PowerLogic™ HDPM6000

Installation Guide

Z208128-0J
12/2024

Schneider Electric

www.se.com

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As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

Safety Information

Important information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

Notice is used to address practices not related to physical injury.

Please note

Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Safety Precautions

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Submetering equipment shall not be mounted within 50.8 mm (2 in.) of any live parts including primary conductors, primary terminals, primary lugs. This requirement excludes insulated cables.
- Submeters attached to the enclosure shall not contact the panel interior insulation.
- Mounting provisions shall not be attached to any live part.
- Voltage sensing and power supply connections to the primary voltage shall have overcurrent protection.
- Do not install submetering equipment in any area where breaker arc venting exhaust gasses could be re-directed as a result of submetering equipment installation.
- This product must be installed inside a suitable fire and electrical enclosure.
- Follow safe electrical work practices. See NFPA 70E in the USA, or applicable local codes.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Do not use this device for critical control or protection applications where human or equipment safety relies on the operation of the control circuit.
- Do not install this product in hazardous or classified locations.
- Read, understand and follow the instructions before installing this product.
- Turn off all power supplying equipment before working on or inside the equipment.
- Product may use multiple voltage/power sources. Disconnect all sources before servicing.
- Use a properly rated voltage sensing device to confirm that power is off.
- Do not use data from this device to confirm power is off.
- Replace all doors, covers and protective devices before powering the equipment.
- Do not exceed the product's ratings or maximum limits.
- Treat communications and I/O wiring connected to multiple devices as hazardous live until determined otherwise.

Failure to follow these instructions will result in death or serious injury.

If this product is used in a manner not specified by the manufacturer, the protection provided by the product may be impaired.

The installer is responsible for conformance to all applicable codes.

The safety of any system incorporating this equipment is the responsibility of the assembler of the system.

Note: See IEC 60950-1:2005, Annex W for more information on communications and I/O wiring connected to multiple devices.

Protective bonding: electrical connection of accessible conductive parts or protective screening to provide electrical continuity to the means for connection of an external protective conductor.

Safety Precautions (cont.)

ATTENTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

⚠ CAUTION

PRODUCT DAMAGE DUE TO ELECTROSTATIC DISCHARGE

Circuit boards and components can be damaged by static electricity or electro-static discharge (ESD). Observe the following electrostatic precautions when handling the product, and cables and components connected to the product:

- Keep static-producing material such as plastic, upholstery, carpeting, etc. out of the immediate work area.
- Store the product in ESD-protective packaging when it is not installed in the panel.
- When handling the product, or a conductive cable / an ESD-sensitive component connected to the product, wear a conductive wrist strap connected to the Ground through a minimum of 1 MΩ resistance.
- Avoid touching exposed conductors and component leads with skin or clothing.

Failure to follow these instructions can result in equipment damage.

⚠ WARNING

UNINTENDED OPERATION

- Do not use this device for critical control or protection of persons, animals, property or equipment.

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

FCC Notice

FCC PART 15 INFORMATION

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The user is cautioned that any changes or modifications not expressly approved by Schneider Electric could void the user's authority to operate the equipment.

This Class A digital apparatus complies with Canadian ICES-003.

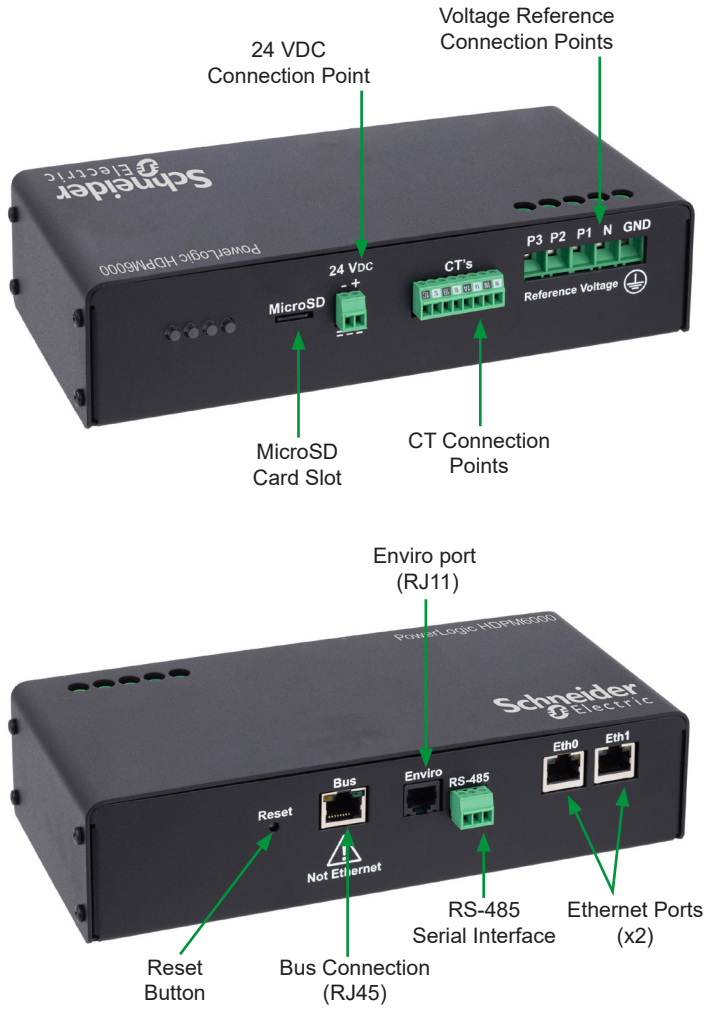
Cet appareil numérique de la classe [*] est conforme à la norme NMB-003 du Canada.

Table of content

1. Overview

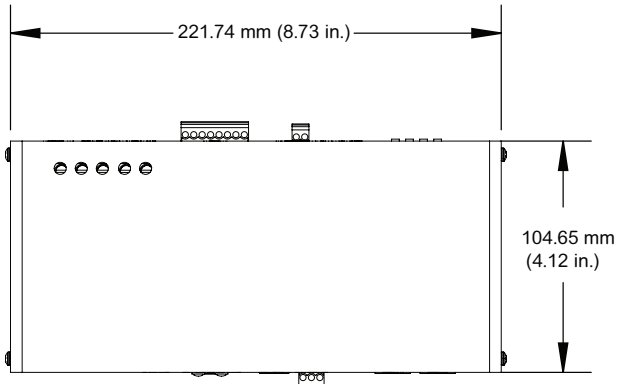
The HDPM6000 platform is comprised of the HDPM6000 head unit, Current Transformers (CTs) and the power supply. The HDPM6000 head unit provides true RMS data for Volts, Amps, Power Factor, Watts, kWh, kVAR, kVARh, Hz, vTHD and iTHD.

Figure1. HDPM6000 Head Unit

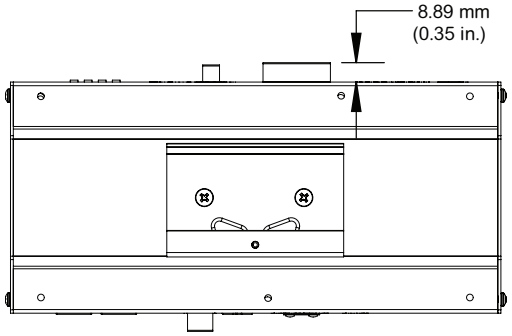


2. Dimensions

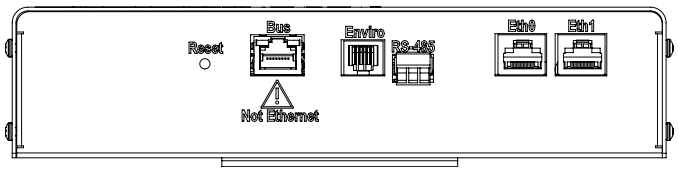
Top View



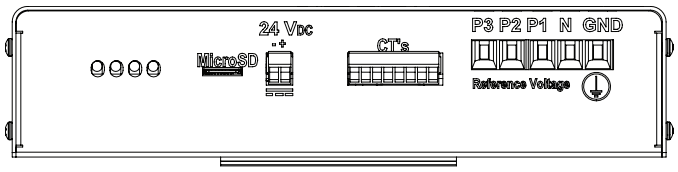
Bottom View



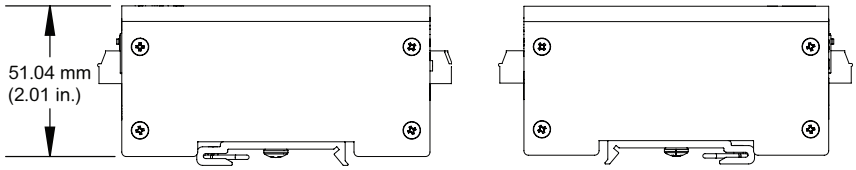
Left View



Right View



Front View, Back View



Note: *Dimensions shown are within ±3.175 mm (±0.125 in.).*

3. Specifications

Electrical Characteristics		
Measurement voltage	Per UL 61010-1: up to 277 VAC L-N / 480 VAC L-L	
	Per IEC 61010-1: up to 277 VAC L-N / 480 VAC L-L	
	Single phase 2-wire plus ground, 3-wire plus ground or 4-wire plus ground	
Specified accuracy range	108 VAC L-N / 187 VAC L-L to 332 VAC L-N / 576 VAC L-L	
Continuous overload at voltage measurement inputs	580 VAC L-L	
Input frequencies	50 / 60 Hz	
24 VDC power supplies input voltage	100 to 240 VAC or 264 to 575 VAC to 24 VDC output	
Measurement category	CAT III	
CT support	20 to 4000 A with internal burdened resister and 250 mV signal (no shorting blocks required)	
CT options	Solid-core or split-core type current transformers with a maximum voltage of 480 V	
Supported protocols		
Maximum number of concurrent Modbus TCP connections	25	
Measurement Accuracy		
The HDPM6000 Head Unit Real Energy (kWh) meets the accuracy limits of ANSI C12.20 Class 0.5 and IEC 62053-22 Class 0.5S according to the following tests:		
Measurement type	**IEC 62053-22 2016 Class 0.5S**	**ANSI C12.20-2010 Class 0.5**
Variation of Current	✓	NA
Equality of Circuits	✓	✓
Variation of Voltage	✓	✓
Variation of Frequency	✓	✓
Variation of Ambient Temperature	✓	✓
Load Performance	NA	✓
Variation of PF	NA	✓
Environmental Characteristics		
Operating temperature	-20 to 60 °C (-68 to 140 °F)	
Storage temperature	-40 to 85 °C (-40 to 185 °F)	
Relative humidity	5 to 90% non-condensing	
Maximum operating altitude	2,000 m (6,562 ft.)	
Non-operating altitude	15,000 m (49,213 ft.)	
Noise level	< 65 dba at six ft. (72 in.) from the HDPM6000	
Mounting location	Not suitable for wet locations. For indoor use only.	
Pollution degree	2	

Specifications (Cont.)

Standards		
Description	**General Standard**	**Reference Standard**
Radiated emissions	IEC/EN 61326-1 :2020 (Industrial Electromagnetic Environment)	CISPR 11: Conducted emissions, AC port inc A1
Conducted emissions, AC port		
Conducted emissions, telecom port		
Radiated RF immunity		IEC/EN 61000-4-3
Fast transient bursts		IEC/EN 61000-4-4
Surge		IEC/EN 61000-4-5
Conducted immunity		IEC/EN 61000-4-6
Power frequency magnetic field		IEC/EN 61000-4-8
Voltage dips and interruptions		IEC/EN 61000-4-11

3.1 Waveform Capture Specifications

Modules	Frequency (Hz)	Number of samples per cycle	Number of cycles per current and voltage waveform	Portion of waveform capture that is pre-event
HDPM6000, HDPM6000R, HDPM6000S, HDPM6000S24	50	160	12.8	2/3
	60	133.3	15.3	2/3
HDPM6000B	50	160	6.4	½
	60	133.3	7.6	½

4. Current Transformers

4.1 CT Orientation

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Use only appropriately specified current sensors which provide reinforced insulation rated for the nominal voltage of the system to be measured and measurement category CAT III or CAT IV.

Failure to follow these instructions will result in death or serious injury.

NOTICE

INCORRECT POLARITY

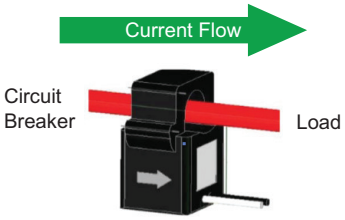
Align CT arrow to point in the direction of the power flow.

Failure to follow this instruction can result in incorrect readings.

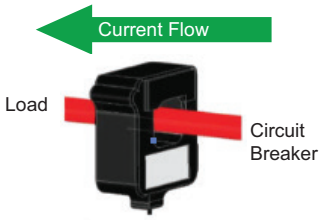
Each CT can be connected to a circuit by opening or removing the top of the CT and snapping it onto the wire that connects the power source to the load. The CT label must face the power source. Ensure that the CT is closed tightly or readings provided by the HDPM6000 head unit may be affected.

Split-Core Models

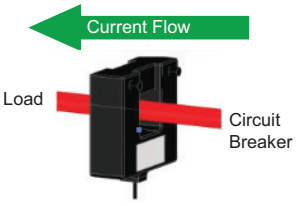
For this model CT, the arrow indicates the current flow (i.e., the label faces away from the circuit breaker).



For this model CT, the label must face the source (i.e., the label faces the circuit breaker).



For this model CT, the label must face the source (i.e., the label faces the circuit breaker).



CTs may be simply hung on the wire which they snap around. An alternative is the use of VELCRO® strips on the bottom or hinged side of the unit, to allow for ease of mounting and removal as necessary. VELCRO is non-conductive.

NOTICE

CT WIRE MISCONNECTION

- Paired lead wires must be kept together.
- Do not install CTs in a panel where they exceed 75% of the wiring space of any cross-sectional area within the panel.
- Do not install CTs in areas of breaker arc venting.
- Do not install CTs using Class 2 wiring methods or connect to Class 2 equipment (NFPA 70)
- Secure CTs and route conductors so that they do not contact live terminals or bus.

Failure to follow these instructions can result in loss of data and damage to equipment.

Each CT output has two wires. The white and black lead wires from each CT are associated with specific ports on the HDPM6000 head unit.

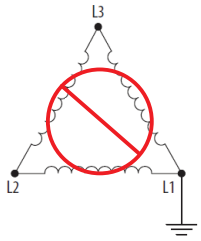
5. Hardware Installation and Wiring

5.1 Electrical Wiring Instructions: 3-Phase

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- While removing or installing panels and covers, ensure that they do not contact an energized bus.
- Never bypass external fusing.
- Never short the secondary of a potential transformer.
- Before closing covers and doors, carefully inspect the work area and remove any tools, wire scraps or other objects that may have been left inside the equipment.
- Do not exceed the product's ratings or maximum limits.
- Turn off all power supply equipment before working on or inside equipment.
- Use a properly rated voltage sensing device to cofirm that power is off.
- Treat all measurement circuits and CT connections as energized live.
- Do not connect the HDPM6000 to a corner-grounded delta system.



Failure to follow these instructions will result in death or serious injury.

Note: *The HDPM6000 must be mounted in a NEMA type 1 or better electrical enclosure that meets the environmental requirements of the location.*

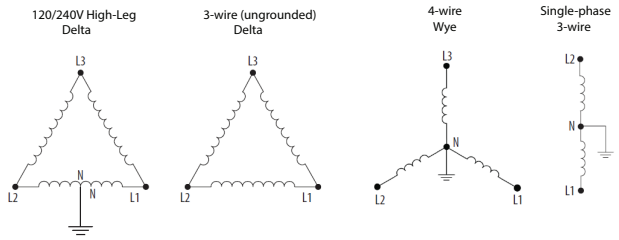
The HDPM6000 head unit includes three separate electrical components that must be connected in order to use the system: the voltage reference, power supply and CTs.

If the system voltage is greater than the meter's specified maximum measurement voltage, potential (voltage) transformers (PTs/VTs) must be used to step down the voltage to below the meter's maximum measurement voltage. Note that the maximum voltage allowed for direct connection may be lower than the manufacturer-specified limits, depending on the local electrical codes and regulations.

All wiring terminals for voltage reference on the HDPM6000 head unit support 18-12 AWG (1 - 2.5mm²) copper wiring. Terminal screws should be tightened to 0.5084 Nm (4.5 lb-inch) of torque. Paired lead wires must be kept together. Select the proper wire type from the table below based on the maximum operating temperature of the installation location.

Location Max. Operational Temp.	Conductor Material	Wire Temp. Rating	Wire Size
50 °C (122 °F)	Copper	75 °C	14 AWG
60 °C (140 °F)	Copper	90 °C	12 AWG

1. Connect the 24 VDC output from the power supply to the two-terminal input on the HDPM6000.
2. Depending on the system to be monitored, connect the 120/208 VAC, 220/380 VAC, 230/400 VAC, 240/415 VAC or 277/480 Vrms input to the power supply.
3. The HDPM6000 head unit supports the measurement of all of the following types of voltage (connection requirements shown below):

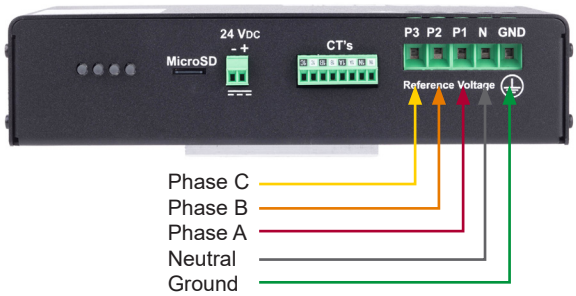


   a. Wye or Single Phase 3-wire (**Refer to Figure 2 and Figure 3 on page 9**):

      i. If potential transformers are not used, connect all phase voltage lines (and neutral, if required by local regulations) to a common-trip breaker with no greater than 15 A of overcurrent protection, located near the HDPM6000 meter (UL Listed for voltages up to 480 Vrms). If potential transformers are used, connect the secondary of the PTs to the common-trip breaker.

      ii. Connect the outputs of the common-trip breaker to the voltage reference connection points on the HDPM6000 meter, as shown in the diagram below.

      iii. Connect the ground connection directly to a stable ground connection on your power panel.



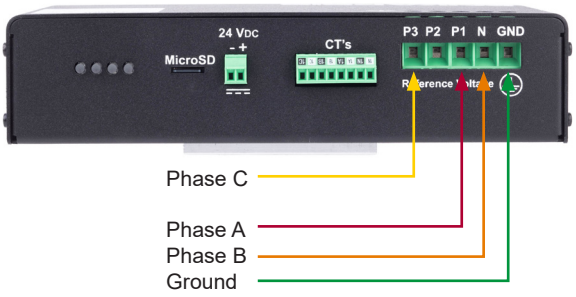
Note: *Phase C is not applicable for Single Phase 3-wire.*

b. 3-phase delta power (**Refer to the Figure 4 on page 10**):

i. If potential transformers are not used, connect the three-phase voltage lines to a common-trip breaker with no greater than 15 A of overcurrent protection, located near the HDPM6000 meter (UL Listed for voltages up to 480 Vrms). If potential transformers are used, connect the secondary of the PTs to the common-trip breaker.

ii. Connect the outputs of the 3-phase common-trip breaker to the voltage reference connection points on the HDPM6000 meter as shown below. Note that the Phase B connection is connected to the space normally used for the neutral connection for the Wye 3-phase scheme.

iii. Connect the ground connection directly to a stable ground connection on your power panel.



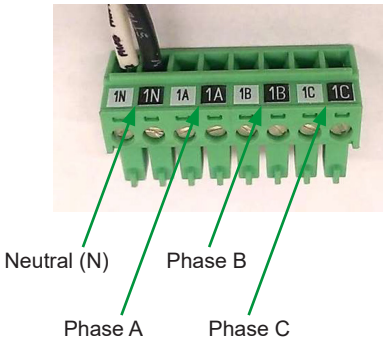
Note: *If installing in IT-S power distribution, a four-conductor disconnect must be used (3-phase + neutral).*

4. Connect the CTs:

a. CTs connect the power panel to be monitored with the HDPM6000 head unit.

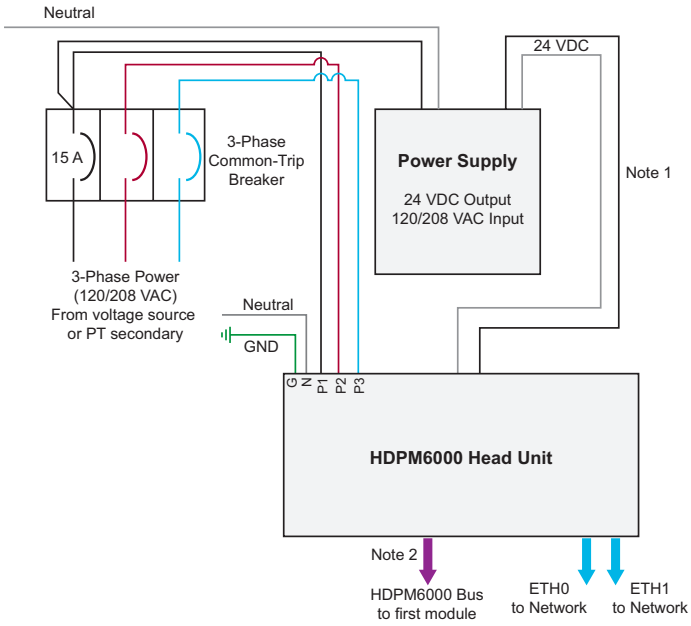
b. Ensure the CT is installed facing the correct direction. (**Refer to the "CT Orientation" on page 5**).

c. The wires connected to the HDPM6000 head unit terminals should be installed in a white/black configuration. Follow the labeling on the provided pluggable terminal block. Terminal screws should be tightened to 3.0 lb-inch (0.339 Nm) of torque.



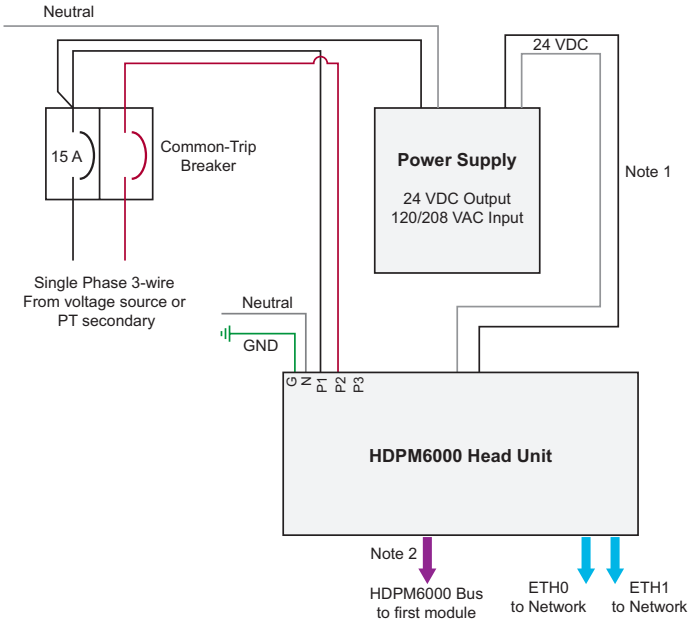
5. Confirm all wiring connections are secure and energize the power supply input.

Figure 2. Example 120/208 VAC 3-Phase Wye Configuration Wiring Diagram



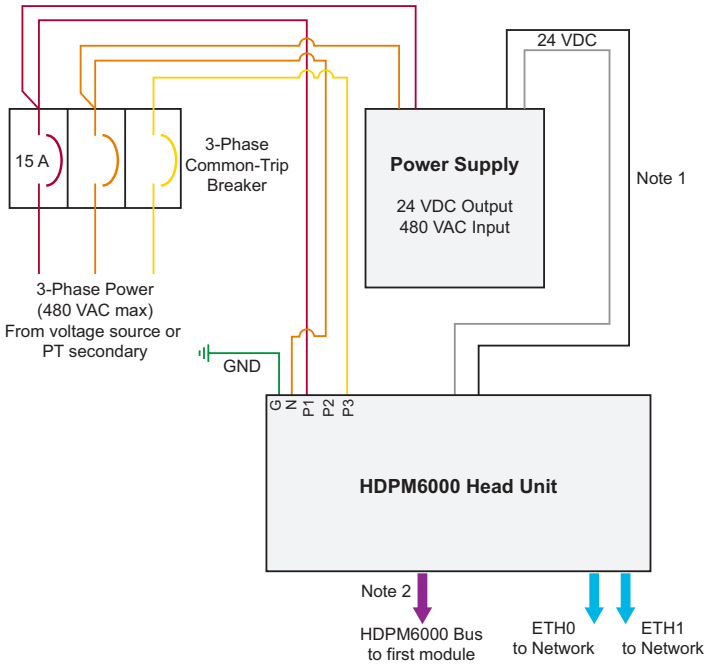
Notes:
1. Power supply cable must be < 3 m (118.11 in.) in length.
2. CAT6 cable must be < 30 m (98 ft.) in length between the HDPM6000 head unit and the first module on the HDPM6000 bus.

Figure 3. Example Single Phase 3-wire Wiring Diagram



Notes:
1. Power supply cable must be < 3 m (118.11 in.) in length.
2. CAT6 cable must be < 30 m (98 ft.) in length between the HDPM6000 head unit and the first module on the HDPM6000 bus.

Figure 4. Example 480 VAC 3-Phase Delta Configuration Wiring Diagram



Notes:
1. Power supply cable must be < 3 m (118.11 in.) in length.
2. CAT6 cable must be < 30 m (98 ft.) in length between the HDPM6000 head unit and the first module on the HDPM6000 bus.

5.2 Power Supply

The power supply for the HDPM6000 head unit is a Class II precision power supply (METSEHDPM6PSV240 and METSEHDPM6PSV500) from Phoenix Contact. The model shown in the figure below requires a 120/240 VAC, 50 or 60 Hz input. Power supplies for all input voltages used with the HDPM6000 head unit are available.

The power supply provides 24 VDC power via one positive and one negative output terminal. There is no ground output terminal. At 24 V, the HDPM6000 head unit uses approximately 25 to 250 mA of power, depending on the connected module (HDPM6000R, HDPM6000S, HDPM6000B or HMI local display).

Figure 5. 24 VDC, 60 W Power Supply

Note: *Power supply cable must be < 3 m (118.11 in.) in length.*

Dimensions

Length	Width	Height
84 mm (3.31 in.)	35 mm (1.38 in.)	90 mm (3.54 in.)

Electrical Properties

Nom. Volts Input	100 to 240 V
Max. Volts Input	85 to 264 V
Max. Amps Input	2 A
Frequency	45 to 65 Hz
Volts Output	24 VDC ±1%
Amps Output	2.5 A
Power Output	60 W

Certifications

- EN61010-1, 61000-3-3, 50082
- CE marked/tested
- UL 508, 1310

5.3 Head Unit Bus Connection

The HDPM6000 bus can be used to connect to modules for branch circuit monitoring (HDPM6000S, HDPM6000R, HDPM6000B) and I/O (HDPM6000 I/O Module). Connect modules to the HDPM6000 bus in the following way:

- Only branch circuit metering modules of one type may be connected together (e.g. all retrofit modules, all busway meters, or all strip modules). A mix of branch circuit modules will not be detected correctly by the head unit.
- I/O Modules and EIM 2.0 modules may be combined with each other and with branch modules (e.g. four retrofit modules, two EIM 2.0 modules and an I/O module).
- Refer to the specific module's installation manual for bus cabling requirements.

Note: *CAT6 cable must be <30 m (98 ft.) in length between the HDPM6000 head unit and the first module on the HDPM6000 bus. Power supply cable must be < 3 m (118.11 in.) in length.*

5.4 RS-485 Wiring

To facilitate RS-485 Modbus RTU communications, the following connections should be made. The HDPM6000 head unit can support a multi-drop network on RS-485 two-wire.

1. Connect the communications wire to the three-pin terminal block (D+/D-/GND).
2. Add a 120 ohm, 0.5W termination resistor at both ends of the RS-485 line.

Figure 6. RS-485 Wiring

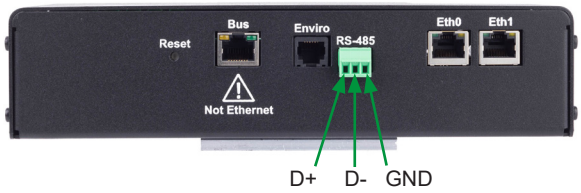


Figure 7. Connection Points for Voltage Reference

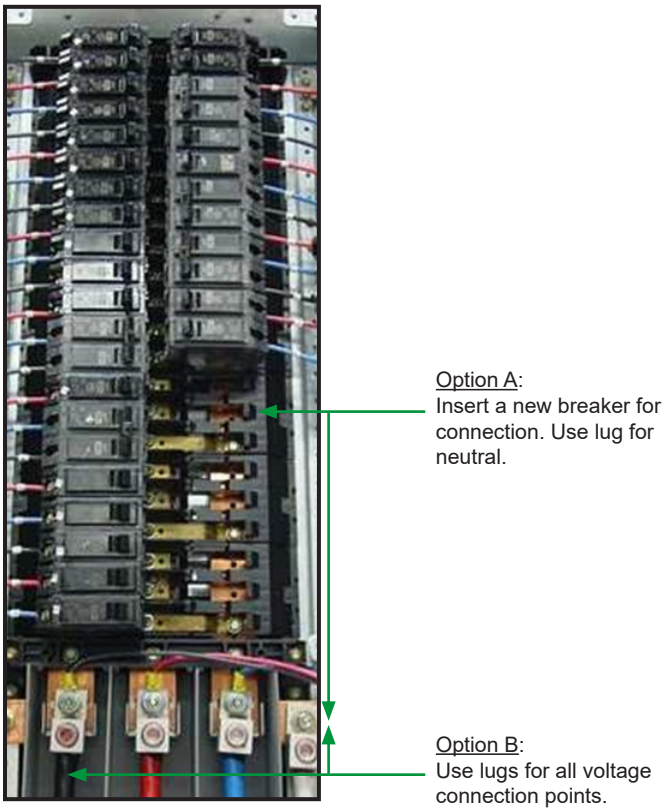


Figure 8. CT Connection Points (300 A CT Shown)

6. Commissioning

This section serves as a quick start guide for commissioning the HDPM6000. The meter's embedded web server provides an interface to modify network settings, change meter configuration, view real-time values, and upload new firmware. In-depth information on each tab of the web page is available in the section 'HDPM6000 Web Interface Tab Details'.

6.1 Cybersecurity

Modbus, SNMP, BACnet and HTTP are insecure protocols. This device does not have the capability to transmit data encrypted using these protocols. If a malicious user gains access to your network, transmitted information could be disclosed or subject to tampering.

- For transmitting data over an internal network, physically or logically segment the network and restrict access using standard controls such as firewalls and utilizing the device's IP whitelisting feature (**Refer to the "General Settings Tab" on page 45**, IP Address Filtering).
- For transmitting data over an external network, encrypt protocol transmissions over all external connections using an encrypted tunnel, TLS wrapper or a similar solution.
- When using SNMP, change the default community name.
- After device configuration, disable configuration writes over Modbus when practical (**Refer to the 'Modbus Configuration Lock' on page 19**).

HDPM head units with system firmware v0.62 and above support TLS v1.2 for HTTPS communication between the embedded web server and web browsers.

Note: *When decommissioning and disposing of a HDPM6000 head unit with either self-signed or custom TLS certificates, be sure to delete the current certificates by prompting the head unit to generate a new self-signed certificate. (**Refer to the "Managing HTTP Certificates" on page 39 or Refer to the "Firmware Update Tab" on page 43**) for instructions describing how to delete custom certificates and generate new self-signed certificates.*

6.2 Accessing the Device for the First Time

NOTICE

HTTPS REQUIRED FOR HEAD UNIT WEB CONNECTION

- Head units with system firmware v0.62 and above will refuse connections from web browsers attempting to connect using HTTP.

Failure to follow this instruction will result in a refused to connect error being reported by the web browser.

1. Connect a CAT6 Ethernet cable directly from the HDPM6000 head unit Eth0/Eth1 port to a computer.
2. Change the IP settings of the computer's Ethernet port to a static IP on the same subnet as the device.
   - The default IP address of the head unit is 10.10.10.4, so assign the computer a static IP such as 10.10.10.1 and a subnet mask such as 255.255.255.0

3. Open a Google Chrome or Firefox web browser window (Internet Explorer not recommended), enter the IP address of the HDPM6000 head unit (10.10.10.4 by default) into the URL bar and click **Enter**. If the head unit has system firmware v0.62 and above, the HTTPS protocol needs to be specified in the URL bar with the IP address (for example, https://10.10.10.4). See the "First Time Access Using HTTPS" section for more detailed web browser access instructions.
4. The web interface opens and you are prompted to enter a password. There are three accounts with different access levels: Guest (view-only), Administrator (view and general configuration), and Super-User (view and advanced configuration). Access level for the login session is determined by which password is entered. Enter your password and click **Log in**.

NOTICE

UNAUTHORIZED SYSTEM ACCESS

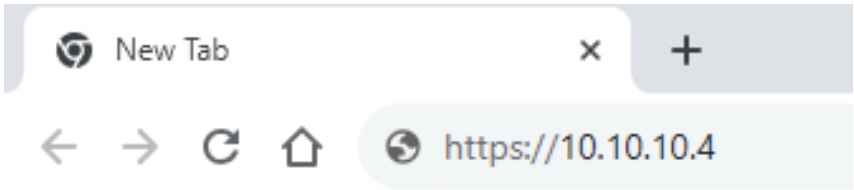
- Default account settings are often the source of unauthorized access by malicious users. If you do not change the default passwords, unauthorized access can occur. Change the default passwords to help reduce this risk.

Failure to follow this instruction can result in compromised data.

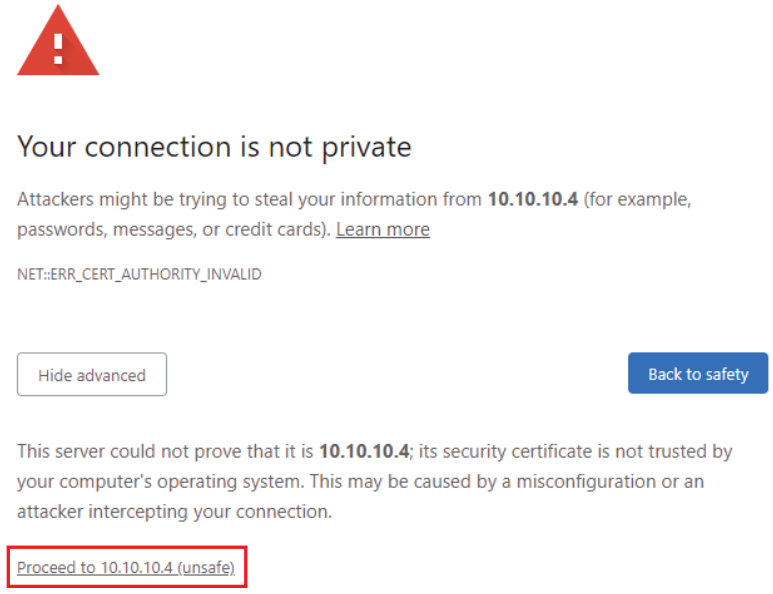
5. For first-time access, change the default password for each account by entering the default password for the account in the 'Password' field and a new password in the 'New password' and 'Confirm password' fields and clicking **Change Password**.
   - Guest (view-only): Default password is 'password'
   - Administrator (view and general configuration): Default password is 'adminpass'
   - Super-User (view and advanced configuration): Must be logged in as administrator first and then (without logging out) log in as super user. Default password is 'superpass'

6.3 First Time Access Using HTTPS

To access the web user interface on the HDPM6000 head unit, specify the HTTPS protocol and IP address in the URL bar of the web browser. As an example, using the initial default IP address of the head unit (10.10.10.4), the following complete URL should be specified in the URL bar as shown in the image below:



Unless the HDPM6000 head unit has been configured to use a custom TLS certificate, the built-in self-signed certificate will be used for the TLS connection between the head unit and a web browser. When a web browser first encounters this self-signed certificate, it will display a warning to the user (see example below for Google Chrome).



If the head unit is accessible only inside a secure network, a security exception can be added to override how the browser identifies head unit web pages. In Google Chrome, click the Advanced button on the warning page to expand the text, and click the link to proceed. Once Google Chrome loads the head unit web page it will display a Not Secure notice next to the URL to indicate that the head unit web page is using an unrecognized certificate (see example below). Although a web browser may indicate the self-signed head unit certificate is unknown, head unit web pages can be browsed after directing the web browser to accept the self-signed certificate.

Refer to the "HTTPS and Custom TLS Certificates" on page 23 for information about configuring the head unit to use a custom TLS certificate (which may be issued by an organization's IT department or by a trusted CA).

6.4 Configuring the Meter

1. Connect to the meter's embedded web server and log in as an Administrator. (**Refer to the "Accessing the Device for the First Time" on page 13 and "First Time Access Using HTTPS" on page 14**).
2. The web page can be navigated using the tabs on the horizontal bar below the Schneider Electric logo. When changes are made on each configuration page, ensure the save button on the page is pressed and the tab is not changed before a popup appears confirming successful save or the changes may be lost.

3. Navigate to the General Settings tab and configure the device's IP settings, metering settings (e.g. supply type, nominal voltage, and circuit numbering) and communications settings (e.g. BACnet, SNMP, RS485). (**Refer to the "General Settings Tab" on page 45**). If directly connected from a PC to the meter and changing to DHCP, this change will apply immediately after saving and the direct connection to the PC will be lost. In this case, completely configure the meter before changing the IP settings to DHCP.
4. Navigate to the TAPs tab and verify all the connected modules on the bus are identified, manually set the device addressing if desired, and configure the orientation for any strip modules attached to the bus. (**Refer to the "TAPs Tab" on page 48**).
5. Navigate to the Channel Cfg tab to set the CT types and expected phases, assign branch channels to circuits and load types, and assign names to circuits. (**Refer to the "Branch Circuit Configuration" on page 16). (Refer to the "Channel Cfg Tab" on page 49**).
6. Navigate to the Demand tab and set the demand type and interval. (**Refer to the "Demand Tab" on page 63**).
7. If any I/O modules are attached to the bus, navigate to the Dry Contact tab to assign the I/O module addresses (card allocations). (**Refer to the "I/O Tab" on page 52**).
8. If any EIM 2.0 modules are attached to the bus, navigate to the "Digital Input" tab to assign the module addresses (card allocations). (**Refer to the "Digital Input Tab" on page 54**).
9. If any environmental sensors are attached to the bus, navigate to the Environmental tab to configure the descriptions and Modbus layout. (**Refer to the "Environmental Tab" on page 50**).
10. Navigate to the Logging tab to enable or disable logs, configure their behavior, and define custom points to log. (**Refer to the "Logging Tab" on page 55**).
11. Navigate to the Alarms tab to define voltage and current alarms for the head unit and any attached metering modules. (**Refer to the "Alarms Tab" on page 56**).
12. To configure Waveform capture triggers, navigate to the Waveform tab and press the **Edit Settings** button to expand the section. Enable or disable specific triggers and set thresholds. (**Refer to the "Waveform Tab" on page 58**).

6.5 Branch Circuit Configuration

Configuration of branch channels of modules attached to the head unit's bus can be made from the "Channel Cfg" tab, including:

- Expected phase of a channel
- CT type
- Circuit groupings (to distinguish between one, two and three pole breakers)
- Circuit names and Rack Ids
- Load Type assignment

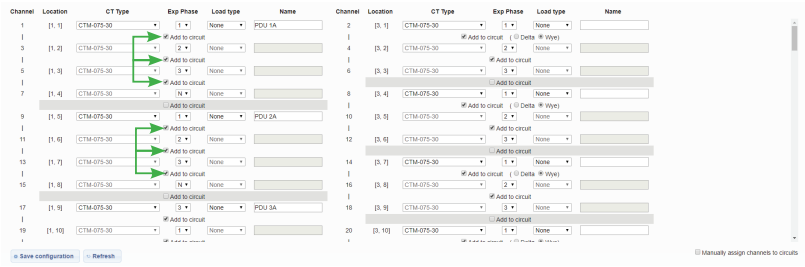
Assign channels to a circuit using either of the following methods:

Automatic Grouping: Uncheck the **Manually assign channels to circuits** box in the lower right hand corner and select the **Add to circuit** boxes between channels to create circuits. When finished, click **Save Configuration**.

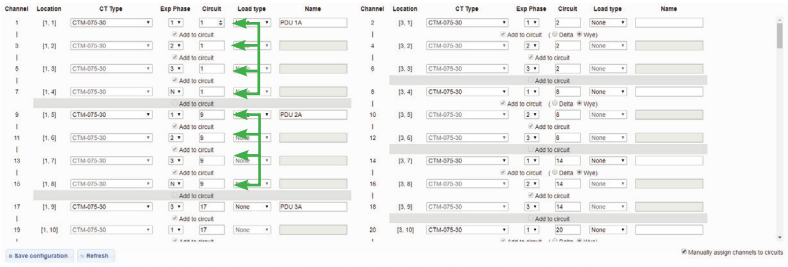
Manual Grouping: Check the **Manually assign channels to circuits** box in the lower right hand corner and assign circuit numbers in the **Circuit** column. Channels are part of a circuit when they share the same circuit number assignment. When finished, click **Save Configuration**.

Note: *If channels are unused and do not have CTs attached, disable them on the Channel Cfg tab by setting their CT type to "Unused".*

Automatic Grouping:



Manual Grouping:



Note: *After clicking Save Configuration, wait for the system prompt OK Save circuit configuration succeeded before continuing.*

6.5.1 2-pole circuit configuration for firmware v62.7 and below

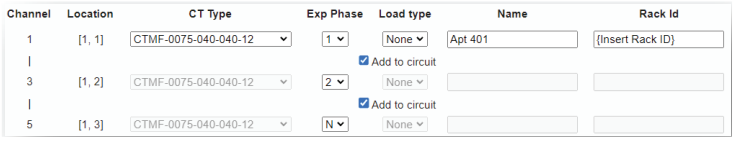
NOTICE

2-Pole Circuit Configuration

- Configure 2-pole circuits according to the requirements for the specific firmware bundle version.

Failure to follow this instruction can result in incorrect readings.

1. Line-to-Line loads can be monitored by assigning the two channels to a circuit that does not include a neutral CT.
2. For monitoring 2-pole circuits with loads that are either Line-to-Neutral or a mix of Line-to-Line and Line-to-Neutral, the neutral must be monitored and grouped together in the circuit. Create a three channel circuit that includes the two lines and the neutral.



6.5.2 2-pole circuit configuration for firmware v62.10 and above

2-pole circuits can be monitored with or without a neutral CT, regardless of whether the load is Line-to-Line, Line-to-Neutral, or a mix of both.

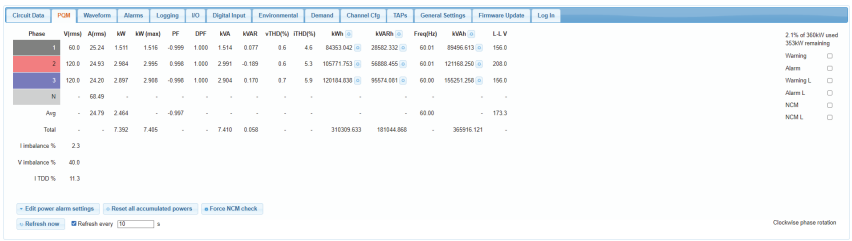
6.6 Sampling Live Data with the Web Interface

After setting up the HDPM6000 metering parameters, it is important to complete some data samples to confirm the installation was done properly and your system is operating correctly.

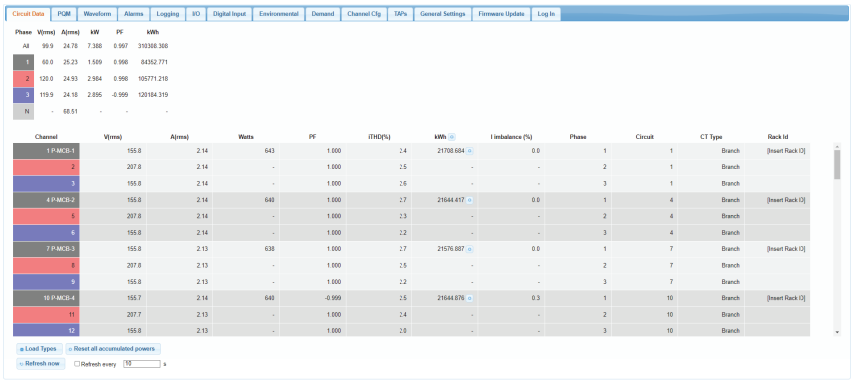
To sample live data:

1. Click the **PQM** tab to view data from the HDPM6000 head unit.
2. Select the **Circuit Data** tab to view data from any attached HDPM6000R, HDPM6000S or HDPM6000B modules.
3. Click **Refresh Now** to refresh the data.

Note: *To view a summary of all connected HDPM6000B modules, select the Circuits option under Phase Summary in the General Settings tab).*Data from HDPM6000 head unit:



Data from connected HDPM6000B:



6.7 Measurement Scaling

There are two selections in the General Settings tab of the web interface with settings that control measurement scaling.

High Power Mode: This setting is used when the circuits being monitored exceed 655 amps. Adjusting this setting has the following impact on measurements.

- Branch circuit current and power measurement values in Modbus registers are scaled according to the High Power setting.
- Branch circuit current and watt measurement values in the Per-Circuit Modbus register block (starting at address 10) are scaled according to the High Power setting.
- Branch circuit current and watt measurement values in the Summary Modbus register block (starting at address 4690) have precision adjusted according to the High Power setting.
- Branch circuit current and watt measurement values in the 123N Circuit Summaries Modbus register block (starting at address 21998) have precision adjusted according to the High Power setting.
- The displayed precision of current and watt values shown on head unit web pages are adjusted according to this setting.

There are 3 selections for this mode:

Off: No power scaling is applied – the default current resolution of 0.01A and default power resolution of 1W is used.

On: The current resolution is changed to 0.1A (a 10x increase over the default resolution) and the power resolution is changed to 100W (a 100x increase over the default resolution). Branch current values in Modbus registers are decreased by a factor of 10 and branch power values in Modbus registers are decreased by a factor of 100. Branch and head unit current values displayed in head unit web pages are shown with a precision of 0.1A and power values are shown with a precision of 100W.

Custom: Selecting the Custom high power setting reveals two additional settings: Amps Resolution and Watts Resolution. Where the high power mode setting of On applies preset power and current resolution settings (as described above), the Custom high power mode allows current and power resolution settings to be changed independently.

Note: *The V Scaler setting present in previous head unit firmware has been removed in firmware versions v0.62 and above.*

Energy resolution: This setting scales energy values in Modbus registers and adjusts the displayed precision of energy values shown on head unit web pages. For most applications, the recommendation is to leave this setting at the default (1 Wh).

6.8 Modbus Configuration Lock

Once the HDPM6000 is configured, a setting is available to disallow changes to the core configuration over Modbus. This features helps to mitigate the impact of Modbus as an insecure protocol.

The following registers are controlled by the Modbus Configuration Lock:

Parameter	Register Range
High Power Mode (power scale)	4501
External PT Ratio	4503
V, I, W Scale	4498 - 4500
ANSI_IEC Mode	4598
Supply Type (wye,delta)	8
Circuit assignment, CT Type, CT Factor, Expected Phase (Voltage Phase Association)	10 - 1969
Strip Config (Top feed/ bottom feed)	4684
CT Type Registers (all except 55400 Index)	55401 - 55899
Resets (bus, processor, module, etc.)	7, 4509,4595,4609,65500
Energy Scale Factor	9
Branch Energy Accumulator Resets	8000 - 8385
Head Unit Energy Accumulator resets	5198 - 5359
123N circuit summary energy accumulator resets	21998 - 26797
Circuit summary accumulator resets	32998 - 52197
Demand type, # of sub-intervals, peak resets	55994 - 58199
Load Type assignment	8741 - 8949
Phase Summary Source	4596

To prevent writes to these Modbus registers, set the 'Allow core configuration over Modbus' option on the General Settings tab to 'Disabled'.

6.9 Firmware Updates

Occasionally new firmware versions for the HDPM6000 are released with new features and bug fixes. The head unit has two firmware files, one for the system firmware and the other for the 3-phase meter (mains metering). Modules that attach to the HDPM6000 bus will also have their own firmware files. The HDPM6000 Web Interface can be used to apply these new firmware files to the devices.The HDMP6000 Manager software may also be used to upgrade firmware.

NOTICE

INABILITY TO DOWNGRADE BELOW FIRMWARE VERSION 60

Read instructions in below section carefully before you decide to proceed with the firmware upgrade.

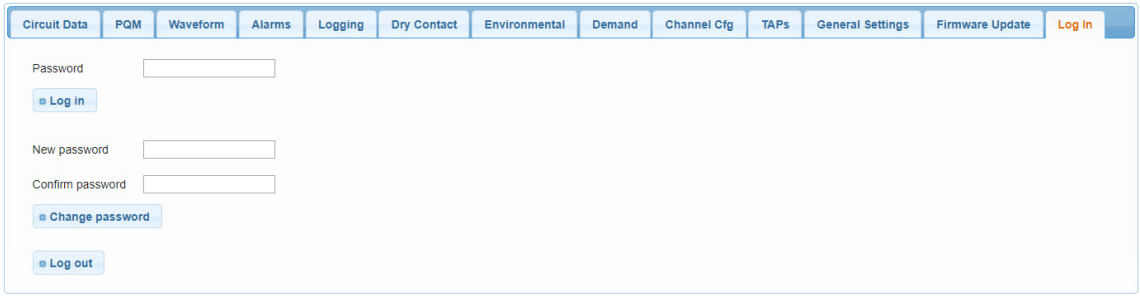
Starting with HDPM Firmware Version 60 Bundle, the firmware files are digitally signed by Schneider Electric. To upgrade from an unsigned version to a signed version (60 or above), use HDPM6000 Manager version 1.21.0 or later rather than the web interface. If the web interface or a version of HDPM6000 Manager less than 1.21.0 are used, the firmware upgrade may incorrectly report that it did not succeed. If this scenario occurs, check the “Firmware Upgrade” tab of the web interface to verify that the upgrade was successful and retry if not. After upgrading to firmware version 60 or higher, the firmware cannot be downgraded to lower than version 60.

6.10 Applying firmware through the web interface

1. Download firmware files to a computer from the Schneider Electric webpage.

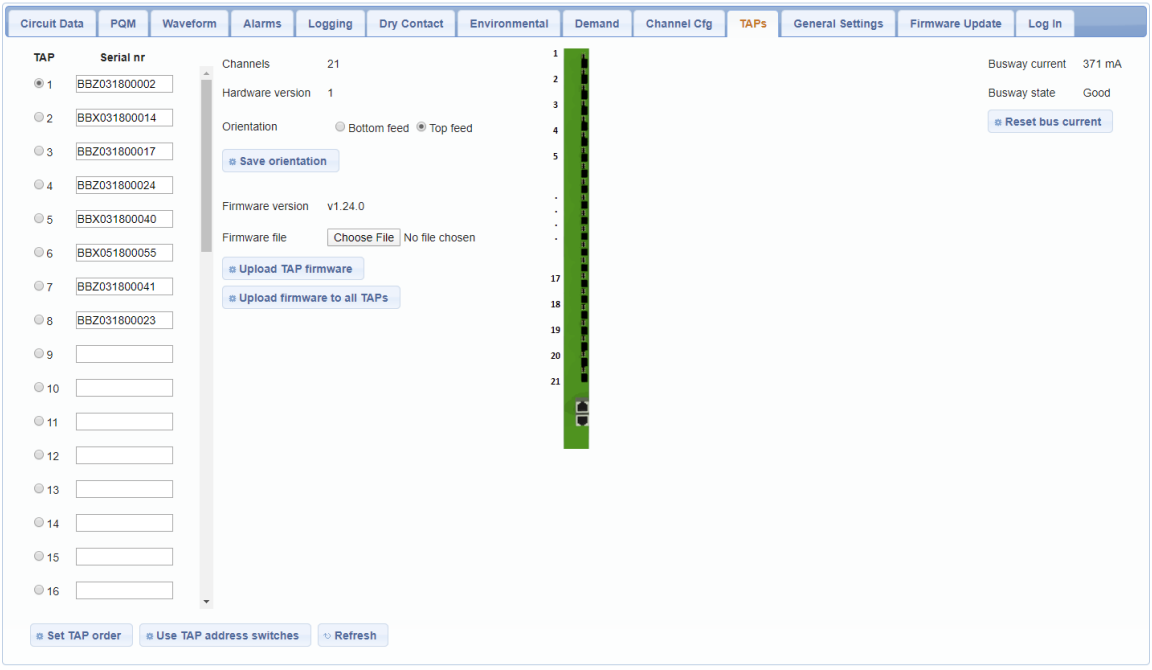
   https://www.se.com/us/en/product-range/8297113-powerlogic-hdpm6000/#software-and-firmware

2. Log in to the HDPM6000 Web Interface.

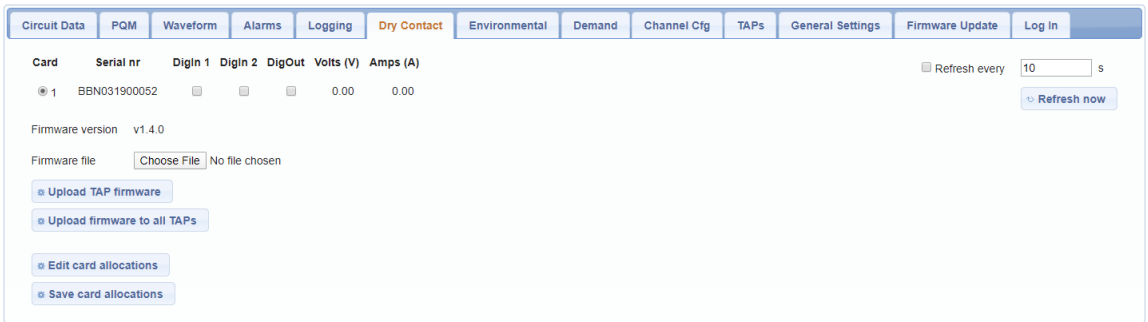


3. Navigate to the **Firmware Update** tab to update the head unit's firmware or upload a custom TLS certificate and associated private key. There are 4 rows: one for the system firmware, one for the 3-phase meter firmware, one for a custom TLS certificate, and one for the private key associated with the custom TLS certificate.

4. Click the **Choose File** button to the right of the firmware to update (system or 3-phase meter).
5. Navigate to the location where the new firmware files were downloaded, select the new firmware file (system or 3-phase meter) and choose **Open**.
6. Click the **Upload firmware** button to the right of the firmware to be updated.
7. Repeat steps 4 through 6 for the second head unit firmware (system or 3-phase meter).
8. If branch metering modules are attached to the bus, navigate to the 'TAPs' tab to update their firmware.



9. Click the **Choose File** button, navigate to the location where the new firmware files were downloaded, select the new firmware file (busway meters, strip modules, retrofit modules) and click **Open**.
10. Click **Upload firmware to all TAPs** to update all of the modules connected to the bus, or click **Upload TAP firmware** to update the selected module (radio button on left controls selected module).
11. If I/O modules or EIM 2.0 modules are attached, navigate to the 'Dry Contact' tab or 'Digital Input' tab (respectively), choose the firmware file, and upload firmware to one or all attached I/O modules or EIM 2.0 modules.



6.11 HTTPS and Custom TLS Certificates

The HDPM6000 head unit has the following requirements for TLS connections:

- TLS version 1.2 (TLS 1.3 is not supported)
- Cipher suite TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
- Custom certificate and associated private key in either PEM or DER format

The HDPM6000 head unit has a self-signed certificate for HTTPS connections, but a custom TLS certificate (and associated private key) can be uploaded to the head unit using either the web interface or HDPM6000 Manager software. To learn more about uploading a custom TLS certificate and private key to the head unit using HDPM6000 Manager software, (**Refer to the "HDPM6000 Manager" on page 24**). To upload a custom TLS certificate and associated private key to the head unit using the head unit web interface, follow the instructions below.

1. Log into the head unit web interface and navigate to the **Firmware Update** tab.
2. Click the **Choose File** button on the Private Key row and navigate to the location of the private key file.
3. Click the **Upload private key** button to upload the selected private key file to the head unit.
4. Click the **Choose File** button on the Custom TLS Certificate row and navigate to the location of the custom TLS certificate.
5. Click the **Upload certificate** button to upload the selected custom TLS certificate to the head unit.

Note: *The private key file needs to be uploaded to the head unit before the custom TLS certificate file is uploaded.*

To delete a custom TLS certificate and revert to the built-in self-signed certificate, click the **Delete Custom Certificate** button.

7. HDPM6000 Manager

HDPM6000 Manager is a Windows-based tool created to manage HDPM6000 meters. It does not require installation and provides the following functionality:

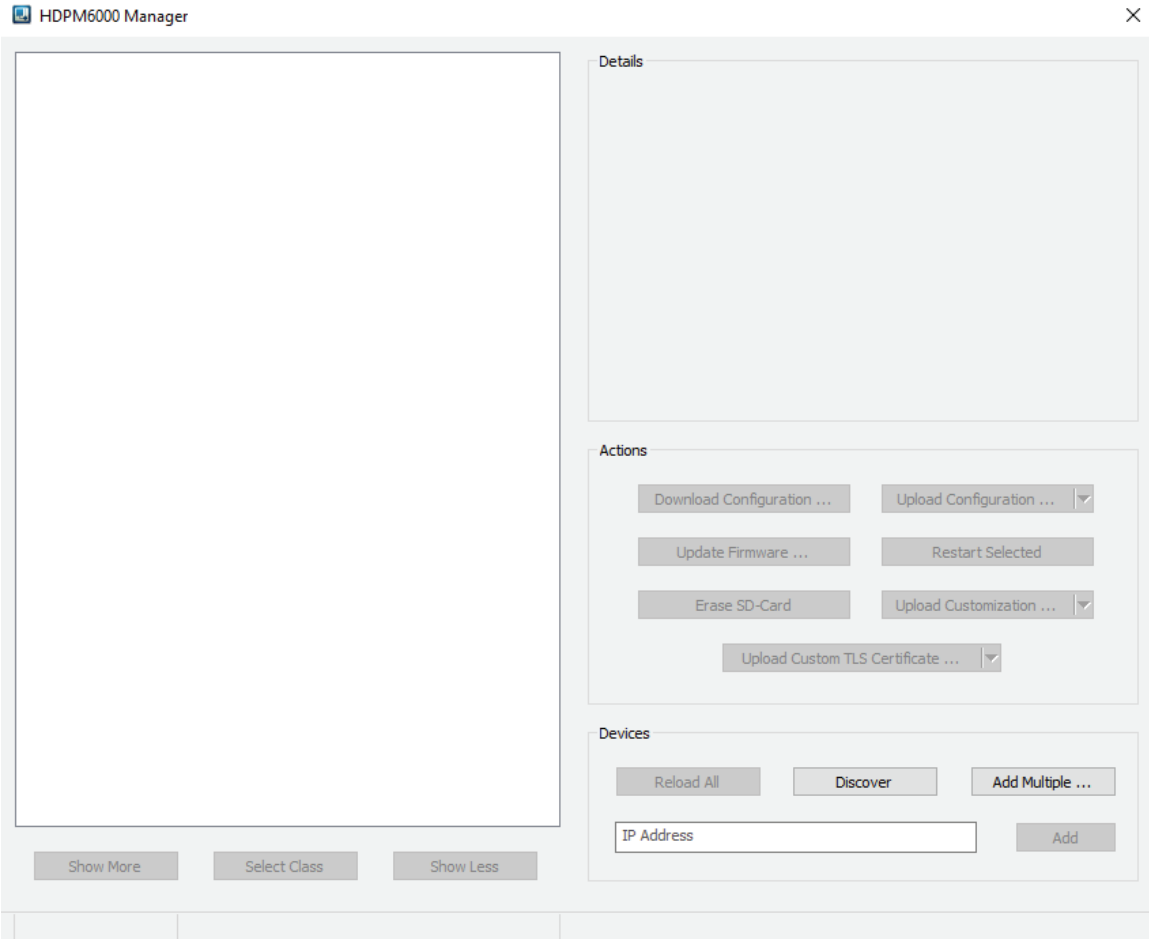
Device connectivity and management: Connects to HDPM6000 meter's and displays a device tree, allow users to view and manage all connected meter's.

Firmware upgrades: Enable users to upgrade the firmware of HDPM6000 meters to ensure that they are running the latest version.

Meter configuration: Allow users to propagate meter configuration changes to multiple meter's simultaneously, saving time and effort.

HTTPS certificate management: Allow users to import custom HTTPS certificates and private key for HDPM6000 meter's, ensuring secure communication between the meters and the **HDPM Manager Management** tool.

The following image shows an example of the HDPM6000 Manager:

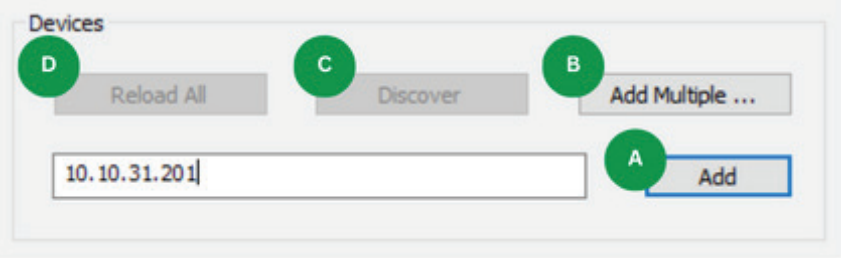


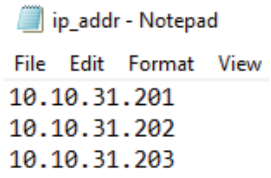
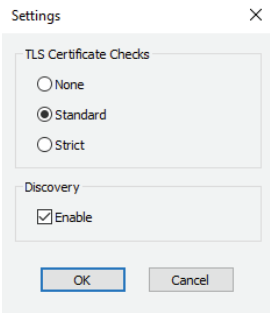
7.1 Connecting to Devices and navigating the Device tree

1. The latest version of **HDPM6000 Manager** is included with each version of firmware available on the Schneider Electric webpage for the HDPM6000 meter.

   https://www.se.com/us/en/product-range/8297113-powerlogic-hdpm6000/#software-and-firmware

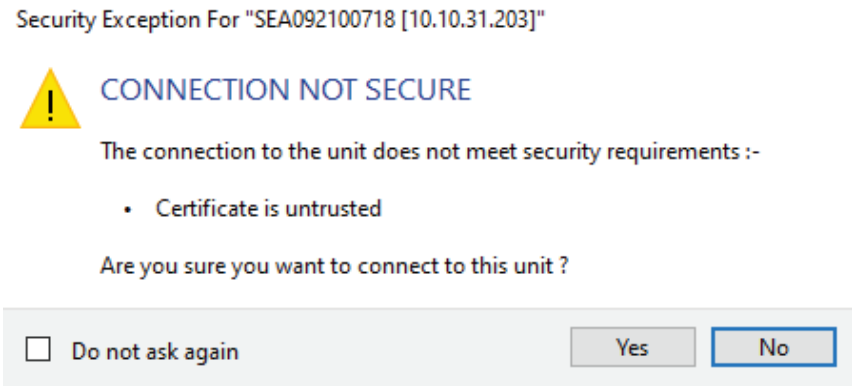
2. Download the latest firmware bundle and extract it.
3. Connect a computer to the same subnet as the meters.
4. Open the version of **HDPM6000 Manager.exe** included with the firmware release.
5. Refer to the image below for instructions on how to connect a single unit or multiple units.



Label	Title	Description	Additional Info
A	Add a Single Unit	Add a single device by IP address	
B	Add Multiple Units	Adds multiple devices from a text file. The image under **Additional Info** illustrates the correct IP address text file format	
C	Discover Units	To automatically find all devices on the network, enable discovery. To do this, right click on the program icon in the top left corner, Select **Settings**, and select **Enable** under Discovery. If Discover is blocked by corporate security tools, please contact your company's IT helpline	
D	Reloads All Units	Performs a soft reset of all devices in the system. User re-authentication will be required	

Connecting via the Add button

1. A warning dialog may be displayed because the TLS certificate default mode is set to **Standard**, which checks if the connection is encrypted and the certificate is valid and trusted.
2. Unless the HDPM6000 head unit has been configured to use a custom TLS certificate, the built-in self-signed certificate will be used for the TLS connection between the head unit and HDPM6000 Manager. Because the certificate is self-signed and not signed by a trusted Certificate Authority (CA), HDPM6000 Manager will display the message "Connection Not Secure". If the head unit is accessible only inside a secure network, the **Yes** button can be clicked to connect to the unit.



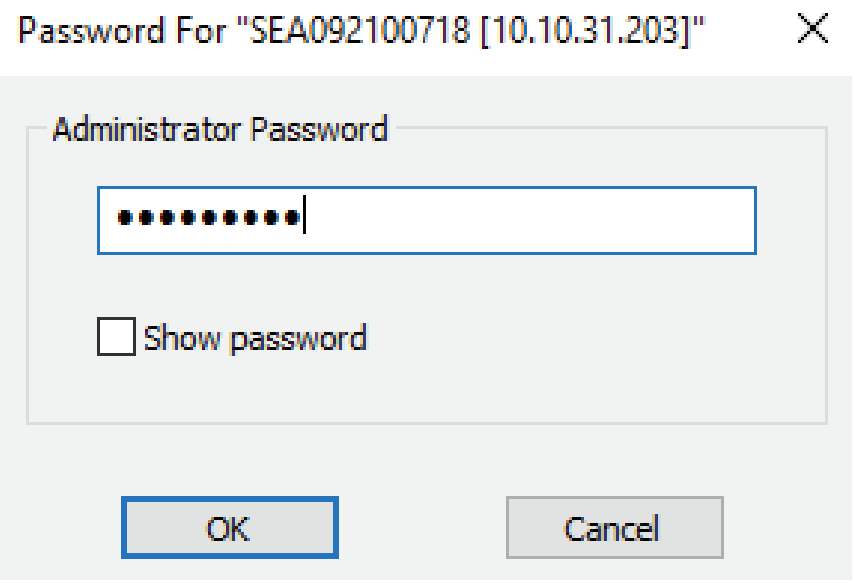
3. In the next pop-up window that appears, enter the admin-level password for the meter.

NOTICE

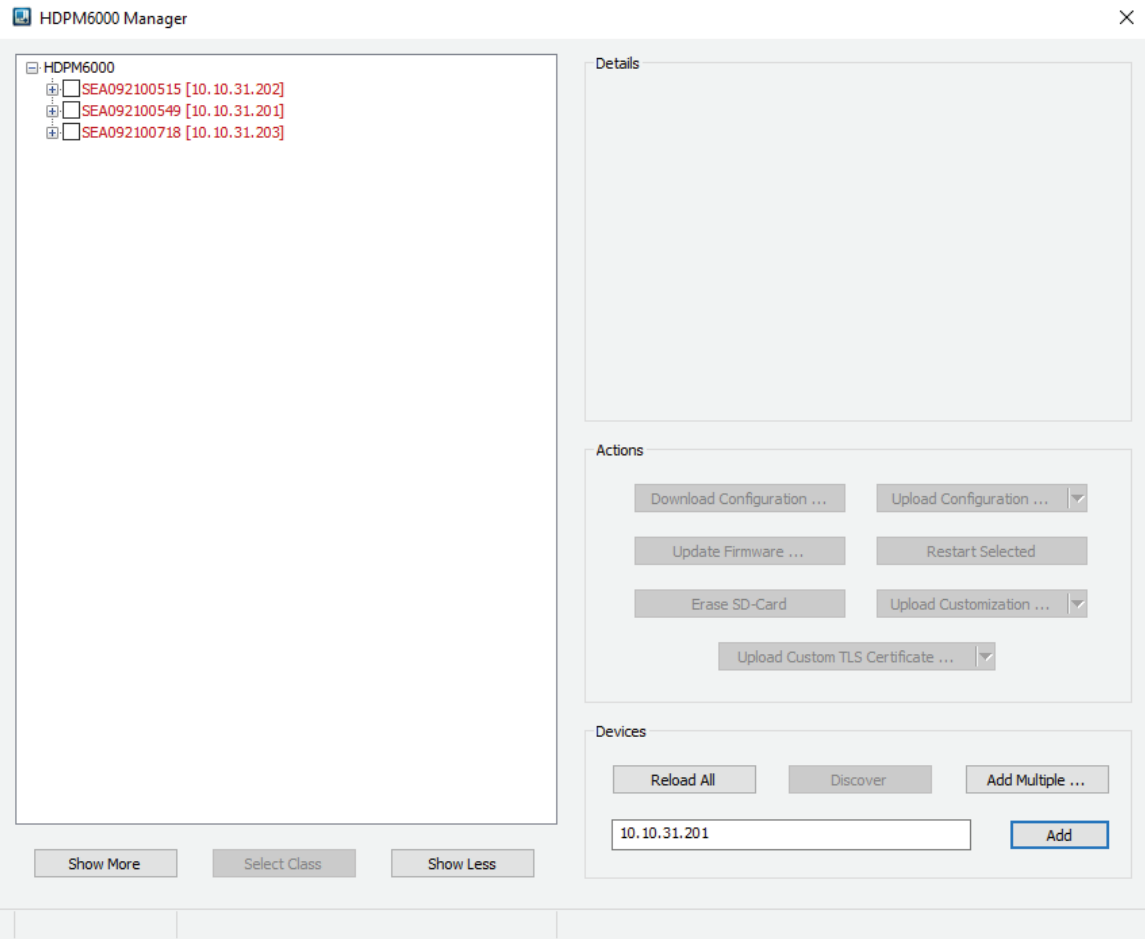
UNAUTHORIZED SYSTEM ACCESS

- Default account setting are often the source of unauthorized access by malicious users. If you do not change the default passwords, unauthorized access can occur. Change the default passwords to help reduce this risk.

Failure to follow this instruction can result in compromised data and/or a security breach.

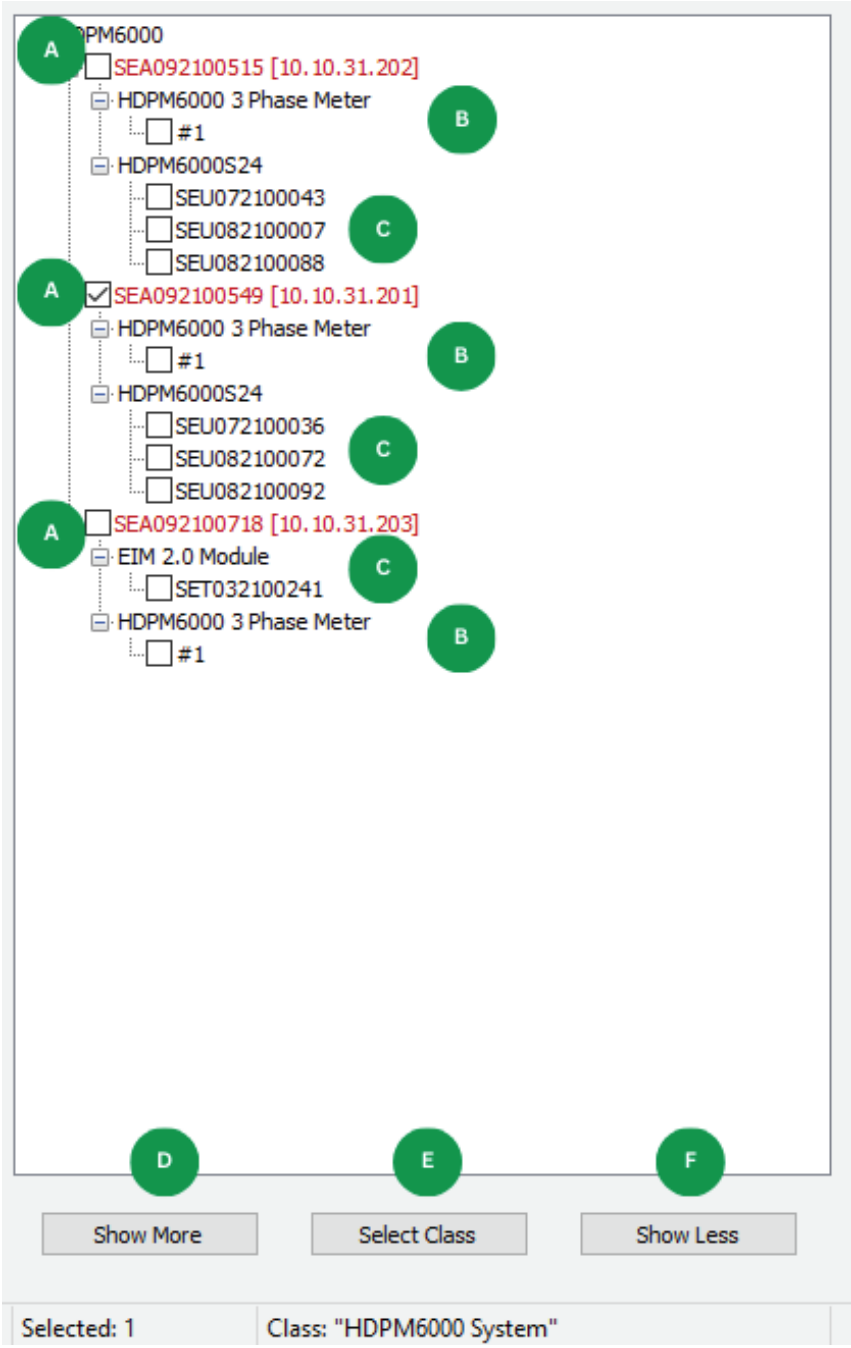


4. Press the **Show More** button to expand the list of devices in the device tree on the left.



5. Press the **Show More** button twice more to expand the meters attached devices and 3 Phase Meter (the meters measurement processor).

6. The fully expanded tree is shown below.



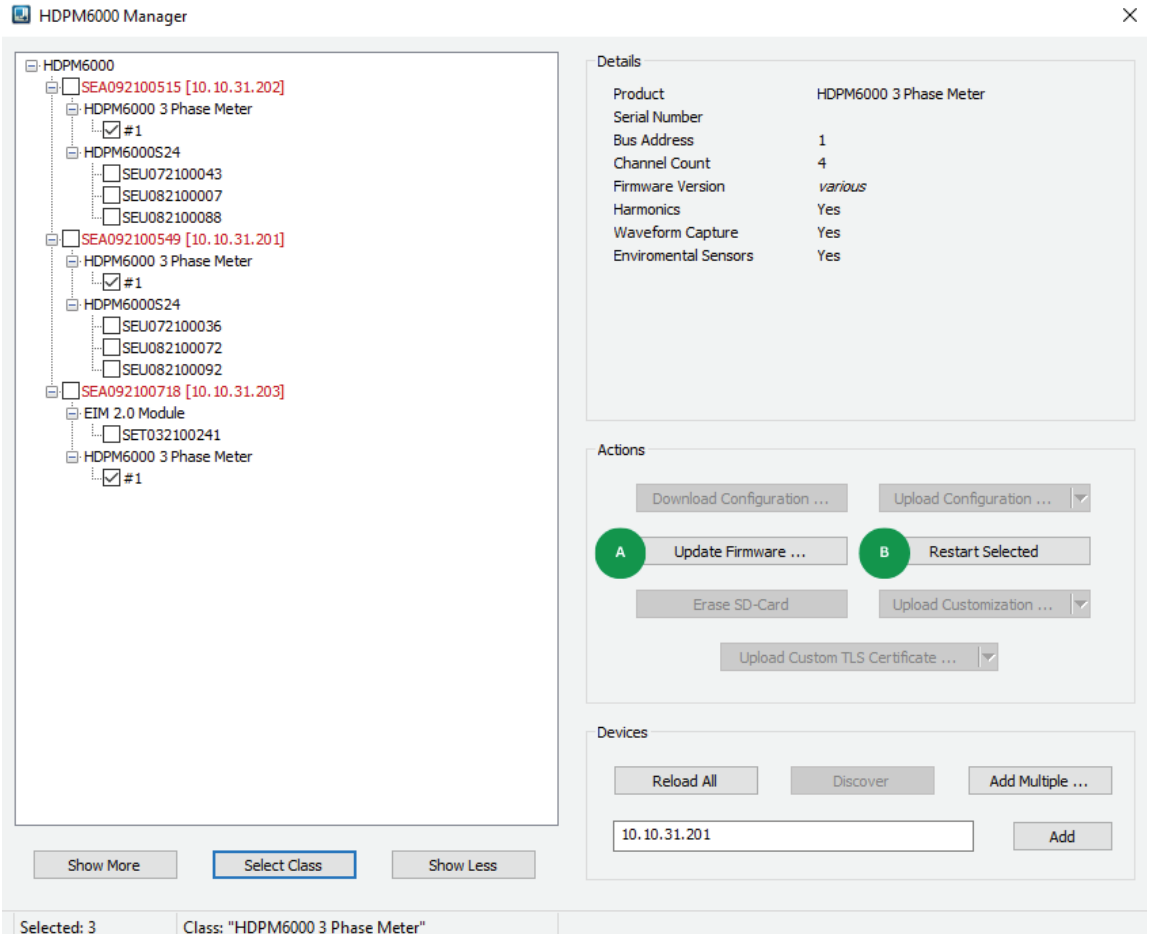
The table below shows each connected device and shows details of the selected item in the **HDPM6000 Manager**, as viewed in the top right section of the GUI.

Label	Title	Class/Description
A	Head Unit	HDPM6000 System
B	3 Phase Meter	HDPM6000 3 Phase Meter
C	Modules	24/21 Circuit Strip module(s), EIM 2.0 Module, Busway Module, IO Module(s), Retrofit
D	Show More	Expands the tree one level
E	Select Class	Automatically selects all units of the same class
F	Show Less	Collapses the lowest level of the tree

7.2 Updating Meter Firmware

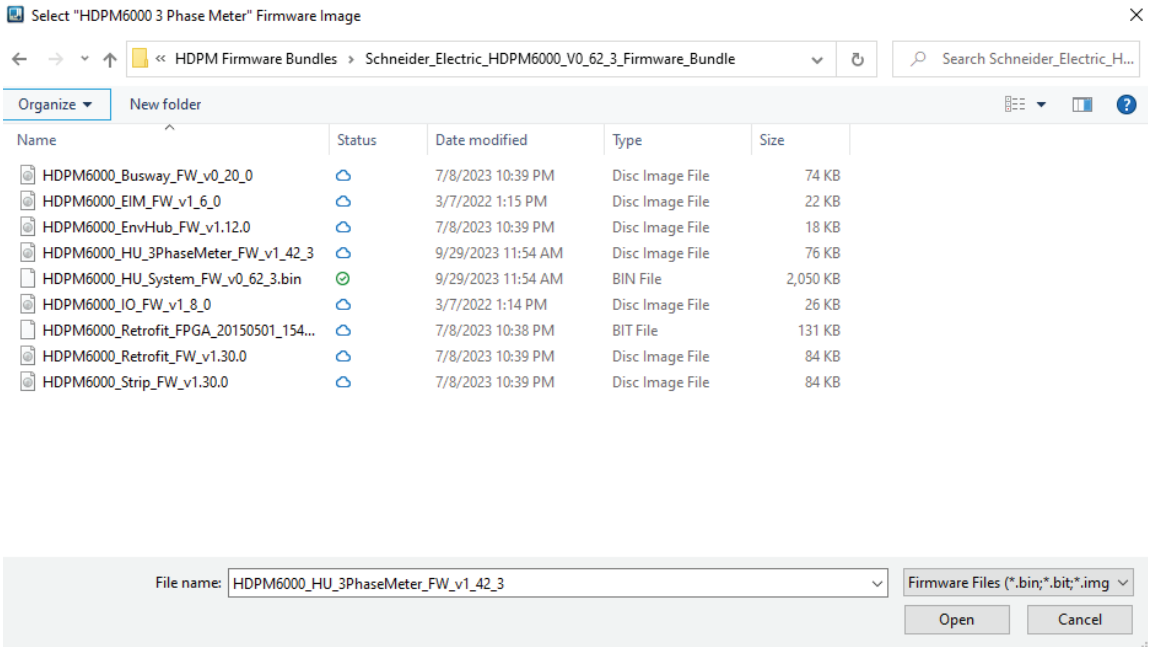
Updating 3-Phase Meter Firmware

1. Check #1 under "**HDPM 3 Phase Meter**". If updating all connected units, click **Select Class** to select all 3 Phase Meters.



Label	Title	File Type
A	Update Firmware	.bin; .bit; .img
B	Restart Selected	

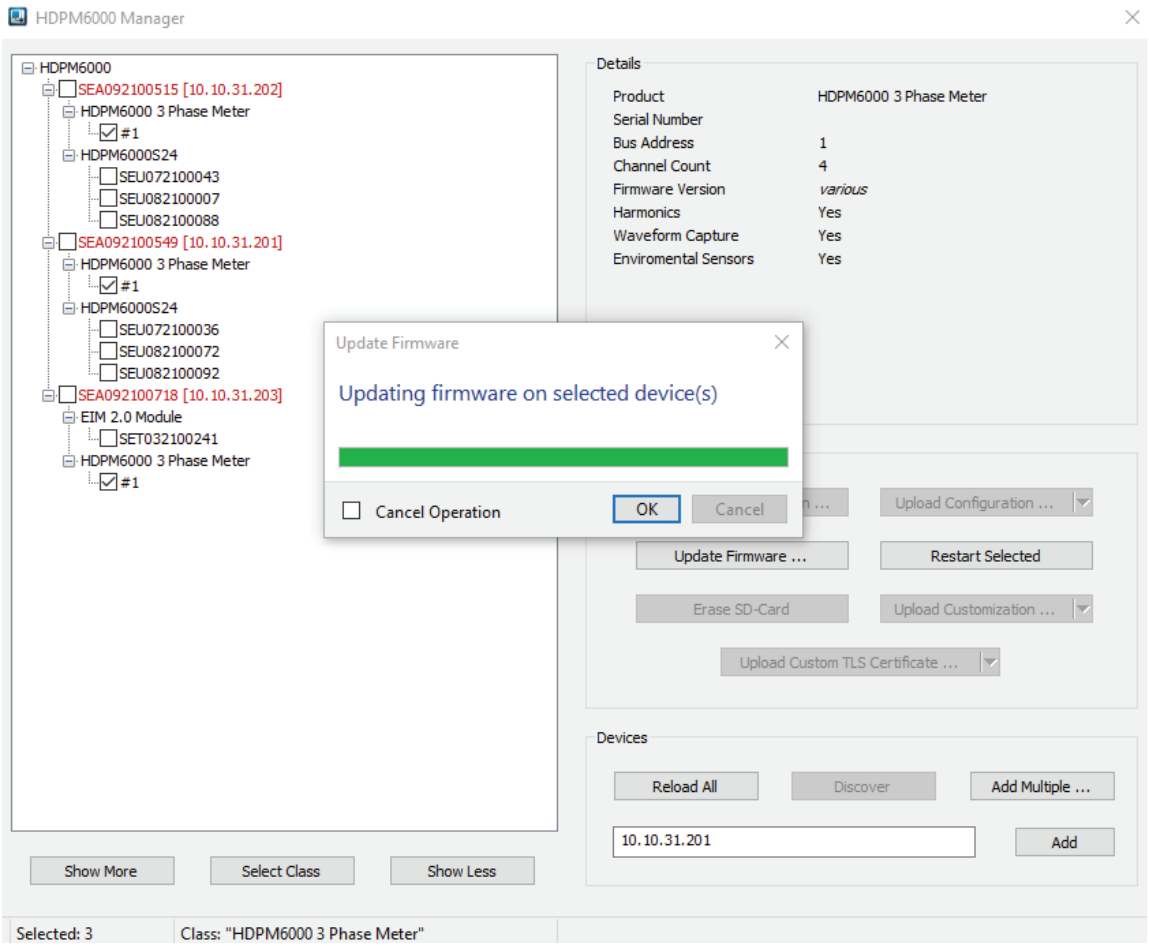
2. Press **Update Firmware**, and in the file selection dialog that appears, select the 3 Phase Meter firmware, named HDPM6000_HU_3PhaseMeter_FW_vX.img, where X represents the firmware version from the folder it has been downloaded to, and press **Open**.



3. Provide confirmation for the update process in the dialog box that appears.

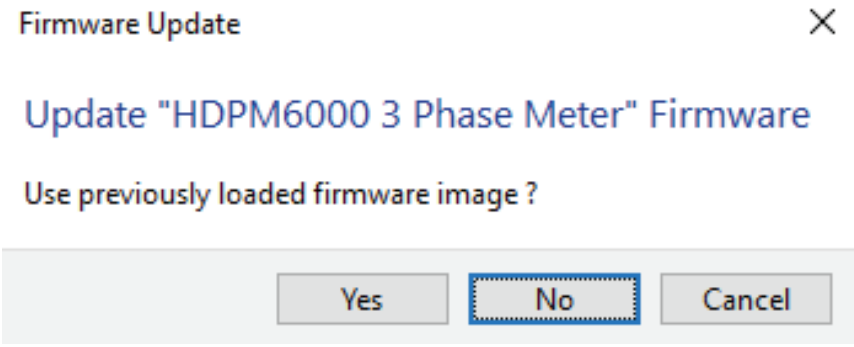
4. A dialog box will appear with a progress bar. If the progress bar turns green and the **OK** button can be pressed, the 3-phase meter firmware update was successful for all devices. If the progress bar turns red, the 3-phase meter firmware update was unsuccessful for one or more devices.

Note: *An unsuccessful firmware update does not cause a meter to stop functioning. The meter continues to use the previous firmware version.*



5. If upgrading one or more meters was unsuccessful, return to step 1 and retry the 3-Phase Meter update. If multiple upgrade attempts are unsuccessful, contact the Schneider Electric Customer Care Center.

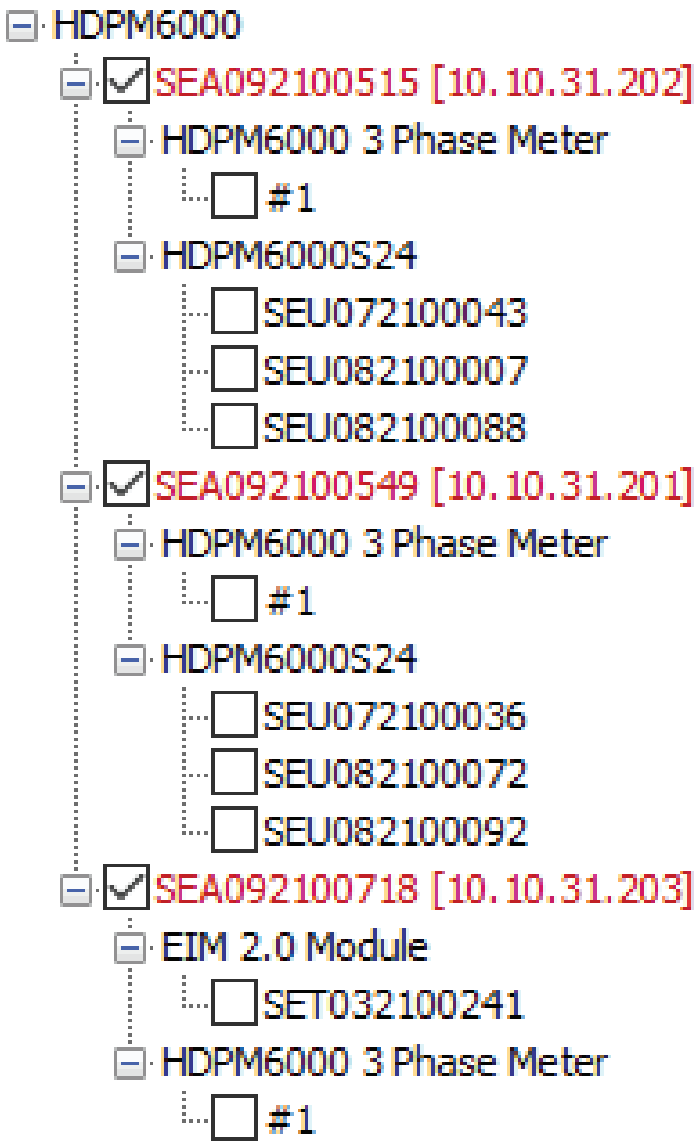
Note: *When attempting a firmware update for the second time, the HDPM6000 Manager will ask whether to use the previously selected firmware file. To account for the possibility that an incorrect file was selected the first time, select* ***No*** *to reopen the window and select the correct firmware file.*



6. If all desired firmware updates (e.g. head unit 3 Phase Meter, Head Unit System and module) are complete, restart the devices using the steps in the **Restarting** section below.

Updating Head Unit System Firmware

1. Check the box next to the first meters serial number and IP address.
2. Click **Select Class** to select all head units if upgrading all connected units.
3. All of the meter serial numbers should now be selected.



4. Click the **Update Firmware** button.
5. In the file selection dialog, select the **System Firmware File** (named HDPM6000_HU_System_FW_vX.bin where X represents the firmware version).
6. Provide confirmation for the update process in the dialog box that appears.
7. A dialog will appear with a progress bar. If the progress bar turns green and the **OK** button can be pressed, all of the meters upgraded the system firmware successfully. If the progress bar turns red, one or more meters were not updated successfully.

8. If all desired firmware updates (e.g. Head unit 3 Phase Meter, Head Unit System and module) are complete, restart the devices using the steps in the **Restarting** section below. If upgrading one or more meters was unsuccessful, return to step 1 and retry the Head Units update. If multiple upgrade attempts are unsuccessful, contact the Schneider Electric Customer Care Center.

Note: *An unsuccessful firmware update does not cause a meter to stop functioning. The meter continues to use the previous firmware version.*

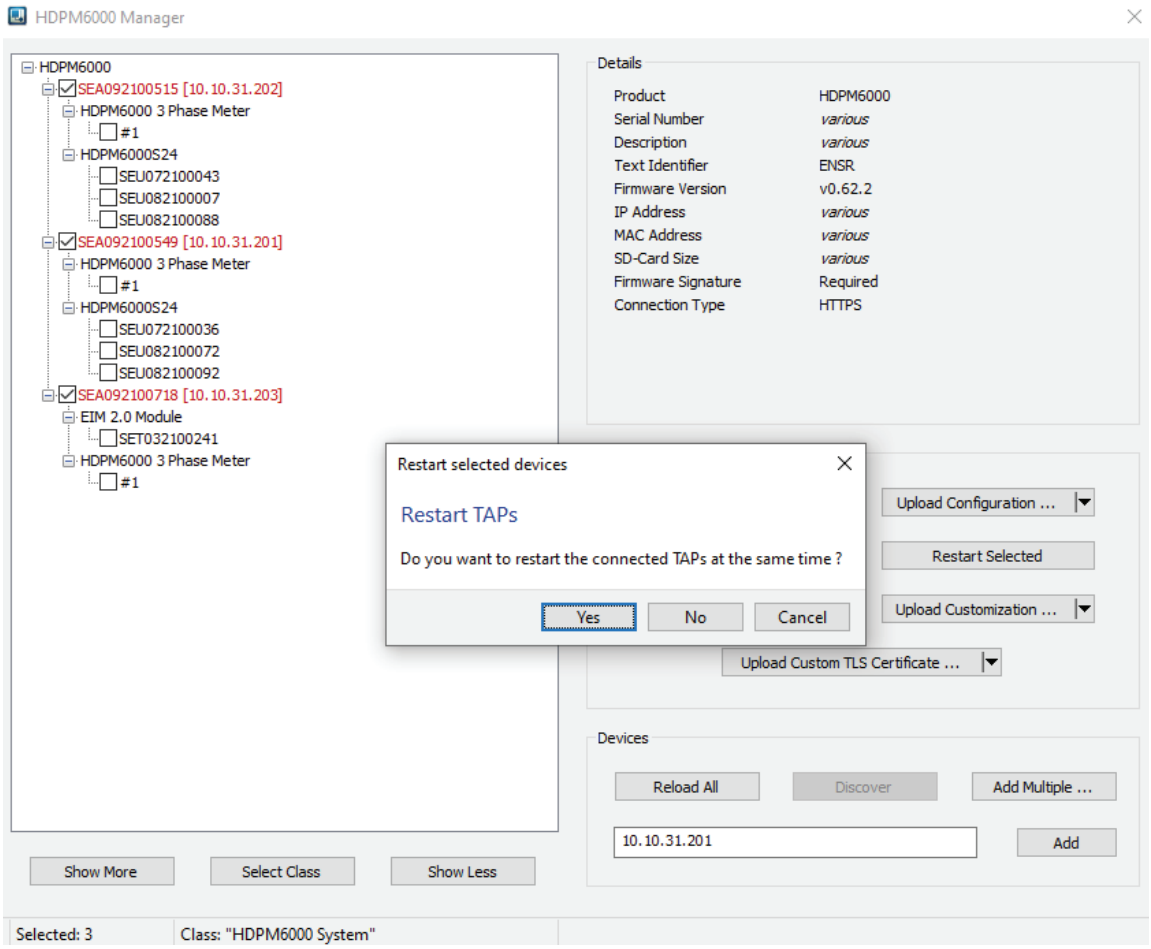
Updating Module Firmware (24 Circuit Strip, 21 Circuit Strip, EIM 2.0, Busway, IO Module, Retrofit)

1. Check the box under the desired module.
2. To update all modules of the selected type (on all meters in the device tree), press **Select Class**.
3. Click the **Update Firmware...** button.
4. In the file selection dialog, select the **System Firmware File**.
   - 24/21 Circuit Strip firmware corresponds to the HDPM6000_Strip_FW_vX.bin where X represents the firmware version.
   - EIM 2.0 module firmware corresponds to HDPM6000_EIM_FW_vX.bin where X represents the firmware version.
   - Busway module corresponds to the HDPM6000_Busway_FW_vX.bin where X represents the firmware version.
   - IO Module(s) corresponds to the HDPM6000_IO_FW_vX.img where X represents the firmware version.
   - Retrofit Module corresponds to the HDPM6000_Retrofit_FW_vX.img where X respresents the firmware version.
5. Provide confirmation for the update process in the dialog box that appears.
6. A dialog will appear with a progress bar. If the progress bar turns green and the **OK** button can be pressed, the firmware on all selected modules updated successfully. If the progress bar turns red, the firmware on one or more modules was not updated successfully.
7. If all desired firmware updates (e.g. head unit 3 Phase Meter, Head Unit System, module) are complete, restart the devices using the steps in **Restarting** section below. If upgrading one or more modules was unsuccessful, return to step one of this section and retry module firmware update. If multiple upgrade attempts are unsuccessful, contact the Schneider Electric Customer Care Center.

Note: *An unsuccessful firmware update does not cause a module to stop functioning. The meter continues to use the previous firmware version.*

Restarting

1. Select the devices to be restarted. Click **Select Class** to select all head units if rebooting all connected units.
2. Click the **Restart Selected** button.
3. Select **Yes** in the popup that appears to restart the modules.



4. Provide confirmation for the update process in the dialog box that appears.
5. A dialog will appear with a progress bar. If the progress bar turns green and the **OK** button can be pressed, all of the meters restarted successfully. If the progress bar turns red, one or more meters were not restarted successfully.

7.3 Propagating Meter Configuration

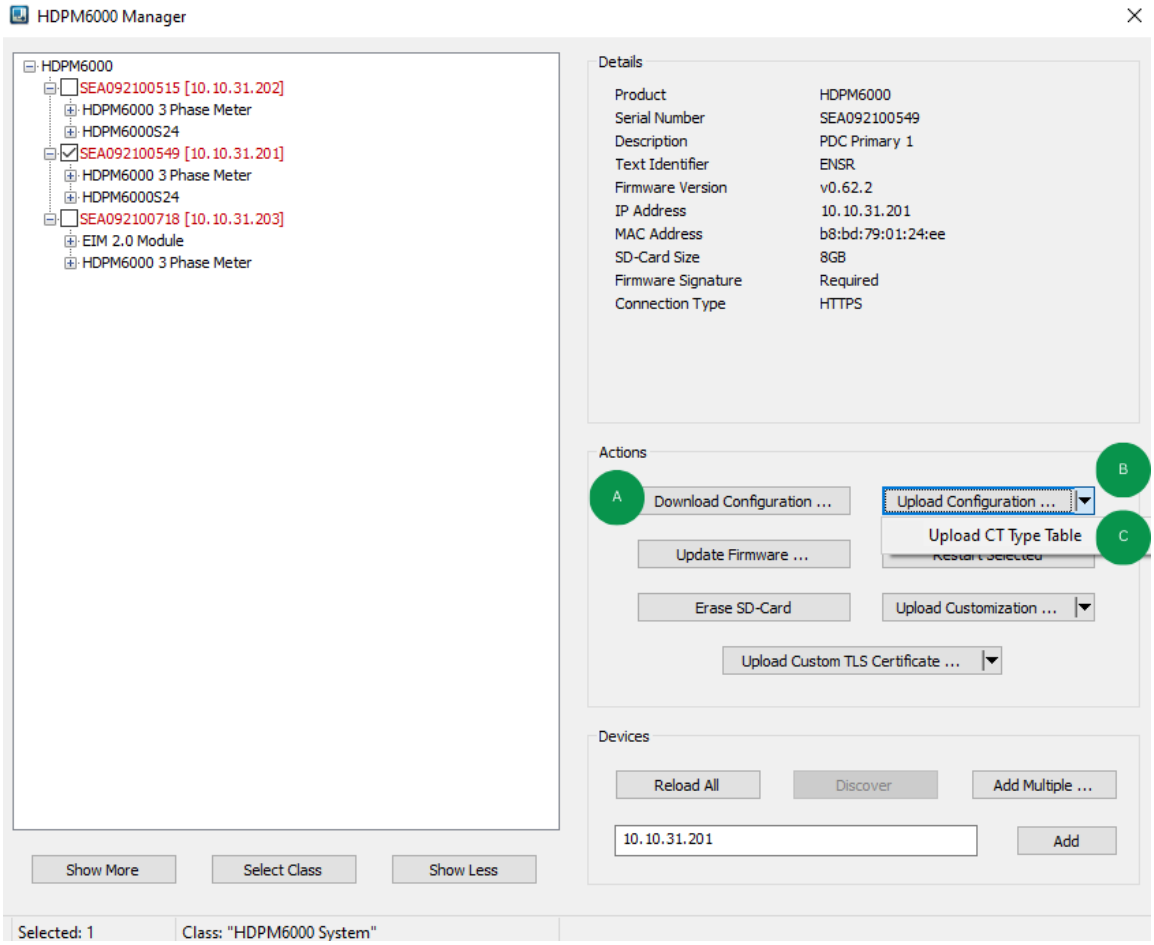
NOTICE

IMPROPER CONFIGURATION

- Only upload configuration files to meters with the same firmware version as the meter the configuration file was created from

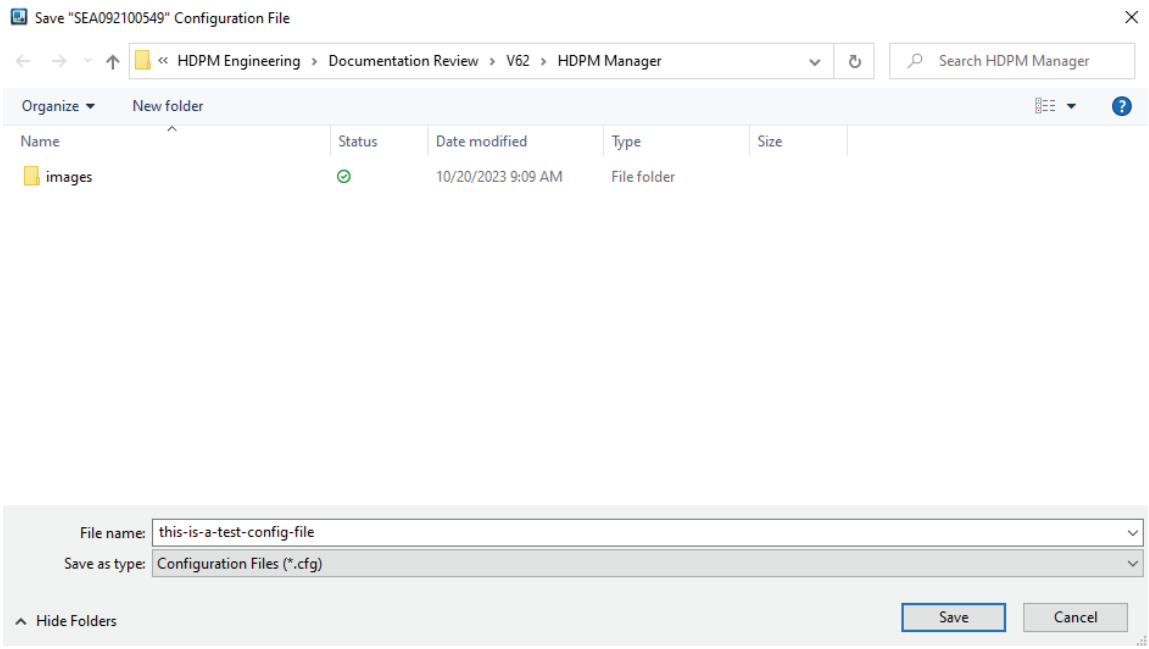
Failure to follow these instructions may lead to incorrect meter configuration

The **HDPM6000 Manager** software does not allow for the direct modification of the configuration of individual meters. Instead, one meter must be configured using the web interface or Modbus. Once the meter is configured, the configuration can be downloaded to a file. This file can be uploaded to other meters using the **HDPM6000 Manager** software to apply the same configuration to all of them.



Label	Title	File Type
A	Download Configuration...	.cfg
B	Upload Configuration	.cfg
C	Upload CT Type Table	.csv

1. Check the box next to a meter's serial number and IP address.
2. Click the **Download Configuration ...** button.
3. When the file explorer opens, save the .cfg file to the desired location.

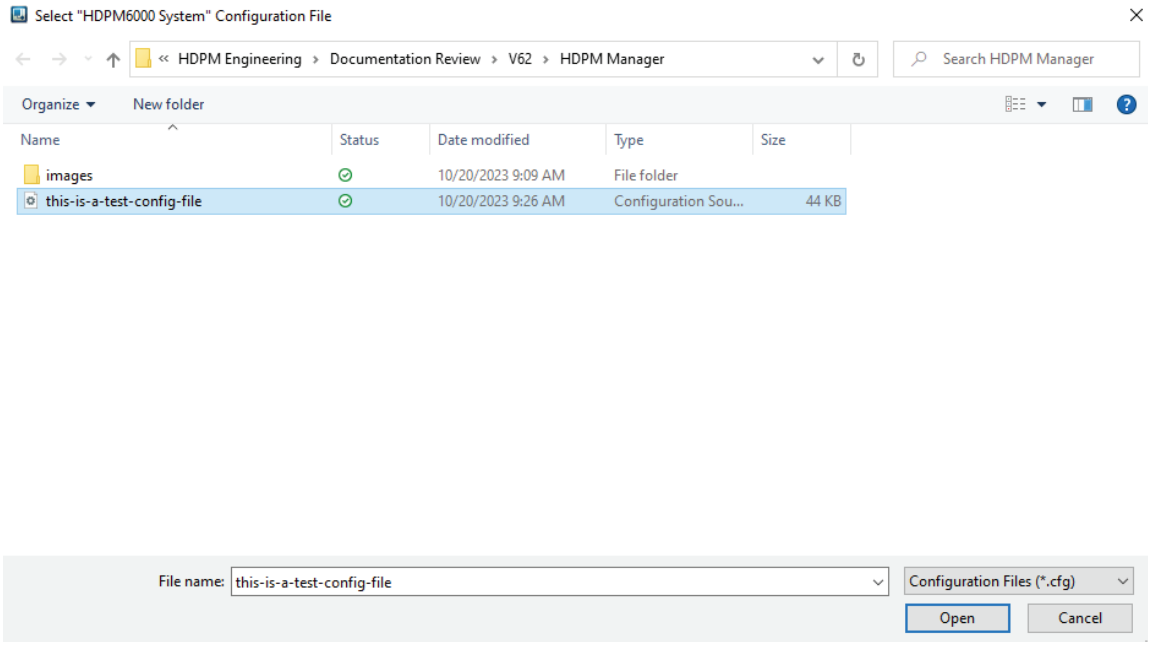


4. A dialog will appear with a progress bar. If the progress bar turns green and the "OK" button can be pressed, the configuration file was downloaded successfully. If the progress bar turns red, the meter's configuration file was not downloaded successfully.

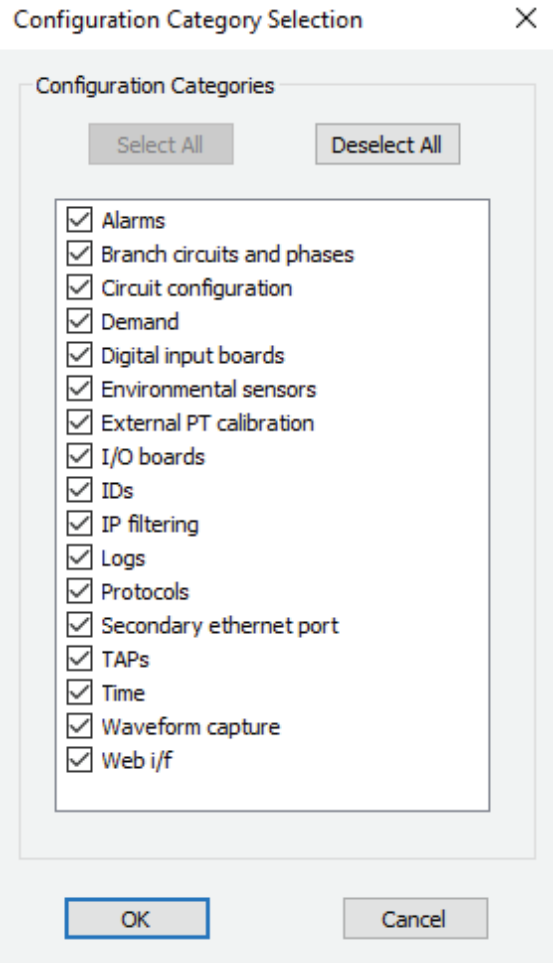
Uploading Meter Configuration

1. Select all of the meters to be updated with a single file (e.g. all HDPM6000 meters) by checking the box to the left of their serial numbers ('SEA….") and IP address.

2. To upload a configuration file, click the **Upload Configuration** button and select a .cfg file.



3. When the file explorer opens, select the .cfg file at the desired location.
4. A popup will appear asking which categories to apply. Press **Select All** and then **OK**.
5. Provide confirmation for the update process in the dialog box that appears.



6. A dialog will appear with a progress bar. If the progress bar turns green and the **OK** button can be pressed, all of the meters uploaded meter configuration successfully. If the progress bar turns red, one or more meter configurations were not uploaded successfully.

Note: *An unsuccessful configuration file upload does not cause a meter to stop functioning.*

Upload CT Type Table

The CT Type Table determines what options are available in the CT Type dropdown box on the **Channel Cfg** tab of the meter web interface. Each entry in this table is pre-populated with **CT Factor** (magnitude) and **PHCal** (phase shift) data for a CT so that these values do not need to be entered manually.

A CT Type Table upload will not delete values already in the meter's CT Type storage. Any modifications to existing CTs will be applied, and new entries will be added.

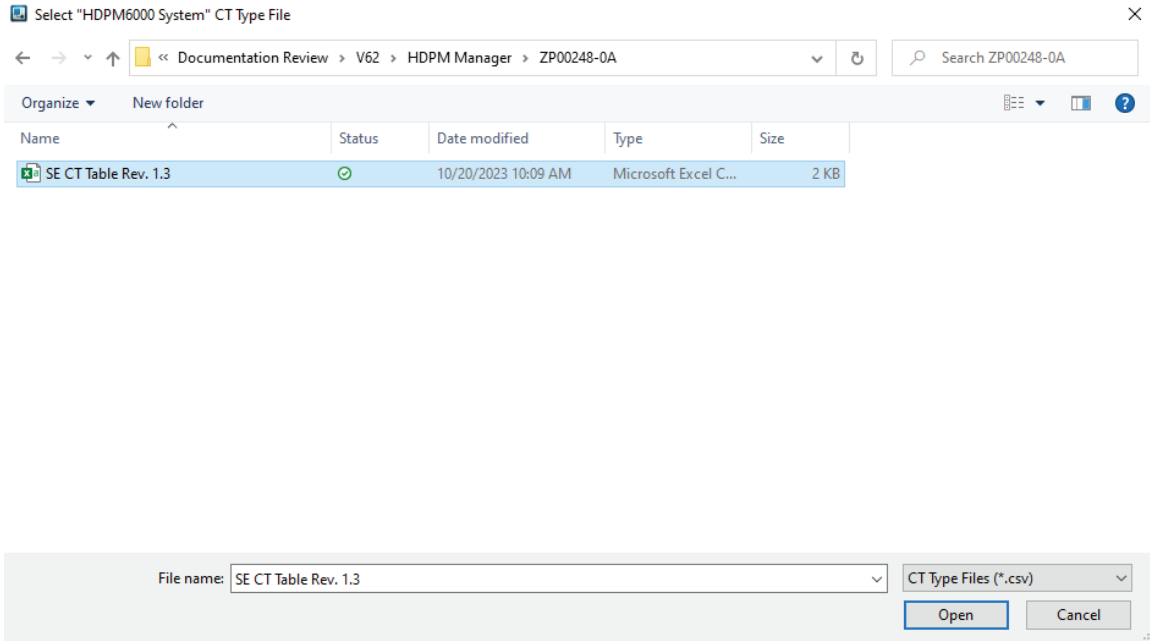
NOTICE

HDPM6000 CONFIGURATION FILES AND CT TYPE TABLES

- Configuration files contain a copy of the CT Type table from the meter they were downloaded from.

Uploading a configuration file will overwrite the CT Type table on the target meter with the CT Type table data located in the configuration file.

1. Check all of the meters to be updated with a single file (e.g. all HDPM6000 meters) by checking the box to the left of their serial numbers ('SEA….") and IP address.
2. To upload a CT Type table, click the **Upload CT Type Table** button visible after pressing the down arrow to the right of the **Upload Configuration** button and select a .csv file.
3. When the file explorer opens, select the desired .csv file to upload.



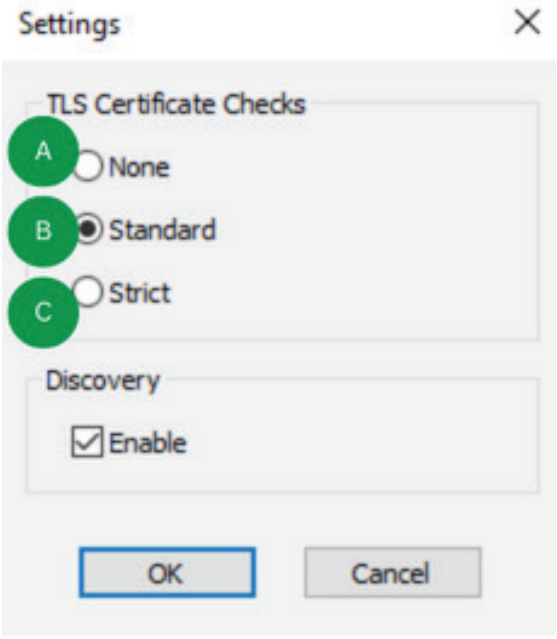
4. Provide confirmation for the update process in the dialog box that appears.
5. A dialog will appear with a progress bar. If the progress bar turns green and the **OK** button can be pressed, the CT Type table was uploaded to all of the selected meters successfully. If the progress bar turns red, the CT Type table upload was unsuccessful for one or more meters.

Note: *An unsuccessful CT Type Table file upload does not cause a meter to stop functioning.*

7.4 Managing HTTPS Certificates

TLS Certificate Check Settings

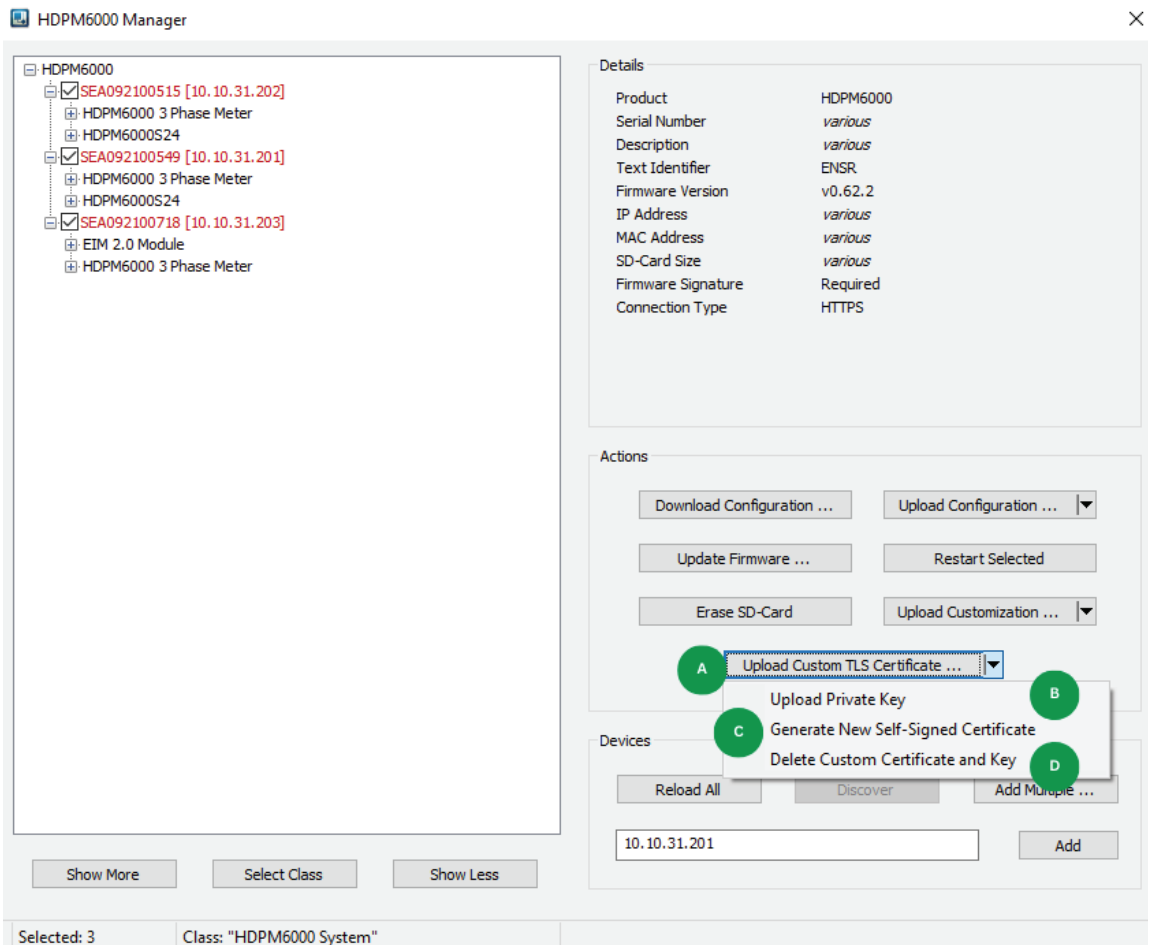
The TLS Certificate Check setting determines how strictly **HDPM6000 Manager** verifies the TLS certificate of each meter it is connecting to. There are three levels of checking: None, Standard, and Strict. The default setting is **Standard**. If the connection from **HDPM6000 Manager** to the meter does not meet the requirements of the selected level, a warning will be shown when initiating a connection to the meter. If the warning is acknowledged and a connection is made to the meter, it will show as red in the device tree.



Label	TLS Certificate Check Setting	Security Requirements
A	None	No certificate checks are done
B	Standard	Certificates must be in date and must be trusted by the host (e.g signed by a trusted certificate authority)
C	Strict	Certificates must be in date, must be trusted by the host (e.g. signed by a trusted certificate authority) and the SAN must match the IP address of the unit

Uploading a Custom TLS Certificate and Private Key

Upload a custom TLS certificate and private key in PEM or DER format, using TLS version 1.2 (TLS 1.3 is not supported) and the cipher suite TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256.



Label	TLS Certificate Check Setting	Security Requirements
A	Upload Custom TLS Certificate	This option allows the upload of a custom TLS certificate, which is a digital certificate that verifies the identity of the meter. The following cipher suite is supported: TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256.
B	Upload Private Key	This option allows the upload of the private key that is associated with the custom TLS certificate.
C	Generate New Self-Signed Certificate	This option triggers the HDPM head unit to generate a new self-signed certificate. The certificate is automatically renewed annually from the date it was generated.
D	Delete Custom Certificate and Key	This option deletes the custom TLS certificate and its associated private key from the meter, which will revert to using a self-signed certificate.

1. Check the box next to a meter's serial number and IP address.
2. Click "**Upload Custom TLS Certificate ...".**
3. Select the Custom TLS certificate in either PEM or DER format.
4. Provide confirmation for the update process in the dialog box that appears.

Note: *An unsuccessful TLS Certificate file upload does not cause a meter to stop functioning.*

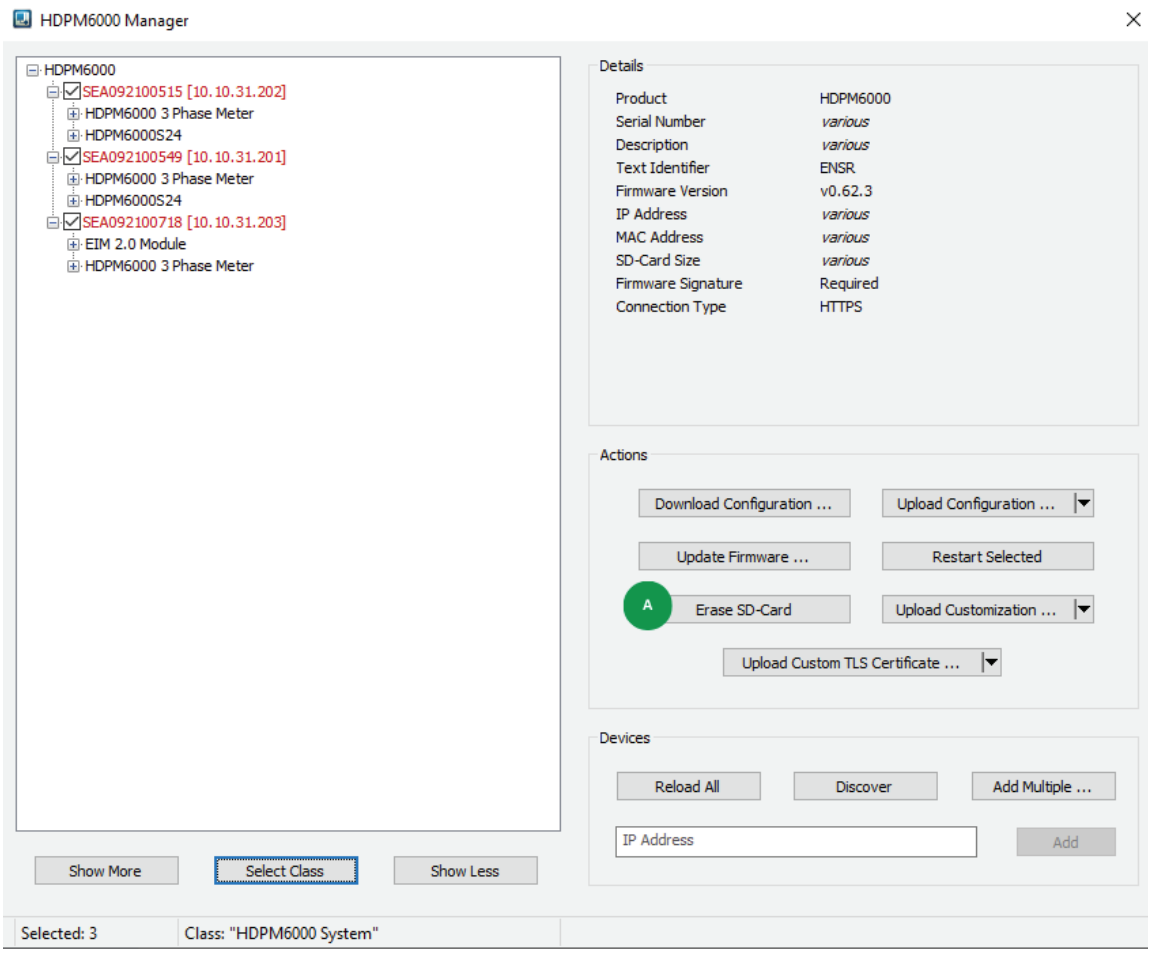
5. A dialog will appear with a progress bar. If the progress bar turns green and the **OK** button can be pressed, the certificate is uploaded successfully. If the progress bar turns red, the meter was not updated successfully.
6. Click **Upload Private Key.**
7. Select the **Private Key**.
8. Provide confirmation for the update process in the dialog box that appears.
9. A dialog will appear with a progress bar. If the progress bar turns green and the **OK** button can be pressed, the private key is uploaded successfully. If the progress bar turns red, the meter was not updated successfully.

Note: *An unsuccessful private key upload does not cause a meter to stop functioning.*

10. The TLS certificate and private key are now set.

7.5 Erasing SD-Card

Erasing the SD-Card will delete all of its contents, including captured waveforms and logged events.



Label	Title	Description
A	Erase SD-Card	Clears the SD-Card of all data

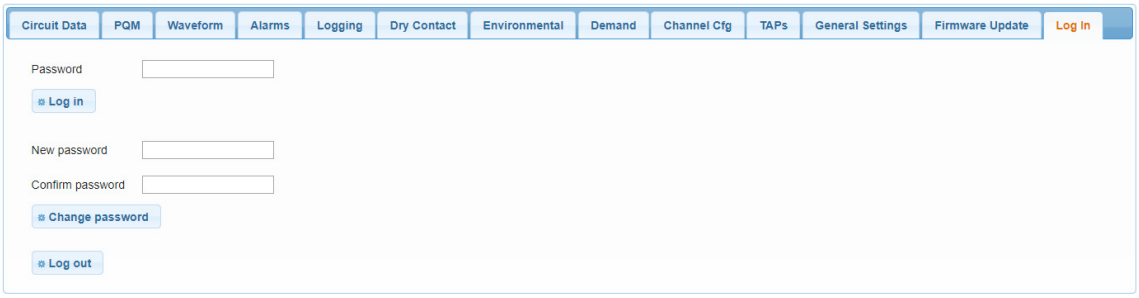
1. Check the box next to a meter's serial number and IP address.
2. Click "**Erase SD-Card ...**".
3. Provide confirmation for the update process in the dialog box that appears.
4. A dialog will appear with a progress bar. If the progress bar turns green and the **OK** button can be pressed, the SD-Card has been erased. If the progress bar turns red, the meter's SD-Card may not have been erased successfully.

8. HDPM6000 Web Interface Tab Details

The HDPM6000 web interface is used to configure the head unit and branch circuits and to commission the meter system. This section describes the displays, settings and controls provided by each tab within the interface.

8.1 Log In Tab

Logging into an account on the Log In tab is required before accessing any of the other web interface tabs.



Field or Control	Description
Password	Account (Guest, Administrator, Super-User) and corresponding privileges (view-only, view and basic configuration, view and advanced configuration, respectively) are determined by which password is entered. See "Accessing the Device for the First Time" on page 12 for default passwords for each account.
New password/ Confirm password	Enter the current password for the account to be changed in the 'Password' field and a new password in the 'New password' field (maximum length 32 characters). In the 'Confirm Password' field, enter the new password again, ensuring that it matches the text entered in the 'New Password' field. Click the **Change Password** button to confirm your new user-created password for that account.
Logout	Click this button to log out of the web interface.

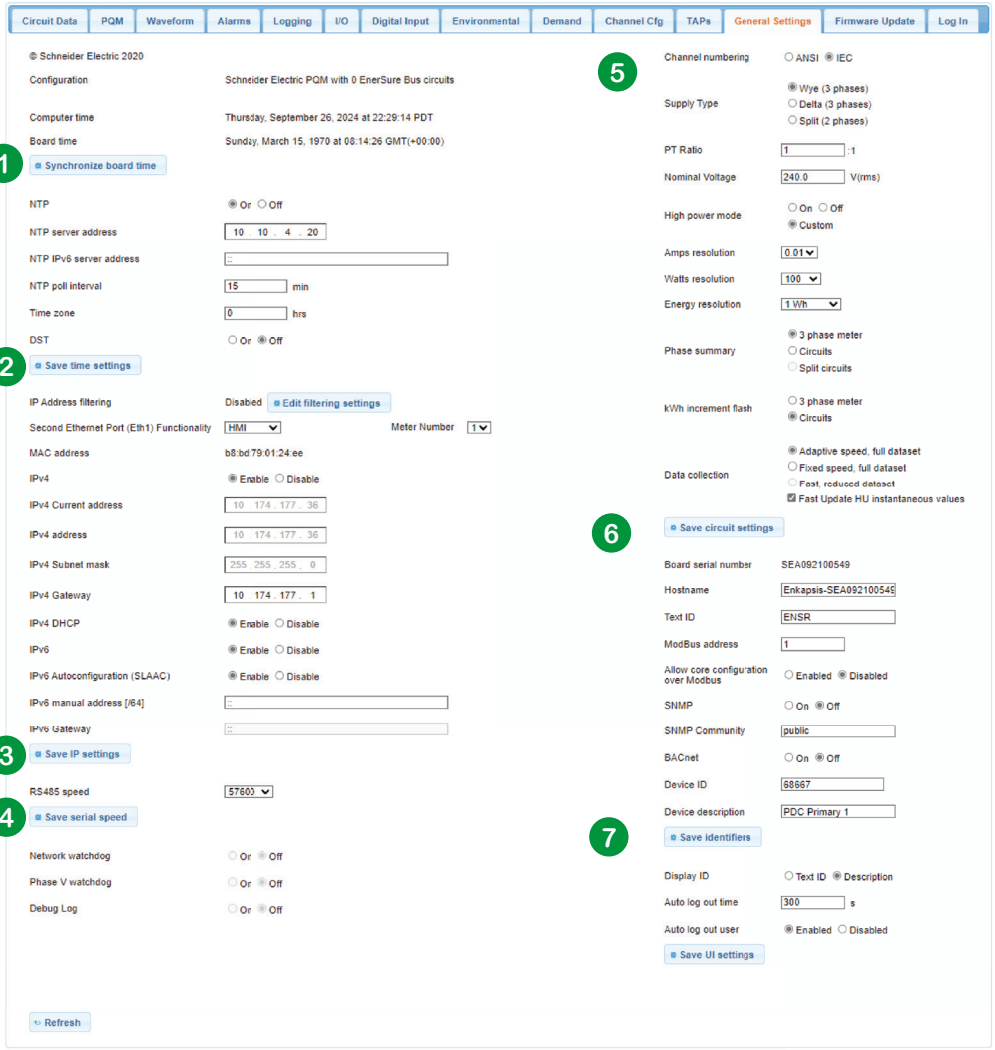
8.2 Firmware Update Tab

The Firmware Update tab allows users to update the firmware of the HDPM6000 head unit and to clear data logs and waveforms.

Field or Control	Description
System Firmware	This refers to the part of the head unit that handles communication. The current version of the firmware is displayed. To update, click the **Choose File** button and navigate to the file containing the new firmware. Then click the **Upload Firmware** button to complete the firmware update.
3 Phase Meter	This refers to the part of the head unit that handles metering of the mains voltage and current. The current version of the firmware is displayed. To update, click the **Choose File** button and navigate to the file containing the new firmware. Then click the **Upload Firmware** button to complete the firmware update.
Private Key	The private key associated with the custom TLS certificate. To update, click the **Choose File** button and navigate to the file containing the new private key. Then click the **Upload Private Key** button to complete the private key update.
Custom TLS Certificate	The custom TLS certificate used by the head unit for HTTPS communications. To update, click the **Choose File** button and navigate to the file containing the new custom certificate. Then click the **Upload Certificate** button to complete the custom certificate update.
Delete Custom Certificate	Deletes the custom TLS certificate and reverts to the built-in self-signed certificate.
Generate New Self-Signed Certificate	Generates a new self-signed certificate. This certificate is automatically renewed annually from the date it was generated.
Reboot	Force a system reboot.
Erase SD Card	Erases and clears all entries.
Clear All Logs and Captured Waveforms	Resets the data logs and waveform counters. Rewrites over old data.
Refresh	Force a manual refresh of the data.

8.3 General Settings Tab

The General Settings tab includes additional settings that control the HDPM6000 system.



Field or Control	Description
1 Time Settings	
Set Board Time	Force populates the system date/time to match your computer.
NTP On/Off	Enables automatic date/time synchronization with Network Time Protocol (NTP) servers.
NTP Server Address	Enter the IP address of the NTP server, if applicable.
NTP IPv6 Server Address	If an IPv6 NTP server is used, enter its address here.
NTP Poll Interval	Sets how often the NTP server will be polled and meter time adjusted.
Time Zone	Set the time zone the meter is installed in, as an adjustment to GMT (e.g. for PST enter '-8').
DST	Enable or disable Daylight Savings Time adjustments.
Save Time Settings	Save the user-entered time settings.
2 IP Settings	
IP Address Filtering	Allows specific IP addresses to be whitelisted (i.e. only connections from these IP addresses will be accepted).

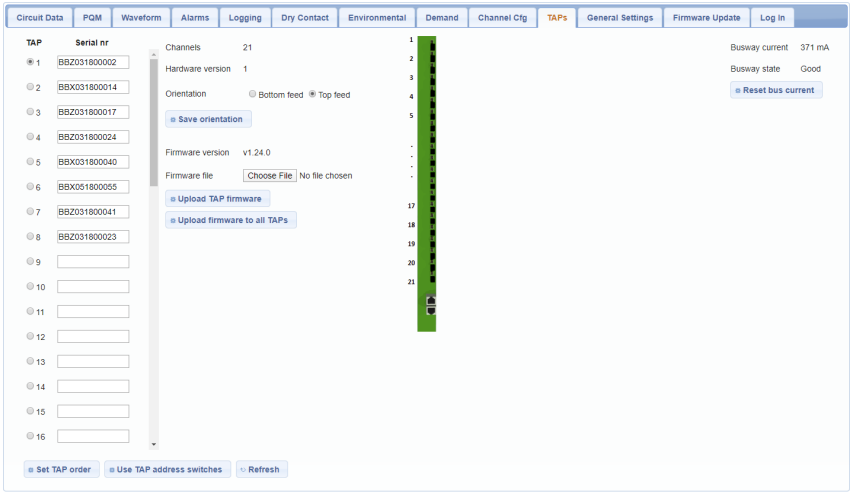
Field or Control	Description
Edit Filtering Settings	Click this button for a dialog that allows IP addresses to be added to or removed from the list of allowed IP addresses, as well as to enable filtering.
Second Ethernet Port (Eth1) Functionality	Configure whether the second Ethernet port (Eth 1) is 'switched' for daisy-chaining meters on the same subnet (default) or dedicated to an Ethernet based HMI on a separate subnet (Note: Do not connect to any network in HMI mode). If 'HMI' is selected, choose which meter (1-4) to display the current one as on the HMI.
IPv4 Current Address	Displays the system's IP address.
IPv4 Address IPv4 Subnet Mask IPv4 Gateway	Allows users to configure static IP address settings.
IPv4 DCHP	Enables automatic IP address configuration (disables static configuration).
IPv6 Manual Address	Allows the user to manually enter an IPv6 address.
IPv6 Gateway	Manual configuration of the IPv6 gateway address if IPv6 Autoconfiguration is disabled.
IPv4/6	Allows user to enable IPv4, IPv6 or both.
Save IP Settings	Save the user-entered IP settings.
3 Serial Settings	
RS-485 Speed	Allows user to select the RS-485 bus speed from a drop-down menu.
4 Watchdogs	
Network Watchdog	Enable or disable the Network Watchdog (super-user access is required). This function reboots the communications processor every 5 minutes if no communications are detected (metering is unaffected).
Phase V Watchdog	Enable or disable the voltage watchdog (super-user access is required). This function reboots the meter every minute if no voltage is detected.
Debug Log	Super-user access is required. Only enable this option if instructed to do so by Schneider Electric support.
5 Circuit Settings	
Channel Numbering	Options: ANSI, IEC Allows user to select panel channel numbering scheme. ANSI is alternating numbers left-right (1-3-5… on left, 2-4-6… on right). IEC is sequential numbers filling the left side before continuing down the right (1-2-3… on left, 43, 44, 45… on right). This distinction is important even if the branch channel CTs are connected to correctly numbered inputs on the HDPM6000R, since it affects circuit grouping for multi-phase circuits. For busway modules use IEC.
Supply Type	Options: Wye (3 phases), Delta (3 phases) and Split (2 phases). Split phase is applicable for single-phase 3-wire sources fed from a center tapped transformer. For single-phase 3-wire fed from two legs of a three-phase Wye transformer (lines are 120 degrees out of phase), select a Wye supply type.
PT Ratio	If an external potential transformer (PT) is connected between the source and the HDPM6000 voltage terminals, enter the ratio of the PT primary voltage to secondary voltage as a decimal (e.g. for a 600V:120V potential transformer, enter '5' or '5.0'). Note that higher PT ratios will cause the energy registers to reach their maximum value sooner. Energy Resolution may be adjusted to scale the energy (see setting details below).

Field or Control	Description
Nominal Voltage	Approximate voltage of the service the Head Unit is monitoring. This is the line to neutral voltage for services with a neutral, or the line to line voltage for delta.
High Power Mode	Options: On, Off and Custom Only needs adjustment if channels exceed 655 amps or with a potential transformer. Only applies to HDPM6000R, HDPM6000S and HDPM6000B.
Energy Resolution	Options: 10kWh, 1kWh, 100Wh, 10Wh, 1Wh (default), 0.1Wh, 0.01Wh, 0.001Wh Adjusts the scaling of the 32-bit integer energy registers. Settings larger than 1Wh will reduce energy resolution but allow for longer without integer rollover for high power systems. Values less than 1Wh increase resolution but reduce the time to rollover (recommended only for short durations such as during accuracy testing). 1Wh is recommended.
Phase Summary	Options: 3 phase meter, Circuits, Split Circuits Controls data displayed in the phase summary at the top of the circuit data page. This setting also affects the information displayed on the HMI. If a display is used, only select ‘Circuits’ or 'Split Circuits' (‘3 phase meter’ will configure the display to not show the branches).
KWh Increment Flash	Options: 3 phase meter, Circuits The second green LED from the left on the HDPM6000 head unit that flashes once per unit of energy consumed. This setting selects energy measured by the head unit or the sum of the HDPM6000R circuits as the source for the flash.
Data Collection	Options: Adaptive Speed (full dataset), Fixed Speed (full dataset), Fast (reduced dataset), Fast Update HU Instantaneous Values. Adaptive Speed, Full Dataset - The recommended mode in which data is refreshed (updated) every 1 second for 84 circuits or less (retrofit or strip systems) or every 2 seconds otherwise. Polling on the network can be faster but updated values will be available at this interval. Fixed Speed, Full Dataset - Data is refreshed (updated) every 2 seconds regardless of system configuration. Fast, Reduced Dataset - Special mode in which data is refreshed every 500 milliseconds, but the dataset is significantly reduced (voltage, current, real power, power factor). Super-user access is required to enable this mode. Fast Update Instantaneous Values - Optional mode when Adaptive Speed, Full Dataset is selected. Instantaneous values such as voltage, current, power and power factor on the head unit will be refreshed (updated) at a 200ms interval. The remainder of the data will continue to be updated at the 1 second (or two second based on the system size) interval.
Save Circuit Settings	Save the user-entered circuit settings.
6 Identifiers	
Board Serial Number	Displays the HDPM6000 serial number (read only).
Text ID	Allows the user to set the text ID of the system. The text ID can be displayed in the upper left corner of the web page. Limited to 4 characters.
Modbus Address	Options: 1 through 254 Sets the Modbus address of the device.
Allow Core Configuration over Modbus	When enabled, all Modbus writes are allowed. When disabled, a subset of Modbus registers associated with the core configuration of the device (e.g. CT selection, circuit grouping, etc.) is disallowed. For a full list of registers, refer to the "Modbus Configuration Lock" section.

SNMP Community	Sets the SNMP community string. The device will only respond to SNMP requests containing the correct community string.
BACnet	Options: On or Off Enables or disables BACnet communication.
Device ID	Allows the user to manually enter a BACnet ID.
Device Description	Allows the user to name the device if desired. This field can optionally be displayed in the upper left of the web page. This field can also be left blank. Limited to 30 characters.
Save Identifiers	Save the user-entered identifier settings.
Field or Control	**Description**
7 UI Settings	
Display ID	Options: Text ID, Description Selects the field to be displayed at the top of the web interface next to 'Board ID', either the Text ID or the Device Description.
Auto Log Out Time	Sets idle time for auto log out in seconds.
Auto Log Out User	Options: Enabled, Disabled If enabled, allows log in from a different computer if the previous user forgot to log out.
Save UI Settings	Save the user-entered UI settings.

8.4 TAPs Tab

The TAPs tab is used for configuring and updating firmware on the various HDPM6000 modules (HDPM6000R, HDPM6000S, HDPM6000B, etc.) by serial number. Users can also customize the module ordering scheme.



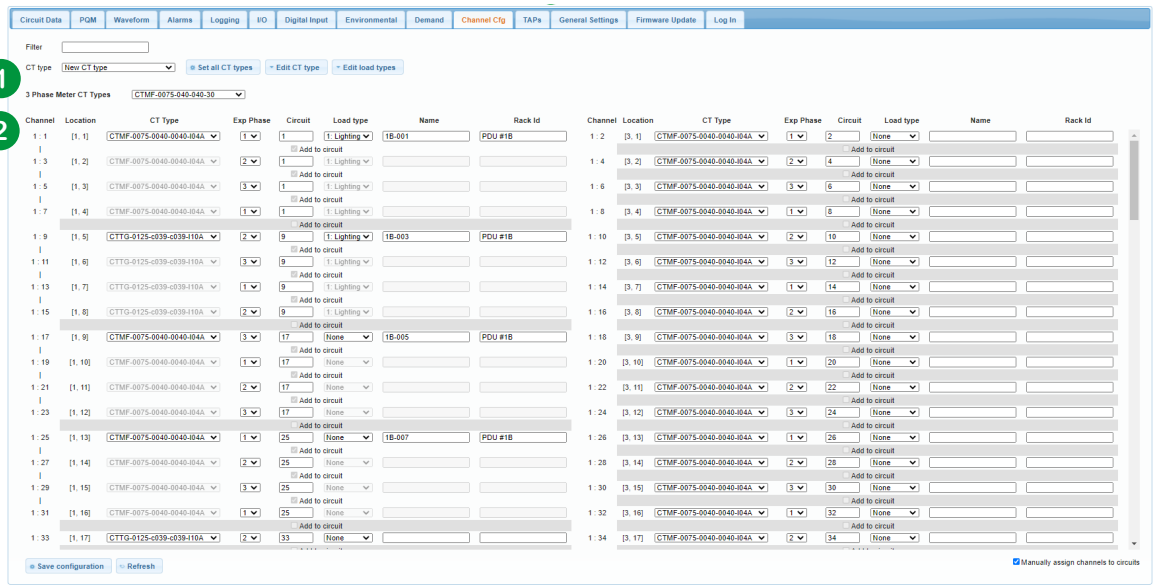
Field or Control	Description
TAP	Click a radio button to select a particular module from the list.
Serial Number	Serial number for each module. Either user-entered or pulled from the device if 'Use TAP Address Switches' is selected.
Channels and Firmware Version	The number of channels and version of the active firmware are displayed for the selected module.
Firmware File	Use the 'Choose File' button to navigate to the file containing the updated firmware.
Upload TAP Firmware	Press this button to upload the new firmware to the selected module (radio button on the left controls selected module).

Upload Firmware to All Taps	Press this button to upload the new firmware to all modules.
FPGA Time Stamp	Displays the build date of the FPGA firmware.
FPGA File	Use the 'Choose File' button to navigate to the file containing the updated firmware.
Upload FPGA Firmware	Press this button to upload the new FPGA firmware to selected modules.
Upload FPGA Firmware to All Taps	Press this button to upload the new FPGA firmware to all modules.
Set TAP Order	To override physical module addresses, enter serial numbers in the desired order and select 'Set Tap Order' to use this configuration. This method can save installation time by eliminating the need to set physical switches. It can also be used to remotely remedy an incorrectly set switch.
Use Tap Address Switches	Reads the physical address switches on the modules and sets the order based on these. This is the default method for setting module order.
Refresh	Force a manual refresh of the data.

8.5 Channel Cfg Tab

This tab is used to define which CT is being used to monitor a particular phase of a given circuit, define expected phases, load types and alphanumeric names.

Note: It is important to select the correct CT Type for each Channel in order to obtain measurements with specified accuracy. The correct type can be found on the label printed on the CT.



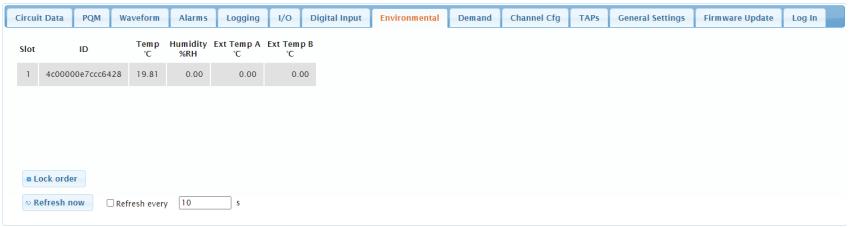
Field or Control	Description
1 **CT Type**	
Filter	Filter the CT models that will show up in the 'CT Type' drop-down. Only CTs with model names starting with this string will be populated.
CT Type Drop Down	Select a CT type by model number.
Set All CT Types	Applies the CT selected in the 'CT Type' drop-down to all CTs (both for the mains and all branches).

Field or Control	Description
Edit CT Type	Allows the user to edit or delete a defined CT type. A CT is defined by its name, factor and PHCAL (Phase Calibration Correction). Factors for hardware v1 and v2 are different. Hardware revision can be found on the Firmware Update tab on the row for the 3-phase meter. Only values for the hardware revision in use are required.
Edit Load Types	Opens a window to define Load Types by assigning alphanumeric names up to 18 characters. Load Types (also called virtual meters) provide aggregated real power for channels/circuits assigned to the type (available on the Circuit Data tab).
3 Phase Meter CT Types	Sets the CT types for CTs connected to the HDPM6000 head unit.
Dry Contact CT Types	Sets the CT type for CTs connected to the HDPM6000 I/O module (if attached).
2 Channel Configuration	
Channel	Channel Number for CT. Numbering is based on IEC/ ANSI mode and module address.
Location	The first number in the pair corresponds to the module, the second number in the pair corresponds to the input.
CT Type	Model number of the CT used for the channel.
Exp Phase	'Expected Phase' is the voltage phase (1,2,3 or N) the channel's CT is associated with (will be determined by the physical installation location in the panel).
Circuit	If 'Manually assign channels to circuits' is checked in the lower right hand corner, this column appears and the input here is used to assign channels to circuits.
Load Type	Assign the channel/circuit to a load type.
Name	Assign a name to the channel/circuit (optional), up to 40 alphanumeric characters.
Rack ID	Assign an ID to the rack (optional), up to 40 alphanumeric characters.
Add to Circuit	Check boxes used to define multiple circuits if the 'Manually assign channels to circuits' box in the lower right hand corner is not checked. Check the 'Add to circuit' box between channels on the same breaker, and uncheck the box between channels of different breakers. If the three channels are selected, circuit type Delta or Wye may also be selected.
Manually Assign Channels to Circuits	Check this box to access a 'Circuit' drop-down for each channel that allows the user to manually assign a channel to a specific circuit number.
Save Configuration	Save the user-entered data.
Refresh	Force a manual refresh of the data.

8.6 Environmental Tab

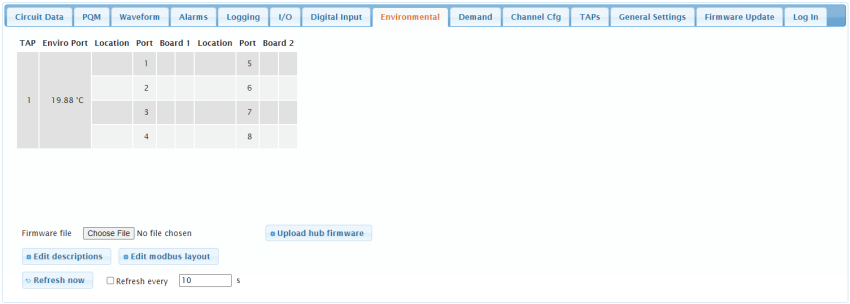
The HDPM6000 head unit and any busway modules or strip modules attached to the bus have ports where environmental sensors for temperature and/or humidity may be connected.

When a sensor is attached to the Enviro port on the head unit, temperature (and humidity, if available from the sensor) will be displayed as shown in the screenshot below. Sensor measurement data is automatically available in the Environmental Modbus register block (starting at address 7500) without further configuration.



Field or Control	Description
Refresh every	Click the check box and enter the refresh time (in seconds) to control how frequently environmental data is automatically refreshed.
Refresh now	Click this button to manually refresh environmental data.

When at least one busway or current strip module has a sensor attached to its Enviro port, temperature (and humidity, if available from the sensor) will be displayed as shown in the screenshot below. If multiple sensors are connected, each major row will show data for one sensor, with the number in the TAP column indicating the branch circuit module the sensor is connected to. A sensor connected to the head unit will have the label “3phm” in the TAP column.



Click the **Edit modbus layout** button to launch a dialog box that can be used to map sensor measurements to head unit Modbus registers (see screenshot below). Sensor measurement data is available in the Environmental Modbus register block (starting at address 32300) after this mapping procedure is completed. Follow the steps below to configure sensor measurements:

1. Click the Add button to add a row for a group of Modbus registers that will be mapped to measurements from a sensor. See the HDPM6000 Protocol Guide for more information about these Modbus registers.
2. Use the TAP dropdown box to select a branch circuit module or the head unit with an attached sensor. Select “3phm” for the head unit or the TAP number of the branch circuit module.
3. Select the sensor measurements to use in Slot 1 through Slot 4 (which map to Modbus registers Value 1 through Value 4). Each dropdown box under Slot 1 through Slot 4 contains a number pair using the format “port : measurement type”. Sensors attached to the Enviro port of a branch circuit module or the head unit have a port value of “0”. A temperature measurement has a type value of “1” and a humidity measurement has a type value of “2”.
4. Click the Save button to save the current Modbus layout configuration. Click the Cancel button to cancel any changes made.

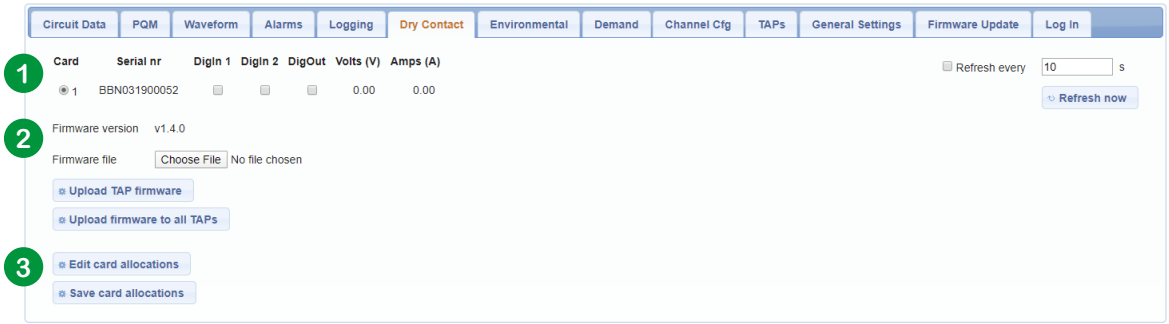
As an example, consider the sensor measurement mapping shown in the screenshot below. The Modbus register range 32300 to 32307 is assigned to the measurements available from a sensor connected to the Enviro port on the head unit (label “3phm” under the TAP column).

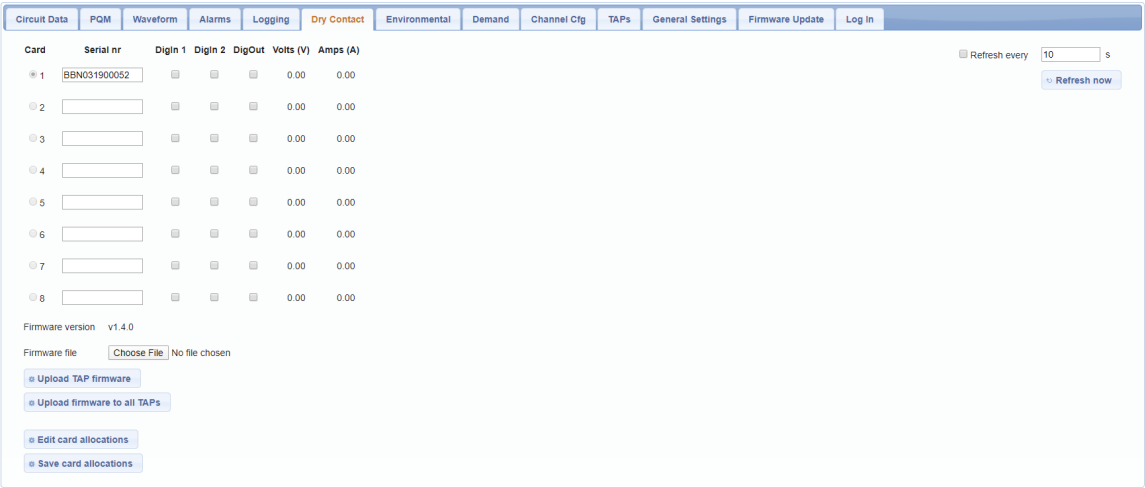
The Modbus register range 32308 to 32315 is assigned to the measurements available from a sensor connected to the Enviro port on the branch circuit module with address 7 (label “7” under the TAP column). Slots 1 through 4 have the port/measurement type configuration “0 : 1”, meaning port “0” (direct connection to an Enviro port) and measurement type “1” (temperature). The connected sensor outputs one temperature measurement, so all 4 Modbus Value registers (corresponding to Slots 1 through 4) will have the same temperature measurement. If a combined temperature/humidity sensor was attached, one of the slots (such as Slot 2) could be configured with the setting “0 : 2” (where measurement type 2 is humidity).

Field or Control	Description
Edit descriptions	Only applicable to HDPM systems with an environmental sensor hub.
Edit modbus layout	Clicking this button launches a dialog box that maps sensor measurements to Modbus registers. This button only appears when at least one busway or current strip module has a sensor attached to its Enviro port.
Upload hub firmware	Only applicable to HDPM systems with an environmental sensor hub
Refresh every	To control how frequently the data is automatically refreshed, click the checkbox and enter the refresh time in seconds.
Refresh now	Force a manual refresh of the data.

8.7 I/O Tab

This tab displays the status of installed HDPM6000 I/O modules identified by serial number.

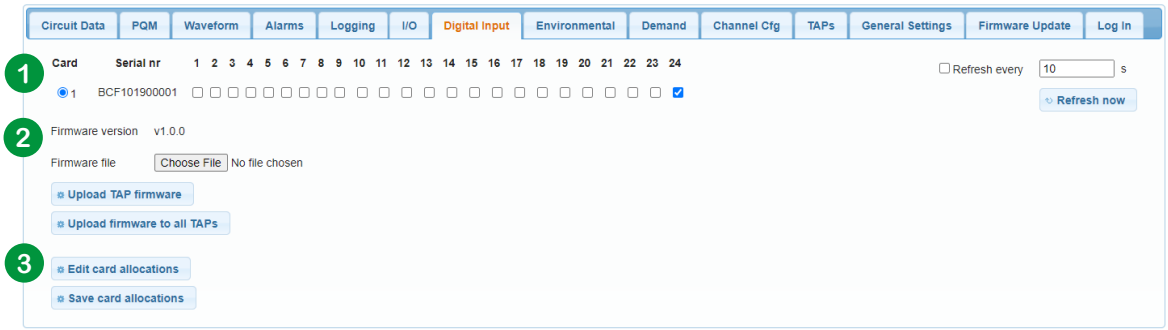




Field or Control	Description
1 Module Status Table	
Card	Allocated address of the I/O module so that data from multiple modules can be read. This is not the same as the TAP address of branch modules or card allocations of Digital Input modules.
Serial nr	Full serial number of the I/O module assigned to the allocated card address.
DigIn 1	State of the first dry contact digital input, D1. A checked box corresponds to a closed dry contact input, and an unchecked box corresponds to an open input.
DigIn 2	State of the second dry contact digital input, D2. A checked box corresponds to a closed dry contact input, and an unchecked box corresponds to an open input.
DigOut	State of the digital output. The output state can be toggled by checking or unchecking the box. An unchecked box corresponds to the normally closed (NC) contact being connected to the common and the normally open (NO) contact open. A checked box changes the state to the NO contacted connected to the common and the NC contact open.
Volts (V)	Voltage of the analog input, A1.
Amps (A)	Current through the connected CT.
2 Firmware	
Firmware version	Firmware version currently on the selected I/O module
Firmware file	Use the 'Choose File' button to navigate to the file containing updated I/O module firmware.
Upload TAP firmware	After choosing a new firmware file, press this button to upload the new firmware to the selected I/O module.
Upload firmware to all TAPs	After choosing a new firmware file, press this button to upload the new firmware to all attached I/O modules.
3 Address Allocation	
Edit card allocations	Press this button to expand the view to assign card allocations (module addresses). This is not the same as the TAP address of branch modules. Input the serial number of each connected I/O module into the 'Serial nr' column of the desired addresses.
Save card allocations	Press this button after assigning I/O module serial numbers to the desired addresses (card allocations) to apply the changes.

8.8 Digital Input Tab

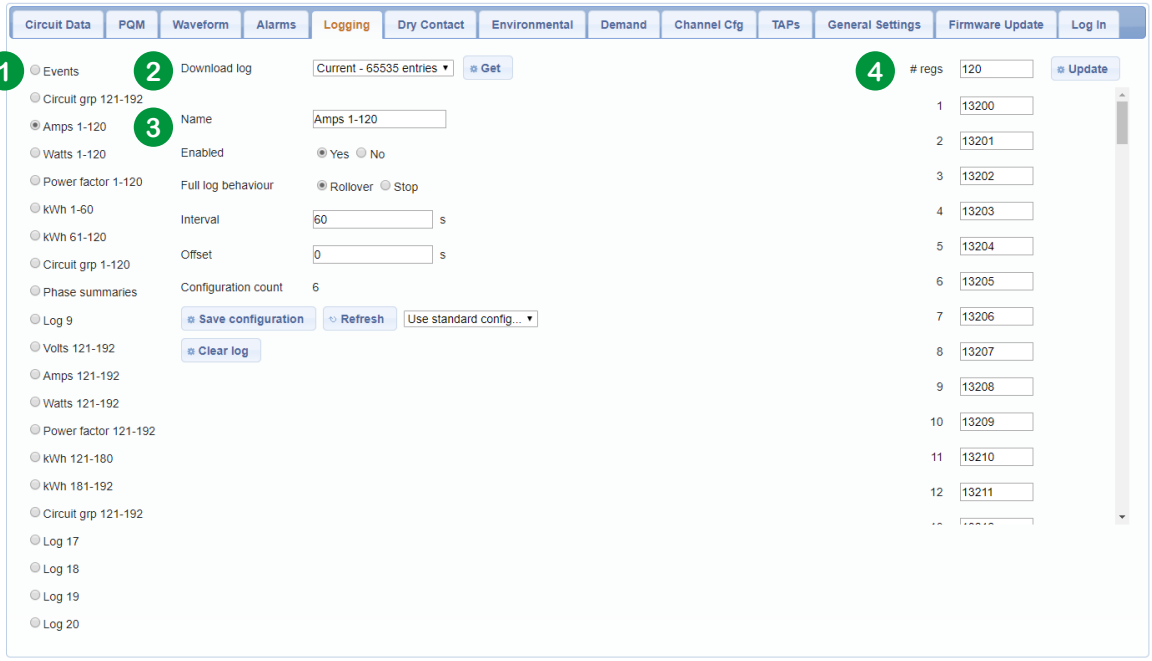
This tab displays the status of installed EIM 2.0 modules identified by serial number.



Field or Control	Description
1 Module Status Table	
Card	Allocated address of the Digital Input module so that data from multiple modules can be read. This is not the same as the TAP address of branch modules or card allocations of I/O modules.
Serial nr	Full serial number of the Digital Input module assigned to the allocated card address.
Input 1...24	State of the dry contact digital inputs. A checked box corresponds to a closed dry contact input, and an unchecked box corresponds to an open input.
2 Firmware	
Firmware version	Firmware version currently on the selected Digital Input module
Firmware file	Use the 'Choose File' button to navigate to the file containing updated Digital Input module firmware.
Upload TAP firmware	After choosing a new firmware file, press this button to upload the new firmware to the selected Digital Input module.
Upload firmware to all TAPs	After choosing a new firmware file, press this button to upload the new firmware to all attached Digital Input modules.
3 Address Allocation	
Edit card allocations	Press this button to expand the view to assign card allocations (module addresses). This is not the same as the TAP address of branch modules. Input the serial number of each connected Digital Input module into the 'Serial nr' column of the desired addresses. As an alternative, if only one EIM 2.0 is connected to the bus, the word "SINGLE" can be populated in the card 1 serial number text box and the EIM 2.0 will be auto-detected.
Save card allocations	Press this button after assigning Digital Input module serial numbers to the desired addresses (card allocations) to apply the changes.

8.9 Logging Tab

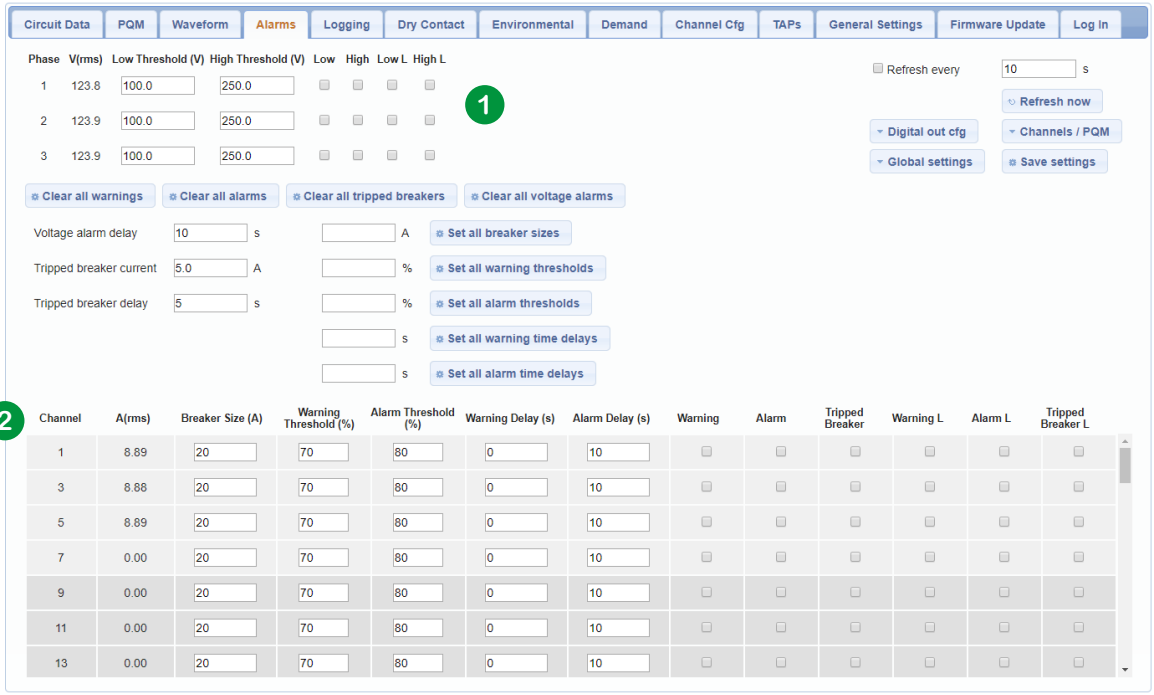
This tab allows the user to download stored data logs and, if desired, customize the data points logged.



Field or Control	Description
1 Select the log to be configured	
Radio Buttons (left-hand column)	Selects the log to be configured.
2 Download the log	
Download Log (drop-down)	Select the log to be downloaded.
Get	Use this button to begin the download. The log will be downloaded to a comma-separated variable (CSV) file.
3 Configure selected log name and parameters	
Name	Enter a name for the data log.
Enabled	Enables the log. Options: Yes or No
Full Log Behavior	Options: Rollover or Stop Rollover: Continuous log. When log is full, the oldest entries are overwritten. Stop: When the log is full, logging stops.
Interval	Enter the logging interval (time between logs) in seconds.
Offset	Enter time in seconds.
Save Configuration	Saves new naming and configuration data to the system.
Refresh	Forces a manual refresh of the data. The drop-down menu next to the Refresh button prepopulates the configuration with default logs.
Clear Log	Clears data from the log.
4 Set Modbus registers	
# Regs	Enter the number of Modbus registers to log (up to 121).
Numbered fields	Set the Modbus registers to be included in the selected log.
Update button	Save new Modbus information.

8.10 Alarms Tab

This tab is used to set warnings and alarms based on user-defined thresholds and delays. Warnings and alarms are available as non-latching and latching. Non-latching warnings and alarms will clear when the value returns across the threshold. Latching warnings and alarms will stay triggered until manually cleared through Modbus or the web interface.



Field or Control	Description
1 Voltage Settings	
Low Threshold (V)	User-entered low voltage alarm threshold for each phase. If the voltage for a phase drops below this threshold for longer than the 'Voltage alarm delay' then a low voltage alarm will be triggered.
High Threshold (V)	User-entered high voltage alarm threshold for each phase. If the voltage for a phase rises above this threshold for longer than the 'Voltage alarm delay' then a high voltage alarm will be triggered.
Low	Indication of low voltage alarm status (checked box indicates a low voltage alarm has been triggered).
High	Indication of high voltage alarm status (checked box indicates a high voltage alarm has been triggered).
Low L	Indication of low voltage latching alarm status (checked box indicates a low voltage alarm is latched).
High L	Indication of high voltage latching alarm status (checked box indicates a high voltage alarm is latched).
Refresh Every	To control how frequently the data is automatically refreshed, click the check box and enter the refresh time in seconds.
Refresh Now	Force a manual refresh of the data.
Digital out cfg	Toggles digital output config mode. When this button is pressed, all the check boxes for the alarm signals change to drop-down menus that allow the associated warning or alarm signal to be routed to an output relay on any attached I/O modules. A dash ('-') in the menu means the signal does not activate any output relay.

Field or Control	Description
Circuits / PQM	Toggles display of the branch circuits or the main circuits (head unit).
Global Settings	Toggles display of the 'Global Settings' fields and controls (listed below). These fields allow the user to configure all channels at the same time.
Save Settings	Save the user-entered data.
Clear All Warnings	Clears all warnings / latched warnings.
Clear All Alarms	Clears all alarms / latched alarms.
Clear All Tripped Breakers	Clears all tripped breaker indicators.
Clear All Voltage Alarms	Clears all voltage alarms.
Voltage Alarm Delay	Time which the voltage must stay below the low alarm threshold or above the high alarm threshold before the alarm is triggered.
Tripped Breaker Current	Current must exceed this threshold for longer than the delay time to arm the tripped breaker alarm.
Tripped Breaker Delay	Amount of time the breaker current must be above the tripped breaker current threshold before the tripped breaker alarm is armed.
Set All Breaker Sizes	This button along with the text field to its left allows all breaker sizes to be programmed at the same time. This programs both the head unit and Branch Circuit Breaker sizes regardless of which is currently displayed. Breaker sizes can also be set individually using the table below.
Set All Warning Thresholds	This button along with the text field to its left allows all over current warning thresholds to be set at the same time. Warning thresholds can also be set individually using the table below.
Set All Alarm Thresholds	This button along with the text field to its left allows all over current alarm thresholds to be set at the same time. Alarm thresholds can also be set individually using the table below.
Set All Warning Time Delays	This button along with the text field to its left allows all over current warning time delays to be set at the same time. Warning time delays can also be set individually using the table below.
Set All Alarm Time Delays	This button along with the text field to its left allows all over current alarm time delays to be set at the same time. Alarm time delays can also be set individually using the table below.
2 Individual Channel Alarm/Warning Detail Table	
Individual Channel Alarm/ Warning Detail Table	Summarizes the settings for warnings and alarms by channel. Allows the user to change settings individually for breaker sizes, warning thresholds, alarm thresholds, warning time delays and alarm time delays. Alarm status is indicated by the color of the cell in the current ('A rms') column. Alarms can be manually cleared by pressing on any checked boxes.

8.11 Waveform Tab

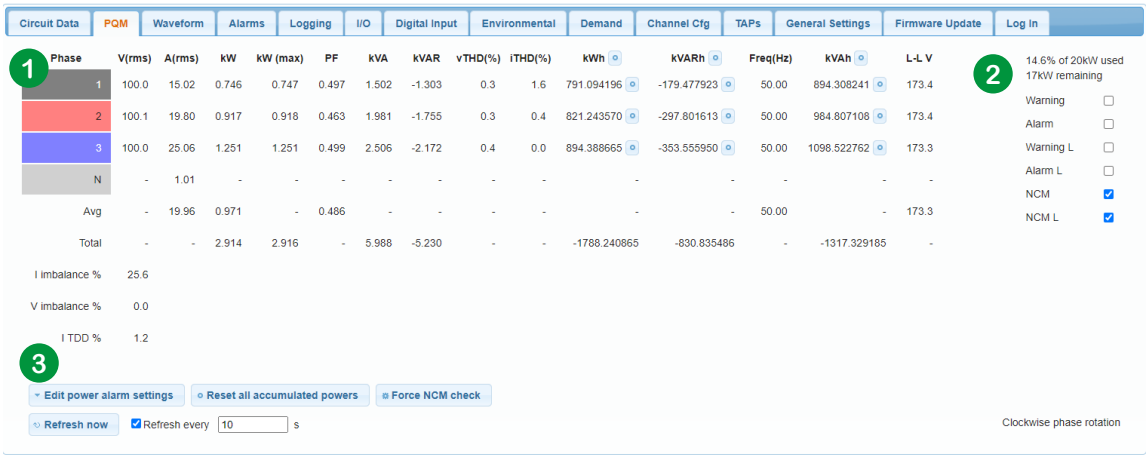
Use this tab to display and export stored waveforms and to configure the conditions which will trigger a waveform capture. A manual trigger (force capture) can be used to inspect present line conditions. An SD card must be inserted into the head unit to use waveform capture.

Field or Control	Description
Captured Waveforms (drop-down)	Controls which waveform capture is displayed/downloaded. Description: Waveform ID | Date/Time of Capture | Trigger
Channel (drop-down)	Use this drop-down to isolate a single phase or branch channel from the selection made in the 'Captured Waveforms' drop-down. This isolates the phase or channel in the graph display or graph download. 'Download Data' is unaffected by this control.
Download Data	Exports a .csv file with all the data from the captured waveform.
Download Graph	This option generates a downloadable image of the captured waveform. This is the same as the image displayed on the web interface.
Force Capture	Requests a manual data capture.
Delete Captures	Deletes all waveform captures from the system and reboots the system.
Refresh	Force a manual refresh of the data.
Edit Settings	Displays the below settings.

Field or Control	Description
Over Voltage Enabled	Checking this box enables waveform capture when voltage exceeds the threshold (voltage swell). For the Delta power supply type, only head unit voltage and current channels will be captured.
Over Voltage threshold	RMS voltage above which a waveform capture will be triggered.
Voltage Sag Enabled	Checking this box enables waveform capture when a voltage falls below the threshold. For the Delta power supply type, only head unit voltage and current channels will be captured.
Voltage Sag Threshold	RMS voltage below which a waveform capture will be triggered.
Phase Currents Enabled	Enables waveform capture based on HDPM6000 head unit currents (mains currents).
Over Current / Tripped Breaker	The system can trigger a waveform capture on either an over current or a tripped breaker (zero crossing timeout on mains current).
Threshold	This threshold depends on the option selected for the above item. • If 'Over Current' is selected, waveforms will be recorded if the mains current exceeds the threshold for at least the number of seconds specified in the 'Hold Time' field (see below). • If 'Tripped Breaker' is selected, the mains current must exceed this threshold for the hold time to arm the mains current tripped breaker waveform capture.
Hold Time	The phase (mains) current must exceed the threshold for this amount of time to trigger 'over current' or arm the 'tripped breaker' waveform capture.
Channels to Capture	Options: All, Fault Either captures all the channels or only the channel that experienced a fault.
Channel Currents TB	Checking this box enables waveform capture when a tripped breaker is detected on a branch channel (zero crossing timeout on current channel).
Threshold	The branch channel current must exceed this threshold for the hold time to arm the branch channel tripped breaker waveform capture.
Hold Time	The branch channel current must exceed the threshold for this amount of time to arm the branch current tripped breaker waveform capture.

8.12 PQM Tab

The PQM tab provides real time data for the power quality of each phase of the HDPM6000 head unit, plus averages or totals where applicable. Branch circuits configured as three phases and a neutral (123N) will also show up below the mains in a similar format. Alarms can be configured to trigger if total power exceeds user-defined thresholds.

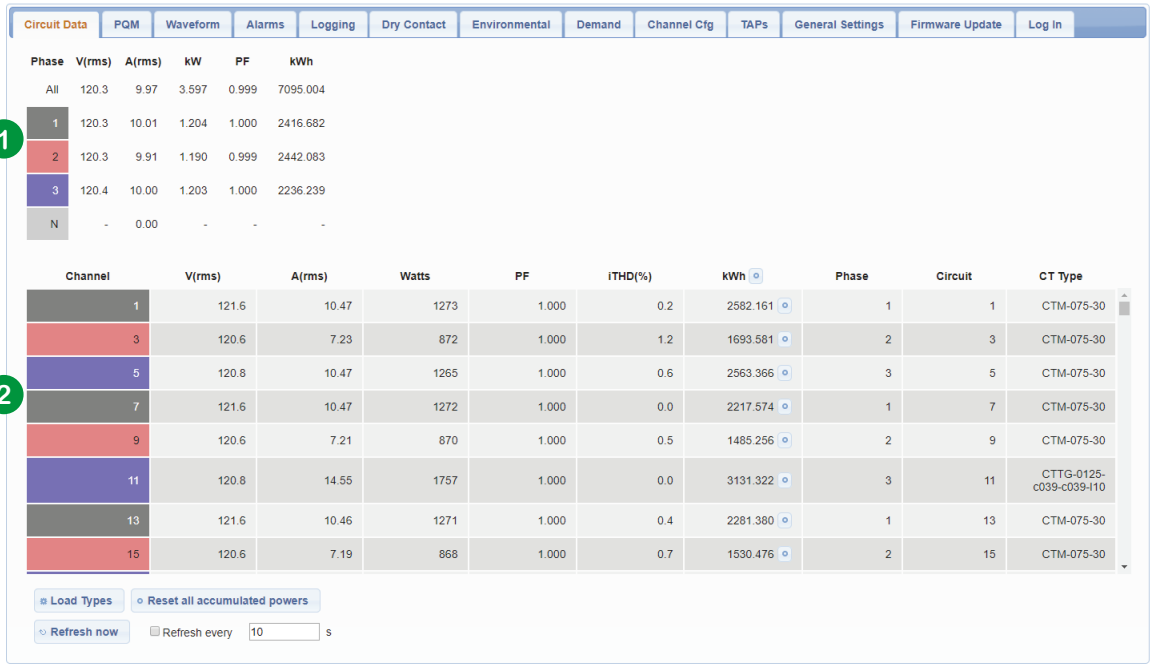


Field or Control	Description
1 Power Values	
Power Values table	This table provides real-time values, plus averages or totals where applicable for the parameters shown. Power Factor follows IEEE power factor sign convention, where capacitive loads have a positive power factor and inductive loads have a negative power factor. See Schneider Electric FAQ article FA212521 for more details. The kVAR measurement includes harmonics, but kVARh only accumulates fundamental reactive power. The kWh, kVARh, and KVAh columns show totals since the previous reset. These can be individually reset to zero using the buttons in their respective columns.
2 Power Limits	
_% of _kW used _kW remaining	Displays a comparison of the actual system power vs. the user-defined design power limits.
Warning / Alarm	A check mark is displayed next to these indicators if the system power is above the warning/alarm thresholds.
Warning L / Alarm L	A check mark is displayed next to these indicators if the system power has been above the warning/alarm thresholds since the previous reset (latched indicators require manual reset). A reset can be performed by clicking on the checkbox.
Neutral Current Mismatch (NCM)	A check mark is displayed next to this indicator if the difference between the sum of the phase currents and the neutral current is greater than the NCM threshold.
Neutral Current Mismatch Latched (NCM L)	A check mark is displayed next to this indicator if a neutral current mismatch was detected since last reset. Reset can be performed by clicking on the checkbox.
3 Power Alarm Settings (Click the Enable Power Alarm Settings button to show this menu)	
Circuit	Circuit or mains (3phm) to which the shown Power Alarm Settings apply to.
Save power alarm settings	Apply the power alarm settings shown to the selected circuit.
Design power limit	Valid values (16-bit): 1 to 65536. If set to '0', power limit alarms and calculations are disabled. This field is the basis of the power alarms.
Warning Threshold	Warning indicator threshold in percent of design power limit.
Alarm Threshold	Alarm indicator threshold in percent of design power limit.
Warning Delay	Number of seconds power must be above warning threshold before warning is activated.

Field or Control	Description
Alarm Delay	Number of seconds power must be above alarm threshold before alarm is activated.
NCM Threshold	Difference between the sum of the phase currents and the neutral current above which the Neutral Current Mismatch (NCM) alarm will trigger.
Warning (drop-down) Alarm (drop-down) Warning L (drop-down) Alarm L (drop-down) NCM (drop-down) NCM L (drop-down)	Options: '-', '1', more if additional I/O modules are installed. This selector routes an alarm to a digital output on an HDPM6000 I/O module.
Reset All Accumulated Powers	Resets all accumulated power values (kWh and kVARh) for the head unit mains and all branch channels to zero.
Refresh Now	Press this button for a manual real-time refresh of the data.
Refresh Every	To control how frequently the data is automatically refreshed, click the check box and enter the refresh time in seconds.

8.13 Circuit Data Tab

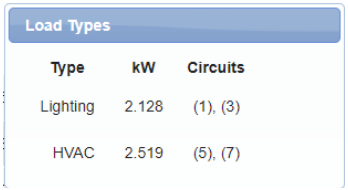
The Circuit Data tab is primarily a view-only page providing a snapshot of real-time branch meter values from attached HDPM6000R, HDPM6000S or HDPM6000B modules.



Phase	V(rms)	A(rms)	kW	PF	kWh
All	120.3	9.97	3.597	0.999	7095.004
1	120.3	10.01	1.204	1.000	2416.682
2	120.3	9.91	1.190	0.999	2442.083
3	120.4	10.00	1.203	1.000	2236.239
N	-	0.00	-	-	-

Channel	V(rms)	A(rms)	Watts	PF	iTHD(%)	kWh	Phase	Circuit	CT Type
1	121.6	10.47	1273	1.000	0.2	2582.161	1	1	CTM-075-30
3	120.6	7.23	872	1.000	1.2	1693.581	2	3	CTM-075-30
5	120.8	10.47	1265	1.000	0.6	2563.366	3	5	CTM-075-30
7	121.6	10.47	1272	1.000	0.0	2217.574	1	7	CTM-075-30
9	120.6	7.21	870	1.000	0.5	1485.256	2	9	CTM-075-30
11	120.8	14.55	1757	1.000	0.0	3131.322	3	11	CTTG-0125-c039-c039-I10
13	121.6	10.46	1271	1.000	0.4	2281.380	1	13	CTM-075-30
15	120.6	7.19	868	1.000	0.7	1530.476	2	15	CTM-075-30

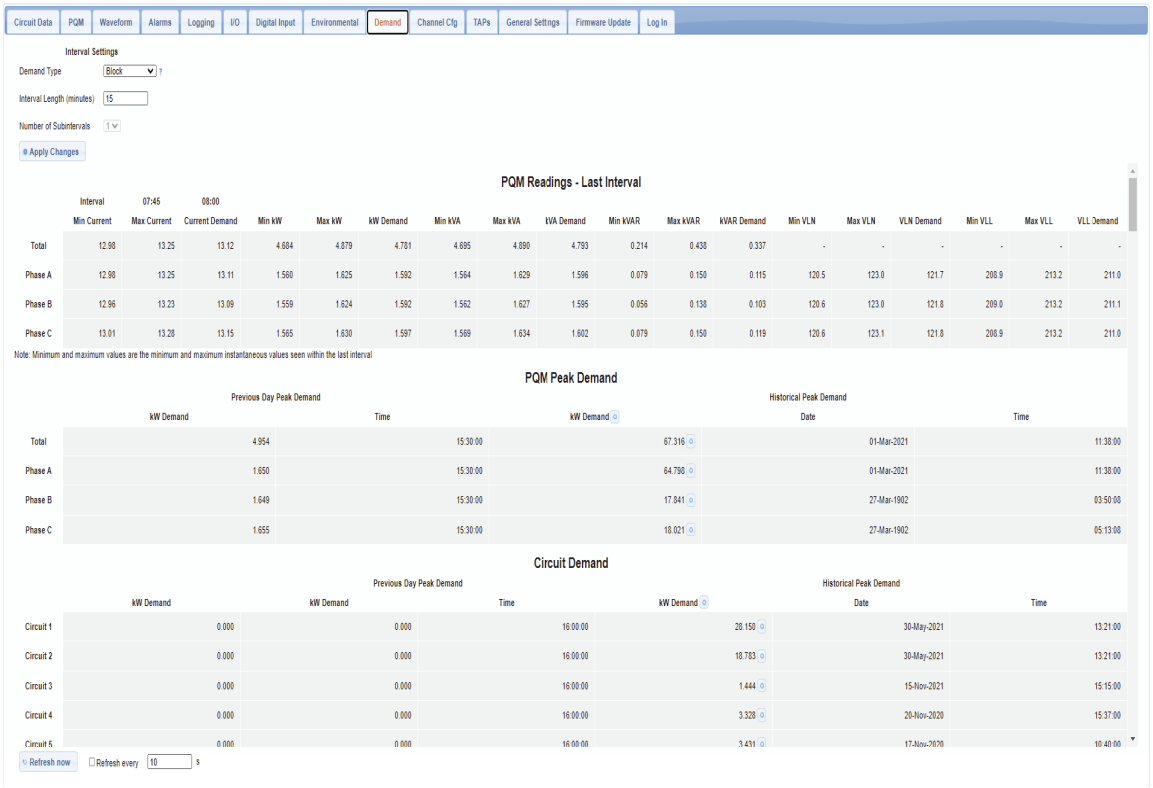
Load Types pop-up window:



Field or Control	Description
1 Phase Summary	
Phase Summary Table	Summarized data for each phase. The source of this data is determined by the 'Phase Summary' setting on the 'General Settings' tab and can be the head unit mains CTs ('3 phase meter'), total of all branch circuits ('Circuits'), or the totals for each attached module ('Split circuits', up to four modules). Power Factor follows IEEE power factor sign convention, where capacitive loads have a positive power factor and inductive loads have a negative power factor. See Schneider Electric FAQ article FA212521 for more details.
2 Channel and Circuit View	
Channel and Circuit Table	This table provides real-time values for branch channels. The kWh column shows the totals since the previous reset. These can be individually reset to zero using the buttons in their respective rows or collectively reset using the button in the column header. Any CT wiring issues identified will be shown below this table. The Channel column will show the circuit name assigned in the Channel Cfg tab. See the PF sign convention note above in the Phase Summary Table row.
Load Types	Opens a pop-up window to view the total power for each load type (virtual meter) that has been defined on the the Channel Cfg tab.
Reset All Accumulated Powers	Resets all accumulated power values (kWh, kVARh, and kVAh) for head unit mains to zero.
Refresh Now	Press this button for a manual real-time refresh of the data.
Refresh Every	To control how frequently the data is automatically refreshed, click the check box and enter the refresh time in seconds.

8.14 Demand Tab

The Demand tab provides settings for configuring the demand calculation and real-time viewing of demand values. Peak demand is available both from the previous day and historic (since reset). The maximum and minimum instantaneous values over the last interval for current, real power, reactive power, and apparent power are also provided for the head unit mains (PQM).



Field or Control	Description
Demand Type	Options: Timed Block, Timed Rolling Block Hover over the question mark next to the selection box to see a visualization of each type. Timed Block - After time equal to the interval length has elapsed, demand will be calculated. Timed Rolling Block - When selected, the number of subintervals must also be defined. After each subinterval length of time (interval divided by number of subintervals), demand will be calculated over the last interval time period. For example, with a 15-minute interval length and 3 subintervals (i.e. 5-minute subintervals), after every 5 minutes demand will be calculated over the last 15 minutes (interval length).
Interval Length	Define the demand interval. At the end of each interval, the minimum, maximum and average (demand) values will be populated in the table and available over the meter's protocols (Modbus, BACnet, SNMP).
Number of Subintervals	Only applies in Timed Rolling Block mode. Demand will be calculated over the full interval length at every subinterval end.
Apply Changes	Apply a change to the demand interval. The interval will restart when aligned with the RTC (e.g. if restarting at 2:08 with a 15 minute interval length, the first interval will be from 2:15-2:30, at which time values for the first interval will be available).

Field or Control	Description
PQM Readings Last Interval Table	This table displays the minimum, maximum, and demand (average) value for current, real power, reactive power, apparent power, and voltage on the head unit mains (PQM) over the last interval. The minimum and maximum are the minimum and maximum instantaneous values seen on the last interval.
PQM Peak Demand Table	This table displays the maximum real power demand on the head unit mains (PQM) from the previous day (updated at midnight local time), and historic (maximum since last reset). Historic peak demand can be reset using the icon adjacent to the value. Although the kVAR measurement includes harmonics, the kVAR demand measurement is fundamental only.
Circuit Demand	This table displays the real power demand on the branch circuits over the last demand interval (leftmost), peak demand during the previous day (middle), and the historic maximum demand since last reset (rightmost). Historic peak demand can be reset using the icon adjacent to the value.
Refresh Now	Press this button for a manual real-time refresh of the data.
Refresh Every	To control how frequently the data is automatically refreshed, click the check box and enter the refresh time in seconds.

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Z208128-0J 12/2024