# **MPDU User Manual**

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In order to use the equipment correctly and safely, please read the safety precautions carefully before using the equipment, and strictly observe the precautions.

#### Use of knowledge

- the Please handle with care during transit or instattion.
- Please ensure that the equipment is reliably grounded before use.
- The rated voltage used to connect AC distribution system must not exceed the allowable range of MPDU product identifier.
- Maximum load must not exceed MPDU rating.

#### **Maintenance requirements**

- Change the main control module and excellent series output module, and must be operated by professional and technical personnel.
- Because the MPDU output module base is strongly charged, in order to ensure personal safety, in the maintenance of equipment, please do a good job of insulation protection.
- Before disassembling the output module, please disconnect all outlet loads and prohibit replacing the output module with load.
- When installing the Outstanding Series output module, please pay attention to the direction of the module installation, do not reverse installation, to avoid damage to the product.

#### **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. The 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, NAMA 5-20) and outlet quantity (8 outlets,24 outlets,36 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

Parameter	Definitions	Units of measurement
U	Input Voltage	V
Ι	Input load	А
Р	Apparent Power	kVA
PF	Power factor	
Е	Power consumption	kWh
T1/T2	Temperature	°C
H1/H2	Humidity	%RH

3.1 Parameter and abbreviated units

- 3.2 MPDU is classificationed based on its function as below:
- 3.2.1 MPDU is divided into three series according to the product structure: excellence, overflight and beyond.

	Product Types			
Main functions	Excellent series	Flyover series	transcendence series	
	(Modular)	(integration)	(Multi Standard)	
Sheet metal shell	•	•		
Aluminum alloy housing			•	
Main control module hot swap	•	•	•	
Output module hot swap	•			
Fixed output socket system	•	•		
Multi mode output socket			•	

Note:• Means the specified function is supported

3.2.2 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

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			•	•

DIREXTRONIK	MPDU Us	ser Manual		
Power ON/OFF delay of individual outlet			•	•

Note:• Means the specified function is supported

Main functions	C/D series		
Main functions	Monostable Relay Type	Latching relay type	
Sequential power on after power cycle	•		
Outlets remain current status when power			
switching supply fails		•	

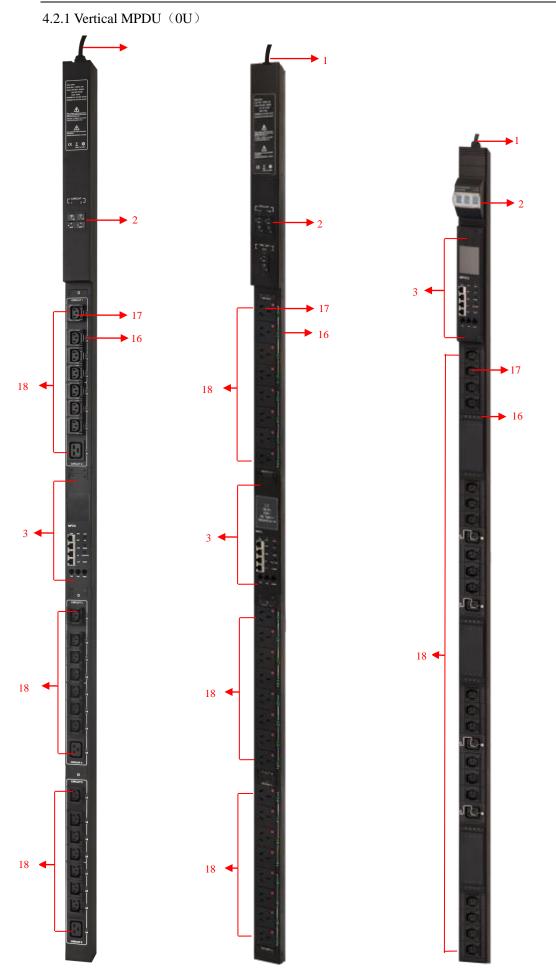
#### 4 Main functions and Installation

#### 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.

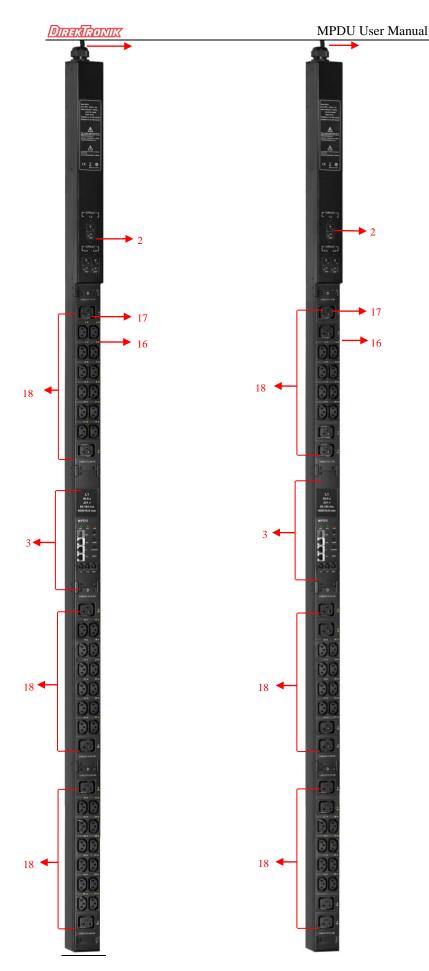
# MPDU A/B/C/D series function table

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	



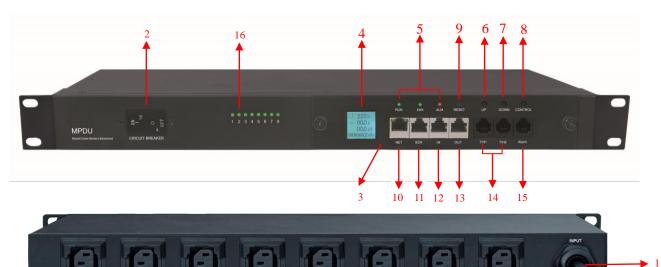
Vertical Excellent series (Modular) Vertical Flyover series(integration)

Vertical transcendence series (Multi Standard)



Excellent series (High-density; Modular) Excellent series (High-density; Modular)

#### 4.2.2 Horizontal MPDU (1U)



# 0004 00.000 kva 000000.0 KWh MPDU 5 O UP 6 10 7 DOWN 11 8 CONTROL 12 9 RESET OUT 13 15 14

# Horizontal Flyover series

- 1. Input power cord;
- 2. Hydraulic circuit breaker;
- 3. NMC Module;
- 4. LCD screen;
- 5. RUN:Operation indicator;

kWh:Energy pulse indicator;

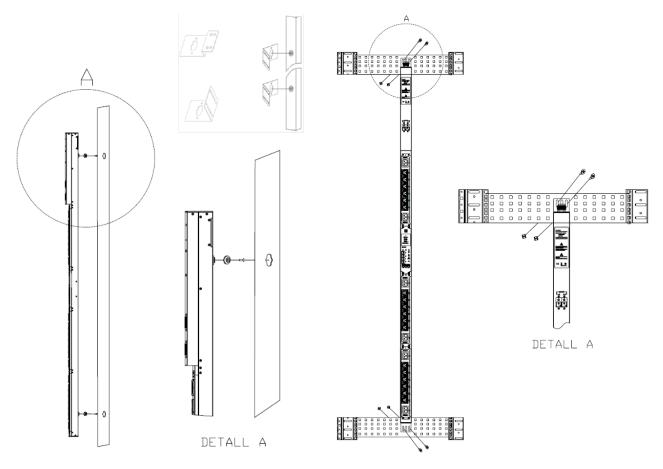
- ALM:Alarm indicator;
- 6. UP:Scroll up to the previous page;
- 7. DOWN:Scroll down to the next page;
- 8. CONTROL:Confirm and flip button;
- 9. RESET: Reset button;
- 10. NET: 10/100M Ethernet port;
- 11. SER: Serial port (MODBUS Supported);
- IN: Daisy-Chain port;Connect to the OUT port of previous PDU;

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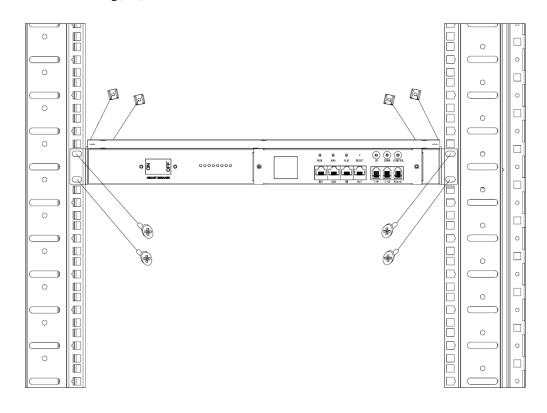
- 13. OUT: Daisy-Chain port; Connect to the IN port of next PDU
- 14. T/H1:Ttemperature and humidity sensor port 1;T/H2:Ttemperature and humidity sensor port 2;
- 15. Alarm: Audible and visual alarm port
- 16. Outlet LED indicator;
- 17. Output sockets;
- 18. Replaceable outlet modules;

#### 4.3 Installation

#### 4.3.1 Vertical-mounting (0U)



4.3.2 horizontal-mounting(1U)



#### 5 Hardware instruction

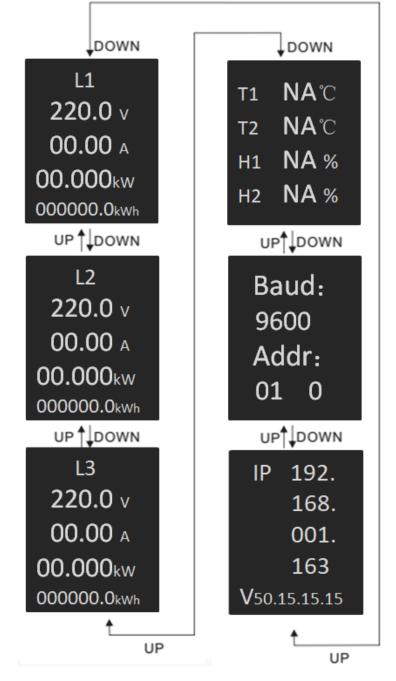
#### 5.1 MPDU module

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.onRestore to factory settings: Press and hold the CONTROLbutton, then press RESET button to restore to factory settings	
UP	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

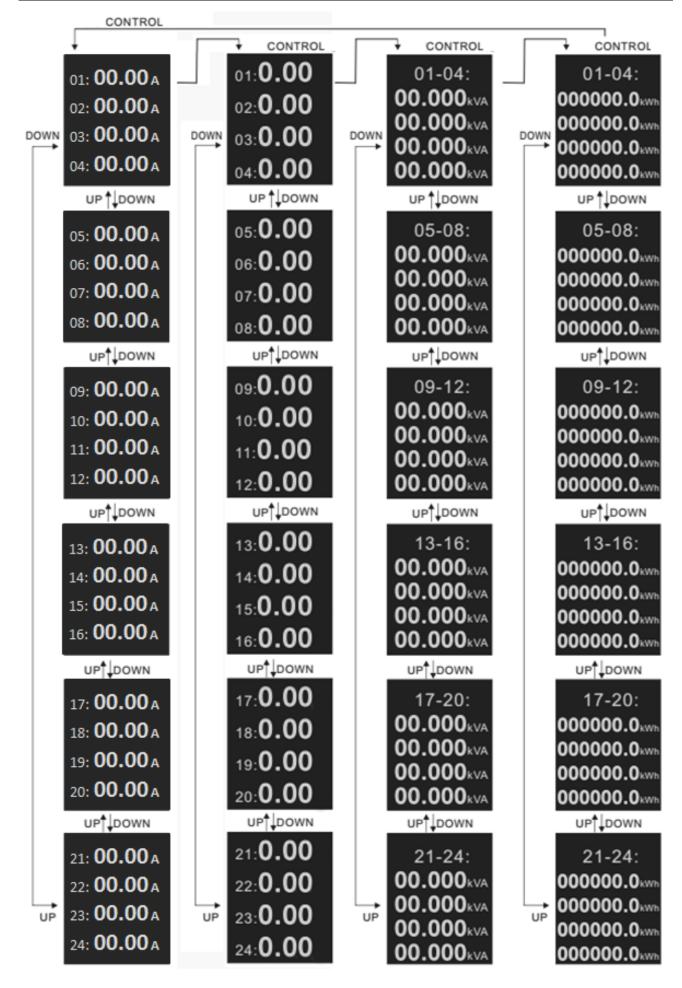
When power on the MPDU, boot animation starts, the buzzer sounds and RUN indicator flashes. It is going to be in normal working mode after that unit has initialized and the LCD has started displaying the power data.

5.2.1 Press the UP/DOWN button to view the Rack PDU information including the input voltage/ current/ power/power consumption of each phase, temperature/humidity status, baud rate, Modbus communication code, Daisy-chain code, IP address and device version.



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 voltage/current/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.

Note: All accounts are cleared and the network configuration is restored to the default after restoring the factory settings.

5.3.2 Buzzer mute button

Press and hold the UP button for 2 second to enable or disable the alarm buzzer.

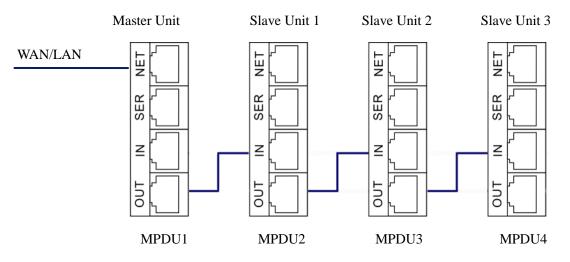
5.3.3 Address code settings

Turn to the Baud rate and Address code page by press the UP or DOWN button, then press and hold the CONTROL button for 4 seconds, When an "S" will be displayed in the upper right corner of the LCD screen, you can press the DOWN button to select the digit of the Modbus address and press UP button to set digit value from 0 to 9. Pree CONTROL button to save the settings and PDU will restart.

#### 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.

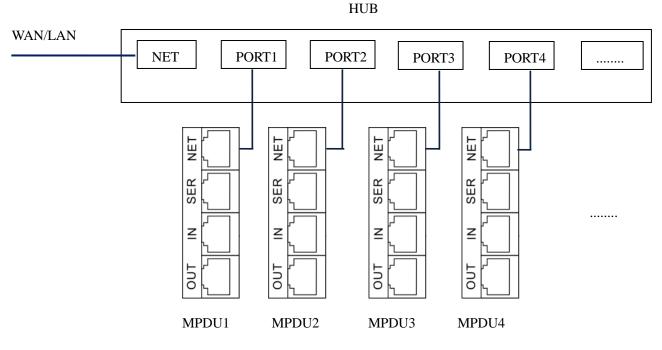
Connect the NET port from the Master Unit to the WAN/LAN, other Daisy-chain cable connect the OUT port to the IN port of the next PDU. Connect all 3 Slave unit by the same way (see Figure above)
 Access the Master through Web interface and check all the status of Slaves. If all are readable,

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.

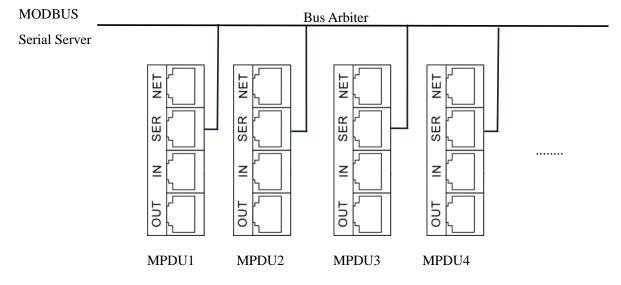
#### 5.4.2 Star Connection

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.



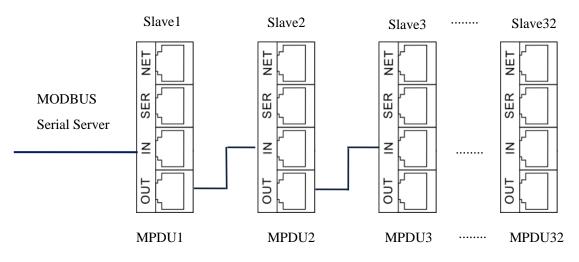
#### Serial connection settings:

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.
- 5.4.4 Serial Connection settings (Optional)

The Modbus-RTU protocol is used here for the Star connection, The MODBUS Serial Server connect to the IN port from the first MPDU. Daisy-chain cable connect the first MPDU OUT port to the IN port of the second MPDU. Connect all 32 Slave unit by the same way (see Figure above)Serial connection can support up to 32 PDUs together. See figure as below.



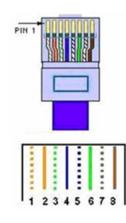
#### Serial connection settings:

- Log on to Web interface of each MPDU to configure the serial communication code from the Modbus address code on Device Manage page;
- The Slave1 unit collects the data from the IN port through the RS-485 serial communication cable.
   Please refer to the 《MPDU MODBUS RTU Protocol Guide》 for details.

Note: This function is disabled by default and user may enable it by accessing the Web UI according to

6.2.1-C. Once the function is enabled, Ethernet Daisy-Chain as 5.4.1 will no longer be available.

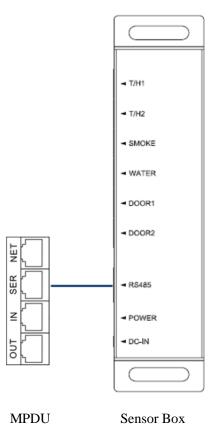
#### 5.5 RJ45 terminal PIN instruction of RS485 port.



No.	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
7	Brown & White	+12VDC
8	Brown	+12VDC

#### 5.6 Sensor Box (Optional)

MPDU could monitoring extend temperature, humidity, door status, smoke status, water status real time through external sensor box.Please refer to the «Sensor Box Operating Manual»



Note: This function is disabled by default and user may enable it by accessing the Web UI according to 6.2.1-C. Once the function is enabled, Ethernet Daisy-Chain as 5.4.3 will no longer be available.

#### 6 MPDU Software introduction

#### 6.1 Software overview

MPDU is equipped with embedded software system which provides lots of network services like WEB server, SNMP, Telnet, SMTP/SMTPS, 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

Type the IP address(https://192.168.1.163 by default, the IP address can be viewed from the LCD display by pressing the UP/DOWN botton) of the Rack PDU in the Web browser's URL address field and press ENTER. The popup will require creating a new account on first login as figure 1-1

Figure 1-1

The Username and Password can be between 6 to 16 characters and contains any letters and numbers. The login popup appears as figure 1-2 when account has been created.

Welcome To MPDU Usemane:
Password

Figure 1-2

Enter your Username and Password to log on to the system.

Note: You will have to wait for 10 seconds to login if you have tried 5 times with incorrect Username or Password.

The system will be blocked for one hour after 15 failed attempts in a row, Or you will have to restart the PDU again

for immediate login.

The main interface will appear as figure 1.3 if you entered the correct Username and Password.

Note: User will be auto logout if no activity in 20 minutes.

- Device information: Selection of Master/Slave Unit, Software version, Daisy-chain address code, device type and device series
- 2) Navigation tab: shows function tabs available
- 3) Detail window: Shows PDU information under each function tab

	DirekTronii	MPDU	Devic	e State Settings	Device Network	User Logs	; System		🕛 中文 English	Navig
	Device Information		Number	Name	Voltage (V)	Current (A)	Power Factor	Active Power (kW)	Energy (kWh)	Tab
	PDU: Master 🗸		1	L1	205.8	0.00	0.00	0.000	0.0	
vare			2	L2	206.1	0.00	0.00	0.000	0.0	
	Version:3P/3C/36 51.1	15.15.15	3	L3	206.1	0.00	0.00	0.000	0.0	
on	Work Mode: Master									
	Input: Three Phase		Number	Name	Current (A)	Power Factor	Active Power (kW)	Energy (kWh)	Circuit Breaker	
	1		1	C1	0.00	0.00	0.000	0.0	Closed	
	Level: Outlet Monitor	ring & Switching	2	C2	0.00	0.00	0.000	0.0	Closed	
			3	C3	0.00	0.00	0.000	0.0	Closed	
	Environment Status									
	Temperature 1 NA	°C	Number	Name	Current (A)	Power Factor	Active Power (kW)	Energy (kWh)	ON/OFF Status	
	Relative Humidity 1 NA	%	1	Output1	0.00	0.00	0.000	0.0	ON	
	Temperature 2 NA	°C	2	Output2	0.00	0.00	0.000	0.0	ON	
			3	Output3	0.00	0.00	0.000	0.0	ON	
	Relative Humidity 2 NA	%	4	Output4	0.00	0.00	0.000	0.0	ON	
			5	Output5	0.00	0.00	0.000	0.0	ON	
			6	Output6	0.00	0.00	0.000	0.0	ON	
			7	Output7	0.00	0.00	0.000	0.0	ON	
			8	Output8	0.00	0.00	0.000	0.0	ON	
			9	Output9	0.00	0.00	0.000	0.0	ON	0.
			10	Output10	0.00	0.00	0.000	0.0	ON	Outp
			11	Output11	0.00	0.00	0.000	0.0	ON	
			12	Output12	0.00	0.00	0.000	0.0	ON	statu
			13	Output13	0.00	0.00	0.000	0.0	ON	
			14	Output14	0.00	0.00	0.000	0.0	ON	
			15	Output15	0.00	0.00	0.000	0.0	ON	
			16	Output16	0.00	0.00	0.000	0.0	ON	
			17	Output17	0.00	0.00	0.000	0.0	ON	
			18	Output18	0.00	0.00	0.000	0.0	ON	
			19	Output19	0.00	0.00	0.000	0.0	ON	
			20	Output20	0.00	0.00	0.000	0.0	ON	
			21	Output21	0.00	0.00	0.000	0.0	ON	
			22 23	Output22	0.00	0.00	0.000	0.0	ON ON	
			23	Output23 Output24	0.00	0.00	0.000	0.0	ON	
			24	Output24	0.00	0.00	0.000	0.0	ON	

#### Figure 1-3

A. Device Status: After enter Figure 1-3 you can view the monitoring information as below:

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

- 1) Input threshold settings:
- a. The input voltage threshold range: 0-250VAC

- b. The input current threshold range: 0-63A for single phase, 0-32A for three phase
- c. Temperature/Humidity threshold range:  $0-40^{\circ}$ C for temperature, 0-99% for humidity

DirekTroi		Device State Set	tings Device N	letwork User	Logs Sy	stem		() 中文 Englist
Settings	Number	Name	Real Time Value	Min	Lower Limit	Upper Limit	Мах	Save
🖕 Total Threshold	1	L1 Current (A)	0.00	0	0	32	32	Save
Output Threshold	2	L2 Current (A)	0.00	0	0	32	32	Save
🖕 Energy Reset	3	L3 Current (A)	0.00	0	0	32	32	Save
Switch ON/OFF								•
Switch Group	Number	Name	Real Time Value	Min	Lower Limit	Upper Limit	Мах	Save
Port Permissions	1	C1 Current (A) C2 Current (A)	0.00	0	0	32	32	Save
	2		0.00	0	0		32	Save
Master 🗸	3	C3 Current (A)	0.00	0	0	32	32	Save
	Number	Name	Real Time Va	lue	Min		Max	Save
	1	L1 Voltage (V)	207.3		0		250	Save
	2	L2 Voltage (V)	207.7		0		250	Save
	3	L3 Voltage (V)	Voltage (V) 207.5				250	Save
	Number	Name	Real Time Va	lue	Min		Max	Save
	1	Temperature 1 (°C)	NA		0		40	Save
	2	Temperature 2 (℃)	NA		0		40	Save
	3	Humidity 1 (%)	NA NA		0		99	Save
	4	Humidity 2 (%)	NA		0		99	Save

Figure 1-4

- 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.

DIRENIRU	MK MPDU	Device	State Settings	Device N	letwork User	Logs	System		ტ 中文 E
Settings	Number				Unify Delay (S)				Save
Total Threshold	1				1				Save
Output Threshold									
Energy Reset	Number	Name	Real Time Value (A)	Min(A)	Lower Limit (A)	Upper Limit (A)	Max (A)	Delay (S)	Save
Switch ON/OFF	1	Output1	0.00	0	0	10	10	1	Save
Switch Group	2	Output2	0.00	0	0	10	10	1	Save
Port Permissions	3	Output3	0.00	0	0	10	10	1	Save
	4	Output4	0.00	0	0	10	10	1	Save
laster 🗸	5	Output5	0.00	0	0	10	10	1	Save
	6	Output6	0.00	0	0	10	10	1	Save
	7	Output7	0.00	0	0	10	10	1	Save
	8	Output8	0.00	0	0	10	10	1	Save
	9	Output9	0.00	0	0	10	10	1	Save
	10	Output10	0.00	0	0	10	10	1	Save
	11	Output11	0.00	0	0	10	10	1	Save
	12	Output12	0.00	0	0	10	10	1	Save
	13	Output13	0.00	0	0	10	10	1	Save
	14	Output14	0.00	0	0	10	10	1	Save
	15	Output15	0.00	0	0	10	10	1	Save
	16	Output16	0.00	0	0	10	10	1	Save
	17	Output17	0.00	0	0	10	10	1	Save
	18	Output18	0.00	0	0	10	10	1	Save
	19	Output19	0.00	0	0	10	10	1	Save
	20	Output20	0.00	0	0	10	10	1	Save
	21	Output21	0.00	0	0	10	10	1	Save
	22	Output22	0.00	0	0	10	10	1	Save
	23	Output23	0.00	0	0	10	10	1	Save
	24	Output24	0.00	0	0	10	10	1	Save
	25	Output25	0.00	0	0	10	10	1	Save
	26	Output26	0.00	0	0	10	10	1	Save
	27	Output27	0.00		0	10	10	1	Save

#### 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.

DIREKIK		Device State Settings Device N	etwork User Logs System	( <b>)</b> 中文
Settings	Number	Name	Energy (kWh)	Reset
Total Threshold	1	L1	0	Reset
Output Threshold	2	L2	0	Reset
Energy Reset	3	L3	0	Reset
Switch ON/OFF	Number	Name	Energy (kWh)	Reset
Switch Group	1	Output1	0	Reset
Port Permissions	2	Output2	0	Reset
	3	Output3	0	Reset
Master 🗸	4	Output4	0	Reset
	5	Output5	0	Reset
	6	Output6	0	Reset
	7	Output7	0	Reset
	8	Output8	0	Reset
	9	Output9	0	Reset
	10	Output10	0	Reset
	11	Output11	0	Reset
	12	Output12	0	Reset
	13	Output13	0	Reset
	14	Output14	0	Reset
	15	Output15	0	Reset
	16	Output16	0	Reset
	17	Output17	0	Reset
	18	Output18	0	Reset
	19	Output19	0	Reset
	20	Output20	0	Reset
	21	Output21	0	Reset
	22	Output22	0	Reset
	23	Output23	0	Reset
	24	Output24	0	Reset
	25	Output25	0	Reset
	26	Output26	0	Reset

- 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.

Lancarda		vice State Settings Device Network	k User Logs System	() 較
Settings	Number	Nam	9	Switch
Total Threshold	1	Overall C	ontrol	ON OFF
Output Threshold				
Energy Reset	Number	Name	Status	Switch
Switch ON/OFF	Nulliber 1	Output1	ON	
Switch Group	2	Output2	ON	
Port Permissions	3	Output2 Output3	ON	ON OFF
	4	Outputs Output4	ON	ON OFF
ster 🗸	5	Output5	ON	ON OFF
	6	Outputs	ON	ON OFF
	7	Output7	ON	ON OFF
	8	Output8	ON	ON OFF
	9	Output9	ON	ON OFF
	10	Output10	ON	ON OFF
	11	Output11	ON	ON OFF
	12	Output12	ON	ON OFF
	13	Output13	ON	ON OFF
	14	Output14	ON	ON OFF
	15	Output15	ON	ON OFF
	16	Output16	ON	ON OFF
	17	Output17	ON	ON OFF
	18	Output18	ON	ON OFF
	19	Output19	ON	ON OFF
	20	Output20	ON	ON OFF
	21	Output21	ON	ON OFF
	22	Output22	ON	ON OFF
	23	Output23	ON	ON OFF
	24	Output24	ON	ON OFF
	25	Output25	ON	ON OFF
	26	Output26	ON	ON OFF
	27	Output27	ON	ON OFF
	28 29	Output28 Output29	ON ON	ON OFF

Figure 1-7

- 5) Switch Group
- a. Tick off the box from the Outlet Groups listed;
- b. Select Enable from the dropdown list and click Save button;
- c. By clicking the ON or OFF button, you can switch on/off the outlets this outlet group at one time;

DirekTr	onik MP	DU Dev	ice State Settings	Device	Network	User Logs	s System			() 中文 En
<ul> <li>Settings</li> </ul>	No.	Outlet name	Group1	Group2	Group3	Group4	Group5	Group6	Group7	Group8
Total Threshold	1	Output1								
Output Threshold	2	Output2								
Energy Reset	3	Output3								
Switch on/off	4	Output4								
Switch Group	5	Output5								
Port Permissions	6	Output6								
	7	Output7								
Vaster 🗸	8	Output8								
	9	Output9								
	10	Output10								
	11	Output11								
	12	Output12								
	13	Output13								
	14	Output14								
	15	Output15								
	16	Output16								
	17	Output17								
	18	Output18								
	19	Output19								
	20	Output20								
	21	Output21								
	22	Output22								
	23	Output23								
	24	Output24								
	25	Output25								
	26	Output26								
	27	Output27								
	28	Output28								
	29	Output29								
	30	Output30								
	31	Output31								
		0.1.100								

6) Port permissions settings:

Modify the port permissions: In the user name drop-down list, select the administrator or normal user account. Next to the corresponding output bit name, click the  $\sqrt{}$  symbol to have the output bit control permission, and the unsigned symbol is no output bit control permission.

Depending on the selected user, you can edit the output rights of multiple users and click the "Save" button.

DIREKIRO	MR MPDU	Device State	Settings Device	Network	User Logs System	ტ 中文 En
Settings	abcd123	~				
Total Threshold	1	Output1		2	Output2	
<ul> <li>Output Threshold</li> </ul>	3	Output3	<b>~</b>	4	Output4	
Energy Reset	5	Output5	<b>Z</b>	6	Output6	
Switch on/off	7	Output7	<b>Z</b>	8	Output8	
Switch Group	9	Output9	<b>Z</b>	10	Output10	
Port Permissions	11	Output11	<b>~</b>	12	Output12	
	13	Output13	<b>Z</b>	14	Output14	
	15	Output15	<b>~</b>	16	Output16	
	17	Output17	<b>~</b>	18	Output18	
	19	Output19	<b>~</b>	20	Output20	
	21	Output21	<b>~</b>	22	Output22	
	23	Output23	<b>~</b>	24	Output24	
	25	Output25	<b>Z</b>	26	Output26	
	27	Output27	<b>~</b>	28	Output28	<b>Z</b>
	29	Output29	<b>Z</b>	30	Output30	
	31	Output31	<b>~</b>	32	Output32	<b>Z</b>
	33	Output33	<b>Z</b>	34	Output34	
	35	Output35	<b>Z</b>	36	Output36	
						Save

# C. Device Management

Device Settings: To configure the device name, mute the buzzer alarm, Sensor Box, IN/OUT port cascade mode, Work mode, Modbus address code and baud rate.

DIREKTRO	NIK MPDU Device State Settings Device Network	User Logs System ① 中文 Englis
Device	PDU Settings	
Levice Settings	PDU Name:	MPDU
	Buzzer Mute:	Off
	Sensor Box	Disable
	IN/OUT port cascade mode	Network One Belt Three
	Work mode:	Master
	Baud Rate:	9600 🗸
	Modbus Address Code:	Slave1
	Save	

- D. Network Settings:
- 1) HTTP settings

Set-up and save the SSL port according to the working 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:0.0.0.0 by default;Please enter a correct DNS address in order to send the E-mail

DIREKTR	ONIK MPDU Device State Settings Device	e Network User Logs System	ტ 中文 English
Network     HTTPS     DHCP     SNMP	HTTPS SSL Mode Port: Save	443	
L SMTP L Teinet L NTP L ModbusTCP	Network Settings IP Address: Subnet Mask: Gateway:	192 168 1.163 255 255 255 0 192 168 1.1	
	DNS: Save	0.0.0	



#### 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.

UIREKIRUNII	24		111	FDU User Ma	anuai				
Dire		Device State	Settings D	evice Network	User	Logs	System	① 中文	English
Network	DHCP Settings								
L HTTPS	IP Address:			192.168.1.1	64				
	Subnet Mask:			255.255.255	5.0				
SMTP	Gateway:			192.168.1.1					
L Telnet	DNS:			0.0.0.0					
ModbusTCP	DHCP			Off		~			
	Save								

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Figure 1-12

Note: 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

Martin

a. SNMP V1/V2c settings:

SNMP v1/v2c is disabled by default, get community and set 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:

SNMP v3 is enabled by default. Username, Password and Key are required before you use it.

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

DIREARONIX			MPDU	U User Man	ual		
DirekTro	MPDU	Device State	Settings Device	Network	User Logs	System	ტ 中文 English
Network     HTTPS     DHCP     SNMP     SMTP     Telnet     NTP     ModbusTCP	SNMP Agent(v1/v2c) S Get Community: Trap1 IP: Trap2 IP: Send Trap: Save SNMP Agent(v3) Settin SNMP: Security Level: Account: Password: Private Key: Save			( () () () () () () () () () () () () ()	public		

Figure 1-13

5) SMTP settings: Click SMTP from the network navigation tab to enter the SMTP setting as figure 1-14 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.

DIREMRONIK	MPDU User Manual	
DirekTron	Device State Settings Device Network User Logs System 🔿 🕂 En	iglish
Network       HTTPS       DHCP       SMMP       SMTP       Teinet       NTP       ModbusTCP	Mail Sanding Account:         Mail Sanding Password:         Mail Sanding Sarver Address:         Mail Sanding Sarver Address:         Mail Receiving Users List:         Mail Receiving Account:         SMTP Port:         SMTP Port:         York Mode:         Test         Date         Add         Save	

Figure 1-14

### 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

DirekTronik	MPDU Device State Settings Device	Network User Logs System	🕛 中文 English
	elnet Settings		
L HTTPS Us	sername:	abcd123	
L DHCP Pa	assword:		
	elnet Port:	23	
La Telnet Tel	elnet	Off V	
S NTP	Save		
ModbusTCP			

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

#### 7) NTP Settings:

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

DIREKTR	MPDU	Device State Settings Device Network User Logs	System 🕐 🕁 English
Network     HTTPS	Local Time	18-05-2021 13:58:50	
🖕 DHCP	Device Time:	18-05-2021 13:59:30	Get time
SNMP	Device fillie.	10-00-2021 10:00:02	Get and
L Telnet	Network Time		
ModbusTCP	NTP Port:	123	
	NTP Server:	0.centos.pool.ntp.org	
	Time Zone:	(GMT+08:00) Beijing, Chongqing, Hong Kong, Urumqi;Irkutsk, Ulaan B 🗸	
	Device Time:	18-05-2021 13:59:32	Get time

Figure 1-16

a. Local time calibration

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

b. 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

8) Modbus-TCP Settings

Modbus-TCP: select "On" or "Off" (Off by default) and save, make sure to restart the software after

Modbus-TCP port is 502, Modbus-TCP address code is 1.

<b>WIREKIRU</b>				indui		
		Device State Settings	Device Network	User Logs	System	ტ 中文 English
Network	ModbusTCP Settings					
L HTTPS	ModbusTCP Port:		502			
L DHCP	ModbusTCP Addres:		1			
SMTP	ModbusTCP		Off	~		
Telnet	Save					
→ NTP	P					

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Figure 1-17

Note: Modbus-TCP settings will take effect when MPDU is restarted.

E. User Settings

Derest

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

Note: The Username and Password can be between 6 to 16 characters and contains any letters or numbers.

Any longer or shorter Username or Password is not accepted.

- b. 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.
- c. Delete User account: Select the user account from the user list and click Delete.

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

d. Permission settings: Click permission setting and select the Administrator or normal user from the drop-down list, then click Save button. See figure 1-18

Note: 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.

DirekTro	NIK MPDU Device State Settings Device	Network User	Logs System	🕐 中文 English
<ul> <li>User</li> <li>User Management</li> </ul>	User Management			
	User and password settings: 6 to 16 characters, including a combination of le User List:	abcd123	]	
	Permission Setting:	Administrator V		
	Username:	abcd123		
	Password:		)	
	Confirm Password:		]	
	Delete Create Modify			

Figure 1-18

F. Logs

Log type: Alarm log and operation log

Log information: time, log type and detail information

Memory capacity: Max 1500 logs, the initial logs will be removed when reached 1500 logs.

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

Every page display 25 logs and maximum support to 60 pages; the initial pages will be deleted when over 60 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 log.xls format through IE/Google/Firefox browser.

DIREKTRONIK MPDU Device State Settings Device Network User Logs	System 🕚 中文 English
Logs       Time       Type         Alarm Logs       Page:       To 1       Go       Previous page       Total: 0	Description Delete

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.

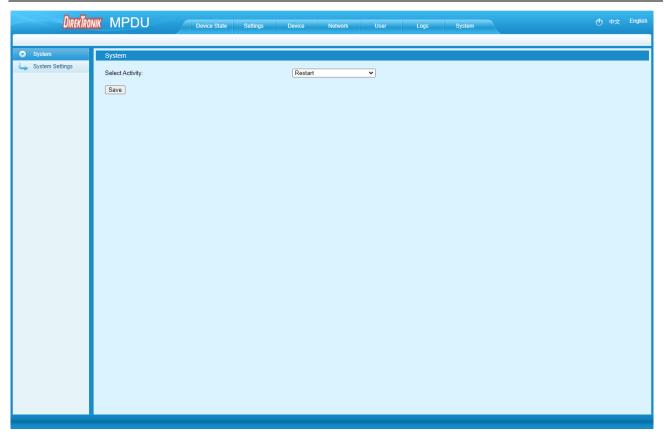


Figure 1-20

#### 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  $\bigcup_{\text{thread} t \text{ Corper}}^{\text{thread} t \text{ stread}}$  by Start  $\rightarrow$  Run command  $\rightarrow$  enter "Telnet" in the input box and click OK

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

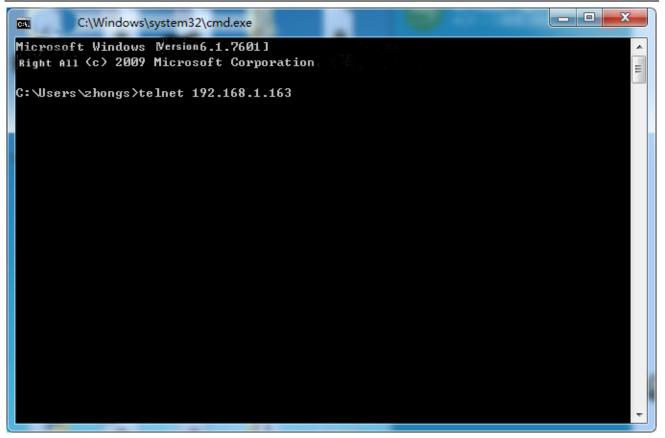
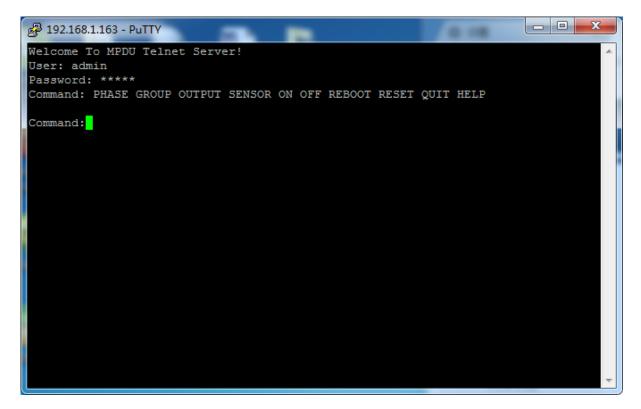


Figure 2-1

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

2-2





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

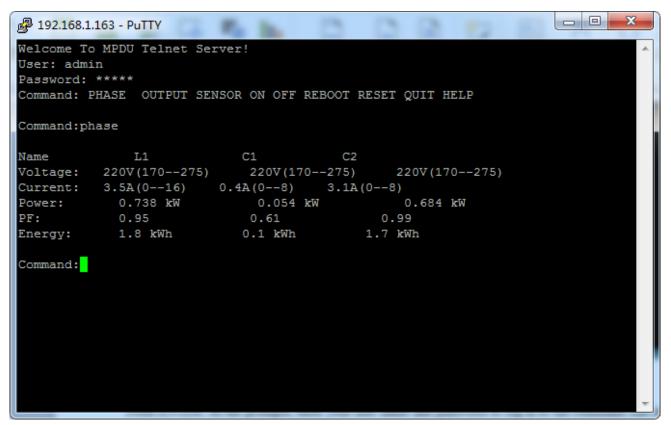


Figure 2-3

#### 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

DIRENTROMIK	MPDU	User Manual	
Putty 192.168.1.163 - Putty			
			<b>^</b>
Command:output			
Output1: 0.0 A(010) 0.0 kVA	0.0 Kwh	Status:ON	
Output2: 0.0 A(010) 0.0 kVA	0.0 Kwh	Status:ON	
Output3: 0.0 A(010) 0.0 kVA	0.0 Kwh	Status:ON	
Output4: 0.0 A(010) 0.0 kVA	0.0 Kwh	Status:ON	
Output5: 0.0 A(010) 0.0 kVA			
Output6: 0.0 A(010) 0.0 kVA	0.8 Kwh	Status:ON	
Output7: 0.0 A(010) 0.0 kVA			
Output8: 0.0 A(010) 0.0 kVA			
Output9: 0.0 A(010) 0.0 kVA			
Output10: 0.0 A(010) 0.0 kVA			
Output11: 0.0 A(010) 0.0 kVA			
Output12: 0.0 A(010) 0.0 kVA			
Output13: 0.0 A(010) 0.0 kVA	0.0 Kwh	Status:ON	
Output14: 0.0 A(010) 0.0 kVA			
Output15: 0.0 A(010) 0.0 kVA			
Output16: 0.0 A(010) 0.0 kVA			=
Output17: 0.0 A(010) 0.0 kVA			-
Output18: 0.0 A(010) 0.0 kVA			
Output19: 0.0 A(010) 0.0 kVA			
Output20: 0.0 A(010) 0.0 kVA			
Output21: 0.0 A(010) 0.0 kVA			
Output22: 0.0 A(010) 0.0 kVA			
Output23: 0.0 A(010) 0.0 kVA			
Output24: 0.0 A(010) 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

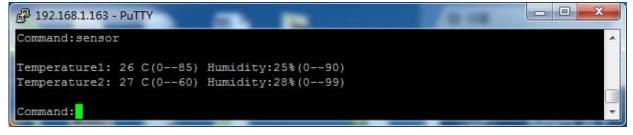


Figure 2-5

#### 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
-----------------------------	---------	-------------	-------------------

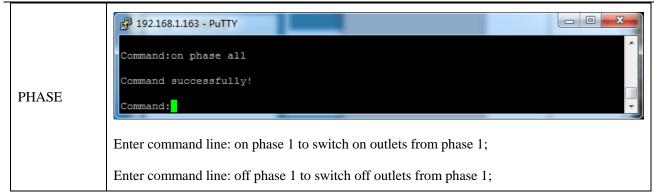
【index】Individual outlets, Group, Phase.

**(**operation **)** Serial number 1 means the outlet 1 from phase 1, see details as below:

DIRENTROMIK	MPDU User Manual	
Putty 192.168.1.163 - Putty		
Command:ON		*
on output [operation]		
operation:'1' is the output1 on group [operation]	switch	
operation: '1' is the group1 s	switch	
on phase all		
Command:		•



[index]	Description
OUTPUT	<pre> P 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! Enter command line: ON OUTPUT 1 to switch on the outlet 1; Enter command line: OFF OUTPUT 1 to switch Off the outlet 1; OUTPUT command can switch ON/OFF only one outlet at one time.</pre>
GROUP	<pre> Put 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: successfully! Command: Enter command line: on group 1 to switch on outlet from branch circuit 1; Enter command line: off group 1 to switch off outlet from branch circuit 1; </pre>



#### E. REBOOT Command

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

P 192.168.1.163 - PuTTY	x
Command:reboot	^
	+

Figure 2-8

#### F. RESET Command

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

P 192.168.1.163 - PuTTY	
Command:reset	
Command:	

Figure 2-9

#### G QUIT Command

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

PuTTY 192.168.1.163 - PuTTY	
Command:quit	
Command:	

Figure 2-10

#### H Help Command

Use the HELP command to shows general help, see 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

Modus-RTU protocol configuration including Modbus -RTU communication address (1-99), baud rate(4800, 9600,

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 Q: 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 Q: 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	Single phase:100VAC~240VAC Frequency: 50~60Hz;
		voltage	Three phase:200VAC~400VAC Frequency: 50~60Hz;
		Input plug	Standard IEC industry plug or connector
		Power cord	32A:3×6mm <sup>2</sup> 63A:3×16mm <sup>2</sup> ;
			3*16A:5×2.5mm <sup>2</sup> 3*32A:5×6.0mm <sup>2</sup>
		Cable length	3M
		Max. load current	Single phase: 32A, 63A
			Three phase: 3×16A, 3×32A
		Overload	16A/32A hydraulic breaker
		protection	
	Output	Socket standard	IEC320 C13, C19
			GB1002, GB2099.3
2			NEMA 5-15R, NAMA 5-20R
		Socket quantity	8/24 / 36/42outlets;
		Output voltage	Single phase:100VAC~240VAC Frequency:50~60Hz;
		Max output current	Single phase:32A, 63A
		Max phase current	16A, 32A
	Control ports	NET port	1×RJ45 port
3		Daisy chain port	2×RJ45 port
		SER port	1×RJ45 port
		Temperature &	2×RJ11 ports
		humidity port	
		Audible and visual	1×RJ11 ports
		alarm port	
4	Display	Working state	1×LED
		Power pulse	1×LED

	Alarm	1×LED
	IP Address, MPDU state, measurement value, alarm state	0U: 2.8 inch TFT screen 1U: 1.44 inch TFT screen
Load current display	Total current	Full-scale:16A/32A, Accuracy:±1%rdg.±10dgt. Resolution:0.01A, Response:500ms
	Individual load	Full-scale:10A/16A, Accuracy:±1%rdg.±10dgt. resolution:0.01A, Response:500ms
Accuracy of Temperature/ humidity sensor	Temperature	Working rang: $0^{\circ}C \sim +45^{\circ}C$ Accuracy: $\pm 1^{\circ}C$ , Response: 400ms
	Humidity	Working rang: 5-95% Accuracy:±5%RH, Response: 400ms
Product size	(L×W×D)	Vertical produt: Excellence, flying series: 1829*56*52mm (24 bits) 1829*56*62mm (36/42 bits) Beyond series: X*66.6*44.4mm, X length depending on the number of socket outlets. Horizontal produt:482.4×216×44.4mm (8 bits)
	Mounting option	Excellent, flying series: behind the nail installation, installation hole center distance 1555.75mm Beyond the series: hanging ear installation, fine adjustment, specific length depends on the number of sockets.
Case color	Color	Black
Standard accessories	Installation bracket	1 set
	Network connection cable	2M, Blue
	Serial connection cable	2M, Ivory white
	User manual	1 set (CD)
Optional	Sensor	Temperature/humidity sensor
	display Accuracy of Temperature/ humidity sensor Product size Case color Standard accessories	IP Address, MPDU state, measurement value, alarm stateLoad current displayTotal currentAccuracy of Temperature/ humidity sensorTemperaturehumidity sensorHumidityProduct size(L×W×D)Product sizeNounting optionCase colorColorCase colorColorStandard accessoriesSerial connection cable connection cableOptionalU

णित	DIREKTRONIK		MPE	DU User Manual
	11	Environment	Working	0°C~+45°C
			Environment	Relative humidity: 5%~95%
			Storage	Temperature: $-20^{\circ}C \sim +70^{\circ}C$
			Environment	Relative humidity :5% $\sim$ 95%
	12	ROHS	Compliance	

#### 9 Warranty and Service

The product is guaranteed for two years from the date of purchase. We will repair or replace the detective 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.

- 9.1 The below cases are not covered by the warranty:
- 9.1.1. Problem caused because of improper maintenance
- 9.1.2. Problem caused because of unauthorized change, modify or improper use
- 9.1.3. The device are not used in the stipulate physical environment
- 9.1.4.Problem in consequence of any Force Majeure incidents

#### 9.2 Repair notice:

- 9.2.1. 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.
- 9.2.2. Please make a short note about the problem and the operation process
- 9.2.3. Please pay for the shipping cost as well as the customs duty
- 9.2.4. Please list your name, address as well as phone number that we can contact you at any time.