



MPDU User Manual



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1 MPDU Introduction

MPDU (Module Power Distribution Unit) is the latest scientific achievements in the power distribution industry for data center. The originated Hot-Swap Control Module and field-replaceable Output Module design enable the user to upgrade the PDU to different product functional series (A, B, C, D series) and different product categories (MPDU, ZPDU) as well. Adopting overload and over-current hydraulic circuit breakers and energy-saving metal structure design, MPDU provides highly accurate and comprehensive energy metering of the connected devices in the data center cabinet. CLEVER MPDU is the innovative solution which meets requirements of Hot-Swappable, Sustainable, Upgrade-able and Maintainable for data center operation.

2 Scope of Application

- 2.1 MPDU can be applied to server rack, network cabinet and etc.
- 2.2 Outlet types (IEC320 C13, IEC320 C19, GB1002, GB2099.3, NEMA 5-15R, NEMA 5-20) and outlet quantity (24 outlets & 42 outlets) can be selected according to the actual needs.
- 2.3 MPDU complies with RoHS requirements. It is applicable for single phase 100~240VAC and three phase 200~400VA, output 32A, 63A, 3×16A, 3×32A, which can meet customers' requirements all over the world.

3 Terms & Definitions

3.1 Parameter and abbreviated units

Parameter	Definitions	Units of measurement
U	Input Voltage	V
I	Input load	A
P	Apparent Power	KVA
PF	Power factor	--
E	Power consumption	KWH
T1/T2	Temperature	°C
H1/H2	Humidity	%RH

3.2 MPDU is organized into A, B, C, D 4 different series based on its function as below:

- A Monitored PDU
- B Per-port Monitored PDU
- C Switched PDU
- D Per-port Monitored & Switched PDU



3.3 The main functions table of MPDU

Main functions	Product Series			
	A Series	B Series	C Series	D Series
Energy consumption monitoring of each phase	●	●	●	●
Input voltage monitoring of each phase	●	●	●	●
Input current monitoring of each phase	●	●	●	●
Apparent Power monitoring of each phase	●	●	●	●
Power factor monitoring of each phase	●	●	●	●
Temperature/Humidity monitoring	●	●	●	●
Current monitoring of individual outlet		●		●
Power monitoring of individual outlet		●		●
Energy consumption monitoring of individual outlet		●		●
On/Off status of individual outlet			●	●
Threshold settings of input voltage of each phase	●	●	●	●
Threshold settings of input current of each phase	●	●	●	●
Threshold settings of individual outlet		●		●
Outlet Switching			●	●
Power ON/OFF delay of individual outlet			●	●

Remark: ● Means the specified function is supported

4 Main functions and Installation

4.1 Function description

4.1.1 Monitoring function: through the local LCD screen, user can view the current, voltage, energy consumption, power of each phase, baud rate, serial communication address, daisy chain address, device series, IP address, the current, power and power consumption of individual outlet (A&C series not included) and temperature, humidity status.

4.1.2 Outlet switching function (A&B series not included): switching On/Off each individual outlet, switching On/Off the breaker, set up the power on/off delay, Return-to-zero for power consumption at phase or individual outlet level.

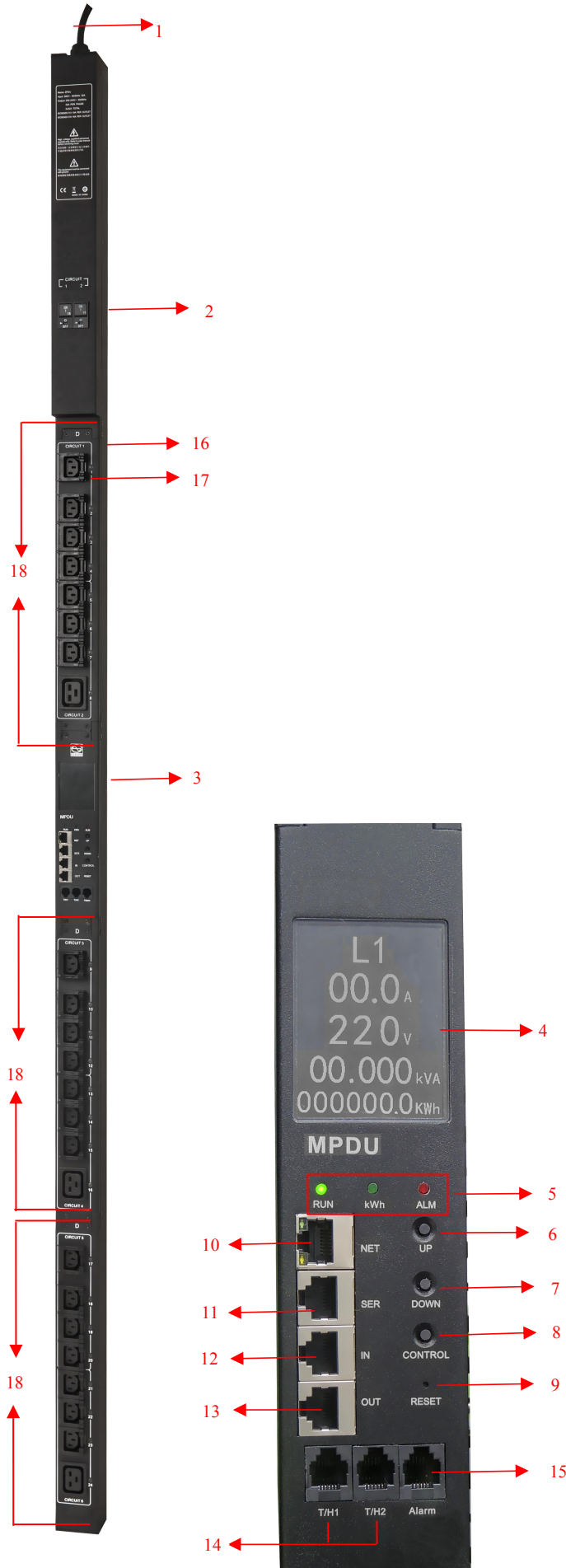
4.1.3 Keep the former status (A&B series not included: keep the former state of each outlet after restart.



- 4.1.4 User-defined alarm: when thresholds of total current, individual current (A&C series not included) or temperature and humidity are exceeded
- 4.1.5 System default alarm: when the total rating current, individual rating current (A&C series not included) are exceeded or temperature and humidity threshold are exceeded.
- 4.1.6 Various alarm methods: Buzzer sounds, Alarm indicator flashes, value displayed in red from Web interface, the value flashes in red from LCD screen, alarm logs, E-mail notification and SNMP trap
- 4.1.7 User management: User permission configuration. (User can be set as administrator or normal user)
- 4.1.8 Access methods: Web Interface, Telnet command line, Modbus, SNMP (v1 / v2c / v3), Serial console,
- 4.1.9 LCD screen Energy-saving mode and mute-alarm-buzzer are supported.
- 4.1.10 Support multi-user operation system, Multi-browser compatible and remote software update.
- 4.1.11 **MPDU A/B/C/D series function table**

No.	Function	Description
1	Monitoring	Monitoring function: Through the local LCD screen user can view the current/voltage/energy consumption/power at input level or individual outlet level(A&C series not included), temperature/humidity status, band rate, serial communication address, device series, IP address.
2	Switching	Outlet switching function (A&B series not included): switching on/off each individual outlet or all outlets, set up the power on/off delay, reset power consumption at input or outlet level.
3	Keeping the former state	Keeping the former status (A&B series not included) :keep the former state of each outlet after restart
4	User-defined alarm	User-defined alarm: when thresholds of the input voltage, total current or individual current(A&C series not included), temperature and humidity are exceeded
5	System default alarm	System default alarm: when the total rating current, individual rating current(A&C series not included) or temperature/humidity threshold are exceeded

4.2 Product picture and description



1. Input power cord;
2. Hydraulic circuit breaker;
3. NMC Module;
4. LCD screen;
5. RUN:Operation indicator;
KWH:Energy pulse indicator;
ALM:Alarm indicator;
6. UP:Scroll up to the previous page;
7. DOWN:Scroll down to the next page;
8. CONTROL:Confirm and flip button;
9. RESET: Reset button;
10. NET: 10/100M Ethernet port;
11. SER: Serial port (MODBUS Supported);
12. IN: Daisy-Chain port; Connect to the OUT port of previous PDU;
13. OUT: Daisy-Chain port; Connect to the IN port of next PDU
14. T/H1:Temperature and humidity sensor port 1;
T/H2:Temperature and humidity sensor port 2;
15. Alarm:Audible and visual alarm port
16. Outlet LED indicator;
17. Output sockets;
18. Replaceable outlet modules;

4.3 Installation

Vertical-mounting (0U)

Both the NMC Module and output module are Hot-Swappable.

CAUTION:

- 1. Request a qualified electrician to change the NMC Module or Output Module.**
- 2. To prevent electrical shock and ensure the personal safety, please do switch off the corresponding circuit breaker before replacing the Output Module as the output module chassis is with strong electricity.**
- 3. Please notice the install direction of the Output Module and don't mount it in a reverse direction.**
- 4. Do not replace the Outlet Module when there is load.**
- 5. The Manufacturer is not responsible for the damage or claims resulting from faulty or incorrect use of its Products.**

5 Hardware instruction

5.1 NMC module

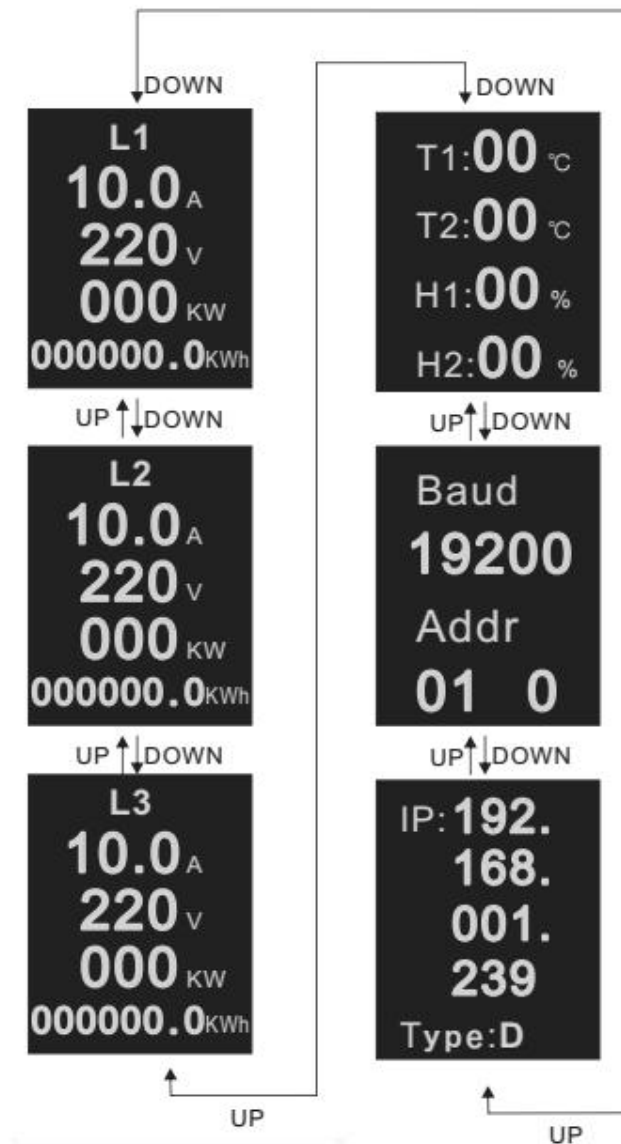
Item	Function	Instruction
RUN	RUN indicator	Status: flashing every second
KWH	kWh indicator	Status: flashing frequency depends on the connected load
ALM	Alarm indicator	Status: flashing when threshold is exceeded.
NET	Ethernet port	LAN/WAN communication port
SER	Serial port	RS-485 Serial communication port
IN	Daisy-Chain port	Connect to the Out port of previous PDU
OUT	Daisy-Chain port	Connect to the IN port of next PDU
CONTROL	Control button	Press to view the Rack PDU status and configuration. Restore to factory settings: Press and hold the CONTROL button, then press RESET button to restore to factory settings
UP	Page UP	Scroll up to the previous page
DOWN	Page Down	Scroll down to the next page
RESET	RESET button	Restart system
LCD screen	View the data status	Display the power data and alarm status
T/H	Temperature/humidity sensor port	Connect to temperature/humidity sensors

5.2 System initialization

When power on the MPDU, boot animation starts, the buzzer sounds and RUN indicator flashes. It is going to be in normal working mode after that unit has initialized and the LCD has started displaying the power data.

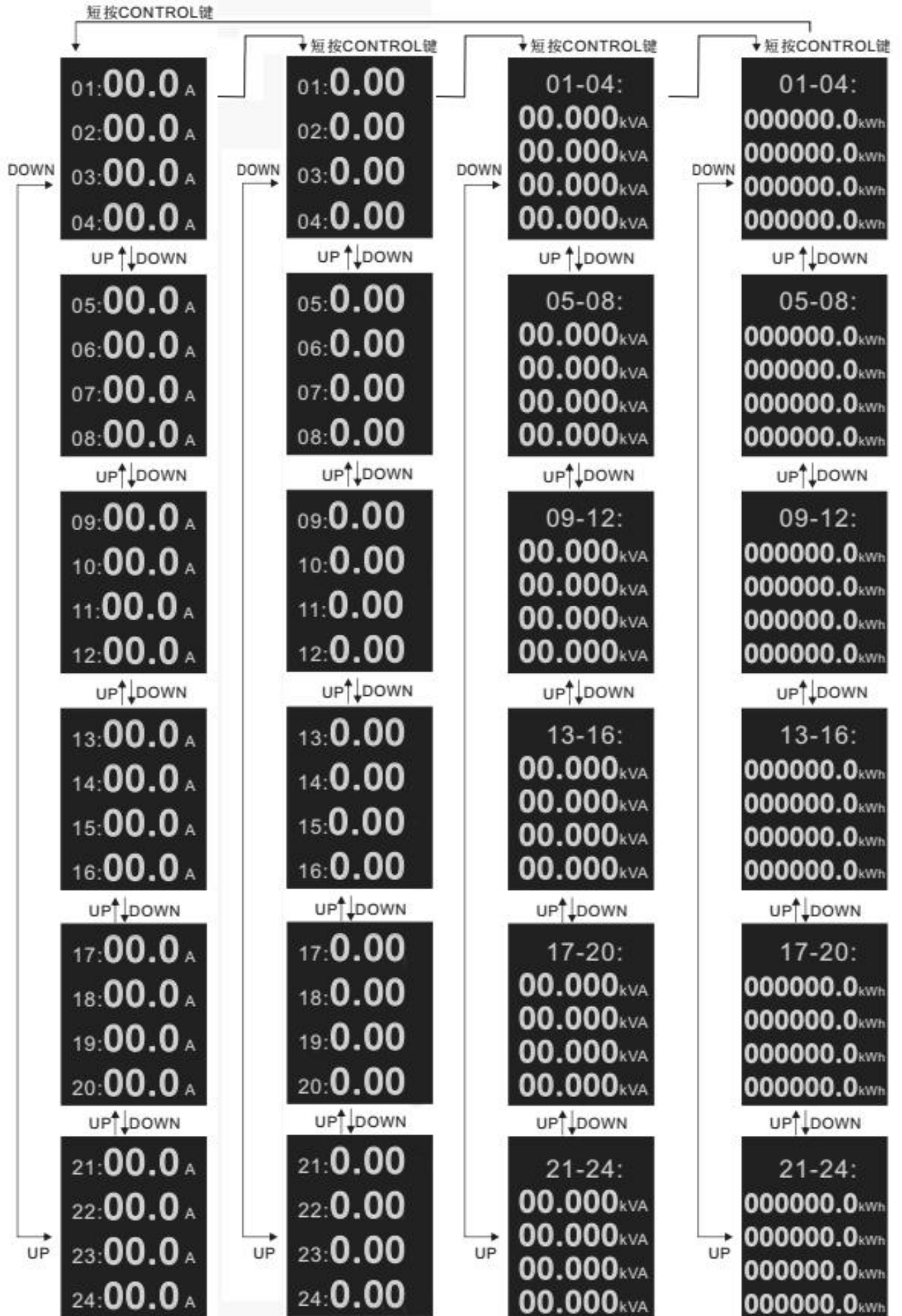
5.2.1 Press the UP/DOWN button to view the Rack PDU information including the input

load/voltage/power/power consumption of each phase, temperature/humidity status, baud rate, Modbus communication code, Daisy-chain code, IP address and device series.



5.2.2 Press the CONTROL button to view the current/power/power consumption of individual outlet (A&C series not included)

5.2.3 Press and hold the CONTROL button for 4 seconds to back to the input current/voltage/power/power consumption of each phase



5.3 Hardware Settings

5.3.1 Restore to factory settings:

Press and hold the CONTROL button to power on the MPDU at the same time (Or press and hold the CONTROL button and press RESET button at the same time) till the RUN indicator is flashing.

5.3.2 Buzzer mute button

Press and hold the CONTROL button for 4 seconds, then press the UP button within 1 second to enable or disable the alarm buzzer.

5.3.3 Energy-saving mode settings

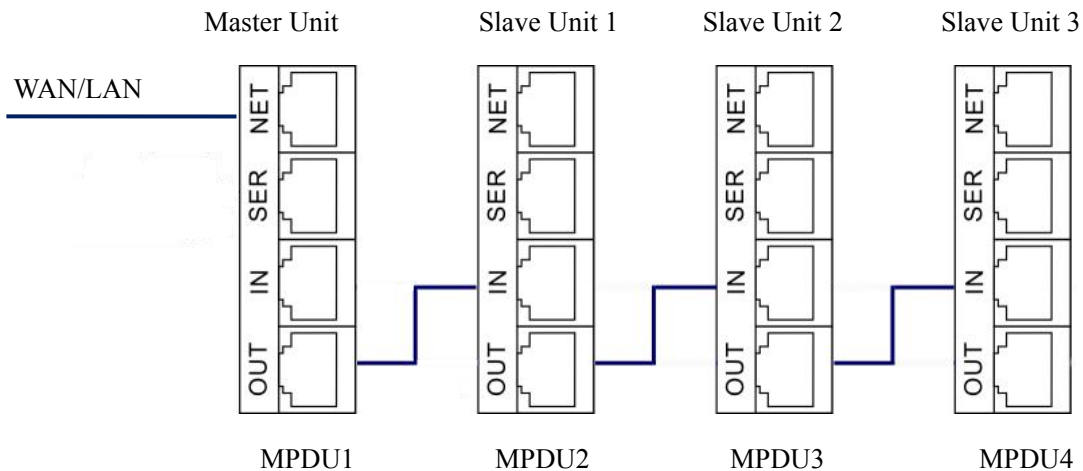
5.3.3.1 Press and hold the CONTROL button for 4 seconds, then press DOWN button within 1 second, one blue ON mark will show on the upper right corner from the first page of LCD screen. The backlight will turn off if there is no operation for 20-30 seconds. The backlight can be turned on by pressing any button.

5.3.3.2 Press and hold the CONTROL button for 4 seconds, then press DOWN button within 1 second to turn off the energy-saving mode and the blue ON mark will disappear from the screen and backlight will be always on

5.4 Daisy-Chain

5.4.1 Ethernet Daisy-Chain

Support daisy-chain up to 4 PDUs (1 master and 3 slaves) so the user can manage multiple PDUs from one IP address through web interface. Daisy-chain schema is as following:



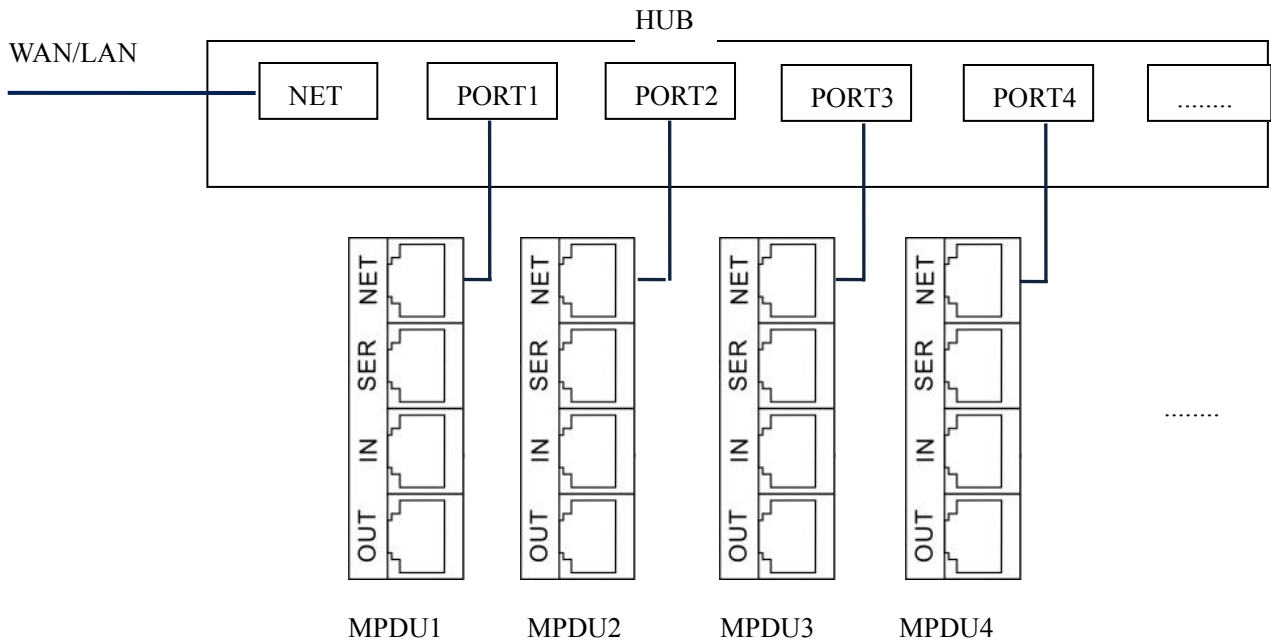
Ethernet Daisy-Chain settings:

1. Log in each MPDU, and configure the Work mode (Master unit or Slave unit) on Device Manage page.
2. Connect the NET port from the Master Unit to the WAN/LAN, other Daisy-chain cable connect the OUT port to the IN port of the next PDU. Connect all 3 Slave unit by the same way (see Figure above)
3. Access the Master through Web interface and check all the status of Slaves. If all are readable, daisy-chain is successful

Note: Only the same product series can support the Daisy-chain connection. Single phase and Three phase or A/B/C/D series cannot Daisy-chain together. For example, A series MPDU with single phase input can be connected by A series with single phase only; D series MPDU with Three phase input can be connected by D series with Three phase input.

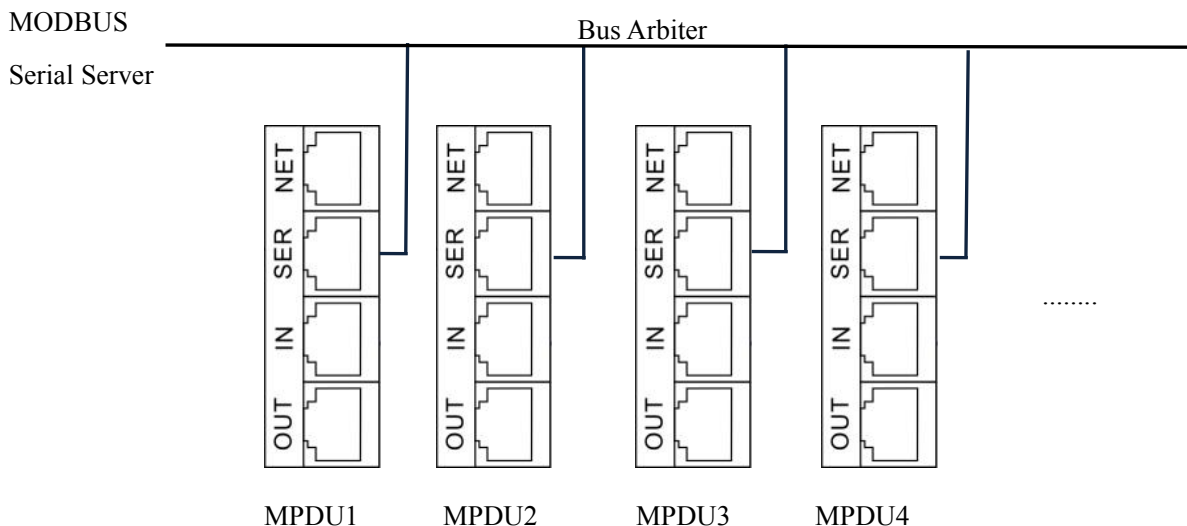
5.4.2 Star Connection

Support Star connection up to unlimited MPDU through a HUB. No limitation for the PDU quantity.



5.4.3 Serial Connection settings

The Modbus-RTU protocol is used here for the Star connection, The MODBUS Serial Server connect to the Bus arbiter, the RS485 port from the Bus arbiter connect to the SER port from each PDU. Serial connection can support up to 32 PDUs together. See figure as below.



Serial connection settings:

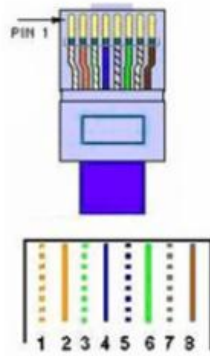
1. Log on to Web interface of each MPDU to configure the serial communication code from the Modbus address

code on Device Manage page;

- The Master unit collects the data from the SER port through the RS-485 serial communication cable. Please refer to the 《MPDU MODBUS RTU Protocol Guide》 for details.

5.5 RJ45 terminal PIN instruction of RS485 port.

RJ45 terminal pin



Color	Instructions
1. Orange & White	GND
2. Orange	GND
3. Green & White	RS485-A
4. Blue	RS485-A
5. Blue & White	RS485-B
6. Green	RS485-B
Brown & White	GND
8. Brown	GND

6 MPDU Software introduction:

6.1 Software overview:

CLEVER RPDU is equipped with embedded software system which provides lots of network services like WEB server, SNMP, Telnet, SMTP/SMTPTS, MODBUS, NTP and etc. User can access MPDU through the Web Interface or other methods, at the same time it provides rich ports of secondary development and integration so the user can manage the device more easily.

6.2 Access method

Access through the Web Interface though IE browser (Supported web browsers includes Internet Explorer, Google chrome, Firefox and etc)

SNMP (V1/V2c/V3)

Command line interface (telnet)

Serial communication MODBUS RTU

6.2.1 Web interface

Open a browser and enter the default IP address (default IP address:192.168.1.163), the login window will pop up like below, See figure1-1.

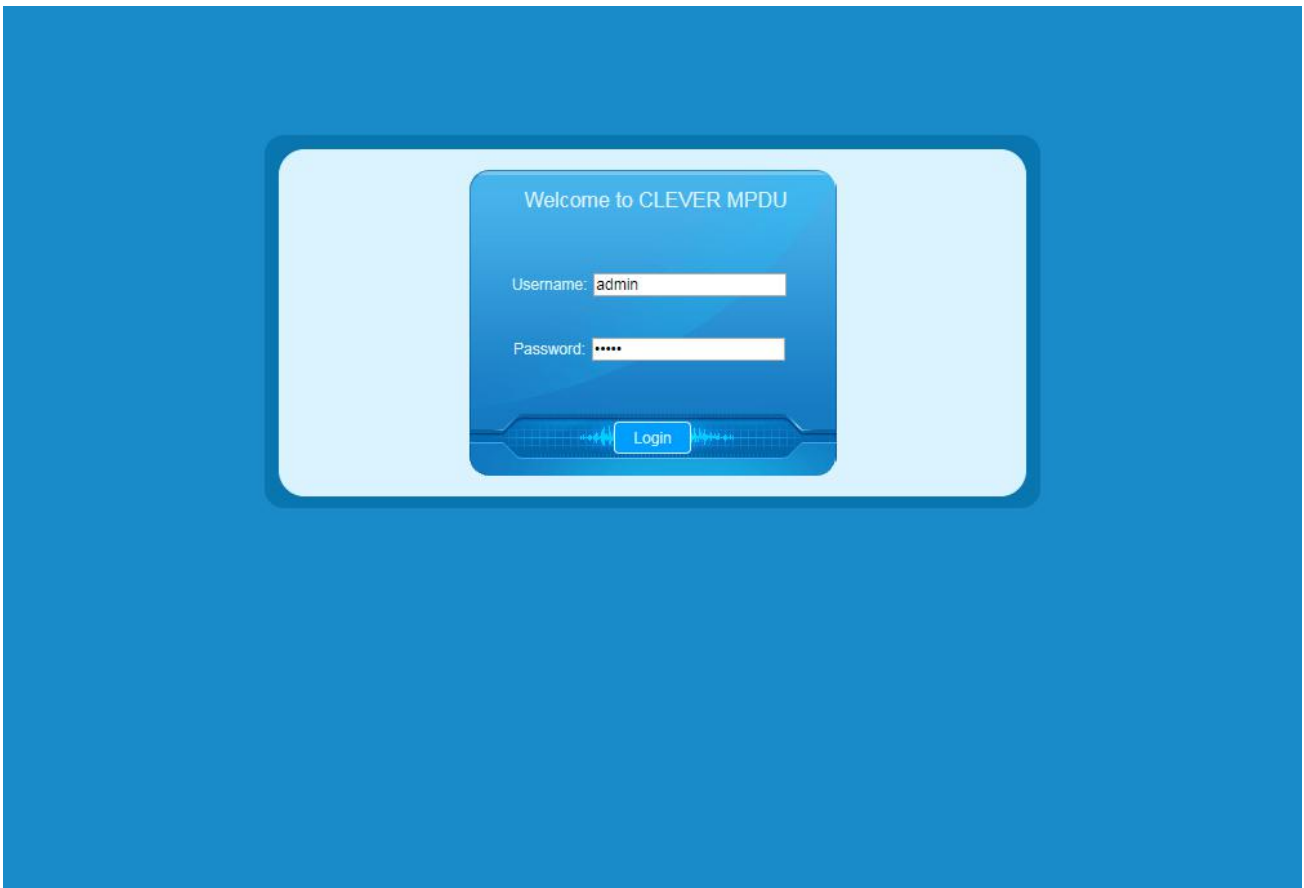


Figure 1-1

Fill in the correct user name and password (Factory default login name is admin, password is admin) to login the main interface. The main interface is designed with three major screen sections shown in the following screenshot as figure 1-2

- 1) Device information: shows company LOGO, product name and software version information, daisy-chain code, device type and device series;
- 2) Navigation tab: shows function tabs available
- 3) Detail window: Shows PDU information under each function tab

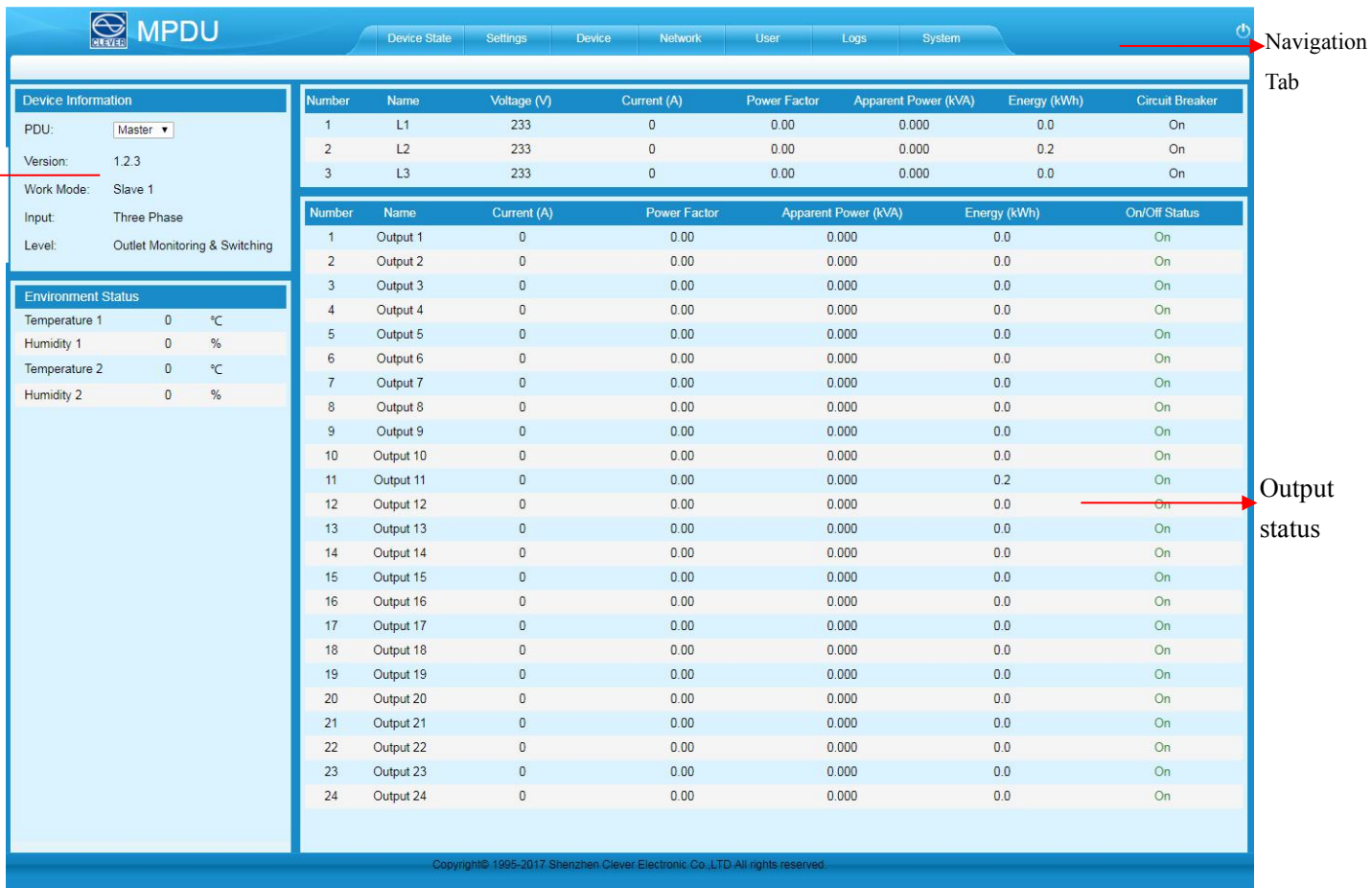


Figure 1-2

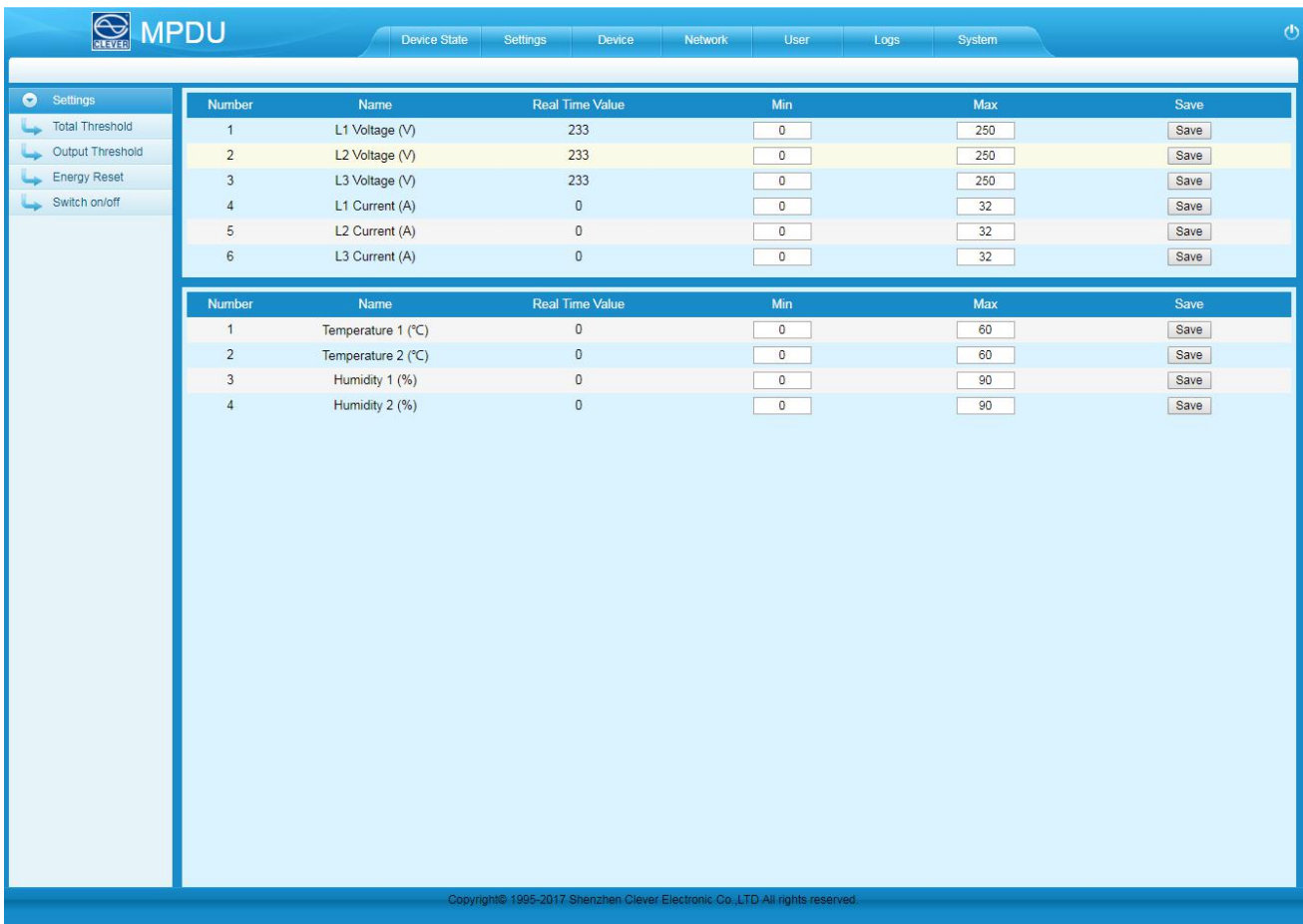
A. Device Status: After enter Figure 1-2 you can view the monitoring information as below:

- 1) Input monitoring: The input current, voltage. Power, power consumption, power factor of each phase and On/Off status of circuit breaker.
- 2) Outlet Monitoring: The current, power, power consumption and ON/OFF status of individual outlet.
- 3) Environment monitoring: The Temperature/humidity status of 2 sensors.

B. Device Settings: Click the Settings tab to enter Figure 1-3 to configure thresholds of input voltage, input current, individual outlet current, temperature, humidity. And configure values for power On/Off delay of

C. Individual outlet, power consumption return to zero and outlet switching.

- 1) Input threshold settings:
 - a. The input voltage threshold range: 170-276VAC
 - b. The input current threshold range: 0-63A for single phase, 0-32A for three phase
 - c. Temperature/Humidity threshold range: 0-40°C for temperature, 0-99% for humidity



The screenshot displays the MPDU web interface. The top navigation bar includes 'Device State', 'Settings', 'Device', 'Network', 'User', 'Logs', and 'System'. The 'Settings' menu is expanded, showing options for 'Total Threshold', 'Output Threshold', 'Energy Reset', and 'Switch on/off'. The main content area contains two tables for configuring thresholds.

Number	Name	Real Time Value	Min	Max	Save
1	L1 Voltage (V)	233	<input type="text" value="0"/>	<input type="text" value="250"/>	<input type="button" value="Save"/>
2	L2 Voltage (V)	233	<input type="text" value="0"/>	<input type="text" value="250"/>	<input type="button" value="Save"/>
3	L3 Voltage (V)	233	<input type="text" value="0"/>	<input type="text" value="250"/>	<input type="button" value="Save"/>
4	L1 Current (A)	0	<input type="text" value="0"/>	<input type="text" value="32"/>	<input type="button" value="Save"/>
5	L2 Current (A)	0	<input type="text" value="0"/>	<input type="text" value="32"/>	<input type="button" value="Save"/>
6	L3 Current (A)	0	<input type="text" value="0"/>	<input type="text" value="32"/>	<input type="button" value="Save"/>

Number	Name	Real Time Value	Min	Max	Save
1	Temperature 1 (°C)	0	<input type="text" value="0"/>	<input type="text" value="60"/>	<input type="button" value="Save"/>
2	Temperature 2 (°C)	0	<input type="text" value="0"/>	<input type="text" value="60"/>	<input type="button" value="Save"/>
3	Humidity 1 (%)	0	<input type="text" value="0"/>	<input type="text" value="90"/>	<input type="button" value="Save"/>
4	Humidity 2 (%)	0	<input type="text" value="0"/>	<input type="text" value="90"/>	<input type="button" value="Save"/>

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Figure 1-3

2). Individual outlet threshold settings:

- a. The individual outlet current threshold range: 0-16A
- b. User-defined power On/Off delay for individual outlets or all outlets range: 0-10 seconds

Note: The low-load and overload threshold should be within the threshold range.

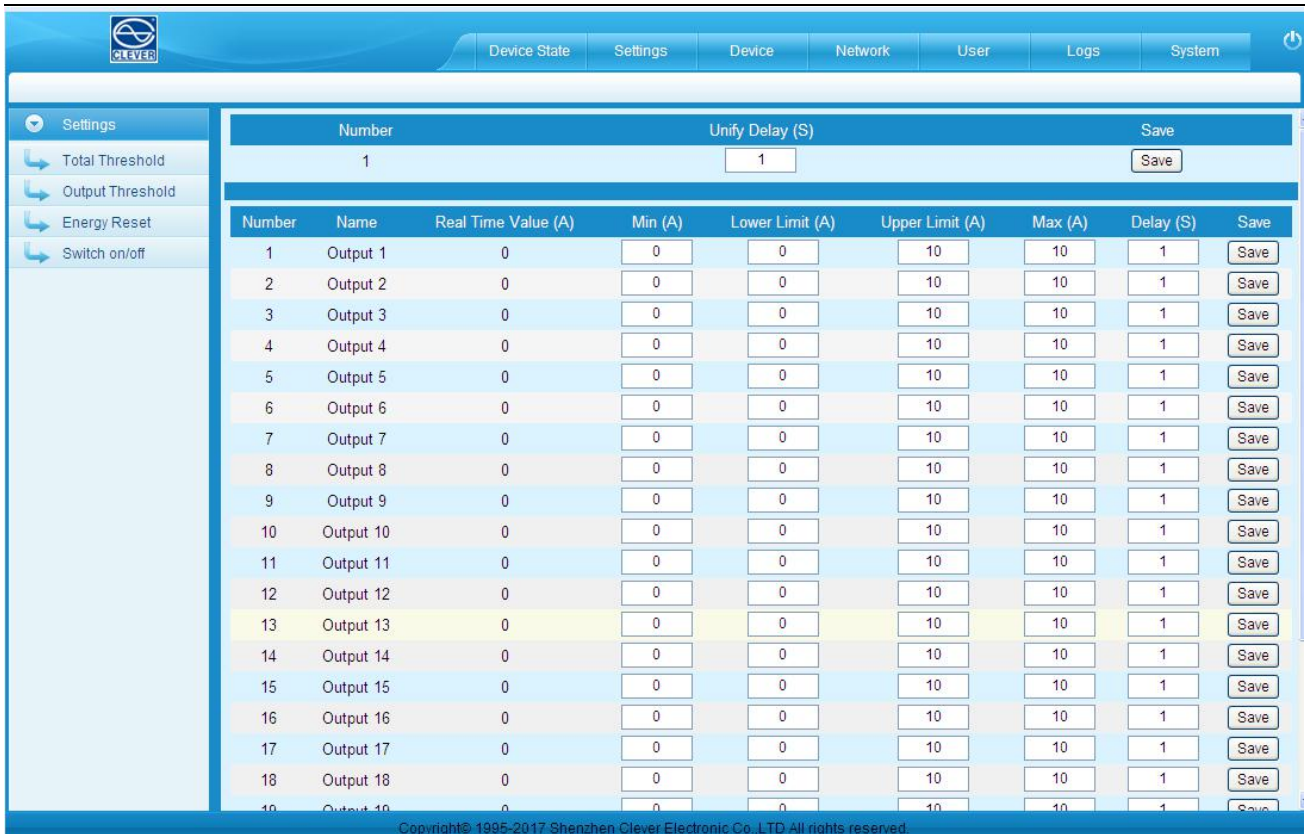


Figure 1-4

3) Power consumption Return-To-Zero

User can view the power consumption of individual outlet or each phase. The specified power consumption can be returned to zero by clicking the Reset button.

The power consumption value of specified outlet will be reduced from the total power consumption.



Figure 1-5

4) Outlet Control

- a. Click the ON/OFF button after the outlet to switch ON/OFF the specified individual outlets;
- b. Click the ON/OFF button after each phase to switch ON/OFF the outlets from the specified phase;
- c. Click All ON/All OFF button to switch ON/OFF all outlets at the same time.

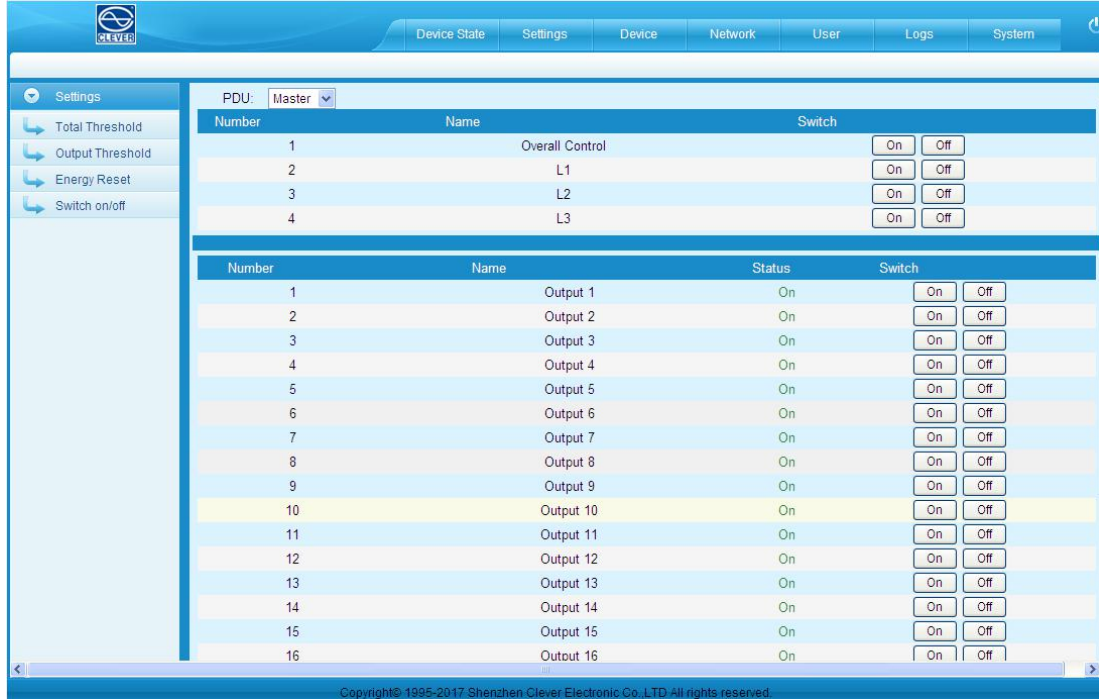


Figure 1-6

C. Device Management

Device Settings: To configure the device name, LCD screen energy-saving mode, mute the buzzer alarm, Work mode, Modbus address code and baud rate.

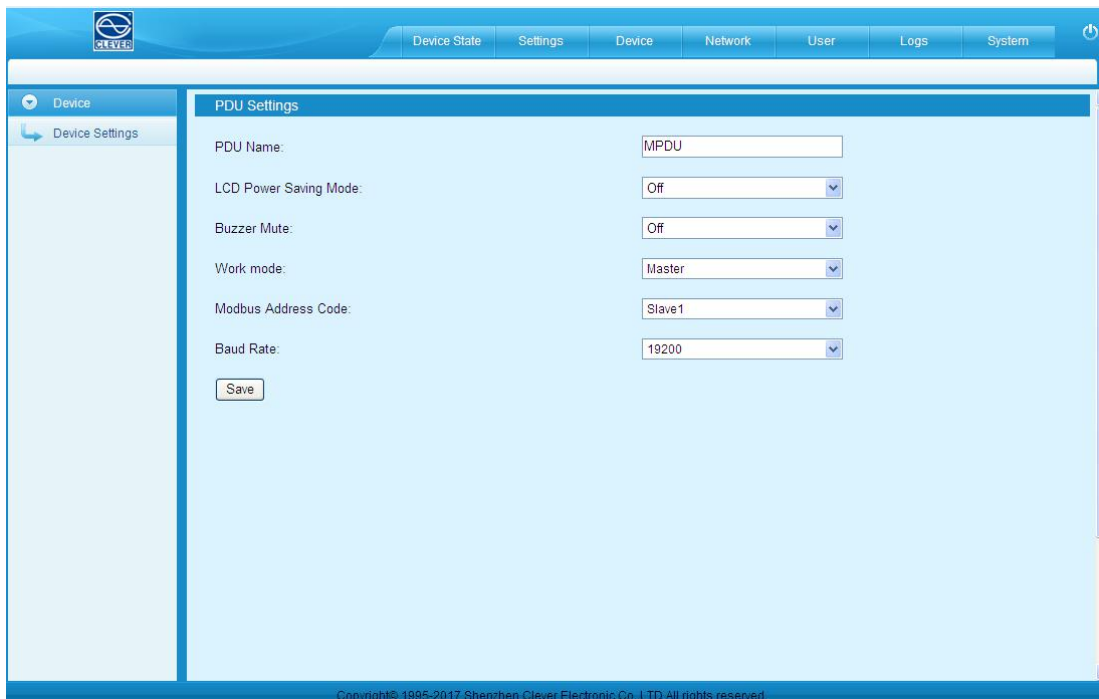


Figure 1-7

D. Network Settings:

1). HTTP/SSL settings

Set-up and save the HTTP/SSL port according to the working mode.

The default port is 80 under normal work mode,

HTTPS(SSL) Mode Port is 443 by default

Note: These settings will take effect when MPDU is restarted

2). Network settings and modify IP address, for example:

IP address:192.168.1.163 (factory default IP) ;

Subnet mask:255.255.255.0

Gateway:192.168.1.1

DNS address:202.96.128.86 by default; Please enter a correct DNS address in order to send the E-mail

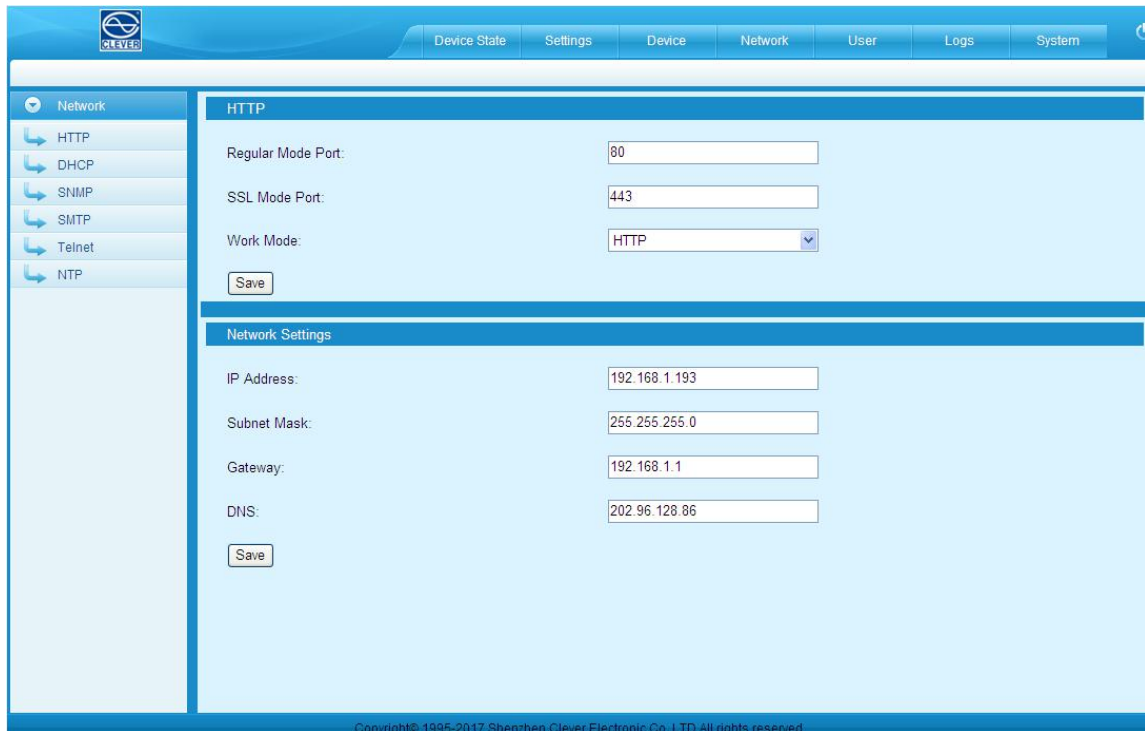


Figure 1-8

3). DHCP settings:

The default state of DHCP setting is Off. User can select On from the DHCP drop-down list and click Save to enable it. After restarting the software, device will get the IP automatically. IP can be viewed from the LCD screen.

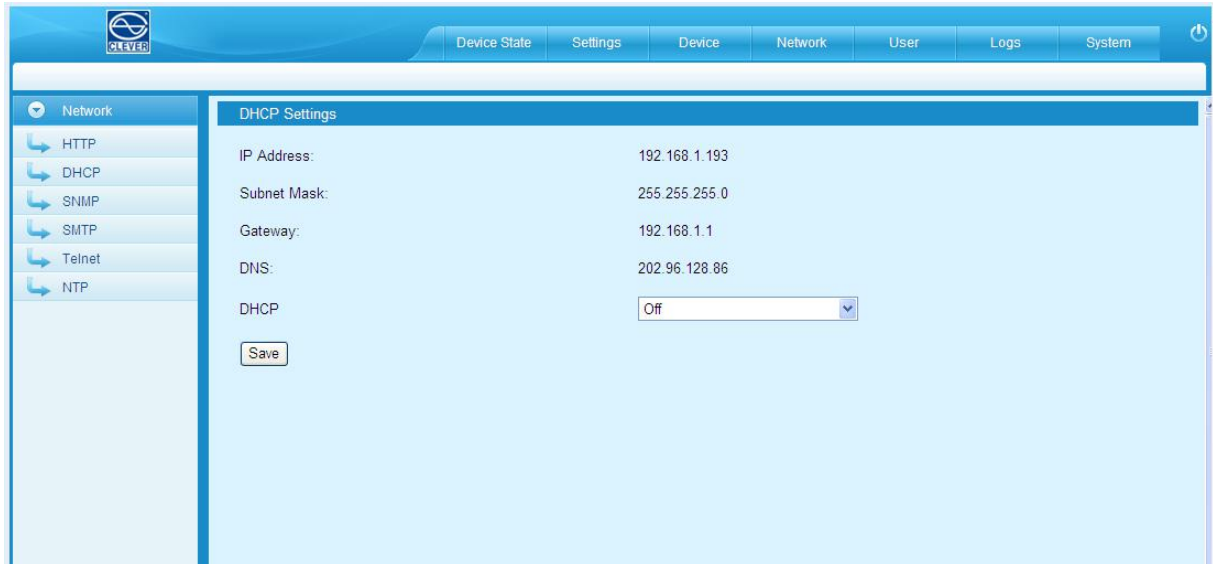


Figure 1-9

Remark: When DHCP is On, the device automatically obtains the router to assign an IP address and will not allow you to manually modify the network settings.

4) SNMP settings

a. SNMP V1/V2c settings:

User can decide to Enable or Disable the SNMP access from the Web Interface.

Enable SNMP V1 and V2c requires configuration of read community and write community. And the default “Read community” and “Write community” is public and private respectively.

Trap address: can set 2 trap addresses. Fill in the trap address of SNMP management platform, Trap information will be sent directly to the addresses.

b. SNMP v3 Settings:

Select “On” and fill in account, password, private key.

Note: After save of the SNMP setting, software must be restarted.

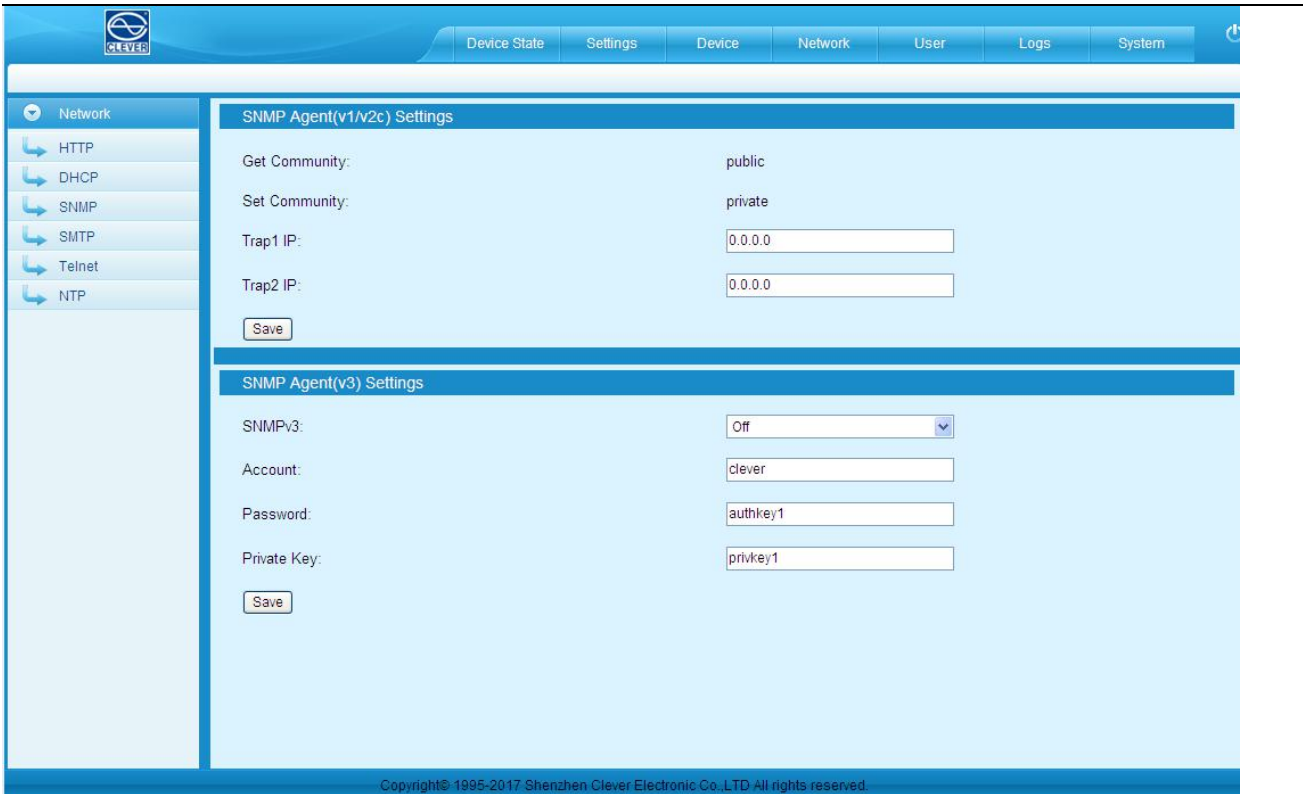


Figure 1-10

5) SMTP settings: Click SMTP from the network navigation tab to enter the SMTP setting as figure 1-11

Fill in the parameters of SMTP service including SMTP account, password, SMTP server, working mode (SMTP/SMTPS) and e-mail recipients (up to 5 recipients), then Click Save. SMTP settings will take effect when MPDU is restarted.

SMTP test: fill in the recipients address and click “Test” SMTP setting is successful if test email was received. If not received, please double check and configure the SMTP again.

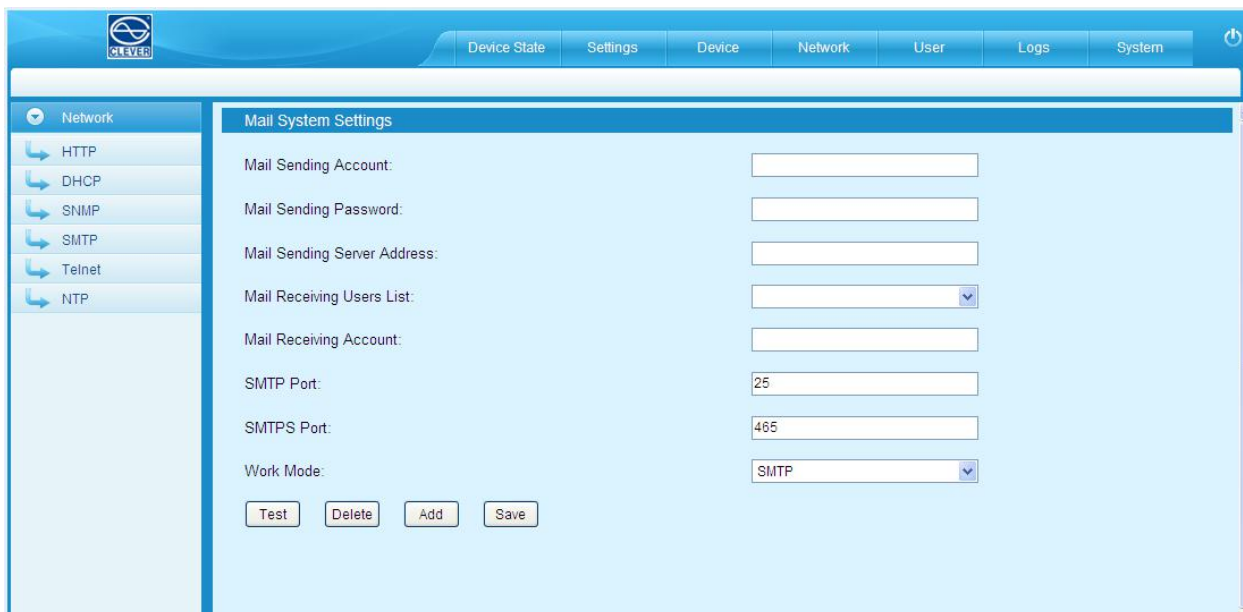


Figure 1-11

6). Telnet Settings

Telnet: select “Enable” or “Disable” (Enable by default) and save, make sure to restart the software after modification. Telnet account and password is the same one used for login. Telnet port is 23

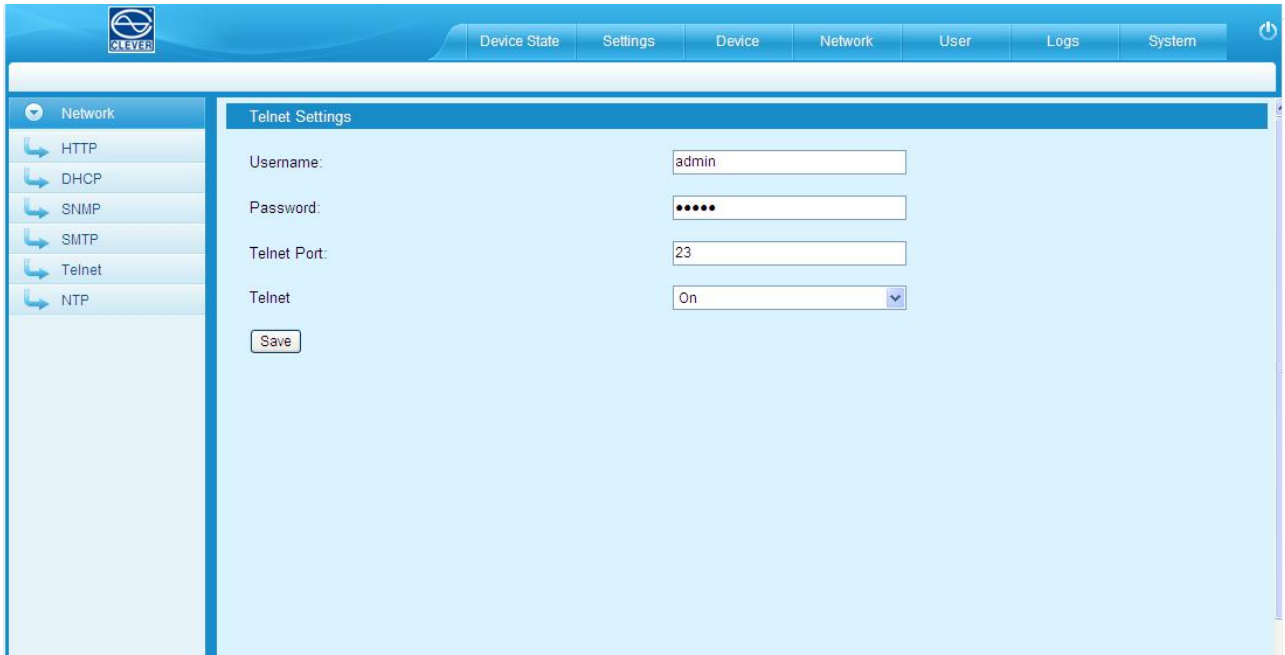


Figure 1-12

Note: SNPM settings will take effect when MPDU is restarted.

7). SNTP Settings:

SNTP section displays the device current time which is also the time recorded for the logs.

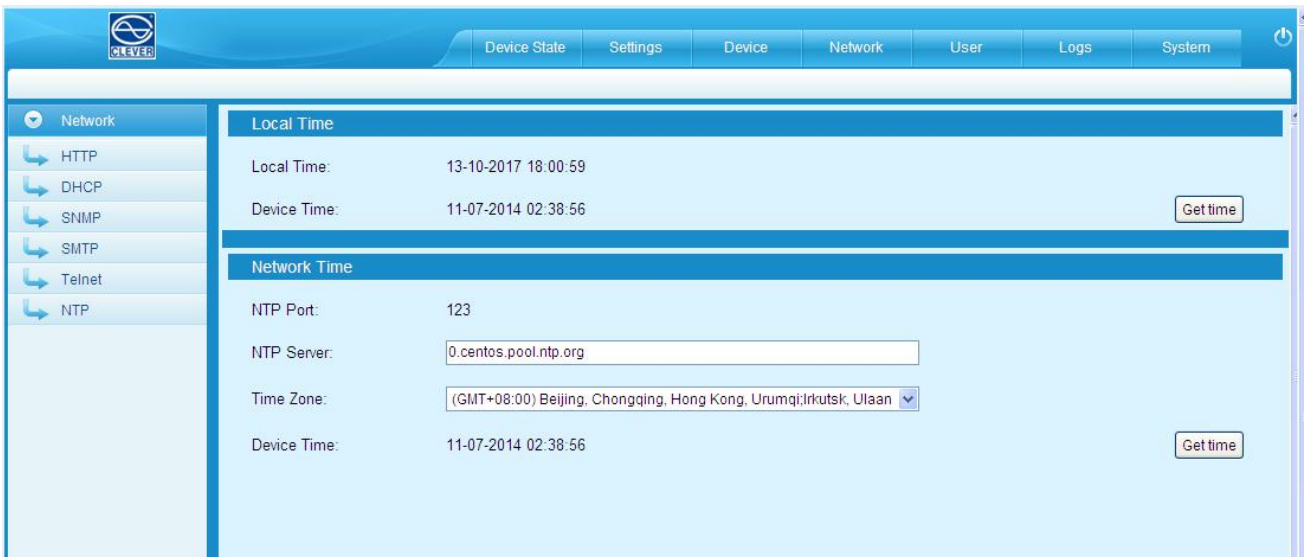


Figure 1-13

1) Local time calibration

Click Time Acquisition to synchronize the MPDU system time to the local machine.

2) Network time calibration

Click Time Acquisition to synchronize the MPDU system time and date to the specified time zone according to the NTP server.

Note: Please make sure the MPDU is connected to the internet when synchronize the system time

E. User Settings

- Create new account: Click User Settings tab and fill in the user name, password, confirm password, then click Add to create new user account.

Remark: The maximum length for user name and passwords is 10 characters, the user name and password exceeds the maximum of 10 characters will be a failure action.

- Edit user account: Click User settings, fill in the new user name, password and confirm-password in the right side of the existing User name and Password, then click Save.
- Delete User account: Select the user account from the user list and click Delete.

Remark: The default Administrator cannot be deleted. The default user Admin can't be deleted.

- Permission settings: Click permission setting and select the Administrator or normal user from the drop-down list, then click Save button. See figure 1-14

Remark: Normal user doesn't have the permission to do the configuration (Save/configure/delete button will not be available), only the administrator have the full permission to do so.

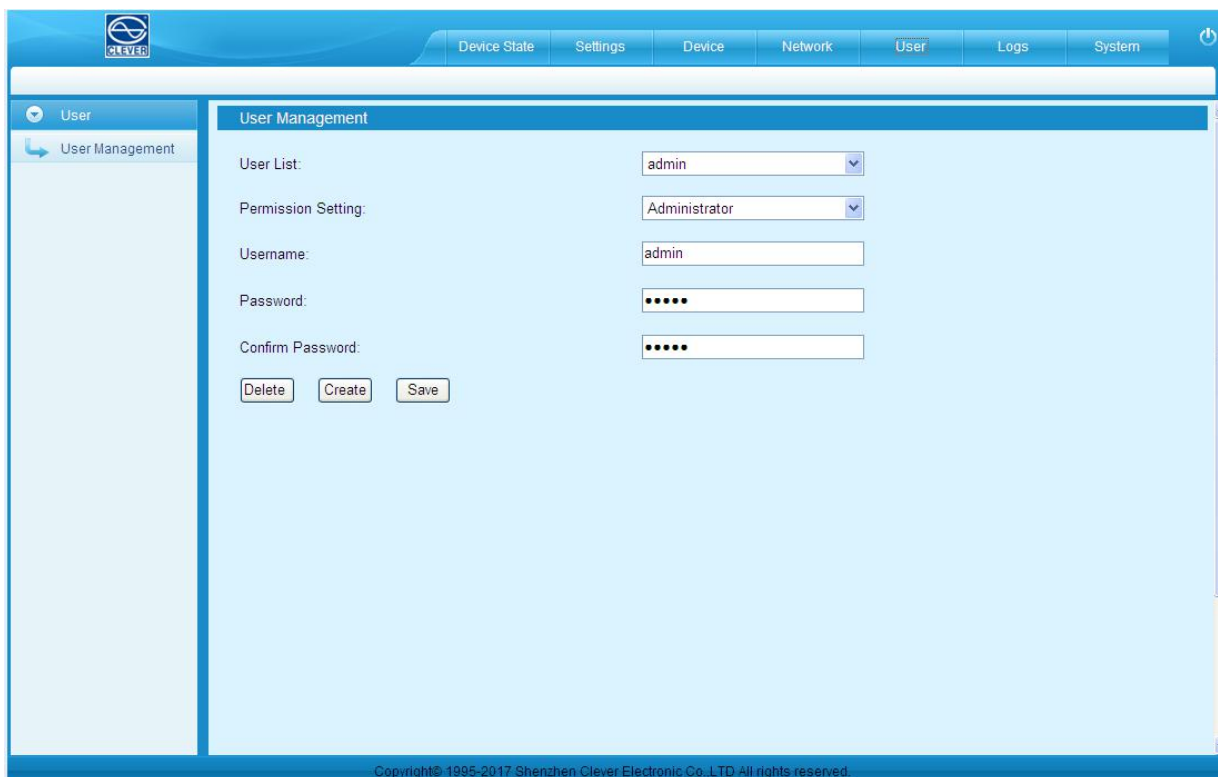


Figure 1-14

F. Logs

Log type: Alarm log and operation log

Log information: time, log type and detail information

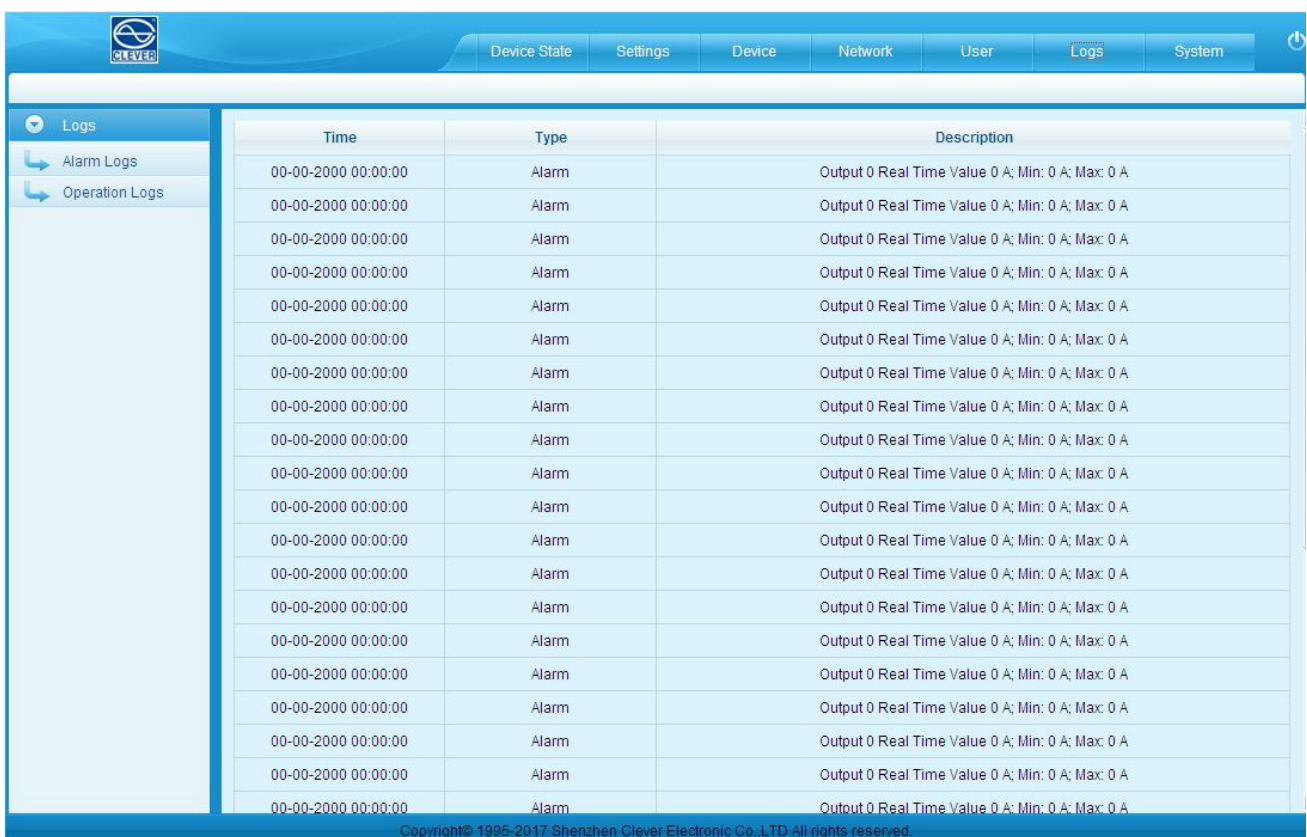
Memory capacity: Max 150 logs, the initial logs will be removed when reached 150 logs.

To view the logs: Click a page number to open a specific page of the log

Every page display 30 logs and maximum support to 5 pages; the initial pages will be deleted when over 5 pages

To delete the log: Click Delete on the web page, at the prompt, check OK to delete all the logs.

To export the log: The logs from the current page can be exported via xls format through IE/Google/Firefox browser.



Time	Type	Description
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A
00-00-2000 00:00:00	Alarm	Output 0 Real Time Value 0 A; Min: 0 A; Max: 0 A

Figure 1-15

Note: At the prompt of “Sever object cannot be built”, please try again after configuring the security level of IE browser following the below steps:

The internet Explorer goes to: Tools-- Internet Options-- Security- Custom Level-- Tick off Enable(unsafe) from Initialize and script ActiveX controls not marked as safe for scripting--- OK-- OK

G. System command settings:

To Restart or Restore to factory settings from the system command drop-down list.

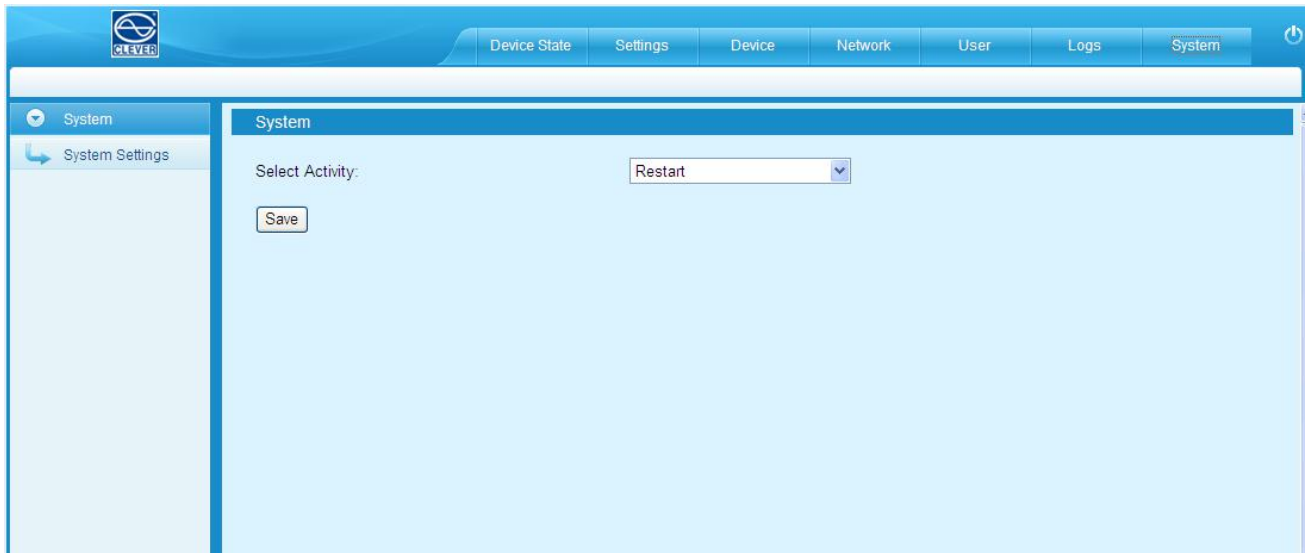


Figure 1-16

6.2.2 SNMP access


This software support SNMP V1, V2C and V3, a MIB file can be provided at customer's request. User can view the power information and environment status and receive the alarming from the device.

After enable the SNMP function from Web Interface, A SNMP management software is required to be installed.

Please refer to protocol instruction for the OID information of the SNMP

6.2.3 Telnet Command Line Interface

User can use the Telnet command line interface to view, configure and manage the Rack PDU remotely and easily. Telnet does not support the Daisy-chain connection, user can only access and manage the Master unit.

6.2.3.1 To open the Telnet client  by Start→ Run command→ enter "Telnet" in the input box and click OK

6.2.3.2 Enter the IP address as illustrated in figure 2-1

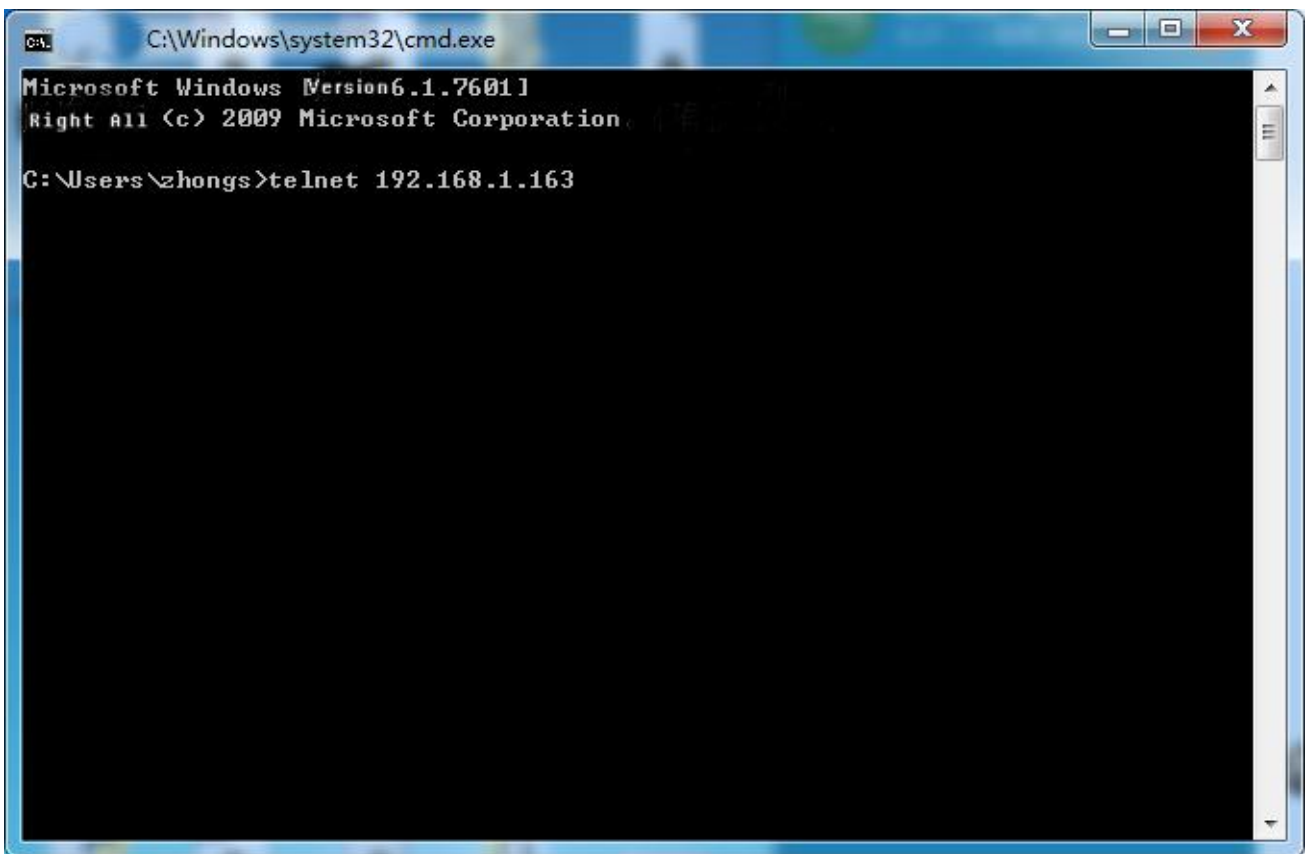


Figure 2-1

Press ENTER. At the prompts, enter your user name and password to log in to the command line interface as figure 2-2

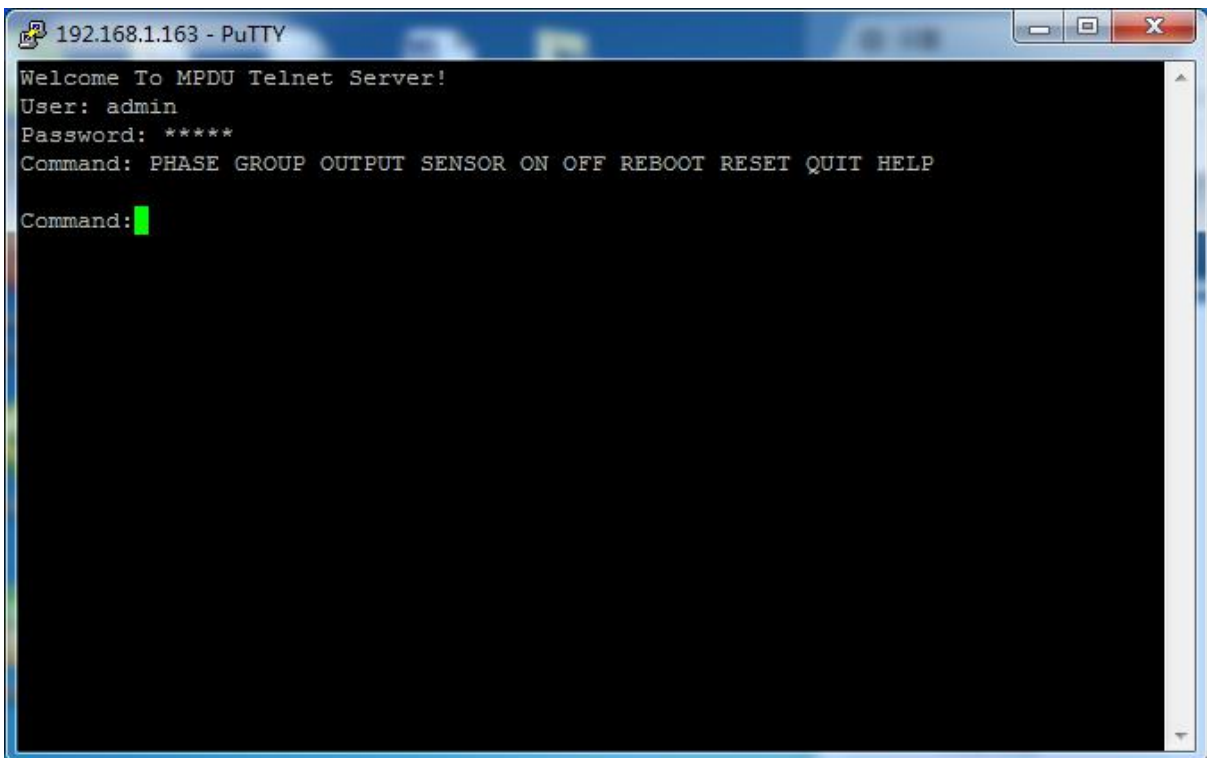
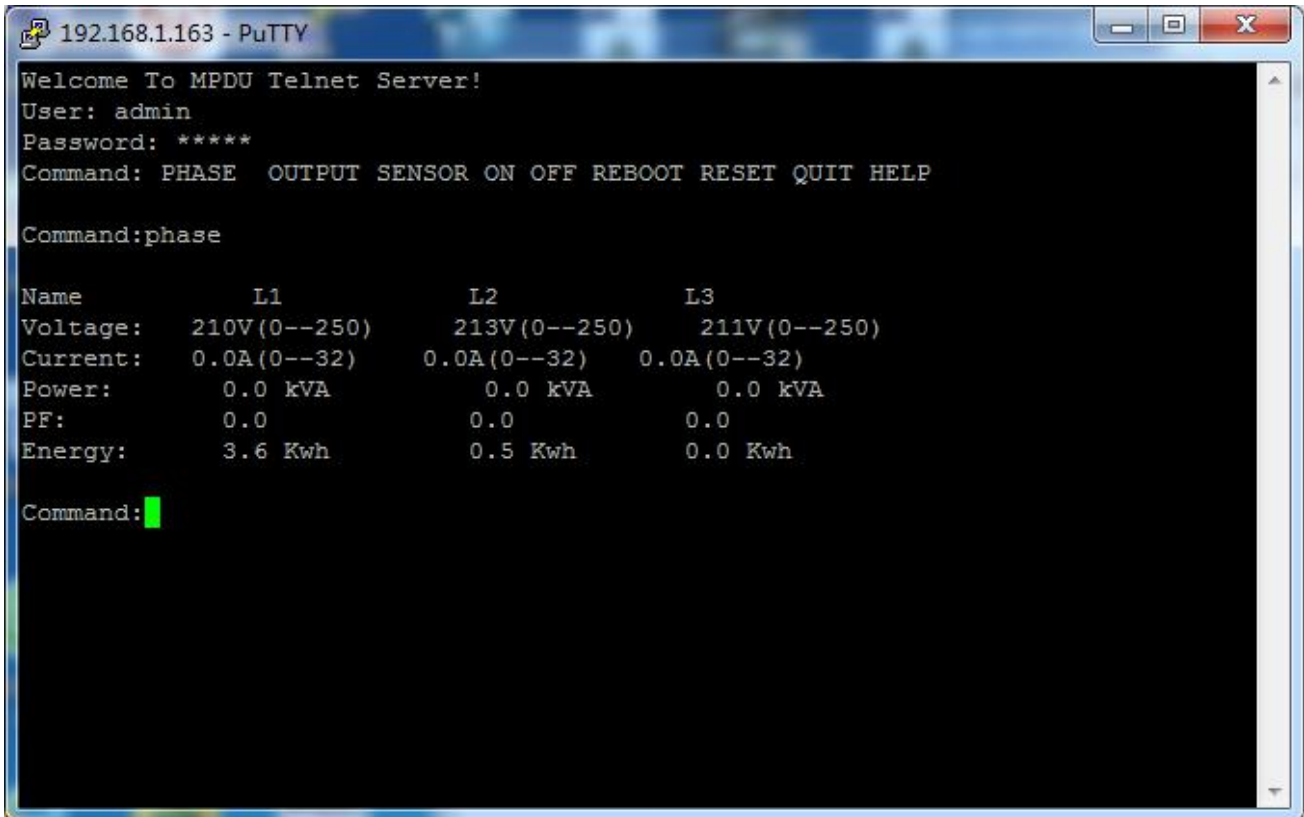


Figure 2-2

A. "PHASE" command

Use the PHASE command to view the power data including current, voltage, power, power factor, power consumption on each phase

Command line format: PHASE as figure 2-3



```
192.168.1.163 - PuTTY
Welcome To MPDU Telnet Server!
User: admin
Password: *****
Command: PHASE  OUTPUT SENSOR ON OFF REBOOT RESET QUIT HELP

Command:phase

Name          L1          L2          L3
Voltage:      210V(0--250)  213V(0--250)  211V(0--250)
Current:      0.0A(0--32)  0.0A(0--32)  0.0A(0--32)
Power:        0.0 kVA     0.0 kVA     0.0 kVA
PF:          0.0        0.0        0.0
Energy:      3.6 Kwh    0.5 Kwh    0.0 Kwh

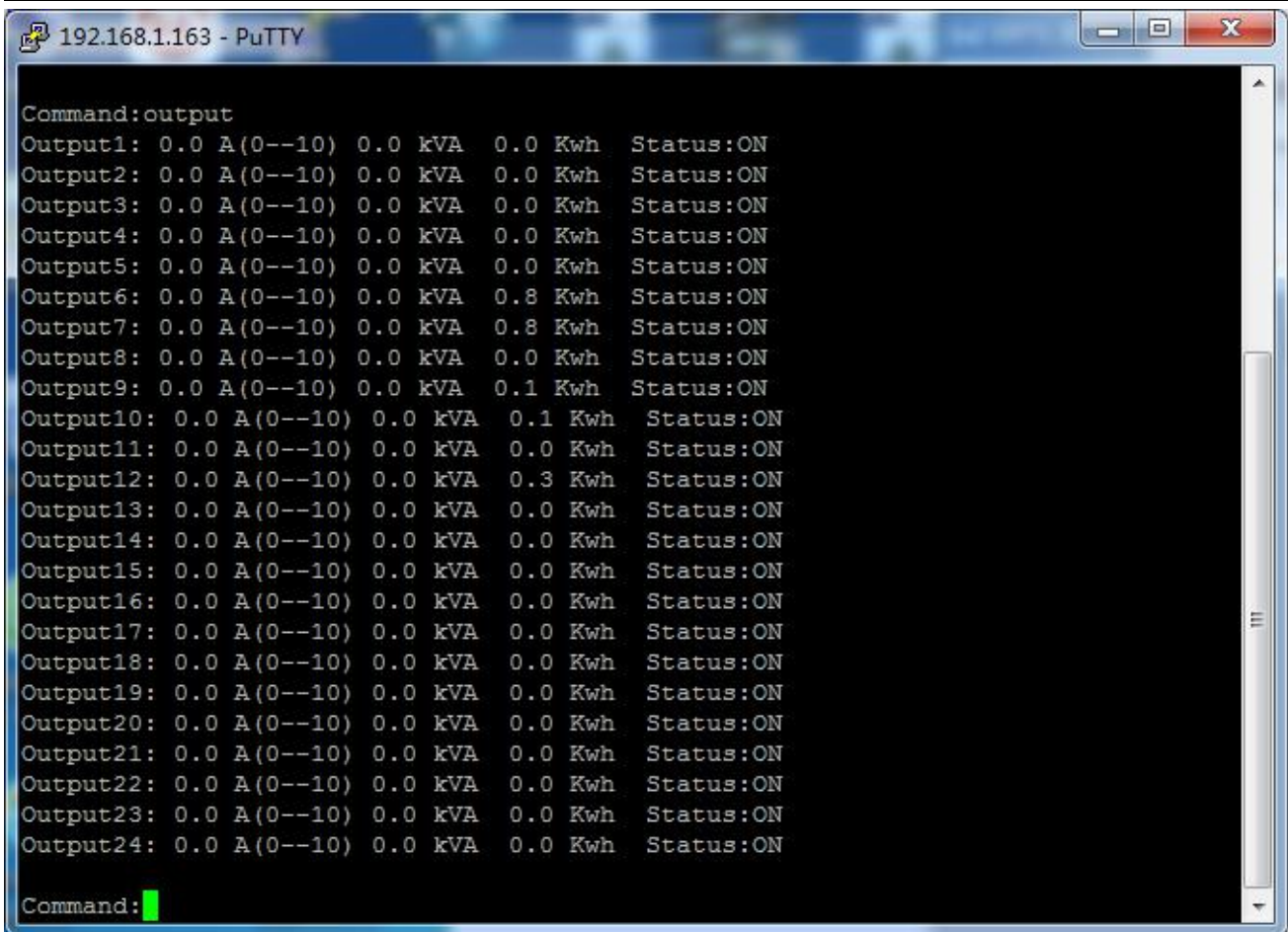
Command: █
```

Figure 2-3

B. “OUTPUT” command

Use the OUTPUT command to view the current, power, power consumption and ON/OFF status at individual outlet level.

Command line format: OUTPUT; See figure as 2-4



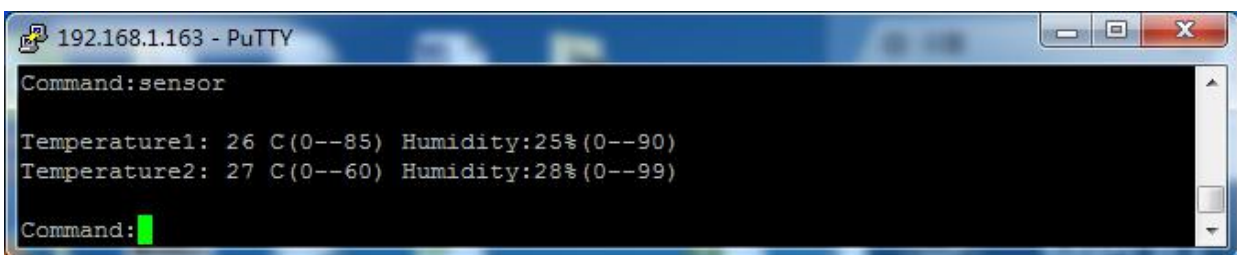
```
192.168.1.163 - PuTTY
Command:output
Output1: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output2: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output3: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output4: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output5: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output6: 0.0 A(0--10) 0.0 kVA 0.8 Kwh Status:ON
Output7: 0.0 A(0--10) 0.0 kVA 0.8 Kwh Status:ON
Output8: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output9: 0.0 A(0--10) 0.0 kVA 0.1 Kwh Status:ON
Output10: 0.0 A(0--10) 0.0 kVA 0.1 Kwh Status:ON
Output11: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output12: 0.0 A(0--10) 0.0 kVA 0.3 Kwh Status:ON
Output13: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output14: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output15: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output16: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output17: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output18: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output19: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output20: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output21: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output22: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output23: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Output24: 0.0 A(0--10) 0.0 kVA 0.0 Kwh Status:ON
Command:
```

Figure 2-4

C. “SENSOR” command

Use the Sensor command to view the temperature/humidity status and its threshold

Command line format: SENSOR; see figure as 2-5



```
192.168.1.163 - PuTTY
Command:sensor
Temperature1: 26 C(0--85) Humidity:25%(0--90)
Temperature2: 27 C(0--60) Humidity:28%(0--99)
Command:
```

Figure 2-5

D. “ON/OFF” command

Use the ON/OFF command to switch On/Off the individual outlet, outlets from each phase or all outlets.

Command line format: ON/OFF **【index】** **【operation】** see as figure 2-6

【index】 Individual outlets, Group, Phase.

【operation】 Serial number 1 means the outlet 1 from phase 1, see details as below:

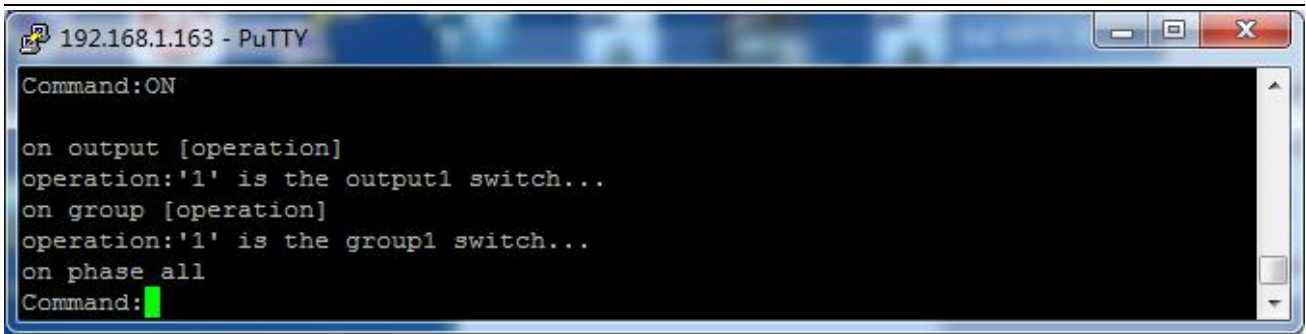
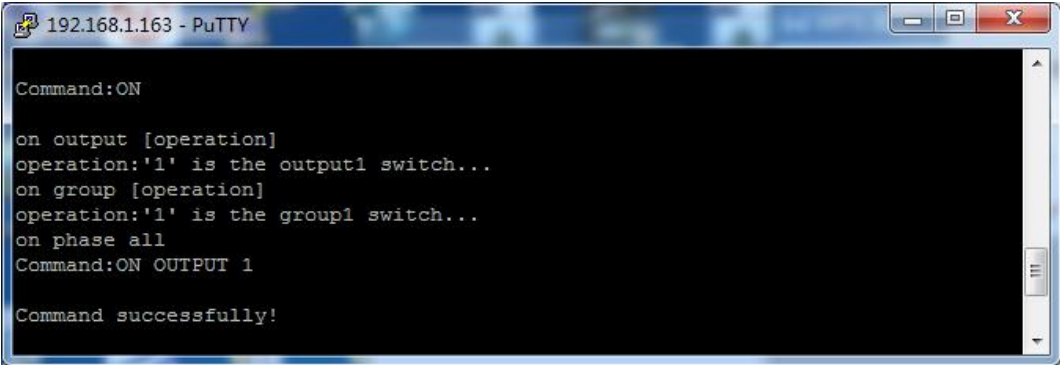
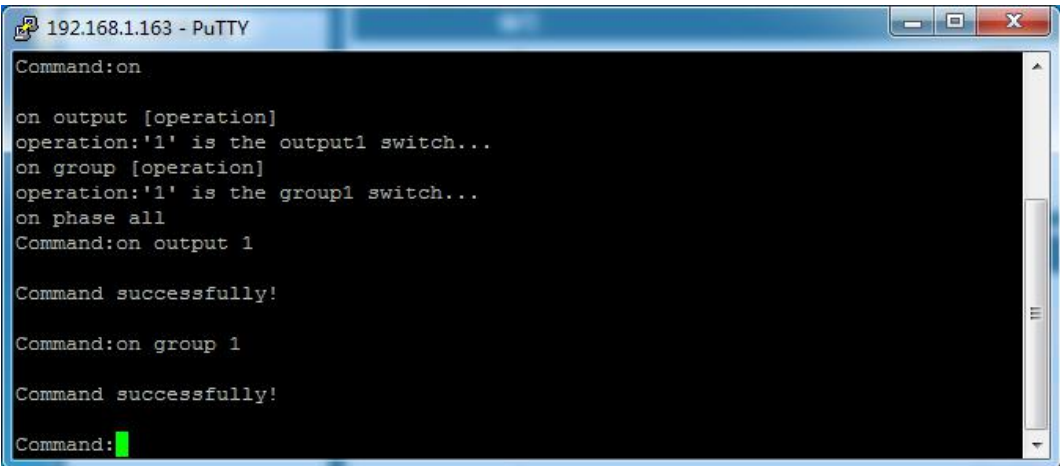



Figure 2-6

【index】	Description
OUTPUT	 <pre> 192.168.1.163 - PuTTY Command:ON on output [operation] operation:'1' is the output1 switch... on group [operation] operation:'1' is the group1 switch... on phase all Command:ON OUTPUT 1 Command successfully! </pre> <p>Enter command line: ON OUTPUT 1 to switch on the outlet 1;</p> <p>Enter command line: OFF OUTPUT 1 to switch Off the outlet 1;</p> <p>OUTPUT command can switch ON/OFF only one outlet at one time.</p>
GROUP	 <pre> 192.168.1.163 - PuTTY Command:on on output [operation] operation:'1' is the output1 switch... on group [operation] operation:'1' is the group1 switch... on phase all Command:on output 1 Command successfully! Command:on group 1 Command successfully! Command: </pre> <p>Enter command line: on group 1 to switch on outlet from branch circuit 1;</p> <p>Enter command line: off group 1 to switch off outlet from branch circuit 1;</p>

PHASE	 <pre>192.168.1.163 - PuTTY Command:on phase all Command successfully! Command:█</pre> <p>Enter command line: on phase 1 to switch on outlets from phase 1; Enter command line: off phase 1 to switch off outlets from phase 1;</p>
-------	---

E. REBOOT Command

Use the REBOOT command to restart the device as figure 2-8

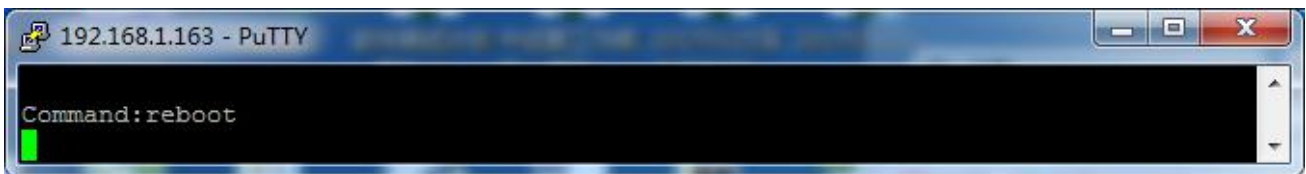


Figure 2-8

F. RESET Command

Use the RESET command to restore to factory settings as figure 2-9



Figure 2-9

G. QUIT Command

Use the QUIT command to logout the current Telnet command line interface. See figure 2-10

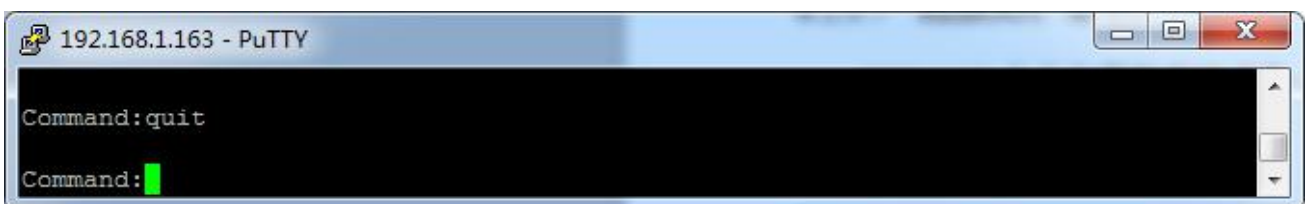


Figure 2-10

H. Help Command

Use the HELP command to shows general help, see figure 2-11

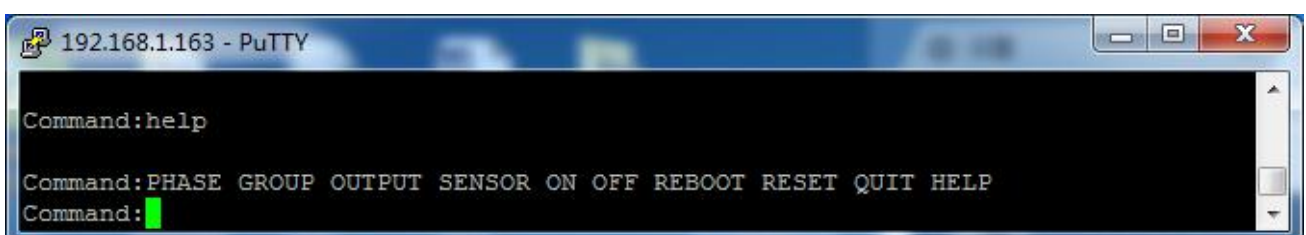


Figure 2-11



6.2.4 MODBUS-RTU access:

MODBUS-RTU access use two-wire RS-485 serial communication port for serial access, please refer to the 《MPDU MODBUS RTU Protocol Instruction》 for the MODBUS access

Modbus-RTU protocol configuration including Modbus -RTU communication address (1-99), baud rate(4800, 9200, 19200, 38400, 115200), data bit (8) , parity (no) , stop bit (1)

Note: The serial communication data is collected from the SER port of PDU. Please refer to the 《MPDU MODBUS RTU Protocol Instruction》 for details.

7 Frequently Asked Questions (FAQs)

7.1 Q: Forget IP address?

A: check on the LCD screen, the first page displays the IP address.

7.2 Q: Failed to login?

A:

7.2.1 Connect the MPDU to the PC directly, change the network setting of the PC and make sure the MPDU and PC are in the same network segment, the default IP address of the MPDU is 192.168.1.163, Subnet mask: 255.255.255.0, gateway: 192.168.1.1, so the PC network will be like following: IP address 192.168.1.2, Subnet mask: 255.255.255.0, gateway: 192.168.1.1

7.2.2 Open a browser and enter the IP address and login to the Web interface with user name and password;

7.2.3 Click Network Setting from the web interface and change the IP address of the MPDU and make sure the address is in the same network segment of the PC.

7.2.4 Recover your network setting of PC and use the new IP address of the MPDU to login.

7.3 Fail to send email notification?

A:

7.2.1 Check the network connection and make sure the network is connected.

7.2.2 Check DNS configuration and confirm whether it is successful.

7.2.3 Check and confirm the SMTP sever is correct and the same as the sender mailbox sever. Please make sure SMTP port is correct.

7.2.4 Make sure the recipients address is correct.

7.4 How to restore to factory settings?



A: Press and hold the CONTROL button to Switch on the MPDU (Or press the CONTROL button and RESET button together), till the RUN indicator is flashing.

8 Technical Parameters

No.	Performance parameter		Technical parameter
1	Input	Rated input voltage	Single phase:100VAC~240VAC Frequency: 50~60HZ; Three phase:200VAC~400VAC Frequency: 50~60HZ;
		Input plug	Standard IEC industry plug or connector
		Power cord	32A:3×6mm ² 63A:3×16mm ² ; 3*16A:5×2.5mm ² 3*32A:5×6.0mm ²
		Cable length	3M
		Max. load current	Single phase: 32A, 63A Three phase: 3×16A, 3×32A
		Overload protection	16A/32A hydraulic breaker
2	Output	Socket standard	IEC320 C13, C19 GB1002, GB2099.3 NEMA 5-15R, NAMA 5-20R
		Socket quantity	A series:24 / 42outlets; B series:24 / 42outlets; C series:24 outlets; D series:24 outlets;
		Output voltage	Single phase:100VAC~240VAC Frequency:50~60HZ; Three phase:100VAC~240VAC Frequency: 50~60HZ;
		Max output current	Single phase:32A, 63A Three phase: 3×16A, 3×32A
		Max phase current	16A, 32A
3	Control ports	NET port	1×RJ45 port
		Daisy chain port	2×RJ45 port
		SER port	1×RJ45 port



		Temperature & humidity port	2× RJ11 ports
		Audible and visual alarm port	1× RJ11 ports
4	Display	Working state	1×LED
		Power pulse	1×LED
		Alarm	1×LED
		IP Address, MPDU state, measurement value, alarm state	2.8 inch LCD screen
5	Load current display	Total current	Full-scale:16A/32A, Accuracy:±1%+2D Resolution:200mA, Response:500ms
		Individual load current	Full-scale:10A/16A, Accuracy:±1%+1D, resolution:100mA, Response:500ms
6	Accuracy of Temperature/humidity sensor	Temperature	Working rang: 0°C ~ +45°C Accuracy:±1°C , Response: 400ms
		Humidity	Working rang: 10-90% Accuracy:±5%RH, Response: 400ms
7	Product size	(L×W×D)	1829×56×52mm, Max depth 73mm at cable entry end
		Mounting option	Tool less mounting buttons spaced 1555.75mm
8	Case color	Color	Black
9	Standard accessories	Installation bracket	1 set
		Network connection cable	2M, Blue
		Serial connection cable	2M, Ivory white
		User manual	1 set (CD)
10	Optional accessories	Sensor	Temperature/humidity sensor
11	Environment	Working temperature	0°C ~ +45°C



		Storage temperature	-20°C ~+70°C
		Relative humidity	0%~95%
12	ROHS	Compliance	

9 Warranty and Service

The product is guaranteed for two years from the date of purchase. CLEVER will repair or replace the defective products covered by this warranty. If product has already exceeded the warranty period or the problem are caused because of illegal operation, a corresponding fee will be charged.

The below cases are not covered by the warranty:

1. Problem caused because of improper maintenance
2. Problem caused because of unauthorized change, modify or improper use
3. The device are not used in the stipulate physical environment

Repair notice:

1. Please make sure to use protective hard carton when arrange the shipment to repair, the problem occurred during the shipment is not covered by the warranty.
2. Please make a short note about the problem and the operation process
3. Please pay for the shipping cost as well as the customs duty
4. Please list your name, address as well as phone number that we can contact you at any time.