Acuvim II and Acuvim-L Series Power Meters AXM WEB2

User's Manual

ACCUENERGY

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Please read this manual carefully before installation, operation and maintenance of the Acuvim II series meter. The following symbols in this manual are used to provide warning of danger or risk during the installation and operation of the meters.

Electric Shock Symbol: Carries information about procedures which must be followed to reduce the risk of electric shock and danger to personal health.

Safety Alert Symbol: Carries information about circumstances which if not considered may result in injury or death.

Prior to maintenance and repair, the equipment must be de-energized and grounded. All maintenance work must be performed by qualified, competent accredited professionals who have received formal training and have experience with high voltage and current devices.
Accuenergy shall not be responsible or liable for any damages or injuries caused by improper meter installation and/or operation.

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Chapter 1: Introduction to AXM-WEB2 Series Modules

The AXM-WEB2 series modules provide Ethernet, Wi-Fi, or fiber optics LC communication interface for Acuvim II and Acuvim-L series power meters. FOLC

The AXM-WEB2 series modules provide users with an industry leading 100ms and 20ms response rate via Modbus TCP that allow users to attain real time updates to key parameters such as voltage, current and power from the Acuvim II and Acuvim-L Series meter.

1.1 Module Types

AXM-WEB2 series has three available modules: the AXM-WEB2 module (dual Ethernet, Wi-Fi), the AXM-WEB2-FOLC module (1 fiber optic LC, 1 Ethernet, Wi-Fi), and the AXM-WEB2-D module (dual Ethernet).

1.1.1 AXM-WEB2

The AXM-WEB2 is equipped with two Ethernet ports for wired connections and Wi-Fi capability for wireless connectivity, providing a comprehensive networking solution for a wide range of applications.

Ethernet Interface: The dual Ethernet ports allow you to establish wired connections for robust and reliable data transfer. Connect your AXM-WEB2 to your network devices using standard RJ45 Ethernet cables to ensure seamless communication between devices.

Wi-Fi Connectivity: The integrated Wi-Fi feature provides the flexibility of wireless networking. Easily connect your AXM-WEB2 to a Wi-Fi network for convenient wireless access and communication in environments where wired connections may be impractical.

1.1.2 AXM-WEB2-FOLC

The AXM-WEB2-FOLC features 1 fiber optics LC Interface and 1 Ethernet port, designed for specific applications requiring fast and reliable connectivity. This module includes 1 fiber optics LC interface and 1 Ethernet port for versatile connectivity.

Fiber Optics LC Interface: The Fiber Optic Link Connector (FOLC) connects the AXM-WEB2 FOLC to a fiber optic network. High-speed data transfer and reliable communication with this advanced optical connectivity option.

1.1.3 AXM-WEB2-D

The AXM-WEB2-D model features two Ethernet ports for establishing a reliable wired connections. Ideal for applications where signal interference is a concern and the need to prioritize reliability and speed.

1.2 Functional Description of the Ethernet module

The AXM-WEB2 series module supports a wide range of communication protocols. Some of the more commonly used protocols are briefly explained below.

These series modules support the Modbus-TCP protocol. When connected to the Acuvim II or Acuvim-L series meter, it is a slave device that can only respond to queries. The default value for the Modbus Port is 502. The user defined range is 2000~5999.

The AXM-WEB2 series grant users the ability to send emails based on a time interval or from a triggered event using the SMPT protocol. It can send emails from an encrypted server and servers using different SMTP ports.

AXM-WEB2 series protocol supports the HTTPS protocol. It is used as a HTTPS server with the protocol default port value set to 443. Using the HTTPS protocol, the AXM-WEB2 series can send post requests to both HTTP and HTTPS servers.

The following are a list of all the protocols supported by the AXM-WEB2 module series:

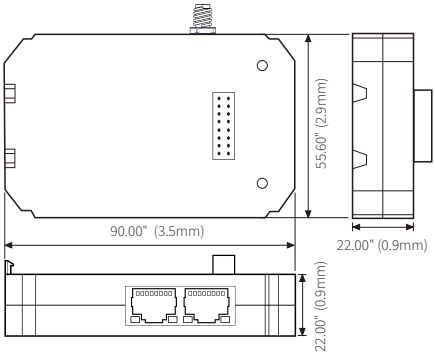
- Modbus TCP
- IPv6
- RSTP
- BACnet-IP
- SNMP V2 , V3
- DNP 3.0 V2
- IEC 61850 1st & 2nd Edition
- SMTP, NTP, SNTP, PTP
- HTTP/HTTPs
- FTP
- SFTP
- Wi-Fi WPA, WPA2 Enterprise (AXM-WEB2, AXM-WEB2 FOLC models only)
- EtherNet/IP
- MQTT
- Google IoT

Chapter 2: Installation

2.1 Appearance and Dimensions

The dimensions in the following diagram are in millimeters.

Dimensions listed in the brackets are inches.

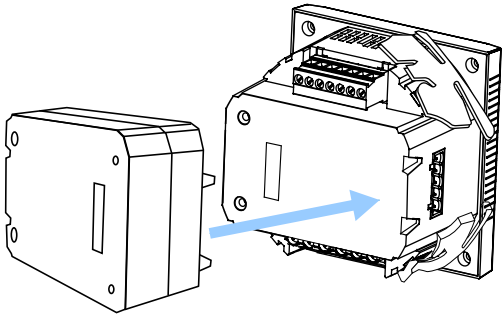


2.2 Installation Method

The AXM-WEB2, AXM-WEB2 FOLC, or AXM-WEB2-D module is linked to the Acuvim II or Acuvim-L series meter by a communication plug. Additional extended modules such as the I/O modules can be linked to the Acuvim series meter after a AXM-WEB2 series.

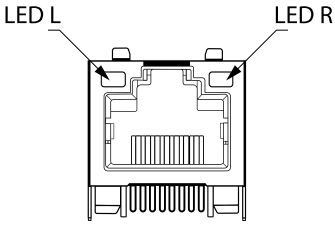
1. Remove cover from the back of the Acuvim series meter which will expose the socket.
2. Insert the installation clips to the grooves in the Acuvim series meter and then press the AXM-WEB2 series module lightly to establish a linking between meter and module.
3. Tighten the installation screws.

WARNING: *Do not Install the meter with power on. The module must be installed/ uninstalled while the meter is powered off to prevent injury or damage to the devices.*



2.3 Cable Connection

The AXM-WEB2 uses two standard RJ45 connectors to access the Ethernet network. The mechanical and electrical characteristics of the connector are consistent with the requirements of IEC 603-7.



Top View

Pin number	Name	Description
1	TX+	Transmit Data+
2	TX-	Transmit Data-
3	RX+	Receive Data+
4	n/c	Not connected
5	n/c	Not connected
6	RX-	Receive Data-
7	n/c	Not connected
8	n/c	Not connected

LED_L (Yellow): Displays the speed status. When the LED is on it indicates 100Mpbs, whiles an off LED represents a speed of 10Mbps.

LED_R (Green): Displays the link and activity status. When the LED is on it indicates the link status. When the LED is flashing it indicates that there is activity.

2.4 Default Settings

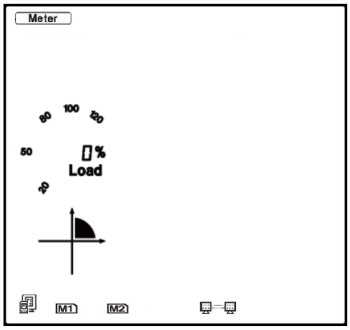
The default settings in the Acuvim II series meter are as followed:

	Ethernet 1	Ethernet 2	Wi-Fi (Access Point)
IP address	192.168.1.254 (Static)	DHCP (Dynamic IP address)	192.168.100.1 (static)
Subnet Mask	255.255.255.0		255.255.255.0
Gateway	192.168.1.1		n/a
DNS Server 1	8.8.8.8		n/a
DNS Server 2	8.8.4.4		n/a
Modbus Port	502		n/a

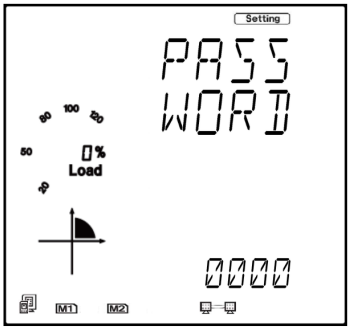
By default, Ethernet 2 is configured for DHCP allowing the network will dynamically assign its network properties. To view the Ethernet 2 IP address from the meter's display the Acuvim II or Acuvim-L meter must be configured to the WEB2 protocol. The following explains how to change the meters protocol settings to work with the WEB2 series module:

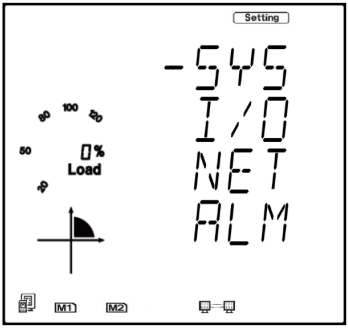
2.5 Initializing

- Press the 'H' and 'V/A' buttons simultaneously on the Acuvim II or Acuvim-L series. Release the buttons and the meter will enter the meter selecting mode, as indicated by the flashing 'Meter' cursor.

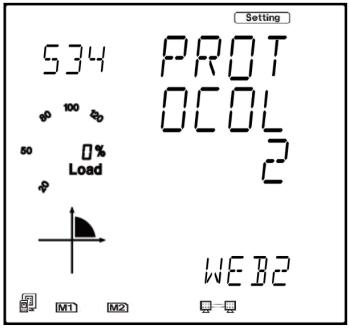


- Press the 'P' or 'E' button to move the cursor to 'Setting'. Press 'V/A' button to enter the parameter setting mode. The device address page is the first page of the 'Setting' mode. It will show the Modbus address of the meter for a second before prompting for the password of the device.
- You will be required to type in a password in the 'PASSWORD' screen. Leave the password as default '0000' and press 'V/A' to enter the parameter selection Mode.





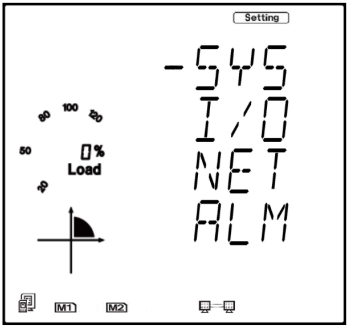
- The cursor will be on 'SYS'. Press 'V/A' on this screen to get to the system settings. This will show screen 'S01 ADDR'.
- Press the 'E' button until you get to 'S37 PROTOCOL 2'. Select the 'WEB2' protocol.
  - Press 'V/A' to modify the setting; the cursor should now flash.
  - Press 'P' or 'E' to select 'WEB2'.
  - Press 'V/A' to confirm the change.



Once the protocol 2 setting of the Acuvim II or Acuvim-L meter is configured for WEB2, users can now view all necessary settings in the meters NET settings.

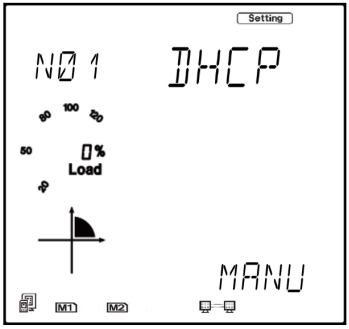
Press the 'H' button to exit the system setting, you will be directed to the parameter selection screen.

Press the 'P' or 'E' button to move the cursor to 'NET' and press the 'V/A' button to enter the Ethernet module settings.

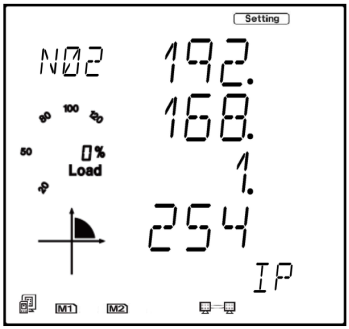


- The first page of the NET Settings will be the N01 DHCP setting. By default, this is configured to Manual. Setting this configuration to Auto will allow the router to assign the meter with an IP address, while manual will allow the user to configure the IP address. Press the 'V/A' button to enter edit mode. Press 'P' or 'E' to change the setting and press 'V/A' to confirm.

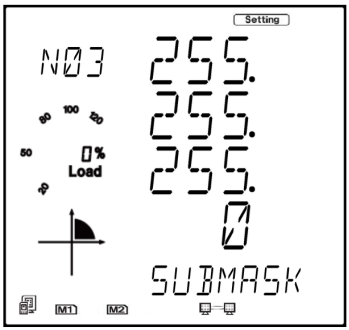
NOTE: *If the DHCP is selected as Auto, the Ethernet module needs to be rebooted before it can be assigned with the new IP address.*



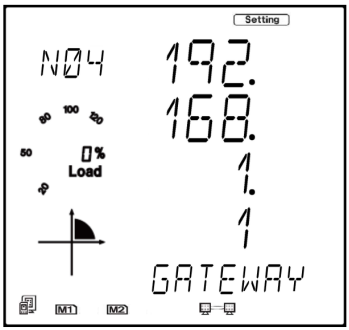
- Press 'P' to get to "N02 IP address" This is the IP address for Ethernet 1 and can be used to access the web interface of the module. Users can configure the IP address if the DHCP is configured to Manual. Press 'V/A' to configure the IP address. The cursor of the first digit will begin to flash. Press the 'H' button to scroll through the digits, press the 'P' or 'E' to change the value of the flashing cursor and press 'V/A' to confirm.



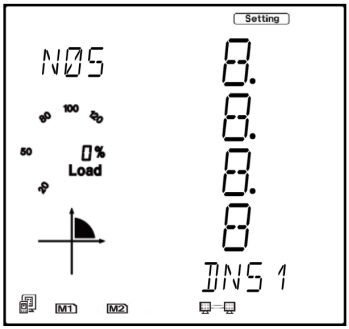
- Press 'P' to get to "N03 Subnet Mask". Press 'V/A' to configure the subnet address. The cursor of the first digit will begin to flash. Press the 'H' button to scroll through the digits, press the 'P' or 'E' to change the value of the flashing cursor and press 'V/A' to confirm.



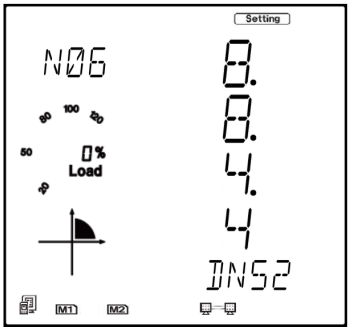
- Press 'P' to get to "N04 Gateway". Press 'V/A' to configure the gateway IP address. The cursor of the first digit will begin to flash. Press the 'H' button to scroll through the digits, press the 'P' or 'E' to change the value of the flashing cursor and press 'V/A' to confirm.



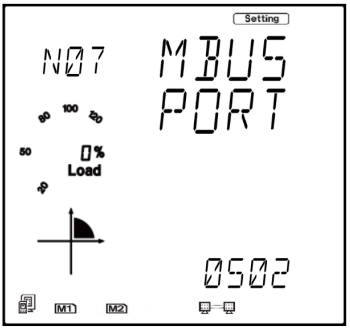
- Press 'P' to get to "N05 DNS Primary Server". Press 'V/A' to configure the DNS address. The cursor of the first digit will begin to flash. Press the 'H' button to scroll through the digits, press the 'P' or 'E' to change the value of the flashing cursor and press 'V/A' to confirm. The DNS parameters must be set correctly to use the SMTP, FTP/HTTP Post and AcuCloud functions.



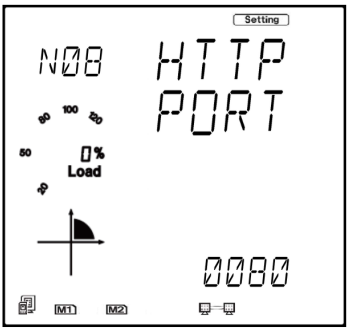
- Press 'P' to get to "N06 DNS Secondary Server". Press 'V/A' to configure the DNS address. The cursor of the first digit will begin to flash. Press the 'H' button to scroll through the digits, press the 'P' or 'E' to change the value of the flashing cursor and press 'V/A' to confirm.



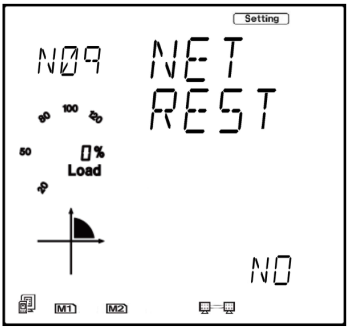
- Press 'P' to get to "N07 Modbus Port". Press 'V/A' to configure the Modbus Port. The cursor of the first digit will begin to flash. Press the 'H' button to scroll through the digits, press the 'P' or 'E' to change the value of the flashing cursor and press 'V/A' to confirm.



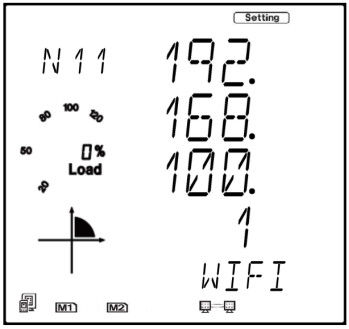
- Press 'P' to get to "N08 HTTP Port". Press 'V/A' to configure the HTTP Port. The cursor of the first digit will begin to flash. Press the 'H' button to scroll through the digits, press the 'P' or 'E' to change the value of the flashing cursor and press 'V/A' to confirm.



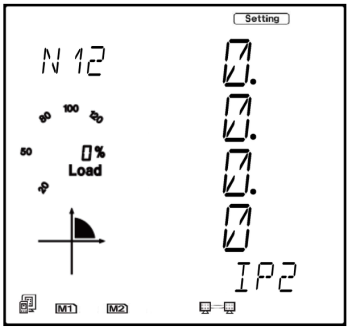
- Press 'P' to get to "N09 NET REST". After making any changes to the NET settings, users must reboot the Ethernet module from this page for the settings to take effect. Press 'V/A' to reboot the module, the cursor will begin to flash. Press the 'P' or 'E' button to change the setting to 'Reset' and press 'V/A' to confirm. The cursor will return to 'No' once the module has successfully reset.



- Press 'P' to get to "N11 Wi-Fi" This is the IP address of Wi-Fi and will be the IP address to access the web interface of the module by using Wi-Fi connection. This IP address cannot be modified from the meters display, it can only be configured on the meter's web server.



- Press 'P' to get to 'N12 IP2'. This is the IP address for Ethernet port 2, it is preset as dynamic DHCP. A new IP address will be assigned to it when it is connected to the internet via Ethernet port 2.



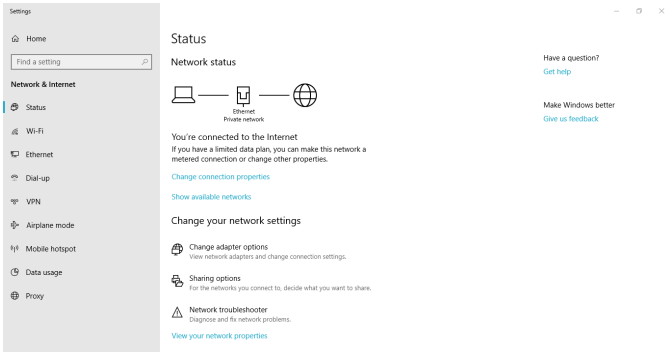
Chapter 3: Connection Method

3.1 Direct Connect to a Computer

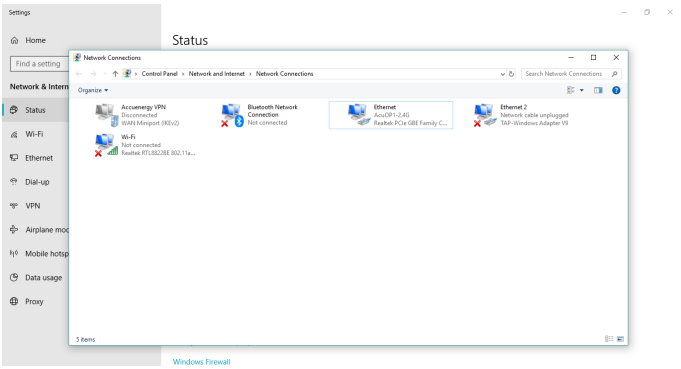
The AXM-WEB2 series can be connected to a computer using a crossover cable (standard 568A). The AXM-WEB2 series module supports Modbus-TCP and HTTPS Functions for this method of connection.

To connect the meter directly to a computer, the computers IP must be within the same subnet as the meters IP address. The following steps outline how to change the computers IP using a Microsoft Windows OS:

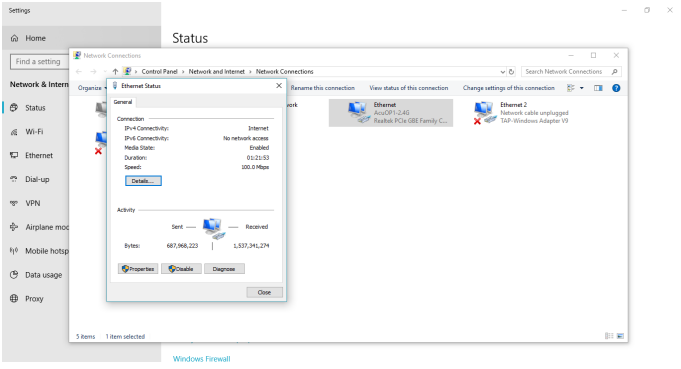
- Manually connect the meter cable to the computer using a RJ45 Ethernet cable
- From the Windows OS screen, right click on the connection icon
- Select "Open Network Sharing Center"



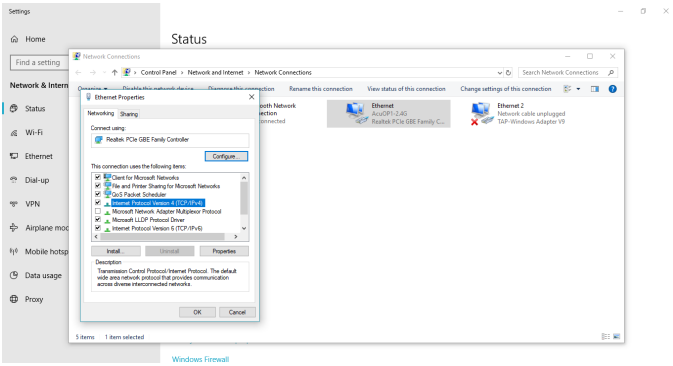
- Click on the Change adapter options



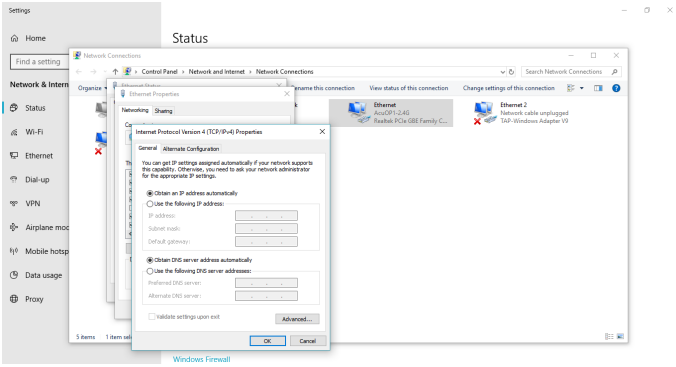
- From the Network Connections window, right click on the icon with the local area connection and select properties



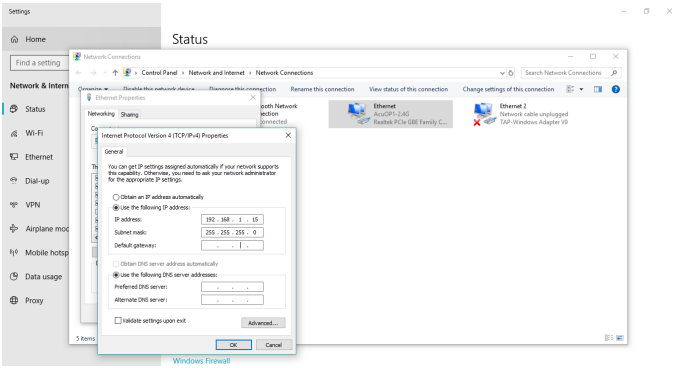
- Select the icon that says Internet Protocol Version 4 TCP/IP



- The Internet Protocol Version 4(TCP/IP) Properties box will pop up



- Click on "Use the following IP address" and enter in an IP number so that meter and computer are in the same local network range. For example, if the meter has IP address of 192.168.1.254, then the computer must be assigned with an IP 192.168.1.xxx, where xxx can be any number but cannot be the same as the value the meter has.



- Once you have entered in the IP address, press the Tab key on your keyboard until you hit the bottom and click OK
- Before selecting the OK button make note of the IP address you have assigned to the meter and then press OK.

NOTE: *The meter and computer cannot have the same IP address, they must be different*

3.2 Direct Connect to a Router/Switch

The AXM-WEB2 series can be connected to a router or switch using a patch cable. The DHCP can be configured to Auto to have the router automatically assign the meter with an IP address or the DHCP can be configured to Manual to set an IP address and network settings manually by the user.

AXM-WEB2 and AXM-WEB2-D has two Ethernet ports, Ethernet 1 is set to have the static DHCP, and Ethernet 2 is set to have the dynamic DHCP. Both Ethernet ports have the same functionalities, which can be used according to the requirements.

3.3 Connect through Wi-Fi

The AXM-WEB2 and AXM-WEB2 FOLC can be connected through Wi-Fi network.

By default, the AXM-WEB2 and AXM-WEB2 FOLC will be in Access Point mode with default IP address of 192.168.100.1. Ensure the device connecting to the communication modules has DHCP enabled, or it should be in the same subnet. The module will appear in the Wi-Fi network

as AXM-WEB2-WIFI-(serial number of module) as the SSID or name of the wireless network. By default, the network key or password will be "accuenergy".

- Once connected to the network, open an internet browser and type in the IP address of the Wi-Fi module: 192.168.100.1
- Log in to the web interface, the default username and password is 'admin'.

3.4 Description of Modbus-TCP Protocol

The Modbus-TCP protocol is used as one of the communication protocols in the AXM-WEB2 series. The protocol establishes a master and slave connection in Ethernet. The master device(client) first sets up a TCP-IP link with slave device(server). The master device then sends a request to the slave device and the slave device in return sends a response to the master device. Figure below shows how the Modbus-TCP protocol works.

3.4.1 Protocol

3.4.1.1. Data Frame Format

MBAP Header	Function	Data
7x8 bits	8-bits	Nx8 bits

3.4.1.2. Modbus Application Header (MBA Header) Field

Modbus application header field is the start of the data frame and consists of seven bytes.

Field	Length	Description
Transaction Identifier	2 Bytes	Identification of a Modbus Request/Response transaction
Protocol Identifier	2 Bytes	Modbus Protocol = 0
Length	2 Bytes	Number of following bytes
Unit Identifier	1 Byte	Slave address, in the range of 0-247 decimal

3.4.1.3. Function Field

The function code field of a message frame contains eight bits. Valid codes are in the range of 1-255. When a message is sent from a client to a server device, the function code field tells the server what kinds of action to perform.

Code	Length	Description
01	Read Relay Output Status	Obtain current status of Relay Output
02	Read Digital Input (DI) Status	Obtain current status of Digital Input
03	Read Data	Obtain current binary value in one or more registers
05	Control Single Relay Output	Force Relay to a state of On or OFF
16	Write Multiple Registers	Place specific value into a series of consecutive multiple registers

3.4.1.4. Data Field

The data field is constructed using sets of two hexadecimal digits, in the range of 00 to FF. The data field of messages sent from a master to slave contains additional information which the slave must use to take the action defined by the function code. This can include information such as the register addresses, the quantity of registers to query and the count of the actual number of data bytes. For example, if the master requests a slave to read a group of holding registers (function code 03), the data field specifies the starting register and how many registers are to be read.

If the master needs to write data (function code 10 hexadecimal) to a group of registers in the slave, the data field specifies the starting register, how many registers to write, the count of data bytes to follow in the data field and the data to be written into the registers.

3.4.2 Format of communication

Explanation of frame

Transaction Identifier hi	Transaction Identifier lo	Protocol Identifier hi	Protocol Identifier lo	Length hi	Length lo	Unit Identifier
00H	00H	00H	00H	00H	06H	01H

Function Code	Data Start Register hi	Data Start Register lo	Data # of Register hi	Data # of Register lo
03H	40H	00H	00H	48H

The meaning of each abbreviated field above is:

Transaction Identifier hi: High byte of transaction identifier

Transaction Identifier lo: Low byte of transaction identifier

Protocol Identifier hi: High byte of protocol identifier

Protocol Identifier lo: Low byte of protocol identifier

Length hi: High byte of length

Length lo: Low byte of length

Unit Identifier: Slave address

Fun: Function code

Data Start Register hi: High byte of starting register address

Data Start Register lo: Low byte of starting register address

Data # of Registers hi: High byte of number of registers

Data # of Registers lo: Low byte of number of registers

3.4.2.1 Read Status of Relay (Function code 01)

Function Code 1

This function code is used to read the relay output status in the Acuvim II or Acuvim-L series meter.

1=On 0=Off

There are 8 relay outputs in the Acuvim series meter and they start at address 0000H.

The following query is to read 2 relay output status of the Acuvim series address 1.

Query

Transaction Identifier hi	Transaction Identifier lo	Protocol Identifier hi	Protocol Identifier lo	Length hi	Length lo	Unit Identifier
00H	00H	00H	00H	00H	06H	01H

Fun	Data Start Register hi	Data Start Register lo	Data # of Register hi	Data # of Register lo
01H	00H	00H	00H	02H

Response

The Acuvim series meter responds back with the MBAP header, function code, quantity of data bytes and the data.

An example of response to read the status of the first 2 relay outputs starting at 0000H is shown below. The status of relay output 1 and 2 is corresponds to the last 2 bits of data.

Relay 1: bit0 Relay 2: bit1

The content of the data is,

7	6	5	4	3	2	1	0
0	0	0	0	0	0	1	0
		MSB				LSB	

(Relay 1 = OFF, Relay 2 = ON)

3.4.2.2 Read Status of DI (Function Code 02)

Function Code 2

1=On 0=Off

There are 28 DIs in the Acuvim II series meter starting at address 0000H.

The following query is to read 4 DI statuses of AXM-IO1 module with logic address of 1 in the Acuvim series meter.

Query

Transaction Identifier hi	Transaction Identifier lo	Protocol Identifier hi	Protocol Identifier lo	Length hi	Length lo	Unit Identifier
00H	00H	00H	00H	00H	06H	01H

Fun	Data Start Register hi	Data Start Register lo	Data # of Register hi	Data # of Register lo
02H	00H	00H	00H	04H

The content of the data is,

7	6	5	4	3	2	1	0
0	0	0	0	0	0	1	0

7	6	5	4	3	2	1	0
	MSB					LSB	

3.4.2.3 Read Status (Function Code 03)

Function Code 3

Query

This function allows the user to obtain the measurement results of the Acuvim series meter.

Below is an example to read 6 registers corresponding to the device clock of the meter, starting at 1040H.

Transaction Identifier hi	Transaction Identifier lo	Protocol Identifier hi	Protocol Identifier lo	Length hi	Length lo	Unit Identifier
00H	00H	00H	00H	00H	06H	01H

Fun	Data Start Register hi	Data Start Register lo	Data # of Register hi	Data # of Register lo
03H	10H	40H	00H	06H

An example response is provided to read the time (2006-12-18 14:15:20).

Transaction Identifier hi	Transaction Identifier lo	Protocol Identifier hi	Protocol Identifier lo	Length hi	Length lo	Unit Identifier
00H	00H	00H	00H	00H	0FH	01H

Fun	Byte count	Data1 hi	Data1 lo	Data2 hi	Data2 lo	Data3 hi	Data3 lo	Data4 hi	Data4 lo	Data5 hi	Data5 lo	Data6 hi	Data6 lo
03H	0CH	07H	D6H	00H	0CH	00H	12H	00H	0EH	00H	0FH	00H	14H

3.4.2.4 Control Relay (Function Code05)

Function Code 5

Query

This function code enables the control of a single relay output in the Acuvim series meter. Any relay output in the Acuvimseries meter can be controlled on or off starting at 0000H.

Sending the data 'FF00H' will set they relay output on and sending '0000H' will turn it off; all other values are illegal and will not affect they relay output status.

The example below is a request to a Acuvim series meter to turn on relay output 1.

Transaction Identifier hi	Transaction Identifier lo	Protocol Identifier hi	Protocol Identifier lo	Length hi	Length lo	Unit Identifier
00H	00H	00H	00H	00H	06H	01H

Fun	Data Start Register hi	Data Start Register lo	Data # of Register hi	Data # of Register lo
05H	00H	00H	FFH	00H

Response

The normal response to the command request is to retransmit the message as received after the relay output status has been altered.

Transaction Identifier hi	Transaction Identifier lo	Protocol Identifier hi	Protocol Identifier lo	Length hi	Length lo	Unit Identifier
00H	00H	00H	00H	00H	06H	01H

Fun	Data start reg hi	Data start reg lo	Value hi	Value lo
05H	00H	00H	FFH	00H

3.4.2.5 Preset/Reset Multi-Register (Function Code 16)

Function Code 16

Query

This function code allows the user to modify the contents of a register. The example below is a request to an Acuvim series meter with device address 1 to preset the CT1(500) and CT2(5) registers. The CT1 data address is 1008H and CT2 is at 1009H.

Transaction Identifier hi	Transaction Identifier lo	Protocol Identifier hi	Protocol Identifier lo	Length hi	Length lo	Unit Identifier
00H	00H	00H	00H	00H	0BH	01H

Fun	Data start reg hi	Data start reg lo	Data #of reg hi	Data #of reg lo	Byte count	Value1 hi	Value1 lo	Value2 hi	Value2 lo
10H	10H	08H	00H	02H	04H	01H	F4H	00H	05H

Response

The normal response to a preset Multi-Register request including the MBAP Header, function code, data start register and the number of registers is shown below.

Transaction Identifier hi	Transaction Identifier lo	Protocol Identifier hi	Protocol Identifier lo	Length hi	Length lo	Unit Identifier
00H	00H	00H	00H	00H	06H	01H

Fun	Data start reg hi	Data start reg lo	Data #of reg hi	Data #of reg lo
10H	10H	08H	00H	02H

Chapter 4: User Management

The AXM-WEB2, AXM-WEB2 FOLC, and AXM-WEB2-D modules support the HTTPS protocol to allow for the use of a web interface. The user will need to access the AXM-WEB2 series web interface to configure the module and use its functions. The web interface allows for remote initial setup of the Acuvim II and Acuvim-L meters.

The AXM-WEB2 series web interface allows for different user access levels where multiple users and role configurations can be made.

To access the web interface the IP address for the WEB2 series module, either Ethernet 1, Ethernet 2 or a Wi-Fi IP address must be known.

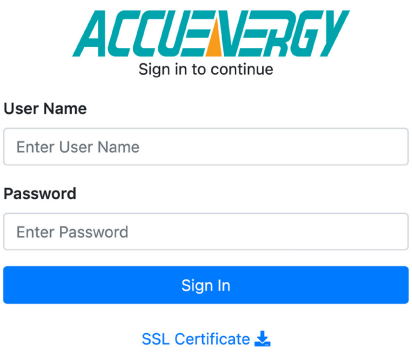
4.1 User Access Login

Enter the correct IP address of the module in the search bar of the internet browser to access the web interface of the AXM-WEB2 series. The user will be redirected to a web page prompting to enter the User Name and the appropriate password for that user. It is recommended that no more than five users are logged in concurrently for this level to ensure optimal performance when using the web interface.

The default User Name is **admin** and the default password for this user name is also **admin.**

User Name: **admin**

Password: **admin**

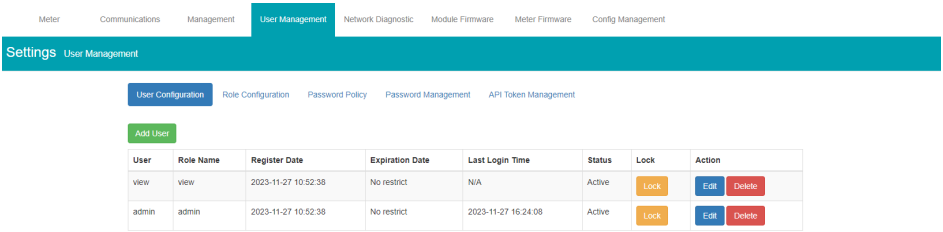


4.2 User Configuration

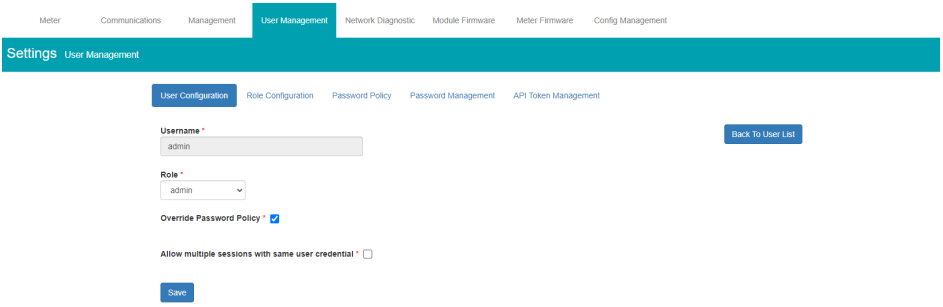
The AXM-WEB2 series supports the creation of different users for the web interface. Each user can be assigned different roles to determine what permissions and functions users will have when logged in. To access the user configuration page, click on the ***User Management*** tab and select ***User Configuration.***

The user configuration table provides information regarding the user access level, such as the register date, expiration date and last login time. If the correct permission is available for the account, the user will have the option to lock an account, and edit and delete users.

NOTE: *Users cannot lock or delete an account they are already signed into.*

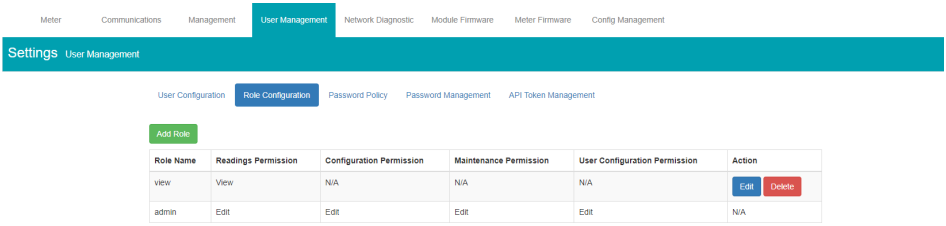


New users can be added with available options to enter an user name, password, role, and option to set the password policy. The role determines the type of access the user will have on the user level created. Users have the option to override the default password policy which is a set of rules for allowable passwords on the AXM-WEB2 series interface, this includes length and complexity of the password (capital letters, number, special characters, etc.).



4.3 Role Configuration

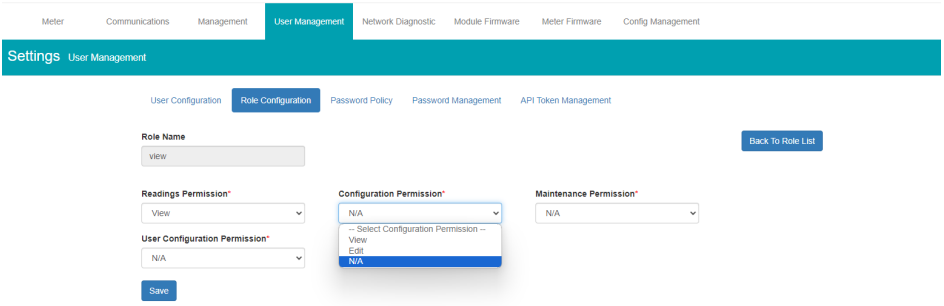
The Role Configuration page allows users to configure and create different roles for user levels. These roles determine whether the user has edit, view or no access to certain features while logged onto the web interface. By default, there are two roles on the module, Admin and View. The Admin role allows the user to view and configure all settings whereas the View role allows users to only view meter readings.



Reading Permissions: Allows users to either edit or view the meter readings, this includes all readings such as real time, energy, harmonics, demand, etc. This also includes access to data logs, trend logs, alarm logs and SOE logs.

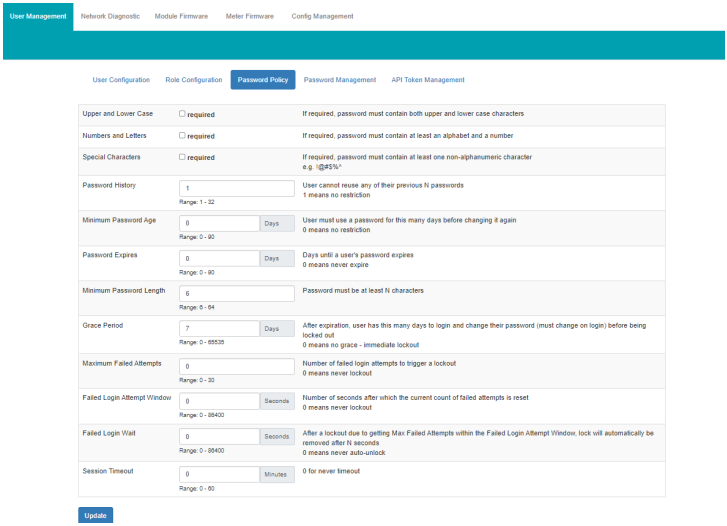
Configuration Permissions: Allows users to edit or view the meter configurations such as the CT/PT ratio, alarms, and communication settings.

Maintenance Permissions: Allows users to access Firmware updates, both module and meter firmware update options.



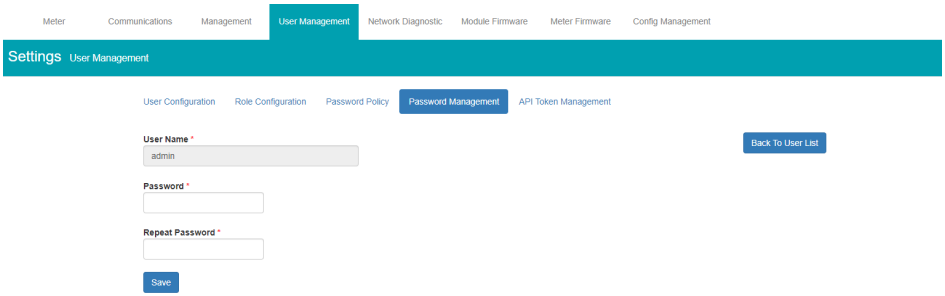
4.4 Password Policy

The Password Policy page provides users with a method to ensure that all passwords created follow specific criteria. The password policy lists specific details relating to the password that some users may find beneficial for security purposes. When creating a user password there is an option to override the password policy if necessary.



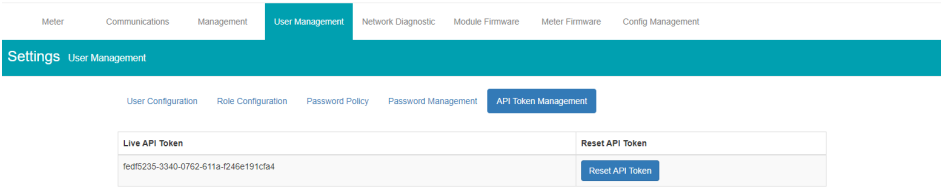
4.5 Password Management

The Password Management page allows users to change the password for each user levels created.



4.6 API Token Management

Provides users with the API token for the web interface. This token can be reset and a new one will be generated.



Chapter 5: Web Interface Readings and Parameter Settings

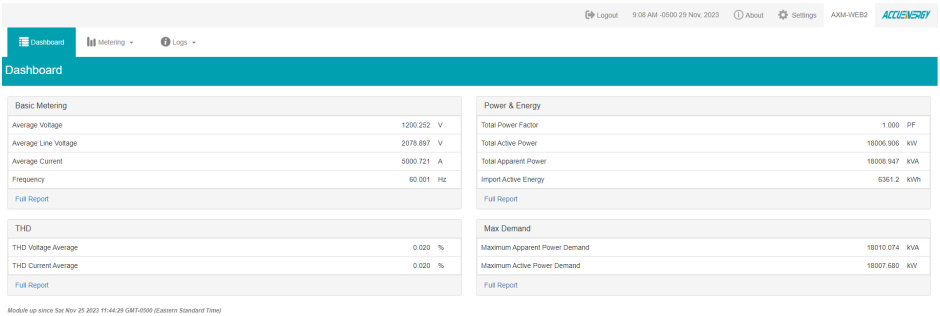
5.1 Dashboard

In the Dashboard page, the user will find the navigation tabs to access different pages in the web interface such as 'Metering', 'Logs', and 'Settings'. The dashboard is the first page users will see once they have successfully logged in to the meters web interface.

The dashboard displays a summary from different groups of metering parameters such as 'Basic Metering', 'Power & Energy', 'THD' and 'Max Demand'. By clicking on the "Full Report" link under any one of these four metering parameter groups the user will be redirected to the web page containing the full parameter list supported by that specific group.

The dashboard also displays how long the AXM-WEB2 series module has been connected to the network since the last reboot of the module in the bottom left corner of the page.

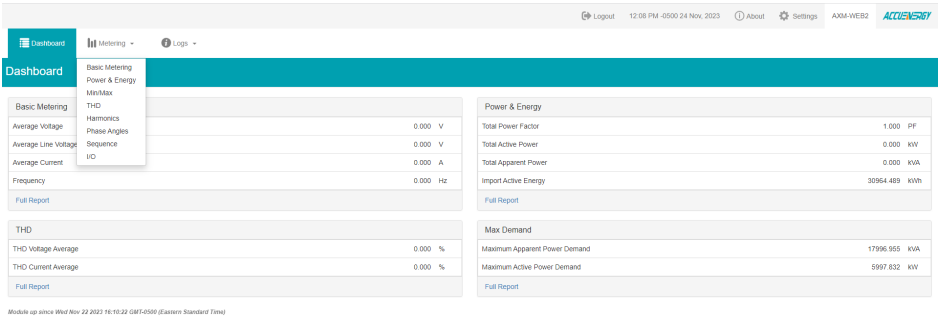
The parameters on this page are updated every five seconds.



5.2 Metering web page

Click on the 'Metering' tab to select the different kinds of parameter readings. There are eight

groups of metering parameter pages including "Basic Metering", "Power & Energy", "Min/Max", 'THD', 'Harmonics', "Phase Angles", "Sequence" and "I/O". Each web page shows data from the Acuvim II or Acuvim-L series meter.



5.2.1 Basic Metering

The Basic Metering webpage includes the data of real-time parameters for the Acuvim II or Acuvim-L series meter. This includes the Line Voltages, Phase Voltages, Current, Neutral Current, Active, Reactive and Apparent Power, Power Factor, Frequency and Load type.

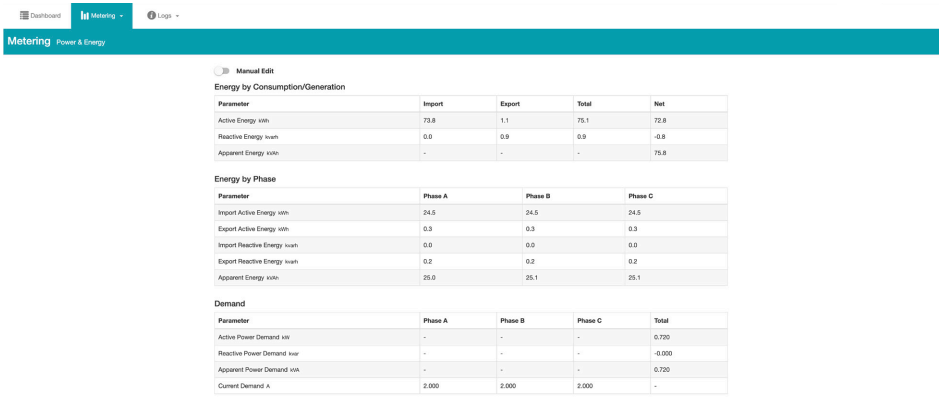
The parameters on this page are updated every one second.

The values displayed in this webpage will depend on the wiring configuration mode of the meter. For example, if the meter is configured as '2LL' or '3LL' then the metering webpage will not display the phase readings, only the total values will be shown.

5.2.2 Power & Energy

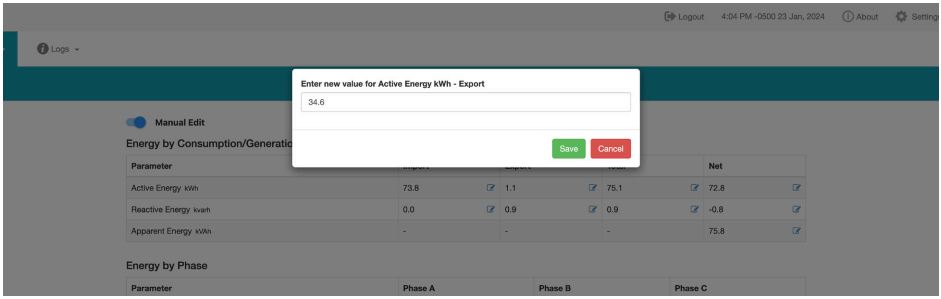
The Power & Energy webpage will show the energy data for the Acuvim II or Acuvim-L series meter such as the Active and Reactive Energy that is consumed and delivered as well as the total and per phase Apparent Energy. This page also shows the different demand types measured by the Acuvim II or Acuvim-L meter such as the Active, Reactive, Apparent Power as well as the three phase Current demands.

The parameters in this webpage are updated every five seconds.



From the Power & Energy page, the user will have the option to edit and write new Energy values. Simply click on the 'Manual Edit' button to edit the energy values.

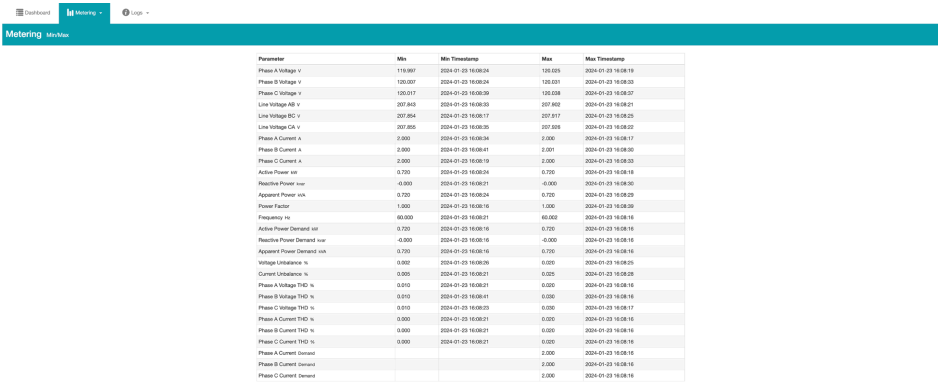
This will be important for users who want to start and monitor energy accumulation at a determined kilowatt-hour reading. All energy parameters including individual phase, total, import, export, and net for the real, reactive and apparent energy support this feature.



5.2.3 Min/Max

The Min/Max page shows the maximum and minimum statistics that the meter has recorded since the lifetime of the meter or from the last reset of the min/max statistics. On this page, each parameter will show the maximum and minimum timestamped events that was recorded.

The parameters in this web page are updated every ten seconds.



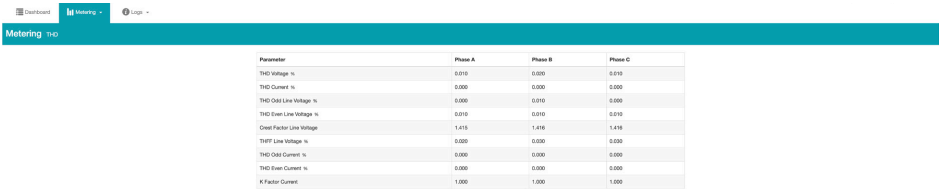
Parameter	Min	Min Timestamp	Max	Max Timestamp
Phase A Voltage V	119.997	2024-01-23 16:08:24	120.025	2024-01-23 16:08:19
Phase B Voltage V	120.007	2024-01-23 16:08:24	120.031	2024-01-23 16:08:33
Phase C Voltage V	120.017	2024-01-23 16:08:39	120.038	2024-01-23 16:08:37
Line Voltage AB V	207.843	2024-01-23 16:08:33	207.902	2024-01-23 16:08:21
Line Voltage BC V	207.854	2024-01-23 16:08:17	207.917	2024-01-23 16:08:25
Line Voltage CA V	207.855	2024-01-23 16:08:35	207.926	2024-01-23 16:08:22
Phase A Current A	2.000	2024-01-23 16:08:34	2.000	2024-01-23 16:08:17
Phase B Current A	2.000	2024-01-23 16:08:41	2.001	2024-01-23 16:08:30
Phase C Current A	2.000	2024-01-23 16:08:19	2.000	2024-01-23 16:08:33
Active Power kW	0.720	2024-01-23 16:08:24	0.720	2024-01-23 16:08:18
Reactive Power kvar	-0.000	2024-01-23 16:08:21	-0.000	2024-01-23 16:08:30
Apparent Power kVA	0.720	2024-01-23 16:08:24	0.720	2024-01-23 16:08:29
Power Factor	1.000	2024-01-23 16:08:16	1.000	2024-01-23 16:08:39
Frequency Hz	60.000	2024-01-23 16:08:21	60.002	2024-01-23 16:08:16
Active Power Demand kW	0.720	2024-01-23 16:08:16	0.720	2024-01-23 16:08:16
Reactive Power Demand kvar	-0.000	2024-01-23 16:08:16	-0.000	2024-01-23 16:08:16
Apparent Power Demand kVA	0.720	2024-01-23 16:08:16	0.720	2024-01-23 16:08:16
Voltage Unbalance %	0.002	2024-01-23 16:08:26	0.020	2024-01-23 16:08:25
Current Unbalance %	0.005	2024-01-23 16:08:21	0.025	2024-01-23 16:08:28
Phase A Voltage THD %	0.010	2024-01-23 16:08:21	0.020	2024-01-23 16:08:16
Phase B Voltage THD %	0.010	2024-01-23 16:08:41	0.030	2024-01-23 16:08:16
Phase C Voltage THD %	0.010	2024-01-23 16:08:23	0.030	2024-01-23 16:08:17
Phase A Current THD %	0.000	2024-01-23 16:08:21	0.020	2024-01-23 16:08:16
Phase B Current THD %	0.000	2024-01-23 16:08:21	0.020	2024-01-23 16:08:16
Phase C Current THD %	0.000	2024-01-23 16:08:21	0.020	2024-01-23 16:08:16
Phase A Current Demand			2.000	2024-01-23 16:08:16
Phase B Current Demand			2.000	2024-01-23 16:08:16
Phase C Current Demand			2.000	2024-01-23 16:08:16

5.2.4 THD

The THD web page shows the power quality data such as the THD, THFF, Crest, and K Factor for both the voltage and current.

The parameters in this web page are updated every fifteen seconds.

5.2.5 Harmonics



Parameter	Phase A	Phase B	Phase C
THD Voltage %	0.010	0.020	0.010
THD Current %	0.000	0.000	0.000
THD Odd Line Voltage %	0.000	0.010	0.000
THD Even Line Voltage %	0.010	0.010	0.010
Crest Factor Line Voltage	1.415	1.416	1.416
THFF Line Voltage %	0.020	0.030	0.030
THD Odd Current %	0.000	0.000	0.000
THD Even Current %	0.000	0.000	0.000
K Factor Current	1.000	1.000	1.000

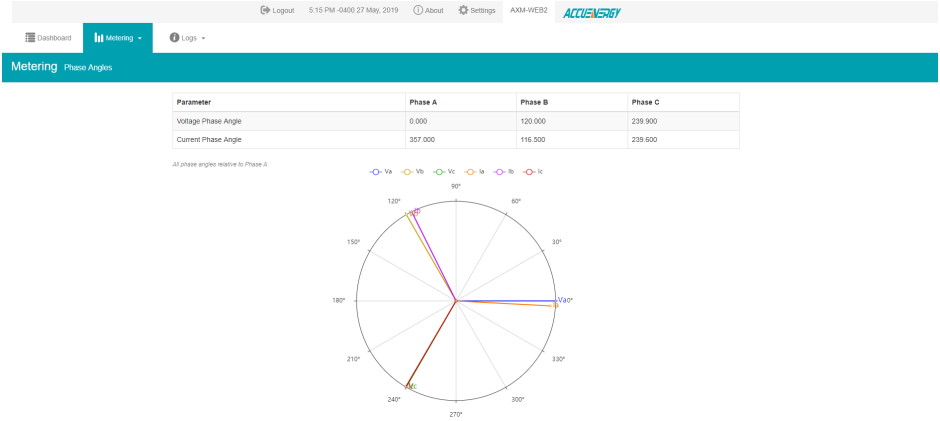
The Harmonics web page will show the harmonics of the voltage and the current waveform being measured. It will display the harmonics of each phase in graphical and tabular format. Two drop-down lists is available to configure the harmonics data. First option allows the selection between voltage and current. Second option provides a choice between 2nd - 31st harmonics or 32nd - 63rd harmonics.

The parameters in this web page are updated every fifteen seconds.

5.2.6 Phase Angles

The Phase Angles web page will show the phase angles of the voltage and current waveform being measured which can be used for remote troubleshooting. This page provides a visual diagram of the phase angles with respect to the voltage connected to the Phase A voltage input.

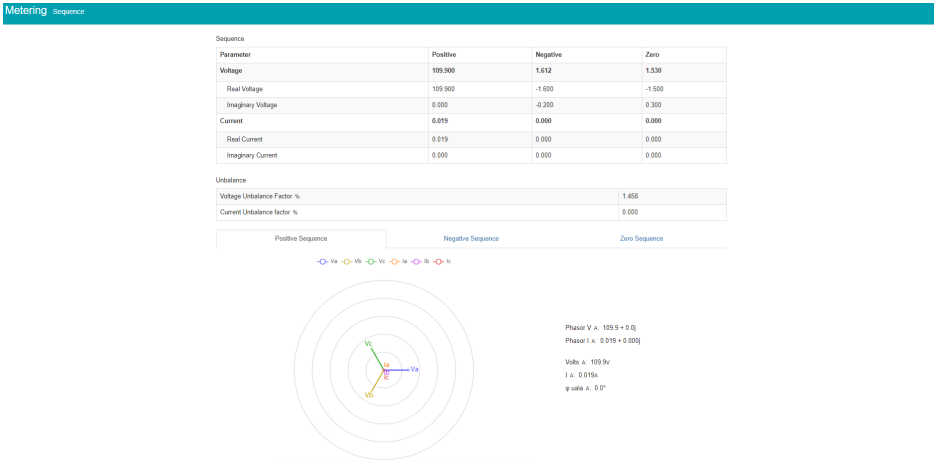
The parameters in this web page are updated every ten seconds.



5.2.7 Sequence

The Sequence page will show the positive, negative and zero components of the voltage and current waveform being measured.

The parameters in this web page are updated every ten seconds.



5.2.8 I/O

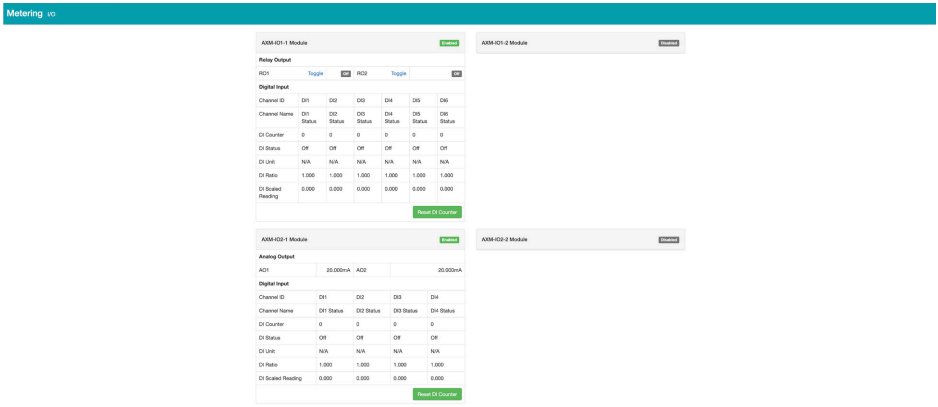
The I/O page displays the status of the I/O modules that are connected and their values depending on the module model connected to the meter. That is, the AXM-IO11 module will display the Relay Output status(on/off), DI status/counter. The I/O module can be configured in the general settings section of the web interface which is discussed later in the manual.

The parameters in this web page are updated every five seconds.

From the I/O readings page, users can perform the following functions depending on the I/O module being used:

IO Module	Functions
AXM-IO1-1/2	• Read Digital Input Status or Digital Input Count value depending on the mode configured (Channels 1-6) • Reset DI Counter back to 0 (Counters 1-6) • Read the Relay Output Channel 1 and 2 Status ON/OFF • Toggle Relay Output Channels 1 and 2 ON/OFF ***NOTE:*** *Relay must be configured for Control Mode for toggle function to work*
AXM-IO2-1/2	• Read Digital Input Status or Digital Input Count value depending on the mode configured (Channels 1-4) • Reset DI Counter back to 0 (Counters 1-4) • Read value of the Analog Output Channels 1 and 2, either 4-20mA, 0-20mA, 0-5V, 1-5V signals

IO Module	Functions
AXM-IO3-1/2	• Read Digital Input Status or Digital Input Count value depending on the mode configured (Channels 1-4) • Reset DI Counter back to 0 (Counters 1-4) • Read the Relay Output Channel 1 and 2 Status ON/OFF • Toggle Relay Output Channels 1 and 2 ON/OFF • Read value of the Analog Input channels 1 and 2, either 4-20mA, 0-20mA, 0-5V, 1-5V signals ***NOTE:*** *Relay must be configured for Control Mode for toggle function to work*

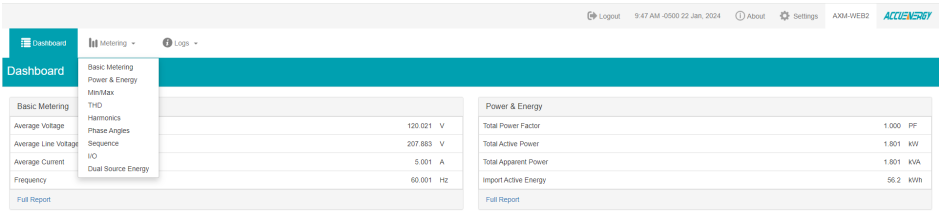


5.3 Logs

Click on the 'Logs' navigation tab to visit the metering logs web pages.

There are six kinds of logs that can be viewed, they are "Trend Log", "Trend Log Management", "Data Log", "Alarm Log", "SOE Log", "Waveform Log"(Only available in Acuvim IIW model) and "Event Log".

Each web page shows data from the Acuvim II or Acuvim-L series meter.



5.3.1 Trend Log

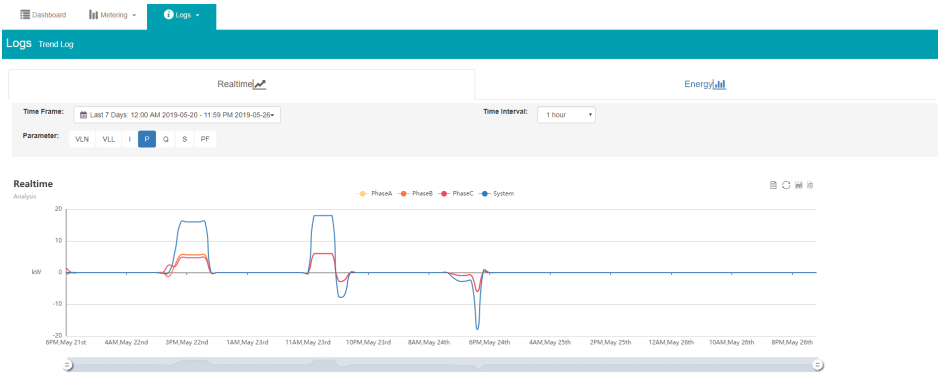
The Trend Log web page includes the Realtime trend diagram and Energy trend diagram. The Realtime menu tab can be selected to show the trend log diagram for the following parameters phase voltage, line voltage, current, active power, reactive power, apparent power, and power factor for each phase as well as the totals. The Energy menu tab show the trend log for the imported and exported active energy, reactive energy, total energy, net energy, and apparent energy.

The data of the trend log can be previewed and downloaded as a .csv file by clicking the 'Data Review' and 'Data' icons on the right top side of the diagram. The trend log diagram can also be saved as an image by clicking the 'Image' icon.

5.3.1.1 Realtime

The real time parameters can be trended at different time intervals depending on the time frame selected. Listed below are the time intervals for each possible time frame setting:

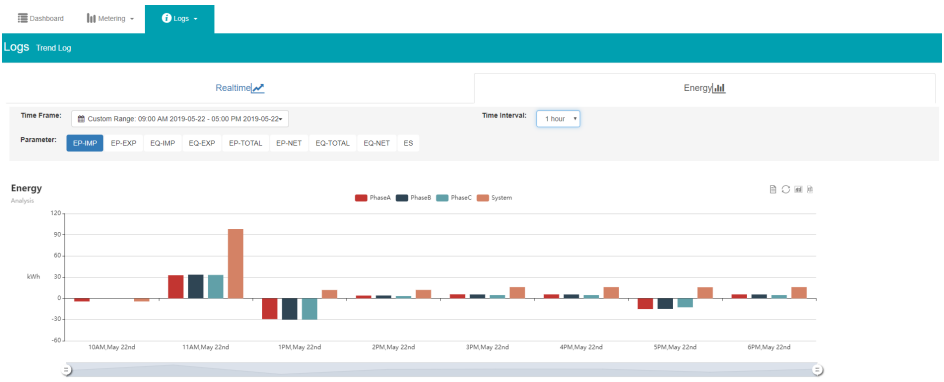
Time Frame	Time Intervals
Last 10 minutes	1 second 15 seconds 1 minute
Last 1 Hour	1 minute
Today	15 minutes 1 hour
Yesterday	15 minutes 1 hour
Last 7 days	15 minutes 1 hour 1 day
Last 30 days	1 hour 1 day
Last Month	1 hour 1 day
Custom Range	Dependent on range specified



5.3.1.2 Energy

The Energy parameters can be trended at different time intervals depending on the Time Frame selected. The table below displays the time intervals:

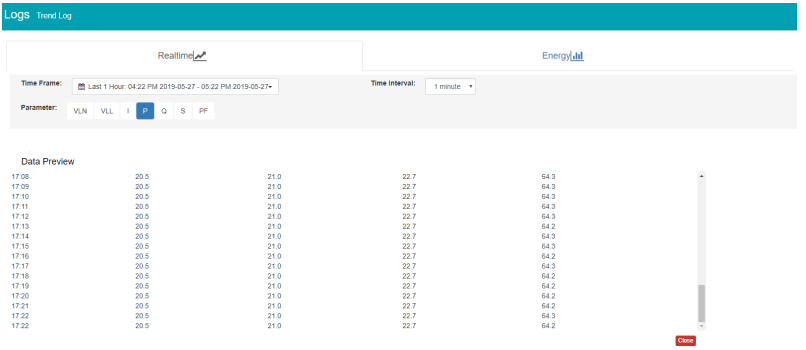
Time Frame	Time Intervals
Last 10 minutes	15 seconds 1 minute
Last 1 Hour	1 minute
Today	15 minutes 1 hour
Yesterday	15 minutes 1 hour
Last 7 days	15 minutes 1 hour 1 day
Last 30 days	1 hour 1 day
Last Month	1 hour 1 month
Custom Range	Dependent on range specified



5.3.1.3 Data Preview

The data preview allows the user to view the graphical data in tabular form.

User can also download this data into a CSV file for further examination.



5.3.2 Trendlog Management

The Trendlog Management page allows the user to download data from the meters database.

The Trendlog Management page acts as a backup to the data logs.

Log Param Type: Users can select which data they want to download from the meter. In the drop-down menu there is a timestamp range that shows the available data.

NOTE: *Energy data will remain in meter database for up to 3-years, whereas all other metering data will*

remain in the meter database for up to 1-month before overriding.

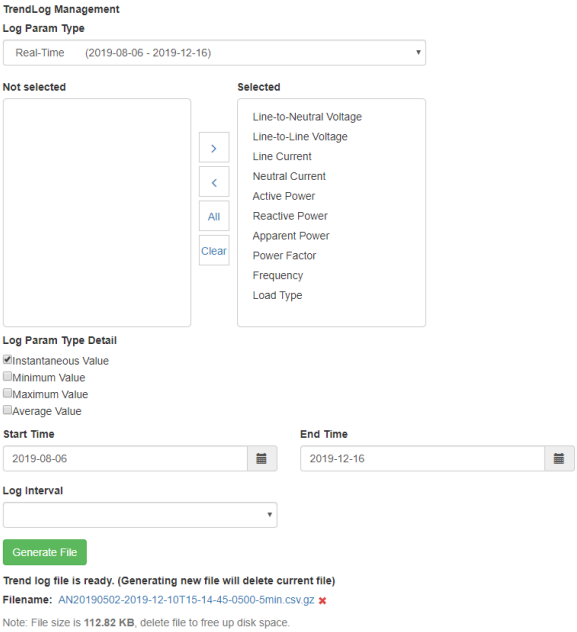
Log Param Type Detail: This setting allows users to modify what values they see in the data log.

Users can select the following parameter details:

- Instantaneous
- Minimum
- Maximum
- Average

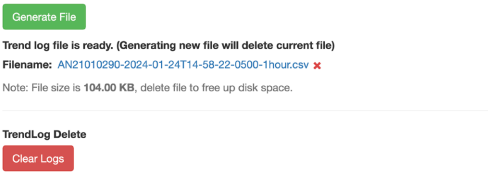
Only the 'Real-time' and 'Demand' parameters support the minimum, maximum and average parameter type details. All other parameter types such as Energy, Power Quality, and IO only support the instantaneous values displayed in the data log.

The log file will be downloaded as a .gz file and will need to be unzipped to view the CSV file.

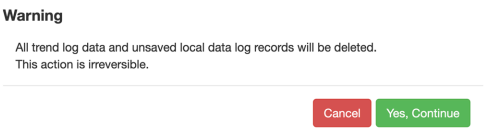


5.3.2.1 Clear Logs

The clear logs function allows the user to clear and remove all metering data stored on the module database. This will allow users to clear all readings and historical data without resetting all features and functions. Users can find the clear logs function at the bottom of the Trendlog page.



To clear the logs, click on the "Clear Logs" button. A warning message is will notify the user that this action is permanent and cannot be reversed once done.

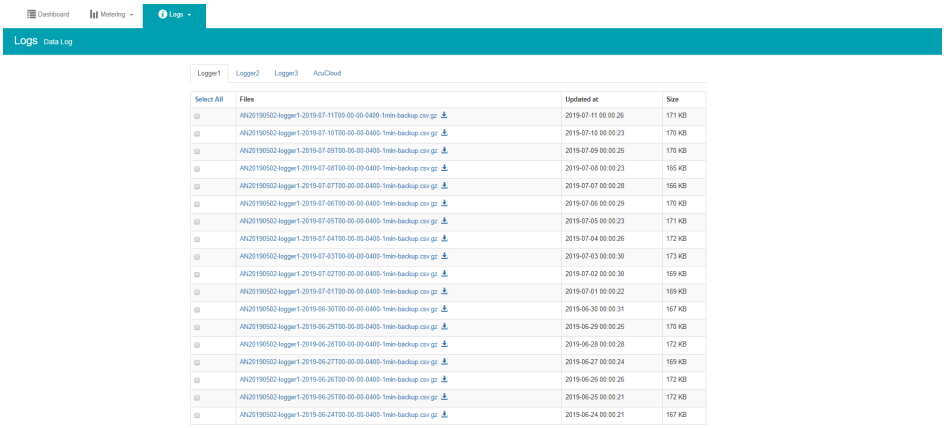


WARNING: *Clear logs cannot be undone, once the trend log is cleared all data stored in the meter database is permanently deleted forever.*

5.3.3 Data log

The Data Log web page includes all the data log files for the three different loggers, Acucloud, and 50/100ms loggers.

You can select each loggers by clicking the logger tab. After the logger is selected, the log file for this logger will show on the screen with the update time and file size. To download a file, click on the download icon to save the file in the computer. The data log will be saved as a compressed CSV file. To download multiple files as once. Check the box next to the data log files and click on the “Download Selected” button.

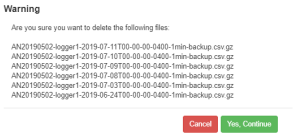


5.3.3.1 Deleting Data Logs

To delete the data logs users can check the box next to the data log file and click on the 'Delete Selected' button at the bottom of the page.

Users will be prompted by a window asking to confirm the data log delete.

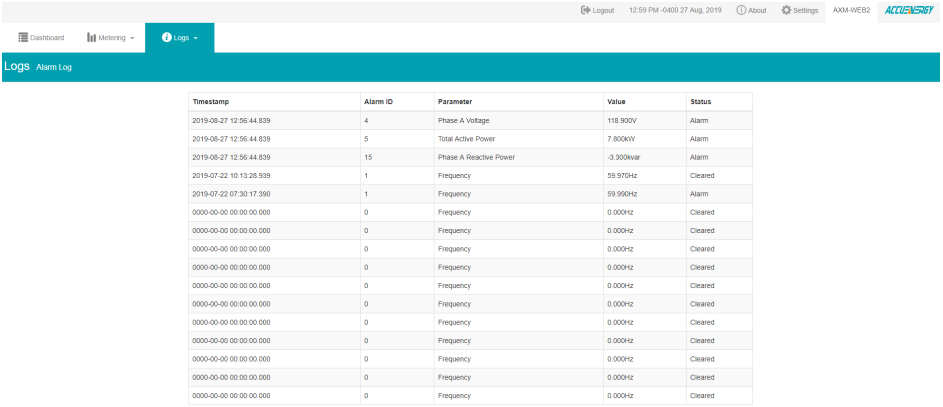
WARNING: *Deleting the data log is permanent, this cannot be undone once this action is performed.*



5.3.4 Alarm Log

The Alarm Log web page provides the user with a summary of the alarm events that have occurred with the meter. It will show the status of up to sixteen (16) alarm events indicating the alarm ID, status, parameter, value that exceeded or falls below the threshold, and the timestamp of the alarm event.

Once all sixteen (16) alarm events are full, the newest alarm event will then wrap around to alarm 1. The parameters in the alarm status web page are updated every ten seconds.

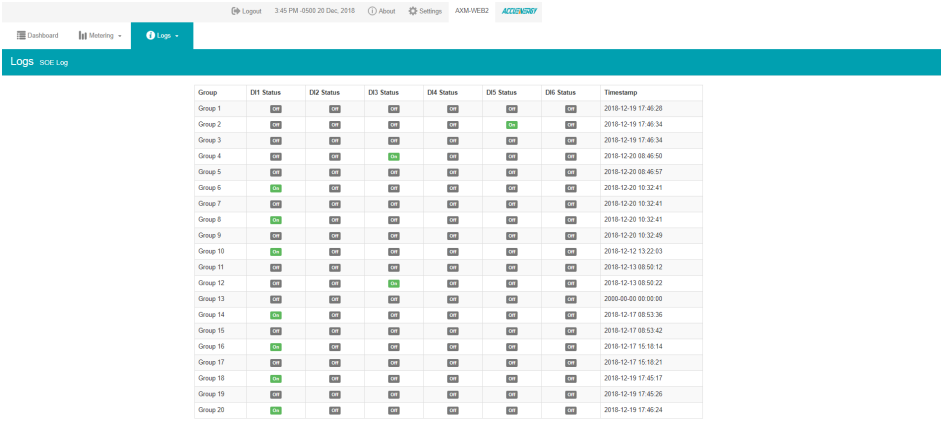


Timestamp	Alarm ID	Parameter	Value	Status
2019-08-27 12:56:44.839	4	Phase A Voltage	118.900V	Alarm
2019-08-27 12:56:44.839	5	Total Active Power	7.800kW	Alarm
2019-08-27 12:56:44.839	15	Phase A Reactive Power	-3.300kvar	Alarm
2019-07-22 10:13:28.939	1	Frequency	59.970Hz	Cleared
2019-07-22 07:30:17.390	1	Frequency	59.990Hz	Alarm
0000-00-00 00:00:00.000	0	Frequency	0.000Hz	Cleared
0000-00-00 00:00:00.000	0	Frequency	0.000Hz	Cleared
0000-00-00 00:00:00.000	0	Frequency	0.000Hz	Cleared
0000-00-00 00:00:00.000	0	Frequency	0.000Hz	Cleared
0000-00-00 00:00:00.000	0	Frequency	0.000Hz	Cleared
0000-00-00 00:00:00.000	0	Frequency	0.000Hz	Cleared
0000-00-00 00:00:00.000	0	Frequency	0.000Hz	Cleared
0000-00-00 00:00:00.000	0	Frequency	0.000Hz	Cleared
0000-00-00 00:00:00.000	0	Frequency	0.000Hz	Cleared
0000-00-00 00:00:00.000	0	Frequency	0.000Hz	Cleared

5.3.5 SOE Log

The SOE Log web page will display the Sequence of Event log for the enabled I/O module that is attached to the Acuvim II series meter with timestamps and will display the DI status for up to 20 SOE events.

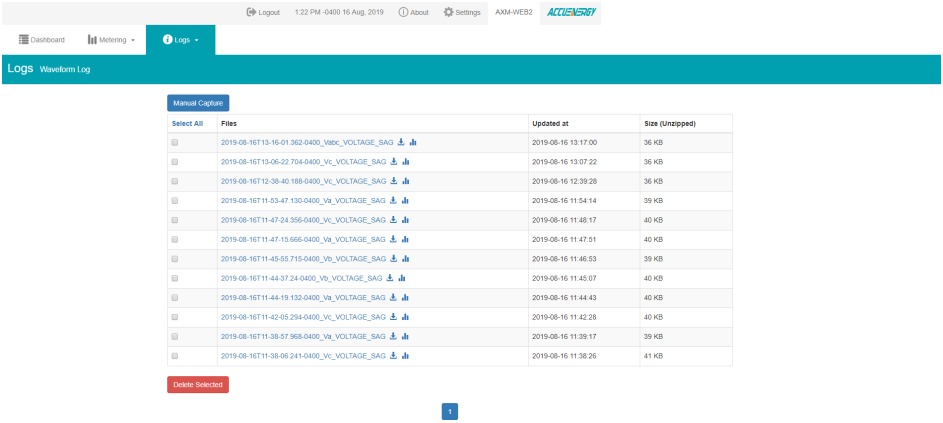
The SOE log parameters are updated every ten seconds.



Group	DI1 Status	DI2 Status	DI3 Status	DI4 Status	DI5 Status	DI6 Status	Timestamp
Group 1	Off	Off	Off	Off	Off	Off	2018-12-19 17:46:28
Group 2	Off	Off	Off	Off	On	Off	2018-12-19 17:46:34
Group 3	Off	Off	Off	Off	Off	Off	2018-12-19 17:46:34
Group 4	Off	Off	On	Off	Off	Off	2018-12-20 08:46:50
Group 5	Off	Off	Off	Off	Off	Off	2018-12-20 08:46:57
Group 6	On	Off	Off	Off	Off	Off	2018-12-20 10:32:41
Group 7	Off	Off	Off	Off	Off	Off	2018-12-20 10:32:41
Group 8	On	Off	Off	Off	Off	Off	2018-12-20 10:32:41
Group 9	Off	Off	Off	Off	Off	Off	2018-12-20 10:32:49
Group 10	On	Off	Off	Off	Off	Off	2018-12-12 13:22:03
Group 11	Off	Off	Off	Off	Off	Off	2018-12-13 08:50:12
Group 12	Off	Off	On	Off	Off	Off	2018-12-13 08:50:22
Group 13	Off	Off	Off	Off	Off	Off	2000-00-00 00:00:00
Group 14	On	Off	Off	Off	Off	Off	2018-12-17 08:53:36
Group 15	Off	Off	Off	Off	Off	Off	2018-12-17 08:53:42
Group 16	On	Off	Off	Off	Off	Off	2018-12-17 15:18:14
Group 17	Off	Off	Off	Off	Off	Off	2018-12-17 15:18:21
Group 18	On	Off	Off	Off	Off	Off	2018-12-19 17:45:17
Group 19	Off	Off	Off	Off	Off	Off	2018-12-19 17:45:26
Group 20	On	Off	Off	Off	Off	Off	2018-12-19 17:46:24

5.3.6 Waveform Log

The Waveform Log is available only on Acuvim IIW models of the Acuvim II series meter. This meter supports a waveform capture function that allows users to capture and record ten cycles before and after the triggering point whether it be a voltage sag, swell, or over current. The waveform log on the web interface allows users to view these waveforms whenever a power quality event has occurred. The log displays a table list of the waveform files, the time the waveform was updated, and the file size. The waveform file name includes the timestamp when the event occurred as well as the parameter name/event name that triggered the power quality event.

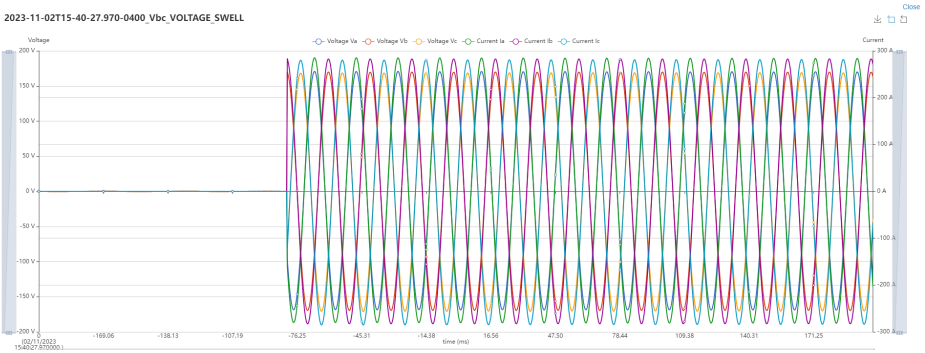


To view the waveform data click on the bar graph icon .

The waveform graph screen will have the option for users can select which voltage or current phase they want to view during the power quality event.

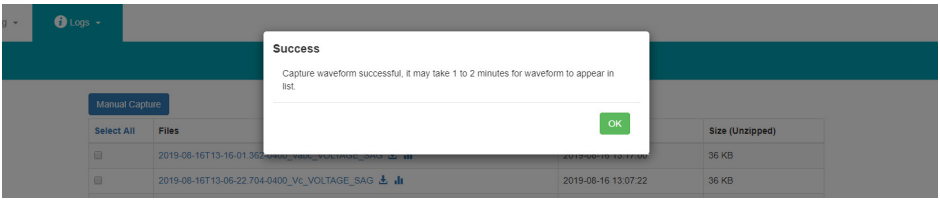
An image of the graph can be downloaded by clicking on the download icon .

Users can zoom into the graph for further detail by clicking on the magnify icon . The graph can be reset back by double clicking the button.

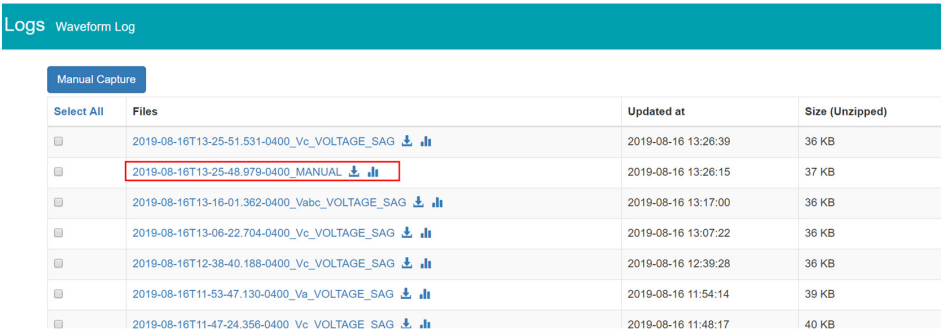


Users can select 'Close' link to exit the waveform graph and return to the Waveform Log page.

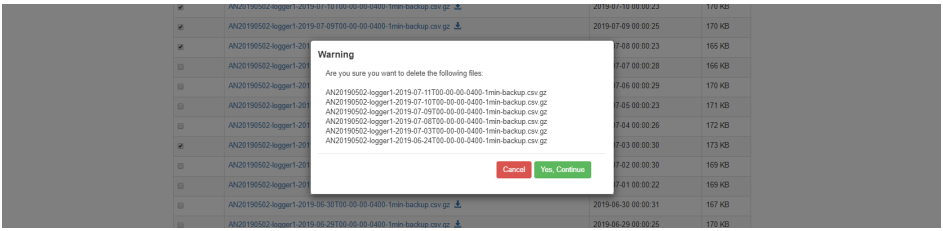
Users can enable the manual waveform capture function by clicking on 'Manual Capture' button. This will allow the user to manually capture voltage and current waveforms of the system being monitored. Once the waveform is capture it will take approximately 1-2 minutes to appear in the waveform log.



The file name for the manually captured waveform will include the timestamp the event occurred, and the text 'MANUAL' will be appended at the end of the file name.



In the Waveform Log page, the option to select and delete waveform files is available. Simply click on the check box next to the individual files to select it, alternatively 'Select All' can be checked to select all the files. Once all desired files are selected, click on "Delete Selected" to remove the files from the waveform log.



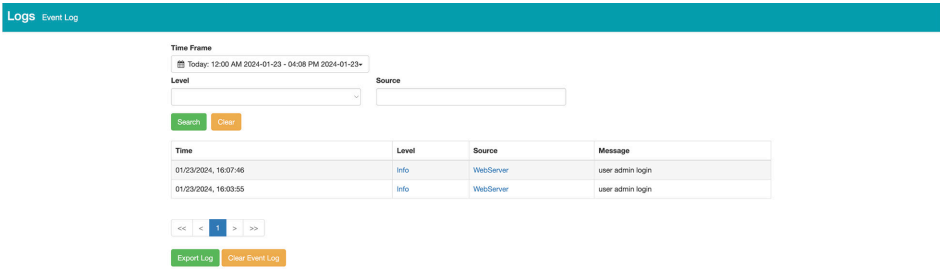
5.3.6.1 COMTRADE

The AXM-WEB2 series allows users to download the waveform data as a COMTRADE file. COMTRADE is a file format for storing waveform data related to transient power system disturbances.

The file can be downloaded from the waveform log by clicking on the file name or by clicking on the button. Once downloaded the file can be read using a COMTRADE file reader where users can further analyze the waveform data provided from the meter.

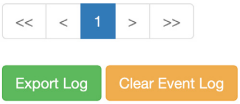
5.3.7 Event Log

The AXM-WEB2 series provide the event log page for the user to track the activities of the module.



The user can specify the event level and source by choosing the level and the source type.

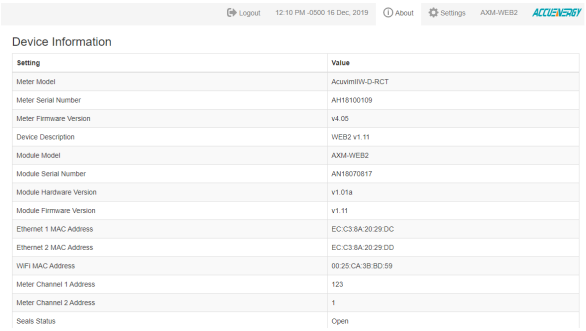
To clear the event logs, click "Clear Event Log". Then click "Yes" when prompted to continue. Users can also export the Event log where it can be exported as a .csv file.



5.4 About

The About menu tab located at the top right corner of the web interface allows users to view the Device Information page. This page provides users with information about the Acuvim II or Acuvim-L series meter and the AXM-WEB2 series module. The Device Information contains the model of the Acuvim II or Acuvim-L meter, serial number, firmware version and the meter addresses. It also contains the serial number, firmware version, hardware version and the MAC addresses of the AXM-WEB2 series module.

The disk usage field at the bottom of the device information page allows users to view the percentage of the memory that is used on the AXM-WEB2 series module.

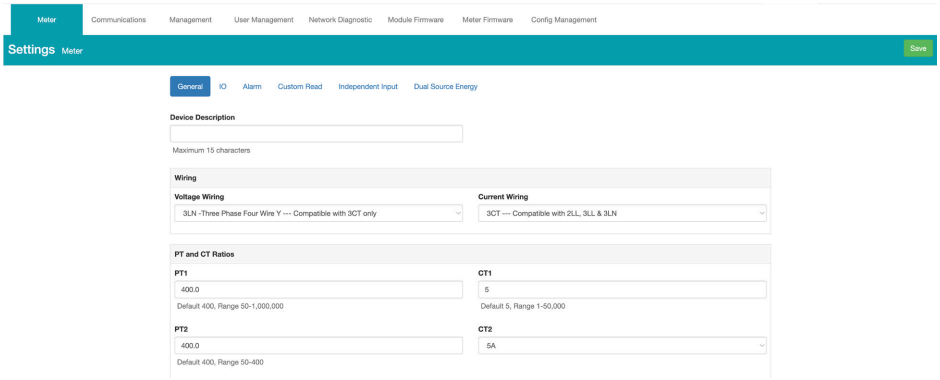


5.5 Settings

5.5.1 Meter Settings

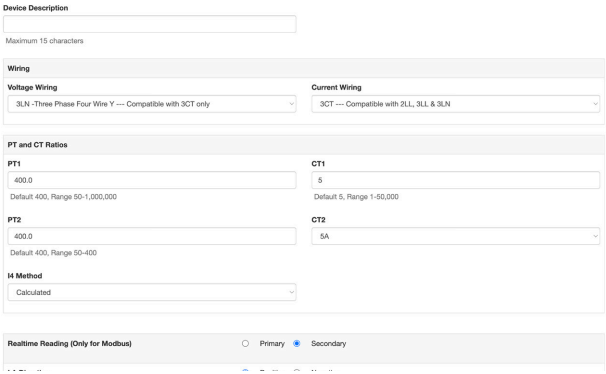
5.5.1.1 General Settings

The basic metering settings needed for installation and commissioning can be done from the web interface. To access these settings users can click on Settings and select the 'Meter' menu tab. On the metering tab users will see the 'General' tab from the submenu selected and the following page presented.



The general page allows users to configure the following settings:

Device Description: A description for the meter can be provided in this field and will be displayed on the Dashboard page.



Voltage Wiring: Select the type of wiring that the meter will be monitoring from the modes in the drop down list.

Current Wiring: Select the number of CT's that will be connected to the meter to measure the current.

PT1: Enter the rated input of the potential transformer that is connected to the meter. Possible range is from 50 to 1,000,000V. By default, PT1 is 400.

PT2: Enter the rated output of the potential transformer. Possible range is from 50 to 400V. The default PT2 setting is 400.

NOTE: *If the voltage input is connected directly to the meter and there are no potential transformer (PT) stepping down the voltage to the meter's voltage input then the PT1 and PT2 settings can be left as the default value of 400.*

CT1: Enter the rated input of the current transformer (CT) that is used with the meter. Possible ranges for the CT1 are from 1 to 50000A.

The default settings for CT1 are dependent on the current input type of the Acuvim II or Acuvim-L meter. The following table displays the default CT1 values for the different current input options.

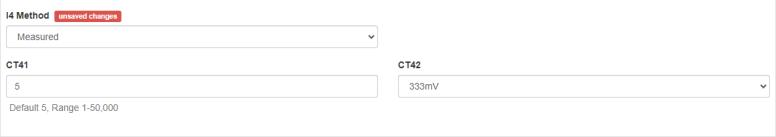
Acuvim II Current Input	Default CT1 Value
1A	1
5A	5
80mA/100mA/200mA	1
333mV	1
RCT	1000

CT2: Select the rated output of the current transformer from the drop down list. By default this setting is already configured.

NOTE: *CT2 is configurable only for 5A and mA current inputs, 5A can be either 5A or 1A and mA can be either 80mA, 100mA or 200mA.*

I4 Method: Represents the Neutral Current Value (I N Value) calculating method – The neutral current value can be configured as either Calculated or Measured.

- **Calculated:** If Calculated is selected, the I4 readings will be calculated based on IA, IB, IC.
- **Measured:** If Measured is selected, the I4 readings will be measured independently based on the independent CT41 and CT42 values.



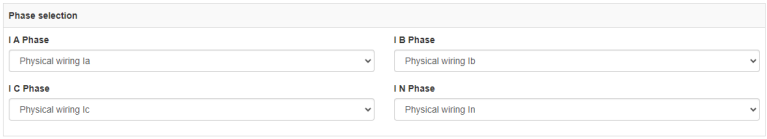
Real Time Reading: Select the mode of the readings for the meter when it is polled through Modbus. Default setting for the meter is Secondary mode, which will require some parameters to be scaled by a relationship. Configuring the meter in Primary mode does not require any scaling.

I A Direction: Represents the flow of direction for the Phase A current being measured, configure this setting to troubleshoot issues related to incorrect polarity of readings such as real power, power factor and other parameters.

I B Direction: Represents the flow of direction for the Phase B current being measured, configure this setting to troubleshoot issues related to incorrect polarity of readings such as real power, power factor and other parameters.

I C Direction: Represents the flow of direction for the Phase C current being measured, configure this setting to troubleshoot issues related to incorrect polarity of readings such as real power, power factor and other parameters.

Phase Selection: The "Phase Selection" feature allows users to determine the physical phase connection (A, B, C, or Neutral - N) for each current reading and modify the current readings at the application layer without changing the physical wiring.



Demand Settings:

Sliding Window: This setting refers to the demand type. There are four (4) demand types that are supported by the Acuvim II or Acuvim-L series meter, users can choose one of the following:

Fixed Window: The demand is calculated based on selecting the calculation period between 1-30 minutes. The meter will calculate and update the demand values at the end of each calculation period.

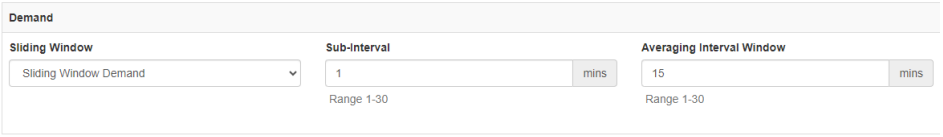
Sliding Window: The demand is calculated by selecting the calculation period between 1-30 minutes. The meter will average the energy accumulated within this period of time and the demand value is updated every one minute.

Thermal: The demand is calculated based on thermal response, used in thermal demand meters. This method uses a sliding window to update the demand value at the end of each calculation period.

Rolling Window: The demand is based on selecting a calculation period between 1 to 30 minutes, a subinterval (Demand Calculation Slip Time) and the demand value is updated at each subinterval. The subinterval must be a factor of the calculation period. For example, with a calculation period of 15-minutes, the subinterval can be configured as 5-minutes.

Sub Interval: The sub interval setting is only relevant if the Rolling Window Method is selected, this method requires a sub-interval time that must be a factor of the demand calculation period. the range for this setting is from 1 to 30 minutes.

Average Interval: The average interval window is the calculation period of the demand and can be set from 1 to 30 minutes.



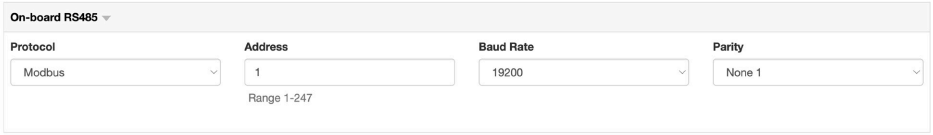
On-board RS485:

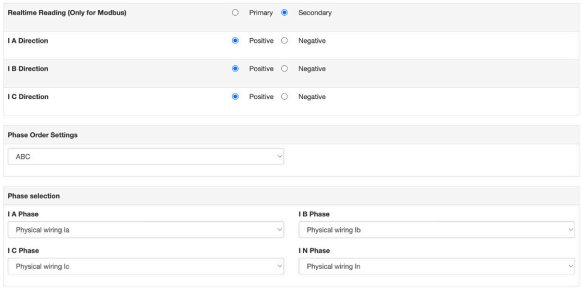
Protocol: Select the protocol for the Acuvim II or Acuvim-L RS485 port, the protocol can be set to Modbus or BACnet MS/TP.

Address: Select the RS485 address for the meter, the range for this setting is from 1-247.

Baud Rate: The baud rate is the communication speed of the RS485 data transfer, this ranges from 1200-115200.

Parity: Select the parity bit setting for communication.





Display

Current Password: This password relates to the four-digit password used to access the meter settings from the display of the meter. Default value is 0000, and the number range is between 0000 - 9999.

New Password: Enter in a new four-digit password.

Repeat Password: Enter the new password again to confirm the numbers matches.

Backlight: This setting determines how long the backlight on the meters display remains on , the possible range is from 0 to 120 minutes, where 0 disables the backlight off function.

Rated Load: The rated load can be represented in terms of either power or current.

If current is selected the rated current that is used would be the CT1 setting value in the PT and CT ratio settings section of the web page. For example, if CT1 is set for 1000A, and the average current the meter is monitoring is 500A, the load percentage would be 50% (500/1000A).

If power is selected the rated primary power would be used in the load percentage calculation. The max primary power can be calculated as follows:

Max Primary Power without using PTs = 3 * (480) * (CT1) Max Primary Power using PTs = 3 * (PT1) * (CT1)

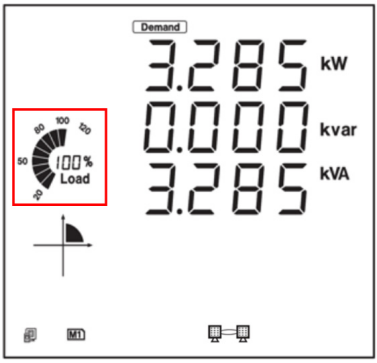
The max primary power would be the power that is entered in this setting.

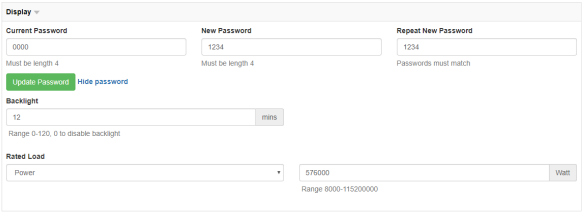
The load percentage is displayed on the front of the Acuvim II or Acuvim-L meter display. The load percentage is calculated based on the following equation:

Load Percentage = (Active System Power / ((5A or 1A) * User Setting))) * 100%, where the meter will have either a 5A or 1A current input. If users have meters with Rogowski Coil (RCT), 333mV and mA type Current Inputs then they would use 1A in this equation.

For example, if the max primary power of your system is 576000W (or 576kW), your system is currently using 211kW and the meters current input type is 5A, then the load percentage would be calculated as follows:

Load Percentage = (211kW / (5 * 576kW)) * 100 = 7%





Advanced

Energy Type: The energy type can either be selected as Fundamental or Fundamental + Harmonics.

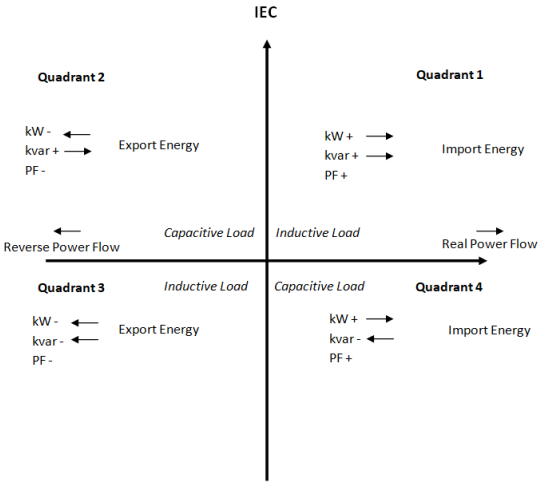
Energy Reading: This can be set to either Primary or Secondary, where Primary displays the energy accumulation in terms of the Primary and Secondary will display the energy accumulation in terms of the secondary with resolution of up to 1Wh.

NOTE: *When the energy reading mode is changed the energy will reset to 0 on the meter.*

VAR/PF Convention: The VAR/PF convention can either be set to IEEE or IEC.

IEC: The power factor is dependent on the direction of the real power flow.

IEEE: The power factor is dependent on the nature of the load, i.e. capacitive, inductive.



VAR Calculation Method: Can be selected as either True or Generalized

- True Method - Uses the Budeanu Concept to calculate the 'True' reactive power. This method generally takes the harmonic components to do the calculation instead of using the power vector triangle method. This method can be defined by the following by the following expression for single phase circuit:

$$Q_b = \sum_{k=1}^{+\infty} I_{k,RMS} \times U_{k,RMS} \times \sin(\theta_k - \psi_k)$$

Where k represent the n-th order harmonic, and $(\theta_k - \varphi_k)$ represent the phase-shift

Budeanu proposed that apparent power consists of two orthogonal components, active power and nonactive power, which is divided into reactive power and distortion power:

$$D_b = \sqrt{S^2 - P^2 - Q_b^2}$$

Where

$$P = UI\,Cos(\varphi),\ S = \left||U|\right| \times \left||I|\right|$$

Generalized Method: Uses Fryze's concept to calculate the 'Generalized' reactive power. This method separates instantaneous current into two components, active and reactive currents. Active and reactive powers are:

$$P = V_{RMS} \times I_a$$

$$Q_f = V_{RMS} \times I_r$$

Where Ia and Ir represents RMS values of instantaneous active and reactive currents.

$$i_r(t) = i(t) - i_a(t)$$

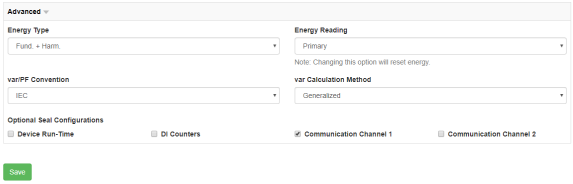
$$i_a(t) = \frac{P}{V_{RMS}^2} v(t)$$

Optional Seal Configurations: Users can choose to seal the following parameters from this setting:

- Device Run Time
- DI Counters
- Communication Channel 1

- Communication Channel 2

Once all settings have been configured users can click on save and then perform a module reboot for the settings to be saved to the meter.



5.5.1.2 IO Settings

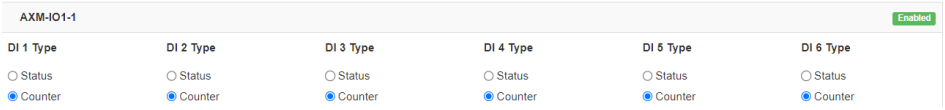
The Acuvim II and Acuvim-L supports 3 different I/O expansion modules that allow users add Digital Inputs, Digital Outputs, Relay Outputs, Analog Inputs, and Analog Outputs. There can be a max two of the same I/O module per meter and will be represented by the I/O logic address 1 or 2. From the AXM-WEB2 series interface users can configure the settings for these I/O modules.

AXM-IO1-1/2

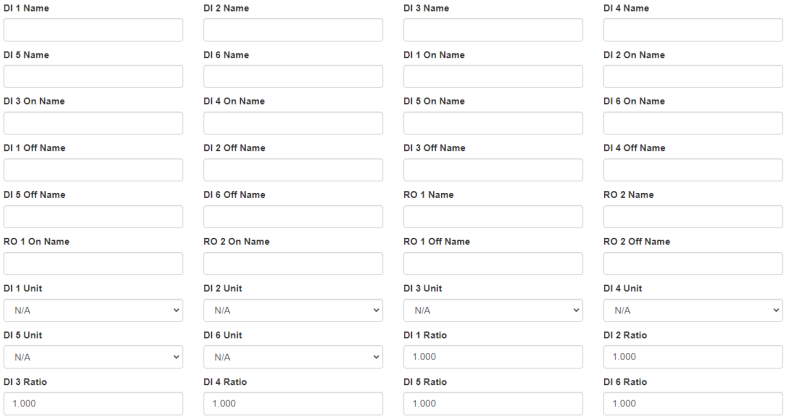
The AXM-IO1 module supports six (6) Digital Input channels, two (2) Relay Output channels, and has a built in 24Vdc supply.

Digital Input - Can be configured as either digital status or pulse counter.

- DI Pulse Constant - If the DI is configured as pulse counter, then the DI pulse constant will represent how many pulses equals one count, i.e pulse constant is 2 that means that every two pulses the inputs reads, the counter is increased by one.
- DI1-6 Name - Users can assign a name for each Digital Input, this name is used for either Counter or Status mode.
- DI1-6 On/Off Name - A custom label when the DI status is on/off can be configured
- DI1-6 Unit - Unit can be assigned to the DI counter reading
- DI1-6 Ratio - Users can configure a scaling ratio for the DI counter reading



The DI name, on/off name, unit, and ratio settings can be found at the bottom of the page under the Analog Output 2 settings.



Relay Output - Can be configured as Relay Control or Alarm Mode

- Control Mode Output Mode - Can be configured as Latch or Momentary where users can manually turn on/off relay
- Latch - Manually turn on/off relay
- Momentary - Manually turn on relay for a short moment of time, the RO on time range is from 50 to 3000ms
- Alarm Mode - The relay can be configured to trigger based on the alarm settings of the meter.

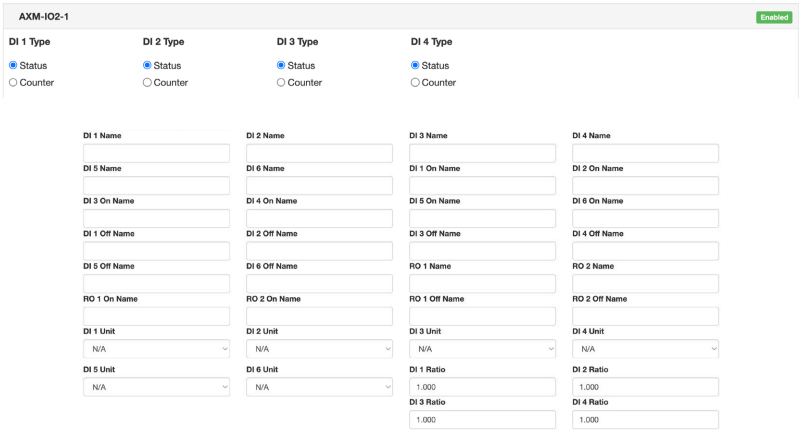
AXM-IO2-1/2

The AXM-IO2 module supports four (4) Digital Input channels, two (2) Digital Output channels, and two (2) Analog Output channels.

Digital Input - Can be configured as either digital status or pulse counter.

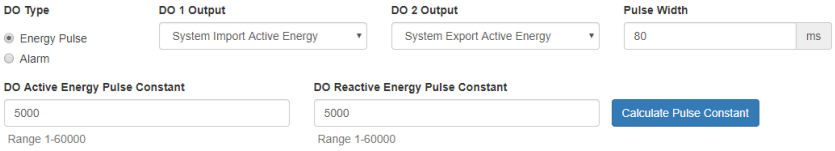
- DI Pulse Constant - If the DI is configured as pulse counter, then the DI pulse constant will represent how many pulses equals one count, i.e. pulse constant is 2 that means that every two pulses the inputs reads the counter is increased by one.
- DI1-4 Name - Users can assign a name for each Digital Input, this name is used for either Counter or Status mode.

- DI1-4 On/Off Name - A custom label when the DI status is on/off can be configured
- DI1-4 Unit - Unit can be assigned to the DI counter reading
- DI1-4 Ratio - Users can configure a scaling ratio for the DI counter reading



Digital Output - Can be configured for Pulse or Alarm mode.

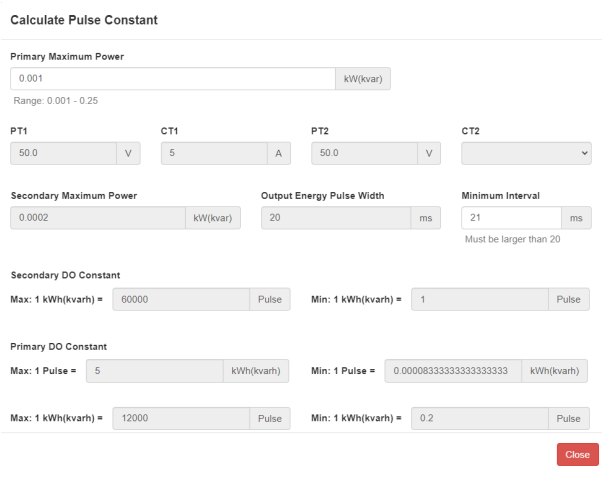
- DO 1 Output - Users can select the type of energy pulse outputted from DO Channel 1
- DO 2 Output - Users can select the type of energy pulse outputted from DO Channel 2
- There are four types of energy that can be used for Energy Pulse Output:
  - System Import Active Energy
  - System Export Active Energy
  - System Import Reactive Energy
- System Export Reactive Energy
- Pulse Width - Users can configure the Energy pulse width, the range is from 20 to 1000ms.
- DO Active Energy Pulse Constant - Select the Pulse Constant for Active Energy Pulse, the range is from 1 to 60000.
- DO Reactive Energy Pulse Constant - Select the Pulse Constant for Reactive Energy Pulse, the range is from 1 to 60000.



Pulse Constant Calculator

The pulse constant calculator allows users to determine the pulse constant value based on the amount of energy per pulse required. Users would first need to input the maximum primary power which is the CT1 value multiplied by the PT1 value.

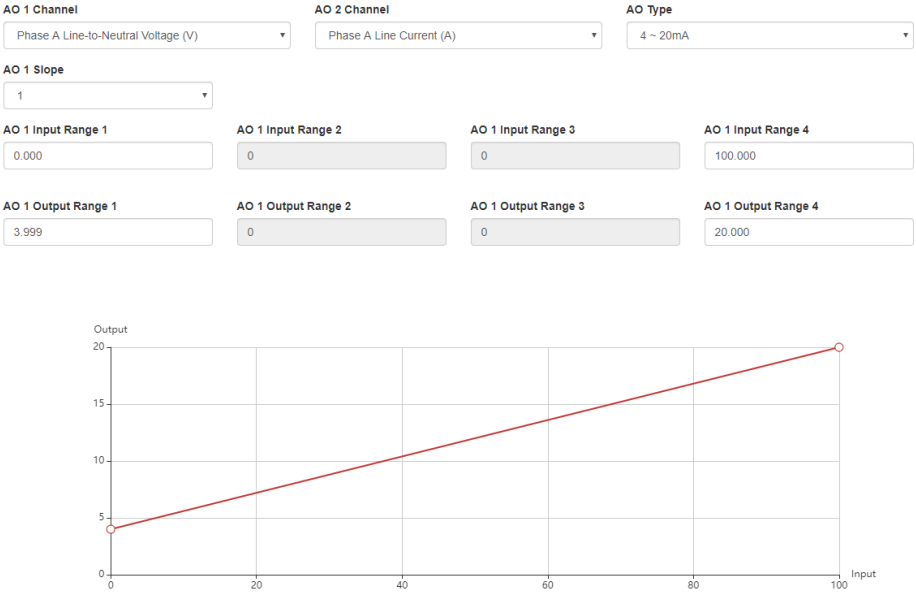
Once entered in, users can then scroll down to the 'Primary 1 Pulse =' and enter the value that one pulse would represent, i.e. 1 pulse = 1kWh. Once this is configured, a secondary pulse value will be populated which is the required pulse constant value. Users can import this value to the pulse constant setting by clicking on the 'Set as Active Energy Constant' or 'Set as Reactive Energy Constant' buttons.



Analog Output - There are two analog output channels that users can configure.

- AO1 Slope - select the slope value, the range is from 1-3
- AO 1 Input Range 1 - Enter in the starting range for the Analog Output
- AO 1 Input Range 2/3/4 - Enter in the ending range for the Analog Output
- AO 1 Output Range 1 - Enter in the analog output signal
- AO 1 Output Range 2/3/4 - Enter in the ending analog output signal.

NOTE: *The analog output range can be a 4-20mA, 0-20mA, 0-5V, 1-5V signal depending on the model of the I/O, either voltage or current model.*



The interface displays a graph for the analog output signal according to the input range that has been configured.

Like the Analog Output channel 1, the second analog output channel can also be configured in the same manner from the web interface.

AXM-IO3-1/2

The AXM-IO3 module supports four (4) Digital Input channels, two (2) Relay Output channels, and two (2) Analog Input channels.

Digital Input - Can be configured as either digital status or pulse counter.

- DI Pulse Constant - If the DI is configured as pulse counter, then the DI pulse constant will represent how many pulses equals one count, i.e. pulse constant is 2 that means that every two pulses the inputs reads the counter is increased by one.
- DI1-4 Name - Users can assign a name for each Digital Input, this name is used for either Counter or Status mode.

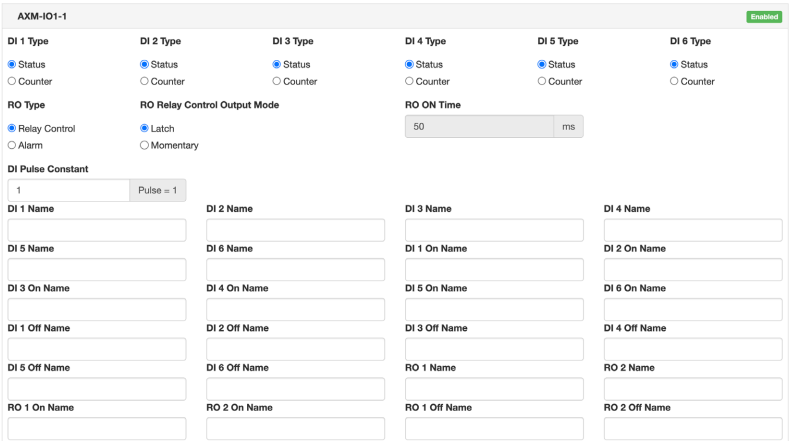
- DI1-4 On/Off Name - A custom label when the DI status is on/off can be configured
- DI1-4 Unit - Unit can be assigned to the DI counter reading
- DI1-4 Ratio - Users can configure a scaling ratio for the DI counter reading

Relay Output - Can be configured as Relay Control or Alarm Mode

- Control Mode Output Mode - Can be configured as Latch or Momentary where users can manually turn on/off relay
- Latch - Manually turn on/off relay
- Momentary - Manually turn on relay for a short moment of time, the RO On time range is from 50 to 3000ms
- Alarm Mode - The relay can be configured to trigger based on the alarm settings of the meter.

Analog Input - There are two analog input channels, users can select the type based on the type of module they have.

- AI types:
  - 4-20mA
  - 0-20mA
  - 1-5V
  - 0-5V
- AI1-2 Name - Users can assign the analog input channels a name
- AI1-2 Unit - A unit can be configured for the analog input
- AI1-2 Ratio - A scaling ratio can be applied and configured for the analog input
- AI1-2 Offset - An offset can be applied and configured for the analog input

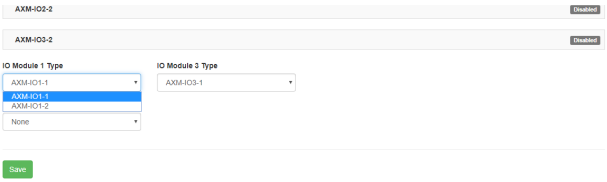


IO Logic Address

From the WEB2 interface users have the option to change the logic addresses for the AXM-IO1 and AXM-IO3 modules. This is useful when users have two modules with the same logic address. For example, if the user has two AXM-IO1-1 and attaches them both to the meter, the meter will only recognize one of the modules. This function allows the user to change the logic number from 1 to 2 where the user would then have one AXM-IO1-1 module and one AXM-IO1-2 module.

To change the logic address the module must be attached and installed on the back of the meter after the WEB2 communications module. Simply click on the drop down menu and select the corresponding logic address.

NOTE: *The meter must perform a physical power cycle for the logic address change to take effect.*



5.5.1.3 Alarm Settings

The Acuvim II and Acuvim-L meters supports over/under alarms for different metering parameters. From the WEB2 interface users can configure these alarms and can find these settings by clicking on 'Settings' and selecting the 'Alarm' tab.

The meter supports up to sixteen (16) Alarm channels that users can monitor when the configured parameter goes over or under the alarm threshold. If users have extended I/O modules attached to the meter, digital outputs (DO) and relay outputs (RO) can be triggered upon alarm condition and used to activate external devices such as a buzzer, light, and other functions.

Alarm Enable: The alarm function can be enabled or disabled

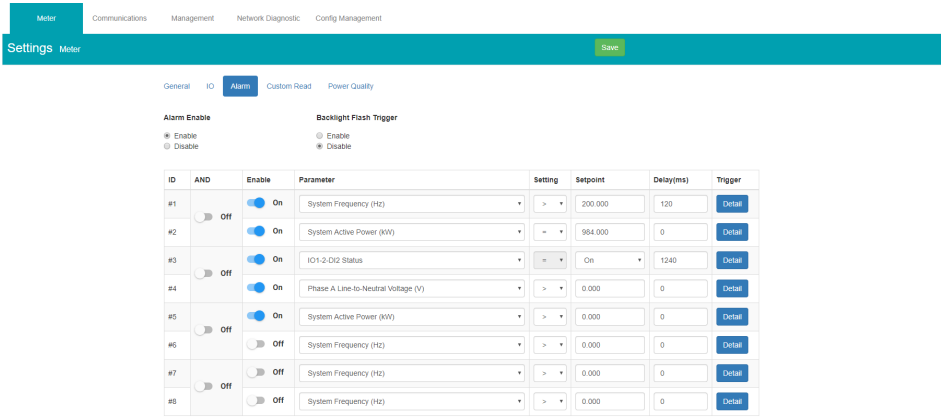
Backlight Flash Trigger: If enabled, when an alarm is triggered the backlight of the Acuvim II or Acuvim-L meter display will flash during the alarm event.

Steps to setup alarm channels:

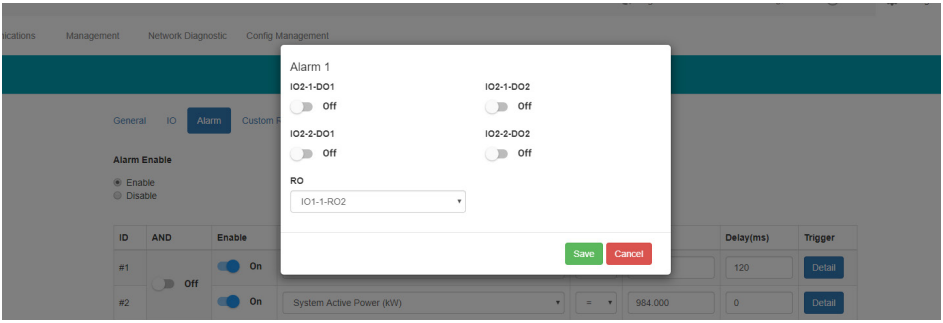
1. To configure an alarm channel, enable the preferred alarm channel(s).
2. Select the required parameter for the alarm channel under the 'Parameter' column.
3. Choose the required setpoint and then select the condition for the alarm, i.e. greater than (>),

less than (<), or equal to (=).

4. Users can set a delay for the alarm trigger, the range is from 0 to 30000ms.
5. Users can use the 'AND' function to trigger an alarm event when two conditions have been met.



If extended I/O modules are being used, users can click on the detail tab to configure the digital output and relay outputs to be triggered when an alarm is triggered.



Once all alarm settings are configured, user must click on the 'Save' button and then reboot the communications module for the settings to take effect.

5.5.1.4 Custom Read

The Acuvim II and Acuvim L meters support a custom read function which allows users to

customize a block of Modbus registers within the meter. Within this custom block, different parameters (i.e. Basic metering, THD, Energy, etc) can be configured as well as different data types for the parameters (i.e. Int, float, etc). There is a total of 64-bytes that can be used to create the customized register block.

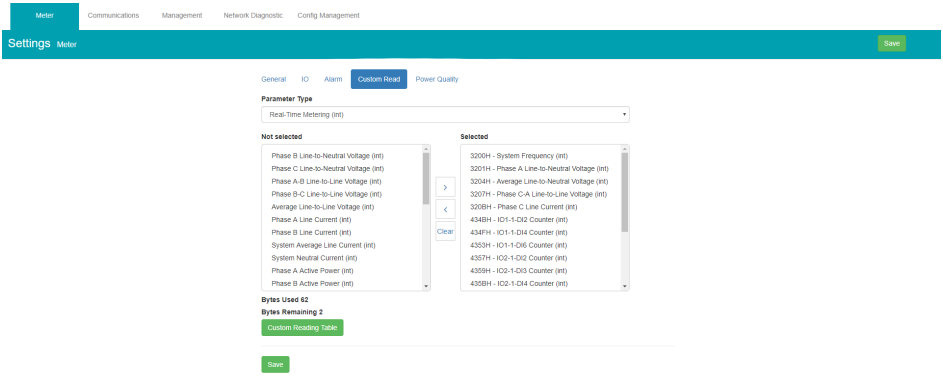
The window on the left under 'Not Selected' are the list of parameters available for the custom read block. Users can choose between different parameters by clicking on the drop-down menu under 'Parameter Type'. The available parameter types include:

- Real-Time Metering
- Demand
- Energy
- THD
- Sequence
- Phase Angles
- DI Counter
- AO/AI value

Each of these parameter types are available in different data types, such as integer (int). float, and double. Users may select the data type for each parameter from this drop-down menu.

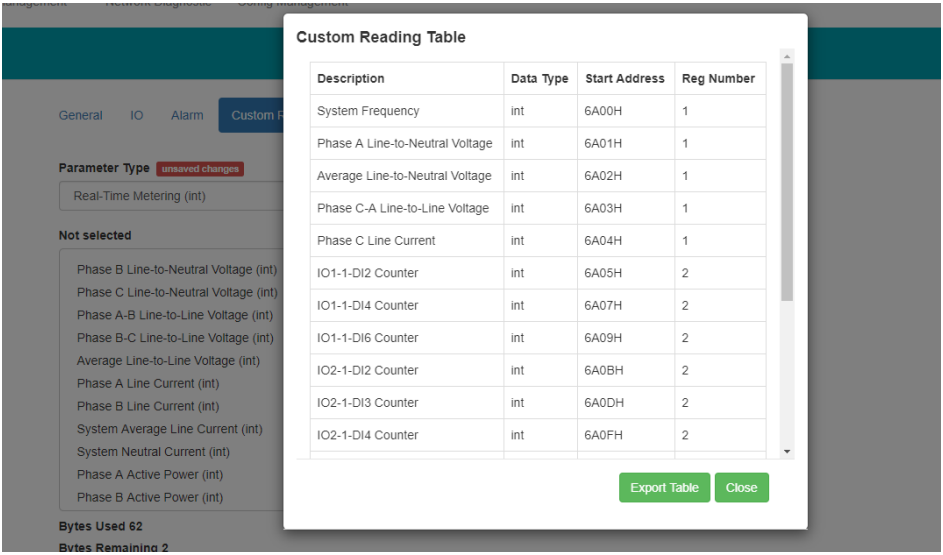
Users can select the parameters and click on the '>' button to add the parameters to the 'Selected' window. The parameters can be removed from the register block by clicking on the '<' button and can clear the entire block by selecting the 'Clear' button.

As users add and remove parameters, there is a 'Bytes Used' and 'Bytes Remaining' value that lets users know how much space is left in the customized register block.



Once the block is configured, users can click on the 'Save' button.

A copy of the custom read register block can be viewed by selecting 'Custom Reading Table'. The table can be downloaded as a CSV file by clicking on ‘Export Table’ button.



5.5.1.5 Independent Input

The independent input feature enables users to utilize multiple types of current transformers on a single meter, offering the flexibility to alternatively choose the power calculation based on the selected voltages and currents.

5.5.1.5.1 Independent Channel Configuration

For users to enable the Independent Channel feature, there are several pre-requisites that are needed on the meters. These include:

- Bootloader version is 6.07 or greater.
- Phase Selection feature is disabled. (recommend)
- The configuration of Phase N Current Type (I N value) is set to Measured.
- The configuration of Modbus Real-Time Reading is set to Primary(0.1kwh).
- In Method should be configured to Measured.
- If Voltag Wiring is”2LL”, Current Wiring should be configured to “3CT”

When Independent Input Channel is enabled:

Realtime reading should be configured to "Primary", Energy Reading should be configured to "Primary (0.1 kWh)", In Method should be configured to "Measured", If Voltage Wiring is "2LL", Current Wiring should be configured to "3CT"

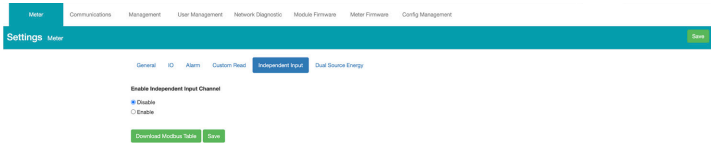
OK

Important Notice:

- When the Independent channel is enabled, the unbalance current reading and the unbalance voltage reading are not available; they will always be 0. Users need to reset the maximum/minimum values and energy every time they enable or disable the independent channel.
- If the input channel is set to None, the corresponding power readings will be empty.
- Waveform, fast read mode, TOU, and alarm functions are not fully supported when the independent channel is enabled. Users can still access those features; however, the results and settings may not be accurate.
- If the data log uses parameters from the Independent Channel, it is important to change the data log parameters to Non-Independent Channel parameters. Otherwise, the data log will record empty input.

Enable Independent Channel:

After meeting the pre-requisite, users can enable Independent Channel by selecting ON for Independent Wiring Mode in the Independent Wiring page under the **Setting** tab.



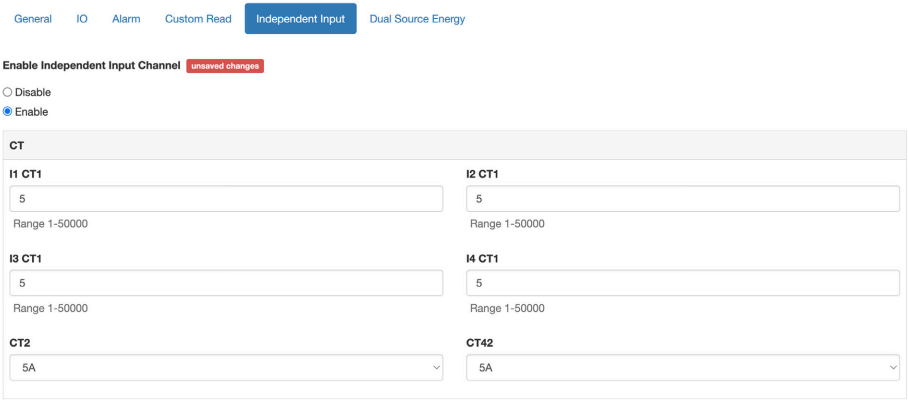
CT Configuration:

When independent channel is enabled, CT's ratio can be configured individually.

For mV or RCT meters, users have the option to connect the meter with two different configurations.

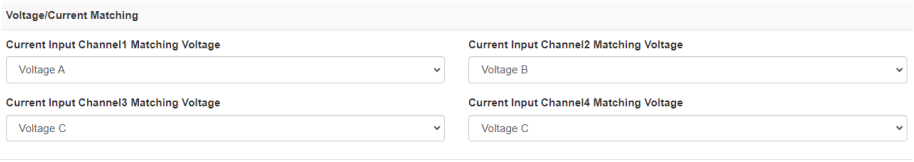
- Option 1: Users can connect the meter with three mV current transformers (CT) on Phase A, B, and C, and one Rogowski current transformer (RCT) on Phase N.
- Option 2: Users can connect the meter with three Rogowski current transformers (RCT) on Phase A, B, and C, and one mV current transformer (CT) on Phase N.

These options provide users with choices according to their specific requirements and the availability of CTs and RCTs.

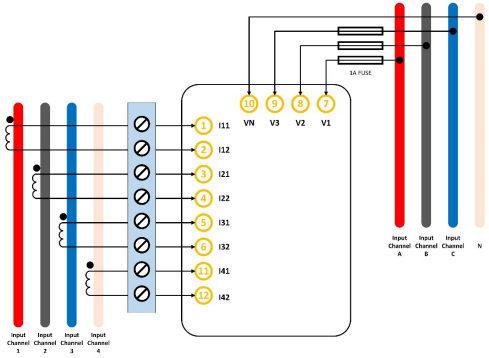


Voltage Channel ID:

In the independent channel mode, users can configure Voltage Channel ID by selecting the corresponding Voltage from the drop-down menu. This setting allows users to access more detailed readings specifically related to the input channel associated with the selected voltage.

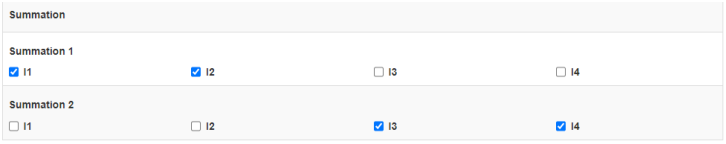


Please note that the configuration of Input Channel 1 to 4 can be customized without changing the physical wiring. The corresponding wiring diagram can be found in Figure below for reference.

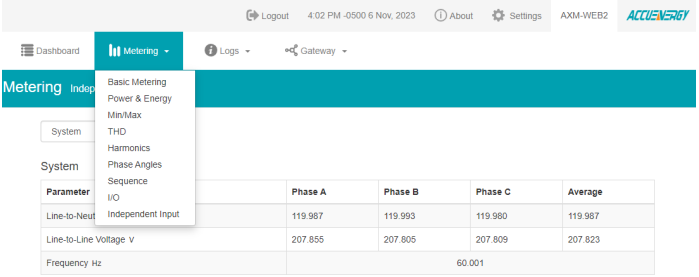


Customized Summation:

In the independent channel mode, users can configure summation by selecting individual phases. This setting allows the users to calculate the average current reading across the chosen channels as well as obtain the total power readings for those selected channels.



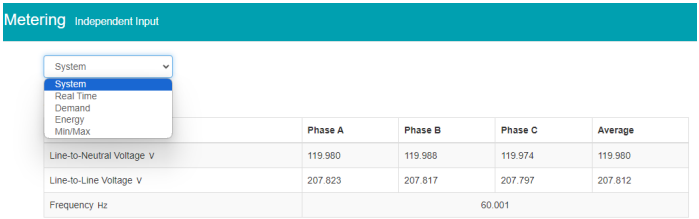
5.5.1.5.2 Independent Channel Reading



When enabling the independent channel feature, the independent input will appear in the drop-down menu under metering. Users can view the corresponding values:

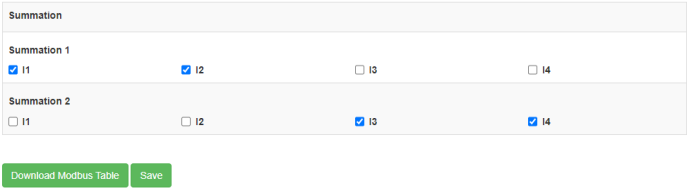
- **System Reading:** Includes voltage and frequency measurements for each phase.
- **Real-Time Reading:** Includes current and power measurements for each input channel.

- **Demand Reading:** Includes current and power demand measurements for each input channel.
- **Energy Reading:** Includes energy measurements for each input channel.
- **Max/Min:** Records maximum and minimum values of each independent channel parameter, along with their corresponding timestamps.



Modbus Table

On the Independent Input settings page, users can download a Modbus table. This table includes Modbus addresses corresponding to the readings for Basic Readings, Energy, Basic Readings, Harmonics, Harmonic Amplitude, and Phase Angle (secondary side).



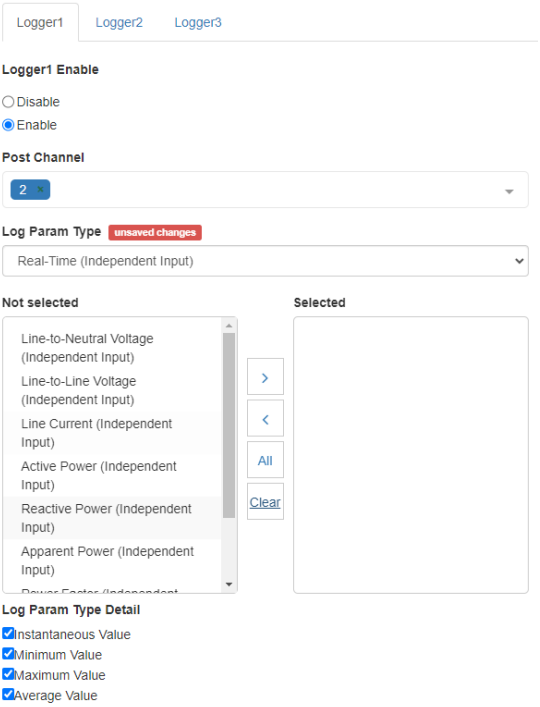
5.5.1.5.3 Changes on other functions when Independent Channel is Enabled

Data Log:

Starting from version 6.15 of the Acuvim II or Acuvim-L firmware, the AXM-WEB2 module introduces support for independent input channel parameters in the data logging feature.

To access the new features, navigate to the "Settings" menu and select "Communications." Then, click on the "Data Log" option. Within this page, users will find the following parameters available for data logging when Independent Input is enabled:

Real-Time (Independent Input):



Demand (Independent Input):

Selecting this option allows users to record demand-related data from the independent input channels. The demand data reflects the rate at which energy is consumed or generated over a specific period.

NOTE: *These features are available only for Acuvim II or Acuvim-L firmware version 6.15 and later.*

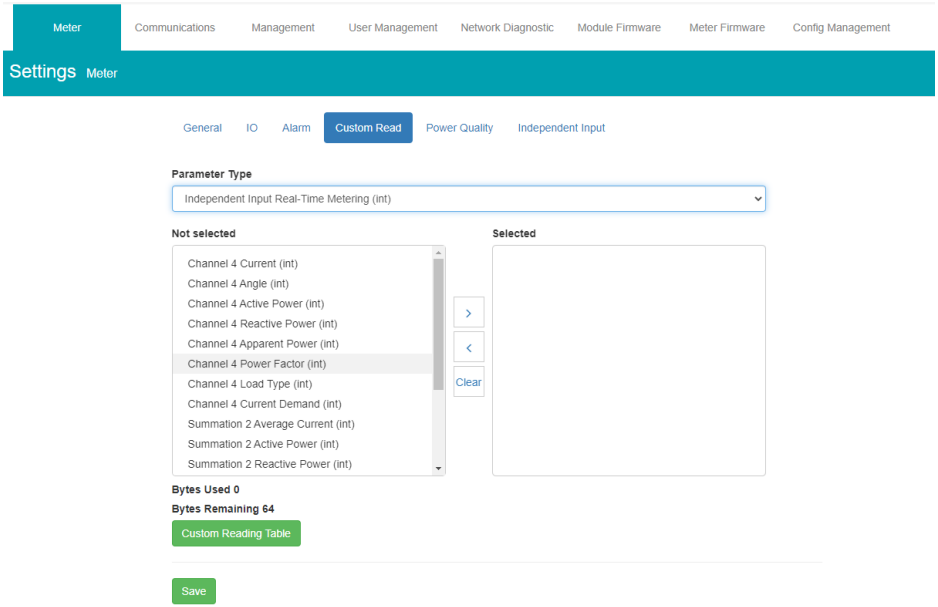
Trend log:

For meter versions equal to or greater than Acuvim II V3 (Acuvim-L V4) firmware v6.15, the meter will log the following new parameters in trend log for Data Log usage:

- Basic readings of Independent Input (float)
- Energy readings for Channel 4 and Summation 2 of Independent Input

Custom read support:

Real-Time Metering (Independent Input, int)



Real-Time Metering (Independent Input, float)

Demand (Independent Input, int)

Demand (Independent Input, float)

Energy (Independent Input, int)

5.5.1.5 Waveform Settings

The Acuvim IIW meters support a waveform capture feature where users can capture waveforms based on power quality events such as voltage sags, voltage swells and over currents. From the WEB2 interface, users can configure these settings by clicking on the 'Settings' menu tab and then selecting the 'Waveform' menu tab.

Rated Voltage: The rated voltage of the system should be entered here, the range is from 50 to 400V for wye systems or 50 to 690V for delta systems.

Voltage Swell

- Triggering Waveform Capture: Select enable to capture voltage swell events
- Threshold: Enter in the percentage of the voltage swell to be captured, the range is from

50-140%. For example, if the rated voltage is 277V, and the voltage swell threshold is set for 110%. The swell event would be captured when the voltage is 110% above 277V, which is roughly 304V.

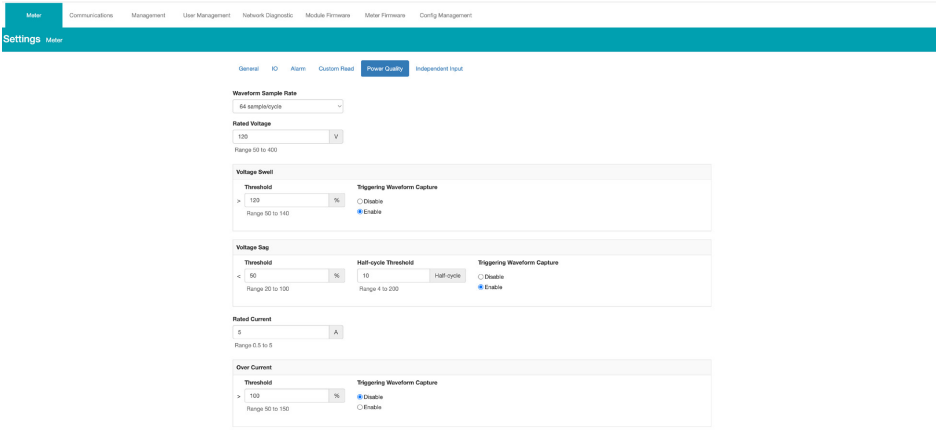
Voltage Sag

- Triggering Waveform Capture: Select enable to capture voltage sag events
- Threshold: Enter in the percentage of the voltage sag to be captured, the range is from 20-100%. For example, if the rated voltage is 277V, and the voltage sag threshold is set for 50%. The sag event would be captured when the voltage drops 50% below 277V, which is roughly 138V.
- Half-cycle Threshold: Enter in the half cycle threshold for the sag event, the range is from 4 to 200 half-cycles.

Rated Current: The rated current for the over current should be entered here, the range will be dependent on the CT1 value configured on the meter. The rated current range will be from 50-100% of the CT1 value. For example, if CT1 is configured as 1000A, then the rated current range for the Power Quality event is from 500A to 1000A.

Over Current

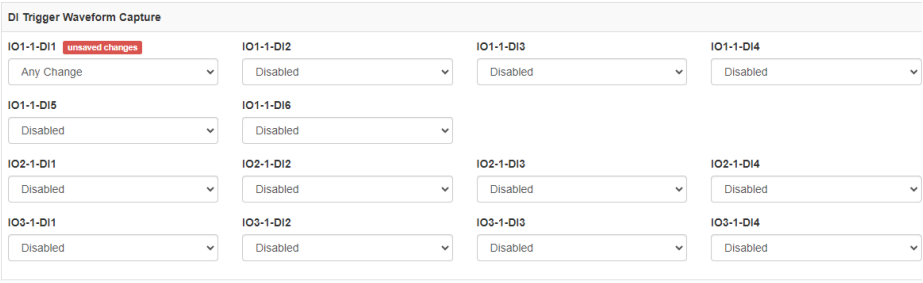
- Triggering Waveform Capture: Select enable to capture over current events
- Threshold: Enter in the percentage of the over current to be captured, the range is from 50-150%. For example, if the rated current is 1000A, and the over current threshold is set for 50%. The over current event would be captured when the current is 50% of the rated current, which is 500A.



If user is using external AXM I/O modules, the waveform capture can be triggered by the Digital Inputs Status. The DI can trigger the waveform by the following:

- From Status Off to On
- From Status On to Off
- Any Change

The DI triggering can be disabled if users do not require it to record any waveform capture events.



Chapter 6: Communications

6.1 Network

The first page the user will see after selecting the Communications option under the Settings tab is the Network page. The network settings allow users to configure all applicable network related settings including both Ethernet 1 and Ethernet 2 as well as Wi-Fi dependent on the AXM-WEB2 series module.

6.1.1 RSTP Protocol

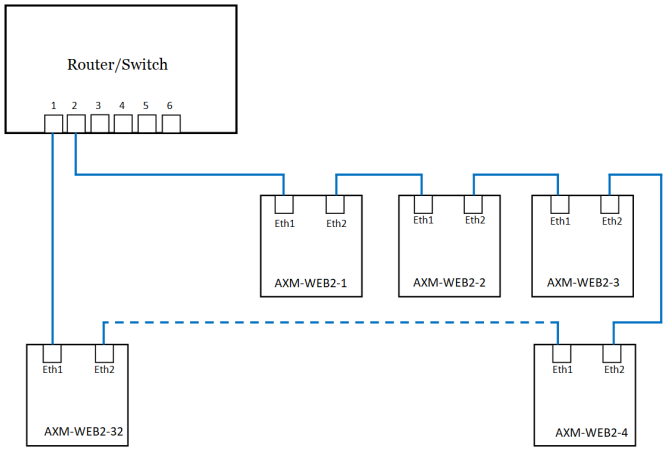
The AXM-WEB2 series supports the RSTP protocol where users can daisy chain the Ethernet ports on the AXM-WEB2 series module to a network switch.

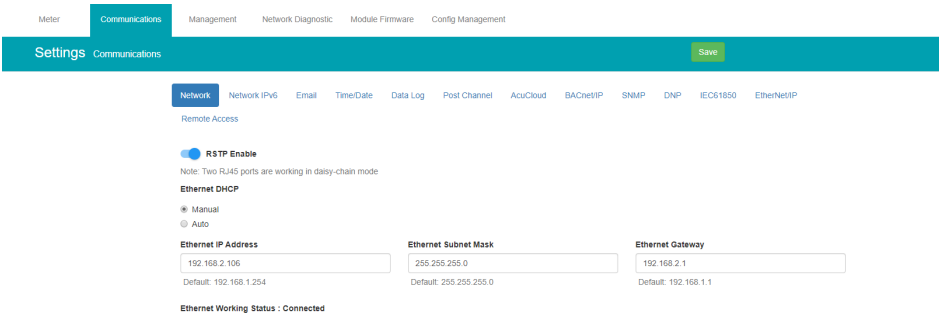
Users can configure the meters IP manually or by setting the DHCP set as Auto.

NOTE: *When the RSTP is enabled, users will not be able to configure Ethernet 1 and Ethernet 2, there is only 1 IP per meter using RSTP protocol.*

Network Topology

Users can daisy chain up to 32 devices using the RSTP protocol. This can cut down the amount of network switches required in different applications and allows the use of one network switch/ router to be used with up to 32 devices. Each device can be accessed by configuring a unique IP address or having the IP addresses assigned automatically by the network.



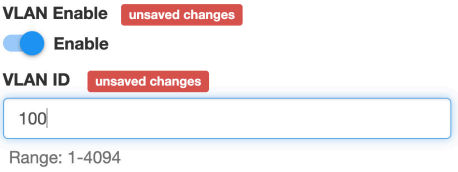


6.1.2 VLAN

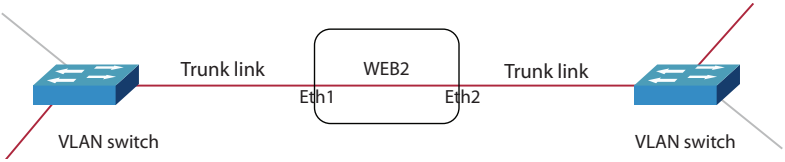
Virtual Local Area Network (VLAN) allows devices under the same physical network to be grouped (by VLAN ID) and act as if they are in separate networks. VLANs are isolated from one another where traffic stays private in the same VLAN.

When VLAN of an interface is enabled, it allows the AXM-WEB2 series module to communicate with other devices under the same VLAN without a VLAN switch, via this interface. In other words, the module can parse IEEE 802.1Q-tagged Ethernet VLAN frames by itself.

Users can enable VLAN from the web interface under either the Ethernet 1 or Ethernet 2 settings, once enabled a VLAN ID is required.



One of the common uses is when RSTP is enabled, the module can be put between two VLAN switches, where both ETH1 and ETH2 ports connecting to switches' trunk ports. In this method, the module can still forward all traffic between the switches; while other devices in the same VLAN can have access to the module, and no additional switch is required.



6.1.3 Network Settings

The settings for the Ethernet 1 and Ethernet 2 are as followed:

Ethernet 1 DHCP: Select 'Manual' to manually configure the IP address to access the meter. If set to 'Manual', the Subnet Mask and Gateway will also need to be set. By default, the IP address for ETH1 will be 192.168.1.254.

Select 'Auto' to have the meter assigned an IP address automatically. With this selection the Subnet Mask, and Gateway will also be automatically assigned.

NOTE: *After changing DHCP to Auto, check the display of the meter (N02 NET Settings) to obtain the new IP address that has been assigned. The new IP address will be displayed only after a module reboot is performed and completed.*

IP Address: If the DHCP is configured to Manual, the IP address can be configured from this page. Default IP address is 192.168.1.254.

Subnet Mask: If the DHCP is configured to Manual, the Subnet Mask can be configured from this page. Default IP address is 255.255.255.0.

Gateway: If the DHCP is configured to Manual, the Gateway can be configured from this web page. Default IP address is 192.168.1.1.

The status of the Ethernet 1 port will display if it is connected or disconnected.

Ethernet 2 DHCP: By default, the Ethernet 2 port is configured to have its DHCP set to 'Auto'. If configured to 'Manual' the default Manual IP address is 192.168.1.253. Users can configure the IP address to any IP once the DHCP is configured for 'Manual', users will also need to set the Subnet Mask and Gateway if using this method.

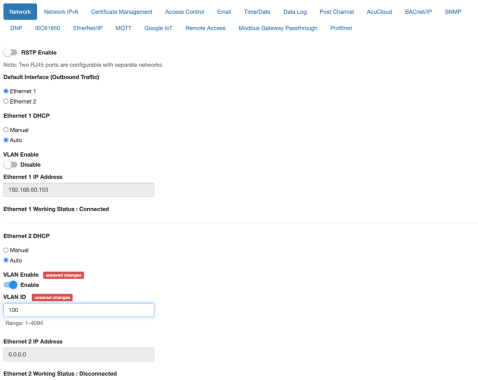
NOTE: *The IP address of the Ethernet 2 can be found page N12 of the NET Settings. The Acuvim II and Acuvim-L protocol setting must be configured to WEB2 to view this from the meters NET settings.*

IP Address: By default, the IP address is configured by DHCP, this field will be grayed out. If the DHCP is configured to Manual, the IP address can be configured from this page.

Subnet Mask: If the DHCP is configured to Manual, the Subnet Mask can be configured from this page.

Gateway: If the DHCP is configured to Manual, the Gateway can be configured from this web page.

The status of the Ethernet 2 port will display if it is connected or disconnected.



Wi-Fi Enabled: Select the Enable or Disable communication through Wi-Fi.

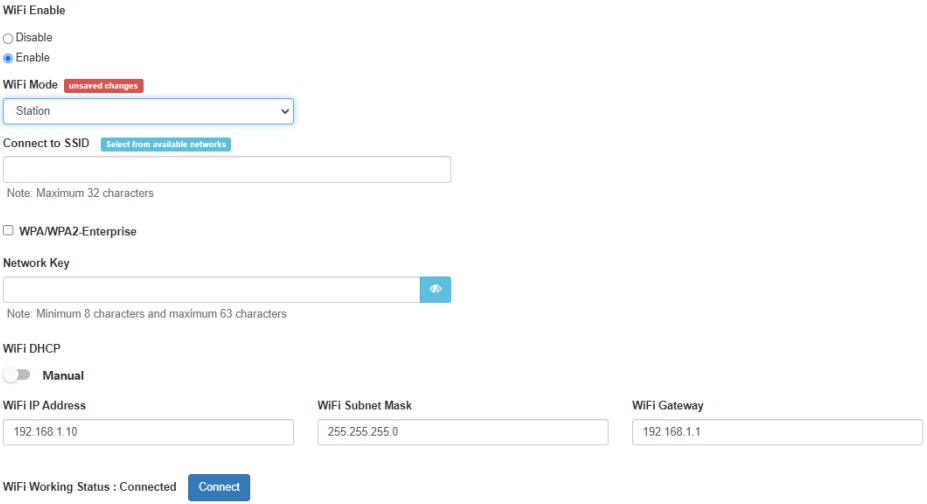
Wi-Fi Mode: The Wi-Fi can be configured to work in two modes just like any other Wi-Fi device. It can be configured as either Access Point (AP) or Station mode.

Access Point: Default configuration for AXM-WEB2 and AXM-WEB FOLC. The module will act as a wireless access point and will allow other wireless devices to connect and access the AXM-WEB2 or AXM-WEB2 FOLC.

- In Access Point mode, users can configure the SSID, Network Key and IP of themodule as well as the DHCP DNS servers.

Station: The AXM-WEB2 or AXM-WEB2 FOLC will behave like a wireless client and bridge to another wireless network that is available.

- In Station mode, users can select the Wireless network to connect to under the “Connect to SSID” setting. Click on “Select from Available Networks” and enter the Network Key for the wireless network that the AXM-WEB2 and AXM-WEB2 FOLC will bridge to.
- If users are connecting to an open Wireless network that is not password protection, the password field can be left blank.
- The AXM-WEB2 and AXM-WEB2 FOLC also supports Enterprise Wi-Fi, where users can connect using an enterprise level Wi-Fi network which is common in many colleges/ universities, and hospitals. When attempting to connect to an enterprise level Wi-Fi network the interface will show options to connect to the network with a username and password.

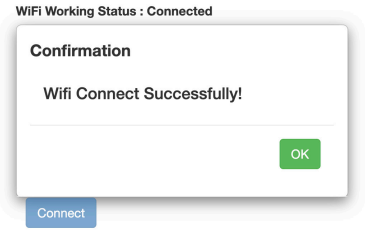


In station Mode the DHCP can configured as either manual or auto.

- If manual, users can configure the IP, Subnet Mask and Gateway and DNS Servers.
- If auto, users can check the meter's display to get the IP address and all other network configurations assigned by the wireless network. The user can also configure the DNS servers if the DHCP is set to Auto.

NOTE: *The Wi-Fi IP address for the AXM-WEB2 and AXM-WEB2 FOLC will be in parameter N11 of the NET settings. The Acuvim II and Acuvim-L protocol setting must be configured to WEB2 to view this from the meters NET settings.*

The AXM-WEB2 and AXM-WEB2 FOLC supports a connection test to the Wi-Fi network, users can use this test to manually connect to the Wi-Fi network.



DNS Server 1: Enter the address of DNS server 1 in this field.

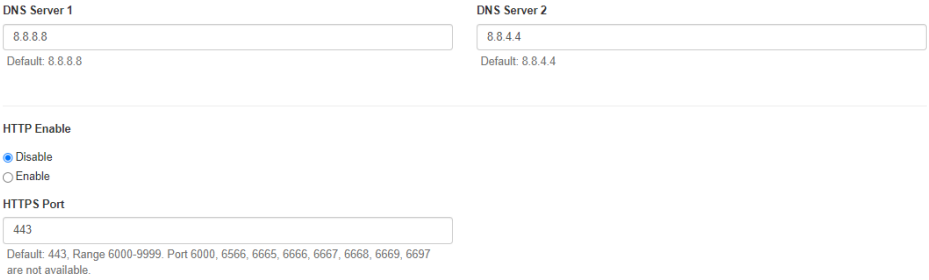
DNS Server 2: Enter the address of DNS server 2 in this field.

HTTPS Port: Enter the HTTPS port number of the meter. By default, this setting is configured to 443. The range can be from 6000 to 9999.

Meter Channel 2 Address (Modbus TCP): Enter the Modbus TCP address of the meter. By default, the address is 1.

HTTP Enable: Enable HTTP so the AXM-WEB2 and AXM-WEB2 FOLC can be accessed through the HTTP protocol, by default the HTTP port is 80 but it can be configured from 6000-9999.

Modbus TCP Port: Enter the Modbus port number of the meter. By default, this setting is configured to port 502. The port range can be from 2000 to 5999.



Fast Read Mode Enable: Selecting Enable allows the user to read the real time parameters at 100ms or 50ms.

- 100ms fast read:
  In 100ms fast read mode, the table reads data at a frequency of 100ms at the specified Modbus address. The following are the Modbus addresses supported by 100ms fast read.:

Start(Hex)	End(Hex)	Start(Dec)	End(Dec)	Description
0x3000	0x3001	12288	12289	Freq_rms
0x3002	0x3003	12290	12291	Ua_rms
0x3004	0x3005	12292	12293	Ub_rms
0x3006	0x3007	12294	12295	Uc_rms
0x3008	0x3009	12296	12297	Uvag_rms
0x300A	0x300B	12298	12299	Uab_rms

Start(Hex)	End(Hex)	Start(Dec)	End(Dec)	Description
0x300C	0x300D	12300	12301	Ubc_rms
0x300E	0x300F	12302	12303	Uca_rms
0x3010	0x3011	12304	12305	Ulag_rms
0x3012	0x3013	12306	12307	Ia_rms
0x3014	0x3015	12308	12309	Ib_rms
0x3016	0x3017	12310	12311	Ic_rms
0x3018	0x3019	12312	12313	Ivag_rms
0x301A	0x301B	12314	12315	In_rms
0x301C	0x301D	12316	12317	Pa_rms
0x301E	0x301F	12318	12319	Pb_rms
0x3020	0x3021	12320	12321	Pc_rms
0x3022	0x3023	12322	12323	P_rms
0x3024	0x3025	12324	12325	Qa_rms
0x3026	0x3027	12326	12327	Qb_rms
0x3028	0x3029	12328	12329	Qc_rms
0x302A	0x302B	12330	12331	Q_rms
0x302C	0x302D	12332	12333	Sa_rms
0x302E	0x302F	12334	12335	Sb_rms
0x3030	0x3031	12336	12337	Sc_rms
0x3032	0x3033	12338	12339	S_rms
0x3034	0x3035	12340	12341	PFa_rms
0x3036	0x3037	12342	12343	PFb_rms
0x3038	0x3039	12344	12345	PFc_rms
0x303A	0x303B	12346	12347	PF_rms

- 50ms fast read:
  In 50ms fast read mode, the table reads data at a frequency of 50ms at the specified Modbus address. The following are the Modbus addresses supported by 50ms fast read.:

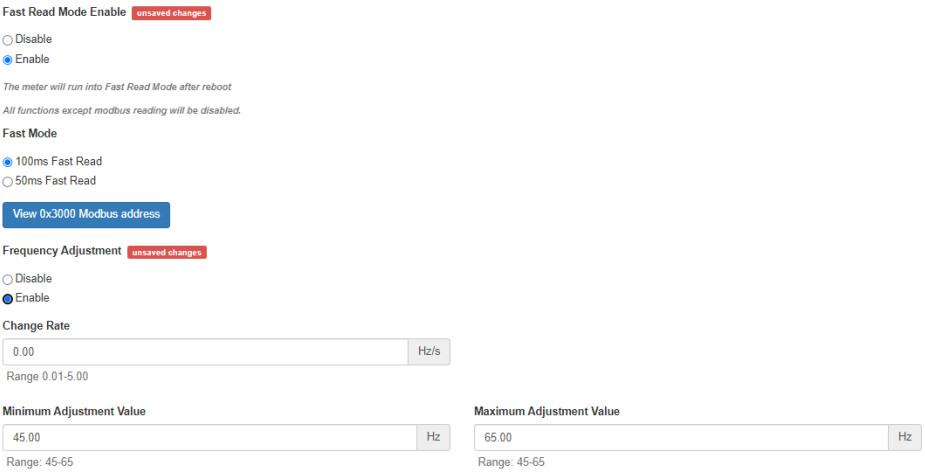
Start(Hex)	End(Hex)	Start(Dec)	End(Dec)	Description
0x3400	0x3401	13312	13313	FAST_RMS_UA
0x3402	0x3403	13314	13315	FAST_RMS_UB
0x3404	0x3405	13316	13317	FAST_RMS_UC
0x3406	0x3407	13318	13319	FAST_RMS_UAB
0x3408	0x3409	13320	13321	FAST_RMS_UBC
0x340A	0x340B	13322	13323	FAST_RMS_UCA
0x340C	0x340D	13324	13325	FAST_RMS_IA
0x340E	0x340F	13326	13327	FAST_RMS_IB

Start(Hex)	End(Hex)	Start(Dec)	End(Dec)	Description
0x3410	0x3411	13328	13329	FAST_RMS_IC
0x3412	0x3413	13330	13331	FAST_RMS_UAVG
0x3414	0x3415	13332	13333	FAST_RMS_VLLAVG
0x3416	0x3417	13334	13335	FAST_RMS_IAVG
0x3418	0x3419	13336	13337	FAST_RMS_PSUM
0x341A	0x341B	13338	13339	FAST_RMS_QSUM
0x341C	0x341D	13340	13341	FAST_RMS_FREQ

- Frequency Adjustment: Allows users to control the rate of change of frequency. The range can be set from 1.00-5.00 Hz/s, by default this is set for 1 Hz/s.
  - The minimum range is 45Hz and the max range is 65Hz, any frequency outside of the range will not have the frequency adjustment applied.

NOTE: *Frequency Adjustment is only available when the meter is in Fast Read Mode.*

NOTE: *When Fast Read mode is enabled, all functions except Modbus and the web server are disabled.*



Proxy Server Enable: Select enable to allow forwarding of data log files to pass through the Proxy server first and then the data post server. I.e. AcuCloud.

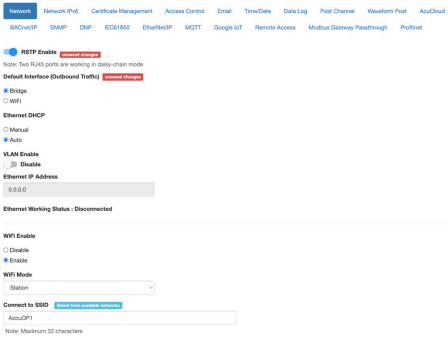
After making any changes on the network settings page, click the 'Save' button. Users will be prompted to reboot the AXM-WEB2 series module immediately or at a later time. If later is chosen the AXM-WEB2 series module will need to be rebooted from the 'Management' page in order for the settings to take effect.

6.1.4 Default Routing Interface (Outbound Traffic)

The AXM-WEB2 series module supports a routing default interface setting which allows users to configure which port to use for primary routing to external networks. Since there are multiple ways, the user can connect such as Ethernet1/2, Wi-Fi, RSTP, this setting will establish which one is used for the main routing interface. The other interfaces can be used for local routing if being used.

Users can select the default routing interface as:

- Ethernet 1
- Ethernet 2
- Wi-Fi - only valid if Wi-Fi is configured for station mode
- Bridge (RSTP) - only valid if RSTP is enabled



6.2 IPv6

The AXM-WEB2 series module supports IPv6 communication where users can use IPv6 to access the web interface as well as connect via SNMP protocol. The settings for IPv6 can be accessed by clicking on Settings and selecting the Communications tab. On the Communications page select the IPv6 tab to configure the settings.

IPv6 Enable: Enable to access the settings for IPv6

Ethernet DHCP: This can be set to manual or auto.

- When set to Manual, users must configure the IPv6 address, the Subnet Prefix Length, and

the Gateway.

- When set to Auto, the network will assign an IPv6 address automatically.

Ethernet Link Local Address: Is an IPv6 address that is automatically configured on the device with prefix 'fe80' followed by the MAC address of the module.

Ethernet Status: Displays whether there is an Ethernet cable connected or disconnected.

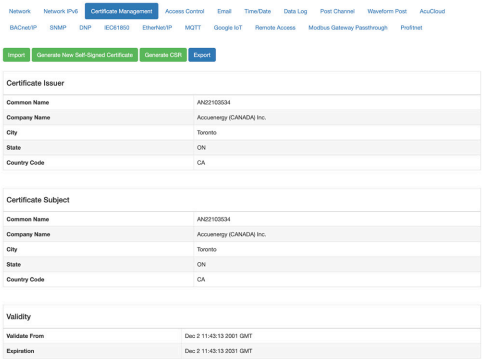
6.3 Certificate Management

From the AXM-WEB2 series web interface, there is a certificate management section that allows users to view the web page certificate details. Users can also generate a new self-signed certificate, generate a certificate signed request, and import/export the certificates.

6.4 Access Control

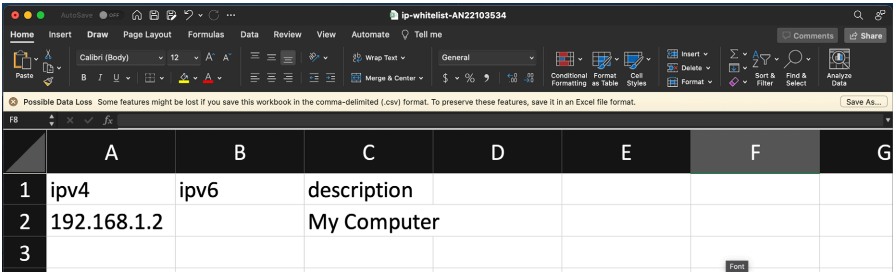
The AXM-WEB2 series supports the access control function, also known as the IP whitelist.

When enabled, only select IP addresses can access the meter's web interface. Users can enter in an IPv4 or IPv6 address along with a description for the address. A maximum of twenty IP addresses that can be added to the IP Whitelist.



Users can import the IP whitelist or export an existing IP whitelist.

Click "Choose File" to import a whitelist, it should be a CSV file as shown in the image below.



To export the IP whitelist, simply add the IP addresses and click “Export”. A CSV file will be downloaded automatically.

6.5 Email

The AXM-WEB2 series supports the SMTP protocol to set up the email function to enable the meter to send emails based at specific time intervals or whenever there is an alarm or SOE event or a combination of both. The Email configuration page can be accessed by clicking on the 'Email' navigation tab on the settings page. Users must know the SMTP server provider and other details regarding their SMTP server This information can be provided by the organization’sIT personnel.

There are three modes available for sending emails that the user can enable.

Triggered Sending: Emails are sent immediately when there is a new alarm, SOE, or waveform event.

Timed Sending: Emails are sent at regular time periods based on the time interval configured. The email will include the data that is selected to be sent.

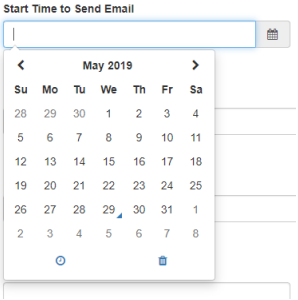
Triggered Sending and Timed Sending: This mode is when both of the above modes are enabled.

To use this function, the following settings need to be configured:

SMTP Enabled: Select 'Enable' to allow SMTP functionality and to further configure the settings.

Start Time to Send Email: Select the date and time for when the emails should begin to send.

- Click on the calendar icon to configure the time and date.
- Click on the trash icon in the bottom right to clear the time and date.



SMTP Server: Enter the URL of a valid SMTP server. I.e. mail.accuenergy.com or smtp.gmail.com

SMTP Port: Enter the port number associated with the SMTP server.

SMTP From: Enter a name or phrase which will appear to let you know who the mail is from. I.e. 'Technical Support'

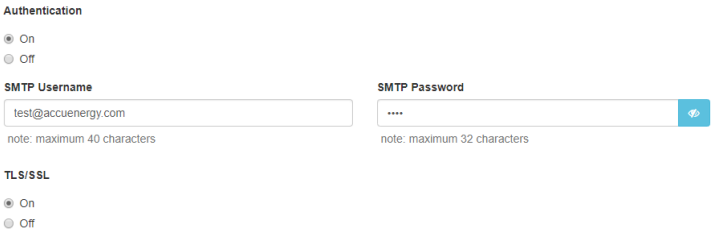
SMTP Subject: Enter a subject line for the email

Authentication: Users can have email authentication set to On or Off. If authentication is set to On users will need to provide the SMTP username and password.

SMTP Username: Enter the SMTP username for the SMTP server set above.

SMTP Password: Enter the SMTP user password for the username set above.

TLS/SSL: Users have the option to send emails using TLS/SSL communication protocol

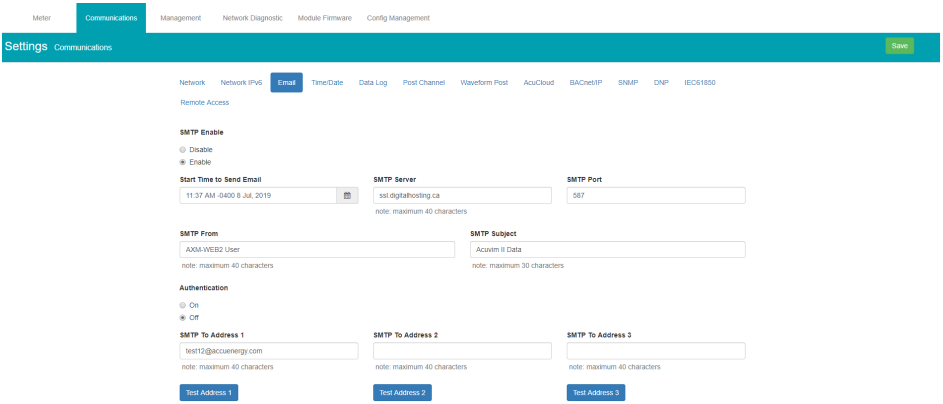


SMTP To Address 1;2;3: Enter up to three recipients that you wish to have the email sent to in 'SMTP To Address 1', 'SMTP To Address 2' and 'SMTP To Address 3'.

Test Address 1,2,3: Test if the email can be sent to 'SMTP To Address 1', 'SMTP To Address 2', 'SMTP To Address 3'.

NOTE: *If the test address function fails, users can view the email post failure by clicking on the 'Details' option from the test post screen.*

After configuring the above settings, the next step is to select the content for the emails.



The content of the emails can either be time-based triggers or event-based triggers.

For receiving emails on a time-based, under Enable Periodic Email Reporting:

Enter a time between 5 to 1440 minutes in the Set time interval.

Check off the box beside the parameters to include information in the email users will receive.

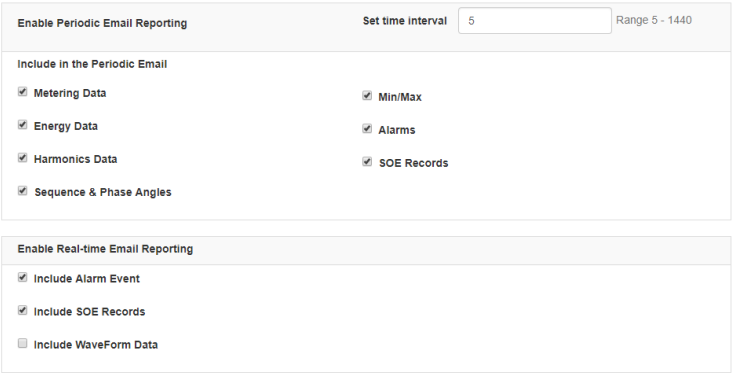
- **Metering Data:** Report on Real-time voltage, current, power etc.
- **Energy Data:** Report on energy parameters.
- **Harmonics Data:** Report on the voltage and current harmonics from 2nd to 63rd.
- **Sequence & Phase Angles:** Report on the positive, negative and zero components of the voltage and current waveform.
- **Min/Max:** Report on the maximum and minimum statistics that the meter has recorded since the lifetime of the meter or from the last reset of the min/max statistics.
- **Alarm:** Report of the alarm log.
- **SOE Record:** Report of the SOE log.
- **Waveform:** Report of the waveform log.

The user will receive an email with CSV file attachment.

For receiving emails on an event-based, select either Alarm Event, SOE Record or Waveform Data under the Enable Real-time Email Reporting.

NOTE: *Waveform Data is only available for Acuvim IIW model.*

The user will receive an email with CSV file attachment corresponding to the triggered event selected.



6.6 Time/Date

The device clock of the Acuvim II and Acuvim-L series meter can be set through the web interface of the AXM-WEB2 series module. The AXM-WEB2 series module supports the NTP (Network Time Protocol) protocol and PTP so that the module can update the meter's device clock by synchronizing with a time server.

The settings for the time and date can be found by clicking on the 'Settings' and selecting the 'Communications' tab. Users can select 'Time/Date' to configure the time settings.

NTP:

Under the NTP mode, the module can sync with up to three time servers. If a time server is down, the module will attempt to synchronize with the second or third time server if they are configured.

The following must be configured to set the time/date and NTP settings:

NTP Enabled: Select enable to further configure the settings related to the NTP (Network Time Protocol) function.

Device Clock: Configure the date and time on the meter.

- Click on the calendar icon to configure the time and date.
- Click on the trash icon in the bottom right to clear the time and date.

Sync Time: Click on Force Update to have the AXM-WEB2 series module sync its time with the NTP server

NTP Type: Select the NTP type from NTP or SNTP. SNTP should be selected when using the IEC 61850 protocol.

NTP Server 1;2;3: Enter up to 3 NTP servers in the "NTP Server 1", "NTP Server 2" and "NTP Ser

0.us.pool.ntp.org

1.us.pool.ntp.org

2.us.pool.ntp.org

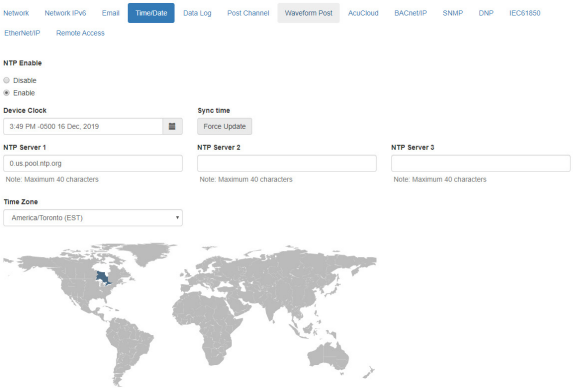
3.us.pool.ntp.org

For more NTP servers based on region, visit the following site:

http://www.pool.ntp.org/en/

Time Zone: Select the meter's current time zone or a different time zone for the meter's time to be synchronized to from the drop-down list. The time zone can also be selected by clicking on the region in the map.

Click the 'Save' button after configuring the time settings. Users will be prompted to reboot the AXM-WEB2 series module immediately or at a later time. If later is chosen the AXM-WEB2 series module must be rebooted from the 'Management' page in order for the settings to take effect.



PTP: PTP (Precision Time Protocol) is a protocol used for synchronizing time between network devices. The following must be configured to set the time/date and PTP settings:

PTP Enabled: Select enable to further configure the settings related to the NTP (Network Time Protocol) function.

Interface Selection: Start by selecting the interface to be used for PTP time synchronization on your device.

Domain Configuration: In PTP, a "domain" is a group of network devices that synchronize time within the same time domain.

Delay Measurement Mode:

- **Two-Step (End-to-End) Delay Measurement Mode:** In the two-step delay measurement mode, the delay measurement process occurs in two steps: request and response. The master clock sends a timestamped sync message (request) to the slave clock, and the slave clock responds with a timestamped follow-up message. By measuring the time between these two events, the PTP protocol calculates the one-way delay between the master and slave clocks and adjusts the slave's clock accordingly.
- **One-Step (Point-to-Point) Delay Measurement Mode:** In the one-step delay measurement mode, the delay measurement process occurs in a single step. The master clock sends a timestamped sync message, and the slave clock responds with a timestamped delay request-response in a single message. This approach measures the round-trip delay between the master and slave clocks.

6.7 Data Log

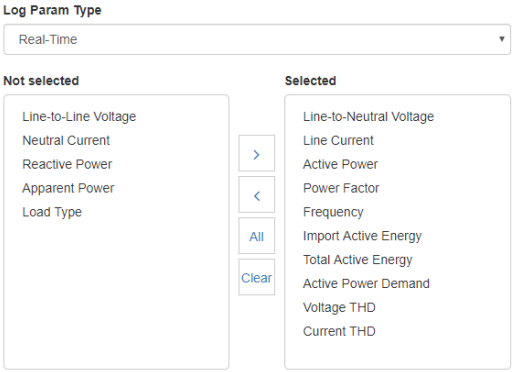
The AXM-WEB2 series module supports logging data onto its on-board memory, which has a capacity of 8GB. The module supports three loggers for different parameters and requirements. The data can be downloaded as a CSV file from the data log page in the logs section or by using a HTTP/FTP client.

Logger Enable: To use the data log function to log the data onto the module, select 'Enable' to view and configure the settings that are applicable.

Post Channel: Select the channel to push the data log. Only an enabled post channel can be selected here. A post channel can be enabled in the 'Post Channel' tab on the settings page.

Log Param Type: Users can select the type of parameters they wish to log into logger.

Users can click the › button to add selected parameters into the data log and use the ‹ button to remove selected parameters from the data log. Users can also use the All or Clear buttons to add all parameters or clear all parametersfrom the data log. The supported parameter types include real-time readings, energy readings, demand readings, power quality readings and I/O readings.



Log Param Type Detail: This setting allows users to modify what values they see in the data log.

Users can select the following parameter details:

- Instantaneous
- Minimum
- Maximum
- Average

Only the 'Real-time' and 'Demand' parameters support the minimum, maximum and average

parameter type details. All other parameter types such as Energy, Power Quality, and IO only support the instantaneous values displayed in the data log.

The image below describes how these parameter details function in the data log. The image of the CSV file below depicts a sample of a data log where the data is logged every 5-minutes. The first few columns are highlighted showing the Phase A Line-Neutral voltage.

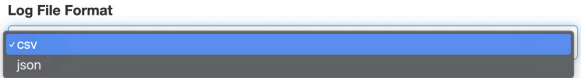
- Column B highlighted in yellow shows the instantaneous value for Phase A voltage at every 5-minute interval.
- Column C highlighted in green shows the minimum value for Phase A voltage between each 5-minute interval.
- Column D highlighted in red shows the maximum value for Phase A voltage between each 5-minute interval.
- Column E highlighted in orange shows the average value for Phase A between each 5-minute interval.

A1 Time

	A	B	C	D	E	F	G	H	I	J	K	L
1	Time	V1	V1_MIN	V1_MAX	V1_AVG	V2	V2_MIN	V2_MAX	V2_AVG	V3	V3_MIN	V3_MAX
2	2019-06-20 9:55	120.067	120.067	120.077	120.0714667	120.084	120.078	120.087	120.084	120.091	120.09	120.096
3	2019-06-20 10:00	120.072	120.032	120.076	120.0728667	120.079	120.077	120.087	120.081	120.091	120.09	120.094
4	2019-06-20 10:05	120.068	120.01	120.076	120.0720667	120.084	120.08	120.086	120.083	120.093	120.091	120.094
5	2019-06-20 10:10	120.073	120.065	120.073	120.0707143	120.083	120.079	120.088	120.083	120.092	120.091	120.094
6												
7												
8												
9												
10												

Log File Format: Users can select the log file format at either JSON or CSV.

NOTE: *JSON format is only supported via HTTP/FTP/MQTT posting and is not supported when logging data locally to the module memory. Only CSV file format is supported for local log files.*



Timestamp Format: Select the format of the timestamp for the data that is logged. The format for the timestamp can be based on the Local Time (not available for JSON format), UTC Seconds or based on ISO8601 Format.

Log File Name Format: Select the format of the log file name for the data that is logged. The format for the log file name can be based on the UTC timestamp or based on Time Interval Format.

Log Interval: Select how frequently the meter will log data to the file that will be uploaded to the server from the drop-down list. The logging interval can be from one second to one month. The minimum time interval option is according to the selected parameter.

- The Real-time & IO's minimum Log Interval is 1-second
- The Energy's minimum Log Interval is 15-seconds
- The Demand & Power Quality's minimum Log Interval is 1-minute

NOTE: *If selected parameters are Real-time and I/O, the minimum log interval is one second. If selected parameters are Real-time and Energy, the minimum log interval is 15-second.*

Post File Length: Select how frequently the log file will be uploaded to the HTTP/FTP server. From the drop-down list the log file length can be from one minute to one month.

Log File Name Prefix: Provide a name for the log file posted to the post channel, The name will prefix the beginning of the log file if "Time Interval Format" is selected as the Post File Name Format. By default, "logger1" will be appended at the beginning of the log file.

Local Log File Length: Select the length of the local log file as 1 hour, 1 day, 7 days or 1 month of data from the drop-down list. The log file will appear at the end of the log file length interval, for example if set for 1-day users will not see the local logs until the next day at 12AM. See the table below for more details.

Local Long File Length	Date Configured	Date log file will appear in module
1 hour	November 11th 2020 at 1:00PM	November 11th 2020 at 2PM
1 day	November 11th 2020 at 1PM	November 12th 2020 at 12AM
7 days	November 11th 2020 at 1PM	November 18th 2020 at 12AM
1 month	November 11th 2020 at 1PM	December 11th 2020 at 12AM

Local Log File Name Prefix: Provide a name for the local log file which will prefix the beginning of the log file if "Time Interval Format" is selected as the Post File Name Format. By default, "logger1" will be appended to the beginning of the log file.

NOTE: *The Post File Length and Local Log File Length must be less than or equal to the log interval selected.*

SFTP Enable: To download the logged data from the module using an FTP client, select Enable. The log file will then be available to be downloaded using an FTP client using the following credentials:

Host: sftp://IPaddressofthemeter

Username: sftpuser

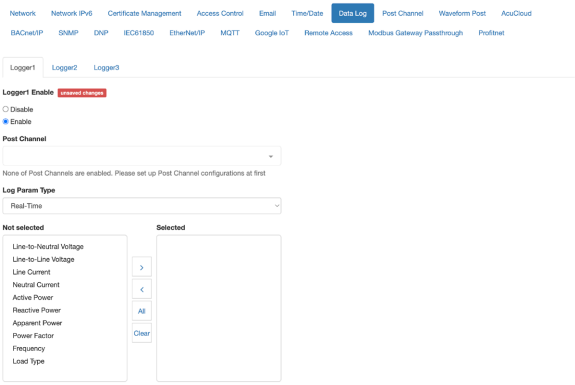
SFTP Password: accuenergy

Port: 22

The default password for retrieving the backup log files is **accuenergy.** The user can configure any password or can reset to the default to **accuenergy** by clicking on the "Reset SFTP Password".

NOTE: *After enabling the SFTP function the user must reboot the communication module to access the data logs with the default password of 'accuenergy'.*

Click the 'Save' button after modifying any settings. Users will be prompted to reboot the AXM-WEB2 series module immediately or at a later time. If later is chosen the AXM-WEB2 series module must be rebooted from the 'Management' page for the changes to take effect.



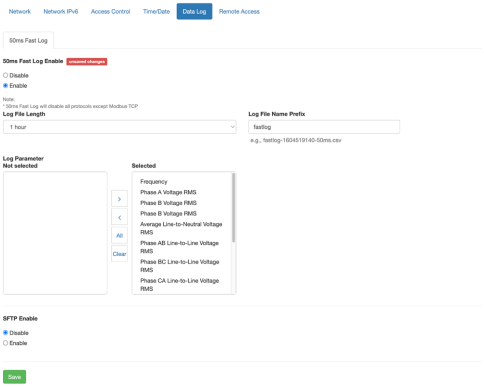
6.7.1 50ms Fast Log

There is a 50ms fast logger supported on the AXM-WEB2 series module, this logger allows users to log Frequency and active power data at 50ms. No other parameters besides these two are supported on the 50ms logger.

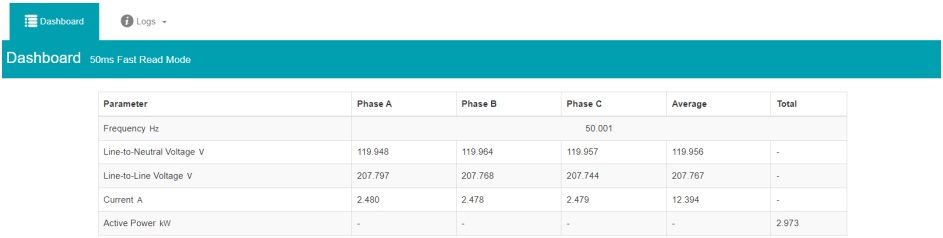
NOTE: *The 50ms fast logger is only supported on Acuvim II meters with firmware version 4.12 and higher. To use the fast logger mode, the baud rate 2 setting in the meter is required to be 115200.*

Users can configure the log file length and log file name prefix for the fast logger. Once enabled, all other protocols supported on the AXM-WEB2 series modules are disabled except for Modbus TCP. Users will still have access to the meters network settings, however all other protocol related

settings such as BACnet and MQTT are disabled when the fast logger is enabled.

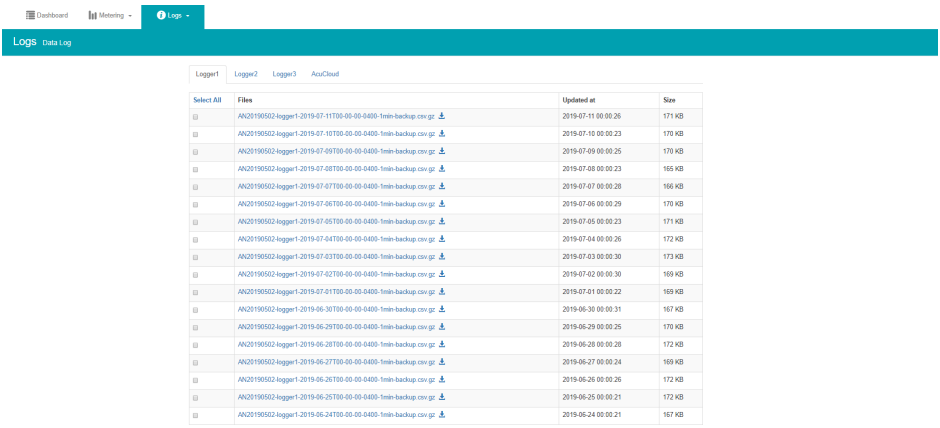


After all settings have been saved and the module is rebooted from the web interface, the AXM-WEB2 series module will be in Fast Log Mode. When logging into the web interface during fast log mode, users will observe that the dashboard will only display frequency and total active power.



Parameter	Phase A	Phase B	Phase C	Average	Total
Frequency Hz			50.001		
Line-to-Neutral Voltage V	119.948	119.964	119.957	119.956	-
Line-to-Line Voltage V	207.797	207.768	207.744	207.767	-
Current A	2.480	2.478	2.479	12.394	-
Active Power kW	-	-	-	-	2.973

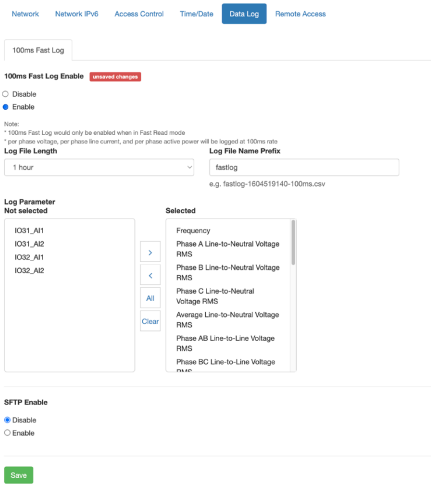
The fast log files can be downloaded under the log's menu.



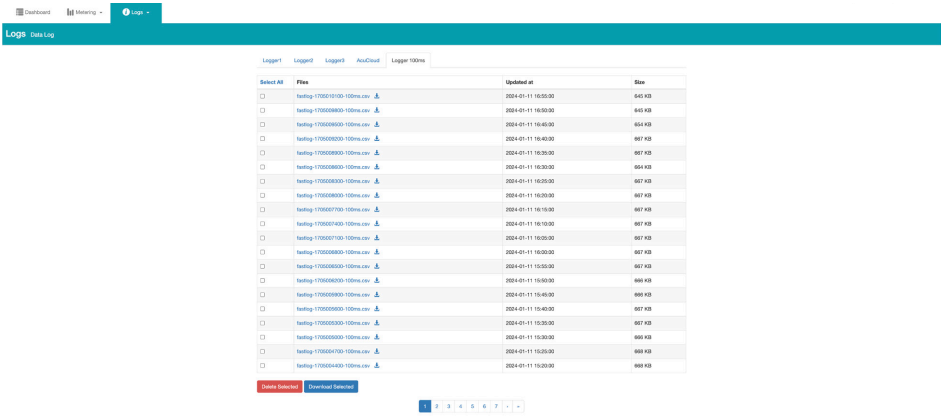
6.7.2 100ms Fast Log

When the meter is in Fast Read mode users can enable the 100ms Fast Log on the AXM-WEB2 series module. This logger allows users to log real time data such as voltage, current, and power at 100ms intervals.

NOTE: *This can only be enabled if the meter is in Fast Read mode, the 100ms logger cannot be enabled during normal mode.*



The data log files for the 100ms logger can be downloaded under the log's menu.



6.8 Post Channel

The AXM-WEB2 series module supports the HTTP, FTP and SFTP Post functions to send data from the meter to a HTTP/ FTP/SFTP server. The AXM-WEB2 series can post .csv/.json files to three different HTTP, FTP or SFTP servers using HTTP, FTP or SFTP Post.

In the case when there is no connection to the server, the AXM-WEB2 series will store the posts and send it out after the connection is restored. The module can store up to 3GB of cache post files. The Clear Post Channel Logs button will allow users to clear the buffered files on meter.

NOTE: *If the disk usage exceeds 85%, the module will begin to delete some older backup/post cached files.*

The AXM-WEB2 series can post data to a server at intervals of time ranging from one minute to one month.

The settings for configuring the post channels to post the data can be found by clicking on 'Settings' navigation tab and then selecting 'Communications' menu tab. Click "Post Channels" to configure any of the three post channels.

Post Channel 1/2/3 Enable: Enable the Post Channel 1 to configure the settings needed to post data via the HTTP(S)/FTP/SFTP post functions.

Post Method: Select the method for posting the files, the user can choose HTTP/HTTPS /FTP/ SFTP.

Post Name Fixed: This configuration needs to be enabled for the user to control the name of the file that will be posted. Otherwise, file name will be based on the Log File Name Format configuration from the Data Log settings.

Post File Name: Users can enter a name for the file that will be posted as if 'Post Name Fixed' is enabled.

If the HTTP/HTTPs post method is selected:

Need Authorization: If the HTTP server requires some sort of password/authorization to send files users can enter that under the token field.

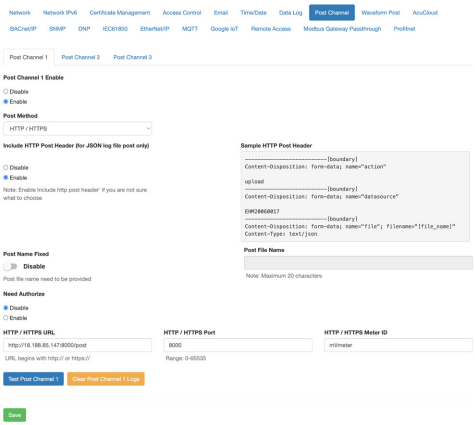
Default Authorization: Requires a password/token to be entered for the server.

Basic Authentication: Requires a username and password for the server.

HTTP/HTTPS URL: Enter the URL for the HTTP/HTTPS server. The URL needs to begin with the prefix http:// or (https://).

HTTP/HTTPS Port: Enter the port number the server will be listening on.

HTTP/HTTPS Meter ID: Enter a name or description for the meter to be identified on the server.



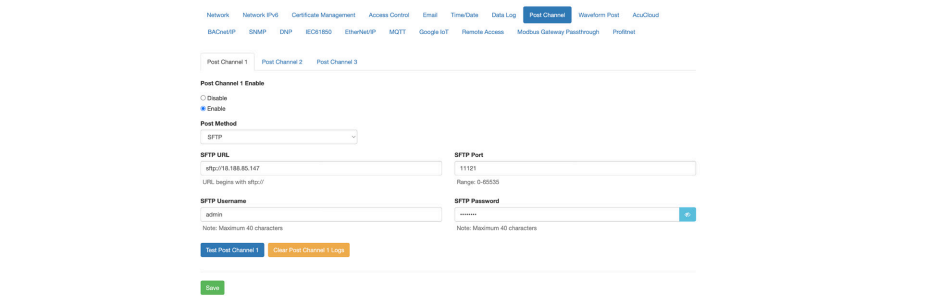
If the FTP post method is selected:

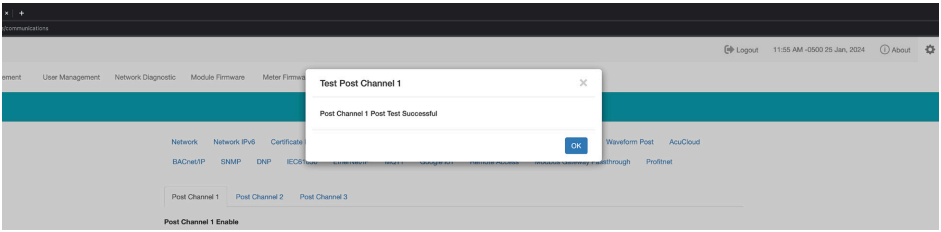
FTP URL: Enter the URL for the FTP server. The URL needs to begin with the prefix ftp://.

FTP Port: Enter the port number the server will be listening on.

FTP Username: Enter the username required to log into the FTP server.

FTP Password: Enter the password required to log into the FTP server.





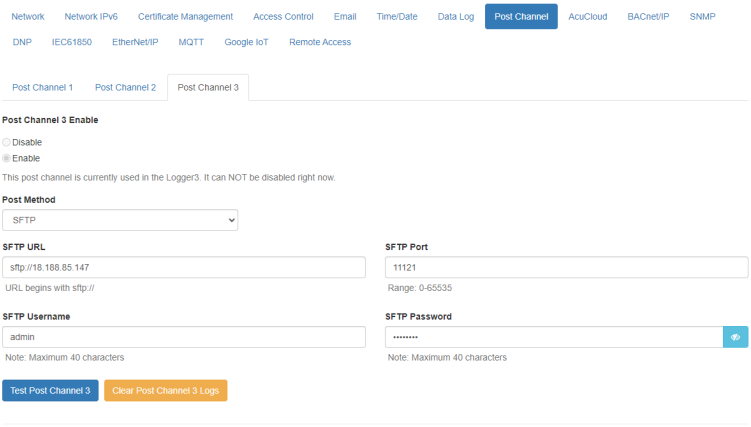
If the SFTP post method is selected:

SFTP URL: Enter the URL for the SFTP server. The URL needs to begin with the prefix sftp://.

SFTP Port: Enter the port number the server will be listening on.

SFTP Username: Enter the username required to log into the SFTP server.

SFTP Password: Enter the password required to log into the SFTP server.



Click the 'Save' button after changing any settings. Users will be prompted to reboot the AXM-WEB2 series module immediately or at a later time. If later is chosen the AXM-WEB2 series module must be rebooted from the 'Management' page for the settings to take effect.

The Test Post button can be used to test the connection to the server. This should only be used after saving the HTTP/FTP/SFTP post settings, otherwise a failed message will appear. If a failed messaged is observed the "test post details" will provide users with a description of why the test failed.

When the AXM-WEB2 series module is disconnected from the internet, data logs will be stored locally on the AXM-WEB2 series module. Once the internet connection is restored, the AXM-WEB2 series module will automatically transmit these data logs to the target server and clear the local cache. Alternatively, users have the option to manually clear the cache by clicking the **'Clear Post Channel Logs'** button.

6.9 Waveform Post

The AXM-WEB2 series supports a waveform post function that allows users to send waveform data to a HTTP/FTP server. The AXM-WEB2 series will send Comtrade (.cfg and .dat) files to either a HTTP or FTP whenever a power quality event has occurred. The settings for the Waveform Post can be found by clicking on the 'Settings' tab and selecting 'Communications', from the Communications page click on the 'Waveform Post' tab.

NOTE: *This function is only available on Acuvim IIW models which support the Waveform Capture Function, all other models will not have this feature available.*

Waveform Post Enable: Select Enable to enable the waveform post and configure the settings further.

Scan Interval: Users can configure a scan interval where the AXM-WEB2 series module scans the Acuvim IIW meter to check whether there are any power quality events that occurred during the selected scan interval. For example, if the scan interval is set for 15-minutes the module will scan for all the power quality events that occurred within 15-minutes and post it to the server. The scan interval ranges from 15-seconds to one month.

File Name Prefix: Users can configure the file name prefix for the Comtrade file that is sent to the server.

Post Method: From the drop-down menu select either FTP or HTTP/HTTPs

NOTE: *The 'Test Waveform Post' button should only be utilized after clicking the 'Save' button otherwise a failed response will be observed. If the test post fails users can view the test post details by clicking on the 'Details' option from the test post screen.*

Like the Post Channel function discussed earlier, in the case when there is no connection to the server the AXM-WEB2 series will store the posts and send it out after the connection is restored. A maximum of 3000 files will be buffered on the module. The 'Clear Waveform Post Channel Logs' button will allow users to clear the buffered waveform files on the meter.

There is no interval setting for sending the waveform data using the waveform post, the data will post directly to the FTP/HTTP server when a power quality event has occurred.

6.10 AcuCloud

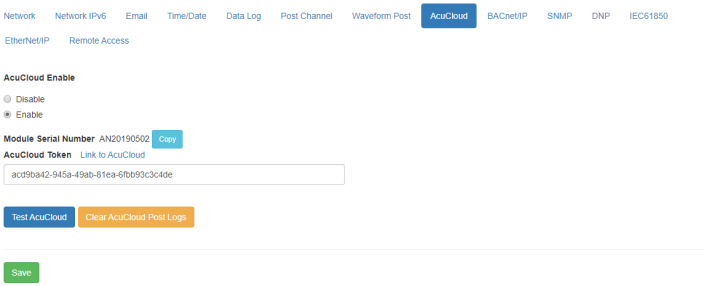
The AXM-WEB2 series module can directly interface with the Accuenergy cloud-based Energy Management software AcuCloud. The AXM-WEB2 series will post data to AcuCloud every five minutes.

AcuCloud will require the serial number of the AXM-WEB2 series module which will then provide a token that will be used to configure the AXM-WEB2 series so it can send its data to AcuCloud.

The settings for the AcuCloud post function can be found by clicking on the 'Settings' menu tab and selecting 'Communications'. Select 'AcuCloud' to access the settings to configure the AXM-WEB2 series to send data to the cloud.

AcuCloud Enable: Select 'Enable' to enable the function and to further configure the settings related to AcuCloud.

AcuCloud Token: Copy the token provided by the AcuCloud software and paste into this field.



NOTE: *The "TEST AcuCloud" button should only be utilized after clicking the 'Save' button otherwise a failure response will be observed. If a failed response occurs after clicking 'Save', please double check the serial number entered in AcuCloud, the token entered in the web page as well as viewing the test post details by clicking on the 'Details' option.*

Users can use the 'Link to AcuCloud' to access AcuCloud software and configure the required settings on that platform. Users must have sufficient access to add devices on their account to correctly configure the meter on the software. For inquiries on creating your AcuCloud account please contact Accuenergy Technical Support.

Click the 'Save' button after changing any settings. Users will be prompted to reboot the AXM-WEB2 series immediately or at a later time. If later is chosen the AXM-WEB2 series must be rebooted from the 'Management' page for the settings to take effect.

The AXM-WEB2 series will post the data continuously every five minutes to AcuCloud after the reboot.

6.11 BACnet/IP

The AXM-WEB2 series module supports the BACnet/IP protocol. The settings for the BACnet/IP protocol can be found on the web by clicking on the 'Settings' tab and selecting 'Communications'. Once on the communications page select "BACnet/IP" to access the settings to configure the AXM-WEB2 series module to communicate with a BACnet client.

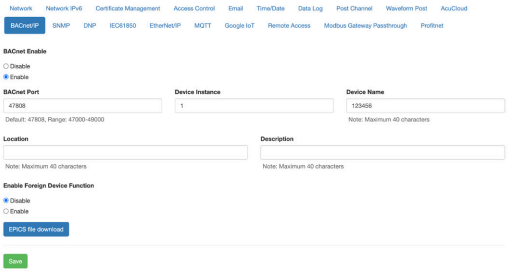
BACnet Enabled: Select Enable to enable the BACnet protocol.

BACnet Port: Enter the BACnet or UDP port number. Default port is 47808.

Device Instance: Enter the instance number for the device in the BACnet system. It must be

unique within the system.

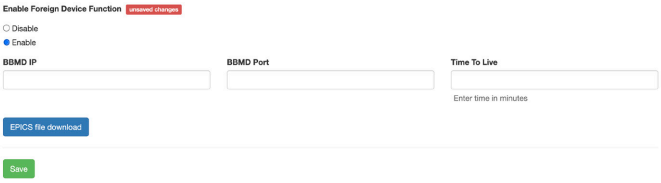
Device Name: Enter a name for the device to distinguish it from other devices within the network.



Under the "Enable Foreign Device Function", select 'Enable' to communicate with a BACnet device from another subnet.

- Enter the IP of the BACnet Broadcast Management Device(BBMD) under the 'BBMD IP' field for the device which will receive broadcast messages on one subnet and forward them to another subnet.
- Enter BACnet Port of the BBMD in "BBMD Port"
- Enter a value between 5 to 1440 min in the "Time To Live" for how often the foreign device will register in the BBMD's foreign device table.

Click the 'Save' button after changing any settings. Users will be prompted to reboot the AXM-WEB2 series immediately or later. If later is chosen the AXM-WEB2 must be rebooted from the 'Management' page in order for the settings to take effect.



6.12 SNMP

The AXM-WEB2 series module supports the Simple Network Management Protocol (SNMP) protocol for reporting the metering data to the management station. The AXM-WEB2 series uses a public community string for read-only access. By default, the module will communicate using

SNMP port 161. The AXM-WEB2 series also supports 'traps' to send unsolicited messages to up to four management stations.

The settings for the SNMP protocol can be found by clicking on the 'Settings' navigation tab and selecting 'Communications'. From the communications page select the 'SNMP' tab to access the settings to configure the AXM-WEB2 series for communication with a SNMP management station.

SNMP Enable: Select 'Enable' to enable the function and to further configure the settings related to the SNMP protocol.

SNMP Version: Users can select the SNMP version, the AXM-WEB2 series module supports SNMPv2c and SNMPv3.

SNMP Port: The default SNMP Port is configured to 161. The SNMP Port can be any value from ranging from 16100 to 16199.

Read Only Community: The default community string is Public, this configuration is like a password which allows only authorized users to access the meters data.

Trap Enable: Select 'Enable' so that the meter will send a message to the management station when an event is triggered. The event could be a change in Digital Input Status. The notification can then be sent to up to four stations.

Trap Target 1: Enter the IP address and port number of station number 1 that should be notified when there is an event.

Trap Target 2: Enter the IP address and port number of station number 2 that should be notified when there is an event.

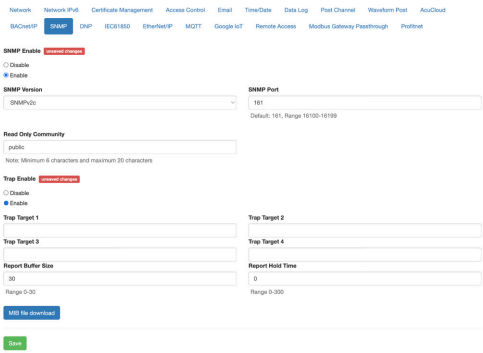
Trap Target 3: Enter the IP address and port number of station number 3 that should be notified when there is an event.

Trap Target 4: Enter the IP address and port number of station number 4 that should be notified when there is an event.

Report Buffer Size: Enter the size of the buffer for the number of notifications will be stored before being sent to the management station. A maximum of thirty notifications can be stored.

Report Hold Time: Enter the time in seconds for how long the notification will be in queue before it gets sent to the management station. The default setting is configured to 0 so the notification will be sent immediately after an event occurs. This setting could be configured from 0 to 30 seconds.

Click the 'Save' button after changing any settings. Users will be prompted to reboot the AXM-WEB2 series immediately or later. If later is chosen the AXM-WEB2 series must be rebooted from the 'Management' page for the settings to take effect.



6.13 DNP

The AXM-WEB2 series supports the DNP communications protocol. The Distributed Network Protocol (DNP) is an open protocol used in the electric utility industry for communication and interoperability among substation computers, Remote Terminal Units (RTUs), Intelligent Electronic Devices (e.g. meters), and master stations.

The settings for the DNP protocol can be found by clicking on the 'Settings' navigation tab and selecting 'Communications'. Select 'DNP' to access the settings to configure the AXM-WEB2 series to communicate with a DNP master.

DNP Enable: Select 'Enable' to enable the function and to further configure the settings related to the DNP function.

TCP/IP Mode: the default TCP/IP is set as TCP&UDP, it can be changed to TCP dual endpoint mode or UDP only.

Local TCP Port: Enter the port number for the local TCP server.

Local UDP Port: Enter the port number for the local UDP server.

Destination IP Address: The default IP address is set as *.*.*. * to allow all incoming requests.

Dual Endpoint IP Port: Enter the port number for the endpoint IP server.

Destination UDP Port for Initial Unsolicited Null Responses: Enter the port number of the destination UDP server for the initial unsolicited null responses.

Destination UDP Port for Response: Enter the port number of the destination UDP server for response.

Link Address: Enter the address number of the slave device.

Master Link Address: Enter the address number of the master device.

Source Address Validation: By default, the validation is disabled, select 'Enable' to enable the destination address validation.

Supports Unsolicited Reporting: Select 'Enable' to enable the function and further configure the settings related to the unsolicited report.

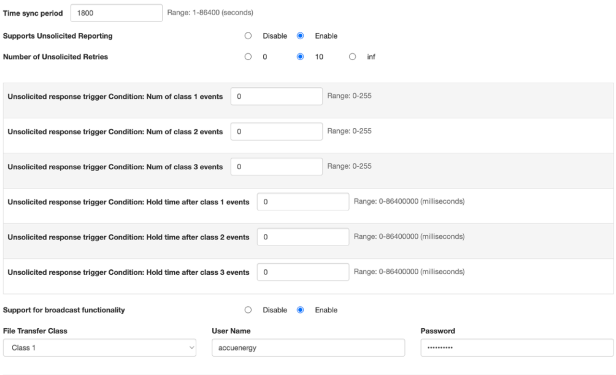
Number of Unsolicited Retries: Number of retries can be selected as '0', '10' and 'infinite'.

Unsolicited Response Trigger Condition (Num of Class # Events): Enter the number of events for each class to setup the trigger point. The unsolicited response will be triggered once the number the class events reach the configured triggering number. The range is from 0 to 255.

Unsolicited Response Trigger Condition (Hold Time After Class # Events): Enter the threshold holding time for each class, the unsolicited response will be triggered once the event holding time is longer or equal to the threshold time. The range is from 0 to 86400000 milliseconds.

Support for Broadcast Functionality: In DNP there three broadcasting addresses that are supported. Enabling this setting would allow the module to respond to requests (from the client) sending them to the broadcasting addresses.

File Transfer: The DNP function in the AXM-WEB2 series allows for file transfer, where users can send and transfer data. This transfer requires a username and password which is user configurable, the default username/password is **accuenergy**.



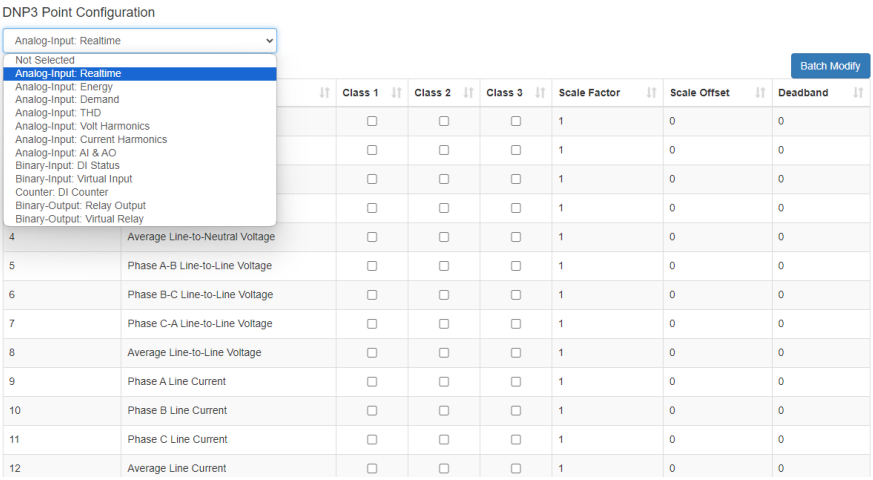
DNP3 Point Configuration

Users can assign certain parameters to either class 1, class 2, or class 3.

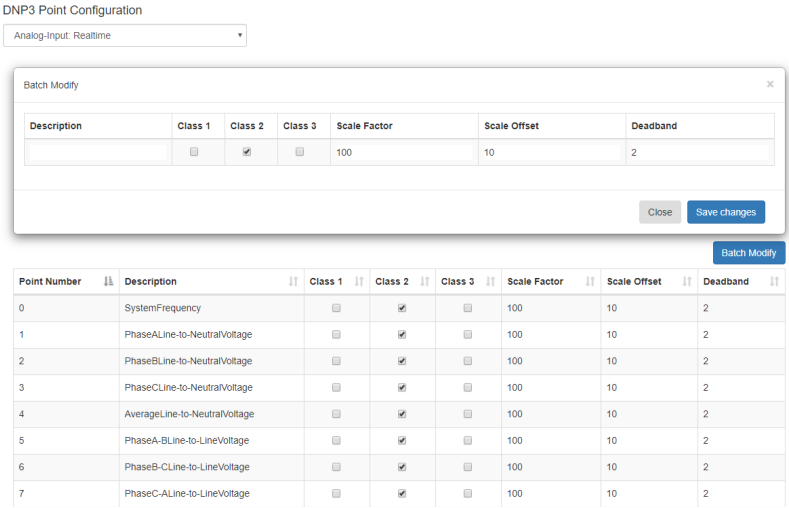
The scale factor is a multiplier that can be applied to a certain parameter when viewing the readings.

An offset can be applied to the reading.

The dead band can be set for each parameter, where if the value of the parameter exceeds the dead band value a DNP event will occur.



The 'Batch Modify' button can be used to apply certain settings to all parameters instead of individually configuring each point. Once the configuration in the Batch Modify is complete click the 'save changes' button.



After all DNP settings are complete, click on the 'Save' button. Users will be prompted to reboot the AXM-WEB2 series immediately or at a later time. If later is chosen the AXM-WEB2 series must be rebooted from the 'Management' page for the settings to take effect.

6.14 IEC 61850

The AXM-WEB2 series supports IEC 61850 which is a standard for Ethernet communication among IEDs (intelligent Electronic Devices) in substations.

The settings for IEC 61850 can be found by clicking on the 'Settings' navigation tab and selecting 'Communications'. Select 'IEC61850' to access the settings to configure the AXM-WEB2 series to communicate using the standard.

IEC61850 Enable: Select 'Enable' to enable the function and to further configure the settings related to the IEC61850 function.

IEC61850 Port: The default IEC 61850 Port is configured to 102. The IEC 61850 Port can be any value from 10200 to 10299.

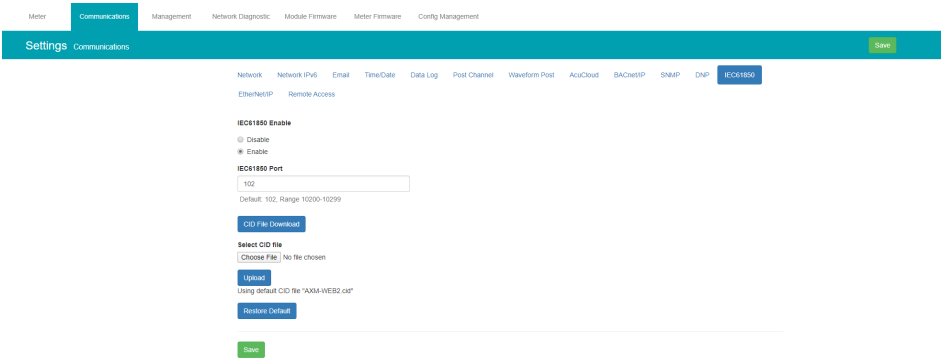
CID File: The CID file is the configuration file that holds the meter settings pertaining to the IEC

61850 standard. This file can be downloaded from this page and altered by the user to meet their requirements.

Select CID File: Users can upload their own CID configuration file by selecting 'Choose File' and then selecting 'Upload' once the correct file is chosen.

Restore to Default: At any point the user can divert back to the original CID file by selecting this button.

Users can download the CID file for the module, where both Edition 1 and Edition 2 of the protocol is supported. Either edition CID file can be downloaded from the web interface.



NOTE: *CID file in v1.13 and lower are not compatible with firmware v1.14 and higher. If communicating with the meter using IEC 61850 protocol and then update to firmware v1.14 or higher, users will need to restore to default to use the compatible CID file.*

Once all settings are entered in correctly click on the 'Save' button and reboot the communications module. If the user decides to reboot the module later, users will have to perform the reboot manually from the 'Management' page for the settings to take effect.

6.15 EtherNet/IP

The AXM-WEB2 series module supports the EtherNet/IP protocol which is an industrial based network protocol that uses standard Ethernet and TCP/IP technology.

EtherNet/IP Enable: Select Enable to enable the EtherNet/IP protocol.

EtherNet/IP Explicit Exchanges Port: Users can configure the EtherNet/IP port, the default port

is 44818 and the port number ranges from 44800 to 44899.

EtherNet/IP Implicit Exchange Interface: Users can only select Ethernet 1 for EtherNet/IP communication. Ethernet 2 is not supported.

6.16 MQTT

The AXM-WEB2 series supports the MQTT protocol where the meter can publish device data to a subscriber using an MQTT broker. The MQTT broker is a central server where all MQTT clients would connect to. The broker/server manages all message topics and updates new messages to all clients that are subscribed to a particular topic (Acuvim II or Acuvim-L). All related MQTT settings can be configured in the MQTT page under the Communications tab.

6.16.1 MQTT General Settings

Under the General tab in the MQTT page, users can enable the MQTT protocol and configure the broker settings.

Enable MQTT: Select Enable to use MQTT protocol.

Broker Address: Enter the broker address of the MQTT server.

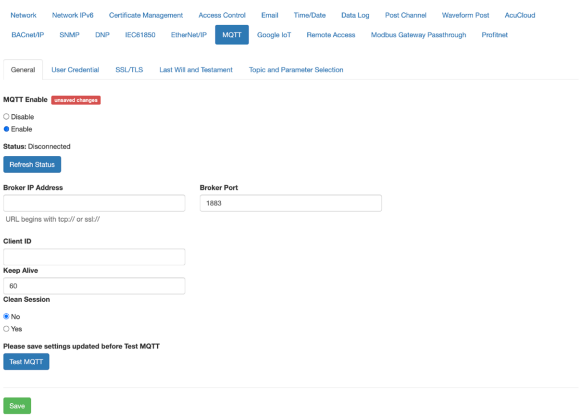
Broker Port: Enter the port number for the MQTT Broker.

Client ID: Enter the Client ID for the Acuvim II or Acuvim-L; must be a unique ID number.

Keep Alive: The client communicates a time interval in seconds to the broker, "Keep-Alive" is the maximum length of time in seconds that the broker and the client cannot communicate with each other.

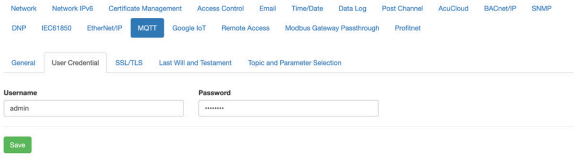
Clean Session: If selected as Yes, the session data is cleared all offline data is lost, if selected as No messages are queued are received up reconnection.

Once all settings are configured click the 'Save MQTT' button. The connection to the broker can be tested by using the Test MQTT button.



6.16.2 MQTT Authentication

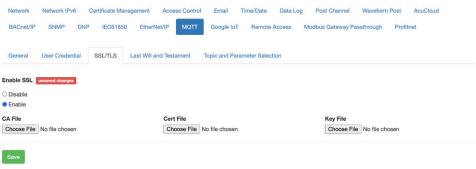
The **User Credential** tab allows users to configure a Username and Password authentication if the broker can support it.



6.16.3 MQTT Encryption

The **SSL/TLS** menu tab allows users to use the MQTT protocol with encryption.

In this page users will be able to upload the required certificate and key files.



6.16.4 Last Will & Testament

The AXM-WEB2 series supports Last Will and Testament messages via the MQTT protocol. These settings can be configured under the Last Will & Testament tab.

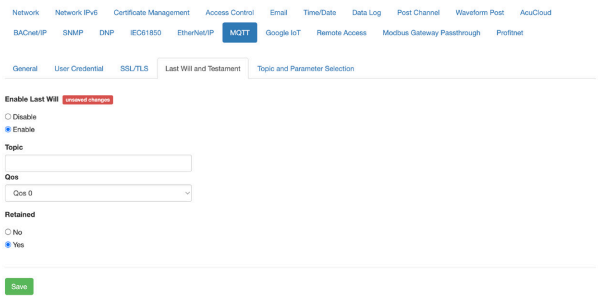
The last will and testament message is used to notify other clients regarding other disconnected clients. The message is an MQTT message that contains a topic, a QoS level and a payload.

Topic: Refers to the path used to access the MQTT message.

QoS: Stands for Quality of Service and refers to the reliability of the message delivery between the publisher and subscriber. There are three types of quality of service:

1. **QoS 0:** - The lowest level and is defined as “at most once” delivery. This level has the fastest message delivery, but the success rate of delivery is less reliable.
2. **QoS 1:** - Defined as “at least once” delivery. These types of messages are reliable and are guaranteed, however duplicate messages may be sent several times.
3. **QoS 2:** The highest level and is defined as “exactly once” delivery. These messages are more reliable and are guaranteed to be sent once without any duplicates. This type of messaging sends the most reliable message however it has a slower message delivery. Each client can optionally specify its own LWT message when it connects to a broker. The broker stores this message so that if the client disconnects abruptly, the broker will send the disconnected client’s LWT message to all the other clients that are subscribed to that last will message topic.

Retained: Users have the option to retain messages or not. If a client retains messages that was published to a specific topic, a second client that is subscribed to the same topic will be able to see the retained message.



6.16.5 Top and Parameter Selection

Under the Topic and Parameter Selection menu tab users can configure the sending interval and devices data they want to publish to the broker.

Topic: Users will enter in the Topic used to read all devices.

QoS: Users can configure the quality-of-service level, where Qos 0 is the lowest level and Qos 2 is the highest level.

Retained: Users have the option to retain messages or not. If a client retains messages that was published to a specific topic, a second client that is subscribed to the same topic will be able to see the retained message.

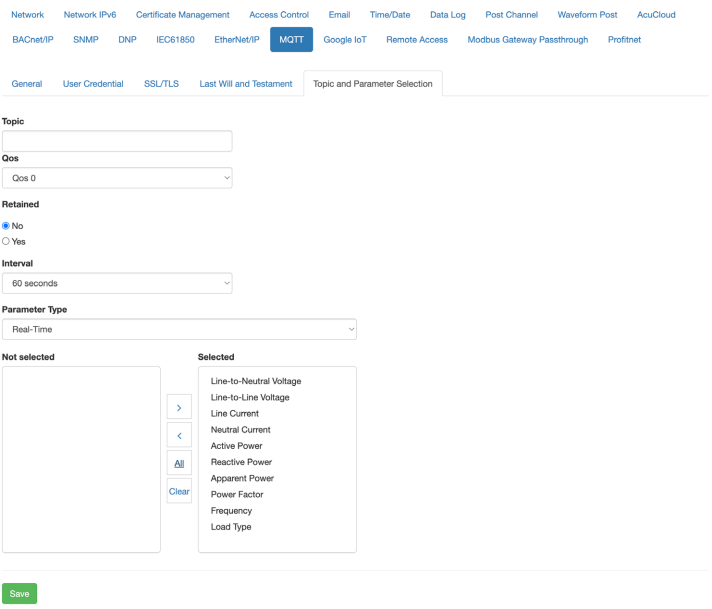
Interval: Users can select the publishing interval; the range is from 10 to 600 seconds.

Parameter Type: Users can select different parameter types, i.e Real Time, Energy, and Demand.

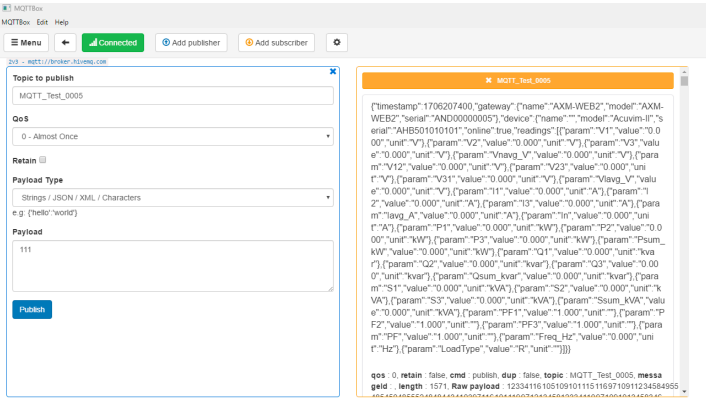
Parameter Selected/Not Selected: Users can click and select different parameters from the 'Not selected' panel and add them over to the 'Selected' panel using the right arrow button ›.

Users can use the left arrow button ‹ to remove parameters from the selected panel. The 'All' button All and 'Clear' button Clear are used to add all parameters or remove all parameters from the 'Selected' panel.

Once all settings are configured, click on the 'Save' button and reboot the device for the settings to be saved.



Once configured, on you can verify on your MQTT server if the data is being received. The data is received in JSON format.

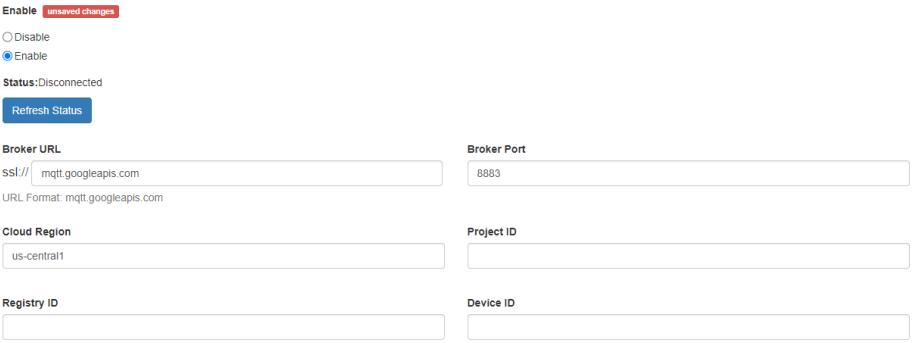


6.17 Google IoT

Google IoT functionality is a powerful platform provided by Google Cloud that enables seamless integration with the Acuvim II and,Acuvim-L family for the Google ecosystem.

Configuration Steps

Location: The Google IoT Page can be found at 'Communication' menu tab, under Settings navigation tab.



Key Configuration Parameters

Broker URL: This is the endpoint to which your device will connect to communicate with Google's IoT core. It typically looks like mqtt.googleapis.com.

Broker Port: The port number is used to establish the connection with the broker. For Google IoT, it's commonly set to 8883 for a secure MQTT communication.

Cloud Region: This parameter specifies the Google Cloud region where your IoT Core registry is located. Common regions include us-central1, europe-west1, and asia-east1.

Project ID: Your Google Cloud project ID is a unique identifier for your project. You need to associate your IoT device with this project.

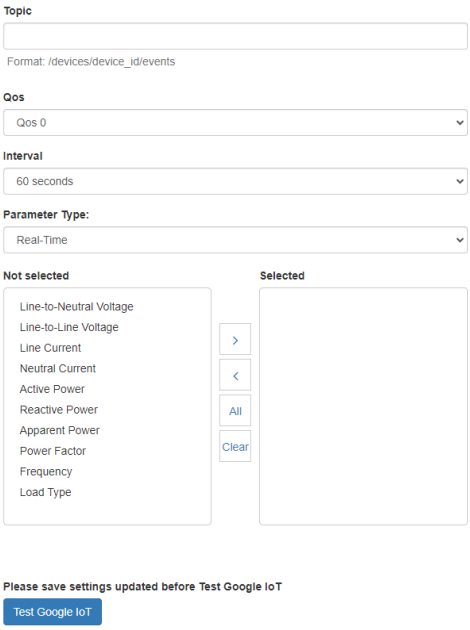
Registry ID: A registry is a logical container for your devices. You should create a registry within your project and provide its unique name.

Device ID: The device ID is a unique identifier for your individual IoT device. It should be

associated with a registry.

Google CA File: This file contains the certificate authority (CA) public key used to establish a secure connection with Google's IoT core. Ensure it is correctly configured on your device.

Private Key File: This file stores your device's private key for secure communication. Keep this file secure and configure it properly.



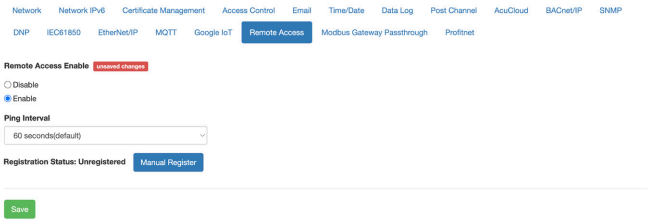
6.18 Remote Access

The AXM-WEB2 series has a remote access function. This will allow users to provide other users with remote access to the meter's web interface. Users will have full functionality and access to all meter readings and settings with this function enabled.

Remote Access Enable: Select 'Enable' to enable the function and allow for Remote Access.

Ping Interval: The ping interval for remote access refers to the frequency at which the remote server communicates with the AXM-WEB2 series module. This interval is essentially the time between each ping request, with a default value of 60-seconds. Additionally, there is an extra option allowing users to set a ping interval of 600-seconds if needed.

Current Status: Provides a status of the Remote Access indicating whether it is 'Registered' or 'Unregistered'.



Users can click on the 'Manual Register' button to register the remote access. The following page will be displayed.

NOTE: *The module must be rebooted for the remote access connection to work properly.*

Registration Status: Displays the status as 'Registered' or 'Unregistered'

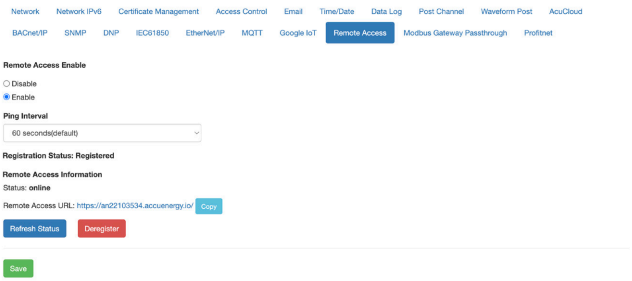
Remote Access Information: Lets users know if the remote access status is online or offline.

Remote Access URL: The URL used to access the meters web server remotely. This URL can be copied and shared with all users that require the remote access.

Remote Access Deregister:

The user can reset the remote access link by deregistering the remote access if there is an issue.

Click "Deregister" and the URL will be reset. the user can reboot the meter or re-register the remote access to re-enable the link.



6.19 Config Management

The AXM-WEB2 series module has a configuration management page that allows users to save most web settings into a configuration file. There are a few settings that are not included in configuration and are described below. This is useful if users have more than one meter that needs to be programmed with the same settings and eliminates any error when trying to configure another AXM-WEB2 series module.

The following settings are saved in the configuration file:

All Meter settings (General, IO, Alarm, Custom Read, Waveform, Independent Input) It's essential to note that these settings are stored in the configuration file but cannot be utilized for importing into a new meter. If the settings are initially retrieved from the meter, the configuration file will not take effect. However, the exported configuration file can be valuable for debugging purposes.

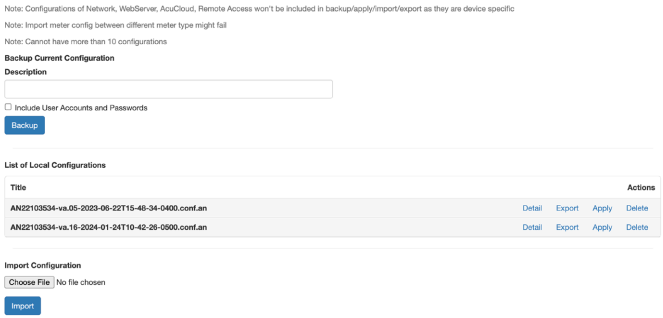
- Network settings (Only DNS1, DNS2, Modbus TCP Port, HTTP Proxy)
- All Email settings
- All Time/Date settings
- All Data Log settings
- All Post Channel settings
- All BACnet settings
- All SNMP settings
- All DNP settings (Point configuration will also be applied)
- All IEC61850 settings (CID file will also be applied)
- Management settings (the View and Admin Access Level passwords, SSH, and Debug Configuration)

The settings that are not included or effected by the Config Management file is:

Most Network settings (RSTP, DHCP, IP, Submask, Gateway, HTTP Port for both Ethernet 1 and 2. All Wi-Fi settings, Fast Read Mode, HTTP enable, and HTTPS port are not changed)

- IPv6
- AcuCloud
- Access Control (IP Whitelist)
- Remote Access

The Config Management page can be accessed by clicking on the Settings navigation tab and selecting **Config Management**.



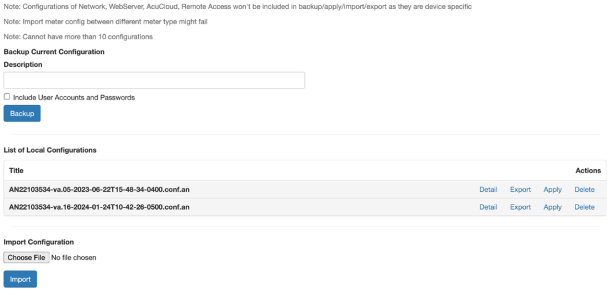
6.19.1 Backup Configuration

Users can create a backup of the current configurations on the AXM-WEB2 series interface.

Backup Current Configuration Description: Enter in a description for the backup configuration file.

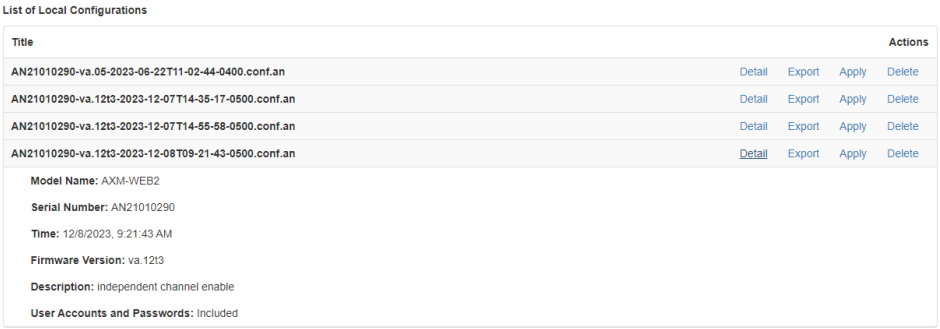
Once the description has been entered, click on the 'Backup' button.

The backup is displayed in the List of Local Configurations. The file has a file format that includes the module serial number, module firmware version, and time stamp when the file was created.



NOTE: *Users cannot have more than ten configurations in the List of Local Configurations.*

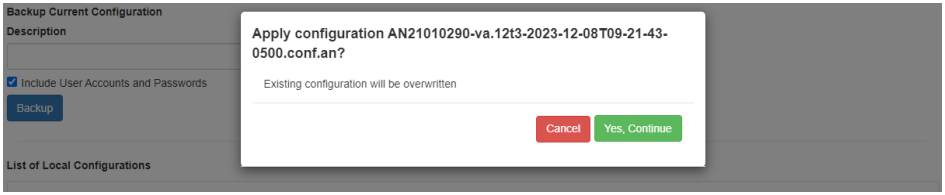
Users can click on the 'Detail' action to view the description of the configuration file. The details include the model name, serial number, time created. firmware version and the description when the backup was created. Users can remove any of the configuration files from the list at any time by selecting 'Delete' action.



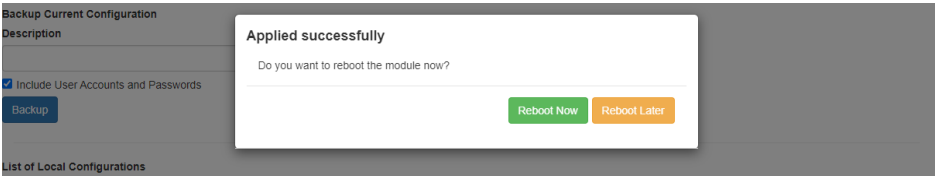
6.19.2 Export/Apply Configuration

The configuration file can be exported and imported into other AXM-WEB2 series modules. The file is downloaded as a .an file.

To implement the configuration file, click on **Apply**. A prompt warning the user that the existing .conf.an file will be overwritten is shown. Click **Yes** to continue.

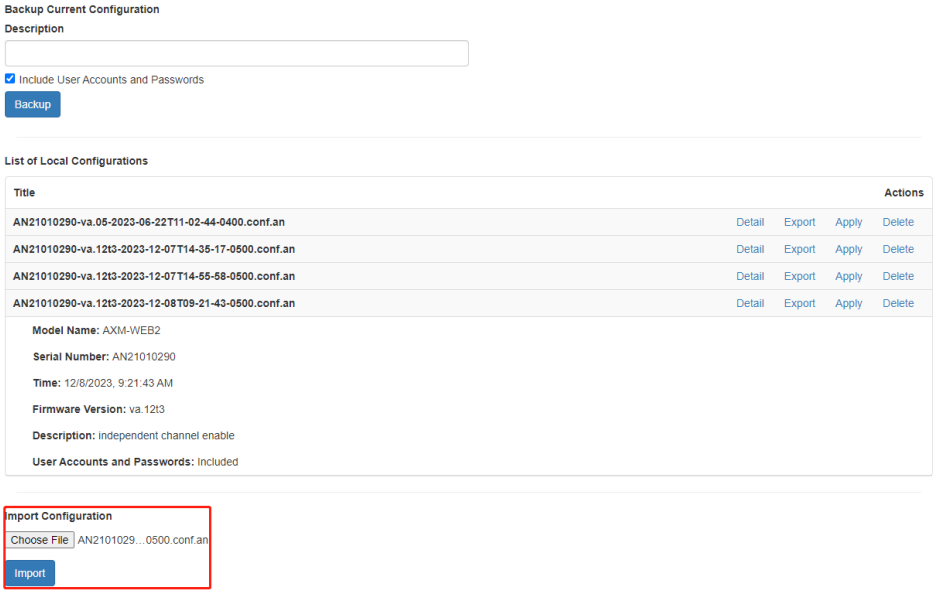


A module reboot is required for the configuration to take effect. if users decided to reboot later the reboot must be performed from the Management page for the settings to take effect on the device.

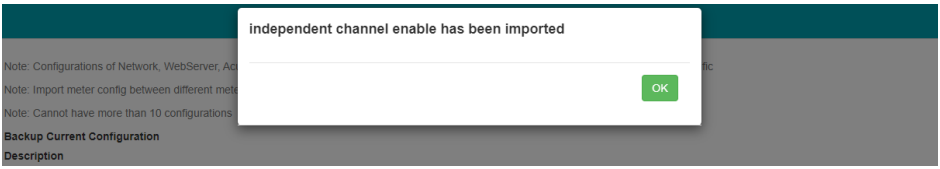


6.19.3 Import Configuration

Import Configuration: Users can import a configuration file (.conf.an file format) to the AXM-WEB2 series module.



Click on Import to upload the configuration file to the AXM-WEB2 series module.



The newly imported file will now appear in the List of Local Configurations.

NOTE: *Configuration files cannot be imported in certain circumstances. When a configuration file that already exists on the local configurations. When the list already contains ten configuration files. When a configuration file has been exported from a AXM-WEB2 series module with a higher firmware version.*

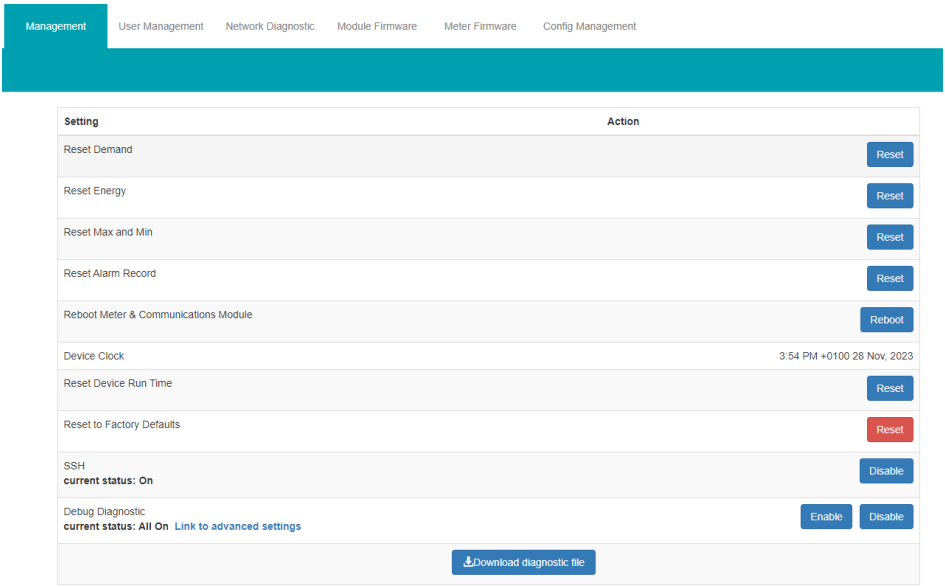
Chapter 7: Management

7.1 Parameter Reset

The Management web page allows the user to clear and reset certain parameters in the meter.

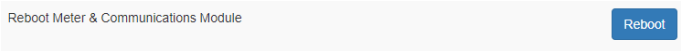
The following parameters can be reset from the Management page:

- Demand
- Energy
- Max and Min
- Alarm Record
- Device Run Time



7.2 Reboot Meter & Communications Module

Users can also reboot the web module and meter which is required after any communication or meter setting is changed. If a module reboot is not performed the settings will not be saved to the meter and will go back to its default settings. This not only resets the communication module, but it also performs a soft reboot on the Acuvim II or Acuvim-L meter.



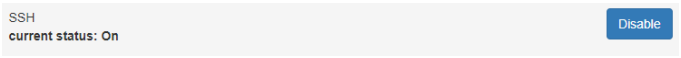
7.3 Reset to Factory

The AXM-WEB2 series module supports a reset to factory function where all module settings would be configured back to its default factory settings. This impacts all configurations and logs stored on the module.

NOTE: *This factory reset action is permanent and cannot be undone.*

7.4 SSH

The AXM-WEB2 series module supports the SSH protocol , however this is only used for internal purposes and SSH access is not provided for external use. When enabled the status will show 'On', when disabled the status will show 'Off'.

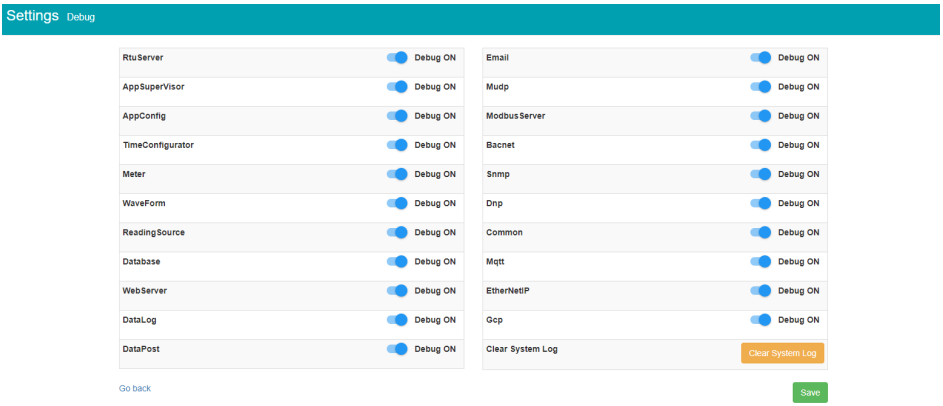


7.5 Debug Diagnostic

The debug diagnostic allows the user to enable or disable the debug logs. The current status will say 'All off' if disabled, 'All On' if enabled.

Clicking on the advanced link will turn on or off specific debug logs. If certain debug logs are enabled the current status will show 'Partial On'.

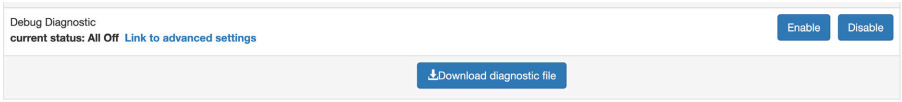
NOTE: *The system performance may be affected when the debug logs is enabled.*



7.6 Diagnostic File

The diagnostic file on the AXM-WEB2 series module can be downloaded to help troubleshoot issues by allowing the user to view and analyze the modules diagnostics.

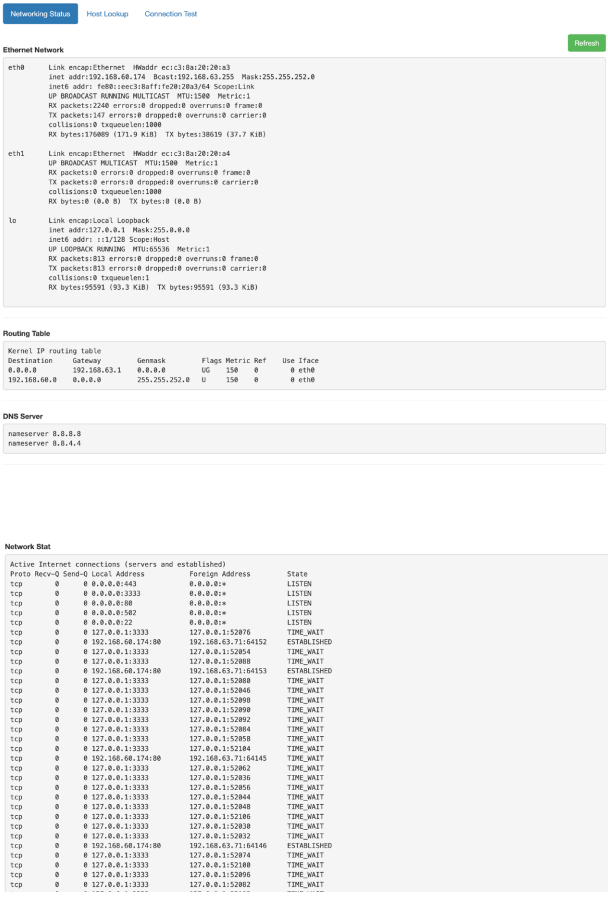
NOTE: *To help facilitate any troubleshooting issues the diagnostic file can be sent to Accuenergy Technical Support (support@accuenergy.com) for analysis.*



Chapter 8: Network Diagnostic

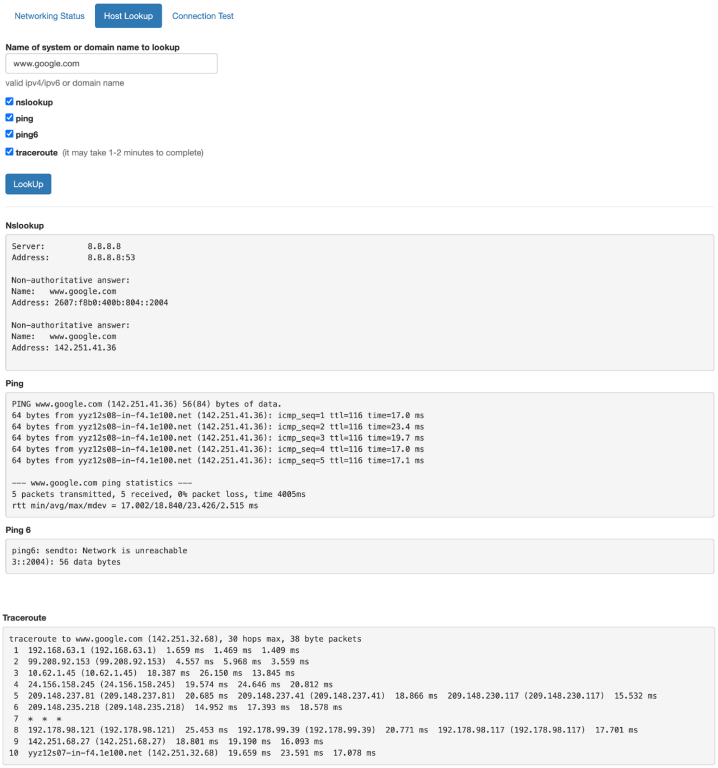
8.1 Network Status

The Network Diagnostic page can be used to monitor the current network status of the AXM-WEB2 series module.



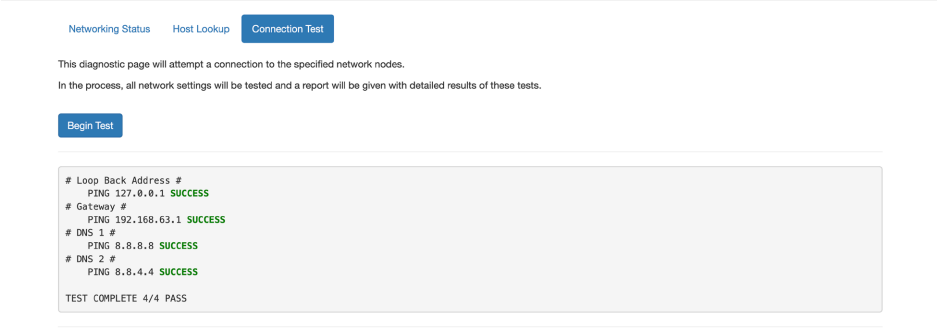
8.2 Host Lookup

In the **Host Lookup** menu tab users can utilize the 'ping' function to test the reachability to other networks. Users can also use the **ping6** function to test an IPv6 address.



8.3 Connection Test

User can also use the **Connection Test** function to test the local network that the module connected to. The test result will show **SUCCESS** and **PASS** if there are no issues found.



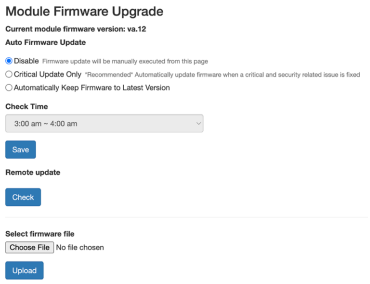
Chapter 9 Firmware Update

9.1 Module Firmware Update

The Module Firmware web page is used for updating the firmware version on the AXM-WEB2 series module. The user can check the module's current firmware version or perform remote firmware update to the module if needed. Users can also manually update the firmware by uploading a firmware file. The current version of the firmware will be displayed on the Module Firmware Update page and can also be viewed on the 'Device Information' page of the web interface.

There is an Auto Firmware Update feature available for the module to update automatically without manually going into the web server and performing the update.

NOTE: *Users can also contact Accuenergy Technical Support to receive the latest firmware.*



9.1.1 Auto Firmware Update

The auto firmware update allows users to select three different updating options.

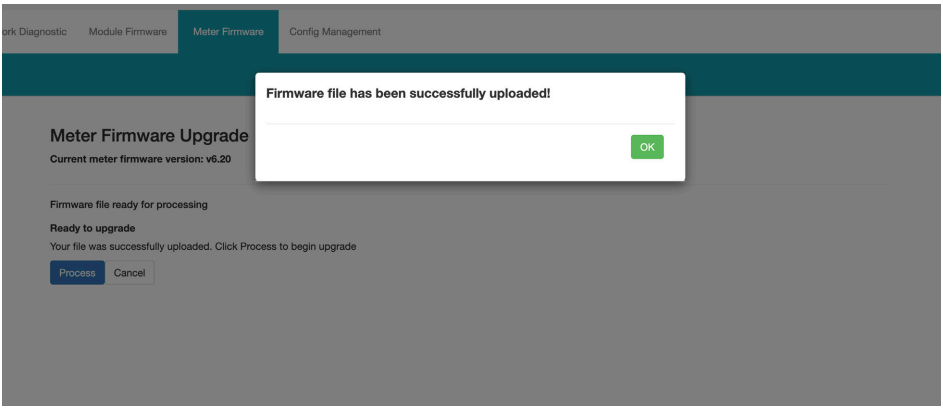
- Disable: Disables the auto firmware update function.
- Critical Update Only: Updates the module to the latest critical firmware.
- Automatically keep firmware to Latest: Updates the module to the latest firmware.

If users select critical or latest firmware update options, the time for the update can be configured.

By default, the update time is set for 3 am to 4 am.

NOTE: *The one-hour time block means that the update will occur anytime within the hour.*

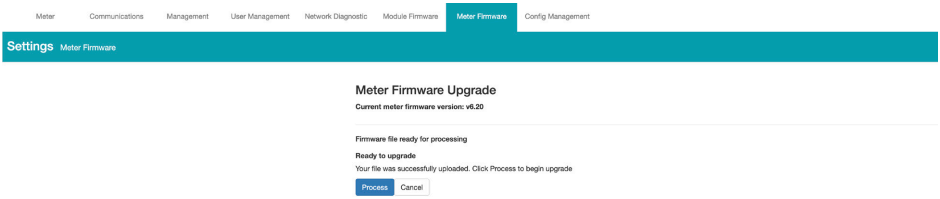
After the automatic firmware update, when users log in to the web interface for the first time after the update, they will see a message displayed, which shows the time and date the module was updated at as well as the new updated firmware version.



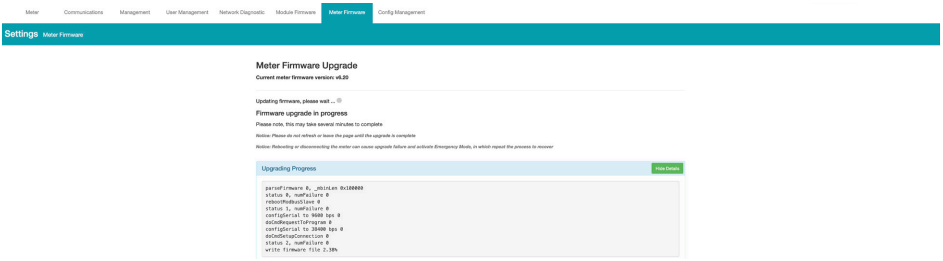
9.1.2 Manual Update

Select and upload the AXM-WEB2 series firmware .a2up file.

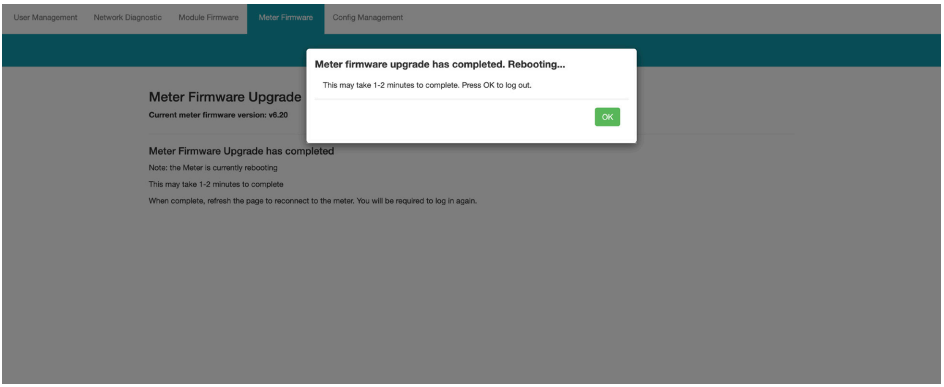
Once the upload is successfully uploaded, the following page will confirmthe file was uploaded.



Click 'Process' to begin the update.



Click 'OK' to log out the web interface and wait for 1 to minutes to complete the reboot.



Log into the web interface of the AXM-WEB2 series module after the reboot is complete and go to the 'About' page to check if the module firmware version is updated.

9.1.3 Remote Update

Users can also use the remote firmware server to update the module firmware. Click on 'Check' to verify if there is a firmware update available.

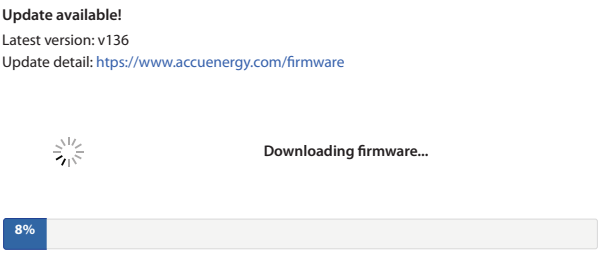
Update available!

Latest version: v136

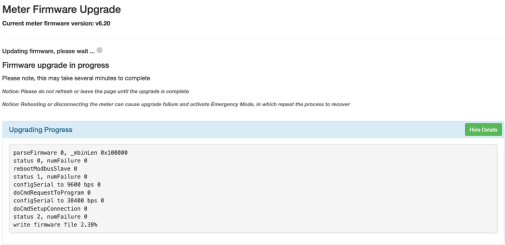
Update detail: https://www.accuenergy.com/firmware

Proceed

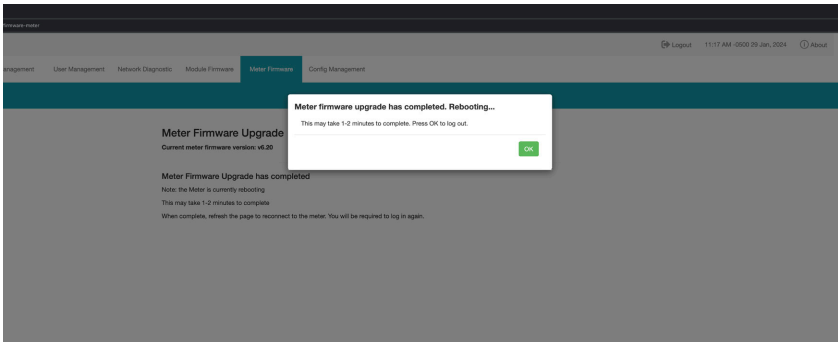
If there is an update available users can proceed to download the firmware.



The updating process will begin once the download is complete.



When the firmware update is complete, the module will reboot. The rebooting process will take approximately 1 to 2 minutes to complete.

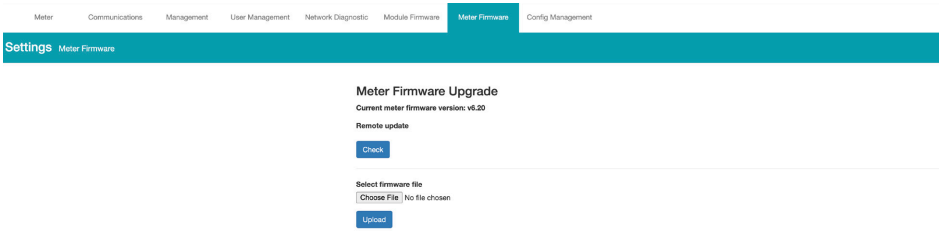


After the module reboots, users will be able to log back into the web interface. When logged in, click on the 'About' tab located on the top right corner of the web page to view the 'Device Information' page. Users can check this page to confirm the meter's firmware version was updated correctly.

9.2 Meter Firmware Update

The AXM WEB2 series module allows users to update the meters firmware from its web server. The meters firmware can be updated manually by uploading the required firmware file or by connecting to our remote firmware server.

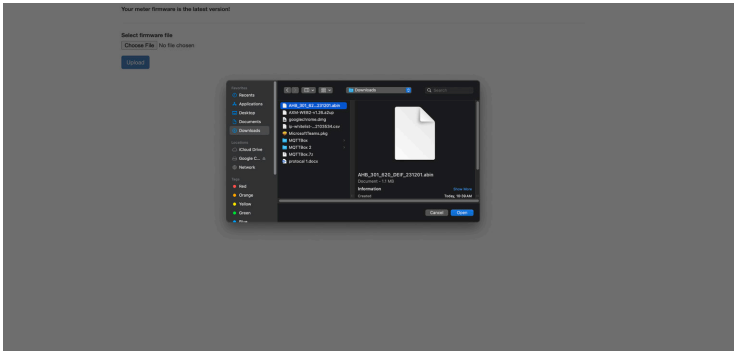
NOTE: *The meter firmware update option is only available on meters that are firmware version 3.69 and above.*

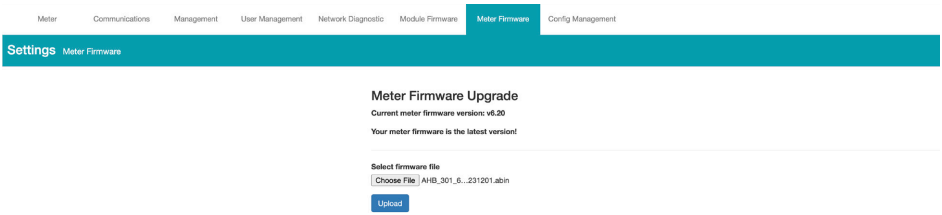


9.2.1 Manual Update

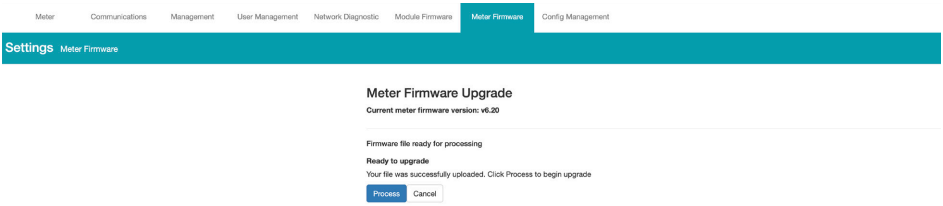
Users can update the meter firmware manually by loading the firmware file to the web server.

Click on 'Choose File' and upload the correct file. All firmware files are .abin type files.





Once the file is selected click on the 'Upload' button.

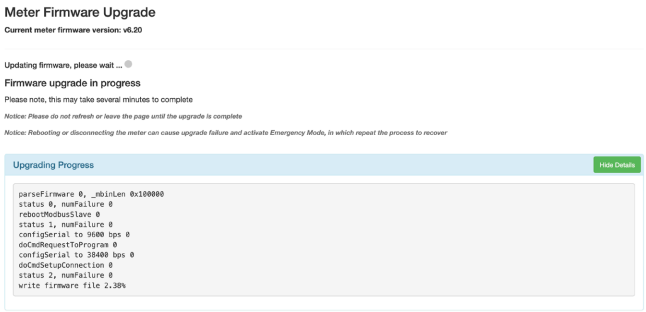


NOTE: *If the meter's bootloader version is outdated, users cannot update meter's firmware via AXM-WEB2 series module. Instead, use the RS485 port to update the meter's firmware. Follow the chart below to check the compatibility between the bootloader and firmware versions.*

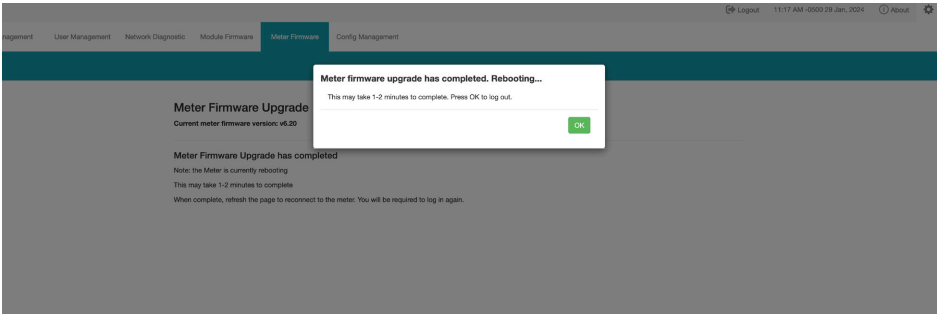
Compatibility of firmware with bootloader		Bootloader version						
		v6.01	v6.02	v6.04	v6.05	v6.06	v6.07	v6.20
Firmware Version	v6.01	√	√	√	√	√	√	
	v6.03	√	√	√	√	√	√	
	v6.04	√	√	√	√	√	√	
	v6.05	√	√	√	√	√	√	
	v6.06	√	√	√	√	√	√	
	v6.07	√	√	√	√	√	√	
	v6.08	√	√	√	√	√	√	
	v6.09	√	√	√	√	√	√	
	v6.10	√	√	√	√	√	√	
	v6.11	√	√	√	√	√	√	
	v6.12	√	√	√	√	√	√	
	v6.13						√	
	v6.14						√	
	v6.15						√	
	v6.16						√	
	v6.17						√	√

After the firmware has uploaded to the web server, click on the 'Process' button.

The firmware update will take approximately 5 to 10 minutes to complete.



When the firmware update is complete, the module will reboot. The rebooting process will take 1 to 2 minutes to complete.

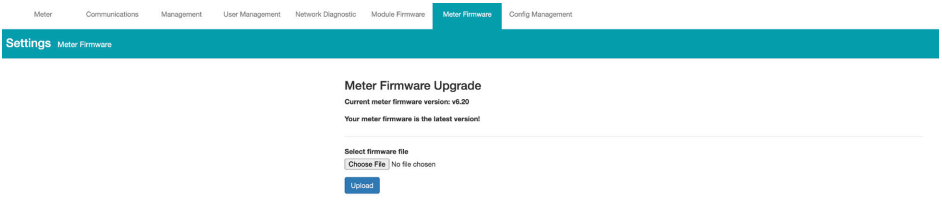


After the meter reboots, users will be able to log back into the web interface. When logged in, click on the 'About' navigation tab located on the top right corner of the web page to view the 'Device Information' page. Users can check this page to confirm the meter's firmware version was updated correctly.

9.2.2 Remote Update

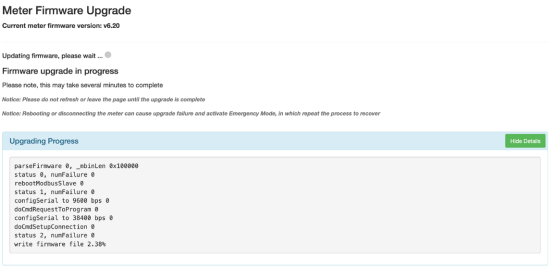
Users also have the option to use the remote firmware server to update the meters firmware.

Click on the 'Check' button to verify if there is a firmware update available.



If there is an update available users can proceed to download the firmware. The updating process will begin once the download is complete.

Users can click on the 'Show Details' button to view the update progress percentage of the firmware.

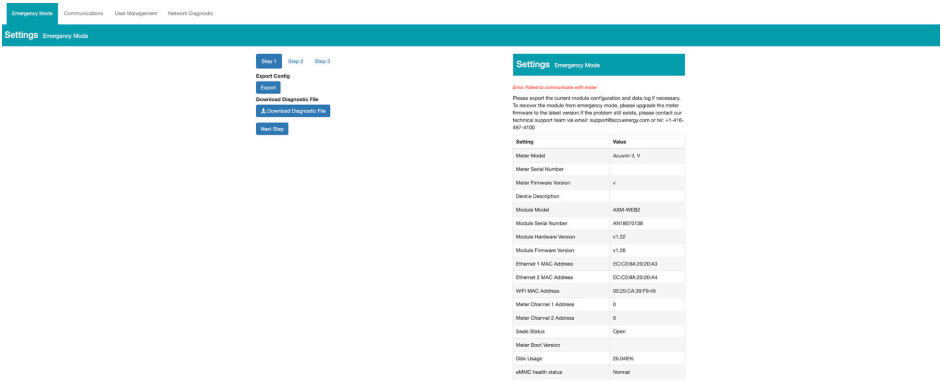


When the firmware update is complete, the module will reboot. The rebooting process will take 5 to 10 minutes to complete.

After the meter reboots, users will be able to log back into the web interface. When logged in click on the ‘About’ navigation tab located on the top right corner of the web page to view the 'Device Information' page. Users can check this page to confirm the meter’s firmware version was updated correctly.

9.3 Emergency Mode

During the meter firmware update process if the meter loses power or connectivity to the web interface the meter will switch to emergency mode. In this mode, the next time the user logs into the web interface, they will be redirected to the Emergency Mode screen with detailed instructions on how to proceed.

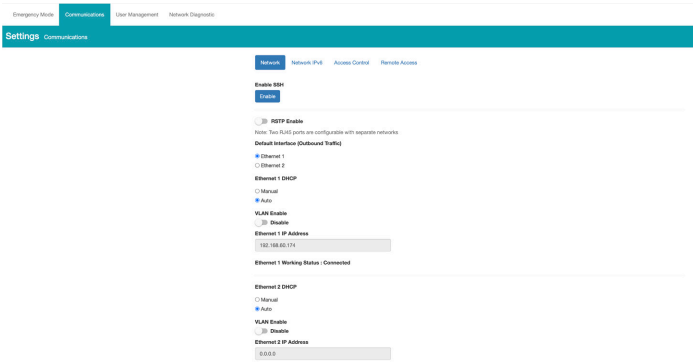


The Emergency Mode page will explain that the meter firmware update process failed and to try updating the meter firmware again. The meter will stay in this mode until the meter's firmware updates successfully.

Users can update the meter's firmware manually or through the remote server while the meter is in Emergency mode. After the update is complete the meter will exit emergency mode and users will be able to see the web server in its normal mode.

NOTE: *The meter will only go into emergency mode if the meter firmware update fails, emergency mode is not applicable if the Module firmware update fails.*

While in emergency mode, users can still view the meters network settings under the Communications tab. From here all the meter's network related settings can be viewed and configured.



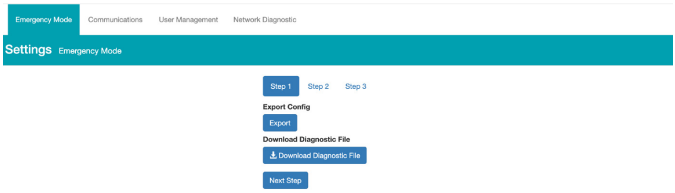
The communications tab users can also enable remote access and configure the IPv6 and Access Control settings.

NOTE: *Remote access is still accessible when the meter is in Emergency Mode.*

There is a three-step process to ensure all data and meter configuration can be saved before completing the update.

Step 1:

In emergency mode users must first export the module configuration. This allows users to save all module settings which can be imported to any AXM-WEB2 series module. The meter's diagnostic file can also be downloaded to provide detailed analysis of any errors that occur within the AXM-WEB2 series module. This file should be provided to the Accuenergy Technical Support for further analysis. Only provide the file if you are experiencing issues with the AXM-WEB2 series communications module.



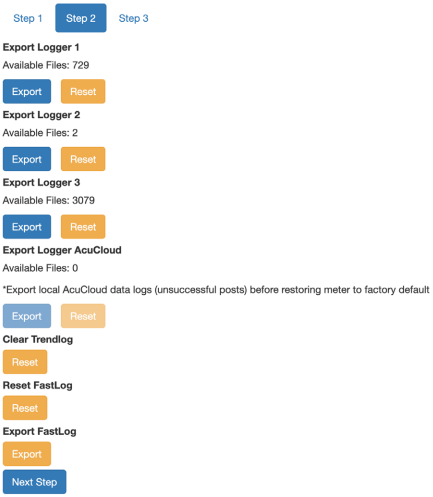
Step 2:

In the second step of emergency mode, users can export and download data from the data loggers. If all three data loggers have been configured, the user will have the option to export or reset the data on the module. The AcuCloud data can also be exported and deleted from this page, this data will only be deleted from the module and will still be available on the cloud server.

The 'Clear Trendlog' option allows users to reset and delete all existing data on the module.

Users may will find it useful to clear the trend logs and all data logs if the module disk space is full.

Users can check the disk usage under the Emergency Mode tab in the device information table.



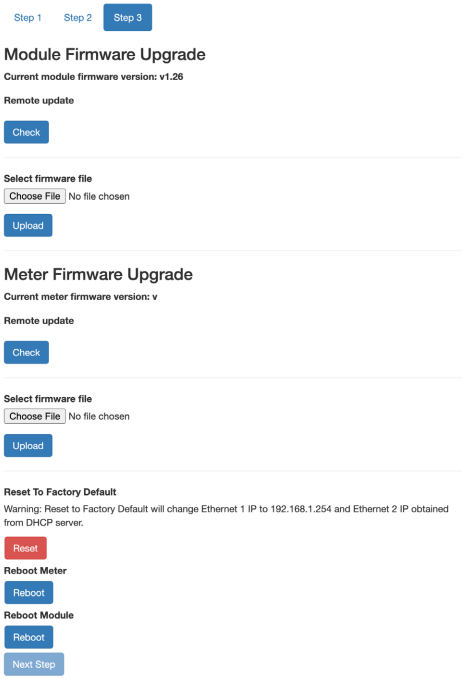
Step 3:

In the third step of emergency mode, users will have the option to update the module/meter firmware or perform a soft reboot to both meter/module.

Users can reset the entire module back to its factory settings,

NOTE: *When resetting the module back to factory settings while in emergency mode, the meters network settings will be restored to its default setting.*

Updating the **AXM-WEB2 series module's** firmware while in emergency mode will keep the **meter** in emergency mode.The only way for the meter to exit emergency mode is to update the **Acuvim II or Acuvim-L meter** firmware successfully. The meter firmware can be updated either remotely or by manual upload.


Step 1
Step 2
Step 3
Module Firmware Upgrade
Current module firmware version: v1.26
Remote update
Check
Select firmware file
Choose File
No file chosen
Upload
Meter Firmware Upgrade
Current meter firmware version: v
Remote update
Check
Select firmware file
Choose File
No file chosen
Upload
Reset To Factory Default
Warning: Reset to Factory Default will change Ethernet 1 IP to 192.168.1.254 and Ethernet 2 IP obtained from DHCP server.
Reset
Reboot Meter
Reboot
Reboot Module
Reboot
Next Step

ACCUENERGY

MAKE ENERGY USAGE SMARTER

ACCUENERGY INC.

22 Howden Rd
Scarborough, ON M1R 3E4, Canada

TF: 1-877-721-8908
INT: +1-416-497-4100
FAX: +1-416-497-4130
E: marketing@accuenergy.com

ACCUENERGY SOUTH AFRICA (PTY) LTD

Castle Walk Corporate Park,
Block B, Cnr. Nossob & Swakop Street
Erasmuskloof, Pretoria, 0181
South Africa

TF: +27 (0) 87 802 6136

Revision Date: January 2024