

SmartLogger1000

User Manual

Issue 09

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About This Document

Overview

This document describes the SmartLogger1000 (SmartLogger) in terms of installation, electrical connections, system operation and maintenance, and troubleshooting measures. Get familiar with the functions and features of the SmartLogger, and read safety precautions before installing and operating the SmartLogger.

You can print the document. Store the paper copies properly for future use. You can also download the latest documents from http://support.huawei.com/carrier/.

Intended Audience

This document is intended for photovoltaic (PV) plant operators and qualified electrical technical personnel.

Symbol Conventions

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

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

Symbol	Description
□ NOTE	Calls attention to important information, best practices and tips.
	NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

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

Issue 09 (2016-08-15)

Added 3.6 Installing the RS485 signal SPD.

Added 4.2 Connecting the PE Cable for the RS485 Signal SPD.

Added 4.3 Connecting the RS485 Signal SPD.

Updated 4.4.1 Connecting the SmartLogger to the SUN2000.

Updated 4.4.2 Connecting the SmartLogger to the SUN8000.

Updated 4.5 Connecting to an EMI.

Updated 4.7 Connecting to an AC Combiner Box.

Updated 4.9 Connecting an Ethernet Network Cable.

Added 6.2.4 Sending a Reset Command to the Inverter.

Added 6.2.32 Resetting the System.

Added 7.11.7 Querying the Inverter Tracking System.

Added 7.11.9 Setting the Inverter LVRT Characteristic Curve.

Added 7.19 IEC103 Devices.

Issue 08 (2015-08-20)

Added 6.2.28 Exporting All Files.

Added 6.2.29 Importing All Files.

Added 7.31 Setting Modbus TCP Parameters.

Issue 07 (2015-01-20)

Added 4.10 Connecting to a PID.

Added PLC information query and parameter settings.

Added PID information query and parameter settings.

Added Custom Devices information query and parameter settings.

Added 7.43 Onsite Test.

Updated 7.44 Device management.

Issue 06 (2014-09-20)

Added 4.7 Connecting to an AC Combiner Box.

Added 6.2.9 Querying AC Combiner Box Information.

Added 6.2.10 Setting Feature Parameters for an AC Combiner Box.

Added 7.5 Querying the Power Station Running Information.

Added 7.13.2 Querying the Performance Data of a Power Meter.

Added 7.32 Setting IEC103 Parameters.

Issue 05 (2014-05-20)

Added 4.6 Connecting the SmartLogger to a Power Meter.

Added 6.2.6 Querying Master SmartLogger Information.

Added 6.2.7 Querying Slave SmartLogger Information.

Added 6.2.8 Querying Power Meter Information.

Added 6.2.20 Setting SmartLogger Contrast.

Added Batch Power-On/Off.

Added 7.3 WebUI Layout.

Added 7.10.1 Querying the Master SmartLogger Running Information.

Added 7.10.2 Querying the Active Alarms of the Master SmartLogger.

Added 7.10.3 Querying the Slave SmartLogger Running Information.

Added 7.29 Setting Power Meter Parameters.

Added 8.2 Application Scenarios.

Added 9.3 Alarms.

Issue 04 (2013-12-01)

This is the fourth official release.

Added **Server+Client** mode as a NetEco parameter in 6.2.23 Setting Communications Parameters.

Added address assignments in 6.2.30 Managing Devices.

Added the setting of USB parameters in 7.36.2 Setting USB Parameters.

Updated parts of the web user interface (WebUI).

Issue 03 (2013-09-10)

This issue is the third official release.

Compared with the second official release, this document updates some operations and figures for the LCD and WebUI.

Issue 02 (2013-06-06)

This issue is the second official release.

Issue 01 (2013-04-25)

This issue is the first official release.

Compared with the original draft, this document updates some operations and figures for the LCD and WebUI.

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Safety Precautions

Read the safety precautions carefully. Otherwise, human injury and equipment damage may occur.

1.1 Precautions

This topic describes the precautions for installing and operating the SmartLogger.

Personnel Requirements

- Only qualified and trained electrical technicians are allowed to install and operate the SmartLogger.
- Operation personnel should understand the composition and working principles of the PV grid-tied power generating system and local regulations.



NOTICE

Read this document thoroughly before operations. Huawei shall not be liable for any consequence caused by violation of the storage, transportation, installation, and operation regulations specified in this document.

Identification Protection

- The signs on the SmartLogger shell specify important information about secure operations. Do not damage the signs.
- The nameplate attached to the bottom of the SmartLogger lists the SmartLogger parameters. Do not damage the nameplate.

Installation

- Before installing the SmartLogger, ensure that it is not connected or energized.
- Install the SmartLogger in well-ventilated environments to ensure system performance.
- Ensure that the heat dissipation holes of the SmartLogger are not blocked.

• Do not move the components inside the shelf except for the wiring terminals at the bottom

Operation



NOTICE

Strictly comply with the safety precautions in this document and associated documents to operate the SmartLogger.

When operating the SmartLogger, follow local laws and regulations.

Maintenance and Replacement

- A faulty SmartLogger requires overall maintenance. Contact the dealer if any fault occurs in the SmartLogger shelf.
- Maintain the SmartLogger after you get familiar with this document and tools and testing equipment are available.
- When maintaining the SmartLogger, wear ESD gloves and comply with ESD precautions.

1.2 Symbols

The following table describes all symbols on the SmartLogger.

Symbol	Name	Meaning
CE	CE certification label	This product complies with the Conformite Europeenne (CE) certification standards.
V€I	VCCI certification label	This product complies with Voluntary Control Council for Interference by Information Technology Equipment (VCCI) certification standards.
50	Environmentally friendly use period (EFUP) label	This product does not pollute the environment during a specified period.
	EU waste electrical and electronic equipment (WEEE) label	Do not dispose of the SmartLogger as household garbage. For details about how to deal with the undesirable SmartLogger, refer to 10 Disposing of the SmartLogger.

2 Overview

This topic describes the SmartLogger in terms of functions, networking applications, product features, appearance, and the monitoring panel.

2.1 Product Introduction

This section describes the SmartLogger in terms of functions, networking applications, and product features.

Functions

The SmartLogger is dedicated for monitoring and managing the PV power generating system. It converges all ports, converts protocols, collects and stores data, and centrally monitors and maintains the PV power generating system.

Networking

The SmartLogger applies to a PV system.

- It can monitor Huawei inverters, AC combiner boxes, PID, and other devices.
- It supports third-party devices such as inverters, environment monitoring instruments, AC combiner boxes, box-type transformers, and smart meters that use the standard Modbus protocol or provide RS485 ports.
- It can simultaneously connect to the Huawei and third-party network management systems by using the Modbus-TCP and IEC104 protocols.
- It can connect to a multi-functional power meter over DLT645.

The SmartLogger networking is shown in Figure 2-1.

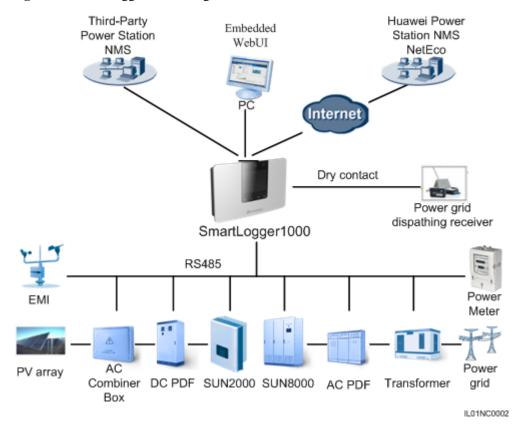


Figure 2-1 SmartLogger networking

Features

The SmartLogger has the following features:

- Central monitoring
 - Centrally monitors a maximum of 80 devices.
 - Allows users to view information about the power station, devices, products, and alarms, set parameters, and maintain devices on the liquid crystal display (LCD).
 - Allows users to monitor and manage the PV power generating system on the embedded WebUI, for example, viewing real-time information about the power station, devices, and faults, and setting device parameters in remote mode.

Graphical data

- Displays energy yields and real-time monitoring information on the LCD in graphics and texts.
- Displays energy yields, real-time monitoring information, and performance data of the power station and devices on the embedded WebUI in tables and curves.

Convenient maintenance

- Allows users to upgrade the firmware of the SmartLogger and inverters and export data by using a USB flash drive.
- Allows users to upgrade the firmware of the SmartLogger or inverters and export logs over the embedded WebUI.
- Grid dispatching

Supports power grid dispatching: active power reduction and reactive power compensation.

• Intelligent management

- Automatically scans and identifies Huawei inverters and AC combiner boxes and supports protocol conversion for third-party devices
- Supports access from third-party devices that use the standard Modbus-RTU protocol.
- Automatically assigns RS485 addresses to the connected inverters and allows for adjusting RS485 addresses based on device sequence numbers to facilitate remote configuration and maintenance.
- Supports remote setting of inverter parameters and synchronizes the parameters of one inverter to other inverters in batches.

• Remote maintenance

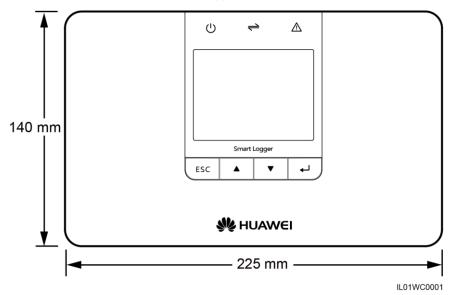
- Supports connection to Huawei NetEco and a third-party network management system (NMS) simultaneously using Modbus-TCP and IEC104 to remotely manage all devices.
- Allows users to access a third-party NMS over the File Transfer Protocol (FTP).
- Sends energy yield and fault information to users by emails.

2.2 Appearance

This topic describes the SmartLogger in terms of its appearance and specifications.

Front View of the Shell

Figure 2-2 Front view of the SmartLogger

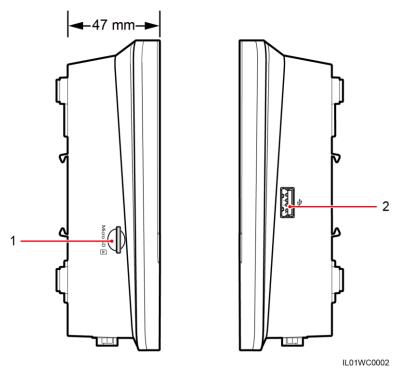


NOTE

The LCD on the SmartLogger monitoring panel displays information about the power site, devices, in the LCD on the SmartLogger monitoring panel displays information about the power site, devices, in the LCD on the SmartLogger monitoring panel displays information about the power site, devices, in the LCD on the SmartLogger monitoring panel displays information about the power site, devices, in the LCD on the SmartLogger monitoring panel displays information about the power site, devices, in the LCD on the SmartLogger monitoring panel displays information about the power site, devices, in the LCD on the SmartLogger monitoring panel displays information about the power site, devices, in the LCD on the SmartLogger monitoring panel displays information about the power site, devices, and the LCD on the SmartLogger monitoring panel displays information about the power site, devices, and the LCD on the SmartLogger monitoring panel displays information about the power site, devices, and the LCD on the SmartLogger monitoring panel displays information about the power site, devices and the LCD on th monitoring panel.

Side View of the shell

Figure 2-3 Side view of the SmartLogger

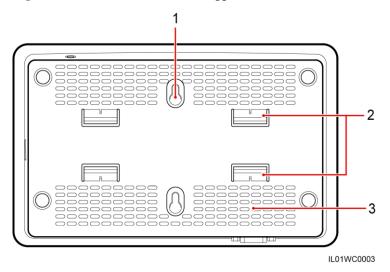


1. SD card slot

2. USB port

Rear View of the Shell

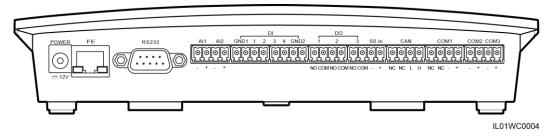
Figure 2-4 Rear view of the SmartLogger



- 1. Mounting hole
- 2. Rail snap
- 3. Heat dissipation hole

Bottom of the Shell

Figure 2-5 Bottom view of the SmartLogger



The following table describes functions of each port of the SmartLogger, as shown in Table 2-1.

Table 2-1 Port description

Port (Silk Screen)	Function	Description
POWER	Power supply	12 V DC
FE	Fast Ethernet	Connects to a local area network (LAN) switch, router, power over Ethernet (POE) or PC.
RS232	RS232	Connects to an external RS232 device.

Port (Silk Screen)	Function	Description
AI	Analog input	4–20 mA and 0–20 mA current input (active), reserved.
DI	Digital input	Connects to a dry contact input.
DO	Digital output	Relay output
S0.In	Connects to a pulse output power meter	Reserved
CAN	CAN	Reserved
COM1-COM3	RS485	Supports three RS485 ports that can connect to devices such as the inverter and environmental monitoring instrument (EMI).

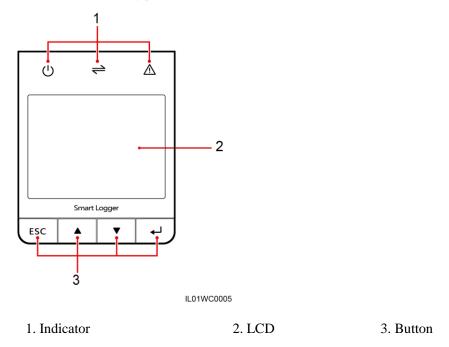
2.3 Monitoring Panel

This topic describes the monitoring panel, including an LCD, indicators, buttons, and the default page.

Monitoring panel

The monitoring panel provides one LCD, three indicators, and four buttons, as shown in Figure 2-6.

Figure 2-6 Monitoring panel



Indicators

There are three indicators on the monitoring panel. They are Power indicator, Run indicator, and Alarm indicator from left to right.

Table 2-2 describes the indicators.

Table 2-2 Indicator description

Indicator	Status	Meaning
Power indicator	Steady green	The power supply is normal.
U	Off	There is no power supply.
Run indicator	Blinking green (on for 1s and then off for 1s)	The SmartLogger is working.
	Off	The SmartLogger stops working.
Alarm indicator	Steady red	The inverter connected to the SmartLogger generates a major alarm. For details about the alarm, see 6.2.17 Querying Alarm Records.
	Blinking red (on for 0.5s and then off for 0.5s)	The inverter connected to the SmartLogger generates a minor alarm. For details about the alarm, see 6.2.17 Querying Alarm Records.

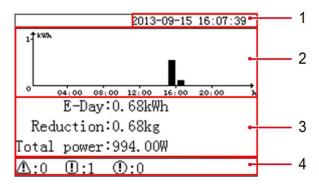
Indicator	Status	Meaning
	Blinking red (on for 1s and then off for 4s)	The inverter connected to the SmartLogger generates a warning. For details about the warning, see 6.2.17 Querying Alarm Records.
	Off	The inverter connected to the SmartLogger is working normally.

LCD

The LCD displays data in graphics and text, including the information about the site, devices, alarms and products. Users can also set parameters and maintain devices on the LCD.

If you do not press any button within 90s on a non-default page, the LCD returns to the default page automatically, as shown in Figure 2-7.

Figure 2-7 Default page



1. Date and time	Allows you to view the date and time.
2. Energy production histogram	Allows you to view the total energy production in each hour by all the inverters connected to the SmartLogger.
3. Energy production data	 Allows you to view the total energy production from 0:00 to the current time by all the inverters connected to the SmartLogger. Allows you to view the emission reduction of CO₂ corresponding to the energy yield of the current day. Allows you to view the total output power by all the online inverters connected to the SmartLogger at the present.
4. Status information	Allows you to view the number of the major alarms, minor alarms, and warnings of all the inverters connected to the SmartLogger. When remote grid dispatching is enabled, you can view the current status of grid dispatching.

Buttons

There are four buttons on monitoring panel. They are the Return button, Cursor Up button, Cursor Down button, and Confirm button from left to right.

Table 2-3 describes the button functions.

Table 2-3 Button description

Buttons	Name	Functions
ESC	Return button	Allows you to return to the last page or end an operation.
•	Cursor Down button	Allows you to go to the upper-level menu or set parameters.
•	Cursor Up button	Allows you to go to the lower-level menu or set parameters.
—	Confirm button	Allows you to go to the menu or confirm the value.



The backlight lasts 120s after you press any button.

2.4 Typical Cable Connection Scenarios

2.4.1 Scenarios with the Communication Box

Overview

- The general input power cable for the SUN2000 communication box needs to be prepared by yourself. Recommended cable: four-core multi-wire (L1, L2, L3, and GND) armored cable with the operating voltage to the ground not less than 600 V and cross-sectional area of a single core wire being 4 mm².
- The cable from the busbar to the knife switch needs to be prepared by the customer. Recommended cable: three-core multi-wire (L1, L2, and L3); operating voltage to the ground: ≥ 600 V; cross sectional area of a single core: 4 mm².
- The SmartLogger can be connected to the SUN2000 through an RS485 communications cable or PLC. If the SmartLogger communicates with the inverter over PLC, a PLC CCO module needs to be connected between the X1 terminal block and the X2 terminal block. If they communicate over RS485, no PLC CCO module is required between the X1 terminal block and the X2 terminal block.
- If the SmartLogger uses the RS485 communications mode, it is recommended that RS485 signal surge protective devices (SPDs) be installed. Each SmartLogger can be configured with a maximum of two RS485 signal SPDs.
- The PID module and PID inductor are configured only in the SUN2000 communication box (with the PID module) and are factory-installed.

Optical Fiber+RS485/PLC Scenario

Connections inside the SmartLogger1000 Ring network switch communication box RS485 signal SPD PID module X2 terminal block Inductor Ground bar PLC CCO X1 terminal block General Fiber RS485 input PΕ communications power input cable input Connections inside the box-type transformer Functional earth cable for the PID module Knife switch Box-type transformer ground bar Box-type transformer busbar A/B/C Communications cable Power cable AC power cable Ground cable C IL01I10001

Figure 2-8 Cable connections in the optical fiber+RS485/PLC scenario

Table 2-4 lists the components required in this scenario.

Table 2-4 Required components

Location	Component	Model or Specifications	Quantity
Communication box	SmartLogger	SmartLogger10 00	1 PCS
	Ring network switch	AR531 or standard 1 U ring network switch	1 PCS

Location	Component		Model or Specifications	Quantity
	RS485 signal surge protective device (SPD)		SPM01A	2 PCS
	ATB		CT-GZF2PJ-8 or CT-GPH-A-8	1 PCS
	PLC CCO module		PLC CCO01A	1 PCS
	PID module (optional)		PID01	1 PCS
	PID inductor (working with the PID module)		EIFI50 ohm	1 PCS
Box-type transformer	Knife switch	Fuse	Rated voltage: ≥ 500 V; rated current: 6 A	3 PCS
		Knife switch box	Rated voltage: ≥ 500 V; rated current: ≥ 6 A; number of phases: three	1 PCS

LTE+RS485/PLC Scenario

Connections inside the communication box SmartLogger1000 POE module Socket RS485 signal SPD PID module X2 terminal block Inductor Ground : bar POE SPD X1 terminal block PLC CCO General CPE RS485 input power input Connections inside the box-type transformer Functional earth cable for PID module Knife switch Box-type transformer ground bar Box-type transformer busbar A/B/C Communications Power cable AC power cable < Ground cable <</p> cable IL01I10002

Figure 2-9 Cable connections in the LTE+RS485/PLC scenario

Table 2-5 lists the components required in this scenario.

Table 2-5 Required components

Location	Component	Model or Specifications	Quantity
Communication box	SmartLogger	SmartLogger10 00	1 PCS
	POE module	POE35-54A or POE85-56A	1 PCS
	RS485 signal SPD	SPM01A	2 PCS
	PLC CCO module	PLC CCO01A	1 PCS

Location	Component		Model or Specifications	Quantity
	PID module (optional) PID inductor (working with the PID module)		PID01	1 PCS
			EIFI50ohm	1 PCS
	POE SPD		POE-2A	1 PCS
Box-type transformer	Knife switch	Fuse	Rated voltage: ≥ 500 V; rated current: 6 A	3 PCS
		Knife switch box	Rated voltage: ≥ 500 V; rated current: ≥ 6 A; number of phases: three	1 PCS
Outside the communication box and box-type transformer	СРЕ		N/A	1 PCS

2.4.2 Scenarios Without the Communication Box

Overview

- The cable from the busbar to the knife switch needs to be prepared by yourself. Recommended cable: three-core multi-wire (L1, L2, and L3) cable with the operating voltage to the ground not less than 600 V and the cross sectional area of a single core wire being 4 mm².
- The cable from the knife switch to the miniature circuit breaker (MCB) needs to be prepared by yourself. Recommended cable: three-core multi-wire (L1, L2, and L3) cable with the operating voltage to the ground not less than 600 V and the cross sectional area of a single core wire being 4 mm².
- If the SmartLogger communicates with the inverter over PLC, a PLC CCO module needs to be connected. If they communicate over RS485, no PLC CCO module is required.

Optical Fiber+RS485/PLC Scenario

SmartLogger1000 Ring network switch Socket ! PLC CCO RS485 Signal SPD Ground bar Knife switch Optical communications RS485 input Busbar A/B/C cable input AC power cable Communications cable Power cable 🕳 ■ Ground cable IL01I10003

Figure 2-10 Cable connections in the optical fiber+RS485/PLC scenario

Table 2-6 lists the components required in this scenario.

Table 2-6 Required components

Component		Model or Specifications	Quantity
SmartLogger		SmartLogger1000	1 PCS
Ring network switch		AR531	1 PCS
RS485 signal SPD		X4B-05	2 PCS
Optical module		FTLF1323P1BTR-H W	2 PCS
Access terminal box (A	Access terminal box (ATB)		1 PCS
PLC CCO		PLC CCO01A	1 PCS
MCB		Rated voltage: ≥ 500 V; rated current: ≥ 6 A	1 PCS
Knife switch	Fuse	Rated voltage: ≥ 500 V; rated current: 6 A	3 PCS

Component		Model or Specifications	Quantity
	Knife switch box	Rated voltage: ≥ 500 V; rated current: ≥ 6 A; number of phases: three	1 PCS
Socket		Matching with the power adapter	1 PCS

LTE+RS485/PLC Scenario

SmartLogger1000

POE module
PLC CCO

Signal SPD

Ground bar

Knife switch

Busbar A/B/C

■ Ground cable <

IL01I10004

Figure 2-11 Cable connections in the LTE+RS485/PLC scenario

Table 2-7 lists the components required in this scenario.

■ Power cable •

Table 2-7 Required components

RS485 input

Communications cable —

Component	Model or Specifications	Quantity
SmartLogger	SmartLogger1000	1 PCS
POE module	POE35-54A or POE85-56A	1 PCS
PLC CCO	PLC CCO01A	1 PCS
RS485 signal SPD	X4B-05	2 PCS

Component		Model or Specifications	Quantity
POE SPD		POE-2A	1 PCS
МСВ		Rated voltage: ≥ 500 V; rated current: ≥ 6 A	1 PCS
Knife switch	Fuse	Rated voltage: ≥ 500 V; rated current: 6 A	3 PCS
	Knife switch	Rated voltage: ≥ 500 V; rated current: ≥ 6 A; number of phases: three	1 PCS
CPE		EG860V2-C71	1 PCS
Socket		Matching with the power adapter	1 PCS

3 Installation

This topic describes how to install the SmartLogger.

Context

Install the SmartLogger in an appropriate position and surface.



DANGER

- Do not store the SmartLogger in areas with flammable or explosive materials.
- Do not install the SmartLogger on flammable building materials.

3.1 Installation Process

This topic describes the SmartLogger installation process.

The SmartLogger installation process is shown in Figure 3-1.

Figure 3-1 Installation flowchart

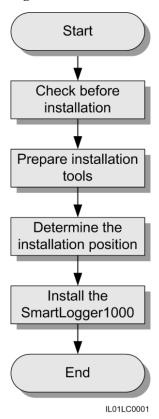


Table 3-1 describes the installation process.

Table 3-1 Description of the installation process

Step	Operation	Description
1	Checking Before Installation	Before unpacking, check that the outer packing materials are intact. After unpacking, check that deliverables are complete and intact.
2	Preparing Tools	Prepare tools required for installation and electrical connections.
3	Determine the installation position.	Before installing the SmartLogger, determine an appropriate position to ensure that the SmartLogger works properly.
4	Installing the SmartLogger	The SmartLogger can be installed on a desk, a wall or along a guide rail.

3.2 Checking Before Installation

Checking Outer Packing Materials

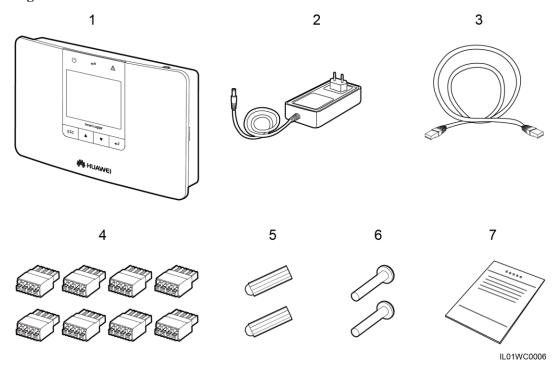
Check the outer packing materials for damage before unpack the SmartLogger, such as holes and cracks. If any damage is found, do not unpack the SmartLogger and contact the dealer as soon as possible.

Checking Deliverables

After unpacking the SmartLogger, check whether deliverables are intact and complete. If any damage is found or any component is missing, contact the dealer.

Figure 3-2 shows the components and mechanical parts that should be delivered.

Figure 3-2 Deliverables



No.	Quantity	Description
1	1	SmartLogger
2	1	Adapter (adapter type depends on the country specified in the order)
3	1	Network cable (2.2 meters long)
4	8	Terminal block
5	2	Expansion tube
6	2	Screws (used to secure the SmartLogger to the wall)

No.	Quantity	Description
7	1	Auxiliary documents

3.3 Preparing Tools

Prepare tools required for installation and electrical connections.

Tools	Model	Function
Hammer drill	Φ6 drill bit	Drills holes in the wall when the SmartLogger is wall-mounted.
Diagonal pliers	-	Cuts and tighten cable ties.
Wire stripper	-	Peels cable jackets.
Rubber mallet	-	Hammers expansion bolts into holes.
Guarded blade utility knife	-	Removes package.

Tools	Model	Function
Cable cutter	-	Cuts cables.
Vacuum cleaner	-	Cleans up dust after holes are drilled.
Marker	Diameter: ≤ 10 mm	Marks signs.
4		
Measuring tape	-	Measures distance
Plumb line	-	Ensures that the screws are perpendicular to the wall.
Safety goggles	-	Protect your eyes during hole drilling.
		G. Miller

Tools	Model	Function
Anti-dust respirator	-	Prevents dust from entering your mouth and nostrils during hole drilling.

3.4 Determining the Installation Position

Before installing the SmartLogger, determine an appropriate position to ensure that the SmartLogger works properly.

Comply with the following requirements when determining the installation position for the SmartLogger:

- Do not install the SmartLogger outdoors because it is protected to IP20.
- Install the SmartLogger in a dry environment to protect it against water.
- Keep the product in an ambient temperature range of $-40 \,\mathrm{C}$ to $+60 \,\mathrm{C}$ and away from direct sunlight.
- The communication distance for the RS485 port should be less than 1000 m and for the Ethernet less than 100 m.
- Install the SmartLogger at an appropriate height for the user's ease to view and operate on the monitoring panel.
- Do not place the SmartLogger upside down. Ensure that the heat dissipation holes are facing upwards, preventing dust from entering the SmartLogger and reducing its service life
- Choose appropriate installation method and position for the Smart Logger according to its weight and size. For details, refer to 11 Technical Specifications.
- If you install the SmartLogger on a wall or along a guide rail, the area for connecting cables should be downwards.
- The SmartLogger is at least 100 mm away from the neighboring objects on both sides, the top side, and the bottom side respectively, as shown in Figure 3-3.

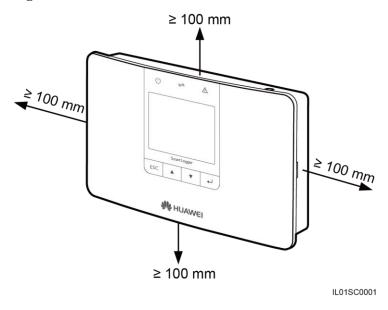


Figure 3-3 Minimum installation clearance

3.5 Installing the SmartLogger

The SmartLogger can be installed on a desk, on a wall, or along a guide rail.

3.5.1 Installing the SmartLogger on a Desk

This topic describes how to install the SmartLogger on a desk.

Context



NOTICE

- Ensure that the desk on which the SmartLogger is installed is horizontal to prevent it from falling down.
- Install the SmartLogger in places where cables cannot be easily touched to avoid signal disruption.

Procedure

- **Step 1** Take the SmartLogger out from the package.
- **Step 2** Place the SmartLogger onto a horizontal desk.

----End

3.5.2 Mounting the SmartLogger on a Wall

This topic describes how to mount the SmartLogger on a wall.

Context



NOTICE

- Install the SmartLogger on a solid and smooth wall to ensure that it can be secured on the wall.
- Before hanging the SmartLogger on the screws, secure the expansion tubes and screws into the wall.

Procedure

Step 1 Install the expansion tubes and screws.

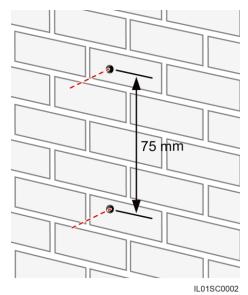


NOTICE

If you need to use a ladder to install the SmartLogger on a high position, keep balance to protect yourself from falling down.

1. Use a plumb line to ensure that the line between the centric points of the two holes is vertical to the ground. Use a marker to mark out the holes, as shown in Figure 3-4.

Figure 3-4 Hole positions and dimensions



2. Drill holes using a hammer drill and install expansion tubes and screws, as shown in Figure 3-5.

Figure 3-5 Drilling a hole and installing an expansion tubes and screws

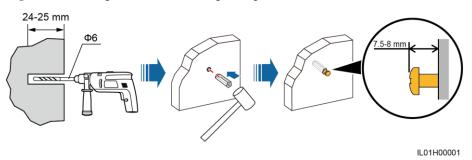


Table 3-2 describes the operations shown in Figure 3-5.

Table 3-2 Drilling a hole and installing an expansion tubes and screws

Step	Operation
1	Put a hammer drill with a $\Phi 6$ drill bit on a marked hole position perpendicularly against the wall and drill holes with a depth of 24 mm to 25 mm.
	 NOTICE To prevent dust inhalation or contact with eyes, wear safety goggles and an anti-dust respirator when drilling holes. Wipe away any dust in or around the holes and measure the hole distance. If the holes are inaccurately positioned, drill holes again.
2	Vertically insert an expansion tube into a hole, and knock it completely into the hole by using a rubber mallet.
3	Insert the screws into the expansion tube until the screw heads are 7.5 mm to 8 mm away from the wall.

Step 2 Hang the SmartLogger onto the secured screws by the mounting holes on the rear of the SmartLogger.



NOTICE

Ensure that the area for connecting cables in the SmartLogger is downwards for the ease of electrical connections and maintenance.

----End

3.5.3 Mounting the SmartLogger Along a Guide Rail

This topic describes how to mount the SmartLogger along a guide rail.

Context

The guide rails are not delivered together with the SmartLogger. If you need to mount the SmartLogger along a guide rail, prepare a 35 mm wide guide rail.



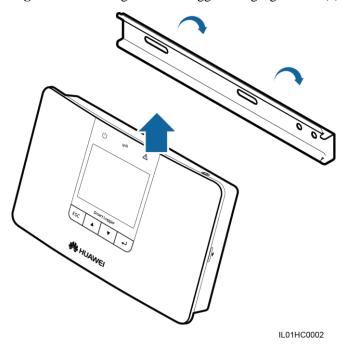
NOTICE

- Choose a guide rail with appropriate lengths to ensure that the SmartLogger can be secured along it.
- Secure the guide rail before mounting the SmartLogger.

Procedure

Step 1 Hold both sides of the SmartLogger, keep it parallel with the guide rail, and then tilt it slightly to insert its upper hooks into the guide rail, as shown in Figure 3-6.

Figure 3-6 Mounting the SmartLogger Along a guide rail (1)



Step 2 Hold the two lower corners of the SmartLogger, pull it downwards appropriately, and then push it towards the guide rail. When you hear a click sound, the SmartLogger is successfully mounted along the guide rail, as shown in Figure 3-7.

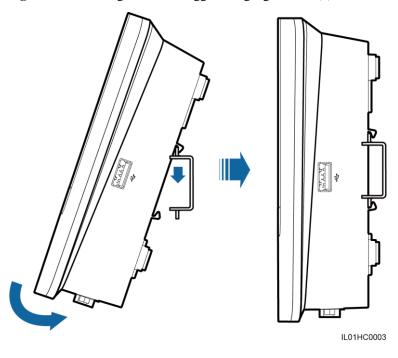


Figure 3-7 Mounting the SmartLogger along a guide rail (2)

----End

3.6 Installing the RS485 signal SPD

Context

- If the SmartLogger needs to be connected to outdoor equipment through the COM port, it is recommended that an RS485 signal SPD be installed.
- Each SmartLogger can be configured with a maximum of two RS485 signal SPDs.
- The RS485 signal SPD can be mounted on guide rail. No guide rail is delivered with an RS485 signal SPD. If you need to install an RS485 signal SPD on a guide rail, prepare a standard 35 mm wide guide rail with a length no less than 80 mm.



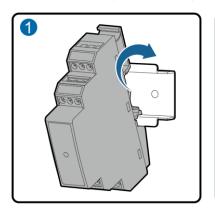
NOTICE

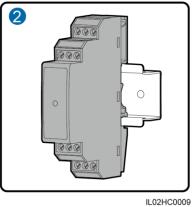
- Secure the guide rail before mounting the RS485 signal SPD.
- If the SmartLogger is installed on a guide rail, the RS485 signal SPD can share the guide rail with the SmartLogger. In this case, the recommended guide rail length is 400 mm or greater.

Procedure

Step 1 Secure the RS485 signal SPD to the guide rail, as shown in Figure 3-8.

Figure 3-8 Securing the RS485 signal SPD to the guide rail





----End

4 Electrical Connections

This topic describes how to connect the SmartLogger to the inverters, environmental monitoring instrument, and PCs.

Context



NOTICE

- Ensure that all cables are connected and secured.
- Do not connect a power adapter to the SmartLogger before the cable connections are complete because the SmartLogger has no startup button.

4.1 Connection Description

Port Description

For the bottom view of the SmartLogger and port description, see Bottom of the Shell in 2.2 Appearance.

Device Connection Description

Figure 4-1 shows the recommended method for connecting the SmartLogger to multiple devices through the COM ports. For details, see 4.3 Connecting the RS485 Signal SPD-4.10 Connecting to a PID.

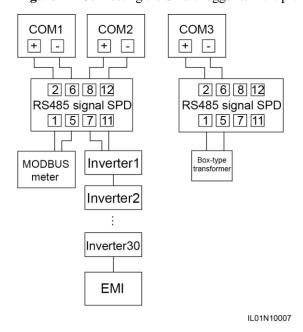


Figure 4-1 Connecting the SmartLogger to multiple devices through the COM ports

4.2 Connecting the PE Cable for the RS485 Signal SPD

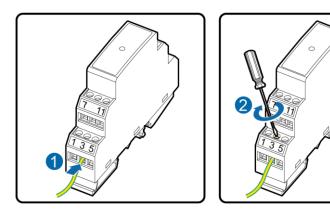
Prerequisites

The ground cable is available. Outdoor copper-core cables with a cross sectional area of 4 $\,$ mm 2 or 12 AWG are recommended.

Procedure

- **Step 1** Remove 8 mm of the insulation layer from the ground cable using the wire stripper.
- Step 2 Insert the bare cable cores into port 3 of the RS485 signal SPD, as shown by (1) in Figure 4-2.

Figure 4-2 Connecting the PE cable for the RS485 signal SPD



IL02IC1001

Step 3 Use a flat-head screwdriver to tighten the screws on port 3, as shown by (2) in Figure 4-2.



NOTICE

Connect the other end of the PE cable to the ground bar.

----End

4.3 Connecting the RS485 Signal SPD

Prerequisites

The communications cable is prepared. The DJYP2VP2-22 2x2x1 network cable or a communications cable with a cross sectional area of 1 mm² and outer diameter of 14–18 mm is recommended.

Context

M NOTE

The way of connecting two RS485 signal SPDs is the same as the way of connecting one RS485 signal SPD

One RS485 signal SPD provides two RS485 surge protection ports, as shown in Figure 4-3.

Figure 4-3 Ports on an RS485 signal SPD

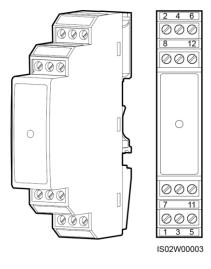


Table 4-1 describes the surge protection ports.

Table 4-1 Port description

RS485 Surge Protect ion Port	Protect ion Port	Port Definit ion	Function	Surge Port	Port Definiti on	Function
RS485 surge protecti on port 1	2	RS485A IN	RS485A, for RS485 positive differential signaling	1	RS485A OUT	RS485A, for RS485 positive differential signaling
	6	RS485B IN	RS485B, for RS485 negative differential signaling	5	RS485B OUT	RS485B, for RS485 negative differential signaling
RS485 surge protecti on port 2	8	RS485A IN	RS485A, for RS485 positive differential signaling	7	RS485A OUT	RS485A, for RS485 positive differential signaling
	12	RS485B IN	RS485B, for RS485 negative differential signaling	11	RS485B OUT	RS485B, for RS485 negative differential signaling

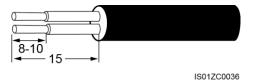
M NOTE

- Protection ports are connected to COM ports on the SmartLogger. Port 4 is not connected.
- Surge ports are connected to RS485 ports of other devices. Port 3 is the ground port.
- Protection ports and Surge ports must not be reversely connected.
- One RS485 signal SPD can protect two COM ports.
- Protection ports 2 and 6 and Surge ports 1 and 5 form an RS485 signal SPD port for protecting one COM port. Protection ports 8 and 12 and Surge ports 7 and 11 form another RS485 signal SPD port for protecting one more COM port.

Procedure

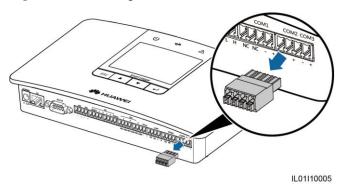
Step 1 Remove an appropriate length of steel armor and insulation layer from the cable using a wire stripper, as shown in Figure 4-4.

Figure 4-4 Stripping an RS485 communications cable (unit: mm)



Step 2 Remove the terminal block from the SmartLogger COM port, as shown in Figure 4-5.

Figure 4-5 Connecting the terminal block (1)



Step 3 Connect the cable to the SmartLogger terminal block, as shown in Figure 4-6.

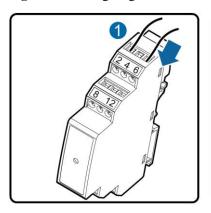
Figure 4-6 Connecting the terminal block (2)

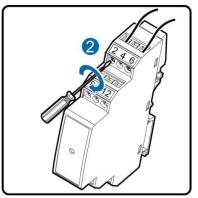


(1) Wiring terminal

- (2) White contact plate
- 1. Press the white contact plate of the corresponding wiring terminal to flip the metal spring inside the wiring terminal.
- 2. Insert the uninsulated part of the core wire into the wiring terminal.
- 3. Release the white contact plate to fasten the core wire.
- **Step 4** Insert the terminal block into the SmartLogger COM port.
- **Step 5** Insert the bare cable cores at the other end of the cable into a Protection port of the RS485 signal SPD, as shown by (1) in Figure 4-7.

Figure 4-7 Wiring diagram for the RS485 signal SPD





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NOTICE

Verify that the **COM**+ port on the SmartLogger is connected to Protection port 2 or 8 on the RS485 signal SPD, and that the **COM**- port on the SmartLogger is connected to Protection port 6 or 12 on the RS485 signal SPD.

Step 6 Use a flat-head screwdriver to tighten the screws on the Protection ports, as shown by (2) in Figure 4-7.

----End

Follow-up Procedure

Disconnection can be performed in reverse order.

4.4 Connecting the SmartLogger to Inverters

This topic describes how to connect the SmartLogger to inverters.

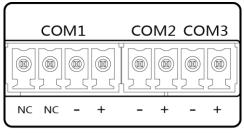
4.4.1 Connecting the SmartLogger to the SUN2000

This topic describes how to connect the SmartLogger to the SUN2000 using an RS485 communications cable.

Context

The SmartLogger provides three COM ports for RS485 communication, as shown in Figure 4-8.

Figure 4-8 COM ports on the SmartLogger



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Table 4-2 describes the COM ports.

Table 4-2 COM port description

Port	Identifier	Function
	NC	Reserved
	NC	Reserved
COM1 port	-	RS485B, for RS485 negative differential signaling
	+	RS485A, for RS485 positive differential signaling
COM2 nort	-	RS485B, for RS485 negative differential signaling
COM2 port	+	RS485A, for RS485 positive differential signaling
COM2 mont	-	RS485B, for RS485 negative differential signaling
COM3 port	+	RS485A, for RS485 positive differential signaling

The RS485 communications port of the SUN2000 is the RS485 terminal block or RJ45 port. Terminal block connection is recommended.

Terminal block connection

Terminal block of the SUN2000-24.7KTL-JP/33KTL-JP/40KTL-JP/36KTL/42KTL/43KTL-IN-C1/50KTL/50 KTL-C1 is connected in a different way from the terminal blocks of other models of inverters.

SUN2000-24.7KTL-JP/33KTL-JP/40KTL-JP/36KTL/42KTL/43KTL-IN-C1/5 0KTL/50KTL-C1

Figure 4-9 shows the position of the terminal block in the SUN2000.

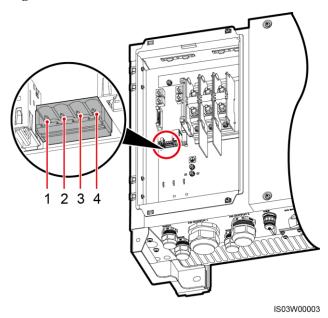


Figure 4-9 Position of the terminal block in the SUN2000

Table 4-3 Functions of the RS485 terminal block

No.	Port Definition	Function
1	RS485A IN	RS485A, for RS485 positive differential signaling
2	RS485A OUT	RS485A, for RS485 positive differential signaling
3	RS485B IN	RS485B, for RS485 negative differential signaling
4	RS485B OUT	RS485B, for RS485 negative differential signaling

- Other models of SUN2000s

Figure 4-10 shows the position of the terminal block in the SUN2000-33KTL/40KTL. Figure 4-11 describes the functions.

Solicoo25

Figure 4-10 Position of the terminal block in the SUN2000

Figure 4-11 Terminal block

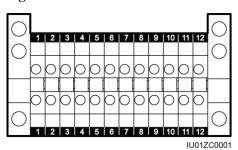


Table 4-4 Functions of the RS485 terminal block

No.	Port Definition	Function
5	RS485A IN	RS485A, for RS485 positive differential signaling
6	RS485A OUT	RS485A, for RS485 positive differential signaling
7	RS485B IN	RS485B, for RS485 negative differential signaling
8	RS485B OUT	RS485B, for RS485 negative differential signaling

• RJ45 network port connection

The RJ45 port needs to be connected using an RJ45 connector, as shown in Figure 4-12.

1 8 IS01ZC0011

Figure 4-12 RS485 crystal plug of the SUN2000 (side view without the fastener)

Table 4-5 lists the wire colors and functions.

Table 4-5 Cable colors and functions

Category	Color	Function
1	White and orange	RS485A, for RS485 positive differential signaling
2	Orange	RS485B, for RS485 negative differential signaling
3	White and green	-
4	Blue	RS485A, for RS485 positive differential signaling
5	White and blue	RS485B, for RS485 negative differential signaling
6	Green	-
7	White and brown	-
8	Brown	-

Figure 4-13 shows how to connect the SmartLogger to the SUN2000 through an RS485 signal SPD. This section describes how to connect the SUN2000-33KTL/40KTL to the SmartLogger through a terminal block.

RS485 Signal SPD

RS485 Signal SPD

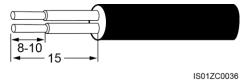
| 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 | 1/17 |

Figure 4-13 Connecting the SmartLogger to the SUN2000

Procedure

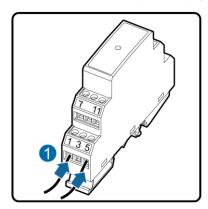
- **Step 1** Prepare a cable with an appropriate length, strip a proper part of the insulation layer from one end, and connect the end to the SUN2000 terminal block.
 - The DJYP2VP2-22 2x2x1 network cable or a communications cable with a cross sectional area of 1 mm² and outer diameter of 14–18 mm is recommended.
 - For details about how to strip and connect the wires, see *SUN2000-(30KTL-A, 33KTL, 40KTL) User Manual*.
- **Step 2** Remove an appropriate length of the steel armor and wire insulation layer from the other end of the cable using a wire stripper, as shown in Figure 4-14.

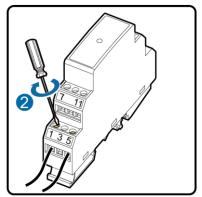
Figure 4-14 Stripping an RS485 communications cable (unit: mm)



Step 3 Insert the bare cable cores into the Surge port of the RS485 signal SPD, as shown by (1) in Figure 4-15.

Figure 4-15 Connecting the Surge port of the RS485 signal SPD





IL02IC1002



NOTICE

- Verify that the RS485A (IN) port on the SUN2000 is connected to Surge port 1 or 7 on the RS485 signal SPD, and that the RS485B (IN) port on the SUN2000 is connected to Surge port 5 or 11 on the RS485 signal SPD.
- After connecting cables, wrap the part without an insulation layer using insulation tape.
- **Step 4** Use a flat-head screwdriver to tighten the screws on the Surge ports, as shown by (2) in Figure 4-15.
- **Step 5** Set **Baud Rate** to the same value for the SUN2000 and SmartLogger.
 - For details about the communications parameters settings for the SmartLogger, see 6.2.23 Setting Communications Parameters.
 - For details about the communications parameter configurations for the SUN2000, see *SUN2000 APP User Manual*.

----End

Follow-up Procedure

Take operations in reversed order to disconnect the SmartLogger from the SUN2000.

4.4.2 Connecting the SmartLogger to the SUN8000

This topic describes how to connect the SmartLogger to the SUN8000.

Context

Figure 4-16 shows the RS485 wiring terminals of the SUN8000.

Figure 4-16 RS485 wiring terminals for the SUN8000

IU01ZC0001

Ports 07, 08, 09, 10, 11, and 12 are communications ports. Table 4-6 describes the functions of these ports.

Table 4-6 Port description

No.	Function	Description
07	S485A	RS485A, for RS485 positive differential signaling (reserved)
08	S485B	RS485B, for RS485 negative differential signaling (reserved)
09	N485A_OUT	RS485A, for RS485 positive differential signaling
10	N485A_IN	RS485A, for RS485 positive differential signaling
11	N485B_OUT	RS485B, for RS485 negative differential signaling
12	N485B_IN	RS485B, for RS485 negative differential signaling

There are three RS485 ports in the SmartLogger. For the port descriptions, see **Context** in 4.4.1 Connecting the SmartLogger to the SUN2000.

Figure 4-17 shows how to connect the SmartLogger to the SUN8000 through an RS485 signal SPD.

IL01IC3003

COM1 COM2 COM3

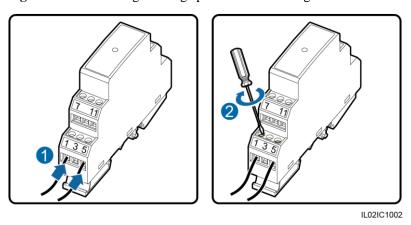
NC NC TO THE PARTY OF THE PA

Figure 4-17 Connecting the SmartLogger to the SUN8000

Procedure

- **Step 1** Configure a shielded network cable with an appropriate length. Connect two core wires of the cable to the N485A_IN and N485B_IN ports of the RS485 port for the SUN8000.
 - Recommended communications cable: dual-core shielded network cable (outdoor shielded network cables are also acceptable, if only two core wires are connected).
 - For details about connecting the RS485 ports for the SUN8000, see the *SUN8000-500KTL User Manual*.
- Step 2 Remove 15 mm of the insulation layer from the dual-core shielded cable using a wire stripper.
- **Step 3** Remove 8 mm of the insulation layer from the two core wires using the wire stripper.
- **Step 4** Insert the bare cable cores into the Surge port of the RS485 signal SPD, as shown by (1) in Figure 4-18.

Figure 4-18 Connecting the Surge port of the RS485 signal SPD





NOTICE

- Verify that the **N485A_IN** port on the **SUN8000** is connected to Surge port 1 or 7 on the RS485 signal SPD, and that the **N485A_IN** port on the **SUN8000** is connected to Surge port 5 or 11 on the RS485 signal SPD.
- After connecting cables, wrap the part without an insulation layer using insulation tape.
- **Step 5** Use a flat-head screwdriver to tighten the screws on the Surge ports, as shown by (2) in Figure 4-18.
- **Step 6** Set **Baud Rate** for the **SUN8000** to the same **Baud Rate** configured for the SmartLogger.
 - For details about how to set the communications parameters for the SmartLogger, see 6.2.23 Setting Communications Parameters.
 - For details about the communications parameters settings for the **SUN8000**, see *SUN8000-500KTL User Manual*.

----End

Follow-up Procedure

Take operations in reversed order to disconnect the SmartLogger from the SUN8000.

4.4.3 Connecting Multiple Inverters to the SmartLogger

This topic describes how to connect the SmartLogger to multiple inverters.

Connect the SmartLogger to multiple inverters in daisy chain, that is, first connect the RS485OUT port of one inverter to the RS485IN port of another inverter and then connect the first inverter to the SmartLogger, as shown in 4.4.1 Connecting the SmartLogger to the SUN2000 or 4.4.2 Connecting the SmartLogger to the SUN8000. Figure 4-19 shows the daisy chain connecting the SmartLogger and multiple inverters.

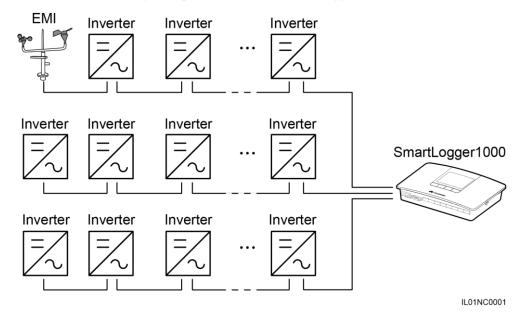


Figure 4-19 Connecting Multiple Inverters to the SmartLogger

M NOTE

- A maximum of 80 devices can be connected to one SmartLogger. You are advised to connect less than 30 devices to each RS485 route.
- If an EMI is to be connected, connect it at the end of the chain. Set the address for the EMI to 1.
- Set Match Resistance of every inverter at the end of the daisy chain to Connect in Comm. Param.
 For details about this, see the SUN2000 (8KTL-28KTL) User Manual or SUN2000 APP User
 Manual.
- The addresses for all devices in the daisy chain should be within the searching scope set in the SmartLogger and they must differ from each other. Otherwise, the communications would fail between the device and the SmartLogger.
- If the firmware version of the SUN2000 is V100R001C00SPC010 or later, or V100R001C81SPC105 or later, you can perform Addr. Allocate on the SmartLogger. If detecting that an RS485 address is repeatedly used, the SmartLogger automatically allocates another address and hence no local operation is required.
- Baud rate of all the devices in one daisy chain should stay consistent with those of the SmartLogger.

4.5 Connecting to an EMI

This topic describes how to connect the SmartLogger to an environmental monitoring unit (EMI).

Context

The SmartLogger can be connected to an EMI that supports the standard MODBUS/RS485 protocol. One SmartLogger can be connected to and manage only one EMI.

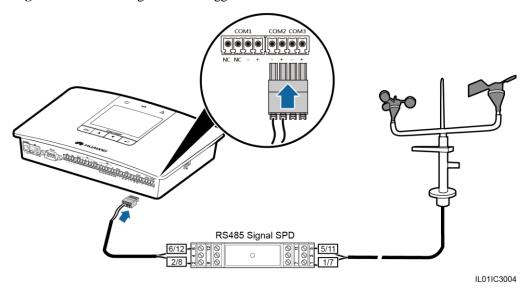
Devices from different vendors may support different protocols. To normally obtain information from the connected EMI, correctly configure the protocol on the WebUI of the SmartLogger based on the document delivered by the vendor.

For the definition of the RS485 communications cable for the EMI, see the instructions delivered with the EMI.

There are three RS485 ports in the SmartLogger. For the port descriptions, see **Context** in 4.4.1 Connecting the SmartLogger to the SUN2000.

Figure 4-20 shows how to connect the SmartLogger to the EMI.

Figure 4-20 Connecting the SmartLogger to the EMI



Procedure

- **Step 1** Connect one end of the cable delivered with the EMI to the RS485 port of the unit.
- **Step 2** Connect the other end of the cable to a Surge port of the RS485 signal SPD. For details, see Step 2-Step 4 in **Procedure** in 4.4.1 Connecting the SmartLogger to the SUN2000.



NOTICE

Verify that the RS485+ port on the EMI is connected to Surge port **1** or **7** on the RS485 signal SPD, and that the RS485- port on the EMI is connected to Surge port **5** or **11** on the RS485 signal SPD.

$\square\!\!\!\square$ note

- After connecting the cable, log in to the WebUI and set parameters under EMI. For details about this
 operation, see 7.28 Setting EMI Parameters.
- The EMI cannot be detected automatically. You need to add this device manually. For details about this operation, see 6.2.30 Managing Devices.
- When the SmartLogger is connected to an EMI and multiple inverters at the same time, connect the EMI to the end of the daisy chain. For details, see 4.4.3 Connecting Multiple Inverters to the SmartLogger.

----End

Follow-up Procedure

Take the reverse steps to disconnect the SmartLogger from the EMI.

4.6 Connecting the SmartLogger to a Power Meter

This topic describes how to connect the SmartLogger to a meter.

Context

Connect the SmartLogger to a Power Meter that complies with the standard MODBUS/RS485 protocol. The SmartLogger can connect to and manage only one Power Meter at a time.

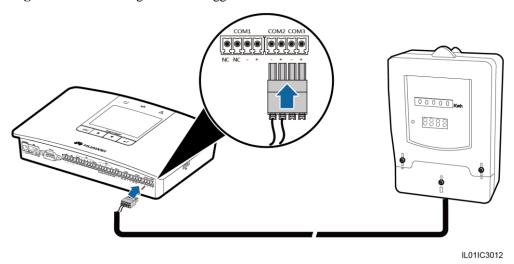
The protocol points for Power Meters provided by different vendors are varied. Therefore, to obtain information from a Power Meter, configure the protocol point on the WebUI of the SmartLogger properly based on the document delivered by the vendor.

For details about the definition of the RS485 communications cables for the Power Meter, see the operation manual delivered with the Power Meter.

There are three RS485 ports in the SmartLogger. For details about the port descriptions, see **Context** in 4.4.1 Connecting the SmartLogger to the SUN2000.

Figure 4-21 shows how to connect the SmartLogger to the Power Meter.

Figure 4-21 Connecting the SmartLogger to a Power Meter



M NOTE

A Power Meter is typically installed indoors, and can be connected to the COM port of the SmartLogger without an RS485 signal SPD.

Procedure

Step 1 Connect one end of the cable delivered with the power meter to the RS485 port of the Power Meter.

Step 2 Connect the other end of the cable to the COM port of the SmartLogger. For details about the operation, see Step 1-Step 4 in 4.3 Connecting the RS485 Signal SPD.



NOTICE

Connect the RS485+ port of the Power Meter to the **COM**+ port of the SmartLogger and the RS485- port of the Power Meter to the **COM**- port of the SmartLogger.

M NOTE

- After connecting the cable, log in to the WebUI and set parameters under **Power Meter**. For details about this operation, see 7.29 Setting Power Meter Parameters.
- The Power Meter cannot be detected automatically. You need to add this device manually. For details about this operation, see 6.2.30 Managing Devices.

----End

Follow-up Procedure

Take operations in reversed order to disconnect the SmartLogger from the Power Meter.

4.7 Connecting to an AC Combiner Box

This section describes how to connect the SmartLogger to an AC combiner box.

Context

The SmartLogger can be connected to an AC combiner box that complies with the Modbus/RS485 protocol.

Figure 4-22 shows the communications terminals of a Huawei AC combiner box.

Figure 4-22 Communications ports

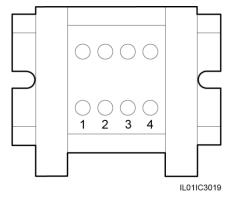


Table 4-7 describes the ports.

Table 4-7 Port description

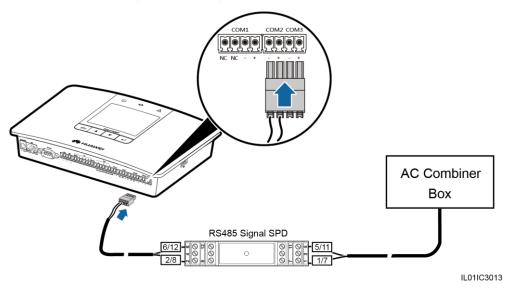
No.	Function	Description
1	RS485A	RS485 differential signal +
2	RS485B	RS485 differential signal -
3	RS485A	RS485 differential signal +
4	RS485B	RS485 differential signal -

For the descriptions of RS485 communications ports of a third-party AC combiner box, see the operation guide delivered with the combiner box.

There are three RS485 ports in the SmartLogger. For the port descriptions, see **Context** in 4.4.1 Connecting the SmartLogger to the SUN2000.

Figure 4-23 shows how to connect the SmartLogger to the AC combiner box.

Figure 4-23 Connecting the SmartLogger to the AC combiner box



Procedure

- **Step 1** Connect one end of the communications cable to the RS485 port of the AC combiner box.
- **Step 2** Connect the other end of the cable to a Surge port of the RS485 signal SPD. For details, see Step 2-Step 4 in 4.4.1 Connecting the SmartLogger to the SUN2000.



NOTICE

- Verify that the RS485+ port on the AC combiner box is connected to Surge port 1 or 7 on the RS485 signal SPD, and that the RS485- port on the AC combiner box is connected to Surge port 5 or 11 on the RS485 signal SPD.
- AC combiner boxes from Huawei can be automatically detected. Those from other vendors cannot be detected automatically, and you need to add them manually. For details about this operation, see 6.2.30 Managing Devices.

----End

Follow-up Procedure

Take the reverse steps to disconnect the SmartLogger from the AC combiner box.

4.8 Connecting to a PLC

This topic describes how to connect the SmartLogger to a PLC.

Context

The RS485 port of a PLC is an RJ45 port that should be connected to an RJ45 connector, as shown in Figure 4-24.

Figure 4-24 PLC RS485 port connection (side view without the fastener)

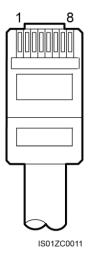


Table 4-8 lists the cable colors and functions.

Table 4-8 Cable colors and functions

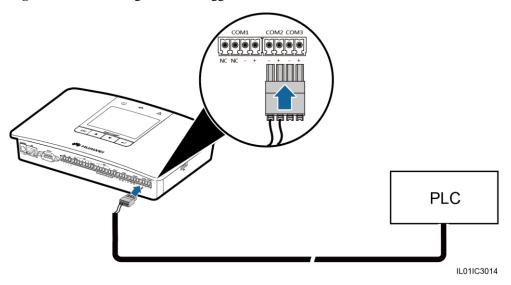
No.	Color	Function
1	White and orange	Reserved

No.	Color	Function
2	Orange	Reserved
3	White and green	12 Vin, power
4	Blue	RS485A, and RS485 differential signal +
5	White and blue	RS485B, and RS485 differential signal -
6	Green	Reserved
7	White and brown	Reserved
8	Brown	-

There are three RS485 ports in the SmartLogger. For the port descriptions, see **Context** in 4.4.1 Connecting the SmartLogger to the SUN2000.

Figure 4-25 shows how to connect the SmartLogger to the PLC.

Figure 4-25 Connecting the SmartLogger to the PLC



Procedure

- **Step 1** Choose a shielded network cable of appropriate length. Crimp an RJ45 connector at one end and connect it to the RS485 port of the PLC.
- **Step 2** Connect the other end of the cable to the COM port of the SmartLogger. For details about this operation, see Step 2-Step 4 in 4.3 Connecting the RS485 Signal SPD.



NOTICE

- Connect the RS485+ port of the PLC to the **COM**+ port of the SmartLogger and connect the RS485- port of the PLC to the **COM** port of the SmartLogger.
- The PLC cannot be detected automatically. You need to add this device manually. For details about this operation, see 6.2.30 Managing Devices.
- The Huawei PLC supports auto-negotiation of baud rate 9600 bps/115200 bps. If the PLC networking is used, you are advised to set **Baud rate** to 115200bps for the RS485 ports of the SmartLogger to achieve better communication performance.

----End

Follow-up Procedure

Take the reverse steps to disconnect the SmartLogger from the PLC.

4.9 Connecting an Ethernet Network Cable

Context

The SmartLogger can be connected to an Ethernet switch, router, or POE module. It can also be connected to the Ethernet electrical port of a PC directly or through a hub. Select the connection device based on the actual networking scenario.

Procedure

Step 1 Connect one end of the delivered network cable to the Ethernet electrical port of a device.



If the delivered cable is too short, pay attention to the following when preparing a cable:

- Select CAT 5E or a higher-class shielded network cable.
- It is suggested that the cable length is less than or equal to 100 meters.
- **Step 2** Connect the other end of the network cable to the **FE** port of the SmartLogger, as shown in Figure 4-26.

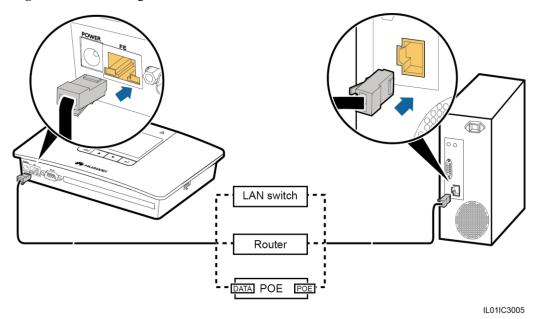


Figure 4-26 Connecting an Ethernet network cable

■ NOTE

- When connecting to a POE module, the SmartLogger should connect to the DATA port of the POE module.
- The default IP address of the SmartLogger is 192.168.0.10, the default subnet mask is 255.255.255.0, and the default gateway is 192.168.0.1.
- If the SmartLogger is connected to a PC directly or through a hub, the IP addresses of the SmartLogger and PC must be in the same network segment. For example, if the IP address of the SmartLogger is 192.168.0.10, the IP address of the PC can be 192.168.0.11. The subnet mask and the gateway of the PC should be consistent with those of the SmartLogger.
- If the SmartLogger connects to the PC through a network device (for example, a router), set the IP
 addresses for the SmartLogger and network device to be in the same network segment. Correctly set
 the gateway of the SmartLogger to ensure that the SmartLogger can normally communicate with the
 network device.
- To enable communication between the SmartLogger and the NetEco on the PC, set the NetEco parameters properly. For details, see 6.2.23 Setting Communications Parameters.

----End

Follow-up Procedure

Take operations in reversed order to disconnect the SmartLogger from the PC.

4.10 Connecting to a PID

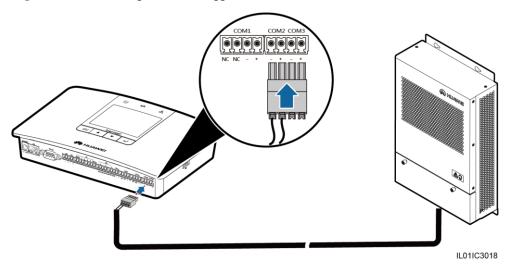
This section describes how to connect the SmartLogger to a PID.

Context

There are three RS485 ports in the SmartLogger. For the port descriptions, see **Context** in 4.4.1 Connecting the SmartLogger to the SUN2000.

Figure 4-27 shows how to connect the SmartLogger to the PID module.

Figure 4-27 Connecting the SmartLogger to the PID



■ NOTE

In the scenarios with the communication box, the SmartLogger and PID module are installed before delivery, and the PID module is connected to the SmartLogger through the X2 terminal block.

Procedure

- **Step 1** Connect one end of the cable delivered with the PID to the RS485 port of the PID.
- **Step 2** Connect the other end of the cable to a Surge port of the RS485 signal SPD. For details about the operation, see Step 2-Step 4 in 4.4.1 Connecting the SmartLogger to the SUN2000.



NOTICE

Verify that the brown cable (RS485A) of the PID module is connected to Surge port 1 or 7 on the RS485 signal SPD, and that the black cable (RS485B) is connected to Surge port 5 or 11 on the RS485 signal SPD.

----End

Follow-up Procedure

Take the reverse steps to disconnect the SmartLogger from the PID module.

4.11 Connecting the SmartLogger to a Ripple Control Receiver

This topic describes how to connect the SmartLogger to a ripple control receiver.

Context

In Germany and some European areas, a ripple control receiver is used to convert a power grid scheduling signal to a dry contact signal, in which a dry contact is required.

Figure 4-28 shows the DI ports of the SmartLogger.

Figure 4-28 DI ports in the SmartLogger

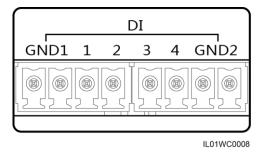


Table 4-9 describes the definition of the DI ports.

Table 4-9 DI port description

Port	Functions
GND1	Active power reduction
1	DI_1
2	DI_2
3	DI_3
4	DI_4
GND2	Reactive power compensation

Figure 4-29 shows how to connect the Smart Logger to the ripple control receiver.

GND1 DI_1 DI_2 DI_3 DI_4 GND2

Figure 4-29 Connecting the SmartLogger to a Ripple Control Receiver



NOTICE

When active power remote control and reactive power remote control are supported, only one out of the four outputs of each ripple control receiver can be closed.

Procedure

- **Step 1** Select a cable of appropriate length and connect one end of a cable to the ripple control receiver.
- **Step 2** Connect the other end to the DI port in the SmartLogger. For details about the operation, see Step 2-Step 4 in 4.3 Connecting the RS485 Signal SPD.



NOTICE

To enable a normal power grid scheduling function, you need to set the corresponding parameters (Active Power Control or Reactive Power Control) on the embedded WebUI. For details, see 8.1.1 Active Power Control or 8.1.2 Reactive Power Control.

----End

Follow-up Procedure

Take operations in reversed order to disconnect the SmartLogger from the ripple control receiver.

5 System Operation

This topic describes how to start the SmartLogger and set the initialization parameters.

5.1 Power-on Process

This section describes how to check the SmartLogger before power-on and how to power on the SmartLogger.

Checking Before Powering On the SmartLogger

Check and ensure the following before powering on the SmartLogger.

- All cables are intact and well insulated.
- All cables are of proper size.
- All cables are correctly connected and secured.

Power-on Process

Power on the devices in the following sequence: Inverter > SmartLogger > PC terminal.

MOTE

The PC terminal refers to a PC where the NMS is installed.

Step	Operation
1	Perform the requirements mentioned in Checking Before Powering On the SmartLogger.
2	Start the inverter and correctly set the communications parameters (including Address , and Baud rate).
	For details about how to set the communications parameters, refer to Setting Communications Parameters in the <i>SUN2000 (8KTL-28KTL) User Manual</i> , <i>SUN2000 APP User Manual</i> and <i>SUN8000-500KTL User Manual</i> .
3	Connect the output terminal of the power adapter for the SmartLogger to the power port POWER and the input terminal to the AC socket.

Step	Operation
4	Set the search address segment and baud rate for the RS485 port on the SmartLogger monitoring panel.
	If the SmartLogger is powered on for the first time, set the search address segment and baud rate for the RS485 port in the Wizard, as shown in 5.2 Setting Initialization Parameters. If it is not powered on for the first time, set the parameters in the Comm. Param. under the Settings, as shown in 6.2.23 Setting Communications Parameters.
5	Wait for the SmartLogger to search for inverters. After the search is completed, the SmartLogger automatically connects to all inverters.
	Alternatively, you can skip this operation and manually search for, add, or delete inverters in follow-up operations. For details, see 6.2.30 Managing Devices.
6	(Optional) Manually add an environment monitoring instrument, power meter, PLC, or third-party device.
	For details, see 6.2.30 Managing Devices.
	NOTICE Before adding an environment monitoring instrument or power meter, log in to the WebUI and correctly set parameters for the device to be added. Before adding a third-party device, import a correct configuration file for the device.
7	(Optional) Start the PC terminal and set Ethernet and NetEco parameters on the SmartLogger.



NOTICE

- When starting the SmartLogger, use only the 12 V power adapter shipped along with the shell. If adapters of other models are used, the SmartLogger may be damaged.
- Log in to the SmartLogger on the monitoring panel. When you log in to the **Settings** page or **Maintenance** page, an identity authentication is required. The initial password is 000001. Change the password as soon as possible to ensure the security of the user account. For details about how to change the password, refer to 6.2.22 Changing a Password.

5.2 Setting Initialization Parameters

When starting the SmartLogger for the first time, set initialization parameters on the monitoring panel. The initialization parameters include system language, system time, the search address segment for the RS485 port, and the Ethernet parameters.

Context



If the SmartLogger is started for the first time, set the initialization parameters by referring to this section. If it is not started for the first time, it directly performs the automatic search and then the default page.

Procedure

• The following table describes the process for setting initialization parameters. The parameter values in the following figures are for reference only.

LCD	Operation Procedure
HUAWEI 80%	After startup, the SmartLogger enters the initialization page. The default system language is English .
Start initialization wizard? ESC:Cancel →:Enter	2. Press to enter the Wizard page. To return to the default page, press ESC. If some later re-settings are required, refer to 6.2.18 Setting the System Language, 6.2.19 Setting System Time Parameters, and 6.2.23 Setting Communications Parameters.
Wizard Language English 中文 Deutsch Italiano 日本語 Français	3. Select a display language and then press The pages will be displayed in the selected language.
Wizard Date&Time TZ:UTC Dublin DST:Disable Date:2016-02-27 Time:10:53:11	 4. Set the correct date and time and then press To select the specific parameter, press or To set the parameter value, press or The date and time are displayed in the formats of YYYY-MM-DD and hh:mm:ss respectively. YYYY stands for the year, MM the month, DD the date, hh the hour, mm the minute, and ss the second. NOTICE After the Time is successfully set, this time can be synchronized in all the inverters connected to the SmartLogger.

LCD	Operation Procedure
Wizard->Ethernet Auto obtain IP:Disable IP address:192.168. 0. 10 Subnet mask:255.255.255. 0 Gateway:192.168. 0. 1 DNS-1:192.168. 0. 1 DNS-2: 0. 0. 0. 0 Submit Wizard Search Address Segments RS485-1:001-100 RS485-2:001-100 RS485-3:001-100	
Initialization->Search Devices Search devices now? ESC:Cancel:Enter	7. On the page, press After the search is complete, the SmartLogger displays a search result. Press to end this operation.

□ NOTE

Visiting some menu requires identity authentication. Therefore, after you set the initialization parameters, change the password immediately to ensure the security of the user account. For details, see Change the Password.

----End

6 User Interface

This topic describes the monitoring menu and operations.

Context

Figures provided in this chapter correspond to the SUN2000 V100R001C95SPC108 version. The data in the figures provided in this document are for reference only.

6.1 Monitoring Menu Hierarchy

This topic describes the monitoring menu hierarchy, which allows you to perform operations conveniently.

Figure 6-1 shows the monitoring menu hierarchy.

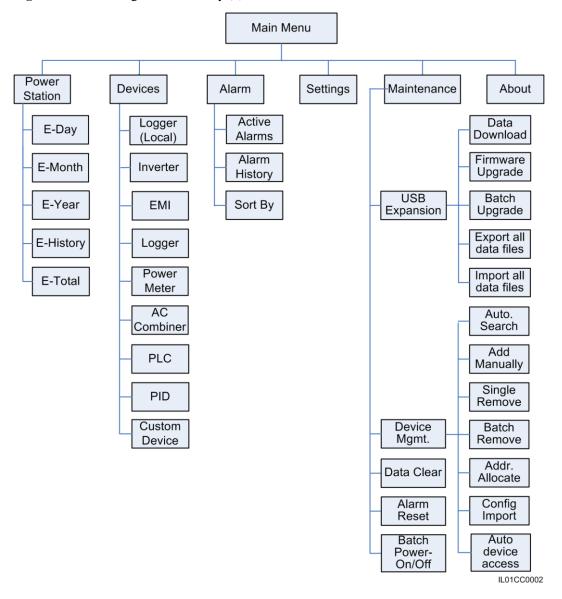


Figure 6-1 Monitoring menu hierarchy (1)

M NOTE

If you access the **Maintenance** menu as a **Common User**, the message "Current user has no authority" is displayed.

Different identities (Common User, Advanced User, and Special User) have different permissions for setting parameters. The hierarchies of **Settings** are shown in Figure 6-2.



NOTICE

The initial password for **Common User**, **Advanced User** and **Special User** is *000001*. If the SmartLogger is logged in for the first time, use the initial password to log in and change the password immediately to ensure the account security.

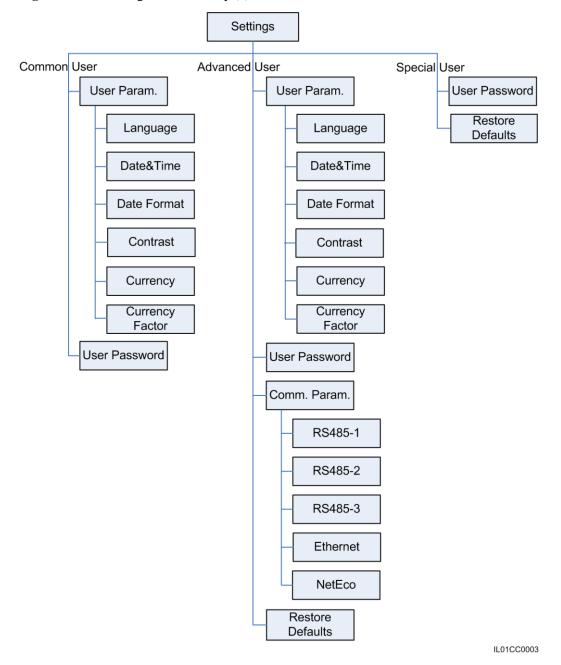


Figure 6-2 Monitoring menu hierarchy (2)

6.2 Monitoring Operations

This topic describes how to operate on the monitoring panel, such as querying site and device information and setting system parameters and user parameters.

6.2.1 Querying Power Station Information

This topic describes how to view the power station information on the monitoring panel of the SmartLogger, such as the daily, monthly, yearly, historical, and total energy yield.

Procedure

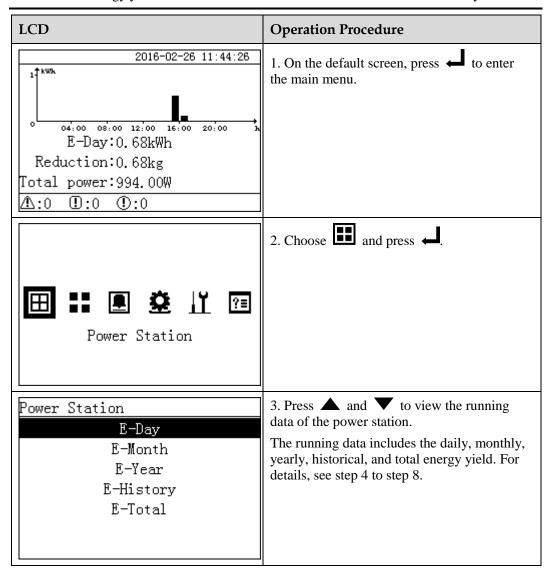
• The following table describes the procedure for viewing power station information. The parameter values in the following figures are for reference only.

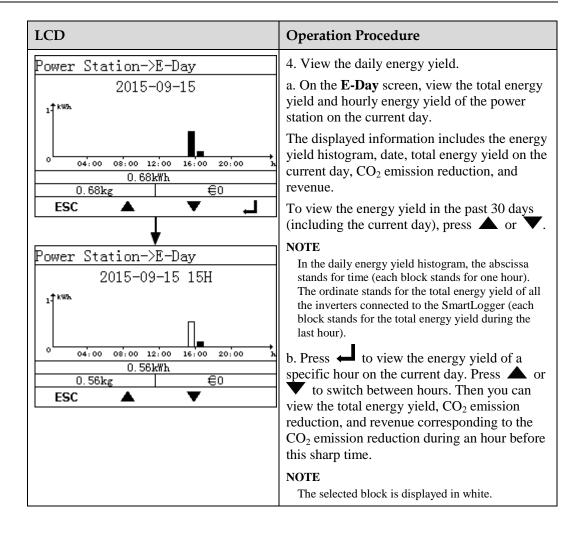


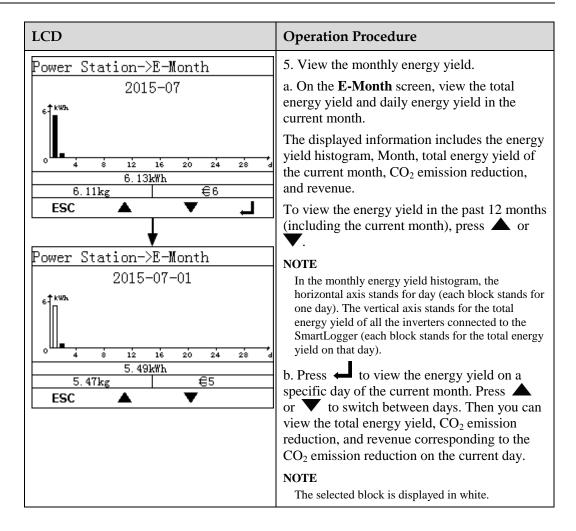
NOTICE

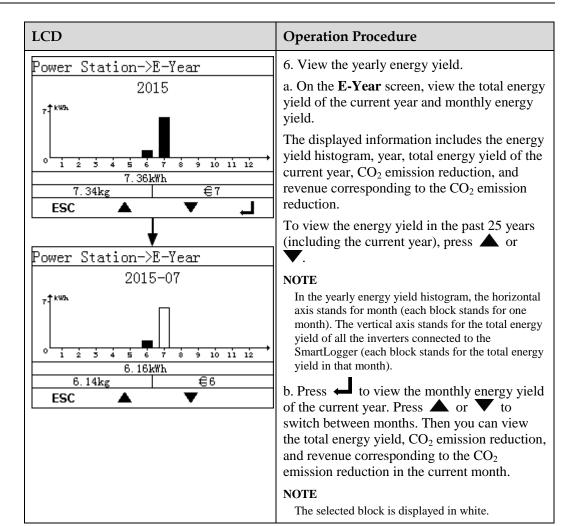
You can view the daily, monthly, yearly, and historical energy yield of the power station. The values relate to the number of connected inverters.

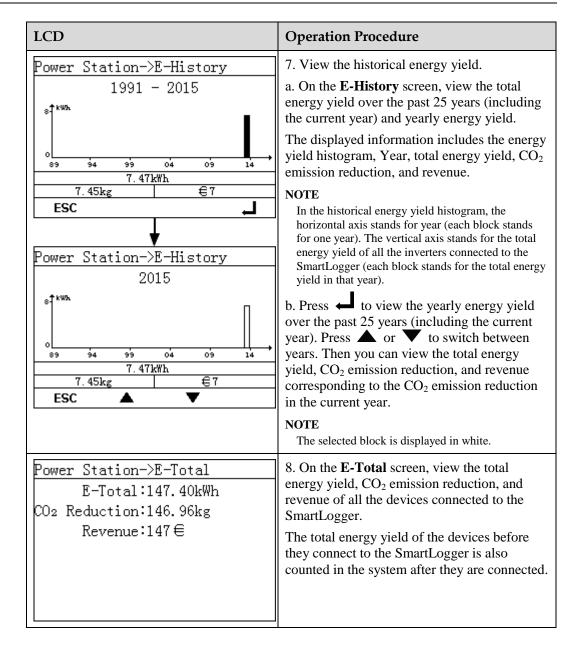
- Daily energy yield. Data of a maximum of 80 devices can be stored for 34 days.
- Monthly energy yield. Data of a maximum of 80 devices can be stored for 27 months.
- Yearly energy yield. Data of a maximum of 80 devices can be stored for 25 years.
- Historical energy yield. Data of a maximum of 80 devices can be stored for 25 years.









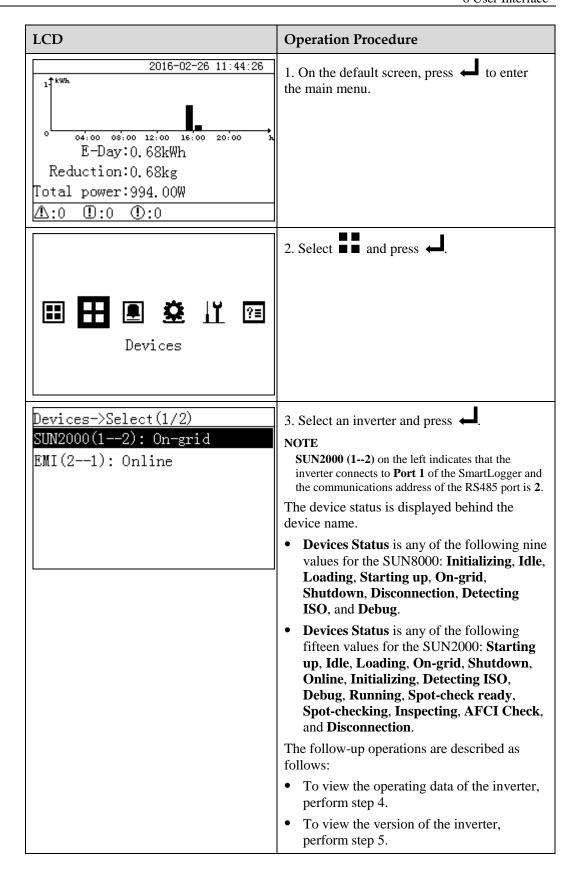


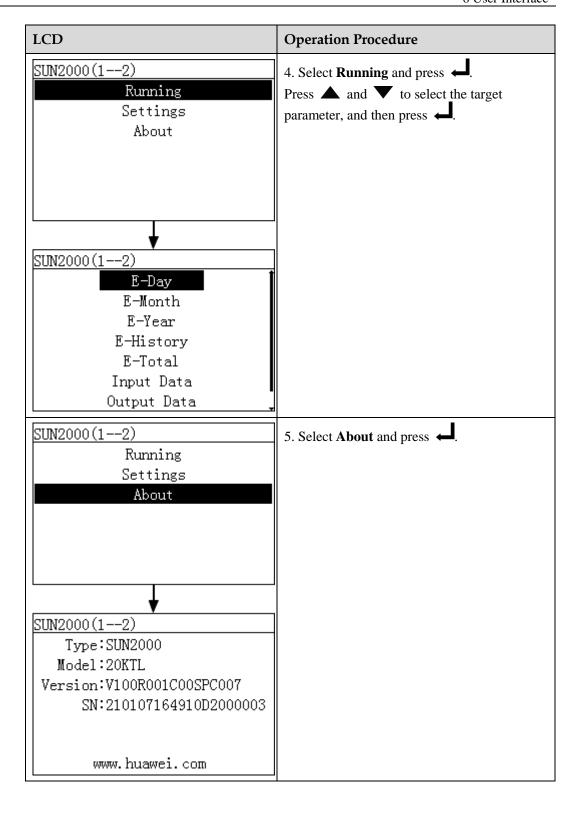
6.2.2 Querying Inverter Information

This topic describes how to query the running information and version of each inverter connected to the SmartLogger.

Procedure

• The following table describes the procedure for viewing inverter information. The parameter values in the following figures are for reference only.





6.2.3 Manually Powering On or Off the Inverter on the monitoring panel

This topic describes how to power on or off the inverter on the monitoring panel.

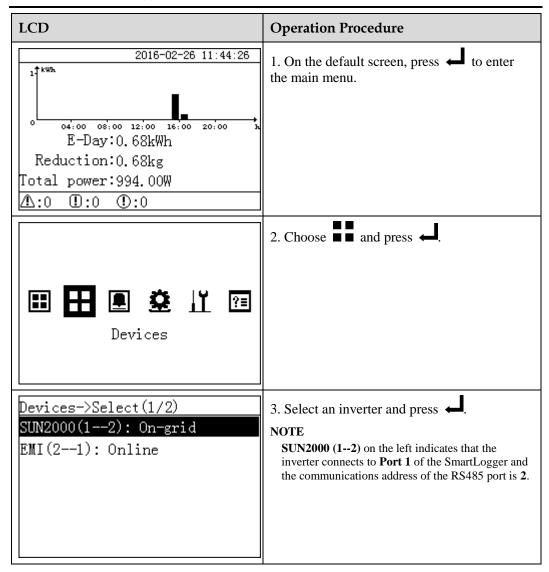
Procedure

• The following table shows the procedure for powering on or off the inverter on the monitoring panel. The parameter values in the following figures are for reference only.

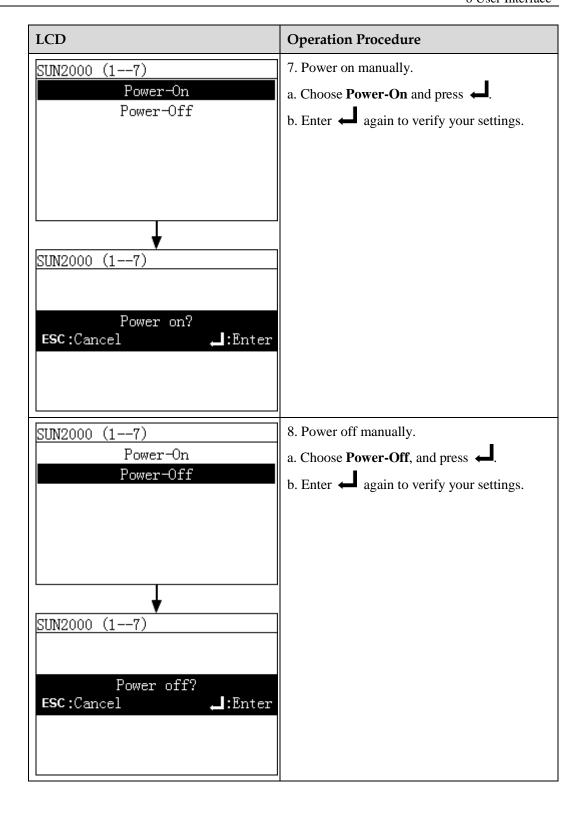


NOTICE

Choose **Batch Power-On/Off** under **Maintenance** to power on or off all inverters that connect to the SmartLogger.



LCD	Operation Procedure	
SUN2000 (17) Running Settings About	4. Choose Settings , and press .	
Settings->Login User Name:Advanced User Password:000000	5. Set the specific User Name and Password. NOTE The following user names can be selected: Common User, Advanced User, and Special User. The initial password for Common User, Advanced User and Special User is 000001.	
SUN2000(3-1) Power-On/Off Reset	 6. Choose Power-On/Off, and press . Perform step 7 if you want to power on the inverter manually. Perform step 8 if you want to power off the inverter manually. 	

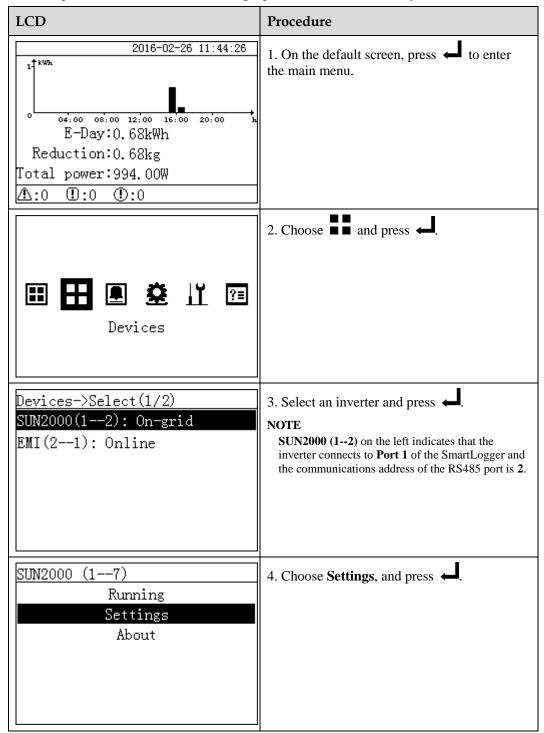


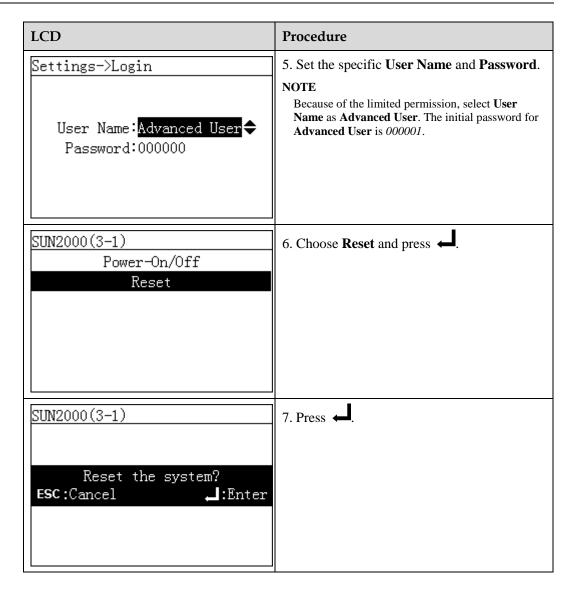
6.2.4 Sending a Reset Command to the Inverter

You can send a reset command to the inverter on the LCD.

Procedure

• The following table describes the procedure for sending a reset command to the inverter. The parameter values in the following figures are for reference only.





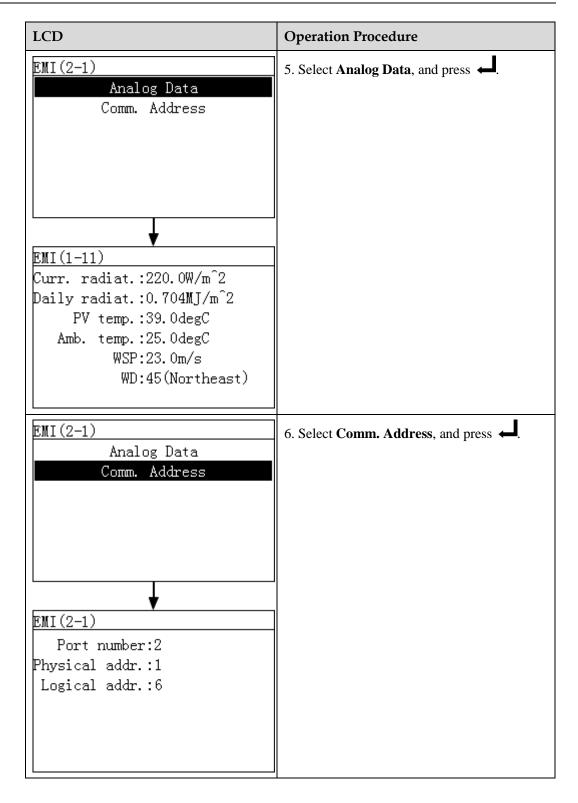
6.2.5 Querying Information about the EMI

This topic describes how to query the EMI information on the monitoring panel.

Procedure

• The following table describes the procedure for querying information about the EMI. The parameter values in the following figures are for reference only.

LCD	Operation Procedure
2016-02-26 11:44:26 1	 On the default screen, press to enter the main menu. Choose
Devices->Select(7/7) Logger(Local):Online SUN2000(2-11):On-grid SUN2000(2-12):On-grid SUN2000(1-1):Idle SUN8000(3-2):Initializing AC Combiner(3-3):Online EMI(2-1):Online	3. Choose the name of the EMI and press to view information about the instrument. Devices Status is either of the following values for the EMI: Online and Disconnection .
EMI(2-1) Running	 4. Select Running and press . To view the analog data of the EMI, perform step 5 only. To view the communications address of the EMI, perform step 6 only.

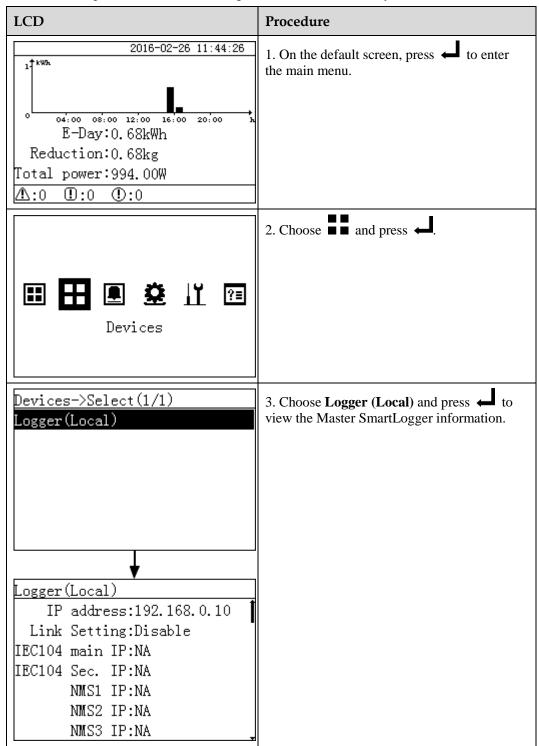


6.2.6 Querying Master SmartLogger Information

This topic describes how to query Master SmartLogger information.

Procedure

• To query Master SmartLogger information, perform the steps described in the following table. The parameter values in the figures are for reference only.



----End

6.2.7 Querying Slave SmartLogger Information

This topic describes how to query Slave SmartLogger information on the monitoring panel.

Context

The Slave SmartLogger mainly applies to power grid scheduling of large-sized power stations. One SmartLogger can connect to a maximum of 80 devices. When there are more than 80 inverters in the power station, a certain number of Slave SmartLoggers should be configured. The power grid scheduling command sent to the Master SmartLogger is synchronized to the Slave SmartLogger to enable the centralized power grid scheduling of the power station.

Devices can only be manually added and removed in the Slave SmartLogger on the monitoring panel or the embedded WebUI.

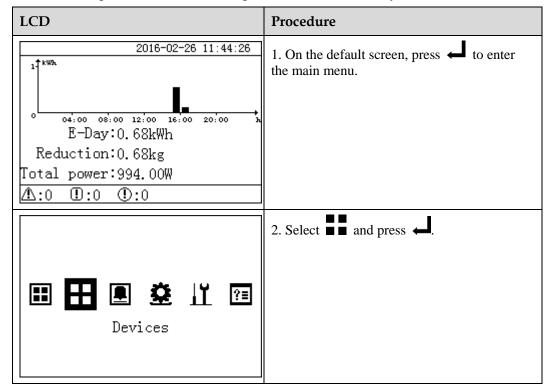


NOTICE

The Slave SmartLogger and the Master SmartLogger should be within the same local area network (LAN).

Procedure

• To query Slave SmartLogger information, perform the steps described in the following table. The parameter values in the figures are for reference only.



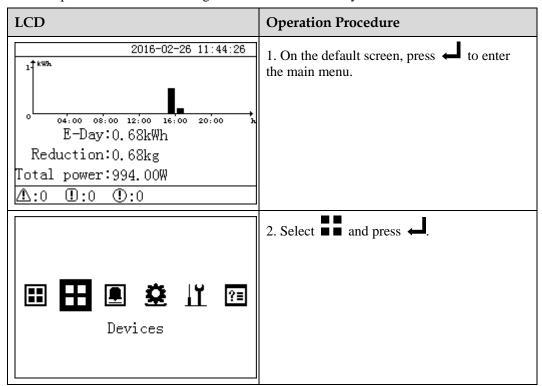
LCD	Procedure
Devices->Select(1/2) Logger(net.22.243): Disconnec Power Meter(12): Online	3. Choose Logger to view the status and IP address of the Slave SmartLogger. The status of the Slave SmartLogger can either Online or Disconnection .

6.2.8 Querying Power Meter Information

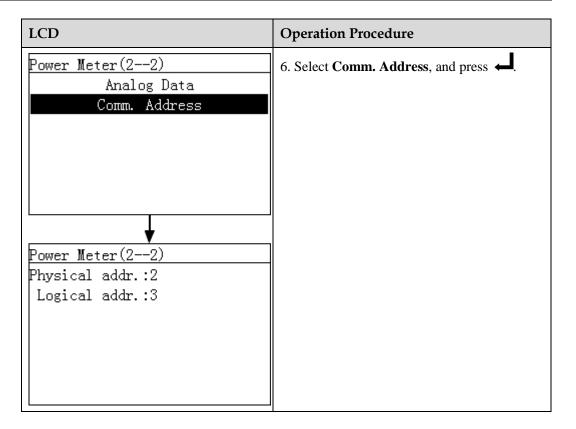
This topic describes how to query the power meter information on the monitoring panel.

Procedure

• To query the power meter information, perform the steps described in the following table. The parameter values in the figures are for reference only.



LCD	Operation Procedure
Devices->Select(4/5) Logger(Local) Logger(net.0.11): Disconnecti SUN8000(32): Disconnection Power Meter(22): Disconnect AC Combiner(31): Disconnect	3. Choose Power Meter and press to query the power meter information. NOTE Power Meter (22) on the left indicates that the power meter connects to Port 2 of the SmartLogger and the communications address of the RS485 port is 2 . The status of the power meter can be neither Online or Disconnection .
Power Meter(22) Running	 4. Select Running and press . To view the analog data of the power meter, perform step 5 only. To view the communications address of the power meter, perform step 6 only.
Power Meter(22) Analog Data Comm. Address	5. Select Analog Data, and press ←.
Power Meter(12) A-B line voltage: 387.00V B-C line voltage: 387.20V C-A line voltage: 386.80V Phase A current: 23.0A Phase B current: 23.0A Phase C current: 23.0A Active power: 15.000kW	

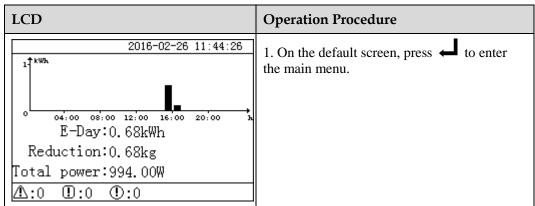


6.2.9 Querying AC Combiner Box Information

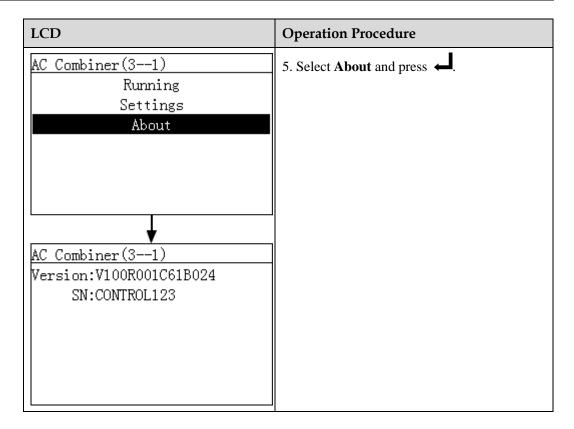
This topic describes how to query the running information and version of an AC combiner box connected to the SmartLogger.

Procedure

• The following table describes the procedure for viewing the information about an AC combiner box. The parameter values in the figures are for reference only.



LCD	Operation Procedure
■ ■ ♣ ∐ 11 Devices	2. Select and press.
Devices->Select(5/5) Logger(Local) Logger(net.0.11): Disconnecti SUN8000(32): Disconnection Power Meter(22): Disconnect AC Combiner(31): Disconnect	 3. Select an AC combiner box and press INOTE AC Combiner (31) in the left figure indicates that the AC combiner box is connected to the Port 3 of the SmartLogger, and its RS485 communications address is 1. The states of the AC combiner box can be Online and Disconnection. The subsequent operations are as follows: To view the operating data of the AC combiner box, perform step 4 only. To view the version information of the AC combiner box, perform step 5 only.
AC Combiner(31) Running Settings About	4. Select Running and press ←. Press ♠ and ▼ to select the target parameter, and then press ←.
AC Combiner(31) Analog Data Binary Data Comm. Address	

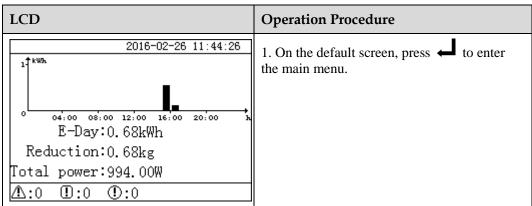


6.2.10 Setting Feature Parameters for an AC Combiner Box

This topic describes how to set feature parameters for an AC combiner box on the monitoring panel.

Procedure

• The following table describes the procedure for setting feature parameters for an AC combiner box. The parameter values in the figures are for reference only.



LCD	Operation Procedure
■ ■ ♣ ∐ ☎ Devices	2. Select ■ and press ← .
Devices—>Select(5/5) Logger(Local) Logger(net.0.11): Disconnecti SUN8000(32): Disconnection Power Meter(22): Disconnect AC Combiner(31): Disconnect	3. Select an AC combiner box and press NOTE AC Combiner (31) in the left figure indicates that the AC combiner box is connected to the Port 3 of the SmartLogger, and its RS485 communications address is 1.
AC Combiner(31) Running Settings About	4. Select Settings and press ✓.
Settings->Login User Name: <mark>Advanced User</mark> Password:000000	5. Set the specific User Name and Password. NOTE Because of the limited permission, select User Name as Advanced User. The initial password for Advanced User is 000001.

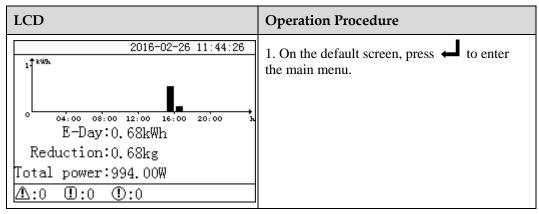
LCD	Operation Procedure
AC Combiner(31) Feature Param.	6. Select Feature Param. and press —.
AC Combiner(31) Number of inputs:5	7. Set Number of inputs based on the AC combiner box connection.

6.2.11 Querying PLC Information

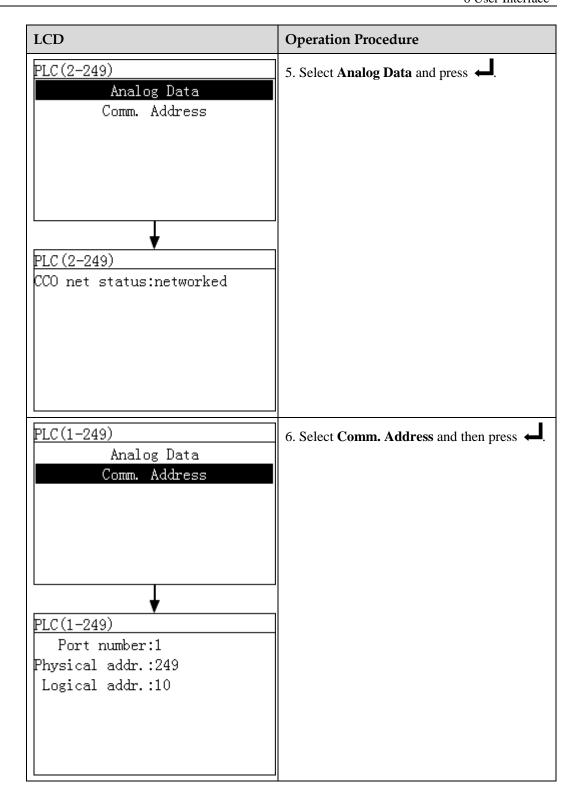
This section describes how to query the running information and version of a PLC connected to the SmartLogger.

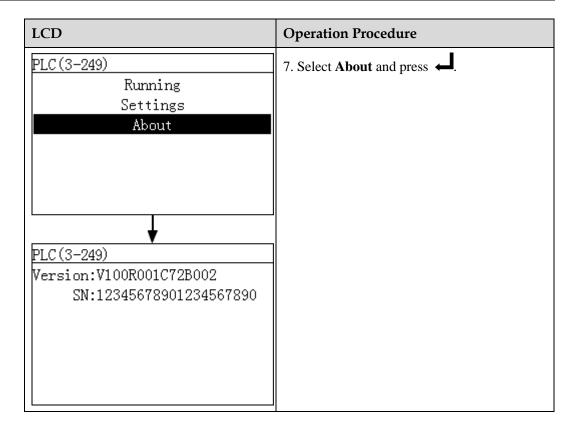
Procedure

• The following table describes the procedure for viewing the information about a PLC. The parameter values in the figures are for reference only.



LCD	Operation Procedure
	2. Select ■ and press ←.
Devices	
Devices->Select(3/5) Logger(Local):Online SUN2000(3-1):Loading PLC(3-249):Online PID(3-2):Running EMI(3-5):Online	 3. Select a PLC and press NOTE PLC (3-249) in the left figure indicates that the PLC is connected to the Port 3 of the SmartLogger, and its RS485 communications address is 249. The states of the PLC can be Online and Disconnection. The subsequent operations are as follows: To view the running information of the PLC, perform step 4 to 6. To view the version information of the PLC, perform step 7 only.
PLC(3-249) Running Settings About	4. Select Running and press ← .



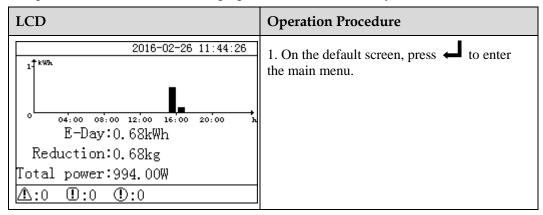


6.2.12 Sending a Reset Command to the PLC

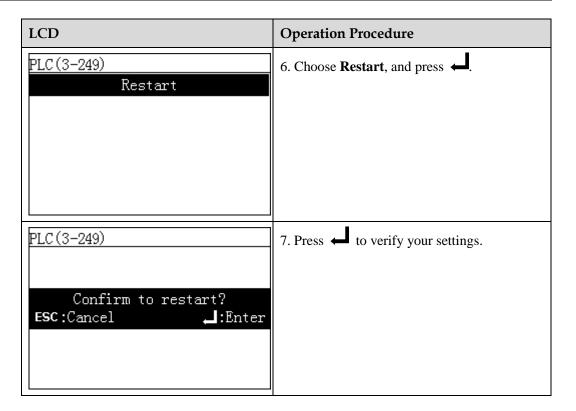
You can send a reset command to the PLC on the monitoring panel.

Procedure

• The following table describes the steps for sending a reset command to the PLC. The parameter values in the following figures are for reference only.



LCD	Operation Procedure
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	2. Choose and press .
Devices->Select(3/5) Logger(Local):Online SUN2000(3-1):Loading PLC(3-249):Online PID(3-2):Running EMI(3-5):Online	3. Select a PLC and press NOTE PLC (3-249) in the left figure indicates that the PLC is connected to the Port 3 of the SmartLogger, and its RS485 communications address is 249.
PLC(3-249) Running Settings About	4. Select Settings and press
Settings->Login User Name: Advanced User Password: 000000	5. Set the specific User Name and Password . NOTE Because of the limited permission, select User Name as Advanced User . The initial password for Advanced User is 000001.

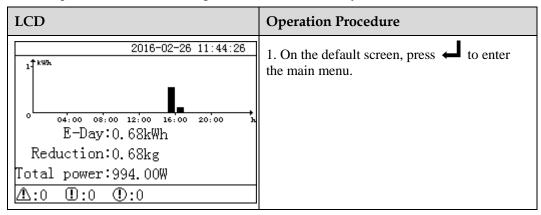


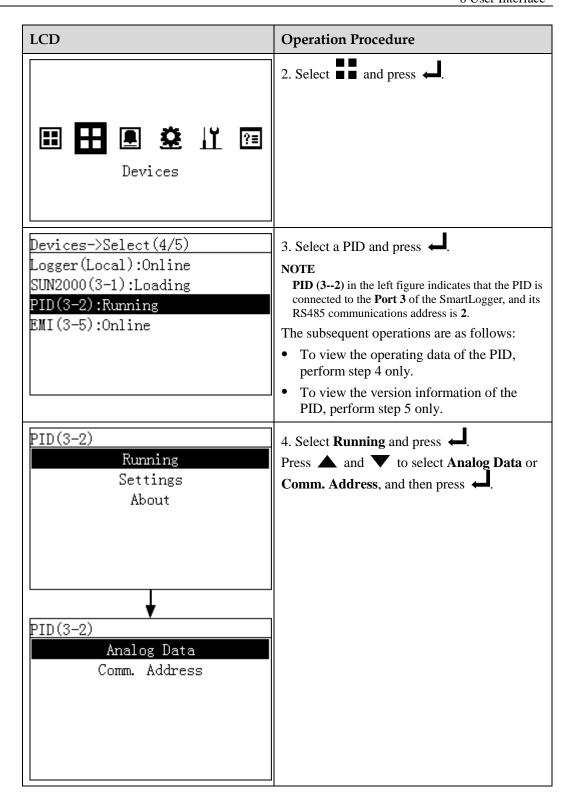
6.2.13 Querying PID Information

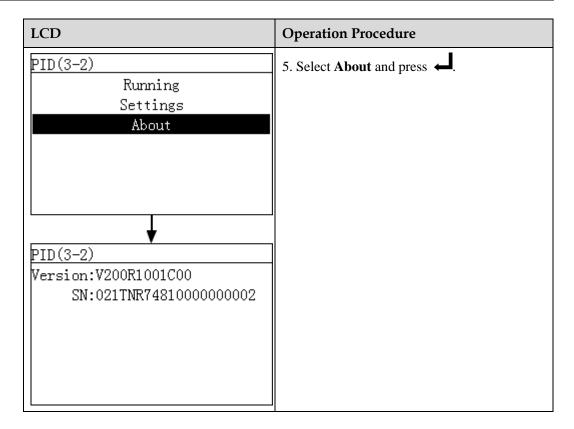
This topic describes how to query the running information and version of a PID connected to the SmartLogger.

Procedure

• The following table describes the procedure for viewing the information about a PID. The parameter values in the figures are for reference only.





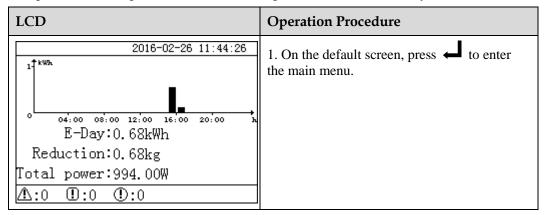


6.2.14 Setting the PID Module Feature Parameters

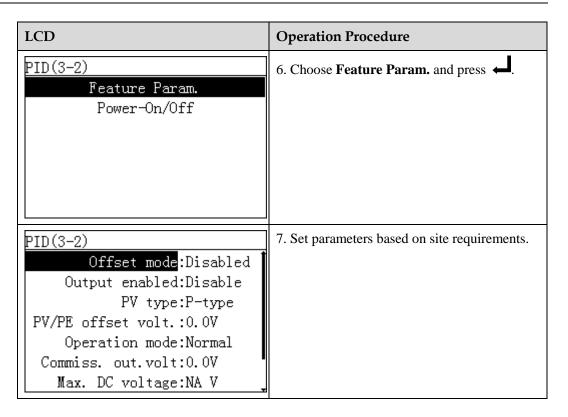
You can set the PID module Feature parameters on the LCD.

Procedure

• The following table describes the procedure for setting the PID module running parameters. The parameter values in the figures are for reference only.



LCD	Operation Procedure
■ ■ ♣ ∐ Devices	2. Choose and press .
Devices->Select(4/5) Logger(Local):Online SUN2000(3-1):Loading PID(3-2):Running EMI(3-5):Online	3. Select a PID and press NOTE PID (32) in the left figure indicates that the PID is connected to the Port 3 of the SmartLogger, and its RS485 communications address is 2.
PID(3-2) Running Settings About	4. Choose Settings and press .
Settings->Login User Name: Advanced User Password: 000000	5. Set the specific User Name and Password . NOTE Because of the limited permission, select User Name as Advanced User . The initial password for Advanced User is 000001.



Parameter Description

Table 6-1 describes the PID module feature parameters.

Table 6-1 Feature parameter descriptions

N o.	Para meter Nam e	Function	Parame ter Value	Description	
1	Offset mode	Specifies the offset	Disable d	Set this parameter to Disable if the PID module is not required.	
		mode of the PID module.	PID	N/PE	Set this parameter to N/PE if the PID module is required to use voltage output from the inductor virtual midpoint N.
			PV/PE	Set this parameter to PV/PE if the PID module is required to use voltage output from the negative PV terminal.	
				This mode is applicable only to SUN8000.	

N o.	Para meter Nam e	Function	Parame ter Value	Description
			Automa tic	 In the SUN2000, Automatic indicates the N/PE offset mode. In the SUN8000, set this parameter to Automatic if the PID is required to automatically switch between N/PE and PV/PE offset modes based on the PV module voltage.
2	Outpu t enable	Specifies whether the PID module	Enable	Set this parameter to Enable to allow the PID module output.
	d	output is enabled.	Disable	Set this parameter to Disable to forbid the PID module output.
3	PV modul e type	Specifies the type of the PV	P-type	Set this parameter to P-type if the PV module type is P. In this case, the PID module output voltage is positive.
		module used in the power station. For details about the PV module type, consult the manufacture r.	N-type	Set this parameter to N-type if the PV module type is N. In this case, the PID module output voltage is negative.
4	PV/P E offset volt.	Specifies the DC voltage when the offset mode is set to PV/PE.	N/A	It is recommended that the offset voltage be set to a value ranging from 50 V to 200 V.
5	Opera tion Mode	Specifies whether the PID module is currently working in normal or commission ing mode.	Commis sioning	In commissioning mode, if you need to set the output mode to PV/PE or N/PE, set Output enabled to Enable. The PID module delivers output voltages based on the value of Commiss. out.volt. NOTE Before the first power-on, to check whether the PID functions properly, it is recommended that Operation mode be set to Commissioning.

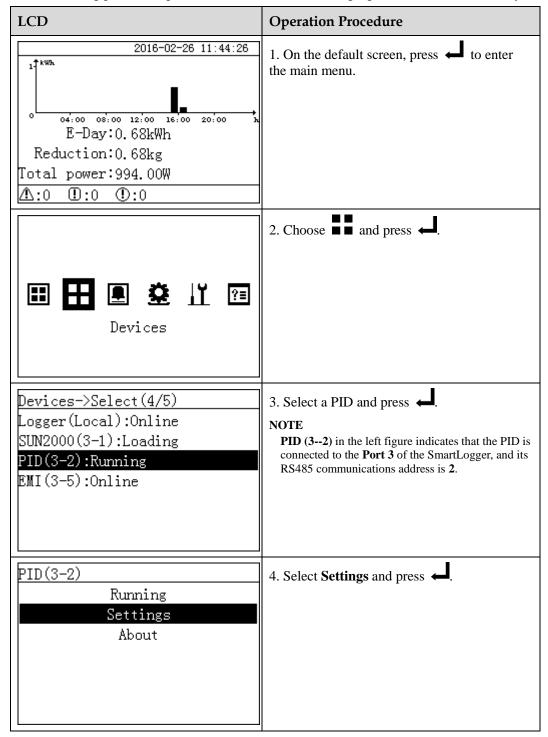
N o.	Para meter Nam e	Function	Parame ter Value	Description
			Normal	In normal mode, the PID module operates automatically after the PID module, inverter, and SmartLogger communicate with each other properly.
6	Com miss. out.vo lt	Specifies the output voltage when the PID module works in commission ing mode.	N/A	The setting range is 0–500 V. It is recommended that the commissioning voltage in the SUN2000 scenario should be 50–400 V, and the commissioning voltage in the SUN8000 scenario should be 50–200 V.
7	Data Clear	Clears the active alarms and historical alarms stored on the PID module.	Start	You can select Data Clear to clear active alarms and historical alarms. NOTE To clear the historical information about the PID module stored on the SmartLogger, see the Clearing Data from the PID Module.
8	DC voltag e max.	Specifies the PV-PE voltage when the normal operation mode is used.	N/A	In normal mode, the setting range is 500–1500 V. If the PV module type is P, the parameter value indicates the highest DC voltage between PV+ and PE; if the PV module type is N, the parameter value indicates the highest DC voltage between PV- and PE.
9	Maxi mum output voltag e	Sets the highest output voltage of the PID module in normal or commission ing operation mode.	N/A	The setting range is 0–500 V. If the compensation mode is PV/PE , the parameter value indicates the highest DC output voltage between PV and PE; if the compensation mode is N/PE , the parameter value indicates the highest DC output voltage between N and PE.

6.2.15 Manually Powering On or Off the PID on the monitoring panel

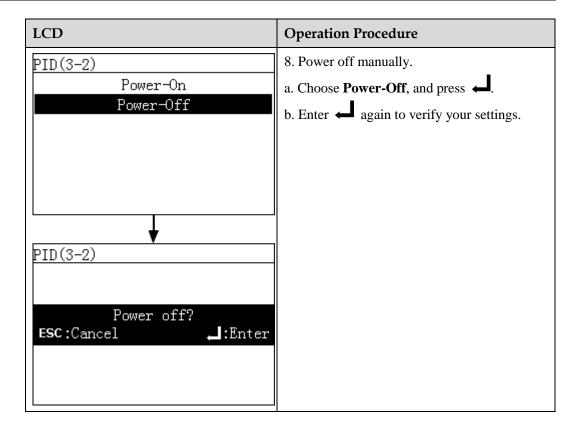
This topic describes how to power on or off the PID on the monitoring panel.

Procedure

• The following table shows the procedure for powering on or off the PID on the monitoring panel. The parameter values in the following figures are for reference only.



LCD	Operation Procedure
Settings->Login User Name:Advanced User Password:000000	5. Set the specific User Name and Password. NOTE Because of the limited permission, select User Name as Advanced User. The initial password for Advanced User is 000001.
PID(3-2)	6. Choose Power-On/Off , and press \leftarrow .
Feature Param. Power—On/Off	• Perform step 7 if you want to power on the inverter manually.
	Perform step 8 if you want to power off the inverter manually.
PID(3-2) Power-On	7. Power on manually.a. Choose Power-On and press ←
Power-Off	b. Enter again to verify your settings.
PID(3-2)	
Power on? ESC:Cancel	

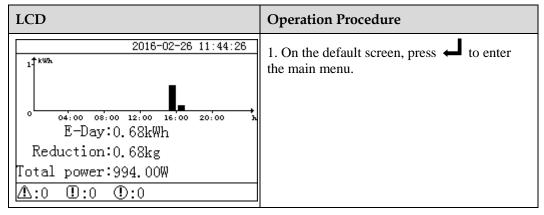


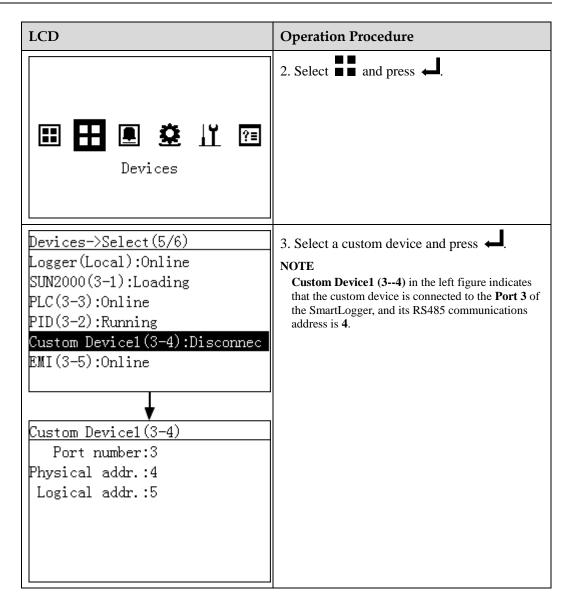
6.2.16 Querying Custom Device Information

This topic describes how to query the running information and version of a custom device connected to the SmartLogger.

Procedure

• The following table describes the procedure for viewing the information about a custom device. The parameter values in the figures are for reference only.





6.2.17 Querying Alarm Records

This topic describes how to query active and historical alarms for the SmartLogger and the connected inverters and how to set the alarm record sort mode on the monitoring panel.

Context

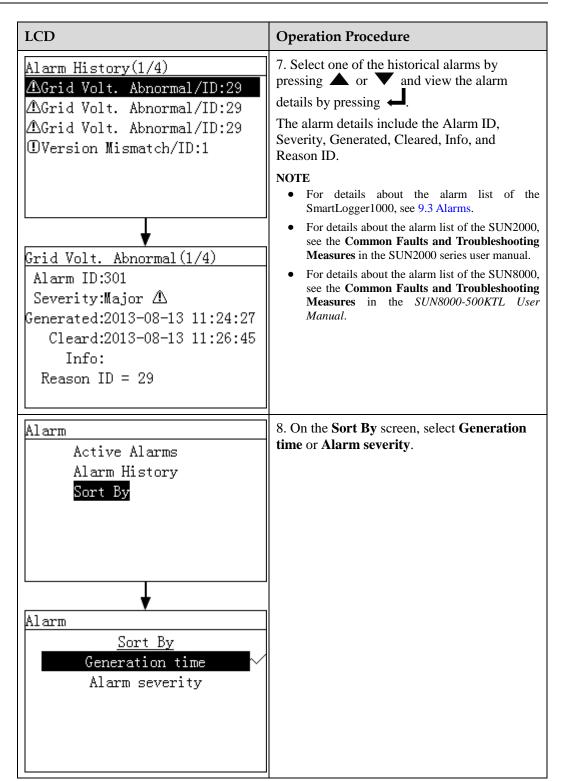
The LCD displays a maximum of 8000 latest alarm records.

Procedure

 The following table describes the procedure for querying active and historical alarms and setting the alarm record sort mode. The parameter values in the figures are for reference only.

LCD	Operation Procedure
2016-02-26 11:44:26 1	 On the default screen, press to enter the main menu. Choose
Alarm Active Alarms Alarm History Sort By	 3. Press , choose the appropriate menu, and press . Perform step 4 and step 5 to view active alarms. Perform step 6 and step 7 to view historical alarms. Perform step 8 to set the alarm sort mode.
Active Alarms->Select(1/2) SUN2000 (17) (1) SUN8000 (18) (0)	4. On the Active Alarms screen, select the target device name and press to view all the active alarms for this device.

LCD	Operation Procedure
Active Alarms(1/1) ①Version Mismatch / ID:1 Version Mismatch (1/1) Alarm ID:504 Severity:Minor ① Generated:2013-08-13 11:26:18 Info: Reason ID = 1	 5. Select one of the alarm records by pressing or , and view the alarm details by pressing . The alarm details include the Alarm ID, Severity, Generated, Info, and Reason ID. NOTE For details about the alarm list of the SmartLogger1000, see 9.3 Alarms. For details about the alarm list of the SUN2000, see the Common Faults and Troubleshooting Measures in the SUN2000 series user manual. For details about the alarm list of the SUN8000, see the Common Faults and Troubleshooting Measures in the SUN8000-500KTL User Manual.
Alarm History->Select(1/2) SUN2000 (17) (7) SUN8000 (18) (9)	6. On the Alarm History screen, select the target device name and press to view all the historical alarms for this device.

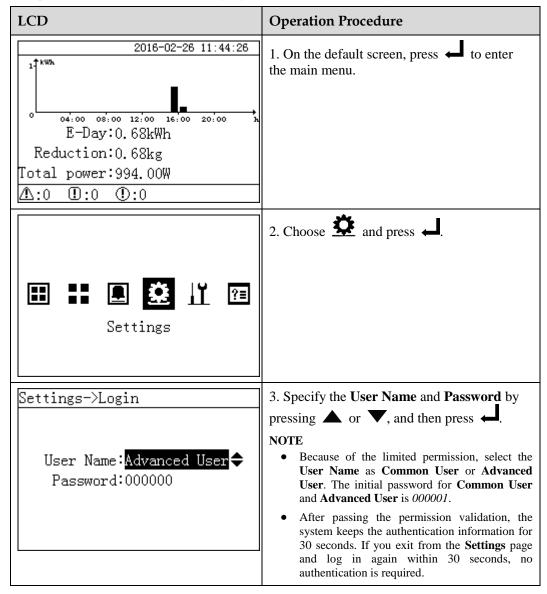


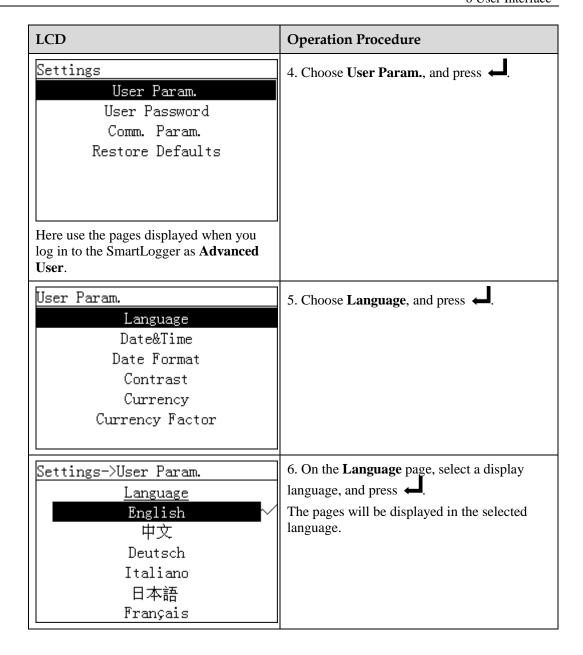
6.2.18 Setting the System Language

This topic describes how to set the display language for the SmartLogger on the monitoring panel.

Procedure

• The following table describes the procedure for setting the display language. The parameter values in the following figures are for reference only.



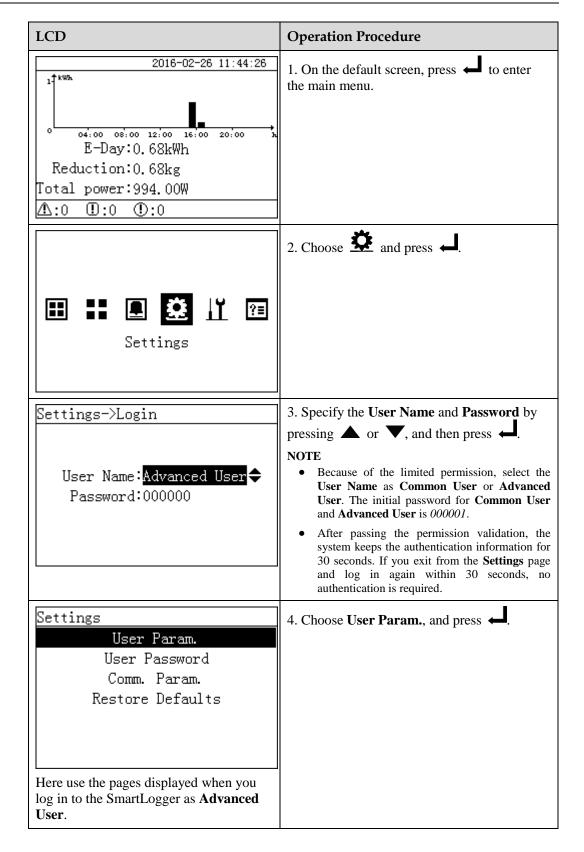


6.2.19 Setting System Time Parameters

This topic describes how to set the date, time and date format for the SmartLogger on the monitoring panel.

Procedure

• The following table describes the procedure for setting the time and date. The parameter values in the following figures are for reference only.



LCD	Operation Procedure
User Param. Language Date&Time Date Format Contrast Currency Currency Factor User Param. Language Date&Time Date Format Contrast Currency	 5. Choose Date&Time or Date Format by pressing ▼, and press ←. NOTICE • Modifying Date&Time will affect the integrity of the SmartLogger's energy yield and performance data. Hence, do not change it at will. • After Date&Time is successfully set, this time can be synchronized in all the inverters connected to the SmartLogger.
Currency Factor User Param. Date&Time TZ:UTCDublin DST:Disable Date:2016-07-04 Time:13:52:02	 6. On the Date&Time page, set the date and time, set the time zone, enable or disable the daylight saving time, and press . To select the specific parameter, click To set the parameter value, set or . Set TZ based on the location of the inverters and enable or disable DST as required.
Settings->User Param. Date Format YYYY-MM-DD MM-DD-YYYY DD-MM-YYYY	7. On the Date Format page, select a date format, and press .

6.2.20 Setting SmartLogger Contrast

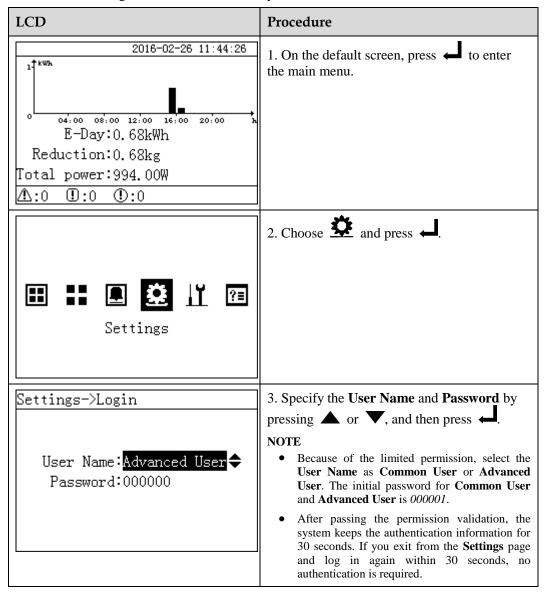
You can set the SmartLogger contrast on the monitoring panel.

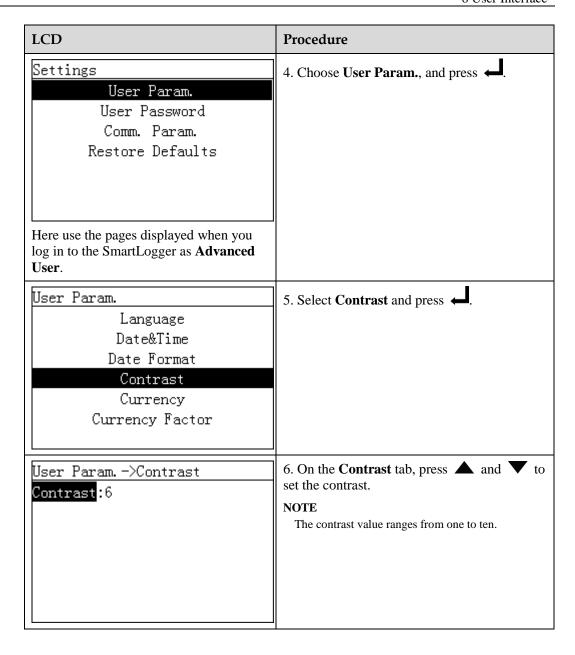
Context

In addition to the method provided in this section, you can also press and hold \triangle or \bigvee on the home screen to adjust the contrast.

Procedure

• To set the SmartLogger contrast, perform the steps in the following table: The parameter values in the figures are for reference only.



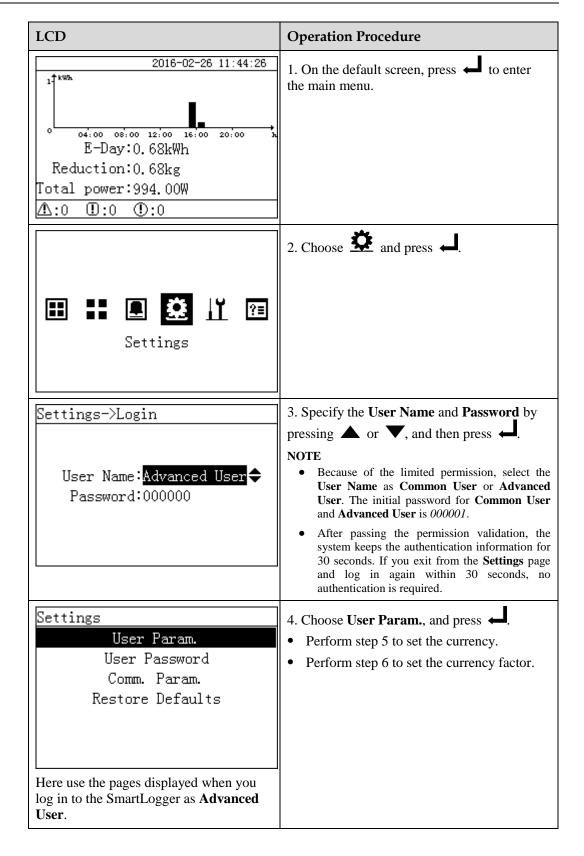


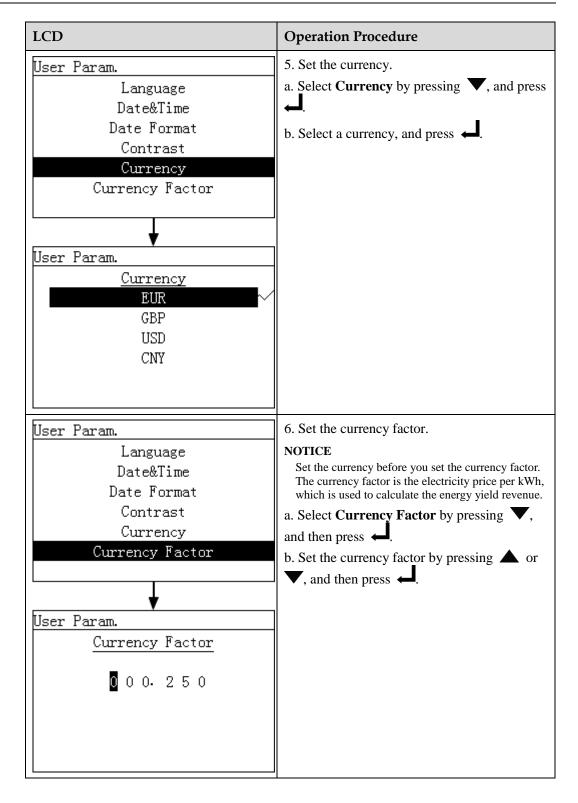
6.2.21 Setting the Currency and Currency Factor

This topic describes how to set the currency and currency factor for the SmartLogger.

Procedure

• The following table describes the procedure for setting the currency and currency factor. The parameter values in the following figures are for reference only.





6.2.22 Changing a Password

This topic describes how to change a password on the monitoring panel.

Context

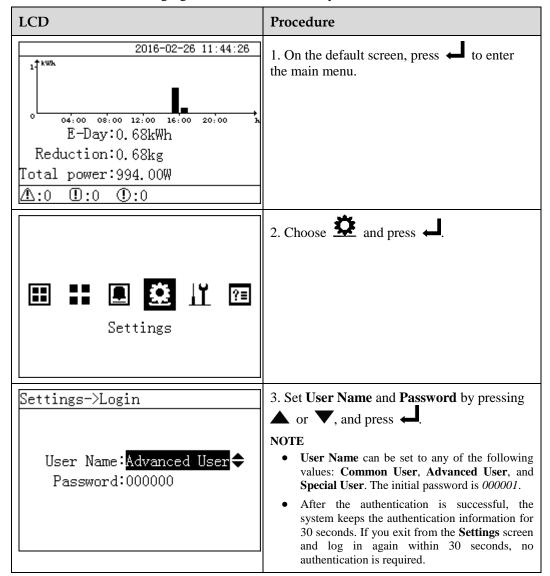
- The initial password is 000001 for Common User, Advanced User, and Special User.
- After the first login, it is recommended that you change the initial password immediately to ensure account security.
- You are advised to change the password at least once every half year to prevent unauthorized use of your account, which affects system security.

Change the password in compliance with the following principles:

- Six characters are required.
- The password consists of digits, uppercase letters, and lowercase letters.

Procedure

• The following table describes the procedure for changing a password. The parameter values in the following figures are for reference only.



LCD	Procedure
Settings User Param. User Password Comm. Param. Restore Defaults	4. Select User Password by pressing ▼ , and press ← .
Here use the pages displayed when you log in to the SmartLogger as Advanced User .	
Settings->User Password Enter old password:	5. Enter the old password and press Increase or decrease the value by pressing or Switch between data bits by pressing
(000000-ZZZZZZ)	
Settings->User Password Enter new password: 0 0 0 0 0 0 (000000-ZZZZZZZ)	6. Enter a new password and press . Increase or decrease the value by pressing or . Switch between data bits by pressing .
Settings->User Password	7. Enter the new password again and press
Confirm new password again:	NOTE Ensure that you enter the new password twice coherently. Otherwise, an error message is displayed.
(000000-ZZZZZZ)	After the password is changed successfully, the LCD displays operation success information.

■ NOTE

If you want to change the password for another account, exit from the **Settings** screen (without logging in to the **Maintenance** screen), wait 30 seconds, log in by using the account for which you want to change the password, and perform step 3 to step 7 in the preceding table.

6.2.23 Setting Communications Parameters

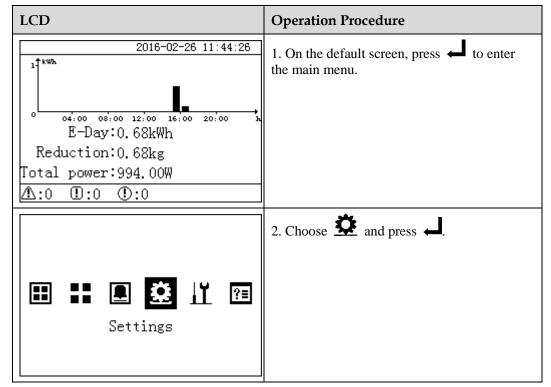
You can set the SmartLogger parameters for communication on the monitoring panel.

Context

- Correctly set RS485 parameters to ensure normal communication between the SmartLogger and the inverters and between the SmartLogger and the environmental monitoring instrument.
- Correctly set Ethernet parameters to ensure proper operation of Ethernet ports and functions of logging in to the embedded WebUI, connecting to the element management system, and sending emails.
- Correctly set NetEco parameters to ensure normal communication between the SmartLogger and the NetEco.

Procedure

• The following table describes the procedure for setting communications parameters. The parameter values in the following figures are for reference only.



LCD **Operation Procedure** 3. Set User Name and Password by pressing Settings->Login \blacktriangle or \blacktriangledown , and press \hookleftarrow . NOTE • Set User Name to Advanced User. The initial User Name:Advanced User ♦ password for **Advanced User** is 000001. Password:000000 After passing the permission validation, the system keeps the authentication information for 30 seconds. If you exit from the **Settings** screen and log in again within 30 seconds, no authentication is required. Settings 4. Select **Comm. Param.** and press \leftarrow . User Param. Perform step 5 and step 6 to set the User Password parameters for the RS485. Comm. Param. Perform step 7 and step 8 to set the parameters for the Ethernet. Restore Defaults Perform step 9 and step 10 to set the parameters for the NetEco. Perform step 11 and step 12 to set the parameters for the Modbus TCP. Here use the pages displayed when you Perform step 13 and step 14 to set the log in to the SmartLogger as Advanced parameters for the IEC103. User. 5. Select an RS485 port by pressing \triangle or Settings->Comm. Param. \bigvee and then press \longleftarrow . RS485-1 There are three RS485 ports: RS485-1, RS485-2 RS485-2, and RS485-3. The corresponding RS485-3 port for RS485-1 is COM1; RS485-2 is Ethernet COM2; RS485-3 is COM3. NetEco Modbus TCP IEC103 6. Set Baud Rate, Parity, Start Address and Comm. Param.—>RS485—1 **End Address**, and press ← Baud rate: 9600 Parity:None The following baud rates are supported: 4800 bps, 9600 bps, 19200 bps and Start address:1 **115200 bps**. 9600 bps is recommended. End address:100 $1 \le$ **Start Address** \le **End Address** ≤ 247 . The address segments for these three ports can overlap. Set the address scope properly. The broader the scope is, the longer the time is for searching the devices. **Parity** must be set to the same value for all devices connected to the same RS485 port.

LCD	Operation Procedure
Settings->Comm. Param. RS485-1 RS485-2 RS485-3 Ethernet NetEco Modbus TCP IEC103	7. Press , select Ethernet , and press .
Comm. Param>Ethernet Auto obtain IP:Disable IP address:192.168. 0. 10 Subnet mask:255.255.255. 0 Gateway:192.168. 0. 1 DNS-1:192.168. 0. 1 DNS-2: 0. 0. 0. 0 Submit	 8. Set Auto obtain IP, IP address, Subnet mask, Gateway, and DNS, and press NOTE If the SmartLogger connects to the Internet through a router, note the following when setting Ethernet parameters: • If you set Auto obtain IP to Enable, the DHCP server on the network assigns IP addresses. In this case, you must ensure that a DHCP server is working on the network. • Set the gateway address to the IP address of the router. • Ensure that the IP address of the SmartLogger is in the same network segment as the gateway address. • Set the domain name server (DNS) address to the IP address of the router or obtain the DNS address from the network provider.
Settings->Comm. Param. RS485-1 RS485-2 RS485-3 Ethernet NetEco Modbus TCP IEC103 Comm. Param>NetEco Address mode:Logical addr. NetEco IP: 0. 0. 0. 0 Port number:16100	 9. Press , select NetEco, and press . 10. Set Address mode, NetEco IP, and Port number, and press . In most cases, set Address mode to Physical addr If the devices connected to the three RS485 ports of the SmartLogger have duplicate addresses, you must set Address mode to Logical addr Set the NetEco IP address correctly.

LCD	Operation Procedure
Settings->Comm. Param. RS485-1 RS485-2 RS485-3 Ethernet NetEco Modbus TCP IEC103	11. Press , select Modbus TCP , and press .
Comm. Param>Modbus TCP Link setting:Disable Address mode:Physical addr. Client 1 IP: 0. 0. 0. 0. 0 Client 2 IP: 0. 0. 0. 0 Client 3 IP: 0. 0. 0. 0 Client 4 IP: 0. 0. 0. 0 Client 5 IP: 0. 0. 0. 0	 12. Set Link setting, Address mode, Client 1 IP-Client 5 IP, and press —. Modbus-TCP is a general standard protocol without a security authentication mechanism. Therefore, the function of connecting to a third-party NMS using Modbus-TCP is disabled by default to reduce network security risks. Parameters must be set correctly to enable the function. In most cases, set Address mode to Physical addr If the devices connected to the three RS485 ports of the SmartLogger have duplicate addresses, you must set Address mode to Logical addr
Settings->Comm. Param. RS485-1 RS485-2 RS485-3 Ethernet NetEco Modbus TCP IEC103	• Set the client IP addresses correctly. 13. Press , choose IEC103, and press
Comm. Param>IEC103 Port number:No Address:126 IEC103 IP: 0. 0. 0. 0	14. Set Port number, Address and IEC103 IP, and press NOTE IEC103 is a general standard protocol without a security authentication mechanism. Therefore, the function of connecting to the NMS using IEC103 is disabled by default to reduce network security risks. Parameters must be set correctly to enable the function.

6.2.24 Restoring Factory Settings

This topic describes how to restore factory settings for the SmartLogger on the monitoring panel. After this operation, all parameters, excluding the current date and time, will restore to the default factory settings. However, the running information, alarm records, and system logs do not change.

Context

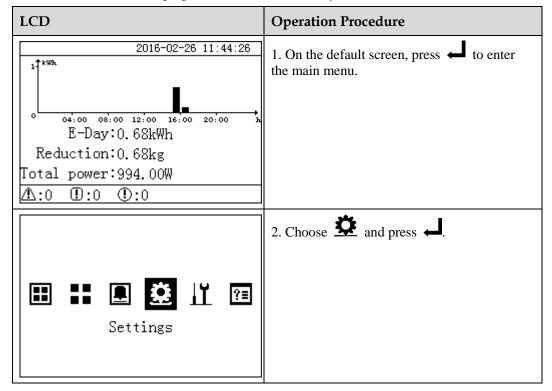


NOTICE

- After restoring factory settings for the SmartLogger, set the user parameters and communications parameters in time and log in to the WebUI to set the environmental monitoring instrument parameters and power grid dispatching parameters.
- The displayed language is **English** by default.

Procedure

• The following table describes the procedure for restoring factory settings. The parameter values in the following figures are for reference only.



LCD	Operation Procedure
Settings->Login	3. Enter the User Name and Password by
User Name: <mark>Advanced User</mark> ◆ Password:000000	 pressing or , and then press . NOTE Because of the limited permission, select the User Name as Advanced User or Special User. The initial password for Advanced User and Special User is 000001. After passing the permission validation, the system keeps the authentication information for 30 seconds. If you exit from the Settings page and log in again within 30 seconds, no
	authentication is required.
Settings User Param. User Password Comm. Param. Restore Defaults	4. Choose Restore Defaults , and press .
Here use the pages displayed when you log in to the SmartLogger as Advanced User .	
Settings->Restore Defaults Restore defaults? ESC:Cancel	5. On the displayed page, press ←.
Settings->Restore Defaults	6. Press to complete the settings.
Complete ↓:Enter	

6.2.25 Downloading Data Using a USB Flash Drive

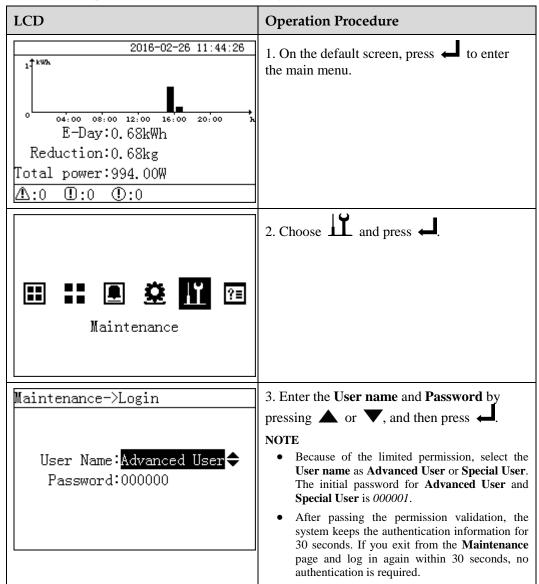
This topic describes how to use a USB flash drive to download data on the monitoring panel, such as the performance data, operation logs, commissioning logs of the SmartLogger and the alarm records of all the inverters. It provides reference for backtracking and problem analysis.

Context

Side View of the shell shows the USB port in the SmartLogger.

Procedure

• The following table describes the procedure for downloading data using a USB flash drive. The parameter values in the following figures are for reference only.



LCD	Operation Procedure
Maintenance USB Expansion Device Mgmt. Data Clear System Reset Here use the pages displayed when you log in to the SmartLogger as Advanced	 4. Choose USB Expansion and press NOTE Before this operation, connect the USB flash drive to the USB port. If no USB flash drive is detected, the LCD displays a message prompting No USB device detected. The system takes 5 to 10 seconds to detect the USB flash drive. Then perform the following steps.
User. Maintenance->USB Expansion Data Download Firmware Upgrade Batch Upgrade Export all data files Import all data files	5. Choose Data Download and press .
USB Expansion->Data Download Data Download 100%	6. When the progress bar reaches 100%, press

6.2.26 Upgrading Firmware by Using a USB Flash Drive

You can upgrade the firmware on the monitoring panel by using a USB flash drive. You can upgrade the firmware of the SmartLogger and devices connected to the SmartLogger.

Context

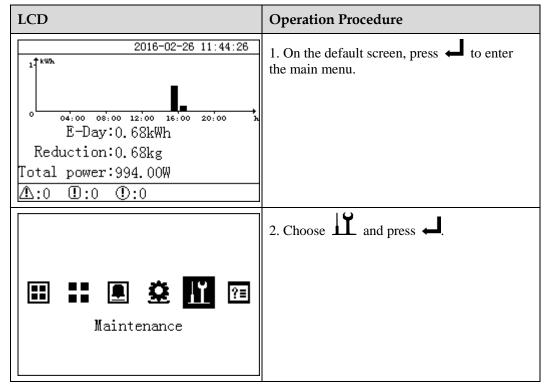


NOTICE

- Before upgrading the firmware, download the upgrade package from http://support.huawei.com and copy it to your USB flash drive.
- Save the package under the root directory and do not extract the package.
- When upgrading the firmware for the SUN2000, change the file name of the package to sun2000_usb.zip.
- When upgrading the firmware for an AC combiner box, change the file name of the package to **acbox_usb.zip**.
- When upgrading the firmware for the PID, change the file name of the package to **pid_usb.zip**.
- When upgrading the firmware for the PLC, change the file name of the package to **plc_usb.zip**.
- When upgrading the SmartLogger1000, ensure that the file name of the package is **logger_usb.tar.gz**.

Procedure

• The following table describes the procedure for upgrading the firmware by using a USB flash drive. The parameter values in the figures are for reference only.



LCD	Operation Procedure
Maintenance->Login User Name:Advanced User ◆	3. Enter the User name and Password by pressing ▲ or ▼, and then press ←. NOTE Because of the limited permission, select the
Password:000000	 User name as Advanced User or Special User. The initial password for Advanced User and Special User is 000001. After passing the permission validation, the system keeps the authentication information for 30 seconds. If you exit from the Maintenance page and log in again within 30 seconds, no authentication is required.
Maintenance	4. Choose USB Expansion and press \leftarrow .
USB Expansion Device Mgmt. Data Clear System Reset	 NOTE Before this operation, connect the USB flash drive to the USB port. If no USB flash drive is detected, the LCD displays a message prompting No USB device detected. The system takes 5 to 10 seconds to detect the USB flash drive. Then perform the following
Here use the pages displayed when you log in to the SmartLogger as Advanced User .	steps.
Maintenance->USB Expansion Data Download Firmware Upgrade Batch Upgrade Export all data files Import all data files	5. Choose Firmware Upgrade , and press .
Firmware Upgrade->Select(1/3) SUN2000 (17) SmartLogger1000	6. Press to select a specific device. The SmartLogger and the inverters connected to it can be upgraded. The SUN2000 (17) on the left indicates that this inverter connects to the Port 1 of the SmartLogger and the communications address for the RS485 port is 7.

LCD	Operation Procedure
Maintenance->USB Expansion	7. After checking that Target Ver. is correct, press \checkmark .
Curr. Ver.:V100R001C00SPC002 Target Ver.:V100R001C00SPC003	NOTICE For the SUN2000, its firmware can be upgraded only if the device status is On-grid or Shutdown. Check the device status before firmware upgrade. The SmartLogger, inverter, PLC, or PID will restart after being upgraded.
ESC:Cancel →:Enter	
(The inverter upgrade screen is used as an example.)	

6.2.27 Batch Upgrade

This topic describes how to perform a batch upgrade for the SUN2000 on the monitoring panel.

Context

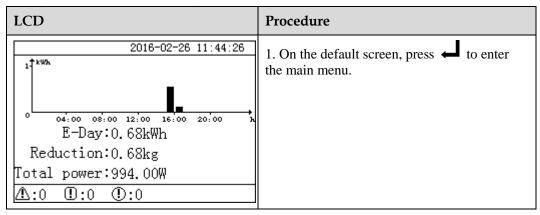


NOTICE

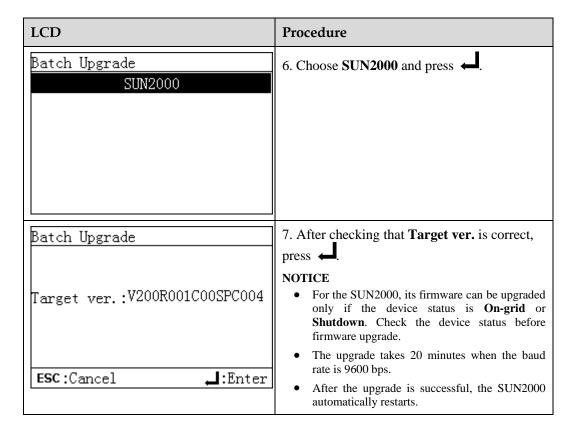
The SUN2000 that can be upgraded in batches on the SmartLogger must be SUN2000 V100R001C11SPC409, SUN2000 V100R001C81SPC101 and its later patch versions, or SUN2000 V200R001C00 and its later patch versions.

Procedure

• The following table describes the batch upgrade procedure. The parameter values in the figures are for reference only.



LCD	Procedure
■ ■ ② □ □ Maintenance	2. Choose and press ■.
Maintenance->Login User Name:Advanced User Password:000000	 3. Enter the User name and Password by pressing ▲ or ▼, and then press ←. NOTE Because of the limited permission, select the User name as Advanced User or Special User. The initial password for Advanced User and Special User is 000001. After passing the permission validation, the system keeps the authentication information for 30 seconds. If you exit from the Maintenance page and log in again within 30 seconds, no authentication is required.
Maintenance USB Expansion Device Mgmt. Data Clear System Reset	 4. Choose USB Expansion and press . NOTE Before this operation, connect the USB flash drive to the USB port. If no USB flash drive is detected, the LCD displays a message prompting No USB device detected. The system takes 5 to 10 seconds to detect the USB flash drive. Then perform the following steps.
Here use the pages displayed when you log in to the SmartLogger as Advanced User. Maintenance->USB Expansion Data Download Firmware Upgrade Batch Upgrade Export all data files Import all data files	5. Choose Batch Upgrade and press



6.2.28 Exporting All Files

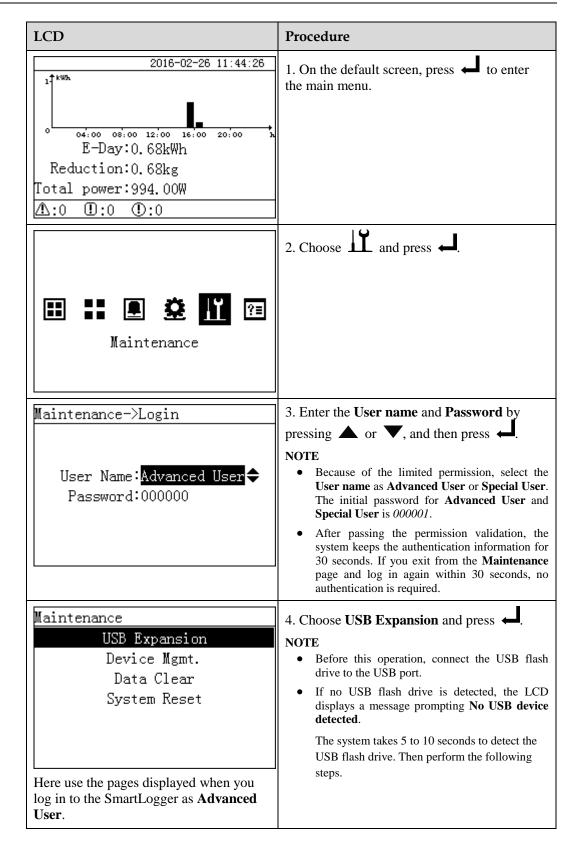
You can export all files from the SmartLogger on the monitoring panel.

Context

If the SmartLogger needs to be replaced, you can export all files before the replacement and then import the exported files to the new SmartLogger to ensure data integrity.

Procedure

• The following table describes the procedure for exporting all files. The parameter values in the figures are for reference only.



LCD	Procedure
Maintenance->USB Expansion Data Download	5. Select Export all data files and press \checkmark .
Firπware Upgrade Batch Upgrade	
Export all data files	
Import all data files	

6.2.29 Importing All Files

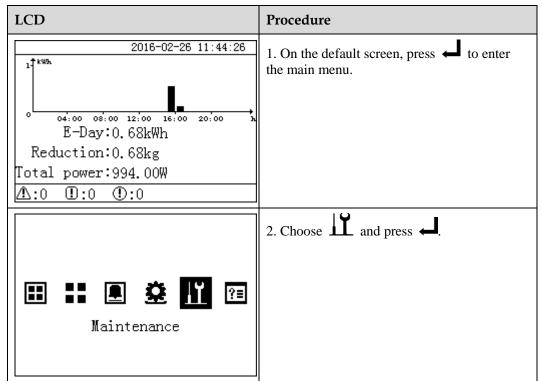
You can import all files to the SmartLogger on the monitoring panel.

Context

If the SmartLogger needs to be replaced, you can export all files before the replacement and then import the exported files to the new SmartLogger to ensure data integrity.

Procedure

• The following table describes the procedure for importing all files. The parameter values in the figures are for reference only.



LCD	Procedure
Maintenance—>Login User Name:Advanced User Password:000000	 3. Enter the User name and Password by pressing or , and then press . NOTE Because of the limited permission, select the User name as Advanced User or Special User. The initial password for Advanced User and Special User is 000001. After passing the permission validation, the system keeps the authentication information for 30 seconds. If you exit from the Maintenance page and log in again within 30 seconds, no authentication is required.
Maintenance USB Expansion Device Mgmt. Data Clear System Reset Here use the pages displayed when you	 4. Choose USB Expansion and press NOTE Before this operation, connect the USB flash drive to the USB port. If no USB flash drive is detected, the LCD displays a message prompting No USB device detected. The system takes 5 to 10 seconds to detect the USB flash drive. Then perform the following steps.
log in to the SmartLogger as Advanced User. Maintenance->USB Expansion Data Download Firmware Upgrade Batch Upgrade Export all data files Import all data files	5. Select Import all data files and press $lacksquare$.

6.2.30 Managing Devices

You can search, add, delete, and assign addresses to devices that are connected to the SmartLogger on the monitoring panel.

Context

 Provided that all the inverters are correctly connected to the SmartLogger and that all the communications parameters are correctly set, the SmartLogger can perform the automatic search and detect all the connected inverters.

- Before you perform the Auto. Search operation, if the SmartLogger is connected to
 devices that no longer exist in the PV power system, remove them from the SmartLogger
 manually. Otherwise, these devices are still detectable with Disconnection status.
- After you add, delete, or replace a device, or change the RS485 address, search for devices again or restart the SmartLogger (the SmartLogger automatically searches for devices after it restarts).
- EMI, slave SmartLogger, power meter, PLC, and third-party devices cannot be automatically recognized, and must be manually added.
- For devices that no longer exist in the PV power system, perform **Single Remove** or **Batch Remove** in time to avoid wasting the system resources.
- The RS485 addresses of all inverters are the same when delivered. If the firmware version of the SUN2000 is V100R001C00SPC010 or later, or V100R001C81SPC105 or later, you can perform automatic address assignment on the SmartLogger and adjust the addresses to realize remote site setup and improve maintenance efficiency.
- When connecting a third-party device, you need to import a configuration file for the device, and then manually add the device.
- If you perform **Alarm Reset**, all active and historical alarms for the selected device will be deleted and the SmartLogger will be enabled to collect new alarm data.

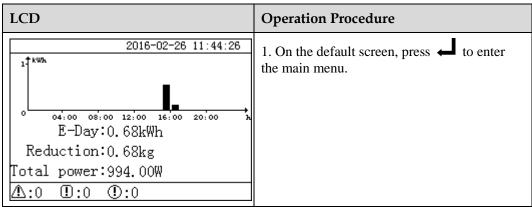


NOTICE

- If **Data Clear** is performed on the inverter, **Alarm Reset** must be performed on the SmartLogger and NMS. Otherwise, the SmartLogger cannot collect alarm information generated by the inverter after **Data Clear** is performed.
- If **Alarm Reset** or **Data Clear** is performed on the SmartLogger, **Alarm Reset** must also be performed on the NMS. Otherwise, the NMS cannot obtain alarm information collected by the SmartLogger after **Alarm Reset** or **Data Clear** is performed.

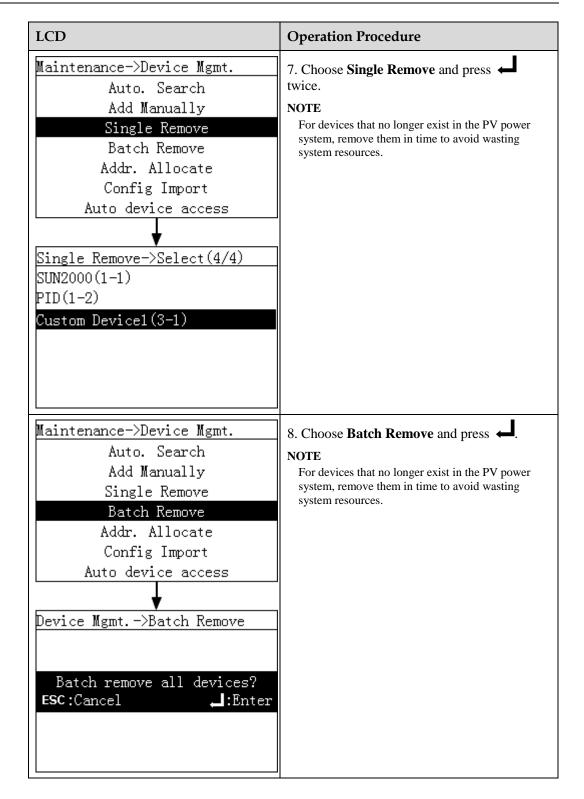
Procedure

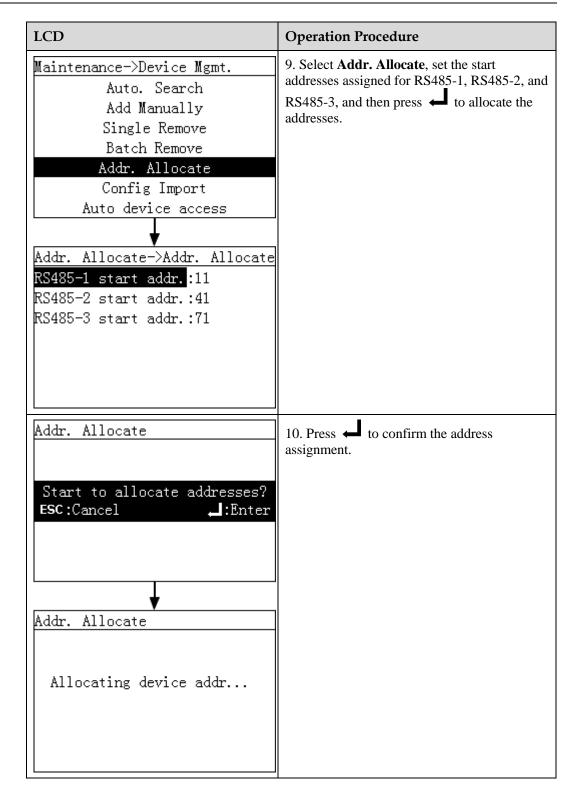
• The following table describes the procedure for managing the devices. The parameter values in the following figures are for reference only.

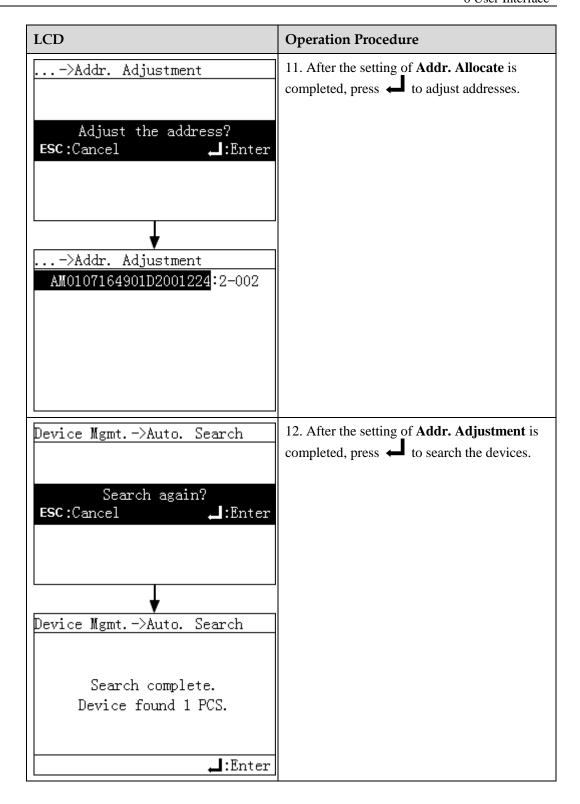


LCD	Operation Procedure
	2. Choose and press ■.
Ⅲ Ⅲ 凰 ✿ Ⅲ ៕ Maintenance	
Maintenance->Login	3. Enter the User name and Password by
	pressing \triangle or \bigvee , and then press \longleftarrow .
User Name: Advanced User 💠 Password: 000000	NOTE ■ Because of the limited permission, select the User name as Advanced User or Special User. The initial password for Advanced User and Special User is 000001.
	 After passing the permission validation, the system keeps the authentication information for 30 seconds. If you exit from the Maintenance page and log in again within 30 seconds, no authentication is required.
Maintenance	4. Choose Device Mgmt. and press \leftarrow .
USB Expansion Device Mgmt.	Perform step 5 to enable the SmartLogger to automatically search for devices.
Data Clear System Reset	Perform step 6 to add devices to the SmartLogger.
	Perform step 7 to remove a single device.
	Perform step 8 to remove devices in batches.
	Perform steps 9-12 to automatically assign addresses.
	Perform step 13 to import a configuration file.
	Perform step 14 to enable the Auto device access function.
	Perform step 15 to reset alarms.
	Perform steps 16-18 to start or shut down inverters in batches.
	Perform step 19 to reset inverters in batches.

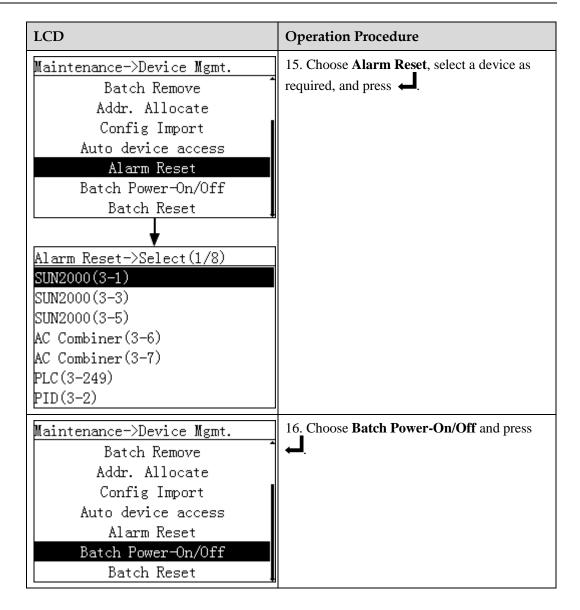
LCD **Operation Procedure** Maintenance->Device Mgmt. 5. Choose **Auto. Search** and press \leftarrow . Auto. Search Before performing the automatic search, Add Manually ensure that all the devices can normally communicate with the SmartLogger. Single Remove NOTE Batch Remove • After you add, delete, or replace a device, or Addr. Allocate change the RS485 address, search for devices Config Import again. Auto device access If a device is added, search for the device on the SmartLogger or restart the SmartLogger and then search for the device on the NMS. Device Mgmt.—>Auto. Search Devices already exist: 4 Search again? ESC:Cancel 🗕 :Enter Maintenance->Device Mgmt. 6. Choose **Add Manually** and press ← . Auto. Search NOTE Add Manually EMI, slave SmartLogger, power meter, PLC, and third-party devices must be manually Single Remove added. Batch Remove If the communication is abnormal, or the Addr. Allocate address on the port has been used, the device cannot be added. Config Import Auto device access Device Mgmt.->Add Manually Device type:SUN2000 Comm. protocal:Modbus-RTU IP address: 0. 0.

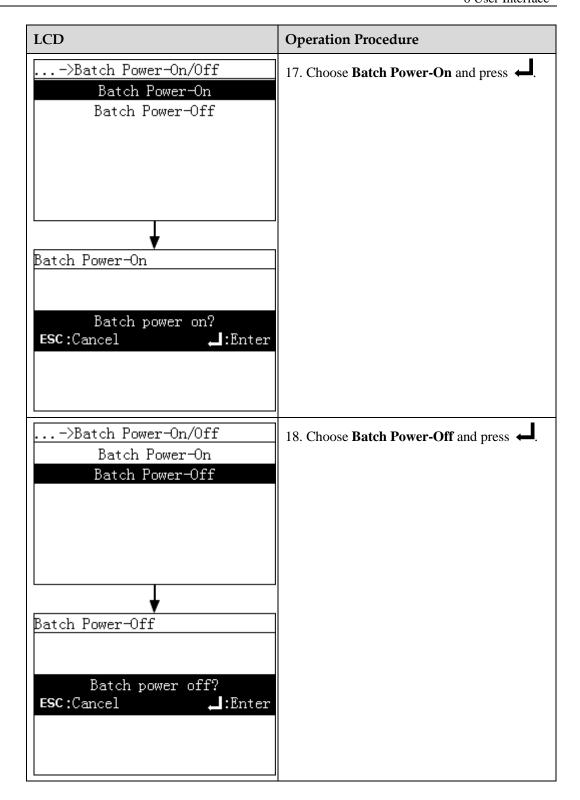


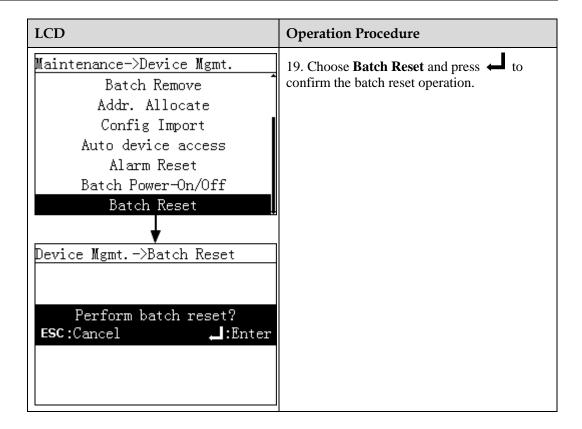




LCD	Operation Procedure
Maintenance—>Device Mgmt. Auto. Search Add Manually Single Remove Batch Remove Addr. Allocate Config Import Auto device access Device Mgmt.—>Config Import Custom Device 1 Custom Device 2 Custom Device 3 Custom Device 4 Custom Device 5	 13. Choose Config Import, select a custom device as required, and press to import a configuration file. NOTE Before importing a configuration file, you must plug in a USB drive that contains the configuration file. After importing a configuration file, you need to manually add a third-party device.
Maintenance->Device Mgmt. Auto. Search Add Manually Single Remove Batch Remove Addr. Allocate Config Import Auto device access Auto device access Auto device access Enable	14. Select Auto device access, click Enable or Disable, and press NOTE If the Auto device access is enabled, the SmartLogger scans the system for new devices once every 10 minutes. New devices automatically connect to the SmartLogger when either of the following conditions is met: • No device is connected to the SmartLogger. • The time falls in the range of 00:00 to 04:00, and all inverters are not grid-tied.







----End

6.2.31 Clearing Data

This topic describes how to delete alarm and performance data on the monitoring panel.

Context

Clear data if the SmartLogger location changes and its historical data need to be deleted.

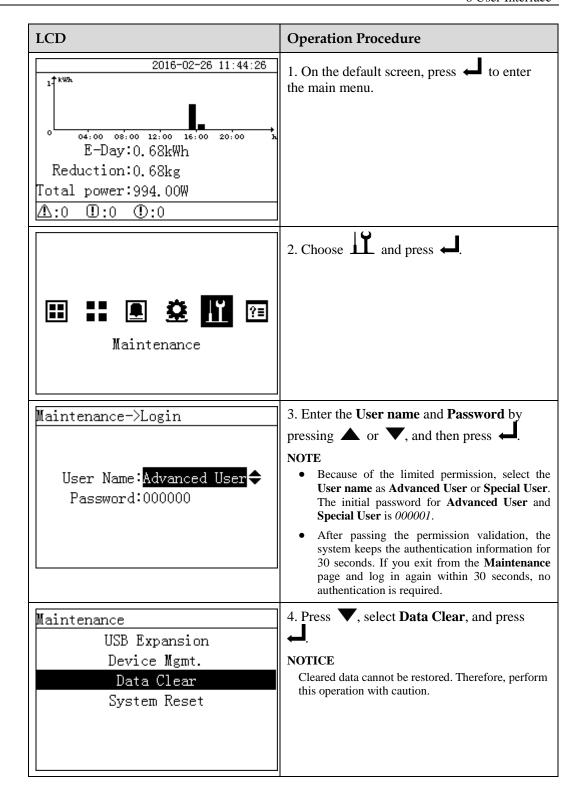


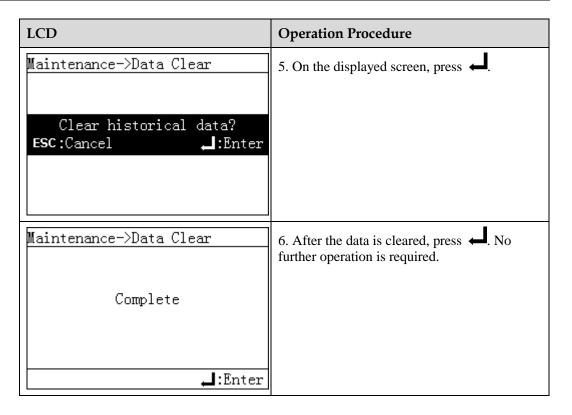
NOTICE

- After the data clear operation is performed, all information stored on the SmartLogger, including energy yield, performance data, and alarms, will be removed.
- After the data clear operation is performed, the devices connected to the SmartLogger are not removed. If an original device will not connect to the SmartLogger, remove the device.
- If you perform **Data Clear** on the SmartLogger, you also have to perform **Alarm Reset** on the NMS. Otherwise, the alarm information collected by the NMS and SmartLogger will be different.

Procedure

• The following table describes the procedure for clearing data. The parameter values in the figures are for reference only.





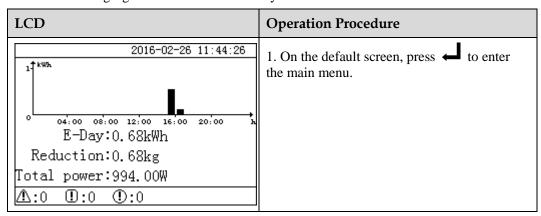
----End

6.2.32 Resetting the System

You can reset the system on the LCD.

Procedure

• The following table lists the procedure for resetting the system. The parameter values in the following figures are for reference only.



LCD	Operation Procedure
Ⅲ Ⅲ ▣ ፟ № № № № № № № № № № № № № № № № № №	2. Choose A and press .
Maintenance->Login User Name: <mark>Advanced User</mark> Password:000000	 3. Enter the User name and Password by pressing or , and then press . NOTE Because of the limited permission, select the User name as Advanced User or Special User. The initial password for Advanced User and Special User is 000001. After passing the permission validation, the system keeps the authentication information for 30 seconds. If you exit from the Maintenance
Maintenance USB Expansion Device Mgmt. Data Clear System Reset	page and log in again within 30 seconds, no authentication is required. 4. Choose System Reset by pressing , and press .
Maintenance->System Reset Reset the system? ESC:Cancel1:Enter	5. Press 🗗.

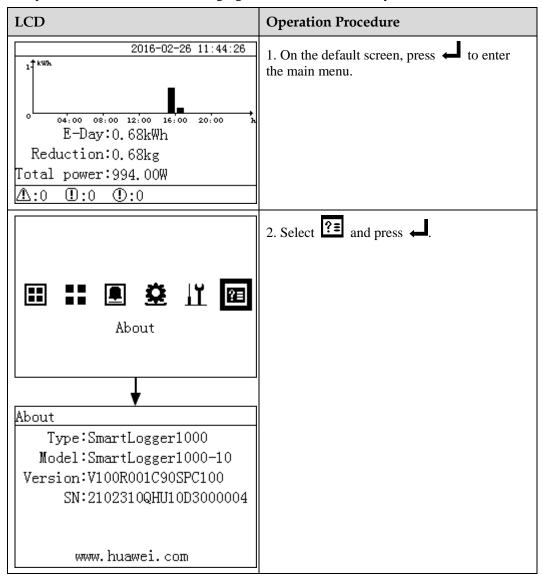
----End

6.2.33 Querying Product Information

This topic describes how to query the information about the SmartLogger on the monitoring panel, including the device type, firmware version, and serial number.

Procedure

• The following table describes the procedure for querying product information. The parameter values in the following figures are for reference only.



----End

Web User Interface

This topic describes how to log in to the Web user interface (WebUI) and the WEB menu, and set parameters and maintain devices on the WebUI.

Context

Figures provided in this chapter correspond to the SUN2000 V100R001C95SPC108 version. The data in the figures provided in this document are for reference only.

7.1 Preparations for Login

Operating Environment

The running environment for the WebUI should meet the following requirements:

- Operating system: Windows.
- Browser: Internet Explorer 8 to Internet Explorer 11, Firefox17 to Firefox39, and CHROME41 to CHROME45 (Windows 7).
- Minimum resolution: 1024 x 768.

M NOTE

- For Internet Explorer 8.0, the recommended release is 8.0.7601.17514 or later.
- For Internet Explorer 10, the compatible mode is recommended.

Setting the IP Address

Correctly set the IP address, subnet mask, and gateway for the SmartLogger, PC, and network devices.

Setting the LAN



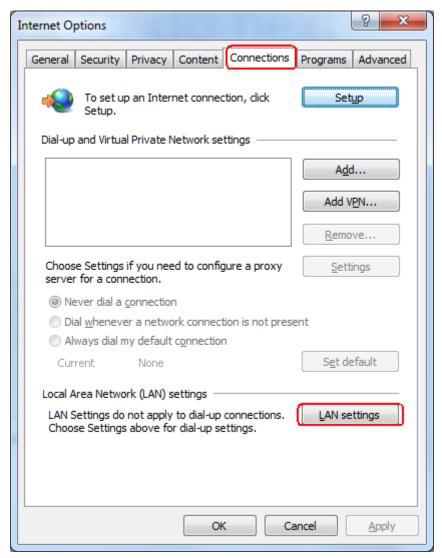
NOTICE

- If the SmartLogger is connected to a local area network (LAN) and a proxy server has been selected, you need to cancel proxy server setting.
- If the SmartLogger is connected to the Internet but the computer is connected to the LAN, you cannot cancel proxy server setting.

To set the LAN, perform the following steps:

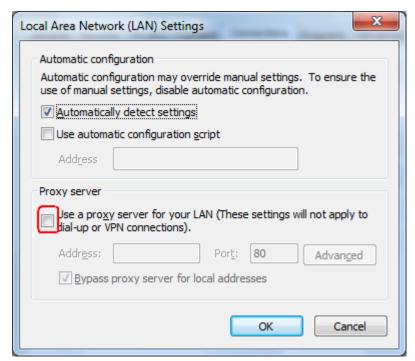
- 1. Open Internet Explorer.
- 2. Choose **Tools** > **Internet Options**.
- 3. Click the **Connections** tab and then click **LAN settings**, as shown in Figure 7-1.

Figure 7-1 LAN settings (1)



4. Deselect the check box under **Proxy server**, as shown in Figure 7-2.

Figure 7-2 LAN settings (2)



5. Click **OK** to finish the LAN settings.

Setting Internet Explorer Security



NOTICE

If you need to export the fault information and operation logs, set Internet Explorer security.

To set Internet Explorer security, perform the following steps:

- 1. Open Internet Explorer.
- 2. Choose **Tools** > **Internet Options**.
- 3. Select **Security** and click **Sites** in **Trusted sites**, as shown in Figure 7-3.

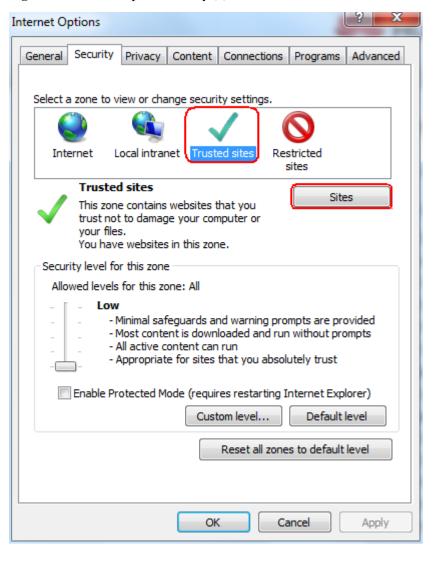


Figure 7-3 Internet Explorer security (1)

4. After entering the Web address (namely, the IP address for the SmartLogger), click **Add**, as shown in Figure 7-4.

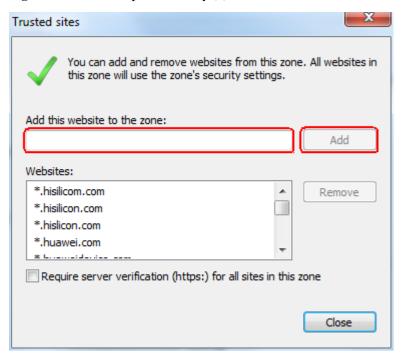


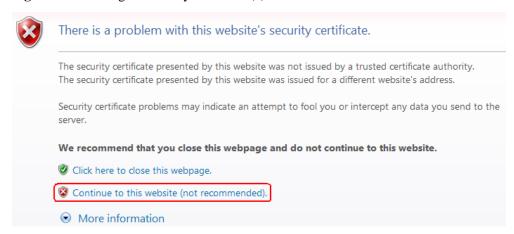
Figure 7-4 Internet Explorer security (2)

5. Set Security level for this zone to Medium or Low.

Installing a Security Certificate

1. If you log in to the WebUI for the first time, a message as shown in Figure 7-5 is displayed. Click **Continue to this website**.

Figure 7-5 Installing the security certificate (1)



2. Click **Certificate Error** on the right of the address bar and choose **View certificates**, as shown in Figure 7-6.

Figure 7-6 Installing the security certificate (2)



3. Click **Install Certificate**, as shown in Figure 7-7.

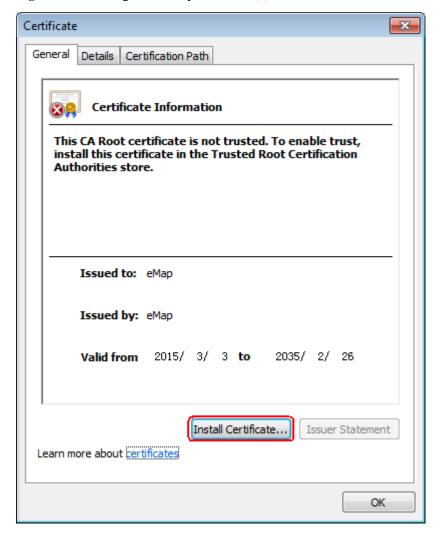
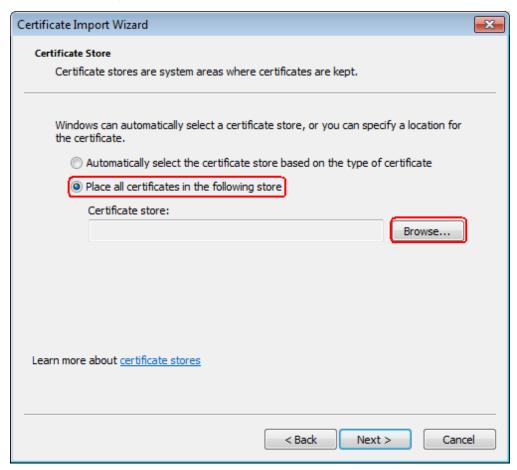


Figure 7-7 Installing the security certificate (3)

- 4. Click Next.
- 5. Select **Place all certificates in the following store** and click **Browse**, as shown in Figure 7-8.

Figure 7-8 Installing the security certificate (4)



6. Select **Trusted Root Certification Authorities** and click **OK**, as shown in Figure 7-9.

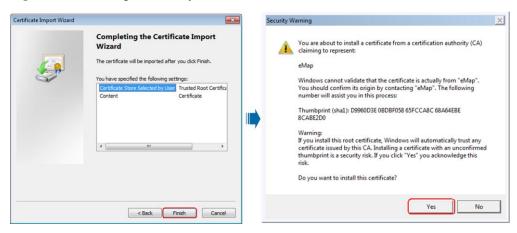
Figure 7-9 Installing the security certificate (5)



7. Click **Next**.

8. Click **Finish**. A security warning dialog box is displayed. Click **Yes**, as shown in Figure 7-10.

Figure 7-10 Installing the security certificate (6)



- 9. Choose **Tools** > **Internet Options**.
- 10. Choose the **Advanced** tab page, and deselect **Warn about certificate address mismatch**, click **OK**, as shown in Figure 7-11.

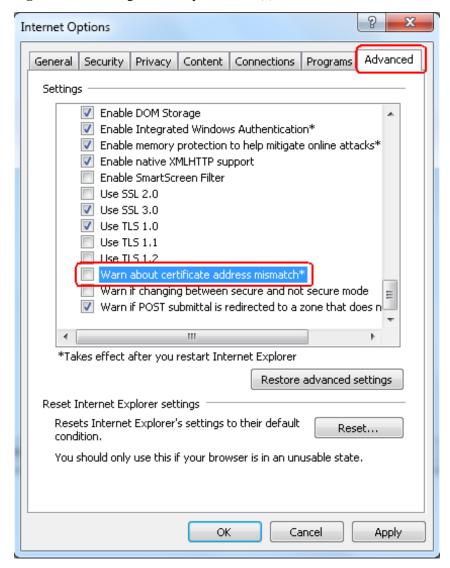


Figure 7-11 Installing the security certificate (7)

7.2 Logging In to the WebUI

Procedure

- **Step 1** Connect the SmartLogger to a PC directly or over the Internet. For details about this operation, see 4.9 Connecting an Ethernet Network Cable.
- Step 2 Set the IP address, subnet mask, and gateway on the LCD of the SmartLogger.
- Step 3 Enter https://XX.XX.XX.XX in the address box of the browser, and press Enter. The login page appears, as shown in Figure 7-12. Enter a correct User Name and Password, select a value for Language, and click Login to enter the home screen.

Figure 7-12 Login page of the WebUI



■ NOTE

- XX.XX.XX is the IP address of the SmartLogger, for example, https://192.168.0.10.
- There are three roles of the system user: Common User, Advanced User and Special User. The
 initial password is 000001 in V100R001C95SPC010 or earlier and is Changeme in
 V100R001C95SPC020 or later.
- After the first login, it is recommended that you change the initial password immediately to ensure
 account security.
- If you enter a wrong password for six times in five minutes, a message "Repeat check fail several
 times, this account have been locked, please login after an hour!" is displayed.



NOTICE

If the displayed page is blank or the page does not respond when you click any menu after logging in to the WebUI, solve this problem by clearing the cache, refreshing the page, or logging in to the WebUI again.

----End

7.3 WebUI Layout

Figure 7-13 shows the layout of the WebUI.

Figure 7-13 WebUI layout

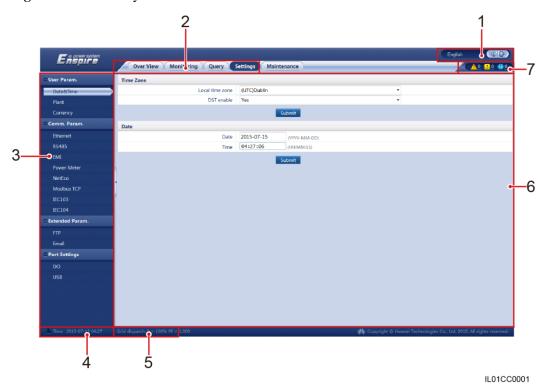


Table 7-1 describes the layout of the WebUI shown in Figure 7-13.

Table 7-1 WebUI layout description

No.	Functions	Description
1	Display language	Selects the display language or chooses to log out.
2	Primary navigation menu	Click the corresponding primary navigation menu before you perform any operation on the WebUI.
3	Secondary navigation menu	Under the primary navigation menu, choose the device to be queried or the parameter to be set under the secondary navigation menu.
4	System time	Displays the current system time.
5	Power grid scheduling	Displays the current power grid scheduling mode of the system.
6	Page of parameter details	Displays details of the queried information or the parameter setting.
7	Alarm icon	Displays the severities and number of alarms in the system. You can enter the alarm page by clicking the number.

MOTE

7.4 WebUI Menu shows the menu tree of the WebUI.

7.4 WebUI Menu

The WebUI menu consists of five parts: **Over View, Monitoring, Query, Settings** and **Maintenance**. Different identities (**Common User, Advanced User**, and **Special User**) have different permissions for setting parameters and maintenance, as shown in Figure 7-14.

Figure 7-14 Structure of the main menu

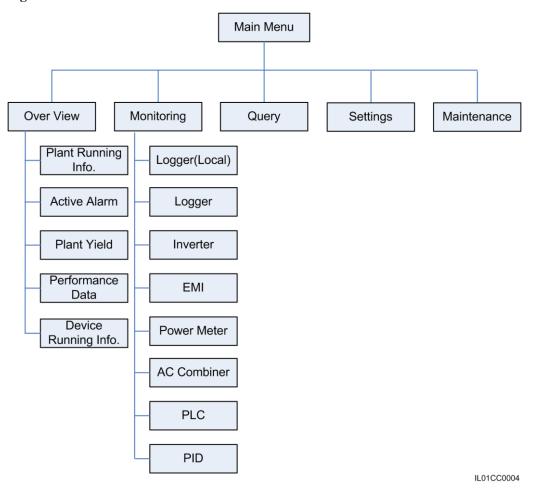


Figure 7-15 shows the information available on the **Query** tab page based on user rights.

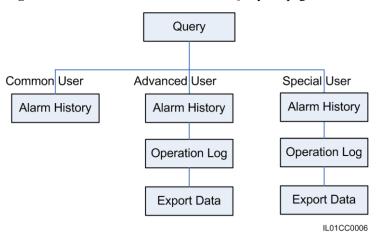


Figure 7-15 Information available on the Query tab page based on user rights

Figure 7-16 shows the information available on the **Settings** tab page based on user rights.

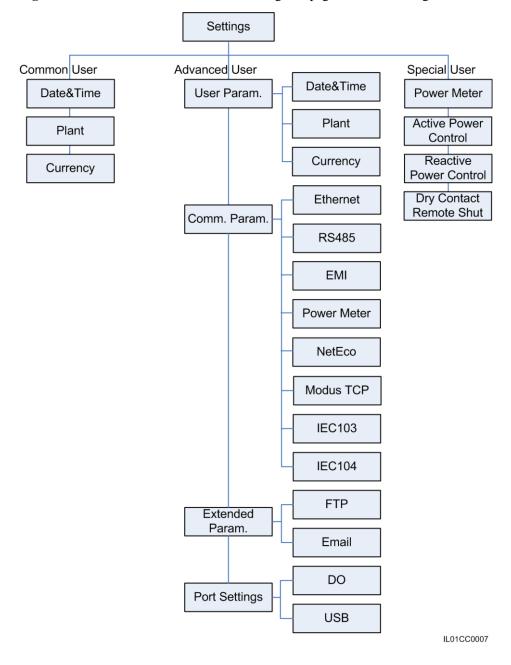


Figure 7-16 Information available on the Settings tab page based on user rights

Figure 7-17 shows the information available on the **Maintenance** tab page based on user rights.

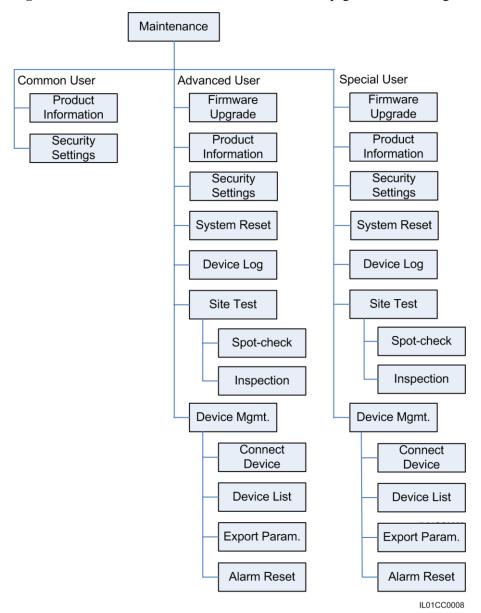


Figure 7-17 Information available on the Maintenance tab page based on user rights

7.5 Querying the Power Station Running Information

On the **Over View** tab page, select **Plant Running Info.** to query the power station information and energy yield information, as shown in Figure 7-18.



Figure 7-18 Power station running information

Ⅲ NOTE

The power station running information contains only the information about all the Huawei inverters connecting to the SmartLogger.

7.6 Querying Current Active Alarms in the System

You can query the current active alarms in the system and details about the alarms over the WebUI.

On the **Over View** tab page, choose **Active Alarm** to access the active-alarm query page. You can query the information about all the current active alarms in the system on this page, including the values of **Alarm ID**, **Severity**, **Equipment**, **Alarm Name**, **Generation Time**, **Reason ID**, and **Cabinet**.

On the **Active Alarm** tab page, set **Device**, **Severity**, and **Sorting mode**, and click **Filter**, as shown in Figure 7-19.

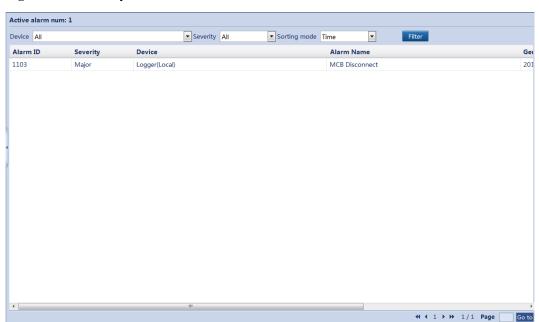


Figure 7-19 Active system alarm

MOTE

You can also quickly determine the severity and quantity of current active alarms by viewing the alarm icons and values in the upper right corner of the WebUI. By clicking a value behind an alarm icon, you can directly access the active system alarm page.

7.7 Querying System Electric Energy Yields

You can query the electric energy yield over the WebUI, including the daily, monthly, annual, and historical energy yields.

On the Over View tab page, click Yield and query the system electric energy yields.



NOTICE

You can view the daily, monthly, yearly, and historical energy yields of the power station. The values relate to the number of connected inverters.

- Daily energy yield. Data of a maximum of 80 devices can be stored for 34 days.
- Monthly energy yield. Data of a maximum of 80 devices can be stored for 27 months.
- Yearly energy yield. Data of a maximum of 80 devices can be stored for 25 years.
- Historical energy yield. Data of a maximum of 80 devices can be stored for 25 years.

M NOTE

When you query system electric energy yields, select a date from the Time drop-down list box or adjust the date by clicking the buttons on both sides of the drop-down list box.

Daily Electric Energy Yields

On the **E-Day** tab page, select the date to be queried, and click **Query**. The daily and hourly electric energy yields are displayed, as shown in Figure 7-20.

Yield **▼** 27 (2016 Yield(kWh) CO₂ Reduction(kg) Time Total 94.27 93.99 0 53.46 53.30 0 00:00:00-01:00:00 01:00:00-02:00:00 26.93 26.85 0 13.88 13.84 0 03:00:00-04:00:00 0.00 0 04:00:00-05:00:00 0.00 0.00 0 05:00:00-06:00:00 0.00 0.00

Figure 7-20 Daily energy yield

The displayed information includes the electric energy yield histogram, hourly electric energy yield, CO₂ emission reduction, and revenue.

□ NOTE

In the daily energy yield histogram, the horizontal ordinate stands for time (each block stands for one hour). The vertical coordinate stands for the energy yield (each block stands for the total energy yield during the last hour).

Monthly Electric Energy Yields

On the **Monthly yield** tab page, select the month to be queried and click **Query**. The monthly and daily electric energy yields are displayed, as shown in Figure 7-21.

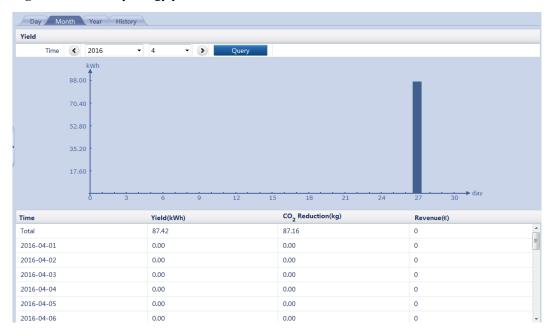


Figure 7-21 Monthly energy yield

The displayed information includes the electric energy yield histogram, daily electric energy yield, CO₂ emission reduction, and revenue.

Ⅲ NOTE

In the monthly electric energy yield column graph, the horizontal axis indicates time (by day), and the vertical axis indicates electric energy yields. Each column indicates the total electric energy yields of a day.

Annual Electric Energy Yields

On the **Yearly yield** tab page, select the year to be queried and click **Query**. The annual and monthly electric energy yields are displayed, as shown in Figure 7-22.

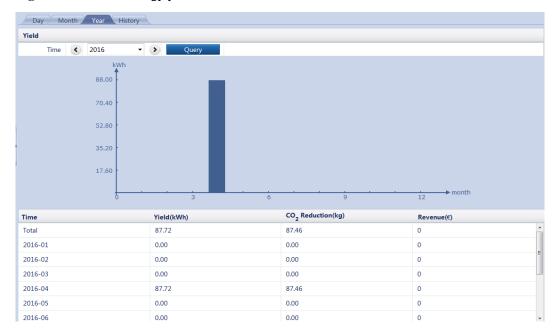


Figure 7-22 Annual energy yield

The displayed information includes the electric energy yield histogram, monthly electric energy yield, CO₂ emission reduction, and revenue.

MOTE

In the annual electric energy yield column graph, the horizontal axis indicates time (by month), and the vertical axis indicates electric energy yields. Each column indicates the total electric energy yields of a month

Historical Electric Energy Yields

On the **History yield** tab page, the total and annual electric energy yields of the past 25 years are displayed, as shown in Figure 7-23.

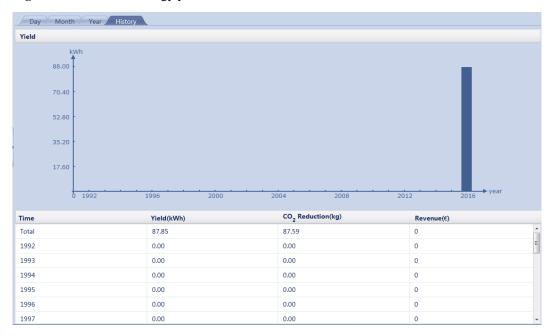


Figure 7-23 Historical energy yields

The displayed information includes the electric energy yield histogram, annual electric energy yield, CO₂ emission reduction, and revenue.

∭ NOTE

In the historical energy yield histogram, the horizontal axis indicates time (by year), and the vertical axis indicates energy yields. Each column indicates the total energy yield of a year.

7.8 Querying System Performance Data

You can query system performance data, display system performance data in a table or curve, and export system performance data over the WebUI.

On the **Over View** tab page, click **Performance Data** to enter the performance data query page.

M NOTE

When you query the system performance data, select a date from the **Time** drop-down list box or adjust the date by clicking the buttons on both sides of the drop-down list box.

Select **Table**, set **Time**, and click **Query**. You can query the values of various performance parameters, such as **Generation time**, **Daily yield of plant**, and **Input power of plant**, as shown in Figure 7-25.

● Table ○ Curve ○ Export Time **∢** 2016 **▼** 4 **▼** 27 Generation time Daily yield of plant(kWh) Input power of plant(kW) AC power of plant(kW) Current ra 2016-4-27 06:00:00 0.00 0.000 0.000 2016-4-27 06:05:00 5.85 0.000 63,500 2016-4-27 06:10:00 10.98 0.000 63,500 2016-4-27 06:15:00 16.27 0.000 63.500 2016-4-27 06:20:00 21.48 0.000 63.500 2016-4-27 06:25:00 26.72 0.000 63.500 2016-4-27 06:30:00 31.92 0.000 63.500 2016-4-27 06:35:00 0.000 63.500 2016-4-27 06:40:00 36.63 0.000 63.500 2016-4-27 06:45:00 36.63 0.000 63.500 2016-4-27 06:50:00 36.63 0.000 63,500 2016-4-27 06:55:00 57.23 0.000 63.500 2016-4-27 07:00:00 57.23 0.000 63,500 2016-4-27 07:05:00 57.37 0.000 63.500

Figure 7-24 Performance data displayed in a table

Select Curve, set Time, Y1, and Y2, and click Query, as shown in Figure 7-25.



Figure 7-25 Performance data displayed in a curve

Select **Export** and click **Export** to export the performance data, as shown in Figure 7-26.

Figure 7-26 Exporting performance data



M NOTE

When changing the name of the exported file, retain the extension .tar.gz. Otherwise, the file cannot be functional.

7.9 Querying Device Running Information

You can query the running information about all inverters connected to the SmartLogger over the WebUI.

On the **Over View** tab page, click **Device Running Info.** to access the page for querying the device running information, as shown in Figure 7-27.

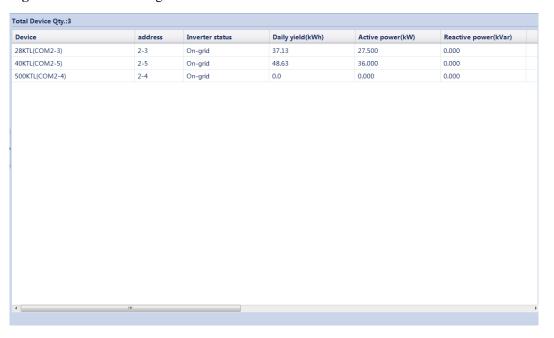


Figure 7-27 Device running information

7.10 SmartLogger

7.10.1 Querying the Master SmartLogger Running Information

This topic describes how to query the Master SmartLogger running information over the WebUI.

On the **Monitoring** tab page, select a Master SmartLogger, and click **Running Info.**. The corresponding **SN**, **Version**, **Hardware Ver.** and **IP Address** are displayed, as shown in Figure 7-28.

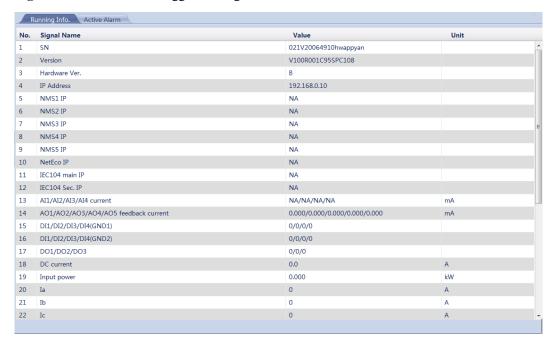


Figure 7-28 Master SmartLogger running information

7.10.2 Querying the Active Alarms of the Master SmartLogger

You can query the active alarms of the master SmartLogger and details about the alarms over the WebUI.

On the **Monitoring** tab page, select the master SmartLogger to be queried and click **Active Alarm** to access the active alarm query page. You can query the information about all the active alarms of the selected SmartLogger on this page, including the values of **Alarm ID**, **Severity**, **Alarm Name**, **Generation Time**, **Reason ID**, and **Cabinet**.

On the **Active Alarm** tab page, choose an alarm severity and click **Filter**, as shown in Figure 7-29.

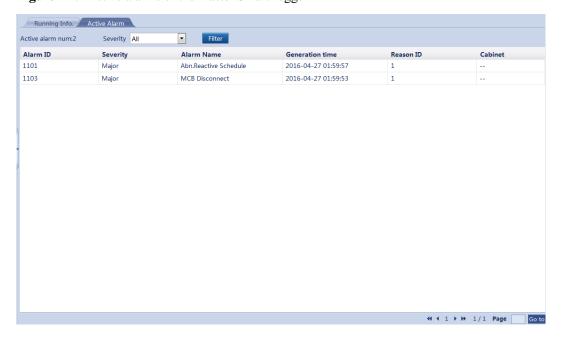


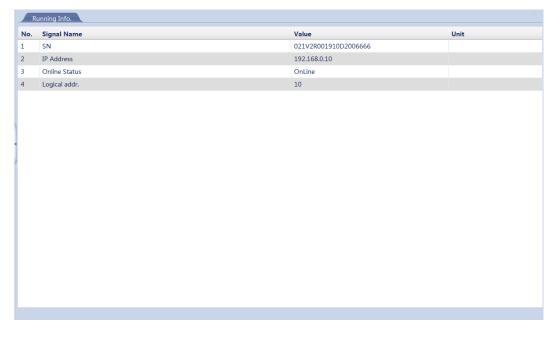
Figure 7-29 Active alarms of the master SmartLogger

7.10.3 Querying the Slave SmartLogger Running Information

This topic describes how to query the Slave SmartLogger running information over the WebUI.

On the **Monitoring** tab page, select a Slave SmartLogger, and click **Running Info.**. The corresponding **SN**, **IP Address**, **Online Status** and **Logical addr.** are displayed, as shown in Figure 7-30.

Figure 7-30 Slave SmartLogger running information



7.11 Inverters

7.11.1 Querying Running Information of Inverters

Figure 7-31 Running information of an inverter

This topic describes how to query running information, including SN, Version, and Devices Status, of inverters over the WebUI.

Querying Device Status

Names and status of devices connected to the SmartLogger are displayed in the left pane of the Monitoring tab page.

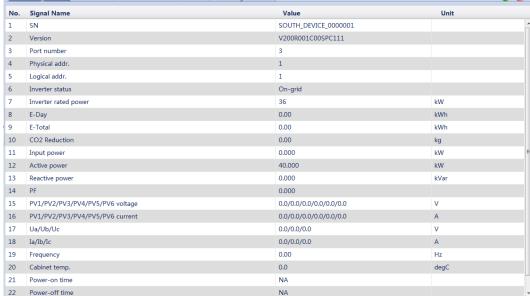
The indicator in front of the device name indicates the current status of a device.

- When the indicator is , the inverter is in the **On-grid** state, and the EMI, Power Meter, AC Combiner Box, Slave SmartLogger, PLC, PID is in the Online state.
- When the indicator is , the inverter, EMI, Power Meter, AC Combiner Box, Slave SmartLogger, PLC, PID is in the **Disconnection** state.
- When the indicator is , the inverter is in the **Loading** state.
- When the indicator is , the inverter is in a non-on-grid state, for example, **Initializing**, Shutdown, or Idle state.

Querying Running Information

On the **Monitoring** tab page, select an inverter, and click **Running Information**. **SN**, Version, and Devices Status are displayed, as shown in Figure 7-31.

Running Info. Active Alarm Performance Data No. Signal Name Unit SN SOUTH DEVICE 0000001 Version V200R001C00SPC111 Port number Physical addr.



7.11.2 Manually Sending Powering On/Off Instructions to an Inverter

You can manually send powering on or off instructions to an inverter over the WebUI.

On the **Monitoring** tab page, choose the inverter to be powered on or off, and click **Running Info.**. The Power-On and Power-Off buttons are located at the upper right corner of the WebUI from the left to the right side, as shown in Figure 7-32.

No. Signal Name Value 2 Version V200R001C00SPC111 Port number 4 Physical addr. 6 Inverter status On-grid Inverter rated power 8 E-Day 0.00 kWh E-Total 0.00 10 CO2 Redu kg 12 Active power 40,000 kW Reactive power 14 PF 0.000 15 PV1/PV2/PV3/PV4/PV5/PV6 voltage 0.0/0.0/0.0/0.0/0.0/0.0/0.0 16 PV1/PV2/PV3/PV4/PV5/PV6 current 0.0/0.0/0.0/0.0/0.0/0.0 18 Ia/Ib/Ic 0.0/0.0/0.0 Α

0.0

NA

Figure 7-32 Manually powering on/off the inverter

O NOTE

19 Frequency20 Cabinet temp.

22 Power-off time

- After you click **Power-On** or **Power-Off**, the system asks you to confirm the operation. Then click **OK** and enter **Password of current user** to execute the powering on/off operation.
- You can power on or power off inverters using menus over the WebUI. For details, see Batch Power-On/Off in 7.44.1 Connecting a Device.

7.11.3 Querying the Active Alarms of an Inverter

You can query the active alarms of an inverter and details about the alarms over the WebUI.

On the **Monitoring** tab page, choose the inverter to be queried and click **Active Alarm** to access the active-alarm query page. You can query the information about all the active alarms of the selected SmartLogger on this page, including the values of **Alarm ID**, **Severity**, **Alarm Name**, **Generation Time**, **Reason ID**, and **Cabinet**.

On the **Active Alarm** tab page, choose an alarm severity and click **Filter**, as shown in Figure 7-33.

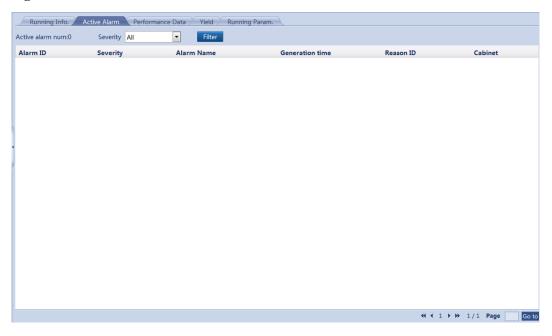


Figure 7-33 Active alarms of the inverter

7.11.4 Querying the Performance Data of an Inverter

This topic describes how query the performance data of an inverter over the WebUI. You can choose to display the performance data in a table or curve or export it.

On the **Monitoring** tab page, choose the inverter to be queried and click **Performance Data** to access the performance data query page.

M NOTE

- When querying the performance data of an inverter, you can select a query period directly from the Time drop-down list or by clicking the time adjustment buttons on both sides of the drop-down list box
- Valid performance data of at most one month is stored for each inverter.

Select **Table**, set **Time**, and click **Query**. You can query the values of various performance parameters, such as **Generation time**, **Inverter status**, and **Daily yield**, as shown in Figure 7-35.

Running Info. Active Alarm Performance Data Yield Running Param. Grid Code ■ Table

○ Curve

○ Export Time **4** 2016 **-** 4 **▼** 27 Generation time Daily yield(kWh) Inv. efficiency(%) Input power(kW) 2016-4-27 06:05:00 0.00 On-grid 2.52 0.00 0.000 27,500 0.000 0.000 2016-4-27 06:10:00 4.75 0.00 0.000 27.500 0.000 0.000 0.00 2016-4-27 06:15:00 7.04 0.00 0.000 27.500 0.000 0.000 0.00 2016-4-27 06:20:00 9.33 0.000 27.500 0.000 0.000 0.00 0.00 2016-4-27 06:25:00 11.59 0.00 0.000 27.500 0.000 0.000 0.00 On-grid 2016-4-27 06:30:00 0.00 13.81 0.00 0.000 27.500 0.000 0.000 On-grid 2016-4-27 06:35:00 15.86 0.000 27,500 0.000 0.000 0.00 On-grid 0.00 2016-4-27 06:40:00 On-grid 15.86 0.00 0.000 27.500 0.000 0.000 0.00 2016-4-27 06:45:00 On-grid 15.86 0.00 0.000 27.500 0.000 0.000 0.00 2016-4-27 06:50:00 15.86 0.00 0.000 27.500 0.000 0.000 0.00 2016-4-27 06:55:00 0.00 0.000 27.500 0.000 0.00 On-grid 2016-4-27 07:00:00 On-grid 24.80 0.00 0.000 27.500 0.000 0.000 0.00 2016-4-27 07:05:00 24.80 0.000 27.500 0.000 0.000 0.00 On-grid 0.00 2016-4-27 07:10:00 On-grid 24.91 27.500 0.00 0.00 0.000 0.000 0.000 ← 1 → → 1/2 Page

Figure 7-34 Performance data displayed in a table

Select Curve, set Time, Y1, and Y2, and click Query, as shown in Figure 7-35.



NOTICE

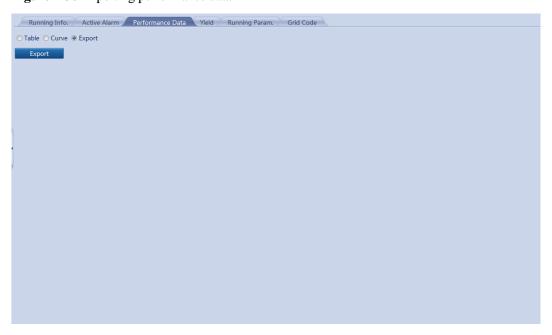
You can compare the curves of two parameters by selecting Y1 and Y2 at the same time. However, the values of Y1 and Y2 must be different.



Figure 7-35 Performance data displayed in a curve

Select **Export** and click **Export** to export the performance data, as shown in Figure 7-36.

Figure 7-36 Exporting performance data



☐ NOTE

When changing the name of the exported file, retain the extension .tar.gz. Otherwise, the file cannot be functional.

7.11.5 Querying the Electric Energy Yield of Inverters

You can query the electric energy yield of inverters over the WebUI, including the daily, monthly, annual, and historical energy yields.

On the **Monitoring** tab page, you can choose the inverter to be queried and click **Yield** to query the information about the electric energy yields of the inverter.

M NOTE

When you query system electric energy yields, select a date from the Time drop-down list box or adjust the date by clicking the buttons on both sides of the drop-down list box.

Daily Electric Energy Yield of Inverters

On the **Yield** > **Day** tab page, select the date to be queried and click **Query**. The daily and hourly electric energy yields are displayed, as shown in Figure 7-37.

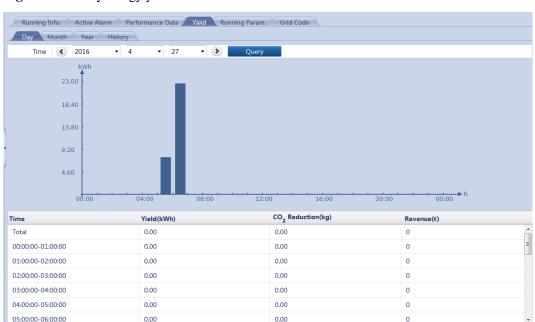


Figure 7-37 Daily energy yield

The displayed information includes the electric energy yield histogram, hourly electric energy yield, CO_2 emission reduction, and revenue.

Ⅲ NOTE

In the daily energy yield histogram, the horizontal ordinate stands for time (each block stands for one hour). The vertical coordinate stands for the energy yield (each block stands for the total energy yield during the last hour).

Monthly Electric Energy Yield of Inverters

On the **Yield > Month** tab page, select the month to be queried and click **Query**. The monthly and daily electric energy yields are displayed, as shown in Figure 7-38.

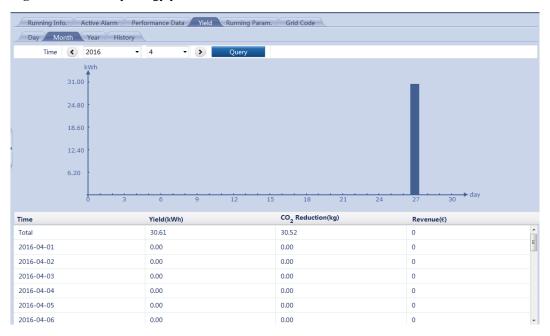


Figure 7-38 Monthly energy yield

The displayed information includes the electric energy yield histogram, daily electric energy yield, CO₂ emission reduction, and revenue.

M NOTE

In the monthly electric energy yield column graph, the horizontal axis indicates time (by day), and the vertical axis indicates electric energy yields. Each column indicates the total electric energy yields of a day.

Annual Electric Energy Yield of Inverters

On the **Yield** > **Year** tab page, select the year to be queried and click **Query**. The annual and monthly electric energy yields are displayed, as shown in Figure 7-39.

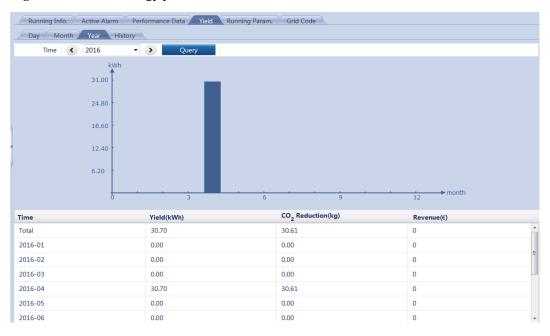


Figure 7-39 Annual energy yield

The displayed information includes the electric energy yield histogram, monthly electric energy yield, CO₂ emission reduction, and revenue.

M NOTE

In the annual electric energy yield column graph, the horizontal axis indicates time (by month), and the vertical axis indicates electric energy yields. Each column indicates the total electric energy yields of a month

Historical Electric Energy Yield of Inverters

On the **Yield** > **History** tab page, the total and annual electric energy yields of the past 25 years are displayed, as shown in Figure 7-40.

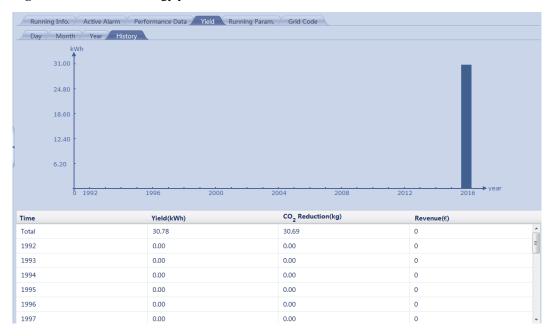


Figure 7-40 Historical energy yields

The displayed information includes the electric energy yield histogram, annual electric energy yield, CO₂ emission reduction, and revenue.

MOTE

In the historical energy yield histogram, the horizontal axis indicates time (by year), and the vertical axis indicates energy yields. Each column indicates the total energy yield of a year.

7.11.6 Setting the Running Parameters of an Inverter

This topic describes how to set the running parameters of an inverter over the WebUI. Due to permission limits, the parameters that can be set by advanced users and special users are different.

On the **Monitoring** tab page, choose the inverter to be set and click **Running Param.** to access the running parameter setting page. Because of the limited permission, select **User name** as **Advanced User** or **Special User**.



NOTICE

- When the SUN8000 status is **Disconnection**, you cannot set or synchronize parameters.
- You can set or synchronize parameters only when the SUN2000 status is On-grid or Shutdown.

Running Parameter (1)

When you log in as an **Advanced User**, you can set various parameters, such as **LVRT**, **Anti-islanding**, **String monitor**, and **Feed grid recovery time**, as shown in Figure 7-41.

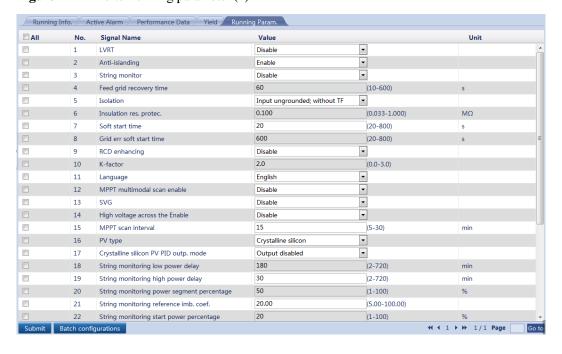


Figure 7-41 Inverter running parameter (1)

□ NOTE

The forced adaptation mode allows inverters to work properly in a harsh power grid environment. If you want to enable this mode, confirm with Huawei technical support first.

Running Parameter (2)

When you log in as a **Special User**, you can set various parameters, such as the protection point and protection time, as shown in Figure 7-42.

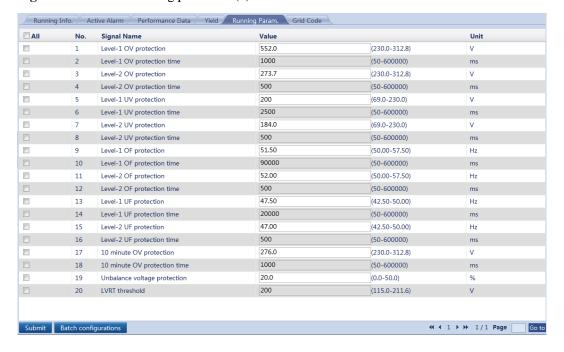


Figure 7-42 Inverter running parameter (2)

■ NOTE

Different parameter configurations on the **Grid Code** tab page correspond to different **Running Param.** tab pages. Before setting parameters on the **Running Param.** tab page, set the parameters on the **Grid Code** tab page.

Setting Running Parameters in Batches

After setting the running parameters of an inverter, you can click **Batch configurations** to synchronize the settings of required parameters to other inverters, as shown in Figure 7-43.

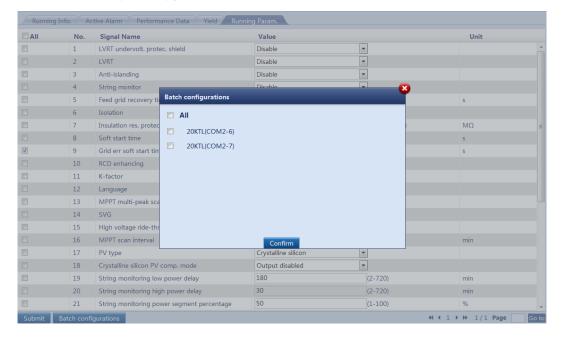


Figure 7-43 Setting running parameters in batches

7.11.7 Querying the Inverter Tracking System

If the PV string uses a support system with controllers, you can query the tracking system over the WebUI.

NOTE

This function applies only to the SUN2000-30KTL-A/33KTL/40KTL and SUN2000-24.7KTL-JP/33KTL-JP/40KTL-JP/36KTL/42KTL/43KTL-IN-C1/50KTL/50KTL-C1.

On the **Monitoring** tab page, choose the inverter to be queried and click **Tracking System** to access the tracking system query page, as shown in Figure 7-44.

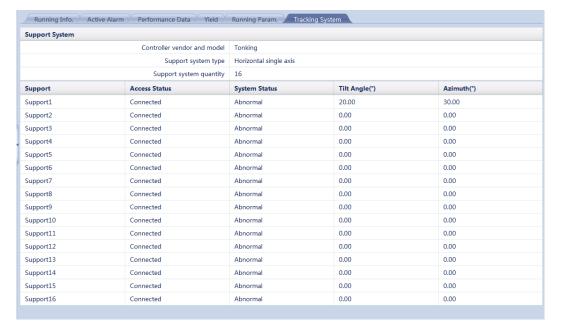


Figure 7-44 Inverter tracking system

7.11.8 Setting the Power Grid Standard Code for an Inverter

Setting a Power Grid Standard Code over the WebUI

Normal inverter feedback to the power grid can be ensured only if the power grid standard code is set properly.

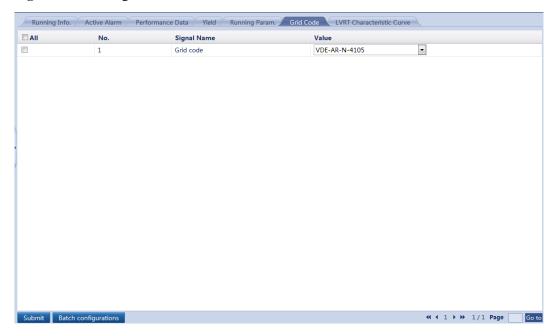


NOTICE

This parameter must be set by professional personnel. Otherwise, the equipment may be damaged.

On the **Monitoring** tab page, choose the inverter for which the power grid standard code needs to be set and click **Grid Code**, as shown in Figure 7-45. Because of the permission restriction, log in as **Special User**.

Figure 7-45 Power grid standard code





NOTICE

Properly set the power grid standard code based on the local standard.

Setting Power Grid Standard Codes in Batches over the WebUI

After setting the power grid standard code for one inverter, press **Batch configurations** to synchronize the standard code to other inverters, as shown in Figure 7-46.

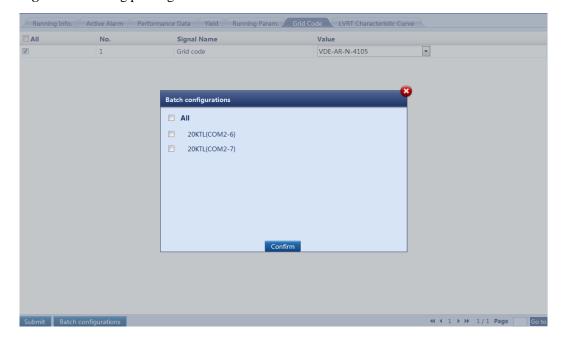


Figure 7-46 Setting power grid standard codes in batches over the WebUI

7.11.9 Setting the Inverter LVRT Characteristic Curve

You can set the inverter low voltage ride-through (LVRT) characteristic curve over the WebUI.

Setting the LVRT Characteristic Curve

MOTE

Only the SUN2000-24.7KTL-JP/33KTL-JP/40KTL-JP/36KTL/42KTL/43KTL-IN-C1/50KTL/50KTL-C1 support the LVRT characteristic curve, and other types of inverters do not have this function.

On the **Monitoring** tab page, choose the inverter for which the LVRT characteristic curve will be set and click **LVRT Characteristic Curve**, as shown in Figure 7-47. Because of the permission restriction, log in as **Special User**.

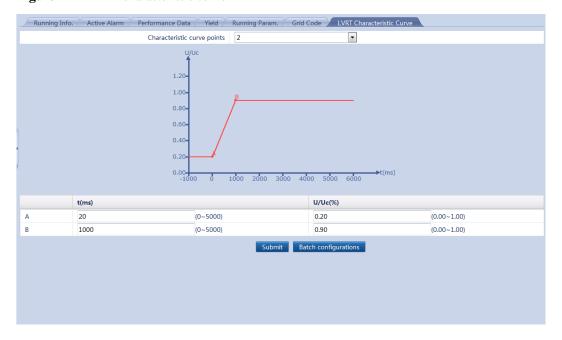


Figure 7-47 LVRT characteristic curve

Synchronizing the LVRT Characteristic Curve

After you set the LVRT characteristic curve for one inverter, press **Synchronize** to synchronize the LVRT characteristic curve to the other inverters, as shown in Figure 7-48.

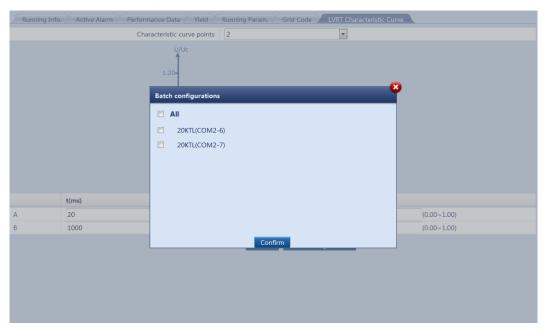


Figure 7-48 Synchronizing the LVRT characteristic curve

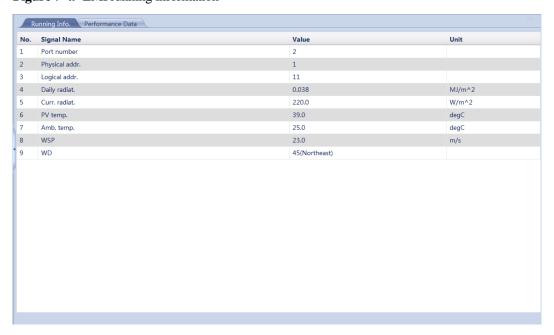
7.12 EMI

7.12.1 Querying the EMI Running Information

You can query the running information about an environmental monitoring instrument (EMI) over the WebUI.

On the **Monitoring** tab page, you can choose the EMI to be queried and click **Running Info.** to query the EMI information, such as **Port number**, **Physical addr.**, **Logical addr.**, **Daily radiat.**, and **Curr. radiat.**, as shown in Figure 7-49.

Figure 7-49 EMI running information



7.12.2 Querying the Performance Data of an EMI

You can query the performance data of an environmental monitoring instrument (EMI) over the WebUI. You can choose to display the performance data in a table or curve or export it.

On the **Monitoring** tab page, choose the EMI to be queried and click **Performance Data** to access the performance data query page.

oxdiv note

- When you query the EMI performance data, select a date from the drop-down list box or adjust the date by clicking the buttons on both sides of the drop-down list box.
- EMI performance data can be stored for a month.

Select **Table**, set **Time**, and click **Query**. You can query the values of various performance parameters, such as **Generation time**, **Current radiation value**, **Daily radiation volume**, **PV temp.**, and **Amp. temp.**, as shown in Figure 7-50.

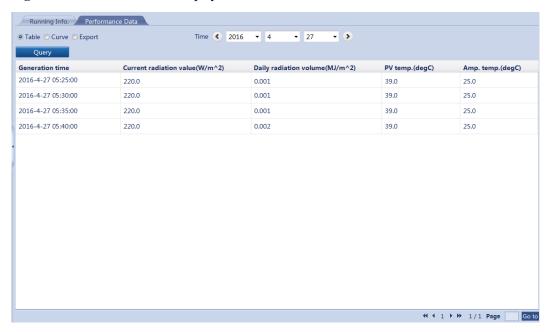


Figure 7-50 Performance data displayed in a table

Select Curve, set Time, Y1, and Y2, and click Query, as shown in Figure 7-51.



NOTICE

You can compare the curves of two parameters by selecting Y1 and Y2 at the same time. However, the values of Y1 and Y2 must be different.



Figure 7-51 Performance data displayed in a curve

Select **Export** and click **Export** to export the performance data, as shown in Figure 7-52.

Figure 7-52 Exporting performance data



■ NOTE

When changing the name of the exported file, retain the extension .tar.gz. Otherwise, the file cannot be functional.

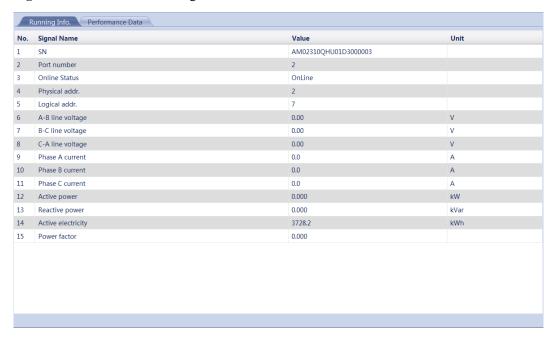
7.13 Power Meter

7.13.1 Viewing the Power Meter Running Information

This topic describes how to query the power meter running information over the WebUI.

On the **Monitoring** tab page, select an power, and click **Running Information**. The corresponding **SN**, **Port number**, **Online Status**, **Physical addr.** and **Logical addr.** are displayed, as shown in Figure 7-53.

Figure 7-53 Power meter running information



7.13.2 Querying the Performance Data of a Power Meter

This topic describes how to query the performance data of a power meter over the WebUI. You can choose to display the performance data in a table or curve or export it.

On the **Monitoring** tab page, choose the inverter to be queried and click **Performance Data** to access the performance data query page.

☐ NOTE

When querying the performance data of a power meter, you can select a period in which the performance data you want to query directly from the **Time** drop-down list or by clicking the time adjustment buttons on both sides of the drop-down list box.

Select **Table** as the display mode, select a period in which the performance data you want to query, and click **Query**. You can query the values of various performance parameters, such as **Generation time**, **Active power**, **Reactive power** and **Active electricity**, as shown in Figure 7-54.

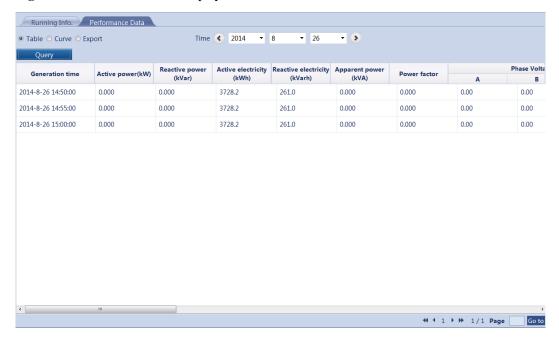


Figure 7-54 Performance data displayed in a table

Select **Curve** as the display mode, select a period in which the performance data you want to query, specify the parameters indicated by Y1 and Y2, and click **Query**, as shown in Figure 7-55.



NOTICE

You can specify two parameters respectively indicated by Y1 and Y2 simultaneously to compare the value curves of the two parameters. However, the two parameters must be different.



Figure 7-55 Performance data displayed in a curve

You can select **Export** as the display mode and click **Export** to export the performance data, as shown in Figure 7-56.

Figure 7-56 Exporting performance data



☐ NOTE

When changing the name of the exported files, retain the extension .tar.gz. Otherwise, the file cannot be functional.

7.14 DL/T645 Power Meter

7.14.1 Querying the DL/T645 Power Meter Running Information

You can query the DL/T645 power meter running information over the WebUI.

On the **Monitoring** tab page, select the DL/T645 power meter whose running information is to be queried, and click **Running Info.**. The corresponding **SN**, **Online Status**, **Port number**, **Physical addr.**, and **Logical addr.** are displayed, as shown in Figure 7-57.

Figure 7-57 DL/T645 power meter running information



7.14.2 Querying the DL/T645 Power Meter Performance Data

You can query the performance data of the DL/T645 power meter over the WebUI. You can choose to display the performance data in a table or curve or export it.

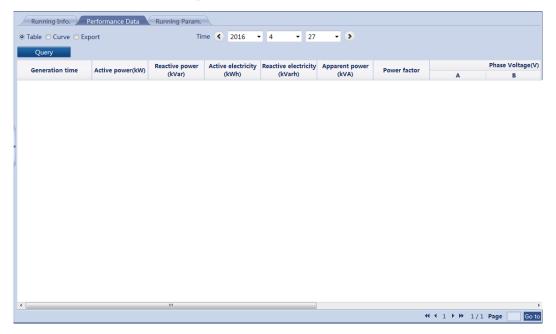
On the **Monitoring** tab page, choose the power meter to be queried and click **Performance Data** to access the performance data query page.

M NOTE

When you query the DL/T645 power meter performance data, select a date from the drop-down list box or adjust the date by clicking the buttons on both sides of the drop-down list box.

Select **Table**, set **Time**, and click **Query**. You can query the values of various performance parameters, such as **Generation time**, **Active power**, **Reactive power**, and **Active electricity**, as shown in Figure 7-58.

Figure 7-58 Performance data displayed in a table



Select Curve, set Time, Y1, and Y2, and click Query, as shown in Figure 7-59.



NOTICE

You can compare the curves of two parameters by selecting Y1 and Y2 at the same time. However, the values of Y1 and Y2 must be different.



Figure 7-59 Performance data displayed in a curve

Select **Export** and click **Export** to export the performance data, as shown in Figure 7-60.

Figure 7-60 Exporting performance data



M NOTE

When changing the name of the exported file, retain the extension .tar.gz. Otherwise, the file cannot be functional.

7.14.3 Setting DL/T645 Power Meter Running Parameters

You can set the DL/T645 power meter running parameters over the WebUI.

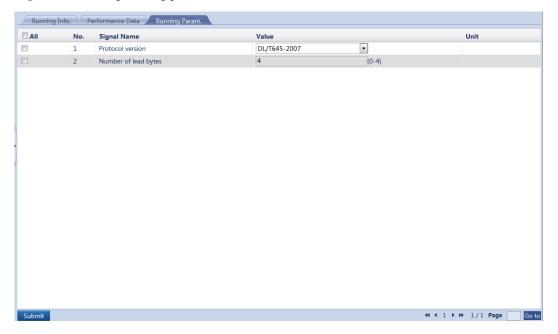
On the **Monitoring** tab page, choose the power meter to be set and click **Running Param.** to access the page for setting running parameters, as shown in Figure 7-61. Because of the permission restriction, log in as **Advanced User**.



NOTICE

Running parameters cannot be set if the DL/T645 power meter is in the **Disconnection** status.

Figure 7-61 Setting running parameters



M NOTE

Select the protocol version and number of boot bytes based on site requirements.

7.15 AC Combiner Box

7.15.1 Querying Running Information of an AC Combiner Box

This topic describes how to query the running information of an AC combiner box over the WebUI.

On the **Monitoring** tab page, select an AC combiner box, and click **Running Info.**. **SN**, **Version**, and **Online Status** are displayed, as shown in Figure 7-62.



Figure 7-62 Running information of an AC combiner box

7.15.2 Querying the Active Alarms of an AC Combiner Box

This topic describes how to query the active alarms of an AC combiner box and details about the alarms over the WebUI.

On the **Monitoring** tab page, choose the AC combiner box to be queried and click **Active Alarm** to access the active-alarm query page. You can query the information about all the current active alarms of the selected inverter on this page, including the values of **Alarm ID**, **Severity**, **Alarm Name**, **Generation time**, **Reason ID**, and **Cabinet**.

On the **Active Alarm** tab page, choose an alarm severity and click **Filter**, as shown in Figure 7-63.

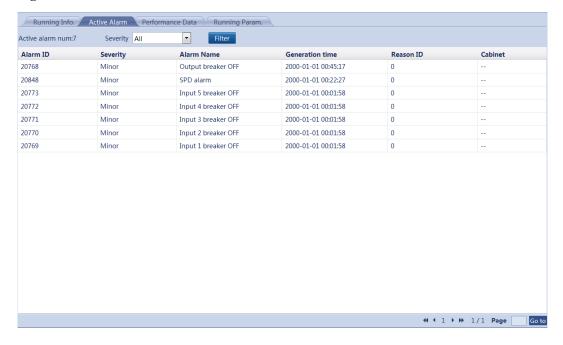


Figure 7-63 Active alarms of the AC combiner box

7.15.3 Querying the Performance Data of an AC Combiner Box

This topic describes how to query the performance data of an AC combiner box over the WebUI. You can choose to display the performance data in a table or curve or export it.

On the **Monitoring** tab page, choose the inverter to be queried and click **Performance Data** to access the performance data query page.

MINOTE

When querying the performance data of an AC combiner box, you can select a period in which the performance data you want to query directly from the **Time** drop-down list or by clicking the time adjustment buttons on both sides of the drop-down list box.

Select **Table** as the display mode, select a period in which the performance data you want to query, and click **Query**. You can query the values of various performance parameters, such as **Generation Time**, **Active power**, **Reactive power**, as shown in Figure 7-64.

● Table ○ Curve ○ Export Time **∢** 2013 **▼** 9 **-** 17 Daily yield of plant(kWh) AC Power of plant(kW) Radiation(W/m^2) PV temp.(degC) **Generation Time** Input power of plant(kW) 2013-9-17 12:50:00 41.11 11.384 11.217 660.0 0.0 2013-9-17 12:55:00 41.81 643.0 11.062 10.964 0.0 2013-9-17 13:00:00 2.477 2.270 154.0 0.0 2013-9-17 13:05:00 6.483 3.160 213.0 0.0 2013-9-17 13:10:00 10.766 10.833 646.0 0.0 2013-9-17 13:15:00 10.304 11.143 636.0 0.0 2013-9-17 13:20:00 2.644 2.578 0.0 2013-9-17 13:25:00 4.106 200.0 0.0 2013-9-17 13:30:00 598.0 0.0 2013-9-17 13:35:00 604.0 0.0 2013-9-17 13:40:00 2.584 157.0 0.0 2013-9-17 13:45:00 2.231 2.054 136.0 0.0 2013-9-17 13:50:00 9.782 9.582 545.0 0.0 2013-9-17 13:55:00 9.578 9.556 558.0 0.0 ← ← 12 → → 12 / 21 Page Go to

Figure 7-64 Performance data displayed in a table

Select **Curve** as the display mode, select a period in which the performance data you want to query, specify the parameters indicated by Y1 and Y2, and click **Query**, as shown in Figure 7-65.



Figure 7-65 Performance data displayed in a curve

You can select **Export** as the display mode and click **Export** to export the performance data, as shown in Figure 7-66.

Figure 7-66 Exporting performance data



\square NOTE

When changing the name of the exported files, retain the extension .tar.gz. Otherwise, the file cannot be functional.

7.15.4 Setting Running Parameters for an AC Combiner Box

This topic describes how to set running parameters for an AC combiner box over the WebUI.

On the **Monitoring** tab page, choose the AC combiner box to be set and click **Running Param.** The page for setting running parameters is displayed, as shown in Figure 7-67. Because of the limited permission, select **User name** as **Advanced User**.



NOTICE

You cannot set or synchronize running parameters for an AC combiner box in **Disconnection** state.

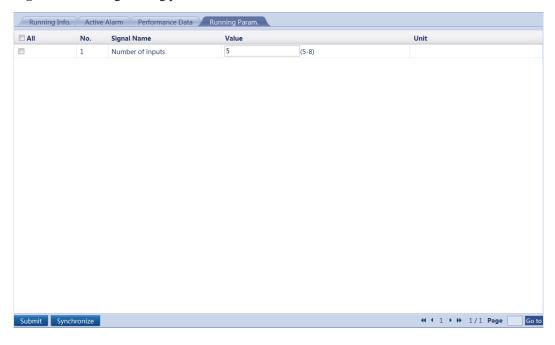


Figure 7-67 Setting running parameters

Synchronizing Running Parameters

After you finish setting running parameters for an AC combiner box, you can click **Synchronize** to synchronize the required parameters to other AC combiner boxes, as shown in Figure 7-68.

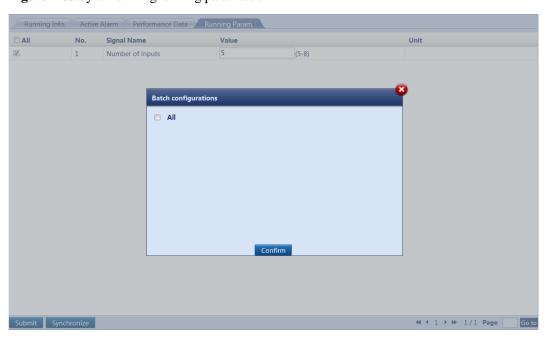


Figure 7-68 Synchronizing running parameters

7.16 PLC

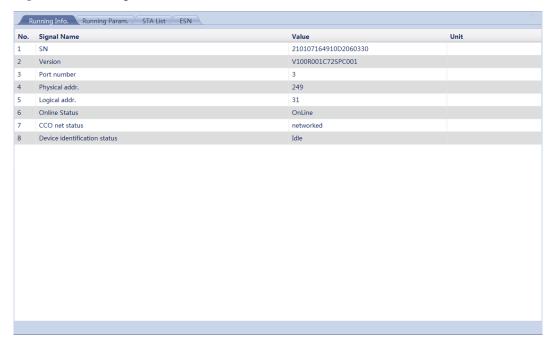
The PLC CCO connects to the SUN2000 that supports the PLC function over a power cable, and data is transmitted over the power cable to implement PLC networking. The PLC CCO connects to the SmartLogger over an RS485 communications cable, and data is transmitted over the RS485 communications cable. In this way, switchover between the PLC communication and RS485 communication is implemented.

7.16.1 Querying the Running Information of a PLC

This topic describes how to query the running information of a PLC over the WeBUI.

On the **Monitoring** tab page, you can choose the PLC to be queried and click **Running Info.** to query the values of various parameters related to the running of the PLC, such as **SN**, **Version**, and **Port number**, as shown in Figure 7-69.

Figure 7-69 Running information of the PLC



7.16.2 Setting Running Parameters for a PLC

This topic describes how to set running parameters for a PLC over the WebUI.

On the **Monitoring** tab page, choose the PLC to be set and click **Running Param.**. The page for setting running parameters is displayed, as shown in Figure 7-70. Because of the limited permission, select **User name** as **Advanced User**.



NOTICE

You cannot set running parameters for a PLC in **Disconnection** state.

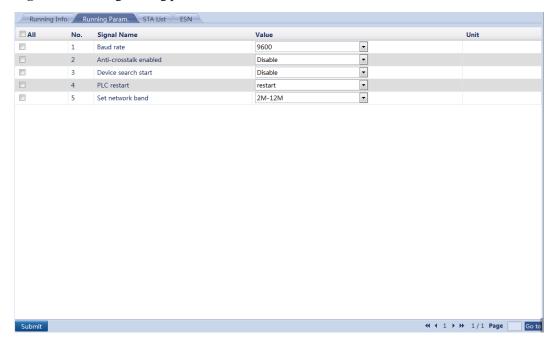


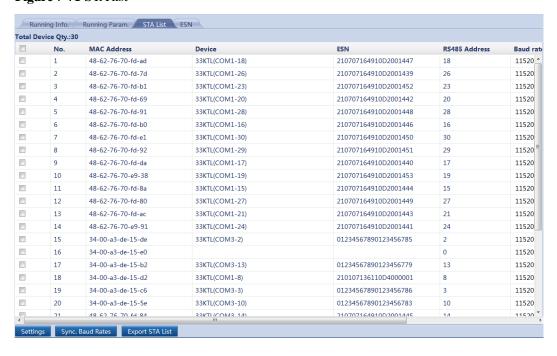
Figure 7-70 Setting running parameters

7.16.3 Setting the PLC STA List

You can set the PLC STA list on the WebUI.

On the **Monitoring** tab, select PLC and click **STA List**. Then you can configure the **Baud rate** for listed devices, as shown in Figure 7-71

Figure 7-71 STA list



MOTE

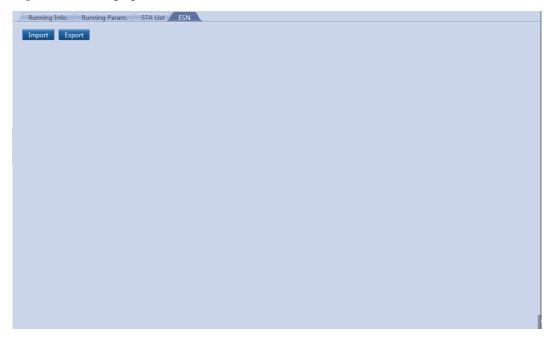
- To modify the baud rate in batches, select **Sync. Baud Rates**. To export the PLC STA list, select **Export STA List**.
- When changing the name of the exported file, retain the extension .tar.gz. Otherwise, the file cannot be functional.

7.16.4 Managing PLC ESNs

You can manage PLC ESNs on the WebUI.

On the **Monitoring** tab page, select the PLC to be managed, click **ESN**, and click **Import** or **Export**, as shown in Figure 7-72.

Figure 7-72 Managing ESNs



M NOTE

When changing the name of the exported file, retain the extension .tar.gz Otherwise, the file cannot be functional.

7.17 PID Module

The PID module is used to prevent PV module output power degradation due to the potential induced degradation effect in a PV power system.

The PID module must work with the devices such as Huawei inverters, SmartLogger, and PID inductors. It can automatically switch the output mode based on the PV voltage and inverter status, and shut down for protection if a fault occurs.

7.17.1 Querying PID Module Running Information

You can query the PID module running information over the WebUI.

On the **Monitoring** tab page, select the PID module to be queried and click **Running Info.**. The corresponding **SN**, **Version**, and **Port number** are displayed, as shown in Figure 7-73.

Figure 7-73 PID module running information



7.17.2 Querying PID Module Active Alarms

You can query the PID module active alarms over the WebUI.

On the **Monitoring** tab page, select the PID module to be queried and click **Active Alarm** to access the active alarm query page. You can query the information about all the active alarms of the selected SmartLogger on this page, including the values of **Alarm ID**, **Severity**, **Alarm Name**, **Generation time**, **Reason ID**, and **Cabinet**.

On the **Active Alarm** tab page, choose an alarm severity and click **Filter**, as shown in Figure 7-74.

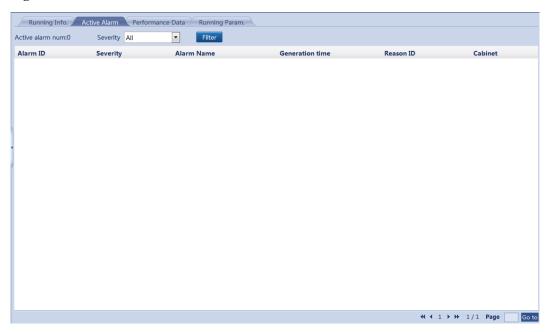


Figure 7-74 PID module active alarms

7.17.3 Querying the PID Module Performance Data

You can query the PID module performance data, display the performance data in a table or curve, and export the performance data over the WebUI.

On the **Monitoring** tab page, click **Performance Data** to access the page for querying performance data.



When you query the PID module performance data, select a date from the drop-down list box or adjust the date by clicking the buttons on both sides of the drop-down list box.

Select **Table**, set **Time**, and click **Query**. You can query the values of various performance parameters, such as **Generation Time**, **Output Voltage**, and **Output Current**, as shown in Figure 7-75.

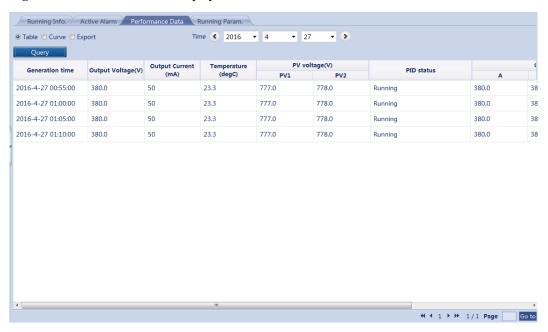


Figure 7-75 Performance data displayed in a table

Select Curve, set Time, Y1, and Y2, and click Query, as shown in Figure 7-76.



Figure 7-76 Performance data displayed in a curve

Select **Export** and click **Export** to export the performance data, as shown in Figure 7-77.

Figure 7-77 Exporting performance data



When changing the name of the exported file, retain the extension .tar.gz. Otherwise, the file cannot be functional.

7.17.4 Setting the PID Module Running Parameters

You can set the PID module running parameters over the WebUI.

On the **Monitoring** tab page, choose the PID module to be set and click **Running Param.** to access the page for setting running parameters, as shown in Figure 7-78. Because of the permission restriction, log in as **Advanced User**.

Running parameters cannot be set if the PID module is in the **Disconnection** status.

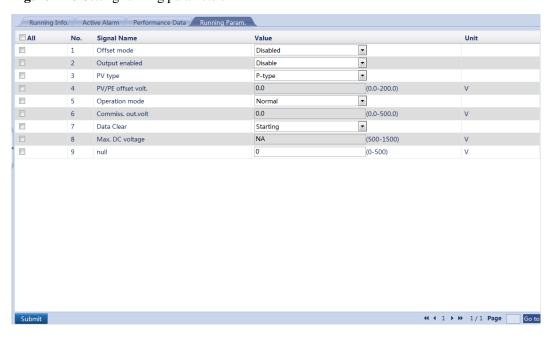


Figure 7-78 Setting running parameters

Table 7-2 describes the PID module running parameters.

Table 7-2 Running parameter descriptions

No ·	Paramet er Name	Function	Paramet er Value	Description
1	Offset mode	Specifies the offset mode of the PID module.	Disabled	Set this parameter to Disable if the PID module is not required.
			N/PE	Set this parameter to N/PE if the PID module is required to use voltage output from the inductor virtual midpoint N.
			PV/PE	Set this parameter to PV/PE if the PID module is required to use voltage output from the negative PV terminal. This mode is applicable only to SUN8000.
			Automati c	In the SUN2000, Automatic indicates the N/PE offset mode.
				• In the SUN8000, set this parameter to Automatic if the PID is required to automatically switch between N/PE and PV/PE offset modes based on the PV module voltage.
2	Output enabled	Specifies whether the PID module output is enabled.	Enable	Set this parameter to Enable to allow the PID module output.
			Disable	Set this parameter to Disable to forbid the PID module output.
3	PV module	Specifies the type of the PV module	P-type	Set this parameter to P-type if the PV module type is P. In this case, the PID module output voltage is positive.

No ·	Paramet er Name	Function	Paramet er Value	Description
	type	used in the power station. For details about the PV module type, consult the manufacturer.	N-type	Set this parameter to N-type if the PV module type is N. In this case, the PID module output voltage is negative.
4	PV/PE offset volt.	Specifies the DC voltage when the offset mode is set to PV/PE.	-	It is recommended that the offset voltage be set to a value ranging from 50 V to 200 V.
5	Operation Mode	Specifies whether the PID module is currently working in normal or commissioning mode.	Commissi oning	In commissioning mode, if you need to set the output mode to PV/PE or N/PE, set Output enabled to Enable. The PID module delivers output voltages based on the value of Commiss. out.volt. NOTE Before the first power-on, to check whether the PID functions properly, it is recommended that Operation mode be set to Commissioning.
			Normal	In normal mode, the PID module operates automatically after the PID module, inverter, and SmartLogger communicate with each other properly. NOTE After checking that the PID module functions properly, you can set Operation mode to Normal.
6	Commiss. out.volt	Specifies the output voltage when the PID module works in commissioning mode.	-	The setting range is 0–500 V. It is recommended that the commissioning voltage in the SUN2000 scenario should be 50–400 V, and the commissioning voltage in the SUN8000 scenario should be 50–200 V.
7	Data Clear	Clears the active alarms and historical alarms stored on the PID module.	Start	You can select Data Clear to clear active alarms and historical alarms.
8	DC voltage max.	Specifies the PV-PE voltage when the normal operation mode is used.	-	In normal mode, the setting range is 500–1500 V. If the PV module type is P, the parameter value indicates the highest DC voltage between PV+ and PE; if the PV module type is N, the parameter value indicates the highest DC voltage between PV- and PE.
9	Maximum output voltage	Sets the highest output voltage of the PID module in normal or commissioning operation mode.	-	The setting range is 0–500 V. If the compensation mode is PV/PE , the parameter value indicates the highest DC output voltage between PV and PE; if the compensation mode is N/PE , the parameter value indicates the highest DC output voltage between N and PE.

7.18 Custom Devices

The SmartLogger can connect to third-party devices that support standard Modbus-RTU, such as the box-type transformer, inverter, and EMI. Since the protocol information points vary depending on vendors, you need to obtain a protocol information file in .cfg format from Huawei and import the file into the SmartLogger for successfully connecting to a third-party device.

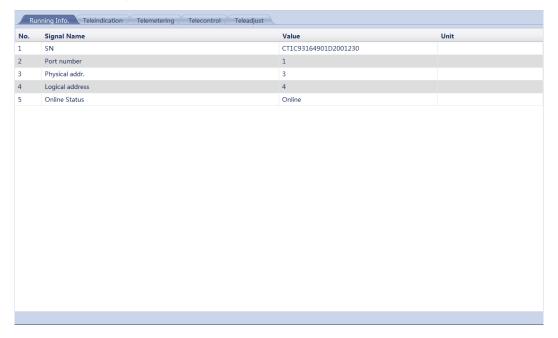
M NOTE

- Custom devices cannot be detected automatically, and need to be added manually.
- The SmartLogger supports the connection to a maximum of five types of Custom devices and can connect to multiple devices of the same type.

7.18.1 Querying Running Information of Custom Devices

On the **Monitoring** tab page, select the user-defined device to be queried and click **Running Info.**, as shown in Figure 7-79.

Figure 7-79 Running information of a custom device



7.18.2 Querying Teleindication Information

On the **Monitoring** tab page, select the custom device whose teleindication information needs to be queried and click **Teleindication**, as shown in Figure 7-80.

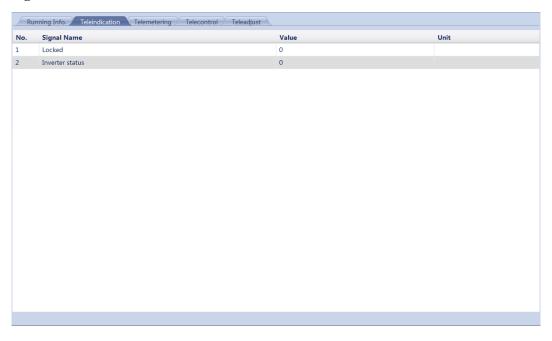
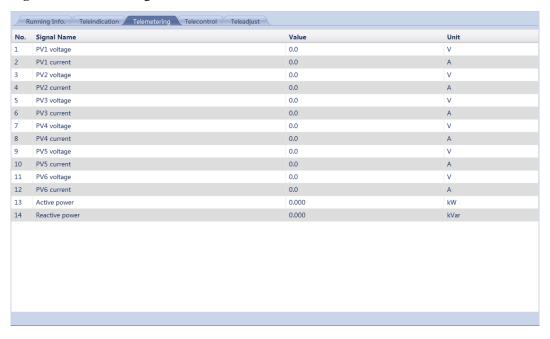


Figure 7-80 Teleindication information of a custom device

7.18.3 Querying Telemetering Information

On the **Monitoring** tab page, select the custom device whose telemetering information needs to be queried and click **Telemetering**, as shown in Figure 7-81.

Figure 7-81 Telemetering information of a custom device



7.18.4 Setting Telecontrol Parameters

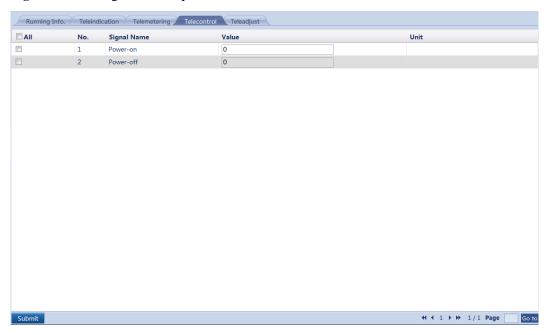
On the **Monitoring** tab, choose the device to be set and click **Telecontrol**. The page for setting telecontrol parameters is displayed, as shown in Figure 7-82. Because of permission restriction, you must select **User name** as **Advanced User**.



NOTICE

Telecontrol parameters cannot be set for a custom device in the **Disconnection** state.

Figure 7-82 Setting telecontrol parameters



7.18.5 Setting Teleadjust Parameters

On the **Monitoring** tab, choose the device to be set and click **Teleadjust**. The page for setting teleadjust parameters is displayed, as shown in Figure 7-83. Because of permission restriction, you must select **User name** as **Advanced User**.



NOTICE

Teleadjust parameters cannot be set for a custom device in the **Disconnection** state.

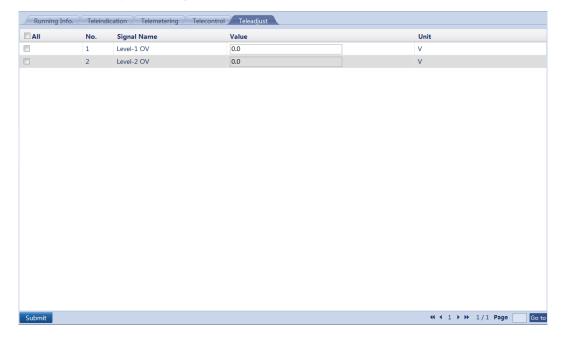


Figure 7-83 Setting teleadjust parameters

7.19 IEC103 Devices

The SmartLogger can connect to a third-party device that supports IEC103, such as a replay protection or monitoring device like a box-type transformer. Since the protocol information points vary depending on vendors, you need to obtain a protocol information file in .cfg format from Huawei and import the file into the SmartLogger for successfully connecting to a third-party device.

MOTE

- IEC103 devices cannot be detected automatically, and need to be added manually.
- The SmartLogger supports the connection to a maximum of five types of IEC103 devices and can connect to multiple devices of the same type.

7.19.1 Querying IEC103 Device Running Information

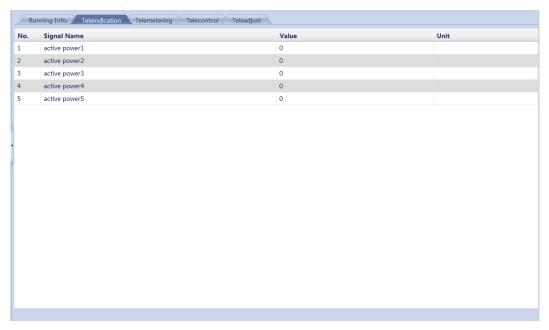
On the **Monitoring** tab page, select the IEC103 device whose running information needs to be queried and click **Running Info.**, as shown in Figure 7-84.

Figure 7-84 Querying running information

7.19.2 Querying the IEC103 Device Teleindication Information

On the **Monitoring** tab page, select the IEC103 device whose teleindication information needs to be queried and click **Teleindication**, as shown in Figure 7-85.

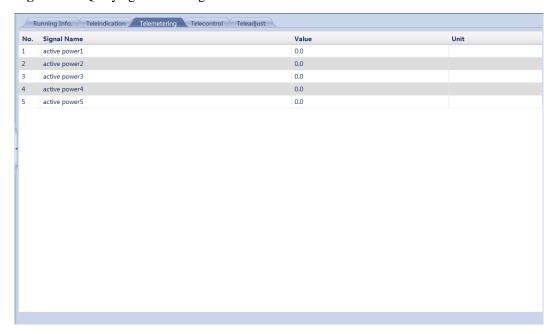
Figure 7-85 Querying teleindication information



7.19.3 Querying the IEC103 Device Telemetering Information

On the **Monitoring** tab page, select the IEC103 device whose telemetering information needs to be queried and click **Telemetering**, as shown in Figure 7-86.

Figure 7-86 Querying telemetering information



7.19.4 Setting the IEC103 Device Telecontrol Parameters

On the **Monitoring** tab page, choose the IEC103 device to be set and click **Telecontrol** to access the page for setting Telecontrol parameters, as shown in Figure 7-87. Because of the permission restriction, log in as **Advanced User**.



NOTICE

Telecontrol parameters cannot be set for an IEC103 device in the **Disconnection** status.

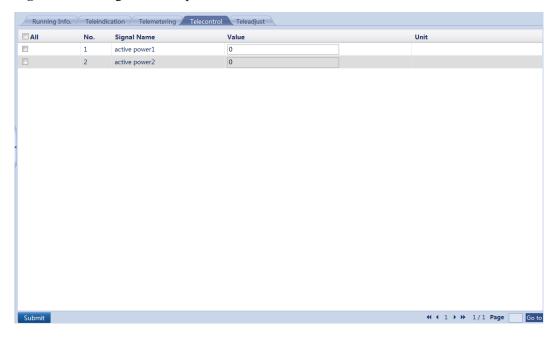


Figure 7-87 Setting telecontrol parameters

7.19.5 Setting the IEC103 Device Teleadjust Parameters

On the **Monitoring** tab page, choose the IEC103 device to be set and click **Teleadjust** to access the page for setting teleadjust parameters, as shown in Figure 7-88. Because of the permission restriction, log in as **Advanced User**.



NOTICE

Teleadjust parameters cannot be set for an IEC103 device in the **Disconnection** status.

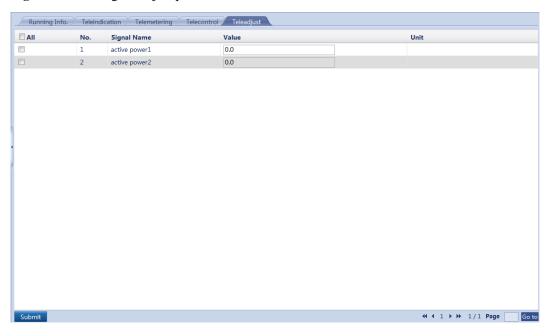


Figure 7-88 Setting teleadjust parameters

7.20 Querying Historical Alarms

You can query historical alarms of the equipment over the WebUI.

On the **Query** tab page, you can select **Alarm History** to query the alarm information of the equipment.

On the **Alarm History** page, choose the equipment to be queried and the start time, end time, and sorting mode of alarms. After that, click **Query**, as shown in Figure 7-89.

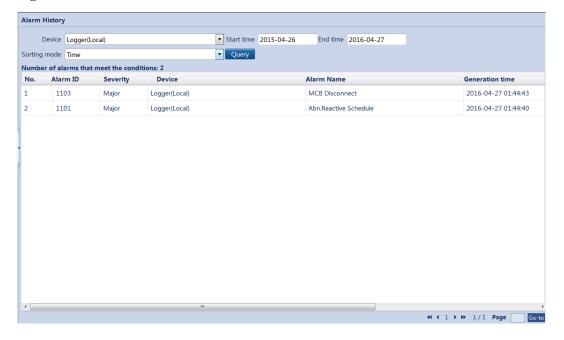


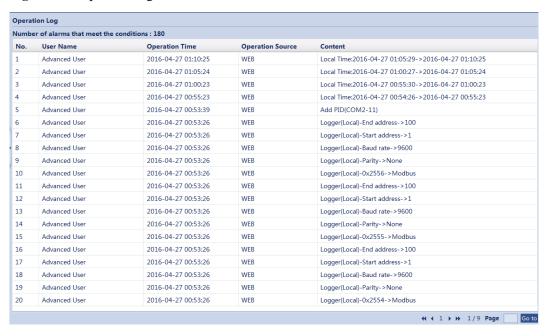
Figure 7-89 Historical alarms

7.21 Querying Operation Logs

You can query operation logs over the WebUI.

On the **Query** tab page, click **Operation Log**. Operation logs (such as login, parameter setting, data export, firmware upgrade, and password change) of users are displayed, as shown in Figure 7-90. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-90 Operation log



7.22 Exporting Data

This topic describes how to export historical alarms, energy yield, operation logs and grid dispatching logs over the WebUI.

Exporting Data

In the **Export Data** window, you can export **Alarm History**, **Yield**, **Operation Log**, **Grid Dispatching** or **All** in CSV format, as shown in Figure 7-91. Because of the limited permission, select the User name as **Advanced User** or **Special User**.

Figure 7-91 Exporting Data



When changing the name of the exported files, retain the extension .tar.gz. Otherwise, the file cannot be functional.

Opening the Exported File

The exported files are in CSV format and can be opened in Microsoft Office Excel. If the table is in disorder after file is opened, check that **List separator** is ,. If **List separator** is not ,, change it to ,.

To view and change List separator, perform the following steps:

- 1. Open Control Panel and choose Region and Language.
- 2. Under **Formats**, click **Additional settings**, as shown in Figure 7-92.

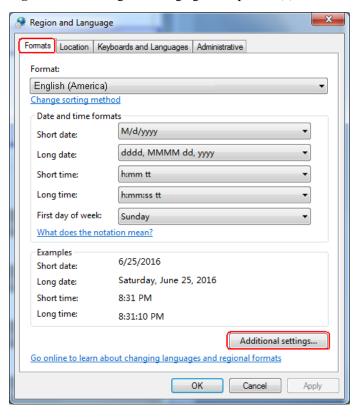


Figure 7-92 Viewing and changing List separator (1)

- 3. View and change List separator, as shown in Figure 7-93.
 - If List separator is ,, click OK.
 - If **List separator** is not ,, change it to , and click **OK**.

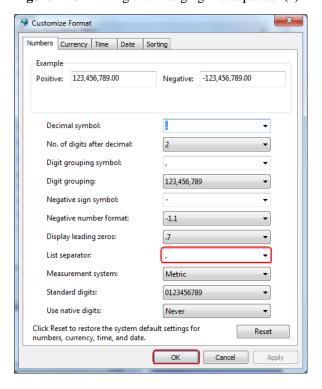


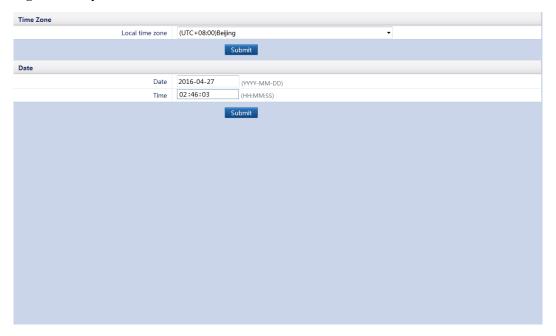
Figure 7-93 Viewing and changing List separator (2)

7.23 Set the Data and Time

You can set the time zone, time, and date over the WebUI.

On the **Settings** tab page, choose **User Parameters** > **Date&Time** and set **Local time zone**, **Date**, and **Time**, as shown in Figure 7-94. Because of the permission restriction, log in as **Common User** or **Advanced User**.

Figure 7-94 System time





NOTICE

- Set **Local time zone** based on the location of the inverters and enable or disable **DST** as required.
- After Date&Time is set, the date and time of all the inverters connected to SmartLogger are updated accordingly. Make sure that the settings are correct.
- Modification of **Date&Time** may affect the recording of the electricity yield and performance data. Therefore, do not change the time zone or system time.

7.24 Setting Plant Information

You can set plant information over the WebUI, including the plant name, owner and address and nationality of the plant owner.

After you set the plant information, a plant configuration file can be generated. You can upload this file to a third-party hosting website to implement remote monitoring.

On the **Settings** tab page, choose **User Parameters** > **Power Station**, and set **Plant Info.**, as shown in Figure 7-95. Because of the permission restriction, log in as **Common User** or **Advanced User**.

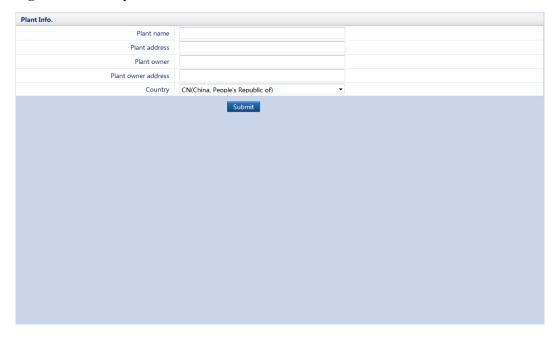


Figure 7-95 Power plant information

7.25 Setting Currency Parameters

You can set currency parameters, such as Currency and Currency Factor, over the WebUI.

On the **Settings** tab page, choose **User Parameters** > **Currency**, and set **Currency** and **Currency Factor**, as shown in Figure 7-96. Because of the permission restriction, log in as **Common User** or **Advanced User**.

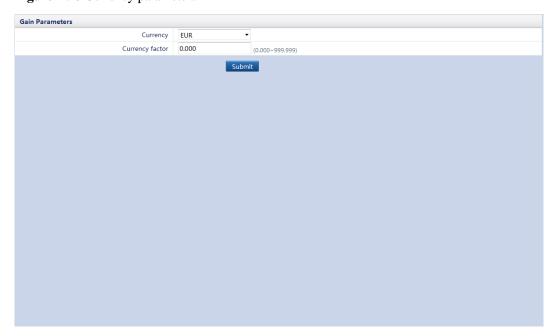


Figure 7-96 Currency parameters

NOTE

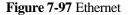
- Four values are available for Currency, that is, EUR, GBP, USD, and CNY.
- The currency factor indicates the local power price, and is used to calculate the translation gain of the energy yield.

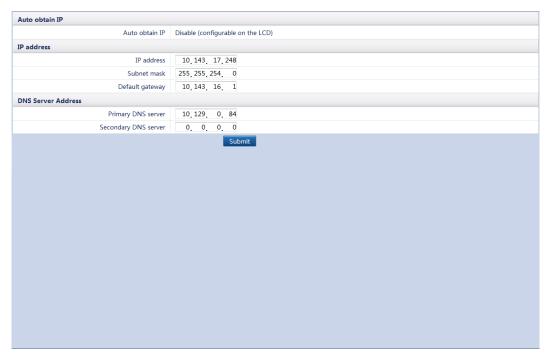
7.26 Setting Ethernet Parameters

This topic describes how to set Ethernet parameters, including IP Address, Subnet mask, Gateway and DNS server address over the WebUI.

Set Ethernet parameters to ensure proper operation of Ethernet ports and functions of logging in to the embedded WebUI, connecting to the network management system (NMS), and sending emails.

On the **Settings** tab page, choose **Comm. Parameters** > **Ethernet** and set **IP address**, **Subnet mask**, **Default gateway**, and **DNS Server Address**, as shown in Figure 7-97. Because of the limited permission, select the User name as **Advanced User**.







NOTICE

Take the following precautions for setting Ethernet parameters when the SmartLogger connects to the Internet through a router:

- Set the gateway address to the IP address of the router.
- Ensure that the IP address of the SmartLogger is in the same network segment as the gateway address.
- Set the DNS address to the IP address of the router or obtain the DNS address from the network provider.

When you change an IP address, a dialog box is displayed asking for your confirmation. After the IP address is changed, you need to use the new IP address to log in to the system.

7.27 Setting RS485 Parameters

This topic describes how to set RS485 parameters, including Baud Rate, Start Address, and End Address, over the WebUI.

Correctly set the parameters for the RS485 to ensure the normal communications between the SmartLogger and the inverters and between the SmartLogger and the environmental monitoring instrument.

On the **Settings** tab page, choose **Comm. Parameters** > **RS485** and set **Parity**, **Baud rate**, as shown in Figure 7-98. Because of the permission restriction, log in as **Advanced User**.

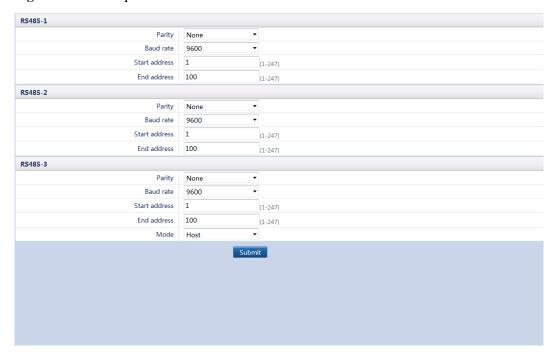


Figure 7-98 RS485 parameters

MOTE

- RS485-1 indicates communications port COM1, RS485-2 indicates communications port COM2, and RS485-3 indicates communications port COM3.
- Parity must be set to the same value for all devices connected to the same RS485 port.
- The following baud rates are supported: 4800 bps, 9600 bps, 19200 bps and 115200 bps.
- The default baud rate is 115200 bps if the SUN2000 is connected to a PLC and is 9600 bps if the SUN2000 is not connected to a PLC. The baud rate for the RS485 ports of the SmartLogger must be the same as this value.
- 1 ≤ Start Address ≤ End Address ≤ 247. The address segments for these three ports can overlap.
 Set the address scope properly. The broader the scope is, the longer the time is for searching the devices.

7.28 Setting EMI Parameters

This topic describes how to set parameters, including Read Function Code, Read Mode, Start Address, and End Address, for the environmental monitoring instrument over the WebUI.

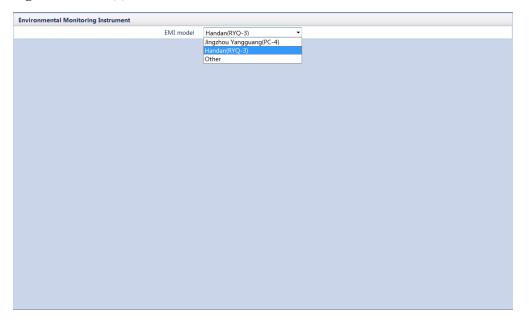
Connect the SmartLogger to an EMI that complies with the standard MODBUS/485 protocol. The SmartLogger can connect to and manage only one EMI at a time.

The protocol points for EMIs provided by different vendors are varied. Therefore, to obtain information from an EMI, configure the protocol point on the WebUI of the SmartLogger properly based on the document delivered by the vendor.

On the **Settings** tab page, choose **Comm. Parameters** > **EMI** and set EMI parameters. Because of the limited permission, select the user name as **Advanced User**.

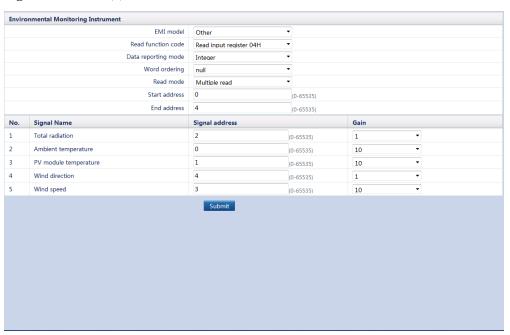
• If the EMI model is Handan or Jinzhou Yangguang, select **Handan** (**RYQ-3**) or **Jinzhou Yangguang** (**PC-4**) from the drop-down list, as shown in Figure 7-99.

Figure 7-99 EMI (1)



• If an EMI of other model is used, select **Other** from the drop-down list and then set EMI parameters, as shown in Figure 7-100.

Figure 7-100 EMI (2)



Correctly set the parameters in accordance with the Modbus parameters provided by the EMI manufacturers. Otherwise, the EMI data cannot be correctly read.

 Based on the mode supported by the EMI, set Read function code to Read holding register 03H or Read input register 04H.

- Set **Data reporting mode** and **word ordering** based on site requirements.
- Based on the mode supported by the EMI, set Read code to Single read or Multiple read.
 If Multiple read is set, set Start address and End address based on the acquired Modbus signal address range on the EMI.
- The Signal address and Gain of parameters like Total radiation and Ambient temperature should be set as the manufacturers require.

If a certain signal cannot be collected by the EMI, set the Signal address of the signal to 65535.

7.29 Setting Power Meter Parameters

This topic describes how to set the power meter parameters on the WebUI.

On the **Settings** tab, choose **Power Meter** under **Comm. Param.** to set the power meter parameters. To set the power meter parameters, log in as **Advanced User** or **Special User**.

Power Meter Without Feedback of Grid-tied Point Data

If a power meter configured in the power station does not need to provide feedback of the grid-tied point data, set **Meter feedback output** to **Disable**.

- When the **Intelligent Power Meter Type** is **UMG604**, **PD510**, or **PZ96L**, select the model in the drop-down list box of **Intelligent Power Meter Type**.
- When the connected meter models are beyond the foregoing three, select Other from the
 drop-down list box of Intelligent Power Meter Type and set Read function code, Read
 mode, and Data reporting mode.

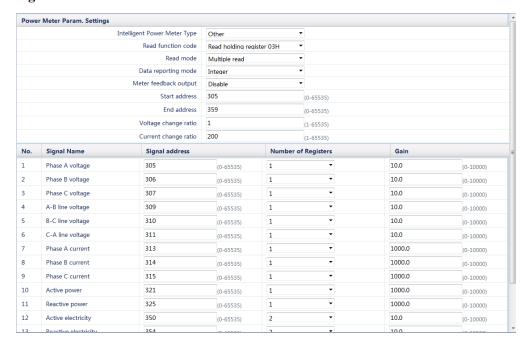
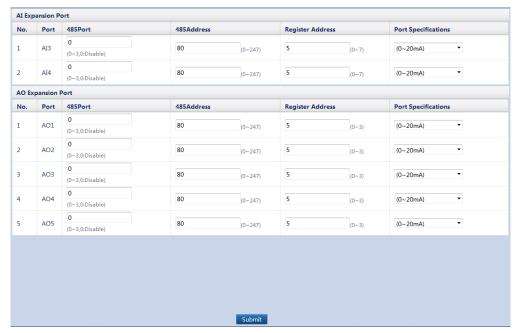


Figure 7-101 Power meter

Power Meter with Feedback of Grid-tied Point Data

If the power meter configured in the power station provides feedback of the grid-tied point data over the AO port, connect the SmartLogger to an ADAM to extend an AI/AO port and log in to the WebUI to correctly configure the parameters of the extended port. To set **Extended Port Settings**, log in as **Special User**, as shown in Figure 7-102.

Figure 7-102 Extended Port Settings



MOTE

- 1 to 3 under 485Port indicates that the AO ports connect to the COM1 to COM3 correspondingly. 0 indicates that the port is disabled.
- 485Address is the actual 485 address set for the ADAM. Set Register Address based on the actual
 connection.
- Set **Port Specifications** based on the standards of the power grid company.

Set **Meter feedback output** under **Power Meter** to **Enable**. Set parameters for each port, as shown in Figure 7-103.

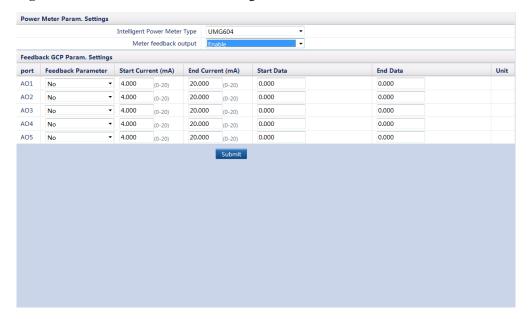


Figure 7-103 Feedback GCP Param. Settings

- A maximum of five concurrent AO ports can provide feedback of the grid-tied point data.
- In the **Feedback Parameter** drop-down list box, select the parameter to be reported. One parameter can be selected only for one AO port.
- Start Current and End Current indicate the valid value range of signals carried by the analog
 output loop. The current range is less than or equal to the current range set in the AO specifications.
 Start Data corresponds to End Data.
- **Star Data** and **End Data** are the valid signal value range of the current **Feedback Parameter**. Set the two parameters based on site requirements. An excessive range results in low precision of the feedback while an insufficient range results in the incompleteness of the feedback.
- Unit is the unit for the current Feedback Parameter. When setting Start Data and End Data, note the unit selected. Otherwise, a false input and output may be caused.

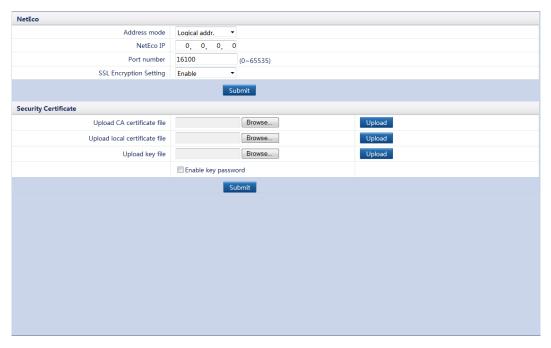
7.30 Setting NetEco Parameters

This topic describes how to set NetEco parameters over the WebUI.

Set NetEco parameters to ensure normal communication between the SmartLogger and the NetEco.

On the **Settings** tab page, choose **Comm. Param.** > **NetEco** and **set NetEco** and **Security Certificate**, as shown in Figure 7-104. Because of the limited permission, select the User name as **Advanced User**.

Figure 7-104 NetEco



- Set NetEco IP correctly.
- In most cases, set Address mode to Physical addr.. If the devices connected to the three RS485
 ports of the SmartLogger have duplicate addresses, you must set Address mode to Logical addr..
- If SSL Encryption Setting is set to Disable, data will be transmitted without encryption, which may
 result in user data leakage. Therefore, exercise caution when deciding to set SSL Encryption
 Setting to Disable.

7.31 Setting Modbus TCP Parameters

You can set Modbus TCP parameters on the WebUI.

Set Modbus TCP parameters to ensure normal communication between the SmartLogger and a third-party network management system (NMS).

On the **Settings** tab page, choose **Comm. Parameters** > **Modbus TCP** and set **Modbus TCP**, as shown in Figure 7-105. Because of the limited permission, select the User name as **Advanced User**.

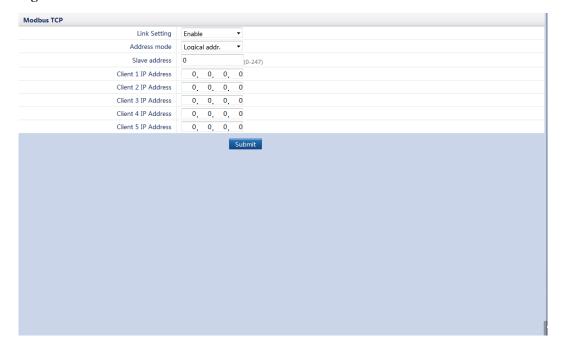


Figure 7-105 Modbus TCP

- Modbus-TCP is a general standard protocol without a security authentication mechanism. Therefore, the function of connecting to a third-party NMS using Modbus-TCP is disabled by default to reduce network security risks. To enable this function, set Link Setting to Enable.
- If the function of connecting to a third-party NMS using Modbus-TCP is enabled, data will be transmitted without encryption, which may result in user data leakage. Therefore, exercise caution when deciding to enable this function.
- In most cases, set **Address mode** to **Physical addr.**. If the devices connected to the three RS485 ports of the SmartLogger have duplicate addresses, you must set **Address mode** to **Logical addr.**.
- Set the client IP addresses and SmartLogger address correctly.

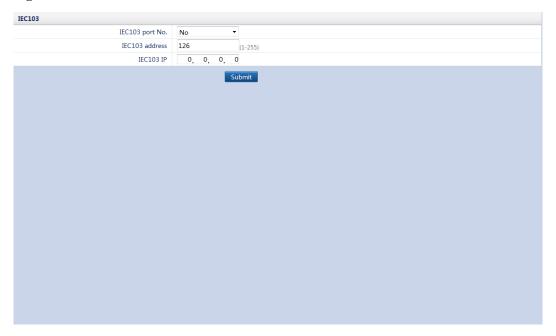
7.32 Setting IEC103 Parameters

Third-party devices that use the IEC103 interface protocol may be connected to a PV power station. The SmartLogger can read the information about such third-party devices and upload the information to the NetEco, enhancing the PV power station solution.

As Huawei inverter devices (such as inverters) support different protocols from third-party IEC103 devices (such as box-type transformers, combiner boxes, and inverters), they cannot be connected in series on the same RS485 bus.

The SmartLogger manages IEC103 devices in different ways depending on the NMS. If the SmartLogger connects to a third-party NMS, choose **Maintenance** > **Device Mgmt.** > **Connect Device** to allow the SmartLogger to manage IEC103 devices. If the SmartLogger connects to the NetEco, it transparently transmits IEC103 device information to the NetEco. On the **Settings** tab page, choose **Comm. Param.** > **IEC103** and set **IEC103 port No.** and **IEC103 address**, as shown in Figure 7-106. Because of the permission restriction, log in as **Advanced User**.

Figure 7-106 IEC103



- IEC103 is a general standard protocol without a security authentication mechanism. Therefore, the
 function of connecting to a third-party NMS using IEC103 is disabled by default to reduce network
 security risks. To enable this function, set Link setting to Enable.
- Third-party devices and Huawei devices must connect to different ports of the SmartLogger. Otherwise, the communication will fail.
- Correctly set IEC103 port No. and IEC103 address based on the actual cable connection.
- The value of **IEC103 IP** must be consistent with the NetEco IP address.

7.33 Setting IEC104 Parameters

You can set IEC104 parameters over the WebUI.

If the SmartLogger connects to a third-party network management system (NMS) over the IEC104 protocol, IEC104 parameters must be correctly set to enable the third-party NMS to monitor the running status of devices connected to the SmartLogger.

On the **Settings** tab page, choose **Comm. Param.** > **IEC104** and set **Link Setting**, **Public IP address**, and **IEC104 IP**, as shown in Figure 7-107. Because of the limited permission, select the User name as **Advanced User**.

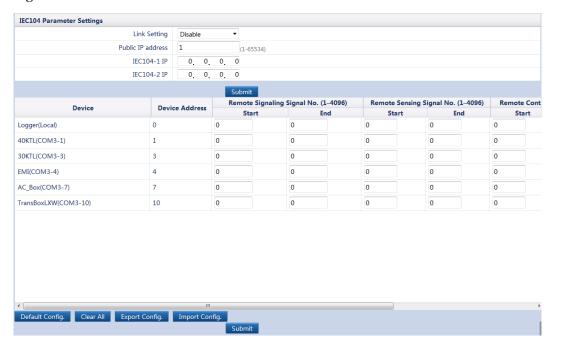


Figure 7-107 IEC104

- IEC104 is a general standard protocol without a security authentication mechanism. Therefore, the
 function of connecting to a third-party NMS using IEC104 is disabled by default to reduce network
 security risks. To enable this function, set Link Setting to Enable and correctly set Public IP
 address and IEC104 IP.
- If you click **Default Config.**, the **Start** and **End** values of **Remote Regulating Signal No.**, **Remote Signaling Signal No.**, **Remote Sensing Signal No.**, and **Remote Control Signal No.** parameters will be set to their default values.
- If you click Clear ALL, the Start and End values of Remote Regulating Signal No., Remote Signaling Signal No., Remote Sensing Signal No., Remote Control Signal No. will be set to 0.
- If you click **Export Config.**, configurations will be exported to a CSV file.

 After the IEC104 configuration file exported from the SmartLogger and the or

After the IEC104 configuration file exported from the SmartLogger and the device type IEC104 information files delivered with devices are correctly configured in a third-party NMS, the third-party NMS will be able to monitor devices connected to the SmartLogger by using the IEC104 protocol.

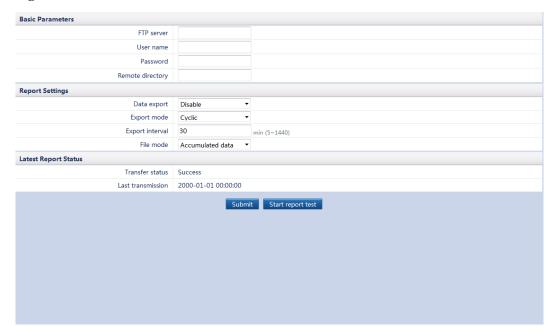
7.34 Setting FTP Parameters

You can set basic parameters and report settings of the FTP server and view the latest report status over the WebUI.

The FTP function is used to access a third-party network management system (NMS). The SmartLogger can report the configuration information and running data of the managed plant system through the FTP. A third-party NMS can access Huawei devices with proper configurations.

On the **Settings** tab page, choose **Extended Parameters** > **FTP**. On the displayed page, you can set parameters in the **Basic Parameters** and **Report Settings** areas, and view the information in the **Latest Report Status** area, as shown in Figure 7-108. Because of the permission restriction, log in as **Advanced User**.

Figure 7-108 FTP



- FTP Server can be set to the domain name or IP address of the FTP server.
 - If **FTP Server** is set to the domain name of the FTP server, ensure that the address of the DNS server is set correctly.
- User name and Password indicate the user name and password that need to be entered when you
 log in to the FTP server.
- Set Remote directory. You can create a subdirectory of the same name under the default path for uploading data.
- You can click Start report test to check whether the SmartLogger can successfully report data to the third-party NMS.
- You can enable or disable the data report function as required.
- If you enable the data report function, you can set the SmartLogger to report data regularly or at a specified time.
- Data reported on schedule is accumulated data, whose file name remains the same for a whole day. You can choose accumulated data or incremental data to be reported within a specified cycle.

7.35 Setting Email Parameters

You can set basic email parameters and view the latest report status over the WebUI.

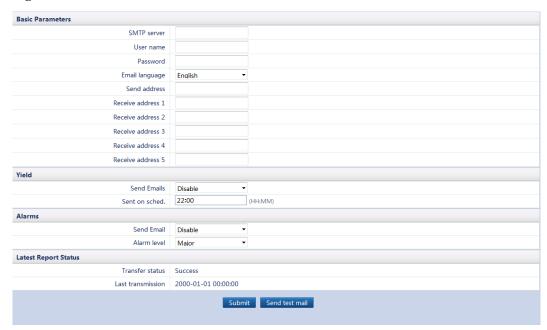
The SmartLogger can send emails to inform users of the current electric energy yield information of the power station system, alarm information, and equipment status, helping users to know the running conditions of the power station system in time.

When using this function, ensure that the SmartLogger can be connected to the configured email server and set the Ethernet parameters and email parameters of the SmartLogger.

On the **Settings** tab page, choose **Extended Parameters** > **E-mail**, set parameters in the **Basic Parameters**, **Yield**, and **Alarm** areas, and view the information in the **Latest Report**

Status area, as shown in Figure 7-109. Because of the permission restriction, log in as **Advanced User**.

Figure 7-109 Email



NOTE

- SMTP Server can be set to the domain name or IP address of the SMTP server.
 If SMTP Server is set to the domain name of the SMTP server, ensure that the address of the DNS server is set correctly.
- User name and Password indicate the user name and password that need to be entered when you log in to the SMTP server.
- **Send address** specifies the sender's email address. Ensure that the sender's email server is the same as the server specified by **SMTP server**. Set **Receive address** to a maximum of five addresses.
- You can enable or disable SmartLogger to send energy yield and alarm emails.
- You can click Send test Email to check whether the SmartLogger can successfully send emails to
 users.

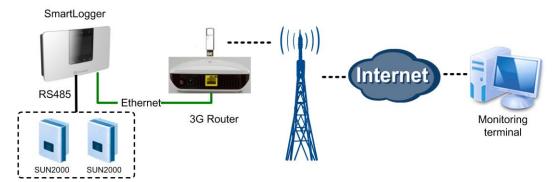
7.36 Port Settings

This topic describes how to reset a 3G router by configuring a DO port or USB port.

When the PV plant and the network management system (NMS) are not in the same area, the SmartLogger needs to be connected to the NMS to implement the function of monitoring a remote PV plant. After you connect the SmartLogger to a router and set the Ethernet parameters, the SmartLogger can be connected to the remote NMS, SMTP mail server, or FTP server through the router.

If it is inconvenient to connect the PV plant in wired mode, you can connect it to a wireless 3G router for accessing the Internet, as shown in Figure 7-110.

Figure 7-110 3G router networking



A 3G router is a communication device for civil use. Its reliability is limited. You can connect the DC power supply cable of a 3G router to the SmartLogger. This allows the SmartLogger to control the reset of the 3G router when the communication link is interrupted, improving the reliability of the communication link.

7.36.1 Setting DO Parameters

This topic describes how to set DO configuration parameters for resetting an external 3G router over the WebUI.

Context

The SmartLogger provides three DO ports. You can connect one DC power cable of the 3G router to one DO port of the SmartLogger in series and power on or off the wireless module by disconnecting or connecting the DO dry contact to control the reset of the 3G router.

Considering the restrictions on the current that can pass the DO port of the SmartLogger, you need to determine the number of DO ports to be used for the control based on the maximum power supply current of the 3G router (the maximum power supply current can be calculated based on the maximum power consumption and DC power supply voltage).

- When the power supply current is smaller than 1 A, use one DO port.
- When the power supply current is larger than 1 A but smaller than 1.6 A, use two DO ports.
- When the power supply current is larger than 1.6 A but smaller than 2.4 A, use three DO ports.
- When the power supply current is larger than 2.4 A, access is not allowed because the current exceeds the upper limit.

Connecting a 3G Router to the SmartLogger Over a DO Port

Before connecting a 3G router to the SmartLogger, cut off a DC power cable of the connector, and then connect the cable cut to the DO port on the SmartLogger.

• Figure 7-111 shows the connection when one DO port is used.

AC Input

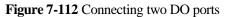
Adapter

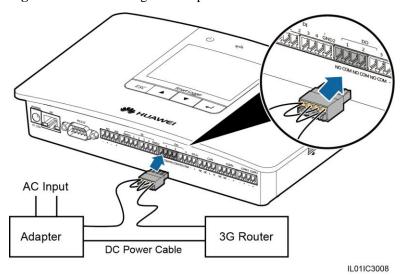
DC Power Cable

IL01IC3007

Figure 7-111 Connecting one DO port

• Figure 7-112 shows the connection when two DO ports are used.





• Figure 7-113 shows the connection when three DO ports are used.

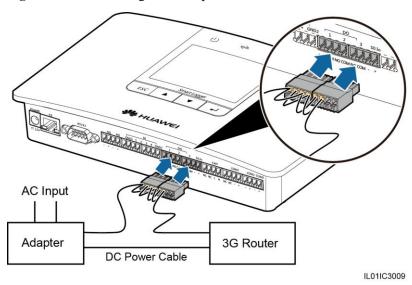


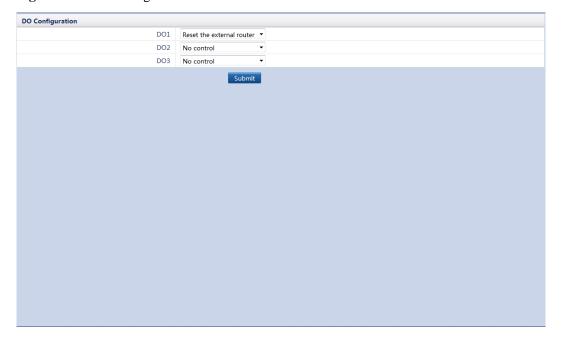
Figure 7-113 Connecting three DO ports

DO Configuration

After connecting the 3G router to the SmartLogger properly, you can set DO configuration parameters over the WebUI to make the external 3G router automatically reset if the SmartLogger fails to connect to the NetEco, email server and FTP server within 30 minutes.

On the **Settings** tab page, choose **Port Settings** > **DO** and set **DO1**, **DO2**, and **DO3** to **Reset the external router** or **No control**, as shown in Figure 7-114. Because of the limited permission, select the User name as **Advanced User**.





■ NOTE

Set **DO1**, **DO2**, and **DO3** to **Reset the external router** or **No control** based on the connections between the router and the three DO ports of the SmartLogger.

7.36.2 Setting USB Parameters

This topic describes how to set USB parameters for resetting an external 3G router over the WebUI.

Context

The SmartLogger provides a USB port, which has a power capacity of 5 V/1 A. If the DC power cable of the 3G router has a standard USB connector and has a maximum current of less than 1 A, it can directly connect to the USB port on the SmartLogger. Hence the SmartLogger can power on or off the 3G router, which allows the SmartLogger to control the reset of the 3G router when the communication link is interrupted.



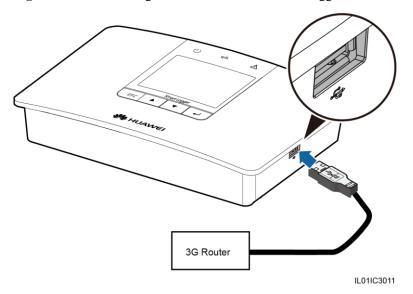
NOTICE

- Only the SmartLoggers in versions later than V100R001C90SPC300 enjoy this function.
- If the maximum working current of the 3G router is greater than 1 A, it cannot be connected over a USB port.

Connecting a 3G Router over a USB

Connect the USB connector of the DC power cable of the 3G router to the USB port on the SmartLogger, as shown in Figure 7-115.

Figure 7-115 Connecting the 3G router and the SmartLogger

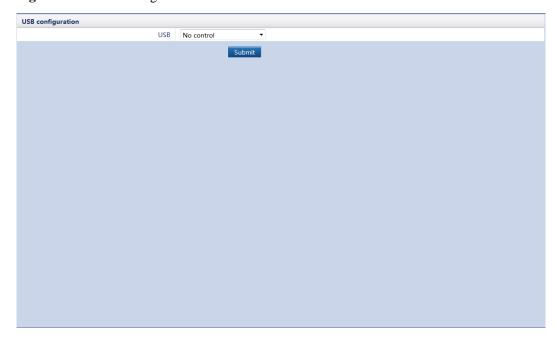


USB Configuration

After connecting the 3G router to the SmartLogger properly, you can set USB configuration parameters over the WebUI to make the external 3G router automatically reset if the SmartLogger fails to connect to the NetEco, email server and FTP server within 30 minutes.

On the **Settings** tab page, choose **Port Settings** > **USB** and set USB to **Reset the external router** or **No control**, as shown in Figure 7-116. Because of the limited permission, select the User name as **Advanced User**.

Figure 7-116 USB configuration



7.37 Dry contact remote shutdown

You can shut down the inverter remotely by controlling dry contacts on the WebUI.

The SmartLogger provides eight DI ports, that is, DI1 (GND1) to DI4 (GND1) and DI1 (GND2) to DI4 (GND2). The OVGR can be connected to any DI port, as shown in Figure 7-117.

Figure 7-117 Networking

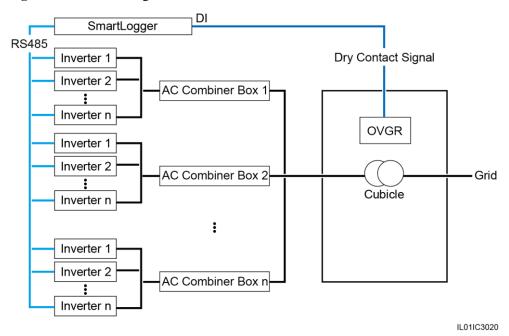


Figure 7-118 shows the DI ports of the SmartLogger.

Figure 7-118 DI ports of the SmartLogger

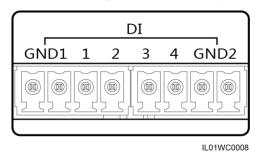


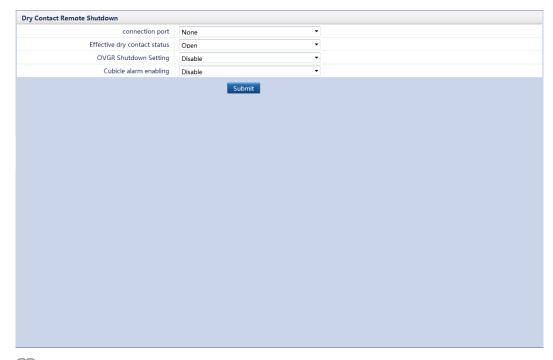
Table 7-3 describes the DI ports.

Table 7-3 DI port description

Port	Function
GND1	GND1
1	DI_1
2	DI_2
3	DI_3
4	DI_4
GND2	GND2

On the **Settings** tab page, select **Dry Contact Remote Shutdown** and set **Connection port**, **Effective dry contact status**, **OVGR Shutdown Setting**, and **Cubicle alarm enabling**, as shown in Figure 7-119. Because of permission restriction, you must log in as **Special User**.

Figure 7-119 Dry contact remote shutdown



MOTE

- The OVGR sends dry contact signals and can be connected to any DI port of the SmartLogger. Set
 related parameters based on the actual connection between the OVGR and the SmartLogger.
 Otherwise, the dry contact remote shutdown function cannot be implemented.
- Set **Connection port** based on the actual connection between the OVGR and the SmartLogger.
- Effective dry contact status can be set to Close or Open. If OVGR Shutdown Setting is set to Enable and Effective dry contact status is set to Close, the SmartLogger sends the inverter remote shutdown command only when the DI port specified by Connection port is in Close state.
- OVGR Shutdown Setting can be set to Enable or Disable. Set OVGR Shutdown Setting as required.
- Cubicle alarm enabling can be set to Enable or Disable. If Cubicle alarm enabling is set to
 Enable, if the dry contact signal is effective and the Cubicle is abnormal, an alarm indicating
 abnormal Cubicle is generated.

7.38 Firmware Upgrade

You can upgrade the firmware of the SmartLogger, inverters, or AC combiner boxes, PLC module, or PID module over the WebUI.

On the **Maintenance** tab page, click **Firmware Upgrade** to upgrade firmware for the SmartLogger, inverters, AC combiner boxes, PLC module, or PID module, as shown in Figure 7-120. Because of the permission restriction, log in as **Advanced User** or **Special User**.

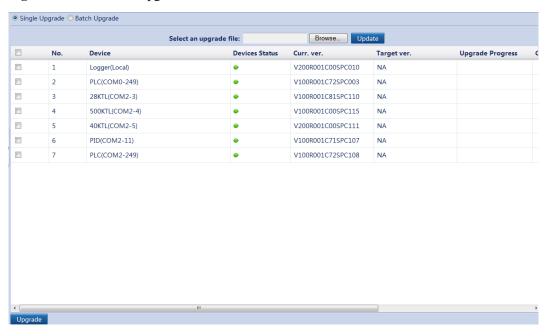


Figure 7-120 Firmware upgrade

- The single upgrade mode will upgrade the specified device.
- The batch upgrade mode will upgrade the SUN2000 inverters in batches.

Single Upgrade

- 1. Select **Single Upgrade**.
- 2. Select the name of the device that requires a firmware upgrade.



NOTICE

The Single Upgrade mode does not apply to two or more types of devices each time. For example, you cannot select both SUN2000 and the PLC module.

- 3. Select the upgrade file.
- 4. Click Upgrade.

Batch Upgrade



The SUN2000 that can be upgraded in batches on the SmartLogger must be SUN2000 V100R001C11SPC409, SUN2000 V100R001C81SPC101 and its later patch versions, or SUN2000 V200R001C00 and its later patch versions.

- 1. Select **Batch Upgrade**.
- 2. Select the upgrade file.
- 3. Click Upgrade.

7.39 Viewing Product Information

This topic describes how to view SmartLogger information, including SN, Hardware Version, Device Type, and Firmware Version, over the WebUI.

On the **Maintenance** tab page, click **Product Information**. **SN**, **Hardware Version**, **Device Type**, and **Firmware Version** are displayed, as shown in Figure 7-121.

Figure 7-121 Product information



7.40 Security Settings

You can configure security settings on the WebUI.

On the **Maintenance** tab page, select **Security Settings** to view the user names and online status, set the automatic logout time, upload the network security certificate, update the key, or export certificate file, as shown in Figure 7-122.

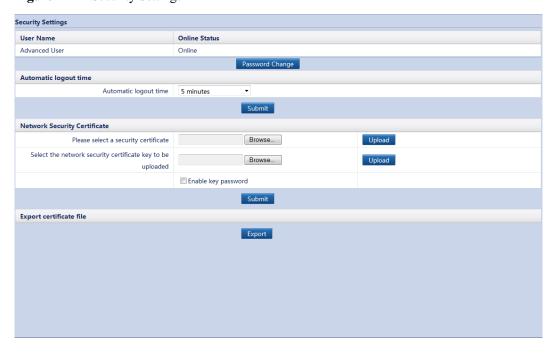


Figure 7-122 Security Settings

MOTE

- There are three roles of the system user: Common User, Advanced User and Special User. The
 initial password is 000001 in V100R001C95SPC010 or earlier and is Changeme in
 V100R001C95SPC020 or later.
- After the first login, it is recommended that you change the initial password immediately to ensure
 account security.
- You are advised to change the password at least once every half year to prevent unauthorized use of your account, which affects system security.
- It is recommended that the existing network security certificate and key (if available) be used. If a
 network security certificate is not available, you can export the root certificate and import the
 certificate to the browser.

Change the password in compliance with the following principles:

- A password must contain 6 to 20 characters.
- A password must be a combination of at least two types of digits, uppercase letters, and lowercase letters.
- The new password must be different from the old one.

7.41 System Reset

You can reset the system on the WebUI.

On the **Maintenance** tab page, select **System Reset** to reset the SmartLogger, as shown in Figure 7-123.

Figure 7-123 System reset

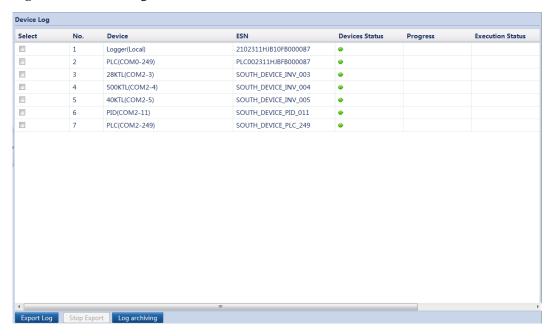


7.42 Exporting Device Logs

You can export device logs over the WebUI.

On the **Maintenance** tab page, select **Device Log**, select the device whose logs need to be exported, and click **Export Log**, as shown in Figure 7-124. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-124 Device logs



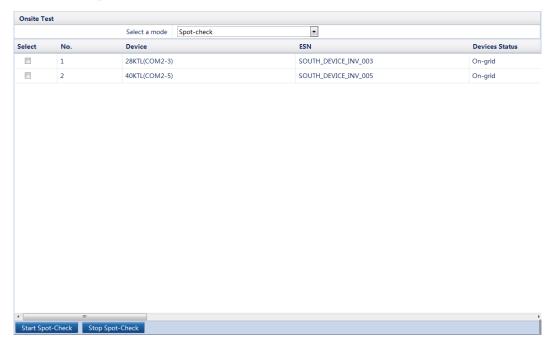
- You can click **Stop Export** to cancel the export when logs are being exported.
- After logs are exported, click Log archiving to open or save the log file.

7.43 Onsite Test

Spot-check

To carry out a spot-check for the device whose **Grid Code** is **Japan standard**, choose **Onsite Test** > **Spot-check**, as shown in Figure 7-125.

Figure 7-125 Spot-check

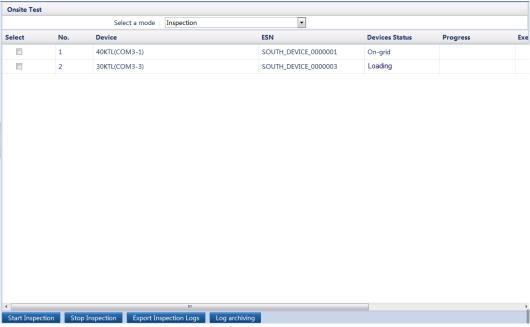


Inspection

After an inverter is put into use, it needs to be inspected periodically for potential risks and problems. The SmartLogger can inspect inverters over the WebUI.

Choose **Onsite Test** > **Inspection** to inspect inverters one by one or in batches, as shown in Figure 7-126.

Figure 7-126 Inspection
Onsite Test



MOTE

- To inspect one or more inverters, select **Single Inspection**.
- To inspect all inverters whose status is **On-grid**, select **Batch Inspection**.
- After the inspection is complete, click **Export Inspection Logs** to export logs if necessary. After logs are exported, you can click **Log archiving** to open or save log files.

7.44 Device management

This topic describes how to manage devices on the WebUI.

7.44.1 Connecting a Device

You can manage devices on the WebUI.

Connecting a Device

On the **Maintenance** tab page, choose **Device Mgmt.** > **Connect Device**, as shown in Figure 7-127. Because of the permission restriction, log in as **Advanced User** or **Special User**.

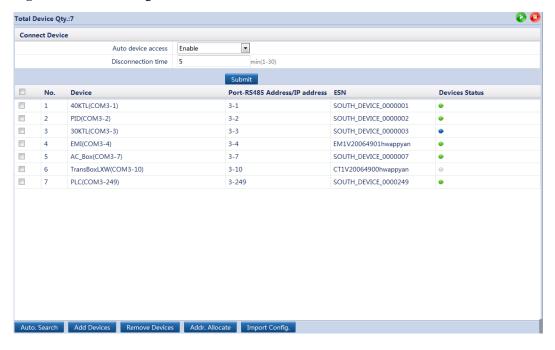


Figure 7-127 Connecting a Device

Select Auto. Search, Add Devices, Remove Devices, Auto Assign Address, Import Config., or Export Config. as required.

M NOTE

- If Auto device access is set to Enable, the SmartLogger will detect the system every 10 minutes if
 the SmartLogger connects to an inverter over an RS485 communications cable in non-grid-tied
 status from 0:00 a.m. to 4:00 a.m. or the SmartLogger connects to no device. If a new device is
 found, the SmartLogger automatically connects to the device. If the RS485 address of the device is
 already in use, the SmartLogger automatically allocates a new address to the device.
- The environment monitoring instrument (EMI), power meter, SmartLogger, PLC module, and third-party device cannot be automatically detected, and need to be added manually.
- Before adding an EMI manually, correctly set the EMI parameters. For details, see 7.28 Setting EMI Parameters.
- Before adding a power meter manually, correctly set the meter parameters. For details, see 7.29
 Setting Power Meter Parameters.
- After the setting of Addr. Allocate is completed, device addresses can be adjusted based on sequence numbers.
- When connecting a third-party device, you can click **Import Config.** to import a configuration file and manually add the device. Then, the device can be queried on the **Monitoring** page.
- When connecting a third-party device, you can export the configuration file by clicking Export Config.
- When changing the name of the exported file, retain the extension .tar.gz. Otherwise, the file cannot be functional.

Batch Power-on and Power-off

On the **Connect Device** tab, you can power on or off all the inverters connected to the SmartLogger. The power-on button (green) and power-off button (red) are located in the upper right corner of the tab as shown in Figure 7-128.

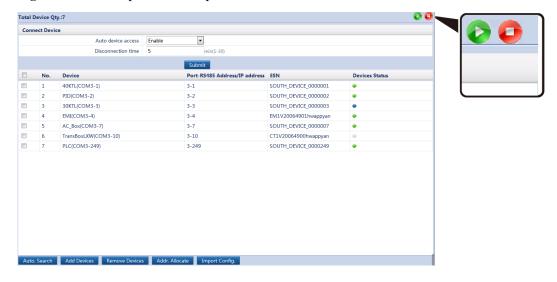


Figure 7-128 Batch power-on and power-off

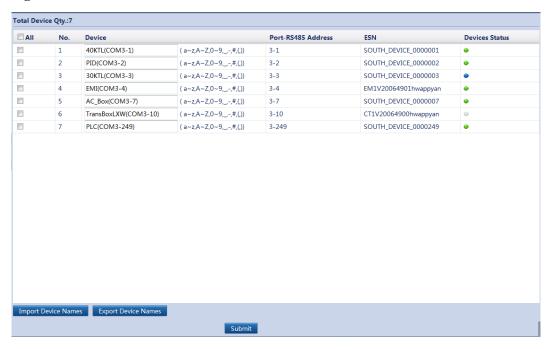
- When you click the **Batch power on** or **Batch power off** button, the system displays a message asking you to confirm the operation. You can click **OK**.
- If a slave SmartLogger is configured in a power station, when the batch power-on/off command is sent to the master SmartLogger, the command is also synchronized to the slave SmartLogger. The slave SmartLogger then synchronizes the command to all inverters connected to it.

7.44.2 Device Name

You can modify **Device** and **RS485 Address** on the **Device list** over the WebUI. You can modify each device or import a device information file to the APP for batch modification. Batch modification facilitates site deployment.

On the **Maintenance** tab, choose **Device Mgmt.** > **Device Name**, as shown in Figure 7-129. Because of permission restriction, you must log in as **Advanced User** or **Special User**.

Figure 7-129 Device name



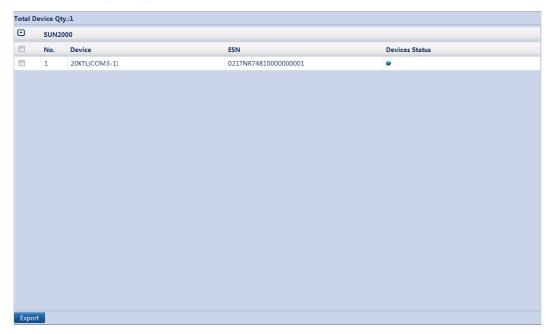
- Click Import Device Names to import a CSV file that contains device names.
- Click **Export Device Names** to export the current device names to a CSV file.

7.44.3 Exporting Parameters

You can export parameters on the WebUI.

On the **Maintenance** tab, choose **Device Mgmt.** > **Export Param.**, as shown in Figure 7-130. Because of permission restriction, you must log in as **Advanced User** or **Special User**.

Figure 7-130 Exporting parameters



■ NOTE

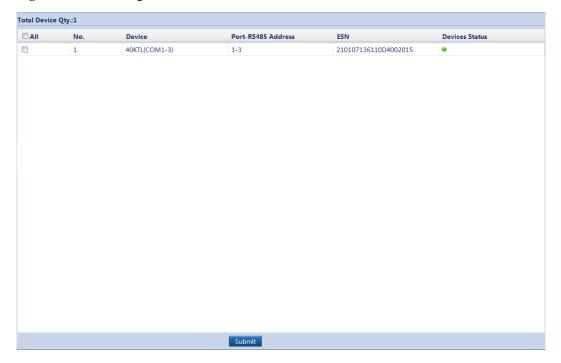
You can click **Export** to export configuration parameters of multiple SUN2000 inverters to a CSV file. Onsite engineers can then check whether the inverter configurations are correct in the exported file.

7.44.4 Resetting Alarms

If you need to clear certain or all active alarms and historical alarms and re-collect alarms, reset alarms.

On the **Maintenance** tab page, choose **Device Management** > **Alarm Reset**, as shown in Figure 7-131. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-131 Resetting alarms





- Resetting alarms on the WebUI will delete all active and historical alarms for the selected device and enable the SmartLogger to collect new alarm data.
- If **Data Clear** is performed on the inverter, **Alarm Reset** must be performed on the SmartLogger and NMS. Otherwise, the SmartLogger cannot collect alarm information generated by the inverter after **Data Clear** is performed.
- If **Alarm Reset** or **Data Clear** is performed on the SmartLogger, **Alarm Reset** must also be performed on the NMS. Otherwise, the NMS cannot obtain alarm information collected by the SmartLogger after **Alarm Reset** or **Data Clear** is performed on the SmartLogger.

8 Grid Dispatch

This topic describes the power grid dispatching function.

In a PV power generating system, the short-term fluctuation and periodic changes of the local illumination may lead to a tremendous power fluctuation, which brings risks to the power grid running.

The power grid dispatching center should build up a real-time dispatching mechanism to ensure that the power output from the PV power generating system takes precedence during the load peak hours. If the power grid is faulty or a voltage or frequency imbalance occurs between the power generating side and the power consuming side, the power grid dispatching center sends the active power control and reactive power control command to ensure the secure power grid running.

As the core device in the communications system of the PV power station, Smart Logger receives the remote dispatching signals, analyzes the dispatching commands, and sends the commands to all the inverters connected to it. The power grid dispatching person can set all the parameters on the WebUI to meet different customers' requirements.

By integrating grid-tied PV system standards of various countries and regions, the Smart Logger also provides various and flexible power grid dispatching meet different requirements of countries and regions.

8.1 Power Grid Dispatching Modes

This topic describes the power grid dispatching modes.

Two power grid dispatching modes are available, active power control and reactive power control. Before you perform the power control for the power station, set the corresponding mode to **Enable** and then correctly set related parameters.

8.1.1 Active Power Control

This topic describes how to set the active power control mode.

The SmartLogger can send remote dispatching commands in real time to inverters connected to it, which ensures that the PV power station can quickly respond to the requirements of the power grid company.

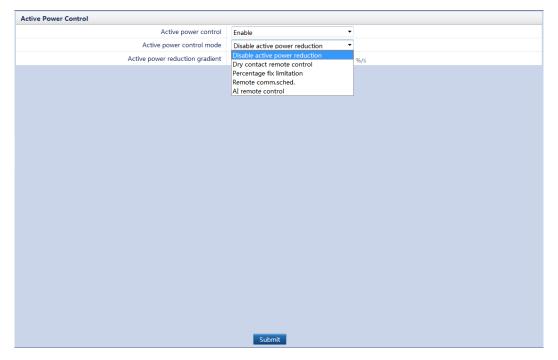
If the power grid or the PV power station is faulty, the power grid dispatching personnel should limit the active power or disable all the active power for the power station, that is, to enable the active power reduction mode.



NOTICE

The SmartLogger controls the active power of connected inverters only when active power control is **Enable**.

Figure 8-1 Active Power Control



8.1.2 Reactive Power Control

This topic describes how to set the reactive power control mode.

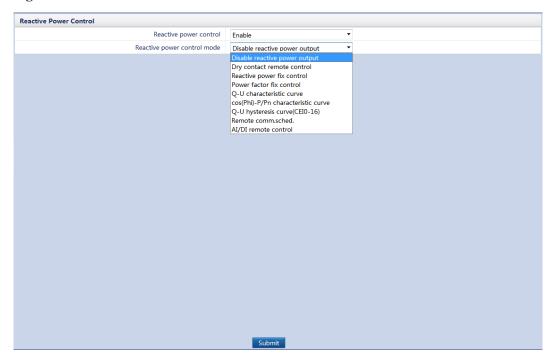
The SmartLogger can send remote dispatching commands in real time to inverters connected to it, which ensures that the PV power station can quickly respond to the requirements of the power grid company.

Large-scale power stations are required to adjust the voltage at the grid-feeding point. Power grid dispatching personnel enables the power station to reduce or add the reactive power at the grid-feeding point, that is, to enable the reactive power compensation, based on the real-time reactive power status in the power grid.



The SmartLogger controls the reactive power of connected inverters only when reactive power control is **Enable**.

Figure 8-2 Reactive Power Control



8.2 Application Scenarios

This topic describes the application scenarios of the power grid dispatching function.

Requirements of power grid dispatching vary with countries and power grid companies. The number of inverters varies in accordance with the power level of the power station and hence the networking mode differs too. A different networking mode indicates a different power grid dispatching data source and a different communication mode between the SmartLogger and the power grid. There are four application scenarios of the power grid dispatching: local dispatching, dry contact dispatching, AI/DI dispatching, and communication dispatching.

8.2.1 Local Dispatching

This topic describes the compositions and application of the local dispatching.

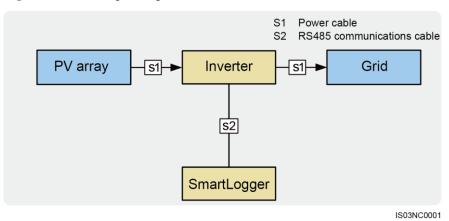
Local dispatching applies to power stations that have a rated power of no more than 100 kW and less than five grid-tied inverters. As the system is small-sized, the power grid company has simple requirements of power dispatching. Hence, local dispatching is sufficient.

Some power grid companies require no remote reactive power control but multiple local reactive power control modes.

You can set the power control modes on the WebUI based on the actual output features. The SmartLogger continuously controls the power output of the inverters based on the user setting.

Figure 8-3 shows the networking application of the local dispatching.

Figure 8-3 Local dispatching



Active Power Control

The SmartLogger provides simplified local active power percentage configuration as well as the local power control automation, that is, to automatically adjust the active power reduction percentage in different periods of the day.

• If the inverters are allowed to run overloaded, set **Active Power Control Mode** to **Disable active power reduction**.



NOTICE

This function takes effect only when **Active Power Control** is set to **Enable**.

• If the maximum power output of the inverters should be controlled, set **Active Power Control Mode** to **Percentage fix limitation**.

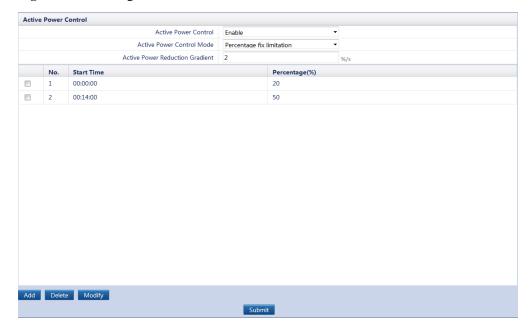


Figure 8-4 Percentage fix limitation

- Set Start Time in the format of hh:mm:ss (in which hh means hour, mm means minute, ss means second).
- If no separate periods are required, users can set only one start time.
- If the inverters should run under a specified maximum power in certain periods of the day, first set
 Active Power Control Mode to Percentage fix limitation, add setting records based on the site
 requirements, and then set Start Time and Percentage.
- If the inverters should run under 70% derating power, set **Active Power Control Mode** to **Percentage fix limitation**, add one setting record, and then set **Percentage** to **70**.

Reactive Power Control

The SmartLogger provides simplified local reactive power parameters configuration as well as local power control automation, that is, to automatically adjust the power factor or absolute value of the reactive power compensation in different periods of the day.

• If the power station is not required to adjust the voltage at the grid-tied point or perform reactive power compensation, inverters can run with pure active power output. Hence, set Reactive Power Control Mode to Disable reactive power output.



NOTICE

This function takes effect only when **Reactive Power Control** is set to **Enable**.

• If the power station is required to generate at the grid-tied point a specified constant reactive power within the power factor range, set **Reactive Power Control Mode** to **Reactive power fix control**, add the setting records, and then set **Start Time** and **Reactive Power** corresponding to a certain period.

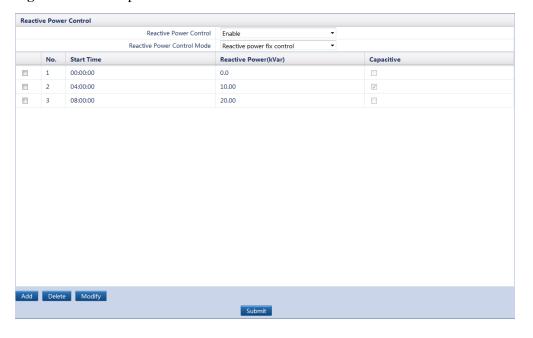


Figure 8-5 Reactive power fix control

- Set Start Time in the format of hh:mm:ss (in which hh means hour, mm means minute, ss means second).
- If no separate periods are required, users can set only one start time.
- If a " $\sqrt{}$ " is under **Capacitive**, the power grid supplies capacitive reactive power to the power station. If no " $\sqrt{}$ " is under **Capacitive**, the power station supplies inductive reactive power to the power grid.
- The upper threshold of **Reactive Power** is the rated output power sum of all online inverters and the lower threshold is **0**.
- Limited by the power factor (the maximum range is 1 to 0.8), the reactive power at the grid-tied point cannot stay constant when the real-time active power is small.
- If the power station is required to generate a constant power factor at the grid-tied point
 and the inverters are required to adjust the real-time reactive power based on the set
 power factor, set Reactive Power Control Mode to Power factor fix control, add the
 setting records, and then set Start Time and Power Factor corresponding to a certain
 period.

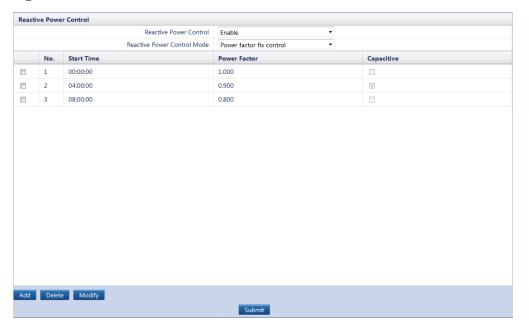


Figure 8-6 Power factor fix control

- Set Start Time in the format of hh:mm:ss (in which hh means hour, mm means minute, ss means second).
- If no separate periods are required, users can set only one start time.
- If a "√" is under **Capacitive**, the power grid supplies capacitive reactive power to the power station. If no "√" is under **Capacitive**, the power station supplies inductive reactive power to the power grid.
- If the remote control of the reactive power compensation is unavailable, the SmartLogger provides the Q-U characteristic curve, cos(Phi)-P/Pn characteristic curve, or Q-U Hysteresis curve(CEI0-16) for substitute. The power dispatching personnel specifies the characteristic curve according to the requirements of the local power grid and grid-tied power system and sends the signal to all the connected inverters in real time

Set Reactive Power Control Mode to Q-U characteristic curve, as shown in Figure 8-7, or to cos(Phi)-P/Pn characteristic curve, as shown in Figure 8-8, or to Q-U Hysteresis curve(CEI0-16), as shown in Figure 8-9.

M NOTE

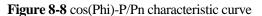
- Q-U characteristic curve control mode is to dynamically adjust the ratio of the output reactive power
 to apparent power Q/S in accordance with the ratio of the actual grid voltage to the rated grid
 voltage U/Un (%).
- The cos(Phi)-P/Pn characteristic curve control mode is to dynamically adjust the output power factor cos(Phi) in accordance with the ratio of the actual inverter output power to rated inverter power P/Pn (%) based on the VDE-4105\BDEW German standard.
- Q-U Hysteresis curve(CEI0-16) control mode is the Italian standard CEI0-16 version of the Q-U characteristic curve. It dynamically adjusts the output reactive power of the inverter in accordance with the ratio of the actual voltage to the rated voltage of the grid-tied point. And the final value should be in the form of Q/Pn.

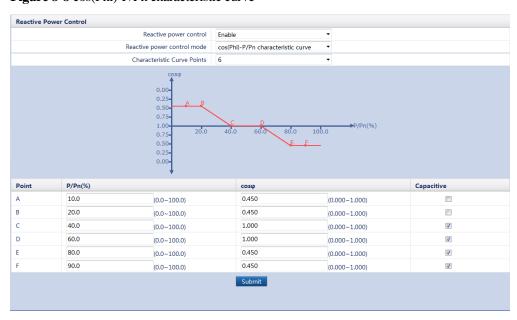


Set the parameters of characteristic curves under instructions from professionals to ensure that the inverters work properly.

Reactive Power Control Reactive Power Control Reactive Power Control Mode Q-U characteristic curve Reactive Power Adjustment Time 10 Percents Of Trigger Frequency Characteristic Curve Points U/Un(%) Q/S Capacitive (80.0~115.0) (0.000~0.500) 90.0 (80.0~115.0) 0.310 (0.000~0.500) 95.0 0.000 (80.0~115.0) (0.000~0.500) D (80.0~115.0) (0.000~0.500) 105.0 0.310 V

Figure 8-7 Q-U characteristic curve





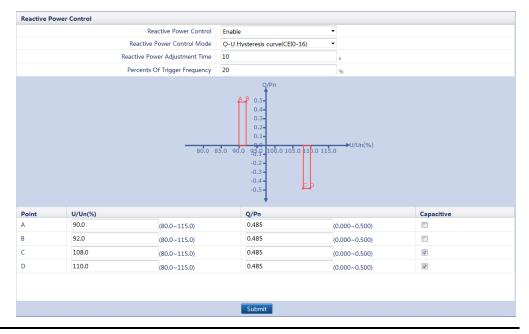


Figure 8-9 Q-U Hysteresis curve(CEI0-16)



When you set **Q-U Hysteresis curve** (**CEI0-16**), ensure that the **Capacitive** settings of A and B are consistent, the **Capacitive** settings of C and D are consistent, and the **Capacitive** settings of A and B are different from the **Capacitive** settings of C and D.

M NOTE

- When you set the curve, ensure that the U/Un(%) or P/Pn(%) value of a point is larger than the U/Un(%) or P/Pn(%) value of the previous point. Otherwise, the Invalid input message is displayed.
- If a "√" is under **Capacitive**, the power grid supplies capacitive reactive power to the power station. If no "√" is under **Capacitive**, the power station supplies inductive reactive power to the power grid.
- Both the Q-U characteristic curve and cos(Phi)-P/Pn characteristic curve can support a maximum of 10 valid data points.
- Set **Reactive Power Adjustment Time** to specify the changing intervals of the reactive power compensation for the grid-feeding point in the PV power station. The range is 0 to 60s.
- When adding data points for the curve, refer to the provided range in the right of the text box.

8.2.2 Dry Contact Dispatching

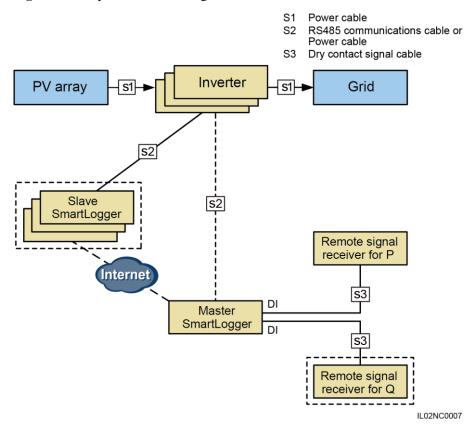
This topic describes the compositions and application of the dry contact scheduling.

Dry contact scheduling mainly applies to power stations that have a rated power larger than 100 kW and require remote and real-time adjustment of active power and reactive power over dry contacts.

The SmartLogger scans all the dry contact signals sent from the power grid scheduling devices (the wireless receiver controller or power carrier communications devices), converts the signals into valid command data identified by the inverters, and sends the data to all the inverters connected to the SmartLogger.

Figure 8-10 shows the networking application of the dry contact dispatching.

Figure 8-10 Dry contact scheduling





If a Slave SmartLogger is configured in the system, inverters should be connected to the Slave SmartLogger instead of the Master SmartLogger. Otherwise, inverters that connect to the Master SmartLogger cannot perform the power grid dispatching command.

M NOTE

- Slave SmartLogger and Remote signal receiver for Q are optional access devices.
 If a Slave SmartLogger is to be connected, manually add the Slave SmartLogger on the monitoring panel or WebUI of the Master SmartLogger.
- Master SmartLogger connects to Slave SmartLogger over the Ethernet. The Slave SmartLogger functions as the network device for the Master SmartLogger.
 - A slave SmartLogger synchronizes the commands sent by master SmartLogger to devices connected to the slave SmartLogger.
- Remote signal receiver receives the scheduling commands sent by the power grid company, converts them into dry contact signals, and then sends them to the Master SmartLogger.
 - Remote signal receiver for P receives the active power scheduling commands and Remote signal receiver for Q receives the reactive power scheduling commands.

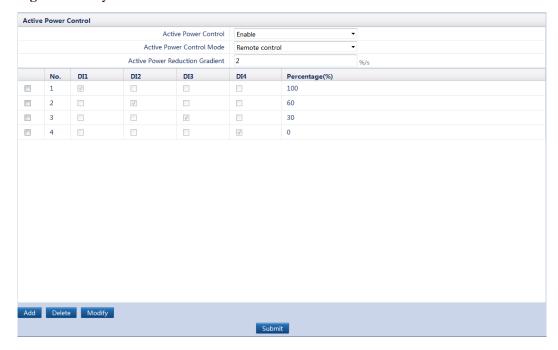
Active Power Control

Set Active Power Control Mode to Dry contact remote control, as shown in Figure 8-11.



Ensure that the SmartLogger is properly connected to the ripple control receiver before you set **Active Power Control Mode** to **Dry contact remote control**. For details, see 4.11 Connecting the SmartLogger to a Ripple Control Receiver.

Figure 8-11 Dry contact remote control



MOTE

- \bullet The active power is reduced by percentage. Four levels are recommended: 100%, 60%, 30%, and 0%.
- A maximum of 16 levels is supported for the active power reduction percentage.
- "√" indicates low level. When connecting to GND1, the four DI ports of the SmartLogger are low-level ports. If not connected, the ports are high-level ports.
- The percentage levels of DI1, DI2, DI3, and DI4 should differ from each other. Otherwise, an abnormal command is generated.
- If the SmartLogger supports both active power control and reactive power control, DI1, DI2, DI3, or DI4 can be selected only once. In this case, four percentage levels are available.

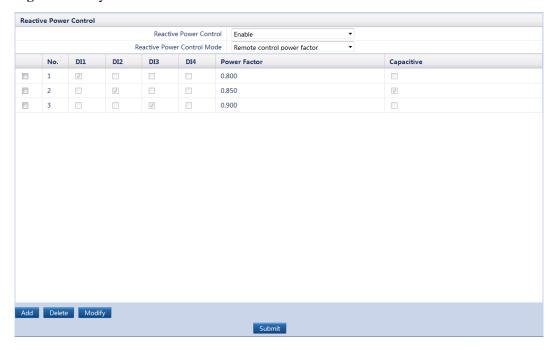
Reactive Power Control

Set Reactive Power Control Mode to Dry contact remote control, as shown in Figure 8-12.



Ensure that the SmartLogger is properly connected to the ripple control receiver before you set **Reactive Power Control Mode** to **Dry contact remote control**. For details, see 4.11 Connecting the SmartLogger to a Ripple Control Receiver.

Figure 8-12 Dry contact remote control



MOTE

- A maximum of 16 levels is supported for power factors.
- "√" means low level. When the four DI ports in the SmartLogger are connected to the GND2, low level is indicated; when they are not connected to the GND2, high level is indicated.
- The power factors of DI1, DI2, DI3, and DI4 should differ from each other. Otherwise, an abnormal command is generated.
- If the SmartLogger supports both active power control and reactive power control, DI1, DI2, DI3, or DI4 can be selected only once. In this case, four power factor levels are available.
- If a "\" is under **Capacitive**, the power factor is a negative value, indicating that the power grid supplies reactive power to the power station. If no "\" is under **Capacitive**, the power factor is a positive value, indicating that the power station supplies reactive power to the power grid.

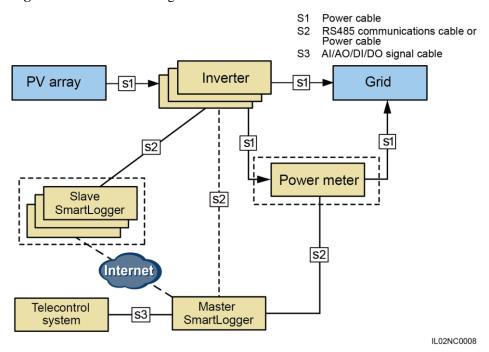
8.2.3 AI/DI Scheduling

This topic describes the compositions and application of the AI/DI scheduling.

AI/DI scheduling mainly applies to power stations that have a higher rated output power level and complex networking. The power grid company requires more remote and real-time scheduling methods, scheduling commands of higher precision, and communication of higher reliability. The power grid company adjusts the power of the power station and also requires the power station to send back the key sampling data of the grid-tied point.

One SmartLogger can connect to a maximum of 80 devices. The number of inverters is more than 80 in the AI/DI dispatching scenario. Hence, a certain number of Slave SmartLoggers should be configured. The Master SmartLogger scans over the AI/DI port the remote dispatching commands sent by the power grid company, sends them to the Slave SmartLogger. The Slave SmartLogger sends the commands to all inverters. Figure 8-13 shows the networking application of the AI/DI dispatching.

Figure 8-13 AI/DI scheduling





NOTICE

If a Slave SmartLogger is configured in the system, inverters should be connected to the Slave SmartLogger instead of the Master SmartLogger. Otherwise, inverters that connect to the Master SmartLogger cannot perform the power grid dispatching command.

M NOTE

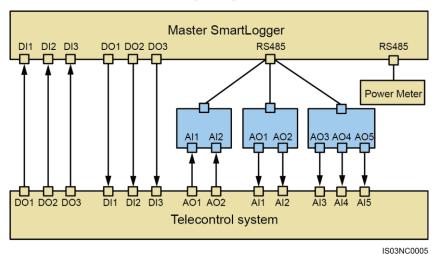
- The Master SmartLogger connects to the Slave SmartLogger over the Ethernet. The Slave SmartLogger functions as the network device for the Master SmartLogger.
 - If a Slave SmartLogger is to be connected, manually add the Slave SmartLogger on the monitoring panel or WebUI of the Master SmartLogger.
- The Master SmartLogger forwards the scheduling commands sent by the Telecontrol system to all Slave SmartLoggers. The Slave SmartLoggers send the commands to the connected inverters.
- The power and voltages at the grid-tied point collected by the power meter are compared with the scheduling commands from the power grid company to verify that the power station operates in accordance with requirements of the power grid company.

Port Expansion

Power grid scheduling commands are sent over AI/AO ports while the SmartLogger is not configured with AI/AO ports. Hence an ADAM device is required.

The ADAM port expansion device and remote terminal control system should both be connected to the Master SmartLogger. Figure 8-14 shows the cable connection.

Figure 8-14 Cable connection for port expansion



10001

☐ NOTE

Functions of ports in the remote terminal control system are described as follows:

- AO1 sends the active power derating command.
- AO2 sends the reactive power derating command.
- All receives the active power data of the grid-tied point.
- AI2 receives the reactive power data of the grid-tied point.
- AI3 receives the voltage data of the grid-tied power point.
- AI4 receives the active power derating command feedback of the SmartLogger.
- AI5 receives the reactive power derating command feedback of the SmartLogger.
- DO1 to DO3 send the reactive power adjustment mode command.
- DI1 to DI3 receive the reactive power adjustment mode command feedback of the SmartLogger.

Extended Port Settings

Correct settings of the extended ports ensure the normal communication between the SmartLogger and power meter and the remote terminal control system, as shown in Figure 8-15.

AI Expansion Port Port 485Port 485Address Register Address Port Specifications AI3 80 (0~20mA) (0~247) (0~7) (0~3,0:Disable) AI4 80 (0~20mA) (0~3,0:Disable) **AO Expansion Port** 485Port 485Address Register Address Port Specifications No Port AO1 80 (0~247) (0~3) (0~20mA) (0~3,0:Disable) AO2 80 (0~247) (0~3) (0~20mA) (0~3,0:Disable) 80 AO3 (0~247) (0~3) (0~20mA) (0~3,0:Disable) 80 (0~20mA) AO4 (0~247) (0~3) (0~3.0:Disable) AO5 80 (0~247) (0~3) (0~20mA) (0~3.0:Disable)

Figure 8-15 Extended Port Settings

NOTE

- 1 to 3 under 485Port indicates that the AO ports connect to the COM1 to COM3 correspondingly. 0 indicates that the port is disabled.
- 485Address is the actual 485 address set for the ADAM. Set Register Address based on the actual
 connection.
- Set Port Specifications based on the standards of the power grid company.

Power Meter Parameters Settings and Feedback GCP Parameters Settings

To configure the power meter parameters and feedback GCP parameters, see 7.29 Setting Power Meter Parameters.

Active Power Control

The remote scheduling command sent by the SmartLogger controls the active power output of the power station in analog input mode. Set **Active Power Control Mode** to **AI remote control**, as shown in Figure 8-16.



NOTICE

Before you set **Active Power Control Mode** to **AI remote control**, ensure that connections between the SmartLogger, ADAM, and the remote terminal control system are correct.

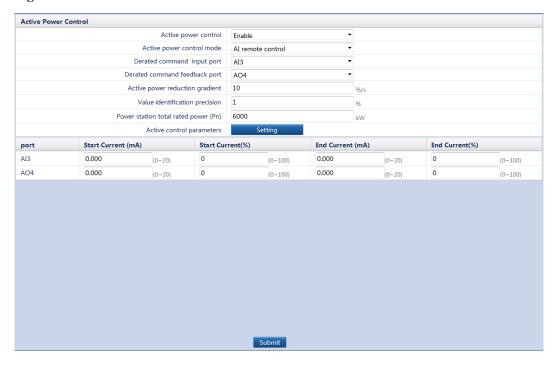


Figure 8-16 AI remote control

- Based on the actual cable connection, select a proper Derated command input port.
- Based on the actual cable connection, select a proper Derated command feedback port.
- Value identification precision identifies the remote scheduling command variation threshold in the case of active power adjustment to prevent frequent control command sending due to the sampling deviation. Its setting range is 1% to 100%.
- Power station total rated power (Pn) is the maximum power capacity of the power station agreed by the power station and the power grid company. Confirm this parameter value with the power grid company and set it correctly.
- Set Start Current, End Current, Start Current(%), and End Current(%) based on requirements of the power grid company.

Reactive Power Control

The remote scheduling command sent by the SmartLogger controls the reactive power output of the power station in analog input mode. Set **Reactive Power Control Mode** to **AI/DI remote control**, as shown in Figure 8-17.



NOTICE

Before you set **Reactive Power Control Mode** to **AI/DI remote control**, ensure that connections between the SmartLogger, ADAM, and the remote terminal control system are correct.

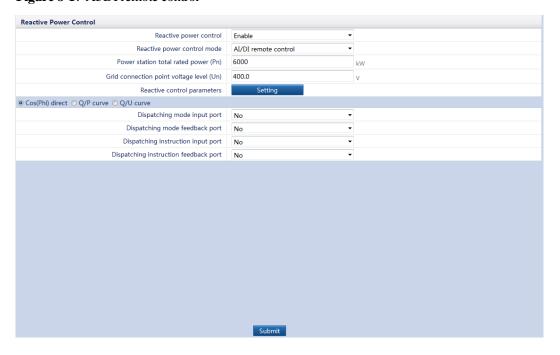


Figure 8-17 AI/DI remote control

- Power station total rated power (Pn) is the maximum power capacity of the power station agreed by the power station and the power grid company. Confirm this parameter value with the power grid company and set it correctly.
- Grid connection point voltage level (Un) is the voltage level at the connection point between the power station and the power grid. Set this parameter based on the power grid status.
- Set parameters under Cos(Phi) direct, Q/P curve, and Q/U curve respectively.

8.2.4 Communication Scheduling

This topic describes the compositions and application of the communication scheduling.

Communication scheduling applies to PV plants in China, where an independent power control device delivers a scheduling instruction to the SmartLogger over a communication interface. User configurations or operations are not required in this scenario. The SmartLogger can automatically switch to an appropriate scheduling mode and delivers the scheduling instruction.

Figure 8-18 shows the networking application of the communication scheduling.

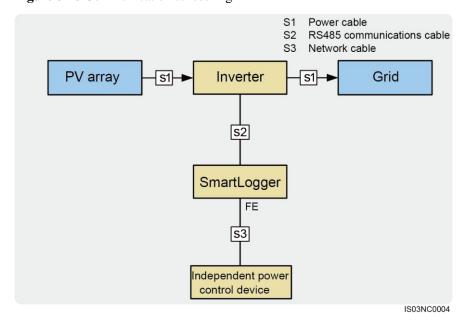
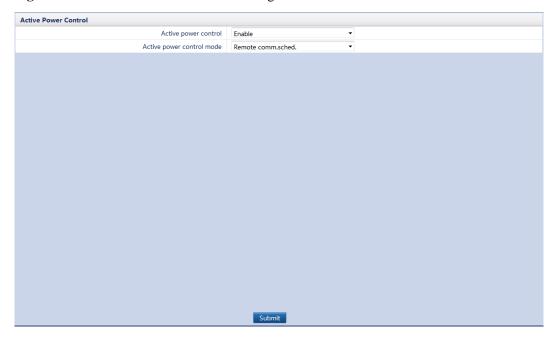


Figure 8-18 Communication scheduling

Active Power Control

When **Active Power Control Mode** is set to **Remote comm.sched.**, as shown in Figure 8-19, the SmartLogger receives the scheduling commands from the upstream NMS, converts them into valid command data identified by the inverters, and then sends the data to all the connected inverters. Based on the principle of preference of remote communication scheduling, the SmartLogger automatically set **Active Power Control Mode** to **Remote comm.sched.** after receiving a scheduling command from the upstream NMS.

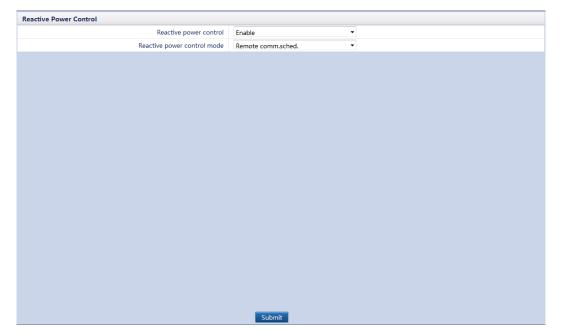




Reactive Power Control

When **Reactive Power Control Mode** is set to **Remote comm.sched.**, as shown in Figure 8-20, the SmartLogger receives the scheduling commands from the upstream NMS, converts them into valid command data identified by the inverters, and then sends the data to all the connected inverters. Based on the principle of preference of remote communication scheduling, the SmartLogger automatically set **Reactive Power Control Mode** to **Remote comm.sched.** after receiving a scheduling command from the upstream NMS.

Figure 8-20 Remote communication scheduling



9 Maintenance

This topic describes how to perform daily maintenance and troubleshooting to ensure long-term proper operation of the SmartLogger.

9.1 Daily Maintenance

This topic describes the daily maintenance for the SmartLogger.

- Check that the SmartLogger is free from strong electromagnetic interference.
- Check that the SmartLogger is free from heat sources.
- Check that the heat dissipation holes are not blocked.
- Clean up the dirt and dust for the SmartLogger periodically.
- Check that the cables are secured periodically.

9.2 Troubleshooting

This topic describes the common faults in the SmartLogger and the troubleshooting measures.

Table 9-1 describes the common faults and the troubleshooting measures.

Table 9-1 Common fault list

No.	Sympto m	Possible Cause	Measures
1	The SmartLog ger cannot be powered on.	 The DC output terminal of the power adapter does not connect to the Power port of the SmartLogger. The AC input terminal of the power adapter does not connect to the AC power port. Power adapter is faulty. The SmartLogger is faulty. 	 Connect the DC output of the power adapter to the Power port of the SmartLogger. Connect the AC input of the power adapter to the AC power port. Replace the power adapter. Contact the supplier or Huawei Customer Service Dept.

No.	Sympto m	Possible Cause	Measures
2	The LCD is off.	 The LCD is faulty. The SmartLogger is faulty. 	Contact the supplier or Huawei Customer Service Dept.
3	The LCD does not respond when a button is pressed.	 The button is faulty. The SmartLogger is faulty. 	Contact the supplier or Huawei Customer Service Dept.
4	Devices cannot be searched.	 The COM ports are not connected to devices, or the cables are loose, disconnected, or reversely connected. The communications parameters for the RS485 port are incorrect. No EMI is manually added. The communications parameters for the EMI are incorrect. The address for the inverter is not within the search address segment set for the SmartLogger. 	 Check the RS485 communications cable connection. If any cable is loose, drops off, or is reversely connected, rectify the connection. Correctly set the RS485 communications parameters, and ensure that the baud rate and the communications address are correctly set. Add the EMI manually. Correctly set the EMI parameters Set the address of the inverter to be within the search address segment set for the SmartLogger.
5	Devices Status is Disconne ction on the SmartLog ger.	 The cable between the device and the SmartLogger is loose or disconnected. The device is powered off. The baud rate or RS485 address of the device is changed. The device is replaced. The device is no longer connected. 	 Verify that the cable between the device and the SmartLogger is properly connected and tightened. Power on the device. Verify the baud rate and RS485 address of the device. If a device is replaced, search for or manually add the device. If the device is removed, remove the device on the SmartLogger.

No.	Sympto m	Possible Cause	Measures
6	The EMI cannot be added.	 The RS485 communications cable between the EMI and the SmartLogger is not properly connected, or the RS485 communications cable is loose or disconnected. The EMI is powered off. The baud rate of the EMI is inconsistent with that of the SmartLogger. Parameter settings of the EMI are incorrect. 	 Verify that the RS485 communications cable is properly connected and tightened. Power on the EMI. Verify the baud rate of the EMI. Log in to the WebUI and verify the parameter settings of the EMI.
7	The SmartLog ger cannot communi cate with the NetEco in the PC.	 The SmartLogger is not connected to the PC, or the cable between the SmartLogger and the PC is loose or disconnected. Ethernet parameters are not properly set. NetEco parameters are not properly set. 	 Connect the Ethernet network port of the SmartLogger to the PC or router. Check that the Ethernet parameters are correctly set. Check that the NetEco parameters are correctly set.
8	Emails cannot be received.	 The SmartLogger cannot communicate with the email server. Ethernet parameters are not properly set. Email parameters are not properly set. 	 Connect the Ethernet network port of the SmartLogger to the PC or router. Check that the Ethernet parameters are correctly set. Check that the Email parameters are correctly set.

9.3 Alarms

This topic describes the common faults in the SmartLogger and the troubleshooting measures.

Table 9-2 describes the common faults and the troubleshooting measures.

Table 9-2 Alarms

Ala rm ID	Alarm	Alarm Severit y	Alarm Sub-I D	Causes	Measure
110	3	Major	1	Under the active power AI remote control mode, the AI port receives currents beyond the configuration range.	 Check on the ADAM4117 the cable connection of the port corresponding to the AI number. Reconnect and secure the cable if it is loose, disconnected, or reversely connected. Enter the active power AI remote control configuration page and check that the start and end current ranges of the AI comply with the requirements of the power grid company. Enter the Extended Port Settings page, check that the current configuration of the AI number is consistent with the current specification of the ADAM4117.
					4. Contact the power grid company to check whether the command data sent is correct.
			2	Under the reactive power AI remote control mode, the command data of the AI port cannot be read due to the ADAM fault, power disconnection, or abnormal link.	 Check whether the communications cable connection between the ADAM4117 and the SmartLogger is correct, whether the RS485 address conflicts with the addresses of other devices, whether the baud rate is consistent with that set for the corresponding SmartLogger port. Check whether the auxiliary power supply for the ADAM4117 is normal.

Ala rm ID	Alarm	Alarm Severit y	Alarm Sub-I D	Causes	Measure
			3	Under the active power AI remote control mode, the feedback command data of the AO port cannot be read due to the ADAM fault, power disconnection, or abnormal link.	Check whether the communications cable connection between the ADAM4024 and the SmartLogger is correct, whether the RS485 address conflicts with the addresses of other devices, whether the baud rate is consistent with that set for the corresponding SmartLogger port. Check whether the auxiliary power supply for the ADAM4024 is normal.
			4	Under the active power Dry contact remote control mode, the four DI ports read commands beyond the configuratio n.	 Check whether the cable connections to the DI ports are correct. Enter the active power Dry contact remote control configuration page and check the mapping table of the current DI signal configuration. Contact the power grid company to check the completeness of the combination configurations in the mapping table and check whether the configurations comply with the requirements of the power grid company.

Ala rm ID	Alarm	Alarm Severit y	Alarm Sub-I D	Causes	Measure
110		Major	1	Under reactive power AI remote control mode, the AI port receives currents beyond the configuration range.	 Check on the ADAM4117 the cable connection of the port corresponding to the AI number. Reconnect and secure the cable if it is loose, disconnected, or reversely connected. Enter reactive power AI remote control configuration page and check that the start and end current ranges of the AI comply with the requirements of the power grid company. Enter the Extended Port Settings page, check that the current configuration of the AI number is consistent with the current specification of the ADAM4117. Contact the power grid
					company to check whether the command data sent is correct.
			2	Under the reactive power AI remote control mode, the command data of the AI port cannot be read due to the ADAM fault, power disconnection, or abnormal link.	 Check whether the communications cable connection between the ADAM4117 and the SmartLogger is correct, whether the RS485 address conflicts with the addresses of other devices, whether the baud rate is consistent with that set for the corresponding SmartLogger port. Check whether the auxiliary power supply for the ADAM4117 is normal.

Ala rm ID	Alarm	Alarm Severit y	Alarm Sub-I D	Causes	Measure
			3	Under the reactive power AI/DI remote control mode, the command data of the AO port cannot be read due to the ADAM fault, power disconnection, or abnormal link.	 Check whether the communications cable connection between the ADAM4024 and the SmartLogger is correct, whether the RS485 address conflicts with the addresses of other devices, whether the baud rate is consistent with that set for the corresponding SmartLogger port. Check whether the auxiliary power supply for the ADAM4024 is normal.
			4	Under the reactive power Dry contact remote control mode, the four DI ports read commands beyond the configuratio n.	1. Check whether the cable connections to the DI ports are correct. 2. Enter the reactive power Dry contact remote control configuration page and check the mapping table of the current DI signal configuration. Contact the power grid company to check the completeness of the combination configurations in the mapping table and check whether the configurations comply with the requirements of the power grid company.
110 2	Abnorm al Meter Data	Major	1	The power meter cannot properly send feedback signals to a third-party scheduling device due to the ADAM fault, power disconnection, or abnormal link.	1. Check whether the communications cable connection between the ADAM4024 and the SmartLogger is correct, whether the RS485 address conflicts with the addresses of other devices, whether the baud rate is consistent with that set for the corresponding SmartLogger port. 2. Check whether the auxiliary power supply for the ADAM4024 is normal.

Ala rm ID	Alarm	Alarm Severit y	Alarm Sub-I D	Causes	Measure
110	Breaker Disconn ect	Major	1	The general AC circuit breaker at the grid-tied point is OFF.	Check whether the disconnection of the circuit breaker is a normal operation. Otherwise, contact the service engineer to restore the connection.

10 Disposing of the SmartLogger

This topic describes how to dispose the SmartLogger.

If the service life of the SmartLogger expires, dispose of the SmartLogger according to the local disposal act for waste electric appliances.

11 Technical Specifications

This topic describes the SmartLogger technical specifications.

Device management

Specifications	SmartLogger1000
Number of managed devices	80
Communications mode	Three RS485 ports
The maximum communication distance	RS485: 1000 m; Ethernet: 100 m

Display

Specifications	SmartLogger1000
LCD	3.5-inch LCD
LED	Three LED indicators
WEB	Embedded

Common parameters

Specifications	SmartLogger1000
Power supply	100 V AC to 240 V AC, 50 Hz or 60 Hz
Power consumption	Normal: 3 W; maximum: 7 W
Storage capacity	Stores historical inverter performance data of the last month
Language	English, Chinese, German, Italian, Japanese, French
Dimensions (W x H x D)	225 mm x 140 mm x 50 mm

Specifications	SmartLogger1000
Weight	500 g
Operating temperature	-20 ℃ to +60 ℃
Relative humidity (non-condensing)	5%-95%
Protection level	IP20
Installation mode	Installed on a wall, desk, or along a guide rail.

Port

Specifications	SmartLogger1000
Ethernet	10/100M, Modbus-TCP
RS485	Modbus-RTU
USB	Supported
Digital parameter input	4
Analog input	2
Relay output	3

A Monitoring User List

Table A-1 Monitoring User List

Login Mode	User Name	Initial Password
LCD	Common User	000001
	Advanced User	000001
	Special User	000001
WEB	Common User	Changeme
	Advanced User	Changeme
	Special User	Changeme
SSH	root	Changeme
NetEco	emscomm	/EzFp+2%r6@IxSCv

B Acronyms and Abbreviations

 \mathbf{A}

AC Alternating Current

AI Analog Input
AO Analog Output
APP Application

 \mathbf{C}

CCO Central Coordinator

COM Communication

D

DI Digital InputDO Digital Output

 \mathbf{E}

EMI Environmental Monitoring Instrument

ETH Ethernet

L

LED Light-emitting Diode

P

PLC Power Line Communication

R

RSTP Rapid Spanning Tree Protocol

 \mathbf{S}

SFP Small Form-factor Pluggable

SPD Surge Protective Device

STA Station

STP Spanning Tree Protocol

 \mathbf{W}

WEEE Waste Electrical and Electronic Equipment