Acuvim II Series Power Meter SNMP Protocol

User Manual



ACCUENERGY

The information contained in this document is believed to be accurate at the time of publication, however, Accuenergy assumes no responsibility for any errors which may appear here and reserves the right to make changes without notice. Please ask the local representative for latest product specifications before ordering.

Please read this manual carefully before installation, operation and maintenance of the AcuRev 1310 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.

Contents

1. Overview

Simple Network Management Protocol (SNMP) is a internet protocol for collecting and organizing information about managed devices on IP networks and for modifying that information to change device behavior. Devices that typically support SNMP include cable modems, routers, switches, servers, workstations, printers, and more.

SNMP is used in network management applications. SNMP displays the management data as variables on the managed system which are organized in the Management Information Base (MIB). The MIB describes the system status and configuration. These variables can then be queried by the managing applications.

2. Introduction

The AXM-WEB-PUSH supports SNMP protocol, so users can get data from the meter through SNMP, by using the following instructions; get, get-next, and walk instructions. The AXM-WEB-PUSH also supports SNMP Traps which will allow the meter to send alerts when there is a change in event.

The Acuvim II Series Power Meter allows the user to obtain data of the meters' Real Time, Energy, Demand, THD, Harmonics and IO measurements. It also tracks the status of the 28 Digital Input channels that are available.

The SNMP configurations can be accessed through the built-in web interface of the AXM-WEB-PUSH or AXM-WiFi modules.

3. About Simple Network Management Protocol

The SNMP protocol operates like most protocols supported by the Acuvim II Series Power Meters, that is it operates in a client-server environment.

The AXM-WEB-PUSH will act as the agent which will send the data to the manager. The AXM-WEB-PUSH will need to know the IP address of the SNMP manager in order to send the information to it.

The MIB file can be be downloaded from the Accuenergy Website which can then be loaded into the management software:

https://accuenergy.com/files/acuvim-ii/ACUVIMII-MIB.mib.zip

This MIB file contains the information that the manager needs to communicate with the AXM-WEB-PUSH. I.E. it contains the data points that the AXM-WEB-PUSH can report back and the commands it can report back.

Below is an example from the MIB file for the Frequency Object:

systemFrequency OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"System Frequency in 0.001Hz"

4. Using the SNMP Protocol on the AXM-WEB-PUSH

4.1 Installation Method

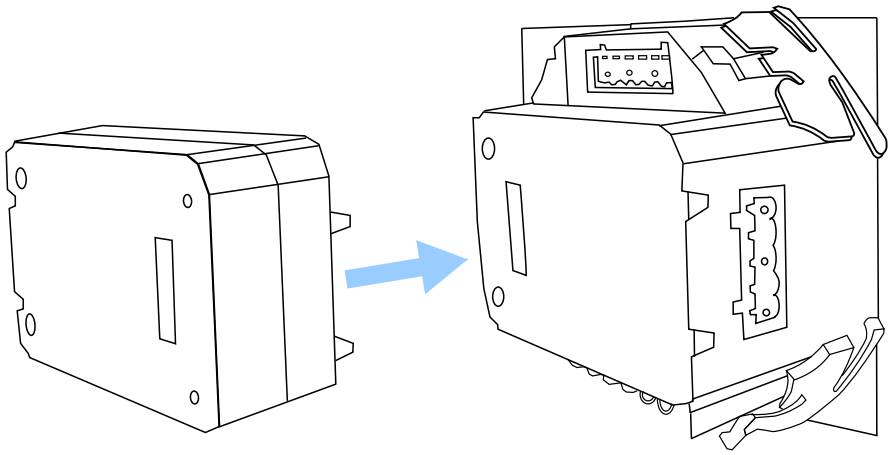


Figure 4-1

The AXM-WEB-PUSH module is linked to the Acuvim II meter by a communication plug. It can also be linked to other extended modules like IO modules.

1. Insert the installation clips to the counterpart of the meter, and then press the AXM-WEB-PUSH module lightly, so linking is established.
2. Tighten the installation screws.

Note:

- Install the AXM-WEB-PUSH carefully to avoid damage;
- Under no circumstances should any installation be done with the meter powered on. Failure to do so may result in injury or death.

4.2 Initializing the AXM-WEB-PUSH

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

IP Address (192.168.1.254);

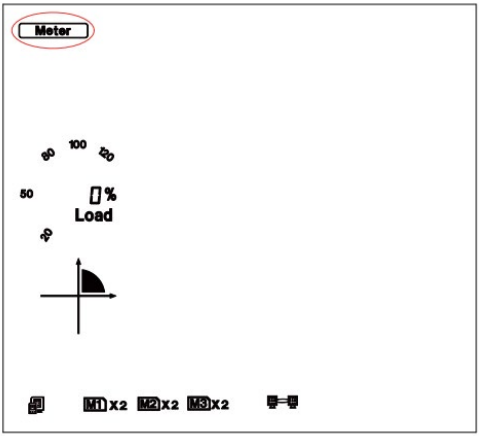
Subnet Mask (255.255.255.0);

Gateway (192.168.1.1);

Primary DNS Server (202.106.0.20);

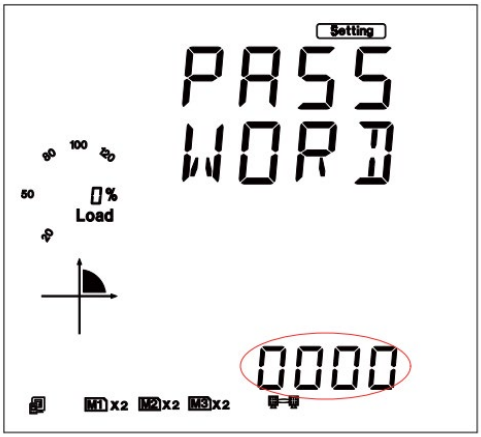
This information can be found by using the buttons from the meter display. The following is how to configure the network settings from the display:

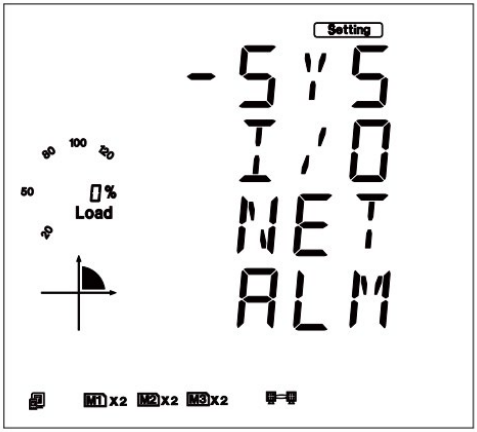
- Press the 'H' and 'V/A' buttons simultaneously on the Acuvim II series. Release the buttons and the meter will enter the meter selecting mode, as indicated by the flashing 'Meter' cursor.

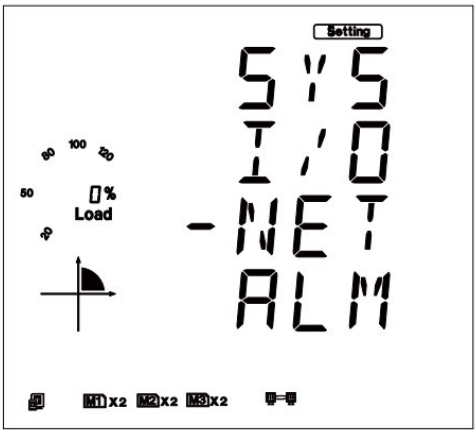


- Press the 'P' or 'E' button to move the cursor to 'Setting'. Press 'V/A' button to enter the parameter setting mode. The device address page is the first page of the 'Setting' mode. It will show the Modbus address of the meter for a second before prompting for the pass-

word of the device. Press 'V/A' button to confirm password and enter the parameter setting page. Press the 'P' or 'E' button to move the cursor to 'NET' and press the 'V/A' button to enter the Ethernet module settings.







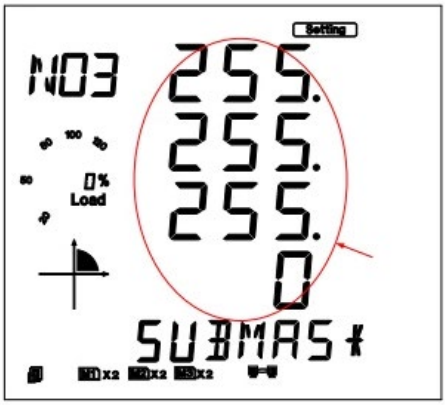
- The first page of the NET Settings will be the N01 DHCP setting. By default this is configured to Manual. Setting this configuration to Auto will allow the router to assign the meter with an IP address, whiles Manual will allow the user to configure the IP address. Press the 'V/A' button to enter edit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

Note: If the DHCP is selected as Auto, the AXM-WEB-PUSH needs to be rebooted before it can be assigned with the new IP address.

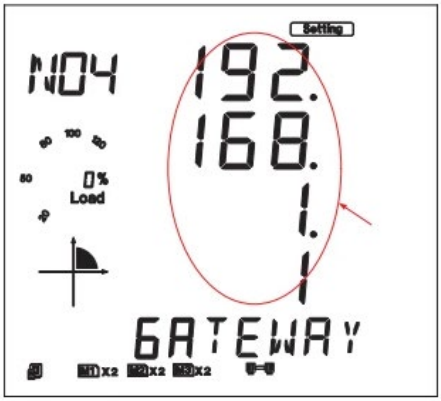
- Press 'P' to get to "N02 IP address" This is the IP address of the meter and will be the IP address to access the web interface of the module. Users can configured the IP address if the DHCP is configured to Manual. Press 'V/A' to configure the IP address. The cursor of the first

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.

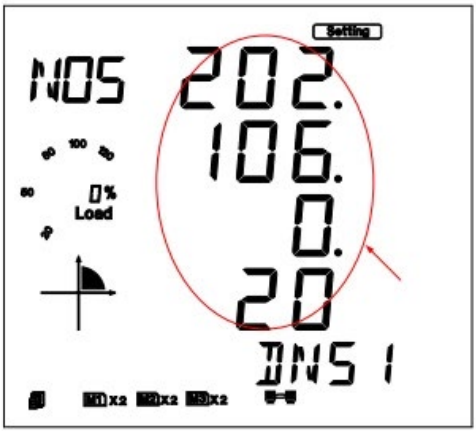
- Press 'P' to get to "N03 Subnet Mask". Press 'V/A' to configure the subnet address. The cursor of the first digit will begin to flash. Press the 'H' button to scroll through the digits, press the 'P' or 'E' to change the value of the flashing cursor and press 'V/A' to confirm.



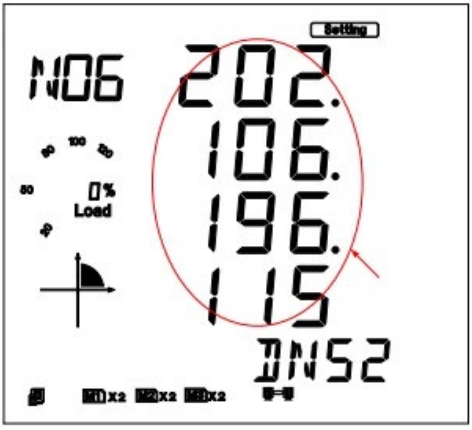
- Press 'P' to get to "N04 Gateway". Press 'V/A' to configure the gateway IP address. The cursor of the first digit will begin to flash. Press the 'H' button to scroll through the digits, press the 'P' or 'E' to change the value of the flashing cursor and press 'V/A' to confirm.

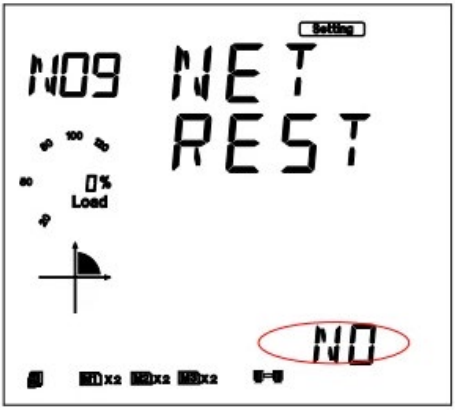


- Press 'P' to get to "N05 DNS Primary Server". Press 'V/A' to configure the DNS address. The cursor of the first digit will begin to flash. Press the 'H' button to scroll through the digits, press the 'P' or 'E' to change the value of the flashing cursor and press 'V/A' to confirm. The DNS parameters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



- 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.





After configuring the AXM-WEB-PUSH module, press the 'H' and 'V/A' buttons simultaneously to return to the menu selection.

The meter should then be accessible at the IP Address found on page N02 of the NET settings.

5. Supported Parameters

The SNMP protocol on the AXM-WEB-PUSH supports measurements from the Acuvim II series Real Time, Energy, Demand, THD, Harmonics and IO measurements. It also tracks the status of the 28 Digital Input channels that are available and can send notifications based on these 28 DI channels. These parameters are defined in the MIB file for the Acuvim II series.

The data returned through SNMP will require a relationship to be applied in order to obtain the actual measurements.

The table below lists each of the supported parameters with their relationship and the units of measurement.

Table 5-1 Measurement parameters

Real-Time Parameter	Data Type	Relationship	Units	Property
System Frequency	32 Bit Integer	Rx/1000	Hz	R
Phase A Line to Neutral Voltage	32 Bit Integer	Rx/1000	V	R
Phase B Line to Neutral Voltage	32 Bit Integer	Rx/1000	V	R
Phase C Line to Neutral Voltage	32 Bit Integer	Rx/1000	V	R
Average Line to Neutral Voltage	32 Bit Integer	Rx/1000	V	R
Phase AB Line to Line Voltage	32 Bit Integer	Rx/1000	V	R
Phase BC Line to Line Voltage	32 Bit Integer	Rx/1000	V	R
Phase CA Line to Line Voltage	32 Bit Integer	Rx/1000	V	R
Average Line to Line Voltage	32 Bit Integer	Rx/1000	V	R
Phase A Line Current	32 Bit Integer	Rx/1000	A	R
Phase B Line Currrent	32 Bit Integer	Rx/1000	A	R
Phase C Line Current	32 Bit Integer	Rx/1000	A	R
System Average Line Current	32 Bit Integer	Rx/1000	A	R
Phase A Active Power	32 Bit Integer	Rx/1000	kW	R
Phase B Active Power	32 Bit Integer	Rx/1000	kW	R
Phase C Active Power	32 Bit Integer	Rx/1000	kW	R
System Active Power	32 Bit Integer	Rx/1000	kW	R
Phase A Reactive Power	32 Bit Integer	Rx/1000	kvar	R
Phase B Reactive Power	32 Bit Integer	Rx/1000	kvar	R
Phase C Reactive Power	32 Bit Integer	Rx/1000	kvar	R
System Reactive Power	32 Bit Integer	Rx/1000	kvar	R
Phase A Apparent Power	32 Bit Integer	Rx/1000	kVA	R
Phase B Apparent Power	32 Bit Integer	Rx/1000	kVA	R
Phase C Apparent Power	32 Bit Integer	Rx/1000	kVA	R
System Apparent Power	32 Bit Integer	Rx/1000	kVA	R
Phase A Power Factor	32 Bit Integer	Rx/1000		R
Phase B Power Factor	32 Bit Integer	Rx/1000		R

Real-Time Parameter	Data Type	Relationship	Units	Property
Phase C Power Factor	32 Bit Integer	Rx/1000		R
System Power Factor	32 Bit Integer	Rx/1000		R
System Voltage Unbalance Factor	32 Bit Integer	Rx/1000	%	R
System Current Unbalance Factor	32 Bit Integer	Rx/1000	%	R
Average Load Nature	32 Bit Integer	Rx/1000	82: R 76: L 67: C	R

Energy Parameter	Data Type	Relationship	Units	Property
System Import Active Energy	32 Bit Integer	Rx/10	kWh	R
System Export Active Energy	32 Bit Integer	Rx/10	kWh	R
System Import Reactive Energy	32 Bit Integer	Rx/10	kvarh	R
System Export Reactive Energy	32 Bit Integer	Rx/10	kvarh	R
System Total Active Energy	32 Bit Integer	Rx/10	kWh	R
System Net Active Energy	32 Bit Integer	Rx/10	kWh	R
System Total Reactive Energy	32 Bit Integer	Rx/10	kvar	R
System Net Reactive Energy	32 Bit Integer	Rx/10	kvar	R
System Apparent Energy	32 Bit Integer	Rx/10	kVAh	R

Demand Parameter	Data Type	Relationship	Units	Property
System Active Power Demand	32 Bit Integer	Rx/1000	kW	R
System Reactive Power Demand	32 Bit Integer	Rx/1000	kvar	R
System Apparent Power Demand	32 Bit Integer	Rx/1000	kVA	R
Phase A Current Demand	32 Bit Integer	Rx/1000	A	R
Phase B Current Demand	32 Bit Integer	Rx/1000	A	R
Phase C Current Demand	32 Bit Integer	Rx/1000	A	R

THD Parameter	Data Type	Relationship	Units	Property
Phase A Voltage THD	32 Bit Integer	Rx/1000	%	R
Phase B Voltage THD	32 Bit Integer	Rx/1000	%	R
Phase C Voltage THD	32 Bit Integer	Rx/1000	%	R
Average Voltage THD	32 Bit Integer	Rx/1000	%	R
Phase A Odd Voltage THD	32 Bit Integer	Rx/1000	%	R
Phase A Even Voltage THD	32 Bit Integer	Rx/1000	%	R
Phase A Voltage Crest Factor	32 Bit Integer	Rx/1000	%	R
Phase A THFF	32 Bit Integer	Rx/1000	%	R
Phase B Odd Voltage THD	32 Bit Integer	Rx/1000	%	R
Phase B Even Voltage THD	32 Bit Integer	Rx/1000	%	R
Phase B Voltage Crest Factor	32 Bit Integer	Rx/1000	%	R
Phase B THFF	32 Bit Integer	Rx/1000	%	R

THD Parameter	Data Type	Relationship	Units	Property
Phase C Odd Voltage	32 Bit Integer	Rx/1000	%	R
Phase C Even Voltage	32 Bit Integer	Rx/1000	%	R
Phase C Voltage Crest Factor	32 Bit Integer	Rx/1000	%	R
Phase C THFF	32 Bit Integer	Rx/1000	%	R
Phase A Current THD	32 Bit Integer	Rx/1000	%	R
Phase B Current THD	32 Bit Integer	Rx/1000	%	R
Phase C Current THD	32 Bit Integer	Rx/1000	%	R
Average Current THD	32 Bit Integer	Rx/1000	%	R
Phase A Odd Current THD	32 Bit Integer	Rx/1000	%	R
Phase A Even Current THD	32 Bit Integer	Rx/1000	%	R
Phase A Current K Factor	32 Bit Integer	Rx/1000	%	R
Phase B Odd Current THD	32 Bit Integer	Rx/1000	%	R
Phase B Even Current THD	32 Bit Integer	Rx/1000	%	R
Phase B Current K Factor	32 Bit Integer	Rx/1000	%	R
Phase C Odd Current THD	32 Bit Integer	Rx/1000	%	R
Phase C Even Current THD	32 Bit Integer	Rx/1000	%	R
Phase C Current K Factor	32 Bit Integer	Rx/1000	%	R

Table 5-2 Harmonics

Harmonic Parameter	Data Type	Relationship	Units	Property
Phase A 2nd Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
Phase A 3rd Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
Phase A 4th Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
.....	32 Bit Integer	Rx/1000	%	R
Phase A 63rd Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
Phase B 2nd Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
Phase B 3rd Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
Phase B 4th Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
.....	32 Bit Integer	Rx/1000	%	R
Phase B 63rd Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
Phase C 2nd Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
Phase C 3rd Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
Phase C 4th Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
.....	32 Bit Integer	Rx/1000	%	R
Phase C 63rd Voltage Harmonics	32 Bit Integer	Rx/1000	%	R
Phase A 2nd Current Harmonics	32 Bit Integer	Rx/1000	%	R
Phase A 3rd Current Harmonics	32 Bit Integer	Rx/1000	%	R
Phase A 4th Current Harmonics	32 Bit Integer	Rx/1000	%	R
.....	32 Bit Integer	Rx/1000	%	R
Phase A 63rd Current Harmonics	32 Bit Integer	Rx/1000	%	R

Harmonic Parameter	Data Type	Relationship	Units	Property
Phase B 2nd Current Harmonics	32 Bit Integer	Rx/1000	%	R
Phase B 3rd Current Harmonics	32 Bit Integer	Rx/1000	%	R
Phase B 4th Current Harmonics	32 Bit Integer	Rx/1000	%	R
.....	32 Bit Integer	Rx/1000	%	R
Phase B 63rd Current Harmonics	32 Bit Integer	Rx/1000	%	R
Phase C 2nd Current Harmonics	32 Bit Integer	Rx/1000	%	R
Phase C 3rd Current Harmonics	32 Bit Integer	Rx/1000	%	R
Phase C 4th Current Harmonics	32 Bit Integer	Rx/1000	%	R
.....	32 Bit Integer	Rx/1000	%	R
Phase C 63rd Current Harmonics	32 Bit Integer	Rx/1000	%	R

Table 5-3 IO Parameters

IO Parameters	Data Type	Relationship	Units	Property	Trap Supported
IO11 DI Counter 1	32 Bit Integer			R	
IO11 DI Counter 2	32 Bit Integer			R	
IO11 DI Counter 3	32 Bit Integer			R	
IO11 DI Counter 4	32 Bit Integer			R	
IO11 DI Counter 5	32 Bit Integer			R	
IO11 DI Counter 6	32 Bit Integer			R	
IO21 DI Counter 1	32 Bit Integer			R	
IO21 DI Counter 2	32 Bit Integer			R	
IO21 DI Counter 3	32 Bit Integer			R	
IO21 DI Counter 4	32 Bit Integer			R	
IO31 DI Counter 1	32 Bit Integer			R	
IO31 DI Counter 2	32 Bit Integer			R	
IO31 DI Counter 3	32 Bit Integer			R	
IO31 DI Counter 4	32 Bit Integer			R	
IO12 DI Counter 1	32 Bit Integer			R	
IO12 DI Counter 2	32 Bit Integer			R	
IO12 DI Counter 3	32 Bit Integer			R	
IO12 DI Counter 4	32 Bit Integer			R	
IO12 DI Counter 5	32 Bit Integer			R	
IO12 DI Counter 6	32 Bit Integer			R	
IO22 DI Counter 1	32 Bit Integer			R	
IO22 DI Counter 2	32 Bit Integer			R	
IO22 DI Counter 3	32 Bit Integer			R	
IO22 DI Counter 4	32 Bit Integer			R	
IO32 DI Counter 1	32 Bit Integer			R	
IO32 DI Counter 2	32 Bit Integer			R	
IO32 DI Counter 3	32 Bit Integer			R	

IO Parameters	Data Type	Relationship	Units	Property	Trap Supported
IO32 DI Counter 4	32 Bit Integer			R	
IO11 DI Status 1	32 Bit Integer			R	Yes
IO11 DI Status 2	32 Bit Integer			R	Yes
IO11 DI Status 3	32 Bit Integer			R	Yes
IO11 DI Status 4	32 Bit Integer			R	Yes
IO11 DI Status 5	32 Bit Integer			R	Yes
IO11 DI Status 6	32 Bit Integer			R	Yes
IO21 DI Status 1	32 Bit Integer			R	Yes
IO21 DI Status 2	32 Bit Integer			R	Yes
IO21 DI Status 3	32 Bit Integer			R	Yes
IO21 DI Status 4	32 Bit Integer			R	Yes
IO31 DI Status 1	32 Bit Integer			R	Yes
IO31 DI Status 2	32 Bit Integer			R	Yes
IO31 DI Status 3	32 Bit Integer			R	Yes
IO31 DI Status 4	32 Bit Integer			R	Yes
IO12 DI Status 1	32 Bit Integer			R	Yes
IO12 DI Status 2	32 Bit Integer			R	Yes
IO12 DI Status 3	32 Bit Integer			R	Yes
IO12 DI Status 4	32 Bit Integer			R	Yes
IO12 DI Status 5	32 Bit Integer			R	Yes
IO12 DI Status 6	32 Bit Integer			R	Yes
IO22 DI Status 1	32 Bit Integer			R	Yes
IO22 DI Status 2	32 Bit Integer			R	Yes
IO22 DI Status 3	32 Bit Integer			R	Yes
IO22 DI Status 4	32 Bit Integer			R	Yes
IO32 DI Status 1	32 Bit Integer			R	Yes
IO32 DI Status 2	32 Bit Integer			R	Yes
IO32 DI Status 3	32 Bit Integer			R	Yes
IO32 DI Status 4	32 Bit Integer			R	Yes
IO31 AI1	32 Bit Integer	Rx/1000	mA	R	
IO31 AI2	32 Bit Integer	Rx/1000	mA	R	
IO32 AI1	32 Bit Integer	Rx/1000	mA	R	
IO32 AI2	32 Bit Integer	Rx/1000	mA	R	
IO21 AO1	32 Bit Integer	Rx/1000	mA	R	
IO21 AO2	32 Bit Integer	Rx/1000	mA	R	
IO22 AO1	32 Bit Integer	Rx/1000	mA	R	
IO22 AO2	32 Bit Integer	Rx/1000	mA	R	

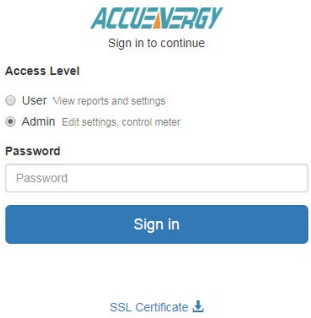
IO Parameters	Data Type	Relationship	Units	Property	Trap Supported
IO11 RO1	32 Bit Integer			R	
IO11 RO2	32 Bit Integer			R	
IO31 RO1	32 Bit Integer			R	
IO31 RO2	32 Bit Integer			R	
IO12 RO1	32 Bit Integer			R	
IO12 RO2	32 Bit Integer			R	
IO32 RO1	32 Bit Integer			R	
IO32 RO2	32 Bit Integer			R	

6. SNMP Configurations through the Web Server

6.1 Configuring the SNMP Settings

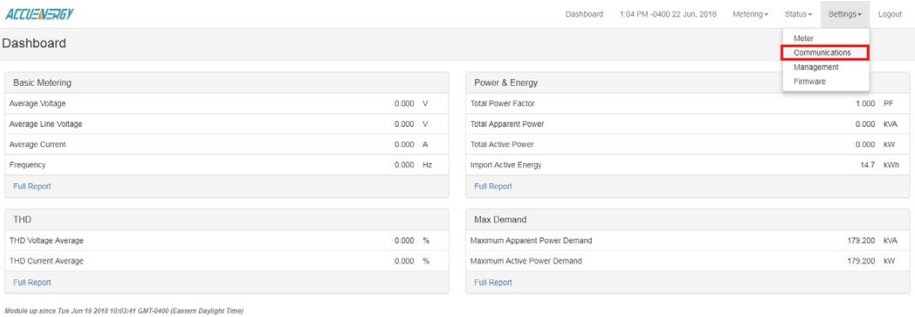
To configure the SNMP related settings on the AXM-WEB-PUSH, user must use the built in web server. Ensure the network settings related to the AXM-WEB-PUSH are configured correctly so it can be accessed within the Local Area Network.

- Open a Internet Browser and enter the IP address of the meter(refer to section 4.2-Initializing the AXM-WEB-PUSH to obtain the IP).
- Login in with 'Admin' access.

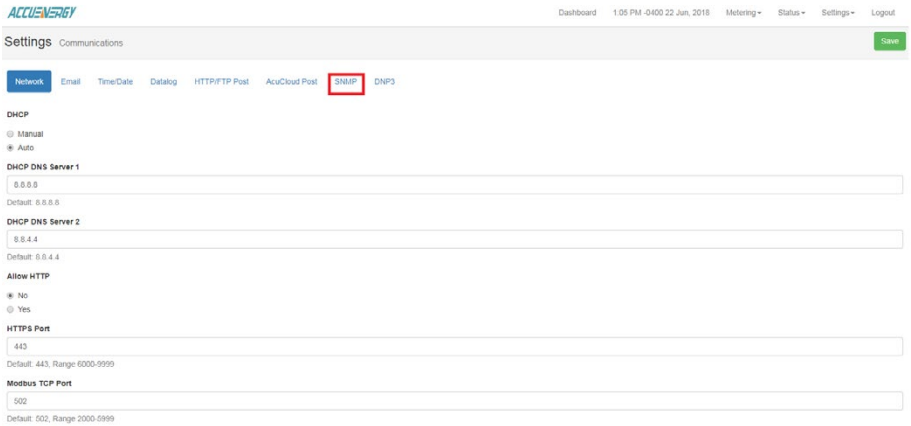


NOTE: The default password for the Admin user access is 'admin'.

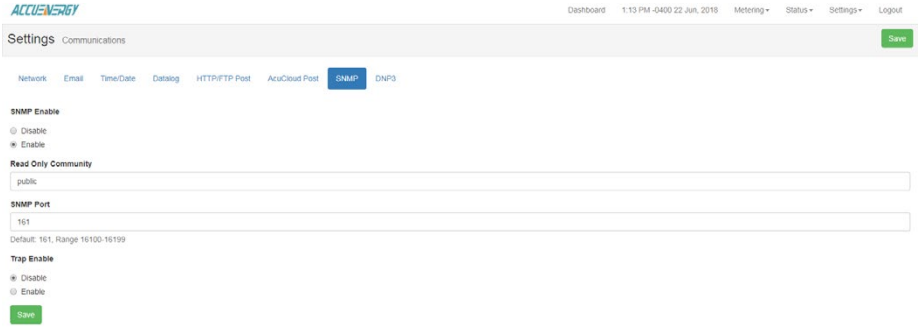
- Click on 'Settings' and select 'Communications'.



- Select the 'SNMP' tab to configure the settings related to the SNMP Protocol.



- Under "SNMP Enable" select 'Enable' to enable the SNMP protocol.



The configurations to configure in order for the AXM-WEB-PUSH to communicate via SNMP are as followed:

Read Only Community: The AXM-WEB-PUSH supports read only community string, by default public is the default. If another string is used, the SNMP client should have the same value.

SNMP Port: Enter the port number that the data will be received on. The default port is 161. The range of ports supported are 16100-16199.

Trap Enabled: Select 'Enabled to enable the meter to send alerts/messages to the client when a certain event occurs. I.E. when there is a change is Digital Input Status.

Trap Target 1/2/3/4: Enter the address and port for the destination of the alerts. Upto four destinations can be entered.

Report Buffer: Enter the number trap messages the module can store. Upto 30 trap messages can stored.

Report Hold Time: Enter the time in seconds, for how long the module will store the trap messages before sending to the client. The default value is '0' so that the traps will be sent immediately when there is an event.

Click 'Save' and select "Reboot Now" after making any changes to allow the configurations to take effect.

6.2 Acuvim II Series Management Information Base(MIB)

The MIB file for the Acuvim II series meter can be downloaded from the following URL: **https://accuenergy.com/files/acuvim-ii/ACUVIMII-MIB.mib.zip**

ACCUENERGY

MAKE ENERGY USAGE SMARTER

ACCUENERGY INC.

440 Comstock Road
Toronto, ON M1L 2H6, 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: September 2024 Document # 1040E2102