

PDU

per outlet monitoring & control/ total kWh

User Manual

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1. Introduction

The PDU is an Internet ready device designed and is equipped with an intelligent current-meter (True RMS) that will indicate the total power consumption of a power strip.

The PDU offers an easy set up and user-friendly communication software. This software provides the function that assistant manager to remotely monitor the multiple PDU power consumption to realize the total current power consumption and utilization for the enterprises.

Features:

- Built-in web server, manager can real time to monitoring the current consumption of the power strip.
- Build-in true RMS current meter.
- Setup easily, meter can read the IP address directly.
- Homepage support SSL.
- Provide per outlet power consumption.
- Provide voltage, frequency, power factor, active power, apparent power and kWh information through web interface and SNMP protocols.
- Provide audible alarm when the power consumption over the threshold of warning and overload.
- Send the email and traps when the power consumption exceed the trigger value of warning or overload to the PDU.
- Provide utility, it can monitor a large mount of PDU at the same time.
- Support the SNMP and provide MIB for the PDU to be monitored by NMS.
- Real time to control outlets of PDU.
- Indicate outlets and circuits status with LED.
- Support power on sequence.
- Schedule control
- User-defined group outlet control
- Auto reboot the locked device by pinging its IP
- Support network time protocols
- Option accessory can support temperature and humidity detection.

2. PDU Package

The standard PDU package contains a Power Distribution Unit with supporting hardware and software. The components of the package are:

- Power Distribution Unit.
- Rack mount Brackets.
- CD-ROM, it contains:
 - User Manual.
 - PDU Software.
 - MIB: Management Information Base for Network. (PDUMIB.mib)
 - Adobe Acrobat Reader.

3. Function

Interface



POM series interface



Switched series interface



Monitored series interface

Functions	Description
Ethernet	RJ45 port for network communication port.
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	<ul style="list-style-type: none"> ● Press and release to turn off the warning beeping. The overload beeping can not be cancelled. ● 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 and hold the key after 6 beeping; it can reset PDU back to default setting.
Meter	3 digits to display current and IP Address.

ID	The identification of power bank or PDU.
LED Indicator	<p>SSL (yellow): Light on means that web access is protected by SSL.</p> <p>DHCP (green): Light on means that PDU gets IP address through DHCP.</p> <p>PDU (green): Indicate each output power status.</p> <p>Status (red): Indicate each circuit status.</p>
ENV	RJ11 for option ENV probe attached to detect temperature and humidity.
Circuit Breaker	Overload power protection.

4. Installation

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

Rack Mount Instructions

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.

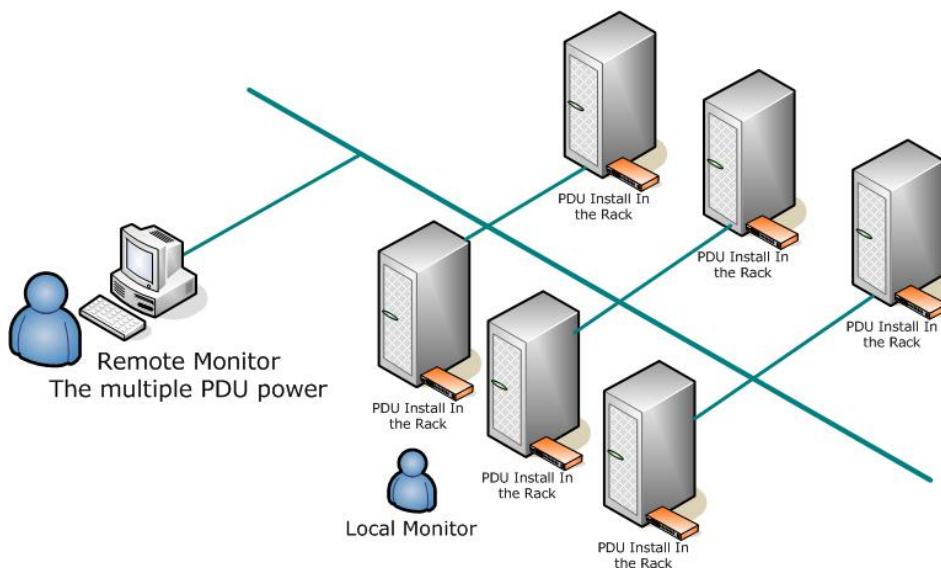
B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

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.
2. The PDU comes with brackets for mounting in a rack. To mount the PDU into a rack performs the following procedure:
3. Attach the mounting brackets to the unit, using the four retaining screws provided for each of the brackets.
4. Choose a location for the brackets.
5. Align the mounting holes of brackets with the notched hole on the vertical rail and attach with the retaining screws.
6. Connect input and output power.
7. Connect Ethernet cable to the PDU.
8. Switch on the PDU.

Note 1:

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

Note 2:

TO SETUP THE NETWORK SYSTEM FOR PDU, STRONGLY RECOMMEND TO BUILD UP THE POWER MONITORING NETWORK SYSTEM ISOLATED WITH THE OTHERS, IN ORDER TO KEEP THE STABILITY OF GETTING POWER INFORMATION AND SYSTEM OPERATION.

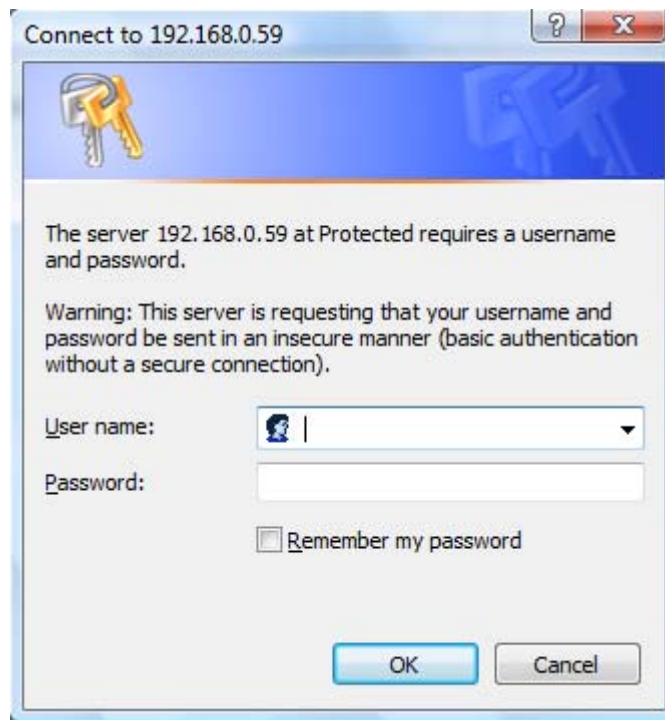
5. Web Interface

Login:

Input the PDU IP address in web browser.

Default ID is snmp.

Password is 1234.




Information: PDU

Display total PDU and each outlet power consumption.

When plug the option device - ENV probe, it will display temperature and humidity information.

Note: Monitored series have not Control functions.

 PDU		
Total load: 0.0 A , Status: Normal		
Information	PDU	
PDU	PDU1	0.0 A Normal
System	PDU2	0.0 A Normal
Power	PDU3	0.0 A Normal
Control	PDU4	0.0 A Normal
Outlet	PDU5	0.0 A Normal
Group	PDU6	0.0 A Normal
Schedule	PDU7	0.0 A Normal
Ping Action	PDU8	0.0 A Normal
Configuration	Total Current	0.0 A Normal
PDU	Option Device	
Threshold	Temperature	N/A
User	Humidity	N/A
Network		
Mail		
SNMP		
SSL		
Time		

Information: System

Indicate PDU system information, including:

Model No.

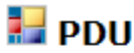
Firmware Version

MAC Address

System Name

System Contact

Location

 PDU		
Total load: 0.0 A , Status: Normal		
Information PDU System Power Control Outlet Group Schedule Ping Action Configuration PDU Threshold User Network Mail SNMP SSL Time	Model No.	MSH-1511A-08N8
	Firmware Version	s4.82-100430-8cb8sk
	MAC Address	00:16:18:77:09:00
	System Name	<input type="text" value="PDU"/>
	System Contact	<input type="text" value="Admin"/>
	Location	<input type="text" value="Office"/>
	<input type="button" value="Apply"/>	

Information: Power


Provide PDU power information, including:

Voltage, Frequency, Power Factor, Active Power, Apparent Power and Main Energy.

Accumulated Energy: Subtotal for energy. User can reset to 0 and restart calculating.

Carbon Emission Data: Reference data.

CO2 Electricity Emission Rate: Users can check this parameter through their power plant.

 **PDU**

Total load: 0.0 A , Status: Normal

Information	Voltage	111.18 V
PDU	Frequency	60.1 Hz
System	Power Factor	1
Power	Active Power	0 W
Control	Apparent Power	0 VA
Outlet	Main Energy	12.809 kWh
Group		
Schedule	Accumulating Energy	0.011 kWh
Ping Action	Carbon Emission Data	0.007 Kg
Configuration	<input type="button" value="Reset"/>	
PDU		
Threshold	Co2 Electricity Emission Rate	<input type="text" value="0.636"/>
User	<input type="button" value="Reset"/>	
Network		
Mail		
SNMP		
SSL		
Time		

Control: Outlet


Indicate PDU outlet on/off status and control outlet.

Select the outlet by checking the box and then click ON or OFF button to control output power for PDU

ON: Press the icon to turn on the assigned outlets.

OFF: Press the icon to turn off the assigned outlets.

OFF/ON: Press the icon to reboot the assigned outlets.

 **PDU**

Total load: 0.0 A , Status: Normal

Information	Outlet Name	Status	
PDU	OutletA	ON	<input type="checkbox"/>
System	OutletB	ON	<input type="checkbox"/>
Power	OutletC	ON	<input type="checkbox"/>
Control	OutletD	ON	<input type="checkbox"/>
Outlet	OutletE	ON	<input type="checkbox"/>
Group	OutletF	ON	<input type="checkbox"/>
Schedule	OutletG	ON	<input type="checkbox"/>
Ping Action	OutletH	ON	<input type="checkbox"/>
Configuration	<div style="display: flex; justify-content: space-around; margin-top: 10px;">ONOFFOFF/ON</div>		
PDU			
Threshold			
User			
Network			
Mail			
SNMP			
SSL			
Time			

Control: Group

Control outlet power for multiple outlets.

Setting: Enter to the setting mode.


Outlet: Assign the outlet in a group.

Note: The outlet number needs to be input by the alphabetical order.

ON: Press icon to turn on the assigned group.

OFF: press icon to turn off the assigned group.

Active: Enable it to be a controllable group.

 **PDU**

Total load: 0.0 A , Status: Normal

Information	Outlet (A,B,C)			Active
PDU	A, <input type="text"/>	<input type="button" value="ON"/>	<input type="button" value="OFF"/>	<input checked="" type="checkbox"/>
System	B, <input type="text"/>	<input type="button" value="ON"/>	<input type="button" value="OFF"/>	<input checked="" type="checkbox"/>
Power	C, <input type="text"/>	<input type="button" value="ON"/>	<input type="button" value="OFF"/>	<input checked="" type="checkbox"/>
Control	D, <input type="text"/>	<input type="button" value="ON"/>	<input type="button" value="OFF"/>	<input checked="" type="checkbox"/>
Outlet	E, <input type="text"/>	<input type="button" value="ON"/>	<input type="button" value="OFF"/>	<input checked="" type="checkbox"/>
Group	F, <input type="text"/>	<input type="button" value="ON"/>	<input type="button" value="OFF"/>	<input checked="" type="checkbox"/>
Schedule	G, <input type="text"/>	<input type="button" value="ON"/>	<input type="button" value="OFF"/>	<input checked="" type="checkbox"/>
Ping Action	H, <input type="text"/>	<input type="button" value="ON"/>	<input type="button" value="OFF"/>	<input checked="" type="checkbox"/>
Configuration				
PDU				
Threshold				
User				
Network				
Mail				
SNMP				
SSL				
Time				

Control: Schedule

Control the assigned outlet by pre-set schedule.


Outlet: Assign the outlet that want to be controlled in this schedule.

Every: Set week's day, assigned day or every day.

Date: When select "sgl" at column of "Every", need to input the truly date here.

Action:	Begin:	End:
ON	Turn on outlet at this time	None
OFF	Turn off outlet at this time	None
OFF/ON	Turn off outlet at this time	Turn on outlet at this time
ON/OFF	Turn on outlet at this time	Turn off outlet at this time

Active: Enable the assigned schedule control.



PDU

Total load: 0.0 A , Status: Normal

	Current Time: 2007/01/01 00:39:06						
	Outlet (A,B,...)	Every	Date (yy/mm/dd)	Begin (hh:mm)	End (hh:mm)	Action	Active
Information							
PDU							
System							
Power							
Control							
Outlet							
Group							
Schedule	A,	Mon	09/06/30	07:59	18:30	ON	<input type="checkbox"/>
Ping Action							
Configuration							
PDU							
Threshold							
User							
Network							
Mail							
SNMP							
SSL							
Time							

Control: Ping Action


Automatically reboot the locked device by ping its IP

Ping IP Address: Set the device IP that want to be monitored by ping from PDU.

Response 10 minutes: PDU will ping the assigned IP address each minute one time, if the equipment has not responded, then number will be increased one time, when the continual 10 minutes have not obtained the response, the number will display 10 and PDU will carry out the assigned action automatically.

Action: Select outlet action to "OFF" or "OFF/ON"

Active: Enable this function.

					
Total load: 0.0 A , Status: Normal					
Information	Ping IP Address	Response 10 minutes	Outlet	Action	Active
PDU					
System	<input type="text" value="19.168.23.200"/>	0	OutletA	OFF <input type="button" value="v"/>	<input type="checkbox"/>
Power					
Control	<input type="text" value="19.168.23.201"/>	0	OutletB	OFF <input type="button" value="v"/>	<input type="checkbox"/>
Outlet					
Group	<input type="text" value="19.168.23.202"/>	0	OutletC	OFF <input type="button" value="v"/>	<input type="checkbox"/>
Schedule					
Ping Action	<input type="text" value="19.168.23.203"/>	0	OutletD	OFF <input type="button" value="v"/>	<input type="checkbox"/>
Configuration	<input type="text" value="19.168.23.204"/>	0	OutletE	OFF <input type="button" value="v"/>	<input type="checkbox"/>
PDU	<input type="text" value="19.168.23.205"/>	0	OutletF	OFF <input type="button" value="v"/>	<input type="checkbox"/>
Threshold					
User	<input type="text" value="19.168.23.206"/>	0	OutletG	OFF <input type="button" value="v"/>	<input type="checkbox"/>
Network					
Mail	<input type="text" value="19.168.23.207"/>	0	OutletH	OFF <input type="button" value="v"/>	<input type="checkbox"/>
SNMP					
SSL					
Time					

Configuration: PDU

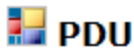
Set the outlet name and delay time.

Name: Rename the outlet.

ON: Set delay time for power on sequential.

OFF: Set delay time for power off sequential.

Note: The maximum delay time is 255 seconds.

**PDU**


Total load: 0.0 A , Status: Normal

	Name	ON Delay (sec)	OFF Delay (sec)
Information PDU System Power Control Outlet Group Schedule Ping Action Configuration PDU Threshold User Network Mail SNMP SSL Time	<input type="text" value="OutletA"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
	<input type="text" value="OutletB"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
	<input type="text" value="OutletC"/>	<input type="text" value="3"/>	<input type="text" value="3"/>
	<input type="text" value="OutletD"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
	<input type="text" value="OutletE"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
	<input type="text" value="OutletF"/>	<input type="text" value="6"/>	<input type="text" value="6"/>
	<input type="text" value="OutletG"/>	<input type="text" value="7"/>	<input type="text" value="7"/>
	<input type="text" value="OutletH"/>	<input type="text" value="8"/>	<input type="text" value="8"/>
	<input type="button" value="Apply"/>	<input type="button" value="Apply"/>	<input type="button" value="Apply"/>

Configuration: Threshold

Set the warning and overload threshold for each circuit.

Set lower and upper threshold for temperature and humidity.

**PDU**


Total load: 0.0 A , Status: Normal

	Name	Threshold (Amp)	
		Warning	Overload
Information PDU System Power	PDU1	<input type="text" value="12"/>	<input type="text" value="16"/>
	PDU2	<input type="text" value="12"/>	<input type="text" value="16"/>
	PDU3	<input type="text" value="12"/>	<input type="text" value="16"/>
	PDU4	<input type="text" value="12"/>	<input type="text" value="16"/>
	PDU5	<input type="text" value="12"/>	<input type="text" value="16"/>
	PDU6	<input type="text" value="12"/>	<input type="text" value="16"/>
	PDU7	<input type="text" value="12"/>	<input type="text" value="16"/>
	PDU8	<input type="text" value="12"/>	<input type="text" value="16"/>
Control Outlet Group Schedule Ping Action			
Configuration PDU Threshold User Network Mail SNMP SSL Time		Lower	Upper
	Temperature	<input type="text" value="1"/>	<input type="text" value="99"/>
	Humidity	<input type="text" value="1"/>	<input type="text" value="99"/>
	<input type="button" value="Apply"/>		

Configuration: User

Change ID and password.

Default ID is snmp and password is 1234.

 **PDU**


Total load: 0.0 A , Status: Normal

Information PDU System Power	Original ID <input type="text"/> Password <input type="text"/>
Control Outlet Group Schedule Ping Action	New ID <input type="text"/> Password <input type="text"/>
Configuration PDU Threshold User Network Mail SNMP SSL Time	<input type="button" value="Apply"/>

Configuration: Network

PDU network information

Enable DHCP: Change the way to get IP address for PDU.

 **PDU**

Total load: 0.0 A , Status: Normal

Information PDU System Power	IP Address Host Name <input type="text" value="DIGIBOARD"/> IP Address <input type="text" value="192.168.0.132"/> Subnet Mask <input type="text" value="255.255.255.0"/> Gateway <input type="text" value="192.168.0.254"/> <input checked="" type="checkbox"/> Enable DHCP
Control Outlet Group Schedule Ping Action	DNS Server IP Primary DNS IP <input type="text" value="192.168.0.254"/> Secondary DNS IP <input type="text" value="0.0.0.0"/> <input type="button" value="Apply"/>
Configuration PDU Threshold User Network Mail SNMP SSL Time	

Configuration: Mail

When event occurs, PDU can send out email message to pre-defined account.

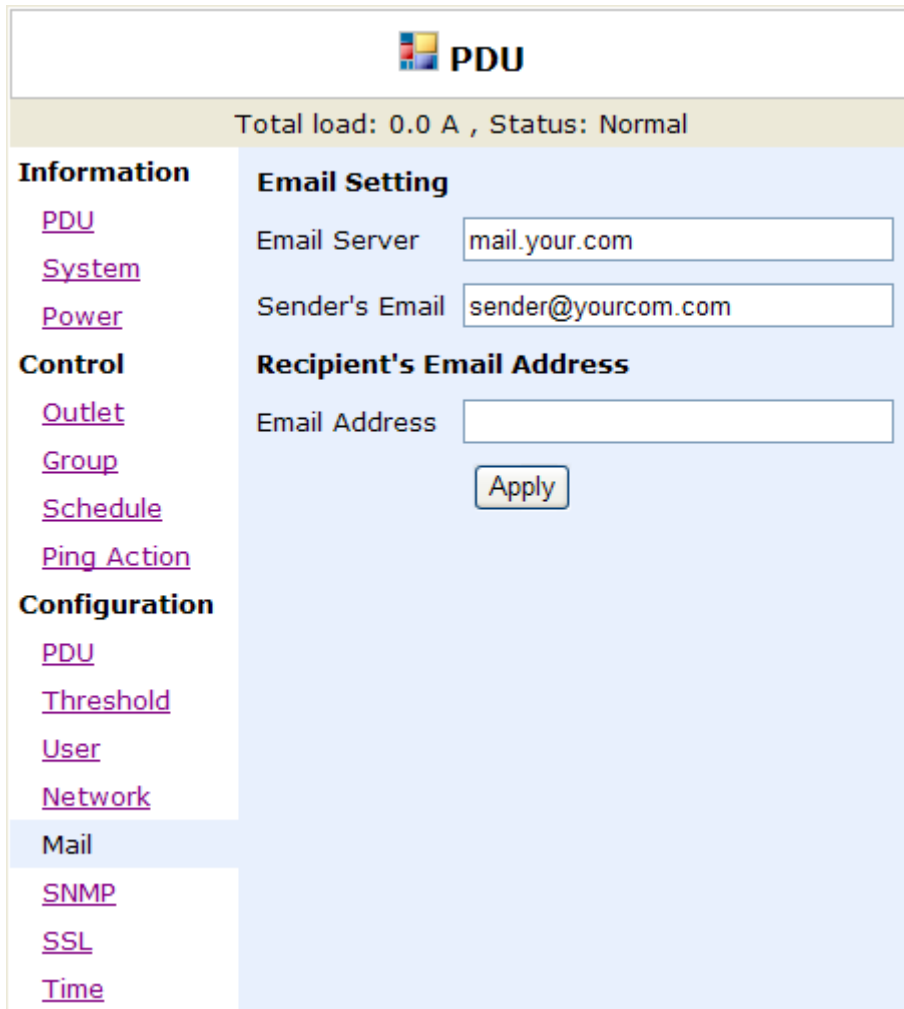
Email Server: The Email Server only support to be input domain name, not IP address.

Sender's Email: Input the sender email address.

Email Address: Input the recipient email address.

The message in the email:
Indicate OutletA~H-XXXXXXXX status in order
X=0 : means the power off.
X=1 : means the power on.

Note: Make sure DNS server can resolve the Email Server's domain name.



The screenshot displays the PDU configuration interface. At the top, it shows the PDU logo and the current status: "Total load: 0.0 A , Status: Normal". The interface is divided into two main sections: a left-hand navigation menu and a main configuration area.

Navigation Menu:

- Information**
 - [PDU](#)
 - [System](#)
 - [Power](#)
- Control**
 - [Outlet](#)
 - [Group](#)
 - [Schedule](#)
 - [Ping Action](#)
- Configuration**
 - [PDU](#)
 - [Threshold](#)
 - [User](#)
 - [Network](#)
 - Mail** (highlighted)
 - [SNMP](#)
 - [SSL](#)
 - [Time](#)

Main Configuration Area:

- Email Setting**
 - Email Server:
 - Sender's Email:
- Recipient's Email Address**
 - Email Address:
 -

Configuration: SNMP


When event occurs, PDU can send out trap message to pre-defined IP address.

Trap Notification: Set receiver IP for trap.

Community: Set SNMP community.

Read Community is public and fixed.

Default Write Community is "public" and can be modified by user.

 **PDU**

Total load: 0.0 A , Status: Normal

Information PDU System Power	Trap Notification Receiver IP <input style="width: 100%;" type="text" value="192.168.0.1"/> <input type="button" value="Apply"/>
Control Outlet Group Schedule Ping Action	Community Read public Write <input style="width: 100%;" type="text" value="public"/> <input type="button" value="Apply"/>
Configuration PDU Threshold User Network Mail SNMP SSL Time	


Configuration: SSL

Enable SSL for web communication.

User must input the correct ID and password to enable SSL function. The ID and password must be the same with the setting in "User".

Change port

User can change network port number for web access.

 **PDU**

Total load: 0.0 A , Status: Normal


Information PDU System Power	Enable SSL <input type="checkbox"/>
Control Outlet Group Schedule Ping Action	PORT <input style="width: 100%;" type="text" value="80"/>
Configuration PDU Threshold User Network Mail SNMP SSL Time	Confirmation ID <input style="width: 100%;" type="text"/> Password <input style="width: 100%;" type="text"/> <input type="button" value="Apply"/>

Configuration: Time

Set the time for schedule control.

Internet Time Setting: Get time from the assigned network time server.

System Time: Input time manually.

 **PDU**

Total load: 0.0 A , Status: Normal

Information PDU System Power	Internet Time Setting Time Between Updates <input type="text" value="10 minutes"/> <input type="button" value="v"/> Primary Time Server <input type="text" value="pool.ntp.org"/> Secondary Time Server <input type="text" value="asia.pool.ntp.org"/> Time Zone <input type="text" value="GMT+8:00"/> <input type="button" value="v"/> <input type="button" value="Apply"/>
Control Outlet Group Schedule Ping Action	System Time 2010/05/17 11:26:39 System Time (yyyy/mm/dd hh:mm:ss) <input type="text" value="2010/05/17 11:26:31"/> <input type="button" value="Apply"/>
Configuration PDU Threshold User Network Mail SNMP SSL	
Time	