PDU SD-1688

Per outlet current monitoring

Per outlet control

User Manual

Safety Precautions

To avoid potential problems when using PDU:

- If the building has 3-phase AC power, ensure that the server and monitor are on the same phase. For best results, they should be on the same circuit.
- To avoid potentially fatal shock hazard and possible damage to equipment, test AC outlets at the server and monitor for proper polarity and grounding.
- To ensure the safety of network communication, it is recommended that the PDU be installed in a network firewall to prevent malicious attacks by hackers, which will affect the safety of power consumption.

Safety instructions

Read all the following safety guidelines to protect yourself and your PDU.

WARNING: All outlets of the PDU output high voltage. Necessary precautions should be taken.

WARNING: Do not push any objects through the openings of the PDU. Doing so may cause fire or electric shock by shorting out interior components.

WARNING: There is a possibility of severe electrical shock from either the live or neutral side of any of the power outlets or their wiring, even if one of the circuit

breakers is disabled.

WARNING: The PDU is intended for indoor use only.

WARNING: To help protect the PDU from electrical power fluctuations, use a surge suppressor, line conditioner or uninterruptible power supply.

WARNING: Be sure that nothing rests on the cables of the PDU and that it is not located where it may be stepped on or tripped over.

WARNING: Do not spill food or liquids on the PDU. If it gets wet, disconnect the power immediately.

WARNING: Keep the PDU away from heat sources.

WARNING: One output can only be connected to a single device. Do not use extension cords to power multiple devices, so as not to damage the output relay due to the accumulation of inrush currents from multiple devices.

Rack mount safety considerations

When installing the PDU, make sure the following environmental specifications are met:

Elevated Operating Ambient Temperature: If the PDU is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature. See above.

Reduced Air Flow: Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading: Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading.

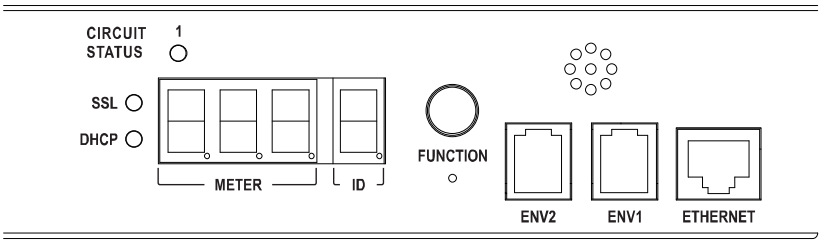
Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Grounding: Reliable grounding of rack-mounted equipment should be maintained.

Particular attention should be given to supply connections other than direct connections to the branch circuit, such as power strips or extension cords.

Features and Benefits

The PDU is an Internet-ready power strip equipped with an intelligent current meter to indicate the total power consumption of the Power Distribution Unit (PDU). Each PDU includes PDU Utility software to monitor and manage multiple PDUs.



Functions	Description
Ethernet	Ethernet connection for the built-in web server.
Audible Alarm	Holes for audible alarm. Warning- 1 beep in 1 second. Overload- 3 beeps in 1 second. Note: The audible alarm will keep beeping until the current gets back to normal and the current is lower than the threshold to 0.5 amps.

Function Button	A function button that can be used to change the meter display ● Press and hold the key after 1 beeping; it can let the meter to show up the current information and temperature/humidity in sequence. ● Press and hold the key after 2 beeping; it can let the meter to show up the IP address ● Press and hold the key after 4 beeping; it can change the way to get IP by DHCP or Fixed IP. Press button then release it after 6 beeping; reset PDU back to default setting.  After six beeps to return to factory settings, do not cut off the power when the long beep sounds until the power information is displayed, otherwise the system will be damaged and may not work normally.
Meter	A built-in true Root Meter Square (RMS) current meter. 3 digits to display current and IP Address.

ID	The identification of power circuit.
LED Indicator	SSL (Blue): Light on means web access is protected by SSL. DHCP (green): Light on means PDU gets IP from DHCP server. Circuit Status (red): Circuit Status LEDs labeled alphabetically to indicate the PDU's circuit status. The number of LED will vary according to different models.
ENV1 / ENV2	RJ11 connection for optional accessory to measure temperature and humidity.
Circuit Breaker	Overload power protection.

Alarms and monitoring

The PDU delivers accurate, real-time global current monitoring of all connected devices via the onboard web interface or through the PDU Utility software. Users have the ability to set a current alarm threshold that, once exceeded, will cause the PDU to sound an alarm or send a notification message, or both.

Sequential power application

The PDU incorporates a sequential power application feature that prevents all power outlet receptacles from turning on at once, eliminating the potential of current surges that could render the equipment inoperable. Together with the global current monitoring, the sequential power application feature lets users safely install more equipment on existing power circuits without the worry of current overloads.

Features:
System

Built-in Web Server to Support Remote Power Management.
Local LED Displays Amps, IP Address ,Temperature or Humidity
Daily, Weekly, Monthly & Yearly Power Consumption Data
10/100 Base-T Ethernet Port
IPv4 and IPv6 Support
SNMP Control (v1,v2c,v3)
Telnet, SSHv2 Encryption Support
Radius Authentication
User Account for Three Different Permissions Management

System

Alarm Notification via Email, SNMP, Syslog, LED or audible alarm

SSLv3, TLS1.0,TLS1.1,TLS1.2 Support

IP Address Filtering

Max. of 100000 entries for each Power Consumption Data and Event Log

Remote firmware Upgrade Support

Alive of Heart Beat Trap Available.

Definable Reset Button

Fahrenheit and Celsius Switchable

Export and Import PDU Configuration

Support wireless network connection

Power Management

True RMS Current Measurement.

Remote Per Outlet On/Off Power Switching

Remote Per Outlet Current Monitoring

User Defined Alarm Thresholds for Warning and Overload.

User Defined Power On/OFF Sequence Time.

Timed & Scheduled On/Off/Reboot Switching

Alternative Outlet Restart Mode: Memorized Previous Status, Always On or Always Off

Ping-No-Answer Alarm

Outlet Action via Pre-Set Event, Including Power Event, Environment Event and Receiving Trap from Other Devices.

Circuit Breaker Protection

Free Bundle Management Utility.

Getting Started

Before installing your PDU, refer to the following list to ensure you have all items that shipped with the PDU, as well as other items necessary for proper installation. The standard PDU package includes the following:

- Power Distribution Unit
- Rack mounting brackets
- Four retaining screws for each rack mounting bracket.

Installation Instructions

This section will provide a quick instruction to install the PDU.

A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature specified by the manufacturer.

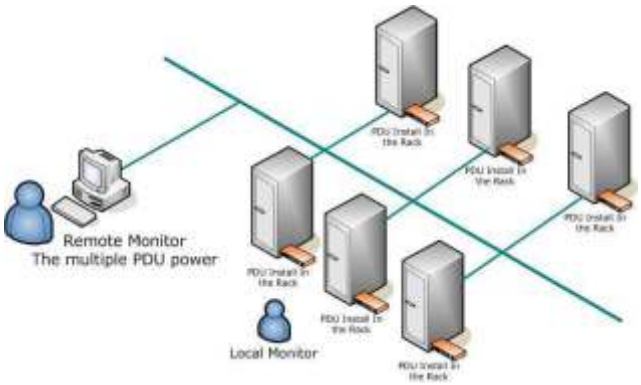
B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

Diagram



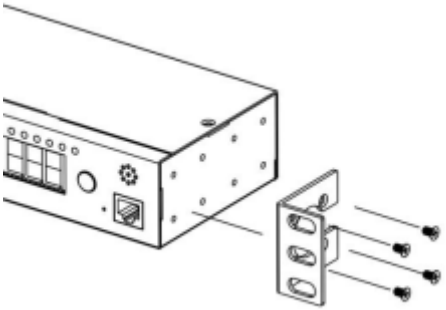
Hardware

1. Install mounting brackets.

   The PDU comes with brackets for mounting in a rack. To mount the PDU into a rack performs the following procedure:

   1.1 Attach the mounting brackets to the unit, using the four retaining screws provided for each of the brackets.

   Horizontal:



1.2 Choose a location for the brackets.

1.3 Align the mounting holes of brackets with the notched hole on the vertical rail and attach with the retaining screws.

2. Connect input and output power.

3. Connect Ethernet cable to the PDU.

4. Power on the PDU.

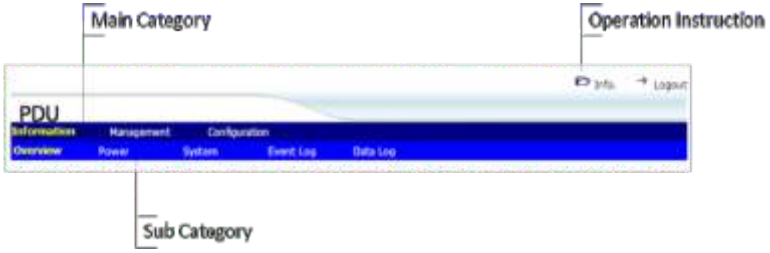
Web interface:

The default setting for the way to get IP address is DHCP. If PDU can not get the IP from DHCP server, the IP address will stay at **192.168.0.216**

Default ID: **snmp**

Default Password: **1234**

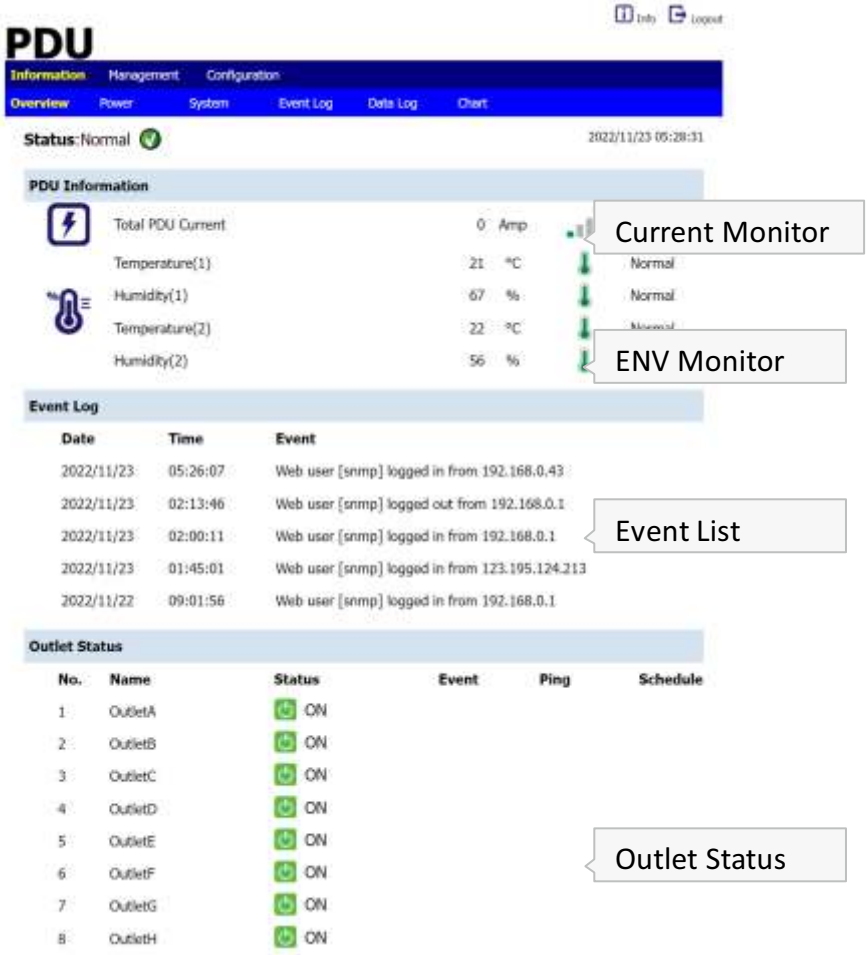
After login to web, user can check all operation instruction in web page of “Info.”



Information

Overview

Display current, temperature and humidity information, event log and outlet status.



Note:

Setting column

S: Schedule is set. PDU will execute the pre-set outlet action in specified time automatically.

P: Ping function is active. If the specified device stops ping response, PDU will execute the pre-set outlets action

E: PDU will execute the pre-set outlets' action according to event happen.

Power

Each outlet current consumption

System

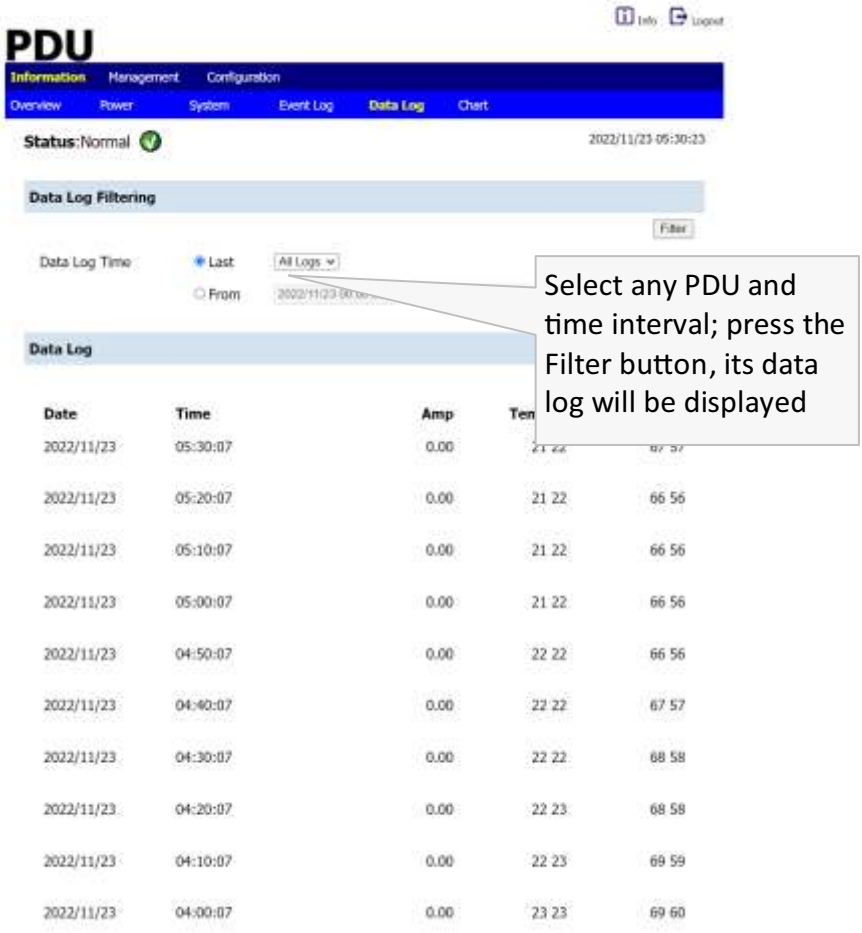
System information

Event Log

System memory can log up to 100000 entries.

Data Log

System memory can log up to 100000 entries.



Chart

Display history chart for current, temperature and humidity.

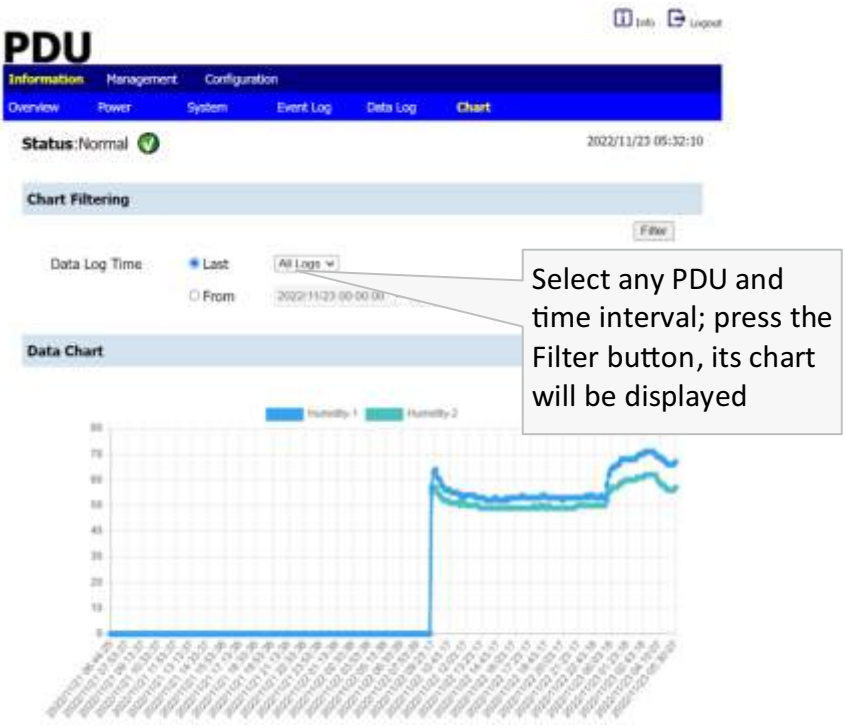
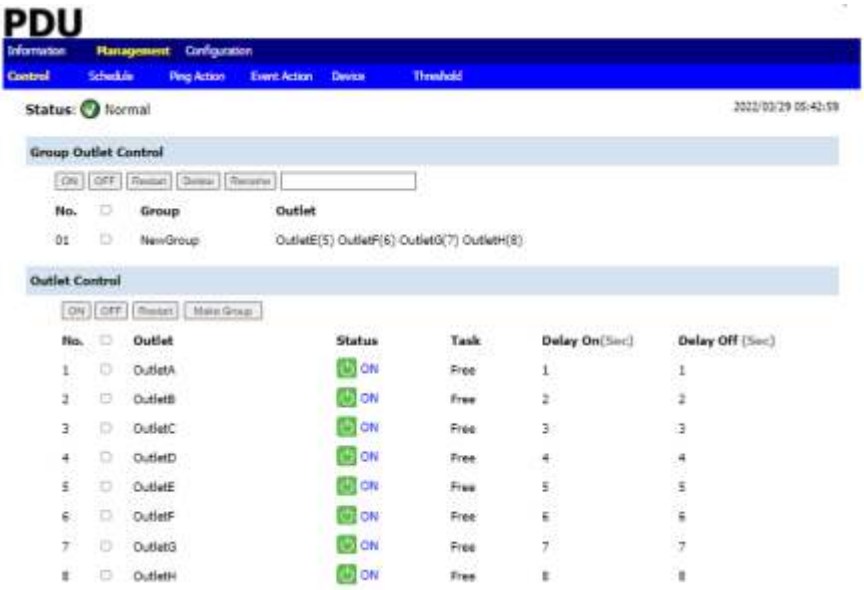


Chart: It can display amp, temperature and humidity history chart

Management

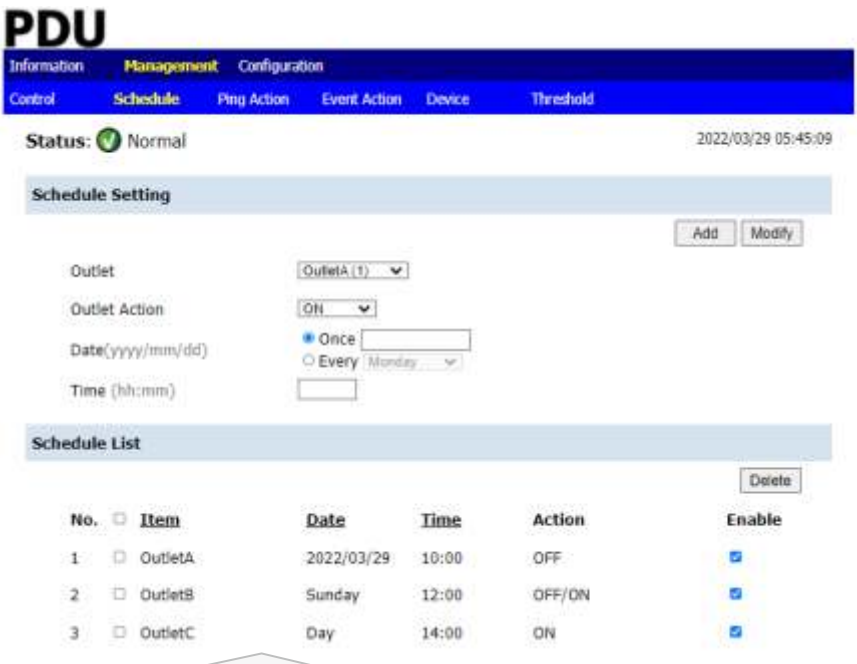
Control

1. Directly control outlet.
2. Set a number of outlets as a group to control them by one function button.



Schedule

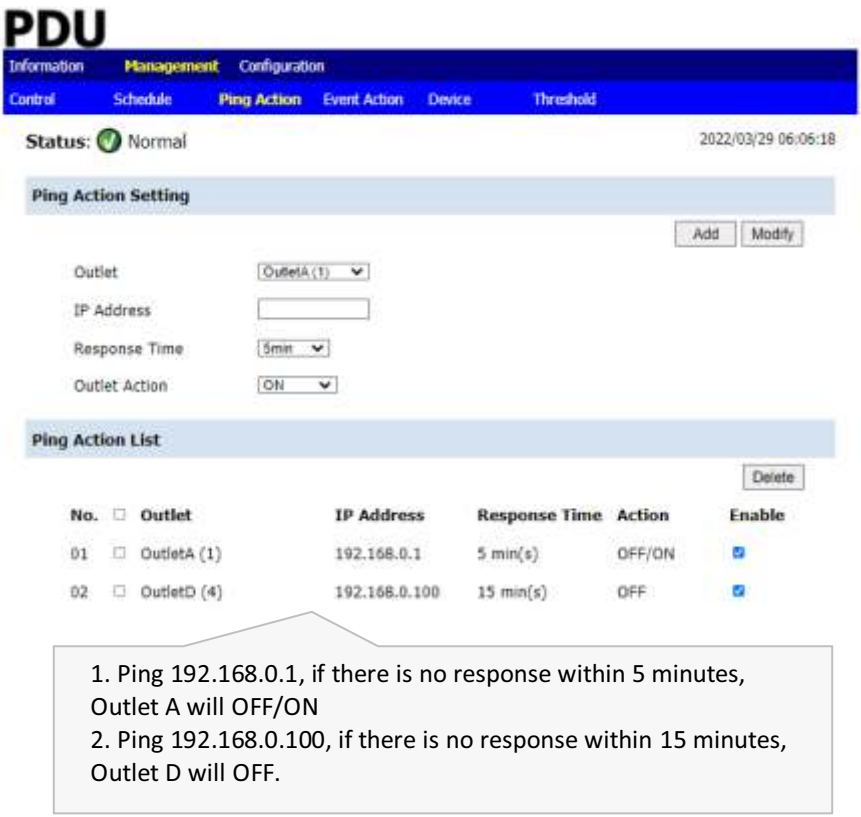
Pre-set time to turn on or off the specified outlet



1. Outlet A is scheduled to off at 10:00 on 2022/03/29.
2. Outlet B executes off/on at 12:00 every Sunday.
3. Outlet C executes on at 14:00 every day.

Ping Action

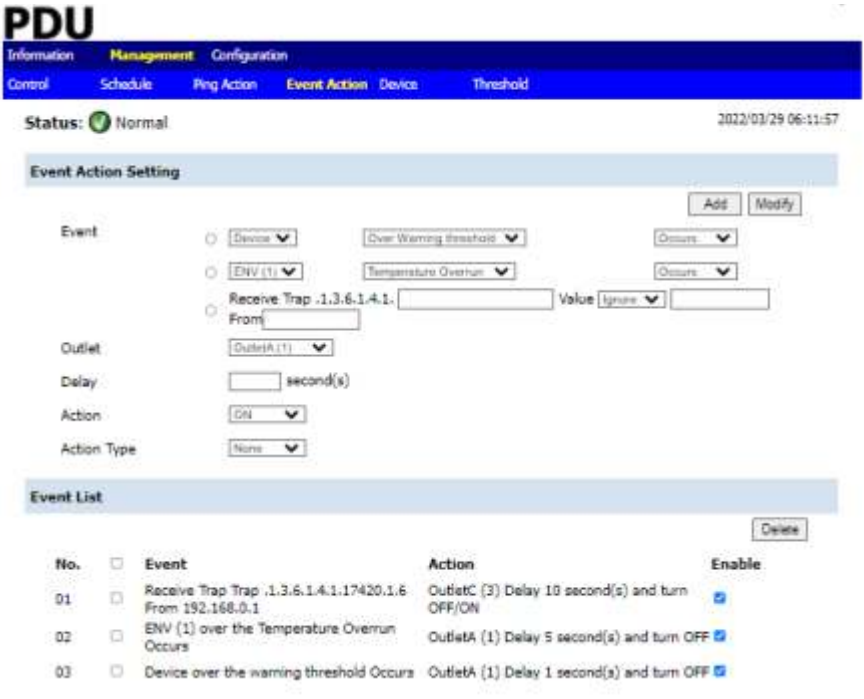
Ping-No-Answer power action



Automatically reboot the locked device by ping its IP

Event Action

Pre-set outlet action once the current, temperature or humidity over threshold



1. Receive Trap message 1.3.6.1.4.1.17420.1.6, IP is 192.168.0.1; after 10 seconds, Outlet C will OFF/ON.

2. When ENV(1) the temperature exceeds the upper limit, after 5 seconds, Outlet A will “OFF”

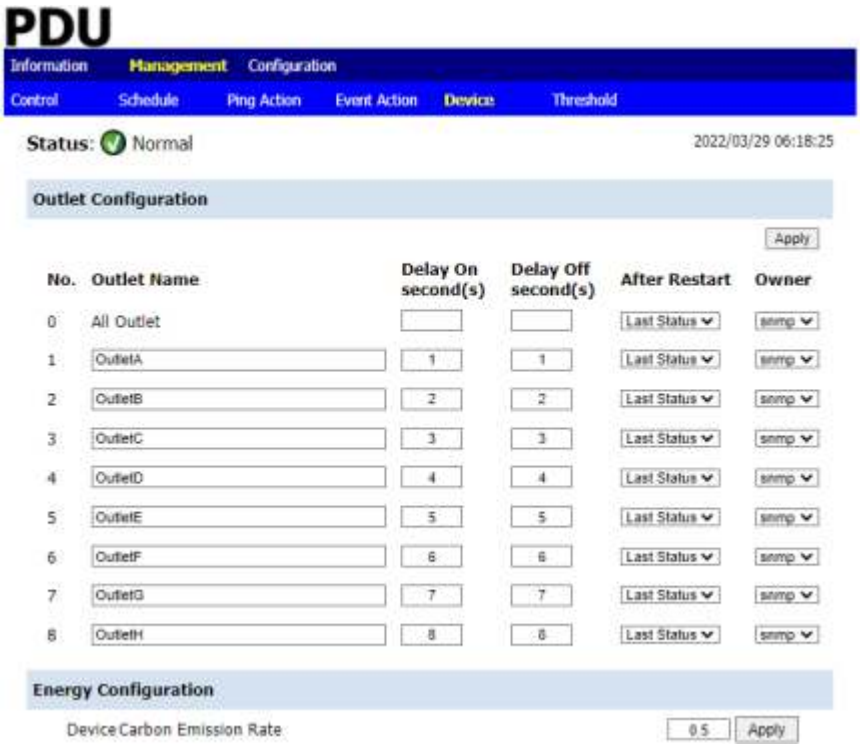
3. When current over warning threshold, after 1 second, Outlet A will “OFF”..

Note:

Receive Trap OID equal to: User can input the private OID to trigger the specified outlet action.

Device

Outlets and circuits name, sequence on/off and outlet owner configuration



The max. length of outlet name is 36 characters

The max. time for delay on/off is 9999 seconds

After Restart:

Define the outlet action after power restart

Last Status: After power restart, outlets remain the same power status.

ON: Turn on outlets after power restart.

OFF: Turn off outlets after power restart.

Note:

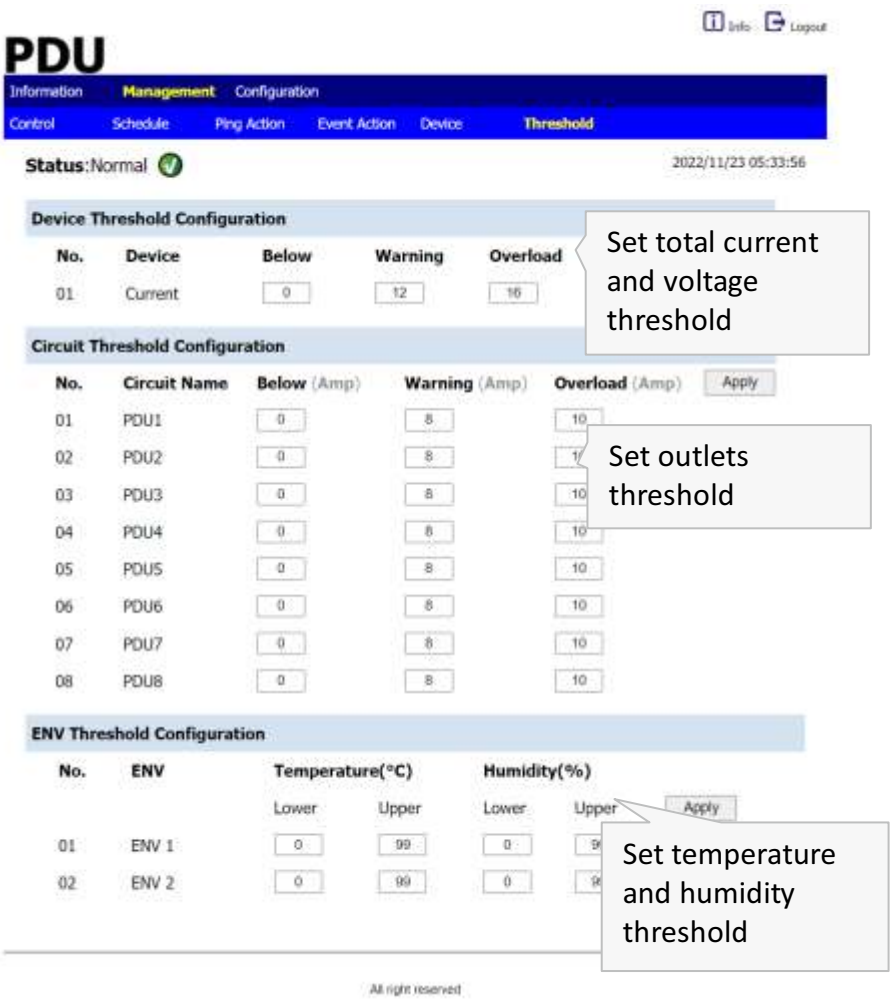
After PDU is plugged into main power, PDU system will start to sequentially turn on the output socket according to the pre-set delay time in PDU web interface. The factory default setting for delay time is one second for each outlet; therefore the 8 ports PDU will take 8 seconds, 24 ports PDU will take 24 seconds to complete start-up procedure.

Before the sequence procedure is completed, if a PDU is unplugged from the power source, the outlets which are not turned on will be regarded as remaining at the power-off status. Next time the PDU is plugged into main power, these outlets will not be automatically turned on. These outlets can only be turned on by web interface.

Carbon Emission Rate: Users can check this parameter through power plant.

Threshold

Set threshold of current, temperature and humidity.



Configuration

Network

IP address related configuration

The default setting for the way to get IP address is DHCP. If PDU can not get the IP from DHCP server, the IP address will stay at **192.168.0.216**

The max. length of host name is 36 characters

Security

Access setup for web, SSL, SSH and Telnet

Default login ID is **snmp** and password is **1234** for SSH and Telnet.

Note: SSH/Telnet command

(1) Device / Phase : Display PDU Power information

(2) Circuit: Display each circuit current.

(3) Outlet: Display each outlet current and control it

(4) Environment: Display temperature and humidity information.

(5) ATS: Display ATS information.

(6) Network: Display network information.

(7) About PDU: PDU system information.

User

Multiple users configuration

Note: Please set the email address to receive alert events.

Users can add up to 8 accounts.

Admin:	Full authority to monitor, control and configure PDU Default ID is **snmp**, password is **1234** (Access Information / Management / Configuration)
Power user:	Monitor PDU, control the specified outlets. No permission to configure PDU. Default Password: **password** (Access Information / Management)
View Only:	Monitor PDU only. No permission to control and configure PDU. Default Password: **password** (Access Information)

Mail

Mail server configuration

Send out alert message to pre-defined account when event occurs.

SNMP

Set the SNMP parameter

Support SNMPv1,v2 and v3

Time

Time by NTP or manually for schedule and log record

Time must be set properly; otherwise the schedule setting will not be performed correctly.

Radius

Advanced authentication

System supports the Remote Authentication Dial-in User Service protocol. (RADIUS). It provides a centralized network protocol to enable remote authentication and authorization.

Log

Log setup

Export	Export events and data log in text format.
	Set the date to mail information.
Syslog	Sent event log to the specified syslog server.
Data log	Set the interval of log time.
Heartbeat Trap	Send trap continuously to the specified IP to indicate PDU is alive.
Event Log	Check the box to enable to log the specified event

System

Configure file export and import, firmware upgrade, reset

functions.

System	Export system configuration.
	Import system configuration from export file.
Firmware Upgrade	Update: Keep all configurations after complete firmware upgrade.
	Update and Reset: Reset all configurations back to default after complete firmware upgrade.
Reset System	Restart network system through web.
Temperature Scale	Switch temperature unit between Celsius and Fahrenheit
Hardware Reset Button Definition	Define reset action. The reset procedure is to press and hold the key in the front panel of PDU, release it after hearing 6 beeping.