

SMU02B
V300R001

User Manual

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About This Document

Purpose

This document describes the site monitoring unit SMU02B in terms of its network diagram, performance specifications, liquid crystal display (LCD) and web user interface (WebUI) operations, installation, and troubleshooting.

Intended Audience

This document is intended for:

- Sales engineers
- Technical support personnel
- Maintenance personnel

Symbol Conventions

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

Symbol	Description
 DANGER	Alerts you to a high risk hazard that could, if not avoided, result in serious injury or death.
 WARNING	Alerts you to a medium or low risk hazard that could, if not avoided, result in moderate or minor injury.
 CAUTION	Alerts you to a potentially hazardous situation that could, if not avoided, result in equipment damage, data loss, performance deterioration, or unanticipated results.
 TIP	Provides a tip that may help you solve a problem or save time.
 NOTE	Provides additional information to emphasize or supplement important points in the main text.

Change History

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

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The corresponding software version is: V300R001C01SP55.

Issue 01 (2013-04-28)

This issue is used for first office application (FOA).

The corresponding software version is: V300R001C01SP51.

Contents

About This Document.....	ii
1 Overview.....	1
1.1 Appearance	1
1.2 Network Diagrams.....	2
1.3 Features.....	5
1.4 Functions	6
2 Panel and Ports	8
3 Installation.....	11
3.1 Safety Precautions	11
3.2 Installing the SMU02B	11
3.3 Removing the SMU02B.....	11
4 LCD Operations.....	12
4.1 LCD Menu Hierarchy	12
4.2 Buttons.....	13
4.3 Display Language	14
4.4 Password	14
5 Web User Interface.....	15
5.1 Preparing for Login.....	15
5.2 Logging In to the WebUI	20
5.3 WebUI Operations	20
5.3.1 Home Page.....	20
5.3.2 Real-time Monitoring	21
5.3.3 Querying Historical Data	32
5.3.4 System Configuration	35
5.3.5 Maintenance.....	39
6 Power System Configuration.....	43
6.1 Basic Parameters about Lead-Acid Batteries.....	43
7 VRLA Battery Management	46
7.1 Battery Charging And Discharging	46
7.1.1 Float Charging	46

7.1.2 Equalized Charging.....	46
7.1.3 Automatic Equalized Charging	47
7.1.4 Scheduled Equalized Charging	48
7.1.5 Pre-equalized Charging.....	49
7.2 Battery Current Limiting	49
7.3 Standard Battery Test.....	50
7.3.1 Starting a Test	50
7.3.2 Terminating a Test.....	51
7.3.3 Viewing Test Records	52
7.4 Short Battery Test	53
7.4.1 Starting a Test	53
7.4.2 Terminating a Test.....	54
7.4.3 Viewing Test Records	54
7.5 Battery Temperature Compensation.....	55
7.6 Battery High Temperature Protection	56
7.7 Low Voltage Disconnection Protection.....	58
7.8 Battery Imbalance Detection	61
7.8.1 Battery Middle Point Voltage.....	61
7.8.2 Battery String Current Imbalance Detection.....	62
7.9 Battery Imbalance Detection	63
7.9.1 Battery Imbalance Detection over an Intelligent Battery Detector	63
7.9.2 Battery Imbalance Detection in Non-Intelligent Mode.....	66
7.10 Battery Capacity Calculation	69
7.11 Intelligent Battery Hibernation	71
8 Rectifier Management.....	73
8.1 Rectifier Power-on/off Control	73
8.2 Rectifier Output Voltage and Current Limiting.....	73
8.3 Rectifier Output Voltage	74
8.4 Sequential Rectifier Startup (Optional).....	75
9 Energy Conservation Management	76
9.1 Intelligent Rectifier Hibernation	76
10 Temperature Control Management (Optional)	78
10.1 Heat Exchanger+Direct Ventilation Unit	78
10.1.1 Monitoring Information	78
10.1.2 Setting the Control Mode and Parameters	79
10.1.3 Setting the Alarm Threshold	80
10.2 Heat Exchange and TEC	80
10.2.1 Monitoring Information	80
10.2.2 Setting the Control Mode and Parameters	81
10.2.3 Setting the Alarm Threshold	82

11 D.G. Management (Optional)	84
11.1 D.G. Management Mode	84
11.2 Power Limitation Management.....	84
12 Maintenance Operation	86
12.1 Viewing Information	86
12.1.1 Viewing System Operating Information	86
12.1.2 Viewing Rectifier Operating Information	87
12.2 Upgrading Software.....	88
12.2.1 Viewing Version Information.....	88
12.2.2 Upgrading Configuration Software.....	88
12.3 Managing System Configuration File	89
12.4 Restarting the SMU02B	89
12.5 Managing Users	90
12.6 Setting the Date and Time.....	91
12.7 Downloading Historical Data	91
12.8 Exporting Electronic Labels	91
13 Alarms Handling.....	92
13.1 Setting Alarm Parameters	92
13.2 Querying Active Alarms	92
13.3 Configuring and Cancelling the Alarm Tone	92
13.3.1 Configuring Alarm Tones	92
13.3.2 Cancelling the Alarm Tone	93
13.4 Managing Historical Alarms	93
13.4.1 Viewing Historical Alarms.....	93
13.4.2 Exporting Historical Alarms	94
13.4.3 Cleaning Historical Alarms	94
13.5 Alarm Description.....	94
14 LCD Menu Hierarchy	104
A Technical Specifications	120
B Acronyms and Abbreviations	121

Figures

Figure 1-1 SMU02B	1
Figure 1-2 UIM02C	2
Figure 1-3 UIM02C	2
Figure 1-4 Typical network diagram for the SMU02B	3
Figure 1-5 Connections between an SMU02B, an extension UIM, and a system interface board	4
Figure 1-6 UIM02D ports	5
Figure 2-1 SMU02B panel	8
Figure 2-2 Pins of the RJ45 port	10
Figure 3-1 Installing the SMU02B	11
Figure 4-1 LCD menu hierarchy	12
Figure 4-2 Selecting a display language	14
Figure 5-1 Canceling proxy server settings	16
Figure 5-2 Compatibility View button	16
Figure 5-3 Internet Explorer security	17
Figure 5-4 Set Internet Explorer security 1	18
Figure 5-5 Set Internet Explorer security 2	18
Figure 5-6 Set Internet Explorer security 3	19
Figure 5-7 Set Internet Explorer security 4	19
Figure 5-8 Login page	20
Figure 5-9 System Overview	21
Figure 5-10 Active Alarm	21
Figure 5-11 Running Information	22
Figure 5-12 Running Parameter (1)	22
Figure 5-13 Running Parameter (2)	23
Figure 5-14 Running Parameter (3)	23
Figure 5-15 Running Control	24

Figure 5-16 Running Information	24
Figure 5-17 Running Parameter	25
Figure 5-18 Running Control	25
Figure 5-19 Running Information	26
Figure 5-20 Running Information	26
Figure 5-21 Running Parameter (1).....	27
Figure 5-22 Running Parameter (2).....	27
Figure 5-23 Running Parameter (3).....	28
Figure 5-24 Running Parameter (4).....	28
Figure 5-25 Running Control	29
Figure 5-26 Running Information	29
Figure 5-27 Running Information	30
Figure 5-28 Running Parameter	30
Figure 5-29 Running Information	31
Figure 5-30 Running Parameter	31
Figure 5-31 Running Control	32
Figure 5-32 Historical	32
Figure 5-33 Performance Data	33
Figure 5-34 Operation Log.....	33
Figure 5-35 Battery Test Records	34
Figure 5-36 Export	34
Figure 5-37 Alarm Parameters.....	35
Figure 5-38 Reserved Digital Input.....	36
Figure 5-39 Time	36
Figure 5-40 Configuration File.....	37
Figure 5-41 Monitoring IP Addr.....	37
Figure 5-42 SNMP	38
Figure 5-43 NetEco	38
Figure 5-44 Serial Port Settings	39
Figure 5-45 Site Settings	39
Figure 5-46 Software Upgrade	40
Figure 5-47 Version Information	40
Figure 5-48 E-label.....	41

Figure 5-49 User Management	41
Figure 5-50 Fault Information	42
Figure 7-1 Battery Test Records	52
Figure 7-2 Battery Test Records	55
Figure 7-3 Conceptual diagram	58
Figure 7-4 Conceptual diagram for detecting the voltage at the middle point of a battery string	62
Figure 7-5 Changing the protocol type	65
Figure 7-6 Running Information	65
Figure 7-7 Running Parameter	66
Figure 7-8 Cable connections	67
Figure 7-9 Modifying the mode for detecting battery voltages	68
Figure 7-10 Battery operating information	71
Figure 9-1 R4850G1 efficiency curve	76
Figure 11-1 Signal cable connections between the D.G. and the UIM02D	85
Figure 12-1 Configuration file operation page	89

Tables

Table 1-1 SMU02B functions	7
Table 2-1 Indicator description	9
Table 2-2 Communications port description	9
Table 2-3 FE port pin definition	10
Table 2-4 RS485 or RS232 port pin definition	10
Table 4-1 Button description	14
Table 5-1 User rights	42
Table 6-1 Basic parameters	43
Table 6-2 Scenario with one shunt connecting to one battery string	43
Table 7-1 Float charging parameter description	46
Table 7-2 Equalized charging parameter description	47
Table 7-3 Automatic equalized charging parameter description	47
Table 7-4 Scheduled equalized charging parameter description	48
Table 7-5 Pre-equalized charging parameter description	49
Table 7-6 Parameter description for battery current limiting	49
Table 7-7 Test method description	50
Table 7-8 Parameter description for mains failure tests	50
Table 7-9 Parameter description for cyclic tests and plan tests	51
Table 7-10 Parameter description for manually starting a battery test	51
Table 7-11 Parameter description for automatically terminating a battery test	51
Table 7-12 Parameter description for manually terminating a battery test	52
Table 7-13 Parameter description for automatic short battery tests	53
Table 7-14 Parameter description for manual short battery tests	53
Table 7-15 Parameter description for automatic short battery tests	54
Table 7-16 Parameter description for manual short battery tests	54
Table 7-17 Parameter description for battery temperature compensation	56

Table 7-18 Battery high temperature protection description.....	56
Table 7-19 Parameter description for high battery temperature protection.....	57
Table 7-20 Description of low voltage disconnection modes	58
Table 7-21 Low voltage disconnection description	59
Table 7-22 Parameter description for battery middle point voltage detection	62
Table 7-23 Parameter description for automatic short battery tests	63
Table 7-24 Battery voltage detection parameter description.....	64
Table 7-25 Battery voltage detection parameter description.....	67
Table 7-26 Battery capacity calculation parameter description	69
Table 7-27 Battery status parameter description.....	70
Table 7-28 Intelligent battery hibernation parameters	71
Table 8-1 Parameter descriptions for rectifier power-on/off control.....	73
Table 8-2 Parameter description for rectifier output control.....	74
Table 8-3 Parameter description for rectifier overvoltage protection	74
Table 8-4 The parameter description of sequential rectifier startup.....	75
Table 9-1 Parameter description for intelligent rectifier hibernation	77
Table 10-1 Parameter description for the integrated cabinet with a heat exchanger and direct ventilation unit ..	78
Table 10-2 Control mode	79
Table 10-3 Control parameter description	79
Table 10-4 Alarm threshold	80
Table 10-5 Running information about the temperature control device group	80
Table 10-6 Running information about the fan group.....	81
Table 10-7 TEC running information	81
Table 10-8 Control mode	81
Table 10-9 Control parameter description	82
Table 10-10 TEC control parameter description	82
Table 10-11 Alarm threshold	82
Table 10-12 TEC alarm threshold parameter description	83
Table 11-1 D.G. management mode parameter description	84
Table 11-2 Parameter description for D.G. power limitation management	85
Table 12-1 System information description	86
Table 12-2 Rectifier information	87
Table 12-3 System configuration management mode	89

Table 12-4 User right description	90
Table 13-1 Parameter description for configuring alarm tones.....	93
Table 13-2 Parameter description for configuring alarm tones.....	93
Table 13-3 Power System Alarm Settings	94
Table 13-4 Rectifier Alarm Settings	97
Table 13-5 Rectifier Group Alarm Settings	97
Table 13-6 Battery Summary Alarm Settings	98
Table 13-7 Battery Strings Alarm Settings	101
Table 13-8 Cooling Device Group Alarm Settings (applicable to the system configured with a cooling device that needs to be controlled by the SMU02B)	101
Table 13-9 Fan Group Alarm Settings (applicable to the power system configured with fan)	101
Table 13-10 TCU Alarm Settings (applicable to the power system configured with TEC)	102
Table 13-11 Batt. Cell Detector Alarm Settings (applicable to the power system configured with Batt. cell detector)	102
Table 14-1 Running Information menu hierarchy.....	104
Table 14-2 Setting Wizard menu hierarchy	107
Table 14-3 Parameters Settings menu hierarchy.....	107
Table 14-4 Running Control menu hierarchy	118
Table A-1 Technical Specifications	120

1 Overview

1.1 Appearance

The SMU02B can monitor and manage all Huawei box-type and cabinet-type power systems. The user interface module UIM02C or UIM02D can be configured to provide 6 dry contact inputs and 8 or 12 dry contact outputs. [Figure 1-1](#) shows an SMU02B, [Figure 1-2](#) shows a UIM02C, and [Figure 1-3](#) shows a UIM02D.

Figure 1-1 SMU02B



Figure 1-2 UIM02C



Figure 1-3 UIM02C



1.2 Network Diagrams

The SMU02B performs comprehensive battery and rectifier management functions, and connects to sensors over a user interface module (UIM) to monitor the operating environment for the power system in real time.

Figure 1-4 shows a typical network diagram for the SMU02B. Figure 1-5 shows the connections between an SMU02B, a UIM, and a system interface board. An SMU02B can connect to a UIM02D or UIM02C, and Figure 1-6 describes the ports on the UIM02D.

NOTE

The figures are for reference only. The hardware and software configurations depend on the power system type.

Figure 1-4 Typical network diagram for the SMU02B

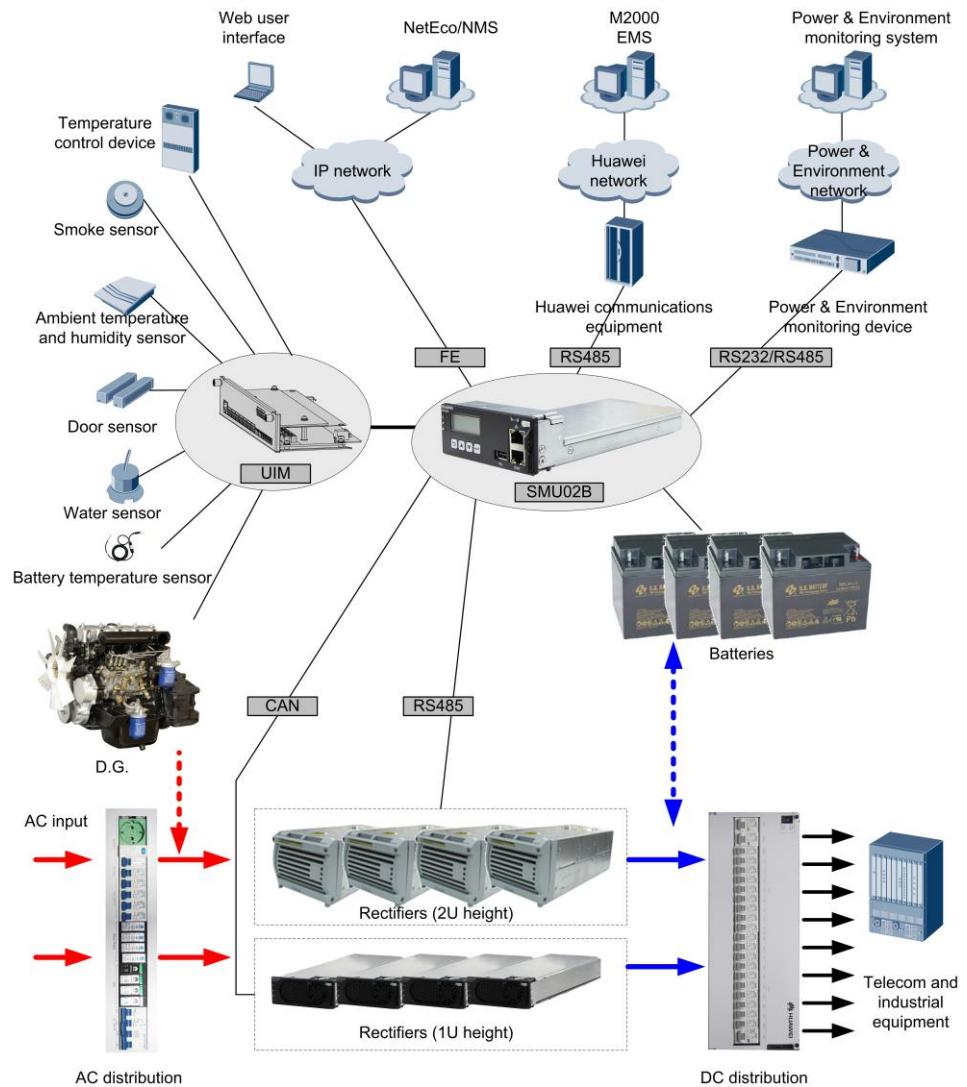


Figure 1-5 Connections between an SMU02B, an extension UIM, and a system interface board

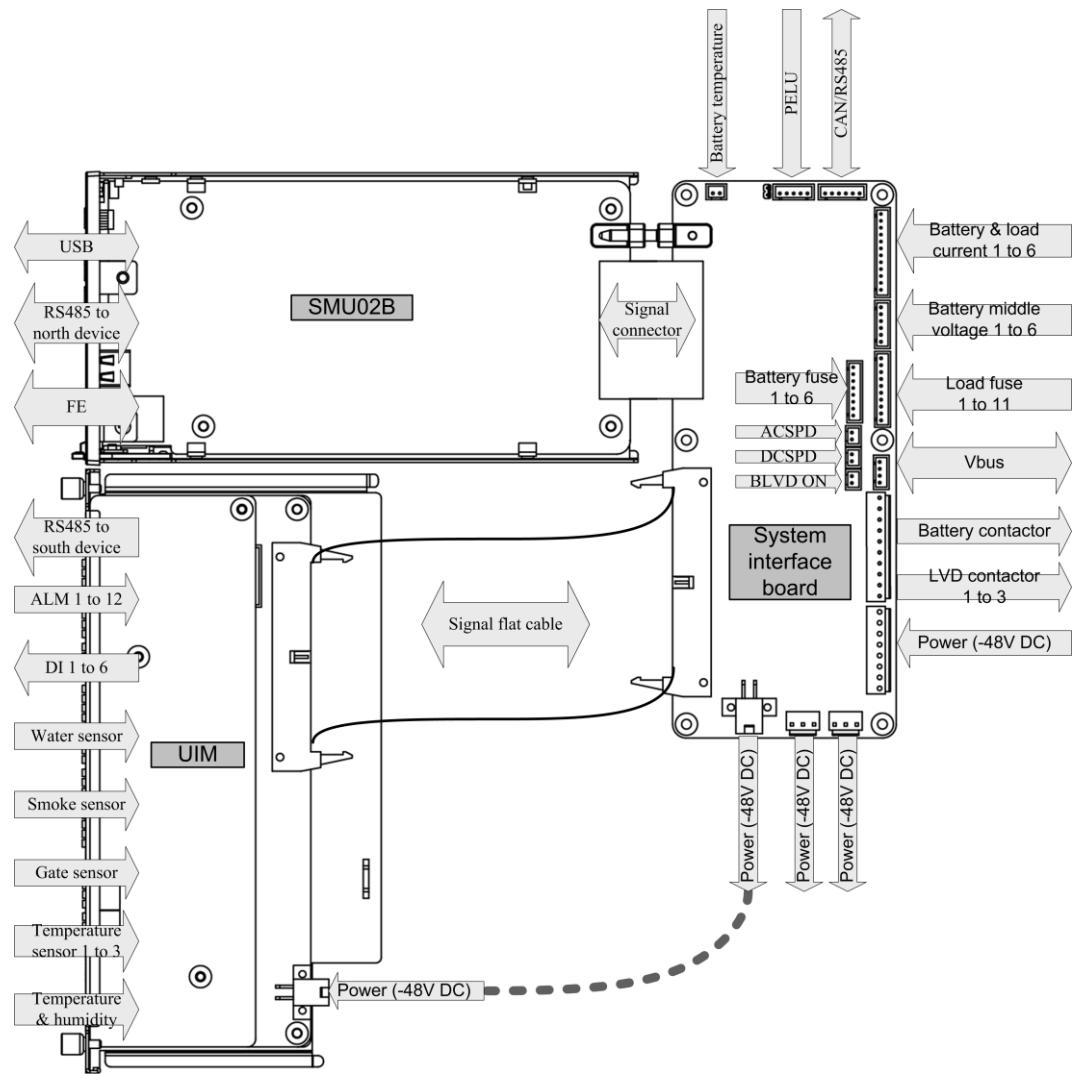


Figure 1-6 UIM02D ports



1.3 Features

- Battery management

The SMU02B manages battery charge and discharge to improve the battery backup time and prolong the battery lifespan.
- Rectifier management
 - The SMU02B displays rectifier running information in real time.
 - The SMU02B manages rectifier voltage adjustment, current limiting, power-on/off, hibernation, and alarms.

- The SMU02B support the NMS (over SNMP), NetEco (over Bin), and EMS (over HTTP).
- Software upgrade

The SMU02B and rectifier software can be upgraded by means such as the WebUI, M2000, and NetEco.
- Performance data recording

The SMU02B records critical performance data such as the ambient temperature, DC output voltage, and DC output power for the power system. You can view and export the data on the WebUI.
- Temperature control and management

The SMU02B interacts with temperature control devices to control and manage the cabinet ambient temperature to prolong equipment service life.
- D.G. management

The SMU02B starts or shuts down the D.G. based on the remaining battery capacity to ensure normal power supply and improve the D.G. fuel-to-electricity efficiency.
- Hierarchical disconnection management

The SMU02B disconnects secondary loads before primary loads based on load importance to prolong the power backup time for primary loads.
- E-label reading

You can use the WebUI to view e-labels for various components in the power system to facilitate asset management.
- Alarm management
 - The SMU02B generates critical, major, minor, and warning alarms.
 - The SMU02B supports 50,000 historical alarms.
 - The SMU02B supports 1000 active alarms.
 - You can enable or disable alarm generation and configure alarm severities, association with dry contacts, and alarm delay time in real time.
 - Alarms can be provided by the buzzer or lamp.
- Environment monitoring

The SMU02B checks for internal and external environment factors such as the ambient temperature, ambient humidity, battery temperature, door status, water leak, and smoke, and reports an alarm when detecting an exception.
- Power distribution signal monitoring

The SMU02B checks power distribution for system voltage, signal-phase or three-phase AC voltage, load fuse, battery fuse, and battery availability in real time, and reports an alarm when detecting an exception.
- Multi-language support

The LCD and WebUI support English, Chinese, Italian, French, Spanish, Portuguese, Russian. The default language is English.
- The SMU02B is hot swappable.

1.4 Functions

Table 1-1 describes the SMU02B functions.

Table 1-1 SMU02B functions

Category	Function
Battery management	Boost and float charging management
	Test management
	Current limiting management
	Temperature compensation management
	High temperature protection
	Low voltage disconnection (BLVD) protection
	Imbalance detection
	Remaining battery capacity monitoring and backup time calculation
Rectifier management	Intelligent battery hibernation
	Operating status
	Power-on/off control
	Output voltage and current limits
	Overshoot protection reset (only for CAN-type rectifier)
Energy saving	Sequential rectifier startup (only for CAN-type rectifier)
	Intelligent rectifier hibernation
Detection	AC voltage, AC current, and AC frequency
	Direct current (DC) voltage
	Total load current
	Battery current and temperature
	Ambient temperature and humidity
Intelligent temperature management	Controlling and managing the ambient temperatures for cabinets over temperature control devices

2 Panel and Ports

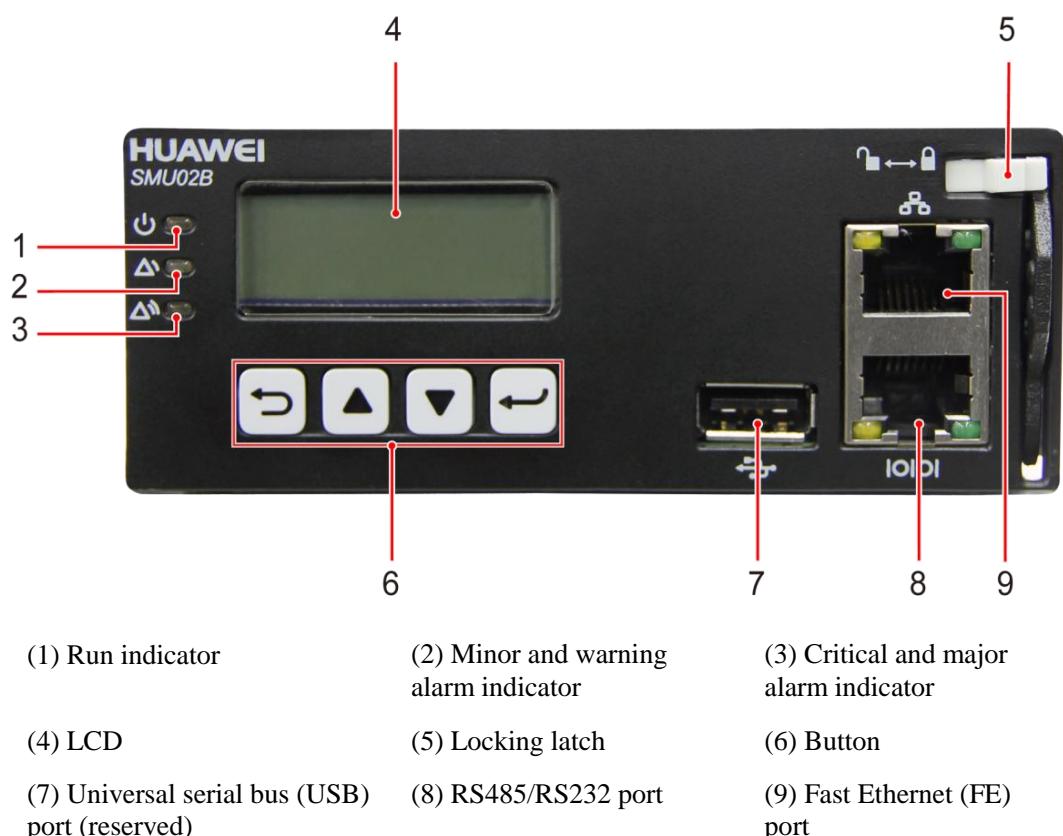
Panel



All ports in this manual are protected by a security mechanism.

Figure 2-1 shows an SMU02B panel.

Figure 2-1 SMU02B panel



Indicators

Table 2-1 describes the SMU02B indicators.

Table 2-1 Indicator description

Indicator	Color	Status	Description
Run indicator	Green	Off	The SMU02B is faulty or has no power supply.
		Blinking at 0.5 Hz	The SMU02B is running properly and communicating with the host normally.
		Blinking at 4 Hz	The SMU02B is running properly but communication with the host is faulty.
Minor and warning alarm indicator	Yellow	Off	No minor or warning alarm is generated.
		Steady on	A minor or warning alarm is generated.
Critical and major alarm indicator	Red	Off	No critical or major alarm is generated.
		Steady on	A critical or major alarm is generated.

LCD

The SMU02B provides a 128 x 48 pixel LCD with white backlight to display power system information. The view region is 34.54 mm x 11.02 mm.

USB Port

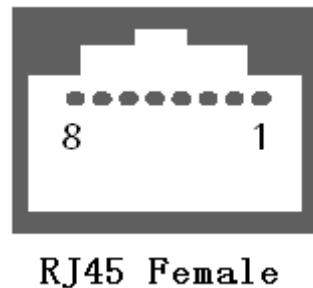
The USB port is reserved in this version.

Communications Ports

The SMU02B provides two communications ports. Table 2-2 describes the ports.

Table 2-2 Communications port description

Communications Ports	Specifications	Protocol Compliance
FE port	10 M/100 M auto-adaptation	HTTPS, SNMP
RS485/RS232 port	Baud rate: 9600 bit/s	Huawei master/slave protocols

Figure 2-2 Pins of the RJ45 port**RJ45 Female****Table 2-3** FE port pin definition

Pin	Signal	Description
1	TX+	Sends data.
2	TX-	
3	RX+	Receives data.
6	RX-	
4, 5, 7, 8	N/A	—

Table 2-4 RS485 or RS232 port pin definition

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	Ground
8	N/A	—

3 Installation

3.1 Safety Precautions

To protect an SMU02B, wear electrostatic discharge (ESD) gloves when installing or replacing the SMU02B.

3.2 Installing the SMU02B

To install the SMU02B, perform the following steps:

1. Rotate the SMU02B knob anticlockwise and pull the handle.
2. Place the SMU02B into its slot in the power subsystem subrack and push the SMU02B until its front panel aligns with the front panel of the subrack.
3. Push the handle in position and rotate the knob clockwise to lock the handle, as shown in [Figure 3-1](#).

Figure 3-1 Installing the SMU02B



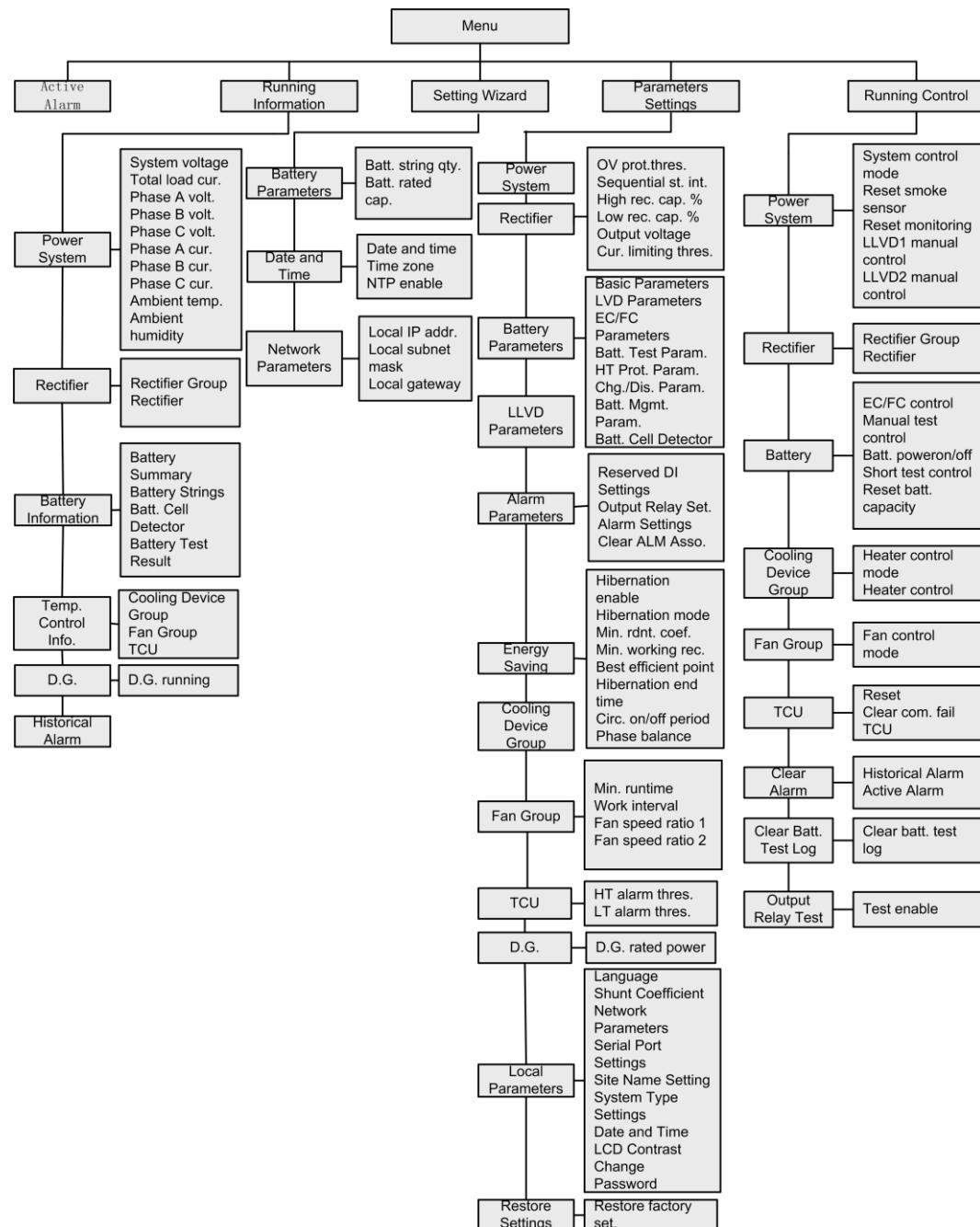
3.3 Removing the SMU02B

Rotate the SMU02B knob anticlockwise and pull the handle, take the SMU02B out of its slot.

4 LCD Operations

4.1 LCD Menu Hierarchy

Figure 4-1 LCD menu hierarchy



NOTE

The LCD menu hierarchy depends on the system configuration. The actual information displayed on the LCD prevails. For details about the LCD menus, see [14 LCD Menu Hierarchy](#).

4.2 Buttons

The SMU02B provides four buttons to set and query parameters. [Table 4-1](#) describes these buttons.

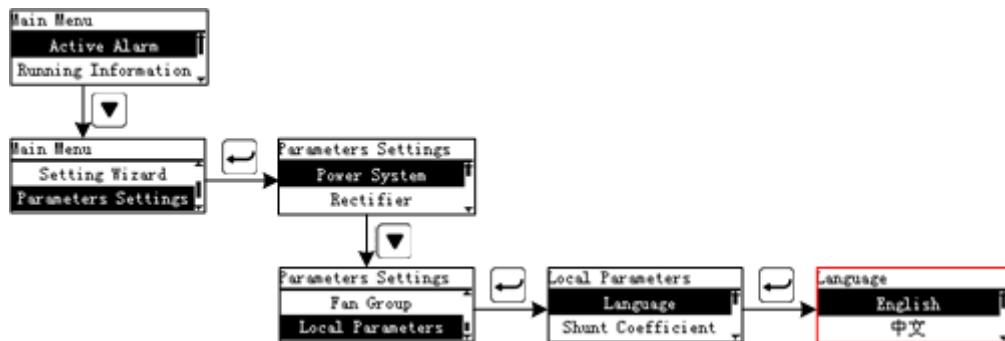
Table 4-1 Button description

Button	Name	Description
▲ or ▼	Arrow key	Allows you to view and set menu items.
	Cancel	Returns to the previous menu without saving the current menu settings.
	Enter	Enters the main menu from the standby screen, enters a submenu from the main menu, or saves menu settings.
NOTE:		
<ul style="list-style-type: none">The LCD screen becomes dark if no button is pressed within 30 seconds.You need to log in again if no button is pressed within 1 minute.The preset user name is <i>admin</i> and the preset password is <i>000001</i>.		

4.3 Display Language

After the SMU02B is powered on, the screen for selecting a display language is displayed. Select a language by pressing ▲ or ▼, and enter the standby screen by pressing Enter.

You can also set the display language by choosing **Main Menu** > **Parameters** > **Local Parameters** > **Language**, as shown in [Figure 4-2](#).

Figure 4-2 Selecting a display language

4.4 Password

You need a password to enter the **Setting Wizard**, **Parameters Settings** and **Running Control** menus. The preset user name is **admin** and the preset password is **000001**.

5 Web User Interface

5.1 Preparing for Login

Operating Environment

Operating system: Windows XP or later

Browser: Internet Explorer 8.0 or later, FireFox13 or later, Chrome20

Connecting the SMU02B to a Network

Connect the FE port on the SMU02B to a IP network.

Setting an IP Address, Subnet Mask, and Gateway

Set the IP address, subnet mask, and gateway for the SMU02B based on those assigned by the customer.

Setting a LAN



CAUTION

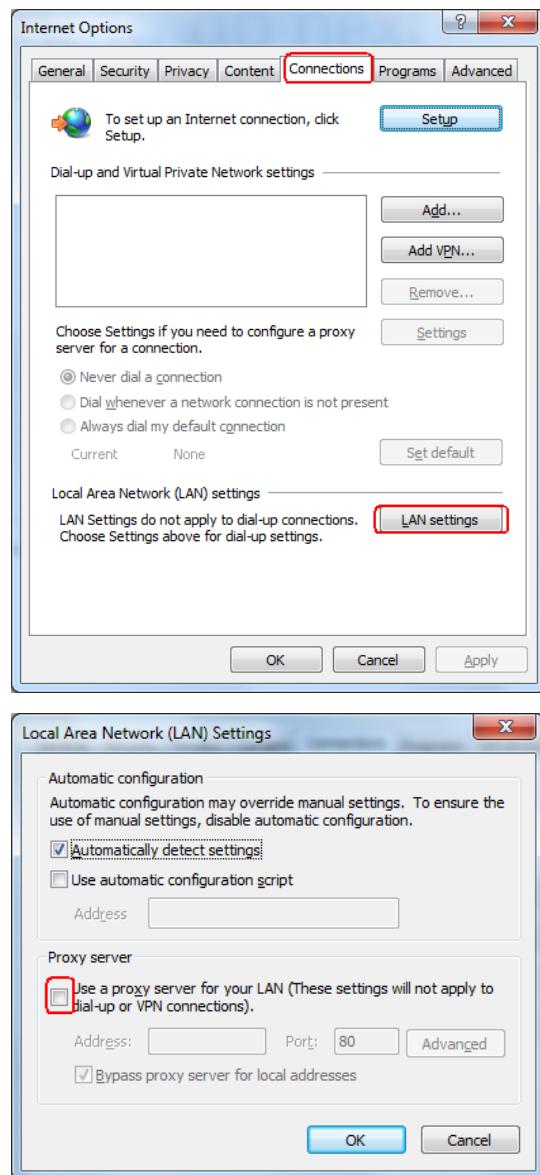
If the SMU02B has connected to a LAN and a proxy server has been selected, cancel the proxy server settings.

If the SMU02B has connected to the Internet but the computer has connected to a LAN, do not cancel the proxy server settings. Otherwise, you cannot access the SMU02B.

To cancel proxy server settings, perform the following steps:

1. Open Internet Explorer.
2. Choose **Tools > Internet Options**.
3. Click the **Connections** tab and then click **LAN settings**.
4. In the displayed dialog box, clear **Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections)**, as shown in [Figure 5-1](#).

Figure 5-1 Canceling proxy server settings

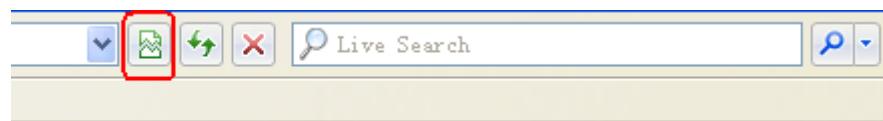


5. Click **OK**.

Setting Compatibility

To ensure the normal display on the WebUI, click **Compatibility View Button** shown in [Figure 5-2](#) to open compatibility view and set Internet Explorer 8.0.

Figure 5-2 Compatibility View button



Setting Internet Explorer Security



CAUTION

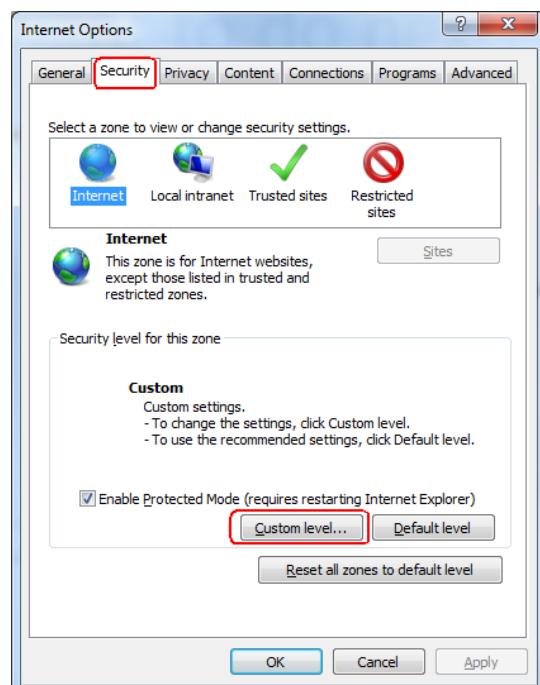
Set Internet Explorer security before you perform the following operations:

- Export historical logs, historical data, statistics, and battery test records.
- Upload system configuration files and energy saving configuration files.
- Download system configuration files and energy saving configuration files.
- Upgrade software.

To set Internet Explorer security, perform the following steps:

1. Open Internet Explorer.
2. Choose **Tools > Internet Options**.
3. Click the **Security** tab.
4. Click **Internet** and then click **Custom level** as shown in [Figure 5-3](#). After set **Internet**, please set **Local intranet** in the same method.

Figure 5-3 Internet Explorer security



5. Enable the following:
 - Allow previously unused ActiveX controls to run without prompt
 - Initialize and script ActiveX controls not marked as safe for scripting
 - Include local directory path when uploading files to a server
 - Automatic prompting for file downloads

Figure 5-4 Set Internet Explorer security 1

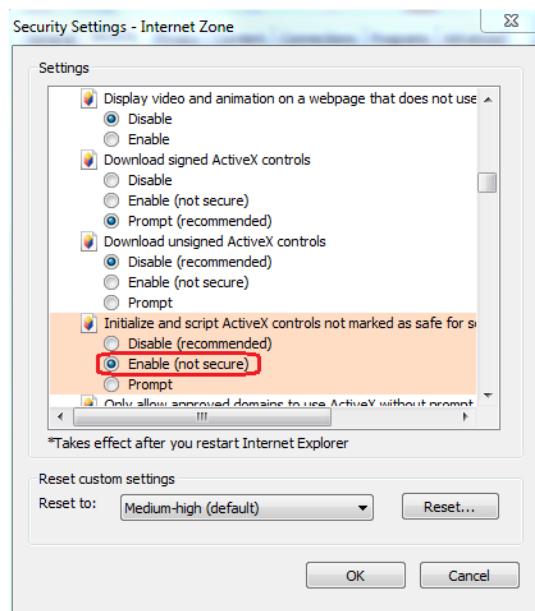


Figure 5-5 Set Internet Explorer security 2

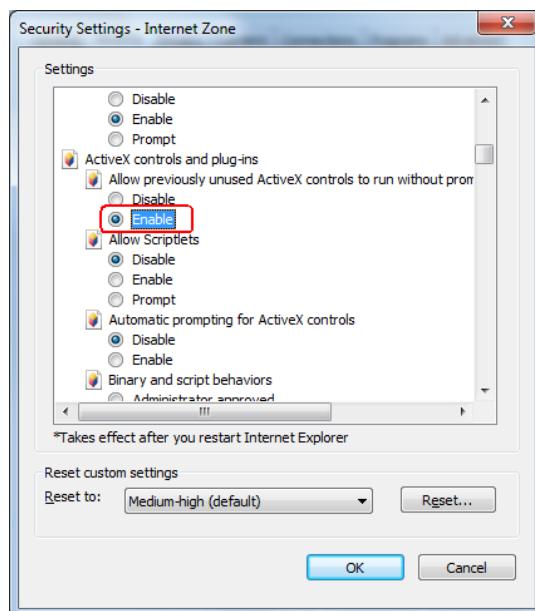


Figure 5-6 Set Internet Explorer security 3

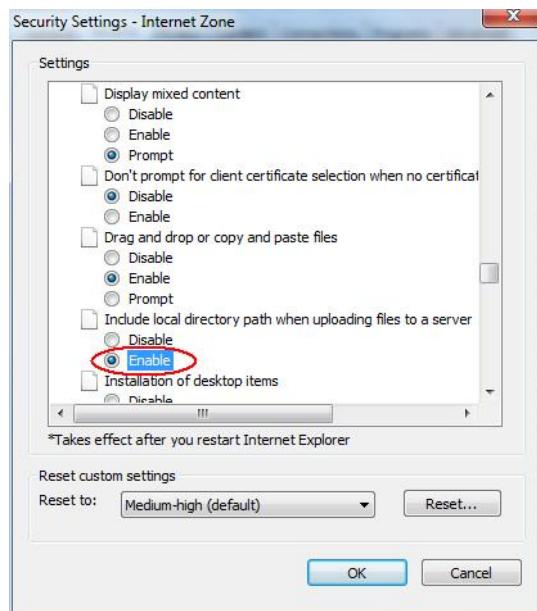
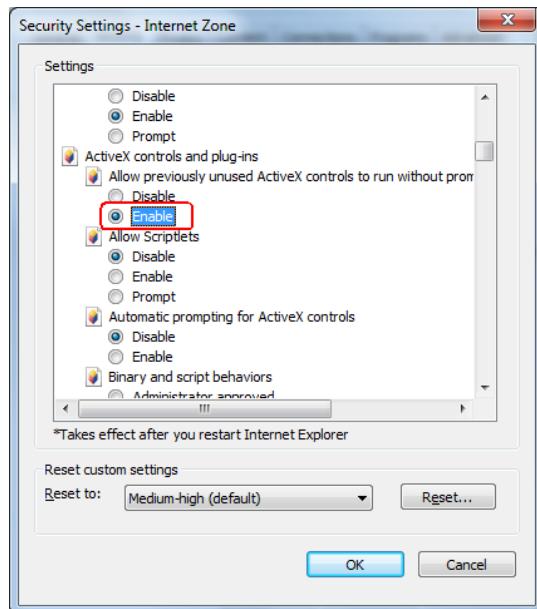


Figure 5-7 Set Internet Explorer security 4



6. Click **OK**.

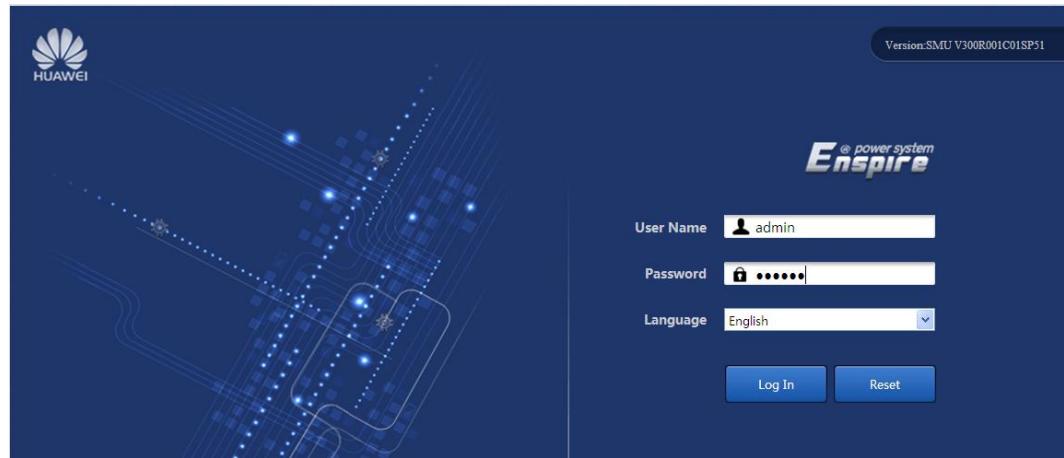
5.2 Logging In to the WebUI

NOTE

- Login to the WebUI through the Security Socket Layer (SSL) is supported to ensure data transfer security.
- The information displayed in Web interface depends on the system configuration. The actual information displayed on the WEB interface prevails.

1. Enter the IP address for the SMU02B in the address box of Internet Explorer.
The login page is displayed, as shown in [Figure 5-8](#).

Figure 5-8 Login page



Select a language from the drop-down list box of **Language**.

The WebUI can be displayed in English (by default), Chinese, Spanish, Italian, French, Portuguese and Russian.

2. Set **User Name** and **Password**.

The preset user name is **admin**, and the preset password is **000001**.

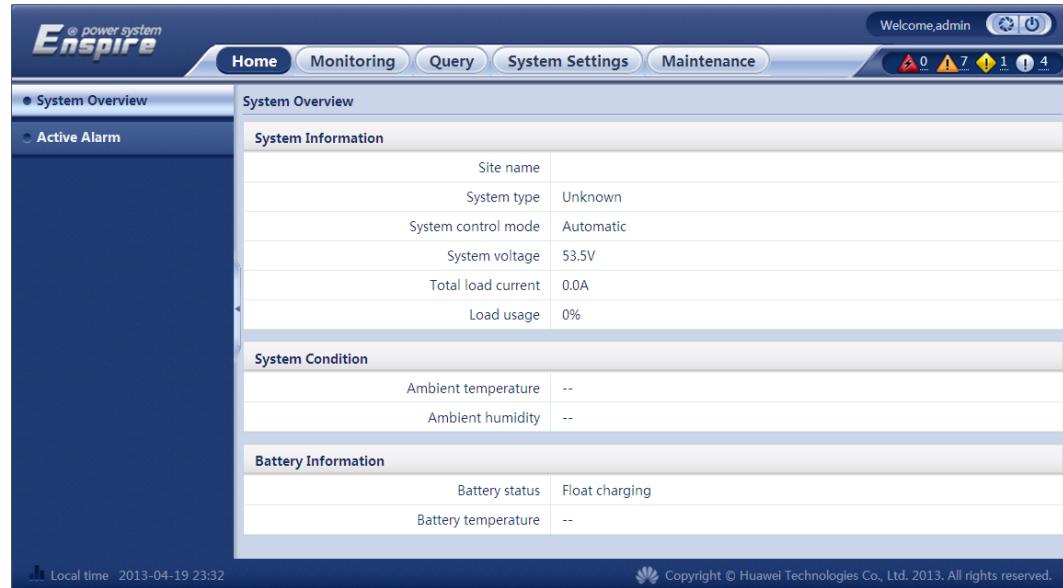
After logging in to the WebUI, you can add or delete users and change their passwords.

3. Click **Login**.

5.3 WebUI Operations

5.3.1 Home Page

The **Home** tab page contains the **System Overview** and **Active Alarm** panes.

Figure 5-9 System Overview**Figure 5-10** Active Alarm

The screenshot shows the 'Active Alarm' page of the Enspire power system. The top navigation bar is identical to Figure 5-9. The main content area displays a table titled 'Active Alarm Num:12' with columns for Equipment, SN, Severity, Equipment, Alarm Name, and Generation Time. The table lists 12 active alarms, including entries for Rectifier2, Fan Group, Cooling Device Group, and various temperature sensors. At the bottom of the table, there are buttons for 'Confirm' and 'Clear Alarm', and a pagination area indicating 1/1 page. The local time is shown as 2013-04-20 15:55, and the copyright notice for Huawei Technologies Co., Ltd. 2013 is present at the bottom right.

All	SN	Severity	Equipment	Alarm Name	Generation Time
<input type="checkbox"/>	13	Minor	Rectifier2	Rectifier Communication Failure	2013-04-17 17:39:32
<input type="checkbox"/>	12	Major	Fan Group	Fan 4 Fault	2013-04-17 17:22:27
<input type="checkbox"/>	11	Major	Fan Group	Fan 3 Fault	2013-04-17 17:22:27
<input type="checkbox"/>	10	Major	Fan Group	Fan 2 Fault	2013-04-17 17:22:27
<input type="checkbox"/>	9	Major	Fan Group	Fan 1 Fault	2013-04-17 17:22:27
<input type="checkbox"/>	8	Warning	Cooling Device Group	External Ambient Temperature Sensor Missing	2013-04-17 17:22:17
<input type="checkbox"/>	7	Major	Cooling Device Group	Return Air Temperature Sensor Missing	2013-04-17 17:22:17
				Battery Temperature	

5.3.2 Real-time Monitoring

The **Monitoring** tab page allows you to monitor and control the power system and its components, such as rectifiers, batteries, and temperature controllers in real time.

Monitoring Power System Information

After you click **Power System**, the **Running Information**, **Running Parameter**, and **Running Control** tabs are displayed in the right pane.

Figure 5-11 Running Information

The screenshot shows the 'Running Information' tab selected in the top navigation bar. The left sidebar lists categories like Power System, Rectifier Group, Battery Summary, Cooling Device Group, and Fan Group. The main content area displays a table of 10 signal parameters:

No.	Signal Name	Value	Unit
1	System voltage	53.5	V
2	Total load current	0.0	A
3	Phase A voltage	--	V
4	Phase B voltage	231.2	V
5	Phase C voltage	--	V
6	Phase A current	--	A
7	Phase B current	0.0	A
8	Phase C current	--	A
9	Ambient temperature	--	degC
10	Ambient humidity	--	%

At the bottom, it shows 'Local time 2013-04-20 16:07' and 'Copyright © Huawei Technologies Co., Ltd. 2013. All rights reserved.'

Figure 5-12 Running Parameter (1)

The screenshot shows the 'Running Parameter' tab selected in the top navigation bar. The left sidebar lists categories like Power System, Rectifier Group, Battery Summary, Cooling Device Group, and Fan Group. The main content area displays a table of 7 signal parameters with edit fields:

All	No.	Signal Name	Value	Unit	Setting Result
<input type="checkbox"/>	1	AC overvoltage threshold	280	↔ (60-300)	V
<input type="checkbox"/>	2	AC undervoltage threshold	180	↔ (60-300)	V
<input type="checkbox"/>	3	DC overvoltage threshold	58.0	↔ (53.0-60.0)	V
<input type="checkbox"/>	4	DC undervoltage threshold	45.0	↔ (35.0-57.0)	V
<input type="checkbox"/>	5	DC ultra overvoltage threshold	59.0	↔ (53.0-60.0)	V
<input type="checkbox"/>	6	DC ultra undervoltage threshold	44.0	↔ (35.0-57.0)	V
<input type="checkbox"/>	7	ALM1 alarm action	Close	<input type="button" value="▼"/>	

At the bottom, it shows 'Local time 2013-04-20 16:07' and 'Copyright © Huawei Technologies Co., Ltd. 2013. All rights reserved.'

Figure 5-13 Running Parameter (2)



Figure 5-14 Running Parameter (3)

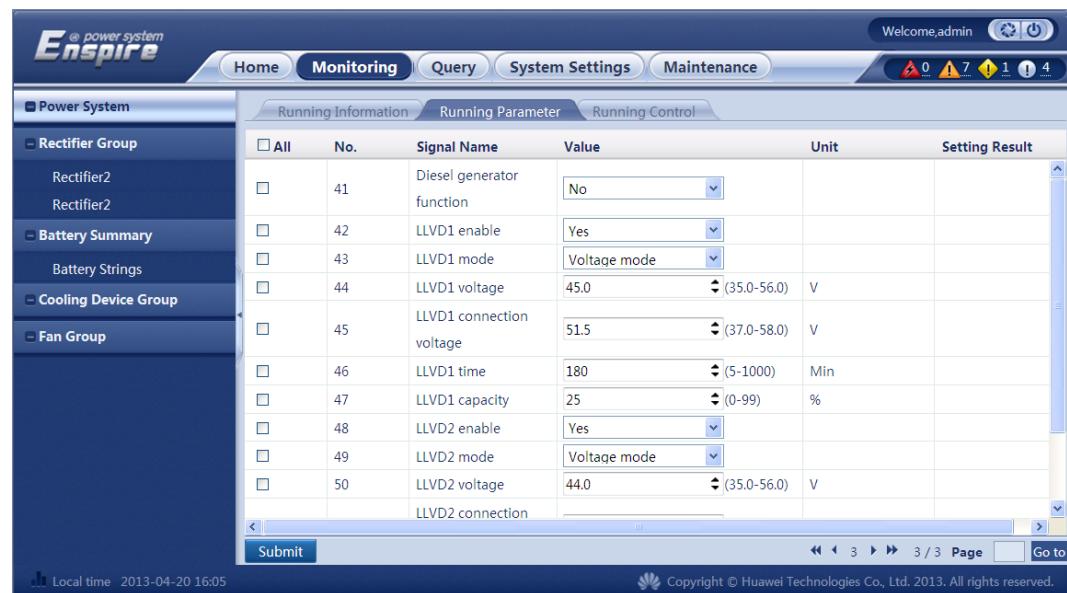
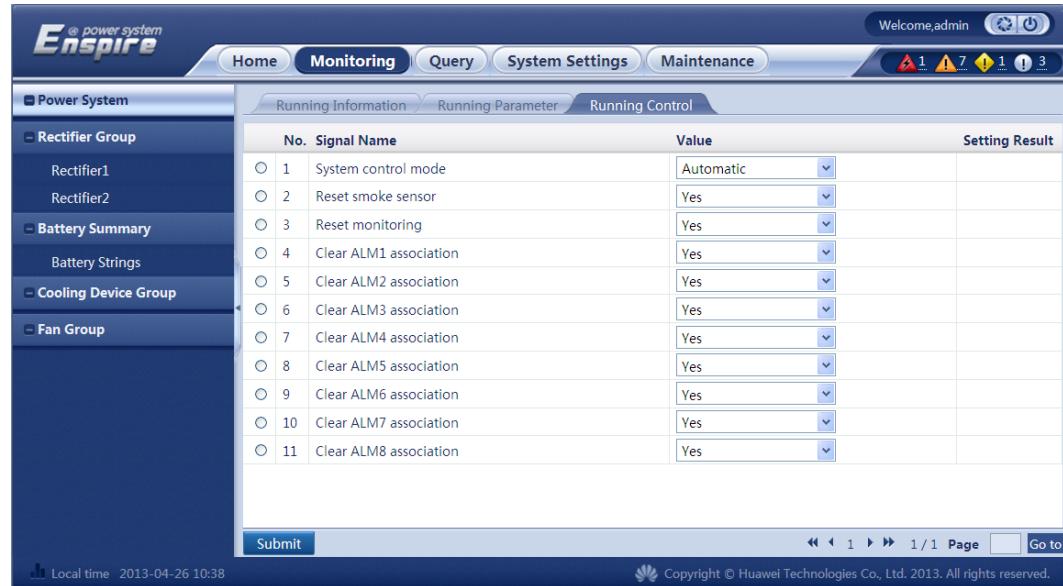


Figure 5-15 Running Control

Monitoring Common Rectifier Information

After you click **Rectifier Group**, the **Running Information**, **Running Parameter**, and **Running Control** tabs are displayed in the right pane.

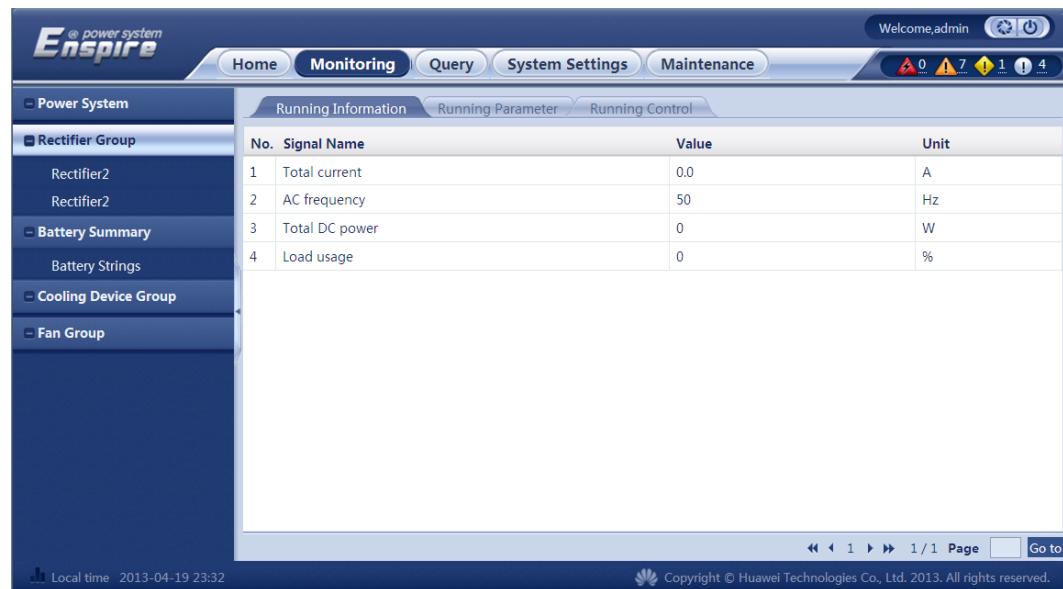
Figure 5-16 Running Information

Figure 5-17 Running Parameter

The screenshot shows the 'Running Parameter' tab selected within the 'Monitoring' section of the Enspire web interface. The left sidebar lists system components: Power System, Rectifier Group, Battery Summary, Cooling Device Group, and Fan Group. The main content area displays a table of running parameters:

All	No.	Signal Name	Value	Unit	Setting Result
	1	Overshoot protection threshold	59.5	± (58.5-60.5)	V
	2	Sequential start interval	0	± (0-20)	s
	3	Hibernation enable	No		
	4	Hibernation mode	Intelligent mode		
	5	Best efficient point	80	± (50-100)	%
	6	Min. working rectifier	2	± (1-100)	
	7	Circulation on/off period	7	± (1-365)	Day
	8	Phase balance	No		
	9	Min. redundant coefficient	0.20	± (0.05-1.00)	

Buttons at the bottom include 'Submit', 'Page' (1/1), and 'Go to'. The footer shows 'Local time 2013-04-19 23:31' and 'Copyright © Huawei Technologies Co., Ltd. 2013. All rights reserved.'

Figure 5-18 Running Control

The screenshot shows the 'Running Control' tab selected within the 'Monitoring' section of the Enspire web interface. The left sidebar lists system components: Power System, Rectifier Group, Battery Summary, Cooling Device Group, and Fan Group. The main content area displays a table of running controls:

No.	Signal Name	Value	Setting Result
1	Overshoot lock reset	Yes	
2	Clear communication fail rectifier	Yes	

Buttons at the bottom include 'Submit', 'Page' (1/1), and 'Go to'. The footer shows 'Local time 2013-04-19 22:10' and 'Copyright © Huawei Technologies Co., Ltd. 2013. All rights reserved.'

Monitoring Specific Rectifier Information

After you click Rectifier, the **Running Information**, **Running Parameter**, and **Running Control** tabs are displayed in the right pane. The **Running Parameter** and **Running Control** tab pages have no data.

Figure 5-19 Running Information

The screenshot shows the 'Running Information' tab selected in the top navigation bar. The left sidebar lists categories like Power System, Rectifier Group, Battery Summary, Cooling Device Group, Fan Group, and Batt. Cell Detector. Under 'Rectifier Group', 'Rectifier1' is selected. The main pane displays a table of running parameters:

No.	Signal Name	Value	Unit
1	Rated output current	52.0	A
2	Slot No.	1	
3	DC output voltage	53.5	V
4	Rectifier temperature	40.0	degC
5	DC output current	0.8	A
6	Power-on/off status	ON	
7	Hardware version	A	
8	Software version	V115	
9	Bar code	2102310FFADOCB000069	
10	DC output power	51	W
11	Phase No.	A	
12	AC voltage	229.3	V
13	Total runtime	394	H

Local time: 2013-04-19 17:28 Copyright © Huawei Technologies Co., Ltd. 2013. All rights reserved.

Monitoring Common Battery Information

After you click **Battery Summary**, the **Running Information**, **Running Parameter**, and **Running Control** tabs are displayed in the right pane.

Figure 5-20 Running Information

The screenshot shows the 'Running Information' tab selected in the top navigation bar. The left sidebar lists categories like Power System, Rectifier Group, Battery Summary, Cooling Device Group, and Fan Group. Under 'Battery Summary', it is selected. The main pane displays a table of running parameters:

No.	Signal Name	Value	Unit
1	Battery temperature	--	degC
2	Total battery current	0.0	A
3	Current limit status	No cur. limiting	
4	Test status	Not tested	
5	Battery status	Float charging	

Local time: 2013-04-19 23:42 Copyright © Huawei Technologies Co., Ltd. 2013. All rights reserved.

Figure 5-21 Running Parameter (1)

The screenshot shows the 'Running Parameter' tab of the Enspire power system monitoring interface. The left sidebar includes sections for Power System, Rectifier Group, Battery Summary, Cooling Device Group, and Fan Group. The main content area displays a table of running parameters:

No.	Signal Name	Value	Unit	Setting Result
1	Equalized charging voltage	56.4	42.0-58.3	V
2	Float charging voltage	53.5	42.0-58.3	V
3	Current limiting coefficient	0.15	0.05-0.25	C10
4	Overshoot coefficient	0.25	0.05-0.50	C10
5	Temperature compensation coefficient	80	0-500	mV/degC
6	Nominal temperature	25	5-45	degC
7	Temperature compensation upper	45	40-45	degC

At the bottom, there is a 'Submit' button and navigation links for page 1/4.

Figure 5-22 Running Parameter (2)

The screenshot shows the 'Running Parameter' tab of the Enspire power system monitoring interface. The left sidebar includes sections for Power System, Rectifier Group, Battery Summary, Cooling Device Group, and Fan Group. The main content area displays a table of running parameters:

No.	Signal Name	Value	Unit	Setting Result
21	Max. current difference	0.05	0.00-1.00	C10
22	AC fall test enable	No		
23	Time test mode	Disable		
24	Constant current test	No		
25	BLVD enable	Yes		
26	BLVD mode	Voltage mode		
27	BLVD voltage	43.2	35.0-56.0	V
28	BLVD time	480	5-1000	Min
29	BLVD capacity	5	0-99	%
30	BLVD reconnect voltage	51.5	37.0-58.0	V
31	Charge efficiency	0.80	0.80-1.00	

At the bottom, there is a 'Submit' button and navigation links for page 2/4.

Figure 5-23 Running Parameter (3)

The screenshot shows the 'Running Parameter' tab of the Enspire power system interface. The left sidebar includes sections for Power System, Rectifier Group, Battery Summary (selected), Cooling Device Group, and Fan Group. The main content area displays a table of running parameters:

No.	Signal Name	Value	Unit	Setting Result
41	Discharge curve point 8 current	0.30	(0.01-2.00)	C10
42	Discharge curve point 9 current	0.20	(0.01-2.00)	C10
43	Discharge curve point 10 current	0.10	(0.01-2.00)	C10
44	Discharge curve point 11 current	0.05	(0.01-2.00)	C10
45	Discharge curve point 1 time	21.0	(1.0-6000.0)	Min
46	Discharge curve point 2 time	25.2	(1.0-6000.0)	Min
	Discharge curve point			

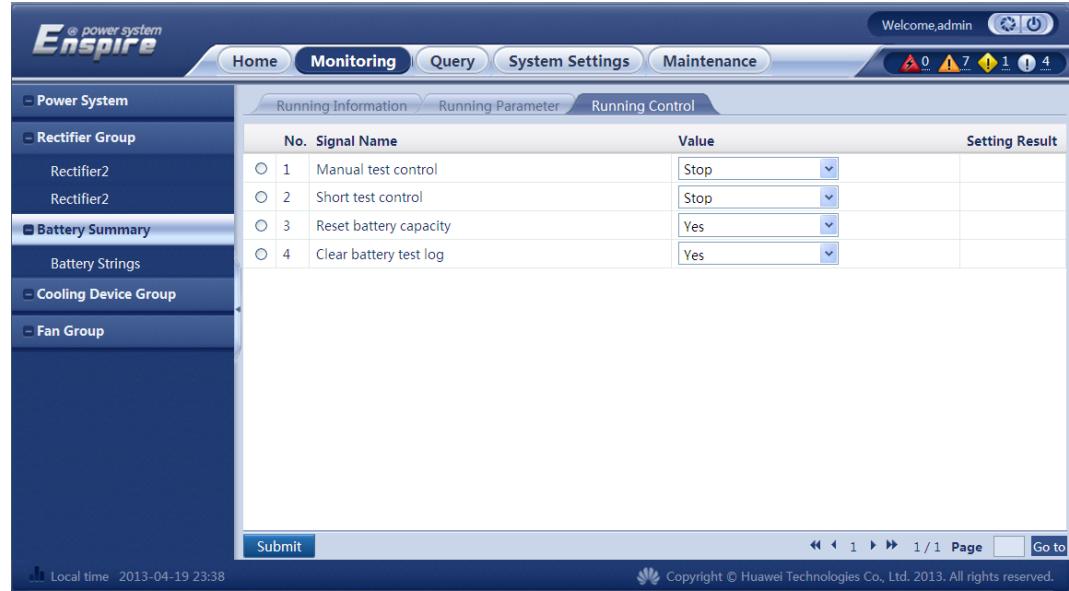
At the bottom, there is a 'Submit' button and a page navigation bar showing '3 / 4 Page'.

Figure 5-24 Running Parameter (4)

The screenshot shows the 'Running Parameter' tab of the Enspire power system interface. The left sidebar includes sections for Power System, Rectifier Group, Battery Summary (selected), Cooling Device Group, and Fan Group. The main content area displays a table of running parameters:

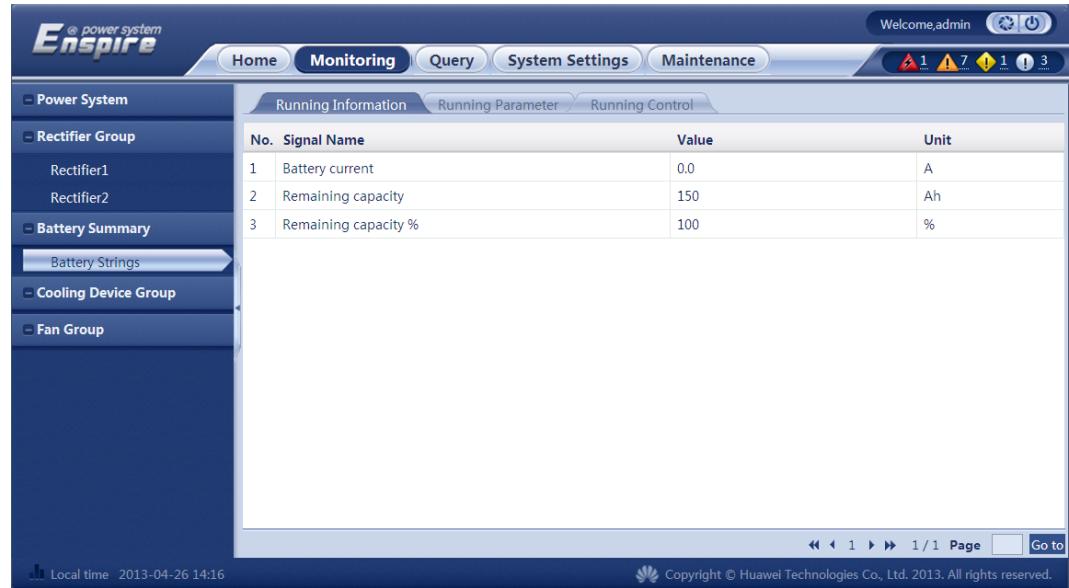
No.	Signal Name	Value	Unit	Setting Result
61	Very low temperature alarm threshold	-20	(-20-20)	degC
62	Equalized charging protection time	16	(5-48)	H
63	Stable equalized charging current	0.01	(0.01-0.25)	C10
64	Stable equalized charging time	30	(2-540)	Min
65	Automatic equalized charging enable	Yes		
66	Equalized charging transfer current coefficient	0.05	(0.01-0.25)	C10

At the bottom, there is a 'Submit' button and a page navigation bar showing '4 / 4 Page'.

Figure 5-25 Running Control

Monitoring Battery String Information

After you click **Battery Strings**, the **Running Information**, **Running Parameter**, and **Running Control** tabs are displayed in the right pane. The **Running Parameter** and **Running Control** tab pages have no data because their contents are included in **Battery Summary**.

Figure 5-26 Running Information

Monitoring Information About Temperature Control Device Groups

After you click **Cooling Device Group**, the **Running Information**, **Running Parameter**, and **Running Control** tabs are displayed in the right pane. The **Running Control** tab page has no data.

Figure 5-27 Running Information

The screenshot shows the Enspire web interface with the 'Monitoring' tab selected. On the left, a navigation tree includes 'Power System', 'Rectifier Group', 'Battery Summary', 'Cooling Device Group' (which is currently selected), and 'Fan Group'. The main content area displays a table titled 'Running Information' with three columns: 'No.', 'Signal Name', 'Value', and 'Unit'. Two rows are listed: '1 Return air vent temperature' with value '--' and unit 'degC', and '2 External ambient temperature' with value '--' and unit 'degC'. At the bottom, there are navigation buttons for 'Page' and 'Go to'.

Figure 5-28 Running Parameter

The screenshot shows the Enspire web interface with the 'Monitoring' tab selected. The navigation tree on the left is identical to Figure 5-27. The main content area displays a table titled 'Running Parameter' with columns: 'All', 'No.', 'Signal Name', 'Value', 'Unit', and 'Setting Result'. There are seven rows, each with a checkbox in the 'All' column. The parameters listed are: 'Test mode' (Value: No), 'Manual-to-automatic time' (Value: 600, Unit: s), 'Temperature control mode' (Value: Intelligent mode), 'Return air temperature sensor' (Value: Yes), 'External temperature sensor' (Value: Yes), 'High temperature alarm threshold' (Value: 68, Unit: degC), and 'High temperature alarm clear threshold' (Value: 65, Unit: degC). A 'Submit' button is at the bottom left, and navigation buttons for 'Page' and 'Go to' are at the bottom right.

Monitoring Fan Group Information

After you click **Fan Group**, the **Running Information**, **Running Parameter**, and **Running Control** tabs are displayed in the right pane.

Figure 5-29 Running Information

The screenshot shows the Enspire web interface with the 'Monitoring' tab selected. On the left, a navigation tree includes 'Power System', 'Rectifier Group', 'Battery Summary', 'Cooling Device Group', and 'Fan Group'. The 'Fan Group' node is expanded, showing 'Rectifier2' and 'Rectifier2'. The main content area displays a table titled 'Running Information' with the following data:

No.	Signal Name	Value	Unit
1	Fan 1 speed	0	RPM
2	Fan 1 status	Faulty	
3	Fan 2 speed	0	RPM
4	Fan 2 status	Faulty	
5	Fan 3 speed	0	RPM
6	Fan 3 status	Faulty	
7	Fan 4 speed	0	RPM
8	Fan 4 status	Faulty	

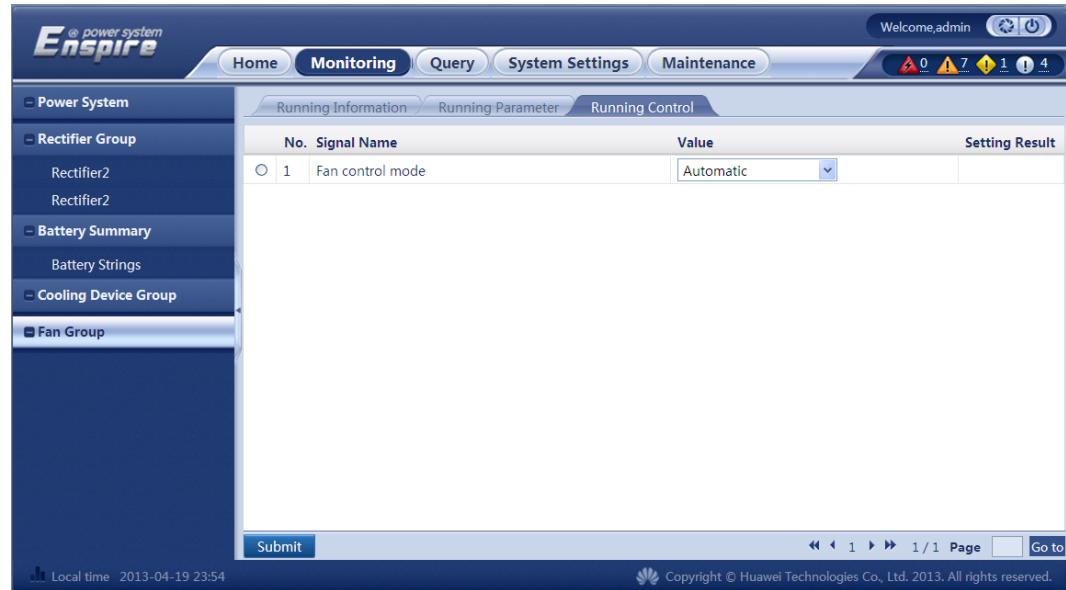
At the bottom, it says 'Local time 2013-04-19 23:55' and 'Copyright © Huawei Technologies Co., Ltd. 2013. All rights reserved.'

Figure 5-30 Running Parameter

The screenshot shows the Enspire web interface with the 'Monitoring' tab selected. The left navigation tree is identical to Figure 5-29. The main content area displays a table titled 'Running Parameter' with the following data:

All	No.	Signal Name	Value	Unit	Setting Result
<input type="checkbox"/>	1	Min. runtime	180	⌚ (0-60000)	s
<input type="checkbox"/>	2	Work interval	30	⌚ (0-60000)	s

At the bottom, there is a 'Submit' button, and it says 'Local time 2013-04-19 23:54' and 'Copyright © Huawei Technologies Co., Ltd. 2013. All rights reserved.'

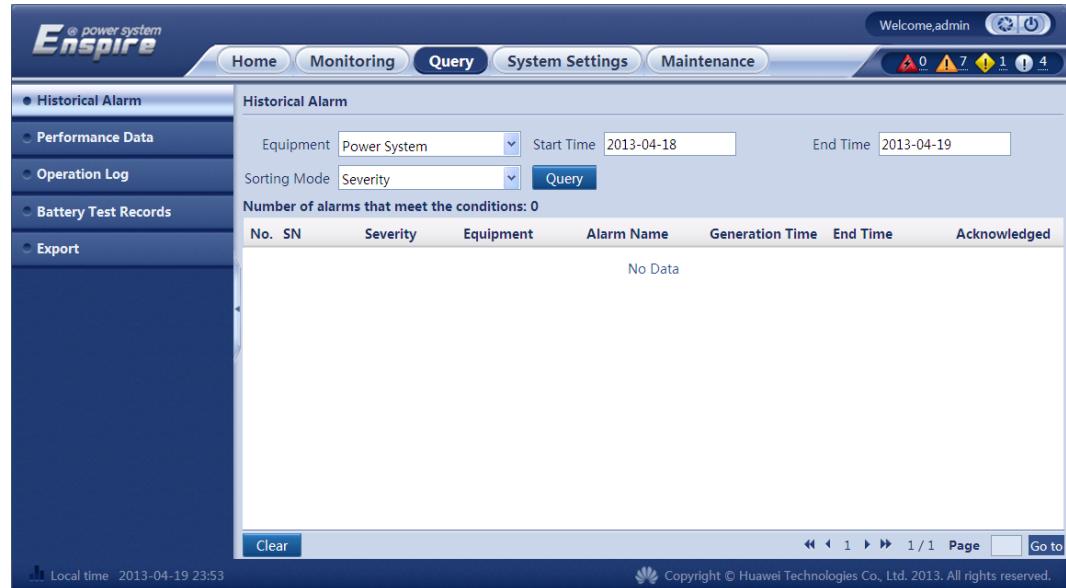
Figure 5-31 Running Control

5.3.3 Querying Historical Data

The **Query** tab page allows you to query and export historical alarms, performance data, operation records, and battery test records.

Querying Historical Alarms

The **Historical** pane allows you to query the alarm information about one or all devices based on the device type.

Figure 5-32 Historical

Querying Historical Performance Data

The **Performance Data** pane allows you to query system parameters, such as ambient temperatures, system voltages, and battery parameters based on the device type.

Figure 5-33 Performance Data

The screenshot shows the 'Performance Data' section of the Enspire web interface. The left sidebar has 'Performance Data' selected. The main area shows a table of data with the following columns: No., Equipment, Performance Data, Statistical Period, Statistical Start Time, Value, and Unit. The data is as follows:

No.	Equipment	Performance Data	Statistical Period	Statistical Start Time	Value	Unit
1	Power System	Ambient temp.	5Min	2013-04-18 00:00:00	No Data	degC
2	Power System	Ambient temp.	5Min	2013-04-18 00:05:00	No Data	degC
3	Power System	Ambient temp.	5Min	2013-04-18 00:10:00	No Data	degC
4	Power System	Ambient temp.	5Min	2013-04-18 00:15:00	No Data	degC
5	Power System	Ambient temp.	5Min	2013-04-18 00:20:00	No Data	degC
6	Power System	Ambient temp.	5Min	2013-04-18 00:25:00	No Data	degC
7	Power System	Ambient temp.	5Min	2013-04-18 00:30:00	No Data	degC
8	Power System	Ambient temp.	5Min	2013-04-18 00:35:00	No Data	degC
9	Power System	Ambient temp.	5Min	2013-04-18 00:40:00	No Data	degC

At the bottom, there are navigation buttons for page 1/3 and a 'Go to' input field. The footer includes local time (2013-04-19 23:52) and copyright information (Huawei Technologies Co., Ltd. 2013).

Querying Historical Operation Records

The **Operation Log** pane allows you to query the historical operation records of all users.

Figure 5-34 Operation Log

The screenshot shows the 'Operation Log' section of the Enspire web interface. The left sidebar has 'Operation Log' selected. The main area shows a table of data with the following columns: No., User Name, Operation Time, Operation Source, and Parameter. The data is as follows:

No.	User Name	Operation Time	Operation Source	Parameter
1	admin	2013-04-19 23:28:33	WEB	Login
2	admin	2013-04-19 22:30:27	WEB	Logout
3	admin	2013-04-19 22:13:26	WEB	Login
4	admin	2013-04-19 22:12:46	WEB	Logout
5	admin	2013-04-19 22:07:10	WEB	Login
6	admin	2013-04-19 21:56:19	WEB	Logout
7	admin	2013-04-19 21:45:15	WEB	Login
8	admin	2013-04-19 21:17:13	WEB	Login
9	admin	2013-04-19 21:10:10	LCD	Logout
10	admin	2013-04-19 21:08:56	LCD	Login
11	admin	2013-04-18 00:47:57	WEB	Power System-Diesel generator function->No
				Power System-Diesel generator function->Power

At the bottom, there are navigation buttons for page 1/3 and a 'Go to' input field. The footer includes local time (2013-04-19 23:51) and copyright information (Huawei Technologies Co., Ltd. 2013).

Querying Historical Battery Test Records

The **Battery Test Records** pane allows you to query historical battery test records.

Figure 5-35 Battery Test Records

The screenshot shows the Enspire power system web interface. The top navigation bar includes Home, Monitoring, Query (which is selected), System Settings, Maintenance, and a status bar with icons for battery level (0), temperature (7), and other metrics (1, 4). The left sidebar has links for Historical Alarm, Performance Data, Operation Log, Battery Test Records (selected), and Export. The main content area is titled "Battery Test Records" and displays a table with columns: No., Start Time, End Time, Test Type, Stop Reason, Test Result, End Voltage (V), Avg. Dis. Cur.(A), Dis. Capacity (Ah), and Batt. Temp. (degC). A message "No Data" is shown in the table. At the bottom, there are navigation buttons (back, forward, search) and a footer with local time (2013-04-19 23:51) and copyright information (Huawei Technologies Co., Ltd. 2013).

Exporting Historical Data

The **Export** pane allows you to export historical alarms, performance data, operation records, and battery test records respectively or as a whole.

Figure 5-36 Export

The screenshot shows the Enspire power system web interface. The top navigation bar includes Home, Monitoring, Query (selected), System Settings, Maintenance, and a status bar with icons for battery level (0), temperature (7), and other metrics (1, 4). The left sidebar has links for Historical Alarm, Performance Data, Operation Log, Battery Test Records, and Export (selected). The main content area is titled "Export" and contains a list of export options: Historical Alarm, Performance Data, Operation Log, Battery Test Records, and All. Below the list is a large blue "Export" button. At the bottom, there are navigation buttons (back, forward, search) and a footer with local time (2013-04-19 23:49) and copyright information (Huawei Technologies Co., Ltd. 2013).

5.3.4 System Configuration

The **System Settings** tab page allows you to define reserved Boolean values, import and back up configuration files, set alarm parameters, time, the SMU02B IP address, SNMP and NetEco network parameters, serial ports, site names, and system types.

Setting Alarm Parameters

The **Alarm Parameters** pane allows you to view alarm information based on the device type and to enable or disable alarm generation and set alarm severities and alarm dry contact outputs based on the site requirements.

Figure 5-37 Alarm Parameters

The screenshot shows the 'Enspire power system' web interface. The top navigation bar includes 'Home', 'Monitoring', 'Query', 'System Settings' (which is the active tab), and 'Maintenance'. A message bar at the top right says 'Welcome,admin'. Below the navigation is a toolbar with icons for power status and system logs. On the left, a vertical sidebar menu lists several categories: 'Alarm Parameters' (selected), 'Reserved Digital Input', 'Time', 'Configuration File', 'Monitoring IP Addr.', 'SNMP', 'NetEco', 'Serial Port Settings', and 'Site Settings'. The main content area is titled 'Alarm Parameters' and contains a table with 11 rows of data. The table columns are: 'All' (checkbox), 'No.' (number), 'Alarm Name' (text), 'Alarm Enable' (dropdown), 'Severity' (dropdown), 'Output Relay' (dropdown), and 'Setting Result' (dropdown). The data in the table is as follows:

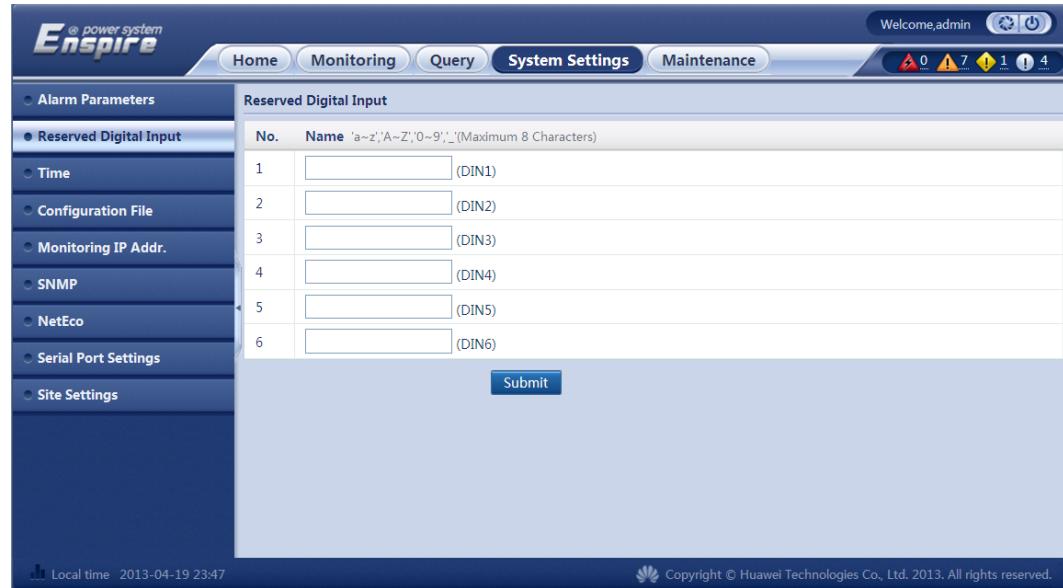
All	No.	Alarm Name	Alarm Enable	Severity	Output Relay	Setting Result
<input type="checkbox"/>	1	AC SPD Fault	Enable	Major	No	
<input type="checkbox"/>	2	DC SPD Fault	Enable	Major	No	
<input type="checkbox"/>	3	AC Failure	Enable	Major	No	
<input type="checkbox"/>	4	AC Phase A Overvoltage	Enable	Minor	No	
<input type="checkbox"/>	5	AC Phase B Overvoltage	Enable	Minor	No	
<input type="checkbox"/>	6	AC Phase C Overvoltage	Enable	Minor	No	
<input type="checkbox"/>	7	AC Phase A Undervoltage	Enable	Minor	No	
<input type="checkbox"/>	8	AC Phase B Undervoltage	Enable	Minor	No	
<input type="checkbox"/>	9	AC Phase C Undervoltage	Enable	Minor	No	
<input type="checkbox"/>	10	AC Phase A Failure	Enable	Critical	No	
<input type="checkbox"/>	11	AC Phase B Failure	Enable	Critical	No	

At the bottom of the table are buttons for 'Submit', 'Page' (with '1 / 3'), and 'Go to'. The footer of the page shows 'Local time 2013-04-19 23:48' and 'Copyright © Huawei Technologies Co., Ltd. 2013. All rights reserved.'

Setting Reserved Boolean Values

The **Reserved Digital Input** pane allows you to define Boolean value names.

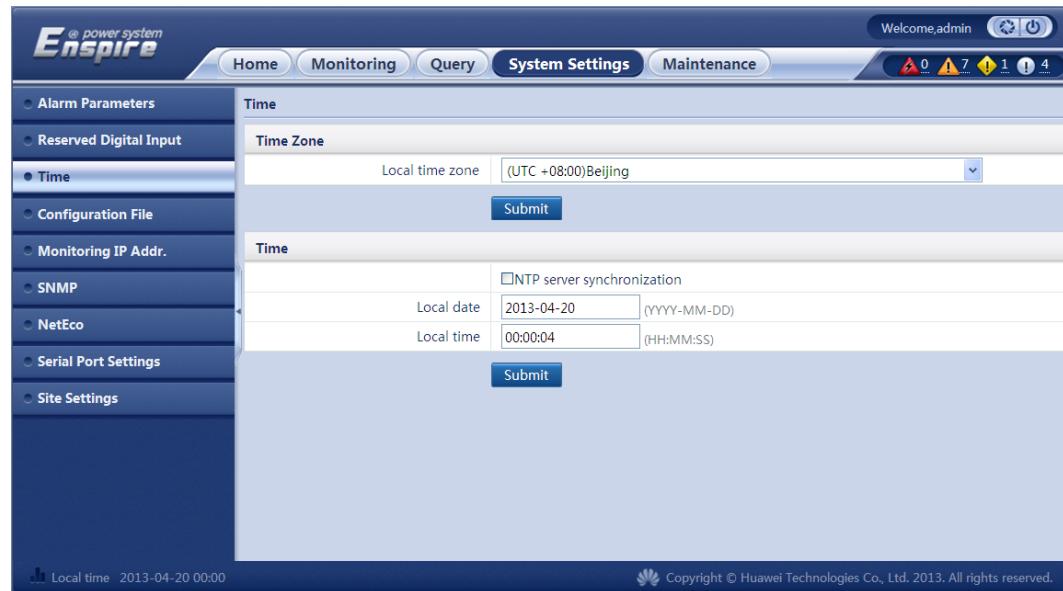
Figure 5-38 Reserved Digital Input



Setting Time

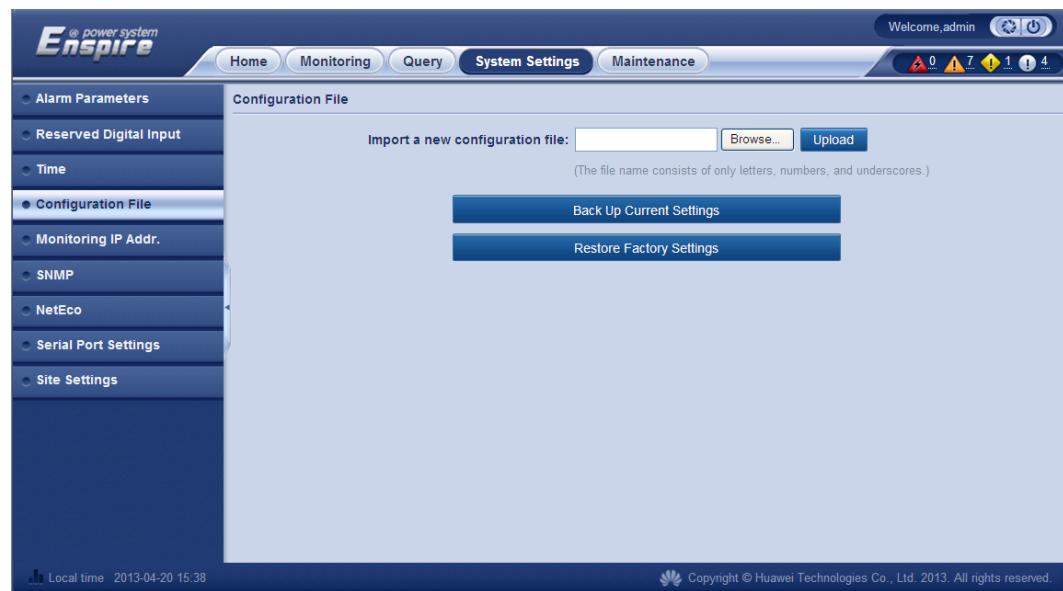
The **Time** pane allows you to set a time zone and local time. You can directly set the local date and time or synchronize the time with that on the NetworkTime Protocol (NTP) server.

Figure 5-39 Time



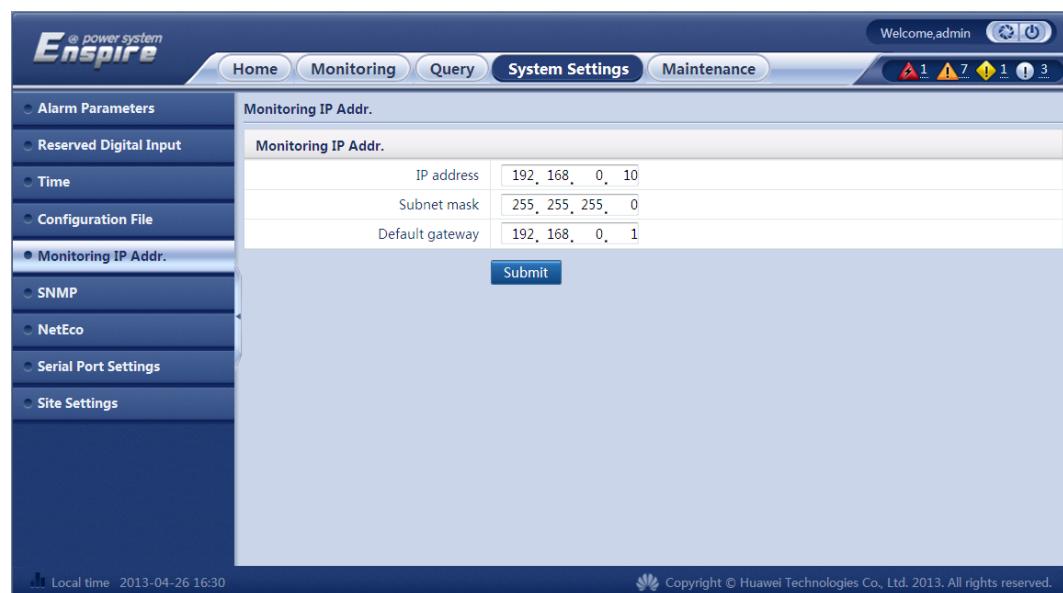
Setting Configuration Files

The **Configuration File** pane allows you to import configuration files, back up current configurations, and restore the default settings.

Figure 5-40 Configuration File

Setting the SMU02B IP Address

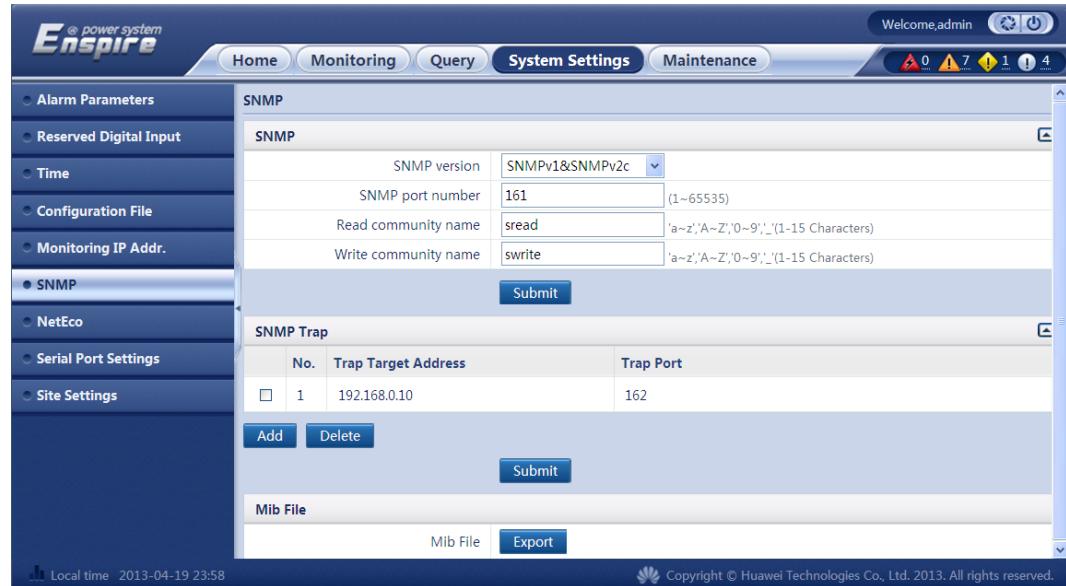
The **Monitoring IP Addr** allows you to set an IP address, a subnet mask, and a default gateway for the SMU02B.

Figure 5-41 Monitoring IP Addr

Setting SNMP Network Parameters

The **SNMP** pane allows you to set SNMP network parameters and export Mib files.

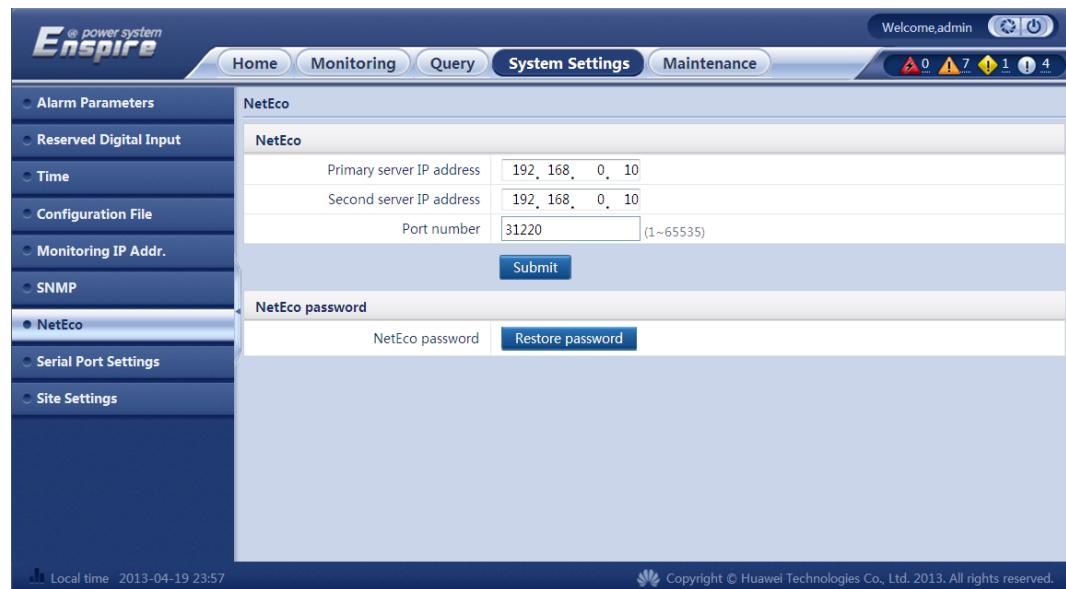
Figure 5-42 SNMP



Setting NetEco Network Parameters

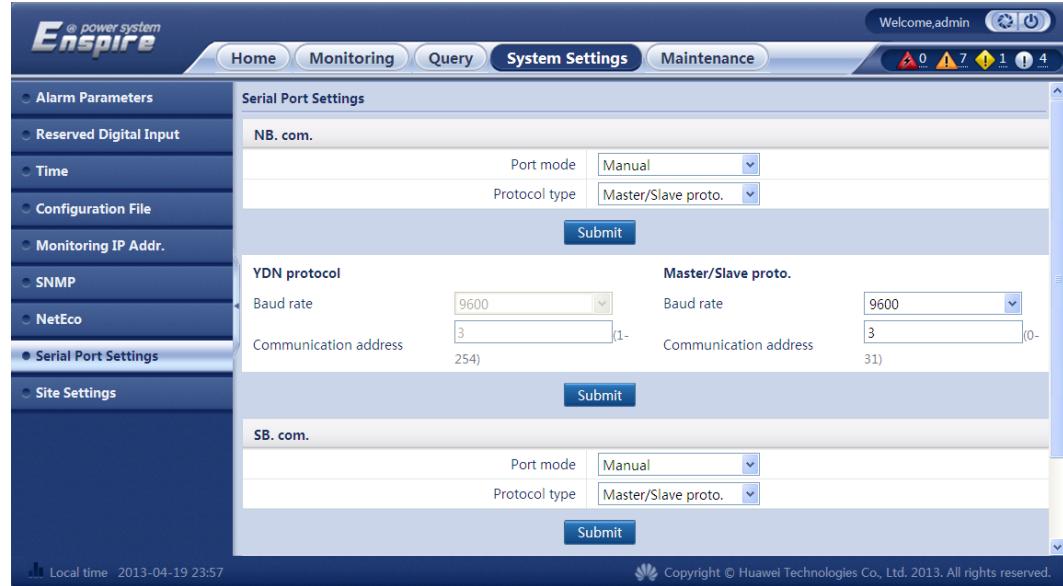
The **NetEco** pane allows you to set NetEco network parameters and restore the NetEco password.

Figure 5-43 NetEco



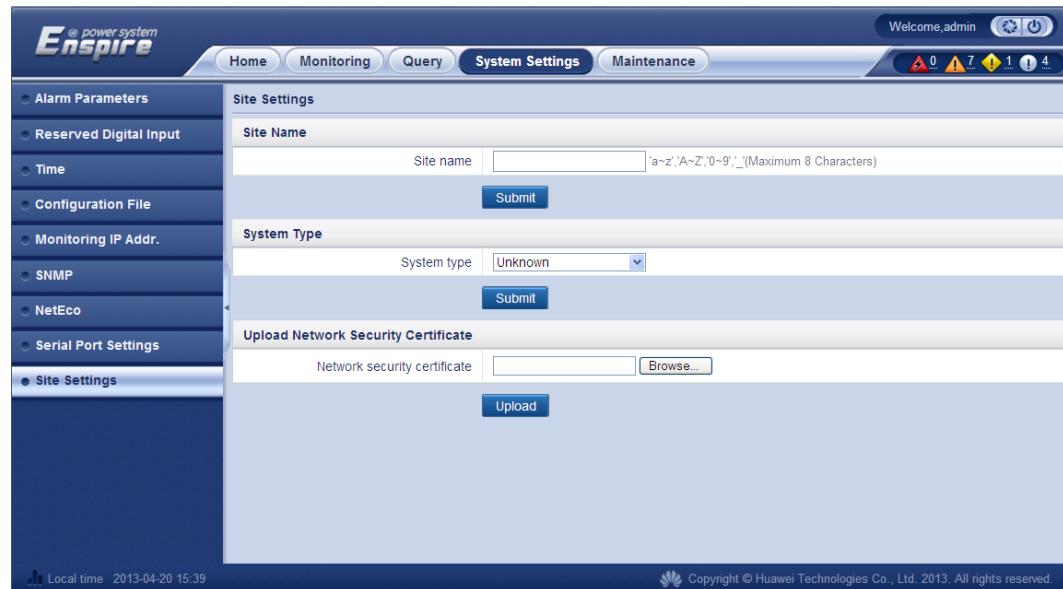
Setting Serial Ports

The **Serial Port Settings** pane allows you to set the communications port mode and protocol content and type.

Figure 5-44 Serial Port Settings

Setting Sites

The **Site Settings** pane allows you to set site names, select system types, and upload network security certificates.

Figure 5-45 Site Settings

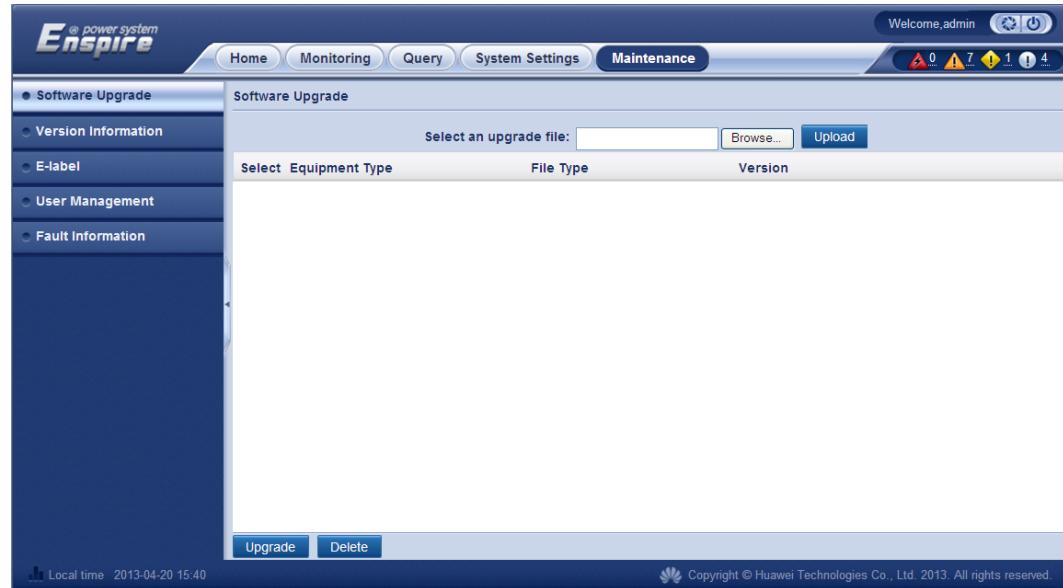
5.3.5 Maintenance

The **Maintenance** tab page allows you to upgrade the system, query version information, query component electrical labels, manage users, and export fault information.

Upgrading the System

The **Software Upgrade** pane allows you to select an upgrade file and upgrade the software.

Figure 5-46 Software Upgrade



Querying Version Information

The **Version Information** pane allows you to query the software version, hardware version, and bottom support program (BSP) version of the power system and its components

Figure 5-47 Version Information

This screenshot shows the 'Version Information' section of the Enspire web interface. The left sidebar has a radio button next to 'Version Information'. The main area has two tables: 'Software Version' and 'Hardware Version'. The 'Software Version' table has columns 'No.', 'Equipment', and 'Software Version'. The 'Hardware Version' table has columns 'No.', 'Equipment', and 'Hardware Version'. Both tables show data for four components: Power System, Rectifier1, Rectifier2, and Rectifier3. The status bar at the bottom shows 'Local time 2013-04-19 17:45' and 'Copyright © Huawei Technologies Co., Ltd. 2013. All rights reserved.'

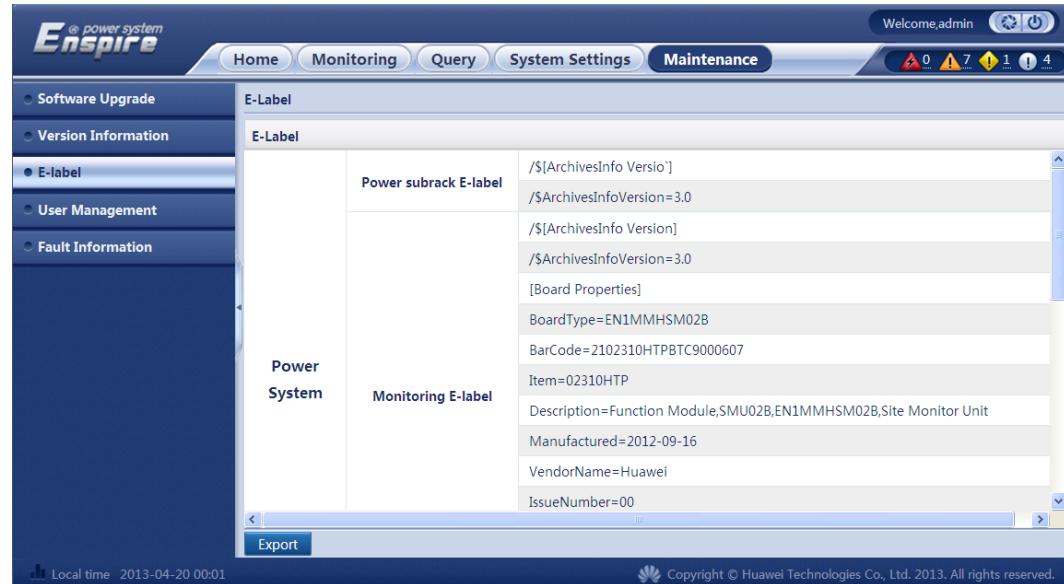
No.	Equipment	Software Version
1	Power System	SMU V300R001C01SP51
2	Rectifier1	V115
3	Rectifier2	V115
4	Rectifier3	V202

No.	Equipment	Hardware Version
1	Power System	B
2	Rectifier1	A
3	Rectifier2	A
4	Rectifier3	A

Querying Electronic Labels

The **E-label** pane allows you to query the electronic labels of the power system and its components.

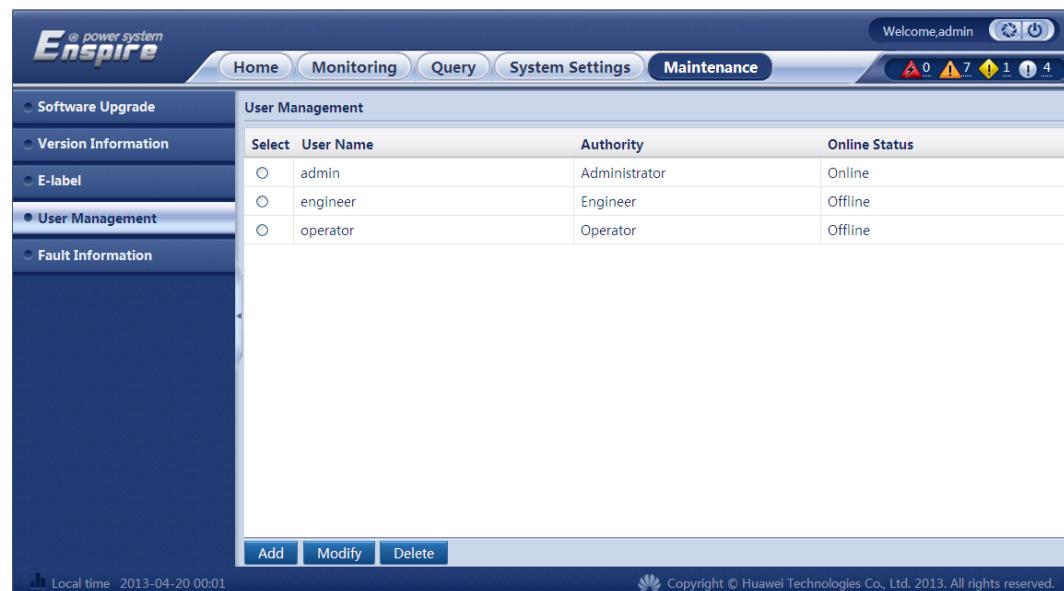
Figure 5-48 E-label



Managing Users

The **User Management** pane allows you to add, modify, and delete users.

Figure 5-49 User Management



SMU supports a maximum of three online users. User types are classified into admin, engineer, and operator. [Table 5-1](#) describes the rights of the three user types.

You can set user types only on the WebUI.

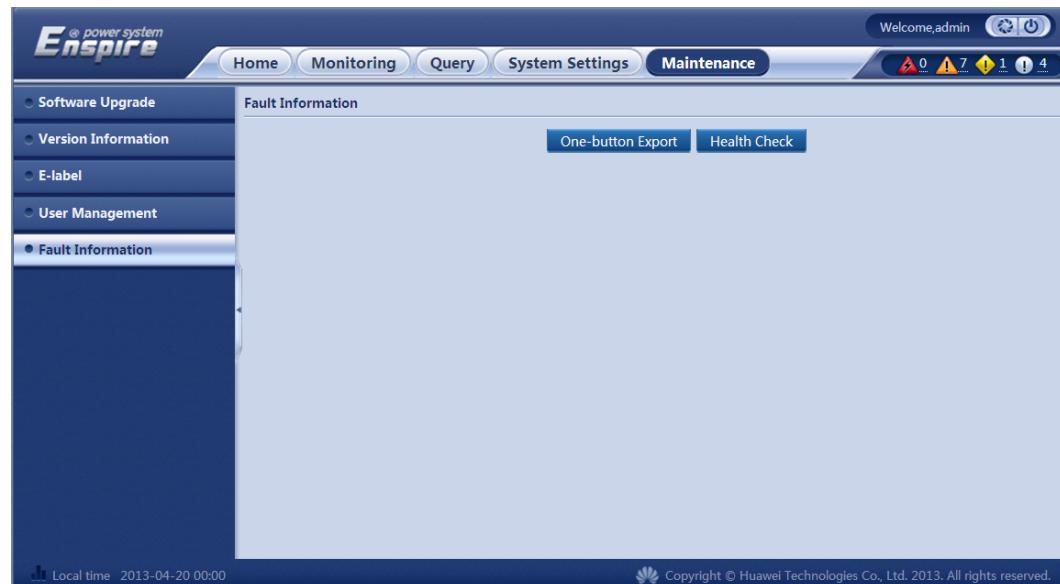
Table 5-1 User rights

User Type	Rights	Maximum Number of Users	Maximum Number of Online Users
Administrator	Has the rights of viewing, setting, and controlling all attributes and functions.	16	3
Engineer	Has the same rights as Admin users except the rights of upgrading software, downloading historical logs and statistics, and setting energy saving parameters.	16	3
Operator	Has the rights of viewing system status, system configuration, control parameters, battery test records, alarm parameters, and electronic labels, and setting time and certain control parameters.	16	3

Exporting Fault Information

The **Fault Information** pane allows you to export fault information and check the system health.

Figure 5-50 Fault Information



6 Power System Configuration

6.1 Basic Parameters about Lead-Acid Batteries

Principles

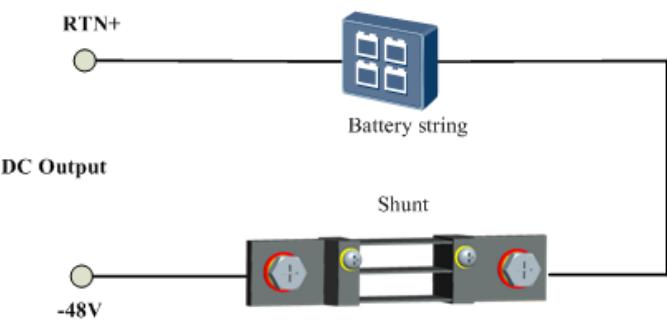
Battery management consists of battery charging, battery current limiting, and battery tests. These functions are based on the basic parameters. Accordingly, the basic parameters must be configured as the real condition of the power system.

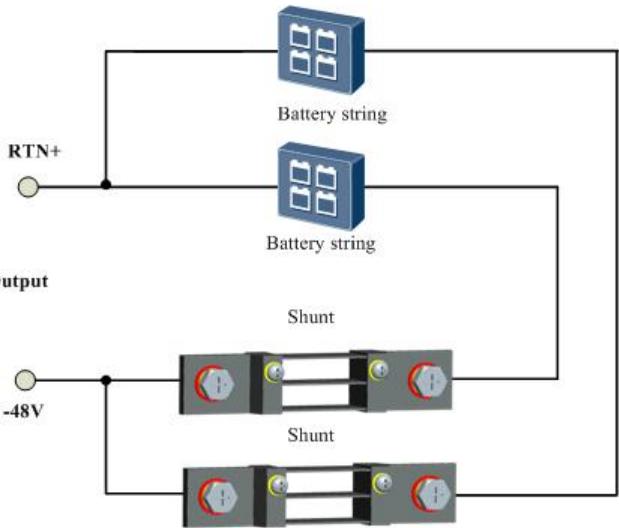
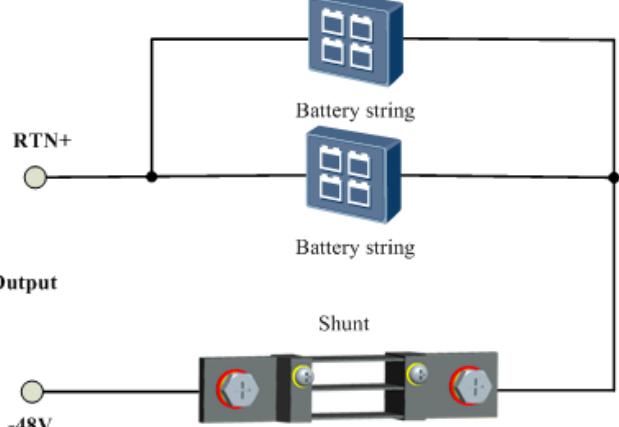
Parameters

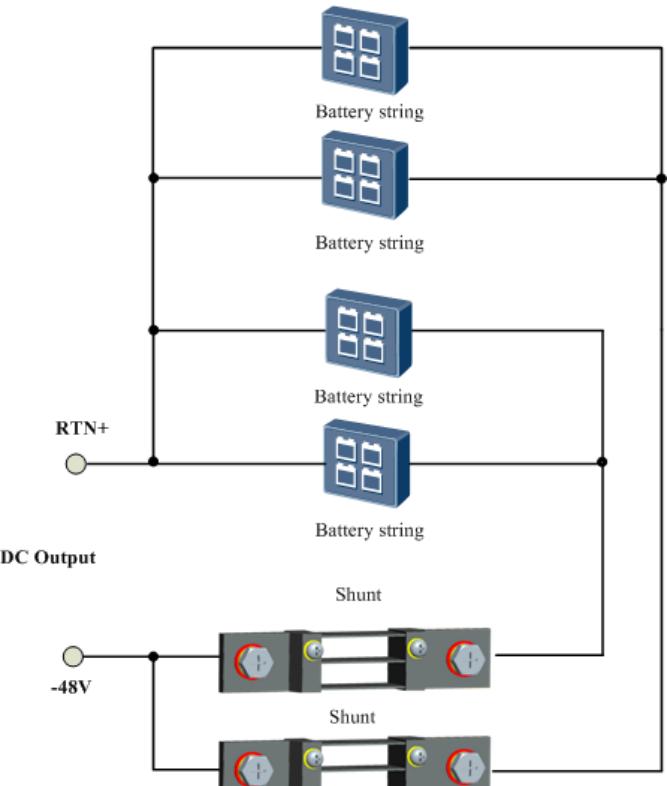
Table 6-1 Basic parameters

Parameter	Description	Default Value	Value Range
Battery string quantity	Number of battery strings	4	0–6
Battery rated capacity (Ah)	Total capacity of the lead-acid batteries connecting to each shunt	150 Ah	5–10000

Table 6-2 Scenario with one shunt connecting to one battery string

Scenario with one shunt connecting to one battery string (each battery string being 150 Ah)	Number of Battery Strings	Rated Battery Capacity
	1	150 Ah

Scenario with one shunt connecting to one battery string (each battery string being 150 Ah)	Number of Battery Strings	Rated Battery Capacity
<p>DC Output</p>  <p>RTN+</p> <p>Battery string</p> <p>Battery string</p> <p>Shunt</p> <p>-48V</p> <p>Shunt</p>	2	150 Ah
<p>DC Output</p>  <p>RTN+</p> <p>Battery string</p> <p>Battery string</p> <p>Shunt</p> <p>-48V</p> <p>Shunt</p>	2	300 Ah

Scenario with one shunt connecting to one battery string (each battery string being 150 Ah)	Number of Battery Strings	Rated Battery Capacity
 <p>The diagram illustrates a power system configuration. At the top, four battery strings are shown in parallel. Each battery string is represented by a blue rectangular icon containing four small battery symbols. A vertical line connects the positive terminals of all four strings. This line then splits into two parallel lines that connect to a central point labeled "RTN+". From this central point, a horizontal line extends to the left, labeled "DC Output". Below the "DC Output" line, there is a component labeled "Shunt". The "Shunt" is represented by two parallel branches. Each branch contains a diode (indicated by a red circle with a white arrow) and a resistor (indicated by a grey rectangle). The two branches are connected in parallel between the "DC Output" line and a ground connection labeled "-48V".</p>	4	300 Ah

7 VRLA Battery Management

7.1 Battery Charging And Discharging

If the AC input to the power system is normal and meets load requirements, the rectifiers supply DC power to loads and VRLA batteries. If the AC input to the power system is abnormal, VRLA batteries supply power to loads. After the AC input is restored, rectifiers supply DC power to loads and VRLA batteries.

7.1.1 Float Charging

Principles

VRLA batteries self-discharge slowly when they are in use. To compensate for the resulting losses, charge VRLA batteries in float mode to ensure they are fully charged. Float charging also helps maintain battery capacity after a large amount of electricity is discharged.

Parameters

Table 7-1 Float charging parameter description

Parameters	Description	Default Value	Value Range
Float Charge(V)	The voltage at which VRLA batteries are charged in float mode. NOTE The float voltage must be lower than or equal to the boost charging voltage.	53.5	42.0–58.3

7.1.2 Equalized Charging

Principles

After long-time float charging, lead-acid batteries suffer great loss caused by self-discharge and their activity deteriorates. Equalized charging helps to rapidly restore battery capacity

after the AC power supply is restored and helps to maintain battery activity and capacity. The equalized charging voltage is higher than the float voltage.

Parameters

Table 7-2 Equalized charging parameter description

Parameter	Description	Default Value	Value Range
Equalized charging voltage	Charge voltage at which lead-acid batteries are being charged in equalized mode	56.4 V	42.0–58.3

7.1.3 Automatic Equalized Charging

Principles

The SMU02B determines whether the remaining battery capacity is sufficient based on the charge current. If equalized charging conditions are met, batteries automatically start to be charged in equalized mode.

Parameters

Table 7-3 Automatic equalized charging parameter description

Parameter	Description	Default Value	Value Range
Automatic equalized charging enable	Enables or disables automatic equalized charging.	Yes	Yes and No
Equalized charging transfer current coefficient	Current threshold above which equalized charging is triggered	0.05 C10	0.01–0.25
Float charging to equalized charging current delay	If the battery current is greater than the value of Float charging to equalized charging current delay lasts for the duration longer than the value of this parameter, equalized charging is triggered.	30 Min	2–1440
Float charging-equalized charging transfer capacity	Capacity threshold above which equalized charging is triggered	80%	50%–100%
Float charging to equalized charging capacity delay	If the battery current is less than the value of Float charging to equalized charging capacity delay lasts for the duration longer than	10 Min	2–1440

Parameter	Description	Default Value	Value Range
	the value of this parameter, equalized charging is triggered.		
Stable equalized charging current	Current threshold below which float charging is triggered.	0.01 C10	0.01-0.25
Stable equalized charging time	In equalized charging mode, if the battery current less than the value of Stable EC current x Rated battery capacity lasts for the duration longer than the value of this parameter, float charging is triggered.	30 Min	2-540
Equalized charging protection time	Longest boost charge time (after which VRLA batteries are charged in float mode).	16 h	5-48

7.1.4 Scheduled Equalized Charging

Principles

If the power grid is of high quality and without AC power failures for a long time, lead-acid batteries have low activity because they are always in the float charging state. To improve battery activity, you can charge lead-acid batteries in scheduled equalized mode by setting charge intervals.

Since no AC power failures occur for a long time, lead-acid batteries are charged in float mode with a small current. Therefore, the change from scheduled equalized charging to float charging depends on the charging duration rather than the battery current.

Parameters

Table 7-4 Scheduled equalized charging parameter description

Parameter	Description	Default Value	Value Range
Scheduled equalized charging enable	Enables or disables scheduled equalized charging.	Yes	Yes and No
Scheduled equalized charging interval	A time interval after which equalized charging starts if no equalized charging happens during the interval	30 Day	1-365
Scheduled equalized charging	Duration for a scheduled	9 h	1-24

Parameter	Description	Default Value	Value Range
time	equalized charging period		

7.1.5 Pre-equalized Charging

Principles

To ensure the accuracy of battery discharge test data, perform a pre-equalized charging for batteries based on the remaining battery capacity before a scheduled, planned, or manual discharge test starts.

Parameters

Table 7-5 Pre-equalized charging parameter description

Parameter	Description	Default Value	Value Range
Pre-Equalized charging enable	Enables or disables pre-equalized charging.	Yes	Yes and No

7.2 Battery Current Limiting

Principles

To prevent battery performance deterioration caused by overcurrent during battery charging, the charge current should be limited. If the charge current exceeds the threshold, an overcurrent alarm is generated.

Parameters

Table 7-6 Parameter description for battery current limiting

Parameter	Description	Default Value	Value Range
Current limiting coefficient	Upper battery charge current limit	0.15 C10	0.05–0.25
Overcurrent coefficient	Alarm threshold for battery charge overcurrent. If the charge current exceeds the threshold, an overcurrent alarm is generated.	0.25 C10	0.05–0.50

7.3 Standard Battery Test

The SMU02B provides the following methods for standard battery test states: AC power failure test, cyclic test, planned test and manual test. You can use one or more of these methods based on power supply and load .

Table 7-7 Test method description

Test Method	Description
AC power failure test	Starts a battery discharge test during an AC power failure.
Cyclic test	Starts a standard test periodically. NOTE A cyclic test and planned test cannot be performed simultaneously.
Planned test	Starts a standard test at a preset time. NOTE A cyclic test and planned test cannot be performed simultaneously.
Manual test	Manually starts a battery discharge test.

During any battery test, the battery discharge current depends on the load current. In all battery tests except for the AC power failure test, set the rectifier output voltage to 1 V below the test end voltage to ensure that all load currents are from VRLA batteries.

7.3.1 Starting a Test

Description

A battery test can start automatically or manually.

- Automatic startup: After parameters are configured, the battery test starts automatically when the conditions are met.
- Manual startup: After you manually start a battery test on the LCD or WebUI, the power system tests batteries immediately.

Parameters

Table 7-8 Parameter description for mains failure tests

Parameter	Description	Default Value	Value Range
AC fail test enable	Enables or disables a mains failure test.	No	Yes and No

Table 7-9 Parameter description for cyclic tests and plan tests

Parameter	Description	Default Value	Value Range
Time test mode	A mode for testing VRLA batteries.	Disable	Disable, planned test, Scheduled test
Scheduled. test period NOTE The parameter is displayed only when Time test mode is set to Scheduled test .	Period for a cyclic test.	90 day	2–999
Annual battery tests NOTE The parameter is displayed only when Time test mode is set to planned test .	Numbers of planned tests per year.	0	0–6

Table 7-10 Parameter description for manually starting a battery test

Parameter	Description	Default Value	Value Range
Manual test control	Starts or stops a battery test.	Stop	Start, Stop

7.3.2 Terminating a Test

Principles

An ongoing standard battery discharge test can be terminated manually or automatically when the test-end voltage, test-end capacity, test-end temperature or battery test time is reached.



- If the AC power resumes during an AC power failure test, the test automatically terminates.
- If the power system generates a critical or major alarm, the test terminates.

Parameters

Table 7-11 Parameter description for automatically terminating a battery test

Parameter	Description	Default Value	Value Range
Test end voltage	The voltage level below which the test ends if battery voltage drops below this level.	46 V	44.2–53
Test end capacity	The electricity amount below which the test ends if the battery electricity drops below this amount.	20%	0–99

Parameter	Description	Default Value	Value Range
Test end temperature	If the battery temperature is lower than the value, stop all ongoing battery tests and do not start any new tests.	5 degC	-5–15
Test end time	Battery test duration	480 Min	1–6000

Table 7-12 Parameter description for manually terminating a battery test

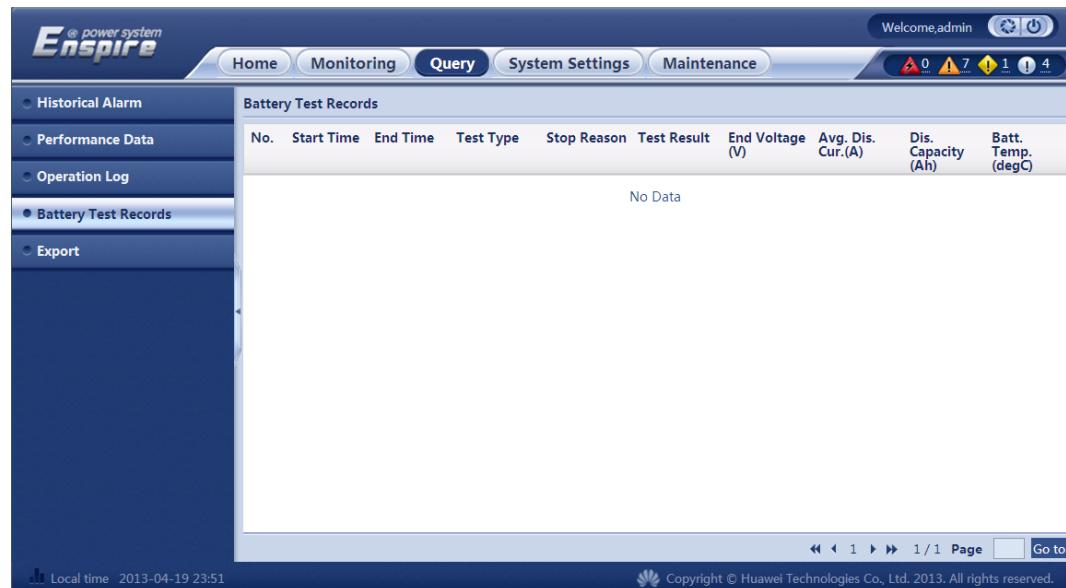
Parameter	Description	Default Value	Value Range
Manual Test Control	Starts or stops a battery test.	Stop	Start, Stop

7.3.3 Viewing Test Records

Principles

The SMU02B records test information during a test so you can monitor the battery status. You can export battery test records in HTML format on the WebUI.

Parameters

Figure 7-1 Battery Test Records

7.4 Short Battery Test

A periodic short test helps to activate VRLA batteries and estimate their instant discharge performance.

7.4.1 Starting a Test

Principles

When batteries are in float charging, boost charging, or hibernation mode, the SMU02B automatically starts a short test based on the parameter settings in [Table 7-13](#).

Parameters

Table 7-13 Parameter description for automatic short battery tests

Parameter	Description	Default Value	Value Range
Short test enable	Enables or disables a short test.	Yes	Yes, No
Short test period NOTE This parameter is displayed only when Short Test Enabled is set to Yes.	Start period for a short test.	30 Day	1–360
Short test time NOTE This parameter is displayed only when Short Test Enabled is set to Yes.	Short test duration after which the test ends.	5 Min	1–240
Max. current difference NOTE This parameter is displayed only when Short Test Enabled is set to Yes and Battery strings quantity is set to a value greater than 1.	When the SMU02B detects that the current deviation between battery strings is greater than the value of this parameter, it reports a battery string current imbalance alarm.	0.05 C10	0.00–1.00

Table 7-14 Parameter description for manual short battery tests

Parameter	Description	Default Value	Value Range
Short Test Control	Indicates whether to start a short test immediately. NOTE This function is enabled only in	Stop	Start, Stop

Parameter	Description	Default Value	Value Range
	manual mode.		

7.4.2 Terminating a Test

Principles

An ongoing standard battery discharge test can be terminated manually or automatically when any of the test end conditions for voltage, short test duration, and test end temperature are met. If the power system generates a critical or major alarm, the test terminates.

Parameters

Table 7-15 Parameter description for automatic short battery tests

Parameter	Description	Default Value	Value Range
Short test enable	Enables or disables a short test.	Yes	Yes and No
Short test period (Day)	Start period for a short test.	30 Day	1–360
Short test time (Min)	Short test duration after which the test ends.	5 Min	1–240
Short test end voltage	The voltage level below which the test ends if battery voltage drops below this level.	45.0 V	42.0–53.0
Test End Temperature	If the battery temperature is lower than the value, stop all ongoing battery tests and do not start any new tests.	5 degC	-5–15

Table 7-16 Parameter description for manual short battery tests

Parameter	Description	Default Value	Value Range
Short Test Control	Indicates whether to start a short test immediately. NOTE This function is enabled only in manual mode.	Stop	Start, Stop

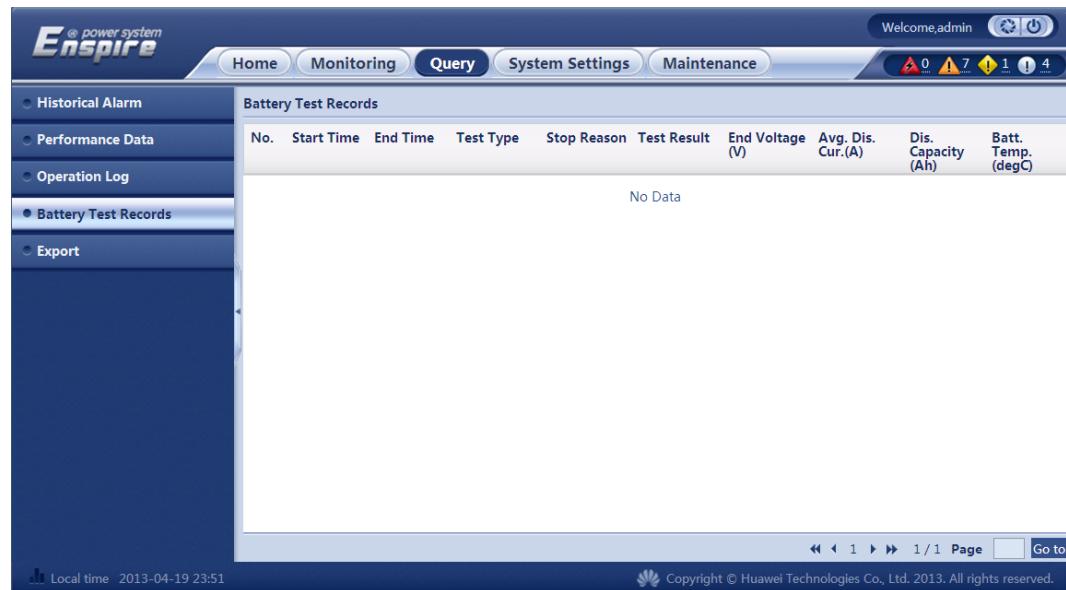
7.4.3 Viewing Test Records

Principles

The SMU02B records test information during a test so you can monitor the battery status. You can export battery test records in HTML format on the WebUI.

Parameters

Figure 7-2 Battery Test Records



7.5 Battery Temperature Compensation

Principles

To prolong the battery lifespan, adjust battery charge voltages based on battery temperatures during float charging or hibernation.

The temperature correction equation for the float and hibernation voltages is as follows:

$$V = V_0 - (T - T_0) \times \rho$$

Where

- V : float charging or hibernation voltage after temperature compensation
- V_0 : float voltages
- T : battery temperature measured by a battery temperature sensor
- T_0 : the **Nominal Temperature** stated by the battery manufacturer for batteries
- ρ : user-configured temperature **Compensation Factor**. The default value is the sum of the temperature compensation coefficients for all batteries in a 48 V battery string. For example, 80 mV = 24 cells x 3.33 mV/cell.

If the battery temperature is in the range of 5degC to 45degC, temperature compensation is triggered. Set T to 5 if the battery temperature is below 5degC and set T to 45 if it is above 45degC.

The temperature compensation correction value ($\delta V = V - V_0$) is within the range of -2 V to +2 V. If the actual δV is beyond the range, the value of V_0 (tolerance ± 2 V) prevails.

Parameters

Table 7-17 Parameter description for battery temperature compensation

Parameter	Description	Default Value	Value Range
Temperature compensation coefficient (mV/degC)	Temperature compensation coefficient.	80 mV/degC	0–500
Nominal temperature (degC)	If the battery temperature equals the value of Nominal Temperature , temperature compensation is not performed. NOTE The optimal temperatures vary depending on battery manufacturers.	25 degC	5–45
Temperature compensation upper threshold (degC)	Upper threshold for battery temperature compensation	45 degC	40–45
Temperature compensation lower threshold (degC)	Lower threshold for battery temperature compensation	5 degC	5–10

7.6 Battery High Temperature Protection

Principles

There are three battery high temperature protection levels:

- Change to float charging at a high temperature.
- Generate a high battery temperature alarm.
- SMU02B operates at a very high temperature: You can adjust the float voltage, disconnect batteries, or perform no operations.

Table 7-18 describes the three protection methods.

Table 7-18 Battery high temperature protection description

Battery Temperature	Protection Method	Description
High battery temperature – 5 °C	Change to float charging at a high temperature	VRLA batteries enter float charging state when the battery temperature remains at the float-charge trigger threshold level for 5 minutes. <ul style="list-style-type: none"> • Temperature for changing to float charging = High battery temperature (user-defined) -5 °C • Range for changing to float charging: 40–50 °C

Battery Temperature	Protection Method	Description
High battery temperature	Generate a battery high temperature alarm Change to float charging at a high temperature	An alarm is generated when the battery temperature remains at or above the high battery temperature threshold for 5 minutes (configurable).
Very high battery temperature	Action on Very High Battery Temp	The SMU02B implements any of the following actions (as configured) when the battery remains at or above the very high temperature threshold for 5 minutes: <ul style="list-style-type: none"> • Reduce DC volt: lowers the busbar voltage to the high temperature protection voltage level. • Disconnect battery: disconnects VRLA batteries. • Disable: do nothing.

Parameters

Table 7-19 Parameter description for high battery temperature protection

Parameter	Description	Default Value	Value Range
Battery very high temperature protection	The parameter can be set to Reduce DC volt. , Disable , or Disconnect batteries .	Reduce DC volt.	Disable, Reduce DC volt, Disconnect batteries
Very high temperature protection voltage	If you set Battery very high temperature protection to Reduce DC volt. , adjust the rectifier output voltage based on the value of Battery very high temperature protection .	50.5 V	42.0–53.0
High temperature alarm threshold	The high temperature threshold for generating the alarm.	50 degC	25–80
Very high temperature alarm threshold	The SMU02B implements Battery very high temperature protection when the preset level is reached	53 degC	25–80

7.7 Low Voltage Disconnection Protection

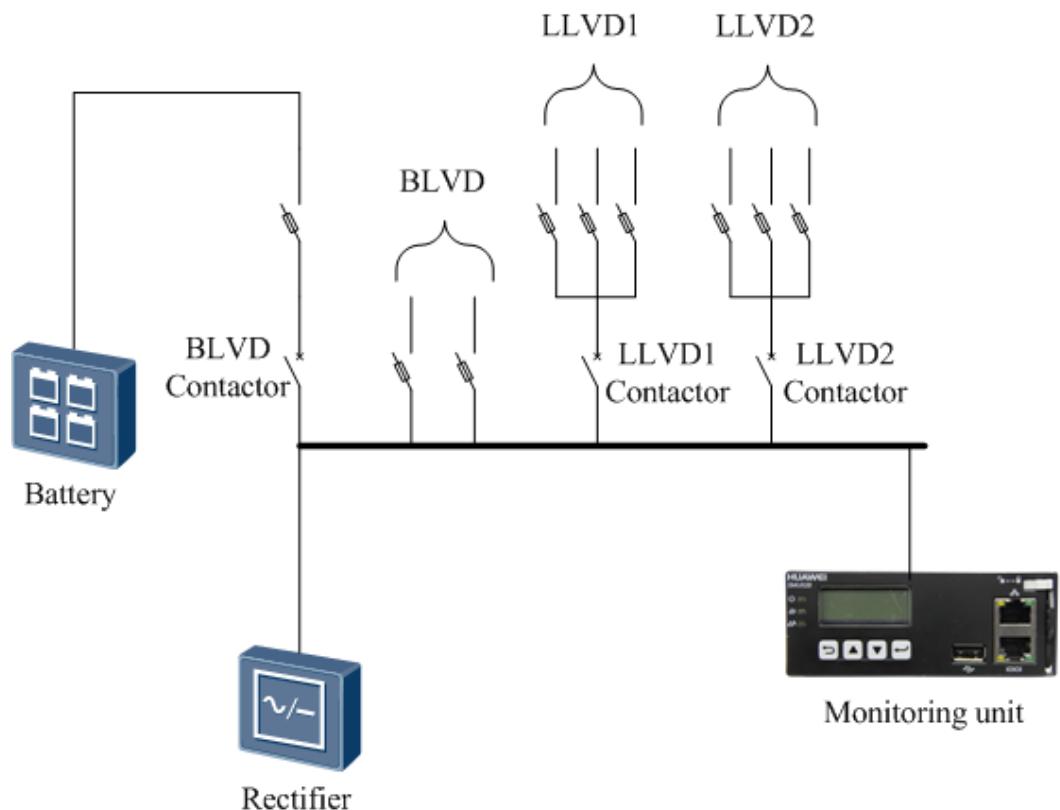
Principles

VRLA batteries start to power loads if AC input becomes abnormal. Then the SMU02B drives contractors to disconnect loads based on preset disconnection parameters. When the AC input returns to normal, reconnect the contactor. Then the rectifiers begin to power loads.

Based on different power system types, the SMU02B supports two-level disconnection (BLVD and LLVD) or three-level disconnection (BLVD, LLVD1, and LLVD2). The SMU02B disconnects secondary loads and then primary loads, helping to prolong the backup time of primary loads.

The power supplies between the power system and loads can be disconnected up to three levels (BLVD, LLVD1, and LLVD2).

Figure 7-3 Conceptual diagram



SMU02B can disconnect loads by voltage, time, and capacity.

Table 7-20 Description of low voltage disconnection modes

Disconnecting Loads by	Disconnecting Loads When	Connecting Loads When
Voltage	The battery voltage is lower than the preset value.	The rectifier output voltage is higher than the preset value.

Disconnecting Loads by	Disconnecting Loads When	Connecting Loads When
Time	<p>Either of the following criteria is met:</p> <p>The battery voltage is lower than the preset value.</p> <p>The duration for supplying power by VRLA batteries is longer than the preset value.</p>	
Capacity	<p>Either of the following criteria is met:</p> <p>The battery voltage is lower than the preset value.</p> <p>The battery capacity is lower than the preset value and the busbar voltage is lower than the load connection voltage minus 2.0 V.</p>	

Parameters

Table 7-21 Low voltage disconnection description

Parameter	Description	Default Value	Value Range
BLVD enable	Enables or disables the BLVD function. If the BLVD function is disabled but the BLVD route has been disconnected, connect the BLVD route immediately.	Yes	Yes/No
BLVD mode	This parameter can be set to Voltage mode , Time mode , or Remaining cap. mode .	Voltage mode	Voltage mode/Time mode/Remaining cap. mode
BLVD voltage	If the battery voltage is lower than the value of BLVD Disconnected Voltage (V) , the BLVD route is disconnected.	43.2 V	35.0-56.0
BLVD connection voltage	If the AC supply is normal and the system voltage is higher than the value of BLVD Reconnected Voltage (V) , the BLVD route is connected.	51.5 V	37.0-58.0
BLVD time	If the busbar voltage is higher	480 Min	5-1000

Parameter	Description	Default Value	Value Range
	than the disconnection voltage and the battery power supply time exceeds the value of BLVD Disconnected Time(Min) , the BLVD route is disconnected.		
BLVD capacity	If the remaining battery capacity is less than the value of BLVD Disconnected Capacity (%) , the BLVD route may be disconnected.	5.0%	0.0-99.0
LLVD1 enable	Enables or disables the LLVD1 function. If the LLVD1 function is disabled but the LLVD1 route has been disconnected, connect the LLVD1 route immediately.	Yes	Yes/No
LLVD1 mode	This parameter can be set to Voltage mode , Time mode , or Remaining cap. mode .	Voltage mode	Voltage mode/Time mode/Remaining cap. mode
LLVD1 voltage	If the battery voltage is lower than the value of LLVD1 Disconnected Voltage (V) , the LLVD1 route is disconnected.	45 V	35.0-56.0
LLVD1 connection voltage	If the rectifier output voltage is higher than the value of LLVD1 Reconnected Voltage (V) , the LLVD1 route is connected.	51.5 V	37.0-58.0
LLVD1 time	If the busbar voltage is higher than the disconnection voltage and the battery power supply time exceeds the value of LLVD1 Disconnected Time(Min) , the LLVD1 route is disconnected.	180 Min	5-1000
LLVD1 capacity	If the remaining battery capacity is less than the value of LLVD1 Disconnected Capacity (%) , the LLVD1 route may be disconnected.	25.0%	0.0-99.0
LLVD2 enable	Enables or disables the LLVD2 function. If the LLVD2 function is disabled but the	Yes	Yes/No

Parameter	Description	Default Value	Value Range
	LLVD2 route has been disconnected, connect the LLVD2 route immediately.		
LLVD2 mode	This parameter can be set to Voltage mode , Time mode , or Remaining cap. mode .	Voltage mode	Voltage mode/Time mode/Remaining cap. mode
LLVD2 voltage	If the battery voltage is lower than the value of LLVD2 Disconnected Voltage (V) , the LLVD2 route is disconnected.	44.0 V	35.0-56.0
LLVD2 connection voltage	If the rectifier output voltage is higher than the value of LLVD2 Reconnected Voltage (V) , the LLVD2 route is connected.	51.5 V	37.0-58.0
LLVD2 time	If the busbar voltage is higher than the disconnection voltage and the battery power supply time exceeds the value of LLVD2 Disconnected Time(Min) , the LLVD2 route is disconnected.	360 Min	5-1000
LLVD2 capacity	If the remaining battery capacity is less than the value of LLVD2 Disconnected Capacity (%) , the LLVD2 route may be disconnected.	15.0%	0.0-99.0

**NOTE**

If **System control mode** is set to **Manual**, LLVD information is displayed on the LCD and WebUI.

7.8 Battery Imbalance Detection

7.8.1 Battery Middle Point Voltage

Principles

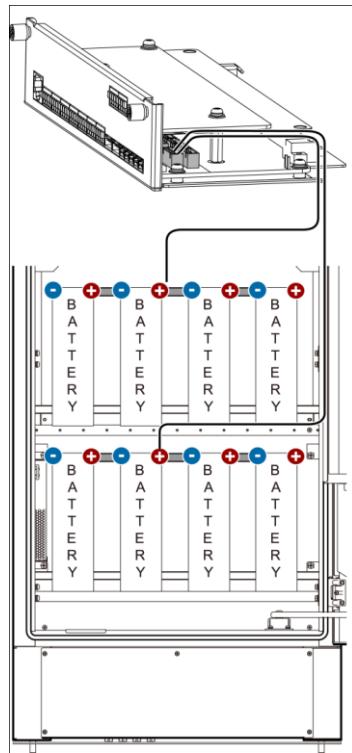
To check the battery balance, detect the voltage at the middle point of a battery string during discharge.

If the following formula is met, a battery imbalance alarm is generated. In this formula, V_B is the voltage at either end of the battery string, V_n is the voltage at the middle point of battery

string n, and V_l is the imbalance alarm threshold. The SMU02B detects the middle point voltages of up to six battery strings.

$$|V_B/2 - V_n| > V_l$$

Figure 7-4 Conceptual diagram for detecting the voltage at the middle point of a battery string



Parameters

Table 7-22 Parameter description for battery middle point voltage detection

Parameter	Description	Default Value	Value Range
Voltage test mode	Battery voltage detection mode.	Middle point volt	Middle point volt/Cell volt

7.8.2 Battery String Current Imbalance Detection

Principles

If the SMU02B detects that the current difference between battery strings is greater than 0.05 C10, it reports an alarm about battery string current imbalance.

The alarm needs to be cleared manually.

Parameters

Table 7-23 Parameter description for automatic short battery tests

Parameter	Description	Default Value	Value Range
Short test enable	Enables or disables a short test.	Yes	Yes, No
Short test period NOTE This parameter is displayed only when Short Test Enabled is set to Yes.	Start period for a short test.	30 Day	1–360
Short test time NOTE This parameter is displayed only when Short Test Enabled is set to Yes.	Short test duration after which the test ends.	5 Min	1–240
Max. current difference NOTE This parameter is displayed only when Short Test Enabled is set to Yes and Battery strings quantity is set to a value greater than 1.	When the SMU02B detects that the current deviation between battery strings is greater than the value of this parameter, it reports a battery string current imbalance alarm.	0.05 C10	0.00–1.00

7.9 Battery Imbalance Detection

The SMU02B allows battery imbalance to be detected in intelligent or non-intelligent mode. In intelligent mode, an intelligent battery detector is used to detect the imbalance of a maximum of four battery strings. In non-intelligent mode, battery detection cables connect to a UIM to detect the imbalance of a maximum of two battery strings.

7.9.1 Battery Imbalance Detection over an Intelligent Battery Detector

A battery string is an important energy storage device. If a battery string is not properly used or managed, batteries will be damaged or the battery capacity drops abruptly. A battery string is a group of batteries connected in series, therefore the whole battery string will be affected even if only one battery deteriorates and power supply is also affected. Therefore, battery detection is crucial for normal running of devices. The batteries in a maximum of four battery strings can be detected in this mode.

Principles

The intelligent battery detector monitors the positive and negative voltages of each battery and reports a battery imbalance alarm over the SMU02B if it detects that the battery imbalance condition is met.

Parameters

Table 7-24 Battery voltage detection parameter description

Parameter	Description	Default Value	Value Range
Cell type	A battery type, such as 2 V, 6 V, or 12 V	-	2 V, 6 V, and 12 V
Cell imbalance alarm threshold (%)	The parameter is configurable.	20	5.0–30
Cell imbalance alarm clear threshold (%)	The parameter is configurable.	10	1–30
Detected battery string	Number of installed battery strings	1	0–4

LCD Operation

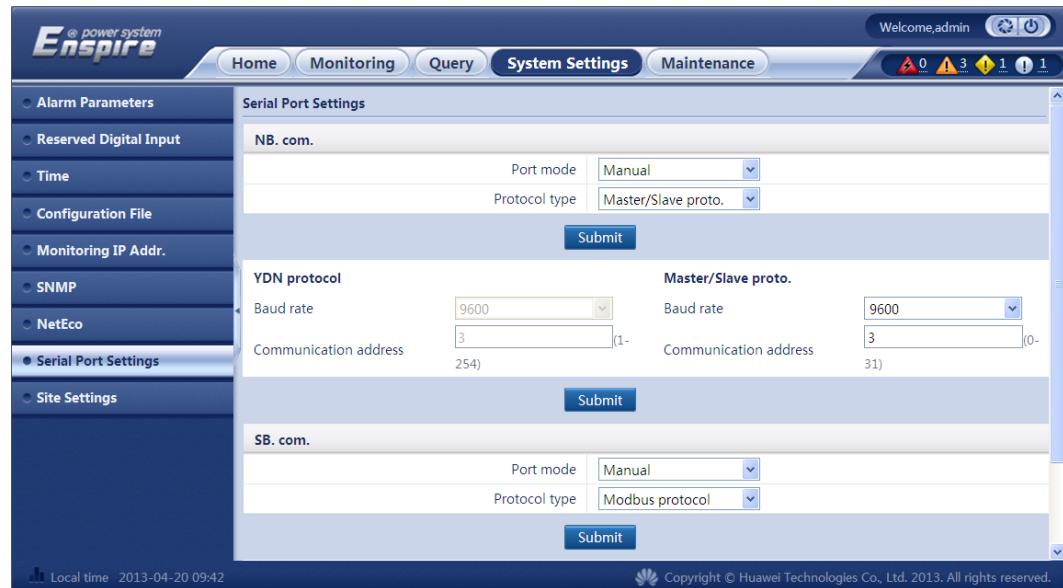
Correctly connect the intelligent battery detector to the power system. For details, see the related installation guide.

1. Set **Protocol type** to **Modbus protocol**. Path: **Main Menu > Parameters Settings > Local Parameters > Serial Port Settings > SB. com. > Protocol type (Modbus protocol)**
2. Set parameters. Path: **Main Menu > Parameters Settings > Battery Parameters > Batt. Cell Detector**

WebUI Operation

Log in to the WebUI of the SMU02B, click **SB. com.**, set **Protocol type** to **Modbus protocol**, and click **Submit**. Then click **Monitoring**. **Batt. Cell Detector** is displayed in the navigation pane about 1 minute later.

If you click **Batt. Cell Detector**, you can view data on the **Running Information** and **Running Parameter** tab pages. The **Running Control** tab page has no data.

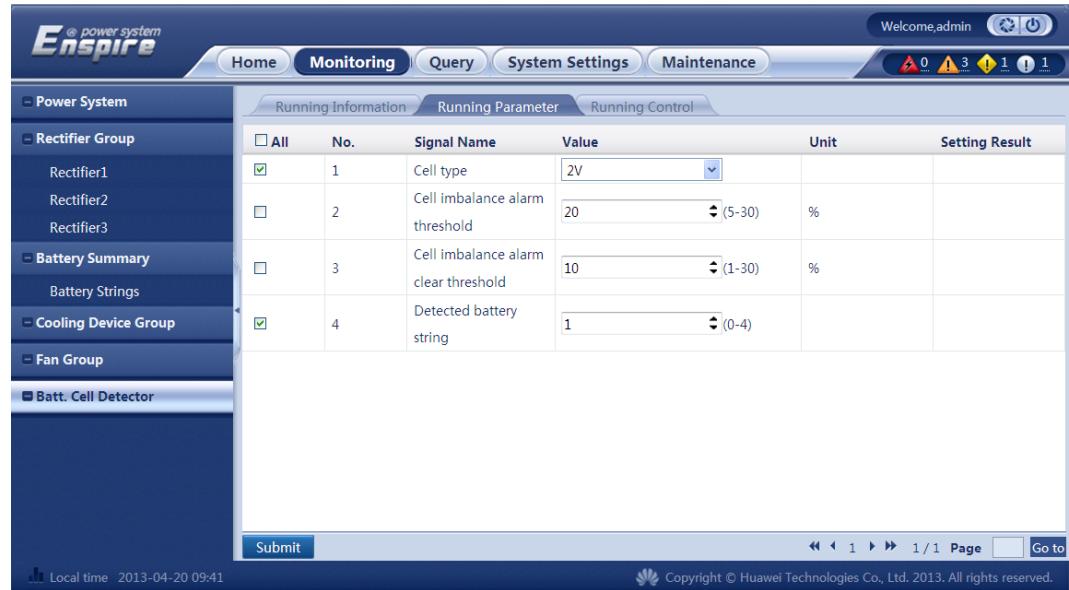
Figure 7-5 Changing the protocol type

The **Running Information** tab page displays the voltages of all batteries.

Figure 7-6 Running Information

No.	Signal Name	Value	Unit
1	Battery1 cell1 voltage	6.704	V
2	Battery1 cell2 voltage	6.679	V
3	Battery1 cell3 voltage	6.741	V
4	Battery1 cell4 voltage	6.628	V
5	Battery1 cell5 voltage	6.668	V
6	Battery1 cell6 voltage	6.693	V
7	Battery1 cell7 voltage	6.700	V
8	Battery1 cell8 voltage	6.692	V
9	Battery2 cell1 voltage	6.691	V
10	Battery2 cell2 voltage	6.661	V
11	Battery2 cell3 voltage	6.716	V
12	Battery2 cell4 voltage	6.712	V
13	Battery2 cell5 voltage	6.656	V

The **Running Parameter** tab page allows you to select battery types (such as 2 V, 6 V, and 12 V), set an alarm threshold and clearance threshold for battery imbalance, and set the number of battery strings.

Figure 7-7 Running Parameter

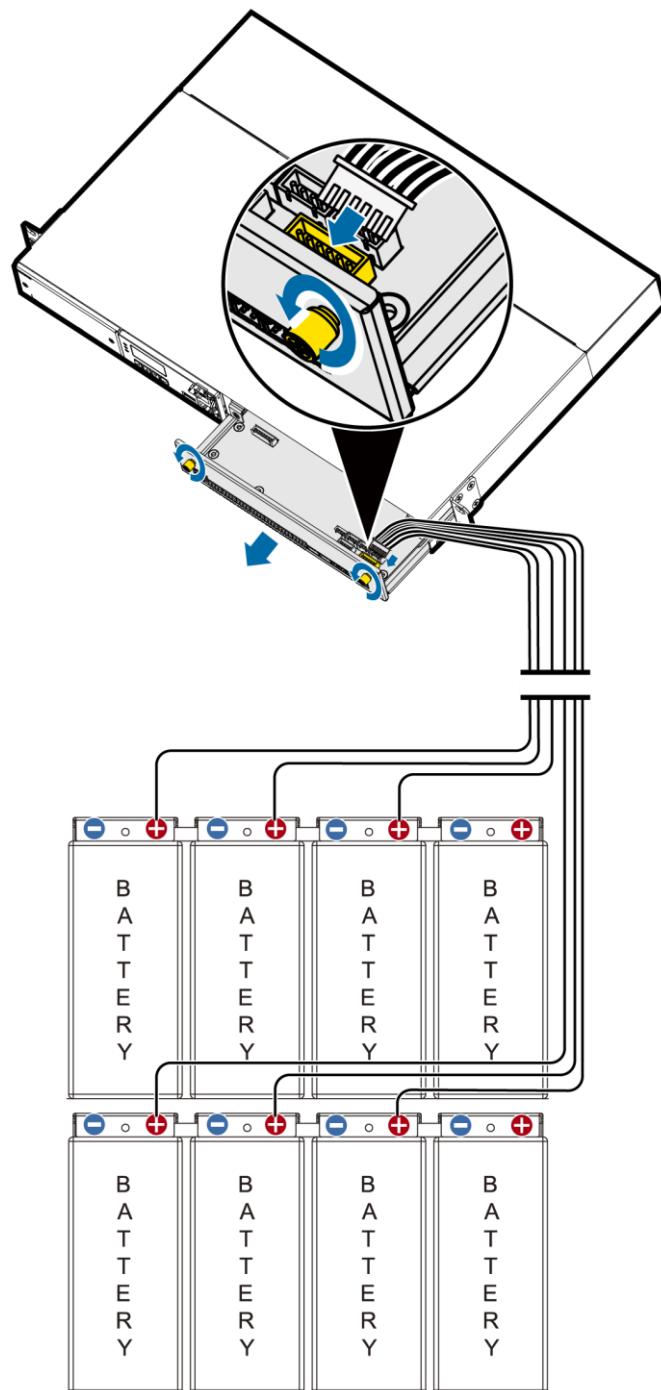
7.9.2 Battery Imbalance Detection in Non-Intelligent Mode

If battery imbalance is detected in non-intelligent mode, a UIM rather than an intelligent battery detector connects to battery detection cables. The batteries in a maximum of two battery strings can be detected in this mode.

Principles

If battery imbalance is detected in non-intelligent mode, a UIM rather than an intelligent battery detector connects to battery detection cables.

Figure 7-8 Cable connections



Parameters

Table 7-25 Battery voltage detection parameter description

Parameter	Description	Default Value	Value Range
Cell type	A battery type, such as 2	-	2 V, 6 V, and 12 V

Parameter	Description	Default Value	Value Range
	V, 6 V, or 12 V		
Cell imbalance alarm threshold (%)	The alarm threshold is configurable.	20	5.0–30
Cell imbalance alarm clear threshold (%)	The clearance threshold is configurable.	10	1–30
Detected battery string	The number of battery strings being used	1	0–4

LCD Operation

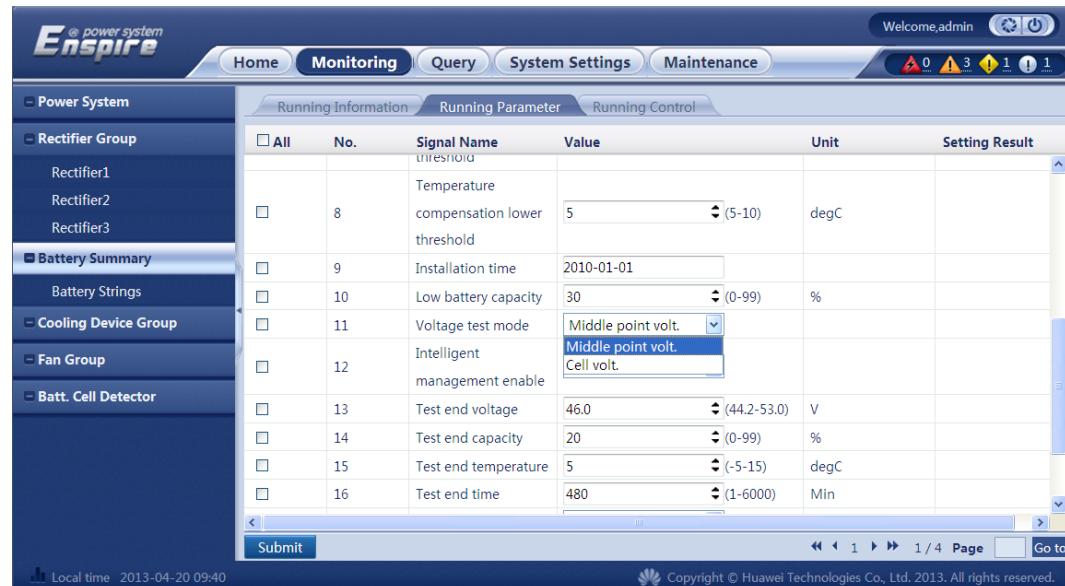
Correctly connect battery detection cables to the power system. For details, see the related installation guide.

1. Set **Voltage test mode** to **Cell Volt..**. Path: **Main Menu > Parameters Settings > Battery Parameters > Basic Parameters > Volt. test mode (Cell volt)**
2. Set parameters. Path: **Main Menu > Parameters Settings > Battery Parameters > Batt. Cell Detector**

WebUI Operation

Log in to the WebUI of the SMU02B, click **Battery Summary**, set **Voltage test mode** to **Cell Volt..**, and click **Submit**. The configurable parameters are displayed under **Voltage test mode**.

Figure 7-9 Modifying the mode for detecting battery voltages



7.10 Battery Capacity Calculation

Principles

Calculate the remaining battery string capacity, calculate the percentage of the remaining capacity related to the rated capacity based on the rated battery capacity and charge and discharge parameters, and calculate the backup time based on the load power.

Parameters

Table 7-26 Battery capacity calculation parameter description

Parameter	Description	Default Value	Value Range
Charge capacity coefficient		0.95	0.6-1.0
Battery discharge curve point quantity	Charge and discharge battery parameters. Configure the parameters based on the specifications for the selected storage batteries.	11	2-20
Discharge curve point 1 time		21.0 Min	1.0-6000.0
Discharge curve point 2 time		25.2 Min	1.0-6000.0
Discharge curve point 3 time		30.0 Min	1.0-6000.0
Discharge curve point 4 time		36.6 Min	1.0-6000.0
Discharge curve point 5 time		52.2 Min	1.0-6000.0
Discharge curve point 6 time		69.6 Min	1.0-6000.0
Discharge curve point 7 time		97.8 Min	1.0-6000.0
Discharge curve point 8 time		145.2 Min	1.0-6000.0
Discharge curve point 9 time		240.0 Min	1.0-6000.0
Discharge curve point 10 time		600.0 Min	1.0-6000.0
Discharge curve point 11 time		1200.0 Min	1.0-6000.0
Discharge curve point 1 current	Charge and discharge battery parameters. Configure the parameters based on the specifications for the selected storage batteries.	1	0.01-2.00
Discharge curve point 2 current		0.9	0.01-2.00
Discharge curve point 3 current		0.8	0.01-2.00
Discharge curve point 4 current		0.7	0.01-2.00
Discharge curve point 5 current		0.6	0.01-2.00

Parameter	Description	Default Value	Value Range
Discharge curve point 6 current		0.5	0.01–2.00
Discharge curve point 7 current		0.4	0.01–2.00
Discharge curve point 8 current		0.3	0.01–2.00
Discharge curve point 9 current		0.2	0.01–2.00
Discharge curve point 10 current		0.1	0.01–2.00
Discharge curve point 11 current		0.05	0.01–2.00

Table 7-27 Battery status parameter description

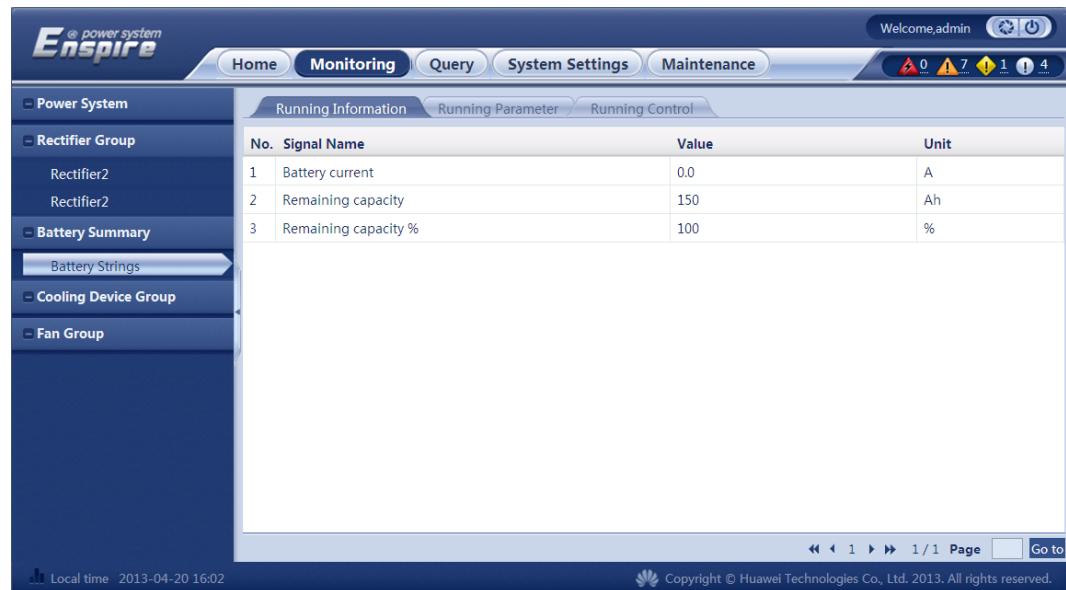
Parameter	Description
Remaining capacity	Remaining capacity of each battery string
Remaining capacity	Percentage of the remaining electricity of each battery string to the rated capacity
Battery current	Battery charge and discharge currents

LCD Operation

Path: **Running Information > Battery Information > Battery Strings.**

WebUI Operation

Figure 7-10 Battery operating information



7.11 Intelligent Battery Hibernation

Principles

A storage battery is usually fully charged, and its float charging capacity is much greater than its self-discharge capacity. This shortens a battery lifespan because surplus electricity is consumed by the corrosion of positive grids and electrolyte drying. To prolong a battery lifespan, enable the intelligent battery hibernation function when charging storage batteries in float mode.

If a mains outage has not occurred for some time, charging storage batteries at a lower voltage than the float voltage helps increase a battery lifespan.

The SMU02B determines a power grid's type based on the total duration of mains failures over 15 consecutive days. It then enables an appropriate battery charge management mode to extend a battery lifespan.

Table 7-28 Intelligent battery hibernation parameters

Total Duration for Mains Failures over 15 Consecutive Days	Power Grid Type	Charge Mode	Current Limit	Hibernation Voltage	Hibernation Duration	Expected Increase Range of a Battery Lifespan
≤ 5 hours	Class 1	Mode A	0.10 C	52.0 V	13 days	100%

Total Duration for Mains Failures over 15 Consecutive Days	Power Grid Type	Charge Mode	Current Limit	Hibernation Voltage	Hibernation Duration	Expected Increase Range of a Battery Lifespan
	power grids					
5–30 hours	Class 2 power grids	Mode B	0.15 C	52.0 V	6 days	50%
30–120 hours	Class 3 power grids	Mode C	0.15 C	N/A	N/A	0%
≥ 120 hours	Class 4 power grids	Mode C	0.15 C	N/A	N/A	0%

 **NOTE**

If **Intelligent management enable** is set to **Yes**, parameters about intelligent battery hibernation are displayed.

8 Rectifier Management

8.1 Rectifier Power-on/off Control

Principles

The SMU02B powers on/off individual rectifier or all rectifiers.



NOTE

This function is enabled only in manual mode.

Parameters

Table 8-1 Parameter descriptions for rectifier power-on/off control

Parameter	Description	Default Value	Value Range
Power on all rectifier	Controls power-on for all rectifiers.	Yes	Yes
Power on/off control	Controls power-on/off for individual rectifiers.	On	On, Off

8.2 Rectifier Output Voltage and Current Limiting

Principles

To limit the output voltage and current, set the expected maximum output values. For example, if the expected output current of a single module is 20 A and the rated rectifier current is 50 A, then set the current limit to 40% ($20\text{ A}/50\text{ A} \times 100\%$).

This function can be enabled only in manual mode. In automatic mode, the value of parameters listed in [Table 8-2](#) are invalid.

Parameters

**NOTE**

This function is enabled only in manual mode.

Table 8-2 Parameter description for rectifier output control

Parameter	Description	Default Value	Value Range
Current limiting threshold	Percentage of the expected output current in relation to the rated rectifier current	121%	1%–121%
Output voltage	Rectifier output voltage	53.5 V	42.0–58.3

8.3 Rectifier Output Voltage

Principles

A rectifier is protected if the output voltage is greater than the maximum value:

- If a rectifier experiences overvoltage due to an internal fault, the rectifier shuts down and then restarts. If the rectifier experiences three consecutive times of overvoltage due to an internal fault within 5 minutes, the rectifier latches off.
- If the busbar voltage exceeds 63 V due to an external fault, and the overvoltage condition lasts for more than 500 ms, the rectifier latches off.

The SMU02B generates a rectifier protection alarm.

This function applies only to CAN-type rectifiers.

Parameters

Table 8-3 Parameter description for rectifier overvoltage protection

Parameter	Description	Default Value	Value Range
High Voltage Limit	If the rectifier output voltage exceeds the value, the SMU02B generates a rectifier protection alarm.	59.5 V	58.5–60.5

8.4 Sequential Rectifier Startup (Optional)

Principles

Sequential rectifier startup enables rectifiers to be started one by one according to a preset sequence and by following a preset time interval, minimizing the adverse effect on the rectifier input end.

This function applies only to CAN-type rectifiers.

Parameters



This function is enabled only in manual mode.

Table 8-4 The parameter description of sequential rectifier startup

Parameter	Description	Default Value	Value Range
Sequential start interval(s)	Time interval between the rectifiers that are started sequentially.	0s	0–20

9 Energy Conservation Management

9.1 Intelligent Rectifier Hibernation

Principles

Rectifier efficiency increases in proportion to load power. If the total load power is low, certain rectifiers can be hibernated to improve the load power of running rectifiers, increase rectifier efficiency, and reduce power consumption.

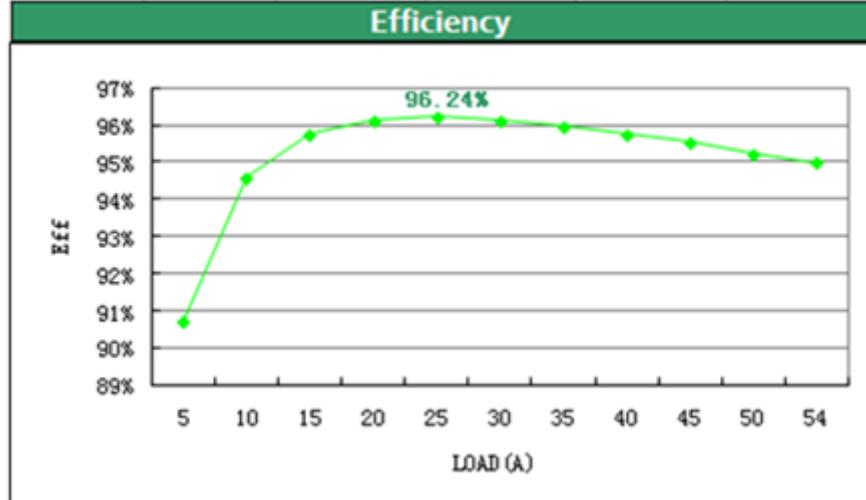
Rectifiers should be hibernated in turn to ensure the same aging degree. If the difference between the longest rectifier running duration and the shortest rectifier running duration exceeds the value of **Cycle Period**, keep all rectifiers running for 2 hours, and then hibernate certain rectifiers.



NOTE

This function is enabled only in manual mode.

Figure 9-1 R4850G1 efficiency curve



Parameters

Table 9-1 Parameter description for intelligent rectifier hibernation

Parameter	Description	Default Value	Value Range
Hibernation Enabled	Enables or disables intelligent rectifier hibernation.	No	Yes and No
Hibernation Mode	Rectifier hibernation mode	Intelligent mode, Common mode, High efficiency mode	Intelligent mode
Best efficient point	Loading capacity for rectifiers running at optimal efficiency.	80%	50–100
Min. working rectifier	Minimum number of running rectifiers under the no-load condition.	2	1–100
Circulation on/off period (Day)	Interval between hibernation operations.	7 Day	1–365
Phase balance	The rectifiers phase balance or unbalance	No	Yes and No
Min. redundant coefficient	Min. redundant coefficient multiplied by the rated rectifier capacity is the minimum output current of rectifiers in no load.	0.20	0.05–1.00
Hibernation end time	The rectifier hibernation end time	3	1–30
Low rectifier capacity (%)	If the rectifier loading capacity is lower than the value of Low rectifier capacity , the SMU02B generates a light load alarm.	5%	0–150
High rectifier capacity (%)	If the rectifier loading capacity is higher than the value of High rectifier capacity , the SMU02B generates a heavy load alarm.	75%	0–150

10 Temperature Control Management (Optional)

10.1 Heat Exchanger+Direct Ventilation Unit

10.1.1 Monitoring Information

Principles

The SMU02B monitors the operating information about the integrated cabinet with a heat exchanger and direct ventilation unit in real time and displays the information on the LCD and WebUI.

Table 10-1 Parameter description for the integrated cabinet with a heat exchanger and direct ventilation unit

Parameter	Description
Return air vent temperature	Indicates the temperature at the return air vent in the cabinet.
External ambient temperature	Indicates the ambient temperature outside the cabinet.
Fan speed	Indicates the fan rotational speed.
Fan status	Indicates the fan operating status.

10.1.2 Setting the Control Mode and Parameters

Parameters

Table 10-2 Control mode

Parameter	Description	Default Value	Value Range
Temperature control Mode	<ul style="list-style-type: none">In the Intelligent Mode, SMU02B adjusts the fan speed and power on or power off the air conditioner automatically depends on the temperature.In the Fan Mode, SMU02B adjusts the fan speed automatically depends on the temperature. The air conditioner is off and can be powered on automatically when the fan is fault.In the A/C Mode, SMU02B power on or power off the air conditioner automatically depends on the temperature. The fan is off and can be powered on automatically when the air conditioner is fault.	Intelligent Mode	Intelligent Mode, Fan Mode, A/C Mode
Fan control mode	<ul style="list-style-type: none">In the Automatic mode, SMU02B adjusts the fan speed automatically depends on the temperature.In the Manual mode, users can adjust the ratio of the fan speed.	Automatic	Automatic, Manual

Table 10-3 Control parameter description

Parameter	Description	Default Value	Value Range
Fan speed ratio 1	Displayed and valid when the Fan control mode is in Manual mode	100%	0%–100%
Fan speed ratio 2	Displayed and valid when the Fan control mode is in Manual mode	100%	0%–100%
Min. runtime	The minimum operating duration of a fan	180s	0–60000
Work interval	If the fan stop duration is shorter than the value of Work interval , the fan cannot start.	30s	0–60000
Manual-to-autom	If the fan works for the time specified by Manual-to-automatic	600s	0–60000

Parameter	Description	Default Value	Value Range
static time	time in manual mode, the SMU02B switches the fan working mode to Automatic .		

10.1.3 Setting the Alarm Threshold

Table 10-4 Alarm threshold

Parameter	Description	Default Value	Value Range
High temperature alarm threshold	If the temperature inside the cabinet exceeds the value of this parameter, the SMU02B generates an alarm.	68 degC	25–80
High temperature alarm clear threshold	If the temperature inside the cabinet is below the value of this parameter, the alarm is cleared.	65 degC	25–80

10.2 Heat Exchange and TEC

10.2.1 Monitoring Information

Principles

The SMU02B monitors the running information about temperature control devices in real time and displays the information on the LCD and WebUI.

Table 10-5 Running information about the temperature control device group

Parameter	Description
Return air vent temperature	Indicates the temperature at the return air vent in the cabinet.
External ambient temperature	Indicates the ambient temperature outside the cabinet.

Table 10-6 Running information about the fan group

Parameter	Description
Fan speed	Indicates the fan rotational speed.
Fan status	Indicates the fan running status.

Table 10-7 TEC running information

Parameter	Description
Address	Indicates the fans connecting to the power system.
Internal circular fan speed	Indicates the rotational speed of the internal circulation fan in the TEC.
External circular fan speed	Indicates the running status of the external circulation fan in the TEC.
Exhaust vent temperature	Indicates the temperature at the air exhaust vent of the battery temperature.
Soft	Indicates the software version of the TEC.

10.2.2 Setting the Control Mode and Parameters

Parameters

Table 10-8 Control mode

Parameter	Description	Default Value	Value Range
Temperature control Mode	<ul style="list-style-type: none">In the Intelligent Mode, SMU02B adjusts the fan speed and power on or power off the air conditioner automatically depends on the temperature.In the Fan Mode, SMU02B adjusts the fan speed automatically depends on the temperature. The air conditioner is off and can be powered on automatically when the fan is fault.In the A/C Mode, SMU02B power on or power off the air conditioner automatically depends on the temperature. The fan is off and can be powered on automatically when	Intelligent Mode	Intelligent Mode, Fan Mode, A/C Mode

Parameter	Description	Default Value	Value Range
	the air conditioner is fault.		
Fan control mode	<ul style="list-style-type: none"> In the Automatic mode, SMU02B adjusts the fan speed automatically depends on the temperature. In the Manual mode, users can adjust the ratio of the fan speed. 	Automatic	Automatic, Manual

Table 10-9 Control parameter description

Parameter	Description	Default Value	Value Range
Fan speed ratio 1	Displayed and valid when the Fan control mode is in Manual mode	100%	0%–100%
Fan speed ratio 2	Displayed and valid when the Fan control mode is in Manual mode	100%	0%–100%
Min. runtime	The minimum operating duration of a fan	180s	0–60000
Work interval	If the fan stop duration is shorter than the value of Work interval , the fan cannot start.	30s	0–60000
Manual-to-automatic time	If the fan works for the time specified by Manual-to-automatic time in manual mode, the SMU02B switches the fan working mode to Automatic .	600s	0–60000

Table 10-10 TEC control parameter description

Parameter	Description	Default Value	Value Range
Reset	Restarts the TEC.	Yes	Yes

10.2.3 Setting the Alarm Threshold

Table 10-11 Alarm threshold

Parameter	Description	Default Value	Value Range
High temperature	If the temperature inside the	68 degC	25–80

Parameter	Description	Default Value	Value Range
alarm threshold	cabinet exceeds the value of this parameter, the SMU02B generates an alarm.		
High temperature alarm clear threshold	If the temperature inside the cabinet is below the value of this parameter, the alarm is cleared.	65 degC	25–80

Table 10-12 TEC alarm threshold parameter description

Parameter	Description	Default Value	Value Range
High temperature alarm threshold	If the temperature inside the battery compartment is greater than the value of this parameter, the SMU02B generates an overtemperature alarm.	50 degC	25–80
Low temperature alarm threshold	If the temperature inside the battery compartment is less than the value of this parameter, the SMU02B generates an undertemperature alarm.	-20 degC	-20 to +20

11 D.G. Management (Optional)

11.1 D.G. Management Mode

Before managing a D.G., set the D.G. management mode and connect signal cables to dry contacts.

Table 11-1 D.G. management mode parameter description

Parameter	Description	Default Value	Value Range
Diesel generator function	<ul style="list-style-type: none">NoDisables D.G. management.Power limitingLimits the AC input power of the power system to avoid D.G. startup failures caused by overload. This mode depends on the D.G. running status.	No	No Power limiting

11.2 Power Limitation Management

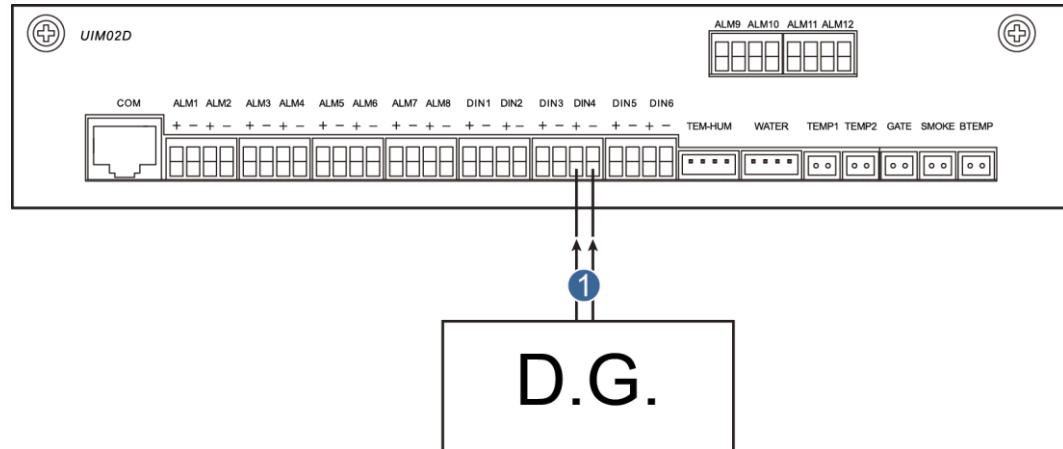
Principles

To ensure that the D.G. works properly and the AC input power is less than the rated D.G. power, the SMU02B limits the output currents of rectifiers based on the rated D.G. power.

This function is enabled to control the output power of the power system only when the D.G. is running. When the D.G. is shut down (for example, when mains supply is used), this function is disabled. Therefore, whether this function is enabled depends on the D.G. status monitored through the DIN interface.

Examples for Signal Cable Connections

[Figure 11-1](#) shows the signal cable connections between the D.G. and the UIM02D

Figure 11-1 Signal cable connections between the D.G. and the UIM02D

1. The SMU02B manages the D.G. status through the DIN4 interface. The D.G. status can be:
 - Close: The D.G. is running.
 - Open: The D.G. is not running.

Parameters

LCD Path: **Parameters Settings > D.G.**

WebUI Path: **Monitoring > D.G. > Running Parameter**



The D.G. menu is displayed when **Diesel generator function** is set to **Power limiting** or a D.G. is connected.

Table 11-2 Parameter description for D.G. power limitation management

Parameter	Description	Default Value	Value Range
Diesel generator rated power	The value should be set to the actual output power of the D.G. used by the site.	12.5	1.0–100.0 kW

12 Maintenance Operation

12.1 Viewing Information

12.1.1 Viewing System Operating Information

Principles

The SMU02B monitors the AC voltage and current, DC voltage and current, ambient temperature and humidity, and battery temperature for the power system in real time. You can view such information on the LCD and WebUI.

Parameters

Table 12-1 System information description

Parameter	Description
System voltage	Busbar voltage detected in real time.
Total load current	The load current equals the total rectifier output current minus the total battery current.
Phase A/B/C voltage	Mains AC voltage detected by rectifiers.
Phase A/B/C current	Mains AC current detected by rectifiers.
Ambient temperature	Ambient temperature around the cabinet.
Ambient humidity	Ambient humidity around the cabinet.
Battery temperature	Temperature of the battery string.
Total battery current	Sum of the currents on all battery loops.
Current limit status	Current limiting in battery charge
Test status	Indicates whether batteries are being tested.
Battery status	Indicates whether batteries are being charged or discharging.
Battery current	Battery discharge current

Parameter	Description
Remaining capacity	Remaining battery capacity
Remaining capacity %	Percentage of the remaining battery capacity to the total battery capacity

LCD Operation

Path: Main Menu > Running Information

WebUI Operations

1. Log in to the WebUI and then enter the **Monitoring** page.
2. Click **Power System** to view the values of **System voltage**, **Total load current**, and other parameters.
3. Click **Rectifier Group** to view the values of **Total current**, **AC frequency**, **Total DC power**, and other parameters.
4. Click **Rectifier** to view the information about each rectifier, including the DC output voltage and current.
5. Click **Battery Summary** to view the values of **Battery temperature**, **Total battery current**, **Current limit status** and other parameters.



NOTE

Total battery current indicates the total battery current.

6. Click **Battery Strings** to view the values of **Battery current**, **Remaining capacity**, **Remaining capacity %**.

12.1.2 Viewing Rectifier Operating Information

Principles

The SMU02B monitors the rectifier operating information in real time and displays this information on the LCD and WebUI.

Parameters

Table 12-2 Rectifier information

Parameter	Description
Total current	Sum of the output currents of all rectifiers.
AC frequency	AC input frequency
Total DC power	Total rectifier output power.
Load usage	Percentage of load currents to rectifier output currents
Rated output current	Rated output current of each rectifier
Slot No.	Slot number of each rectifier

Parameter	Description
DC output voltage	The output voltage of each rectifier.
Rectifier temperature	Temperature of each rectifier
DC output current	The output current of each rectifier.
Power-on/off Status	The power-on or power-off status of each rectifier.
Hardware version	Hardware version of each rectifier
Software version	The software version number of each rectifier.
Bar code	Bar code of each rectifier
DC output power	The DC output power of each rectifier.
Phase No.	Phase number of each rectifier
AC voltage	The AC input voltage of each rectifier.
Total runtime	The total running time of each rectifier.
Current limit status	The current limit status of each rectifier.
Real-time efficiency	The real-time efficiency of each rectifier.

12.2 Upgrading Software

12.2.1 Viewing Version Information

You can view the software version on both the LCD and WebUI.

LCD Operations

To view the SMU02B version on the LCD, enter the standby screen and then press **Cancel**.

WebUI Operations

The **Version Information** page allows you to view the SMU02B version.

Path: **Maintenance > Version Information**

12.2.2 Upgrading Configuration Software

1. Log in to the WebUI.
2. Choose **Maintenance > Software Upgrade**.
3. Click **Browse** after the **Select an upgrade file** text box and select the software upgrade file.
4. Click **Upload**.
5. Click **Upgrade**.

The SMU02B restarts.

6. After the restarting is complete, check the system type by choosing **System Settings > Site Settings**. If the type is incorrect, modify it.

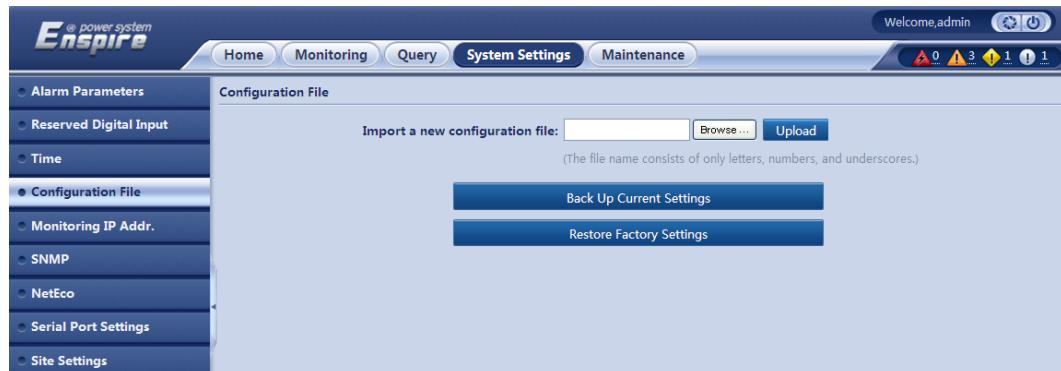
12.3 Managing System Configuration File

You can manage system configuration files only over the WebUI.

Table 12-3 System configuration management mode

Parameter	Description
Import a new configuration file	If you upload the local configuration file to the SMU02B, the parameter settings will be synchronized to the SMU02B.
Back Up Current Settings	Save current parameter settings as default settings.
Restore Factory Settings	The configuration will be restored to the factory settings. NOTE This operation causes the SMU02B to restart.

Figure 12-1 Configuration file operation page



12.4 Restarting the SMU02B

After the SMU02B restarts, the rectifiers, storage batteries, and other devices that connect to the SMU02B cannot be controlled or managed properly. The configuration is loaded automatically after the SMU02B restarts.

The following operations cause the SMU02B:

1. Switch the system type.

The system type is the type of the cabinet where the SMU02B is installed. You should not change the system type as doing so changes the parameter settings.

2. Upload the system type file.
3. Restore Factory Settings
The operator has no permission to perform this operation.
4. System reset
Only admin users have permission to restart the SMU02B over a WebUI.

12.5 Managing Users

The **User Management** page allows you to create and delete users and modify user information.

The SMU02B supports a maximum of three online users. User types are classified as admin, engineer, and operator. [Table 12-4](#) describes the rights of the three user types.

You can manage users only on the WebUI.

Table 12-4 User right description

User Type	Rights	Maximum Number of Users
Administrator	View, set, and control all attributes and functions.	16
Engineer	As above, but cannot upgrade software, download historical logs and statistics, or set energy conservation parameters.	
Operator	View system status, system configuration, control parameters, battery test records, alarm parameters, and electronic labels; set the time and certain control parameters.	

Changing User Passwords

Admin users have permission to change user passwords.

To change a user password, perform the following steps:

1. Log in to the WebUI.
2. Choose **Maintenance > User Management**.
The **User Management** page is displayed.
3. Select the user whose password needs to be changed and click **Modify**.
The **User Management** dialog box is displayed.
4. Set **Old Password**, **New Password**, and **Confirm Password**.
A password can contain six digits.
5. Click **Confirm**.

12.6 Setting the Date and Time

LCD Operation

Path: **Main Menu > Setting Wizard**

WebUI Operation

The **Time** page allows you to set the system time and time zone.

Path: **System Settings > Time**

1. On the **Time Zone** menu, set **Local time zone**.
2. Click **Submit**.
3. On the **Time** menu, set **Local date** and **Local time**.
4. Click **Submit**.

12.7 Downloading Historical Data

- Historical Alarm

Information about historical alarms includes the alarm name, alarm generation time, alarm clearance time, and acknowledgement status.

- Performance Data

Performance data includes the system voltage, total load current, and battery temperature.

- Operation Log

Records for accessing the SMU02B include the login user name, login time, logout time, and login mode.

- Battery Test Records

Battery test records contain the information about the latest 36 battery tests.

Procedure for downloading historical data:

1. Choose **Query > Export**.
2. On the displayed page, select data and click **Export**.

12.8 Exporting Electronic Labels

The **E-label** page enables you to view electronic label information about system components such as the SMU02B, rectifier, and backplane. You can export electronic labels in HTML or TXT format by clicking **Export**.

Path: **Maintenance > E-label**

13 Alarms Handling

13.1 Setting Alarm Parameters

You can enable or disable alarms and set the severity, and association with relays.

LCD Operations

Path: **Main Menu > Parameters Settings > Alarm Parameters**

WebUI Operations

Path: **System Settings > Alarm Parameters**

After setting a device type in the **Select an equipment type** drop-down list box, click **Confirm**, and then set alarm parameters in the alarm list corresponding to the device.

13.2 Querying Active Alarms

LCD Operation

Path: **Main Menu > Active Alarm**

WebUI Operation

Path: **Home > Active Alarm**

13.3 Configuring and Cancelling the Alarm Tone

13.3.1 Configuring Alarm Tones

Principles

You can judge an alarm based on the alarm indicator or alarm tone. If you need an alarm tone to indicate an alarm, set **Alarm tone enable** to **Yes**.

Parameters

LCD Path: **Main Menu > Parameters Settings > Power System**

WebUI Path: **Monitoring > Power System > Running Parameter**

Table 13-1 Parameter description for configuring alarm tones

Parameter	Description	Default Value	Value Range
Alarm tone enable	Enables or disables an alarm tone.	No	Yes and No
Alarm tone delay	Specifies the duration for an alarm tone.	10 Min	1-100

13.3.2 Cancelling the Alarm Tone

Principles

When the alarm clearance condition is met or the alarm tone duration ends, the alarm tone stops. To disable the alarm tone function, either set **Alarm tone enable** to **No**.

Parameters

Table 13-2 Parameter description for configuring alarm tones

Parameter	Description	Default Value	Value Range
Alarm tone enable	Enables or disables an alarm tone.	No	Yes and No

13.4 Managing Historical Alarms

Up to 50,000 pieces alarms can be stored in **Historical Alarm**. You can view, export, and clean them. If the number of alarms exceeds 50,000, the latest overwrite the earliest.

13.4.1 Viewing Historical Alarms

You can view historical alarms on both the LCD and WebUI.

LCD Operations

Path: **Main Menu > Running Information > Historical Alarm**.

WebUI Operations

Path: **Query > Historical Alarm.**

13.4.2 Exporting Historical Alarms

You can export historical alarms in HTML or TXT format on the WebUI.

1. Choose **Query > Export**.
2. On the displayed page, select **Historical Alarm** and click **Export**.

13.4.3 Cleaning Historical Alarms

You can clean all historical alarms on both the LCD and WebUI.

LCD Operations

Path: **Main Menu > Running Control > Clear Alarm > Historical Alarm**

WebUI Operations

Path: **Query > Historical Alarm.**

Click **Clean** to clean the historical alarms.

13.5 Alarm Description

Table 13-3 Power System Alarm Settings

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
AC SPD Fault	AC SPD Fault	Enable	Major	No
DC SPD Fault	DC SPD Fault	Enable	Major	No
AC Failure	AC Failure	Enable	Major	No
AC Ph. A OV	AC Phase A Overvoltage	Enable	Minor	No
AC Ph. B OV	AC Phase B Overvoltage	Enable	Minor	No
AC Ph. C OV	AC Phase C Overvoltage	Enable	Minor	No
AC Ph. A UV	AC Phase A Undervoltage	Enable	Minor	No
AC Ph. B UV	AC Phase B Undervoltage	Enable	Minor	No
AC Ph. C UV	AC Phase C	Enable	Minor	No

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
	Undervoltage			
AC Ph. A Failure	AC Phase A Failure	Enable	Critical	No
AC Ph. B Failure	AC Phase B Failure	Enable	Critical	No
AC Ph. C Failure	AC Phase C Failure	Enable	Critical	No
AC OV	AC Overvoltage	Enable	Minor	No
AC UV	AC Undervoltage	Enable	Minor	No
DC OV	DC Overvoltage	Enable	Critical	No
DC UV	DC Undervoltage	Enable	Critical	No
DC Ultra OV	DC Ultra Overvoltage	Enable	Critical	No
DC Ultra UV	DC Ultra Undervoltage	Enable	Critical	No
Load Fuse Break	Load Fuse Break	Enable	Major	No
Monitoring Fault	Monitoring Fault	Enable	Critical	No
Very High Amb. Temp.	Very High Ambient Temperature	Enable	Minor	No
Unknown System Type	Unknown System Type	Enable	Major	No
Door Alarm	Door Alarm	Enable	Minor	No
Water Alarm	Water Alarm	Enable	Critical	No
Smoke Alarm	Smoke Alarm	Enable	Critical	No
High Amb. Temp.	High Ambient Temperature	Enable	Minor	No
Low Amb. Temp.	Low Ambient Temperature	Enable	Warning	No
High Amb. Humi.	High Ambient Humidity	Enable	Warning	No
Low Amb. Humi.	Low Ambient Humidity	Enable	Warning	No
Ambient TS Missing	Ambient Temperature Sensor Missing	Enable	Warning	No
Amb. TS Fault	Ambient Temperature Sensor Fault	Enable	Minor	No

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Amb. HS Missing	Ambient Humidity Sensor Missing	Enable	Warning	No
Amb. HS Fault	Ambient Humidity Sensor Fault	Enable	Major	No
LLVD1 Warning	LLVD1 Warning	Enable	Major	No
LLVD1	LLVD1	Enable	Major	No
LLVD2 Warning	LLVD2 Warning	Enable	Major	No
LLVD2	LLVD2	Enable	Major	No
Long Mains Failure	Long Mains Failure	Enable	Major	No
Temp. Sensor1 Missin	Temperature Sensor1 Missing	Enable	Major	No
Temp. Sensor2 Missin	Temperature Sensor2 Missing	Enable	Warning	No
Temp. Sensor1 Fault	Temperature Sensor1 Fault	Enable	Major	No
Temp. Sensor2 Fault	Temperature Sensor2 Fault	Enable	Warning	No
High Temp1.	High Temperature1	Enable	Minor	No
High Temp2.	High Temperature2	Enable	Minor	No
Very High Temp1.	Very High Temperature1	Enable	Minor	No
Very High Temp2.	Very High Temperature2	Enable	Minor	No
DIN1 Alarm	DIN1 Alarm	Enable	Minor	No
DIN2 Alarm	DIN2 Alarm	Enable	Minor	No
DIN3 Alarm	DIN3 Alarm	Enable	Minor	No
DIN4 Alarm	DIN4 Alarm	Enable	Minor	No
DIN5 Alarm	DIN5 Alarm	Enable	Minor	No
DIN6 Alarm	DIN6 Alarm	Enable	Minor	No

Table 13-4 Rectifier Alarm Settings

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Rec. Fault	Rectifier Fault	—	Major	No
Rec. Protection	Rectifier Protection	—	Minor	No
Rec. Com. Failure	Rectifier Communication Failure	—	Minor	No
Rec. Power Failure	Rectifier Power Failure	—	Major	No
Rec. Overvoltage	Rectifier Overvoltage	—	Major	No

Table 13-5 Rectifier Group Alarm Settings

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Rectifier Lost	Rectifier Lost	Enable	Major	No
Insuff. Rdnt. Rec.	Insufficient Redundant Rectifier	Disable	Warning	No
Rec. Fault (Rdnt.)	Rectifier Fault (Redundant)	Disable	Minor	No
Rec. Fault (Non-rdnt.)	Rectifier Fault (Non-redundant)	Disable	Major	No
Multi-Rec. Fault	Multi-Rectifier Fault	Enable	Major	No
All Rec. Com. Fail	All Rectifier Communication Fail	Enable	Major	No
Rdnt. Rec. Activated	Redundant Rectifier Activated	Disable	Warning	No
High Rec. Capacity	High Rectifier Capacity	Disable	Minor	No
Low Rec. Capacity	Low Rectifier Capacity	Enable	Critical	No
Rec. Load Fault	Rectifier Load Fault	Enable	Major	No

Table 13-6 Battery Summary Alarm Settings

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
High Batt. Temp.	High Battery Temperature	Enable	Minor	No
Batt. 2 High Temp.	Battery 2 High Temperature	Enable	Minor	No
Low Batt. Temp.	Low Battery Temperature	Enable	Minor	No
Batt. 2 Low Temp.	Battery 2 Low Temperature	Enable	Minor	No
Batt. TS Missing	Battery Temperature Sensor Missing	Enable	Warning	No
Batt. TS 2 Missing	Battery Temperature Sensor 2 Missing	Enable	Warning	No
Equalized Charging	Equalized Charging	Disable	Warning	No
Disconnect Batteries	Disconnect Batteries	Enable	Major	No
Batt. EC Prot.	Battery Equalized Charging Protection	Enable	Major	No
Batt. 1 Fuse Break	Battery 1 Fuse Break	Enable	Critical	No
Batt. 2 Fuse Break	Battery 2 Fuse Break	Enable	Critical	No
Batt. 3 Fuse Break	Battery 3 Fuse Break	Enable	Critical	No
Batt. 4 Fuse Break	Battery 4 Fuse Break	Enable	Critical	No
Batt. 5 Fuse Break	Battery 5 Fuse Break	Enable	Critical	No
Batt. 6 Fuse Break	Battery 6 Fuse Break	Enable	Critical	No
Batt. 7 Fuse Break	Battery 7 Fuse Break	Enable	Critical	No
Batt. 8 Fuse Break	Battery 8 Fuse Break	Enable	Critical	No
Batt. 9 Fuse Break	Battery 9 Fuse Break	Enable	Critical	No

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Batt. 10 Fuse Break	Battery 10 Fuse Break	Enable	Critical	No
Batt. 11 Fuse Break	Battery 11 Fuse Break	Enable	Critical	No
Batt. 12 Fuse Break	Battery 12 Fuse Break	Enable	Critical	No
Batt. 1 Imbalance	Battery 1 Imbalance	Enable	Warning	No
Batt. 2 Imbalance	Battery 2 Imbalance	Enable	Warning	No
Batt. 3 Imbalance	Battery 3 Imbalance	Enable	Warning	No
Batt. 4 Imbalance	Battery 4 Imbalance	Enable	Warning	No
Batt. 5 Imbalance	Battery 5 Imbalance	Enable	Warning	No
Batt. 6 Imbalance	Battery 6 Imbalance	Enable	Warning	No
Batt. 1 Lost	Battery 1 Lost	Enable	Major	No
Batt. 2 Lost	Battery 2 Lost	Enable	Major	No
Batt. 3 Lost	Battery 3 Lost	Enable	Major	No
Batt. 4 Lost	Battery 4 Lost	Enable	Major	No
Batt. 5 Lost	Battery 5 Lost	Enable	Major	No
Batt. 6 Lost	Battery 6 Lost	Enable	Major	No
Batt. Discon. Warn	Battery Disconnection Warn	Enable	Major	No
Batt. Discharging	Battery Discharging	Enable	Warning	No
Batt. TC Activated	Battery Temperature Compensation Activated	Disable	Warning	No
Batt.1 Cell1 Imb.	Battery1 Cell1 Imbalance	Enable	Warning	No
Batt.1 Cell2 Imb.	Battery1 Cell2 Imbalance	Enable	Warning	No
Batt.1 Cell3 Imb.	Battery1 Cell3 Imbalance	Enable	Warning	No
Batt.1 Cell4 Imb.	Battery1 Cell4 Imbalance	Enable	Warning	No
Batt.2 Cell1 Imb.	Battery2 Cell1	Enable	Warning	No

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
	Imbalance			
Batt.2 Cell2 Imb.	Battery2 Cell2 Imbalance	Enable	Warning	No
Batt.2 Cell3 Imb.	Battery2 Cell3 Imbalance	Enable	Warning	No
Batt.2 Cell4 Imb.	Battery2 Cell4 Imbalance	Enable	Warning	No
Batt. Not Detected	Battery Not Detected	Enable	Warning	No
Abnormal Volt. Check	Abnormal Voltage Check	Disable	Warning	No
Batt. Reversely Con.	Battery Reversely Connection	Enable	Major	No
Batt. TS Fault	Battery Temperature Sensor Fault	Enable	Major	No
Batt. Very HT	Battery Very High Temperature	Enable	Major	No
Batt. Very LT	Battery Very Low Temperature	Enable	Major	No
Batt. Forcibly Con.	Battery Forcibly Connection	Enable	Major	No
Batt. Test Cancelled	Battery Test Cancelled	Disable	Warning	No
Batt String Cur. Imb	Battery String Current Imbalance	Enable	Warning	No
Batt. Very HT2	Battery Very High Temperature2	Enable	Major	No
Batt. Very LT2	Battery Very Low Temperature2	Enable	Major	No
Batt. TS2 Fault	Battery Temperature2 Sensor Fault	Enable	Major	No

Table 13-7 Battery Strings Alarm Settings

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Batt. Chg Overcur.	Battery Charge Overcurrent	Enable	Major	No
Low Battery Capacity	Low Battery Capacity	Enable	Warning	No
Cur. Limit Exceeded	Current Limit Exceeded	Disable	Warning	No

Table 13-8 Cooling Device Group Alarm Settings (applicable to the system configured with a cooling device that needs to be controlled by the SMU02B)

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Ret. Air TS Missing	Return Air Temperature Sensor Missing	Enable	Major	No
Ext. Amb. TS Missing	External Ambient Temperature Sensor Missing	Enable	Warning	No
Ret. Air TS Fault	Return Air Temperature Sensor Fault	Enable	Major	No
Ext. Amb. TS Fault	External Ambient Temperature Sensor Fault	Enable	Warning	No
Cooling Device HT	Cooling Device High Temperature	Enable	Critical	No
Heater Fault	Heater Fault	Enable	Major	No
A/C Fault	Air Conditioner Fault	Enable	Major	No

Table 13-9 Fan Group Alarm Settings (applicable to the power system configured with fan)

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Fan 1 Fault	Fan 1 Fault	Enable	Major	No
Fan 2 Fault	Fan 2 Fault	Enable	Major	No

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Fan 3 Fault	Fan 3 Fault	Enable	Major	No
Fan 4 Fault	Fan 4 Fault	Enable	Major	No

Table 13-10 TCU Alarm Settings (applicable to the power system configured with TEC)

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Hardware Fault	Hardware Fault	Enable	Major	No
Com. Failure	Communication Failure	Enable	Major	No
In. Circ. Fan Fault	Internal Circular Fan Fault	Enable	Major	No
Ext. Circ. Fan Fault	External Circular Fan Fault	Enable	Major	No
Exhau. Vent TS Fault	Exhaust Vent Temperature Sensor Fault	Enable	Major	No
Intake Vent TS Fault	Intake Vent Temperature Sensor Fault	Enable	Major	No
TCU High Temp.	TCU High Temperature	Enable	Major	No
TCU Low Temp.	TCU Low Temperature	Enable	Minor	No
Door Alarm	Door Alarm	Enable	Major	No
Water Alarm	Water Alarm	Enable	Major	No
Smoke Alarm	Smoke Alarm	Enable	Major	No
TEC Alarm	TEC Alarm	Enable	Major	No

Table 13-11 Batt. Cell Detector Alarm Settings (applicable to the power system configured with Batt. cell detector)

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Batt.1 Cell1-24 Imb.	Battery1 Cell1-24 Imbalance	Enable	Warning	No

Alarm		Alarm Properties		
LCD	WebUI	Alarm Enabled	Alarm Severity	Relay
Detector Com. Fail	Detector Communication Fail	Enable	Major	No
Abnormal Volt. Check	Abnormal Voltage Check	Enable	Warning	No
Batt.2 Cell1-8 Imb.	Battery2 Cell1-8 Imbalance	Enable	Warning	No
Batt.3 Cell1-4 Imb.	Battery3 Cell1-4 Imbalance	Enable	Warning	No
Batt.4 Cell1-4 Imb.	Battery4 Cell1-4 Imbalance	Enable	Warning	No

14 LCD Menu Hierarchy

**NOTE**

The menu hierarchy and parameter display depend on the system type, parameter settings, and device connections. For example, the **D.G.** menu is displayed when **D.G. function** is set to **Power limiting** or a D.G. is connected.

Table 14-1 Running Information menu hierarchy

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
Power System	System voltage				
	Total load current				
	Phase A/B/C volt.				
	Phase A/B/C current				
	Ambient temp.				
	Ambient humidity				
Rectifier	Rectifier Group	Total current			
		AC Frequence			
		Total DC power			
		Load usage			
	Rectifier	Slot No.			
		DC output volt.			
		DC output cur.			
		DC output power			

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
		AC voltage			
		Phase No.			
		Real-time efficiency			
		Rec. temperature			
		Total runtime			
		Current limit status			
		Power-on/off status			
		Rated output current			
		Hardware version			
		Software version			
		Bar code			
Battery Information	Battery Summary	Battery temperature			
		Total battery cur.			
		Backup time			
		Battery status			
		Test status			
		Current limit status			
		Batt.1 cell1-4 volt.			
	Battery Strings	Batt.2 cell1-4 volt.			
		Battery current			
		Remaining cap.			
		Remaining cap. %			
	Batt. Cell	Batt.1 cell1-24			

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
Detector	Detector	volt.			
		Batt.2 cell1-8 volt.			
		Batt.3 cell1-4 volt.			
		Batt.4 cell1-4 volt.			
	Battery Test Result				
Temp. Control Info.	Cooling Device Group	Ret. air vent temp.			
		External amb. temp.			
	Fan Group	Fan 1 speed			
		Fan 1 status			
		Fan 2 speed			
		Fan 2 status			
		Fan 3 speed			
		Fan 3 status			
		Fan 4 speed			
		Fan 4 status			
	TCU	Address			
		In. circ. fan speed			
		Ext. circ fan speed			
		DCU fan 1 speed			
		DCU fan 2 speed			
		Exhaust vent temp.			
		Intake vent temp.			
		Software version			

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
D.G.	D.G. running				
Historical Alarm					

Table 14-2 Setting Wizard menu hierarchy

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
Battery Parameters	Batt. string qty.			4	0-8
	Batt. rated cap.			150 Ah	5 Ah-10000 Ah
Date and Time	Date and time			yyyy-mm-dd hh:mm:ss	yyyy-mm-dd hh:mm:ss
	Time zone			UTC +08:00 Beijing	The world's major cities time zone, See Web Show
	NTP enable			No	No/Yes
Network Parameters	Local IP addr.			192.168.0.10	
	Local subnet mask			255.255.255.0	
	Local gateway			192.168.0.1	

Table 14-3 Parameters Settings menu hierarchy

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
Power System	AC OV thres.			280 V	60 V-300 V
	AC UV thres.			180 V	60 V-300 V
	DC OV thres.			58.0 V	53.0 V-60.0 V
	DC UV thres.			45.0 V	35.0 V-57.0 V
	DC ultra OV thres.			59.0 V	53.0 V-60.0 V
	DC ultra UV thres.			44.0 V	35.0 V-57.0 V
	Alarm tone enable			No	No/Yes

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
System	Alarm tone delay			10 Min	1 Min-100 Min
	Amb. HT thres.			55 degC	25 degC-80 degC
	Amb. LT thres.			-20 degC	-20 degC-20 degC
	Amb. HH thres.			95%	0%-100%
	Amb. LH thres.			5%	0%-100%
	Amb. very HT thres.			70 degC	25 degC-80 degC
	AC type			Three phase	Single phase/Three phase/Three ph-wir
	DC SPD			Yes	Yes/No
	AC SPD			Yes	Yes/No
	Door sensor			No	Yes/No
	Water sensor			Yes	Yes/No
	Smoke sensor			Yes	Yes/No
	Ambient TSs			1	0-1
	Ambient HSs			1	0-1
	Manualtoauto. Time			2 h	1 h-24 h
	D.G. function			No	No/Power limiting
	Time multiple (min)			1	1-60
	Time multiple (h)			1	1-3600
	Time multiple (day)			1	1-86400
	Time multiple (year)			1	1-525600
Rectifier	OV prot. thres.			59.5 V	58.5 V-60.5 V
	Sequential st. int.			0	0-20

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
Battery Parameters	High rec. cap. %			5%	0%-150%
	Low rec. cap. %			75%	0%-150%
	Output voltage			53.5 V	42 V-58.3 V
	Cur. limiting thres.			121%	1%-121%
Battery Parameters	Basic Parameters	Batt. string qty.		4	0-6
		Batt. rated cap.		150 Ah	5 Ah-10000 Ah
		FC voltage		53.5 V	42 V-58.3 V
		EC voltage		56.4 V	42 V-58.3 V
		Cur. limiting coef.		0.15C10	0.05C10-0.25C10
		Overcurrent coef.		0.25C10	0.05C10-0.5C10
		TC coef.		80 mV/degC	0 mV/degC-500 mV/degC
		Nominal temperature		25 degC	5 degC-45 degC
		TC upper thres.		45 degC	40 degC-45 degC
		TC lower thres.		5 degC	5 degC-10 degC
		Batt. hiber. volt.		52 V	42 V-58 V
		Installation time		2010-01-01	2000-1-1-2037-12-31
		Low battery capacity		30%	0%-99%
	LVD Parameters	Volt. test mode		Middle point volt	Middle point volt/Cell volt
		Imb. alm. thres.		20%	5%-30%
	LVD Parameters	Imb. alm. clr. thres		10%	1%-30%
		BLVD enable		Yes	Yes/No
		BLVD mode		Voltage mode	Voltage mode/Remaining cap. mode/Time

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
EC/FC Parameters	BLVD	BLVD capacity		5%	0%-99%
		BLVD time		480 Min	5 Min-1000 Min
		BLVD voltage		43.2 V	35 V-56 V
		BLVD reconnect volt.		51.5 V	37 V-58 V
	EC protection time	EC protection time		16 h	5 h-48 h
		Stable EC current		0.01C10	0.01C10-0.25C10
		Stable EC time		30 Min	2 Min-540 Min
		Auto. EC enable		Yes	No/Yes
		EC trans. cur. coef.		0.05C10	0.01C10-0.25C10
		FC-EC current delay		30 Min	2 Min-1440 Min
		EC transfer cap.		80%	50%-100%
		FC-EC capacity delay		10 Min	2 Min-1440 Min
		Sched. EC enable		Yes	No/Yes
		Sched. EC interval		30 Day	1 Day-365 Day
		Sched. EC time		9 h	1 h-24 h
	Batt. Test Param.	Pre-EC enable		Yes	No/Yes
		Mains recovery EC		No	No/Yes
		Mains recovery EC		10 Min	0 Min-30 Min
		Test end voltage		46.0 V	44.2 V-53.0 V
	Test end capacity	Test end capacity		20%	0%-99%
		Test end temperature		5 degC	-5 degC-15 degC
		Test end time		480 Min	1 Min-6000 Min

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
		Short test enable		Yes	No/Yes
		Short test period		30 Day	1 Day-360 Day
		Short test time		5 Min	1 Min-240 Min
		Short test end volt.		45 V	42 V-53 V
		Max. cur. difference		0.05C10	0C10-1C10
		AC fail test enable		No	No/Yes
		Time test mode		Disable	Disable/planned test /Scheduled test
		Sched. test start t.		21:00:00	hh:mm:ss
		Sched. test period		90 Day	2 Day-999 Day
		Annual battery tests		0	0-6
		Planned test time 1-6		01-01 00:00	00-00 00:00-12-31 23:59
		Cons. cur. test		No	No/Yes
		Cons. cur. test cur.		9999 A	1 A-9999 A
		HT Prot. Param.	Batt. very HT prot.	Reduce DC volt.	Disable/Reduce DC volt./Disconnect batterie
		Very HT prot. volt.		50.5 V	42 V-53 V
		HT alarm thres.		50 degC	25 degC-80 degC
		Very HT alarm thres.		53 degC	25 degC-80 degC
		LT alarm thres.		-10 degC	-20 degC-20 degC
		Very LT alarm		-20 degC	-20 degC-20

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
		thres.			degC
Chg./Dis. Param.	Charge efficiency	Charge efficiency		0.8	0.8-1
		Charge cap. coef.		0.95	0.6-1
	Dis. curve point qty			11	2-20
	Dis. curve time 1			21 Min	1-6000 Min
	Dis. curve time 2			25.2 Min	1-6000 Min
	Dis. curve time 3			30 Min	1-6000 Min
	Dis. curve time 4			36.6 Min	1-6000 Min
	Dis. curve time 5			52.2 Min	1-6000 Min
	Dis. curve time 6			69.6 Min	1-6000 Min
	Dis. curve time 7			97.8Min	1-6000Min
	Dis. curve time 8			145.2 Min	1-6000 Min
	Dis. curve time 9			240 Min	1-6000 Min
	Dis. curve time 10			600 Min	1-6000 Min
	Dis. curve time 11			1200Min	1-6000Min
	Dis. curve cur. 1			1.00C10	0.01C10-2C10
	Dis. curve cur. 2			0.9C10	0.01C10-2C10
	Dis. curve cur. 3			0.8C10	0.01C10-2C10
	Dis. curve cur. 4			0.7C10	0.01C10-2C10
	Dis. curve cur.			0.6C10	0.01C10-2C10

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
		5			
		Dis. curve cur. 6		0.5C10	0.01C10-2C10
		Dis. curve cur. 7		0.4C10	0.01C10-2C10
		Dis. curve cur. 8		0.3C10	0.01C10-2C10
		Dis. curve cur. 9		0.2C10	0.01C10-2C10
		Dis. curve cur. 10		0.1C10	0.01C10-2C10
		Dis. curve cur. 11		0.05C10	0.01C10-2C10
	Batt. Mgmt. Param.	Int. mgmt. enable		No	No/Yes
		Mode A hiber. time		13 Day	0 Day-30 Day
		Mode A cur. limiting		0.10C10	0.05C10-0.25C10
		Mode B hiber. time		6 Day	0 Day-15 Day
		Mode B cur. limiting		0.15C10	0.05C10-0.25C10
		Mode C cur. limiting		0.15C10	0.05C10-0.25C10
	Batt. Cell Detector	Cell type		2 V	2 V/6 V/12 V
		Detected batt string		1	0-4
		Imb. alm. thres.		20%	5%-30%
		Imb. alm. clr. thres		10%	1%-30%
LLVD Parameters	LLVD1 enable			Yes	No/Yes
	LLVD1 mode			Voltage mode	Voltage mode/Time mode/Remaining cap. mode
	LLVD1 voltage			45.0 V	35 V-56 V

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
	LLVD1 con. volt.			51.5 V	37 V-58 V
	LLVD1 time			180 Min	5 Min-1000 Min
	LLVD1 capacity			25%	0%-99%
	LLVD2 enable			Yes	No/Yes
	LLVD2 mode			Voltage mode	Voltage mode/Time mode/Remaining cap. mode
	LLVD2 volt.			44.0 V	35 V-56 V
	LLVD2 con. volt.			51.5 V	37 V-58 V
	LLVD2 time			360 Min	5 Min-1000 Min
	LLVD2 cap.			15%	0%-99%
Alarm Parameters	Reserved DI Settings	DIN1 alarm condition		Close	Open\Close
		DIN2 alarm condition		Close	Open\Close
		DIN3 alarm condition		Close	Open\Close
		DIN4 alarm condition		Close	Open\Close
		DIN5 alarm condition		Close	Open\Close
		DIN6 alarm condition		Close	Open\Close
	Output Relay Set.	ALM1 action		Close	Open\Close
		ALM2 action		Close	Open\Close
		ALM3 action		Close	Open\Close
		ALM4 action		Close	Open\Close
		ALM5 action		Close	Open\Close
		ALM6 action		Close	Open\Close
		ALM7 action		Close	Open\Close
		ALM8 action		Close	Open\Close

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
Alarm Settings	Power System	Power System			For details, see 13.5 Alarm Description
		Rectifier			For details, see 13.5 Alarm Description
		Rectifier Group			For details, see 13.5 Alarm Description
		Battery Summary			For details, see 13.5 Alarm Description
		Battery Strings			For details, see 13.5 Alarm Description
		Cooling Device Group			For details, see 13.5 Alarm Description
		Fan Group			For details, see 13.5 Alarm Description
		TCU			For details, see 13.5 Alarm Description
	Batt. Cell Detector	Batt. Cell Detector			For details, see 13.5 Alarm Description
		Clear ALM1 asso.		Yes	Yes
		Clear ALM2 asso.		Yes	Yes
		Clear ALM3 asso.		Yes	Yes
		Clear ALM4 asso.		Yes	Yes
		Clear ALM5 asso.		Yes	Yes
		Clear ALM6 asso.		Yes	Yes
		Clear ALM7 asso.		Yes	Yes

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
		Clear ALM8 asso.		Yes	Yes
Energy Saving	Hibernation enable			No	No/Yes
	Hibernation mode			Intelligent Mode	Intelligent Mode/High efficiency mod/common mode
	Min. rdnt. coef.			0.2	0.05-1
	Min. working rec.			2	1-100
	Best efficient point			80%	50%-100%
	Hibernation end time			3 Day	1 Day-30 Day
	Circ. on/off period			7 Day	1 Day-365 Day
	Phase balance			No	No/Yes
Cooling Device Group	Temp. control mode			Intelligent mode	Intelligent mode/ A/C mode/Fan mode
	Manual-to-auto. time			600s	0s-60000s
	HT alarm thres.			68 degC	25 degC-80 degC
	HT alm. clear thres.			65 degC	25 degC-80 degC
	Ret. air TS			Yes	No/Yes
	External TS			Yes	No/Yes
	Test mode			No	No/Yes
	Ret. air temp. test			25.0 degC	-20.0 degC-80.0 degC
	Ext. amb. temp. test			25.0 degC	-20.0 degC-80.0 degC
	Batt. temp. test			25.0 degC	-20.0 degC-80.0 degC
Fan Group	Min. runtime			180s	0s-60000s

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
	Work interval			30s	0s-60000s
	Fan speed ratio 1			100%	0%-100%
	Fan speed ratio 2			100%	0%-100%
TCU	HT alarm thres.			50 degC	25 degC-80 degC
	LT alarm thres.			-20 degC	-20 degC-20 degC
D.G.	D.G. rated power			12.5 kW	1 kW-100 kW
Local Parameters	Language			English	English, Chinese, Italian, French, Spanish, Portuguese, Russian
	Shunt Coefficient	Default shunts		1	0-6
		Batt. shunt volt.		25 mV	5 mV-150 mV
		Batt. shunt cur.		300 A	5 A-3000 A
		Batt. shunt 1 enable		Yes	No/Yes
	Network Parameters	Local IP addr.		192.168.0.10	
		Local subnet mask		255.255.255.0	
		Local gateway		192.168.0.1	
		NetEco IP		192.168.0.10	
		NetEco sec. IP		192.168.0.10	
		NetEco port		31220	1-65535
	Serial Port Settings	NB. com.	Port Mode	Manual	Manual/Automatic
			Protocol type	Master/Slave proto.	Master/Slave protocol/YDN protocol
		Master/Slave proto. B	9600	9600/19200	
		Master/Slave proto. C	3	0-31	

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
System Configuration	Serial Communication	SB. com.	Port Mode	Manual	Manual/Automatic
			Protocol type	Master/Slave proto.	Master/Slave proto./Modbus protocol
			Master/Slave proto. B	9600	9600/19200
	Site Name Setting	Site ID			'a-z', 'A-Z', '0-9', '_'(Up to 8 characters)
	System Type Settings	System type		unKnown	unKnown, TP48200A-H15 B1, TP48200A-H15 B2, ...
	Date and Time	Date and time		yyyy-mm-dd hh:mm:ss	yyyy-mm-dd hh:mm:ss
		Time zone		UTC +08:00 Beijing	The world's major cities time zone, See Web Show
		NTP enable		No	No/Yes
	LCD Contrast	Contrast		5	0-10
	Change Password			000000	'a-z', 'A-Z', '0-9'
Restore Settings	Restore factory set.			Yes	Yes

Table 14-4 Running Control menu hierarchy

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
Power System	System control mode			Manual	Manual/Automatic
	Reset smoke sensor			Yes	Yes
	Reset monitoring			Yes	Yes
	LLVD1 manual			Power-on	Power-on/Power-off

Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Fifth-Level Menu	Default Value	Value Range
	control				r-off
	LLVD2 manual control			Power-on	Power-on/Power-off
Rectifier	Rectifier Group	Power on all rec.		Yes	Yes
		OV lock reset		Yes	Yes
		Clear com. fail rec.		Yes	Yes
	Rectifier	Power on/off control		on	on/off
Battery	EC/FC control			Float charging	Float charging /Equalized charging
	Manual test control			Stop	Stop/Start
	Batt. power on/off			Power-on	Power-on/Power-off
	Short test control			Stop	Stop/Start
	Reset batt. capacity			Yes	Yes
Cooling Device Group					
Fan Group	Fan control mode			Automatic	Manual/Automatic
TCU	Reset			Yes	Yes
	Clear com. fail TCU			Yes	Yes
Clear Alarm	Historical Alarm	Delete his. alarms		Yes	Yes
	Active Alarm			Clear alarm	Clear alarm
Clear Batt. Test Log	Clear batt. test log			Yes	Yes
Output Relay Test	Test enable			No	No/Yes

A Technical Specifications

Table A-1 Technical Specifications

Category	Item	Specifications
Environmental conditions	Operating temperature	–40 °C to +70 °C
	Transportation temperature	–40 °C to +70 °C
	Storage temperature	–40 °C to +70 °C
	Operating humidity	5%–95% RH (non-condensing)
	Storage humidity	5%–95% RH (non-condensing)
	Altitude	0–4000 m When the altitude ranges from 3000 m to 4000 m, the operating temperature decreases by 1 °C for each additional 200 m.
Power supply	Input voltage range	36–72 V DC
	Maximum current	0.5 A
Structure	Dimensions (H x W x D)	40.8 mm x 99 mm x 194.3 mm
	Weight	≤ 1.5 kg
Mean time between failures (MTBF)		≥ 250,000 hours

B Acronyms and Abbreviations

D	
D.G.	diesel generator
DIN	dry contact input
F	
FE	fast Ethernet
H	
HTTPS	Hypertext Transfer Protocol Secure
L	
LCD	liquid crystal display
S	
SMU	site monitoring unit
SNMP	Simple Network Management Protocol
SSL	Security Socket Layer
U	
UIM	user interface module
USB	universal serial bus