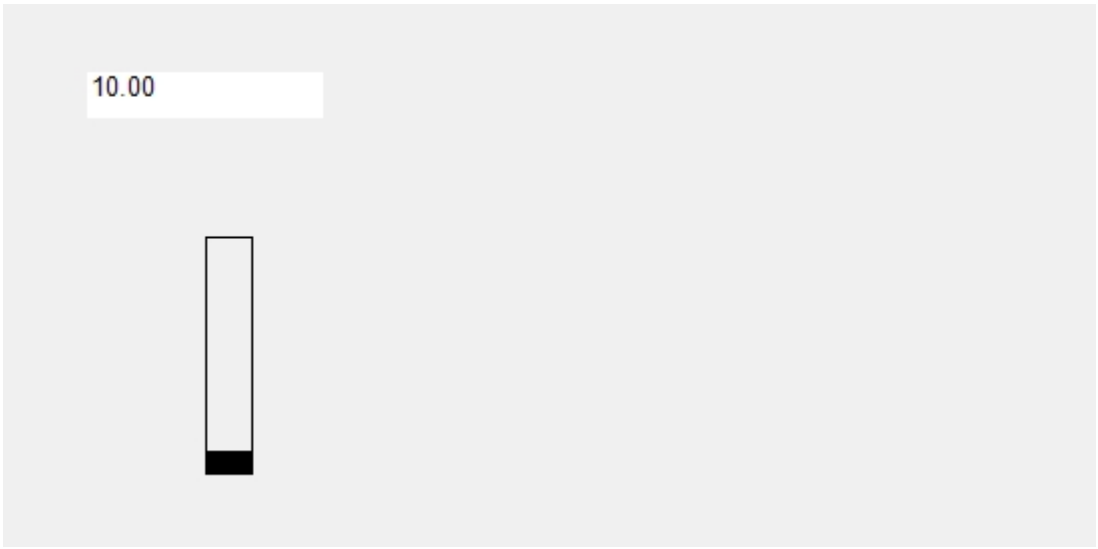


3. Select the **Hand Control** option to display the Hand Control dialog box. You can use this dialog box to perform a hand control (manually set the value of the point associated with the animated object).



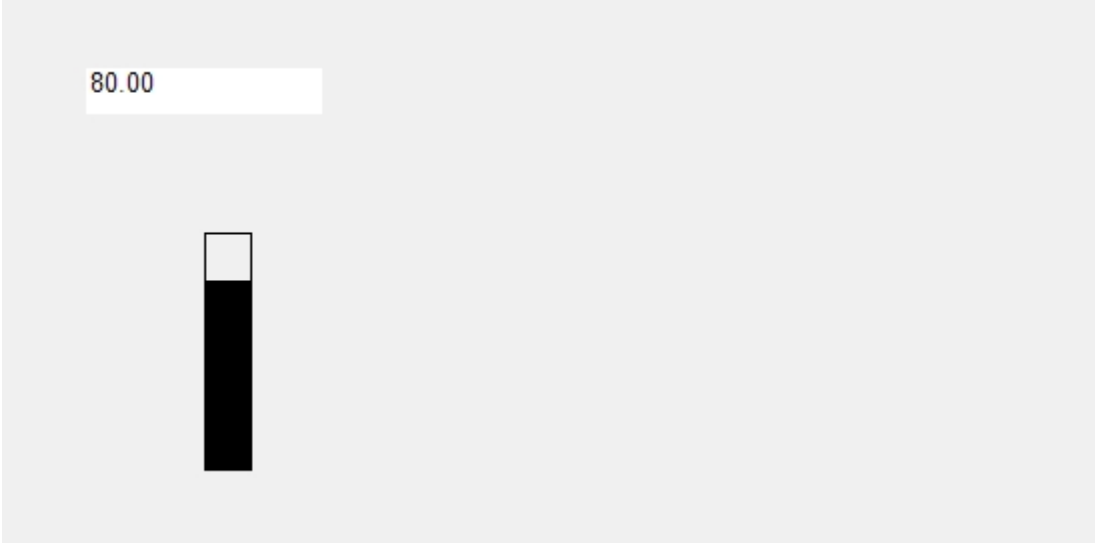
4. Set the **Value** to 10 and then select the **OK** button to confirm the hand control.

   The animated text box now displays 10.00 and the animated size bar shows a black bar that fills up 10% of the entire bar (the bar has a range of 0 to 100 by default).



5. Using the same technique you learned in steps 3 and 4, set the value of the internal point to 15, 20, then 80 in that order.

   When you have set the value to 80, the Mimic should look like this:



You've now learned how to create a very simple Mimic that contains dynamic data (data that changes according to the values in the database), and you've also learned how to manually control a point using the **Hand Control** feature. As you have controlled the point to have several different values, and the point has Historic enabled, you can view a record of the point's values on a Historic Trend or Historic List. So your next task is to Display a Historic Trend for the Internal Analog Point.

Further Information

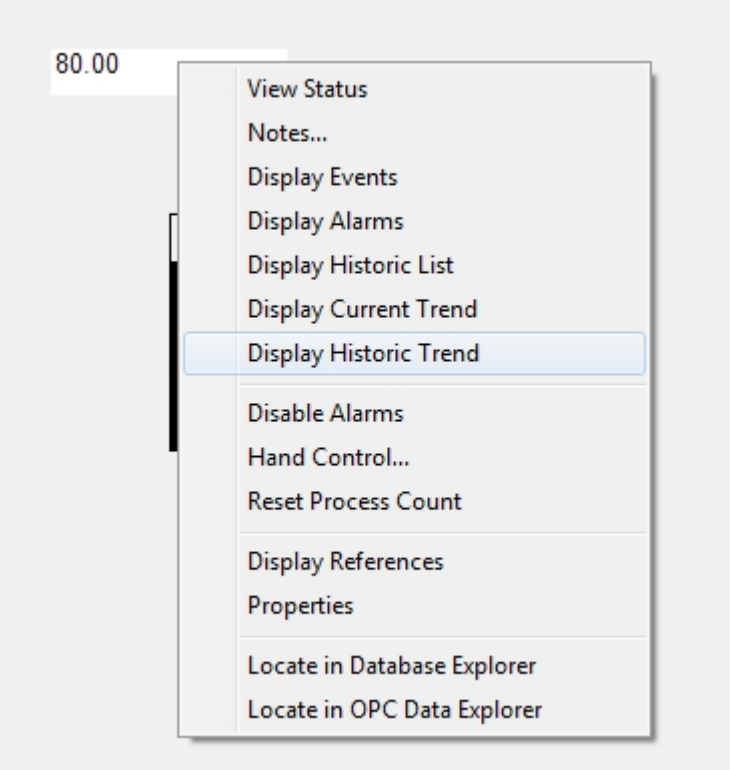
Hand Control: *see* Object Menu Options.

Display a Historic Trend for the Internal Analog Point

If a point has the Historic feature enabled, Geo SCADA Expert keeps a record of the point's values for a specific time period. You can view this 'historic' data on various displays, including Historic Trends (Graphs). One of the main benefits of viewing historic data on a Historic Trend is that you can see a graphical representation of how the point's value changed over time and it is also possible to compare the values of different points on a single Trend.

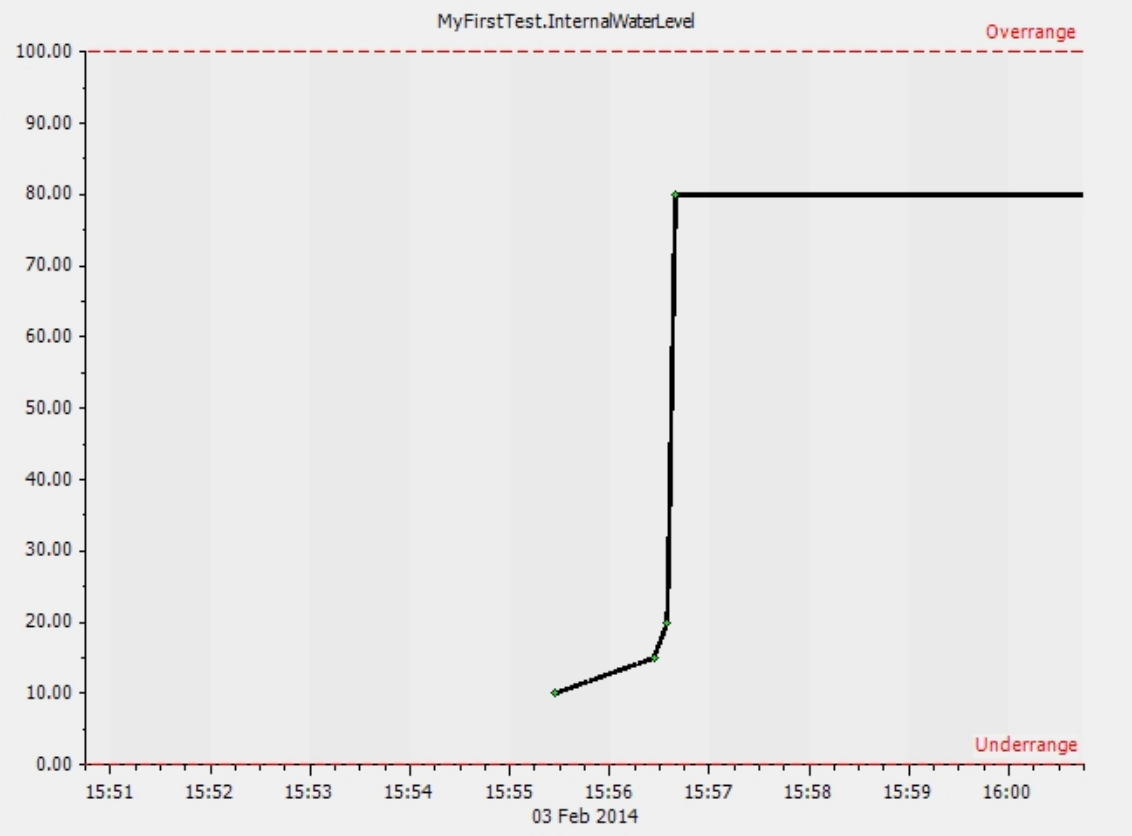
As you have enabled the Historic feature for your internal analog point, and have manually set various values, you can view its data on a Historic Trend:

1. On the 'MyTestPlant' Mimic (in Run mode), select the animated size bar or text box to access the context sensitive menu.
2. Select the **Display Historic Trend** option to display a Historic Trend showing the internal analog point's historic data (remember that the **Display Historic Trend** option is for the internal analog point as it is this point that is used to animate the size bar or text box).



You could also access the **Display Historic Trend** option for the internal analog point by accessing the point's context sensitive menu in the Database Bar.

Your Historic Trend should show that the internal analog point changed value from 10:00 to 15:00 to 20:00 and then to 80:00.



Before you proceed, close the Historic Trend tab (but leave the Mimic on display). Once you've done that, you can move on to the next section which explains how to access another type of historic display—the Historic List (*see* Display the Historic List for the Internal Analog Point).

Further Information

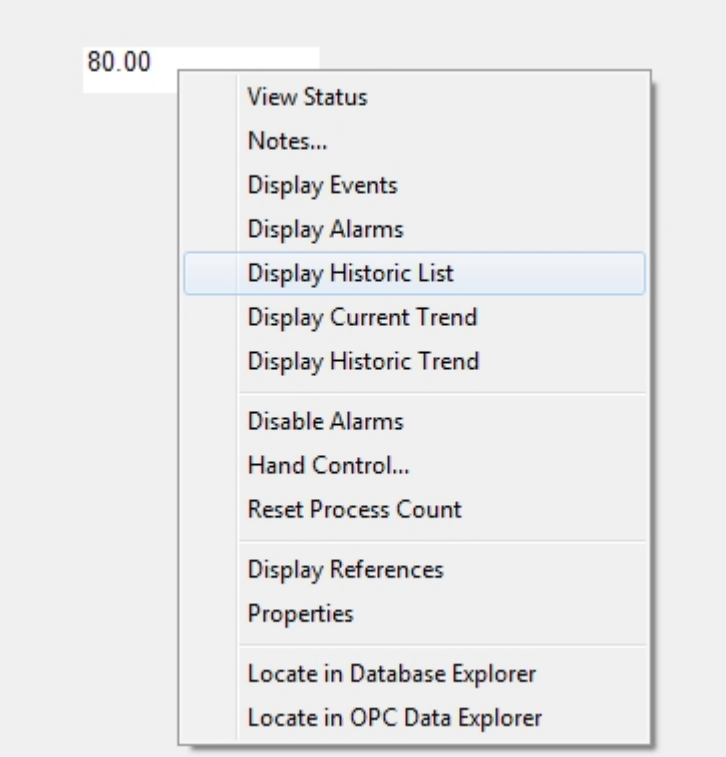
Trends and Historic Trends: *see* Configuring Trends.

Display the Historic List for the Internal Analog Point

Historic Lists allow you to view the historic values of a point in a list format, similar in style to an SQL Query list (the Historic List uses an SQL Query to obtain the data from the database). As the historic values are displayed in list format, it is easy to find specific values and information about each value.

To display the Historic List for the internal analog point:

1. On the 'MyTestPlant' Mimic (in Run mode), select the animated size bar or text box to access the context sensitive menu.



2. Select the **Display Historic List** option to display a Historic List showing the internal analog point's historic data. You could also access the **Display Historic Trend** option for the internal analog point by accessing the point's context sensitive menu in the Database Bar.

Time	Value	State	Quality	Reason	Status	Suppression Type
02/03/2014 15:56:39	80.00	High High	Good	Current Data		None
02/03/2014 15:56:34	20.00	High High	Good	Current Data		None
02/03/2014 15:56:26	15.00	High High	Good	Current Data		None
02/03/2014 15:55:26	10.00	High High	Good	Current Data		None

   The Historic List shows information about the 4 values that have been recorded for the internal analog point.

   If you right-click on a column heading or any of the historic values, you will see that a context sensitive menu is displayed. The menu contains options that allow you to change the order in which information is shown on the Historic List or even change the content of the Historic List. For example, you can Filter the Historic List so that it only shows values that were recorded during a specific time period.

3. Close the Historic List.

Next, you are going to Change the Point Configuration to Trigger an Alarm.

Further Information

Historic Lists: *see* Historic Lists.

Change the Point Configuration to Trigger an Alarm

A key factor when configuring an analog point is the setting of its alarm threshold limits. Each analog point has a range of possible values, and by defining threshold limits, you can set ViewX to raise an alarm if a point's value rises above or drops below specified limits.

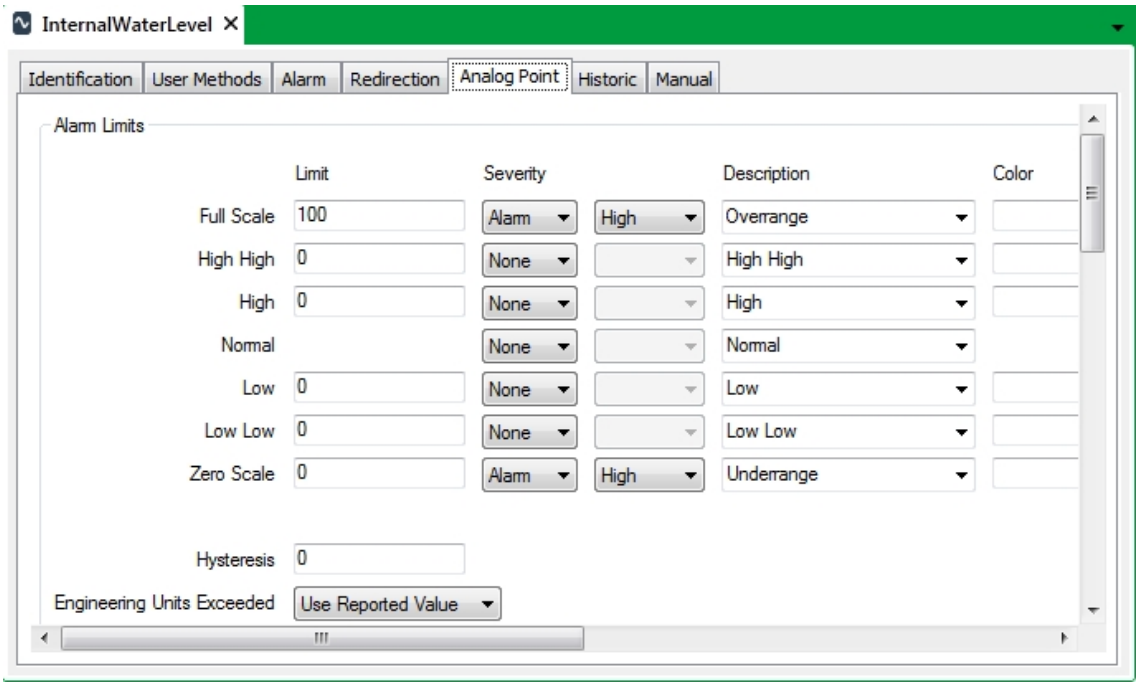
For the tutorial, you are going to define the **High High** alarm threshold for the 'InternalWaterLevel' point you have already created. When you have configured the settings for the threshold, you will perform a **Hand Control** on the point so that its value causes an alarm to be raised ('triggered').

1. Select the relevant **Properties** option for the 'InternalWaterLevel' point. To do this, either:
   - Access the **Edit Properties** option via the context-sensitive menu for the point in the Database Bar

   or:

   - Access the **Properties** option via the context-sensitive menus for the animated text box and size bar on the 'MyTestPlant' Mimic.

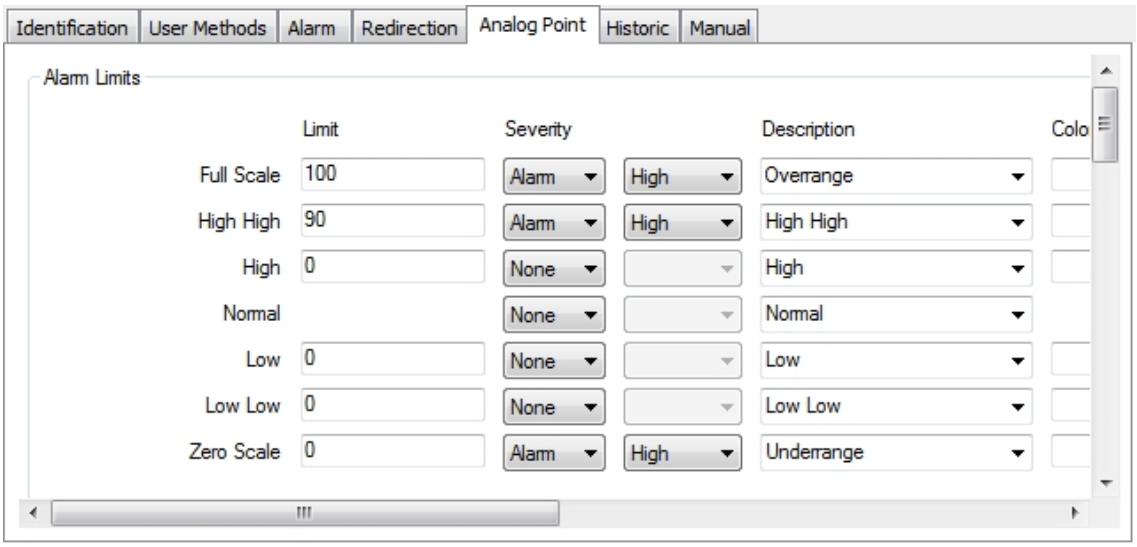
   *The configuration Form for the 'InternalWaterLevel' point is displayed, with the **Analog Point** tab selected by default.*



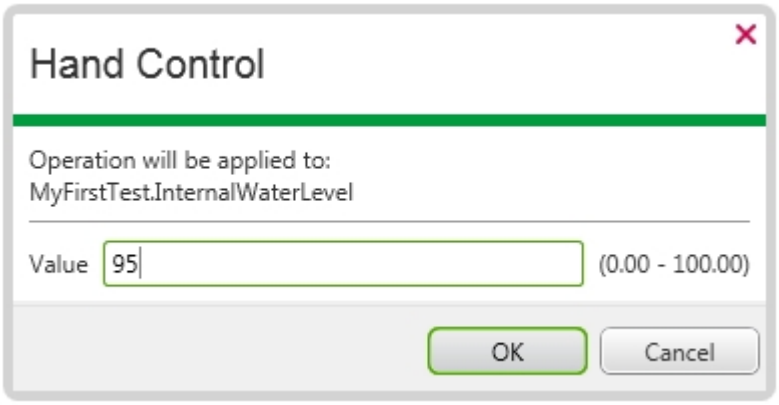
In the **Alarm Limits** section, you will see a **Limit** column of fields, with a field for each limit (**Full Scale**, **High High**, **High**, **Low**, **Low Low**, and **Zero Scale**). You will use these fields to define the thresholds. To the right of each field are **Severity**, **Description**, and **color** settings for each limit. You can use these settings to define what happens when the point's value is within the threshold for the limit, how significant values in the threshold limit are, and to provide a description of the limit and associate it with a color.

2. For the **High High** threshold, define these settings:
   - **Level:** 90
   - **Severity**: **Alarm**, **High** (choose **High** in the combo box to the immediate right of the **Severity** combo box).

   Leave the default **Description** of High High in place and leave the **Color** field empty (this is an optional setting).

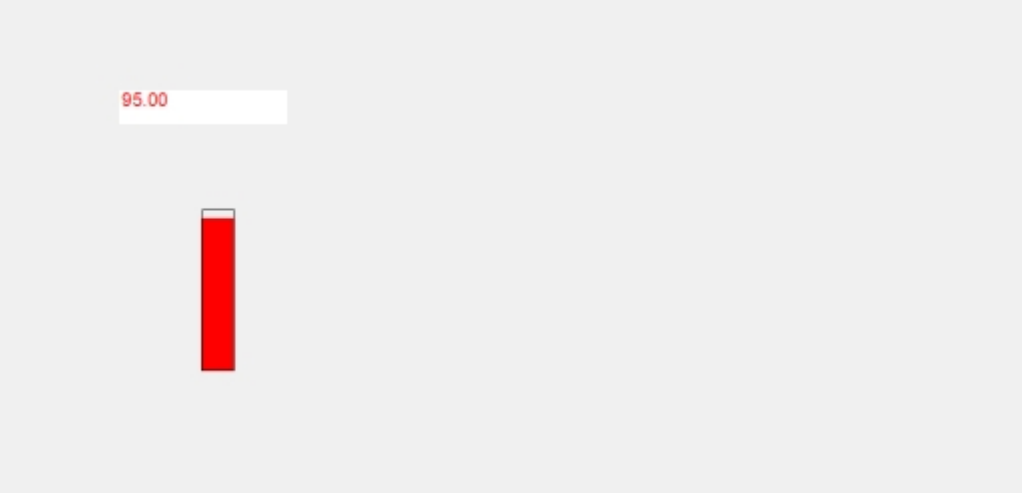


3. Save the Form, then close it.
4. Perform a **Hand Control** on the 'InternalWaterLevel' point to set its value to 95.



When you set the point value to 95, an alarm is raised as 95 is within the **High High** threshold limit (which covers the range 90 to 100) for the point. The **High High** threshold is set to raise a **High** priority alarm when the value is in this range (the **Severity** is **Alarm**, **High**).

To view the alarm on a Mimic, remember that you have to view that Mimic in Run mode rather than Design mode (*see* Put the Mimic into Run Mode).



Now that you have triggered an alarm, you can learn how to use the various alarm displays (*see* View an Alarm).

Further Information

Alarm Limit Thresholds: *see* Configure the Limits for an Analog Point.

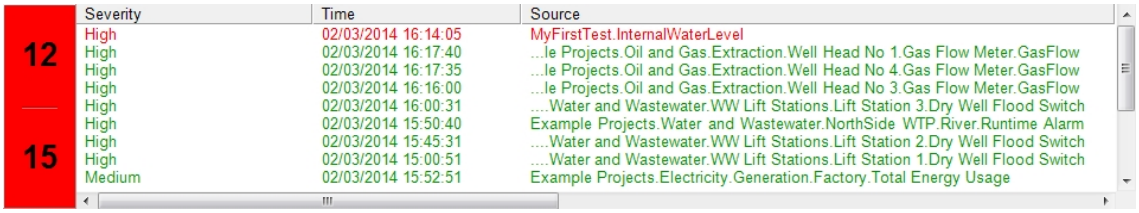
View an Alarm

Several different displays indicate that the 'InternalWaterLevel' point has an alarm. These displays use the color red to draw your attention to the alarm, and they include:

- The Alarm Banner
- The 'MyTestPlant' Mimic (as it contains objects that are animated by the 'InternalWaterLevel' point's values)
- The Alarms List

The alarm is also indicated on any Query lists and status displays that provide information about the 'InternalWaterLevel' point. For this tutorial, we will focus on the Alarm Banner, Alarms List, and the 'MyTestPlant' Mimic.

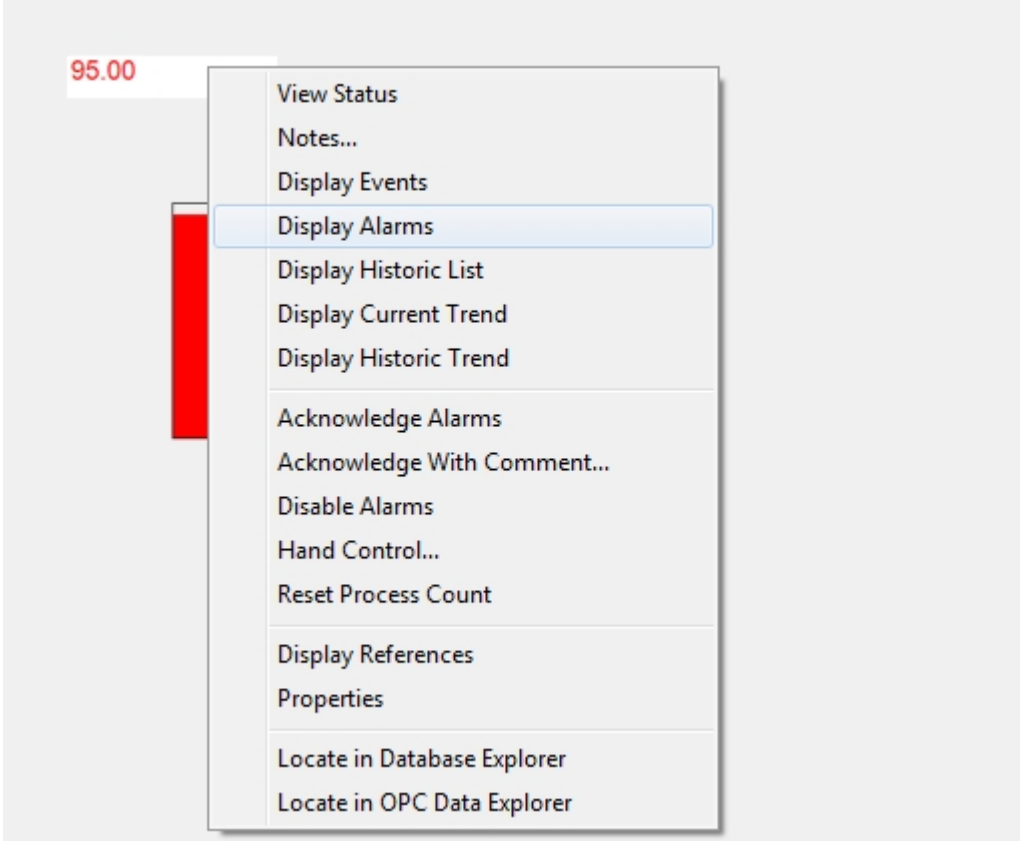
1. Examine the entries shown in the Alarm Banner at the bottom of the ViewX display (if the Alarm Banner is not already on display, select **View>Alarm** Banner from the Main Menu).



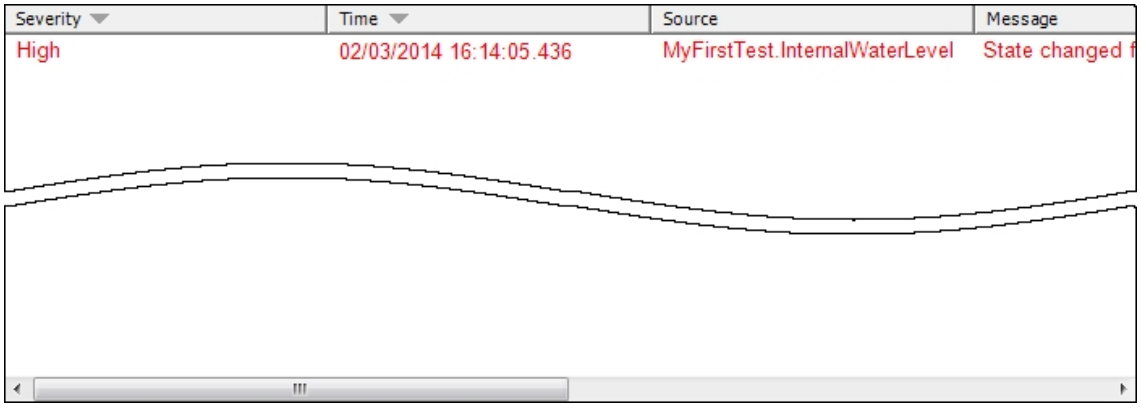
   You will see that the alarm you have triggered for the 'InternalWaterLevel' point is included in the list of alarms. It is placed at the top of the list and is shown in flashing red text. This is because the alarm you have triggered has the highest priority, as it is:

   - Unacknowledged (no user has notified ViewX that they are aware of the alarm)
   - Uncleared (the conditions that caused the alarm to be raised are still in effect)
   - More recent than any other Unacknowledged Uncleared alarms.

2. Examine the animated objects on the 'MyTestPlant' Mimic. You will see that they have changed to indicate that the point is in alarm. The formatted value in the animated text box changes color to red and flashes so that it attracts your attention. The bar in the animated size box increases in size to indicate that the value is close to the maximum value of the point (Full Scale) and also changes color to indicate an alarm.
3. With the Mimic in Run mode, select the size bar or text box to display the context-sensitive menu for the point.



4. Select the **Display Alarms** option.
   The Alarms List is displayed.



   As there is only 1 alarm for the 'InternalWaterLevel' point, the Alarms List only contains a single alarm.

   This Alarms List is filtered so that it only shows alarms for the 'InternalWaterLevel' point. If you wanted to see an unfiltered list of the alarms on the system, you could display the Alarms List for the System by selecting the Alarms command from the **Home** tab in the ViewX Ribbon or by pressing the **F9** key.

Now that you have seen the alarm on various displays, it is time to 'action' the alarm (respond to it)—*see* Action an Alarm.

Further Information

Alarm Information: *see* Alarm Severity, Status, and Category.

Alarms List: *see* Alarms Lists.
Alarm Animations: *see* Alarms on Mimics.
Alarm Banner: *see* Alarm Banner.

Action an Alarm

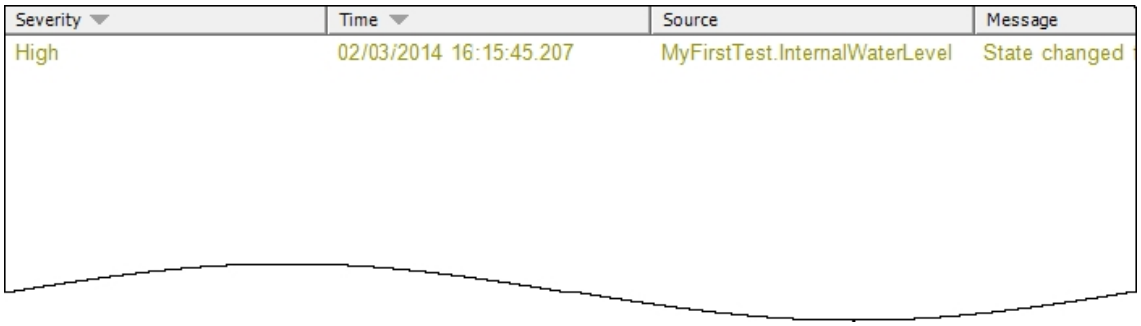
When an alarm is raised, the various alarm displays show the alarm. Typically, alarms are set to flash so that the alarm information catches the attention of a system user, who can then respond to the alarm appropriately.

There are a variety of alarm responses available, but for this part of the tutorial you are only going to use the **Acknowledge** action. This action informs ViewX and other system users that you have seen the alarm and are investigating the conditions that caused it to be raised. For information on the other alarm response options, *see* Perform an Action on an Alarm.

To acknowledge the 'InternalWaterLevel' point's alarm:

1. On the Alarms List for the 'InternalWaterLevel' point, right-click on the **High** severity alarm.
   This displays a context sensitive menu. The top section of this menu contains some display options as well as the alarm response options.
2. Select the **Acknowledge** option. This changes the state of the alarm from Unacknowledged Uncleared to Acknowledged Uncleared, which means you have informed the system and other users that the alarm has been noticed, but the conditions that caused the alarm are still in place.

   The change of alarm state causes the alarm to change color from red to olive-green.



3. Perform a **Hand Control** on the 'InternalWaterLevel' point to set its value to 50. As the value of the point is no longer in the High High range, the alarm is cleared (it has been acknowledged and the conditions that caused the alarm to be raised are no longer in place).

Now that you have familiarized yourself with the basics of configuration and responding to alarms, you can choose to Test Your Knowledge on Configuration Basics, or you can proceed to the next section of the tutorial: Your First 'Live' Configuration.

Test Your Knowledge on Configuration Basics

So you've created a Group, configured an internal analog point, added some automatic animations to a Mimic, and responded to an alarm. Well done. But how much can remember about performing these basic configuration tasks and alarm responses?

1. How do you rename a database item?
2. When you create a new Group item, the Group contains 1 item by default. What type of item is it?
3. What does a database point represent?
4. What is the difference between an internal point and a 'normal' point?
5. How do you display a configuration Form?
6. How do you save the changes you make on a configuration Form?
7. What is a Mimic?
8. What is the difference between a Trend and a Historic Trend?
9. How do you display the Historic List for a point?
10. What configuration setting determines whether a point has historic data?
11. Apart from the Alarm Banner, where else might you see alarm information?

Your First 'Live' Configuration

Your Geo SCADA Expert system can connect to, and interact with, a wide variety of outstations, PLCs, controllers and similar devices. These devices contain 'live' data that is reported to, or retrieved by Geo SCADA Expert and stored in corresponding items in the database. Similarly, Geo SCADA Expert can send controls to the device.

You are now going to configure Geo SCADA Expert to communicate with a hardware device—a SCADAPack Modbus controller that has:

- Its serial port set to Modbus address 1
- Telepace firmware loaded
- Been connected to a plant simulation equipment
- A standard Register Assignment
- Been connected to a COM port on your PC.

While we recommend that you use a SCADAPack Modbus controller (available from your Geo SCADA Expert agent), you can complete this section without any hardware. However, if you don't have a SCADAPack Modbus controller, you won't have live I/O to work with, so to achieve different values and states, you will need to perform Hand Controls on your points.

NOTE: You need to have the Advanced Modbus driver installed on your system (see Installing ClearCADA).

As you set up your first 'live' configuration, you will learn how to configure the main elements required to operate your system.

At the end of this section, you can see how much you have learned by accepting our challenge to Test Your Knowledge on 'Live' Configuration.

Log On to ViewX

To configure the database items required for Geo SCADA Expert to communicate with a SCADAPack Modbus controller, you need to log on to ViewX via a user account with Configure permissions. The preconfigured 'EngExample' user account has sufficient permissions to perform the tasks in this section, so if you are not already logged on as 'EngExample', you need to do so (*see* Log on to your System).

Once you are logged on as the 'EngExample' user, you can proceed to Create a 'Serial Comms' Group and a 'Site' Group.

Further Information

Logging On and Off: *see* System Security.

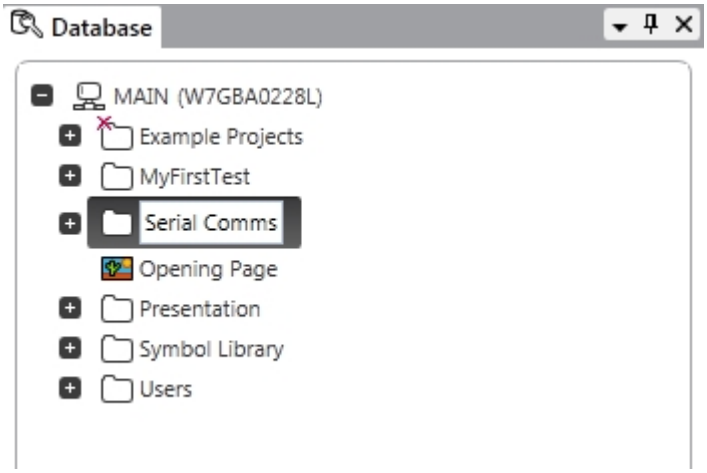
Create a 'Serial Comms' Group and a 'Site' Group

Before you create the items that represent your SCADAPack Modbus device and connection, you are going to create two new Groups: 'Serial Comms' and 'Site'. You will then use these Groups to contain the Advanced Modbus and SCADAPack Modbus items, so that your database is well organized and clear to understand.

To create the two Groups:

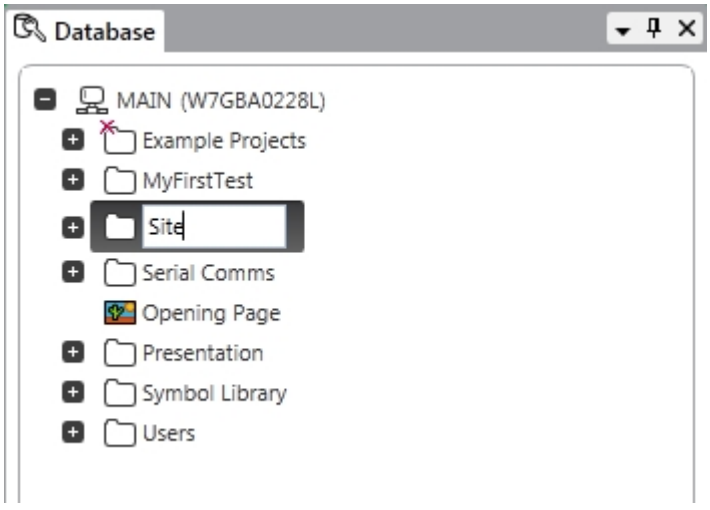
1. Display the Database Bar (see Display an Explorer Bar).
2. Right-click on the System icon in the Database Bar, then select **Create New>Group** from the context sensitive menu. This will add a new Group to the System.
3. Name the Group:

   ```
   Serial Comms
   ```



4. Create another Group.
5. Name the second Group:

   ```
   Site
   ```



When you have added the two Groups, you can proceed to Create an Advanced Modbus Direct Channel.

Further Information

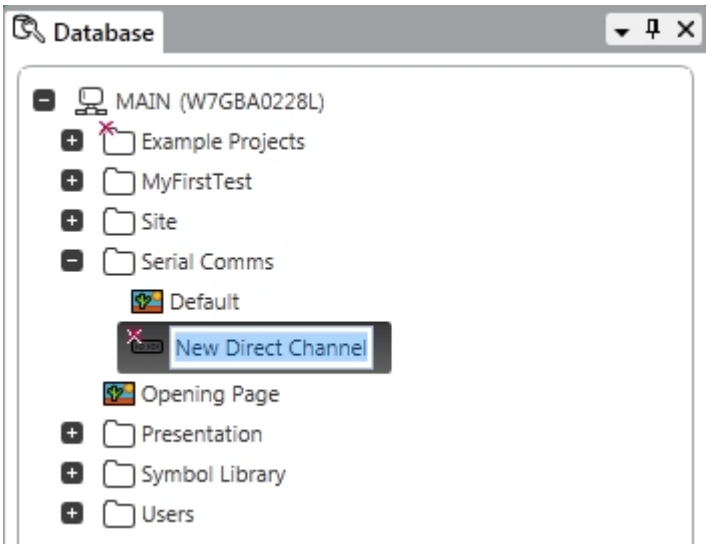
Organizing Your Database with Groups: *see* Groups.

Create an Advanced Modbus Direct Channel

To communicate with an advanced device such as a SCADAPack Modbus controller, ViewX needs to be able to identify the communication settings such as the port, parity, and the protocol to be used. These settings are defined in a channel. Each advanced driver has its own channels, so for your SCADAPack Modbus controller, you need to configure an Advanced Modbus Direct Channel.

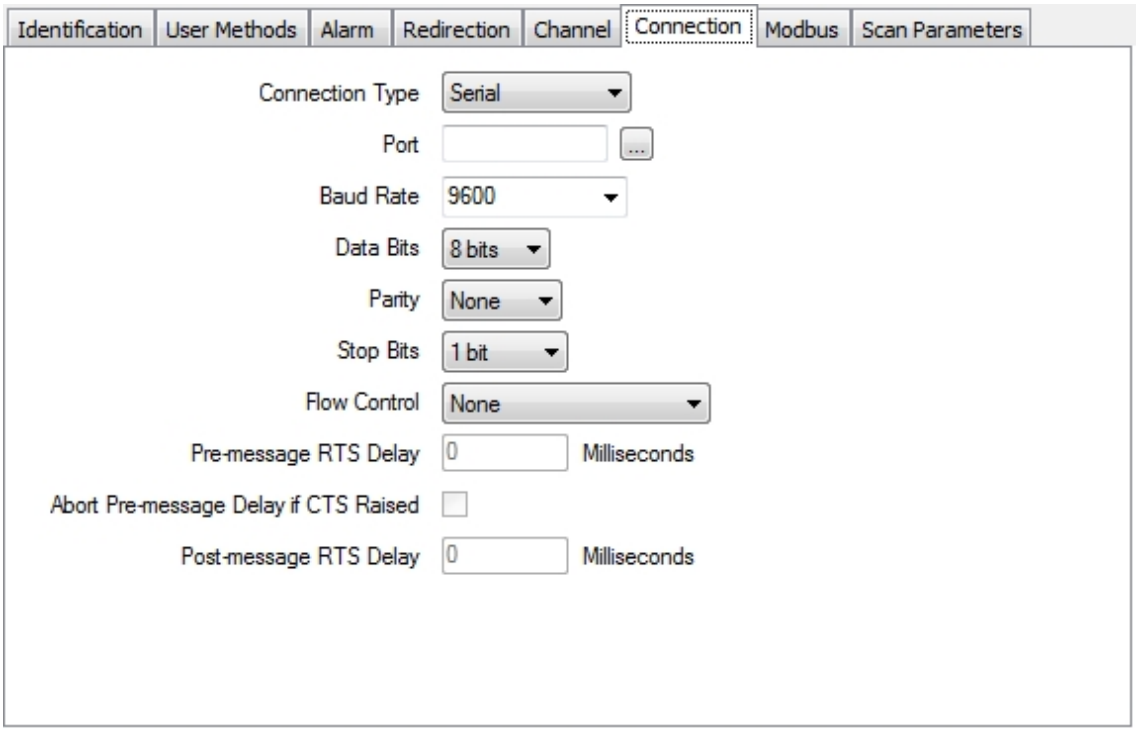
To configure an Advanced Modbus Direct Channel:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, right-click on the 'Serial Comms' Group to display its context sensitive menu, then select **Create New>Modbus - Advanced>Direct Channel** to create a new Modbus Channel database item.



3. Press the **Enter** key to use the default name for the channel: 'New Direct Channel'.
4. Double-click on 'New Direct Channel' to display its configuration Form.

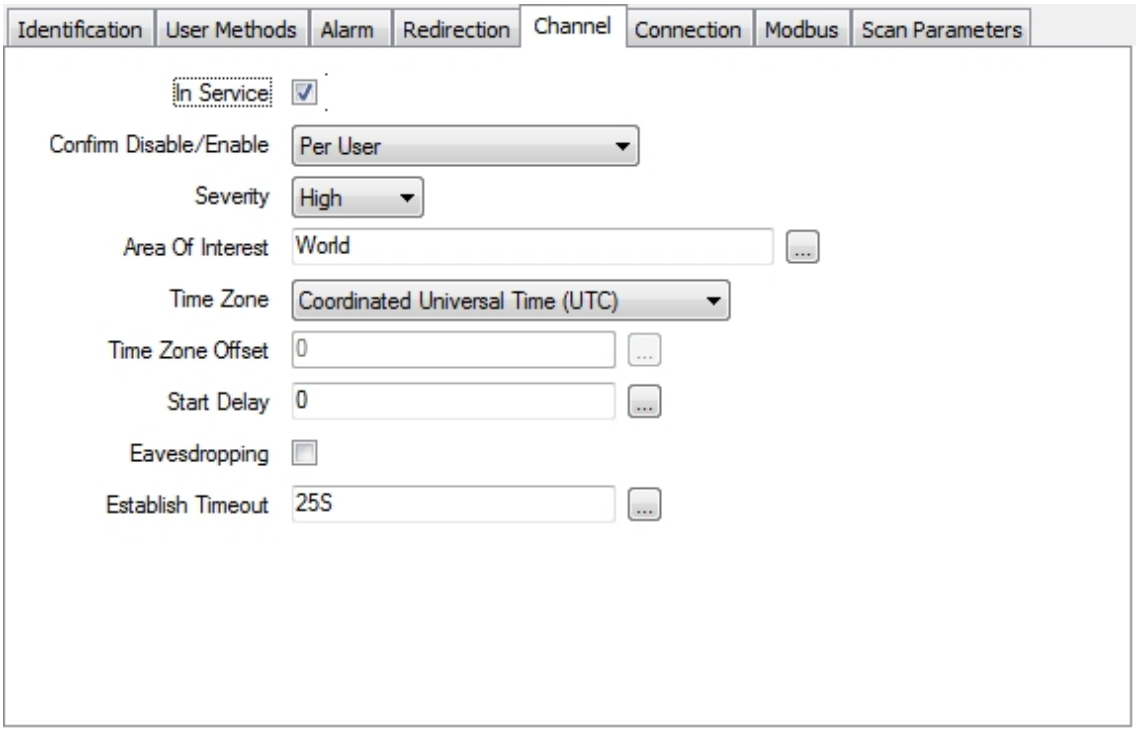
5. Select the **Connection** tab.



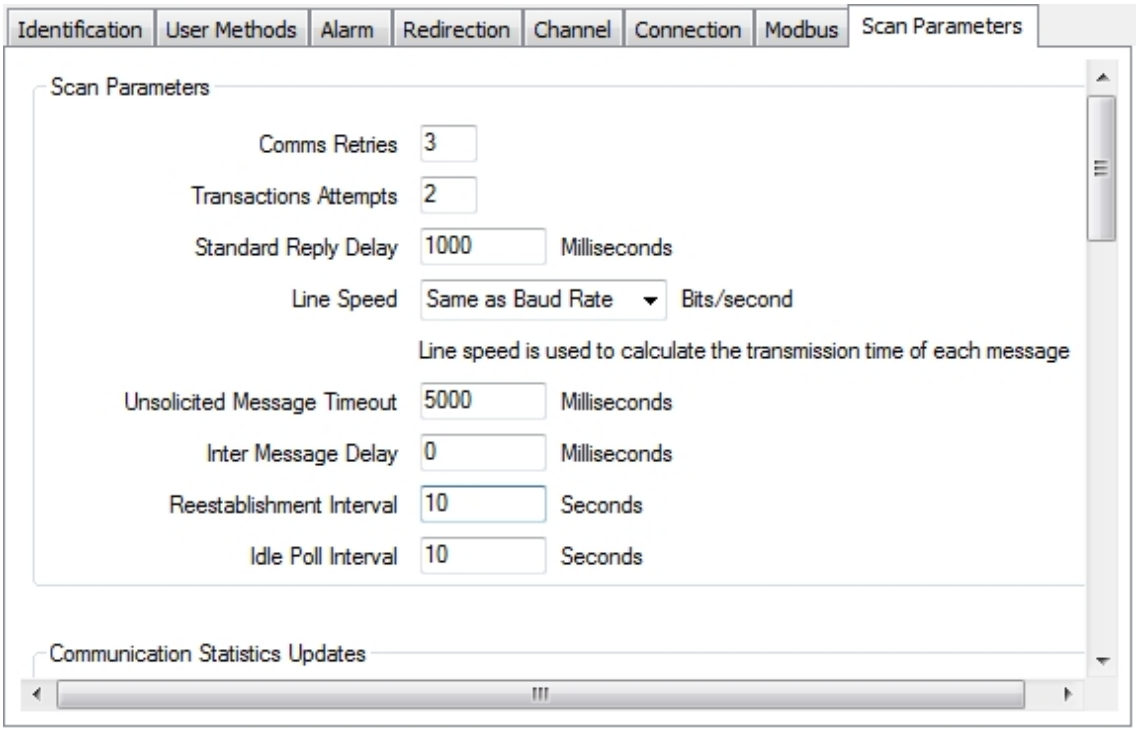
6. On the **Connection** tab, configure the following setting:
   - **Port—**Use the browse button to choose the port to which your SCADAPack Modbus device is connected (COM1, COM2, and so on.)
7. Still on the **Connection** tab, configure the remaining settings as follows:
   - **Baud Rate—**9600
   - **Data Bits—**8 Bits
   - **Parity—**None
   - **Stop Bits—**1 Bit
   - **Flow Control—**Choose the setting that applies to your connection:
     - **None** if a 3 wire cable is being used
     - **Hardware (RTS/CTS)** if a standard null modem cable is being used.

   These settings should match those of your SCADAPack Modbus device.

8. Select the **Channel** tab.



9. On the **Channel** tab, select the **In Service** check box to activate the Direct Channel.
10. Select the **Scan Parameters** tab.



11. On the **Scan Parameters** tab, set the **Re-establishment Interval** to 10 seconds. If the server's attempts to establish communications with an outstation are unsuccessful, or if communications are interrupted, the server will attempt to re-establish communications via the channel every 10 seconds.
12. Save the configuration.

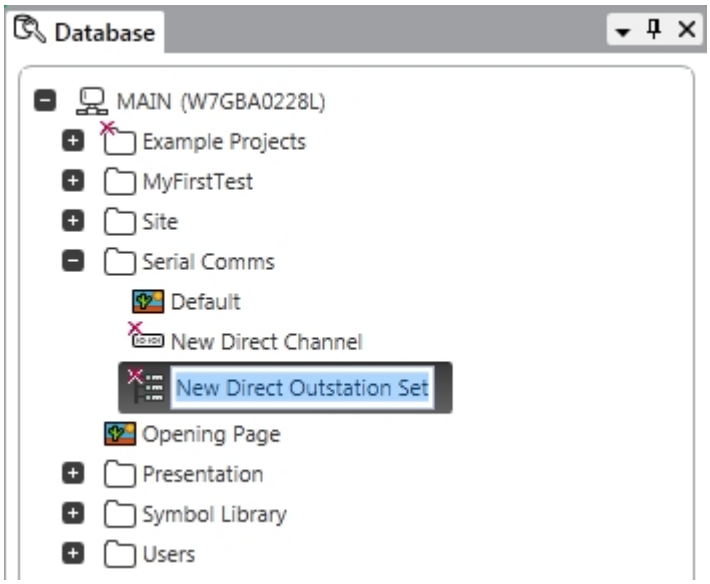
With the Direct Channel configured, next you need to Configure an Advanced Modbus Direct Outstation Set.

Configure an Advanced Modbus Direct Outstation Set

ViewX uses Outstation Sets to represent a Group of outstations that share communication channels. As with channels, each Driver has its own Outstation Sets, with different types of Outstation Set for each type of channel. For example, the Advanced Modbus Driver has outstation sets for direct, shared, switched, and PSTN channel types.

As your SCADAPack Modbus controller is connected via a single direct channel, you need to configure an Advanced Modbus Direct Outstation Set:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, right click on the 'Serial Comms' Group and select **Create New>Modbus - Advanced>Direct Outstation Set** from the context sensitive menu. This adds a new Advanced Modbus Direct Outstation Set item to the 'Serial Comms' Group.

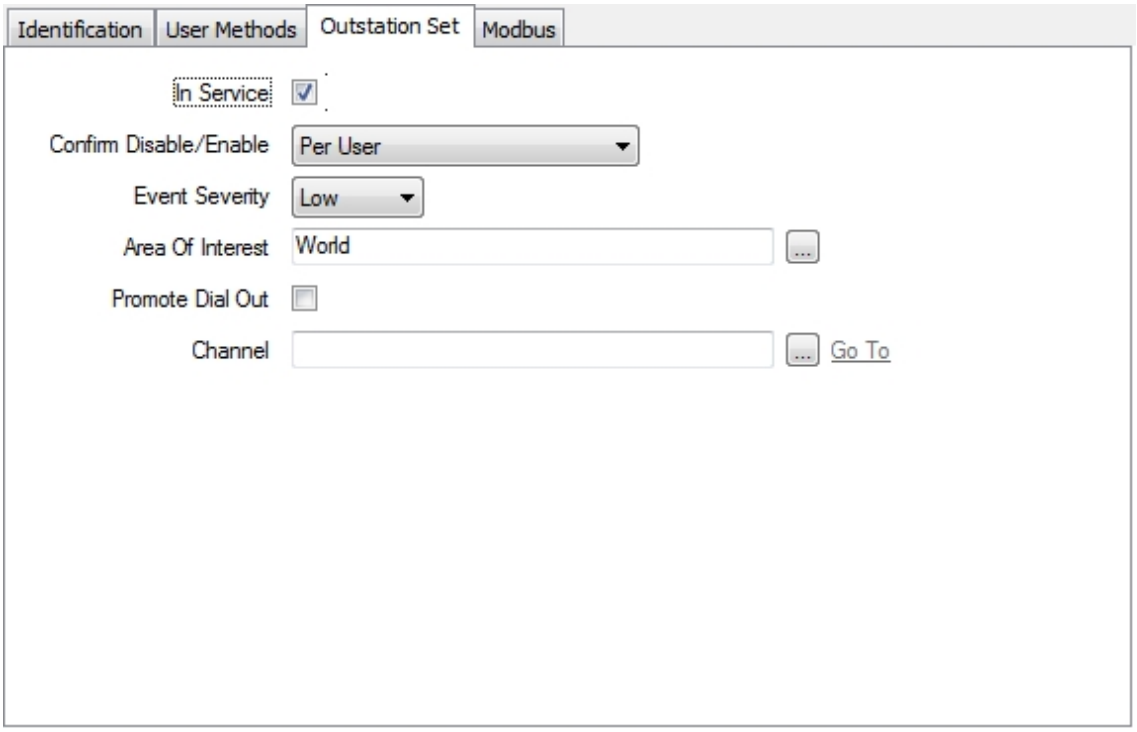


3. Press the **Enter** key to use the default name for the Direct Outstation Set:

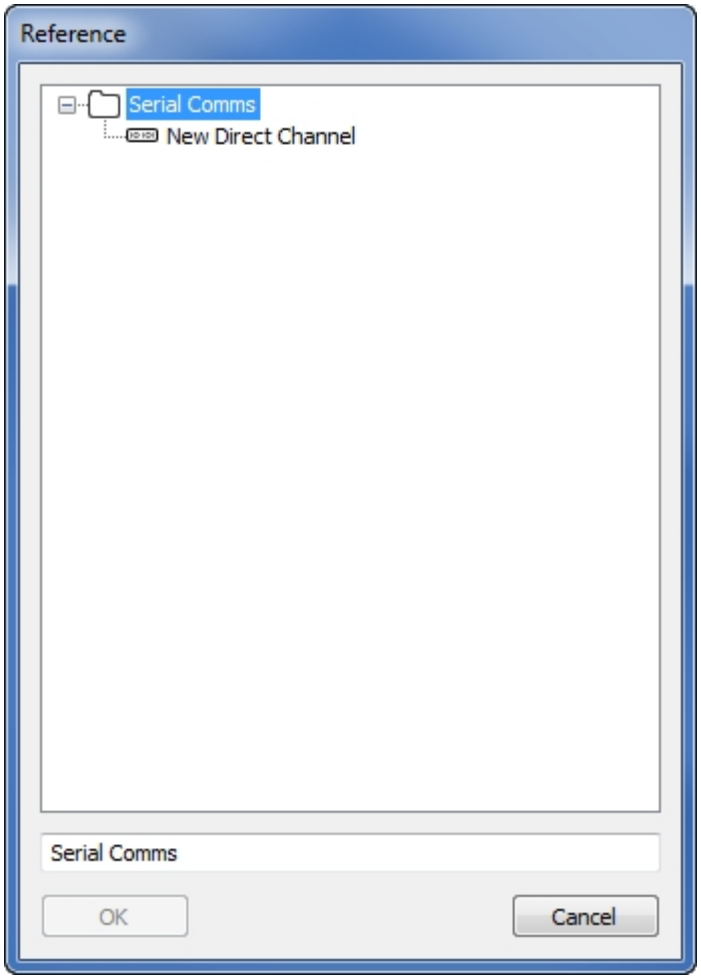
   `New Direct Outstation Set`

4. Double-click on the Direct Outstation Set to display its configuration Form.

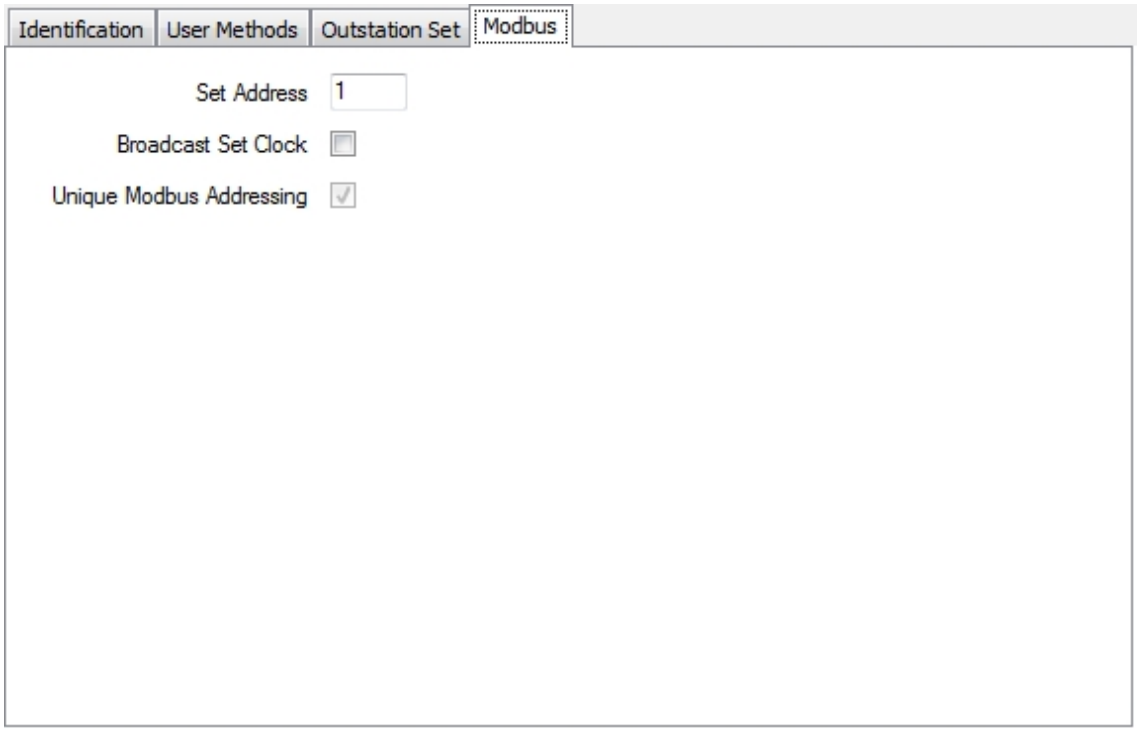
5. Select the **Outstation Set** tab.



6. Select the **In Service** check box to activate the Outstation Set.
7. In the **Channel** field, use the browse button to locate the 'New Direct Channel' item that you created in step 1.



8. Select the 'New Direct Channel' then select the **OK** button. This associates the Direct Outstation Set with the Direct Channel.
9. Select the **Modbus** tab.



10. Configure the **Set Address** so that it is 1.

    NOTE: This address is used internally by Geo SCADA Expert to identify the outstation set with which incoming communications are associated. It does not correspond to any settings in the SCADAPack Modbus controller or to the Outstation Address.

11. Save the configuration changes you have made and close the 'New Direct Outstation Set' configuration Form.

You can now proceed to Configure a SCADAPack Modbus Direct Outstation.

Configure a SCADAPack Modbus Direct Outstation

So far, you have configured:

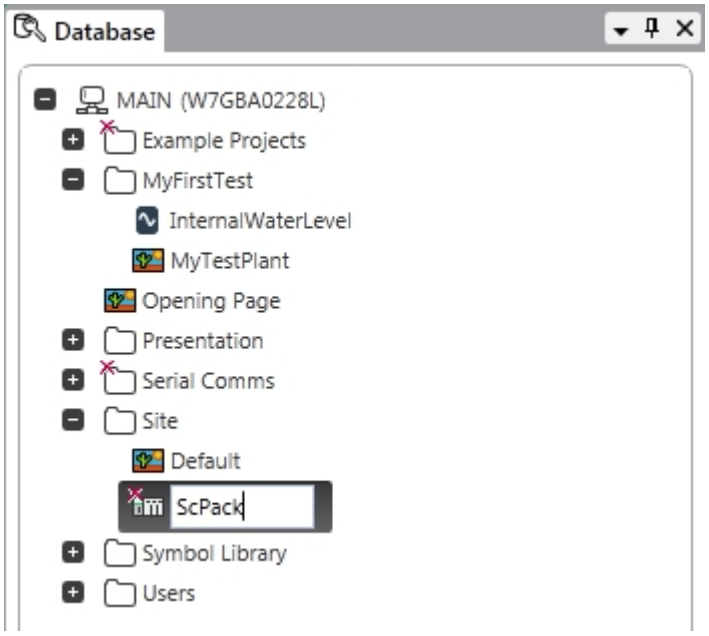
- A Direct Channel to represent the connection between Geo SCADA Expert and your SCADAPack Modbus controller
- A Direct Outstation Set so that Geo SCADA Expert can recognize several devices using the same channel (this is required even if the channel is only used by one device)

Next, you need to configure an item that represents the device that uses the channel, in this case, a direct SCADAPack Modbus controller (which is represented by a SCADAPack Modbus Direct Outstation in ViewX).

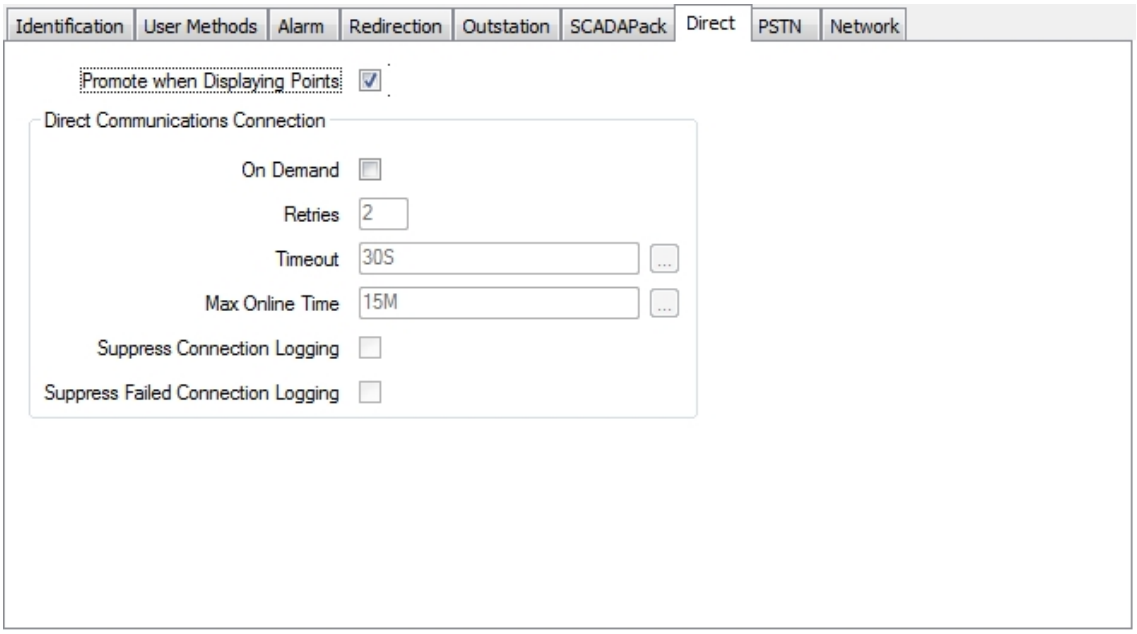
To configure a SCADAPack Modbus Direct Outstation:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, right click on the 'Site' Group and select **Create New>Advanced Modbus>SCADAPack Modbus>SCADAPack Direct Outstation** from the context sensitive menu. This adds a new direct outstation item to the 'Site' Group.
3. Name the direct outstation:

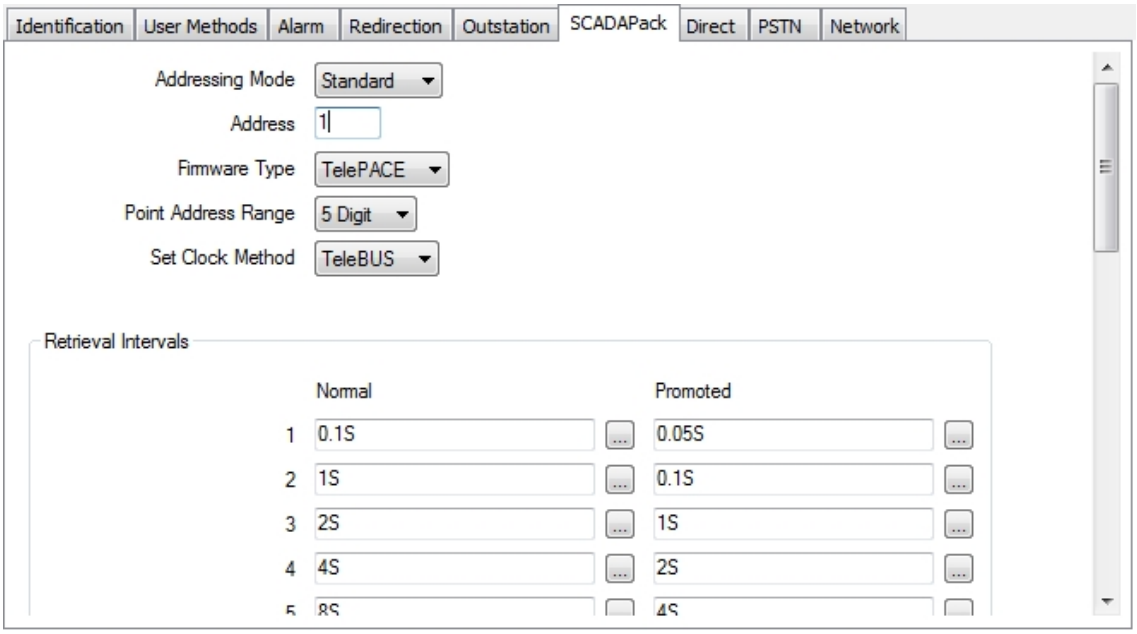
   ```
   ScPack
   ```



4. Display the configuration Form for the 'ScPack' direct outstation.
5. Select the **Direct** tab.
6. Select the **Promote when Displaying Points** check box to activate the promotion feature. Geo SCADA Expert promotes the direct outstation so that when you display the values of any of its points in ViewX, the outstation is scanned more frequently.

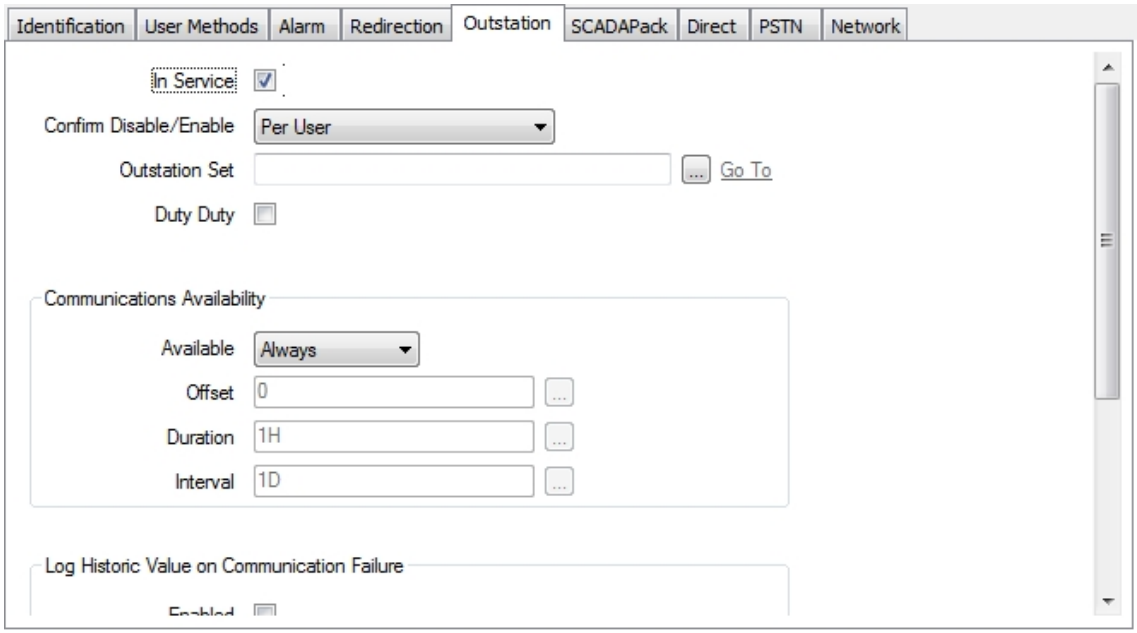


7. Select the **SCADAPack** tab.
8. Set the **Address** to 1. This *is* the address of the SCADAPack Modbus controller.

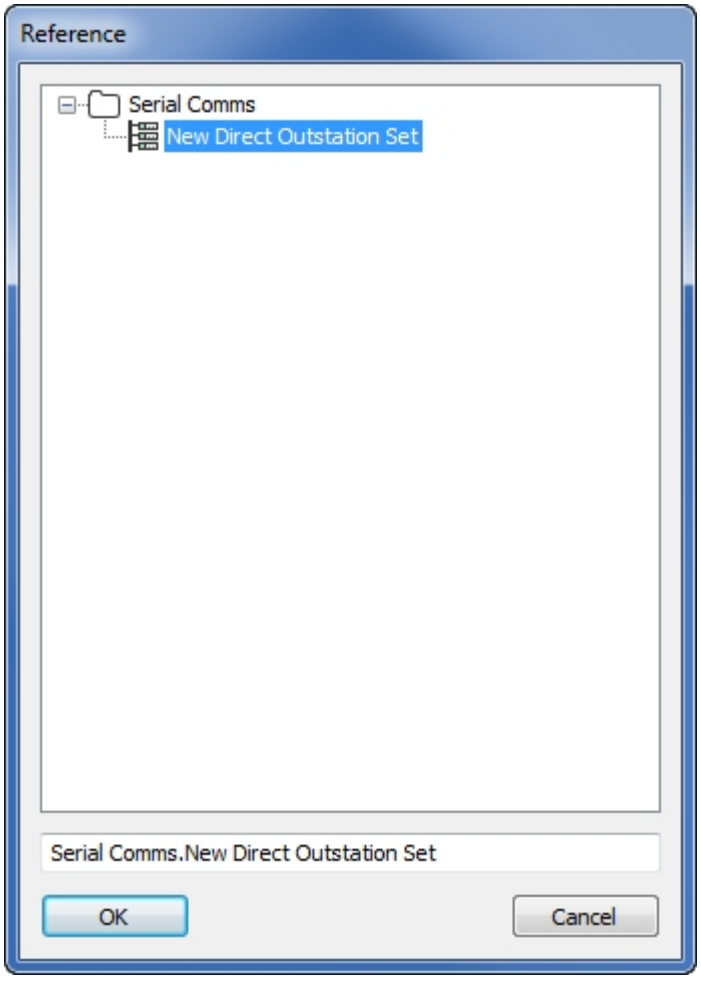


9. Select the **Outstation** tab.

10. Select the **In Service** check box to enable the direct outstation.



11. Use the browse button feature of the **Outstation Set** field to locate the 'New Direct Outstation Set' item.



12. Select the outstation set, then select the **OK** button to confirm your choice and close the browse window. This associates the direct outstation with the direct outstation set (and therefore, with the

direct channel too, as you have already configured the outstation set to be associated with the direct channel).

13. Save the configuration and close the 'ScPack' configuration Form.

You have now configured items to represent the channel and outstation, as well as a set to Group the channel with the outstation. Now you need to configure the database points to represent the inputs and outputs on your SCADAPack Modbus controller.

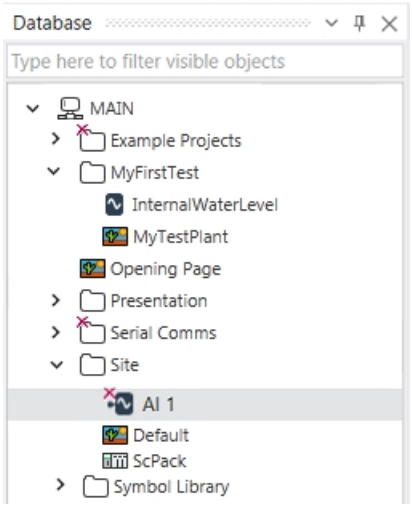
Proceed to Configure Two SCADAPack Modbus Analog Input Points.

Configure Two SCADAPack Modbus Analog Input Points

Each analog input on your SCADAPack Modbus controller can be represented in your system by a SCADAPack Modbus analog point. The configuration of the point defines its alarm limit thresholds, formatting, historic settings, and so on.

Now you are going to create two analog input points which will represent two of the analog inputs on your SCADAPack Modbus controller:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, right click on the 'Site' Group to display its context sensitive menu, and then select **Create New>Modbus - Advanced>SCADAPack> Analog Input Point**.
   A new analog input point is created.

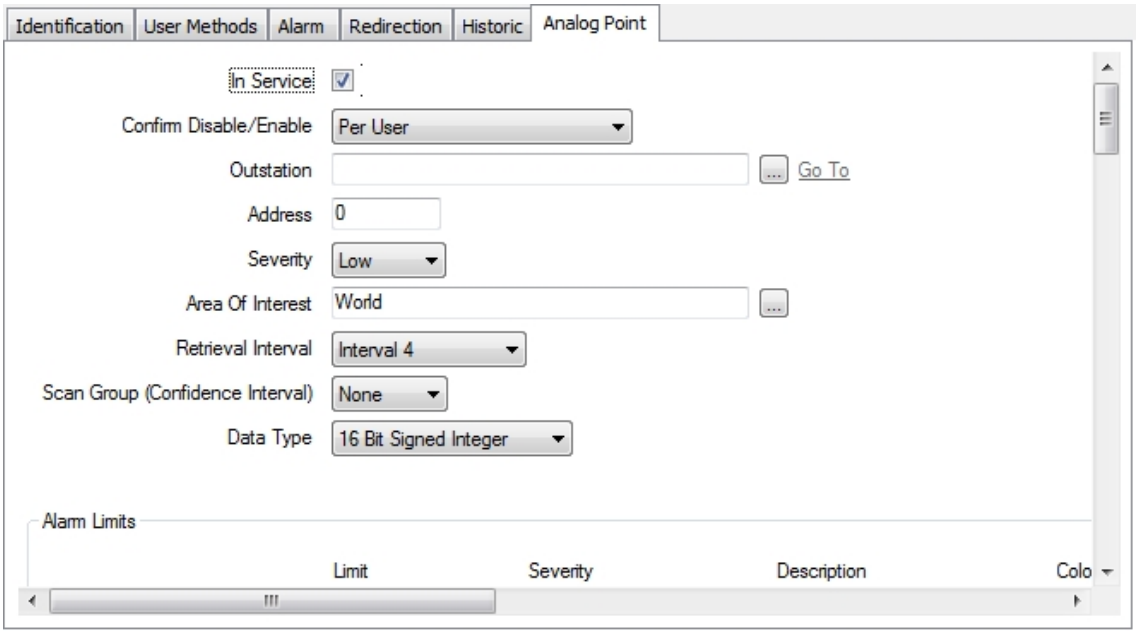


3. Name the analog input point:

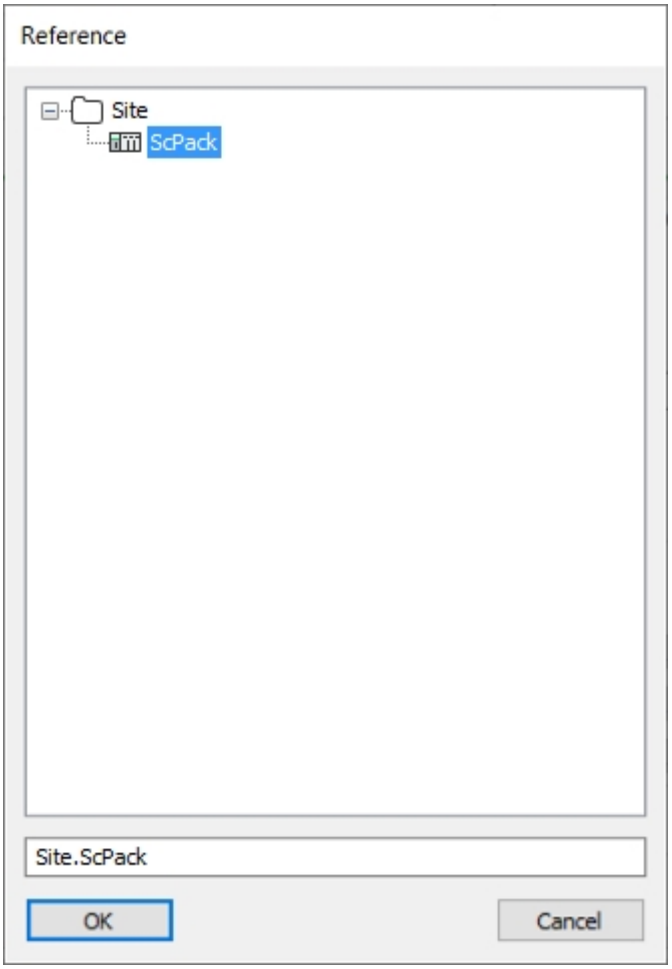
   ```
   AI 1
   ```

4. Display the configuration Form for the 'AI 1' point.
5. Select the **Analog Point** tab.

6. Select the **In Service** check box to enable the point.

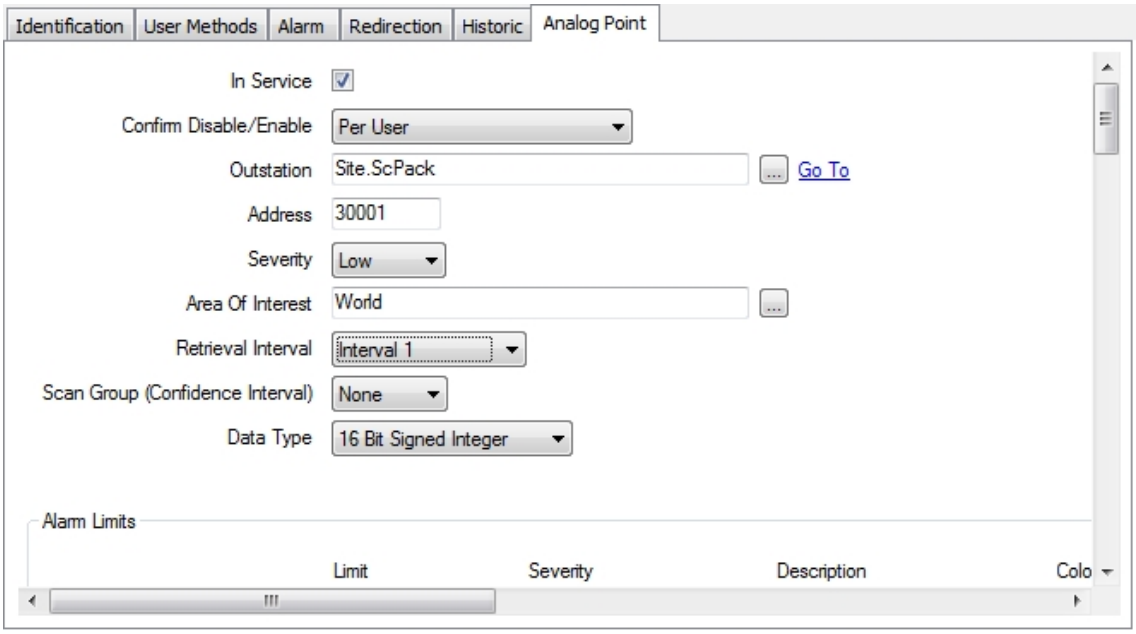


7. Use the browse button feature of the **Outstation** field to associate the point with the 'ScPack' Outstation that you have already created.



8. Set the **Address** to 30001 (this is the first analog input on your controller).

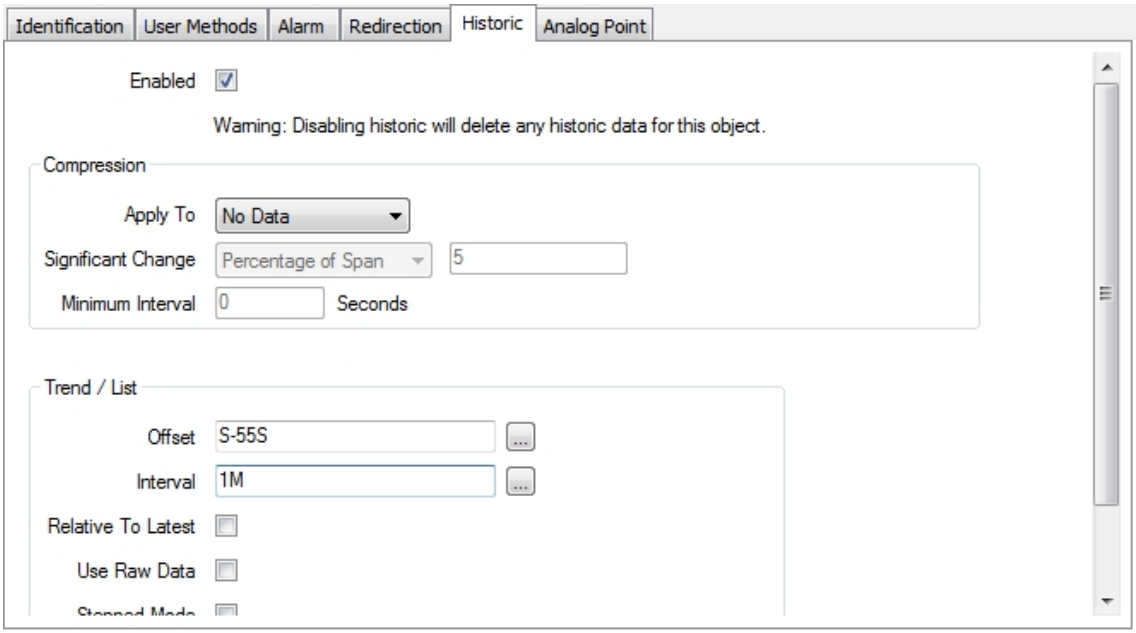
9. Set the **Retrieval Interval** to **Interval 1**. This sets the analog input point to be scanned at the rate defined for Interval 1, which is configured on the Form for the outstation (in this case, the 'ScPack' outstation has the default setting of 0.1 second for Interval 1).



10. Select the **Historic** tab.
11. Select the **Enabled** box to activate the historic feature for the point. Your system will now store a record of the point's values.
12. Set the **Offset** to: `S-55S`

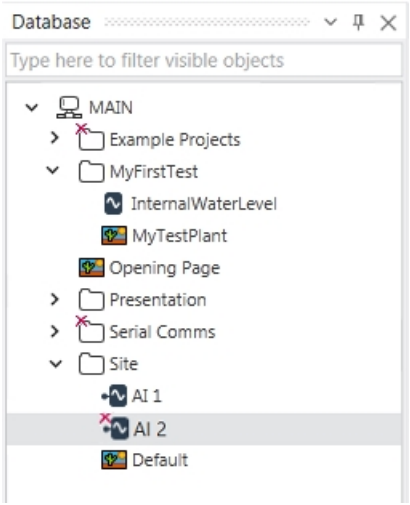
    This time setting represents the current second minus 55 seconds.
13. Set the **Interval** to:`1M`

    This sets the Interval to 1 minute. So the Historic Trend for the point will show 1 minute on the x-axis, with the first time on the x-axis being 55 seconds in the past.

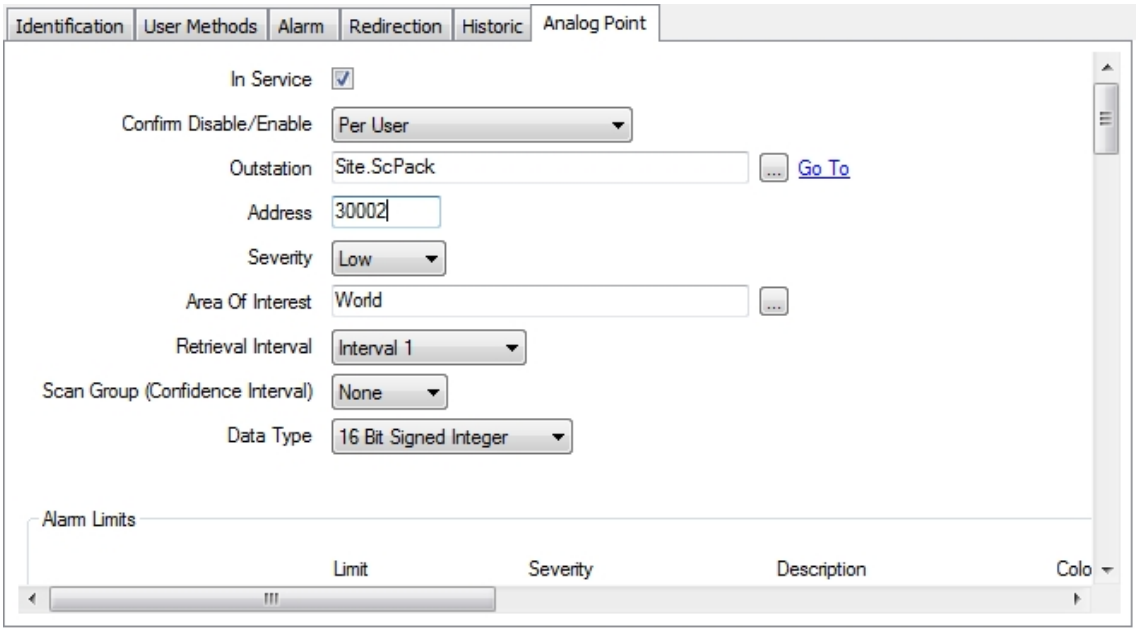


14. Save the Point Form and then close it.

15. Select the 'AI 1' point in the Database Bar so that it is highlighted.
16. Select the **Edit** ribbon, then select the **Copy** command to copy the 'AI 1' point.
17. Select the **Paste** command to add a copy of the 'AI 1' point to your database. The copy is named 'AI 2' by default.



18. Display the configuration Form for the 'AI 2' point.
19. On the Analog Point tab, set the 'AI 2' point's **Address** to 30002.



20. Save the Point Form and then close it.

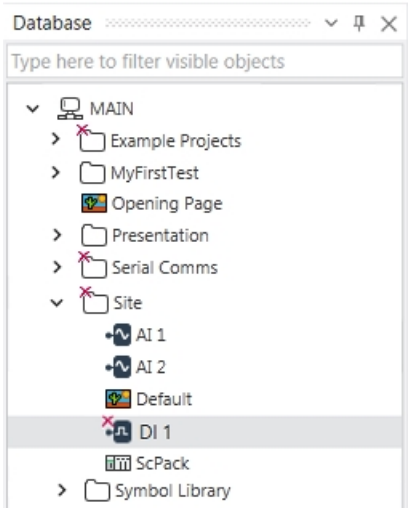
Proceed to Configure Two SCADAPack Modbus Digital Input Points.

Configure Two SCADAPack Modbus Digital Input Points

Each digital input on your SCADAPack Modbus controller can be represented in your system by a SCADAPack Modbus digital point. The configuration of the point defines whether its states trigger alarms, its retrieval rate, address, and so on.

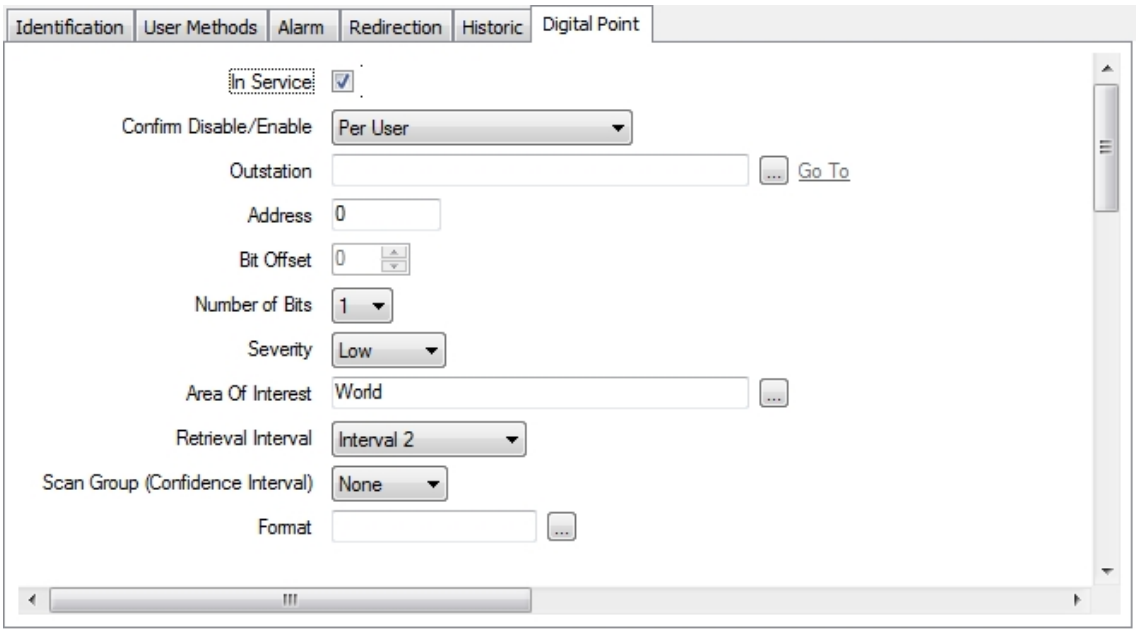
For this tutorial, you are going to create two digital input points which will represent two of the digital inputs on your SCADAPack Modbus controller:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, right click on the 'Site' Group to display its context sensitive menu, and then select **Create New>Modbus - Advanced>SCADAPack > Digital Input Point**.
   A new digital input point is created.
3. Name the digital input point: `DI 1`

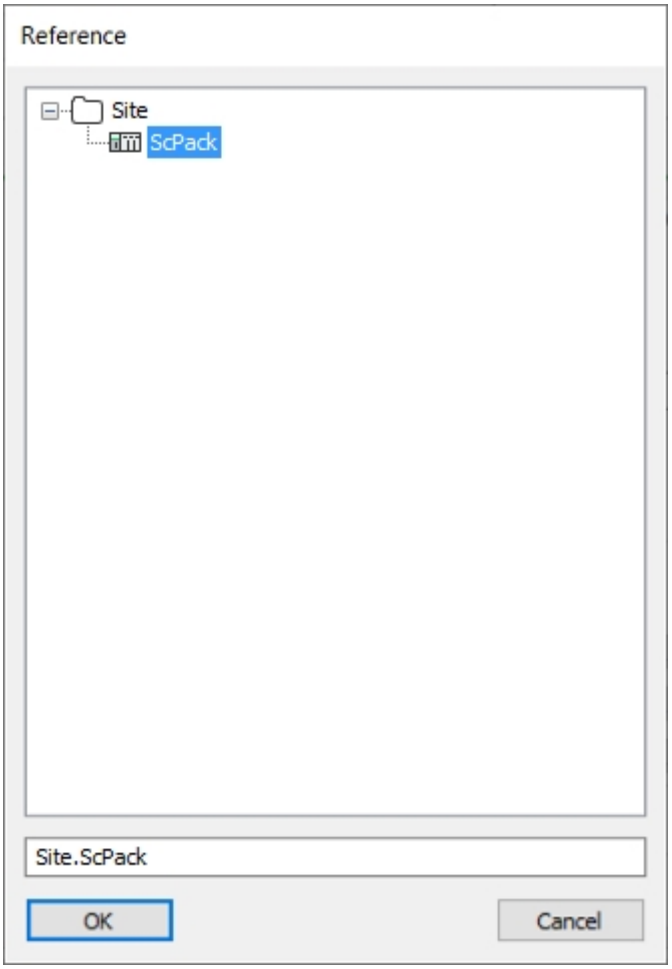


4. Display the configuration Form for the 'DI 1' point.
5. Select the **Digital Point** tab.

6. Select the **In Service** check box to enable the point.

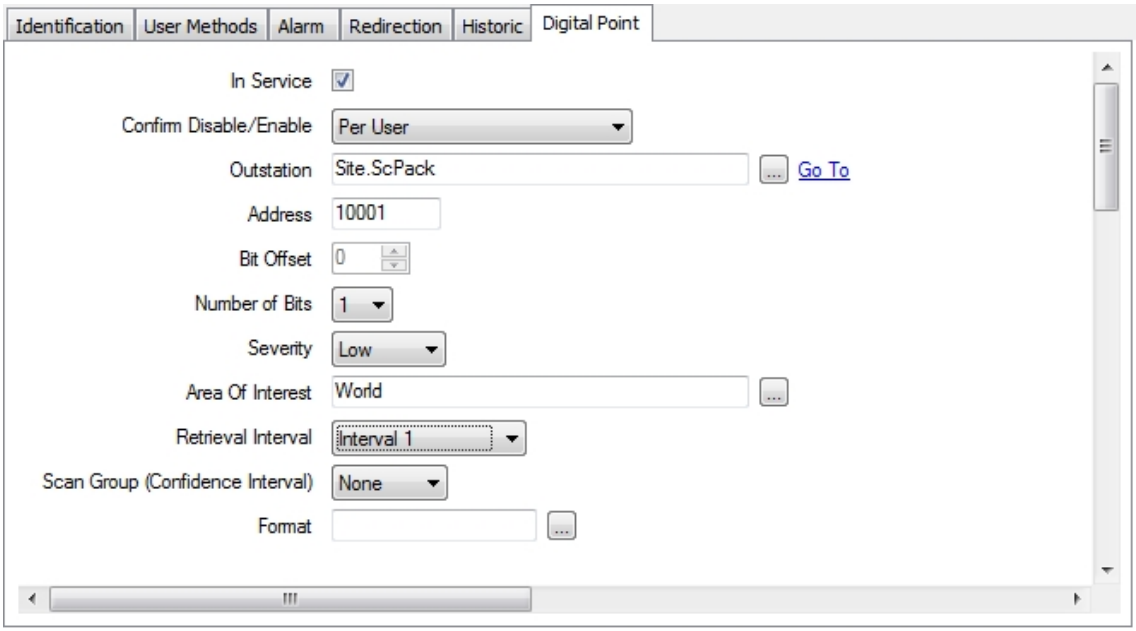


7. Use the browse button feature of the **Outstation** field to associate the point with the 'ScPack' Outstation that you have already created.

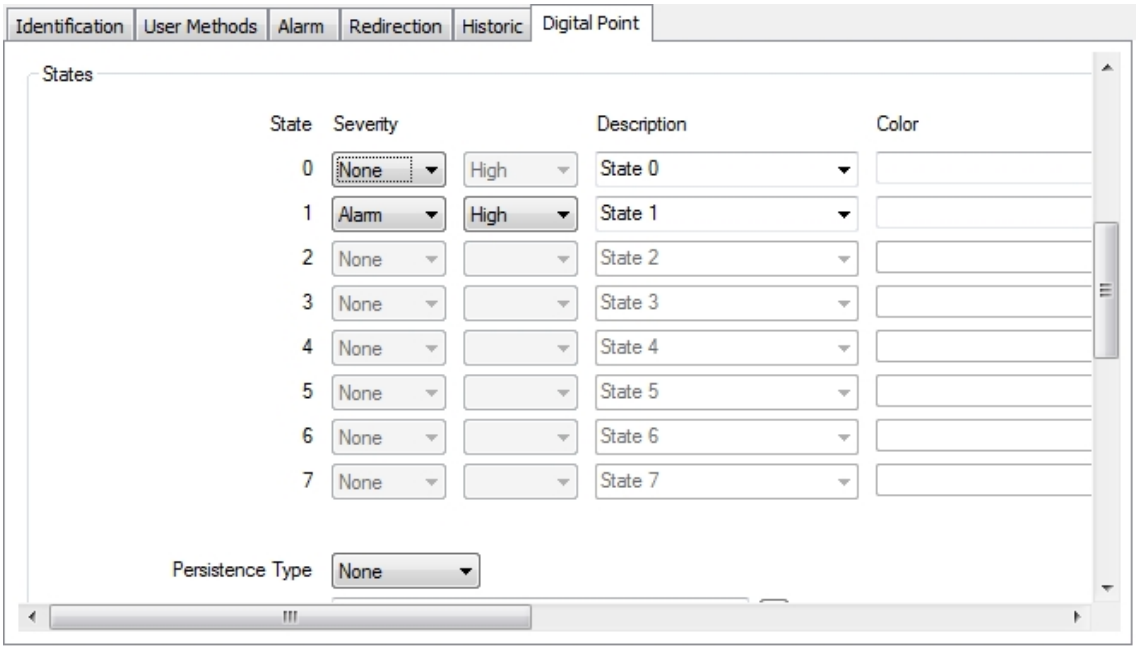


8. Set the **Address** to 10001 (this is the first digital input point address)

9. Set the **Retrieval Interval** to **Interval 1**.



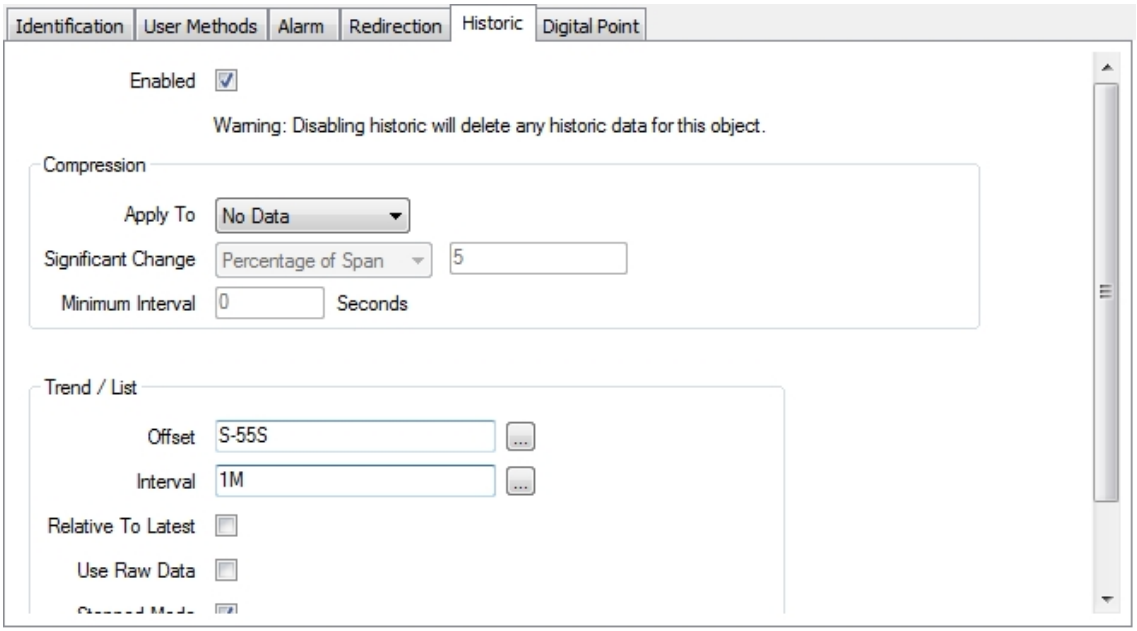
10. In the **States** section, set the **Severity** of **State 1** to **Alarm** and **High**. This means that when the point changes state to State 1, a high priority alarm will be raised.



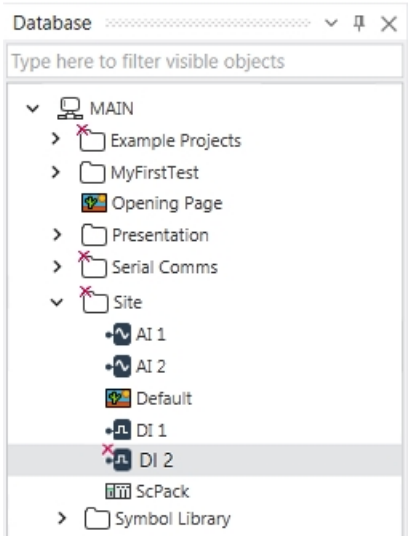
11. Select the **Historic** tab.
12. Select the **Enabled** check box to activate the historic feature.
13. Set the **Offset** to: `S-55S`

    This time setting represents the current second minus 55 seconds
14. Set the **Interval** to: `1M`

    This sets the Interval to 1 minute. So the Historic Trend for the point will show 1 minute on the x-axis, with the first time on the x-axis being 55 seconds in the past.

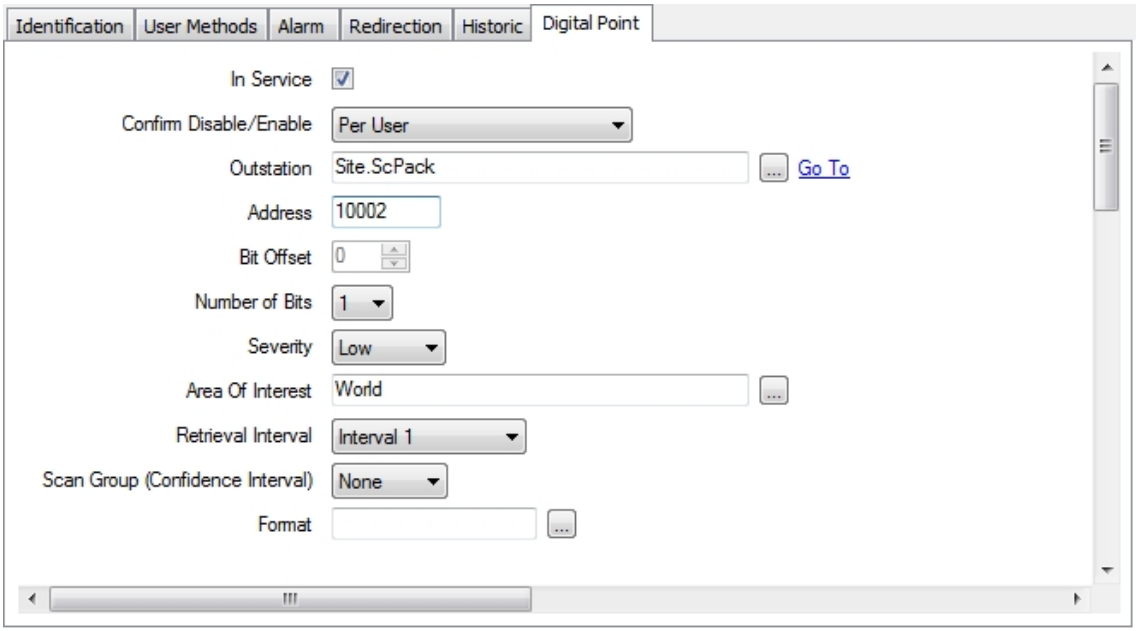


15. Save the Point Form and then close it.
16. Make a copy of the 'DI 1' point and paste the copy into the 'Site' Group. The copy is named ‘DI 2’ automatically.



17. Display the configuration Form for the 'DI 2' point.

18. On the **Digital Point** tab, set the **Address** to 10002.



19. Save the Point Form and then close it.

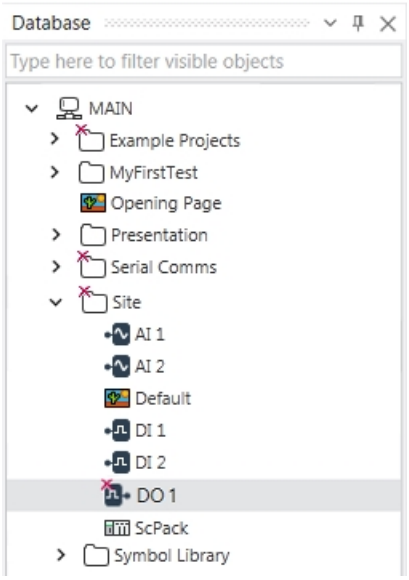
Proceed to Configure Two SCADAPack Modbus Digital Output Points.

Configure Two SCADAPack Modbus Digital Output Points

Each digital output on your SCADAPack Modbus controller can be represented in your system by a SCADAPack Modbus digital output point. The configuration of the point defines whether its states trigger alarms, its retrieval rate, address, and so on.

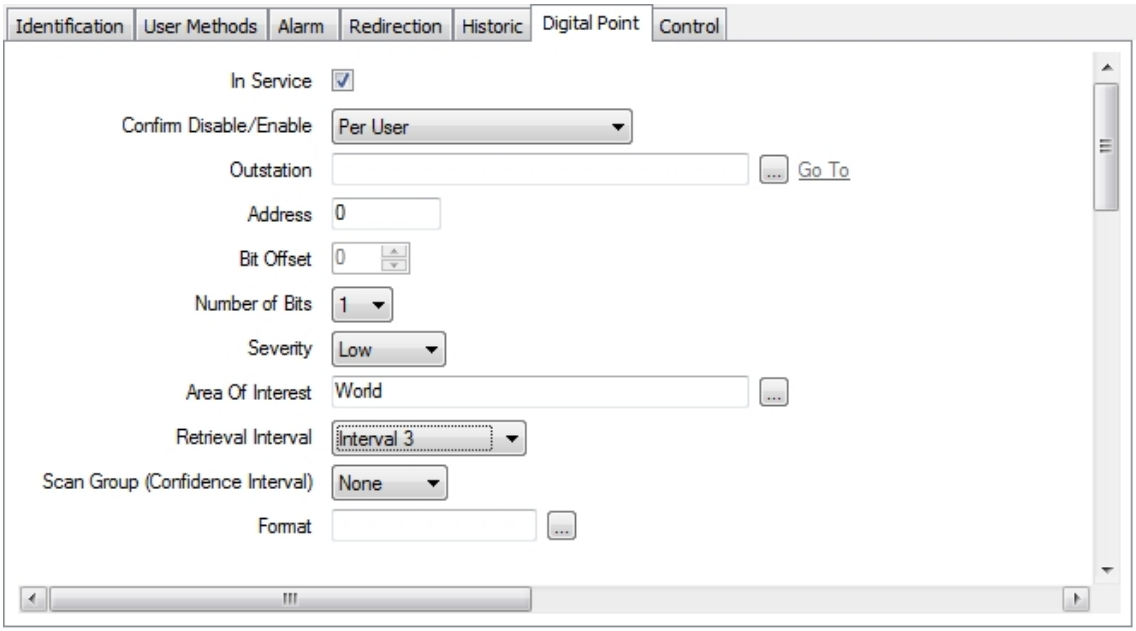
For this tutorial, you are going to create two digital output points which will represent two of the digital outputs on your SCADAPack Modbus controller:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, right click on the 'Site' Group to display its context sensitive menu, and then select **Create New>Modbus - Advanced>SCADAPack> Digital Output Point**.
   A new digital output point is created.
3. Name the digital output point: `DO 1`

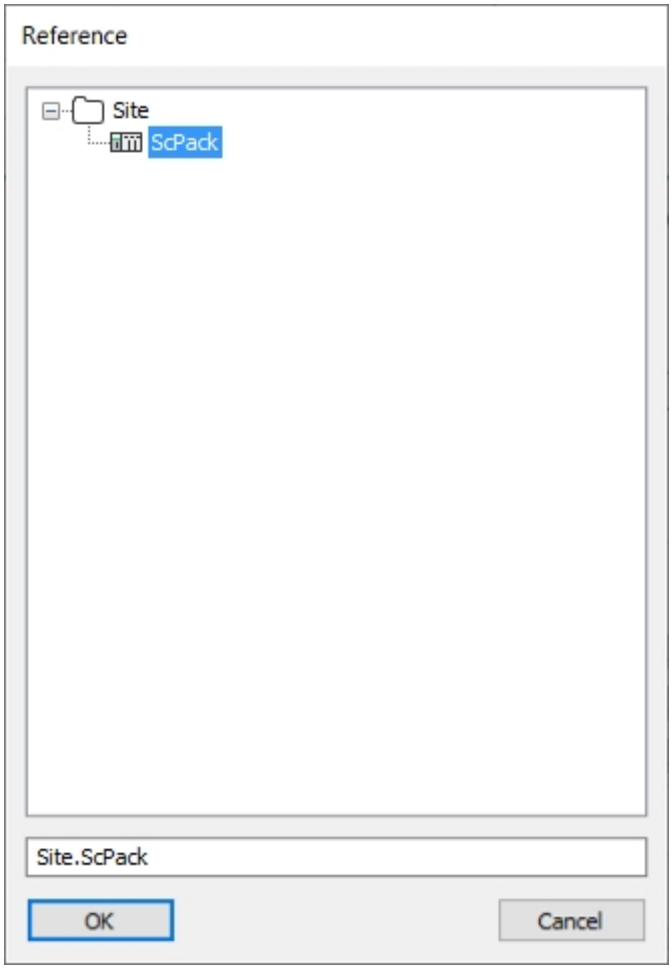


4. Display the configuration Form for the 'DO 1' point.
5. Select the **Digital Point** tab

6. Select the **In Service** check box to enable the point.



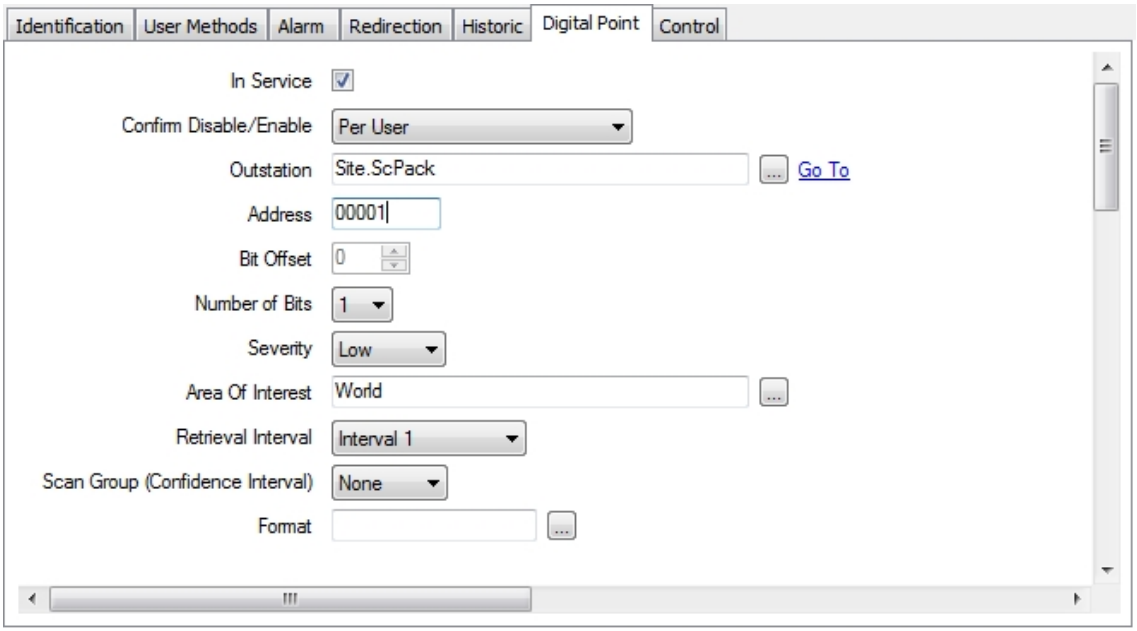
7. Use the browse button feature of the **Outstation** field to associate the point with the 'ScPack' outstation.



8. Set the **Address** to 00001 (this is the address of the first digital output on your controller).

   ATTENTION: If you are using a 5604 lower I/O module, you should use the address 00003 instead.

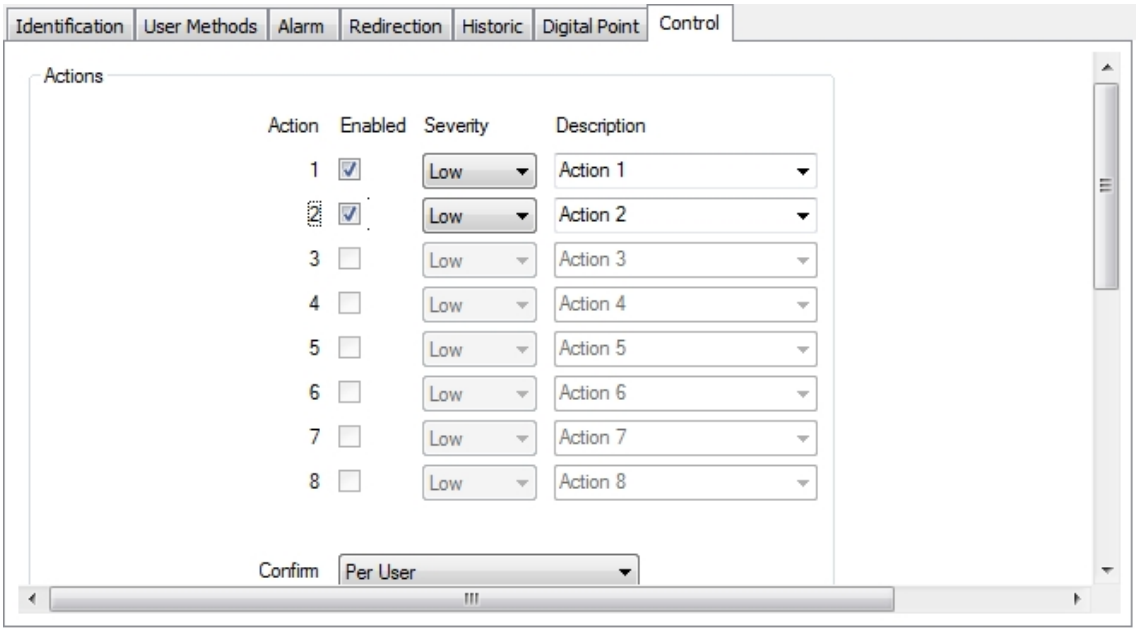
9. Set the **Retrieval Interval** to **Interval 1**.



10. Select the **Control** tab

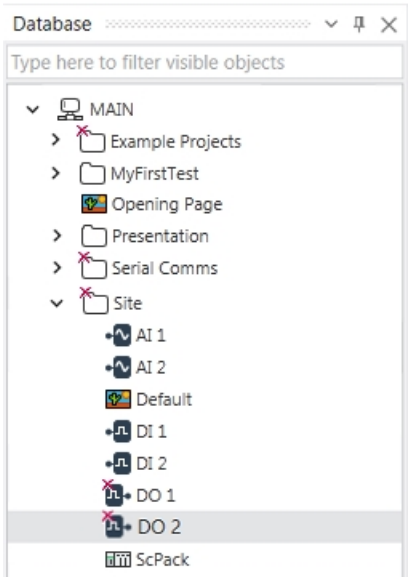
11. Select the **Enabled** check box next to **Action 1**. This activates Action 1 for the output point, which means you can perform a control that sets the point to 0. (The effect of the point being set to 0 will vary according to the set up of your controller and the instruments or sensors that are connected to it).

12. Repeat step 11, only this time select the **Enable** check box next to **Action 2**. This allows you to perform a control that sets the point to 1.

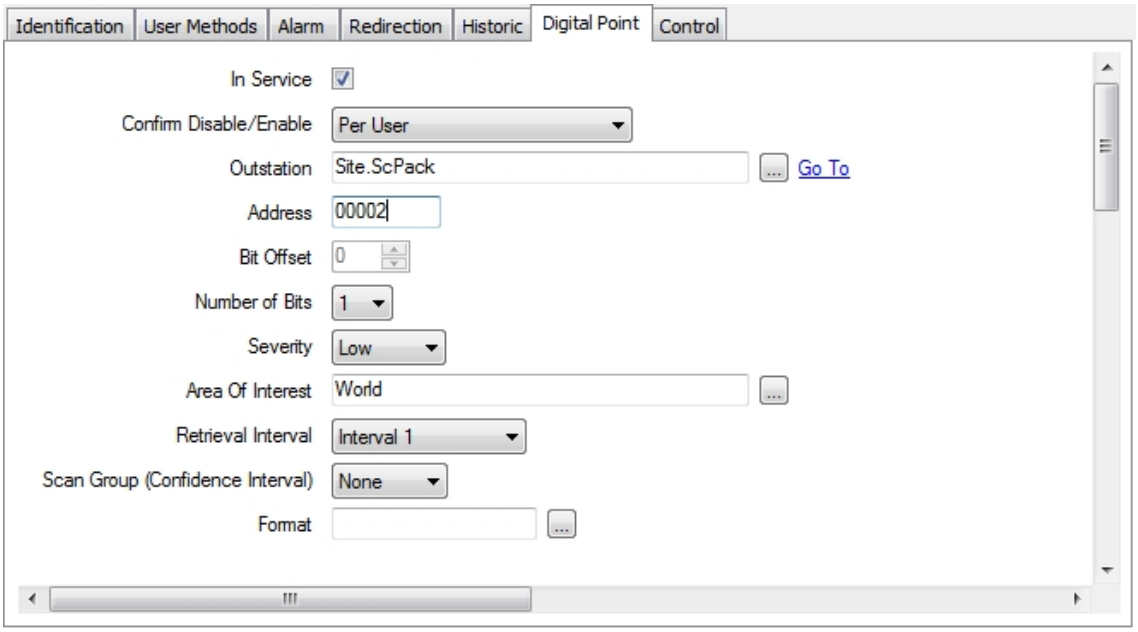


13. Save the Point Form and then close it.

14. Make a copy of the 'DO 1' point and paste the copy into the 'Site' Group. The copy is named ‘DO 2’ automatically.



15. Display the configuration Form for the 'DO 2' point.
16. On the **Digital Point** tab, set the **Address** to 00002 (or 00004 if you are using a 5604).



17. Save the Point Form and then close it.

NOTE: The Digital Output addresses should be relative to the hardware you are using. If you use a 5604, you need to configure the Digital Output addresses so that they correspond to the 3rd and 4th outputs (00003 & 00004).

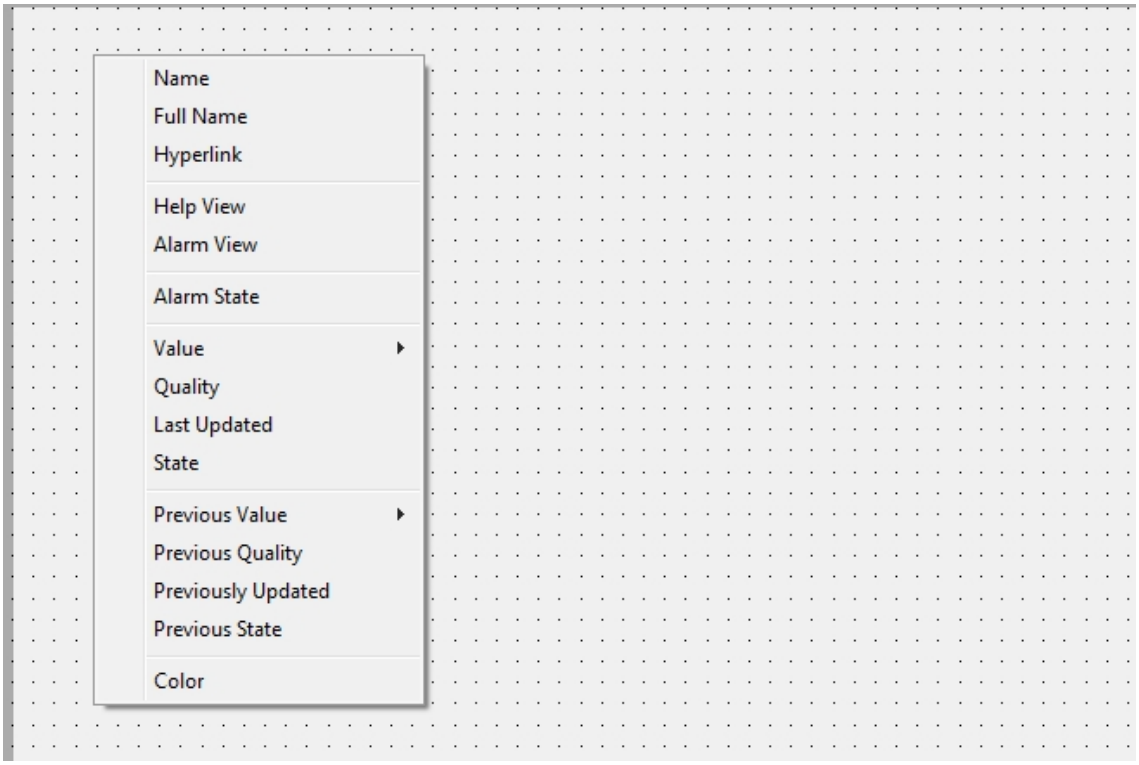
You have now configured 6 points to represent some of the inputs and outputs on your SCADAPack Modbus controller. Next, you should Configure a Mimic to contain Dynamic Data for the Points.

Configure a Mimic to contain Dynamic Data for the Points

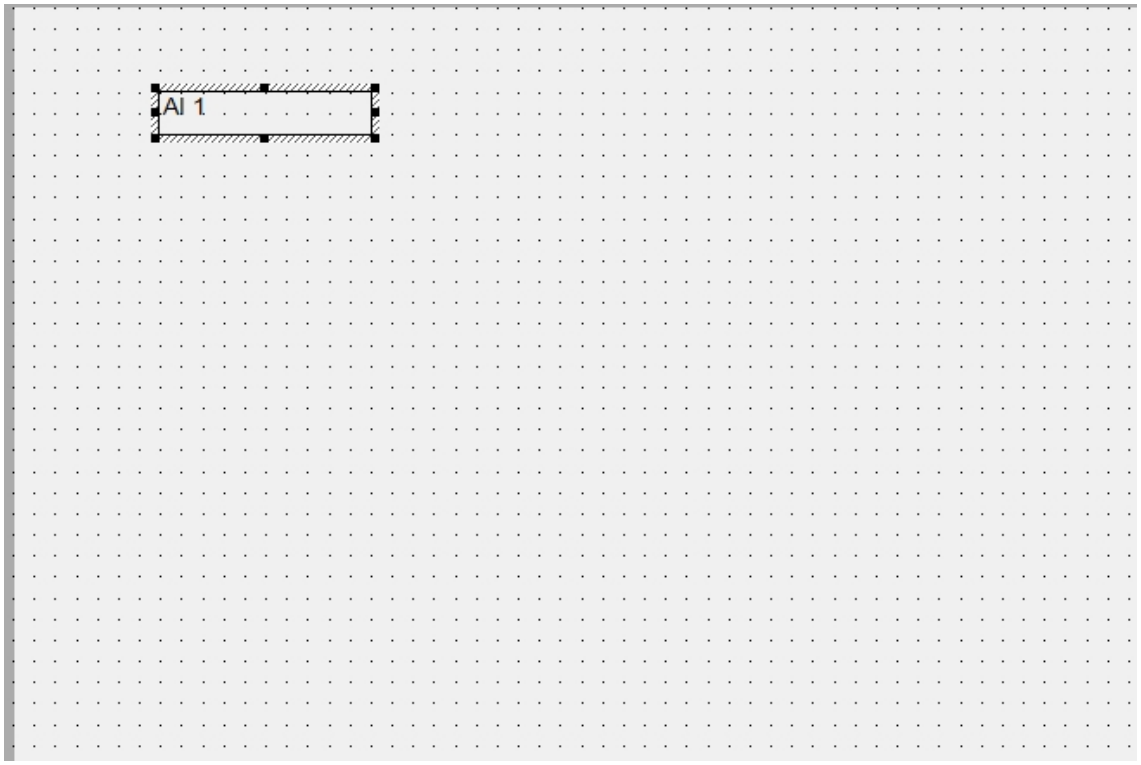
Now that you have configured analog and digital input points and digital output points, you can configure a Mimic to show their values. The Mimic will provide a graphical display that contains an overview of the points' values.

To configure a Mimic to contain dynamic data for the points:

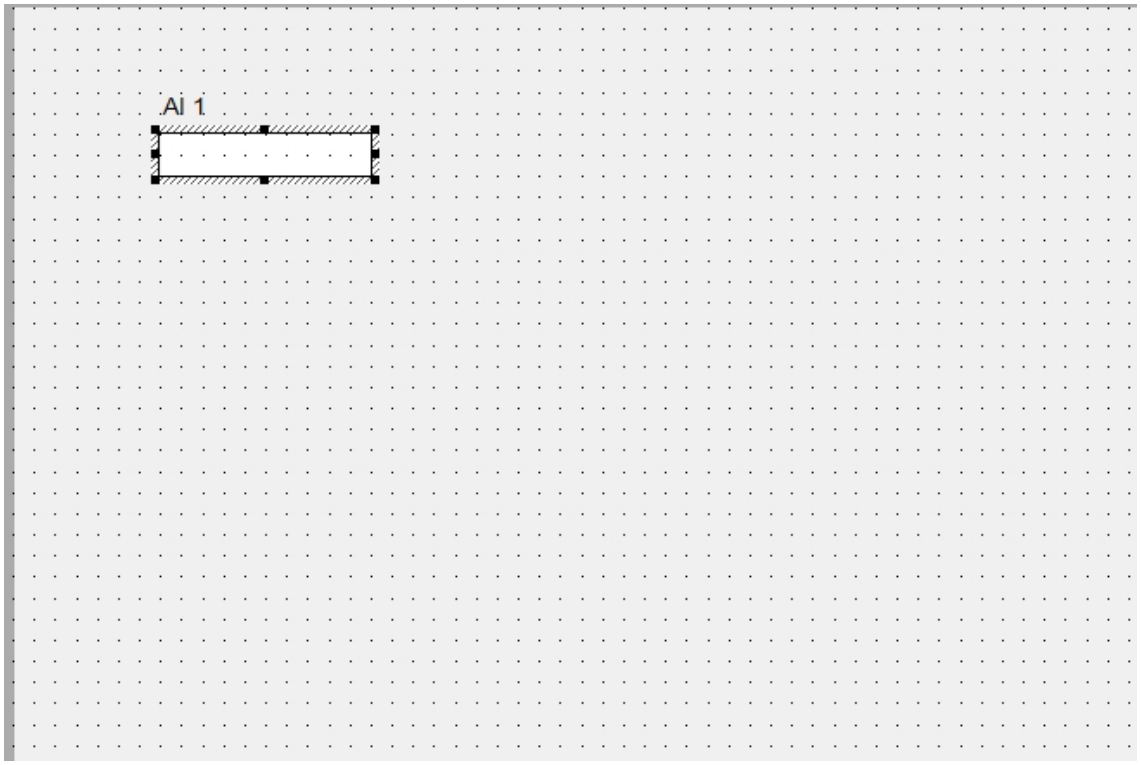
1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, expand the 'Site' Group, then double-click on the 'Default' Mimic to display its editor.
3. In the Database Bar, select the 'AI 1' point and drag it onto the display area of the Default Mimic. Release the mouse button to display a context sensitive menu.
4. Select the **Name** option from the context sensitive menu.



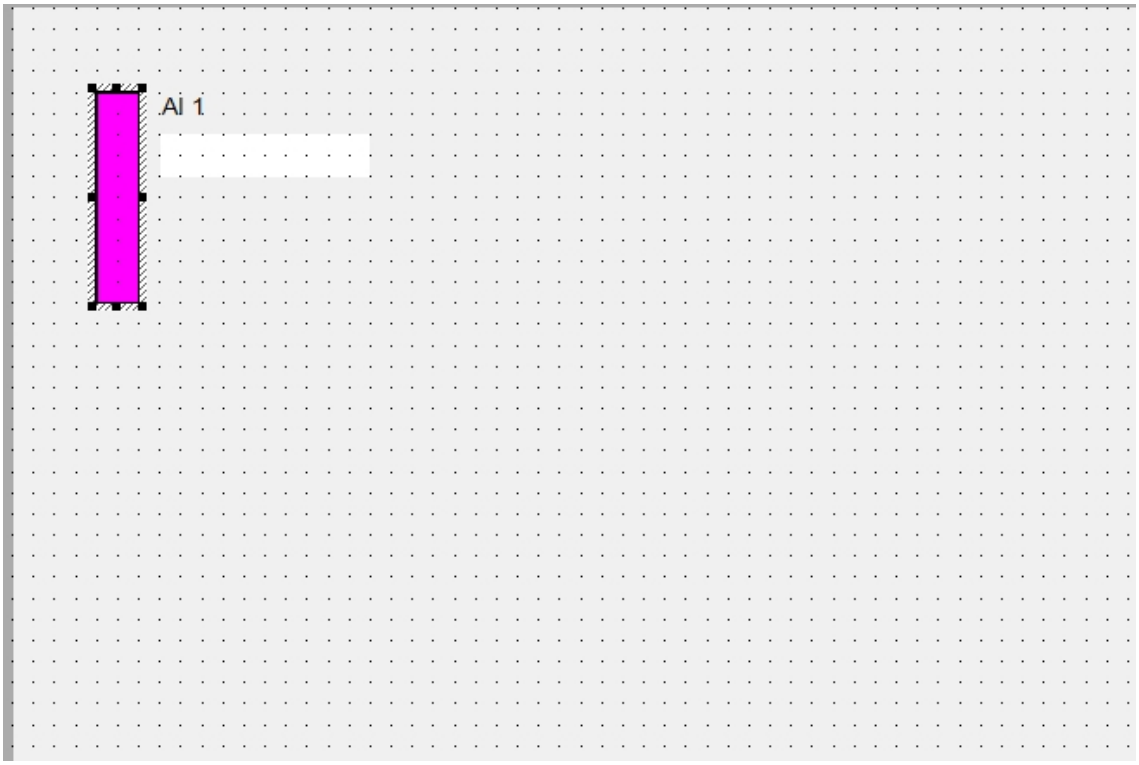
5. This adds a text box to the Mimic, and the text box is automatically configured to be animated by the name property of the 'AI 1' point. So if the name property of the 'AI 1' point changes, the change will be shown on the Mimic automatically—there is no need to update the name value on the Mimic manually.



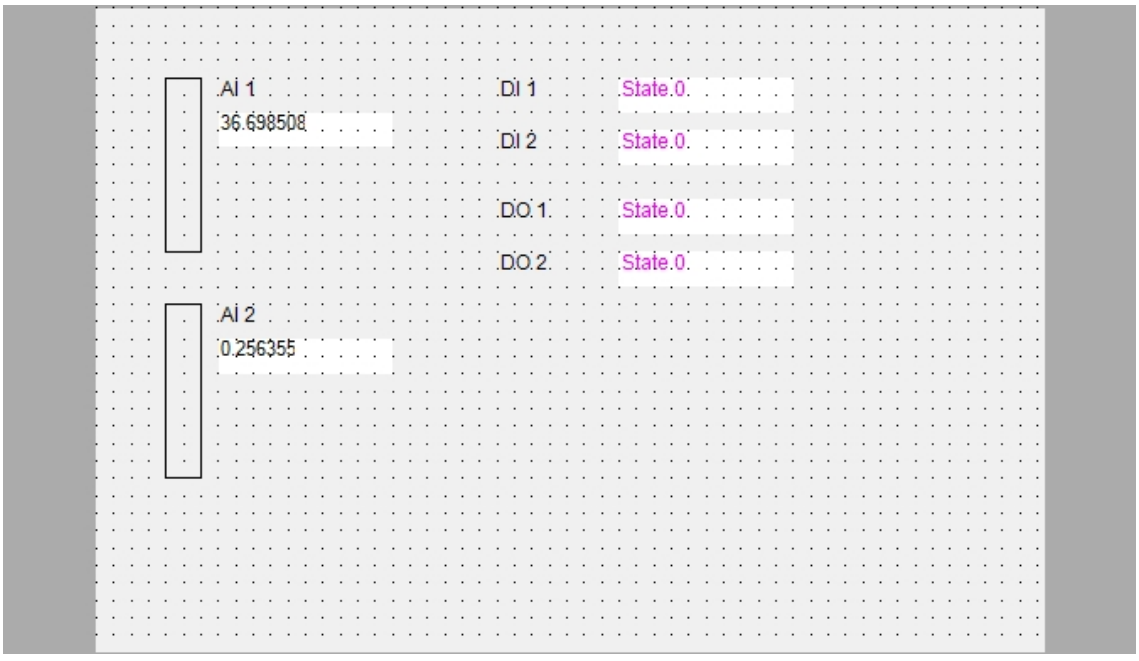
6. Repeat steps 3 and 4, only this time select the **Value>Formatted Value** options. This adds a text box that is animated by the point's **CurrentValueFormatted** property (as well as its **Foreground**, **Background** and **Blink** properties, which affect the appearance of the text in the text box).



7. Repeat steps 3 and 4, only this time select the **Value>Vertical Bar>Up** options. This adds a vertical size bar that is animated automatically so that the size of the bar changes according to the value of the analog point.



8. Repeat steps 3 to 7 for the 'AI 2' point.
9. For each of the digital points, add a Name text box and a State text box. To add a State text box, drag the point onto the Mimic, then select **State** from the menu.
10. Organize your Mimic objects so that your Mimic looks like this:

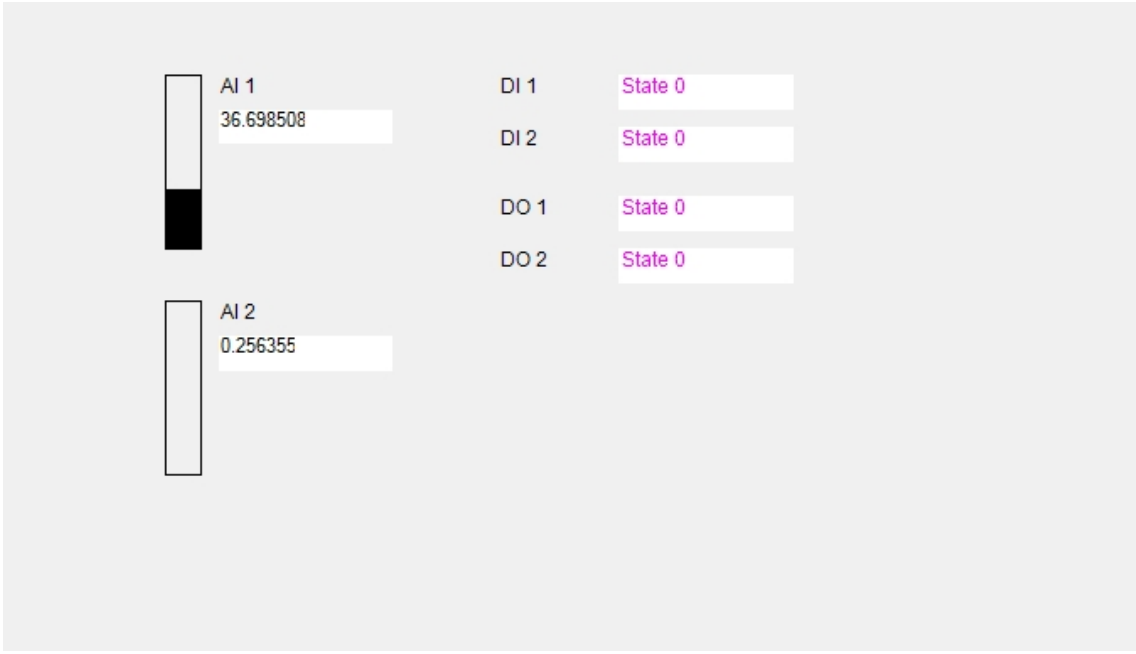


11. Save the Mimic.
12. Deselect the **Design Mode** button on the Quick Access Toolbar. This will display the Mimic in Run mode.

When you display a Mimic in Run mode, the Mimic's configuration features become unavailable and the Mimic displays its dynamic data. Usually, operators will work with Mimics in Run mode.

When you switch a Mimic from Design Mode to Run mode, the grid is turned off automatically, and so the grid dots are no longer visible. This is because grid lines are designed to help align objects during configuration and so are not required during operation.

You will also see that the animated size bars are now sized according to the analog input from your SCADAPack Modbus controller. Many animations are only visible when a Mimic is displayed in Run Mode.



Now you have a Mimic that displays live, 'dynamic' I/O. But the Mimic does more than just display data—it provides access to other displays and controls, as you will see in the next section: Display a Historic Trend for the 'AI 1' Analog Input Point.

Further Information

Displaying Data on a Mimic: *see* Animations.

Considerations when Creating and Configuring a Mimic: *see* Designing a Mimic.

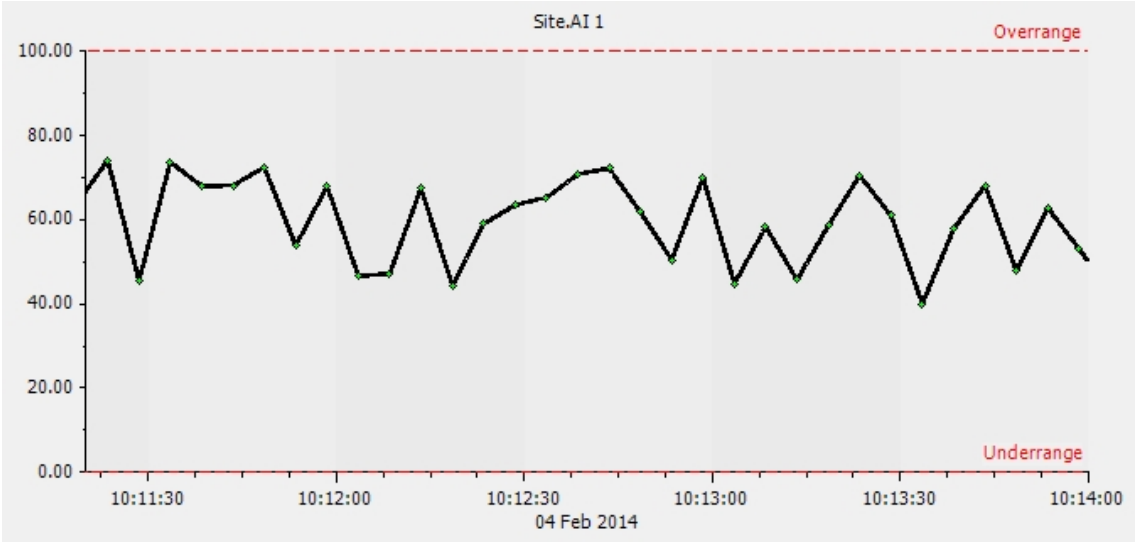
Display a Historic Trend for the 'AI 1' Analog Input Point

If you position the cursor over any of the animated objects on your Mimic and left-click, you will see that a context sensitive menu is displayed. The context sensitive menu is associated with the point that is used to animate the Mimic objects, so if you positioned the cursor over an object that is animated by the 'DO 1' point, the context sensitive menu that is displayed contains options that relate to the 'DO 1' point.

Animated Mimic objects provide access to the context sensitive menus for the items that animate their values. This is a useful feature as it means low level users can view item-specific displays and perform controls from a single display: the Mimic.

To see how easy it is to access displays from a Mimic, display the Historic Trend for the 'AI 1' point:

1. With the 'Default' Mimic displayed in Run mode, position the cursor over the 'Formatted Value' text box for the 'AI 1' point.
2. Press the left-hand mouse button to display the context sensitive menu for the 'AI 1' point, then select the **Display Historic Trend** option.
   A Historic Trend for the 'AI 1' point is displayed.



3. Close the Trend window when you are finished observing the data.

Now that you've seen how an animated Mimic object can provide access to displays and controls for a specific item, it is time to add a display to the configuration of a Mimic. Proceed to Add an Alarms List to the Mimic.

Further Information

Historic Trends: *see* Pre-Configured Trends and Ad Hoc Trends.

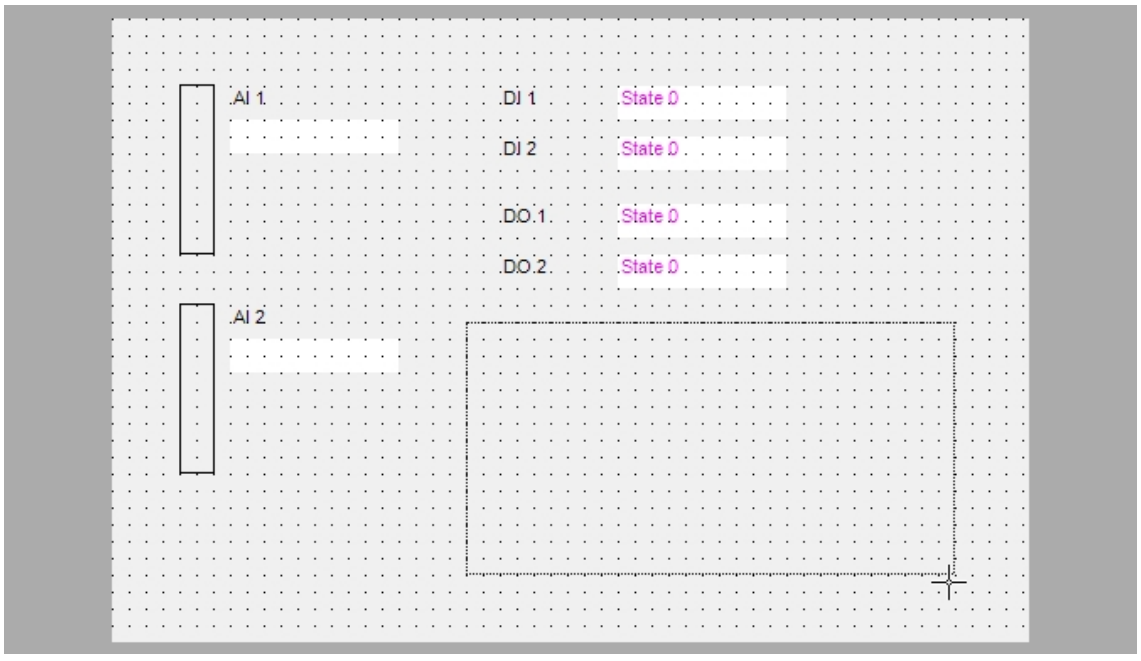
Add an Alarms List to the Mimic

You can add displays such as Lists and Trends to Mimics so that they are included as part of the Mimic's configuration. When you display the Mimic, it will contain a reduced version of the original List, Trend, and so on.

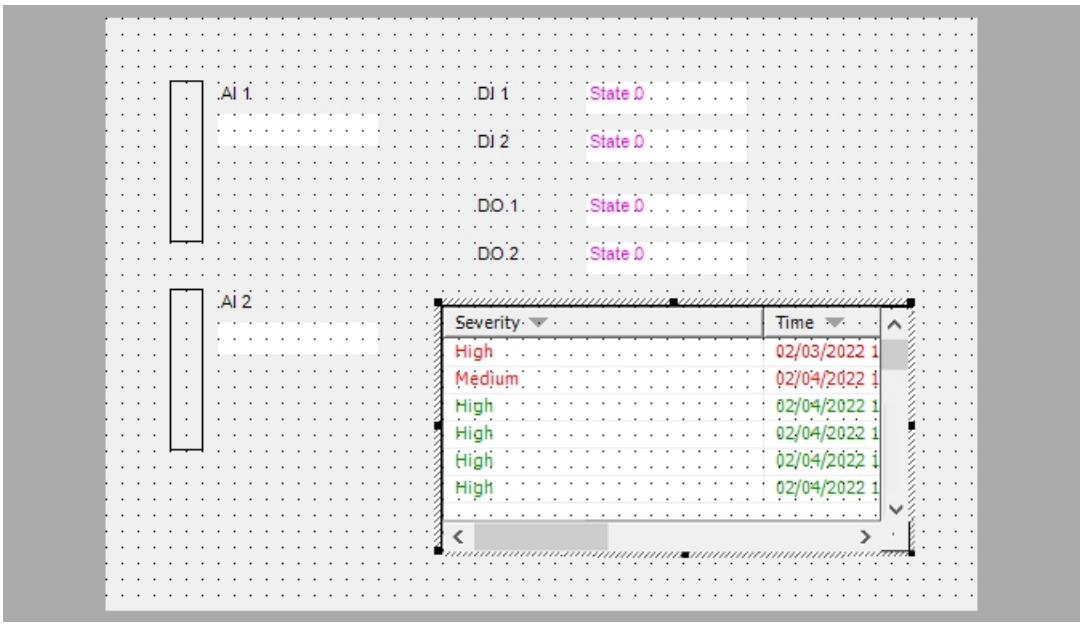
Adding displays to Mimics is a great way of presenting information to users in a variety of formats, for example, a Mimic could contain animated text boxes that show the values of a collection of points, and also a list that shows those points in a list format (which makes it easier to compare one point's values to those of another point).

To learn how adding displays to Mimics works, you are going to add an Alarms List to your 'Default' Mimic:

1. Display the 'Default' Mimic in Design Mode.
2. Select the **Graphics** tab on the ViewX ribbon.
3. Select the **Alarm List** command from the relevant command group.
   You will see that when you position the cursor on the Mimic, it changes to a cross hair.
4. Position the cursor beneath the digital point animations, then press the left-hand mouse button down. Keep it pressed down and move the mouse to draw a rectangle. The rectangle will be the space that is filled by the Alarms List.



5. Release the left-hand mouse button to add the Alarms List.



   The Alarms List has no filters by default, and so shows all of the alarms to which you currently have access. On a live system, there may be other alarms that are not shown, such as suppressed alarms or alarms for items that you cannot access due to restricted user account permissions.

6. Display the Mimic in Run mode.
7. Disconnect the serial cable from the SCADAPack Modbus controller.
8. After a few seconds, a new alarm appears in the Alarms List. Use the scroll bars on the list to scroll to the Message for the new alarm. You will see that it shows: `Communications State - Failed`

   The colors of the values on the Mimic change color from black to magenta. The magenta color indicates that there has been a communications failure.

9. Reconnect the serial cable.
10. After a few seconds, the alarm changes color, from red to green. This indicates that the conditions that caused the alarm to be raised are no longer in place, but the alarm has not been acknowledged by a user.

Now you have added an Alarms List to your Mimic, you can proceed to Filter the Alarms List.

Further Information

Alarms Lists: *see* Alarms Lists.

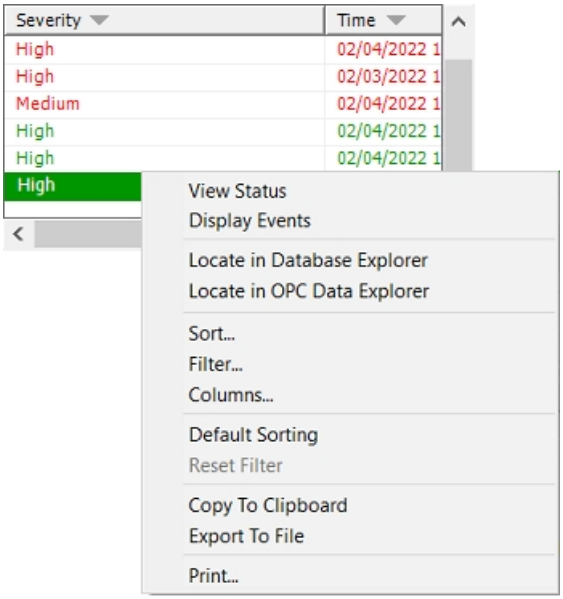
Embedding Alarms Lists: *see* Embed an Alarms List on a Mimic.

Filter the Alarms List

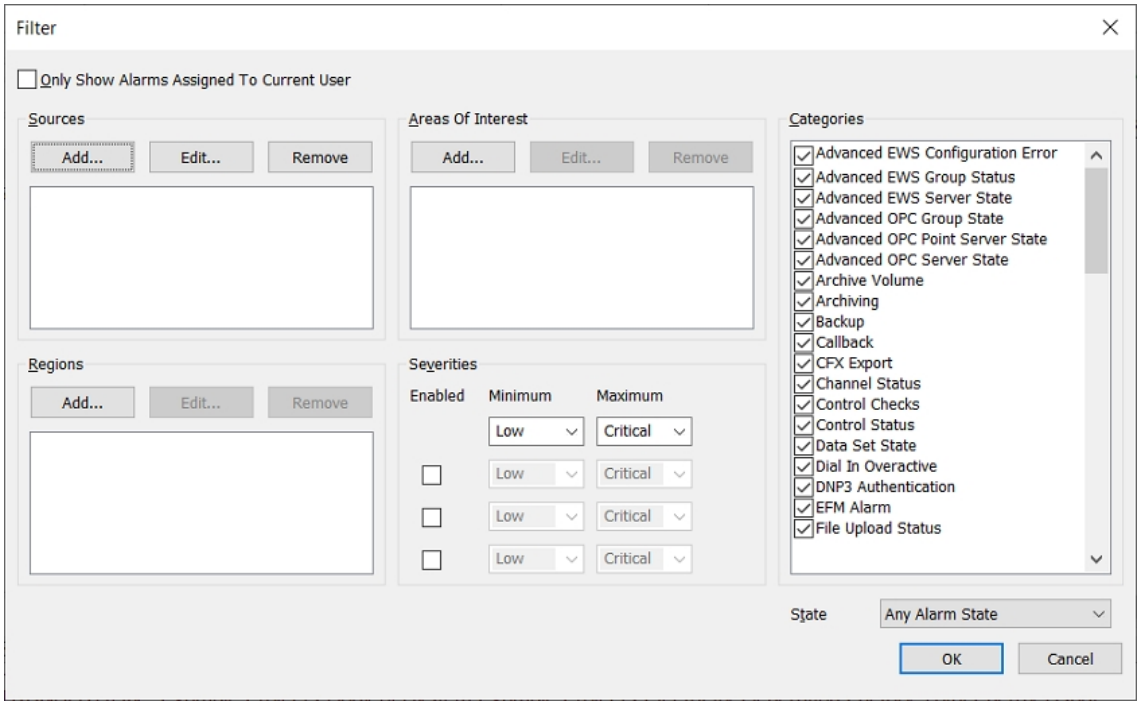
By default, the Alarms List you have added is unfiltered - it shows the alarms on your system, irrespective of their severity, the items with which they are associated, the time at which they were raised, and so on. By using Geo SCADA Expert's comprehensive filter system, you can restrict the Alarms List so that it only displays alarms that have certain properties.

To learn how the Filter feature works, you are going to filter the Alarms List on your Mimic to show only those alarms that relate to items in the 'Site' Group:

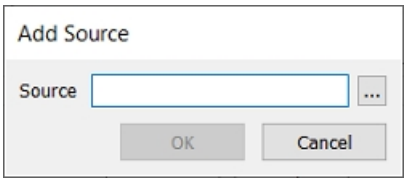
1. With the 'Default' Mimic of the 'Site' Group displayed in Run mode, right-click on an entry in the Alarms List to display a context-sensitive menu.



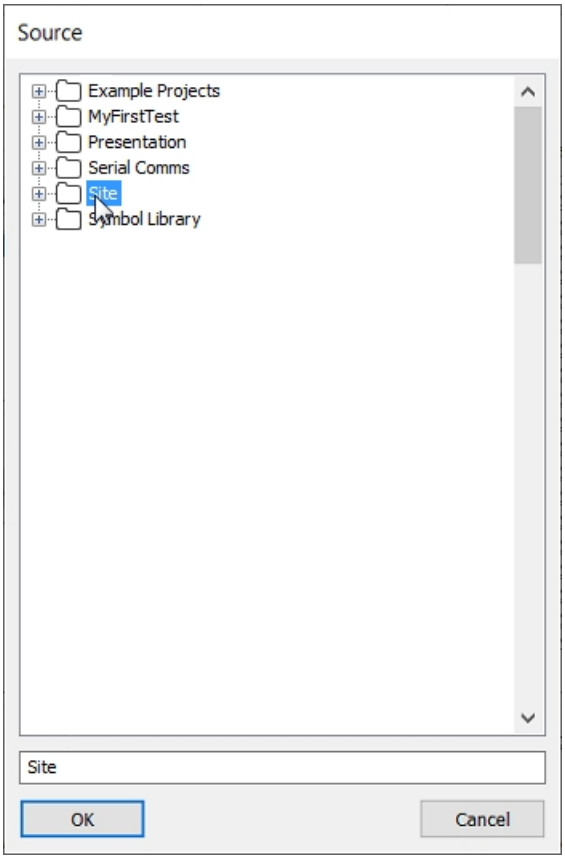
2. Select the **Filter** option to display the Filter Window.



3. In the **Sources** section, select the **Add** button to display the Add Source window.

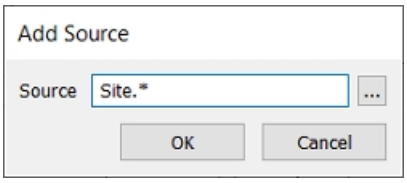


4. Use the browse button feature of the **Source** field to locate and select the 'Site' Group and then the **OK** button.

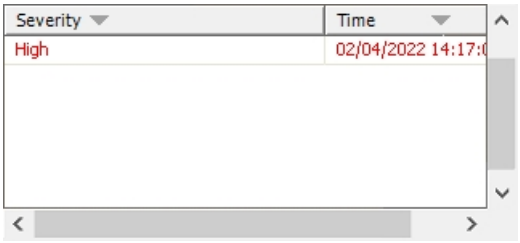


5. The Add Source dialog box's **Source** field will show:`Site.*`

   This means that the Alarms List will only show alarms for items that are in the 'Site' Group.



6. Select the **OK** button to confirm.
7. Select the **OK** button on the Filter window to confirm your filter choice and close the Filter window.
   Now the Alarms List only shows alarms directly related to the 'Site' Group.



Further Information

Alarms List: *see* Alarms Lists.

Filtering an Alarms List: *see* Use the Filter Window to Filter Alarm Entries.

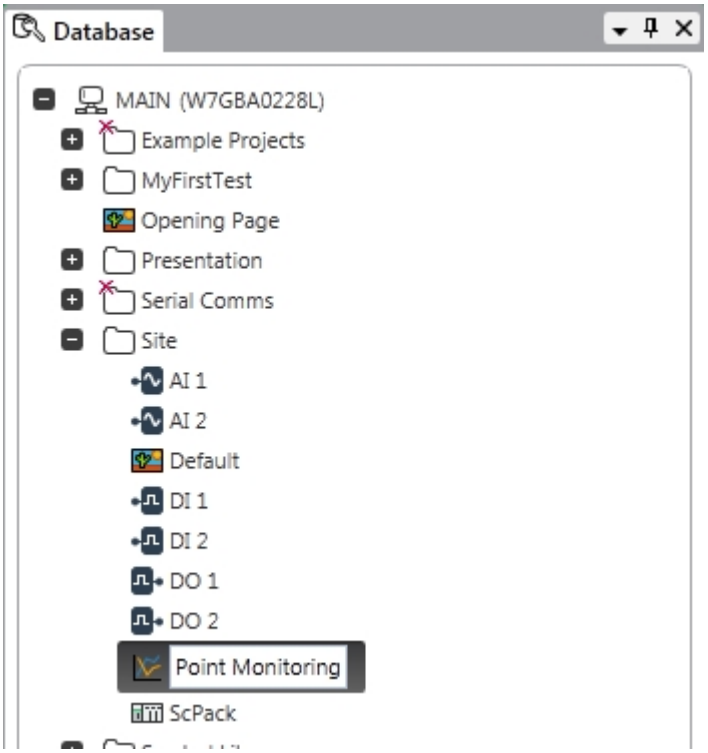
Create a Trend Database Item

To configure a Trend that contains values from the database, you first need to create a Trend database item. You can then configure the Trend item as required.

For the tutorial, you are going to add a new Trend item to the 'Site' Group that you created earlier in the tutorial (or imported).

To create a Trend database item:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, right-click on the 'Site' Group to display its context sensitive menu.
3. Select **Create New>Trend** to create a new Trend database item. The Trend is selected automatically, ready for you to define its name.
4. Define the name of the Trend as: `Point Monitoring`



   You now have a Trend database item that you can configure, but to configure it, you need to display it in Design mode.

5. Double-click on the 'Point Monitoring' Trend to display it in Design mode.

You can now proceed to Add the 'AI 1' Point's Historic Values to a Trend

Further Information

Creating a Trend Item: *see* Pre-Configured Trends and Ad Hoc Trends.

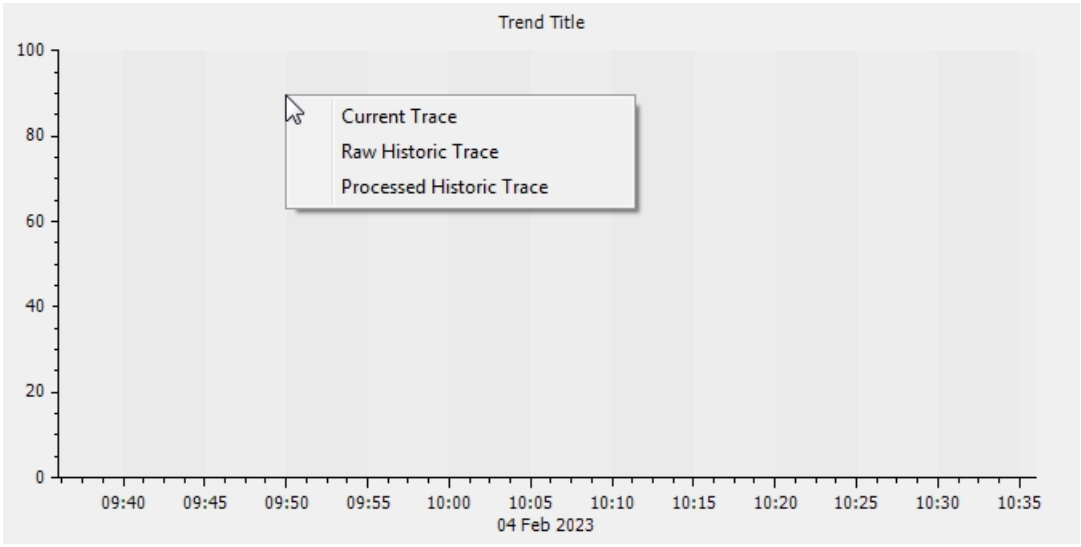
Add the 'AI 1' Point's Historic Values to a Trend

When you create a Trend, you need to associate it with at least one database item—the Trend can then plot the values (current or historic) of that item.

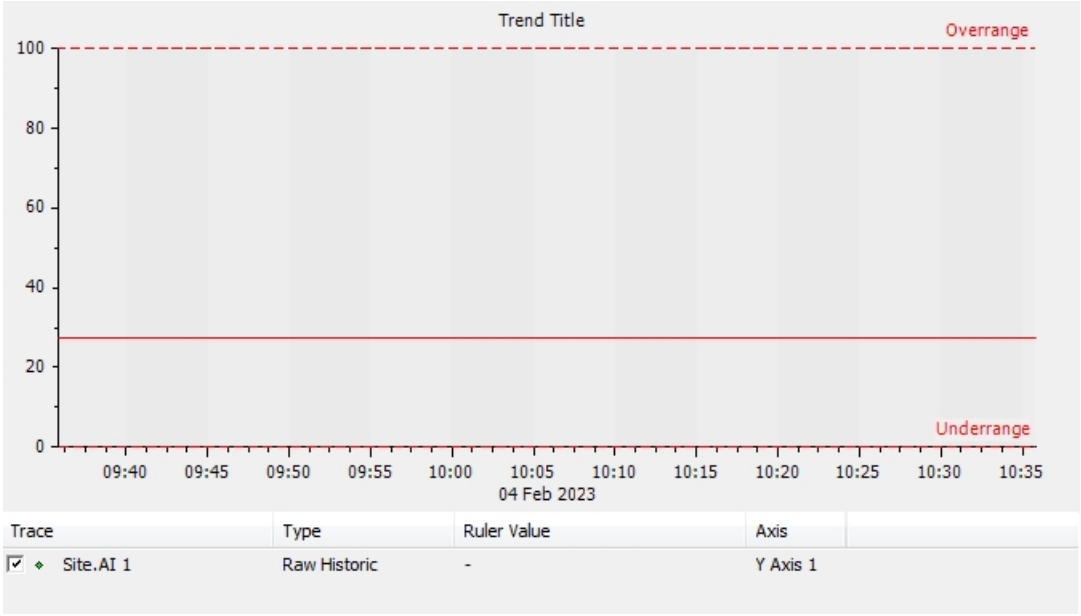
For the tutorial, you are going to plot the historic values of the 'AI 1' point. This point has been configured to have Historic data.

To plot the historic values of the 'AI 1' point:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, select the 'AI 1' point. Keeping the left-hand mouse button pressed down, drag the 'AI 1' point onto the Trend editor.
   A context-sensitive menu is displayed.
3. Select the **Raw Historic Trace** option.



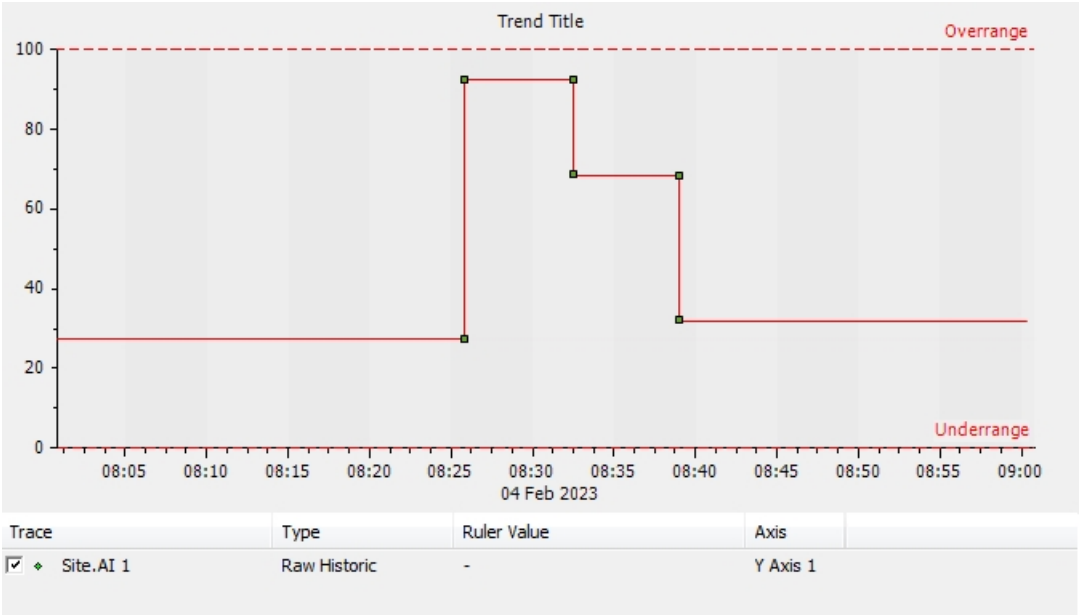
4. This adds a trace to the Trend.



The trace is a line that represents the historic values that have been reported for the point (the **Processed Historic Trace** option adds a trace that represents historic values that have been calculated for the point).

NOTE: You can edit a trace so that it has a different style of appearance, including a Step and a Bar.

5. On your plant simulator equipment, adjust the values of the first analog input so that the 'AI 1' point has a variety of values. If you are unable to access plant simulator equipment, you can simulate this effect by performing an override on the point:
   i. Right-click on the 'AI 1' point and select **Properties** to display its Form.
   ii. On the **Analog Point** tab, scroll down to the **Override** section and select the **Enabled** check box to allow the point's value to be manually overridden.
   iii. Save the Form
   iv. Right-click on the 'AI 1' point in the Database Bar and select its **Override** action.
   This displays the Override window.
   v. Enter a value of 90 then select **OK** to override the point's value to 90.
   vi. Repeat this process, but override the point to have a value of 60 then 25 respectively. These override values will provide some historic data for the point as the point is configured to have **Historic** enabled.
6. Position the cursor over the main display area of the Trend.
7. Press the left-hand mouse button. Keep the button pressed down.
The cursor changes to resemble a hand ⟲. *This indicates that you are in* ***Pan*** *mode*.
8. While keeping the button pressed down, drag the cursor across the main display area of Trend to 'pan' the Trend. The **Pan** feature enables you to navigate to earlier or later time periods on the Trend and so view the plotted values for the point at those other times. (The time line is shown on the x-axis.)



The x-axis uses the default settings to determine the amount of time to show on a single interval. However, you can configure the x-axis to show different time scales (*see* Edit the X-Axis).

If you look at the y-axis, you will see that it is automatically configured to represent the entire range of values that have been configured for the 'AI 1' point (0 to 100). This is because the y-axis uses the default **Mode** of **Range**, which means it represents the configured range for the point.

If you plot the values of another point on the Trend, and the point's possible values are incompatible with the range shown on the y-axis, ViewX will add a new y-axis. The new y-axis will have a range that is suitable for the possible values of the second point. If you continue to add additional traces, the same process will apply—if the y-axes on display have ranges that are incompatible with the points, new y-axes will be created. However, if the existing y-axes have appropriate ranges, the y-axes will be shared.

Now you have added the 'AI 1' point's historic data to your Trend, you should proceed to Edit the X-Axis.

Further Information

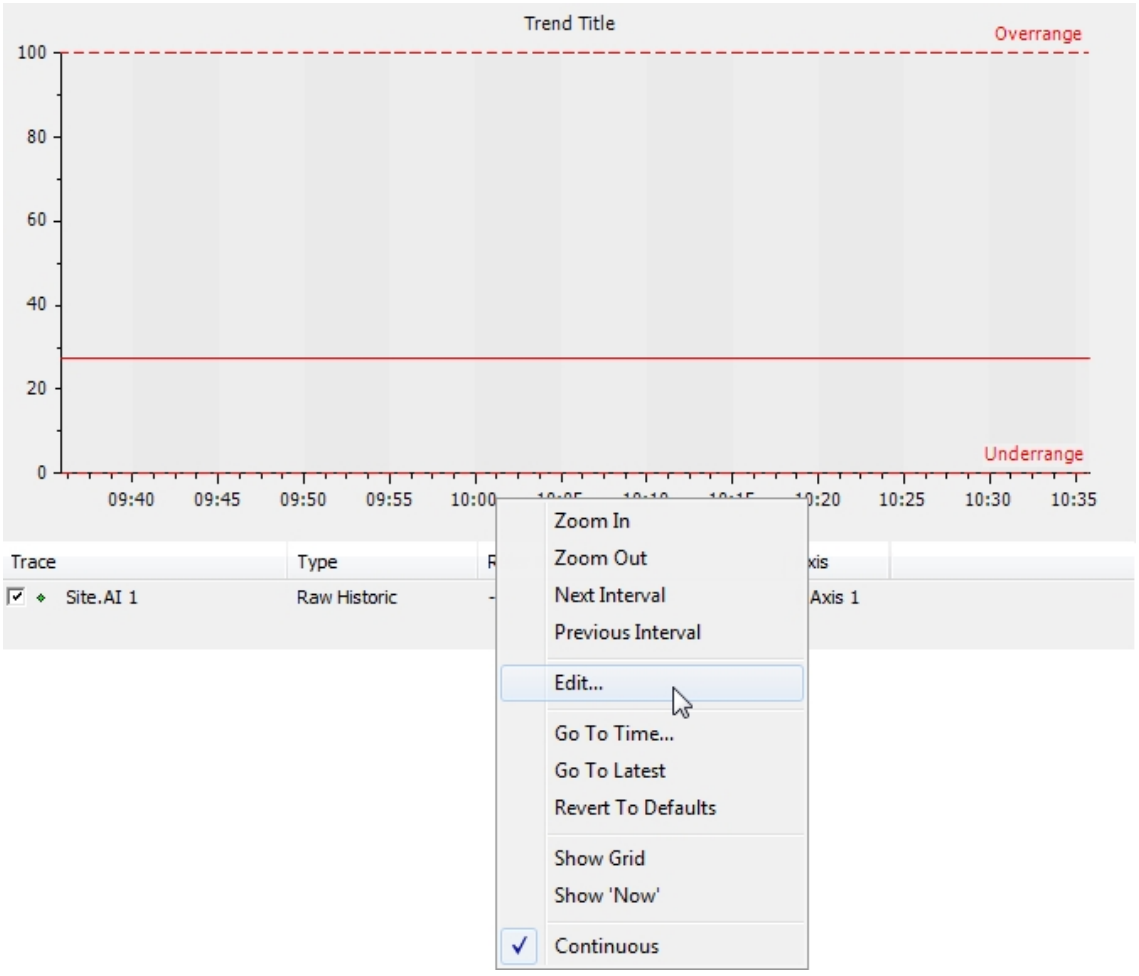
Trends: *see* Understanding Trends.

Edit the X-Axis

The x-axis represents a time scale called the Interval. The Interval is the amount of time that can be seen on the Trend at one time, for example, if the Interval was 30M, the x-axis would represent 30 minutes and the Trend could show 30 minutes' worth of data at once. The Interval is the amount of time you can see at once on the Trend; it is not the total amount of time on the Trend. By using the Previous Interval and Next Interval features, you can navigate to earlier and later intervals as required.

When you edit the X-Axis, you can define the start time of the Interval that is currently being displayed. To do this, you need to use the Edit X-Axis window to adjust the Interval and Offset settings:

1. On the Trend, position the cursor just beneath the x-axis, then right-click to display the x-axis's context sensitive menu.
2. Select the **Edit** option to display the Edit X Axis window.



3. On the Edit X-Axis window, use the combo box under the **Continuous** check box to select **Other**.
4. Set the **Offset** to:

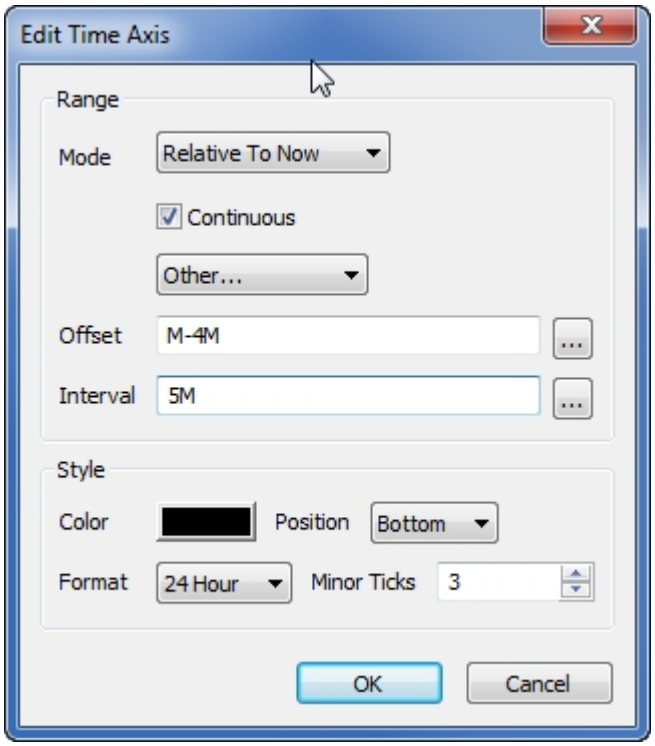
   `M-4M`

   This sets the start time of the x-axis to be 4 minutes ago (the start of the current minute minus 4 minutes).

5. Set the **Interval** to:

   ```
   5M
   ```

   This sets the x-axis to represent 5 minutes at a time.



6. Select the **OK** button to confirm your selections and close the Edit X-Axis window.
   You will see that the x-axis now represents 5 minutes of time, with the first time shown being 4 minutes in the past.
7. Right-click on the background of the Trend to display a context sensitive menu.
8. Select the **Previous Interval** option. This sets the Trend to display the previous interval which is the 5 minutes prior to the 5 minutes you had on display.
9. Repeat steps 7 and 8 to view several previous intervals on the Trend.
10. Repeat steps 7 and 8, only this time, select the **Next Interval** option instead of the **Previous Interval** option. You will see that the **Next Interval** option sets the Trend to display the 5 minutes after the 5 minutes that were on display.

You have now edited some of the available settings for the x-axis. Next, you are going to Add the 'DI 1' Point's Historic Values to a Trend.

Further Information

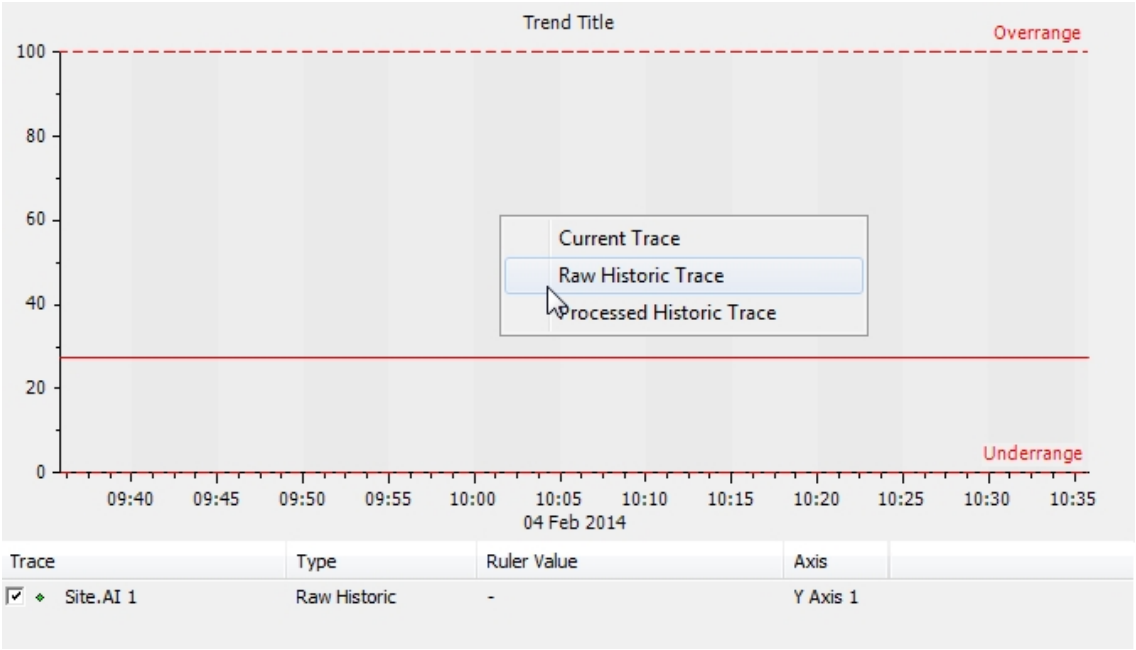
X-axis Configuration: *see* Configure the X-Axis.

Add the 'DI 1' Point's Historic Values to a Trend

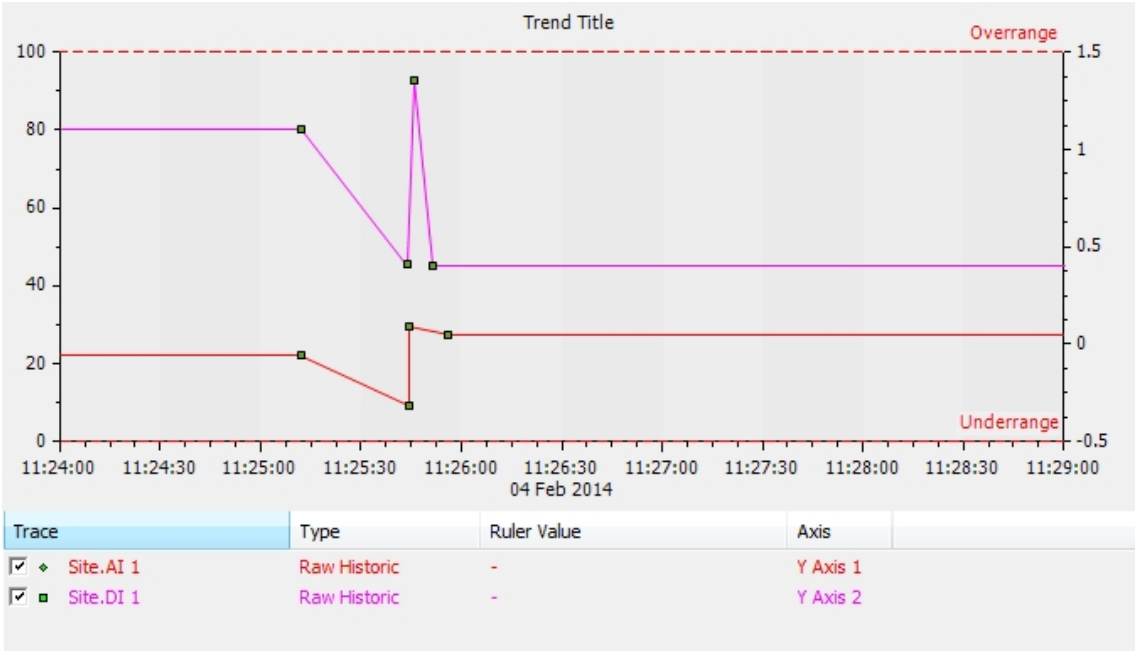
One of the major benefits of Trends is that they allow you to view and compare the values of multiple points simultaneously and in a graphical format.

On your Trend, you already have one trace that represents the 'AI 1' point, so now you are ready to add another trace. For the tutorial, you will add a trace for the 'DI 1' point:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, select the 'DI 1' point. With the left-hand mouse button still pressed down, drag the point onto the Trend to display a context sensitive menu.

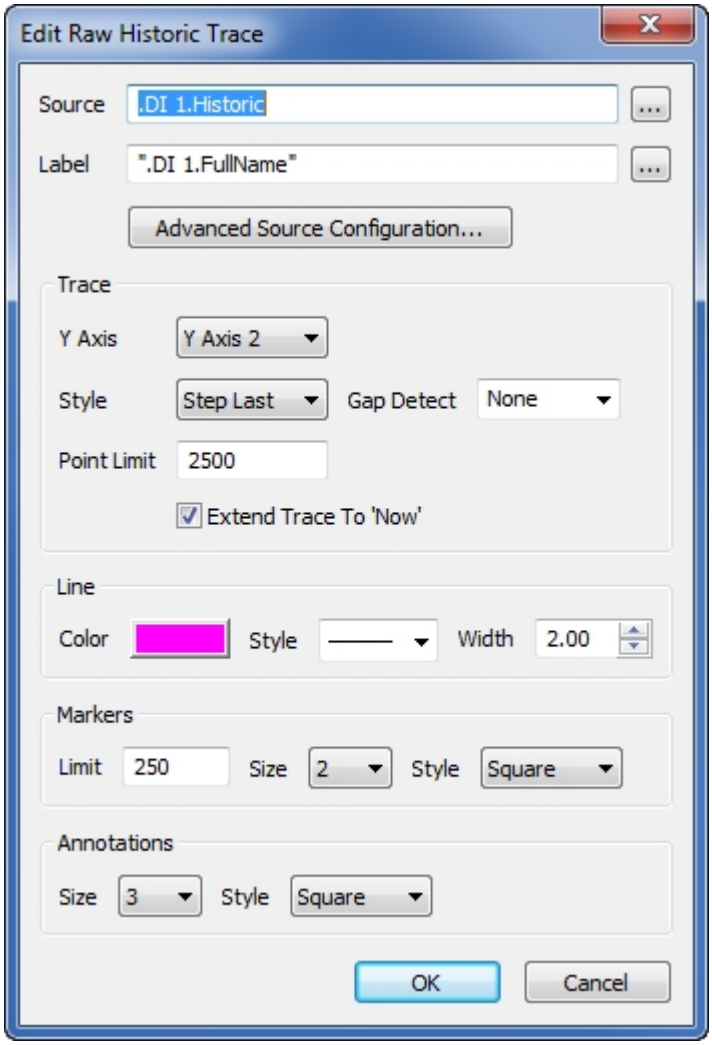


3. Select the **Raw Historic Trace** option to add a trace to the Trend. The trace will plot the reported historic values for the 'DI 1' point.

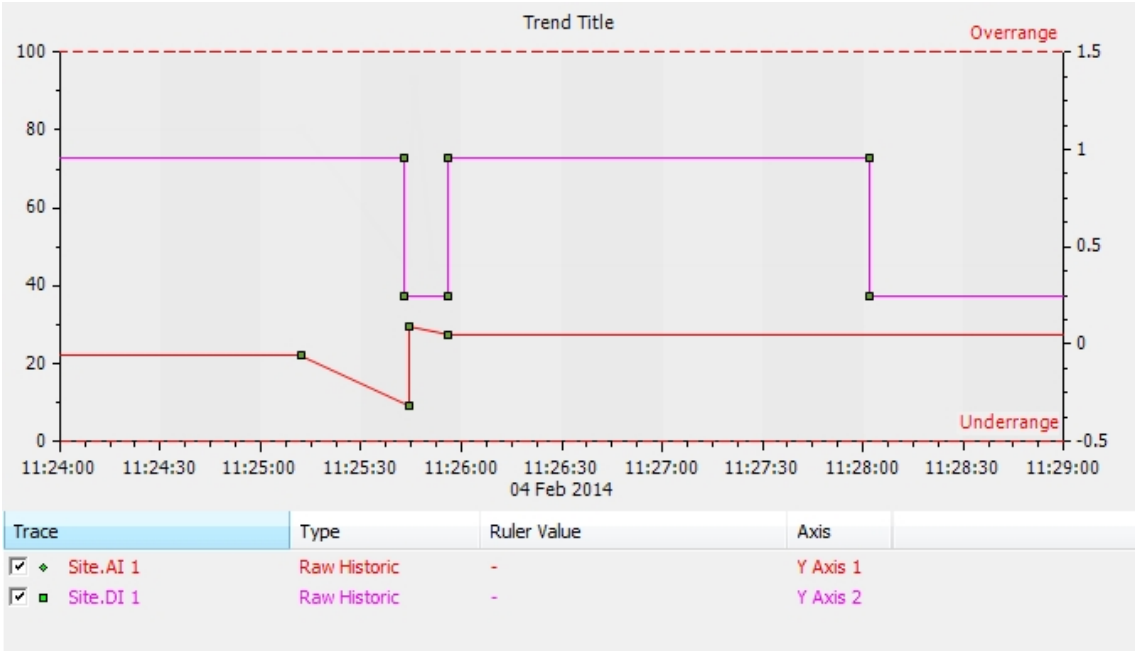


An additional y-axis has been added, as the 'DI 1' point has a different range of possible values than the 'AI 1' point. The y-axis can be placed on the right or left of the trend display.

4. Double-click on the 'Site.DI 1' trace in the key below the x-axis. This displays the Edit Raw Historic Trace window.



5. In the **Trace** settings, set the **Style** to **Step Last**. This changes the type of trace line that is shown—instead of a straight, angled line between markers, the trace will be drawn so that there is a right-angle between markers. The horizontal part of the right-angle is drawn from the previous marker and the vertical part of the right-angle indicates the latest value.



6. Save the Trend.

Further Information

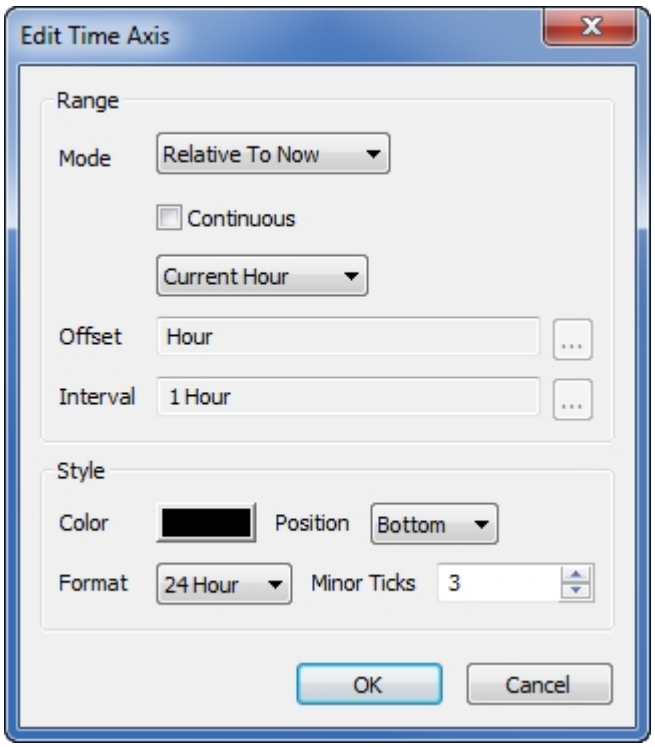
Trace Configuration: *see* Configure a Trace.

Copy the Trend Data to Microsoft Excel

You can copy data from your Trends to spreadsheet applications such as Microsoft Excel. You can then analyzes the data in the spreadsheet and use it for presentations.

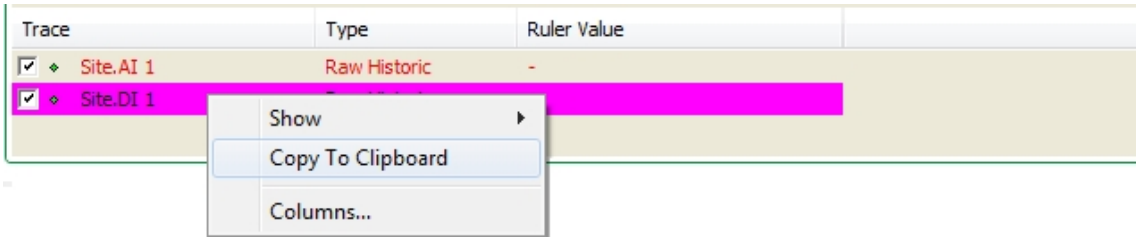
To copy your Trend data to Microsoft Excel:

1. Toggle the digital input and analog input signals on your plant simulation equipment so that you have noticeably varying values on display on the Trend (this makes it easier to see how the values are copied to a spreadsheet application).
2. On the Trend, right-click on the x-axis to display a context-sensitive menu, then deselect the **Continuous** option.



   This turns off the Continuous updating feature so that the Trend does not update during the copying process.

3. In the key, right-click on the point for which you want to copy data.
   A context-sensitive menu is displayed.



4. Select **Copy to Clipboard** from the context-sensitive menu.
5. Run Microsoft Excel.
6. In Excel, select **Edit>Paste** to add the data from the traces on your Trend to the Excel spreadsheet.

You have now configured items to represent your SCADAPack Modbus controller, its connection to Geo SCADA Expert, and its I/O. You have also configured a Mimic to show 'dynamic' data from the controller, and have configured a Trend so that it contains two traces. These same principles can be used when configuring other advanced drivers.

So are you ready to Test Your Knowledge on 'Live' Configuration?

Test Your Knowledge on 'Live' Configuration

You've now configured items that allow Geo SCADA Expert to communicate with a hardware device, in this case, a SCADAPack Modbus controller. Along the way, you have learned how to configure settings using Forms and editors such as the Mimic editor. But how much can you remember about everything you've learned? Put yourself to the test:

1. When configuring database items to represent plant that uses advanced drivers, such as a SCADAPack Modbus controller, there are at least three types of database item that you need to configure. What are they?
2. What type of database item represents the communications connection between Geo SCADA Expert and a device such as a SCADAPack Modbus controller?
3. What term is used as a generic term for devices such as SCADAPack Modbus controllers and PLCs?
4. An outstation set is only used internally by Geo SCADA Expert. But what does Geo SCADA Expert use an outstation set for?
5. If you want Geo SCADA Expert to keep a record of a point's values, what setting do you need to enable?
6. In Geo SCADA Expert, what is meant by the term 'animated object'?
7. What is dynamic data?
8. How can you filter an Alarms List so that it only displays alarms related to a specific database item?
9. A Mimic is displaying a list that shows 'live' I/O from a device. Its list entries suddenly change from black to magenta. What does this mean?
10. Trends are useful as they allow users to view and compare database values that have been reported over periods of time. They can be used as stand-alone displays but are often added to what other type of display?
11. What is the difference between a raw historic trace and a processed historic trace?
12. Why would a Trend need to show more than one y-axis?
13. You can configure an Offset and an Interval for the x-axis. But what do these settings do?
14. Which three Trend navigation tools have you used to change the time range that is displayed on the Trend?
15. How can you change the appearance of a trace?
16. How do you copy Trend data to a Third Party spreadsheet application?

Using a Virtual ViewX Client

NOTE: This branch of topics relates to the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS. For information about the deprecated Original WebX client that is supported by this and earlier versions of Geo SCADA Expert, click here.

You can use a web browser such as Google Chrome to access your system remotely. A PC that accesses the system via a web browser is called a Virtual ViewX client. You can use a Virtual ViewX client to access the operational features of Geo SCADA Expert, including alarm response features and controls. Your system's security settings (user accounts, permissions, passwords and so on) also apply to Virtual ViewX, and help to protect Geo SCADA Expert from unauthorized access by Virtual ViewX clients.

NOTE: Virtual ViewX typically provides operator-level access to many of the same features and functions as a ViewX Client. You can only use Virtual ViewX clients to make configuration changes to the Geo SCADA Expert database when the Virtual ViewX server is configured to run in **Full Virtual ViewX** mode (*see* Mode of Operation of a Virtual ViewX Server).

For the tutorial, you are going to access your system via an up-to-date version of Google Chrome, so you need to have this application installed on your PC. For information on Google Chrome, refer to the Google website at https://support.google.com. For information on other supported browsers *see* Web Browser Support.

If you haven't completed the earlier sections of the tutorial, you will also need to import some configuration. The configuration comprises a collection of database items with which you can interact and use to generate values and alarms:

1. Log On to ViewX as the user 'EngExample' (*see* Log on to your System).
2. Display the Database Bar (see Display an Explorer Bar).
3. In the Database Bar, right-click on the System icon then select **Import** from the context-sensitive menu. This displays the Import From window.
4. In Windows, browse to `C:\Program Files\Schneider Electric\ClearSCADA\Tutorial Files`.
5. Select the SerialComms.sde file
6. Select the **Open** button to close the Import From window and import the file.
7. Repeat this process, only instead of importing the SerialComms.sde file, import the following files (in the order shown below):
   - MyFirstTest.sde
   - SiteTemplate.sde
   - SiteABCInstance.sde
   - SiteDEFInstance.sde

When you have installed the Google Chrome browser on your PC and you have imported the configuration (if required), you can proceed to access your system via the web interface:

1. Display the Virtual ViewX Interface and Log On to the System.
2. Use the Mimic Navigation Tools to Access other Displays.
3. Display a List of System Alarms via Virtual ViewX.
4. Display a List of System Events via Virtual ViewX.
5. Display a Queries List via Virtual ViewX.

   NOTE: If you are automatically logged off when using Virtual ViewX, you should log back on using the 'EngExample' user account.

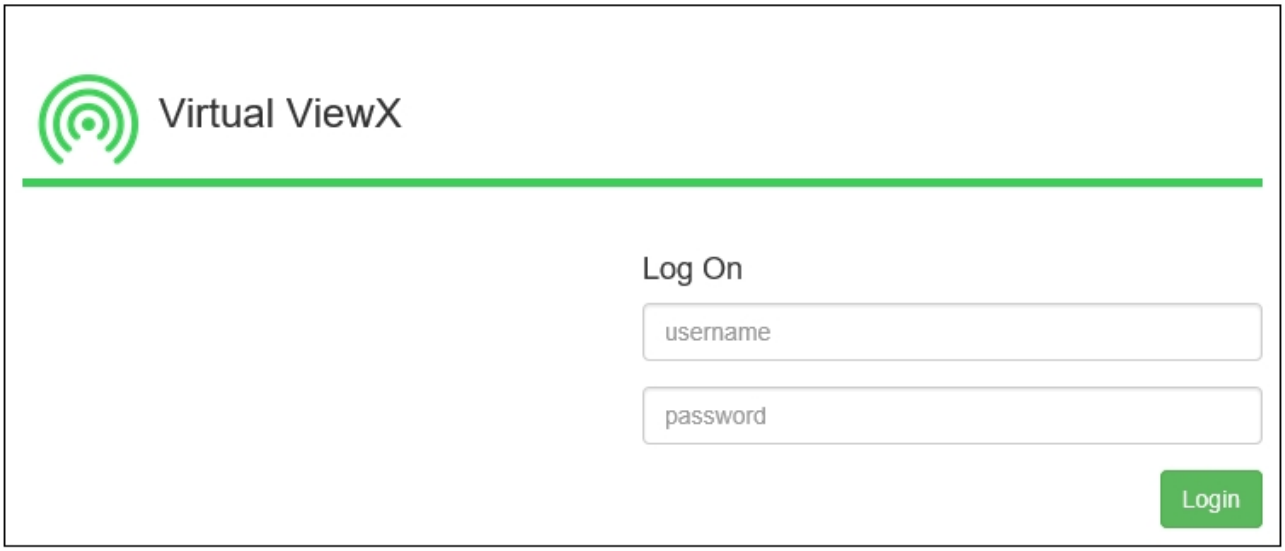
NOTE: The ViewX Ribbon is minimized by default on a Virtual ViewX client. You can still use the ribbon while it is minimized, or you can expand the ribbon if required.

Display the Virtual ViewX Interface and Log On to the System

To display the Virtual ViewX interface:

1. Run Google Chrome.
2. To display the Virtual ViewX interface from a Geo SCADA Expert server, enter `http://localhost:85/` in the **Address** field.

   To display the Virtual ViewX interface from a client, enter the server name in the **Address** field.
3. Press the **Enter** key. This displays the initial Virtual ViewX page.



Diagnostic messages appear briefly onscreen, displaying information about:

- The status of the Virtual ViewX client's connection to the Web server
- The status of the Geo SCADA Expert server that is hosting the database.

NOTE: If the initial Virtual ViewX page is not displayed, there may be a certificate error. You may need to use an alternative address or port number. For more information, see Run a Virtual ViewX Client in the Geo SCADA Expert Guide to ViewX and Virtual ViewX Clients.

The Log On window is also displayed. To access the Geo SCADA Expert database, you need to log on to Virtual ViewX using a valid user account. As with ViewX, access to your database via the web is dependent on the permissions that are allocated to your user account.

To log on to the system via the Virtual ViewX Log On window:

1. Leave the **System** field in the Log On window at the default.
2. In the **User Name** field, enter: `EngExample`
3. In the **Password** field, enter the password for the 'EngExample' user. (Your system administrator might provide you with a password, or you might be required to set a new password when you first attempt to log on as the 'EngExample' user.)

4. Select the **Log On** button.

   At this stage, you will either be logged on as the ‘EngExample’ user, or Google Chrome will display a message regarding certificates. If the browser displays a page titled ‘There is a problem with this website’s security certificate’ (or similar), it means that you do not have a trusted certificate. You can select the **Continue to this website (not recommended)** option to proceed without a trusted certificate.

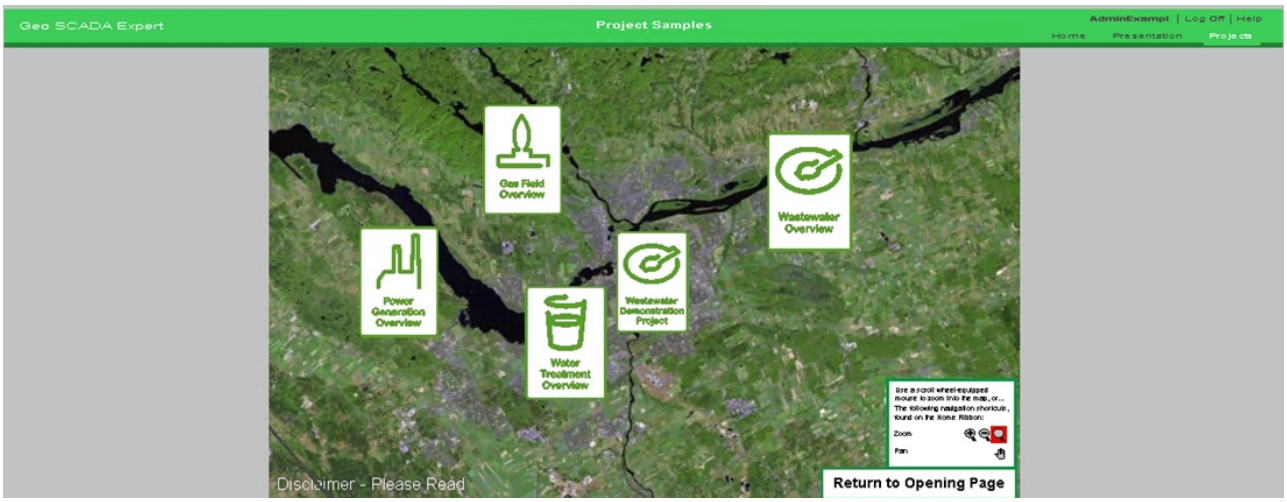
You are now logged on as the 'EngExample' user.

Now that you have logged on, you can use the Virtual ViewX interface to operate your system. You navigate the items and data in your system in the same way on both ViewX and Virtual ViewX clients (*see* Explorer Bars).

Use the Mimic Navigation Tools to Access other Displays

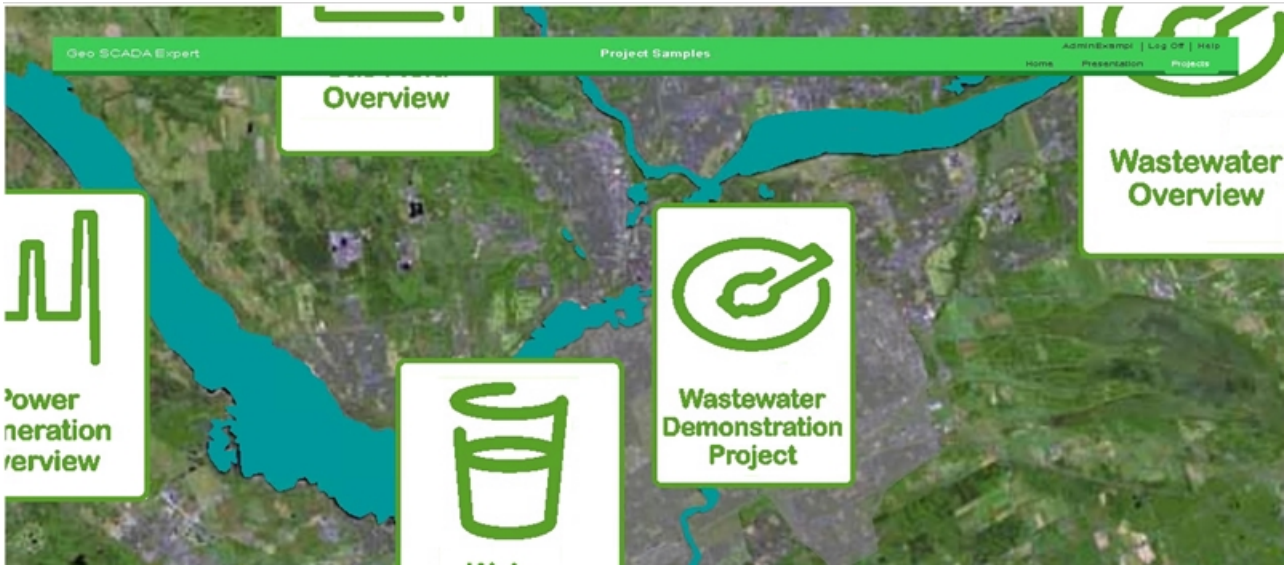
We want you to experience the various navigation tools and see the different types of display that can be shown, so please perform the following:

1. Display the Database Bar (*see* Explorer Bars).
2. In the Database Bar, expand the **Example Projects** folder.
3. Select the **Projects Overview** entry.
   The Projects Overview Mimic is displayed. The Mimic shows a map of a geographical area. At its default size, the map shows quite a large area with little detail.



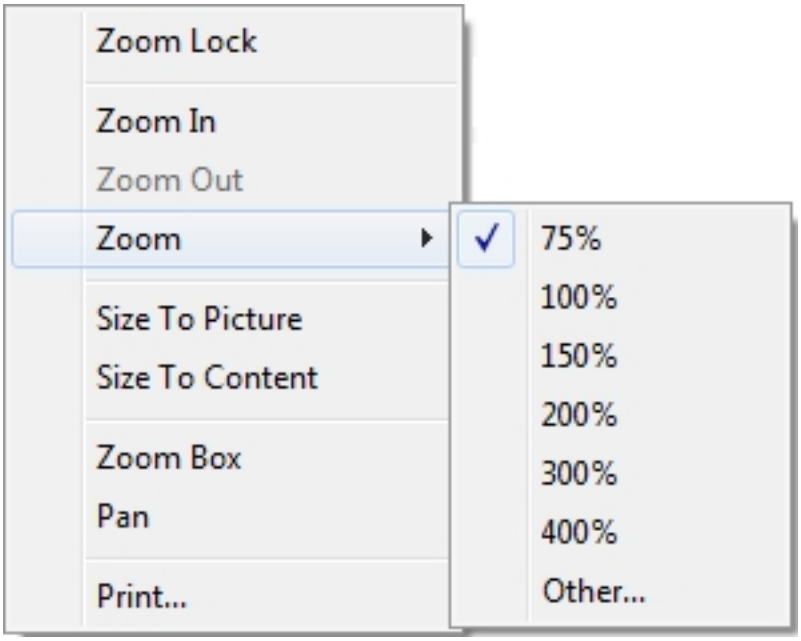
NOTE: You can also display the '**Projects Overview**' Mimic directly from the 'EngExample' user's home page Mimic. That Mimic (called '**Opening Page**') contains two links, '**Presentation**' and '**Projects**'. These are animated to act as hyperlinks—when you select them, they take you to another display. You can select the '**Projects**' link to display the '**Projects Overview**' Mimic shown above.

4. If you have a mouse wheel, roll the wheel forward to zoom in on the map. As you increase the level of magnification, more detail is revealed, including road networks and embedded Mimics that show the locations of different sites.



If you are using a mouse that has no wheel, you can change the magnification level using the context-sensitive menu:

i. Right-click on a blank part of the Mimic.
A context-sensitive menu is displayed.



ii. Either:

- Select the **Zoom In** option (to magnify the image by a pre-defined amount).

Or:

i. Select the **Zoom** option.
ii. Select the percentage by which you want to magnify the image.

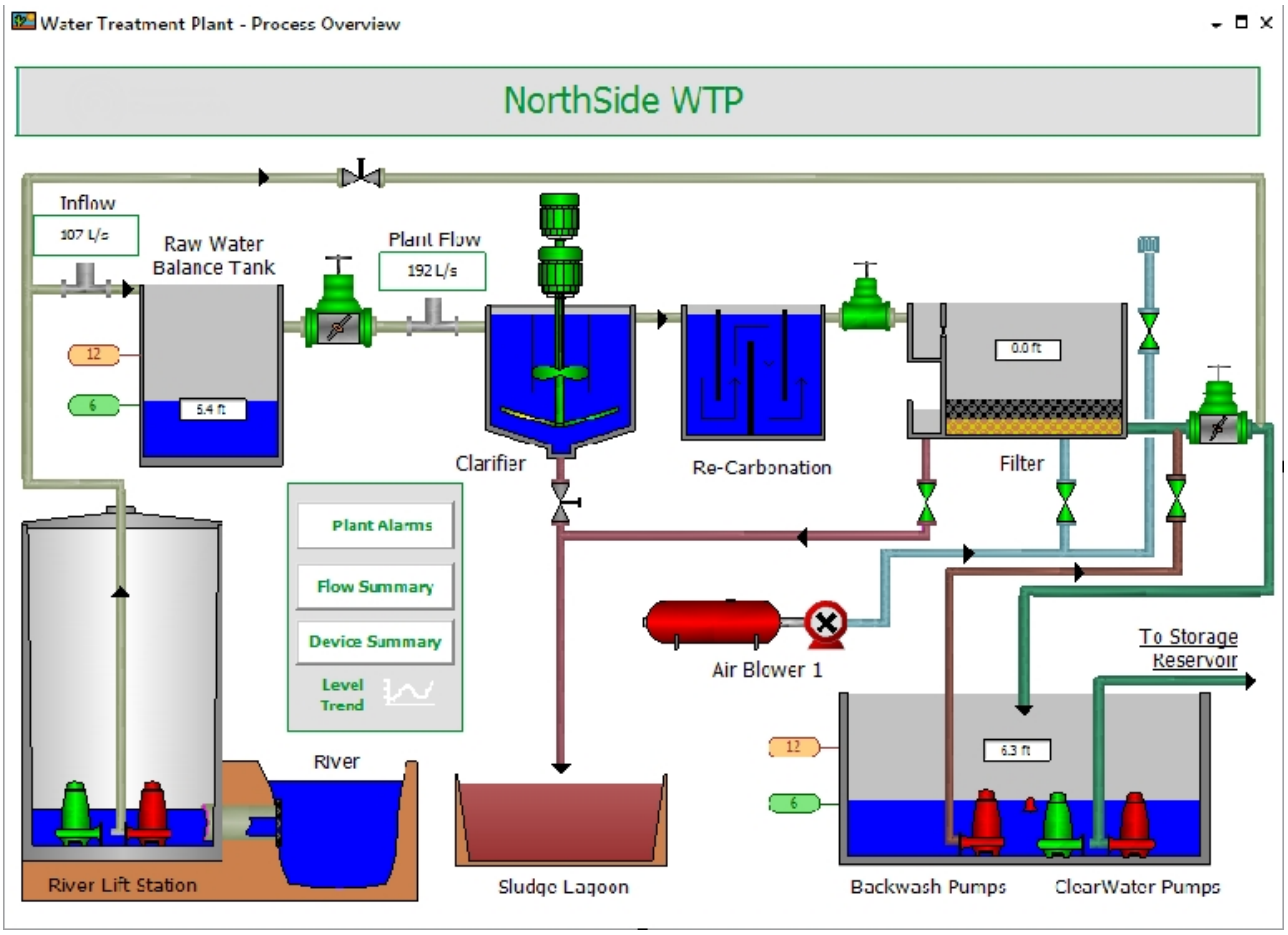
Or:

i. Select the **Zoom** option.
ii. Select the **Other** option.

The Select Zoom window is displayed.

iii. Specify the amount by which you want to magnify the image.

5. Select the 'Water Treatment Overview' embedded Mimic. This embedded Mimic has been configured to act as a hyperlink to another display—the 'Process Overview' Mimic.



6. On the 'Process Overview' Mimic, select the 'Air Blower 1' item to display a context-sensitive menu. As in ViewX, Mimic objects can provide access to context-sensitive menus that relate to the database item that is used to animate the Mimic object.
7. Select the **Device Menu** option, followed by the **Hand Control** option.
   The Hand Control window is displayed.
8. Set the **Value** to Running, and then select the **OK** button to confirm.
   You will see that the 'Air Blower' object on the Mimic changes color to indicate that it is running. You have now issued a control via the Virtual ViewX interface.
9. Perform another **Hand Control** to the 'Air Blower 1' object, only this time set its **Value** back to 'Stopped'.
10. Select the 'Flow Summary' button on the Mimic.
    The 'Flow Summary' Mimic is displayed.

    As the 'Flow Summary page' does not contain any hyperlinks, you cannot use it to access other displays. But you can return to the previous page you viewed by selecting the web browser's **Back** button. Each time you press the **Back** button, you return to the previous page you viewed in sequence. Similarly, if you select the **Forward** button, you display the next page you viewed in sequence.

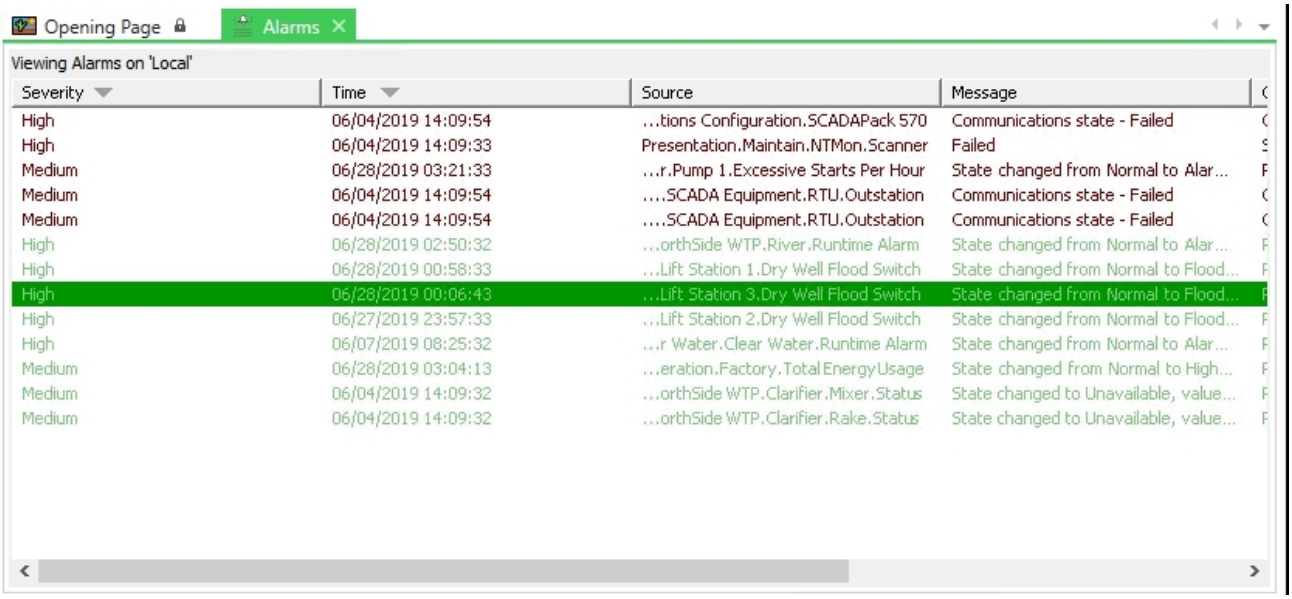
Now that you are familiar with some of Virtual ViewX client's navigation tools, you can proceed to Display a List of System Alarms via Virtual ViewX.

Display a List of System Alarms via Virtual ViewX

You can use Virtual ViewX to display an unfiltered list of alarms on your system. You can then filter the Alarms List as required and use it to respond to alarm conditions.

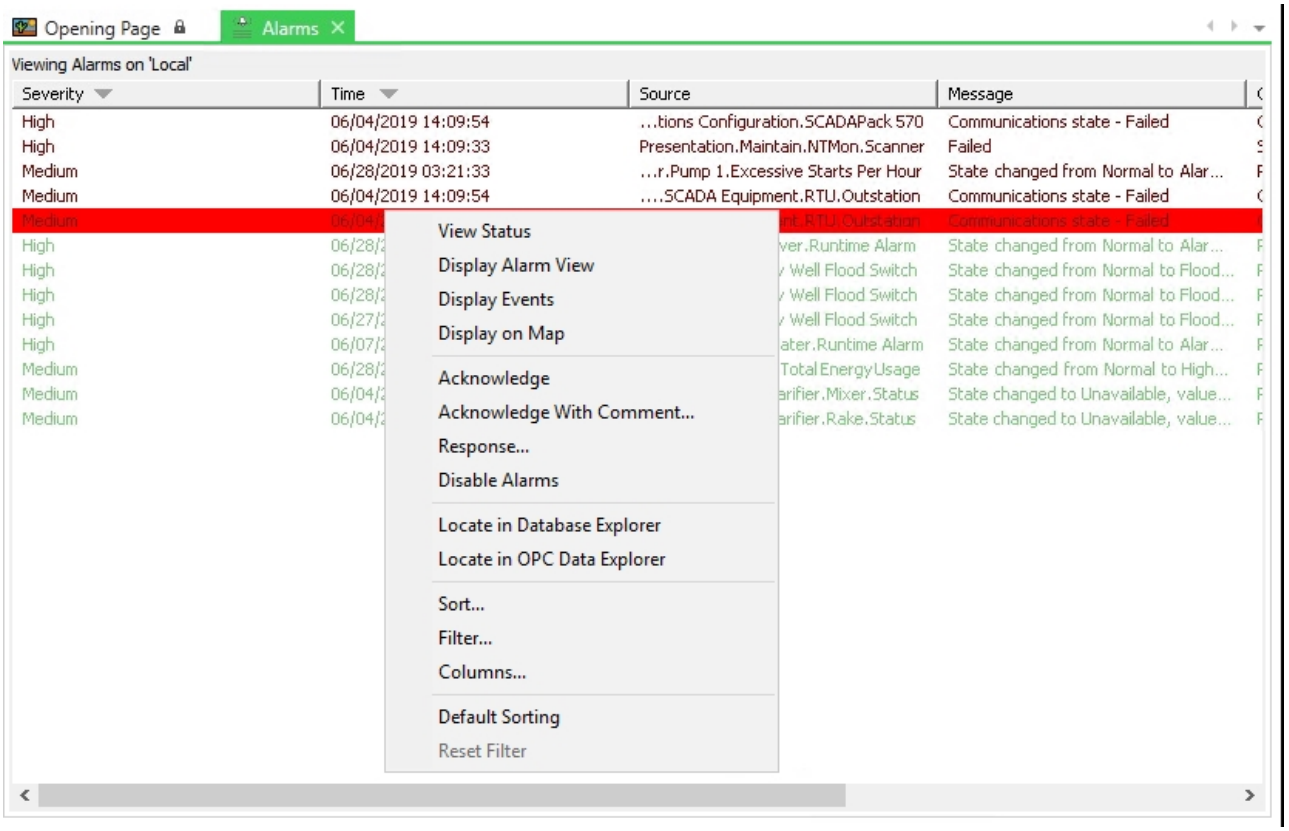
To display an unfiltered Alarms List:

1. Select the **Alarms** button from the **Operate** command group on the ViewX client ribbon's **Home** tab.
   *The **Alarms** List is displayed.*



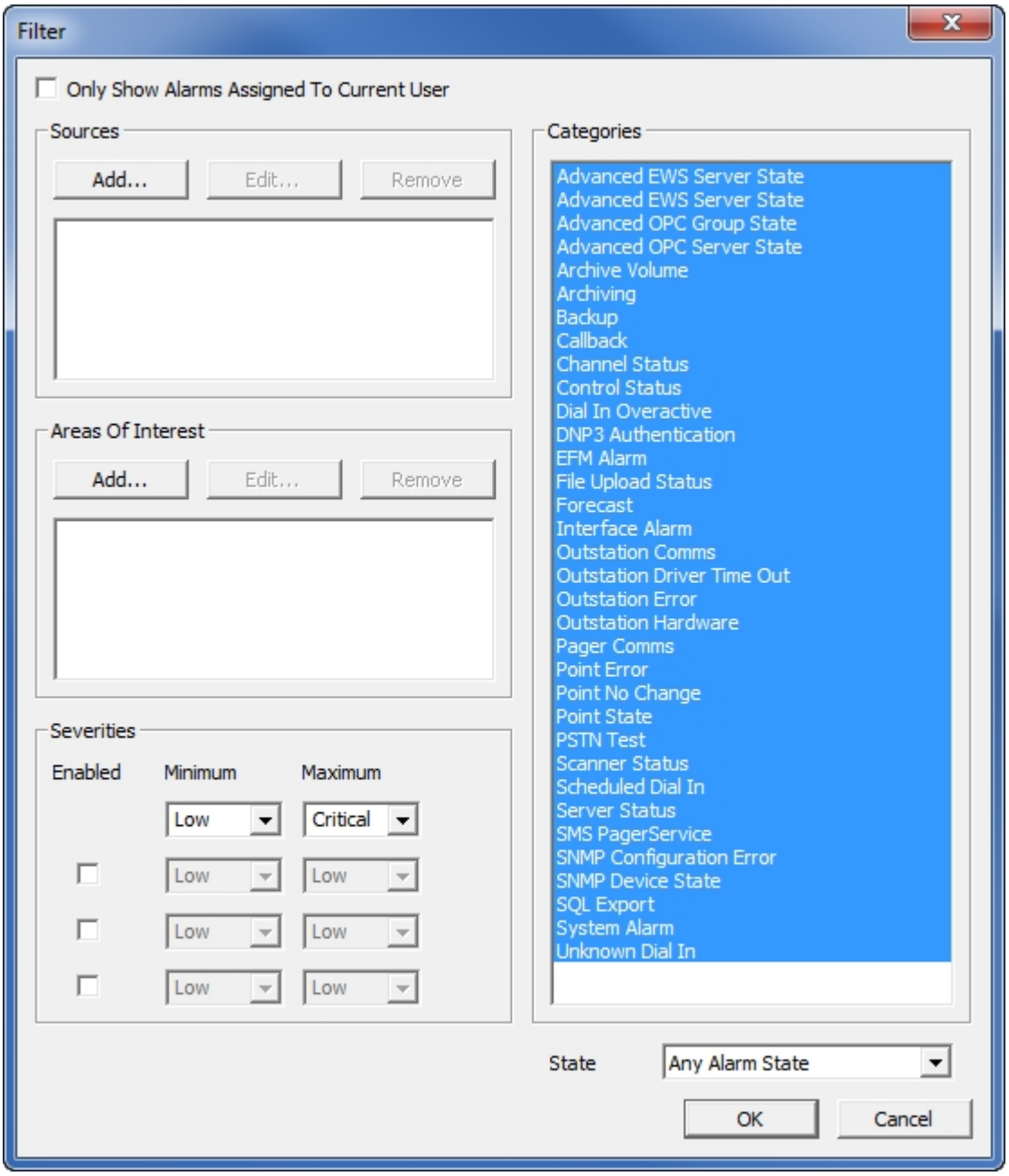
The **Alarms** List contains a list of the alarms on your system, and the alarm information is categorized under headings such as **Severity**, **Time**, **Source**, **Message**, and **Category** in the same way as alarms that are shown on the alarm displays in ViewX.

1. Right-click on one of the alarms in the list to display a context-sensitive menu.



You can see that on the context-sensitive menu for the alarm, you have access to the alarm response options such as **Acknowledge** and **Acknowledge with Comment**. These alarm response features work the same way as on a ViewX client, enabling operators and engineers can manage alarms remotely.

2. Select the **Filter** option from the context-sensitive menu, to display the Filter window.



You can use the Filter window to restrict the Alarms List so that it only shows alarms that meet certain criteria.

3. Use the Filter window to restrict the Alarms List so that it only shows alarms that relate to the items in the 'SiteABC' Group Instance. To do this, you need to:
   i. Select the **Add** button in the **Sources** section to display the Add Source window.
   ii. Use the browse button feature of the **Source** field to associate the source with the 'SiteABC' Group Instance.
   iii. Select the **OK** button to confirm and close the Add Source window. You will see that the Sources list now contains 'SiteABC.*' which means the Alarms List is filtered to only show alarms for items that are in the 'SiteABC' Group or its subgroups.

iv. Select the **OK** button to confirm your selection and close the Filter window.
The Alarms List is filtered so that it only shows alarms for items in the 'SiteABC' Group Instance (it doesn't have any subgroups).

Now that you have displayed the System Alarms web page and learned how to access the filter settings, you can proceed to the next section: Display a List of System Events via Virtual ViewX.

Further Information

Alarms Lists in the Geo SCADA Expert Guide to Alarms.

Use the Filter Window to Filter Alarm Entries, this topic describes the filter process in ViewX, but the same principles apply in Virtual ViewX.

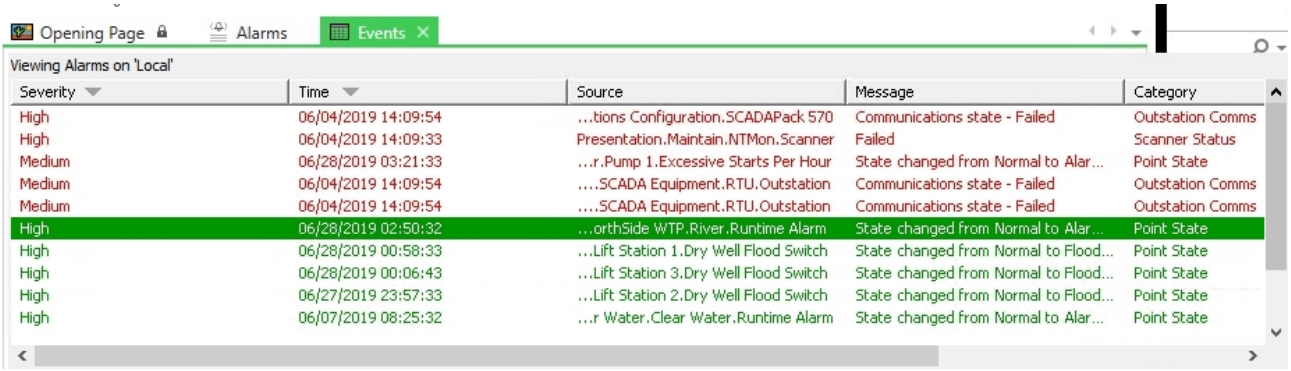
Display a List of System Events via Virtual ViewX

You can also use Virtual ViewX to display an unfiltered list of events on your system. The Events List is a record of what has occurred on your system, with the event, time of event and user that instigated the event (where applicable) included.

To display an unfiltered list of Events on your system:

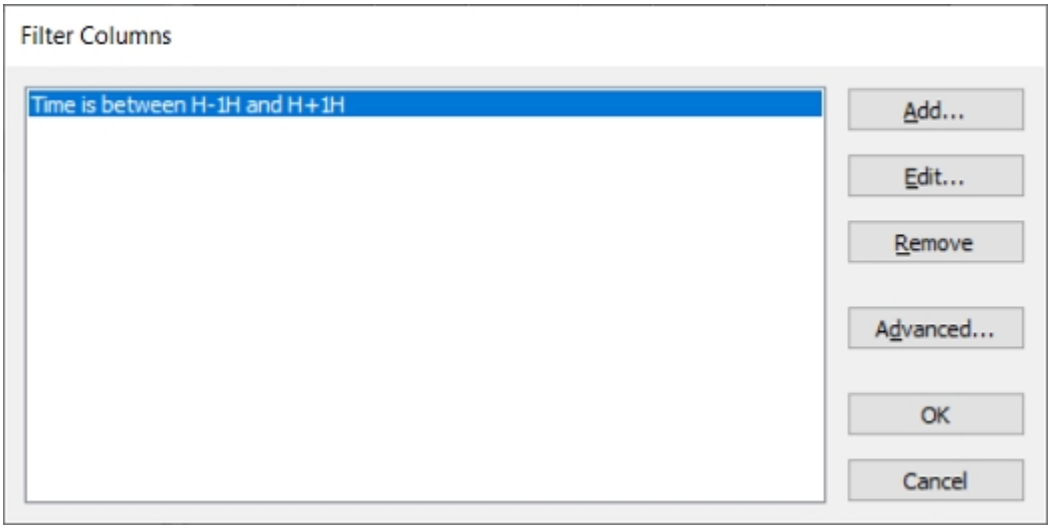
1. Select the **Events** button from the **Operate** command group on the ViewX client ribbon's **Home** tab.

   *The **Events** List is displayed.*



   The Events List shows the events that Geo SCADA Expert has logged on your system over a defined time period. The time period is the amount of time defined in the **Event List Range** for your user account (the **Event List Range** defined for the system is used for Guest users).

2. Right-click on an Event to display a context-sensitive menu.
3. Select the **Filter** option to display the Filter Columns window.



   The Filter Columns window shows the filters that are currently in place. The only filter should be a time filter that matches the setting defined in the **Event List Range** for the 'EngExample' user.

4. Select the **Add** button to display the Add Filter window. You can use the Add Filter window to apply additional filters to the Events List.
5. On the Add Filter window, set the top field to **User**, the operation to **Is Equal To** and then enter the following in the bottom field:

```
EngExample
```

This will filter the Events List so that it only shows those events that have 'EngExample' as their entry in the **user** category (events that are related to the activity of the 'EngExample' user).

6. Select the **OK** button to confirm and close the Add Filter window.
7. Select the **OK** button to confirm your selections and close the Filter Columns window. The Events List is filtered so that it only shows those events that:
   - Were logged in the period starting from 1 hour prior to the start of the current hour and ending 1 hour after the start of the current hour

   and

   - Have 'EngExample' as their entry in the user category (indicating events that were generated in response to your actions as the 'EngExample' user).
8. Display the Filter Columns window for the Events List.
9. Select the **User is equal to EngExample** filter, then select the **Remove** button to delete this filter.
10. Select the **OK** button to confirm your choice and close the Filter Columns window.
11. Right-click on the Events List to display a context-sensitive menu.
12. Select the **Sort** option to display the Sort Order window.
13. Use the Sort Order window to define the order in which events are listed:
    i. Select the **Add** button to display the Add Column window.
    ii. Set the **Column** combo box to **Severity**. This will add another type of sort order to the Events List—it will sort the list according to the Severity level of the events.
    iii. Set the **Direction** combo box to **Descending**. This sets the Events List to show the events with the highest level Severity values at the top.
    iv. Select the **OK** button to close the Add Column window.
    v. Select the **Severity** sort method in the list.
    vi. Select the **Move Down** button to move the Severity sort method down one place in the list. The Sort Order is applied according to the order of sort methods in the list, with the sort order at the top being applied first.
    vii. Select the **OK** button to close the Sort Order window and apply the new sort order. The Events List is now sorted so that:
       - The events are listed in time order, with the events with the latest time stamps shown at the top.
       - Any events that have the same time stamp are then sorted according to their Severity. The Severity sort method is only applied to events that have the exact same time stamps, and the highest level severities are shown above the lower level severities.
       - Any events that have the same time stamps and same severity levels are sorted according to their Sequence Number.

You've now displayed the System Events List in Virtual ViewX and have applied a filter and sort order. Next, you will Display a Queries List via Virtual ViewX.

Further Information

Events Lists in the Geo SCADA Expert Guide to Lists.

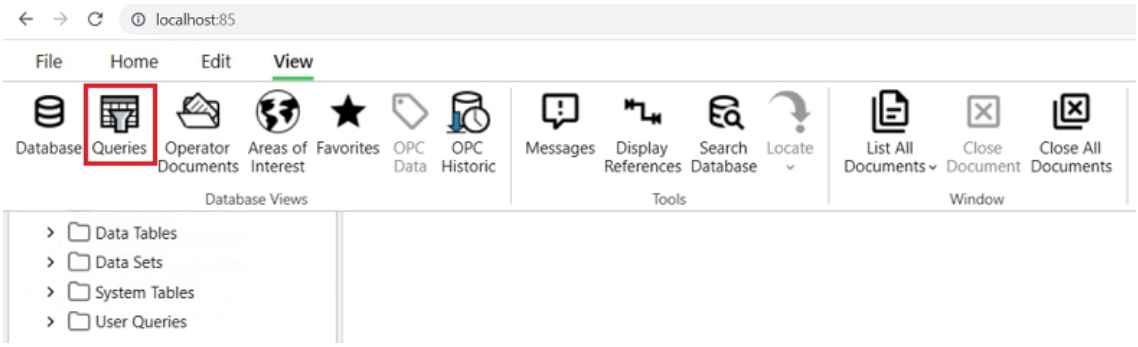
Display a Queries List via Virtual ViewX

You can use Virtual ViewX to access the SQL Queries Lists that are available on your system, such as the Points List. These are the same Lists that you can access in ViewX.

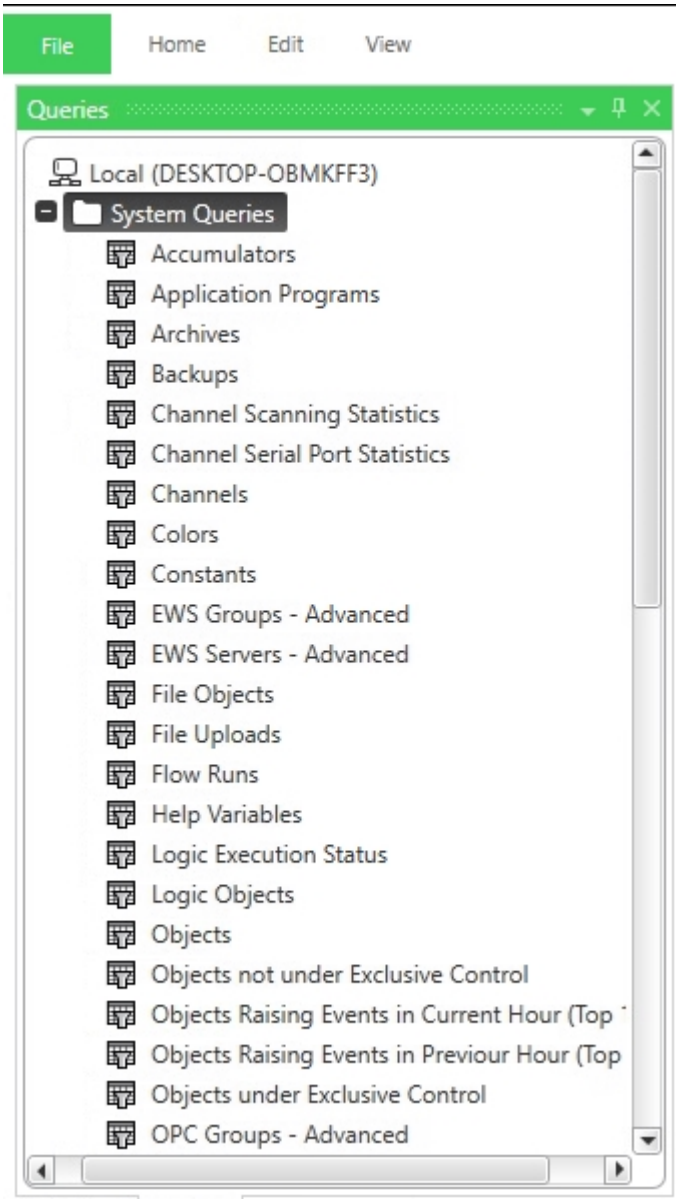
To display a Queries List:

1. Select the **View** tab to display the ViewX ribbon. (The ribbon is minimized by default on a Virtual ViewX client.)
2. Select the **Queries** button on the ViewX client ribbon's **View** tab.

   *The **Queries** Bar is displayed.*



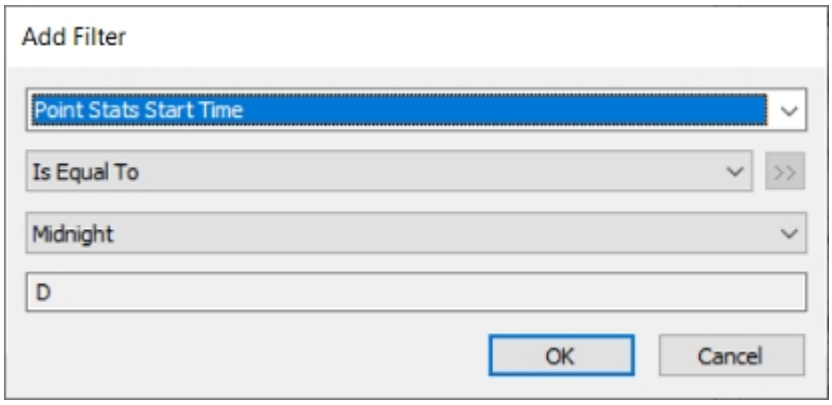
3. Select the plus symbol next to the **System Queries** entry to expand that branch of the Queries Bar. The branch provides access to various types of List, for example, to the Channels List, Points List, and so on.



4. Use the vertical scroll bar to scroll down to the **Points** entry.
5. Select the **Points** entry display the Filter Columns window for the Points List. You can use the Filter Columns window to restrict the Points List so that it only displays points with certain properties or values. For this tutorial, you are going to filter the Points List so that it only shows SCADAPack Modbus digital input points.

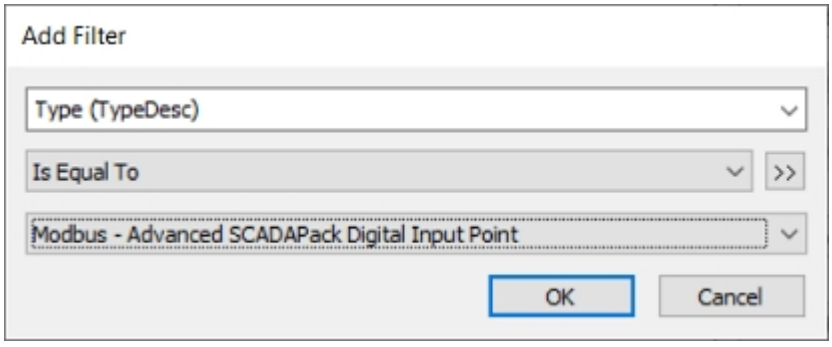


6. Select the **Add** button to display the Add Filter window.



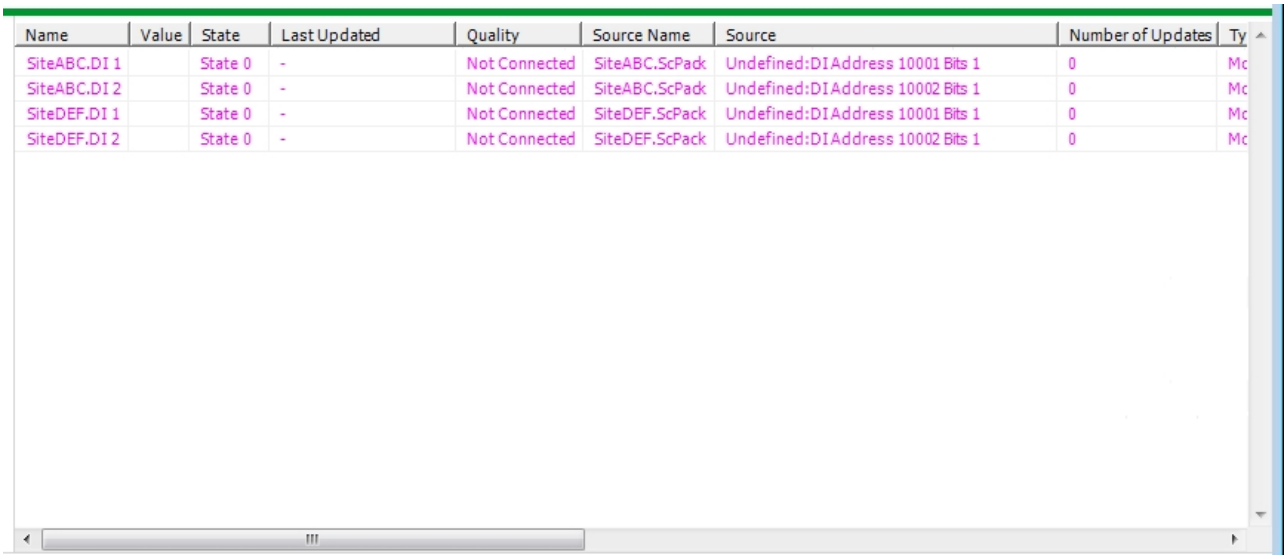
7. Use the Add Filter window to apply a filter:
   i. Set the top combo box to **Type (TypeDesc)**
   ii. Set the middle combo box to **Is Equal To**
   iii. Set the bottom combo box to **Modbus - Advanced SCADAPack Digital Input Point**.

   This restricts the list so that it only displays points that have a **TypeDesc** value of Modbus - Advanced SCADAPack Digital Input Point (points that are SCADAPack Modbus digital input points).



8. Select the **OK** button to confirm your selection and close the Add Filter window.
9. Select the **OK** button on the Filter Columns window to confirm your selection and close the Filter Columns window.

   The Points List is filtered so that it only displays SCADAPack Modbus digital input points:



Name	Value	State	Last Updated	Quality	Source Name	Source	Number of Updates	Ty
SiteABC.DI 1		State 0	-	Not Connected	SiteABC.ScPack	Undefined:DI Address 10001 Bits 1	0	Mc
SiteABC.DI 2		State 0	-	Not Connected	SiteABC.ScPack	Undefined:DI Address 10002 Bits 1	0	Mc
SiteDEF.DI 1		State 0	-	Not Connected	SiteDEF.ScPack	Undefined:DI Address 10001 Bits 1	0	Mc
SiteDEF.DI 2		State 0	-	Not Connected	SiteDEF.ScPack	Undefined:DI Address 10002 Bits 1	0	Mc

Now that you know how to access Queries Lists in Virtual ViewX, you can Log Off from Virtual ViewX.

Further Information

Display and Use Lists in the Geo SCADA Expert Guide to Lists.

Understand the Queries Bar branch structure: *see* Queries Bar.

Log Off from Virtual ViewX

You've now learned how to access Mimics, the Alarms List, the Events List, Queries Lists, and information about database items via the Virtual ViewX interface. You've also learned how to apply sorting and filters to lists. Before you Test Your Knowledge on the Virtual ViewX Interface, you should log off. To do this:

- Select the **Log Off** button  from the **Security** command group on the ViewX client ribbon's **Home** tab.

Now let's see how much you have learned—proceed to Test Your Knowledge on the Virtual ViewX Interface.

Further Information

The ViewX Ribbon.

Test Your Knowledge on the Virtual ViewX Interface

How much do you know about the Virtual ViewX interface? Try and answer the following questions:

1. Virtual ViewX is designed to allow remote access, but can it be used to access your system from anywhere?
2. Apart from remote access and appearance, what is the main difference between Virtual ViewX and ViewX?
3. What features are used to help prevent unauthorized access via a Virtual ViewX client?
4. How do you access Virtual ViewX?
5. If you don't have a mouse with a wheel, how can you zoom in on a Mimic in Virtual ViewX?
6. You can use your web browser's **Back** and **Forward** buttons to navigate through Virtual ViewX displays in the order in which you originally displayed them. But what other ways are there of accessing different Virtual ViewX displays?
7. You want to display status information about a specific point. How might you do this in Virtual ViewX?
8. You are logged on via a Virtual ViewX client when an alarm is raised. You are responsible for responding to the alarm, so what do you do?
9. How can you filter the Alarms List so that it only displays alarms that relate to items in a specific Group?
10. You display the Events List and its entries are sorted in Time order. You want them to be sorted according to their Severity and so create a new Severity sort method. You apply the Severity method but the Events List still appears to be sorted according to time. Do you know why?
11. You want to perform a Hand Control on a database point via Virtual ViewX. How would you achieve this?
12. The Alarm Banner contains an alarm that is associated with a database item. You want to locate that database item in the database. How would you do this?

Using an Original WebX Client

ATTENTION: This topic relates to the deprecated Original WebX client that is supported by this and previous versions of Geo SCADA Expert. For information about the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS, click here.

You can use a web browser such as Microsoft Internet Explorer to access your system remotely. A PC that accesses the system via a web browser is called a WebX client. You can use a WebX client to access the operational features of Geo SCADA Expert, including alarm response features and controls. Your system's security settings (user accounts, permissions, passwords and so on) also apply to WebX, and help to protect Geo SCADA Expert from unauthorized access by WebX clients.

NOTE: WebX provides access to operator-level features. For configuration features, you need to use a ViewX client.

For the tutorial, you are going to access your system via Microsoft Internet Explorer, so you need to have this application installed on your PC. The minimum requirement is for Microsoft Internet Explorer 11. For information on Microsoft's web browser applications, please refer to the Microsoft website at www.microsoft.com.

ATTENTION: Original WebX uses Microsoft ActiveX Controls technology to display various types of document. ActiveX Controls are only supported by Microsoft Internet Explorer®. To access the suite of functions and types of display to which Geo SCADA Expert's web client and your user account provides access, we recommend that you use Internet Explorer 11 to run Original WebX. Other web browsers provide access to a sub-set of functionality and document types. The interface layout varies slightly between browsers. The Original WebX documentation in the online Help explains Original WebX functionality that is available using Internet Explorer 11.

If you haven't completed the earlier sections of the tutorial, you will also need to import some configuration. The configuration comprises a collection of database items with which you can interact and use to generate values and alarms:

1. Log On to ViewX as the user 'EngExample' (*see* Log on to your System).
2. Display the Database Bar (see Display an Explorer Bar).
3. In the Database Bar, right-click on the System icon then select **Import** from the context sensitive menu. This displays the Import From window.
4. In Windows, browse to C:\Program Files\Schneider Electric\ClearSCADA\Tutorial Files.
5. Select the SerialComms.sde file.
6. Select the **Open** button to close the Import From window and import the file.
7. Repeat this process, only instead of importing the SerialComms.sde file, import the following files:
   - MyFirstTest.sde
   - SiteTemplate.sde

- SiteABCInstance.sde
- SiteDEFInstance.sde

When you have installed the relevant Internet Explorer software on your PC and you have imported the configuration (if required), you can proceed to access your system via the web interface:

1. Display the WebX Interface.
2. Log on to the System via WebX.
3. Use the Navigation Tools to Access other Displays.
4. Access Database Items via WebX.
5. Display a List of System Alarms via WebX.
6. Display a List of System Events via WebX.
7. Display a Queries List via WebX.

> **NOTE:** If you are automatically logged off when using WebX, you should log back on as the 'EngExample' user.

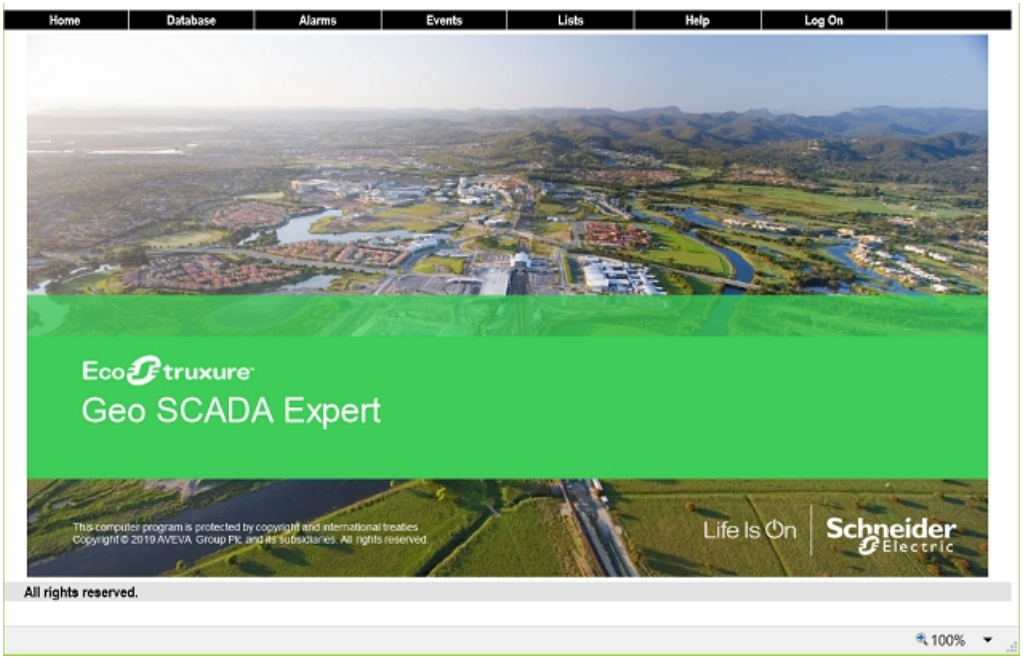
Display the WebX Interface

ATTENTION: This topic relates to the deprecated Original WebX client that is supported by this and previous versions of Geo SCADA Expert. For information about the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS, click here.

To display the WebX interface:

1. Run Internet Explorer.
2. To display the WebX interface from a Geo SCADA Expert server, enter `http://localhost` in the **Address** field.

   To display the WebX interface from a client, enter the server name in the **Address** field.
3. Press the **Enter** key. This displays the WebX home page.



NOTE: If the WebX home page is not displayed, there may be a certificate error. You may need to use an alternative address or port number. For more information, *see* Run a Virtual ViewX Client in the Geo SCADA Expert Guide to ViewX and Virtual ViewX Clients.

The WebX home page contains a navigation bar featuring the following buttons:

- **Home—**Displays the WebX home page.
- **Database—**Displays the System web page, which provides hyperlinks to the items in your database.
- **Alarms—**Displays the Alarms List for your system. If your user account has sufficient permissions, you can use the Alarms List to view and manage any alarms on your system.
- **Events—**Displays the Events List for your system. If your user account has sufficient permissions, you can use the Alarms List to view any events logged on your system.

- **Lists—**Displays the List web page, which provides hyperlinks to the SQL Queries Lists for your system. The Queries Lists work in the same way as in ViewX except that they are view only—you cannot use them to access other displays, actions, etc.
- **Help—**Displays comprehensive information about Geo SCADA Expert system operation, configuration and management. *See* Geo SCADA Expert Help.
- **Log On—**Allows you to log on to the system.

When you have displayed the WebX home page, proceed to Log on to the System via WebX.

Further Information

Understand WebX: see Original WebX Client in the Geo SCADA Expert Guide to ViewX and Virtual ViewX Clients.

Log on to the System via WebX

ATTENTION: This topic relates to the deprecated Original WebX client that is supported by this and previous versions of Geo SCADA Expert. For information about the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS, click here.

When you first display the WebX interface, you are logged on as the Guest user and so have read-only access to your system. As with ViewX, access to your database via the web is dependent on the permissions that are allocated to your user account.

When using the WebX interface, you need to log on to the system before you can access the various features.

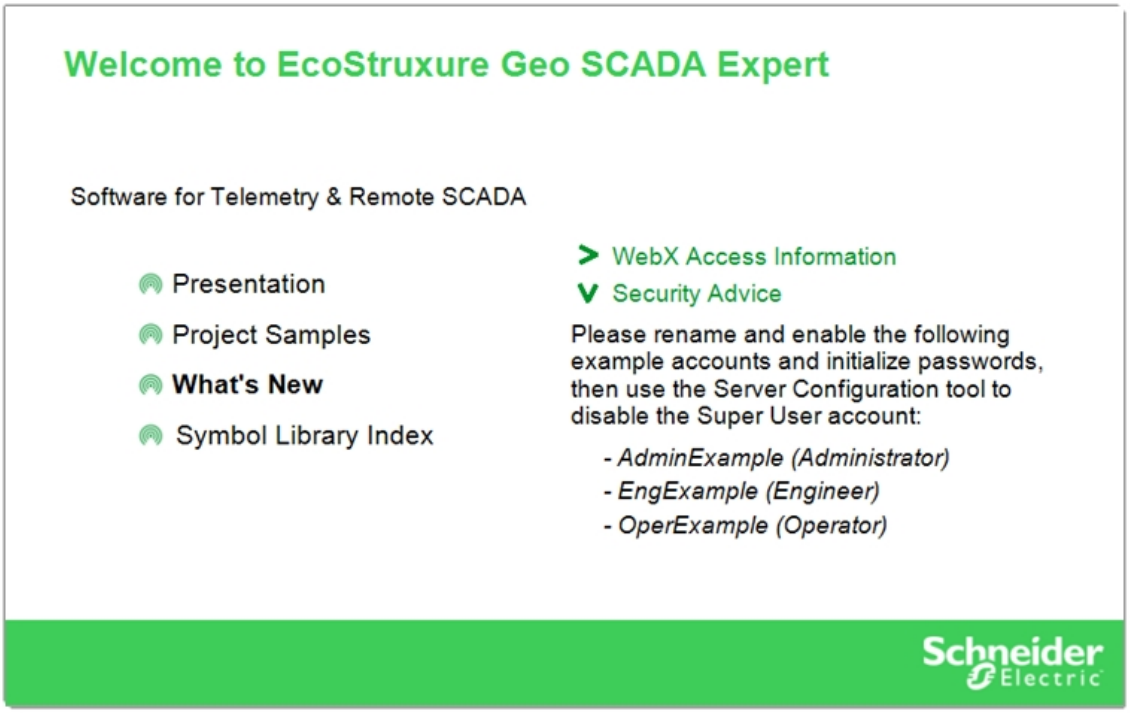
To log on to the system via the WebX interface:

1. Select the **Log On** button on the WebX navigation bar to display the log on page.
2. In the **username** field, enter:

   `EngExample`
3. In the **Password** field, enter the password for the 'EngExample' user account. (Your system administrator might provide you with a password, or you might be required to set a new password when you first attempt to log on as the 'EngExample' user.)
4. Press the **Log On** button.

   At this stage, you will either be logged on as the ‘EngExample’ user, or Internet Explorer (IE) will display a message regarding certificates. If IE shows a page titled ‘There is a problem with this website’s security certificate’, it means that you do not have a trusted certificate. You can select the **Continue to this website (not recommended)** option to proceed without a trusted certificate.

   You are now logged on as the 'EngExample' user. You will see that the home page has changed. This is because the 'EngExample' user account is associated with a Mimic that acts as the home page. This Mimic is called 'Opening Page' and can also be accessed in ViewX. In the configuration of the 'EngExample' user account, the 'Opening Page' Mimic is selected as the **Home Page**.



If you look at the buttons at the top of the display, you will also see that extra buttons are available, including **Documents** and **Favorites**.

Now that you have logged on, you can use the WebX interface to operate your system. Proceed to Use the Navigation Tools to Access other Displays.

Use the Navigation Tools to Access other Displays

ATTENTION: This topic relates to the deprecated Original WebX client that is supported by this and previous versions of Geo SCADA Expert. For information about the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS, click here.

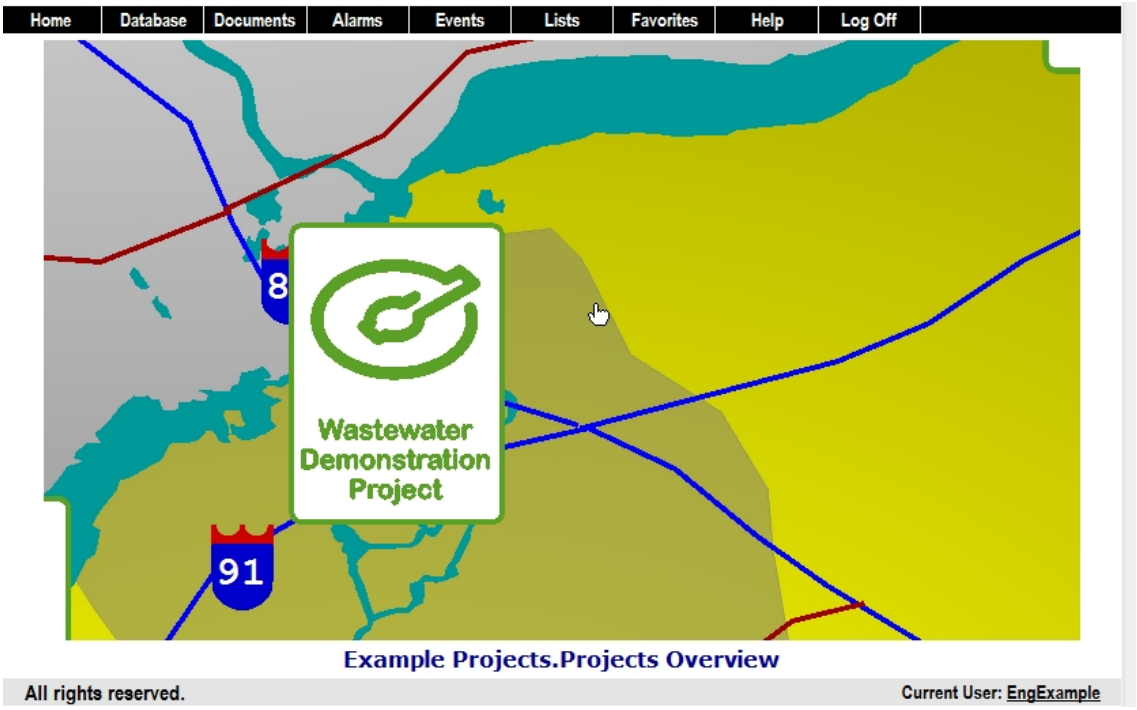
The home page for the 'EngExample' user is a Mimic that has been configured to be used as a user-friendly interface. It has two text boxes which are animated to act as hyperlinks—when you select them, they take you to a different 'page'. The text boxes show 'Presentation' and 'Projects' and look like buttons on the WebX display.

As we want you to experience the various navigation tools and see the different types of display that can be shown, we are going to ask you to select the **Projects** button:

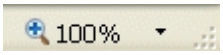
1. On the WebX interface, select the **Projects** button to display the Projects Overview page. This page shows a map of a geographical area. At its default size, the map shows quite a large area with little detail.



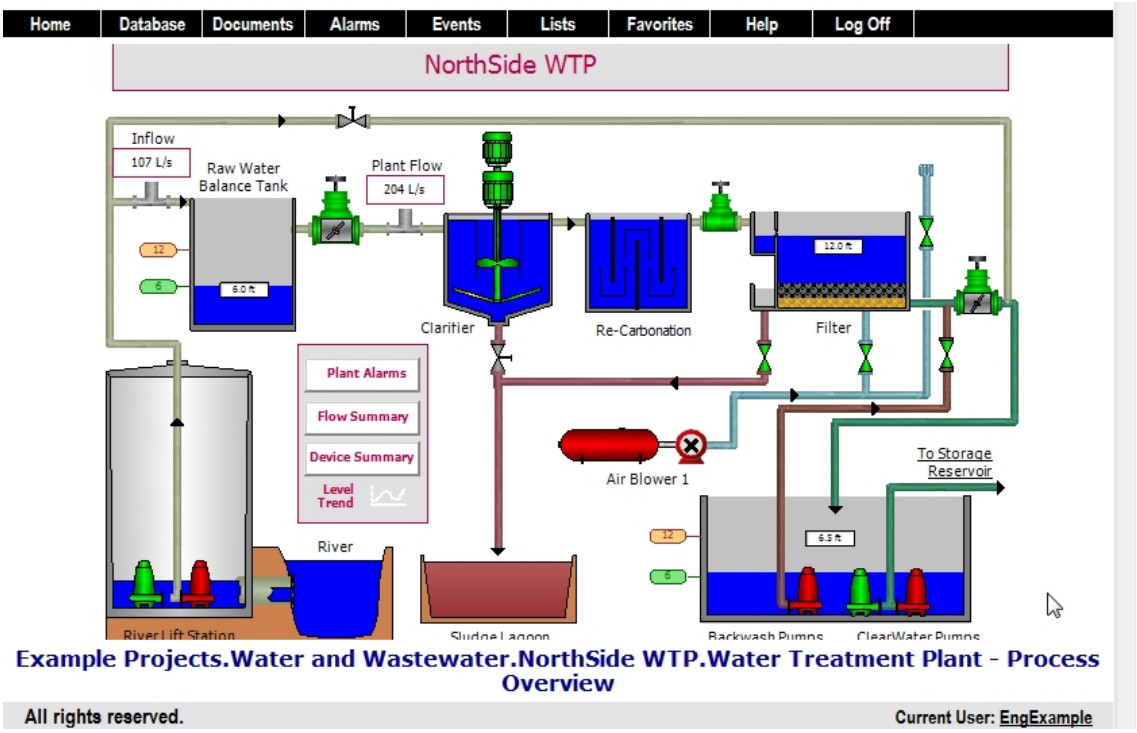
2. If you have a mouse wheel, roll the wheel forward to zoom in on the map. As you increase the level of magnification, more detail is revealed, including road networks and embedded Mimics that show the locations of different sites.



If you are using a mouse that has no wheel, you can change the magnification level by using the pop-up magnification menu at the bottom-right of the browser window.



3. Select the 'Water Treatment Overview' embedded Mimic. This embedded Mimic has been configured to act as a hyperlink to another display—the Process Overview Mimic.



4. On the 'Process Overview' Mimic, select the 'Air Blower 1' item to display a context sensitive menu. As in ViewX, Mimic objects can provide access to context sensitive menus that relate to the database item that is used to animate the Mimic object.
5. Select **Device Menu>Hand Control** to display the Hand Control window.

6. Set the **Value** to Running, then select the **OK** button to confirm. You will see that the 'Air Blower' object on the Mimic changes color to indicate that it is running. You have now issued a control via the WebX interface.
7. Perform another **Hand Control** to the 'Air Blower 1' object, only this time set its **Value** back to Stopped.
8. Select the 'Flow Summary' button on the Mimic. This displays the Flow Summary page.

   As the Flow Summary page does not contain any hyperlinks, you cannot use it to access other displays. But you can return to the previous page you viewed by selecting the web browser's **Back** button. Each time you press the **Back** button, you return to the previous page you viewed in sequence. Similarly, if you select the **Forward** button, you display the next page you viewed in sequence.

Now that you are familiar with some of WebX's navigation tools, you can proceed to Access Database Items via WebX.

Further Information
WebX Navigation: *see* Use the WebX Interface.

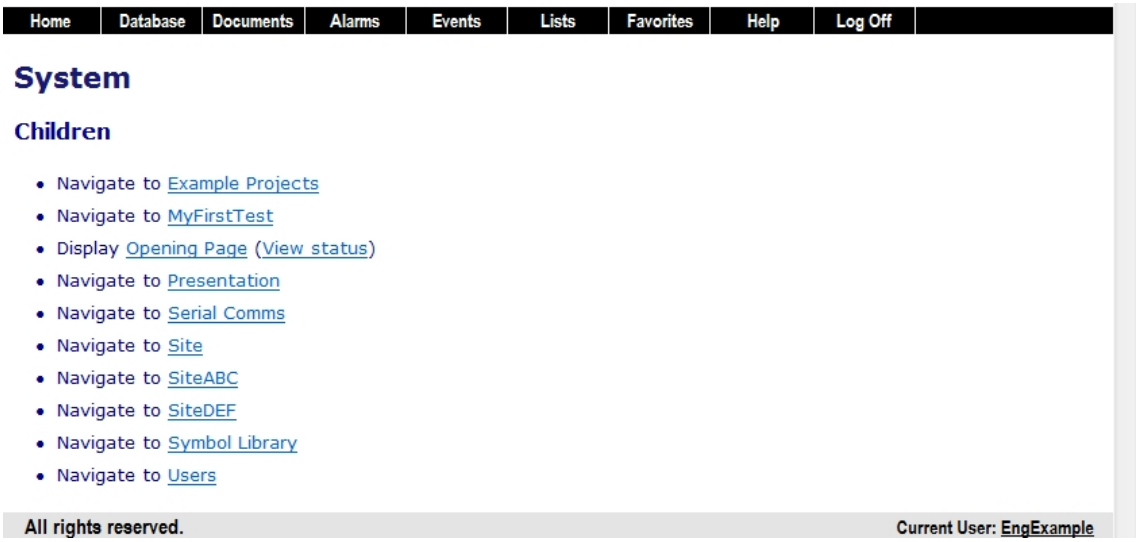
Access Database Items via WebX

ATTENTION: This topic relates to the deprecated Original WebX client that is supported by this and previous versions of Geo SCADA Expert. For information about the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS, click here.

You can use the WebX interface to access displays for individual database items. For each database item there is a status 'page' which provides the latest values and information. As in ViewX, the database items are organized in a hierarchy, with Groups, Group Templates and Group Instances containing other items. However, WebX uses hyperlinks and headings to represent the various types of database items rather than icons.

To access database items via WebX:

1. Select the **Database** button on the navigation bar. This displays the **System** page.



   The System page is the WebX equivalent of the Database Bar—it provides access to the hierarchy of items in your database. Each database item is represented by a hyperlink. If you select the hyperlink, WebX displays information about the selected item. If you select a hyperlink for a Group, Group Template, or Group Instance, WebX displays another page that provides hyperlinks for the items within that Group, Group Template or Group Instance.

2. Select the **Serial Comms** hyperlink to display the Serial Comms page. This page lists the items in the 'Serial Comms' Group and provides hyperlinks for each item. You will see that there are two links for Mimics (one to display the Mimic and another to display information about its status), and there are also links to the **Parent** Group and the **Default View Mimic** for the 'Serial Comms' Group as well as the **Children** (items that are contained in the Group).
3. Select the **New Direct Channel** hyperlink to display the information page for the 'New Direct Channel' database item. The information page provides status details on the 'New Direct Channel' database item.
4. Use the hyperlinks and the web browser's **Back** and **Next** buttons to navigate your database.

When you are comfortable using the navigation features and know how to locate database item displays, you can proceed to the next section: Display a List of System Alarms via WebX.

Further Information

Using WebX to Access Database Items: *see* Browse your Database on a WebX Client.

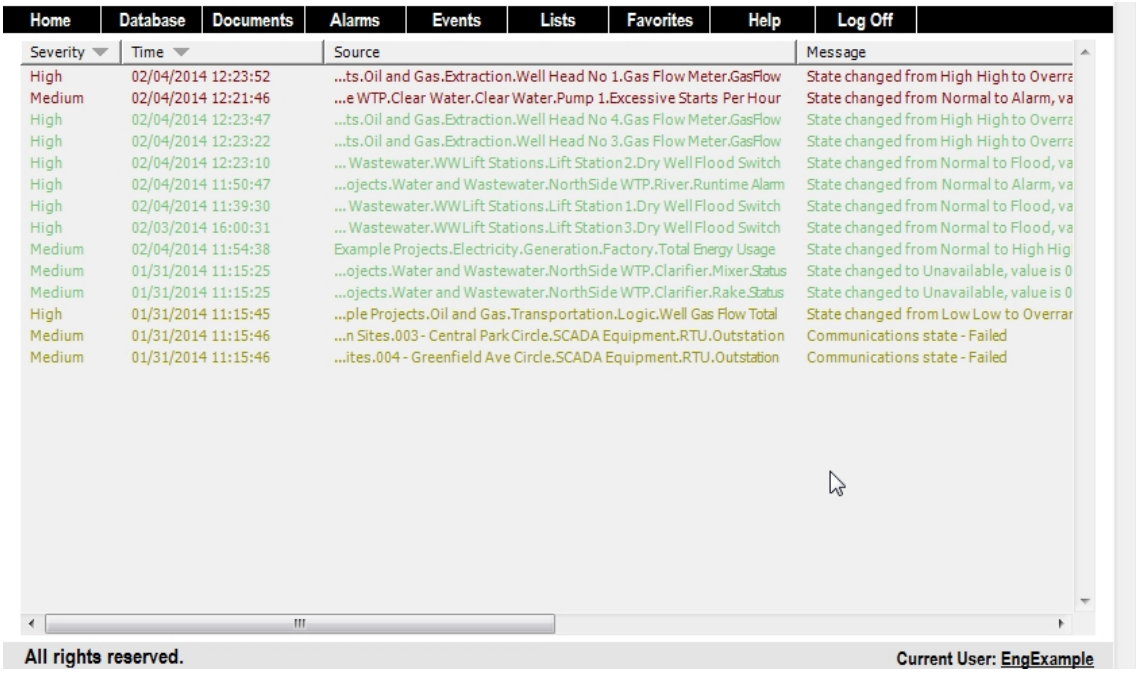
Display a List of System Alarms via WebX

ATTENTION: This topic relates to the deprecated Original WebX client that is supported by this and previous versions of Geo SCADA Expert. For information about the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS, click here.

You can use WebX to display an unfiltered list of alarms on your system. You can then filter the Alarms List as required and use it to respond to alarm conditions.

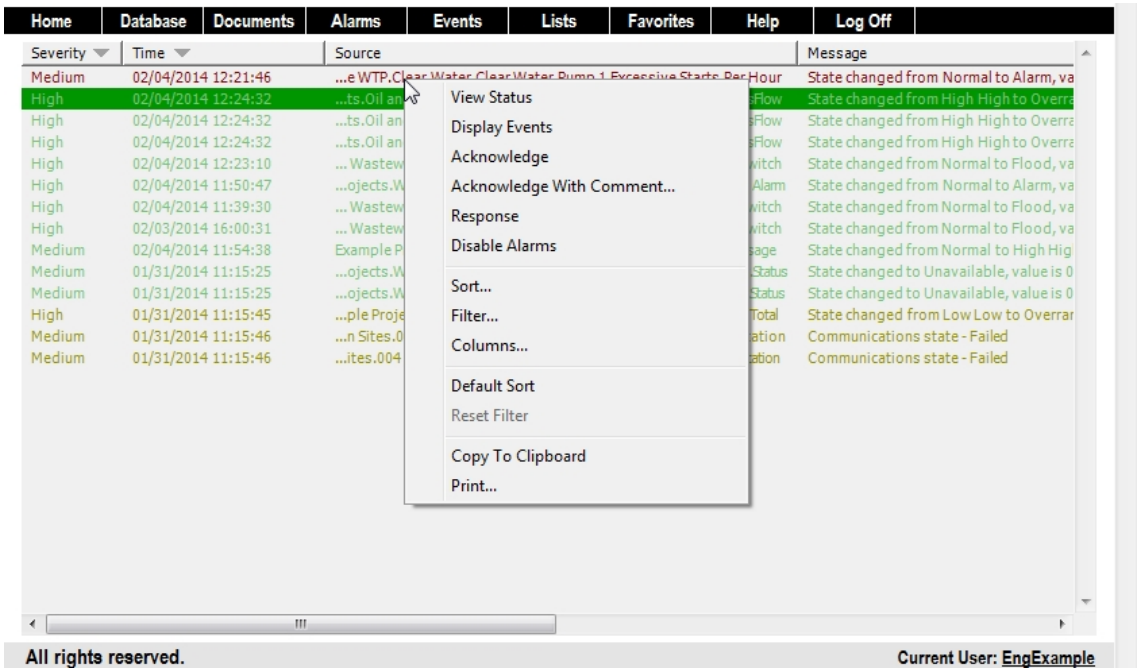
To display an unfiltered alarms list:

1. Select the **Alarms** button on the navigation bar to display the **Alarms** page.



   The **Alarms** page contains a list of the alarms on your system, and the alarm information is categorized under **Severity**, **Time**, **Source**, **Message**, and **Category** headings in the same way as alarms that are shown on the alarm displays in ViewX.

2. Right-click on one of the alarms in the list to display a context sensitive menu.

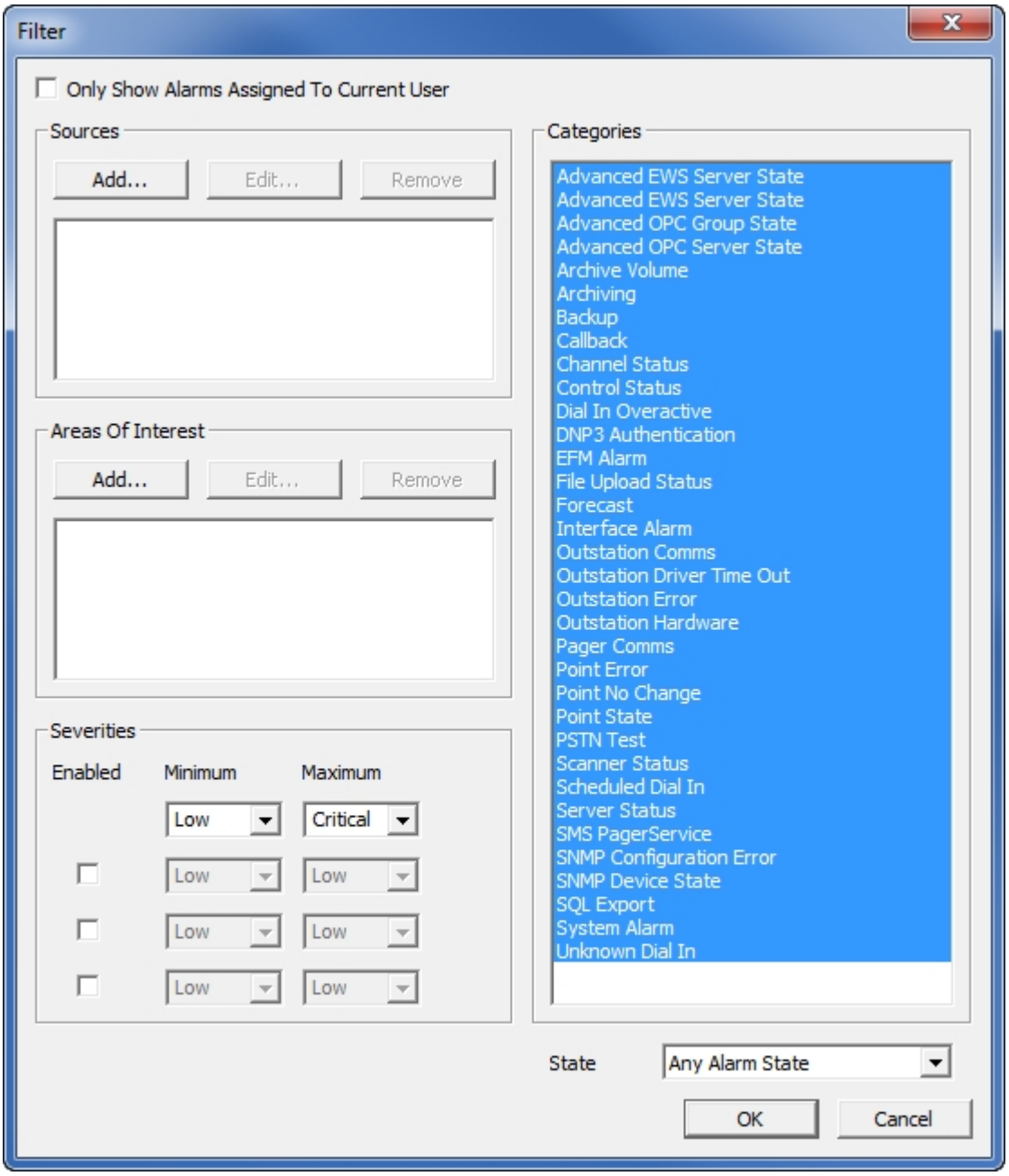


You can see that on the context sensitive menu for the alarm, you have access to the alarm response options such as **Acknowledge** and **Acknowledge with Comment**. These alarm response features work in exactly the same way as on a ViewX client, meaning operators and engineers can manage alarms remotely.

> **NOTE:** If there are no active alarms on your system, you can generate alarms by performing Hand Controls on database points. You can use WebX to access the **Hand Control** action for points—Select **Lists> Points**, then select **OK** so that a filter is not applied, then right-click on the required point in the Points List.

3. Right-click on the background of the Alarms List to display a context sensitive menu.

4. Select the **Filter** option to display the Filter window.



You can use the Filter window to restrict the Alarms List so that it only shows alarms that meet certain criteria.

5. Use the Filter window to restrict the Alarms List so that it only shows alarms that relate to the items in the 'SiteABC' Group Instance. To do this, you need to:
   i. Select the **Add** button in the **Sources** section to display the Add Source window.
   ii. Use the browse button feature of the **Source** field to associate the source with the 'SiteABC' Group Instance.
   iii. Select the **OK** button to confirm and close the Add Source window. You will see that the Sources list now contains 'SiteABC.*' which means the Alarms List is filtered to only show alarms for items that are in the 'SiteABC' Group or its subgroups.

iv. Select the **OK** button to confirm your selection and close the Filter window. *The Alarms List is filtered so that it only shows alarms for items in the 'SiteABC' Group Instance (it doesn't have any subgroups).*

Now that you have displayed the System Alarms web page and learned how to access the filter settings, you can proceed to the next section: Display a List of System Events via WebX.

Further Information

View and Action Alarms on a WebX Client.

Filtering an Alarms List: *see* Use the Filter Window to Filter Alarm Entries. This section describes the filter process in ViewX, but the same principles apply in WebX.

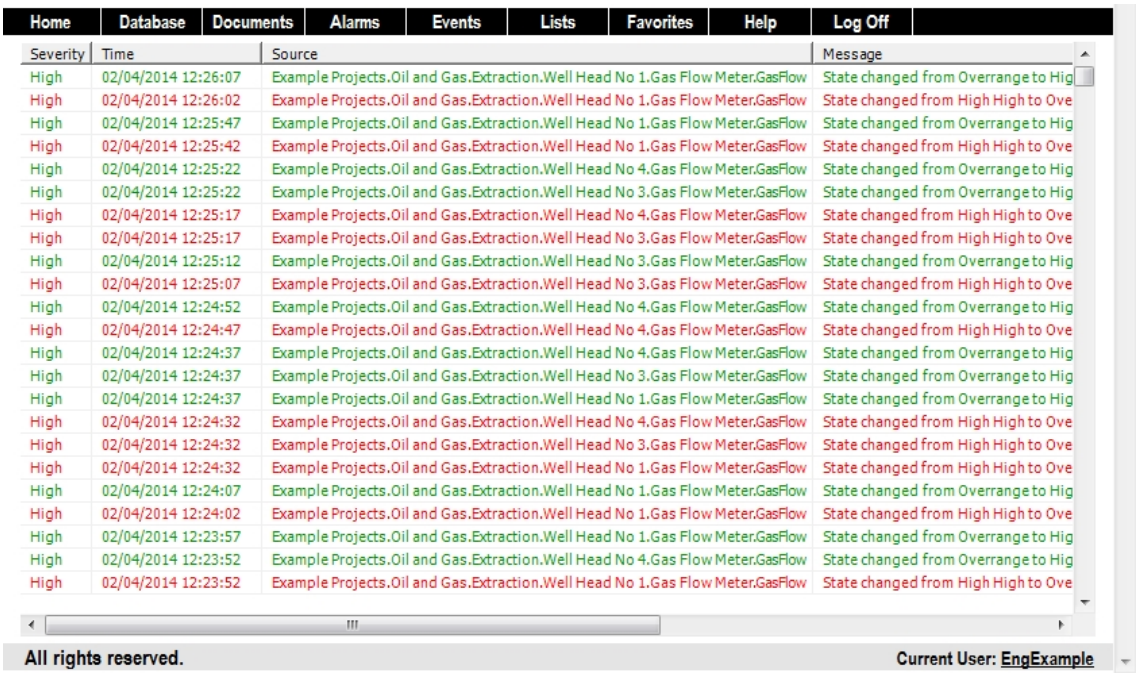
Display a List of System Events via WebX

ATTENTION: This topic relates to the deprecated Original WebX client that is supported by this and previous versions of Geo SCADA Expert. For information about the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS, click here.

You can also use WebX to display an unfiltered list of events on your system. The Events List is a record of what has occurred on your system, with the event, time of event and user that instigated the event (where applicable) included.

To display an unfiltered list of Events on your system:

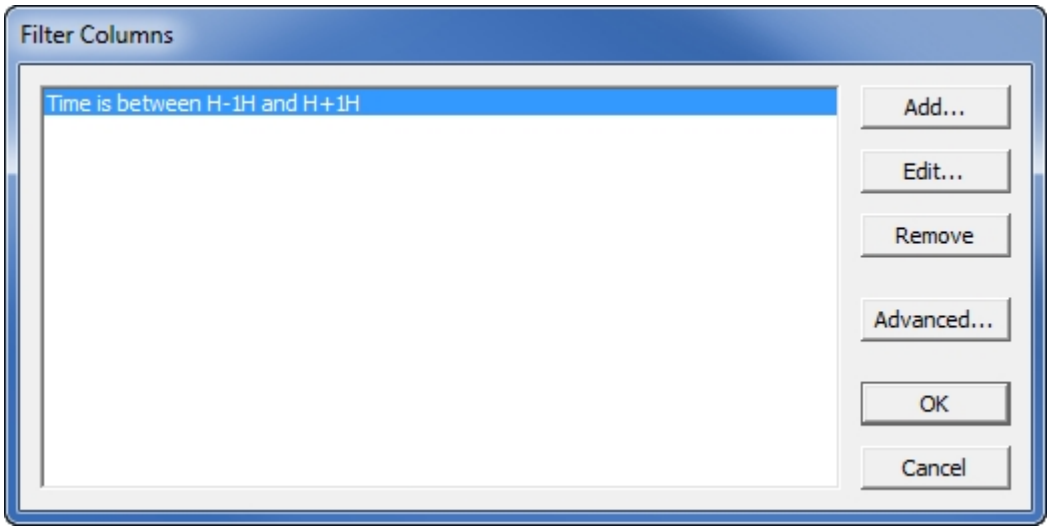
1. Select the **Events** button on the navigation bar to display the **System Events** page.



   The System Events page shows a list of the events logged on your system for a defined time period. The time period is the amount of time defined in the **Event List Range** for your user account (the **Event List Range** defined for the system is used for Guest users).

2. Right-click on an Event to display a context sensitive menu.

3. Select the **Filter** option to display the Filter Columns window.



   The Filter Columns window shows the filters that are currently in place. The only filter should be a time filter that matches the setting defined in the **Event List Range** for the 'EngExample' user.

4. Select the **Add** button to display the Add Clause window. You can use the Add Clause window to apply additional filters to the Events List.
5. On the Add Clause window, set the **Category** to **user**, the operation to **Is Equal To** and then enter the following in the bottom field:

   ```
   EngExample
   ```

   This will filter the Events List so that it only shows those events that have 'EngExample' as their entry in the **user** category (events that are related to the activity of the 'EngExample' user).
6. Select the **OK** button to confirm and close the Add Clause window.
7. Select the **OK** button to confirm your selections and close the Filter Columns window. The Events List is filtered so that it only shows those events that:
   - Were logged in the period starting from 1 hour prior to the start of the current hour and ending 1 hour after the start of the current hour

   And

   - Have 'EngExample' as their entry in the user category (indicating events that were generated in response to your actions as the 'EngExample' user).
8. Display the Filter Columns window for the Events List.
9. Select the **user is equal to EngExample** filter, then select the **Remove** button to delete this filter.
10. Close the Filter Columns window.
11. Right-click on the Events List to display a context sensitive menu.
12. Select the **Sort** option to display the Sort Order window.
13. Use the Sort Order window to define the order in which events are listed:
    i. Select the **Add** button to display the Add Column window.
    ii. Set the **Column** combo box to **Severity**. This will add another type of sort order to the Events List—it will sort the list according to the Severity level of the events.

iii. Set the **Direction** combo box to **Descending**. This sets the Events List to show the events with the highest level Severity values at the top.

iv. Select the **OK** button to close the Add Column window.

v. Select the **Severity** sort method in the list.

vi. Select the **Move Down** button to move the Severity sort method down one place in the list. The Sort Order is applied according to the order of sort methods in the list, with the sort order at the top being applied first.

vii. Select the **OK** button to close the Sort Order window and apply the new sort order. The Events List is now sorted so that:

- The events are listed in time order, with the events with the latest time stamps shown at the top.
- Any events that have the same time stamp are then sorted according to their Severity. The Severity sort method is only applied to events that have the exact same time stamps, and the highest level severities are shown above the lower level severities.
- Any events that have the same time stamps and same severity levels are sorted according to their Sequence Number.

You've now displayed the System Events List in WebX and have applied a filter and sort order. Next, you will Display a Queries List via WebX.

Further Information

Events in WebX: see View and Action Events on a WebX Client.

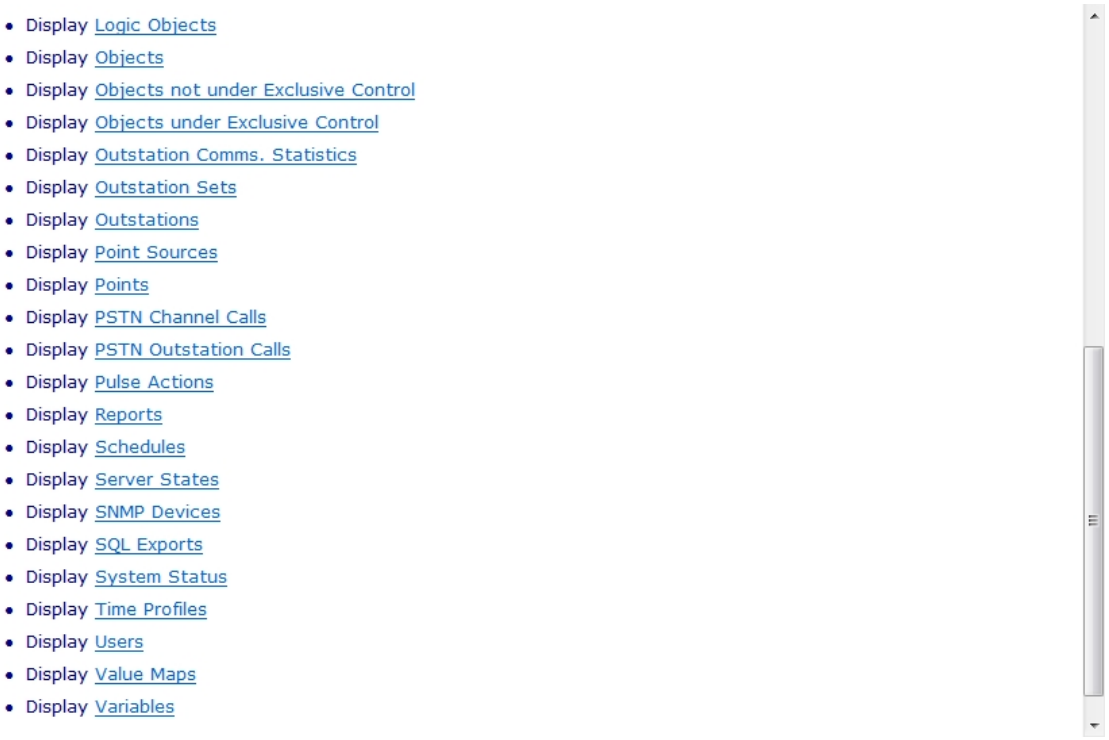
Display a Queries List via WebX

ATTENTION: This topic relates to the deprecated Original WebX client that is supported by this and previous versions of Geo SCADA Expert. For information about the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS, click here.

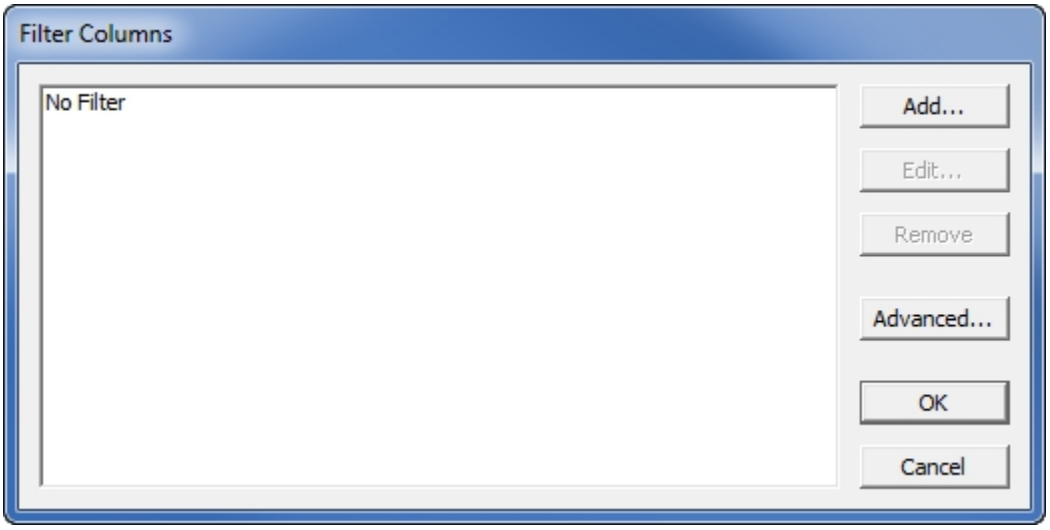
You can use WebX to access the SQL Queries Lists that are available on your system, such as the Points List. These Lists provide exactly the same data as the Queries Lists in ViewX.

To display a Queries List:

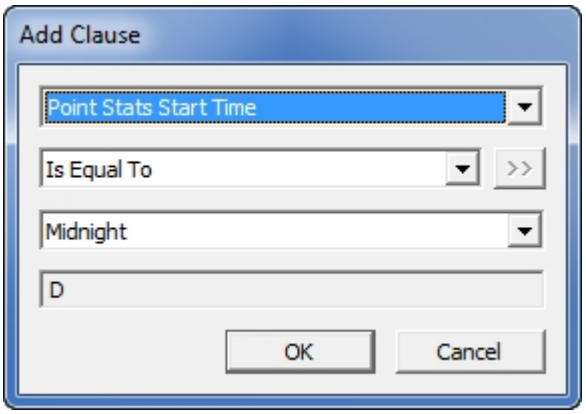
1. Select the **Lists** button on the navigation bar to display the Lists page. The Lists page provides hyperlinks to each type of List, for example, links to the Channels List, Points List, and so on.



2. Select the **Points** hyperlink to display the Filter Columns window for the Points List. You can use the Filter Columns window to restrict the Points List so that it only displays points with certain properties or values. For this tutorial, you are going to filter the Points List so that it only shows SCADAPack Modbus digital input points.

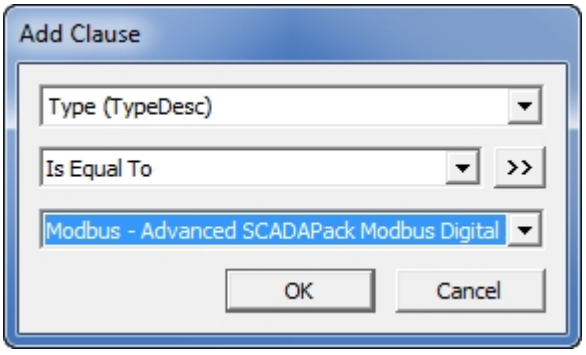


3. Select the Add button to display the Add Clause window.



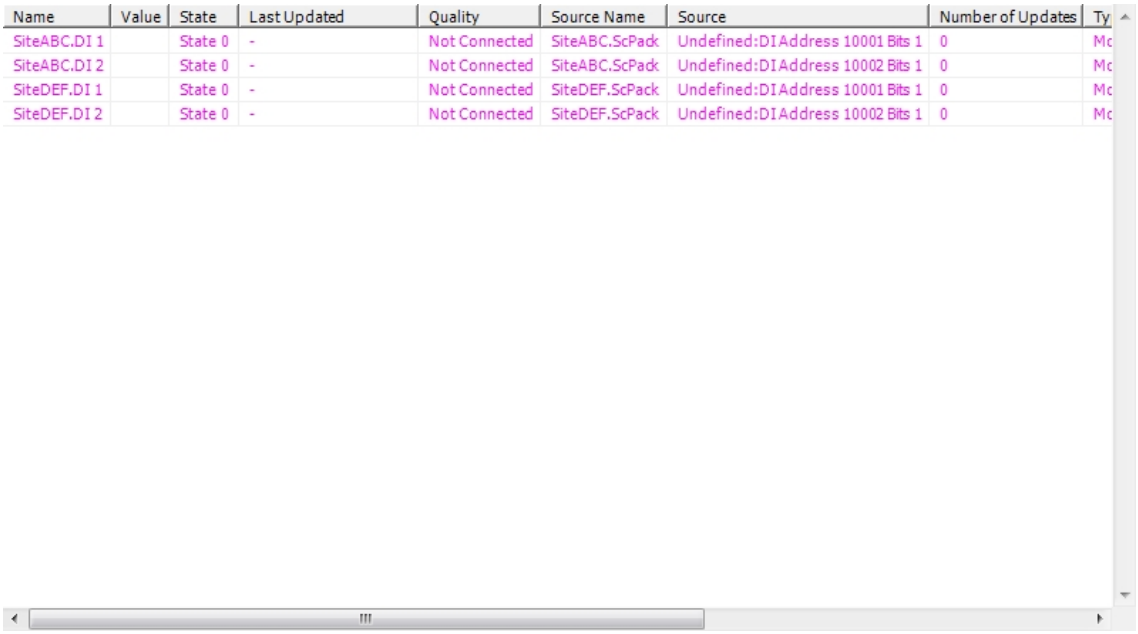
4. Use the Add Clause window to apply a filter:
   i. Set the top combo box to **Type (TypeDesc)**
   ii. Set the middle combo box to **Is Equal To**
   iii. Set the bottom combo box to **Modbus - Advanced SCADAPack Modbus Digital Input Point**.

   This restricts the list so that it only displays points that have a **TypeDesc** value of Advanced Modbus SCADAPack Modbus Digital Input Point (points that are SCADAPack Modbus digital input points).



5. Select the **OK** button to confirm your selection and close the Add Clause window.
6. Select the **OK** button on the Filter Columns window to confirm your selection and close the Filter Columns window.

   The Points List is filtered so that it only displays SCADAPack Modbus digital input points:



Name	Value	State	Last Updated	Quality	Source Name	Source	Number of Updates	Ty
SiteABC.DI 1		State 0	-	Not Connected	SiteABC.ScPack	Undefined:DI Address 10001 Bits 1	0	Mc
SiteABC.DI 2		State 0	-	Not Connected	SiteABC.ScPack	Undefined:DI Address 10002 Bits 1	0	Mc
SiteDEF.DI 1		State 0	-	Not Connected	SiteDEF.ScPack	Undefined:DI Address 10001 Bits 1	0	Mc
SiteDEF.DI 2		State 0	-	Not Connected	SiteDEF.ScPack	Undefined:DI Address 10002 Bits 1	0	Mc

Now that you know how to access Queries Lists via WebX, you can Log Off from WebX.

Further Information

Lists in WebX: see View and Action Lists on a WebX Client.

Log Off from WebX

ATTENTION: This topic relates to the deprecated Original WebX client that is supported by this and previous versions of Geo SCADA Expert. For information about the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS, click here.

You've now learned how to access Mimics, the Alarms List, the Events List, Queries Lists, and information about database items via the WebX interface. You've also learned how to apply sorting and filters to lists. Before you Test Your Knowledge on the WebX Interface, you should log off:

- Select the **Log Off** button on the navigation bar. In WebX, you are logged off as the 'EngExample' user. However, you can still use WebX as the 'Guest' user (if that built-in user account is enabled on your system).

Now let's see how much you have learned—proceed to Test Your Knowledge on the WebX Interface.

Test Your Knowledge on the WebX Interface

ATTENTION: This topic relates to the deprecated Original WebX client that is supported by this and previous versions of Geo SCADA Expert. For information about the Virtual ViewX client that is supported by Geo SCADA Expert 2019 onwards, for which the web server is hosted using IIS, click here.

How much do you know about the WebX interface? Try and answer the following questions:

1. WebX is designed to allow remote access, but can it be used to access your system from anywhere?
2. Apart from remote access and appearance, what is the main difference between WebX and ViewX?
3. What features are used to help prevent unauthorized access via a WebX client?
4. How do you access WebX?
5. If you don't have a mouse with a wheel, how can you zoom in on a Mimic in WebX?
6. You can use your web browser's Back and Forward buttons to navigate through WebX displays in the order in which you originally displayed them. But what other ways are there of accessing different WebX displays?
7. You want to display status information about a specific point. How would you do this in WebX?
8. You are logged on via a WebX client when an alarm is raised. You are responsible for responding to the alarm, so what do you do?
9. How can you filter the Alarms List so that it only displays alarms that relate to items in a specific Group?
10. You display the Events List and its entries are sorted in Time order. You want them to be sorted according to their Severity and so create a new Severity sort method. You apply the Severity method but the Events List still appears to be sorted according to time. Do you know why?
11. You want to perform a Hand Control on a database point via WebX. How would you achieve this?

Group Templates and Group Instances

Group Templates and Group Instances are useful features of Geo SCADA Expert. You can use them to significantly reduce the amount of time and configuration work required to:

- Set up your system
- Make changes to the configuration of database items
- Organize your system.

To learn about the Group Template and Group Instance features, you are going to convert the 'Site' Group that you created earlier in the tutorial into a Group Template. You will then use the Group Template as a model configuration for Group Instances.

NOTE: For this section, you are going to use the 'Site' Group that you created in the Your First 'Live' Configuration section. If you have not completed the Your First 'Live' Configuration section, you can import the configuration by right-clicking on the system icon in the Database Bar, selecting the **Import** option, then browsing to the SerialComms.sde file that is located at C:\Program Files\Schneider Electric\ClearSCADA\Tutorial Files. Select the **OK** button to import the SerialComms.sde file, then use the same technique to import the Site.sde file that is stored in the same location as the SerialComms.sde file.

When you have the 'Site' and 'SerialComms' Groups in your database you can proceed with the Group Template and Group Instances configuration:

1. Log On to ViewX.
2. Convert the 'Site' Group into a Group Template.
3. Create Two Group Instances that Reference the Group Template.
4. Re-configure the Default Mimic in the 'Site' Group Template.
5. Configure the Group Template to Allow Additional Property Overrides.

When you have completed the configuration, you can Test Your Knowledge on Group Templates and Instances.

Log On to ViewX

To convert a Group into a Group Template and create Group Instances, you need to log on via a user account with **Configure** permissions. The preconfigured 'EngExample' user account has sufficient permissions to perform the tasks in this section, so if you are not already logged on as 'EngExample', you need to do so: Log on to your System

You are now logged on as the 'EngExample' user and can proceed to Convert the 'Site' Group into a Group Template.

Further Information

Logging On and Off: *see* System Security.

Convert the 'Site' Group into a Group Template

Group Templates are 'model' collections of database items. They contain items that have been configured, but the items are not 'live'—they provide the configuration 'model' for items in each of the Group Instances that reference the Group Template.

For example, if you have a Group Template that contains a Mimic, 2 Trends, an outstation set, an outstation, a channel and 2 points, you can configure these items in the usual way. But in a Group Template, the items you configure are not used to represent actual displays, connections or devices—they are used to provide the configuration for *any* Group Instance that references the Group Template. When you associate a Group Instance with the Group Template, the Group Instance will automatically contain 'live' versions of the items in the Group Template.

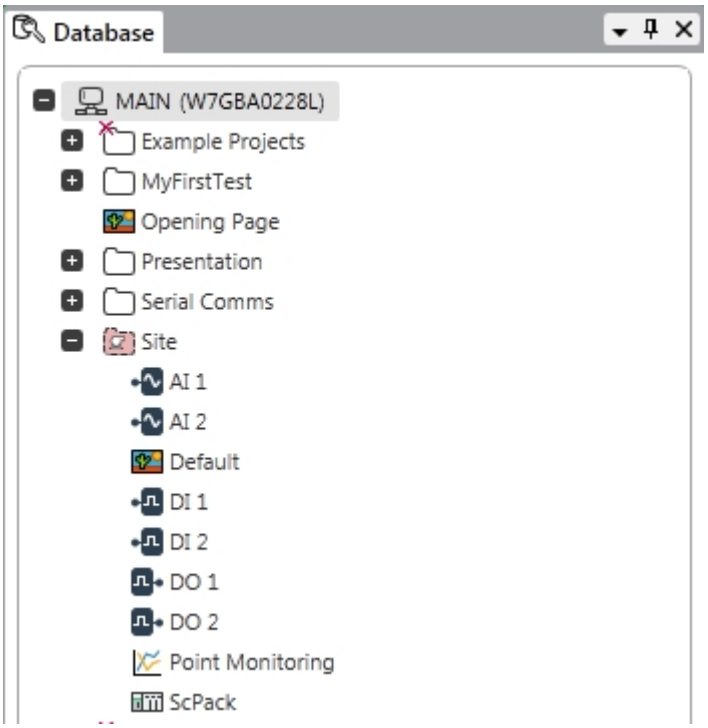
So, if you create 3 Group Instances and configure them to reference the Group Template, each Group Instance will contain a Mimic, 2 Trends, an outstation set, an outstation, a channel and 2 points, and these will have the same configuration settings as defined in the Group Template. You can then use **Property Overrides** to change individual settings for the items in the Group Instances, such as unique addresses.

By using Group Templates to provide the starting configuration for Group Instances, you can significantly reduce the amount of time and effort it takes to configure your system and apply later configuration changes.

There are two ways to create a Group Template—you can create an entirely new Group Template item or you can convert an existing Group into a Group Template. For the tutorial, you are going to convert the 'Site' Group into a Group Template:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, right-click on the 'Site' Group to display its context sensitive menu.
3. Select the **Convert To>Group Template** option. This converts the 'Site' Group from a normal Group into a Group Template. The items in the Group are no longer 'live' and you will see that the

color of the Group folder changes from white(normal Group) to red (Group Template).



You have now converted the 'Site' Group into a Group Template and it can be used as a reference model for Group Instances. To make use of the Group Template, you are going to Create Two Group Instances that Reference the Group Template.

Further Information

Converting a Group into a Group Template: *see* Converting Groups and Group Instances.

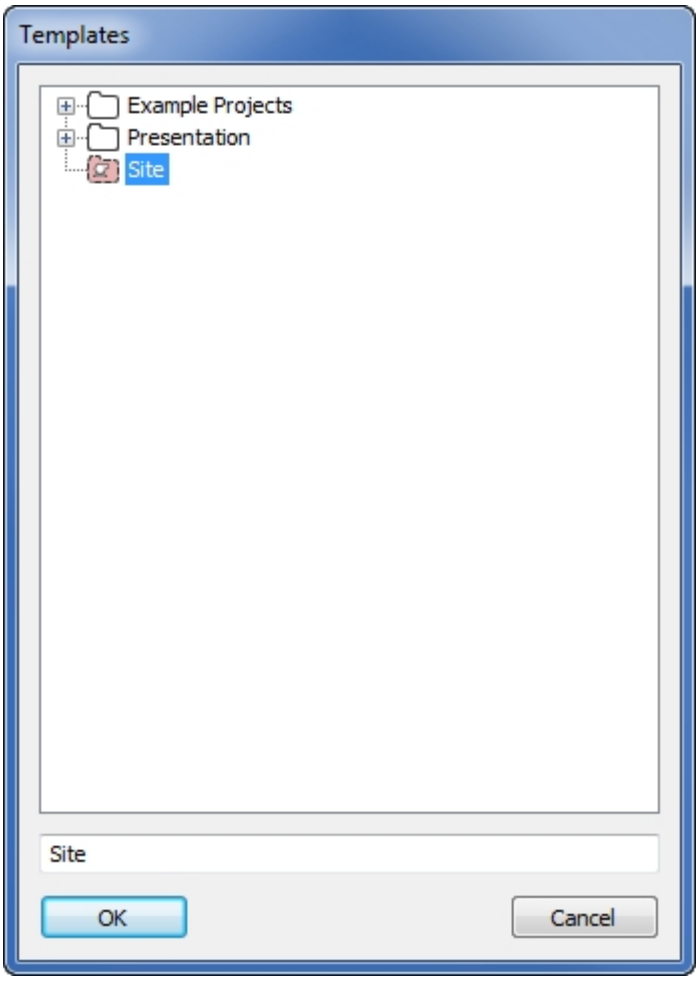
Create Two Group Instances that Reference the Group Template

Group Instances are special types of Groups. Like normal Groups, they are 'live'—the items they contain represent displays, devices, and real inputs and outputs. However, they do have one distinguishing feature: they inherit their configuration from a Group Template.

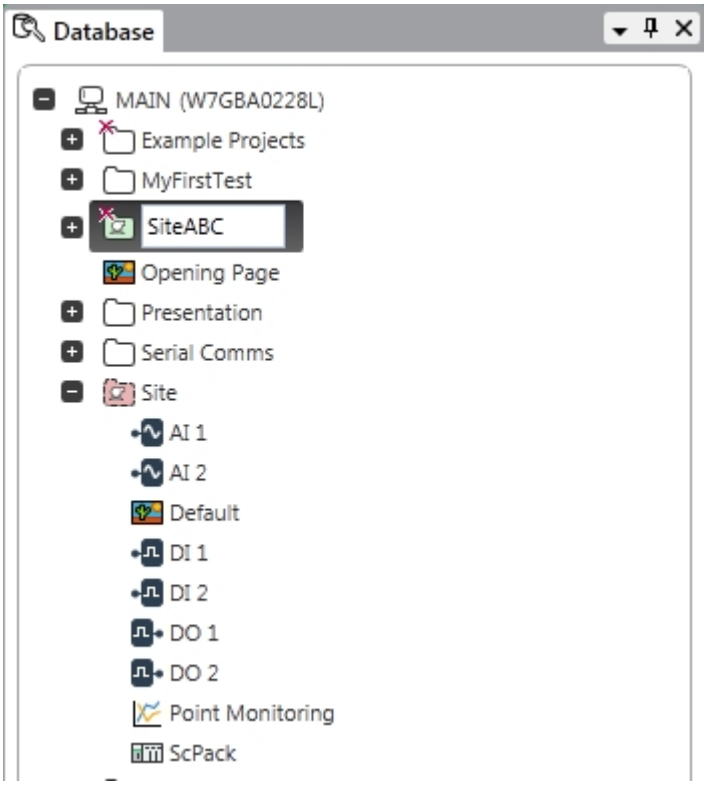
For the tutorial, you are going to create two Group Instances that reference the 'Site' Group Template. Both Group Instances will automatically contain 'live' versions of the items in the 'Site' Group Template. This means that you will have two Group Instances that work in the same way as the original 'Site' Group (the Group that you converted into the Group Template).

To create two Group Instances that reference the Group Template:

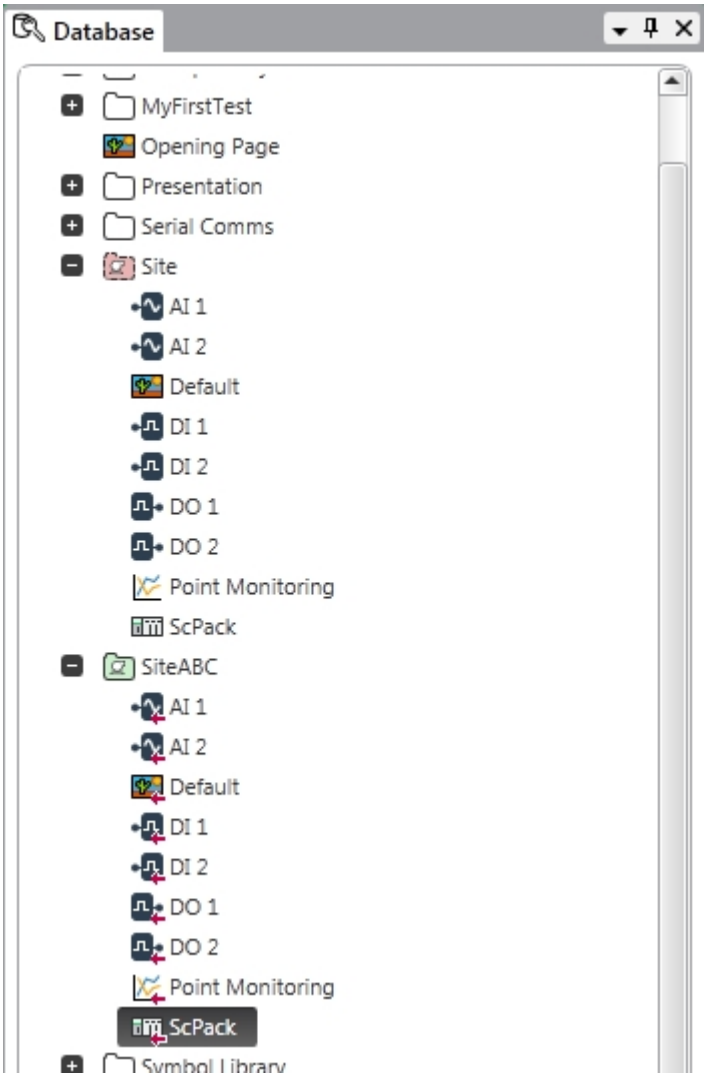
1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, right-click on the System icon to display its context sensitive menu.
3. Select the **Create Instance** option to create a new Group Instance.
   The Template window allows you to choose the template group (Site) you can use to generate the instance.



4. You will see that it is represented by a green folder and is selected automatically, ready for you to define its name.

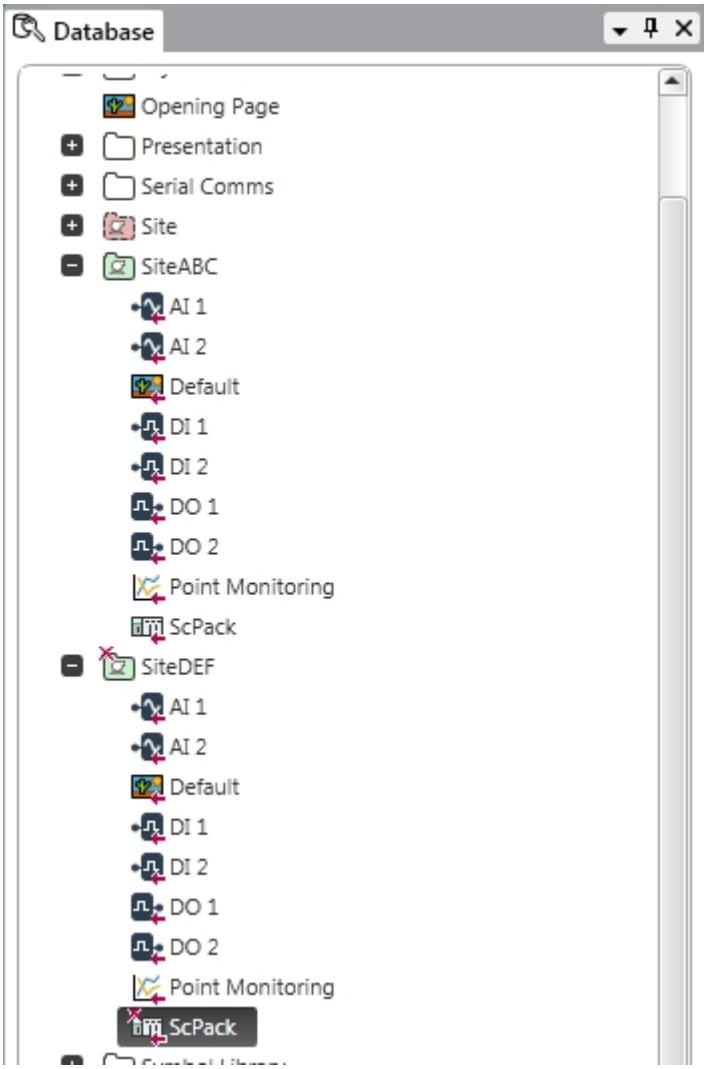


5. In the Database Bar, expand the 'SiteABC' Group Instance and look at its contents. You will see that it contains 'live' versions of the items in the 'Site' Group Template.



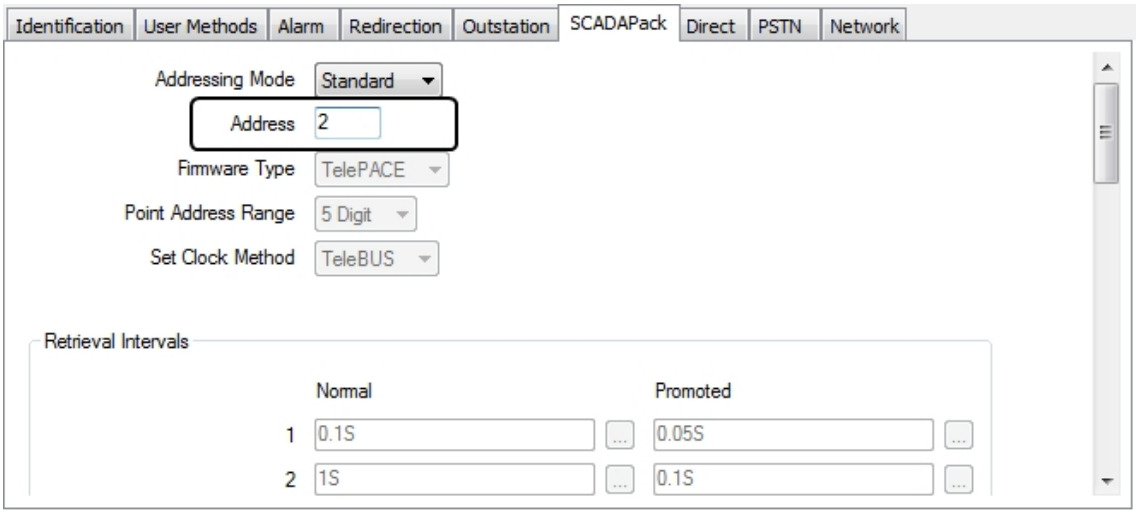
6. Use the same techniques as described in steps 2 to 8 to create a second Group Instance that references the 'Site' Group Template. Name the second Group Instance `'SiteDEF'`.

   You will see that the 'SiteDEF' Group Instance configuration is broken (the broken configuration is indicated by a red cross next to the outstation items). This is because the outstation in the 'SiteDEF' Group Instance has the same address as the outstation in the 'SiteABC' Group Instance, and outstations have to use unique addresses.



By default, SCADAPack Modbus outstations and points in Group Instances can have their addresses overridden with new configuration settings. This is because it is common for outstations and points in Group Instances to require unique addresses. But you can also configure the Group Template to allow any configuration setting to be overridden, as you will see later in the tutorial.

7. Double click on the 'ScPack' outstation in the 'SiteDEF' Group Instance to display its Form.
8. Change the address of the 'ScPack' outstation so that it does not clash with the address of the 'ScPack' outstation in the 'SiteABC' Group Instance.



9. Save the Form.
   If you look at the Database Bar, you will can see that the Group Instances' configuration is no longer broken (as the outstations have unique addresses).

You have now created a Group Template and Group Instances that reference the Group Template. You have also configured one of the properties that is set to allow overrides by default (the outstation address). Next, you are going to change the configuration in the Group Template and see how it affects the Group Instances—proceed to Re-configure the Default Mimic in the 'Site' Group Template.

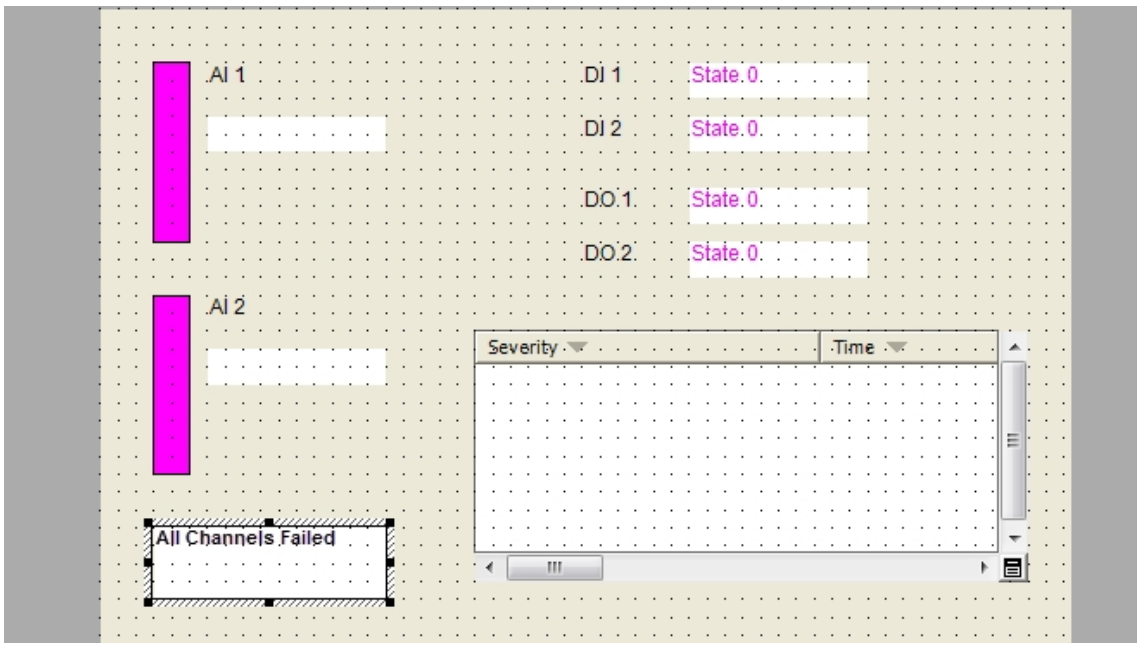
Further Information

Group Templates and Group Instances: *see* Setting Up Group Templates and Group Instances.

Re-configure the Default Mimic in the 'Site' Group Template

Now that you have a Group Template with Group Instances that reference it, you can make adjustments to the configuration in the Group Template and these changes will automatically be applied to the Group Instances. To illustrate this, you are going to make a change to the configuration of the 'Default' Mimic in the Group Template:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, double-click on the 'Default' Mimic in the 'Site' Group Template to display it in Design Mode.
3. Select the 'ScPack' outstation in the 'Site' Group Template and drag it onto the Mimic. When you release the left-hand mouse button, a context sensitive menu is displayed.
4. Select the **State** option to add an animated text box to the Mimic. The text box is animated by the StateDesc property of the outstation (as well as the Foreground, Background, and Blink properties). The StateDesc is a text description of the outstation's current state. When you add the text box to your Mimic, it should show the description: `All Channels Failed`



5. Save the Mimic.
6. Display the 'Default' Mimic in the 'SiteABC' Group Instance. You will see that it has the outstation state text box. If the outstation and channel are correctly configured and a SCADAPack Modbus controller is connected to your system, the text box should show the description: `Healthy, Multidrop`
7. Display the 'Default' Mimic in the 'SiteDEF' Group Instance. You will see that it has the outstation state text box. The text box should show the description: `Failed`

   This is because you have not configured to the items in the 'SiteDEF' Group Instance to represent a second SCADAPack Modbus controller.

As you can see, a single change made in the Group Template is automatically applied to its Group Instances. Used carefully, this feature can make configuring, updating and maintaining your system a considerably quicker and easier process.

So far, you have learned how to create Group Templates and Group Instances, and make changes in the Group Template that affect the Group Instances. But what if you need a Group Instance to take some, but not all of its configuration from a Group Template? Can you choose which properties the Group Instance inherits? The answer is yes, and in the next section, you are going to learn how to override properties: proceed to Configure the Group Template to Allow Additional Property Overrides.

Configure the Group Template to Allow Additional Property Overrides

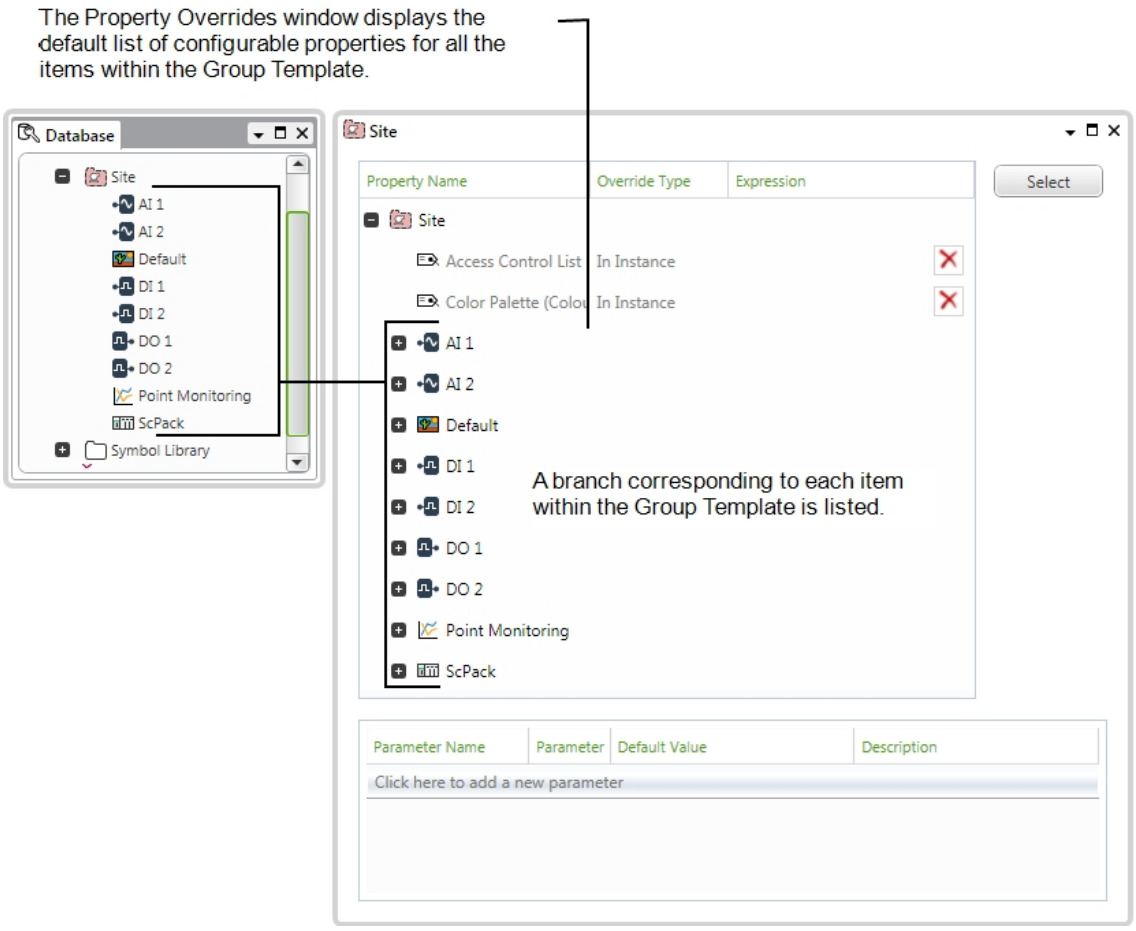
When you configure a Group Instance to reference a Group Template, it automatically inherits the items from the Group Template. Many of the configuration settings for these items are also inherited, and you cannot reconfigure these settings in the Group Instance. However, certain properties, such as addresses (which need to be unique), can be reconfigured. By default, you can change the settings of those properties that need to be unique.

As you configure your system, you may find that you need to configure settings that are unavailable in your Group Instances. For example, you may decide that you want to be able to configure the Historic settings for the points in your Group Instances rather than inherit the Historic settings from the Group Template. To do this, you need to use the Property Overrides feature on the Group Template. With Property Overrides, you can select specific properties of the database items in the Group Template and allow them to be overridden. Any property that you allow to be overridden can be reconfigured in the Group Instances.

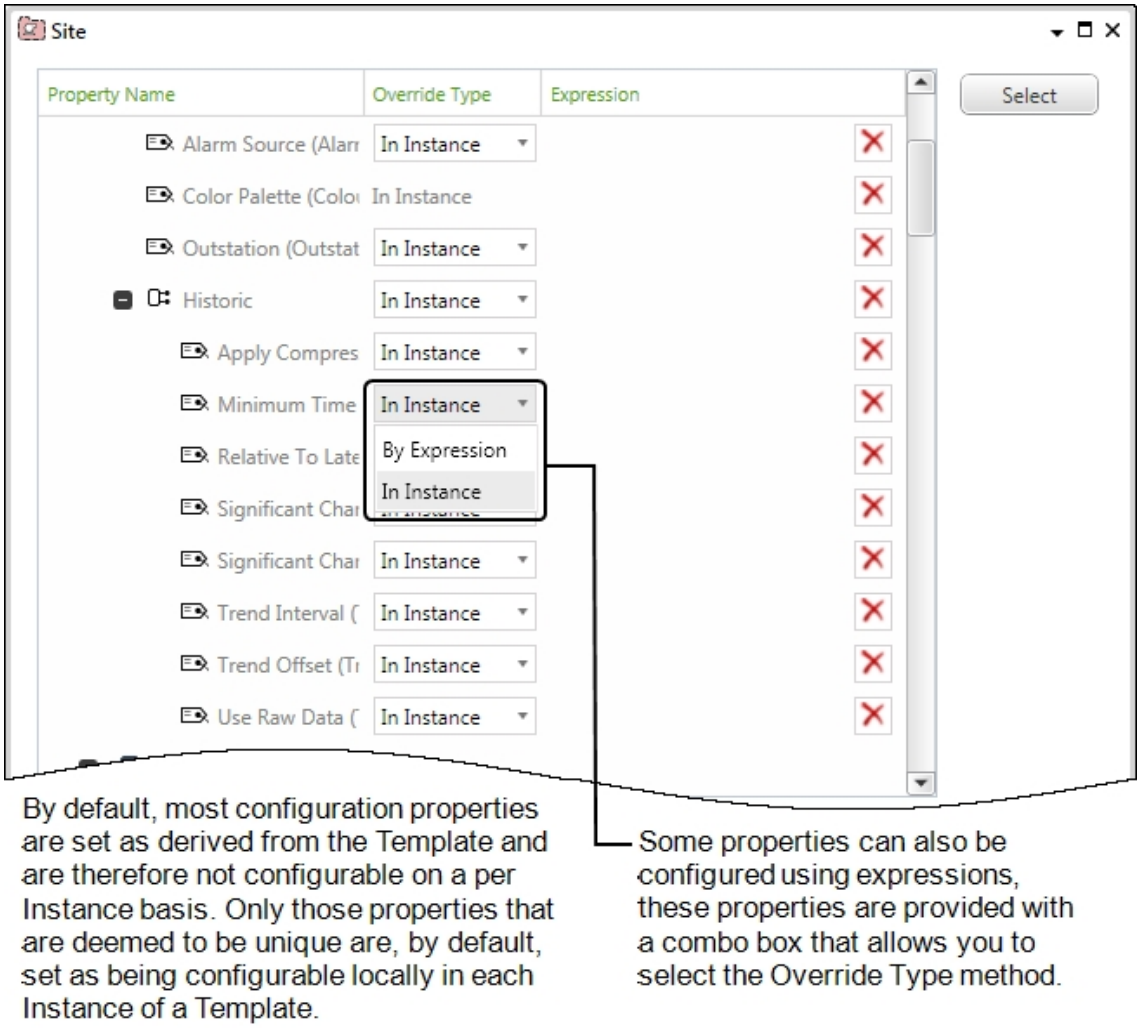
Learn how to use the Property Overrides feature by allowing the Historic settings of the points in the Group Instances to be overridden:

1. Display the Database Bar (see Display an Explorer Bar).
2. In the Database Bar, right-click on the 'Site' Group Template to display its context sensitive menu.
3. Select the **Edit Property Overrides** option to display the Property Overrides window.

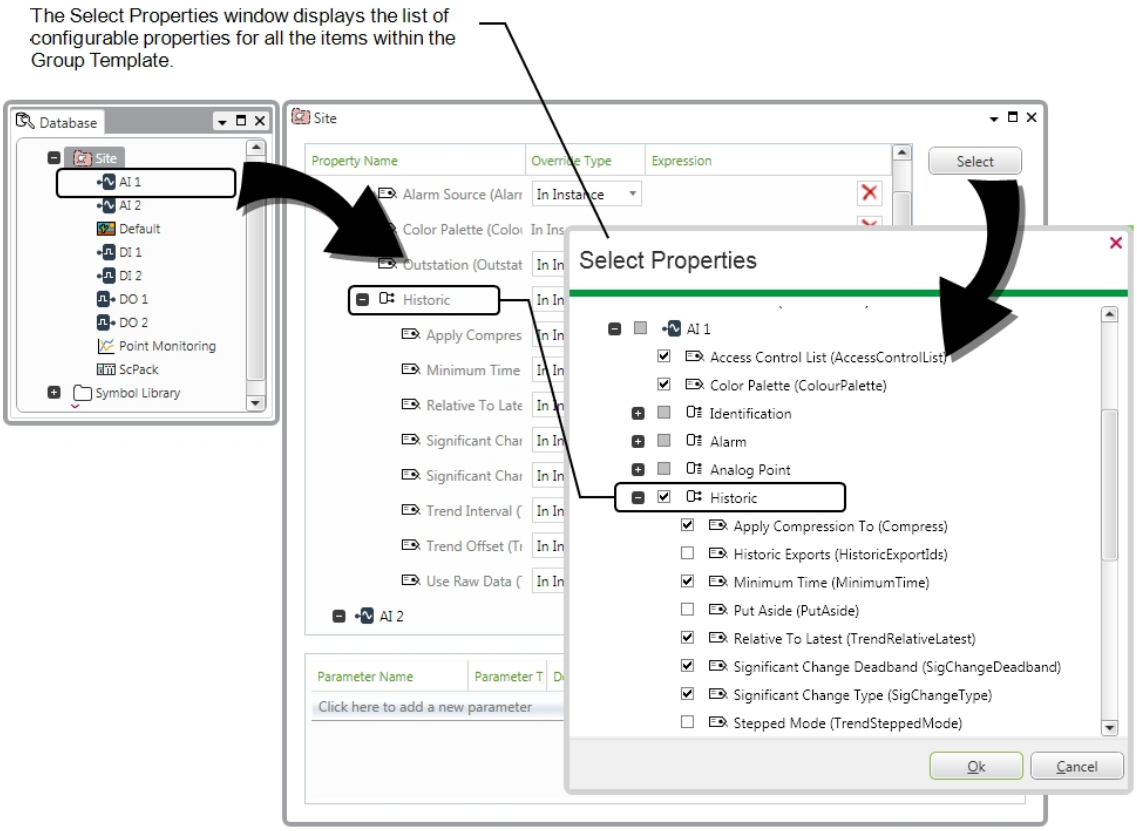
   The window displays the configurable properties of the Group Template and the database items that have been added to that Group Template.



4. On the Property Overrides window, expand the branch for the 'AI 1' point, then expand the **Historic** branch. This reveals the historic properties (these correspond to the fields on the **Historic** tab of the Point Form).

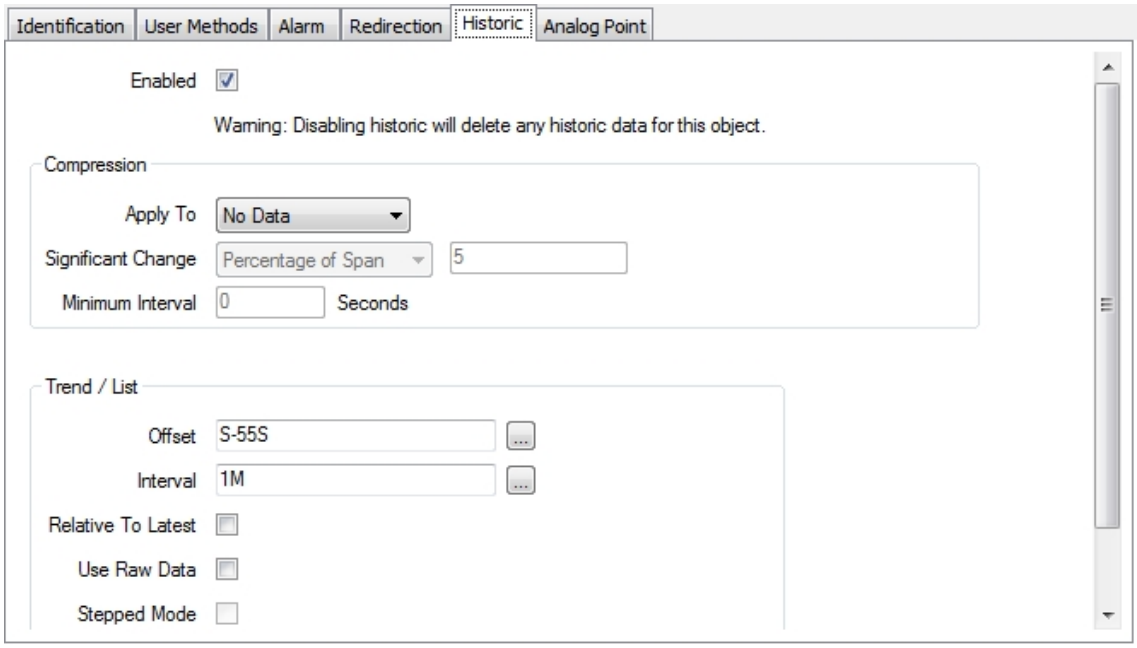


5. You can enable or disable properties from the Property Overrides window by using the **Select** button, which displays the Select Properties window.



6. Select the check box next to the **Historic** branch (this represents the Enabled check box on the Historic tab of the Point Form) and then select the check boxes for the Historic properties (*see* Understanding the Select Properties Window). By doing this, you are allowing the Historic settings of the point to be configured separately in the Group Instance (although the Historic settings of the Group Template will be used as the default Historic settings for the point).
7. Repeat steps 3, 4 and 5 for the other points in the Group Template.
8. Select the **OK** button to confirm your selection and close the Property Overrides window.
9. Display the configuration Form for any of the points in the Group Instances.

10. Select the **Historic** tab.



The **Historic** tab's settings are available for you to configure. The configuration changes you apply will only affect the point on which you apply the changes.

Now that you have worked with a Group Template and Group Instances, with a little forward planning, you should be able to configure your system more quickly, with less effort.

But how much have you learned? Test Your Knowledge on Group Templates and Instances.

Further Information

Property Overrides: *see* Property Overrides.

Test Your Knowledge on Group Templates and Instances

You have created a Group Template and Group Instances and have seen how they can be used to reduce the amount of configuration work required to set up and maintain your system. But are you ready to use what you have learned? Put yourself to the test by answering these Group Template and Group Instance questions:

1. What are the two ways you can create a new Group Template?
2. What is the difference between a Group Template and a Group Instance?
3. What is the difference between a Group Instance and a 'Normal' Group?
4. What does the Property Overrides feature allow you to do?
5. A Group Template contains a Logic program. This program is used by several Group Instances, and the Logic programs in the Group Instances are identical to the Logic program in the Group Template. An amendment needs to be made to the Logic programs. What is the quickest way to make the amendment?
6. A point in a Group Instance needs to have its High High alarm threshold limit re-configured. The High High alarm threshold is grayed out on the point's Form. So how do you reconfigure its High High setting?

Online Help

Throughout the tutorial, you have worked with a variety of Geo SCADA Expert's user-friendly displays and have seen a small sample of the powerful and innovative features it provides. But as the tutorial draws to an end, we'd like to direct you toward the comprehensive Geo SCADA Expert online help.

Geo SCADA Expert online help is an extensive suite of online documentation that is designed for novice users and experienced users alike. It provides you with a wealth of descriptions, explanations, instructions and examples about various aspects of Geo SCADA Expert. So whether you need general information, worked examples, or details about a specific feature or setting, help is just a click away.

Please take time to read through the Using the Help Guide in the online help

Life Is On | Schneider Electric

Schneider Electric Canada Inc.
415 Legget Drive, Suite 101,
Kanata, Ontario, K2K 3R1, Canada

Geo SCADA Expert 2023
October 2024

www.schneider-electric.com

UG-EN-AV001001-00