

# SmartZone<sup>™</sup> Network-Enabled MPO Series Rack PDU

**User Manual** 

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## SmartZone<sup>™</sup> Network-Enabled MPO Series Rack PDU

Network-Enabled MPO (Monitored Per Outlet) Series Rack PDUs integrate with the Panduit PIM Software Platform and other SmartZone applications to enable intelligent management of in-cabinet power usage. This system helps to quickly identify potential power overload issues in order to aid in resolution, identify underutilized power capacity for efficient deployment of network resources, and automate collection of real-time power information.

The MPO Series PDU monitors per-phase power, voltage and current, per-outlet power, voltage and current, and per-branch current.



SmartZone<sup>™</sup> Network-Enabled PDUs are available in a wide range of configurations and power connections and outlets and can be mounted vertically or horizontally.

### **Contacting Panduit**

For Technical Support on PDU hardware and associated software, please contact Panduit Technical Support using one of the following methods:

1-866-721-5302 (toll-free) Monday-Friday, 7:30 am - 5:00 pm CST systemsupport@panduit.com

### Symbols Used

Symbol	Description	
Danger Betre adde na	Danger – Electric Shock Hazard	
!	Warning – Possible Safety Hazard	
	Primary Earth Ground	

#### Network-Enabled MPO Series Rack PDU User Manual

Symbol	Description	
Ŧ	Secondary Earth Ground	
I	ON	
0	OFF	

## **Equipment Overview**

The power inlet/cord(s) connects the PDU to the electrical power source. On metered PDUs, the LCD displays the current load for each input feed or electrical phase per input feed.

- One shielded RJ45 connector for Ethernet connection
- Two unshielded RJ45 connectors for SmartZone<sup>™</sup> sensors (For a list of supported sensors, see "Optional Accessories".)

For IEC C-20 inlet PDUs, a customer-supplied cord is used for connection to the power source. The connection end to the PDU has an IEC C-19 plug for connection to the PDU. The opposite end of the cord shall have a plug suitable for connecting to the customer supplied receptacle. The cord and plug shall be rated for 20A in North America and 16A outside of North America. The connection to the PDU should be made prior to connecting to the power source.

### **Voltage and Current Values**

Non-U.S./Canada		U.S./Canada	
Voltage	Current	Voltage	Current
240, 415	10, 13, 16, 20, 30, 32, 48, 63	120, 208	12, 16, 24, 40, 48

### **Model Numbering Format**

This section describes the model numbering format used to identify equipment in the PDU series. PDU devices are numbering using one of the following formats:

- P1N-ABCDEFGHJKLM
- Q1N-ABCDEFGHJKLM

The P1N prefix indicates that the model is intended for horizontal mounting. The Q1N prefix indicates that the model is intended for vertical mounting. The remaining series of letters represent values as defined in the table below.

Letter	What It Represents	
A	any numeral, 1-8, indicating the phase wiring for the output circuit breakers and receptacles	
В	Any letter, A-F, indicating input cord configuration	
CD*	Any numeral, 1-5, and any letter, A-Z, indicating input plug type and rated voltage	
E	Any numeral, 1-7, indicating the number of output circuit breakers	
F	Any letter, A-Z, indicating the type of overload protection provided for the out- lets	
GH	Any two numerals, 01-45, indicating the number of output receptacles provided	
JK	The letter 'A' or 'B' followed by any letter, A-Z, indicating the type and quantity of output receptacles provided	
L	Any numeral, 0-9, or any letter, A-Z, indicating the length of the power supply cord	
М	Any numeral, 0-9, indicating the color of the enclosure	

\* Voltage and amperage ratings:

120V, single-phase, 10A, 12A, 15A, 16A, 20A, 24A or 30A 208V, single-phase, 10A, 12A, 13A, 15A, 16A, 20A, 24A, 30A, 48A or 60A 230V, single-phase, 16A, 32A, or 48A 208V, three-phase (delta), 16A, 20A, 24A, 30A, 40A, 48A, 50A or 60A, 3W + PE 208V, three-phase (wye), 16A, 20A, 24A, 30A, 48A or 60A, 3W + N + PE 400V, three-phase (wye), 16A, 20A, 24A, 30A, 32A, 48A or 60A, 3W + N + PE

#### **Model Numbers**

Part Number
P1N1B1C0A10AKA0
P1N1B1L2N08ATA0
P1N1B1M2M10AKA0
Q1N1A3W0A24AF00
Q1N1B1C0A24AKA0
Q1N1B1D0A24AKA0
Q1N1B1E0A30AHA0
Q1N1B1F0A30AHA0

Part Number
Q1N1B3H0A24AFA0
Q1N1B3H0A30AHA0
Q1N1B3H0A30AXA0
Q1N2B1J0A30AHA0
Q1N2B1L2N30AHA0
Q1N2B1M2M24AKA0
Q1N2B1N3N30AHA0
Q1N2B1P3N30AHA0
Q1N2B2C3N30AHA0
Q1N2B2P6M30AHA0
Q1N2B2Q0A30AHA0
Q1N2B2T6N30AHA0
Q1N2B2W6N30AHA0
Q1N2B2W6N30APA0
Q1N2B3J2M30AHA0
Q1N2B4E3N30AEA0

### **Additional Model Numbers and Numbering Format**

In addition to the listings above, the model numbers listed below are also covered, based on the naming conventions explained in the table that follows.

Part Number
HQ-208V30A
HQ-240V16A
HT-208V30A
VQ-240V16A
VT-208V60A
VT-415V32A
VW-208V60A
VW-415V32A

The format used for these model numbers is: AB-xxxVyyA

Letter	What It Represents	
A	H = Horizontal V = Vertical	
В	Q = Monitored with Monitored Per Outlet (Network Connection) T = Monitored with Monitored & Switched Per Outlet (Network connection) W = Monitored with Switched Per Outlet (Network Connection)	
xxxV	Any voltage from 100 - 415	
ууА	Amps, from 10 - 80	

## **Pre-Installation**

The Rack PDU products covered by this guide are designed to be installed within EIA racks and cabinets. Use of this product in other applications is acceptable, but other precautions may be required to allow for specific installations not covered by this guideline.

### **Product Inspection**

Inspect the product prior to installation. If the product has any visible signs of damage, please contact the supplier.

## Installation

### **Before You Begin**

Before installing your PDU, refer to the following lists to ensure that you have all the items shipped with the unit as well as all other items required for proper installation.

### **Standard Accessories**

#### **Mounting Hardware:**

- Vertical models:
   Affixed button mounts
- Horizontal models:
   Appropriate local mounting brackets and screws

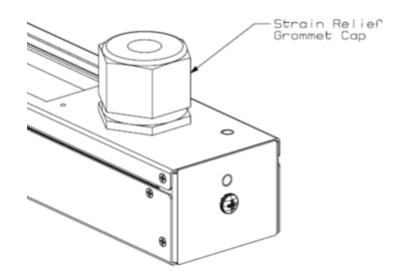
#### Cables/Adapters:

• RJ45 patch cord cable

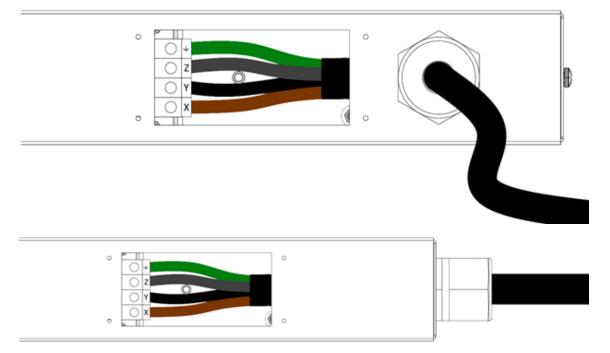
### Hardwire PDU installation instructions

This product is intended to be hardwired by the customer must be installed by a qualified electrician AND adhere to all national & local electrical codes.

- 1. To install, remove the (4) securing screws on the removable user panel.
- 2. Unscrew strain relief grommet cap (indicated below) and feed the power cable through the grommet cap & the input gland.



- 3. Ensure conductors are stripped adequately, exposing 15mm of copper.
- Conductors shall be connected in-line with the terminal markings provided as shown below (Line 1 = X; Line 2 = Y; Line 3 – Z). Ensure screws are secure for each conductor by applying a torque of 2.3 N-m (20 in-lb.).



- 5. Ensure conductors have enough slack (none should be under tension).
- 6. Feed grommet cap down cord and secure to input gland. Reference the table below to ensure the grommet cap is torqued correctly.

<b>Gland Size</b>	<b>Grommet Cap Torque</b>
M16	1.5 N-m (13 in-lb.)
M20	3.0 N-m (27 in-lb.)
M25	40 N m (25 in lb)
M32	4.0 N-m (35 in-lb.)
M40	15 N-m (132 in-lb.)
M50	20 N-m (177 in-lb.)
M63	30 N-m (266 in-lb.)

- 7. Re-install removable cover plate with the screws removed in step 1.
- 8. Connect the other end of the power cord to a suitably rated disconnect device.
- 9. Switch utility circuit breaker "On".

### **Unterminated Cord PDU installation instructions**

This product is intended to be hardwired by the customer must be installed by a qualified electrician AND adhere to all national & local electrical codes.

To install, match the corresponding conductor color to the matching phase in your facility. Reference the color guide below:

<b>Conductor Insulation Color</b>	Line Number / Phase
Brown	Line1 / X
Black	Line 2 / Y
Grey	Line 3 / Z
Blue	Neutral
Green (may include Yellow stripe)	Ground

### **Optional Accessories**

#### SmartZone Environmental Sensors:

- Smoke Sensor
- Humidity Sensor
- Water Rope Sensor
- Door Sensor
- Temperature Sensor
- Water Contact Sensor
- Air Flow Sensor
- Passive Infra-Red Motion Detector

### **Additional Required Items**

- Flathead and Phillips screwdrivers
- Appropriate local AC power receptacle to power the PDU
- Local active Ethernet port to communicate with the PDU

### **Safety Precautions**

This section contains important safety and regulatory information that should be reviewed before installing and using the Rack PDU.

#### Servicing

There are no user-serviceable parts inside these products. Any maintenance or repair must be performed by approved service-trained personnel. Opening the unit will void the product warranty.

#### **Product Safety Warnings**

Warning: Use only in dry locations. Indoor use only.

PDU hardware has an International Protection Rating of IPX0.

The installer must connect the power distribution unit to an electrical supply that has a protective Earth conductor.

For pluggable equipment, the socket outlet should be installed near the equipment and should be easily accessible.

**Warning**: For permanently connected equipment, a readily accessible disconnect device should be incorporated external to the equipment.

Power distribution products must be protected by a branch circuit protective device rated at the maximum rating of the product specified on the product rating label.

To avoid risk of overload, do not plug additional multiple outlet power distribution devices into the power distribution unit socket outlets.

This equipment is intended only for installation and use in a Service Access Location in accordance with the following installation and use instructions.

This equipment is designed to be installed on a dedicated circuit.

- The dedicated circuit must have circuit-breaker or fuse protection.
- Rack PDUs have been designed without a master circuit breaker or fuse to avoid becoming a single point of failure. It is the customer's responsibility to provide adequate protection for the dedicated power circuit. Protection of capacity equal to the current rating of the Rack PDU must be provided and must meet all applicable codes and regulations. In North America, protection must have a 10,000A interrupt capacity.

Warning: Always disconnect the power supply cord before opening to avoid electrical shock.

**DANGER**: High leakage current! Earth connection is essential before connecting supply!

**DANGER**: Double Pole/Neutral Fusing: The plug on the power supply cord must be installed near the equipment and must be easily accessible.

#### **Rules**

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in

accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes/modifications not approved by the responsible party could void the user's authority to operate the equipment.

### **Environmental Specifications**

- Operating Temperature: 0C to 40C
- Transportation Temperature: -10C to 70C
- Operating Humidity: 15% to 85% non-condensing
- Transportation Humidity: 5% to 90% non-condensing

#### Bonding

This product contains an external earthing screw with a star washer, which should be used for supplementary Earth bonding to the rack metalwork.

Bonding			
Minimum Requirements	for Bonding Conductors		
Up to and including 32A	12 AWG		
Up to and including 63A	8 AWG		
Up to and including 80A	6 AWG		
Screv	v Size		
Over 16A, less than or equal to 40A	5mm		
Over 40A, less than or equal to 63A	6mm		
64A	7mm		

## Mounting

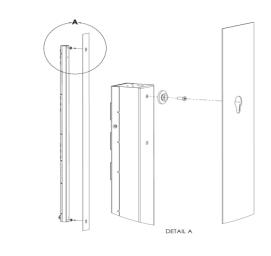
There are two mounting options for Rack RDUs

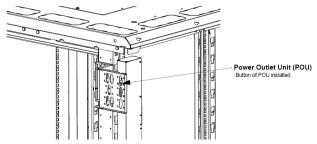
- Vertical Mounting
- Horizontal Mounting

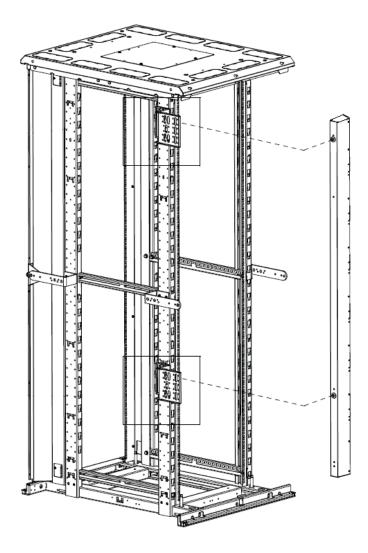
Instructions for each mounting option are detailed below.

### **Vertical Mounting**

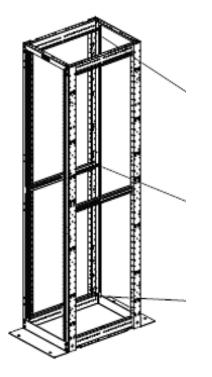
The product is intended to be installed using the tool-less mounting buttons. These buttons locate in the fixing holes provided as shown in the following figure.

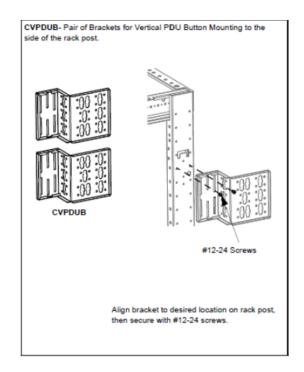






#### **PDU Bracket for 4-Post Racks**





#### **PDU Bracket for 2-Post Racks**



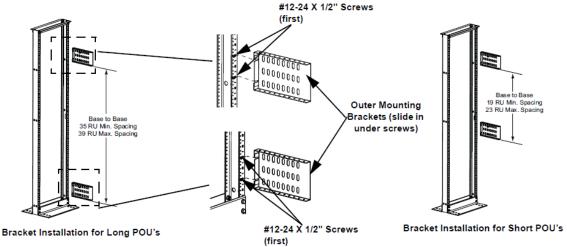
#### Installation Instructions-Outer Mounting Brackets

Attach (2) #12-24 X 1/2" screws to rack (per bracket) at appropriate locations.

Fasten outer mounting brackets to rack using the screws. The large flat surface with slotted holes may face outside or inside.

For mounting long (66.25") POU's, the brackets may be spaced vertically between 35 and 39 RUs apart, in 1 RU increments, measured from bracket base to bracket base.

For mounting short (39") POU's, the brackets may be spaced vertically between 19 and 23 RUs apart, in 1 RU increments, measured from bracket base to bracket base.



#### Installation Instructions-Inner Mounting Brackets

Slide inner mounting brackets into outer mounting brackets with the POU mounting keyway surface facing opposite the outer bracket slotted hole surface. Fasten brackets together using (4) #12-24 X 1/2" screws for each bracket set. (2) screws will be fastened on the top flange and (2) screws will be fastened on the bottom flange.

Important: (2) screws must be fastened in the most **outward** hole on each **outer** mounting bracket (1 top, 1 bottom). (2) screws must be fastened in the position where the hole in the **inner** mounting bracket is **closest** to the face of the rack, regardless of extended position.

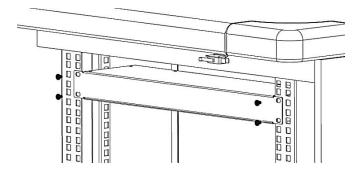
**Note:** Multiple holes on the top and bottom of the brackets allow the distance from the rack a POU can be mounted to be adjustable. This means that the side facing POU can be mounted ranging from 3.7"-18.7" horizontally from the face of the rack. The rear facing POU can be mounted ranging from 12.3"-20.3" horizontally from the face of the rack.

### **Horizontal Mounting**

This product is intended to be installed using the rack's RU mountings via the brackets found at either end of the PDU with the accessory screws provided listed below.

 Horizontal Models North American units (4) #10-32 x 1/2" MOUNTING SCREWS (4) #12-24 x 1/2" MOUNTING SCREWS

Global units (4) M6 x 20mm MOUNTING SCREWS (4) #12-24 x 1/2" MOUNTING SCREWS



## Hardware

### LCD Display

The display shows the firmware version number, device model number, serial number, MAC Address, IP Address, and electrical readings. The display automatically scrolls through the readings. Readings that can be displayed include:

- Start Up messages
- Configuration/serial/product number messages
- Error/Status messages
- Aggregate data
- Single phase data, 3 Phase Delta data, or 3 Phase Wye data
- · Branch current data, if the unit has breakers

During normal operation, the mode button may be used to quickly advance through the LCD display pages.

### **Reset Button**

Push the **Reset** button using a non-metallic item, similar in size to a paper clip, to reset the PDU device.

**Understand** Warning: a metallic item, such as a paper clip, is not recommended as a reset tool.

The reset tool should be inserted perpendicular to the surface of the device and pressed until the button is reached and is actuated.

The reset tool should bump into the button within 1/8 of an inch of being inserted, and should be lightly depressed and held for at least 1 second. The reset tool should never be inserted more than 1/4 of an inch.

Resetting the PDU device starts the bootloader.

*For PDUs with bootloader versions 2.3.03 and 2.3.04:* Wait between 1 and 30 seconds for the Display Backlight to blink on and off at a rate of 2 blinks per second. The bootloader stays in this mode for at least 4 seconds (8 blinks) if no user operation is detected.

*For PDUs with bootloader versions 2.3.05:* Wait between 1 and 30 seconds for the Display Backlight to blink on and off at a rate of 4 blinks per second. The bootloader stays in this mode for at least 2 seconds (8 blinks) if no user operation is detected.

### **Mode Button Operation**

#### **Bootloader Startup**

When the user presses and holds the **Mode** button, the Display Backlight switches to one blink per second, indicating the bootloader is waiting for one of the following operations.

- If the user releases the **Mode** button after two blinks, the backlight goes solid-on and stays in the bootloader, entering the "firmware recovery mode". See the "Firmware Recovery Mode" section (below) for more details.
- If the user releases the **Mode** button after four blinks, the backlight goes solid-on and attempts to boot the "backup firmware image".
- If the user does not operate the **Mode** button as described above, the Display Backlight is turned off. The "firmware updatable application image" continues loading.

#### **Firmware Recovery Mode**

The Network-Enabled PDU provides a firmware recovery mode in case a firmware update is interrupted while in progress and fails to complete successfully.

Note: Do not power cycle or restart a device while a firmware update is in progress.

If a firmware update does not complete successfully, and the device fails to be operational after 30 minutes, contact Panduit Technical Support. 1-866-721-5302 (toll-free) Monday-Friday, 7:30 am - 5:00 pm CST systemsupport@panduit.com

#### **Application Startup**

When the application is ready, a message is displayed on the LCD:

Starting up...

The display backlight blinks quickly three times and remains lit.

The LCD then displays:

Hold MODE button to reset to defaults...

The application stays in this mode for at least 5 seconds. If no button operation is detected, the application continues to normal system operation.

If the customer presses and holds the **Mode** button for 5 seconds, the following message displays on the LCD:

Hold MODE button more than 5 seconds to reset to defaults

If the customer continues to press and hold the **Mode** button, the following message displays on the LCD:

Reset to defaults is detected. Please release MODE button.

The customer should release the **Mode** button at this point. The following message displays on the LCD:

Device is Resetting to factory defaults.

If the customer does not operate the **Mode** button as described above, the application continues normal system operation.

#### **Internal Error Notification**

After system start up is complete, during normal operation of the unit, the LCD screen may blink. This typically indicates a temporary or persistent internal error condition.

If the condition is persistent, the LCD screen displays the word "STATUS:" followed by a hexadecimal code, similar to the following.

STATUS: 0x00900080

The hexadecimal code is a composition of per-outlet control, per-outlet monitoring and per-phase monitoring status. For example, if a three phase Per-outlet Monitoring or Switched unit loses a power phase, the status screen will reflect that communication to those boards has been lost.

For definitions and recommended actions on status codes, provide the displayed hexadecimal number to Panduit Technical Support.

## **Graphical User Interface**

The Panduit Network Enabled Rack PDU provides access to configuration, power, and sensor data through a Graphical User Interface (GUI), using a standard browser. There are several ways to connect to the device's GUI, depending on your network configuration and the firmware revision of the device.

If the PDU has firmware revision 2.3.03 (or earlier), Static IP is the default. The configuration settings in this case are:

IPv4 Address:192.168.0.253 IPv4 Network:255.255.255.0 IPv4 Gateway:192.168.0.1

If the device has firmware revision 2.3.04 (or later), DHCP is the default, and one of the following scenarios will be used.

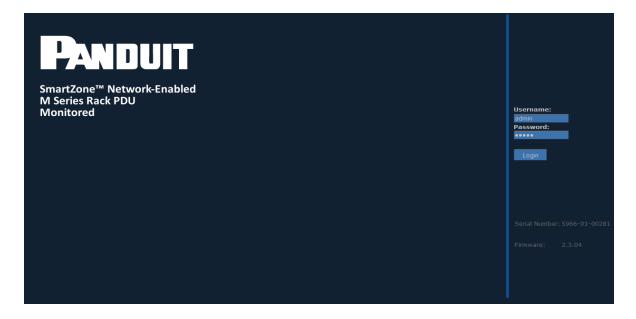
• If you have a DHCP Server available, connect to the appliance through that server, using the PDU's IP Address.

**Note**: The IP address for the Rack PDU is displayed on the device's LCD screen after the label IPv4

- If you do not have a DHCP server, you can run one on your PC. To connect to the device, use the IP address displayed on the LCD screen.
- If you want to use automatic IPv4 address configuration, you must activate DHCP on your PC and then connect directly to the PDU. This will give you an address on the 169.254.0.0/16 network. You can then connect directly using the IP Address displayed on the LCD screen.

### Access the PDU Graphical User Interface

To access the GUI, open a web browser and enter the IP Address of the PDU. When the login page opens, you will be prompted to enter a Login and Password.



The default login and password are:

Login:admin

Password:admin

After successful login, the GUI opens to the Overview page.

Pand	TIUIT				Logged Ir	n: admin ( Admi System Name:	
				Setup	Input Sensors	Power	
	Network Setup / Ove	erview					
Overview							
IP Config	System Name:	sysName					
	System Location:	sysLocation					
нттр	System Contact:	sysContact					
SNMP NMS							
SNMP Rec'rs	Part Number:	Q1T1B3H0A24AFA0					
SHIFF REC 13	MAC Address:	00:07:6e:04:01:58					
Users	Serial Number:	5966-01-00344					
Email Alerts	Firmware Version:	2.3.03					
	Hardware Revision:	V1.0.00					
Time Settings	System Uptime:	0 days, 0 hours, 6 mins, 27 secs					
Syslog Servers							
Events	IP Stack:	Dual					
		IPv4	IPv6 Auto Conf.		IPv6		
Preferences	IP Address:	192.168.0.253	FE80::207:6EFF:FE	04:158			
Restart	Subnet Mask:	255.255.255.0	/64				
	Gateway:	192.168.0.1					
	Config. Protocol:	Static	Auto Configured IP	/6			
	Logged In User:	admin					
	Access Level:	Administrator					

There are three modules within the GUI, each providing access to a different area within the PDU. The modules are:

- Set Up
- Input Sensors
- Power

To select a module, click the appropriate label along the top of the display.

Pane	DUIT	SmartZone™ Network-Ena M Series Rack PDU	Module Selection	Setup	Logged Input Sensors	In: admin ( Adminis System Name: s Power	
	Network Setup /	Overview	-				
Overview							
	System Name:	svsName					

The menu items that appear on the left hand side of the screen will change depending on the module selected.

## Setup

When the setup module is selected, the following menu items appear along the left hand side of the display.

	Setup Menu Options
IP Config	View or edit the network settings
HTTP	View or edit the HTTP settings
SNMP NMS	View or edit information about NMS access
SNMP Rec'rs	View or edit information about the SNMP Receivers
Users	View or edit information about all users
Email Alerts	View or edit email alert settings
Time Settings	View or edit information about the date and time
Syslog Servers	View or edit information about the Syslog servers
Events	View Event history
Preferences	View or edit system preferences
Restart	Provides the ability to restart the PDU

Detailed information on each of these menu items can be found in the corresponding sections below.

## **IP Config**

Selecting this option displays the IP Configuration page, where network settings for the unit can be set. This is the information that will be displayed on the Overview page.

PANE	DUIT					In: admin ( Administr stem Name: iPDU-04: Lo	
				Setup	Input Sensors	Power	
	Setup / IP Configura	tion					
Overview							
IP Config	Network settings for t by a Network Manage	this unit are set here. This ment Station.	will be the IP addres	s that is used to access	s the web managem	ent interface and	
нттр							
SNMP NMS					Includ	e in Trap	
SNMP Rec'rs	System Name:		iPDU-04:01:19				
Users	System Location:		smbycube				
Email Alerts	Contact Name:		sysContact				
Time Settings		IPv4	IPv6				
Syslog Servers	Config. Protocol:	DHCP 💌	AutoConfig Only				
Events							
Preferences	IP Address:	10.72.130.69					
Restart	Subnet Mask:	255.255.255.0					
	Gateway:	10.72.130.1					
						Save	

	IP Configuration
System Name	The name of the PDU
System Location	The location of the PDU
Contact Name	A person to contact regarding the PDU
Config Protocol	Select the configuration protocol
IP Address	The IP address of the PDU
Subnet Mask	The Subnet Mask for the PDU IP Address
Gateway	The Gateway for the PDU IP Address

#### **IPv4 Address Configuration**

There are several kinds of IPv4 address configurations that you can choose from. Static IPv4 is the default configuration for firmware releases before firmware version 2.3.04. DHCP is the default configuration for firmware releases after firmware releases 2.3.03.

#### The DHCP configuration (Dynamic Addressing provided by Infrastructure)

- The DHCPv4 client allows the user to obtain IPv4 configuration information from a DHCPv4 server. The functions that the DHCPv4 client performs include:
  - · Basic server discovery and address assignment.
  - Address renewal and rebinding.
  - Address deprecation when the preferred lifetime expires.
  - Address removal when the valid lifetime expires.
  - Address release when the interface is closed.

#### Static Configuration (Manual Addressing)

• The customer must specify an IP address, Subnet mask, and Gateway.

#### **IPv6 Address Configuration**

There are several kinds of IPv6 address configuration that can be chosen.

#### AutoConfig only (link local addressing)

- IPv6 AutoConfig addressing is always available.
- The customer does not specify an IP Address, IPv6 prefix (shown as Subnet Mask in the web UI) or Gateway.
- The link local address is always based on the MAC Address converted into an EUI-64 address.

For example, the MAC Address: 00:07:6E:04:01:28 is always always accessible at the IPv6 Link local address: FE80::0207:6EFF:FE04:0128.

Note that the first byte of the MAC address has 0x02 added to it where FF:FE is inserted into the middle of the MAC address bytes. The technical term for this address format is stateless address autoconfiguration (SLAAC) using the modified EUI-64 format.

#### Static configuration (manual addressing)

- The customer must specify an IP Address, IPv6 prefix (shown as Subnet Mask in the web UI) and Gateway.
- Static IPv6 configuration works concurrently with stateless address autoconfiguration.

#### DHCPv6 configuration (dynamic addressing provided by infrastructure)

The DHCPv6 client allows the user to obtain IPv6 configuration information from a DHCPv6 server and works concurrently with stateless address autoconfiguration. The functions performed by the DHCPv6 client include:

- · Basic server discovery and address assignment
- Address renewal and rebinding
- Address deprecation when the preferred lifetime expires
- Address removal when the valid lifetime expires
- · Address release when the interface is closed

The current implementation of the DHCPv6 client has certain limitations. The following are the features that are currently not supported:

- Authentication
- RECONFIGURE Messages
- IA\_TAs (Temporary Addresses)
- Rapid Commit FQDN (Fully Qualified Domain Name)
- DUID-LLT
- IA\_PD (Identify Association for Prefix Delegation)

#### Accessing the appliance via a web browser using IPv6

A web browser can access IPv6 addressed devices using the full or short form IPv6 address.

For example, to access an appliance with the MAC address 00:07:6E:04:01:28, you could navigate to the AutoConfig address: http://[FE80::0207:6EFF:FE04:0128]/ or https://[FE80::0207:6EFF:FE04:0128]/ . The open and close square brackets indicate an IPv6 address.

When using a PC with more than one IPv6 enabled network interface (multi-homing), IPv6 scoped URLs may be necessary to access a device. Not all web browsers fully support IPv6 scoped URLs. Therefore, this problem must be worked around by enabling IPv6 on only one interface at a time on the computer running a web browser to access the appliance.

### HTTP

This page allows you to choose the access method for the web management interface.

Pane	JUIT			In: admin ( Adm stem Name: iPDL	
		Setup	Input Sensors	Power	
	Setup / HTTP				
Overview					
IP Config	Access method for the web management interface is selected here. HTTP and HTTPS - Accessible by either HTTP or HTTPS				
нттр	HTTPS Only - Accesible by HTTPS only, recommended for security				
SNMP NMS	HTTP Port: 80				
SNMP Rec'rs	HTTPS Port: 443				
Users					
Email Alerts	O HTTP and HTTPS				
Time Settings	• HTTPS Only				
Syslog Servers					
Events					
Preferences					
Restart					
					Save

To choose the access method, click the corresponding radio button and enter the appropriate **Port** number. Typically the Port does not need to be changed from its default setting (80 for HTTP or 443 for HTTPS).

HTTP or HTTPS access methods can be used. However, HTTPS is recommended for security.

When you save any changes to this page, you will see the following message:

```
After Saving, would you like to restart the unit?
Click 'OK' to restart, otherwise 'Cancel'.
```

If you select **Cancel**, you are reminded that you will need to manually restart for any changes to take effect.

### **SNMP NMS**

This page provides access for Network Management Stations.

PANE	JUIT					n: admin ( Admi tem Name: iPDU	
				Setup	Input Sensors	Power	
	Setup / SNMP (Netw	ork Management Statio	ns)				
Overview							
IP Config	SNMP access credent access (using USM Us	ials are configured here sers).	. The device supports l	both SNMPv2c acc	cess (using Communit	y Strings) and	SNMPv3
нттр							
SNMP NMS	Select the SNMP version you wish to configure: SNMPv2c 💌						
SNMP Rec'rs							
Users		nd access permissions a					
Email Alerts		rmits an NMS using the permits an NMS using t				ands.	
Time Settings		Community String:	NMS Access:				
Syslog Servers	NMS 1	public	Read Only				
Events	NMS 2	private	Read / Write 💌				
Preferences	NMS 3		Read Only 💌				
Restart	NMS 4		Read Only 🔽				
	NMS 5		Read Only 💌				
							Save

Both SNMPv2c and SNMPv3 protocols are supported simultaneously. You must enter the credential information for any device that needs to communicate with the unit via Simple Network Management Protocol (SNMP).

Select the SNMP version settings you wish to edit from the drop-down menu.

For ease of initial deployment and discovery, default credentials for both versions have been provided:

- The SNMPv2 default Community Strings are "public" (read-only access) and "private" (read/write access).
- The unit will respond to SNMPv3 requests using the MD5 authentication and DES privacy protocols. To use the "authUser" and "secureUser" user names, an Authentication and/or Privacy password must first be set.
- To disable a specific version of SNMP, simply remove the Community Strings (SNMPv2c) or User Names (SNMPv3) and save the configuration.

Enter the **Community String** for any device that must access the unit's SNMP functions.

Access permissions can be selected from the drop-down menu under NMS Access.

	Access Permission Settings
Read Only	Permits the NMS to use only GET commands
Read / Write	Permits the NMS to use both GET and SET com- mands

### **SNMP** Receivers

The **SNMP Receivers** page displays information for all devices that receive SNMP traps sent from this unit.

	IUIT		Setup	Input Sensors	Power
	Setup / SNMP (Receivers)				
Overview					
	SNMP Trap Receivers are con Any machine which will be re	figured here. quired to receive SNMP traps sent from this	unit must be entere	ad hara	
-	Notes:				
		when enabled, are generated if an attempt i 2-trap format contained within a SNMPv3 m			
SIMIP INMS	All Traps are generated to po				
SNMP Rec'rs					
Users		Receiver IP Address:	Receive Traps:	Trap	Version:
Email Alerts	Receiver 1		Disabled	▼ v1	
	Receiver 1 Receiver 2		Disabled Disabled	▼ v1 ,	
ime Settings					-
ime Settings yslog Servers	Receiver 2		Disabled	▼ v1 ,	•
Email Alerts Time Settings yslog Servers Events	Receiver 2 Receiver 3		Disabled Disabled	▼ v1	
ime Settings yslog Servers	Receiver 2 Receiver 3 Receiver 4		Disabled Disabled Disabled		
ime Settings yslog Servers Events	Receiver 2 Receiver 3 Receiver 4 Receiver 5		Disabled Disabled Disabled Disabled	vi v	
ime Settings yslog Servers Events Preferences	Receiver 2 Receiver 3 Receiver 4 Receiver 5 Receiver 6		Disabled Disabled Disabled Disabled Disabled		
ime Settings yslog Servers Events Preferences	Receiver 2 Receiver 3 Receiver 4 Receiver 5 Receiver 6 Receiver 7		Disabled Disabled Disabled Disabled Disabled Disabled		

Enter the **IP address** and **Community String** for any device that will be required to receive SNMP traps. Usually any SNMP NMS entries should also be entered here. From the dropdown menu under **Receive Traps**, select one of the following:

Receive Traps Settings			
Disabled	Receiving traps is prohibited		
Enabled	Allows the specified NMS to receive the unit's standard		

	Receive Traps Settings
	range of traps
Enabled (Incl. Auth Fails)	Receive traps – causes the unit to issue traps if there is an unauthorized attempt to access the unit's SNMP func- tions.

The version of trap/notification can be selected from the dropdown menu under **Trap Version**.

#### **SNMP Trap Description Text Format**

SNMP Traps are detected when certain events are detected. The format of the generated text messages is explained below.

NOTE: Before the text message is sent, all leading, trailing and repeated whitespace is removed.

The SNMP trap text format is:

```
<snmp-trap-format> ::= <opt-timestamp-prefix> " " <opt-system-
name> " " <opt-system-location> " " <opt-contact-name> " "
<trap-kind> " " <source-name> " " <chan-no> " " <user-text> "
" <value> " " <data-type> " " <opt-timestamp-postfix>
```

The following table contains definitions for each parameter.

SNMP Trap Text Format	
<opt-system-name> ::= <text></text></opt-system-name>	Optional. When Setup -> IP Config / System Name / Include In Trap is checked, Setup -> IP Config -> System Name is displayed.
<opt-system-location> ::= <text></text></opt-system-location>	Optional. When Setup -> IP Config / System Loca- tion / Include In Trap is checked, Setup -> IP Con- fig -> System Location is displayed.
<opt-contact-name> ::= <text></text></opt-contact-name>	Optional. When Setup -> IP Config / Contact Name / Include In Trap is checked, Setup -> IP Config -> Contact Name is displayed.
<pre><opt-timestamp-prefix> ::= <text></text></opt-timestamp-prefix></pre>	Optional date/time prefix. (When Setup / Prefer- ences Timestamp Traps: is set to "Prefix".)
<trap-kind> ::= <text></text></trap-kind>	Type of notification. Warning, Critical, Information

SNMP Trap Text Format					
	On, Information Off, Cleared, Unknown.				
<source-name> ::= <text></text></source-name>	Data source. Example: "Input 01".				
<chan-no> ::= "(" <number> ")"</number></chan-no>	When available, the number of the sensor Port the alert came from.				
<user-text> ::= <text></text></user-text>	Event description of the reason for the trap. See the "User Text" strings on the Trap Configuration pages or the per-sensor configuration pages. Example: For contact sensors, the "Normal Trap User Text" or "Non-Normal Trap User Text" is used.				
<value> ::= <text></text></value>	The value at which the event occurred. Example: "900" indicates 90% humidity.				
<data-type> ::= <text></text></data-type>	Type of the data. Example: "relative humidity"				
<opt-timestamp-postfix> ::= <text></text></opt-timestamp-postfix>	Optional date/time postfix. (When Setup / Prefer- ences Timestamp Traps: is set to "Append".)				

#### Users

Select the **Users** menu item to add or modify Web GUI User settings.

Pane						In: admin ( Admi tem Name: iPDU	
				Setup	Input Sensors	Power	
	Setup / Users						
Overview							
IP Config			e viewed and modified. gs can only be viewed.				
нттр							
SNMP NMS		Username:	Password:	Level:			
SNMP Rec'rs	User 1	admin		Administrator	•		
Users	User 2			Administrator			
	User 3			Administrator	-		
Email Alerts	User 4			Administrator	-		
lime Settings	User 5			Administrator			
yslog Servers	User 6			Administrator			
Events	User 7			Administrator			
Preferences	User 8			Administrator	-		
Restart	User 9			Administrator	•		
	User 10			Administrator	•		
	User 11			Administrator			
	User 12			Administrator			
	User 13			Administrator			
	User 14			Administrator			
	User 15			Administrator	-		
	User 16			Administrator	•		
	User 17			Administrator			
	User 18			Administrator	·		
	User 19			Administrator			
	User 20			Administrator			
							Save

The PDU GUI comes with the Administrator login predefined as:

- Login:admin
- Password:admin

To add new users, enter a unique **Username** and **Password** for each, then select the desired level of permission. You may configure up to 20 users.

Level of permission for each user can be selected from the drop-down menu on the right. There are three different permission settings:

User Permission Settings					
Administrator	Allows all configuration settings to be viewed and mod- ified				
Controller	Allows configuration settings to be viewed, but only cer- tain pages can be modified				
Viewer	Allows configuration settings to be viewed only				

## **Email Alerts**

On this page, you can edit email alert settings for traps. You may set up to 10 email receivers.

PANDUIT		_	Logged In: admin ( Administra System Name: iPDU-04:0 Lo									
						Set	tup	Inp	ut Sensors	Powe	r	
	Set	up / Email Alerts										
Overview	SM	TP Relay Server:										
IP Config		m Address:										
нттр		oly-To Address:										
SNMP NMS		ail Receivers										
SNMP Rec'rs	No.	Destination Addre	:55			Enabled	Repeat	Timer				
Users	1						u mins.					
Email Alerts	2						0 mins.					
Time Settings	3						0					
Syslog Servers	5						mins.					
Events	4						mins.					
Preferences	5	_					0 mins.					
Restart	6						0					
	0						mins. 0					
	7						mins.					
	8						0					
	_					_	mins. 0					
	9						mins.					
	10						0 mins.					
										TestAll	S	ave

	Email Alerts					
SMTP Relay Server	The IP Address of the SMTP Server					
From Address	Address from which the alert emails are sent					
Reply-To Address	Address to which the email receivers can reply					
Destination Address	Address that will receive the email alerts					
Enabled	Toggle the check box to enable or disable alerts to each address.					
Repeat Timer	Number of minutes after which the email alert will repeat					

#### **Time Settings**

The **Time Settings** page allows you to view or edit the current date and time.

Panduit			Logged In: admin ( Administr System Name: iPDU-04: Lo				
			Setup	Input Sensors	Power		
	Setup / Time Setting	s					
Overview							
IP Config	Date:	6 ▼ January ▼ 2006 ▼					
нттр	Local Time:	17 : 47 : 43 🔲 Update time					
SNMP NMS							
SNMP Rec'rs	Time Adjustments						
Users	Timezone:	(GMT) Dublin, Lisbon, London 📃					
Email Alerts	Daylight Saving:	Enabled					
Time Settings		Start the 4th - Sunday in March Stop the 4th - Sunday in October	<ul> <li>▼</li> </ul>				
Syslog Servers	Date Format:	dd/mm/yyyy <mark>▼</mark>					
Events							
Preferences	SNTP Servers						
Restart	Primary Server:		📃 🔲 Enabled				
	Secondary Server:		📃 🔲 Enabled				
	NTP Update Freq.:	1 Hours					
					Save		

Select the correct day, month, and year from the dropdown menus, and verify the local time. If you want to change the time, you must check the **Update time** checkbox.

#### **Time Adjustments**

Select the correct time zone from the drop-down menu.

- **Daylight Saving** can be enabled or disabled by clicking the check box. If Daylight Saving is enabled, select start/stop dates from the subsequent drop-down menus.
- **Date Format** allows the administrator to choose whether the date is displayed with the day or month first. For example, the date August 20, 2013 can be displayed in one of two ways:

20/08/2013 (DD / MM / YYYY) or 08/20/2013 (MM / DD / YYYY)

Select the desired format from the dropdown menu.

• SNTP Servers - Simple Network Time Protocol synchronizes the clocks of computer systems over a network. Enter the IP address of an SNTP server, and specify (in hours) how often the time should be updated.

### **Syslog Servers**

This page allows you to view or edit information about the Syslog Servers currently being used.

PANDUIT				Logged In: admin ( Adminis System Name: iPDU-04				
				Setup	Input Sensor	rs Power		
	Setup / Syslog Serv	ers						
Overview								
IP Config	Enabled:	Disabled 💌						
нттр								
SNMP NMS	Primary Syslog Serv	/er						
SNMP Rec'rs	Display Name:							
Users	IP Address: Port:	514						
Email Alerts	Log Event Types:	System			Input Config	Logging		
Time Settings		Service	🔲 Power St	rip	input coming	<b>_</b> 20999		
Syslog Servers								
Events	Secondary Syslog S	erver						
Preferences	Display Name:							
Restart	IP Address:							
	Port:	514						
	Log Event Types:	System	Network		Input Config	Logging		
		Service	Power St	rip				
							Save	

From the **Enabled** drop-down menu, you can choose which syslog servers are enabled. Fill in the following fields for each Syslog server.

Syslog Server Setup					
Display name	The name of the Syslog server				
IP Address	The IP address of the Syslog server				
Port	The number of the port being used				
Log Event Types	Click the check boxes to choose which events to log.				

#### **Events**

The View Events page shows a history of events that have occurred, along with specific details about each event.

PANDUIT					I In: admin ( Administrator ) /stem Name: iPDU-04:01:19 Logout	
				Setup	Input Sensors	Power
	View / Events					
Overview						
IP Config	View Events: 2	000 🔽 January 🔽 🔘	Latest First 🔍 Earli	est First [Show		[ <prev] [next="">]</prev]>
НТТР	Date / Time	Туре	User	Event Data		
SNMP NMS	Jan 06 17:47:40	User Login.	User:admin			
	Jan 06 17:45:43	Auto Logout.	User:admin			
SNMP Rec'rs	Jan 06 17:26:06	User Login.	User:admin			
Users	Jan 06 17:24:54	User Logout.	User:admin			
Email Alerts	Jan 06 17:24:45	User Login.	User:admin			
Time Settings	Jan 06 17:10:37	User Logout.	User:admin			
	Jan 06 17:07:53	User Login.	User:admin			
Syslog Servers	Jan 06 17:06:26	Auto Logout.	User:admin			
Events	Jan 06 16:59:38	User Login.	User:admin			
Preferences	Jan 01 00:00:12	Web Preferences Change.	User:System	Skin Id: 255		
	Jan 16 01:17:33	Application Image Updated.	User:System			
Restart	Jan 16 00:33:52	User Login.	User:admin			
	Jan 15 22:37:31	Auto Logout.	User:admin			
	Jan 15 20:32:21	User Login.	User:admin			
	Jan 15 20:31:48	Auto Logout.	User:admin			
	Jan 15 20:26:30		User:admin			
	Jan 15 20:06:03		User:admin			
	Jan 15 20:00:49		User:admin			
	Jan 15 19:42:24		User:admin			
	Jan 15 19:37:18	User Login.	User:admin			

To specify a range of events to view, select the desired year and month from the dropdown menus, then click **Show**.

Date/Time, Type, User, and Event Data for each event are displayed.

Events can be ordered **Latest First** or **Earliest First** by clicking the corresponding radio button.

#### Preferences

The **Preferences** page allows you to edit system preferences.

PANE	TIUT		Logged In: admin ( Administra System Name: iPDU-04:0 Lo				
			Setup	Input Sensors	Power	]	
	Setup / Preferences						
Overview							
IP Config	Default Page:	Network -> Overview					
нттр	Timestamp Traps:	None					
SNMP NMS	User Session Timeout:	5 Minutes					
SNMP Rec'rs	Temperature Scale:	Celsius 🔽					
SIMP Rec 13	Page Refresh Period:	10 Seconds (0 for no refresh)					
Users							
Email Alerts							
Time Settings							
Syslog Servers							
Events							
Preferences							
Restart					S	ave	

	Preferences
Default Page	From the dropdown menu, select the first page you want to open when a user logs in. The preset default page is the Overview page.
	Choose from the dropdown menu where the timestamp will be found on traps. There are three options:
Time stamp Traps	Prefix – timestamp at the beginning
	<ul> <li>Append – timestamp at the end</li> <li>None – no timestamp</li> </ul>
User Session Timeout	Enter a number of minutes, after which a session will be timed out if the user is inactive.
Temperature Scale	Select Celsius, Fahrenheit, or Kelvin from the dropdown menu.
Page Refresh Period	Enter a number of seconds, after which the page will auto- matically refresh. If 0 is entered, the page will not refresh automatically.

#### Restart

PANDUIT			Logged In: admin ( Administra System Name: iPDU-04:0 Log			strator ) 4:01:19 Logout
			Setup	Input Sensors	Power	]
	Network Setup / Restar	t				
Overview						
IP Config						
нттр	Restart Unit:	Restart Now				
SNMP NMS						
SNMP Rec'rs	Factory Defaults:	Reset to Factory Defaults				
Users						
Email Alerts						
Time Settings						
Syslog Servers						
Events						
Preferences						
Restart						

Clicking the **Restart** option brings up the following screen:

To restart the unit or restore to factory defaults, click the corresponding button.

**Note**: Resetting to factory defaults will restart the device.

# **Input Sensors**

When the **Input Sensors** module is selected, the following items appear along the lefthand side of the display.

Input Sensors Menu Options				
Status	View information from connected input sensors			
Defaults	View or edit default settings for input sensors			
Configure	Configure sensor inputs			
Sensor Trap Text	View or edit trap text			

Detailed information on each of these menu options can be found in the corresponding sections below.

#### Status

The **Status** page displays information from connected input sensors.

Pani	DL	JIT			Setup			ystem N		ninistrator ) U-04:01:19 Logout
					Setup	Inbu	l Sensors		Power	
	In	put Sensors / S	tatus							
Status										
Defaults	Info	ormation from c	connected input sen	isors is presented her	e.					
Configure								Ľ	imits	
Sensor Trap		Channel	Туре	Detected	Status	Value	UC	UW	LW	LC
Text		1: Input 01	Auto Detect	None	Fault		N/A	N/A	N/A	N/A
	<b>~</b>	2: Input 02	Auto Detect	Temperature	Enabled	24.9 °C	35.0	30.0	15.0	10.0

The following **Status Indicators** are displayed next to input channels to allow quick determination of normal, warning, and critical alarm statuses.

	Status Indicators					
	All thresholds within limits					
8	Upper Control Limit reached/exceeded					
<u>^</u>	Upper Warning Limit reached/exceeded					
<u>^</u>	Lower Warning Limit reached/exceeded					
8	Lower Control Limit reached/exceeded					

This page may also display the strings "**O**/**R**" and "**U**/**R**" in place of the input sensor measurement. This indicates an over-range or under-range condition.

- **O/R** Value is Over Range
- U/R Value is Under Range

#### Defaults

This page allows you to choose default settings for **Temperature Sensors**, **Humidity Sensors**, **Analog Voltage**, and **Open/Close Contacts**.

PAN	DUIT			In: admin ( Adminis stem Name: iPDU-04	
		Setup	Input Sensors	Power	
	Input Sensors / Defaults				
Status					
Defaults	Defaults settings for Temperature, Humidity, Analog Voltage setups that differ from defaults can be configured via the Co		ontacts are set he	re. Individual chan	nels
Configure					
Sensor Trap Text	Temperature Sensors				\$
TEXL	Humidity Sensors				\$
	Analog Voltages				\$
	Open/Close Contacts				\$
				S	ave

Clicking the arrow opens a drop-down for each Sensor type. For **Temperature Sensors**, the defaults will display similar to the following:

PANI	DUIT							: admin ( Admin em Name: iPDU-	
					Setup	Input S	ensors	Power	
	Input Sensors / Defa	aults							
Status	-								
Defaults		Temperature, Humidit m defaults can be conf				ntacts are	set here. I	ndividual chan	nels
Configure									
Sensor Trap Text	Temperature Senso	rs							<b>\$</b>
	Calibration Offset:	0.0 °C							
	Hysteresis Value:	0.5 °C							
	Limits & Traps:		Value:		p Enabled:	Repeat			
		Upper Control Limit:		C	Enabled	0	Seconds		
		Upper Warning Limit Lower Warning Limit		c c	Enabled Enabled	0	Seconds Seconds		
		Lower Control Limit:		C	 Enabled	0	Seconds Seconds		
			10.0	5	LINUDICU			nperature Sensor	s
	Humidity Sensors								\$
	Analog Voltages								\$
	Open/Close Contac	ts							\$
									Save

The Humidity Sensors screen displays default information as shown below.

PAND	DUIT				S	d In: admin ( Admini ystem Name: iPDU-0	
	Input Sensors / Def	14 -		Setup	Input Sensors	Power	
	Input Sensors / Del	auits					
Status	Defaults settings for	Temperature, Humidity	y, Analog Voltage	and Open/Close Co	ntacts are set here	e. Individual chanr	nels
Defaults	setups that differ fro	m defaults can be confi	igured via the Con	figure menu.			
Configure							
Sensor Trap Text	Temperature Senso						<b>\$</b>
	Humidity Sensors						<b></b>
	Calibration Offset:	0.0 %RH					
	Hysteresis Value:	5.0 %RH					
	Limits & Traps:		Value:	Trap Enabled:	Repeat Timer:		
		Upper Control Limit:	65.0 %RH	🔲 Enabled	0 Second	s	
		Upper Warning Limit:	60.0 %RH	Enabled	0 Second	s	
		Lower Warning Limit:		Enabled	0 Second		
		Lower Control Limit:	10.0 %RH	Enabled	0 Second	s	
					Apply T	o Humidity Sensors	
	Analog Voltages						۵
	Open/Close Contac	ts					-
							Save

The Analog Voltage screen displays default information as shown below.

Pane	DUIT					In: admin ( Admir stem Name: iPDU-	
				Setup	Input Sensors	Power	
	Input Sensors / Defa	aults					
Status							
Defaults		Temperature, Humidity m defaults can be conf			itacts are set here.	. Individual chan	nels
Configure							
Sensor Trap Text	Temperature Senso	rs					\$
	Humidity Sensors						<b>\</b>
	Analog Voltages						<b>\$</b>
	Scaling Factor:	1 -					
	Calibration Offset:	0.0 V					
	Hysteresis Value:	5.0 V					
	Limits & Traps:		Value:	Trap Enabled:	Repeat Timer:		
		Upper Control Limit:		Enabled	0 Seconds		
		Upper Warning Limit		Enabled	0 Seconds		
		Lower Warning Limit		Enabled	0 Seconds		
		Lower Control Limit:	1.0 V	Enabled	0 Seconds		.
					Apply To A	nalog Voltages	
	Open/Close Contac	ts					\$
						Sa	ave

Explanations of the editable fields in the drop-down menus for Temperature, Humidity and Analog Voltage can be found in the table below.

Defaults- Temperature, Humidity, and Analog Voltage					
	The scaling factor is a value multiplied against the measured Analog Voltage to produce the Input Sensor measurement.				
Scaling Factor (Analog Voltage only)	<i>Example</i> : Given a measurement of 10 Volts on the input sensor and a Scaling Factor of 100, the web UI and SNMP interface will report a value of 10*100 = 1000 Volts as the sensor measured value.				
	<b>Note</b> : The <b>[Upper Lower] [Control Warning] Limit</b> fields apply to the post-scaled value.				
	Alters the actual reading of a sensor by the amount specified.				
Calibration Offset	<i>Example</i> : If a Calibration offset of 6 was used and a sensor's true reading was 36, the indicated reading used for display				

Defaults	Defaults- Temperature, Humidity, and Analog Voltage					
	and alarm purposes would be 42. This works in an identical way for both temperature and humidity sensors.					
	The hysteresis default value to be applied to sensors is. The value specified is an offset from a sensor's threshold values.					
Hysteresis Value	<i>Example</i> : A hysteresis value of 5 would mean that in the case of an Upper Control Limits alarm, the alarm value would have to reduce to 5 below the threshold value before another alarm is issued.					
Upper Control Limit	The value at which an Upper Control alarm will be issued.					
Upper Warning Limit	The value at which an Upper Warning alarm will be issued.					
Lower Warning Limit	The value at which a Lower Warning alarm will be issued.					
Lower Control Limit	The value at which a Lower Control alarm will be issued.					

The **Open/Close Contacts** screen displays the following default information.

PANE	JUIT					d In: admin ( Admini ystem Name: iPDU-(	
				Setup	Input Sensors	Power	
	Input Sensors / Defa	ults					
Status							
Defaults		Temperature, Humidity, Anal n defaults can be configured			ntacts are set here	e. Individual chanı	nels
Configure							
Sensor Trap Text	Temperature Sensor						\$
Text	Humidity Sensors						\$
	Analog Voltages						\$
	Open/Close Contact	s					\$
	Normal State: Trigger Type: Traps:	Normaliy Open 🔽 Level Trap Alarm Level: Disabled 🔽	▼ Repeat Tim 0 Sec	er: onds	Ар	oly To Contacts	Save

	Defaults- Open/Close Contacts
Normal State	Normal state specifies the condition in which a contact is considered to be 'Normal', 'Non-alarmed' state. Devices such as smoke alarms and air conditioning units often have normally open contacts. In order to receive alarm indic- ations from these types of units, setting normally open would cause alarms to be issued when the monitored con- tact closes. Setting normally closed, in the case of a rack cabinet door, would cause an alarm condition when the door was opened.
Trap Alarm Level	Rather than using <b>[Upper Lower] [Control Warning] Limit</b> settings, the <b>Open/Close Contact</b> sensors provide a Trap Alarm Level drop down menu with the following options: • Disabled • Critical • Warning • Information When the Trigger Type state occurs, if the <b>Trap Alarm</b> <b>Level</b> is not Disabled, a trap with the given Trap Alarm Level string content is generated.
Trigger Types	Trigger type defaults for Open/Close sensors are specified here. The three available options for trigger types are: Level Level triggering is the default mode. When an input phys- ically transitions from a Normal to Non-Normal state an alarm will be triggered. However the alarm will only persist while the input remains in a Non-Normal state. When the input returns to a normal state the alarm will be cleared. Normal to Non-Normal (Positive Edge) This type of triggering may be used in situations where a momentary type input (e.g. shock sensor, PIR etc.), is used. Since these types of inputs are momentary any alarm con- dition which occurs, no matter how short, will persist until manually cleared. Positive Edge triggering is used when

	Defaults- Open/Close Contacts
	an alarm is required to persist after an input changes from the Normal state to the Non-Normal state.
	Non-Normal to Normal (Negative Edge) This type of triggering may be used in situations where a momentary type input (e.g. shock sensor, PIR etc.), is used. Since these types of inputs are momentary any alarm con- dition which occurs, no matter how short, will persist until manually cleared. Negative Edge triggering is used when an alarm is required to persist after an input changes from the Non-Normal state to the Normal state.
Repeat Timer	Causes alarm traps to be reissued after a specified amount of time if the alarm condition is still present. Setting the timer to zero (0) disables repeat traps.

The drop-down menus can be closed by clicking on the corresponding arrows again.

#### Configure

The **Configure** page, shown below, allows you to configure sensor inputs.

Pane	JU	Π			Setup		I In: admin ( Administrator ) /stem Name: iPDU-04:01:19 Logout
	Inpu	t Sensors /	′ Configure				
Status							
Defaults	Confi	gure senso	r inputs here.				
Configure	Chan	inel	Name	Туре		Detected	
Sensor Trap Text	1:	Cfg 1	Input 01	Auto Detect		None	
reat.	2:	Cfg 2	Input 02	Auto Detect		Temperature	

Clicking one of the configuration buttons – **Cfg 1** or **Cfg 2** – displays the following screen:

PANE	JUIT			In: admin ( Adm stem Name: iPDU		
			Setup	Input Sensors	Power	
	Input Sensor / Co	onfiguration : Port 1				
Status						
Defaults	Name:	Input 01				
Configure	Туре:	Auto Detect 💌				
Sensor Trap Text	Temperature Sen	sor				<b></b>
	Humidity Sensor					\$
	Analog Voltage					\$
	Open/Close Cont	act				\$
					Back	Save

Individual settings can be entered for each input channel. The drop-down menu options are identical to the Defaults page.

**Note**: The important difference between the menus presented here and the menus presented on the Defaults page is that these settings are applied to individual channels.

The drop-down menus can be opened and closed by clicking the corresponding arrows.

### Sensor Trap Text

This page allows you to view or edit the text that will be displayed when certain events occur.

PANI	DUIT					em Name: iPDU-04:01 Log
				Setup	Input Sensors	Power
	Setup / SNMP (T	rap Definitions)				
Status						
Defaults	When a "Data Typ	oe" sensor encounter	rs a "Trap Type" event, the	e "User Text" is p	rovided in the trap mes	ssage.
Configure	Data Type	Тгар Туре	User Text			
Sensor Trap Text	Temperature	UCL	Temperature Critically	High		
	Temperature	UWL	Temperature Warning	High		
	Temperature	LWL	Temperature Warning	_ow		
	Temperature	LCL	Temperature Critically I	_ow		
	Humidity	UCL	Humidity Critically High			
	Humidity	UWL	Humidity Warning High			
	Humidity	LWL	Humidity Warning Low			
	Humidity	LCL	Humidity Critically Low			
	Voltage	UCL	Analog Critically High			
	Voltage	UWL	Analog Warning High			
	Voltage	LWL	Analog Warning Low			
	Voltage	LCL	Analog Critically Low			
						Save

Enter text to be displayed for each type of trap.

## Power

When the Power module is selected, the following menu items appear along the lefthand side of the display.

- Status
- Branch Monitoring (if the unit has breakers)
- Status 3-Phase (if the unit is 3-Phase)
- Thresholds
- Configure

#### **Status Single-Phase**

The Status screen displays information from a connected Single-Phase Power Device.

Pane	ſ		Setup	)		nput Sei				PDU-(	istrator ) 04:01:19 <b>Logout</b>			
	Power / S	Status												
Status Branch Monitoring	Informatio	on from connected Power Dev	ices i	is pres	ente	l here								
Thresholds	Circuit	Name		Volts		Amps		kVA	PF		kW	Hz		kWh
Configure	01	A1	<ul> <li></li> </ul>	117		0.0		0.0	0.00	✓	0.0	60.0	~	14.5

#### **Branch Monitoring**

If the power device has breakers, you will see the **Branch Monitoring** button as shown below. Clicking the **Branch Monitoring** button brings up the following screen, displaying information from branch monitoring.

PAND	DUIT				Logged In: admin ( Administrator ) System Name: PDU-04:01:19 Logou						
				Setup	Input Sensors	Power					
	PDU Branches /	Status :									
Status											
Branch Monitoring	Information from	n the branch	n monitoring of this PDI	U is presented here	e.						
Thresholds	Branch: Name	Current									
Configure	1: C1 2: C2	0.01 0.01									

#### **Status 3-Phase**

If the device is 3-Phase, you will see the **3-Phase Status** button as shown below. The **3-Phase Status** screen displays information from a connected 3-Phase Power Device.

Pand		ſ	Se	tup	Inpu	Logo t Sensor	Sys	min ( Administrator ) tem Name: sysName Logout Power							
	Pov	ver / 3-Phase Status													
Status			nl n	5											
Status 3-Phase	Into	rmation from connected 3-	Phase P	ower Di	evices is	s present	ea ner	e.							
Branch		PDU	Line	e Voltag	jes	Phase	e Curre	rents Aggregate Power					Aggregate Energy		
Monitoring	Id	Name	L1-L2	L2-L3	L3-L1	L1	L2	L3	Hz	k∀A	PF	kW	kWh		
Thresholds	01	A1	198	197	196	0.0	0.0	0.0	60.0	0.0	0.0	0.0	579.5		
Configure															
		Aggregate				0.0	0.0	0.0		0.0	0.0	0.0	579.5		

Many of the following pages use abbreviations for various units. A reference table is provided below for convenience.

	Units of Measurement										
Current	Amps	Amperes									
	kVA	Kilovolt amperes									
Power	PF	Power Factor									
	kW	Kilowatts									

Units of Measurement											
Frequency	Hz	Hertz									
Enorgy	kWh	Kilowatt hours									
Energy	kVArh	Kilovolt amperes reactive hours									

## Thresholds

The Thresholds screen displays threshold information from a connected Power Device.

PAND	PANDUIT														Logged In: admin ( Administrator ) System Name: iPDU-04:01:19 Logout Input Sensors <b>Power</b>						
												Se	etup		I	nput S	enso	rs		Power	
	Pow	er / Th	reshold	ls																	
Status	Thus	-hold Te			£			ted De		Davis				ad Ib							
Branch Monitoring	Inre	shold Ir	погша	lion	IFOII	1 CO	nneo	cied Po	wer	Devid	ces i	s pr	esente	a n	ere.						
Thresholds	Ci	rcuit		Ve	olts				Ar	nps			k	VA			kW			kWh	
	Id	Name	Value	UC	UW	LW	LC	Value	UC	UW	LW	LC	Value	UC	uw	Value	UC	UW	Valu	e UC	UW
Configure	01	A1	117	132	126	114	108	<b>V</b> 0.0	28.5	27.0	0.0	0.0	<b>V</b> 0.0	5.5	4.5	<b>V</b> 0.0	12.0	11.0	<b>v</b> 14.	5 50000.0	48000.0

## Configure

The **Configure** page allows you to view and configure Power Circuits. Depending on the type of unit, not all menu items shown below may be available.

PANI	JUľ	т					Logged I Sys	n: admin ( Admi tem Name: PDU	nistrator ) -04:01:19 Logout
						Setup	Input Sensors	Power	
	Power	/ Configure							
Status									
Branch Monitoring	Power	Circuits are o	onfigured here.					Prev	Next
Thresholds									
Configure									
	Repeat	t Timer:		600	Seconds (On Comms Failure)				
	Circuit		Name		Туре				
	01	Cfg	A1		Monitor Only				
	Agg.	Cfg	Aggregate		Calculated				
		Monit	or Trap Text						
								1	Save

Clicking the configuration button -Cfg – for a circuit brings up a screen similar to the following.

PAND	UIT		Logged Sy	In: admin ( Admini vstem Name: PDU-(	istrator ) 04:01:19 Logout
		Setup	Input Sensors	Power	
	Power / Aggregated				
Status					
Branch Monitoring	RMS Current				<b>\$</b>
Thresholds	Apparent Power (kVA)				<b>\$</b>
Configure	True Power (kW)				<b>\$</b>
				Back Sa	ive

Clicking on the arrows next to each option opens a drop-down similar to the following:

Pane	IUIT							In: admin ( Ad stem Name: iPl	DU-04:0	
				Setu	р	Input S	ensors	Power		
	Power / Aggregated									
Status										
Branch Monitoring	RMS Current									\$
Thresholds										
Configure	Limits & Traps:	Upper Control Limit:	Value: 28.5	Amps	Tra	p Enabled: Enabled	Repeat 0	Timer: Seconds		
		Upper Warning Limit:	27.0	Amps		Enabled	0	Seconds		
		Lower Warning Limit:	0.0	Amps		Enabled	0	Seconds		
		Lower Control Limit:	0.0	Amps		Enabled	0	Seconds		
	Apparent Power (kV/	4)								۲
	True Power (kW)									٢
								Back	Save	e

Explanations of the editable fields within the drop-down menus can be found in the table below.

Configure Power Circuits				
Circuit Name	The name of the chosen circuit.			
Upper Control Limit	The value at which an Upper Control alarm will be issued.			
Upper Warning Limit	The value at which an Upper Warning alarm will be issued.			
Lower Warning Limit	The value at which a Lower Warning alarm will be issued.			
Lower Control Limit	The value at which a Lower Control alarm will be issued.			
Trap Enabled	When the box is checked, enables the unit to send traps relating to the corresponding limit.			
Repeat Timer	This entry (in seconds) determines how often repeat traps will be generated if the error condition persists.			
Upper Threshold Limit	The value at which a "High" alarm will be issued. The default value is 1.00. This value applies to Power Factor only.			
Lower Threshold Limit	The value at which a "Low" alarm will be issued. The default value is 0.01. This value applies to Power Factor only.			

The drop-down menus can be closed by clicking the corresponding arrows again.

#### Cfg Aggregate

Click the configuration button – **Cfg** – for the Aggregate (Agg) to configure all the circuits.

PANI	TIUC			Logged Sy:	In: admin ( Administrator ) stem Name: PDU-04:01:19 Logout
			Setup	Input Sensors	Power
	Power / Configure				
Status	]				
Branch Monitoring	Power Circuits are configured here.				Prev Next
Thresholds					
Configure					
	Repeat Timer:	600 Seconds (On Comms Failure)			
	Circuit Name 01 Cfg A1	Configuration for the Aggregate of all circuits	-	-	
	Agg. Cfg Aggregate	Calculated			
	Monitor Trap Text				
					Save

When Cfg is selected, a screen appears showing the settings for **RMS Current**, **Apparent Power (kVA)** and **True Power (kW)**. The definitions for the displayed fields are the same as found in the corresponding sections above.

RMS Current					<b>\$</b>
Limits & Traps:	Upper Control Limit: Upper Warning Limit: Lower Warning Limit: Lower Control Limit:	14.4 Amps	Trap Enabled: Enabled Enabled Enabled Enabled Enabled	Repeat Timer:0Seconds0Seconds0Seconds0Seconds0Seconds	
Apparent Power (kVA	A)				<b>♦</b>
Limits & Traps:	Upper Control Limit: Upper Warning Limit:	Value: 9.5 KV. 8.5 KV.		Repeat Timer: Seconds Seconds	
True Power (kW)					<b>\$</b>
Limits & Traps:	Upper Control Limit: Upper Warning Limit:	Value: 12.0 kw 11.0 kw		Repeat Timer: Seconds Seconds	Back Save

#### **Monitor Trap Text**

Clicking the **Monitor Trap Text** button brings up screen to customize the text displayed for each trap type.

Pani	DUIT					d In: admin ( Administrator ) System Name: PDU-04:01:58 Logout		
				Setup	Input Sensors	Power		
	Setup / SNMP (1	Trap Definitions)						
Status resholds	When a "Data Ty	pe" sensor encounte	rs a "Trap Type" event, the "User Te	ext" is provided in the tra	p message.			
onfigure	Data Type	Тгар Туре	User Text					
	PDU Volts	UCL	Voltage Critically High					
	PDU Volts	UWL	Voltage Warning High					
	PDU Volts	LWL	Voltage Warning Low					
	PDU Volts	LCL	Voltage Critically Low					
	PDU Amps	UCL	Amps Critically High					
	PDU Amps	UWL	Amps Warning High					
	PDU Amps	LWL	Amps Warning Low					
	PDU Amps	LCL	Amps Critically Low					
	PDU kWHr	UCL	kWHr Critically High					
	PDU kWHr	UWL	kWHr Warning High					
	PDU kVA	UCL	kVA Critically High					
	PDU kVA	UWL	kVA Warning High					
	PDU Pwr Fact	UTL	Power Factor High					
		LTL	Power Factor Low					

Enter the desired text in the text box provided, and click the **Save** button to implement your customization.

#### **Outlet Trap Text**

Clicking the **Outlet Trap Text** button brings up screen to customize the text displayed for each trap type.

PANE	ANDUIT					In: admin ( Administrator stem Name: PDU-04:01: Logo	58
				Setup	Input Sensors	Power	
	Setup / SNMP (Trap	Definitions)					
Status							
Thresholds	When a "Data Type"	sensor encounters a "	'Trap Type" event, the "User Text" is p	provided in the trap	message.		
Configure	Data Type	Тгар Туре	User Text				
	PDU Outlet Amps	UTL	Outlet Amps Critically High				
	PDU Outlet Amps	LTL	Outlet Amps Critically Low				
						Back Save	

Enter the desired text in the text box provided, and click the **Save** button to implement your customization.