# PowerLogic™ HDPM6000

## Installation Guide

**Z208128-0F**
**05/2022**


Schneider Electric

www.se.com

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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.

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.

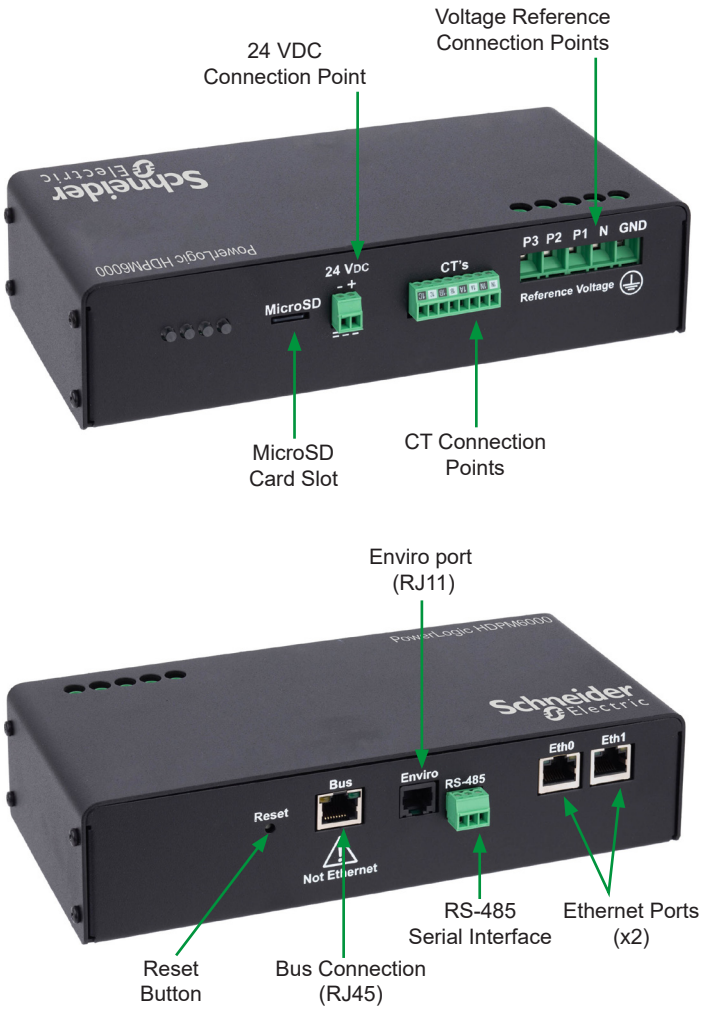
This Class A digital apparatus complies with Canadian ICES-003.

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

## Overview

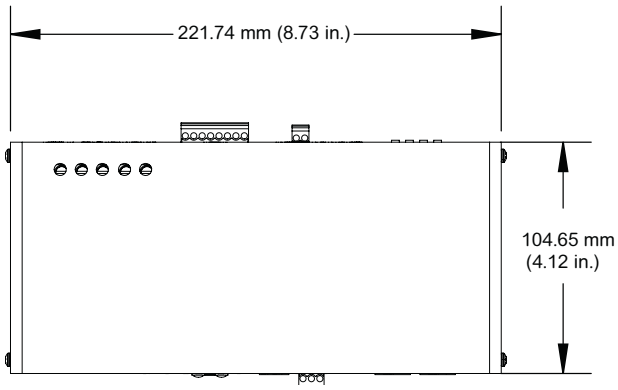
The HDPM6000 platform is comprised of the HDPM6000 head unit, Current Transformers (CTs) and the power supply. The HDPM6000 head unit provides true RMS data for Volts, Amps, Power Factor, Watts, kWh, kVAR, kVARh, Hz, vTHD and iTHD.

**Figure 1. HDPM6000 Head Unit**

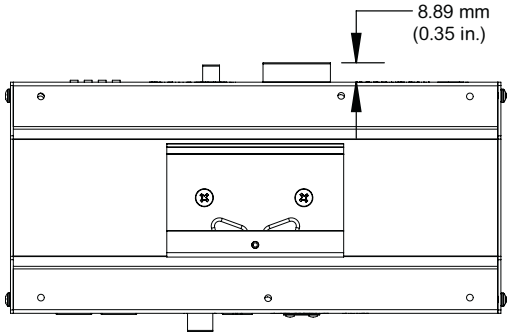


## Dimensions

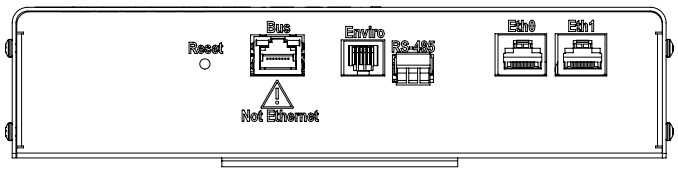
### Top View



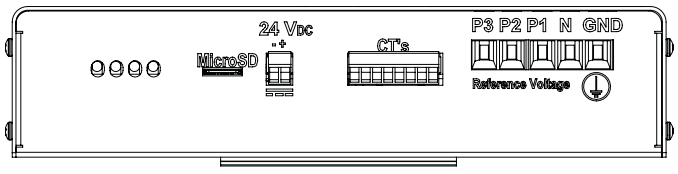

### Bottom View



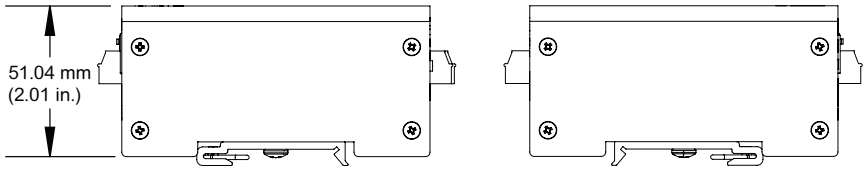

### Left View




### Right View




### Front View, Back View




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

## 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 | 10 | |
| **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 |

*Note: The device may experience measurement accuracy deviation. Contact Schneider Electric technical support for more information.*

## 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 |

# Current Transformers

## 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**

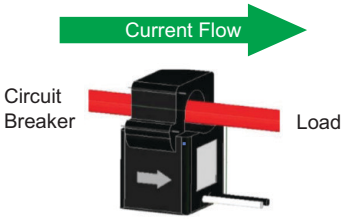
Align CT arrow to point in the direction of the power flow.

**Failure to follow this instruction can result in incorrect readings.**

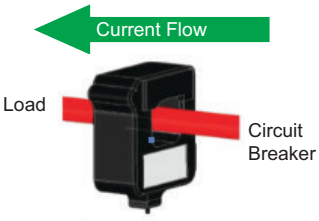
Each CT can be connected to a circuit by opening or removing the top of the CT and snapping it onto the wire that connects the power source to the load. The CT label must face the power source. Ensure that the CT is closed tightly or readings provided by the HDPM6000 head unit may be affected.

**Split-Core Models**

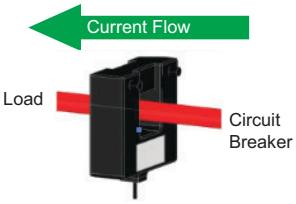
For this model CT, the arrow indicates the current flow (i.e., the label faces away from the circuit breaker).




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.

## 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 2. 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

## Hardware Installation and Wiring

### 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.

**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.*

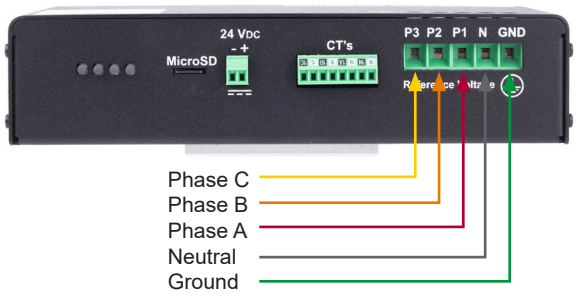
The HDPM6000 head unit includes three separate electrical components that must be connected in order to use the system: the voltage reference, power supply and CTs.

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. 3-phase wye power (also known as 5-wire with Phase A, Phase B, Phase C, Neutral and Ground, see Figure 3):
        i. Connect the three phases to a 3-phase common-trip breaker of no greater that 15 A over current protection located near the HDPM6000 meter (UL Listed for voltages up to 480 Vrms).
        ii. Connect the outputs of the 3-phase 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.

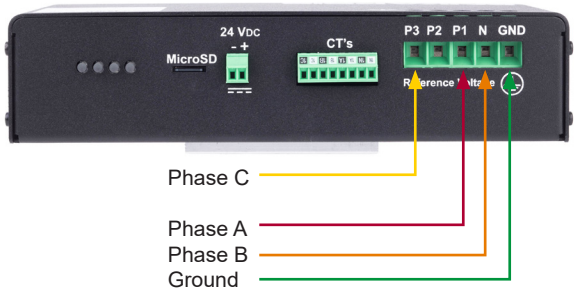



b. 3-phase delta power (also known as four-wire with Phase A, Phase B, Phase C and Ground, see Figure 4 for an example):

i. Connect the three phases to a 3-phase common-trip breaker of no greater than 15 A over current protection located near the HDPM6000 meter (UL Listed for voltages up to 480 Vrms).

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.



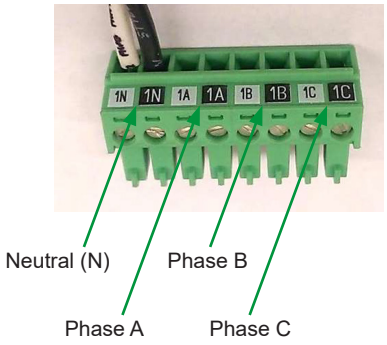

*Note: If installing in IT-S power distribution, a four-conductor disconnect must be used (3-phase + neutral).*

4. Connect the CTs:

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

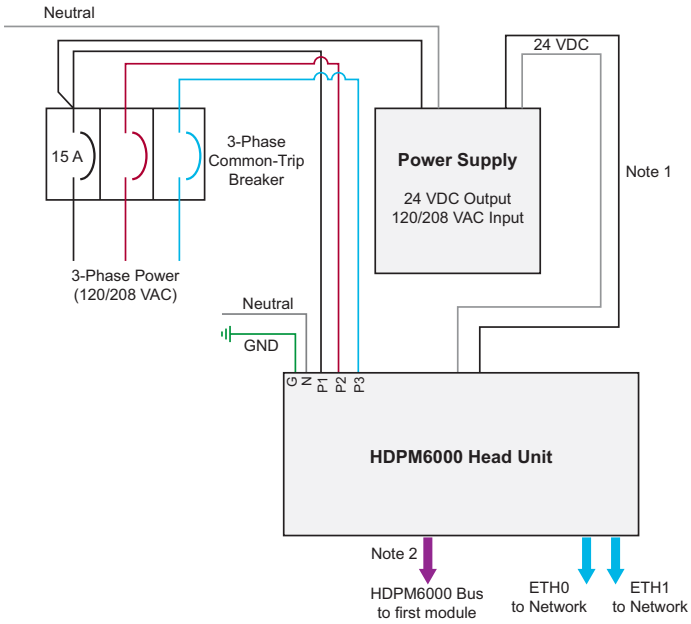
b. Ensure the CT is installed facing the correct direction. See "CT Orientation" on page 5 for details.

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.



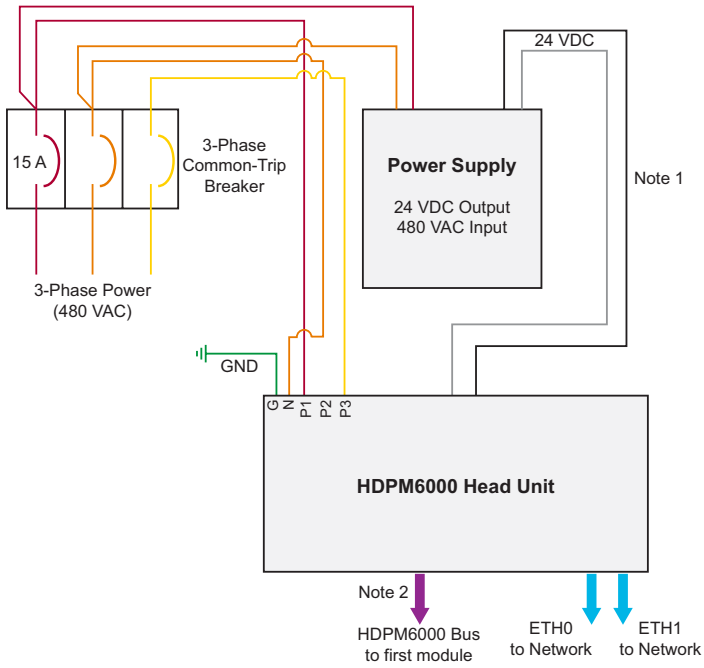

5. Confirm all wiring connections are secure and energize the power supply input.

**Figure 3. 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 4. 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.

## 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.*

## 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).

**Figure 5. RS-485 Wiring**

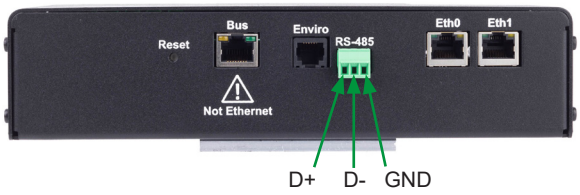



**Figure 6. Connection Points for Voltage Reference**

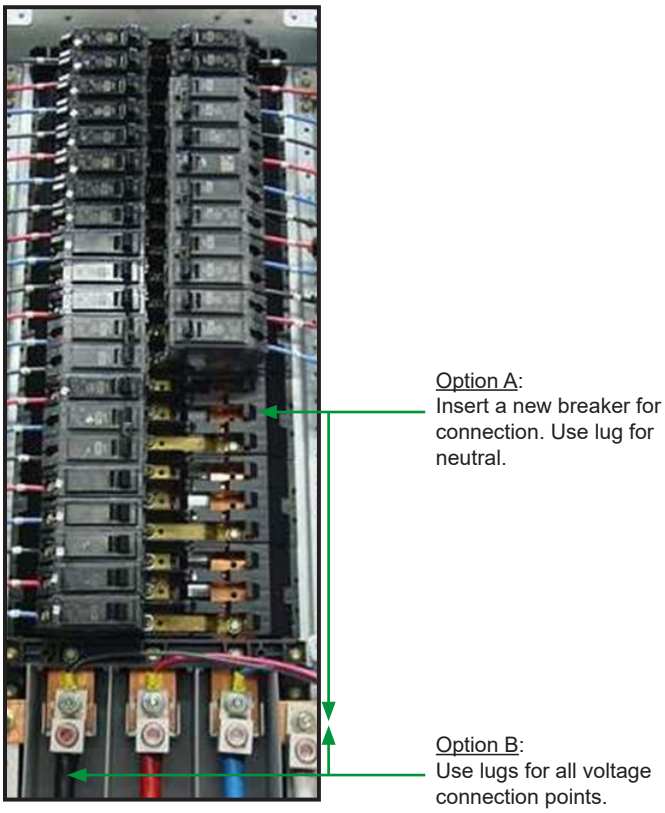



**Figure 7. CT Connection Points (300 A CT Shown)**

# 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'.

## 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 (See "General Settings Tab" on page 21, 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' section).

## Accessing the Device for the First Time

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**.
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'

## Configuring the Meter

1. Connect to the meter's embedded web server and log in as an Administrator (see the section "Accessing the Device for the First Time" on page 12).
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, circuit numbering) and communications settings (e.g. BACnet, SNMP, RS485). See "General Settings Tab" on page 21 for details. 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. See "TAPs Tab" on page 25 for details.
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. See the sections "Branch Circuit Configuration" on page 14 and "Channel Cfg Tab" on page 26 for details.
6. Navigate to the Demand tab and set the demand type and interval. See "Demand Tab" on page 40 for details.
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). See "I/O Tab" on page 29 for details.
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). See "Digital Input Tab" on page 30 for details.
9. If any environmental sensors are attached to the bus, navigate to the Environmental tab to configure the descriptions and Modbus layout. See "Environmental Tab" on page 28 for details.
10. Navigate to the Logging tab to enable or disable logs, configure their behavior, and define custom points to log. See "Logging Tab" on page 32 for details.
11. Navigate to the Alarms tab to define voltage and current alarms for the head unit and any attached metering modules. See "Alarms Tab" on page 33 for details.
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. See "Waveform Tab" on page 35 for details.

## 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:

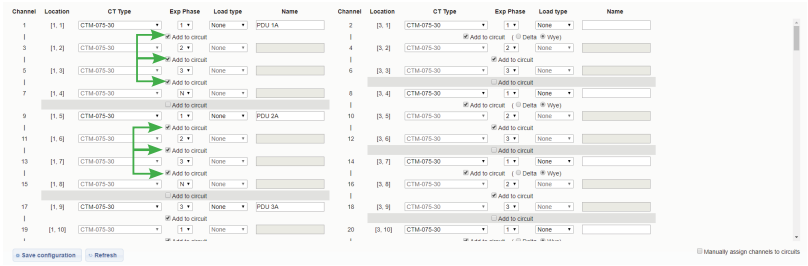
- Expected phase of a channel
- CT type
- Circuit groupings (to distinguish between one, two and three pole breakers)
- Circuit names and Rack Ids
- Load Type assignment

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

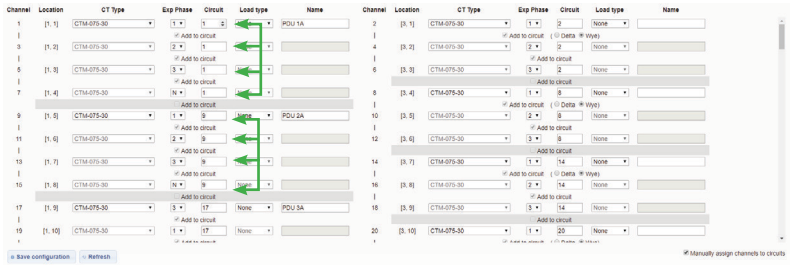
- **Automatic Grouping:** Uncheck the **Manually assign channels to circuits** box in the lower right hand corner and select the **Add to circuit** boxes between channels to create circuits. When finished, click **Save Configuration**.
- **Manual Grouping:** Check the **Manually assign channels to circuits**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


## 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.

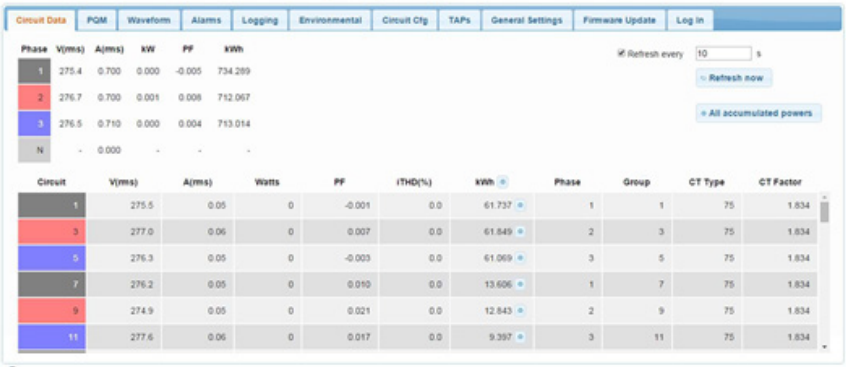
To sample live data:

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:




## Power Scaling

There are two selections in the General Settings tab of the web interface to control power scaling.

- **High Power Mode**: High Power mode is used when the circuits being monitored exceed 655 amps. When High Power mode is activated, by checking the box and sending the configuration change to the board, the power data received is decreased by a power of 10 for amps and a power of 100 for watts. This process provides needed space when the registers begin to overflow at 655 amps.

- **kWh Resolution**: kWh resolution is an administrative function used when the registers of the on-board firmware are being overloaded. Leave this setting at 0.001.

## 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 |
| 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'.

## 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***

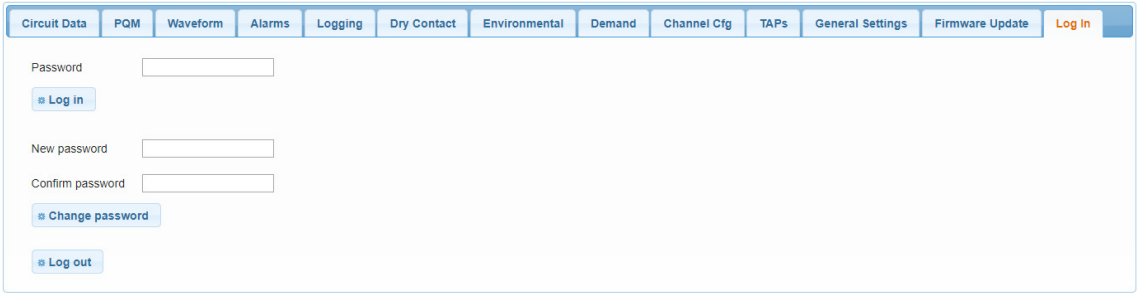
**INABILITY TO DOWNGRADE BELOW FIRMWARE VERSION 60**

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

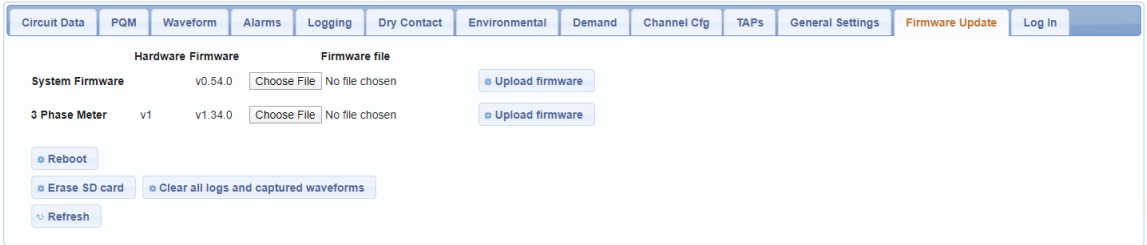
Starting with HDPM Firmware Version 60 Bundle, the firmware files are digitally signed by Schneider Electric. To upgrade from an unsigned version to a signed version (60 or above), use HDPM6000 Manager version 1.21.0 or later rather than the web interface. If the web interface or a version of HDPM6000 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.

Applying firmware through the web interface:

1. Download firmware files to a computer from the Schneider Electric website.
2. Log in to the HDPM6000 Web Interface

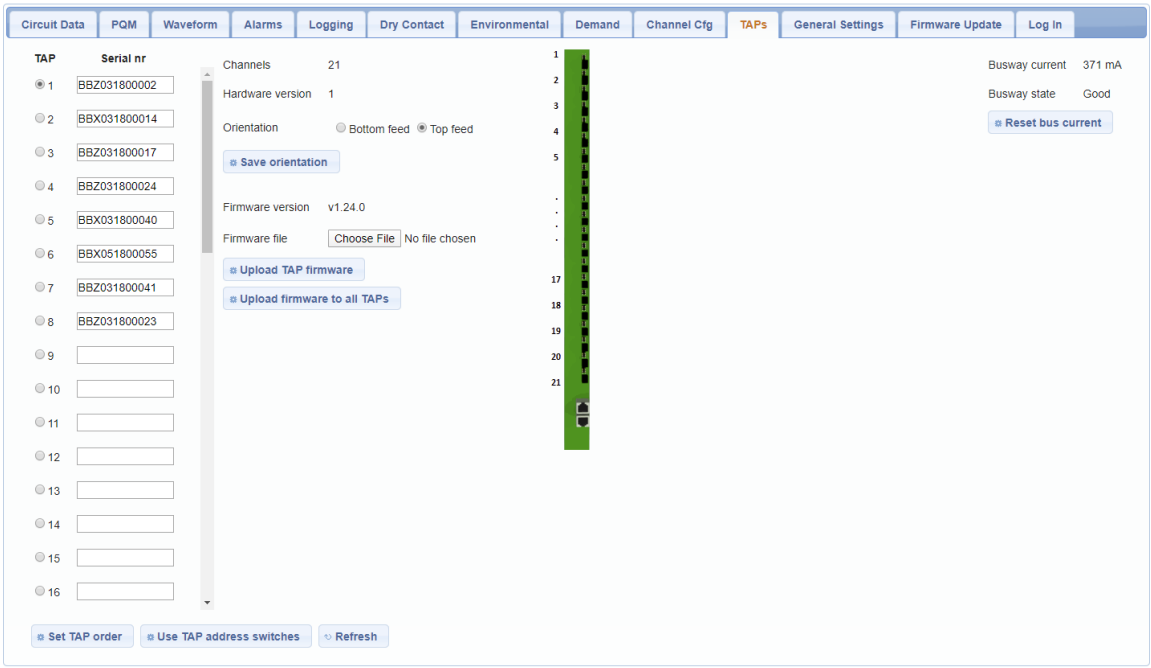



3. Navigate to the 'Firmware Update' tab to update the head unit's firmware. There are two rows, one for the system firmware and one for the 3-phase Meter.




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.



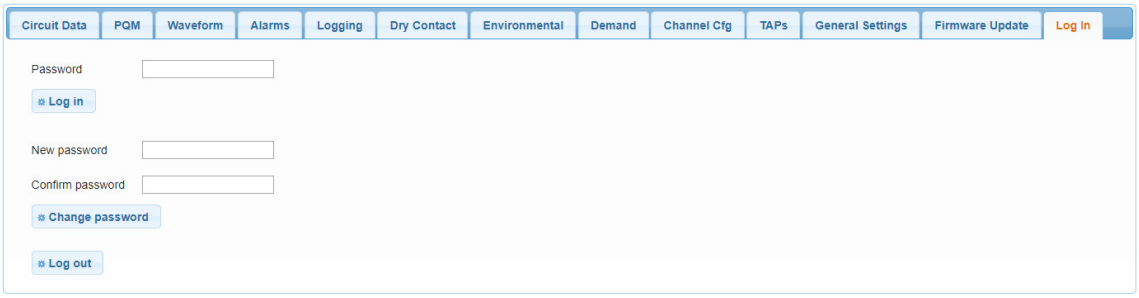

9. Click the **Choose File** button, navigate to the location where the new firmware files were downloaded, select the new firmware file (busway meters, strip modules, retrofit modules) and click **Open**.
10. Click **Upload firmware to all TAPs** to update all of the modules connected to the bus, or 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.

# 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.

## Log In Tab

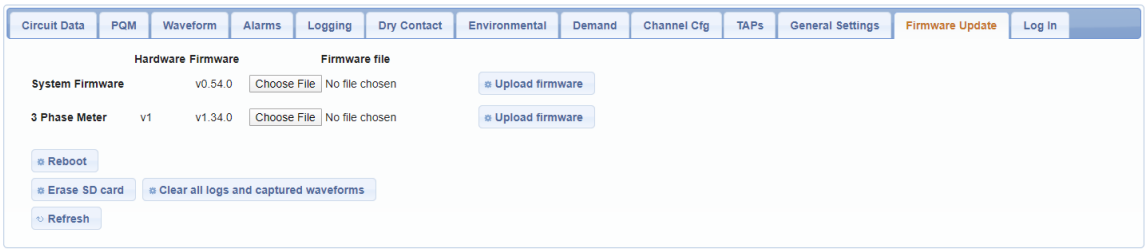
Logging into an account on the Log In tab is required before accessing any of the other web interface tabs.




| 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. |

## Firmware Update Tab

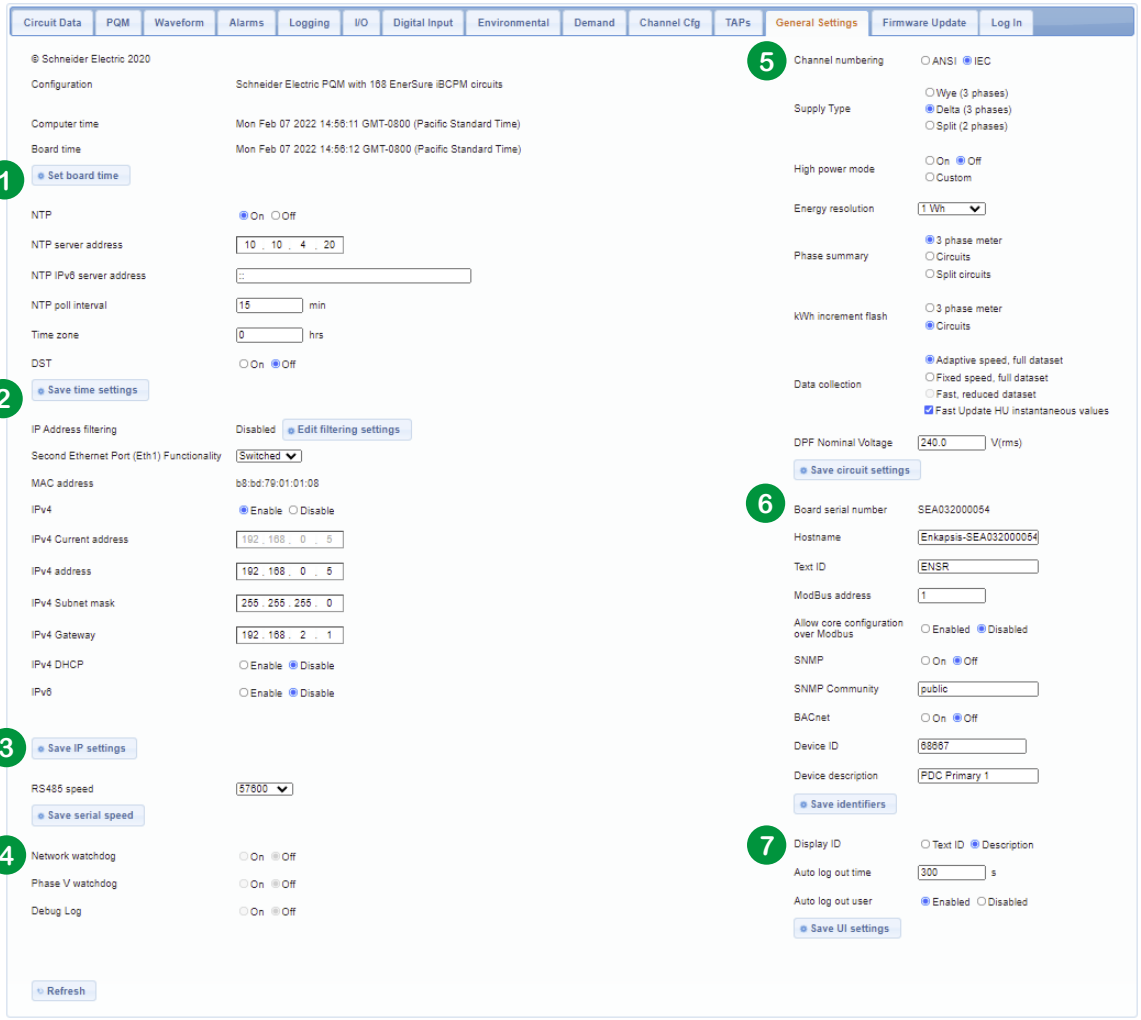
The Firmware Update tab allows users to update the firmware of the HDPM6000 head unit and to clear data logs and waveforms.




| 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. |
| 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. |

## 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). |

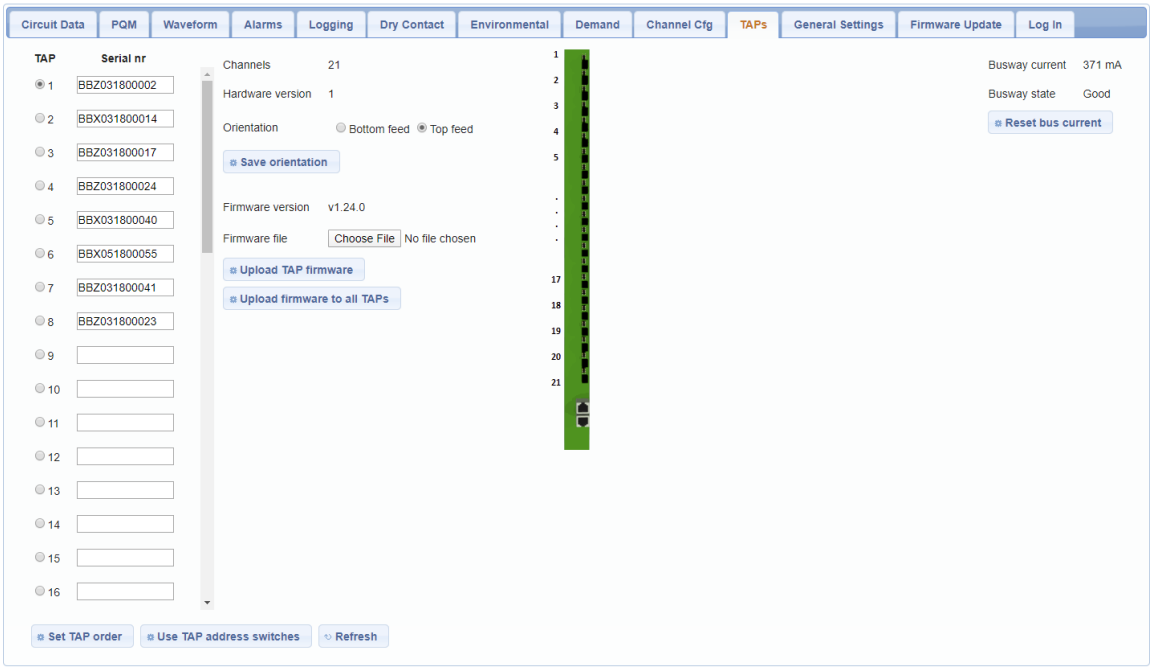
| Field or Control | Description |
|---|---|
| Edit Filtering Settings | Click this button for a dialog that allows IP addresses to be added to or removed from the list of allowed IP addresses, as well as to enable filtering. |
| Second Ethernet Port (Eth1) Functionality | Configure whether the second 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<br>IPv4 Subnet Mask<br>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. |
| 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<br>Allows user to select panel channel numbering scheme. ANSI is alternating numbers left-right (1-3-5… on left, 2-4-6… on right).<br>IEC is sequential numbers filling the left side before continuing down the right (1-2-3… on left, 43, 44, 45… on right).<br>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), Split (2 phases). |
| High Power Mode | Options: On, Off<br>Only needs adjustment if channels exceed 655 amps.<br>Only applies to HDPM6000R, HDPM6000S and HDPM6000B. |
| Energy Resolution | Options: 10kWh, 1kWh, 100Wh, 10Wh, 1Wh (default), 0.1Wh, 0.01Wh, 0.001Wh<br>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. |

| Field or Control | Description |
|---|---|
| Phase Summary | Options: 3 phase meter, Circuits, Split Circuits<br>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<br>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.<br>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.<br>Fixed Speed, Full Dataset - Data is refreshed (updated) every 2 seconds regardless of system configuration.<br>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.<br>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. |
| Primary: Secondary PDU ratio | Secondary PDU ratio -<br>Step down ratio of a transformer upstream of the Head Unit (if present). Used to estimate the transformer's primary side line to line voltage and current. See Modbus registers starting at 05600 for the calculated values. |
| DPF 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's.<br>Aids the accuracy of the Displacement Power Factor calculation. |
| 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<br>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<br>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<br>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<br>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. |

## TAPs Tab

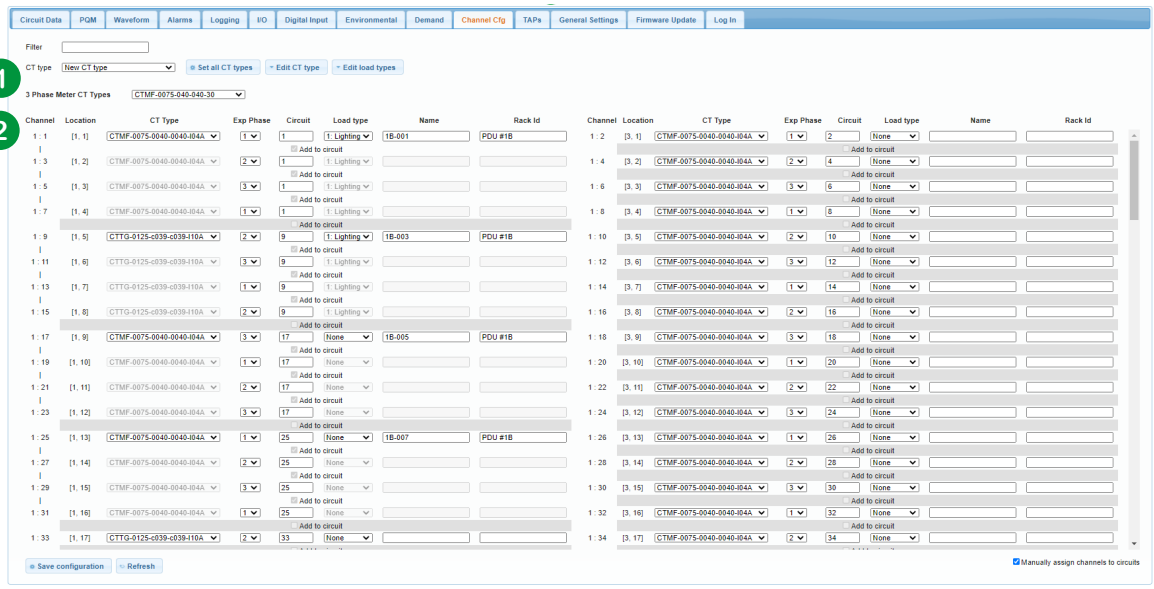
The TAPs tab is used for configuring and updating firmware on the various HDPM6000 modules (HDPM6000R, HDPM6000S, HDPM6000B, etc.) by serial number. Users can also customize the module ordering scheme.




| 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. |

## 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.




| 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). |
| 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). |

| Field or Control | Description |
|---|---|
| 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. |

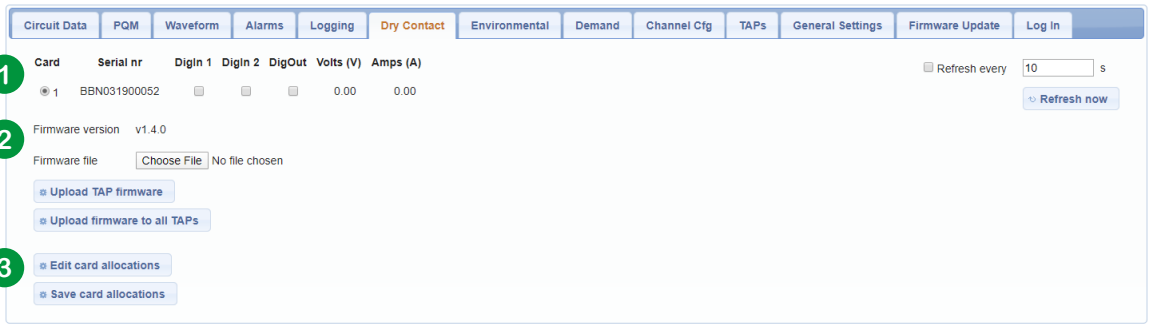
## Environmental Tab

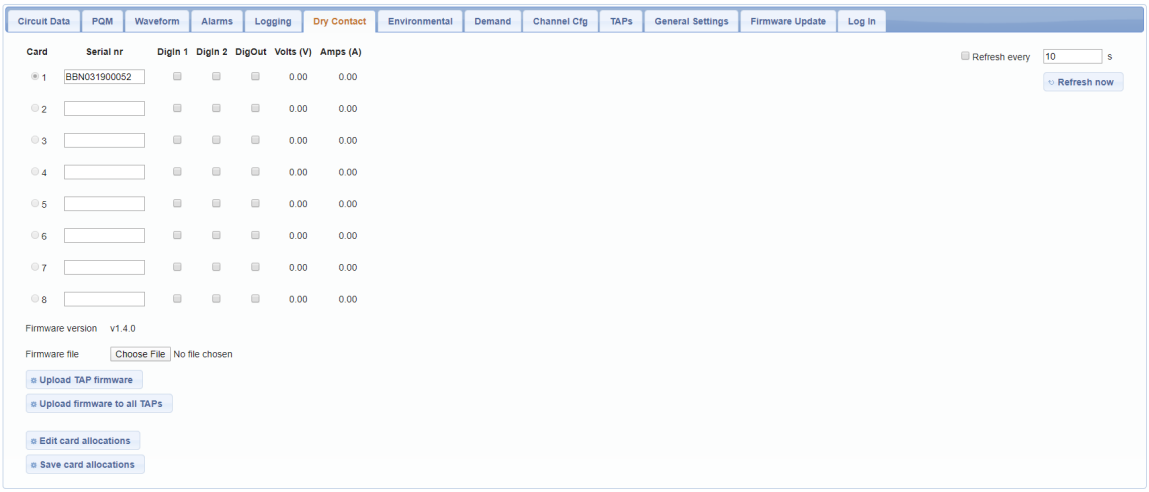
The HDPM6000 head unit and any busway meters or strip modules attached to the bus have ports where environmental sensors for temperature and/or humidity may be connected.


| Field or Control | Description |
|---|---|
| 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. |

## I/O Tab

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



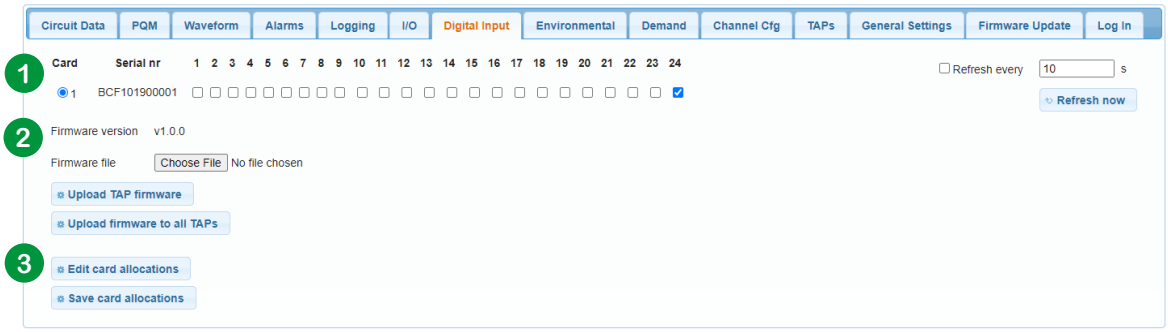




| Field or Control | Description |
|---|---|
| **1 Module Status Table** | |
| Card | Allocated address of the I/O module so that data from multiple modules can be read. This is not the same as the TAP address of branch modules or card allocations of Digital Input modules. |
| Serial nr | Full serial 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. |

| Field or Control | Description |
|---|---|
| **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. |

## Digital Input Tab

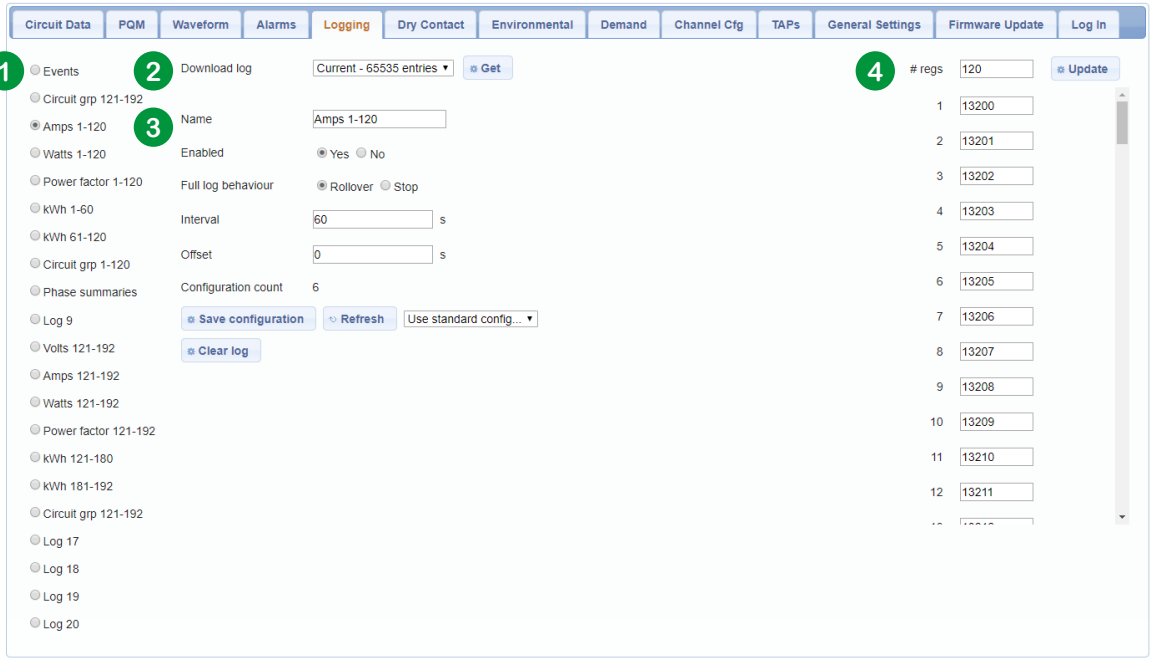
This tab displays the status of installed EIM 2.0 modules identified by serial number.




| 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. |

## Logging Tab

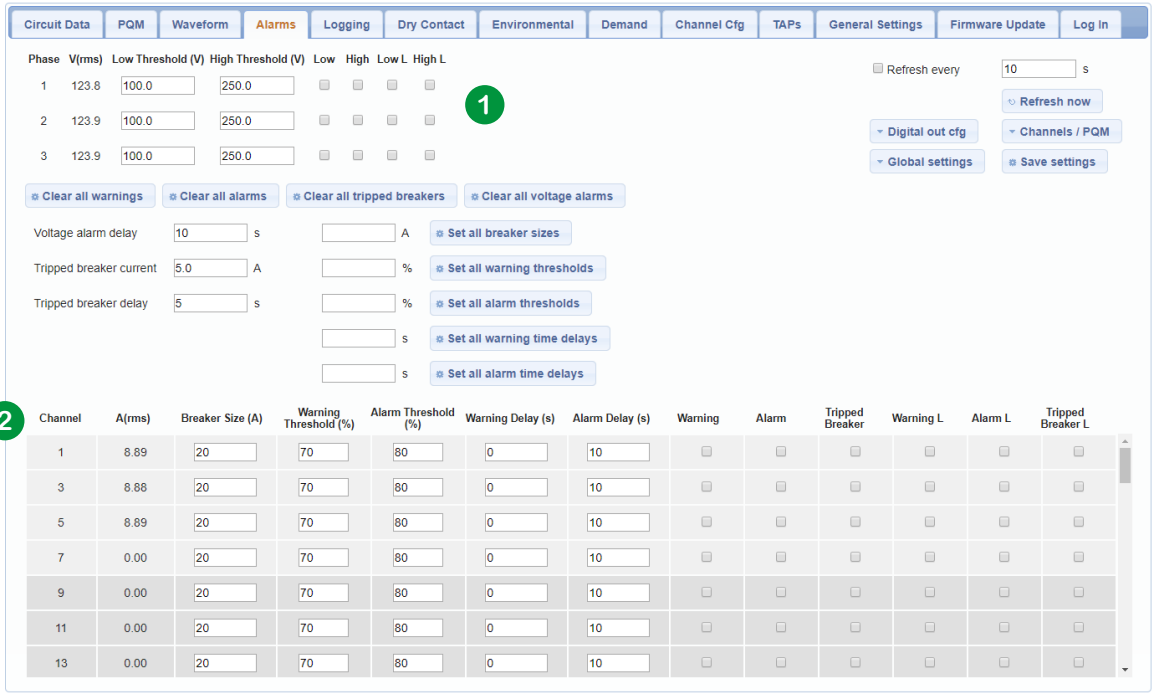
This tab allows the user to download stored data logs and, if desired, customize the data points logged.




| 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<br>Rollover: Continuous log. When log is full, the oldest entries are overwritten.<br>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. |

## 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.<br>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.<br>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.<br>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.<br>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.<br>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. |

## Waveform Tab

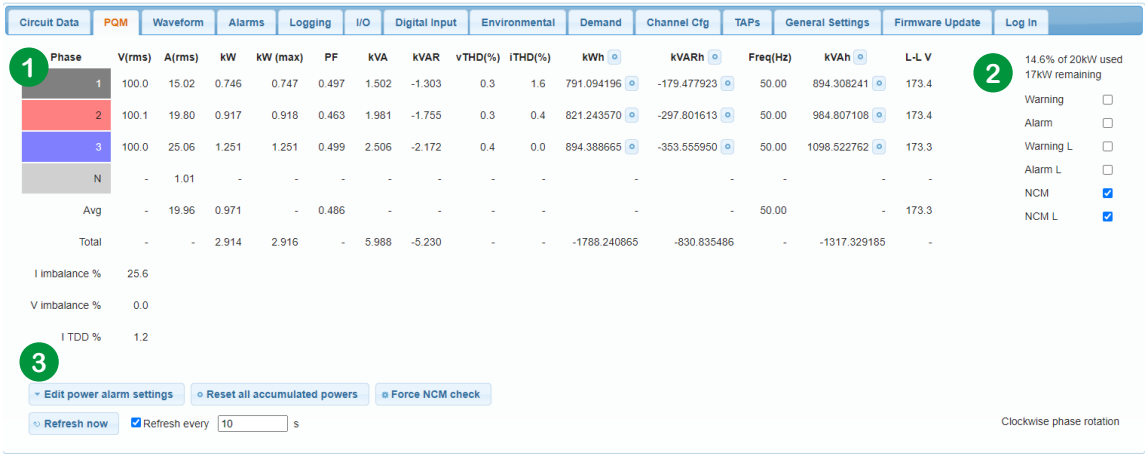
Use this tab to display and export stored waveforms and to configure the conditions which will trigger a waveform capture. A manual trigger (force capture) can be used to inspect present line conditions. An SD card must be inserted into the head unit to use waveform capture.


| 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. |
| Over Voltage Enabled | Checking this box enables waveform capture when voltage exceeds the threshold (voltage swell). |

| Field or Control | Description |
|---|---|
| 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. |
| 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.<br>• 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).<br>• 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<br>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. |

## 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.

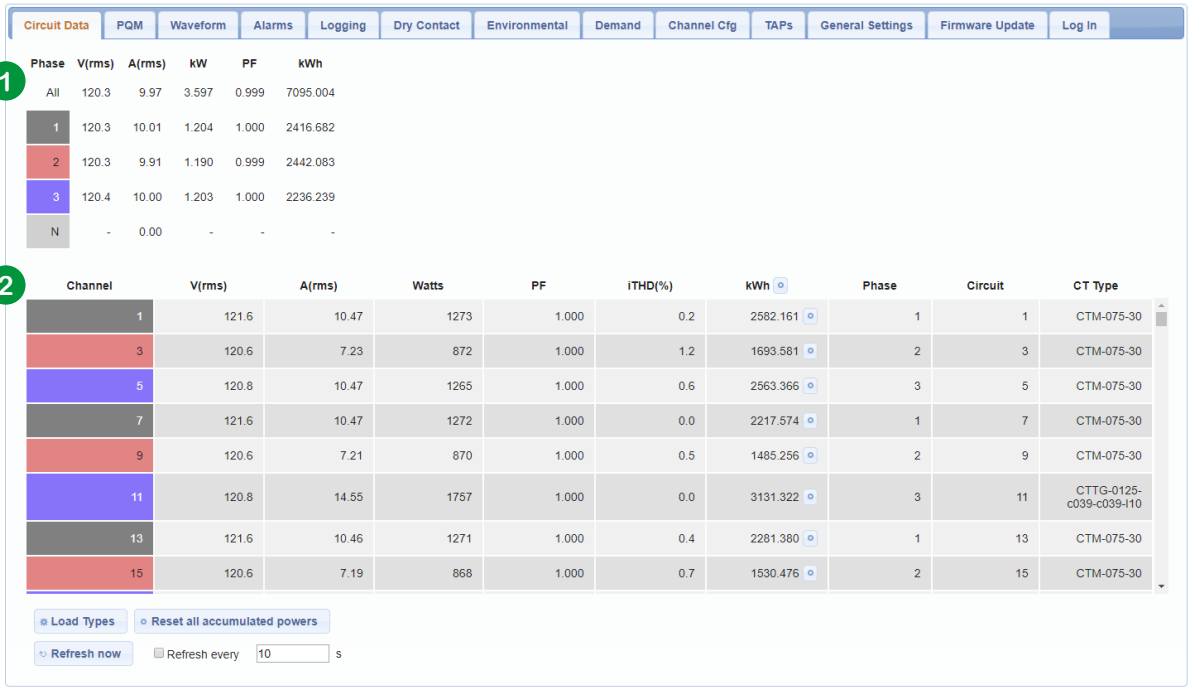



| Field or Control | Description |
|---|---|
| **1 Power Values** | |
| Power Values table | This table provides real-time values, plus averages or totals where applicable for the parameters shown.<br>The kWh, kVARh, and KVAh columns show totals since the previous reset. These can be individually reset to zero using the buttons in their respective columns. |
| **2 Power Limits** | |
| _% of _kW used<br>_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**<br>(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)<br>Alarm (drop-down)<br>Warning L (drop-down)<br>Alarm L (drop-down)<br>NCM (drop-down)<br>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. |

## Circuit Data Tab

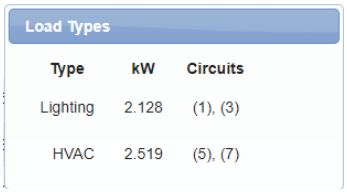
The Circuit Data tab is primarily a view-only page providing a snapshot of real-time branch meter values from attached HDPM6000R, HDPM6000S or HDPM6000B modules.




| 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 |

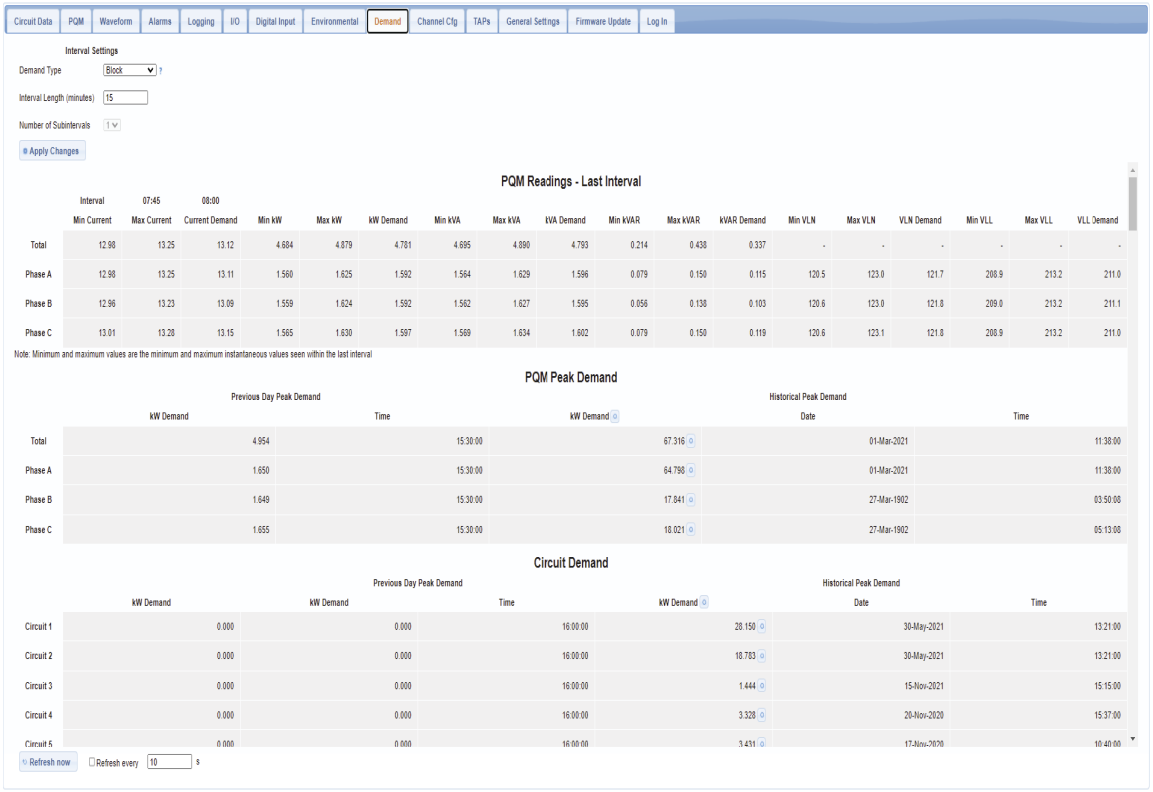
Load Types pop-up window:




| 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). |
| **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. |
| 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. |

## 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<br>Hover over the question mark next to the selection box to see a visualization of each type.<br>Timed Block - After time equal to the interval length has elapsed, demand will be calculated.<br>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. |

| Field or Control | Description |
|---|---|
| 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). |
| 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. |
| 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. |

Schneider Electric
12345 SW Leveton Drive
Tualatin, OR 97062  USA
+1-503-598-4564
www.se.com

**Schneider Electric Limited**
Stafford Park 5
Telford TF3 3BL
United Kingdom



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