

**ETP4830-A1
V300R001
User Manual**

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About This Document

Purpose

This document describes the DC power system in terms of product overview, components, installation, commissioning, and maintenance. This document also describes operations for the site monitoring unit (SMU) and rectifiers.

The figures provided in this document are for reference only.






Intended Audience

This document is intended for:

- Sales specialist
- Technical support personnel
- Maintenance personnel

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to

Symbol	Description
	personal injury, equipment damage, and environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

Issue 06 (2014-02-20)

Chapter 4 Installation

Added section "[4.3.2 \(Optional\) Installing Dry Contact Signal Cables](#)".

Modified "[Figure 4-5](#) Connecting the ground cable".

Modified "[Figure 4-10](#) Connecting the single-phase AC input power cable".

Chapter 6 Commissioning

Added section "[6.4 Setting System Type](#)".

Issue 05 (2013-07-02)

Add the configuration of R4815G1, SMU01A and SMU01C.

Issue 04 (2013-05-07)

Optimized the content of the document, including standardizing the terminology and improving the accuracy of the description

Issue 03 (2013-04-18)

Modify operating temperature, input voltage and output voltage.

Issue 02 (2012-12-03)

Port description is modified.

Issue 01 (2012-05-11)

This issue is the first official release.

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1 Safety

1.1 Health and Safety

1.1.1 Overview

Introduction

This section describes the safety precautions you must take before installing or maintaining Huawei equipment.

- To ensure safety of humans and the equipment, pay attention to the safety symbols on the equipment and all the safety instructions in this document.
- The "NOTICE", "CAUTION", "WARNING", and "DANGER" statements in this document do not represent all the safety instructions. They are only supplements to the safety instructions.
- Installation and maintenance personnel must understand basic safety precautions to avoid hazards.
- When operating Huawei equipment, in addition to following the general precautions in this document, follow the specific safety instructions given by Huawei.
- Only trained and qualified personnel are allowed to install, operate, and maintain Huawei equipment.
- This product should be used in the environment that meets design specifications. Otherwise, the product may be damaged, and the resulting product exceptions or component damage are beyond the warranty scope.

Local Safety Regulations

When operating Huawei equipment, you must follow the local laws and regulations. The safety instructions in this document are only supplements to the local laws and regulations.

General Requirements

To minimize risk of personal injury and damage to equipment, read and follow all the precautions in this document before performing any installation or maintenance.

Ensure that the instructions provided in this document are followed completely. This section also provides guidelines for selecting the measuring and testing devices.

Installation

- The device (or system) must be installed in an access-controlled location.
- The device can be mounted only on concrete or non-combustible surfaces.
- The device must be fixed securely on the floor or to other immovable objects such as walls and mounting racks before operation.
- When installing the unit, always make the ground connection first and disconnect it at the end.
- Do not block the ventilation while the device is operating. Keep a minimum distance of 5 cm between the device and the wall or other objects that may block the ventilation.
- Tighten the thumbscrews by using a tool after initial installation and subsequent access to the panel.

Ground

- Do not damage the ground conductor or operate the device in the absence of a properly installed ground conductor. Conduct the electrical inspection carefully.
- The device (or system) must be connected permanently to the protection ground before an operation. The cross-sectional area of the protective ground conductor must be at least 10 mm².

Power Supply

- For AC-supplied models: The device applies to TN, TT, or IT power system.
- For DC-supplied models: Reinforced insulation or double insulation must be provided to isolate the DC source from the AC mains supply.
- For DC-supplied model: The device applies to DC power source that complies with the Safety Extra-Low Voltage (SELV) requirements in IEC 60950-1 based safety standards.
- Prepared conductors are connected to the terminal block, and only the appropriate AWG/Type of wire is secured with the lug terminals.

Human Safety

- Do not operate the device or cables during lightning strikes.
- Remove the AC power connector when there is lightning. Do not use fixed terminals or touch terminals or antenna connectors when there is lightning.
- To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telecommunication network voltage (TNV) circuits.
- Move or lift the chassis by holding its lower edge. Do not hold the handles on certain modules such as power supply, fans, and boards because they cannot support the weight of the device.
- At least two persons are required to lift the chassis. When lifting it, keep your back straight and move stably.
- Do not wear jewelry or watches when you operate the device.

Operator

- Only qualified professional personnel are allowed to install, configure, operate, and disassemble the device.
- Only the personnel authenticated or authorized by Huawei are allowed to replace or change the device or the parts of the device (including the software).

- Any fault or error that might cause safety problems must be reported immediately to a supervisor.
- Only qualified personnel are allowed to remove or disable the safety facilities and to troubleshoot and maintain the device.

1.1.2 Electrical Safety

High Voltage



DANGER

The high voltage power supply provides power for the device operation. Direct or indirect contact (through damp objects) with high voltage and AC mains supply may result in serious injuries.

- During the installation of the AC power supply facility, follow the local safety regulations. The personnel who install the AC facility must be qualified to perform high voltage and AC operations.
- Do not wear conductive articles, such as watches, hand chains, bracelets, and rings during the operation.
- When water is found in the rack or the rack is damp, switch off the power supply immediately.
- When the operation is performed in a damp environment, make sure that the device is dry.



CAUTION

Non-standard and improper high voltage operations may result in fire and electric shock. Therefore, you must abide by the local rules and regulations when bridging and wiring AC cables. Only qualified personnel are allowed to perform high voltage and AC operations.



CAUTION

Before powering on a device, ground the device. Otherwise, personal injury or device damage may be caused by high leakage current.

Tools



CAUTION

Dedicated tools must be used during high voltage and AC operations. Avoid using ordinary tools.

High Electrical Leakage



CAUTION

Ground the device before powering it on. Otherwise, personal injury or device damage may be caused by high leakage current.

If the "high electrical leakage" tag is present on the power terminal of the device, you must ground the device before powering it on.

1.1.3 Inflammable Environment

Operating the electrical device in an inflammable environment can be fatal.



DANGER

Do not place the device in an environment that has inflammable and explosive air or gas. Do not perform any operation in this environment.

1.1.4 Mechanical Safety

Drilling Holes



CAUTION

Do not drill the cabinet at will. Drilling holes without complying with the requirements affects the electromagnetic shielding performance of the cabinet and damages the cables inside the cabinet. In addition, if the scraps caused by drilling enter the cabinet, the printed circuit boards (PCBs) may be short circuited.

- Before you drill a hole in the cabinet, wear insulated gloves and remove the internal cables from the cabinet.
- Wear an eye protector when drilling holes. This is to prevent your eyes from being injured by the splashing metal scraps.
- Ensure that the scraps caused by drilling do not enter the cabinet.
- Drilling holes without complying with the requirements affects the electromagnetic shielding performance of the cabinet.

- After drilling, clean the metal scraps immediately.

Sharp Objects



CAUTION

Before you hold or carry a device, wear protective gloves to avoid getting injured by sharp edges of the device.

Handling Fans

When handling fans, note the following:

- When replacing a component, place the component, screws, and tools in a safe place. Otherwise, if any of them fall into the operating fans, the fans may be damaged.
- When replacing a component near fans, do not insert your fingers or boards into the operating fans until the fans are switched off and stops running.

Lifting Heavy Objects



CAUTION

When heavy objects are being lifted, do not stand or walk under the cantilever or the lifted object.

1.1.5 Bundling Signal Cables



NOTICE

- Do not bundle signal cables with high current cables or high voltage cables.
 - Maintain a minimum space of 150 mm between adjacent ties.
-

1.2 Equipment Safety

1.2.1 Electricity Safety

High Electrical Leakage



NOTICE

If the "high electrical leakage" tag is present on the power terminal of the device, you must ground the device before powering it on.

1.2.2 Electrostatic Discharge



NOTICE

The static electricity generated by human bodies may damage the electrostatic-sensitive components on boards, for example, the large-scale integrated (LSI) circuits.

Human body movement, friction between human bodies and clothes, friction between shoes and floors, or handling of plastic articles causes static electromagnetic fields on human bodies. These static electromagnetic fields cannot be eliminated until the static is discharged.

To prevent electrostatic-sensitive components from being damaged by the static on human bodies, you must wear a well-grounded electrostatic discharge (ESD) wrist strap when touching the device or handling boards or application-specific integrated circuits (ASICs).

1.2.3 Laying Out Cables

When the temperature is very low, violent strike or vibration may damage the cable sheathing. To ensure safety, comply with the following requirements:

- Cables can be laid or installed only when the temperature is higher than 0 °C.
- Before laying out cables which have been stored in a temperature lower than 0 °C, move the cables to an environment of the ambient temperature and store them at the ambient temperature for at least 24 hours.
- Handle cables with caution, especially at a low temperature. Do not drop the cables directly from the vehicle.

1.2.4 Rectifier

- When a rectifier is running, the temperature around the air exhaust vent at the rear is high. Do not touch the vent or cover the vent with cables or other objects.
- To prevent electric shocks, do not put your hands into rectifier slots.

2 Overview

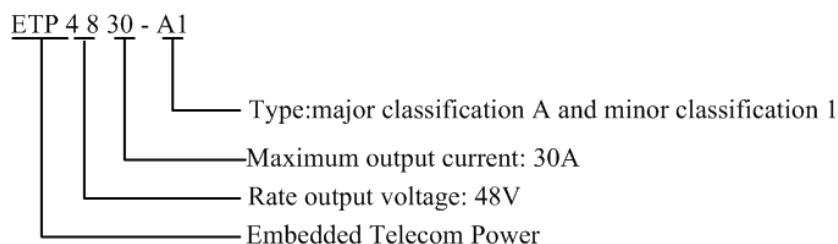
2.1 Introduction

The ETP4830-A1 is a box-type power system that supplies power for -48 V DC communications equipment. It uses 15 A rectifiers and provides a maximum output current of 30 A.

2.2 Model Number Description

Figure 2-1 shows the ETP4830-A1 model number description.

Figure 2-1 ETP4830-A1 model number description



2.3 Features

The ETP4830-A1 has the following features:

- Supports a wide voltage range of 85 V AC to 300 V AC.
- Provides comprehensive battery management.
- The SMU01A communicates with Huawei Network Ecosystem (NetEco) and third-party element management systems (EMSs) over various security protocols, such as the Simple Network Management Protocol (SNMP) and Hypertext Transfer Protocol Secure (HTTPS), featuring flexible networking. It provides WebUI and implements remote unattended management.
- The SMU01B connects to the U2000 over Huawei master/slave protocols.

- Displays information on a liquid crystal display (LCD) and provides buttons for operations.
- Supports electronic labels.
- Rectifiers and the site monitoring unit (SMU) are hot-swappable.
- Allows high-efficiency and standard-efficiency rectifiers with the same capacity to coexist.
- The rectifier power factor is 0.99.

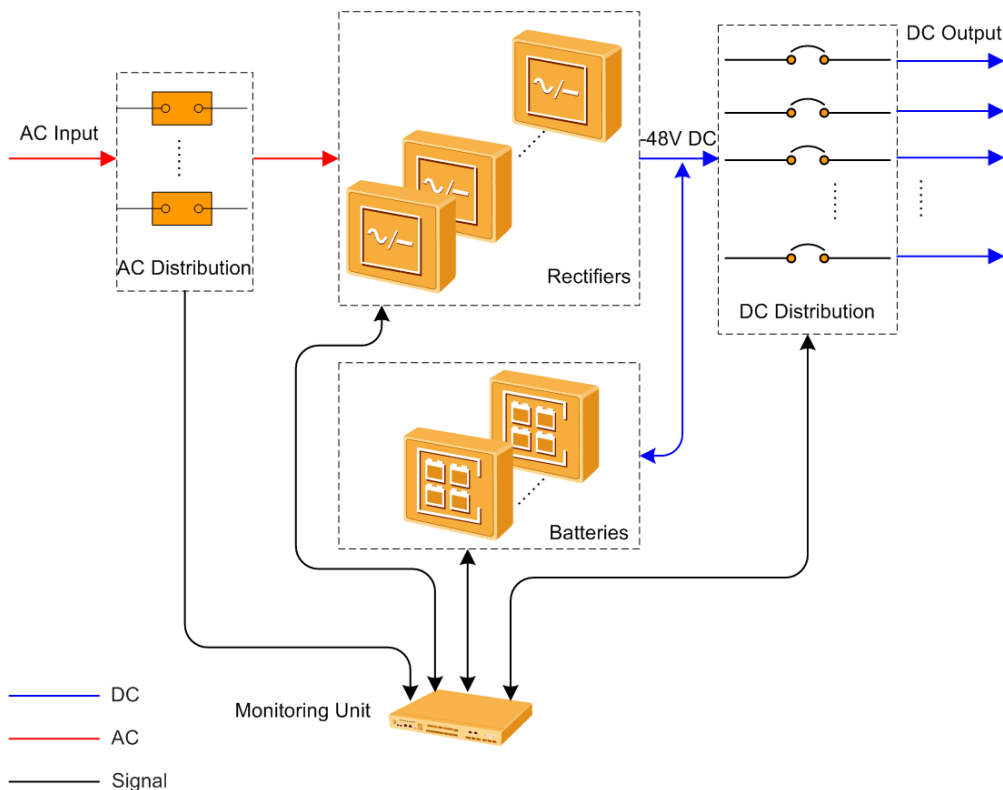
2.4 Working Principles

Figure 2-2 shows the conceptual diagram. AC power enters rectifiers through the AC power distribution unit (PDU). The rectifiers convert the AC power input into -48 V DC power output, which is directed by the DC PDU to DC loads along different routes.

When the AC power is normal, rectifiers power DC loads and charge batteries. When the AC power is absent, rectifiers stop working and batteries start to power loads. After the AC power resumes, rectifiers power DC loads and charge batteries again.

The SMU monitors the operating status of each component in the power system in real time and performs appropriate intelligent control. When detecting a fault, the SMU generates an alarm.

Figure 2-2 Conceptual diagram



2.5 Configuration

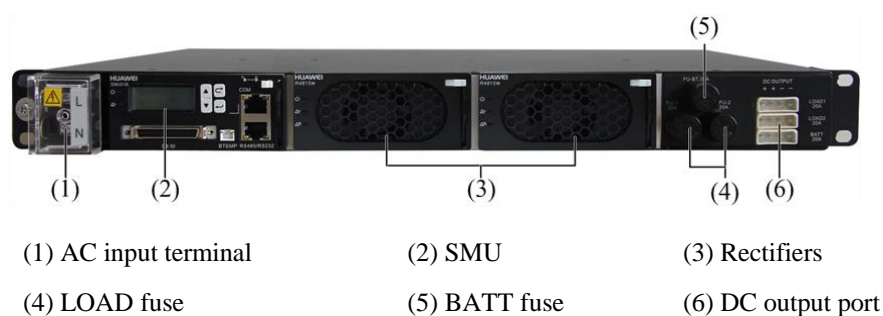
Table 2-1 describes the ETP4830-A1 configuration.

Table 2-1 ETP4830-A1 configuration

Item	Configuration		
PDU	AC input	220 V AC single-phase three-wire (L, N, PE)	
	DC power distribution	Battery circuit breaker	One 1-pole 20 A circuit breaker
		Load circuit breaker	Two 1-pole 20 A circuit breakers
SMU	The following SMUs are supported: <ul style="list-style-type: none">• One SMU01A• One SMU01B• One SMU01C		
Rectifier	The following rectifiers are supported: <ul style="list-style-type: none">• One to two R4815G1s• One to two R4815N1s NOTE <ul style="list-style-type: none">• The R4815G1 and R4815N1 can be installed together.		

Figure 2-3 shows the ETP4830-A1 configuration.

Figure 2-3 Configuration diagram



NOTICE

Do not exchange the SMU slot with the rectifier slot. Otherwise, the SMU and rectifier may be damaged.

3 Components

3.1 AC/DC Power Distribution Subrack

Figure 3-1 shows the AC/DC power distribution subrack.

Figure 3-1 AC/DC power distribution subrack

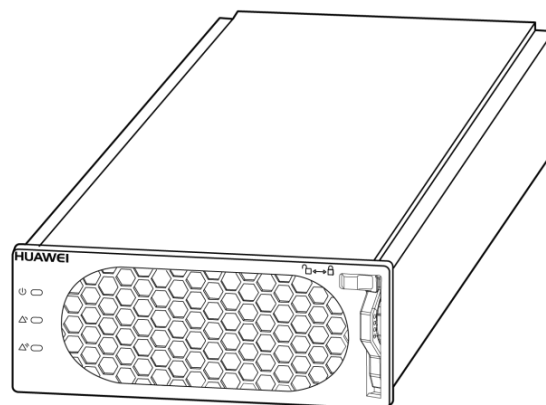


3.2 Rectifier

Appearance

Rectifiers convert AC input into stable 48 V DC output. Figure 3-2 shows a rectifier.

Figure 3-2 Rectifier

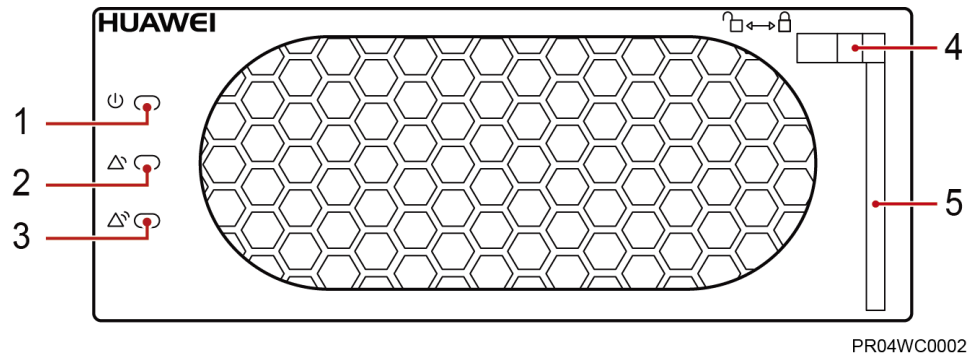


PQ02WC0003

Panel

Figure 3-3 shows the rectifier panel.

Figure 3-3 Rectifier front panel



- (1) Power indicator (2) Alarm indicator (3) Fault indicator
(4) Locking latch (5) Handle

Indicators

Table 3-1 describes the indicators on the rectifier panel.

Table 3-1 Rectifier indicators

Indicator	Color	Status	Description
Power indicator	Green	Steady on	The rectifier has an AC power input.
		Off	The rectifier has no AC power input.
			The rectifier is faulty.
		Blinking at 0.5 Hz	The rectifier is being queried.
		Blinking at 4 Hz	The rectifier is loading an application program.
Alarm indicator	Yellow	Off	No alarm is generated.
		Steady on	The rectifier generates an alarm for power limiting due to ambient overtemperature.
			The rectifier generates an alarm for shutdown due to ambient overtemperature or undertemperature.
			The rectifier protects against AC input overvoltage or undervoltage.
			The rectifier is hibernating.
		Blinking at	The communication between the rectifier and the

Indicator	Color	Status	Description
		0.5 Hz	SMU is interrupted.
Fault indicator	Red	Off	The rectifier is running properly.
		Steady on	The rectifier locks out due to output overvoltage.
			The rectifier has no output due to an internal fault.

3.3 SMU

3.3.1 SMU01A

Appearance

Figure 3-4 shows an SMU01A.

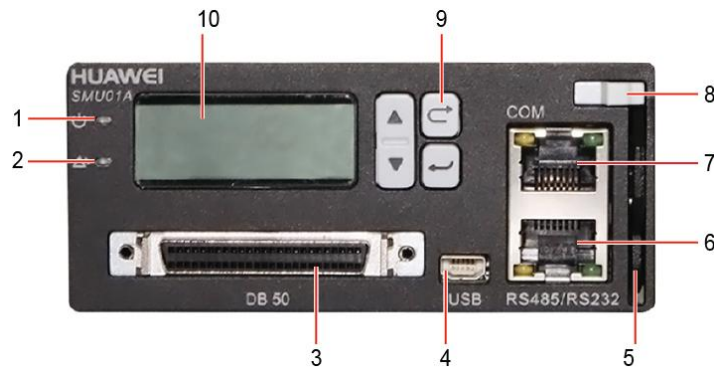
Figure 3-4 SMU01A



Panel

Figure 3-5 shows the SMU01A panel.

Figure 3-5 SMU01A panel







- (1) Run indicator
- (2) Alarm indicator
- (3) DB50 port
- (4) USB port (reserved)
- (5) Handle
- (6) RS485/RS232 port
- (7) COM port
- (8) Locking latch
- (9) Four buttons
- (10) Liquid crystal display (LCD)

Buttons

Table 3-2 describes the buttons on the panel.

Table 3-2 Button description

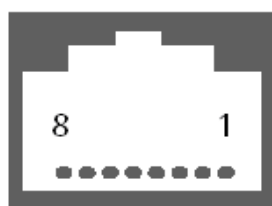
Button	Name	Description
 or 	Up or Down	Allows you to view menu items and set the value of a menu item.
	Back	Returns to the previous menu without saving the settings.
	Enter	<ul style="list-style-type: none">Enters the main menu from the standby screen.Enters a submenu from the main menu.Saves the menu settings.
Note: <ul style="list-style-type: none">The standby screen is displayed and the LCD screen becomes dark if you do not press any button for 5 minutes.You need to log in again to enter the control and setting menus if you do not press any button for 8 minutes.		

Communications Ports

Table 3-3 describes the communications ports.

Table 3-3 Communications ports

Port	Communications Mode	Communications Parameters
COM	FE	Autonegotiation
	RS485/RS232	Baud rate: 9600 bits/s or 19,200 bits/s
RS485/RS232	RS485/RS232	Baud rate: 9600 bits/s or 19,200 bits/s
Note: All the preceding ports are protected by a security mechanism.		

Figure 3-6 Communication port**RJ45 Female**

[Table 3-4](#) describes the pins in the COM port that is used as an FE port. [Table 3-5](#) describes the pins in the COM port that is used as an RS485/RS232 port.

Table 3-4 Pins in the COM port (used as an FE port)

Pin	Signal	Description
1	TX+	Sends data over FE.
2	TX-	
3	RX+	Receives data over FE.
6	RX-	
4, 5, 7, 8	None	-

Table 3-5 Pins in the RS485/RS232 port

Pin	Signal	Description
1	TX+	Sends data over RS485.
2	TX-	

Pin	Signal	Description
4	RX+	Receives data over RS485.
5	RX-	
3	RX232	Receives data over RS232.
7	TX232	Sends data over RS232.
6	PGND	Connects to the ground.
8	None	-

3.3.2 SMU01B

Appearance

Figure 3-7 shows an SMU01B.

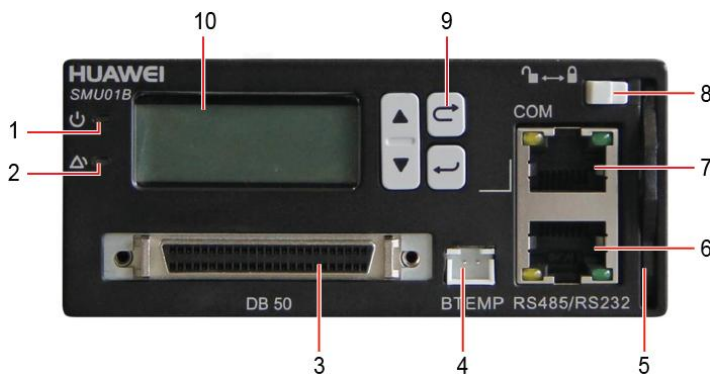
Figure 3-7 SMU01B



Panel

Figure 3-8 shows the SMU01B panel.

Figure 3-8 SMU01B panel







- (1) Run indicator
- (2) Alarm indicator
- (3) DB50 port
- (4) Battery temperature sensor port
- (5) Handle
- (6) RS485/RS232 port
- (7) COM port
- (8) Locking latch
- (9) Four buttons
- (10) Liquid crystal display (LCD)

Buttons

Table 3-6 describes the buttons on the panel.

Table 3-6 Button description

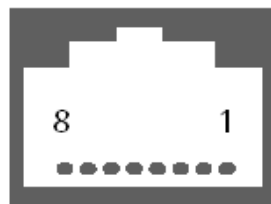
Button	Name	Description
 or 	Up or Down	Allows you to view menu items and set the value of a menu item.
	Back	Returns to the previous menu without saving the settings.
	Enter	<ul style="list-style-type: none">Enters the main menu from the standby screen.Enters a submenu from the main menu.Saves the menu settings.
Note: <ul style="list-style-type: none">The standby screen is displayed and the LCD screen becomes dark if you do not press any button for 5 minutes.You need to log in again to enter the control and setting menus if you do not press any button for 8 minutes.		

Communications Ports

Table 3-7 describes the communications ports.

Table 3-7 Communications ports

Port	Communications Mode	Communications Parameters
COM	FE	Autonegotiation
	RS485/RS232	Baud rate: 9600 bits/s or 19,200 bits/s
RS485/RS232	RS485/RS232	Baud rate: 9600 bits/s or 19,200 bits/s
Note: All the preceding ports are protected by a security mechanism.		

Figure 3-9 Communication port**RJ45 Female**

[Table 3-8](#) describes the pins in the COM port and RS485/RS232 port.

Table 3-8 Pins in the RS485/RS232 port

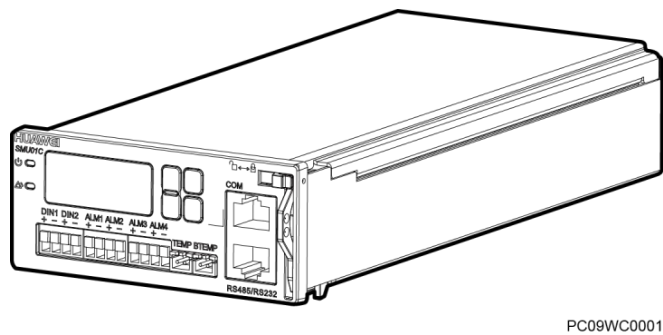
Pin	Signal	Description
1	TX+	Sends data over RS485.
2	TX-	
4	RX+	Receives data over RS485.
5	RX-	
3	RX232	Receives data over RS232.
7	TX232	Sends data over RS232.
6	PGND	Connects to the ground.
8	None	-

3.3.3 SMU01C

Appearance

Figure 3-10 shows an SMU01C.

Figure 3-10 SMU01C

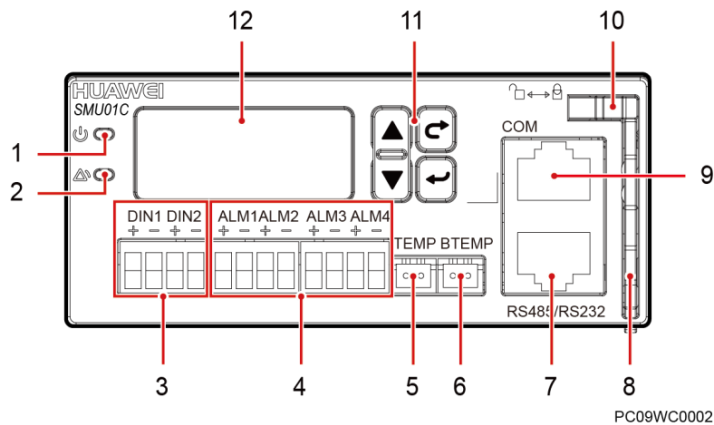


PC09WC0001

Panel

Figure 3-11 shows the SMU01C panel.

Figure 3-11 SMU01C panel



PC09WC0002

- | | | |
|------------------------|-------------------------------------|---|
| (1) Run indicator | (2) Alarm indicator | (3) DIN ports (reserved Boolean value inputs) |
| (4) ALM ports (relays) | (5) Ambient temperature sensor port | (6) Battery temperature sensor port |
| (7) RS485/RS232 port | (8) Handle | (9) COM port |
| (10) Locking latch | (11) Four buttons | (12) Liquid crystal display (LCD) |

Dry contact ports





Table 3-9 Dry contact ports description

Port Type	Silk-screen	Description	Default Alarms
Boolean value input port	DIN1	Boolean value input 1	Reserved
	DIN2	Boolean value input 2	Reserved
Dry contact output port	ALM1	Dry contact output 1	Major Mains Fault, DC Over Volt, DC Under Volt, Batt Off, Batt Loop Trip, Rect Fault, Load Fuse Trip
	ALM2	Dry contact output 2	Minor AC Over Volt, AC Under Volt, Amb. Over Temp1, Amb. Under Temp1, Batt Over Temp, Batt Under Temp, Rect Protect, Rect Comm Fail, Batt Over Curr, Dig. Input1 ALM, Dig. Input2 ALM, Batt Discharge
	ALM3	Dry contact output 3	Reserved
	ALM4	Dry contact output 4	Reserved

Buttons

Table 3-10 describes the buttons on the panel.

Table 3-10 Button description

Button	Name	Description
 or 	Up or Down	Allows you to view menu items and set the value of a menu item.
	Back	Returns to the previous menu without saving the settings.
	Enter	<ul style="list-style-type: none">Enters the main menu from the standby screen.Enters a submenu from the main menu.Saves the menu settings.
Note: <ul style="list-style-type: none">The standby screen is displayed and the LCD screen becomes dark if you do not press any button for 5 minutes.		

Button	Name	Description
<ul style="list-style-type: none">You need to log in again to enter the control and setting menus if you do not press any button for 8 minutes.		

Communications Ports

Table 3-11 describes the communications ports.

Table 3-11 Communications ports

Port	Communications Mode	Communications Parameters
COM	FE	Autonegotiation
	RS485/RS232	Baud rate: 9600 bits/s or 19,200 bits/s
RS485/RS232	RS485/RS232	Baud rate: 9600 bits/s or 19,200 bits/s
Note: All the preceding ports are protected by a security mechanism.		

Figure 3-12 Communication port

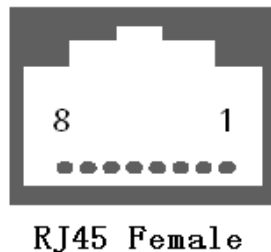


Table 3-12 describes the pins in the COM port and RS485/RS232 port.

Table 3-12 Pins in the RS485/RS232 port

Pin	Signal	Description
1	TX+	Sends data over RS485.
2	TX-	
4	RX+	Receives data over RS485.
5	RX-	

Pin	Signal	Description
3	RX232	Receives data over RS232.
7	TX232	Sends data over RS232.
6	PGND	Connects to the ground.
8	None	-

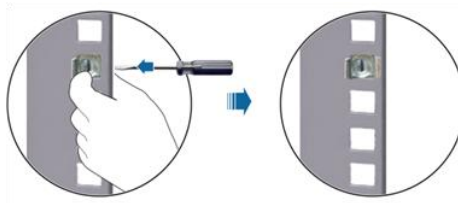
4 Installation

4.1 Installing a Subrack

Procedure

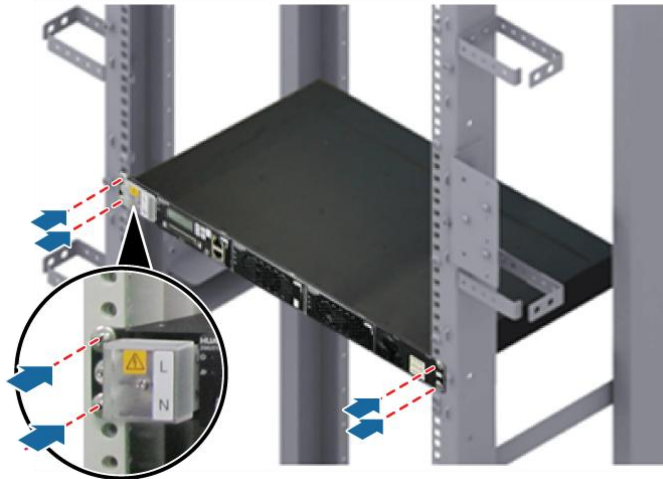
Step 1 Install the floating nuts.

Figure 4-1 Installing floating nuts



Step 2 Install the ETP4830-A1 in a 19-inch rack.

Figure 4-2 Installing a subrack



NOTE

The ETP4830-A1 can be installed in a European Telecommunications Standards Institute (ETSI) rack if the required mounting ears are available.

----End

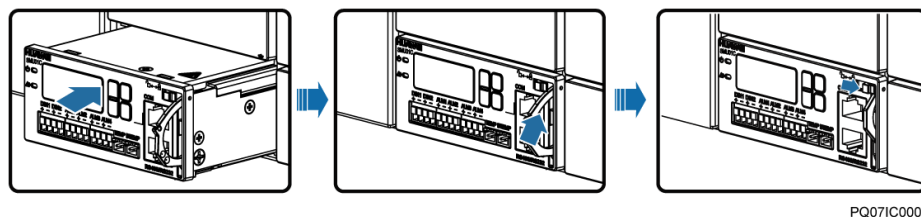
4.2 Installing Components

4.2.1 Installing an SMU

Procedure

- Step 1** Insert a new SMU into the slot, push the locking latch towards the left, and pull out the handle.
- Step 2** Slide the SMU into the subrack along the guide rail, and push the locking latch to the right to secure the handle.

Figure 4-3 Installing an SMU



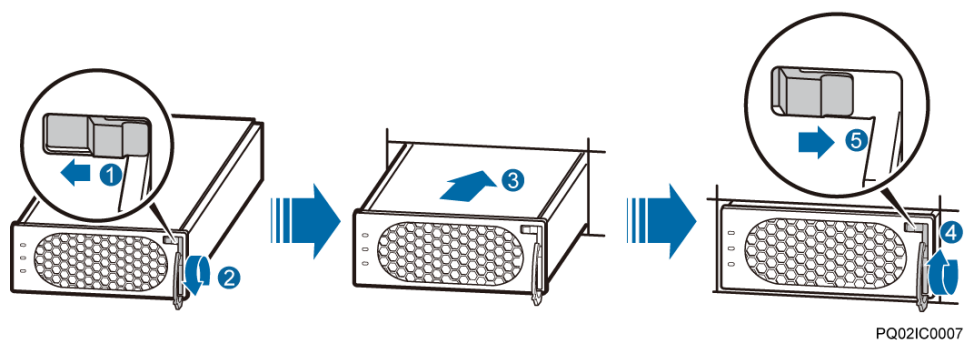
----End

4.2.2 Installing a Rectifier

Procedure

- Step 1** Push the locking latch towards the left.
- Step 2** Draw the handle downwards.
- Step 3** Insert the rectifier into the slot and slide the rectifier into the subrack along the guide rail.
- Step 4** Push the handle upwards.
- Step 5** Push the locking latch towards the right to secure the handle.

Figure 4-4 Installing rectifiers



----End

4.3 Connecting Cables



DANGER

Before connecting a cable, ensure that the AC power input is off.

4.3.1 Connecting the Ground Cable

Figure 4-5 shows how to connect the ground cable (an M4 OT terminal is used for the cable).

Figure 4-5 Connecting the ground cable



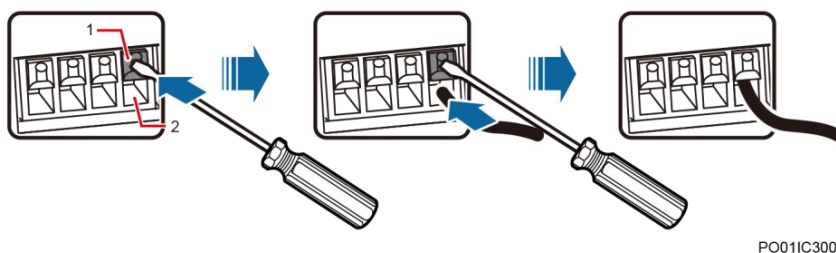
(1) Ground bar

4.3.2 (Optional) Installing Dry Contact Signal Cables

Procedure

- Step 1** Press the contact plate using a flat-head screwdriver to flip the metal spring inside each dry contact.
- Step 2** Connect the signal cables to the corresponding dry contacts.
- Step 3** Put away the flat-head screwdriver and check that the signal cables are securely connected.

Figure 4-6 Installing a dry contact signal cable



PO01IC3002

(1) Contact plate

(2) Dry contact

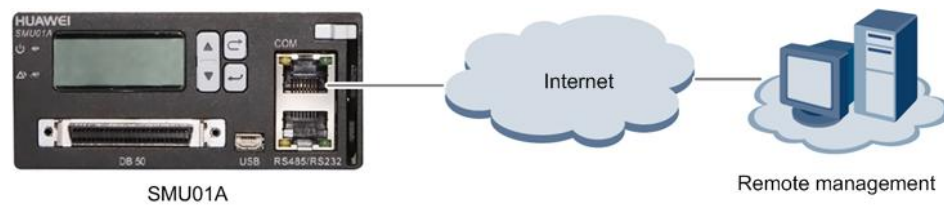
----End

4.3.3 Connecting the Communications Cable

Connecting a Communications Cable to the SMU01A

Connect a communications cable to the COM port on the SMU01A when you use the Web UI, NetEco, or SNMP to remotely manage the power supply system, as shown in [Figure 4-7](#).

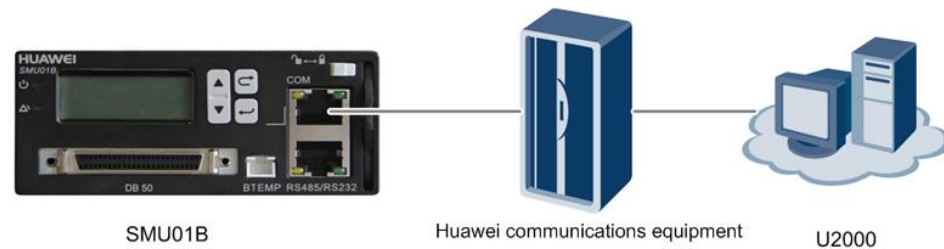
Figure 4-7 Connecting a communications cable to the SMU01A COM port



Connecting a Communications Cable to the SMU01B

Connect the COM port on the SMU01B to the corresponding serial port on the Huawei access network communications equipment when you use the U2000 network management system to remotely manage the power supply system, as shown in [Figure 4-8](#).

Figure 4-8 Connecting a communications cable to the SMU01B COM port

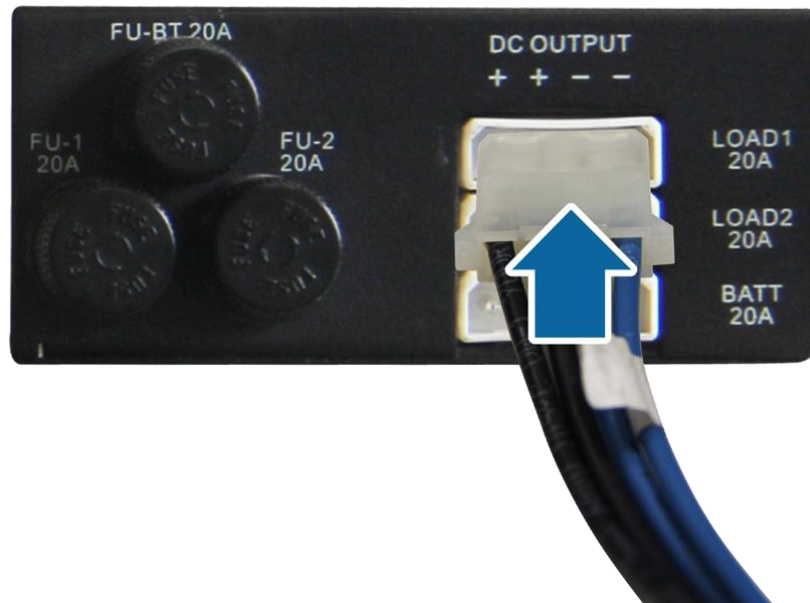


4.3.4 Connecting the DC Load Cable

Procedure

Step 1 [Figure 4-9](#) shows how to connect the DC load cable.

Figure 4-9 Connecting the load cable



----End

4.3.5 Connecting the Battery Cable

Connecting battery cables is similar to connecting load cables. For details, see [4.3.4 Connecting the DC Load Cable](#).

4.3.6 Connecting the AC Input Power Cable



DANGER

Before connecting the AC input power cable:

- Install a circuit breaker for upper-level device to protect the power system.
- Switch the corresponding circuit breaker for the upper-level device to OFF.

Connecting the Single-Phase AC Input Power Cable

Procedure

- Step 1** Remove the protective cover over AC input terminals.
- Step 2** Connect the neutral wire (an M4 OT terminal is used for the cable) to the N wiring terminal.
- Step 3** Connect the live wire (an M4 OT terminal is used for the cable) to the L wiring terminal.

Figure 4-10 Connecting the single-phase AC input power cable



Step 4 Reinstall the protective cover.

----End

5 Verifying the Installation

5.1 Checking Hardware Installation

- Check that all screws, especially those used for electrical connections, are secured. Check that flat washers and spring washers are installed properly.
- Check that rectifiers are completely inserted into their respective slots and properly locked.

5.2 Checking Electrical Connections

- Check that all circuit breakers are switched off.
- Check that flat washers and spring washers are securely installed for all the OT terminals and that all the OT terminals are intact and properly connected.
- Check that batteries are correctly installed and that battery cables are correctly connected without being short circuited.
- Check that input and output power cables and ground cables are correctly connected without being short circuited.

5.3 Checking Cable Installation

- Check that all cables are securely connected.
- Check that all cables are arranged neatly and bound properly to their nearest cable ties without being distorted or excessively bent.
- Check that cable labels are properly and securely attached in the same direction.




6 Commissioning

6.1 Connecting the AC Power Supply

Procedure

- Step 1** Check whether the voltage across the input ports of AC input circuit breakers for the upper-level device is the same as the local voltage. If no, ask professionals to rectify the fault.
 - Step 2** Switch off the AC input circuit breakers for the upper-level device.
 - Step 3** Observe the Run indicator (green) on the rectifier panel. If it is steady on, the rectifier is powered on successfully.
 - Step 4** Observe the Run indicator (green) and LCD on the SMU panel. If the indicator is blinking and the LCD is on, the SMU is powered on successfully.
- End

6.2 Setting the Display Language

After powering on the SMU, select English by pressing  or  on the LCD, and then press  to enter the standby screen.



NOTE

If you select an undesired language, remove and then insert the SMU. Select a language again after the SMU restarts.

6.3 Setting Time and Date

6.3.1 SMU01A

Set the time and date for the SMU01A as required.

Table 6-1 Time and date parameters for the SMU01A

Main Menu	Second-Level Menu	Third-Level Menu	Default Value	Setting
Settings	System Para	Set Date	-	Local date
		Set Time	-	Local time
		Set Time Zone	GMT+08:00	Local time zone

**NOTE**

The default user name of SMU01A is **admin**, and the default password is **001**.

6.3.2 SMU01B and SMU01C

Set the time and date for the SMU01B and SMU01C as required.

Table 6-2 Time and date parameters for the SMU01B and SMU01C

Main Menu	Second-Level Menu	Third-Level Menu	Default Value	Setting
Settings	System Settings	Date	-	Local date
		Time	-	Local time

**NOTE**

- The default user name of SMU01B is **admin**, and the default password is **00200**.
- The default user name of SMU01C is **admin**, and the default password is **000001**.

6.4 Setting System Type

If the SMU01A is configured, set the system type based on the actual situation, as described in [Table 6-3](#). If the SMU01B or SMU01C is configured, you do not need to reset the system type.

Table 6-3 Setting system type

Main Menu	Second-Level Menu	Third-level Menu	Default Value	Setting Value
Settings	Site Summary	System Type	Standard	ETP4830

6.5 Setting Battery Parameters

6.5.1 SMU01A

Set **Qty of Battery** to **1** and **Rated Capacity** to the total capacity of the battery string.

Table 6-4 Battery parameters for the SMU01A

Main Menu	Second-Level Menu	Default Value	Setting
Quick Settings	Qty of Battery	1	1
	Rated Capacity	65 Ah	Battery string capacity

6.5.2 SMU01B and SMU01C

Set **Batt String** to **1** and **Capacity** to the total capacity of the battery string.

Table 6-5 Battery parameters for the SMU01B and SMU01C

Main Menu	Second-Level Menu	Third-Level Menu	Default Value	Setting
Settings	Batt Settings	Batt String	1	1
		Capacity	40 Ah	Battery string capacity

6.6 (Optional) Setting Hibernation Parameters

6.6.1 SMU01A

Set **Rect Redund En** to **Enable** if you need to use the intelligent hibernation function of the rectifiers.

Table 6-6 Hibernation parameter for the SMU01A

Main Menu	Second-Level Menu	Third-Level Menu	Default Value	Setting
Settings	PSU Summary	Rect Redund Ena	Disable	Enable

6.6.2 SMU01B and SMU01C

Set **Sleep Enable** to **Yes** if you need to use the intelligent hibernation function of the rectifiers.

Table 6-7 Hibernation parameter for the SMU01B and SMU01C

Main Menu	Second-Level Menu	Third-Level Menu	Default Value	Setting
Settings	Rect Settings	Sleep Enable	No	Yes/No

6.7 (Optional) Setting Alarm Parameters

6.7.1 SMU01A

Set the following alarm parameters as required if you need to enable the alarm function or modify the alarm severity and relay association.

Table 6-8 Alarm parameters for the SMU01A

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Default Value	Setting
Settings	Alarm Setting	Site Summary	Internal Fault NOTE Take the Internal Fault alarm as an example.	Enable	Set the parameter as required.
				MA	Set the parameter as required.
				None	Set the parameter as required.
	Site Summary	DO (1-8) Alarm Act	-	Close	Set the parameter as required.
		DI (1-8) Alarm	-	Close	Set the parameter as required.

6.7.2 SMU01B and SMU01C

Set the following alarm parameters as required if you need to enable the alarm function or modify the alarm severity and relay association.

Table 6-9 Alarm parameters for the SMU01B and SMU01C

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Default Value	Setting
Settings	Alarm Setting	Alarm Severity	AC Volt Low/High NOTE Take the AC Over Volt alarm as an example.	Major	Set the parameter as required.
			Digital No. 1 NOTE Take Digital No. 1 as an example.		
		Relay Relate	Mode	High	Set the parameter as required.
			AC Volt Low/High (Alarm) NOTE Take the AC Volt Low/High alarm as an example.		
			Relate Relay	None	Set the parameter as required.
			Default type	NC	Set the parameter as required.

6.8 (Optional) Setting Communications Parameters

6.8.1 SMU01A

Setting Parameters Before WebUI Management

Before you use the WebUI to remotely manage the SMU01A, set the required IP parameters.

Procedure

- Step 1** Apply to the site or equipment room network administrator for a fixed IP address.
- Step 2** Set the IP address, subnet mask, and gateway address as shown in [Table 6-10](#).

Table 6-10 IP parameters

Main Menu	Second-Level Menu	Default Value	Setting
Quick Settings	IP Address	192.168.0.10	Set this parameter according to the address assigned by the network administrator.
	Subnet mask	255.255.255.0	Set this parameter according to the address assigned by the network administrator.
	Gateway	192.168.0.1	Set this parameter according to the address assigned by the network administrator.

----End

Setting Parameters Before NetEco Management

Before you use the NetEco to perform remote management, set the required parameters.

Procedure

- Step 1** Apply to the site or equipment room network administrator for a fixed IP address.
- Step 2** Set the IP address, subnet mask, and gateway address as shown in [Table 6-11](#).

Table 6-11 IP parameters

Main Menu	Second-Level Menu	Default Value	Setting
Quick Settings	IP Address	192.168.0.10	Set this parameter according to the address assigned by the network administrator.
	Subnet mask	255.255.255.0	Set this parameter according to the address assigned by the network administrator.
	Gateway	192.168.0.1	Set this parameter according to the address assigned by

Main Menu	Second-Level Menu	Default Value	Setting
			the network administrator.

Step 3 Set the IP addresses and ports for the active and standby servers of the NetEco, as described in [Table 6-12](#).

Table 6-12 NetEco parameters

Main Menu	Second-Level Menu	Third-Level Menu	Default Value	Setting
Settings	Comm Para	NetEco Main IP	58.251.159.136	Set this parameter to the IP address of the active NetEco server.
		NetEco Bak IP	58.251.159.136	Set this parameter to the IP address of the standby NetEco server.
		NetEco Port	31220	Set a port for the NetEco.

----End

Setting Parameters Before SNMP Management

Before you use SNMP to perform remote management, set the required parameters.

Procedure

- Step 1** Apply to the site or equipment room network administrator for a fixed IP address.
- Step 2** Set the IP address, subnet mask, and gateway on the LCD, as described in [Table 6-13](#).

Table 6-13 IP parameters

Main Menu	Second-Level Menu	Default Value	Setting
Quick Settings	IP Address	192.168.0.10	Set this parameter according to the address assigned by the network administrator.
	Subnet mask	255.255.255.0	Set this parameter according to the address assigned by the network

Main Menu	Second-Level Menu	Default Value	Setting
			administrator.
	Gateway	192.168.0.1	Set this parameter according to the address assigned by the network administrator.

Step 3 Connect the network port on your PC to the FE port on the SMU.



NOTICE

The SMU has only one FE port. Remove the existing network cable from the FE port before you perform step 3 and reconnect the network cable after you finish setting the parameters.

Step 4 Set the PC IP address in the same network segment as the SMU IP address set in step 2.

Assume that the SMU IP address is 192.168.0.10 and its subnet mask is 255.255.255.0. Set the PC IP address to 192.168.0.11 and its subnet mask to 255.255.255.0.

Step 5 Enter the SMU IP address in the address box on the PC. Log in to the WebUI on the login page shown in [Figure 6-1](#).



NOTE

The default user name is **admin**, and the default password is **001**.

Figure 6-1 WebUI login page



Step 6 On the **Network Configuration** page, select **SNMP**.

1. If the SNMP version is SNMPv1 or SNMPv2c, set **SNMP Port**, **Read Community**, and **Write Community**, as shown in Figure 6-2.

Figure 6-2 SNMPv1 and SNMPv2c parameters

The screenshot displays the 'SNMP' configuration page within the 'ENSP@ Power System' web interface. The left sidebar contains navigation options: System Status, System Configuration, Network Configuration (selected), Control, User Management, Version Management, Log History, Historical Alarms, Alarm Configuration, Site Configuration, Energy Saving, and Electronic Label. The main content area is titled 'Net Parameter' and includes a 'Host Comm protocol' section. Under 'SNMP', the following parameters are configured: 'SNMP Version' is set to 'SNMPv1&SNMPv2c'; 'SNMP Port' is '161' (range 0-65535); 'Read Community' is 'read' (range a-z, 'A-Z', '0-9', '_' (Length≤15)); and 'Write Community' is 'write' (range a-z, 'A-Z', '0-9', '_' (Length≤15)). A 'Submit' button is located below these fields. The 'SNMP Trap' section shows 'Trap IP' and 'Trap Port' fields, with a table below listing trap configurations. The table has columns for 'No.', 'Trap IP', and 'Trap Port'. One entry is shown: 'No. 1' with 'Trap IP 127.0.0.1' and 'Trap Port 162'. 'Add' and 'Delete' buttons are at the bottom of the table. The bottom of the page shows links for 'PPP' and 'Neteco'.

No.	Trap IP	Trap Port
1	127.0.0.1	162

2. If the SNMP version is SNMPv3, set **User Name**, **Authentication Protocol Password**, and **Privacy Protocol Password**, as shown in Figure 6-3.

Figure 6-3 SNMPv3 parameters

The screenshot displays the Huawei ENSP@ Power System web interface. The left sidebar lists various system management functions, with 'Network Configuration' currently selected. The main panel shows the 'SNMP' configuration settings. The 'SNMP Version' is set to 'SNMPv3', and the 'SNMP Port' is '161'. Below these, the 'SNMPv3' user configuration section is visible, including fields for 'User Name', 'Authentication Protocol Password (at Least Eighth Digits, for MD5)', and 'Privacy Protocol Password (at Least Eight Digits, for DES)'. A table lists the configured users, showing one user with 'No.' 1 and 'User Name' 'admin'. Navigation links for 'SNMP Trap', 'PPP', and 'Neteco' are at the bottom.

Step 7 Set the SNMP trap destination address and trap port.

Step 8 Upload the MIB libraries **HUAWEI-MIB.mib** and **HUAWEI-SITE-MONITOR-MIB.mib** to the NMS.

----End

6.9 Connecting the Battery Supply

Prerequisites



NOTICE

To avoid damage to batteries, switch on the battery circuit breaker only after correctly setting the battery parameters.

Procedure

- Step 1** Switch off the AC circuit breaker for the upper-level device, and then switch on the battery circuit breaker on PDU.
- Step 2** Switch on the AC circuit breaker for the upper-level device, and then switch on the load circuit breakers on PDU.

Step 3 Check whether the battery voltage and system output voltage are the same as the voltages displayed on the SMU LCD. If not, ask the technical support personnel to rectify the fault.

Step 4 Set the battery and load circuit breakers based on the site requirements.

Step 5 Observe the power system for 15 minutes. If no alarm is generated on the SMU LCD, the voltage and current for batteries and loads are normal. In this case, clean and leave the site.

----End

7 Maintenance

7.1 Routine Maintenance

Maintain the ETP4830-A1 periodically based on site requirements. The recommended maintenance interval is six months.

Table 7-1 Routine maintenance checklist

Item	Maintenance Content			
	Check That	Check Method	Repair When	Measures
Electrical connection	The AC input voltage is normal.	Using a multimeter	The AC input voltage does not fall between 210 V AC and 230 V AC.	For details, see 7.2 Rectifying Common Faults and 7.3 Identifying Faults .
	The output voltage is normal.		The battery low voltage disconnection (BLVD) or load low voltage disconnection (LLVD) voltage does not fall between -42 V DC and -58 V DC.	
Preventive inspection	The indicators are normal.	Visual observation	Alarms are generated.	
Grounding inspection	The connection between the ground point and the ground bar in the cabinet is normal.	Using a multimeter	The resistance between the ground point and the ground bar is greater than 0.1 ohm.	Secure or replace the ground cable.

7.2 Rectifying Common Faults

7.2.1 Mains Failure

Possible Causes

- The AC input power cable is faulty.
- The upper-level AC input circuit breaker is OFF.
- The mains grid is faulty.

Measures

1. Check whether the AC input cable is loose. If yes, secure the AC input cable.
2. Check whether the upper-level AC input circuit breaker is OFF. If yes, handle the back-end circuit failure and then switch on the circuit breaker.
3. Check whether the AC input voltage is lower than 50 V AC. If yes, handle the mains grid fault.

7.2.2 AC Over Volt

Possible Causes

- The AC overvoltage alarm threshold is not set properly on the SMU.
- The power grid is faulty.

Measures

1. Check whether the AC overvoltage alarm threshold is properly set. If no, adjust it to a proper value.
2. Check whether the AC input voltage exceeds the AC overvoltage alarm threshold (280 V AC by default). If yes, handle the AC input fault.

7.2.3 AC Under Volt

Possible Causes

- The AC undervoltage alarm threshold is not set properly on the SMU.
- The power grid is faulty.

Measures

1. Check whether the AC undervoltage alarm threshold is properly set. If no, adjust it to a proper value.
2. Check whether the AC input voltage is below the AC undervoltage alarm threshold (180 V AC by default). If yes, handle the AC input fault.

7.2.4 DC Over Volt

Possible Causes

- The DC overvoltage alarm threshold is not set properly on the SMU.

- Rectifiers are faulty.
- The power system voltage is set too high in manual mode.

Measures

1. Check whether the DC overvoltage alarm threshold (58 V DC by default) is properly set. If no, adjust it to a proper value.
2. Remove the rectifiers one by one and check whether the alarm is cleared. If the alarm still exists, reinstall the rectifier. If the alarm is cleared, replace the rectifier.
3. Check whether the system voltage is set too high in manual mode. If yes, confirm the reason and adjust the voltage to normal after the operation.

7.2.5 DC Under Volt

Possible Causes

- An AC power failure occurs.
- The DC undervoltage alarm threshold is not set properly on the SMU.
- Rectifiers are faulty.
- The system configuration is not proper.
- The power system voltage is set too low in manual mode.

Measures

1. Check whether an AC power failure occurs. If yes, resume the AC power supply.
2. Check whether the DC undervoltage alarm threshold (45 V DC by default) is properly set. If no, adjust it to a proper value.
3. Check whether the power system capacity is insufficient for the loads due to rectifier failures. If yes, replace the faulty rectifier.
4. Check whether the load current is greater than the current power system capacity. If yes, expand the power system capacity or reduce the load power.
5. Check whether the system voltage is set too low in manual mode. If yes, confirm the reason and adjust the voltage to a proper value after the operation.

7.2.6 Amb. Over Temp



NOTE

This alarm is generated only for the power system that has ambient temperature sensors installed.

Possible Causes

- The ambient overtemperature alarm threshold is not set properly on the SMU.
- The temperature control system is faulty in the cabinet where the ambient temperature sensor is located.
- The ambient temperature sensor is faulty.

Measures

1. Check whether the ambient temperature alarm threshold (50 °C by default) is properly set on the SMU. If no, adjust it based on site requirements.

2. Check whether the temperature control system in the cabinet is faulty. If yes, rectify the fault. The alarm is cleared when the cabinet temperature falls within the allowed range.
3. Check whether the ambient temperature sensor is faulty. If yes, replace the temperature sensor.

7.2.7 Amb. Under Temp



NOTE

This alarm is generated only for the power system that has ambient temperature sensors installed.

Possible Causes

- The ambient undertemperature alarm threshold is not set properly on the SMU.
- The temperature control system is faulty in the cabinet where the ambient temperature sensor is located.
- The ambient temperature sensor is faulty.

Measures

1. Check whether the ambient undertemperature alarm threshold (0 °C by default) is properly set on the SMU. If no, adjust it based on site requirements.
2. Check whether the temperature control system in the cabinet is faulty. If yes, rectify the fault. The alarm is cleared when the cabinet temperature falls within the allowed range.
3. Check whether the ambient temperature sensor is faulty. If yes, replace the ambient temperature sensor.

7.2.8 Batt Over Temp



NOTE

This alarm is generated only for the power system that has battery temperature sensor installed.

Possible Causes

- The battery overtemperature alarm threshold is not set properly on the SMU.
- The battery temperature controlling system is faulty.
- The battery temperature sensor is faulty.

Measures

1. Check whether the battery overtemperature alarm threshold (50 °C by default) is properly set. If no, adjust it to a proper value.
2. Check whether the battery temperature controlling system is faulty. If yes, rectify the fault. The alarm is cleared when the battery temperature falls within the allowed range.
3. Check whether the battery temperature sensor is faulty. If yes, replace the temperature sensor.

7.2.9 Batt Under Temp



NOTE

This alarm is generated only for the power system that has battery temperature sensor installed.

Possible Causes

- The battery undertemperature alarm threshold is not set properly on the SMU.
- The battery temperature controlling system is faulty.
- The battery temperature sensor is faulty.

Measures

1. Check whether the battery undertemperature alarm threshold (0 °C by default) is properly set. If no, adjust it to a proper value.
2. Check whether the battery temperature controlling system is faulty. If yes, rectify the fault. The alarm is cleared when the battery temperature falls within the allowed range.
3. Check whether the battery temperature sensor is faulty. If yes, replace the temperature sensor.

7.2.10 Batt Over Curr

Possible Causes

- The rectifier communication is interrupted.
- Poor contact of the SMU.
- The SMU is faulty.

Measures

1. Check whether an alarm is generated for rectifier communication interruption. If yes, remove the rectifier and reinstall it to check whether the alarm is cleared. If the alarm still exists, replace the rectifier.
2. Remove the SMU and reinstall it to check whether the alarm is cleared. If the alarm still exists, replace the SMU.

7.2.11 Load Fuse Break

Possible Causes

- The load circuit breaker trips or fuse is blown.
- The load circuit breaker trips or fuse detection cable is disconnected.

Measures

1. Check whether the load circuit breaker trips or fuse is blown. If yes, rectify the back-end circuit fault and then switch on the circuit breaker or replace the fuse.
2. Check whether the load circuit breaker trips or fuse detection cable is disconnected. If yes, reconnect the cable.

7.2.12 Batt Loop Trip

Possible Causes

- The battery circuit breaker trips or battery fuse detection cable is disconnected.
- The battery circuit breaker trips or battery fuse is blown.

- The contactor is faulty.

Measures

1. Check whether the battery circuit breaker trips or battery fuse detection cable is disconnected. If yes, reconnect the cable.
2. Check whether the battery circuit breaker trips or battery fuse is blown. If yes, rectify the battery loop fault and then switch on the circuit breaker or replace the fuse.
3. Manually switch on or switch off the battery contactor and check the battery current changes accordingly. If no, replace the contactor.

7.2.13 Batt Off

Possible Causes

- An AC power failure occurs.
- Batteries are manually disconnected.
- The battery disconnection voltage is set too high on the SMU.
- Rectifiers are faulty.
- The system configuration is not proper.

Measures

1. Check whether an AC power failure occurs. If yes, resume the AC power supply.
2. Check whether batteries are manually disconnected. If yes, confirm the reason of the manual disconnection, and reconnect the batteries after the operation.
3. Check whether the battery disconnection voltage (43 V DC by default) is set too high on the SMU. If yes, adjust it to a proper value.
4. Check whether the power system capacity is insufficient for the loads due to rectifier failures. If yes, replace the faulty rectifier.
5. Check whether the load current is greater than the current power system capacity. If yes, expand the power system capacity or reduce the load power.

7.2.14 Door Alarm



NOTE

This alarm is generated only for the power system that has door status sensor installed.

Possible Causes

- The cabinet doors are open.
- The door status sensor is faulty.

Measures

1. Close cabinet doors.
2. Check whether the door status sensor is faulty. If yes, replace the door status sensor.

7.2.15 Water Alarm



NOTE

This alarm is generated only for the power system that has water sensors installed.

Possible Causes

- Water intrudes into the cabinet.
- The water sensor is faulty.

Measures

1. Check whether water intrudes into the cabinet. If yes, wipe the water with dry cotton or other tools and rectify the fault.
2. Check whether the water sensor is faulty. If yes, replace the water sensor.

7.2.16 Smoke Alarm



NOTE

This alarm is generated only for the power system that has smoke sensors installed.

Possible Causes

- There is smoke inside the cabinet.
- The smoke sensor is faulty.

Measures

1. Check whether there is smoke inside the cabinet. If yes, disconnect the power supply from the cabinet, handle the fault, and then resume system operation and clear the alarm on the SMU.
2. Check whether the smoke sensor is faulty. If yes, replace the smoke sensor.

7.2.17 Rect Fault

Possible Causes

- The rectifier is in poor contact.
- The rectifier is faulty.

Measures

1. Check the Fault indicator on the rectifier panel. If it is steady red, remove the rectifier, and then reinstall it after the indicator turns off.
2. If the alarm still exists, replace the rectifier.

7.2.18 Rect Protect

Possible Causes

- The rectifier input voltage is too high.
- The rectifier input voltage is too low.

- The ambient temperature is too high.
- The rectifier is abnormal.

Measures

1. Check whether the AC input voltage exceeds the upper threshold of the rectifier working voltage. If yes, rectify the power supply fault and then resume the power supply.
2. Check whether the AC input voltage is below the lower threshold of the rectifier working voltage. If yes, rectify the power supply fault and then resume the power supply.
3. Check whether the ambient temperature is higher than the normal operating temperature of the rectifier. If yes, check and rectify the temperature unit fault.
4. Remove the rectifier that generates the alarm and reinstall it after the indicator turns off. If the alarm still exists, replace the rectifier.

7.2.19 Single Rect Fau

Possible Causes

- The subrack or slot connector is faulty.
- The rectifier is faulty.
- The monitoring unit is faulty.

Measures

1. Remove the rectifier and check whether the slot connector is damaged or deformed. If yes, repair or replace the subrack or slot connector.
2. If the alarm persists after the rectifier is reinstalled, replace the rectifier.
3. If the alarm persists after the monitoring unit is restarted, replace the monitoring unit.

7.2.20 Multi-Rect Fault

Possible Causes

- The subrack or slot connector is faulty.
- The rectifier is faulty.
- The monitoring unit is faulty.

Measures

1. Remove the rectifier and check whether the slot connector is damaged or deformed. If yes, repair or replace the subrack or slot connector.
2. If the alarm persists after the rectifier is reinstalled, replace the rectifier.
3. If the alarm persists after the monitoring unit is restarted, replace the monitoring unit.

7.2.21 Rect Comm Fault

Possible Causes

- The rectifier is removed.
- The rectifier is in poor contact.

- The rectifier is faulty.

Measures

1. Check whether the rectifier is removed. If yes, reinstall it.
2. If the rectifier is in position, remove the rectifier and reinstall it.
3. If the alarm still exists, replace the rectifier.

7.3 Identifying Faults

7.3.1 Identifying Rectifier Faults

Table 7-2 Identifying rectifier faults

Symptom	Possible Cause	Measures
The Run indicator (green) is off.	There is no AC input, or the rectifier is faulty.	Check whether the AC input is normal. If the AC input is normal, replace the rectifier. If the AC input is normal and the green indicators on all rectifiers are off, replace the AC/DC power distribution subrack.
The Run indicator (green) is blinking (0.5 Hz).	The rectifier is being queried manually.	Exit the query status. The Run indicator recovers to be steady on.
The Run indicator (green) is blinking (4 Hz).	Software is being loaded.	After software loading is complete, the indicator stops blinking.
The Alarm indicator (yellow) is steady on.	<ul style="list-style-type: none">• The rectifier protects against overtemperature.• The rectifier protects against AC input overvoltage or undervoltage.• The rectifier is faulty.	<ul style="list-style-type: none">• If the ambient temperature is higher than the upper threshold, lower the ambient temperature.• If the air intake vent or the air exhaust vent is blocked, unblock it.• If the AC input is abnormal, ask mains maintenance personnel to rectify the fault.• If the fault persists, the rectifier may be faulty. In this case, replace the faulty rectifier.
The Alarm indicator (yellow) is blinking.	Communication between the rectifier and the SMU is	Clean the edge connector of the faulty rectifier. If the Alarm indicator is still

Symptom	Possible Cause	Measures
	interrupted.	blinking, check the SMU and the AC/DC power distribution subrack.
The Fault indicator (red) is steady on.	The rectifier protects against output overvoltage.	<ul style="list-style-type: none">• If a single rectifier is locked, remove the rectifier whose indicator is steady red, and then power on the rectifier after the indicator turns off. If the overvoltage still occurs, replace the rectifier.• If multiple rectifiers are locked, remove all rectifiers and reinstall them one by one to locate the faulty rectifiers. Then replace faulty rectifiers.
	The rectifier has no output due to an internal fault.	Replace the faulty rectifier.

7.3.2 Identifying SMU Faults

Table 7-3 Identifying SMU faults

Symptom	Cause	Measures
The Run indicator (green) is off.	There is no input.	<ul style="list-style-type: none">• Check whether the green indicators on rectifiers are steady on. If yes, the input to the ETP48150-A3 is normal.• Reseat the SMU. If the fault persists, replace the SMU.
The Run indicator (green) is blinking fast.	The SMU fails to communicate with the host.	Check whether the communication between the SMU and the host is normal.
The Alarm indicator (red) is steady on.	A major or critical alarm is generated.	Query the current alarm on the host or SMU LCD to identify the fault.

7.3.3 Identifying PDU Faults

Table 7-4 Identifying PDU faults

Symptom	Cause	Measures
Load disconnection	The positive and negative cables of the load are reversely connected.	Ensure that the positive and negative cables are properly connected.
Battery disconnection	The positive and negative cables of batteries are reversely connected.	Ensure that the positive and negative cables are properly connected.

7.4 Replacing Components



NOTICE

- Ensure that loads are supplied with power when replacing major components. For example, keep the switches for primary loads in the ON position, and do not turn off the battery switch and AC input switch at the same time.
 - Seek the customer's prior consent if load disconnection is required.
 - Rectifiers and the SMU are hot-swappable.
-

7.4.1 Replacing a Rectifier

Prerequisites

- Prepare a pair of protective gloves, the cabinet door key and maintenance tool box.
- Check that the new rectifier is intact.



CAUTION

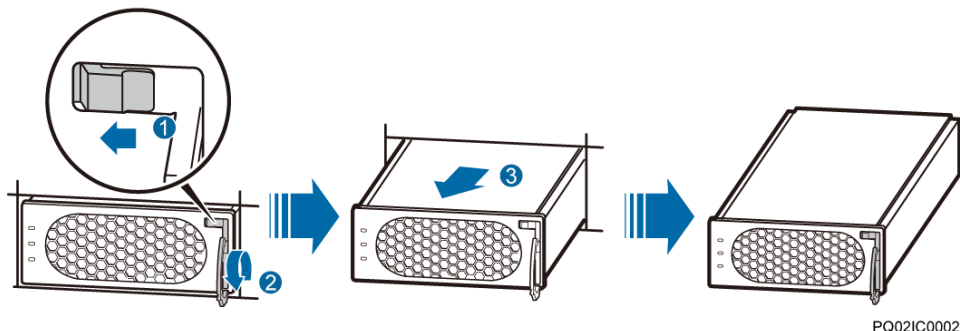
Protect yourself from being burnt when moving the rectifier because the rectifier has a high temperature.

Procedure

- Step 1** Put on protective gloves.
- Step 2** Push the locking latch at the right side of the panel towards the left.

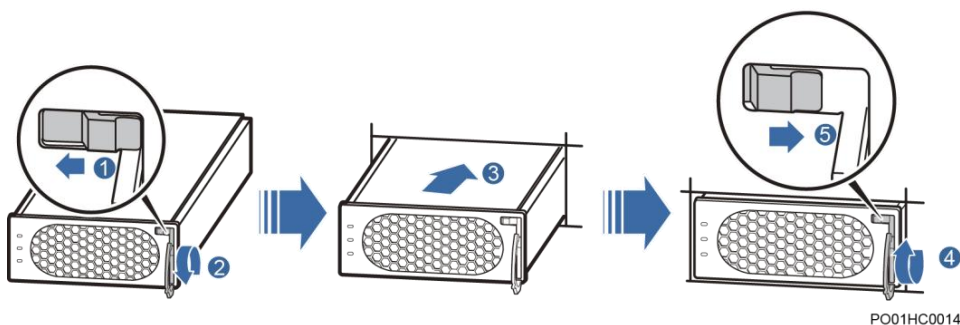
- Step 3** Gently draw the handle outwards, and then remove the rectifier from the subrack, as shown in [Figure 7-1](#).

Figure 7-1 Removing a rectifier



- Step 4** Push the locking latch on the new rectifier towards the left, and pull out the handle.
- Step 5** Place the new rectifier at the entry to the correct slot.
- Step 6** Gently slide the rectifier into the subrack along the guide rail, and lock the handle, as shown in [Figure 7-2](#).

Figure 7-2 Installing a rectifier



- Step 7** Take off protective gloves.

----End

Follow-up Procedure

Send the replaced rectifier for repair.

7.4.2 Replacing an SMU

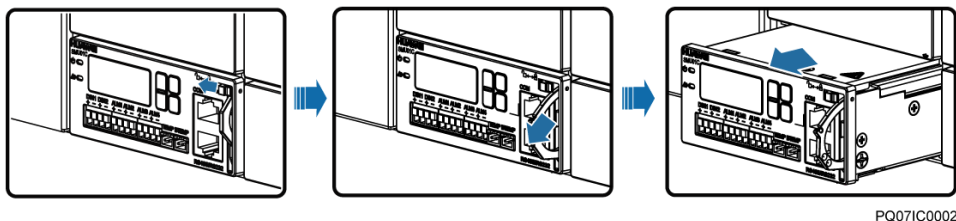
Prerequisites

- Prepare an ESD wrist strap, a pair of protective gloves, an ESD box or bag.
- Check that the new rectifier is intact.

Procedure

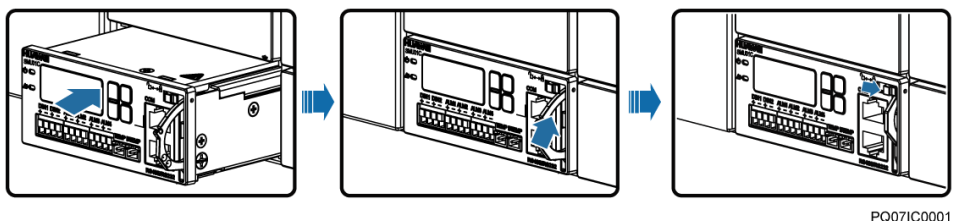
- Step 1** Push the locking latch towards the left.
- Step 2** Draw the handle outwards to remove the SMU, as shown in [Figure 7-3](#).

Figure 7-3 Removing an SMU



- Step 3** Insert a new SMU into the slot, push the locking latch towards the left, and pull out the handle.
- Step 4** Slide the new SMU into the subrack along the guide rail, and then push the locking latch towards the right.
- Step 5** Reset SMU parameters.

Figure 7-4 Installing an SMU



----End

Follow-up Procedure

Repair the replaced SMU.

7.4.3 Replacing a Battery String

Procedure

- Step 1** Ensure that the AC input power supply is normal.
- Step 2** Switch off the battery circuit breaker.
- Step 3** Replace batteries. Ensure that the positive and negative battery cables are properly connected.
- Step 4** Switch on the battery circuit breaker.

- Step 5** Wait until the system is powered on automatically. Check that the battery status is normal (that is, no battery loop broken alarm is generated and the battery charging current is not 0.).

----End

A Appendix

A.1 Technical Specifications

Table A-1 Technical Specifications

Category	Item	Specifications
Environmental conditions	Operating temperature	-40 ℃ to +70 ℃ NOTE The system can run for 8 hours at 70 ℃.
	Transportation temperature	-40 ℃ to +70 ℃
	Storage temperature	-40 ℃ to +70 ℃
	Operating humidity	5%-95%
	Storage humidity	5%-95%
	Altitude	0-4000 m When the altitude ranges from 2000 m to 4000 m, the operating temperature decreases by 1 ℃ for each additional 200 m.
AC input	Input mode	Single-phase three-wire (L, N, PE)
	Input voltage	85–300 V AC (rated voltage: 220 V AC)
	Input frequency	45–66 Hz (rated frequency: 50/60 Hz)
	Power factor	≥ 0.99 (100% load)
DC output	Output voltage range	-42 V DC- -58 V DC
	Default output voltage	-53.5 V DC
	Maximum output	2000 W

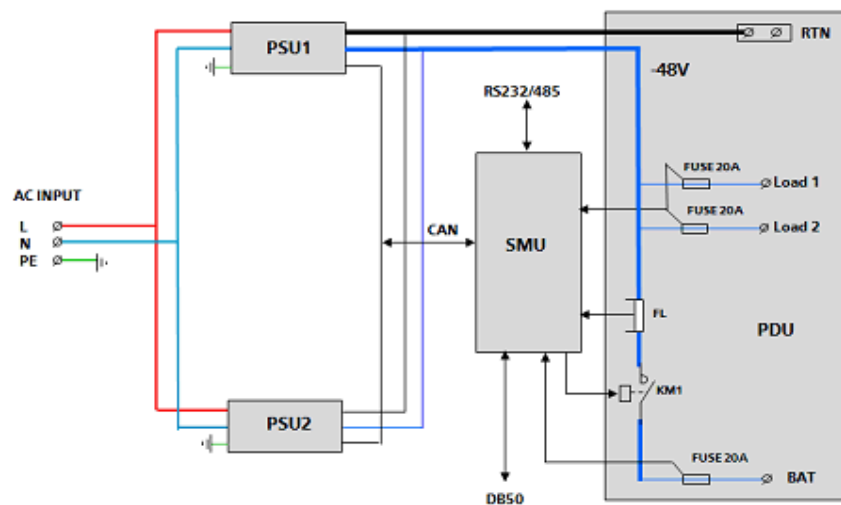
Category	Item	Specifications
	power	
	Regulated voltage precision	$\leq \pm 0.6\%$
	Peak-to-peak noise voltage	≤ 200 mV (0–20 MHz)
AC input protection	AC input overvoltage protection threshold	Overvoltage protection is performed when the single-phase AC input voltage exceeds the AC input overvoltage protection threshold (300 V AC by default).
	AC input overvoltage recovery threshold	When the voltage is restored to 290 V AC, the output resumes.
	AC input undervoltage protection threshold	Undervoltage protection is performed when the single-phase AC input voltage is below the AC input undervoltage protection threshold (80 V AC by default).
	AC input undervoltage recovery threshold	When the voltage is restored to 85 V AC, the output resumes.
DC output protection	DC output overvoltage protection threshold	-58.5 V DC to -60.5 V DC
Rectifier	Efficiency	<ul style="list-style-type: none">R4815G1: Highest efficiency: $\geq 96\%$ $\geq 95\%$ (220 V AC, 40%-100% load)R4815N1: Highest efficiency: $\geq 94\%$ $\geq 93\%$ (220 V AC, 30%-100% load)
	Output Power	R4815G1: 870 W (input voltage range: 176-300 V AC) 435 W (input voltage range: 85-175 V AC, linearly derated) R4815N1: 1000 W (input voltage range: 176-300 V AC) 470 W (input voltage range: 85-175 V AC, linearly derated)
	Output soft start	At the moment when the rectifier is powered on, the output voltage rises slowly.
	Overvoltage protection	-58.5 V DC to -60.5 V DC <ol style="list-style-type: none">If the overvoltage occurs inside the rectifier due to a fault, the rectifier experiences a latch-off.If the output voltage is higher than -63 V DC and lasts for more than 500 ms, the rectifier experiences a latch-off.

Category	Item	Specifications
EMC	Conducted Emission (CE)	Input port: CISPR 22/EN 55022 class B
		Output port: CISPR 22/EN 55022 class A
	Radiated emission (RE)	CISPR 22/EN 55022 class B
	Harmonic	IEC 61000-3-2
	Fluctuation and blinking	IEC 61000-3-3
	ESD	Enclosure port: Contact discharge voltage: 6 kV (Class B); air discharge voltage: 8 kV (Class B); Signal port: Contact discharge voltage: 2 kV (Class R)
	Electrical fast transient (EFT)	The voltage at signal ports is 1 kV, and the voltage at the power ports is 2 kV (criterion B).
	Radiated susceptibility (RS)	Level 3; criterion: A; field strength: 10 V/m
	Conducted susceptibility (CS)	Signal port: 3 V (criterion A); power port: 10 V
	SURGE	(For the AC power port) differential mode: ± 2 kV; common mode: ± 4 kV (criterion B) (For the DC power port) differential mode: ± 2 kV/2 ohms; common mode: ± 2 kV/12 ohms, ± 4 kV/12 ohms (+48 V and PE are short-circuited); isolation protection enabled, criterion B (For internal signal cables) differential mode: ± 0.5 kV; common mode: ± 1 kV; waveform: 8/20(1.2/50) μ s, criterion B (For external signal cables) differential mode: ± 2 kV; common mode: ± 4 kV; waveform: 8/20(1.2/50) μ s, criterion B
	DIP	EN61000-4-11
Others	Safety and regulatory design	Complies with IEC/EN60950-1/GB 4943 and passes TUV and CE.
	Mean time between failures (MTBF)	250,000 hours
Structure	Dimensions (H x W x D)	43.6 mm x 442 mm x 255 mm
	Weight	≤ 10 kg (with rectifiers)

Category	Item	Specifications
	Protection level	IP20
	Installation mode	Adapts to 19-inch cabinets and ETSI cabinets by using different types of mounting ears
	Maintenance mode	Maintained from the front

A.2 Electrical Conceptual Diagram

Figure A-1 ETP4830-A1 electrical conceptual diagram



B

Acronyms and Abbreviations

ATS	automatic transfer switch
ACDB	alternating current distribution box
EMC	electromagnetic compatibility
IEC	International Electrotechnical Commission
IP	Internet Protocol
LCD	liquid crystal display
PDM	Power Distribution with Mechanical Switch
PE	protective earth
SMU	site monitoring unit
TCP	Transmission Control Protocol
USB	Universal Serial Bus