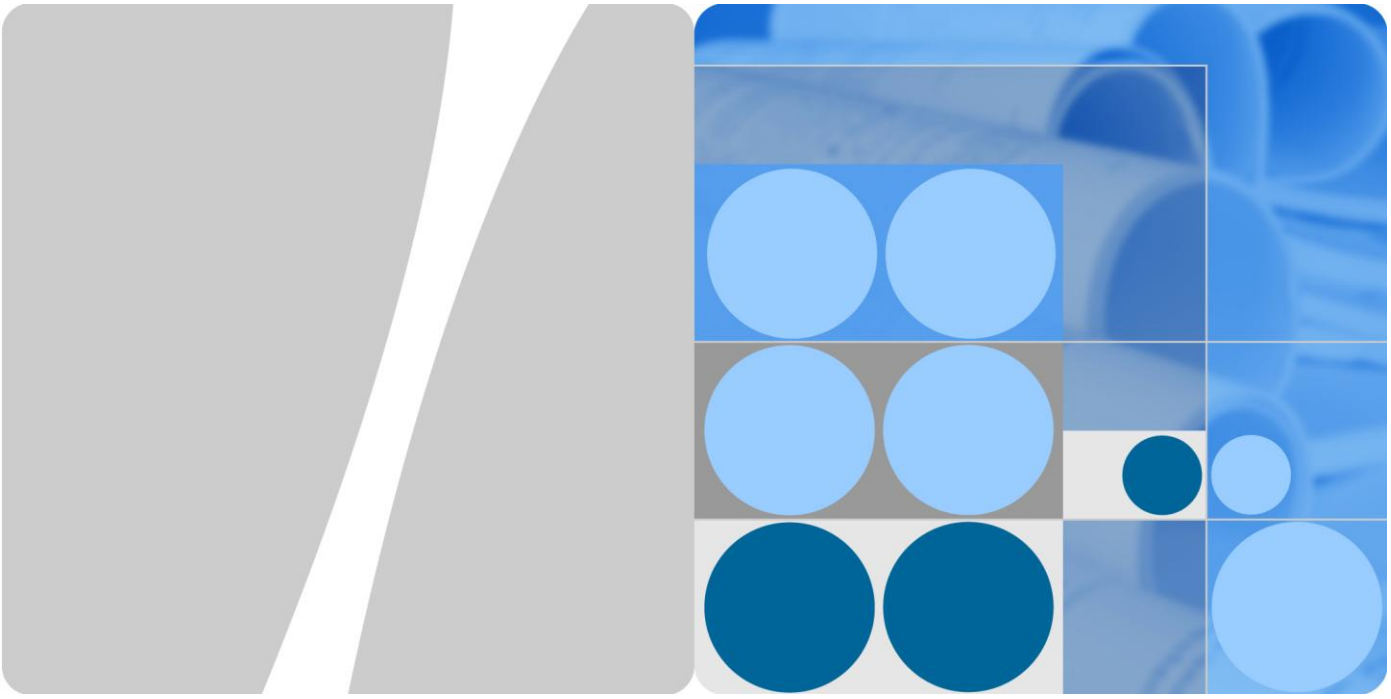

SmartLogger2000

User Manual

Issue	**Draft A**
Date	**2016-06-20**

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About This Document

Overview

This document introduces the SmartLogger2000 (**SmartLogger** for short) in terms of installation, cable connections, system operation and maintenance, and troubleshooting. Readers should understand the SmartLogger features, functions, and safety precautions provided in this document before installing and operating the SmartLogger.

The figures provided in this document are for reference only. The actual product appearance prevails.

You can print the document based on your requirements. Store the paper copy properly for future use. You can log in to http://support.huawei.com/carrier/, click **Product Support**, and search for **SmartLogger** to view and obtain the latest user manual.

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
	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Symbol	Description
NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to 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 Draft A (2016-06-20)

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

Contents

1 Safety Precautions

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

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.

CAUTION

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.
- Install the SmartLogger in a dedicated area.

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.
- The device has multiple inputs. Switch off all inputs before the maintenance.

2 Overview

2.1 Overview

Function

The SmartLogger is a highly integrated device dedicated for monitoring and managing the PV power system. It converges ports, converts protocols, collects and stores data, and centrally monitors and maintains devices in the PV power system.

Features

The SmartLogger provides the following features:

- Wide application
  - Industrial-grade application, wide temperature range: –40 ℃ to +60 ℃
  - High altitude: applicable at an altitude of 4000 m
- Various communications modes
  - Bluetooth

    Has a built-in Bluetooth module through which the SUN2000 APP (APP for short) connects to the SmartLogger for parameter configuration and device maintenance. The SmartLogger Bluetooth is named as **LOG+the last eight figures of the ESN of the SmartLogger**.
  - Optical fiber ring switch

    Provides two 100M Ethernet optical ports that support RSTP and STP to implement fiber ring networking. If RSTP is used, fiber ring protection can be completed within 10 seconds. If STP is used, fiber ring protection can be completed within 60 seconds.
  - PLC

    Has a built-in PLC CCO module through which southbound devices connect to the SmartLogger over AC power cables.
  - Ethernet electrical port

    Provides two 10/100M Ethernet electrical ports that can be used as southbound ports to connect to southbound devices or used as northbound ports to connect to an NMS.

NOTE

- A southbound port connects to a downstream device for collecting data and setting parameters.

- Southbound devices include the inverter, environmental monitoring instrument (EMI), power meter, box-type transformer, and PID module.
- A northbound port connects to an upstream NMS for uploading data.

– RS485

Supports six RS485 routes and access of devices that use Modbus-RTU, IEC103, and DL/T645.

- Graphical data
  - In addition to displaying the electricity yield and real-time monitoring information in graphic and text format, the embedded WebUI can also display performance data of power stations and devices in tables or curves.
  - The APP displays the electricity yield and real-time monitoring information in graphic and text format.
- Centralized monitoring
  - Manages a maximum of 200 devices in centralized mode and supports the access of up to 80 inverters.
  - Allows you to monitor and manage the PV power system on the embedded WebUI, for example, viewing real-time information about power stations, devices, and faults, setting device parameters, and maintaining devices in remote mode.
  - Allows you to monitor the devices in the PV power system on the APP in real time, such as viewing information about power stations, devices, products, and faults, setting device parameters, and maintaining devices.
- Easy maintenance
  - Allows users to upgrade the firmware of the SmartLogger and export data by using a USB flash drive.
  - Allows you to upgrade the firmware of the SmartLogger, inverter, AC combiner box, PLC module, and PID module, and export logs and data over the embedded WebUI.
  - Allows you to manage the devices connecting to the SmartLogger and classify alarms over the APP.
- Intelligent management
  - Automatically searches for and accesses Huawei inverters, AC combiner boxes, PLC modules, and PID modules. If you import a parameter configuration table, the SmartLogger can access third-party devices that support Modbus-RTU and IEC103.
  - Automatically assigns RS485 addresses to the connected Huawei inverters, AC combiner boxes, and PID modules, and allows for RS485 address adjustment based on ESNs to facilitate remote configuration and maintenance.
  - Supports remote configuration of inverter parameters over the embedded WebUI and synchronizes the parameters from one inverter to other inverters in batches.
  - Automatically collects the data generated during the communication disconnection from the inverter or manually collects the data over the embedded WebUI after the connection resumes.
- Remote maintenance
  - Simultaneously accesses multiple NMSs (including Huawei NetEco and third-party NMSs) that support Modbus-TCP, IEC103, and IEC104. Huawei NetEco features centralized O&M, big data analysis, intelligent diagnosis, and mobile O&M.
  - Supports connection to a third-party NMS over File Transfer Protocol (FTP).
  - Sends electricity yield and alarms to users by emails.
- Grid scheduling

- The SmartLogger supports various power grid scheduling modes and therefore can meet the requirements of power grid companies in different countries.
- Implements rapid active power control and reactive power compensation for all the inverters connecting to the SmartLogger.

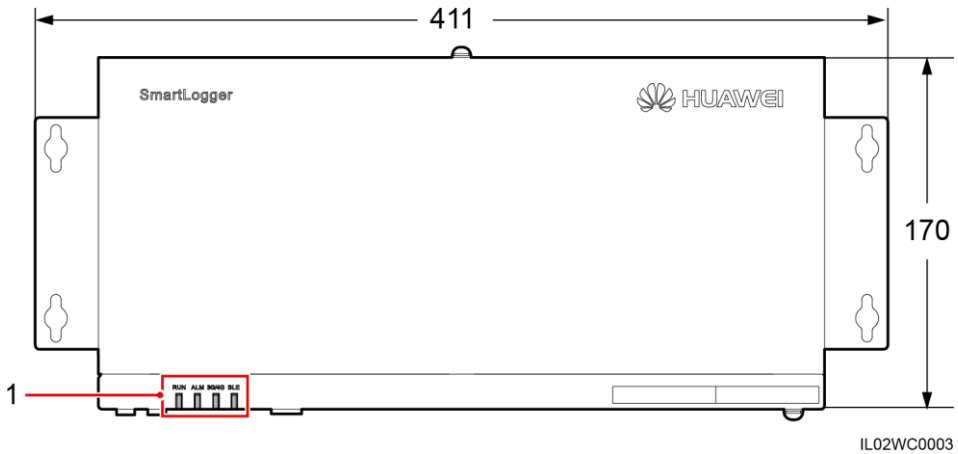
Model Description

Model	PLC Module Configured?	Remarks
SmartLogger2000-10	Yes	The built-in Bluetooth module supports only Android APP.
SmartLogger2000-10-B	Yes	The built-in Bluetooth module supports both Android APP and IOS APP.
SmartLogger2000-11-B	No	

2.2 Appearance

Front View of the Shell

Figure 2-1 SmartLogger front view (unit: mm)



(1) Indicators

Table 2-1 Description of the LED indicators (from left to right)

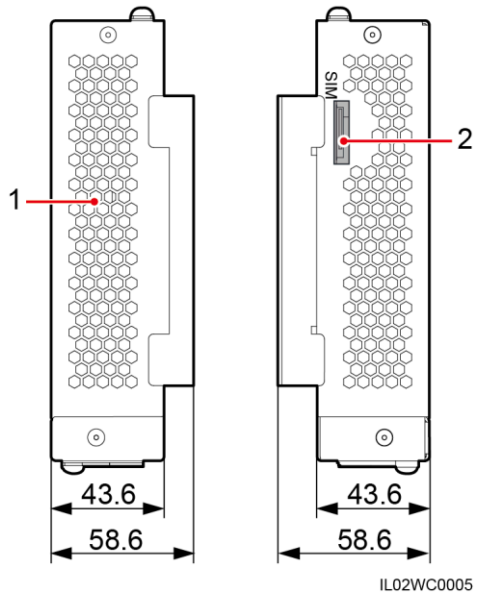
Indicator (Silk Screen)	Status	Meaning
RUN indicator	Green off	The SmartLogger is not powered on.

Indicator (Silk Screen)	Status		Meaning
	Blinking green at short intervals (on for 0.125s and then off for 0.125s)		The SmartLogger and the NMS (the NetEco or a third-party NMS) are not connected or the communication between them is interrupted.
	Blinking green at long intervals (on for 1s and then off for 1s)		The SmartLogger properly communicates with the NMS (NetEco or a third-party NMS).
Alarm/maintenance indicator (ALM)[a]	Alarm status	Red off	The SmartLogger and the devices accessing it do not generate any alarm.
		Blinking red at long intervals (on for 1s and then off for 4s)	The SmartLogger or the devices accessing it generate warnings.
		Blinking red at short intervals (on for 0.5s and then off for 0.5s)	The SmartLogger or the devices accessing it generate minor alarms.
		Steady red	The SmartLogger or the devices accessing it generate major alarms.
	Maintenance status	Green off	No local maintenance is underway[b].
		Blinking green at long intervals (on for 1s and then off for 1s)	Local maintenance is in progress.
		Steady green	Local maintenance succeeds.
		Blinking green at short intervals (on for 0.125s and then off for 0.125s)	Local maintenance fails.
3G/4G indicator	-		Reserved.
Bluetooth indicator (BLE)	Green off		You have not logged in to the APP or login failed. The SmartLogger is not connected to the APP or the communication has been interrupted[c].

Indicator (Silk Screen)	Status	Meaning
	Blinking green at long intervals (on for 1s and then off for 1s)	You have successfully logged in to the APP.
a: If an alarm and local maintenance happen concurrently, the alarm/maintenance indicator shows the near-end maintenance state first. After the USB flash drive is removed, the indicator shows the alarm state. b: Local maintenance refers to operations performed by connecting a USB flash drive to the SmartLogger USB port, such as full data import and export using a USB flash drive. c: After the communication between the SmartLogger and the APP fails, the disconnection is normal if the green indicator goes off immediately, and is abnormal if the indicator goes off after blinking slowly for 30s.		

Side View of the Shell

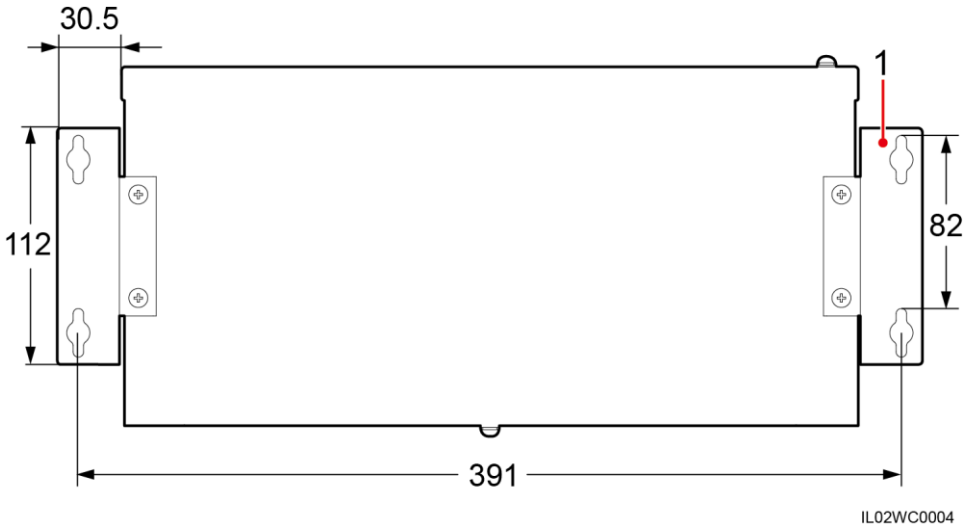
Figure 2-2 SmartLogger side view (unit: mm)



(1) Heat dissipation hole (2) SIM card slot (reserved)

Rear View of the Shell

Figure 2-3 SmartLogger rear view (unit: mm)



(1) Wall-mounting ears

Bottom of the Shell

Figure 2-4 Bottom view of the SmartLogger

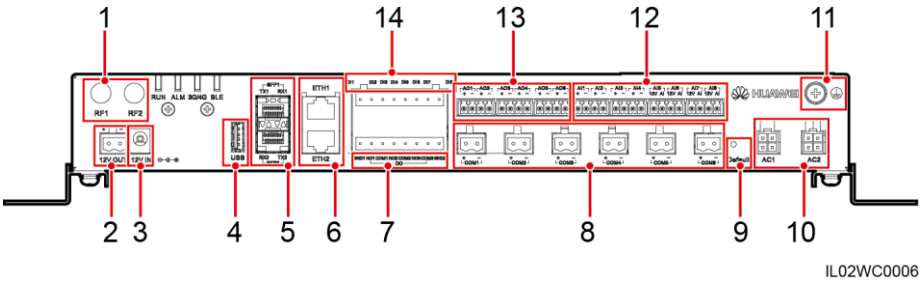


Table 2-2 describes the functions of ports on the SmartLogger.

Table 2-2 Port description

No.	Port (Silk Screen)	Function	Description
1	RF1, RF2	Reserved	Reserved.
2	12V OUT	12 V DC output	Provides 12 V DC power supply with a maximum current of 100 mA.
3	12V IN	12 V DC input	Connects to a power adapter.
4	USB	USB port	Connects a USB flash drive.

No.	Port (Silk Screen)	Function	Description
5	SFP1, SFP2	Ethernet optical port	Connects to an ATB or another cascaded SmartLogger.
6	ETH1, ETH2	Ethernet electrical port	Connects to an Ethernet switch, router, POE module, or PC.
7	DO	Digital parameter output	Relay output.
8	COM1–COM 6	RS485 communication	Six RS485 ports that can be connected to devices such as the inverter, box-type transformer, power meter, or EMI.
9	Default	Default key	Resets and restarts the Bluetooth module or resets the SmartLogger IP address to the default IP address[d].
10	AC1, AC2	AC power cable ports	Connects to A, B, and C three-phase inputs for power line communication (PLC) with the inverter.
11		External grounding	-
12	AI1–AI8	Analog input	• SmartLogger2000-10: AI1–AI4: 4–20 mA and 0–20 mA input current (passive); AI5–AI8: 4–20mA and 0–20 mA input current (active) • Other models: AI1: 0–10 V input voltage (passive); AI2–AI4: 4–20 mA and 0–20 mA input current (passive); AI5–AI8: 4–20 mA and 0–20 mA input current (active)
13	AO1–AO6	Analog output	4–20 mA and 0–20 mA current output.
14	DI1–DI8	Digital parameter input	Connects to a dry contact input.

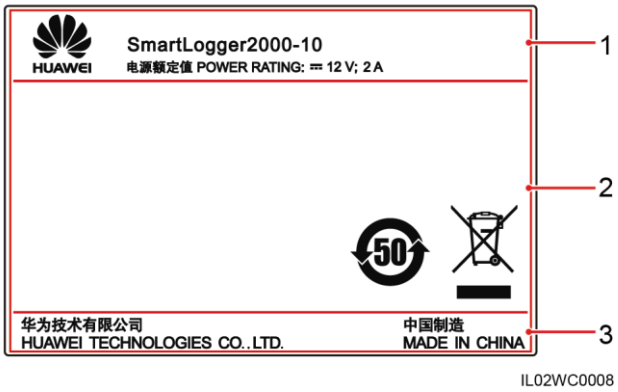
d:

- If the APP fails to connect to the SmartLogger or you have forgotten the IP address, you can press the Default key to reset the Bluetooth module or restore the IP address to the default IP address (192.168.0.10).
- To reset and restart the Bluetooth module, press and hold down the Default key for 3–10s until the BLU indicator blinks at short intervals (0.125s on and 0.125s off) and all other indicators are off, and then release the Default key.
- To restore the IP address to the default IP address, press and hold down the Default key for more than 10s until the RUN indicator blinks at short intervals (0.125s on and 0.125s off) and all other indicators are off, and then release the Default key. The operation is valid within 5 minutes.

2.3 Nameplate Description

A nameplate is attached at the back of the SmartLogger. The content of the nameplate includes the SmartLogger model, rated power supply specifications, and compliance symbols, as shown in Figure 2-5.

Figure 2-5 Nameplate



(1) Trademark, product model, and rated power supply specifications

(2) Compliance symbols

(3) Company name and country of manufacture

Table 2-3 Compliance symbols

Symbol	Name	Meaning
	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.

2.4 Typical Networking Scenarios

Fiber+RS485/PLC Networking

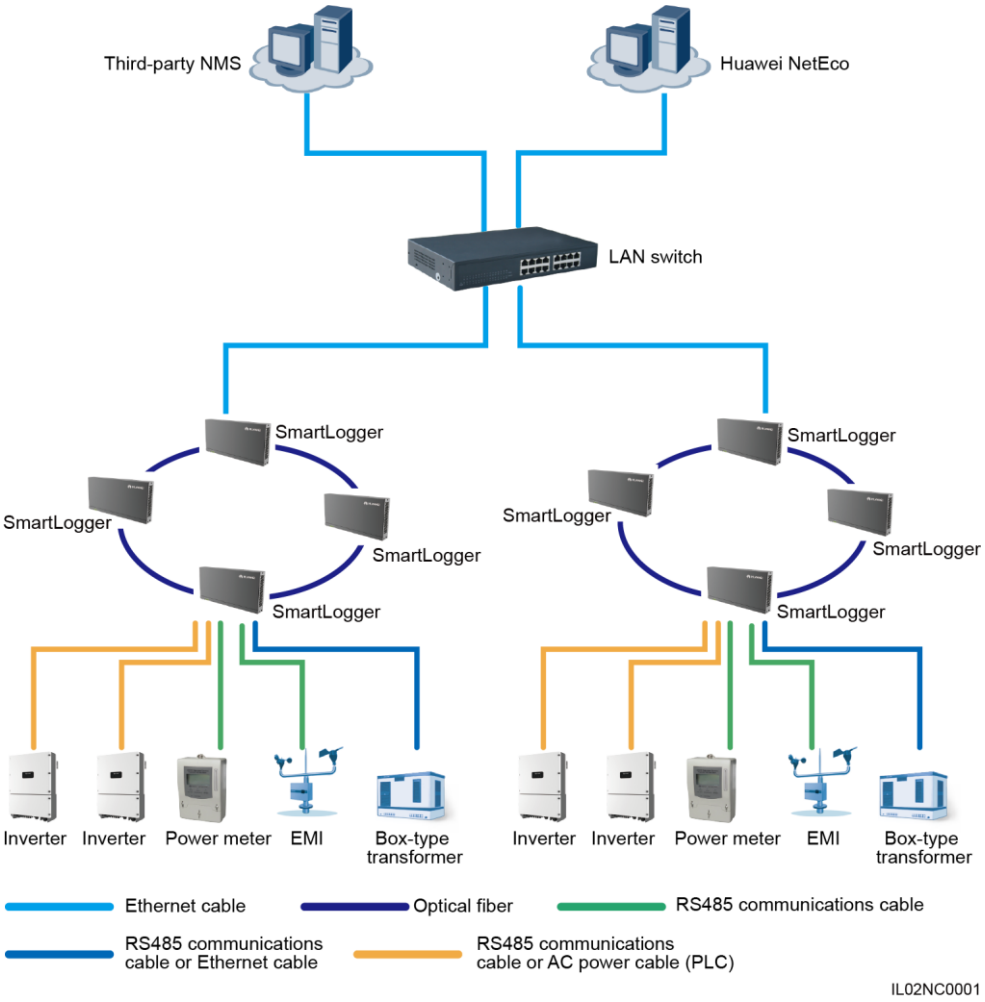
A fiber network can be a ring network or a star network, as shown in Figure 2-6 and Figure 2-7 respectively.

In the fiber networking, the SmartLogger connects to an inverter over an RS485 communications cable or an AC power cable, connects to a box-type transformer over the RS485 communications cable or Ethernet network cable, and connects to southbound devices such as the EMI and power meter over the RS485 communications cable.

NOTE

The SmartLogger is integrated with the PLC central coordinator (CCO) that can work with the SUN2000 integrated with the PLC station (STA) to implement power line communication (PLC) networking over power cables.

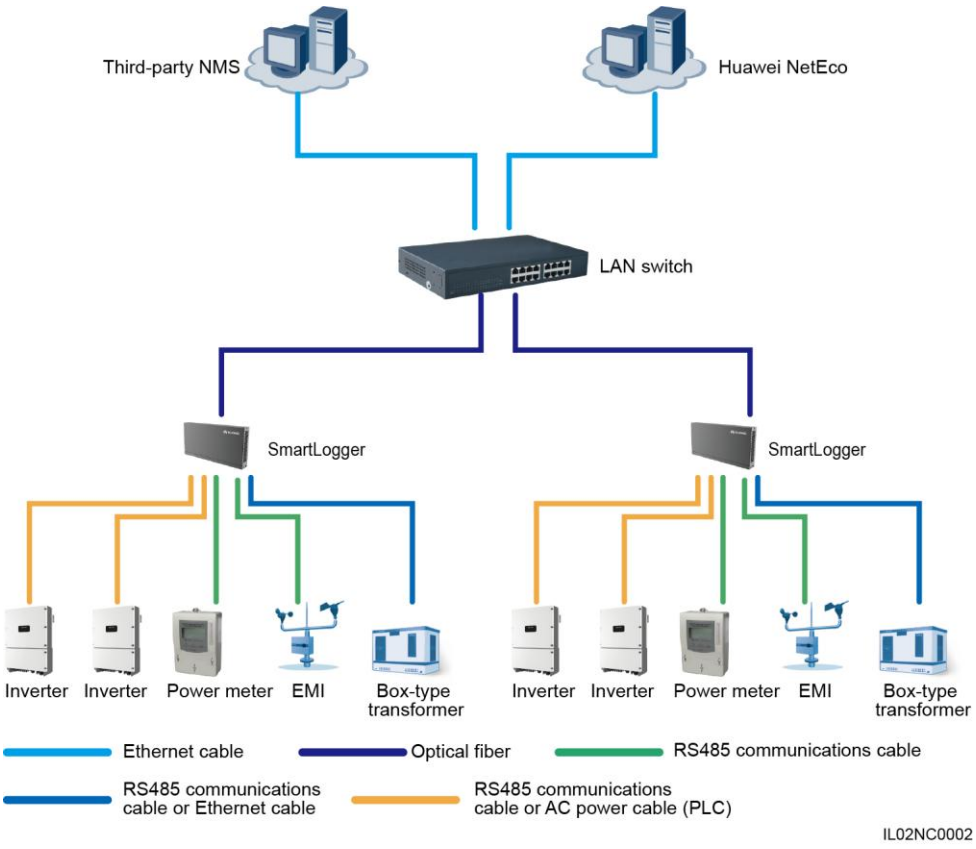
Figure 2-6 Ring fiber network diagram



NOTE

- The SmartLogger provides two 100M Ethernet optical ports to implement ring networking.
- A maximum of 16 SmartLoggers can be connected to form a fiber ring network. Each SmartLogger can connect to southbound devices such as the inverter, EMI, and power meter.
- Multiple fiber ring networks can converge over an Ethernet switch or SmartLogger and then connect to an NMS.

Figure 2-7 Start fiber network diagram



NOTE

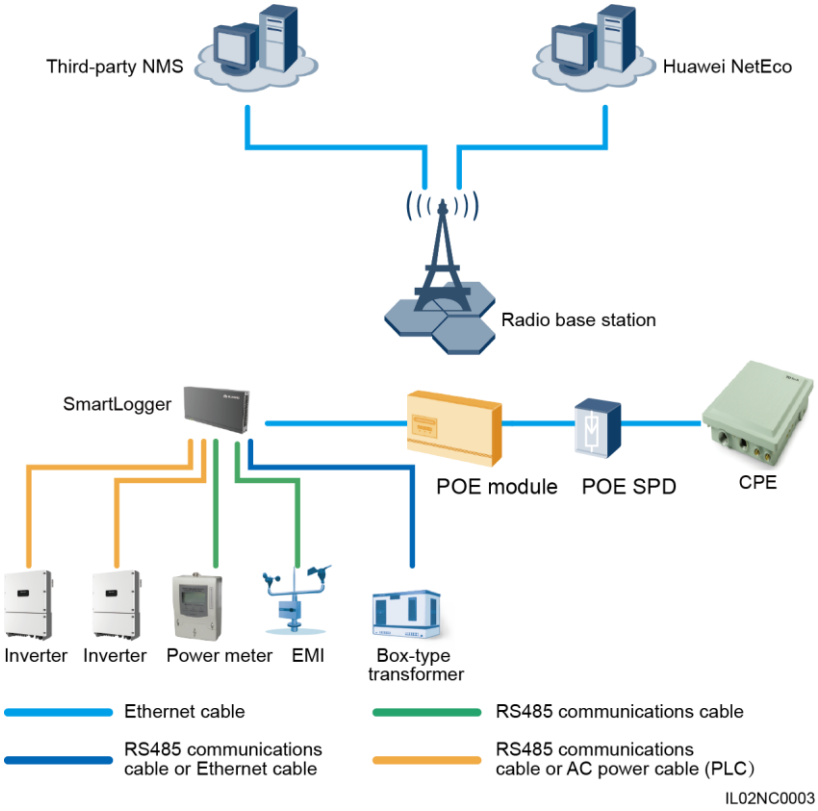
- Multiple SmartLoggers can converge over an Ethernet switch and then connect to an NMS.
- The SmartLogger connects to the Ethernet switch over optical fibers with the maximum communications distance of 12 km in between.

LTE+RS485/PLC Networking

Figure 2-8 shows the LTE+RS485/PLC networking diagram.

In the LTE wireless networking scenario, the SmartLogger connects to the inverter over an RS485 communications cable or an AC power cable, connects to a box-type transformer over the RS485 communications cable or Ethernet network cable, connects to southbound devices such as the EMI and power meter over the RS485 communications cable, connects to a customer premises equipment (CPE) over an Ethernet electrical port, and transmits information collected from southbound devices to an NMS in wireless mode.

Figure 2-8 LTE+RS485/PLC network diagram



NOTE

- The IP addresses for the SmartLogger, CPE, and monitoring devices in the box-type transformer must be in the same network segment.
- The IP address planned for the SmartLogger needs to be imported to the third-party NMS for the NMS to proactively connect to the SmartLogger.
- The IP address planned for the box-type transformer needs to be imported to the third-party NMS for the NMS to proactively connect to the box-type transformer.

2.5 System Wiring Diagram

NOTICE

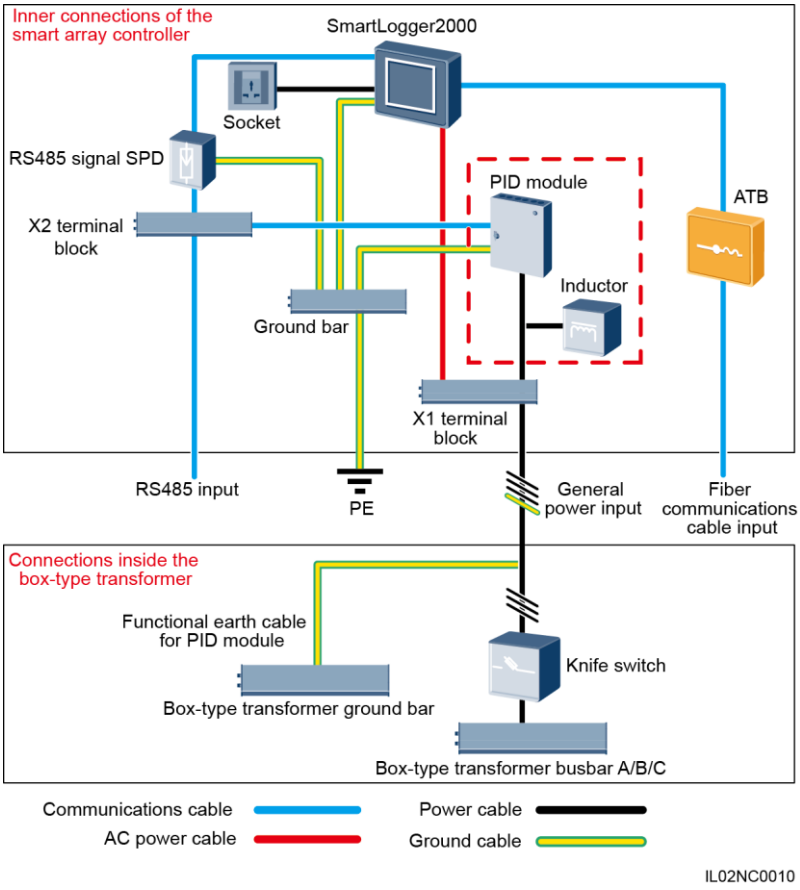
- The general power input cable of the SmartACU2000 smart array controller (smart array controller for short) needs to be prepared by the customer. Recommended cable: four-core multi-wire (L1, L2, L3, and GND) armored; operating voltage to the ground: ≥ 600 V; and cross sectional area of a single core: 4mm^2.
- 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 mm^2.
- The SmartLogger can be connected to the SUN2000 through an RS485 communications cable or AC power cable. If the RS485 communications mode is used, no AC power cable is required between the SmartLogger and the X1 terminal block in the scenario with smart array controllers; no AC power cable is required between the SmartLogger and the MCB in the scenario without smart array controllers.
- If the SmartLogger uses the RS485 communications mode, it is recommended that at least two RS485 signal surge protective devices (SPDs) be installed. A maximum of three RS485 signal SPDs can be installed for each site.

Scenario With a Smart Array Controller

NOTE

- The smart array controller, also a communication box, is an outdoor cabinet that controls the communication of the PV array in a PV plant. The cabinet can house components such as the SmartLogger, RS485 signal SPD, PID module, inductor, ATB, POE module, and POE SPD.
- The PID module and inductor are configured only in the smart array controller with the PID module and have been installed before delivery.

Figure 2-9 Fiber+RS485/PLC



NOTE

The X1 terminal block (general power input and AC output) and X2 terminal block (RS485 communications port) are in the upper part on the rear of the smart array controller.

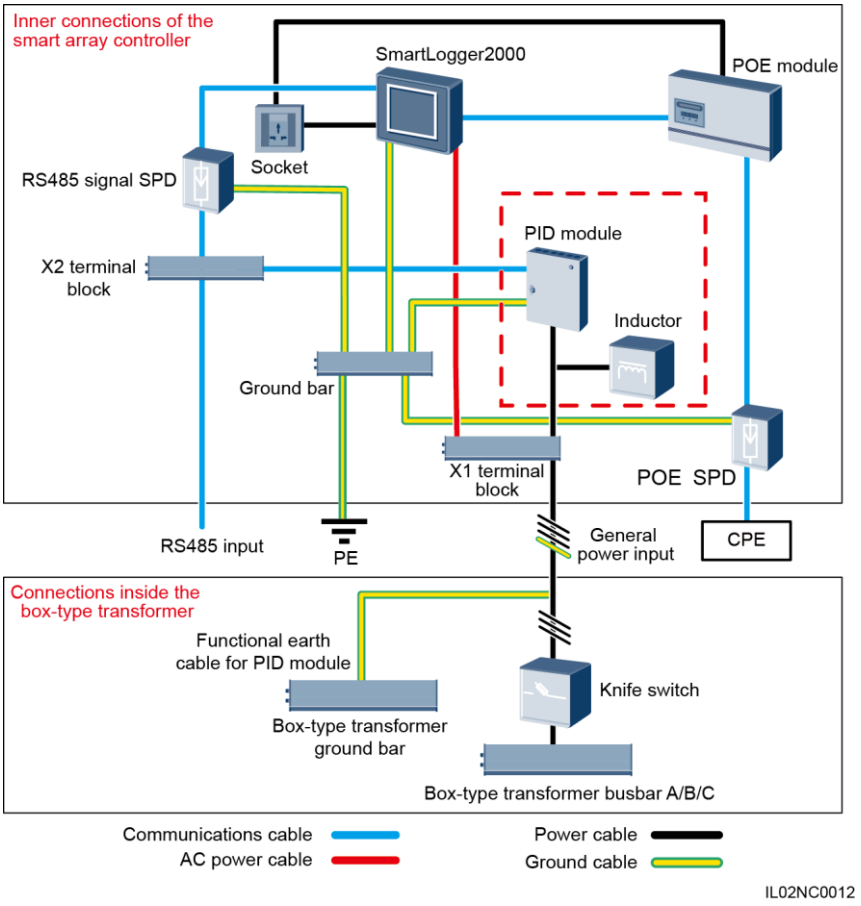
Table 2-4 lists the components required for the fiber+RS485/PLC networking mode in the scenario with a smart array controller.

Table 2-4 Components required

Component	Recommended Model or Specifications	Type	Quantity
PID module (optional)	PID01	Installed before delivery	1 PCS
PID inductor (working with the PID module)	EIFI50ohm	Installed before delivery	1 PCS
SmartLogger	SmartLogger2000	Installed before delivery	1 PCS
RS485 signal SPD	SPM01A	Installed before delivery	3 PCS

Component		Recommended Model or Specifications	Type	Quantity
ATB		CT-GZF2PJ-8 or CT-GPH-A-8	Optional; can be purchased from Huawei	1 PCS
Knife switch	Fuse	Rated voltage: ≥ 500 V; rated current: 6 A	Prepared by the customer	3 PCS
	Knife switch box	Rated voltage: ≥ 500 V; rated current: ≥ 6 A; number of phases: three	Prepared by the customer	1 PCS

Figure 2-10 LTE+RS485/PLC



NOTE

The X1 terminal block (general power input and AC output) and X2 terminal block (RS485 communications port) are in the upper part on the rear of the smart array controller.

Table 2-5 lists the components required for the LTE+RS485/PLC networking mode in the scenario with a smart array controller.

Table 2-5 Components required

Component		Recommended Model or Specifications	Type	Quantity
PID module (optional)		PID01	Installed before delivery	1 PCS
PID inductor (working with the PID module)		EIFI50ohm	Installed before delivery	1 PCS
SmartLogger		SmartLogger2000	Installed before delivery	1 PCS
RS485 signal SPD		SPM01A	Installed before delivery	3 PCS
POE module		POE35-54A or POE85-56A	Optional; can be purchased from Huawei	1 PCS
POE SPD		POE-2A	Optional; can be purchased from Huawei	1 PCS
CPE		EG860V2-C71	Optional; can be purchased from Huawei	1 PCS
Knife switch	Fuse	Rated voltage: ≥ 500 V; rated current: 6 A	Prepared by the customer	3 PCS
	Knife switch box	Rated voltage: ≥ 500 V; rated current: ≥ 6 A; number of phases: three	Prepared by the customer	1 PCS

Scenario Without a Smart Array Controller

NOTICE

If the SmartLogger uses an AC power cable for communication, an MCB or a knife switch needs to be installed to prevent device damage in the case of short circuits.

Figure 2-11 Fiber+RS485/PLC

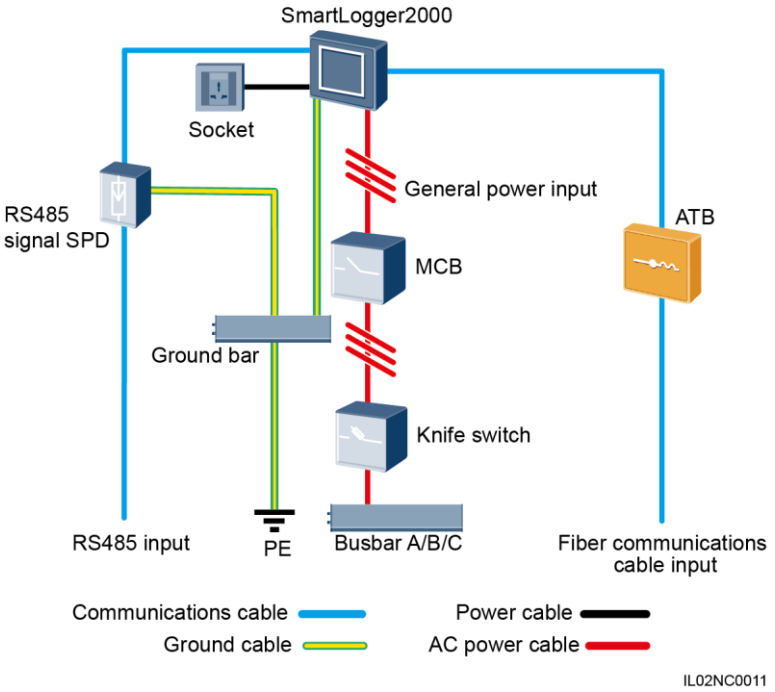


Table 2-6 lists the components required for the fiber+RS485/PLC networking mode in the scenario without a smart array controller.

Table 2-6 Components required

Component		Recommended Model or Specifications	Type	Quantity
SmartLogger		SmartLogger2000	Optional; can be purchased from Huawei	1 PCS
RS485 signal SPD		X4B-05	Optional; can be purchased from Huawei	3 PCS
ATB		CT-GZF2PJ-8 or CT-GPH-A-8	Optional; can be purchased from Huawei	1 PCS
Knife switch	Fuse	Rated voltage: ≥ 500 V; rated current: 6 A	Prepared by the customer	3 PCS
	Knife switch box	Rated voltage: ≥ 500 V; rated current: ≥ 6 A; number of phases: three	Prepared by the customer	1 PCS
MCB		Rated voltage: ≥ 500 V; rated current: ≥ 6 A	Prepared by the customer	1 PCS

Component	Recommended Model or Specifications	Type	Quantity
Socket	Matching with the power adapter	Prepared by the customer	1 PCS

NOTE
Length of the cable used for connecting components depends on the survey result.

Figure 2-12 LTE+RS485/PLC

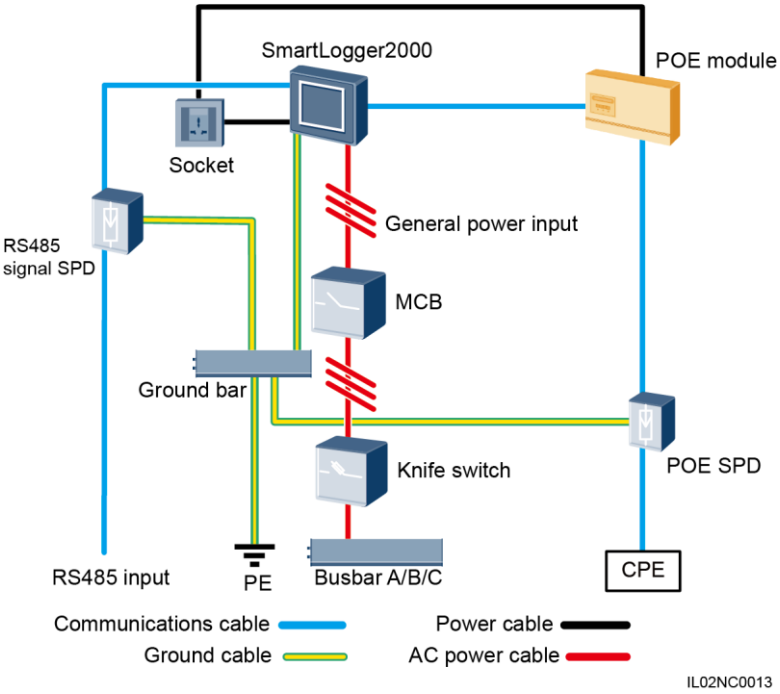


Table 2-7 lists the components required for the LTE+RS485/PLC networking mode in the scenario without a smart array controller.

Table 2-7 Components required

Component	Recommended Model or Specifications	Type	Quantity
SmartLogger	SmartLogger2000	Optional; can be purchased from Huawei	1 PCS
RS485 signal SPD	X4B-05	Optional; can be purchased from Huawei	3 PCS
POE module	POE35-54A or POE85-56A	Optional; can be purchased from Huawei	1 PCS

Component		Recommended Model or Specifications	Type	Quantity
POE SPD		POE-2A	Optional; can be purchased from Huawei	1 PCS
CPE		EG860V2-C71	Optional; can be purchased from Huawei	1 PCS
Knife switch	Fuse	Rated voltage: ≥ 500 V; rated current: 6 A	Prepared by the customer	3 PCS
	Knife switch box	Rated voltage: ≥ 500 V; rated current: ≥ 6 A; number of phases: three	Prepared by the customer	1 PCS
MCB		Rated voltage: ≥ 500 V; rated current: ≥ 6 A	Prepared by the customer	1 PCS
Socket		Matching with the power adapter	Prepared by the customer	1 PCS

NOTE

Length of the cable used for connecting components depends on the survey result.

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 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

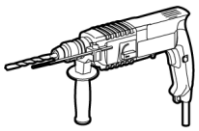
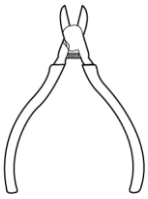
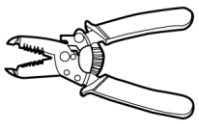
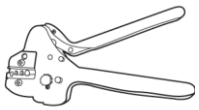
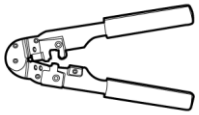
After unpacking the SmartLogger, check whether deliverables are intact and complete. If any damage is found or any component is missing, contact the dealer.

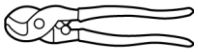
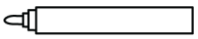
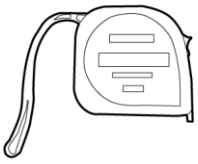
NOTE

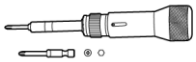
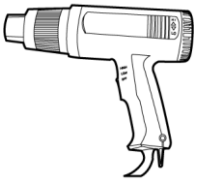
For details about the number of accessories delivered with the SmartLogger, see the *Packing List* in the packing case.

3.2 Preparing Tools

Tools	Model	Function

Tools	Model	Function
Hammer drill 	Drill bit (Φ6 mm)	Drills holes in the wall when the SmartLogger is wall-mounted.
Diagonal pliers 	N/A	Cuts and tighten cable ties.
Wire stripper 	N/A	Peels cable jackets.
Crimping tool 	H4TC0001 Manufacturer: AMPHENOL	Crimps cables.
RJ45 crimping tool 	N/A	Crimps RJ45 connectors for communications cables.
Flat-head screwdriver 	3x100	Tightens screws on the cable terminal block.

Tools	Model	Function
Rubber mallet 	N/A	Hammers expansion sleeves into holes.
Guarded blade utility knife 	N/A	Removes package.
Cable cutter 	N/A	Cuts cables.
Vacuum cleaner 	N/A	Cleans up dust after holes are drilled.
Marker 	Diameter: ≤ 10 mm	Marks signs.
Measuring tape 	N/A	Measures distance

Tools	Model	Function
Safety goggles 	N/A	Protect your eyes during hole drilling.
Anti-dust respirator 	N/A	Prevents dust from entering your mouth and nostrils during hole drilling.
Torque screwdriver 	Phillips head: M4 and ST3.5	Tightens screws during device installation.
Heat gun 	N/A	Heat-shrinks a tube.
Cable tie 	N/A	Binds cables.

3.3 Determining the Installation Position

Observe the following requirements when determining the installation position:

- 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 ℃ to +60 ℃ and away from direct sunlight.

- The communications distance must not exceed 1000 m for the RS485 port, and must not exceed 100 m for the Ethernet port.
- Install the SmartLogger at a proper height to facilitate operation and maintenance.
- Do not place the SmartLogger upside down; otherwise, dust will fall into ports at the bottom of the SmartLogger, thereby reducing the service life.
- The installation mode and position must be suitable for the SmartLogger weight (3800 g) and dimensions with mounting ears (H x W x D: 411 mm x 170 mm x 58.6 mm).
- If you install the SmartLogger on a wall or along a guide rail, the area for connecting cables should be downwards.
- Figure 3-1 and Figure 3-2 show the minimum distance between the SmartLogger and surrounding objects.

Figure 3-1 The minimum clearance for wall-mounting (unit: mm)

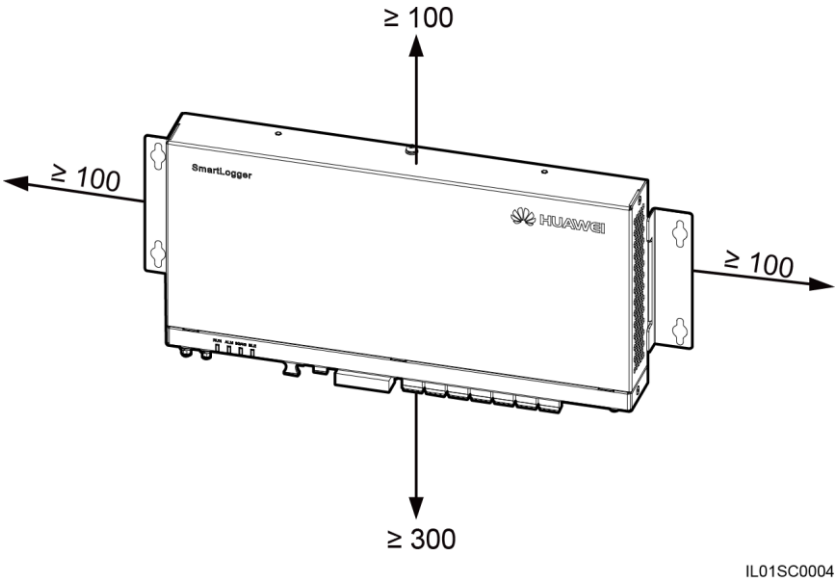
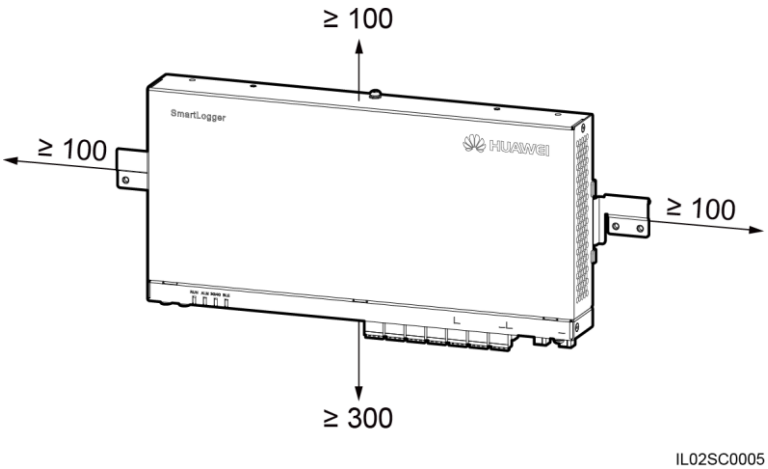


Figure 3-2 The minimum clearance for guide rail–mounting (unit: mm)



3.4 Installing the SmartLogger

Context

For a smart array controller, the SmartLogger is installed before delivery. In other scenarios, the SmartLogger can be mounted on a wall or guide rail.

3.4.1 Mounting 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 sleeves, washers, and tapping screws into the wall.

Figure 3-3 shows the distances between screw holes on the SmartLogger mounting ears.

Figure 3-3 Distances between screw holes (unit: mm)

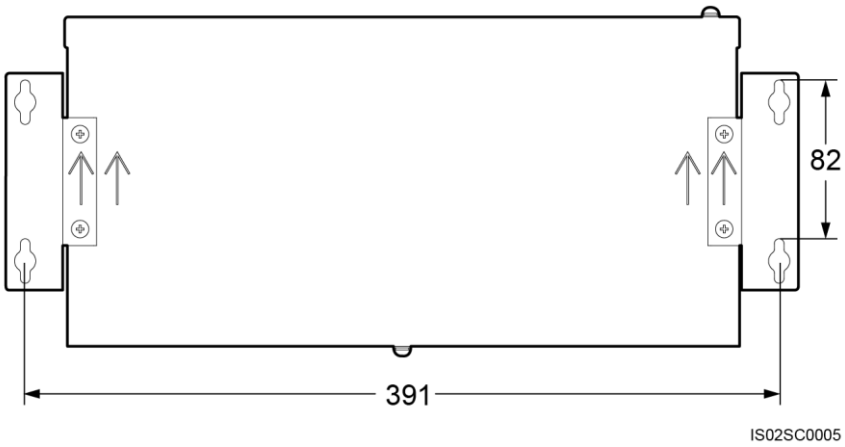
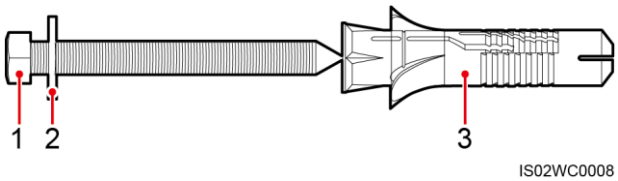


Figure 3-4 shows the screw assembly for wall-mounting:

Figure 3-4 Screw assembly for wall-mounting



(1) ST3.5 tapping screw (2) Washer (3) Expansion sleeve

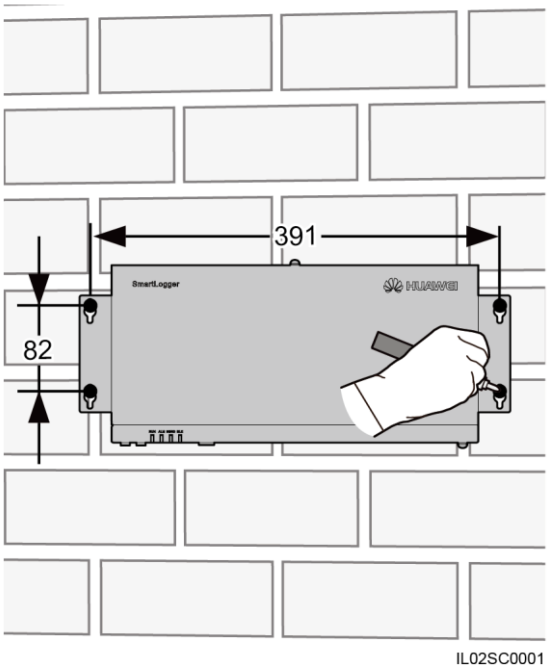
Procedure

Step 1 Determine mounting holes based on the hole positions in the mounting ears, and mark the mounting holes using a marker, as shown in Figure 3-5.

NOTICE

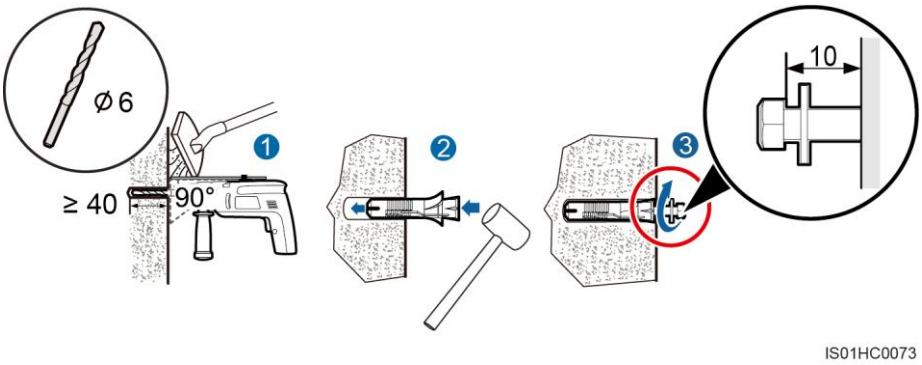
If you need to use a ladder to install the device on a high position, take measures to protect yourself from falling down.

Figure 3-5 Hole positions and dimensions (unit: mm)



Step 2 Drill holes by using a hammer drill and install expansion sleeves, washers, and tapping screws, as shown in Figure 3-6.

Figure 3-6 Drilling holes and installing expansion sleeves, washers, and tapping screws (unit: mm)



1. Put a hammer drill with a Φ6 mm drill bit on a marked hole position perpendicularly against the wall and drill to a depth greater than or equal to 40 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. Slightly tighten the expansion sleeves, vertically insert them into holes, and knock them completely into the holes by using a rubber mallet.
3. Drive the tapping screws into the expansion sleeves, and reserve 10 mm outside of the holes.

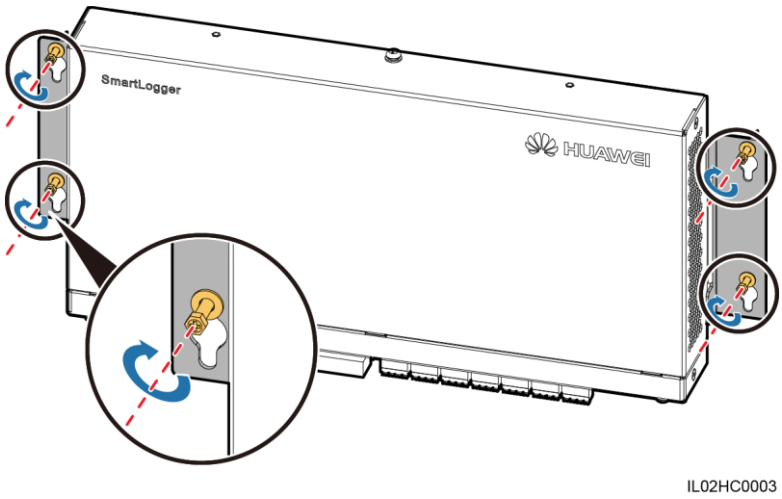
Step 3 Put the tapping screws through the SmartLogger mounting ears and washers into the mounting holes in the wall.

NOTICE

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

Step 4 Tighten the tapping screws to a torque of 0.3 N·m using a torque screwdriver, as shown in Figure 3-7.

Figure 3-7 Tightening the tapping screws



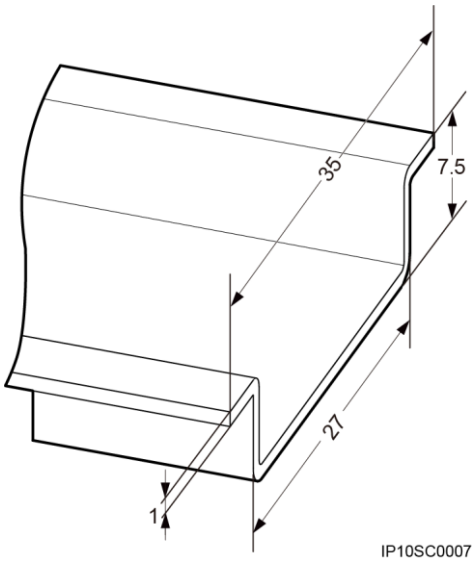
----End

3.4.2 Mounting the SmartLogger Along a Guide Rail

Context

No guide rail is delivered with a SmartLogger. If you need to install a SmartLogger on a guide rail, prepare a standard 35 mm wide guide rail. For details about the guide rail dimensions, see Figure 3-8.

Figure 3-8 Guide rail dimensions (unit: mm)



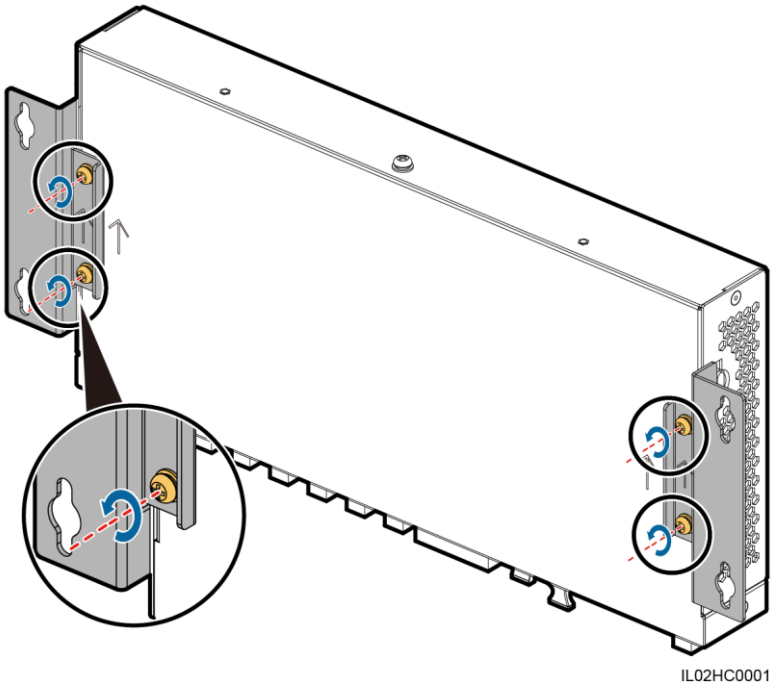
NOTICE

- Verify that the length of the guide rail is sufficient for securing the SmartLogger. The recommended length is 450 mm or greater. If an RS485 signal SPD needs to be installed on the guide rail, the recommended guide rail length is 600 mm or greater.
- Secure the guide rail before mounting the SmartLogger.

Procedure

Step 1 Remove the mounting ears from the SmartLogger using a Phillips screwdriver, as shown in Figure 3-9.

Figure 3-9 Removing the mounting ears

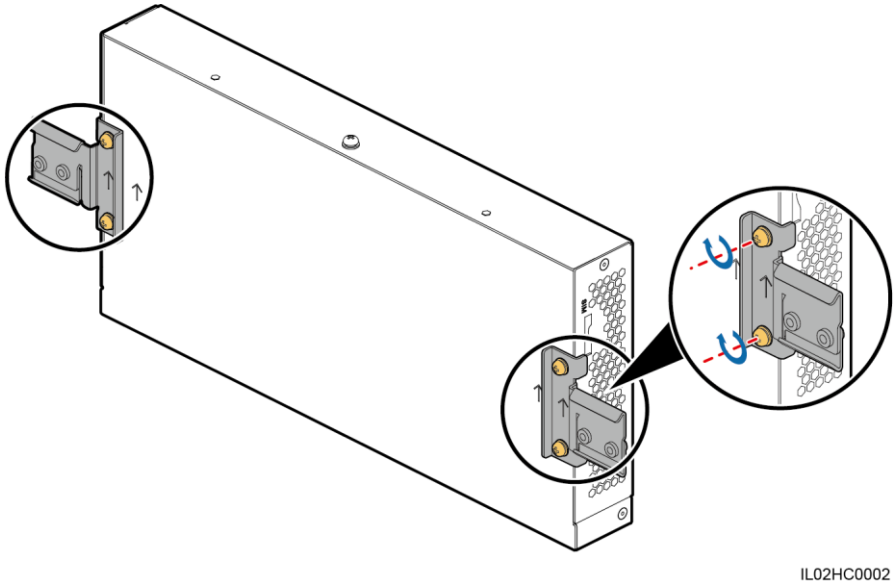


Step 2 Secure the guide rail clamps using M4x8 screws removed from the mounting ears, and tight the screws to a torque of 1.2 N·m, as shown in Figure 3-10.

NOTICE

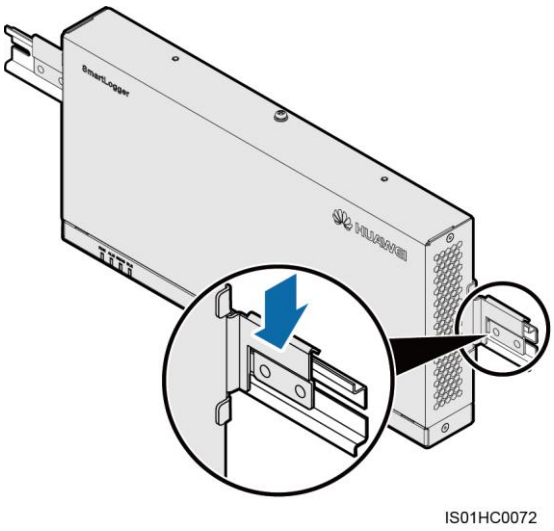
Install the guide rail clamps exactly as shown in the figure; otherwise, you may not be able to mount the SmartLogger onto the guide rail.

Figure 3-10 Installing the guide rail clamps



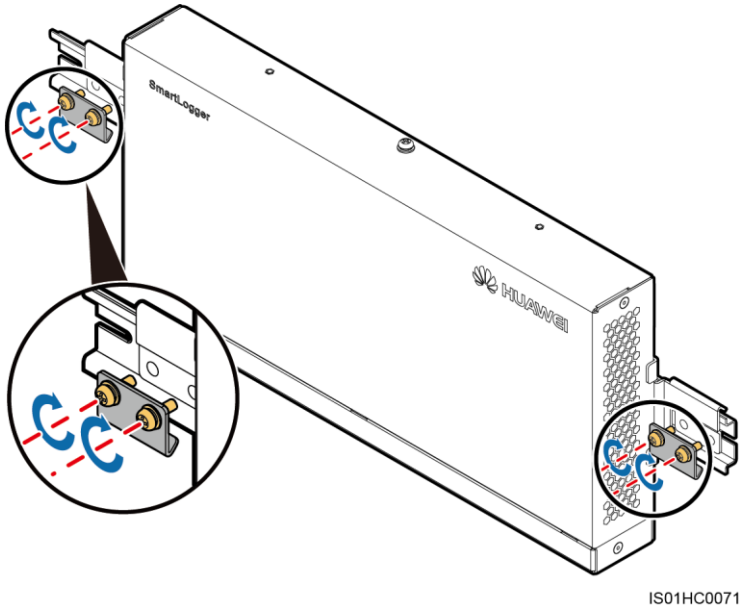
Step 3 Mount the SmartLogger onto the guide rail, as shown in Figure 3-11.

Figure 3-11 Mounting the SmartLogger onto the guide rail



Step 4 Install the guide rails fastener using M4x12 screws, and tighten the screws to a torque wrench of 1.2 N·m, as shown in Figure 3-12.

Figure 3-12 Installing guide rail fasteners



----End

3.5 Installing the RS485 signal SPD

Context

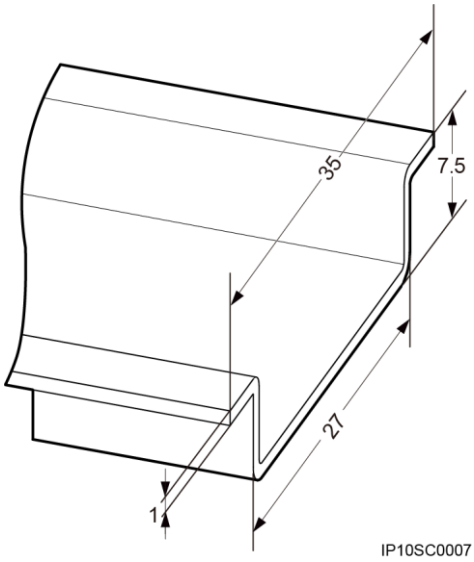
- If the SmartLogger needs to be connected to outdoor equipment through the COM port, it is recommended that an RS485 signal SPD be installed.
- Each RS485 signal SPD can connect to two COM ports. Each SmartLogger can be configured with a maximum of three RS485 signal SPDs.
- For a smart array controller, the RS485 signal SPD is installed before delivery. In other scenarios, the RS485 signal SPD can be mounted on guide rail.

NOTE

When determining the installation position, verify that the linear distance between the RS485 signal SPD and the SmartLogger is no greater than 500 mm.

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. For details about the guide rail dimensions, see Figure 3-8.

Figure 3-13 Guide rail dimensions (unit: mm)



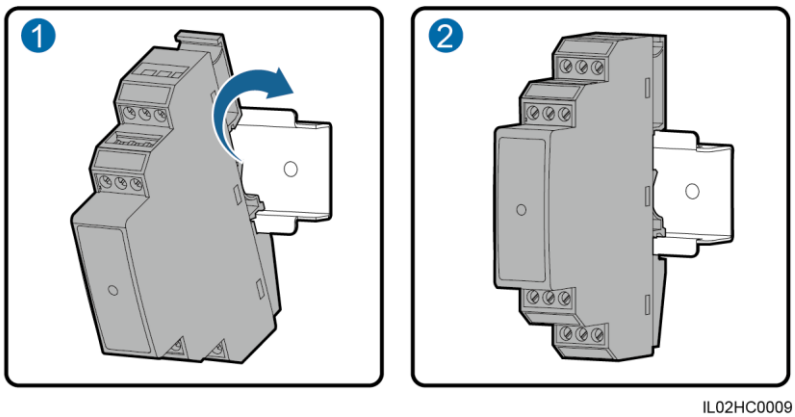
NOTICE

- 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 600 mm or greater.
- Secure the guide rail before mounting the RS485 signal SPD.

Procedure

Step 1 Secure the RS485 signal SPD to the guide rail, as shown in Figure 3-14.

Figure 3-14 Securing the RS485 signal SPD to the guide rail



----End

4 Connecting Cables

Context

NOTE

- This section describes how to connect the SmartLogger to inverters and other devices in the scenario without a smart array controller.
- For a smart array controller, the SmartLogger and RS485 signal SPDs are installed before delivery. For devices using the RS485 communications mode, connect the RS485 communications cable to the X2 terminal block on the smart array controller. For devices using the PLC mode, connect the AC power cable to the X1 terminal block on the smart array controller. For details about the two connection methods, see *SmartACU2000-C-A Smart Array Controller User Manual*.

NOTICE

- Ensure that all cables are connected securely.
- The SmartLogger has no start key. Before the cable connections for the SmartLogger are complete, do not connect a power adapter to it.

4.1 Connection Description

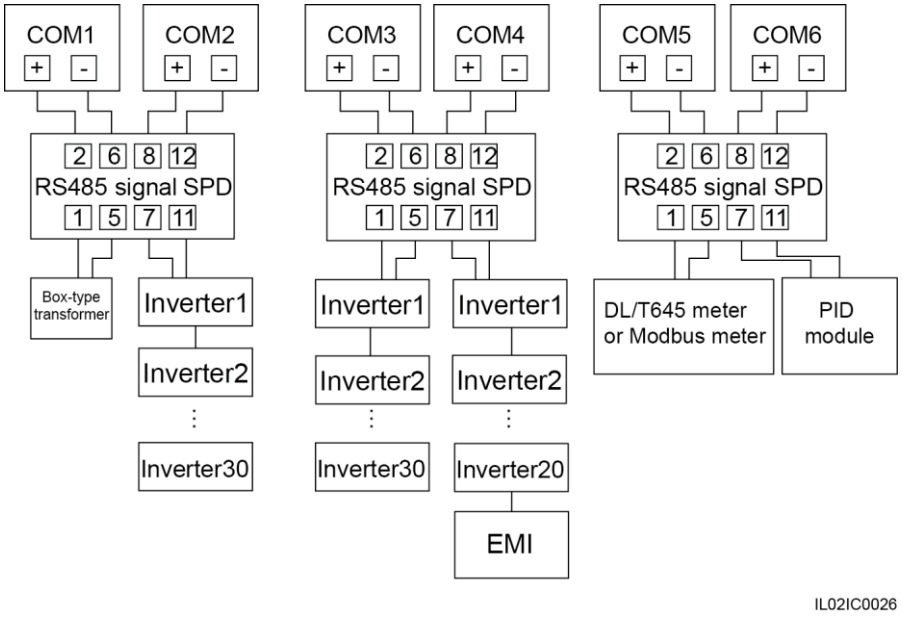
Port Description

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–4.8 Connecting a PID Module.

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



4.2 Connecting the PE Cable

The SmartLogger and SPD are separately connected to the ground bar for grounding protection through a PE cable.

4.2.1 Connecting the PE Cable for the SmartLogger

Prerequisites

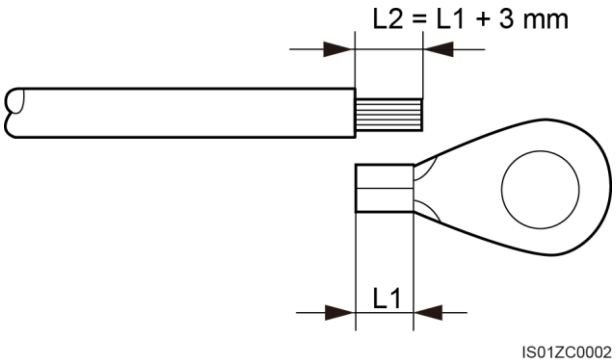
The ground cable and OT terminals are available.

- Ground cable: outdoor copper-core cables with a cross sectional area of 4–6 mm^2 or 12–10 AWG are recommended.
- OT terminal: M6

Procedure

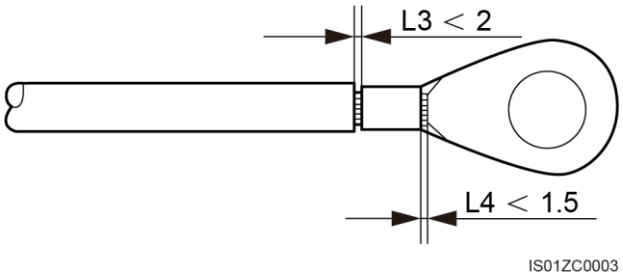
Step 1 Strip an appropriate length of the insulation layer using a wire stripper, as shown in Figure 4-2.

Figure 4-2 Stripping a PE cable



Step 2 Insert the bare cable cores into the OT terminal and crimp them by using a crimping tool, as shown in Figure 4-3.

Figure 4-3 Crimping the cable (unit: mm)



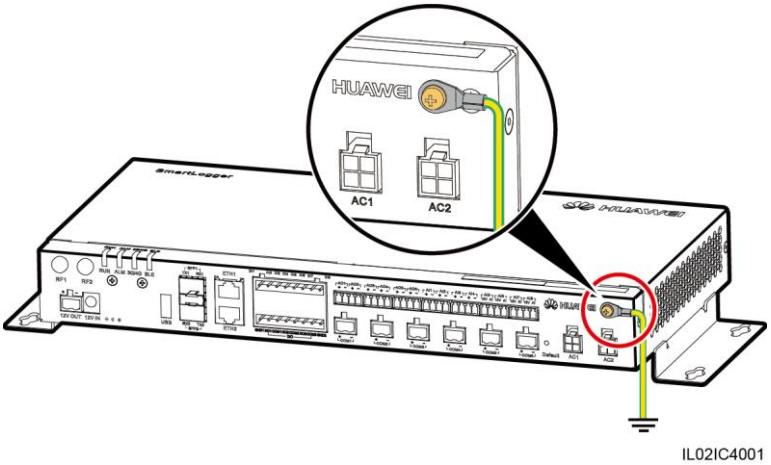
NOTE

The cavity formed after the conductor crimp strip is crimped must wrap the core wires completely. The core wires must contact the terminal closely.

Step 3 Remove the screws, spring washers, and flat washers from the ground point.

Step 4 Install the crimped OT terminal, flat washer, and spring washer onto the screw, and tighten the screw to a torque of 1.4 N ·m using a torque screwdriver, as shown in Figure 4-4.

Figure 4-4 Connecting the PE cable to the SmartLogger



NOTE

To enhance the anti-corrosion performance of the ground terminal, apply silica gel or paint on it after connecting the PE cable.

NOTICE

- For details about how to make the OT terminal at the other end of the cable, see Step 1 and Step 2.
- Connect the other end of the PE cable to the ground bar.

----End

4.2.2 Connecting the PE Cable for the RS485 Signal SPD

Prerequisites

The ground cable and OT terminals are available.

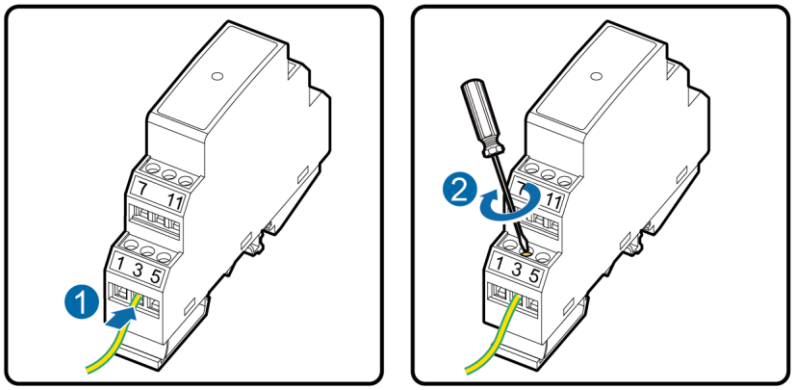
- Ground cable: outdoor copper-core cables with a cross sectional area of 4 mm^2 or 12 AWG are recommended.
- OT terminal: M6

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 4-5.

Figure 4-5 Connecting the PE cable for the RS485 signal SPD



Step 3 Use a flat-head screwdriver to tighten the screws on port 3, as shown by (2) in Figure 4-5.

NOTE

To enhance the anti-corrosion performance of the ground terminal, apply silica gel or paint on it after connecting the PE cable.

NOTICE

- For details about how to make the OT terminal at the other end of the cable, see Step 1 and Step 2 in 4.2.1 Connecting the PE Cable for the SmartLogger.
- Connect the other end of the PE cable to the ground bar.

----End

4.3 Connecting the RS485 signal SPD

Prerequisites

A two-core or multi-core communications cable with a wire cross sectional area of 0.5–2.5 mm^2 has been prepared.

Context

NOTE

The way of connecting two to three 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 4-6.

Figure 4-6 Ports on an RS485 signal SPD

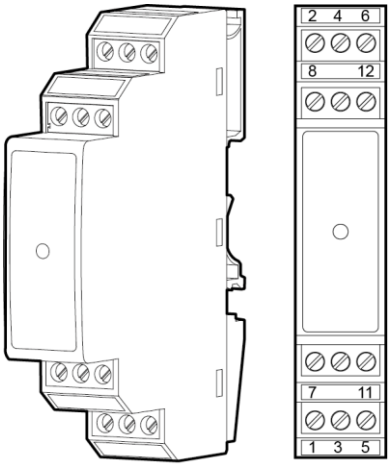


Table 4-1 describes the surge protection ports.

Table 4-1 Port description

RS485 Surge Protection Port	Protection Port	Port Definition	Function	Surge Port	Port Definition	Function
RS485 surge protection 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 protection 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

NOTE

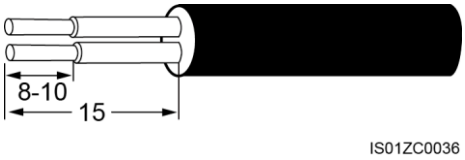
- Protection ports are connected to COM ports on the SmartLogger. Port 4 is not connected.
- Surge ports are connected to RS485 ports of other devices. Port 3 is the ground port.
- Protection ports and Surge ports must not be reversely connected.
- One RS485 signal SPD can protect two COM ports.

- 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.
- An RS485 signal SPD port supports cables with a maximum cross sectional area of 2.5 mm^2. If devices need to be connected to an RS485 port in parallel, use cables with a cross sectional area of 1 mm^2, and connect no more than two cables to the same port.

Procedure

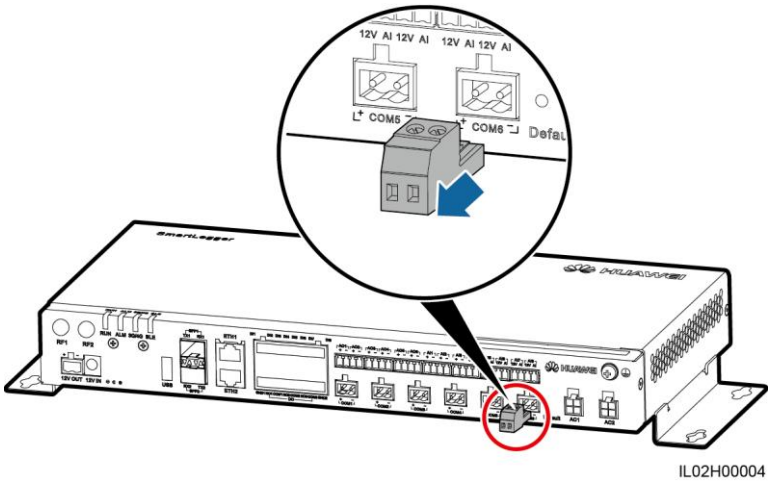
Step 1 Remove an appropriate length of steel armor and insulation layer from the cable using a wire stripper, as shown in Figure 4-7.

Figure 4-7 Stripping an RS485 communications cable (unit: mm)



Step 2 Remove the terminal block from the SmartLogger COM port, as shown in Figure 4-8.

Figure 4-8 Connecting the terminal block

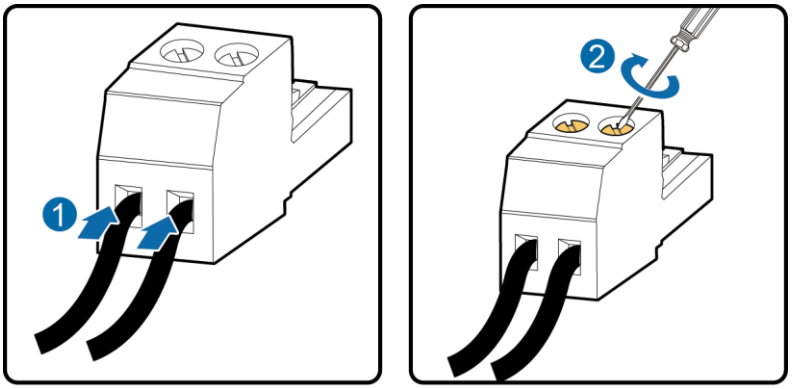


NOTE

- For details about the definitions of SmartLogger COM ports, see **Context** in Connecting the SUN2000 Using an RS485 Communications Cable of 4.4.1 Connecting the SUN2000.
- Remove the terminal block using a flat-head screwdriver.

Step 3 Insert the bare cable cores into the terminal block, as shown by (1) in Figure 4-9.

Figure 4-9 Cable connection for the terminal block

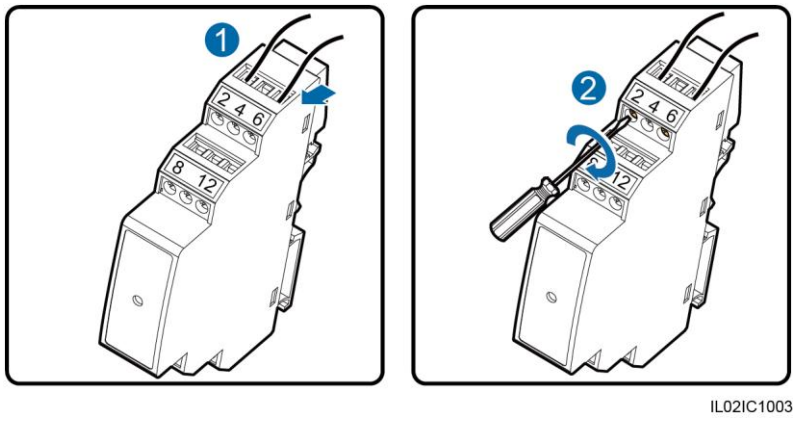


Step 4 Use a flat-head screwdriver to tighten the screws on the terminal block, as shown by (2) in Figure 4-9.

Step 5 Insert the terminal block into the SmartLogger COM port.

Step 6 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 4-10.

Figure 4-10 Wiring diagram for the RS485 signal SPD



NOTICE

Verify that the **COM+ (RS485A)** port on the SmartLogger is connected to Protection port 2 or 8 on the RS485 signal SPD, and that the **COM- (RS485B)** port on the SmartLogger is connected to Protection port 6 or 12 on the RS485 signal SPD.

Step 7 Use a flat-head screwdriver to tighten the screws on the Protection ports, as shown by (2) in Figure 4-10.

----End

Follow-up Procedure

Disconnection can be performed in reverse order.

4.4 Connecting Inverters

4.4.1 Connecting the SUN2000

The SmartLogger can be connected to the SUN2000 through an RS485 communications cable or AC power cable. Communication modes for the SUN2000 with PLC and those without PLC are different. Select an appropriate communication mode based on the actual situation.

For models with the PLC function, you can select either the PLC or RS485 communications mode. For models without the PLC function, you can select only the RS485 communications mode.

NOTE

The RS485 and PLC communication modes are mutually exclusive.

- If the RS485 communications mode is selected, do not connect an AC power cable to the PLC power input port of the SmartLogger.
- If the PLC communications mode is selected, do not connect the RS485 communications cable, and do not connect the RS485 signal SPDs.

Connecting the SUN2000 Using an RS485 Communications Cable

Context

The SmartLogger provides six COM ports for RS485 communication, as shown in Figure 4-11.

Figure 4-11 COM ports of the SmartLogger

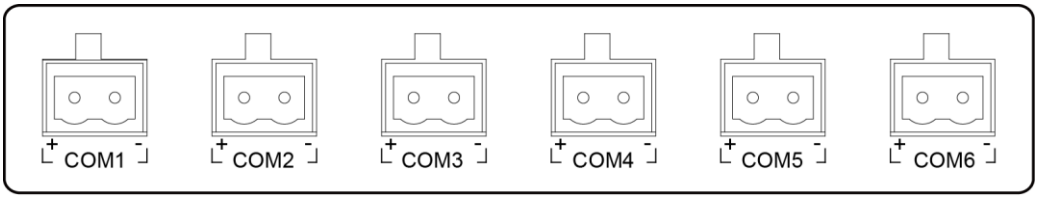


Table 4-2 describes the COM ports.

Table 4-2 COM port description

Port	Silk Screen	Function
COM1	+	RS485A, for RS485 positive differential signaling
	-	RS485B, for RS485 negative differential signaling
COM2	+	RS485A, for RS485 positive differential signaling

Port	Silk Screen	Function
	-	RS485B, for RS485 negative differential signaling
COM3	+	RS485A, for RS485 positive differential signaling
	-	RS485B, for RS485 negative differential signaling
COM4	+	RS485A, for RS485 positive differential signaling
	-	RS485B, for RS485 negative differential signaling
COM5	+	RS485A, for RS485 positive differential signaling
	-	RS485B, for RS485 negative differential signaling
COM6	+	RS485A, for RS485 positive differential signaling
	-	RS485B, for RS485 negative differential signaling

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

- Terminal block connection

  Terminal block of the SUN2000-24.7KTL-JP/33KTL-JP/40KTL-JP/36KTL/42KTL/43KTL-IN-C1/50KTL/50KTL-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-C1/50KTL/50KTL-C1**

    Figure 4-12 shows the position of the terminal block in the SUN2000.

    Figure 4-12 Position of the terminal block in the SUN2000

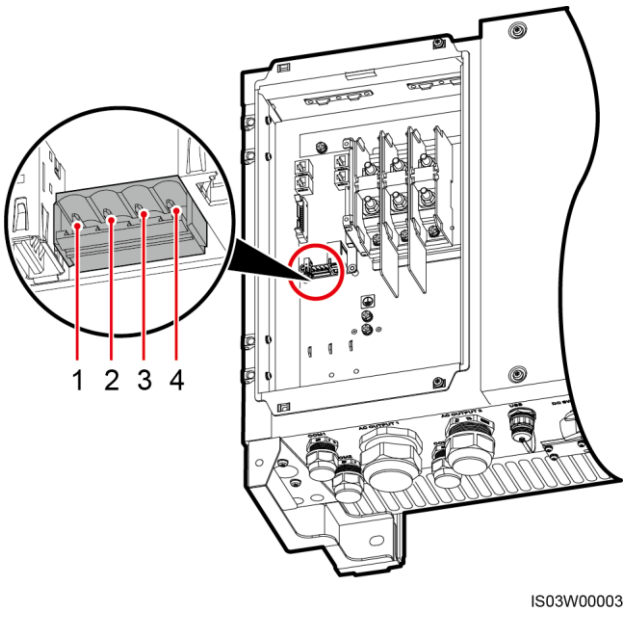


Table 4-3 Functions of the RS485 terminal block

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 4-13 shows the position of the terminal block in the SUN2000-33KTL/40KTL. Figure 4-14 describes the functions.

  Figure 4-13 Position of the terminal block in the SUN2000

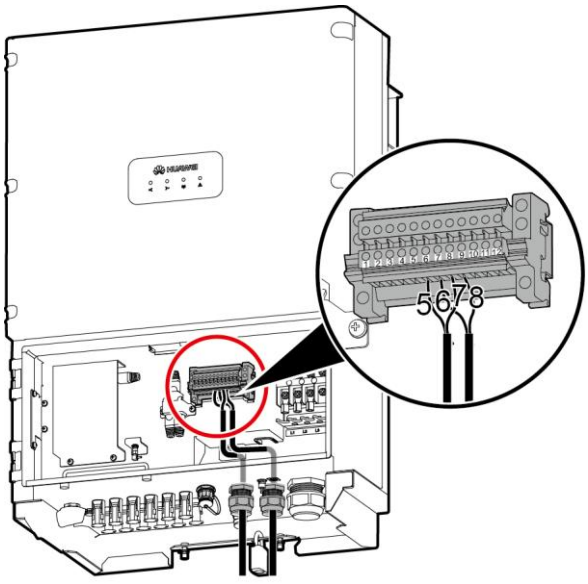


Figure 4-14 Terminal block

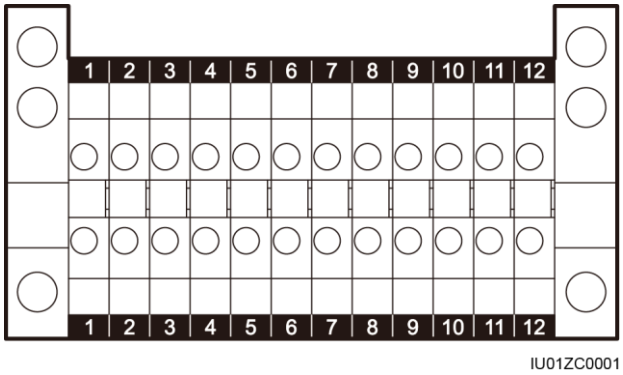


Table 4-4 Functions of the RS485 terminal block

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

- RJ45 network port connection

  The RJ45 port needs to be connected using an RJ45 connector, as shown in Figure 4-15.

  Figure 4-15 RS485 RJ45 connector of the SUN2000 (side view without the fastener)

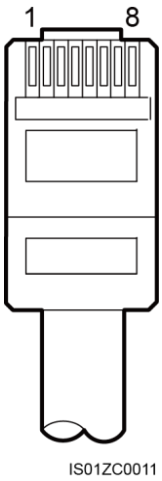


Table 4-5 lists the wire colors and functions.

Table 4-5 Wire colors and functions

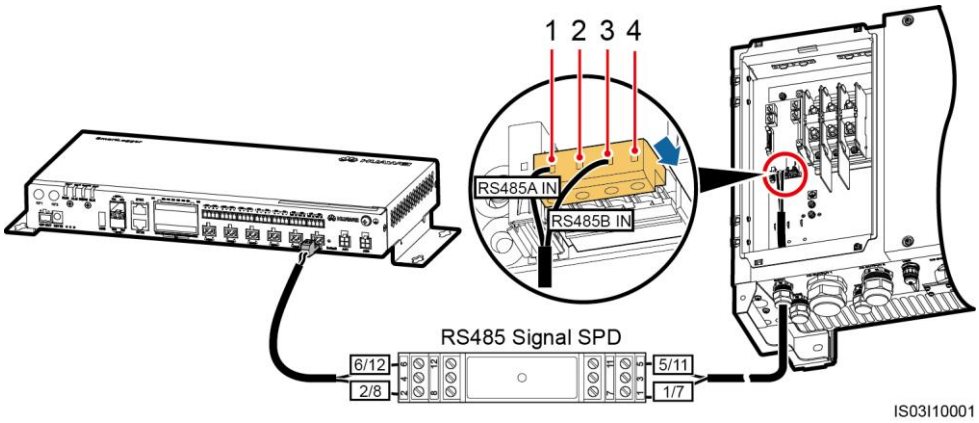
No.	Color	Function

No.	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	-

NOTE
This section describes how to connect the SUN2000-50KTL to the SmartLogger through a terminal block.

Figure 4-16 shows how to connect the SmartLogger to the SUN2000 through an RS485 signal SPD.

Figure 4-16 Connecting the SmartLogger to the SUN2000



(1) RS485A IN (2) RS485A OUT (3) RS485B IN (4) RS485B OUT

Procedure

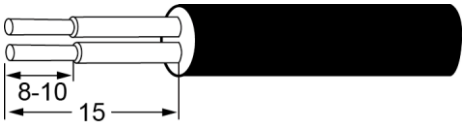
Step 1 Prepare a cable with an appropriate length, strip a proper part of the insulation layer from one end, and connect the end to the SUN2000 terminal block.

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

- For details about how to strip and connect the wires, see *SUN2000-(50KTL, 50KTL-C1) 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 4-17.

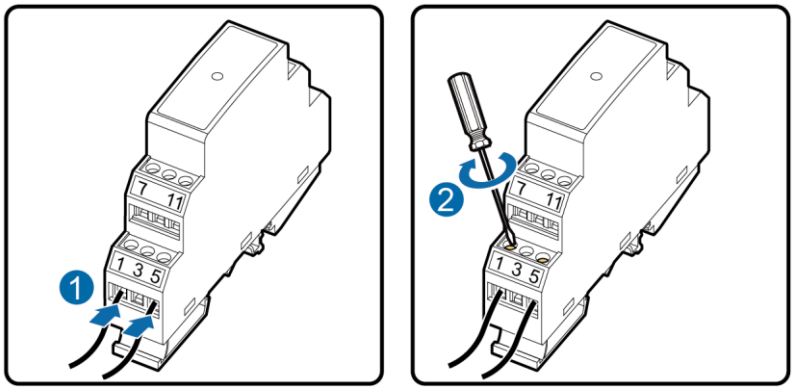
Figure 4-17 Stripping an RS485 communications cable (unit: mm)



IS01ZC0036

Step 3 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



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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.

Step 4 Use a flat-head screwdriver to tighten the screws on the Surge ports, as shown by (2) in Figure 4-18.

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 Setting RS485 Parameters or *SUN2000 APP User Manual*.
- For details about the communications parameters settings for the SUN2000, see *SUN2000 APP User Manual*.

----End

Follow-up Procedure

Disconnection can be performed in reverse order.

Connecting the SUN2000 Through an AC Power Cable

Context

The SmartLogger is integrated with the PLC central coordinator (CCO) that can work with the SUN2000 integrated with the PLC station (STA) to implement power line communication (PLC) networking over power cables.

Procedure

Step 1 Connect one end of the delivered AC power cable to an MCB.

Step 2 Connect the AC1 and AC2 terminals at the other end of the cable to the **AC1** and **AC2** ports on the SmartLogger respectively, as shown in Figure 4-19.

Figure 4-19 Connecting an AC power cable to the SmartLogger

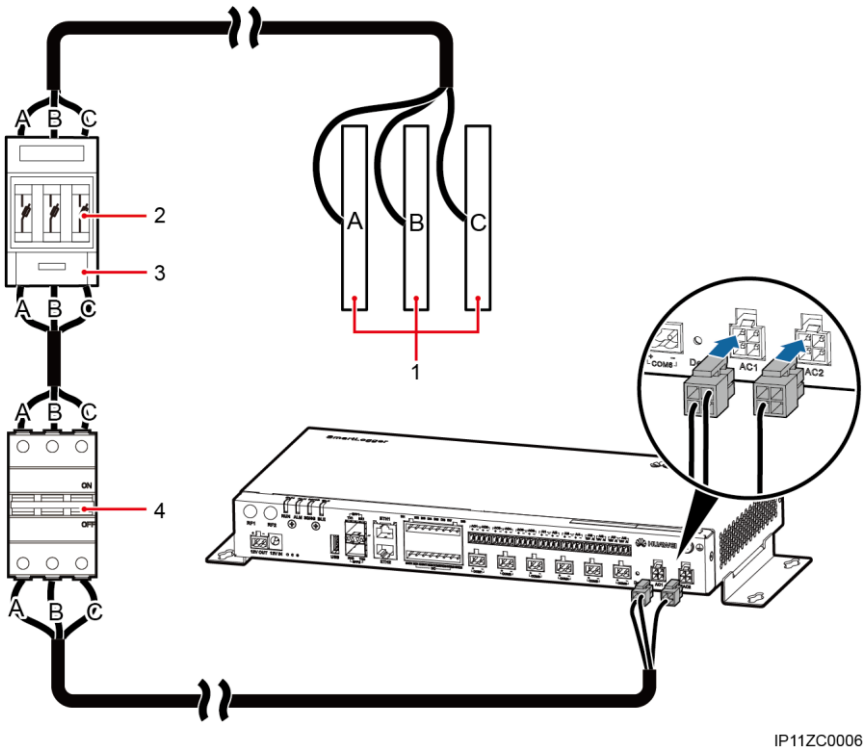


Table 4-6 describes the components shown in Figure 4-19.

Table 4-6 Component

No.	Component	Item	Quantity
1	Busbar A/B/C	-	1 PCS

No.	Component	Item	Quantity
2	Fuse	Rated voltage: ≥ 500 V; rated current: 6 A	3 PCS
3	Knife switch box	Rated voltage: ≥ 500 V; rated current: ≥ 6 A; number of phases: three	1 PCS
4	MCB	Rated voltage: ≥ 500 V; rated current: ≥ 6 A	1 PCS

NOTE

- Each SmartLogger can be connected to a maximum of 80 SUN2000s.
- If the SmartLogger is connected to the SUN2000 through an AC power cable, no RS485 communications cable needs to be connected.
- After connecting cables, log in to the WebUI and enable the PLC function in the SmartLogger. For details, see Connecting a Device. PLC describes how to configure PLC parameters for the SmartLogger.
- The port used for PLC networking is **RS485-0**. The recommended **Baud Rate** for the port is **115200 bit/s**, which can provide optimal communications performance.

----End

Follow-up Procedure

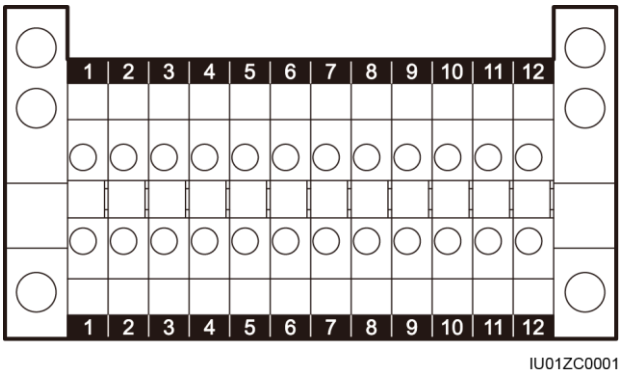
Disconnection can be performed in reverse order.

4.4.2 Connecting the SUN8000

Context

Figure 4-20 shows the wiring terminals of the RS485 ports of the SUN8000.

Figure 4-20 RS485 wiring terminals for the SUN8000



Ports 07, 08, 09, 10, 11, and 12 are communications ports. Table 4-7 describes the functions of these ports.

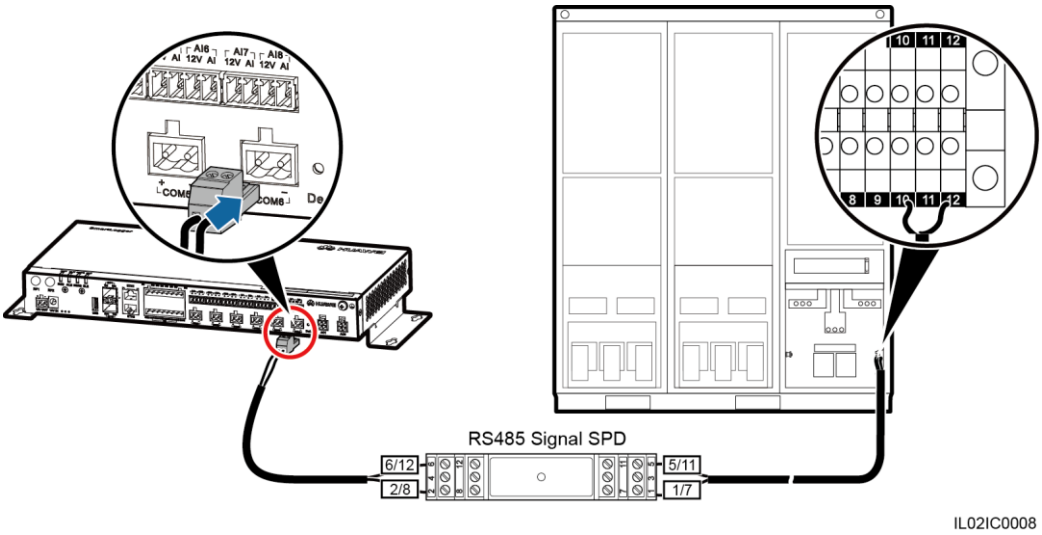
Table 4-7 Port description

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 six RS485 ports in the SmartLogger. For the port descriptions, see **Context** in Connecting the SUN2000 Using an RS485 Communications Cable of 4.4.1 Connecting the SUN2000.

Figure 4-21 shows how to connect the SmartLogger to the SUN8000 through an RS485 signal SPD.

Figure 4-21 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.

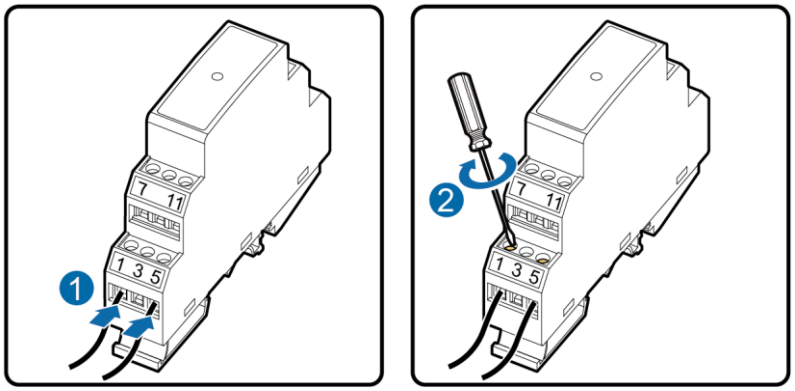
- Recommended communications cable: dual-core shielded network cable (outdoor shielded network cables are also acceptable, if only two core wires are connected).
- For details about connecting the RS485 ports for the SUN8000, see the *SUN8000-500KTL User Manual*.

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 4-22.

Figure 4-22 Connecting the Surge port of the RS485 signal SPD



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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 **N485B_IN** port on the SUN8000 is connected to Surge port 5 or 11 on the RS485 signal SPD.

Step 5 Use a flat-head screwdriver to tighten the screws on the Surge ports, as shown by (2) in Figure 4-22.

Step 6 Set **Baud Rate** for the SUN8000 to the same **Baud Rate** configured for the SmartLogger.

- For details about the communications parameters settings for the SmartLogger, see 7.27 Setting RS485 Parameters or *SUN2000 APP User Manual*.
- 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.

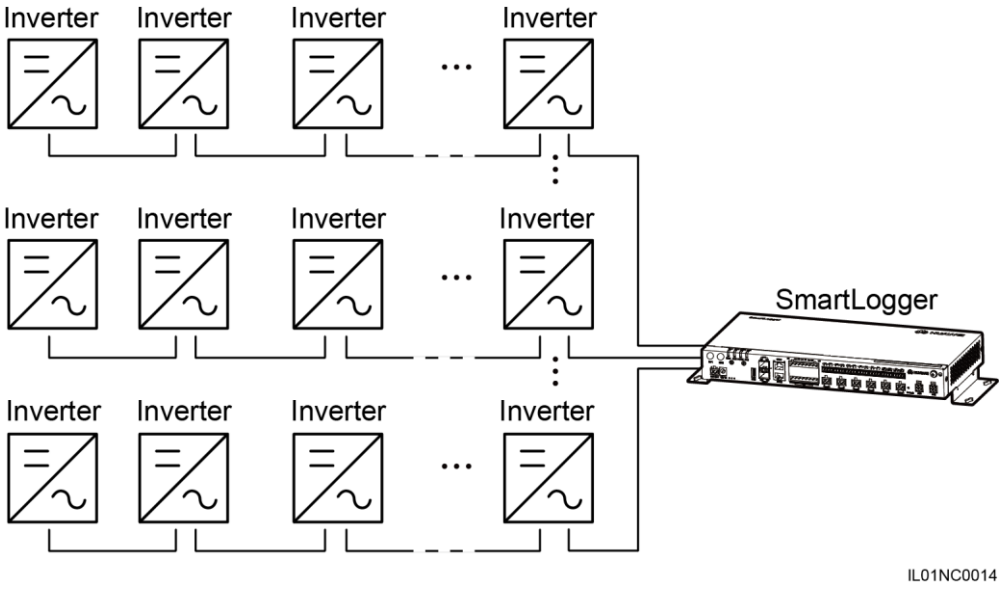
4.4.3 Connecting Multiple Inverters to the SmartLogger

The SmartLogger can connect to multiple inverters through a daisy chain or an AC power cable.

Daisy Chain Connection

In the daisy chain connection mode, the RS485OUT of one inverter is connected to the RS485IN port of the next inverter, and the first inverter is connected to the SmartLogger as described in Connecting the SUN2000 Using an RS485 Communications Cable or 4.4.2 Connecting the SUN8000 in 4.4.1 Connecting the SUN2000. Figure 4-23 shows the connection.

Figure 4-23 Connecting the SmartLogger to multiple inverters



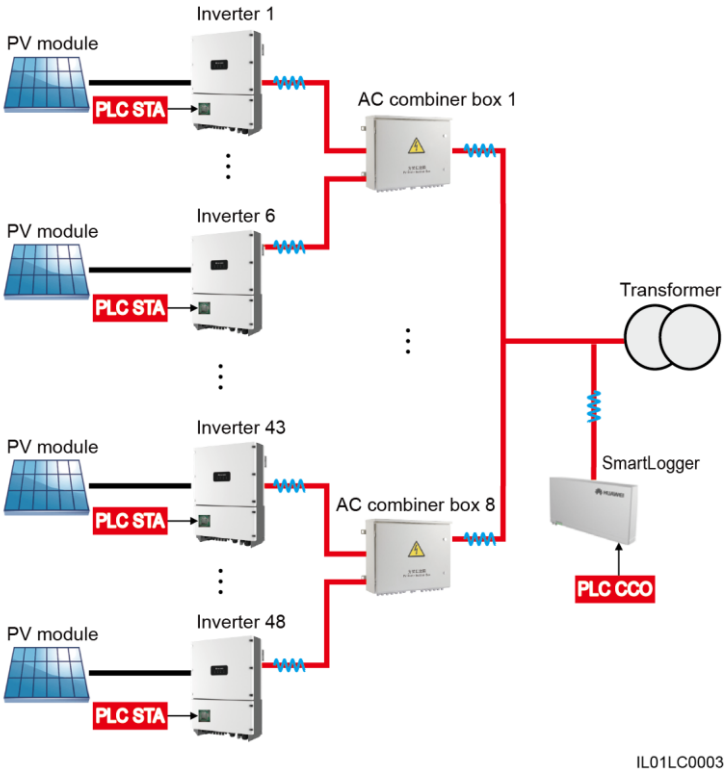
NOTE

- A maximum of 200 devices can be connected to one SmartLogger. You are advised to connect fewer than 30 devices to each RS485 route. Each SmartLogger can be connected to a maximum of 80 inverters.
- If an EMI is to be connected, connect it at the end of the chain.
- Set **Build-out Resistor** to **Enable** under **Comm. Param.** for the inverter at the end of each daisy chain. For details, see *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.
- You can perform the **Auto Assign Address** operation on the built-in WebUI of the SmartLogger. If an RS485 address conflict is detected for inverters, the SmartLogger automatically reassigns the addresses without the need for local address upgrade for the inverters.
- **Baud rate** of all the devices in one daisy chain should stay consistent with those of the SmartLogger.

AC Power Cable Connection

Figure 4-24 shows the method for connecting the SmartLogger to multiple SUN2000s over an AC power cable.

Figure 4-24 PLC networking



NOTE

Only PLC models of the SUN2000s can be connected to the SmartLogger over an AC power cable.

4.5 Connecting an EMI

Context

The SmartLogger can be connected to an EMI that supports the standard Modbus-RTU protocol. One SmartLogger can be connected to and manage only one EMI.

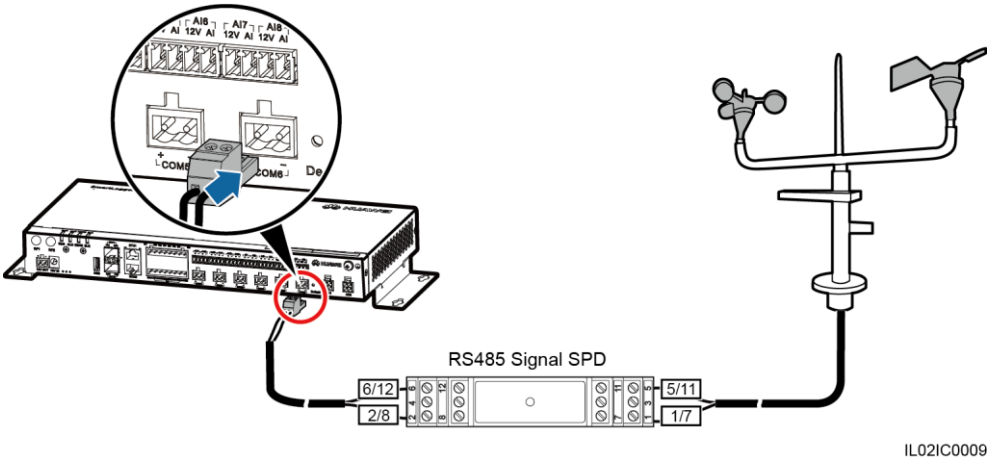
Devices from different vendors may support different protocols. To obtain information from the connected EMI, correctly configure the protocol on the WebUI of the SmartLogger based on the document delivered by the vendor.

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

There are six RS485 ports in the SmartLogger. For the port descriptions, see **Context** in Connecting the SUN2000 Using an RS485 Communications Cable of 4.4.1 Connecting the SUN2000.

Figure 4-25 shows how to connect the SmartLogger to an EMI through an RS485 signal SPD.

Figure 4-25 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 EMI.

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 Connecting the SUN2000 Using an RS485 Communications Cable of 4.4.1 Connecting 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.

NOTE

- After connecting the cable, log in to the WebUI and set parameters under **EMI**. For details about this operation, see Setting EMI Parameters.
- The EMI cannot be detected automatically. You need to add this device manually. For details about this operation, see Connecting a Device.
- If the SmartLogger needs to be connected to an EMI and multiple inverters, connect the EMI at the end of the daisy chain, and verify that the port connecting to the EMI has a unique communications address. For details about the daisy chain connections, see Daisy Chain Connection in 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 a Power Meter

Context

The SmartLogger can be connected to a power meter that supports the standard Modbus-RTU or DL/T645 protocol.

NOTE

- The SmartLogger can be connected to and manage only one power meter that supports the Modbus-RTU protocol.
- The SmartLogger can be connected to and manage multiple power meters that support the DL/T645 protocol.

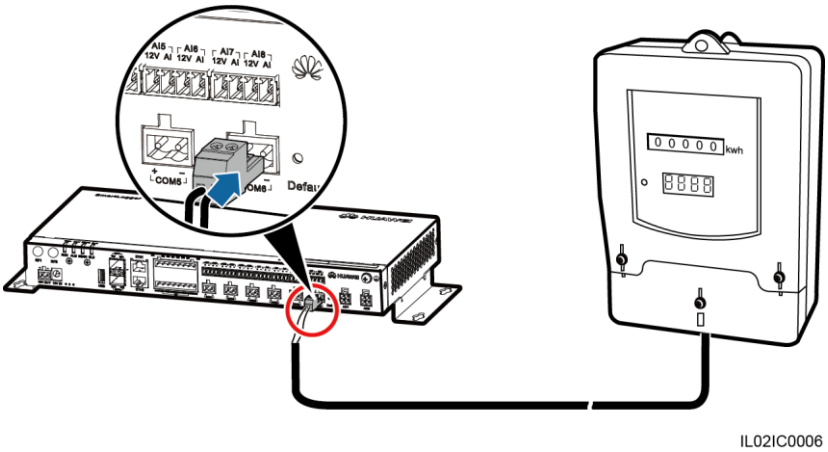
The protocol points for Power Meters provided by different vendors are varied. Therefore, to obtain information from a Power Meter, configure the protocol point on the WebUI of the SmartLogger properly based on the document delivered by the vendor.

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 six RS485 ports in the SmartLogger. For the port descriptions, see **Context** in Connecting the SUN2000 Using an RS485 Communications Cable of 4.4.1 Connecting the SUN2000.

Figure 4-26 shows how to connect the SmartLogger to a power meter.

Figure 4-26 Connecting a Power Meter



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 5 in 4.3 Connecting the RS485 signal SPD.

NOTE

- After connecting the cable for a power meter that supports the Modbus-RTU protocol, log in to the WebUI and set parameters under **Modbus Power Meter**. For details, see 7.29 Setting Modbus Power Meter Parameters.
- The communications protocol configured for devices connected to the same SmartLogger COM port must be the same. After connecting the cable, log in to the WebUI and modify the COM port protocol. For details, see 7.27 Setting RS485 Parameters.
- A power meter cannot be detected automatically. You need to add this device manually. For details, see 7.44.1 Connecting Devices.
- After modifying the protocol for a DL/T645 power meter and adding it manually, log in to the WebUI to query and set parameters under **DL/T645 Power Meter**. For details, see 7.15 DL/T645 Power Meter.

----End

Follow-up Procedure

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

4.7 Connecting the Box-type Transformer

Context

The SmartLogger can be connected to a box-type transformer over the RS485 and Ethernet communication modes.

NOTE

The SmartLogger provides two Ethernet electrical ports. A box-type transformer that supports Ethernet communication can be connected to the SmartLogger through an Ethernet electrical port, and then to an NMS through the northbound interface of the SmartLogger. In this connection mode, the IP addresses of the SmartLogger and the box-type transformer must be in the same network segment.

This section describes how to connect a box-type transformer that supports the Modbus-RTU or IEC103 protocol to the SmartLogger using the RS485 communication mode.

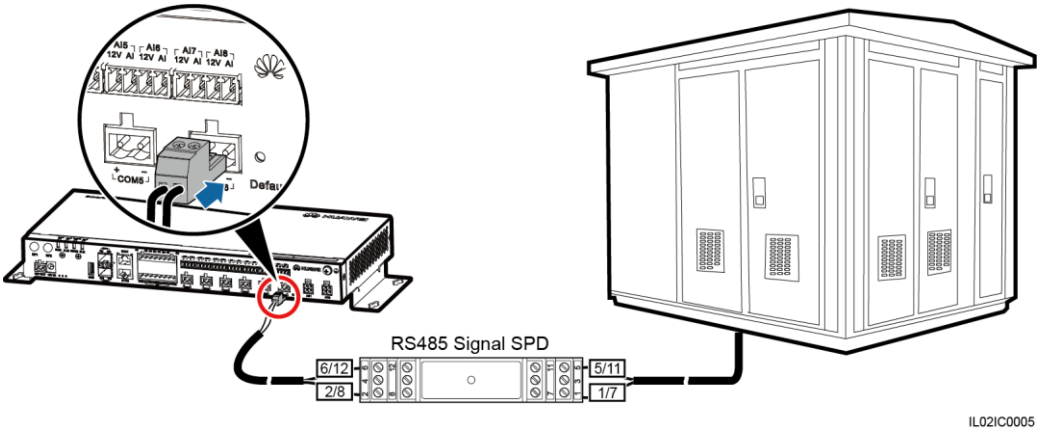
Devices from different vendors may support different protocols. To obtain information from the connected box-type transformer, correctly configure the protocol on the WebUI of the SmartLogger based on the document delivered by the vendor.

For the definition of the RS485 communications cable for the box-type transformer, see the delivered operation guide.

There are six RS485 ports in the SmartLogger. For the port descriptions, see **Context** in Connecting the SUN2000 Using an RS485 Communications Cable of 4.4.1 Connecting the SUN2000.

Figure 4-27 shows how to connect the SmartLogger to the box-type transformer through an RS485 signal SPD.

Figure 4-27 Connecting the SmartLogger to the box-type transformer



NOTE

If the SmartLogger is installed inside the box-type transformer, connect the box-type transformer to the SmartLogger COM port that has no RS485 signal SPD. For details about how to connect cables at the SmartLogger side in this scenario, see Step 1–Step 5 in 4.3 Connecting the RS485 signal SPD.

Procedure

Step 1 Connect one end of the cable delivered with the box-type transformer to the RS485 port of the box-type transformer.

Step 2 Connect the other end of the cable to a Surge port of the RS485 signal SPD. For details, see Step 3–Step 4 in Connecting the SUN2000 Using an RS485 Communications Cable of 4.4.1 Connecting the SUN2000.

NOTICE

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

NOTE

- The communications protocol configured for devices connected to the same SmartLogger COM port must be the same.
- After connecting the cable, log in to the WebUI and set parameters under **Box-type Transformer**. For details about this operation, see 7.17 User-Defined Devices.

----End

Follow-up Procedure

Disconnection can be performed in reverse order.

4.8 Connecting a PID Module

Context

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

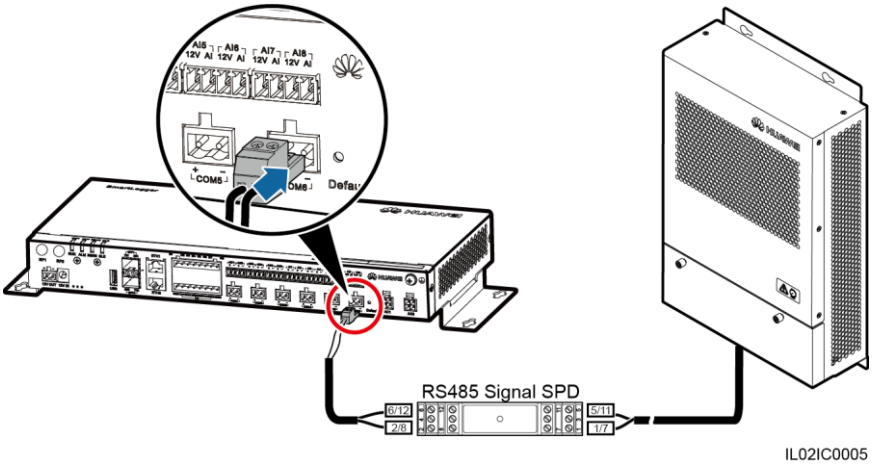
The SmartLogger can be connected to and manage only one PID module that supports the Modbus-RTU protocol.

For the definition of the RS485 communications cable for the PID module, see the delivered operation guide.

There are six RS485 ports in the SmartLogger. For the port descriptions, see **Context** in Connecting the SUN2000 Using an RS485 Communications Cable of 4.4.1 Connecting the SUN2000.

Figure 4-28 shows how to connect the SmartLogger to the PID module.

Figure 4-28 Connecting the SmartLogger to the PID module



NOTE

For a smart array controller, 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 module to the RS485 port of the PID module.

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 3–Step 4 in Connecting the SUN2000 Using an RS485 Communications Cable of 4.4.1 Connecting 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.

Step 3 Set **Baud Rate** for the PID module to the same **Baud Rate** configured for the SmartLogger.

NOTE

- The baud rates supported by the PID module include 4800 bit/s, 9600 bit/s, 19200 bit/s, and 115200 bit/s.
- The PID module supports automatic address allocation. After connecting cables, log in to the WebUI and search for the PID module in the **Connect Device** > **Auto. Search** menu.
- For details about PID parameter settings, see 7.16 PID Module.
- The default RS485 communications address of the PID module is 1. To change the RS485 communications address, log in to the WebUI and follow instructs in 7.44.1 Connecting Devices.

----End

Follow-up Procedure

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

4.9 Connecting a Ripple Control Receiver

Context

In Germany and some other 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 needed.

Figure 4-29 shows the DI ports of the SmartLogger.

Figure 4-29 DI ports of the SmartLogger

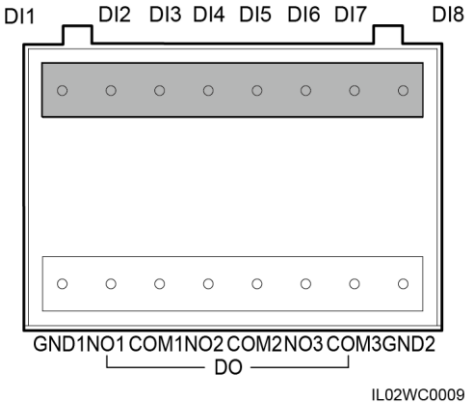


Table 4-8 describes the DI ports.

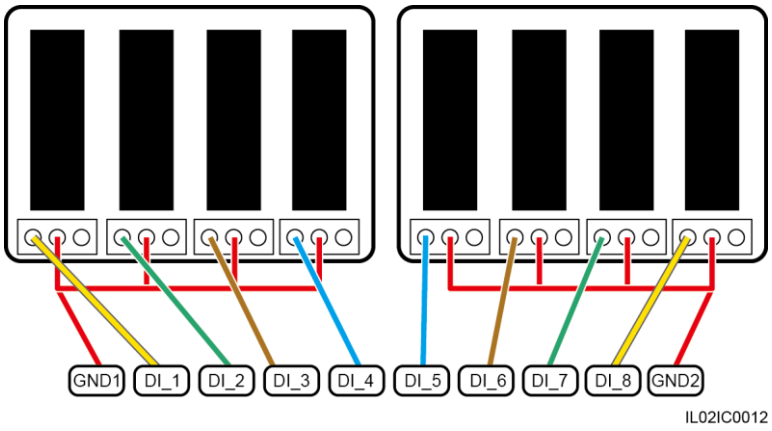
Table 4-8 DI port description

Port	Function
GND1	Dry contact input common terminal 1, used for active power derating for DI1–DI4
DI1	DI_1
DI2	DI_2
DI3	DI_3
DI4	DI_4
DI5	DI_5
DI6	DI_6
DI7	DI_7
DI8	DI_8
GND2	Dry contact input common terminal 2, used for reactive power compensation for DI5–DI8

NOTE
DI1–DI4 involve active power deration, and DI5–DI8 involve reactive power compensation.

Figure 4-30 shows how to connect the SmartLogger to a Ripple Control Receiver.

Figure 4-30 Connecting a Ripple Control Receiver



Procedure

Step 1 Select a cable of appropriate length and connect one end of the cable to the Ripple Control Receiver.

NOTE
A two-core or multiple-core cable with a cross sectional area of 1.5 mm^2 is recommended.

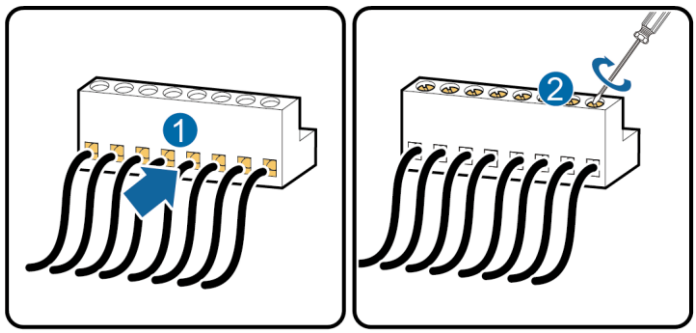
Step 2 Strip 8 mm of the insulation layer at the other end.

Step 3 Remove the terminal block from the SmartLogger DI port.

NOTE
Remove the terminal block using a flat-head screwdriver.

Step 4 Insert the bare cable cores into the terminal block, as shown by (1) in Figure 4-31.

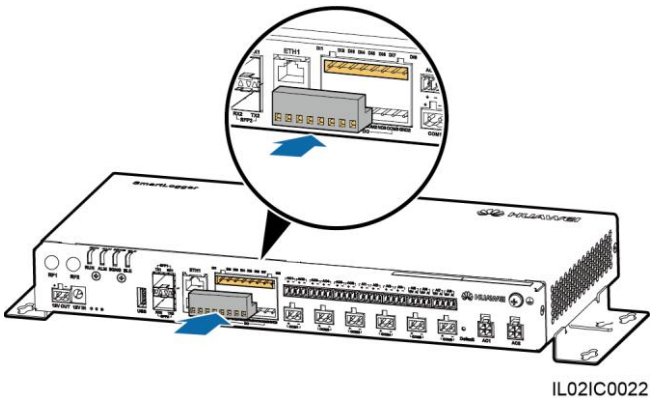
Figure 4-31 Cable connection for the terminal block



Step 5 Use a flat-head screwdriver to tighten the screws on the terminal block, as shown by (2) in Figure 4-31.

Step 6 Insert the terminal block into the SmartLogger DI port, as shown in Figure 4-32.

Figure 4-32 Connecting the terminal block



NOTICE

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

----End

Follow-up Procedure

Disconnection can be performed in reverse order.

4.10 Connecting an Ethernet Network Cable

Context

- The SmartLogger provides two Ethernet electrical ports, through which the SmartLogger can connect to a third-party device.
- 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. For the typical application scenarios, see Figure 2-6 and Figure 2-8 in 2.4 Typical Networking Scenarios.

Procedure

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

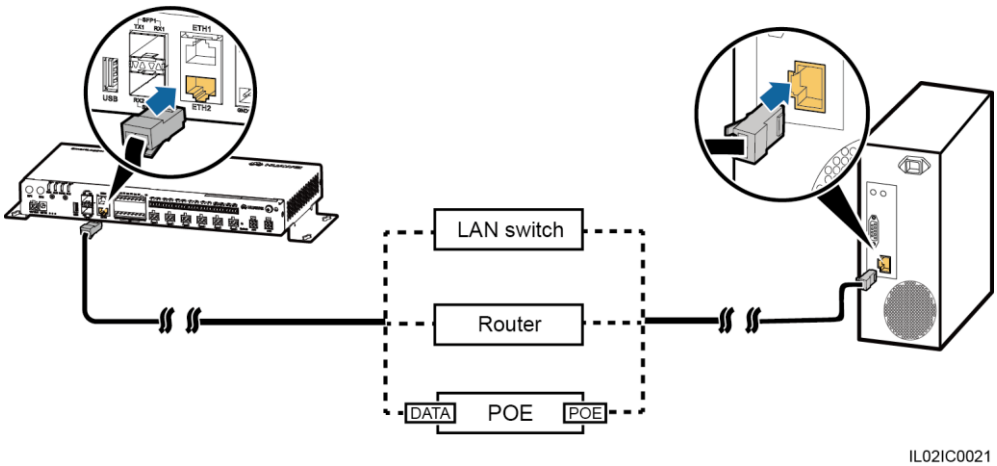
NOTE

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.
- The cable should not exceed 100 m in length.

Step 2 Connect the other end of the network cable to the **ETH1** or **ETH2** port of the SmartLogger, as shown in Figure 4-33.

Figure 4-33 Connecting an Ethernet network cable



NOTE

- A POE module can be connected only to the **DATA** port of the SmartLogger.
- 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 is connected to a PC through a networking device (such as a router), the IP addresses of the SmartLogger and networking device must be in the same network segment. Set the gateway of the SmartLogger correctly so that it can communicate with the networking device.
- To enable communication between the SmartLogger and the NetEco, set the NetEco parameters properly on the SmartLogger. For details, see 7.30 Setting NetEco Parameters.

----End

Follow-up Procedure

Disconnection can be performed in reverse order.

4.11 Connecting Optical Fibers

Context

The SmartLogger can be connected to devices such as an ATB through optical fibers. You can select the devices to be connected based on the actual networking scenario. For the typical application scenarios, see Figure 2-6 and Figure 2-7 in 2.4 Typical Networking Scenarios.

Procedure

Step 1 Insert the optical module into the **SFP1** or **SFP2** port on the SmartLogger.

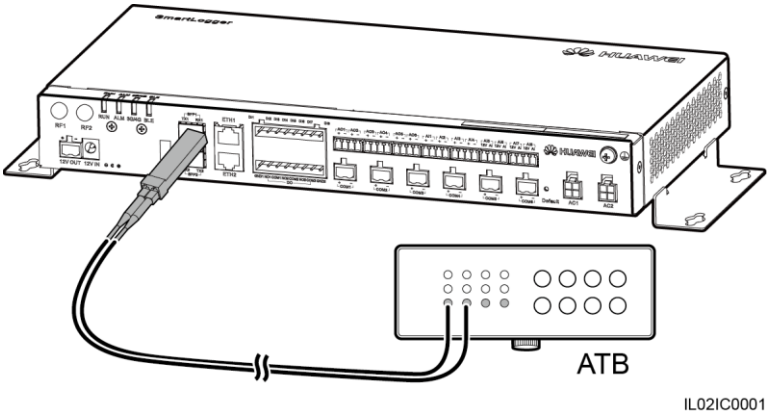
NOTICE

- The optical module is optional. If you need to configure one, it is recommended that you select the 100M optical module (eSFP encapsulation, 1310 nm, single mode) with a transmission distance of 15 km or longer.
- When inserting an optical module into the **SFP1** port, verify that the side with a handle faces upwards. When inserting an optical module into the **SFP2** port, verify that the side with a handle faces downwards.
- The optical switch used for the central control room supports RSTP and STP. To ensure the communication between the optical switch and the SmartLogger, the configured optical module must have a transmission speed of 100 Mbit/s.

Step 2 Connect the two optical fibers delivered with the optical module to the ports on the optical module.

Step 3 Connect the other end of the optical fiber to the ATB, as shown in Figure 4-34.

Figure 4-34 Connecting an ATB



Step 4 Determine the operating status based on the Ethernet optical port indicators, as shown in Table 4-9.

Figure 4-35 Ethernet optical port indicators

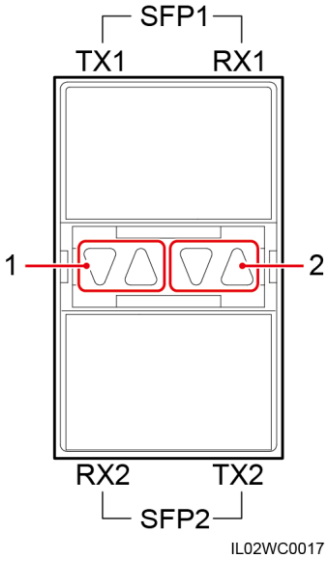


Table 4-9 Blinking status of the Ethernet optical port indicators

Indicator	Status	Meaning
(1) Upper port (2) Lower port	Green steady on and yellow blinking at short intervals (0.1s on and 0.1s off)	An optical module has been inserted into the Ethernet optical port.
	Green steady on and yellow off	An optical fiber link has been successfully established.

Indicator	Status	Meaning
	Green steady on and yellow blinking slowly (0.1s on and 1.9s off)	Optical fiber communication is in progress.

----End

Follow-up Procedure

Disconnection can be performed in reverse order.

NOTE

1. When removing an optical fiber, press down the clip first.
2. When removing an optical module, press down the handle, and then pull the module outwards.

5 System Operation

5.1 Checking Before Power-On

Table 5-1 lists the items to be checked before the SmartLogger is powered on.

Table 5-1 Items to be checked for the SmartLogger before power-on

No.	Check Item	Check Result
1	The SmartLogger and RS485 signal SPDs are installed correctly and securely.	□ Compliant □ Incompliant
2	Ground cables of the SmartLogger and RS485 signal SPDs are connected to ground points securely.	□ Compliant □ Incompliant
3	The cables between the SmartLogger and the RS485 signal SPDs are securely connected.	□ Compliant □ Incompliant
4	The RS485 communications cable is securely and reliably connected.	□ Compliant □ Incompliant
5	The AC power cable is securely connected to the SmartLogger when the PLC communication is used.	□ Compliant □ Incompliant
6	Ports not used (such as the RF1, RF2, optical port, and Ethernet port) are protected by dustproof plugs.	□ Compliant □ Incompliant
7	Routing for the power cable and signal cable meets the requirements for routing strong-current and weak-current cables and complies with the cable routing plan.	□ Compliant □ Incompliant
8	Cables are bound neatly, and cable ties are secured evenly and properly in the same direction.	□ Compliant □ Incompliant
9	There is no unnecessary adhesive tape or cable tie on cables.	□ Compliant □ Incompliant

5.2 Powering On the System

Prerequisites

You have performed 5.1 Checking Before Power-On.

NOTICE

- When powering on the system, use the power adapter delivered with the product. The rated input of the power adapter is 100–240 V AC, 50 Hz or 60 Hz. If adapters of other models are used, the equipment may be damaged.
- Select an AC socket that matches the power adapter.

Context

For a smart array controller, the SmartLogger is installed before delivery, and the power cable is connected.

Procedure

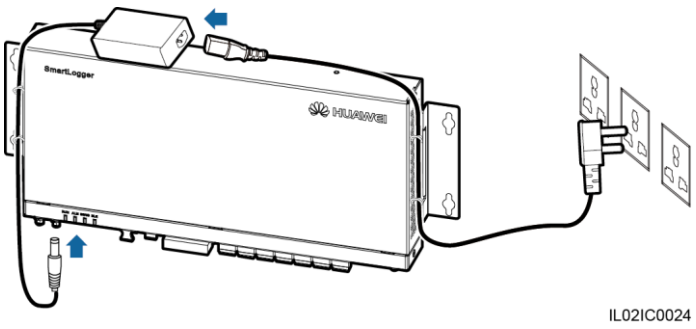
Step 1 Insert the output terminal of the power adapter into the **12V IN** port of the SmartLogger.

Step 2 Insert the power cable into the power adapter.

Step 3 Insert the power cable plug into an AC socket.

If the SmartLogger is installed outside a smart array controller, place the power adapter on the top of the SmartLogger and secure the power adapter using cable ties, as shown in Figure 5-1.

Figure 5-1 Connecting the power cable if the SmartLogger is installed outside a smart array controller



Step 4 Switch on the circuit breaker of the AC socket.

Step 5 Switch on the upstream circuit breaker of the AC power cable.

NOTE

Step 5 needs to be performed only in the PLC networking scenario.

----End

6 User Interface

6.1 USB Flash Drive Operations

6.1.1 Exporting Data

Context

USB flash drives of SanDisk, Netac, and Kingston are recommended. Other brands may be incompatible.

By exporting data, you can obtain data of active alarms, historical alarms, performance, exception takeover logs, commissioning logs, operation logs, fault information file, and electronic labels.

Procedure

Step 1 Insert the USB flash drive into the USB port at the bottom of the SmartLogger.

Step 2 Log in to the APP, and choose **More** > **System Maintenance** > **Generate Local Maint. Script** on the main menu page. For details, see *SUN2000 APP User Manual*.

NOTE
The generated boot script file is automatically saved in the root directory of the USB flash drive.

Step 3 Remove the USB flash drive from the USB port at the bottom of the SmartLogger, and insert the USB flash drive into the port again.

NOTE
After the USB flash drive is connected again, the SmartLogger can automatically detect the boot script file.

Step 4 The SmartLogger automatically executes all commands specified in the boot script file. View the LED indicator to determine the operating status.

NOTICE

- Verify that the USB flash drive contains a boot script file; otherwise, the SmartLogger cannot execute the operations.
- If SmartLoggers have the same APP login password, the boot script file generated by one SmartLogger can be used in other SmartLoggers.
- The initial APP login password of the SmartLogger is **00000a**. Change it upon the first login.

Table 6-1 Indicator status

Indicator (Silk Screen)	Status	Meaning
ALM	Off	No local maintenance is underway.
	Blinking green at long intervals (on for 1s and then off for 1s)	Local maintenance is in progress.
	Steady green	Local maintenance succeeds.
	Blinking green at short intervals (on for 0.125s and then off for 0.125s)	Local maintenance fails.

----End

6.1.2 Exporting All Files

Context

USB flash drives of SanDisk, Netac, and Kingston are recommended. Other brands may be incompatible.

NOTE

- If the SmartLogger needs to be replaced, you can export the files before the replacement and then import the files into the new SmartLogger to ensure data integrity.
- After exporting all files, you can view information about the SmartLogger and devices connected to the SmartLogger.

Procedure

Step 1 Insert the USB flash drive into the USB port at the bottom of the SmartLogger.

Step 2 Log in to the APP, and choose **More** > **System Maintenance** > **Generate Local Maint. Script** on the main menu page. For details, see *SUN2000 APP User Manual*.

NOTE

The generated boot script file is automatically saved in the root directory of the USB flash drive.

Step 3 Remove the USB flash drive from the USB port at the bottom of the SmartLogger, and insert the USB flash drive into the port again.

NOTE
After the USB flash drive is connected again, the SmartLogger can automatically detect the boot script file.

Step 4 The SmartLogger automatically executes all commands specified in the boot script file. View the LED indicator to determine the operating status.

NOTICE

- Verify that the USB flash drive contains a boot script file; otherwise, the SmartLogger cannot execute the operations.
- If SmartLoggers have the same APP login password, the boot script file generated by one SmartLogger can be used in other SmartLoggers.
- The initial APP login password of the SmartLogger is **00000a**. Change it upon the first login.

Table 6-2 Indicator status

Indicator (Silk Screen)	Status	Meaning
ALM	Off	No local maintenance is underway.
	Blinking green at long intervals (on for 1s and then off for 1s)	Local maintenance is in progress.
	Steady green	Local maintenance succeeds.
	Blinking green at short intervals (on for 0.125s and then off for 0.125s)	Local maintenance fails.

----End

6.1.3 Importing All Files

Prerequisites

A USB flash drive contains a boot script file and all export files.

Context

USB flash drives of SanDisk, Netac, and Kingston are recommended. Other brands may be incompatible.

Procedure

Step 1 Insert the USB flash drive into the USB port at the bottom of the SmartLogger.

Step 2 Log in to the APP, and choose **More** > **System Maintenance** > **Generate Local Maint. Script** on the main menu page. For details, see *SUN2000 APP User Manual*.

NOTE
The generated script file will replace the script file for full file export in the USB flash drive.

Step 3 The SmartLogger automatically executes all commands specified in the boot script file. View the LED indicator to determine the operating status.

NOTICE

- Verify that the USB flash drive contains a boot script file; otherwise, the SmartLogger cannot execute the operations.
- If SmartLoggers have the same APP login password, the boot script file generated by one SmartLogger can be used in other SmartLoggers. If the SmartLogger to which files are imported have a different password, you need to generate a new boot script file in the SmartLogger.
- The initial APP login password of the SmartLogger is **00000a**. Change it upon the first login.

Table 6-3 Indicator status

Indicator (Silk Screen)	Status	Meaning
ALM	Off	No local maintenance is underway.
	Blinking green at long intervals (on for 1s and then off for 1s)	Local maintenance is in progress.
	Steady green	Local maintenance succeeds.
	Blinking green at short intervals (on for 0.125s and then off for 0.125s)	Local maintenance fails.

----End

6.1.4 Upgrading the Application

Context

USB flash drives of SanDisk, Netac, and Kingston are recommended. Other brands may be incompatible.

Procedure

Step 1 Log in to http://support.huawei.com/carrier/, click **Product Support**, browse to or search for **SmartLogger**, and download the required upgrade package on the **Software** tab.

NOTE
The upgrade package is named smartlogger2000.zip. Store the upgrade package in the root directory of a USB flash drive, and do not decompress it.

Step 2 Insert the USB flash drive into the USB port at the bottom of the SmartLogger.

Step 3 Log in to the APP, and choose **More** > **System Maintenance** > **Generate Local Maint. Script** on the main menu page. For details, see *SUN2000 APP User Manual*.

Step 4 Replace the boot script file in the upgrade package with the boot script file in the USB flash drive.

NOTE
The boot script file in the upgrade package is named logger_lmt_mgr_cmd.emap.

Step 5 Insert the USB flash drive into the USB port at the bottom of the SmartLogger. The SmartLogger automatically executes all commands specified in the boot script file. View the LED indicator to determine the operating status.

Table 6-4 Indicator status

Indicator (Silk Screen)	Status	Meaning
ALM	Green off	No local maintenance is underway.
	Blinking green at long intervals (on for 1s and then off for 1s)	Local maintenance is in progress.
	Steady green	Local maintenance succeeds.
	Blinking green at short intervals (on for 0.125s and then off for 0.125s)	Local maintenance fails.

Step 6 After the upgrade is complete, the SmartLogger automatically restarts.

----End

6.1.5 Upgrading the BSP

Context

USB flash drives of SanDisk, Netac, and Kingston are recommended. Other brands may be incompatible.

NOTICE

For details about how to upgrade the board support package (BSP), see *SmartLogger Upgrade Guide* or contact Huawei technical support.

Procedure

Step 1 Log in to http://support.huawei.com/carrier/, click **Product Support**, browse to or search for **SmartLogger**, and download the required upgrade package on the **Software** tab.

NOTE

The upgrade package is named smartlogger2000_bsp.zip. Store the upgrade package in the root directory of a USB flash drive, and do not decompress it.

Step 2 Insert the USB flash drive into the USB port at the bottom of the SmartLogger.

Step 3 Log in to the APP, and choose **More** > **System Maintenance** > **Generate Local Maint. Script** on the main menu page. For details, see *SUN2000 APP User Manual*.

Step 4 Replace the boot script file in the upgrade package with the boot script file in the USB flash drive.

NOTE

The boot script file is named logger_lmt_mgr_cmd.emap.

Step 5 Insert the USB flash drive into the USB port at the bottom of the SmartLogger. The SmartLogger automatically executes all commands specified in the boot script file. View the LED indicator to determine the operating status.

Table 6-5 Indicator status

Indicator (Silk Screen)	Status	Meaning
ALM	Green off	No local maintenance is underway.
	Blinking green at long intervals (on for 1s and then off for 1s)	Local maintenance is in progress.
	Steady green	Local maintenance succeeds.
	Blinking green at short intervals (on for 0.125s and then off for 0.125s)	Local maintenance fails.

Step 6 After the upgrade is complete, the SmartLogger automatically restarts.

----End

6.2 NMS Operations

Using the NMS, you can perform firmware upgrade and log export for the SmartLogger. For details, see *iManager NetEco 1000S User Manual*.

6.3 APP Operations

Using the APP, you can monitor, query alarms for, and manage the SmartLogger and southbound devices connected to the SmartLogger. For details, see *SUN2000 APP User Manual*.

7 WebUI

This chapter describes how to log in to the web user interface (WebUI) and the web menu, and set parameters and maintain devices over the WebUI.

Context

Figures provided in this document correspond to the SmartLogger V200R001C00SPC100 version.

7.1 Preparations for Login

Operating Environment

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

- Operating system: Windows
- Internet Explorer 8 to Internet Explorer 11, Firefox17–Firefox39, and CHROME41–CHROME45 (Window 7)
- Minimum resolution: 1024x768

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.

Configuring the IP Address

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

Setting a LAN

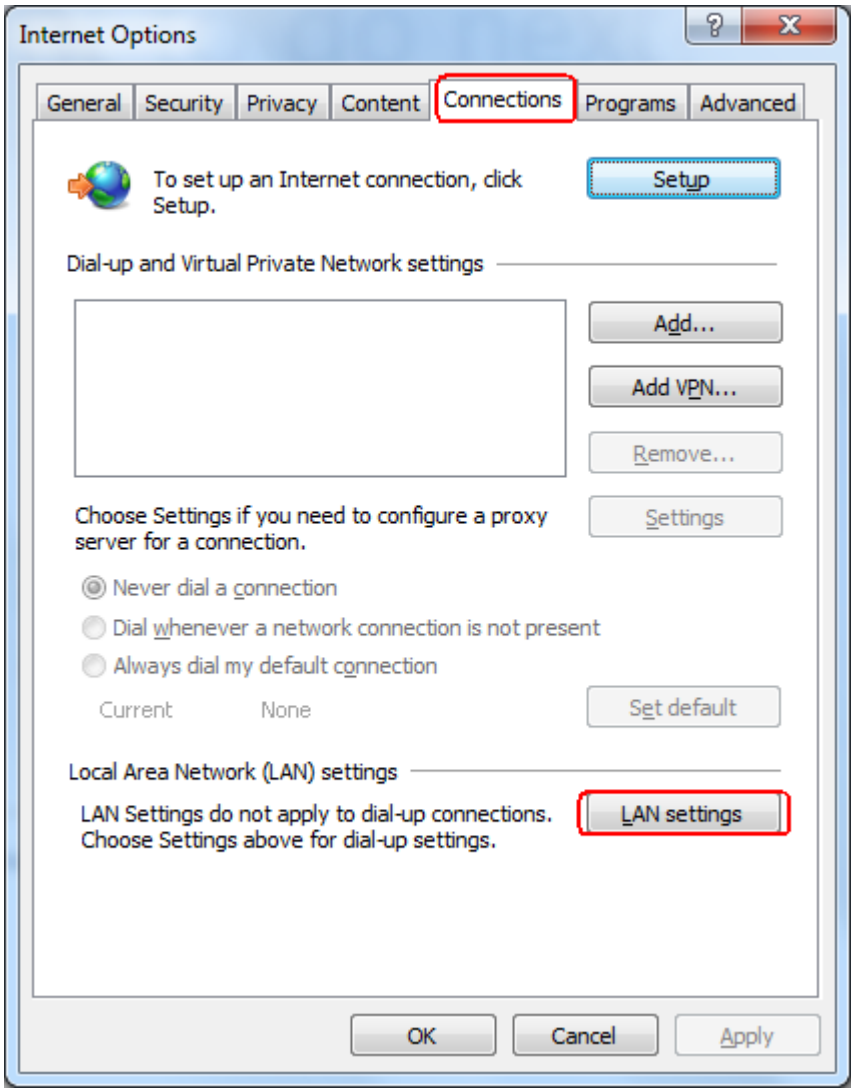
NOTICE

- If the SmartLogger is connected to a local area network (LAN) and a proxy server has been configured, you need to cancel the proxy server.
- If the SmartLogger is connected to the Internet and the PC is connected to the LAN, do not cancel the proxy server configurations.

To set the LAN, perform the following steps:

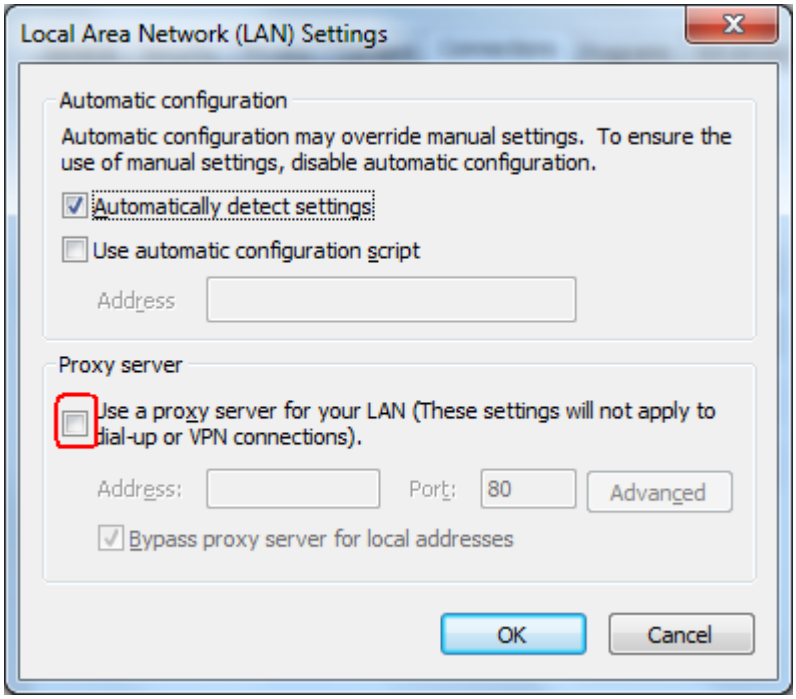
1. Open Internet Explorer.
2. Choose **Tools** > **Internet Options**.
3. Click the **Connections** tab and then click **LAN settings**, as shown in Figure 7-1.

Figure 7-1 LAN setting (1)



4. Deselect **User a proxy server for your LAN**, as shown in Figure 7-2.

Figure 7-2 LAN setting (2)



5. Click **OK**.

Setting Internet Explorer Security

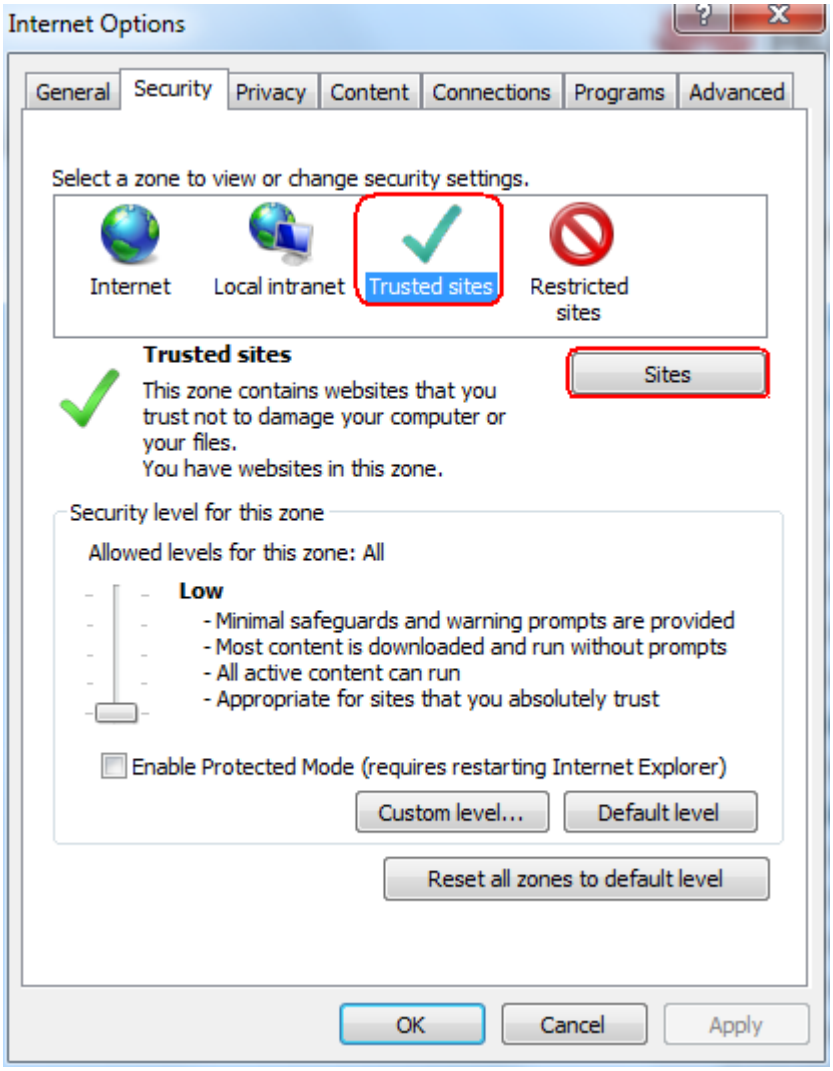
NOTICE

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

To set Internet Explorer security, perform the following steps:

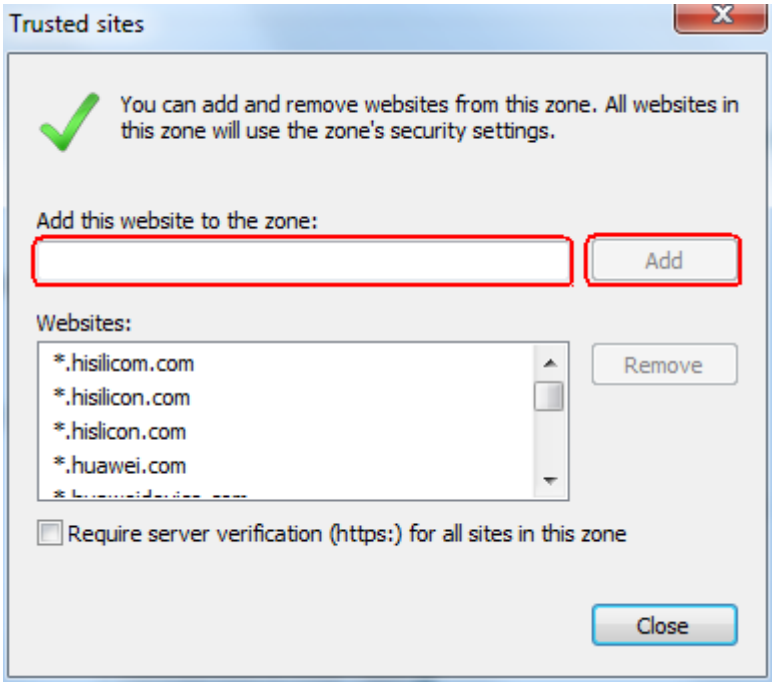
1. Open Internet Explorer.
2. Choose **Tools** > **Internet Options**.
3. Select **Security** and click **Sites** in **Trusted sites**, as shown in Figure 7-3.

Figure 7-3 Internet Explorer security setting (1)



4. Enter the website address of the WebUI (enter the default IP address 192.168.0.10 of the SmartLogger for the first login), click **Add**, and click **Close**, as shown in Figure 7-4.

Figure 7-4 Internet Explorer security setting (2)

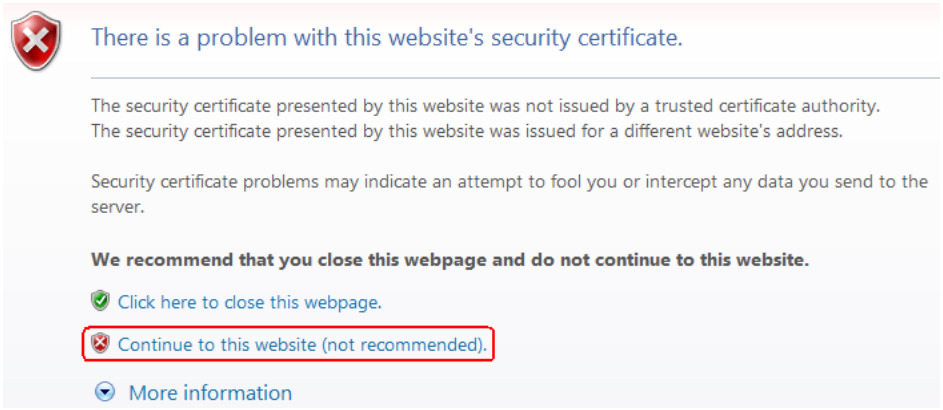


5. Set **Security level for this zone** to **Medium** or **Low**.

Installing a Security Certificate

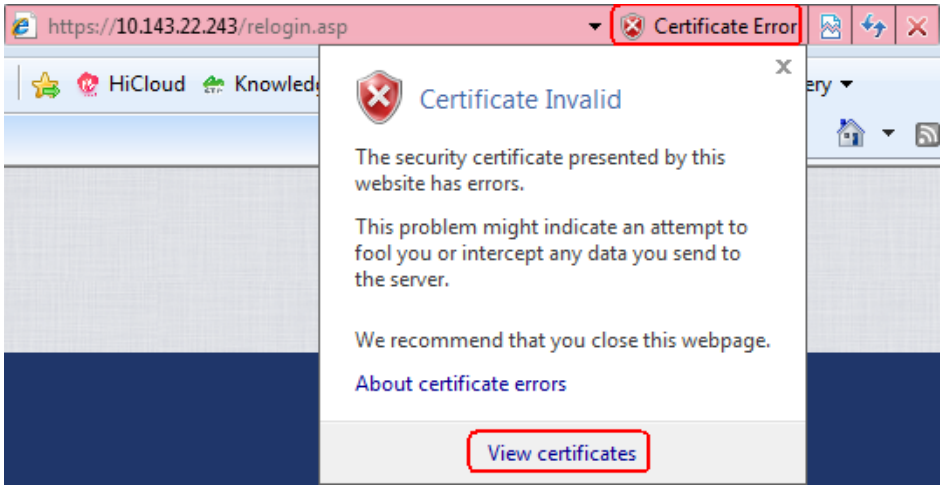
1. If you log in to the WebUI for the first time, a message as shown in Figure 7-5 is displayed. Click **Continue to this website**.

Figure 7-5 Installing the security certificate (1)



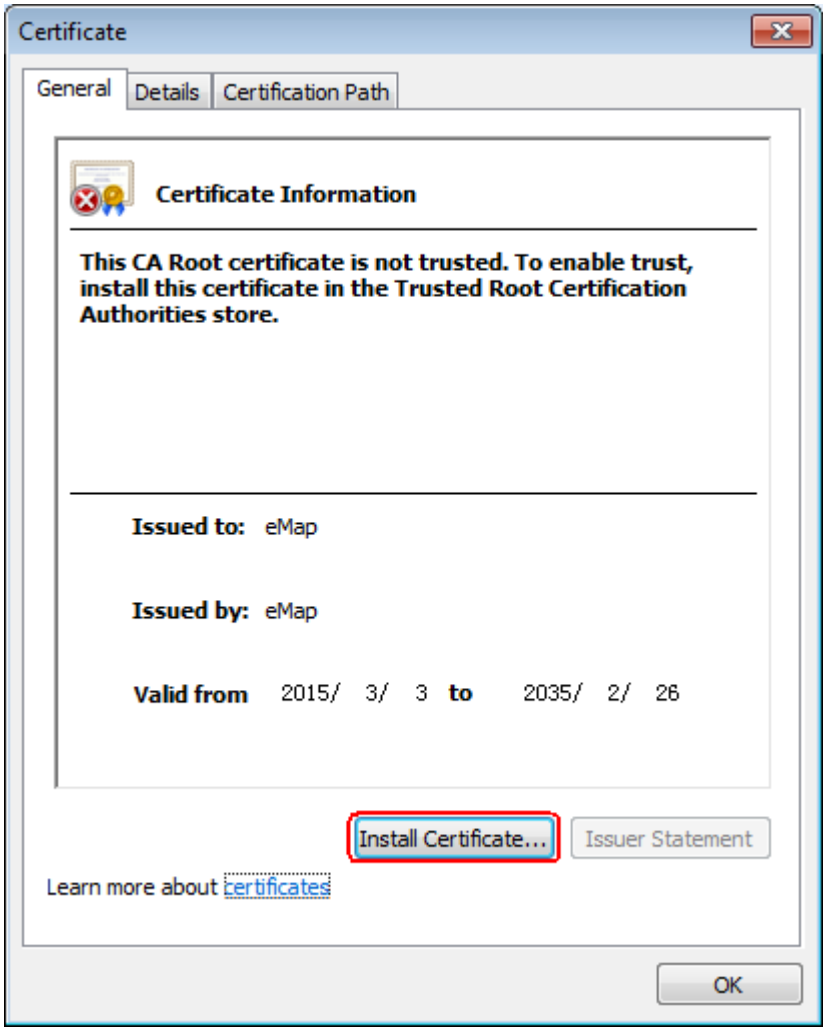
2. Click **Certificate Error** on the right of the address bar and choose **View certificates**, as shown in Figure 7-6.

Figure 7-6 Installing the security certificate (2)



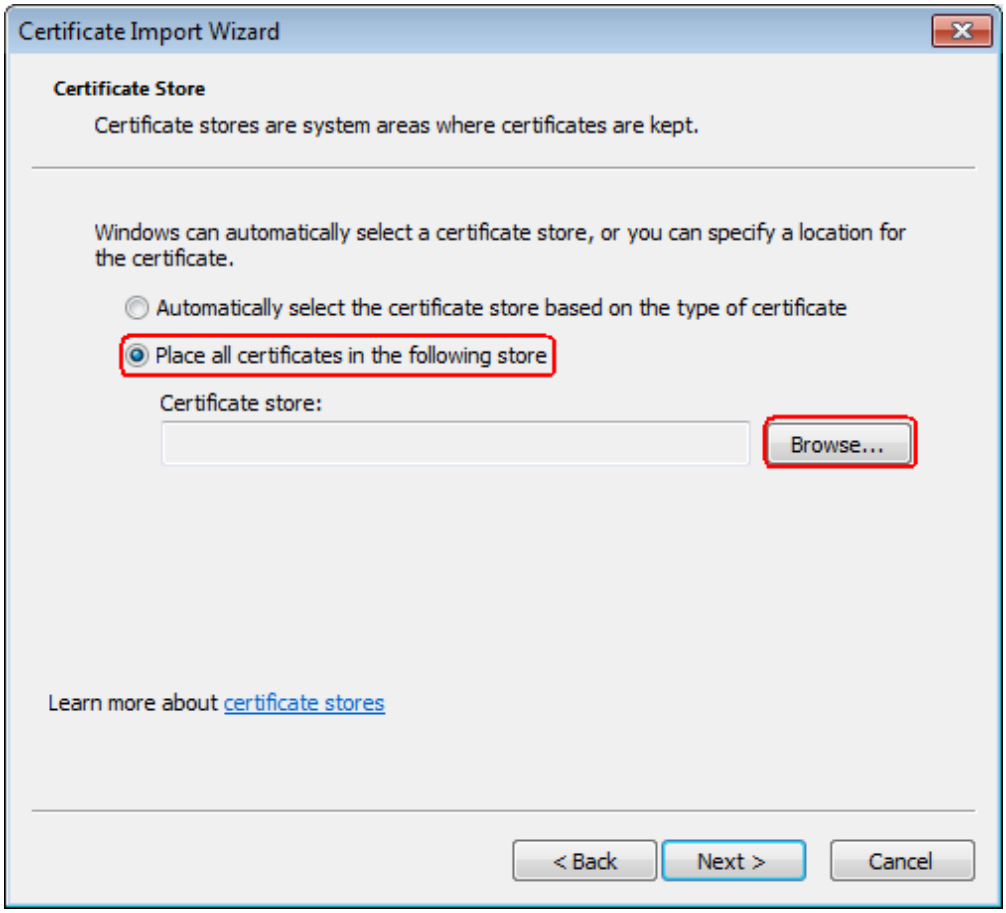
3. Click **Install Certificate**, as shown in Figure 7-7.

Figure 7-7 Installing the security certificate (3)



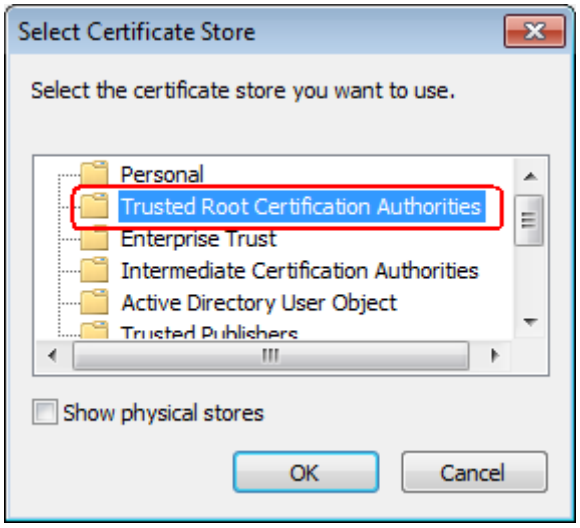
4. Click **Next**.
5. Select **Place all certificates in the following store** and click **Browse**, as shown in Figure 7-8.

Figure 7-8 Installing the security certificate (4)



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

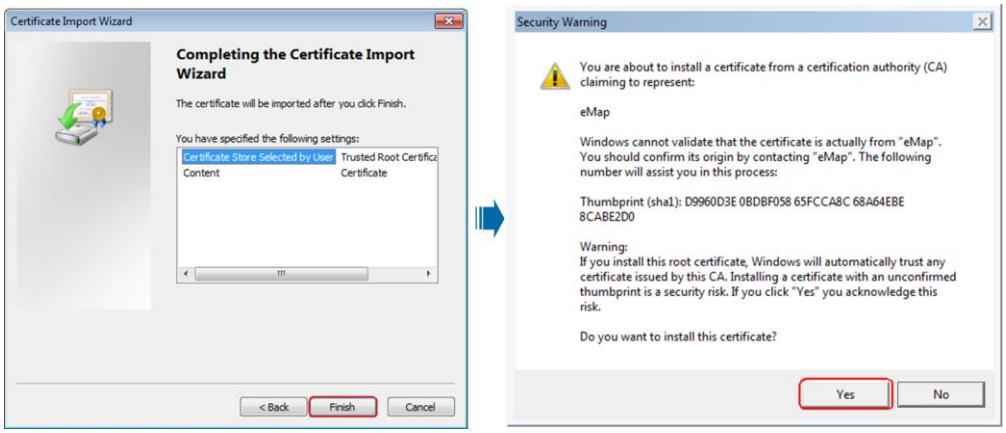
Figure 7-9 Installing the security certificate (5)



7. Click **Next**.

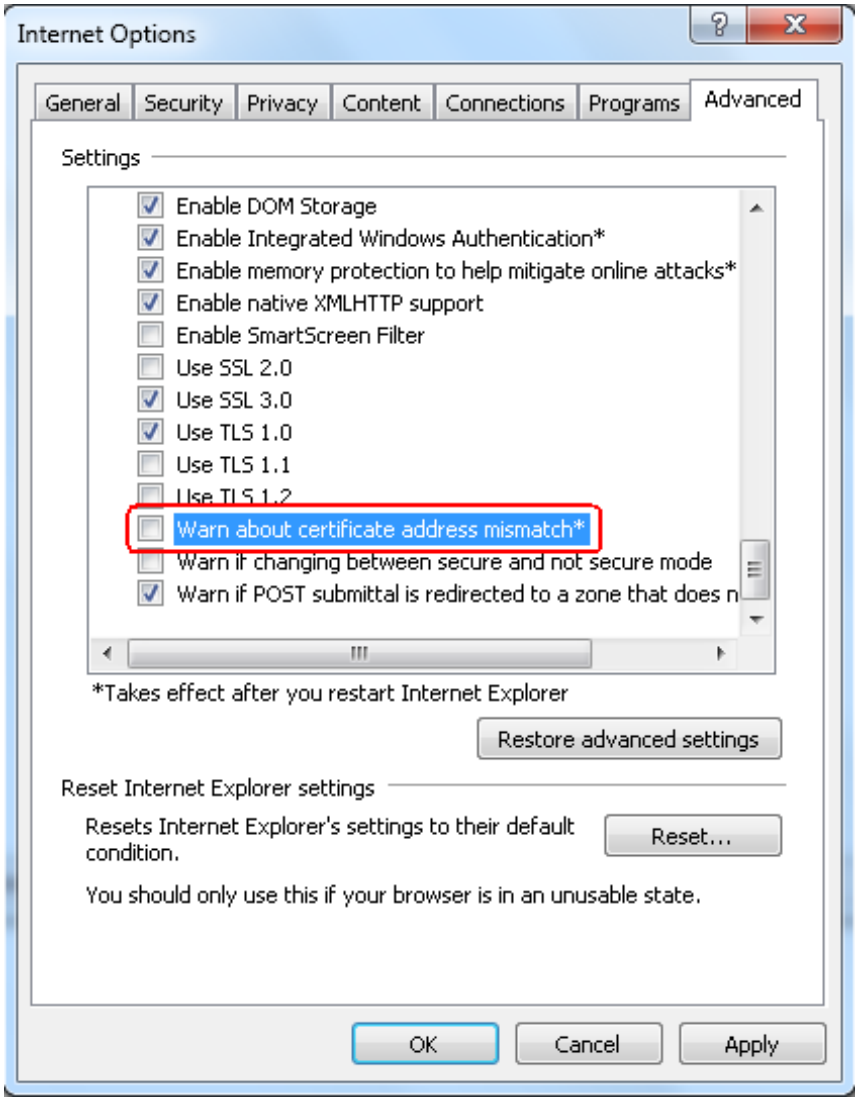
8. Click **Finish**. The **Security Warning** dialog box is displayed. Click **Yes**, as shown in Figure 7-10.

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**, as shown in Figure 7-11.

Figure 7-11 Installing the security certificate (7)



7.2 Logging In to the WebUI

Context

The SmartLogger has been connected to a PC directly or over the Ethernet. For details, see Connecting an Ethernet Network Cable.

NOTE

The IP address of the SmartLogger can be obtained as follows:

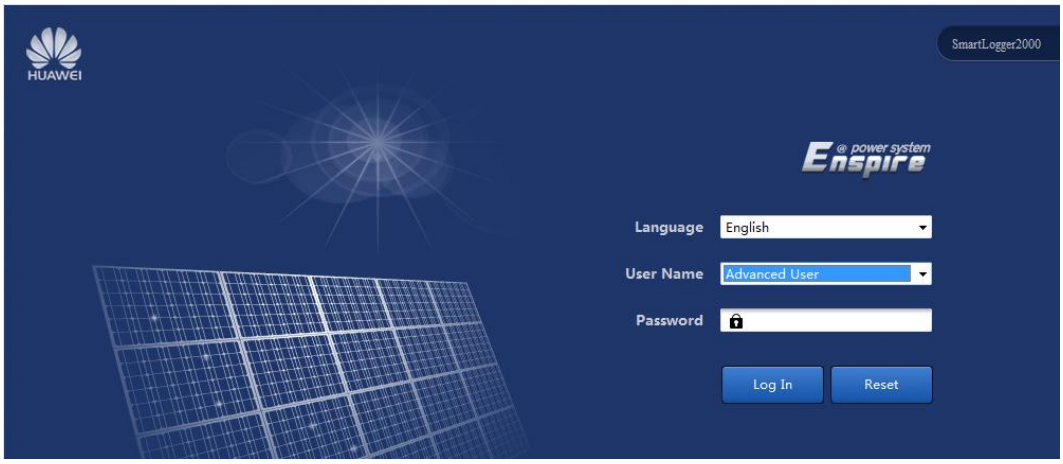
- When logging in to the APP for the first time, obtain the **IP address**, **Subnet mask**, and **Default gateway** information from the **Quick settings** > **Ethernet** menu.
- When logging in to the APP subsequently, choose **Settings** > **Comm. Param.** > **Ethernet** to view the information.

- To restore the IP address to the default IP address, press and hold down the Default key for more than 10s until the RUN indicator blinks at short intervals (0.125s on and 0.125s off) and all other indicators are off, and then release the Default key. The operation is valid within 5 minutes.

Procedure

Step 1 Enter **https://XX.XX.XX.XX** in the address box of the browser, and press **Enter**. The login page is displayed, as shown in Figure 7-12. Enter a correct **User Name** and **Password**, select a value for **Language**, and click **Log In** to enter the home screen.

Figure 7-12 Login page of the WebUI



NOTE

- XX.XX.XX.XX is the IP address for the SmartLogger. The default IP address is **https://192.168.0.10**.
- The initial password is *Changeme* for system users **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.
- If you enter wrong passwords 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 any page is blank or a menu cannot be accessed after you log in to the WebUI, clear the cache, refresh the page, or log in again.

----End

7.3 WebUI Layout

Figure 7-13 shows the layout of the WebUI.

Figure 7-13 WebUI layout

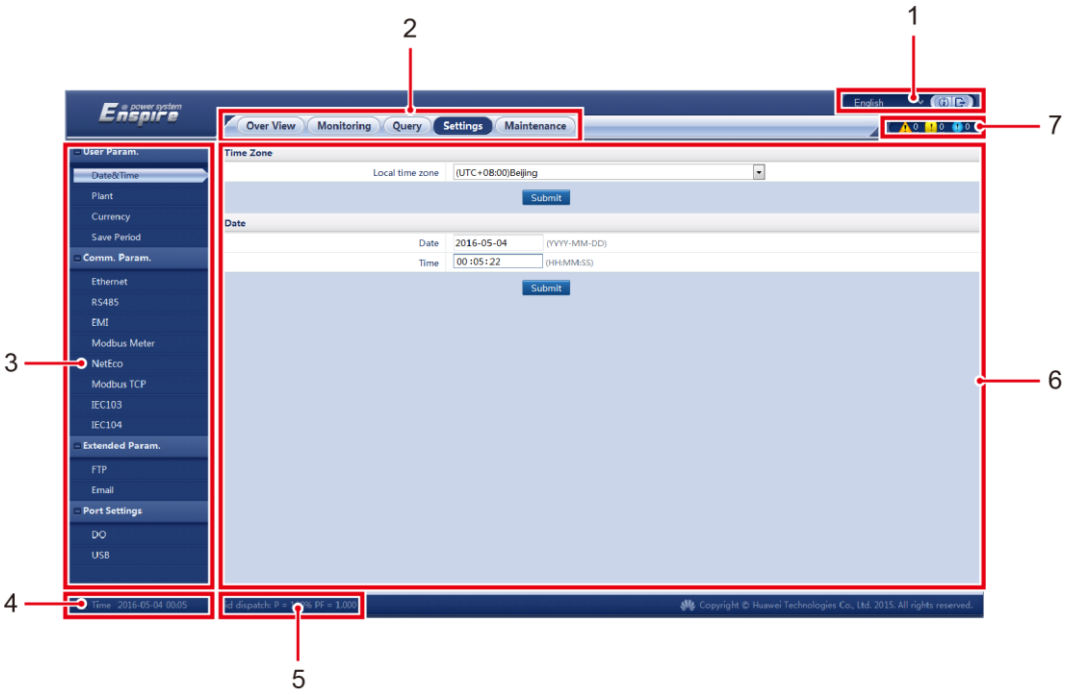


Table 7-1 describes the layout of the WebUI shown in Figure 7-13.

Table 7-1 WebUI layout description

No.	Function	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 over 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.

NOTE

7.4 WebUI Menus shows the menu tree of the WebUI.

7.4 WebUI Menus

The main WebUI menu contains five tabs: **Over View**, **Monitoring**, **Query**, **Settings**, and **Maintenance**, as shown in Figure 7-14. The parameters that can be set and modified vary depending on the user role (common user, advanced user, or special user).

Figure 7-14 Structure of the main WebUI menu

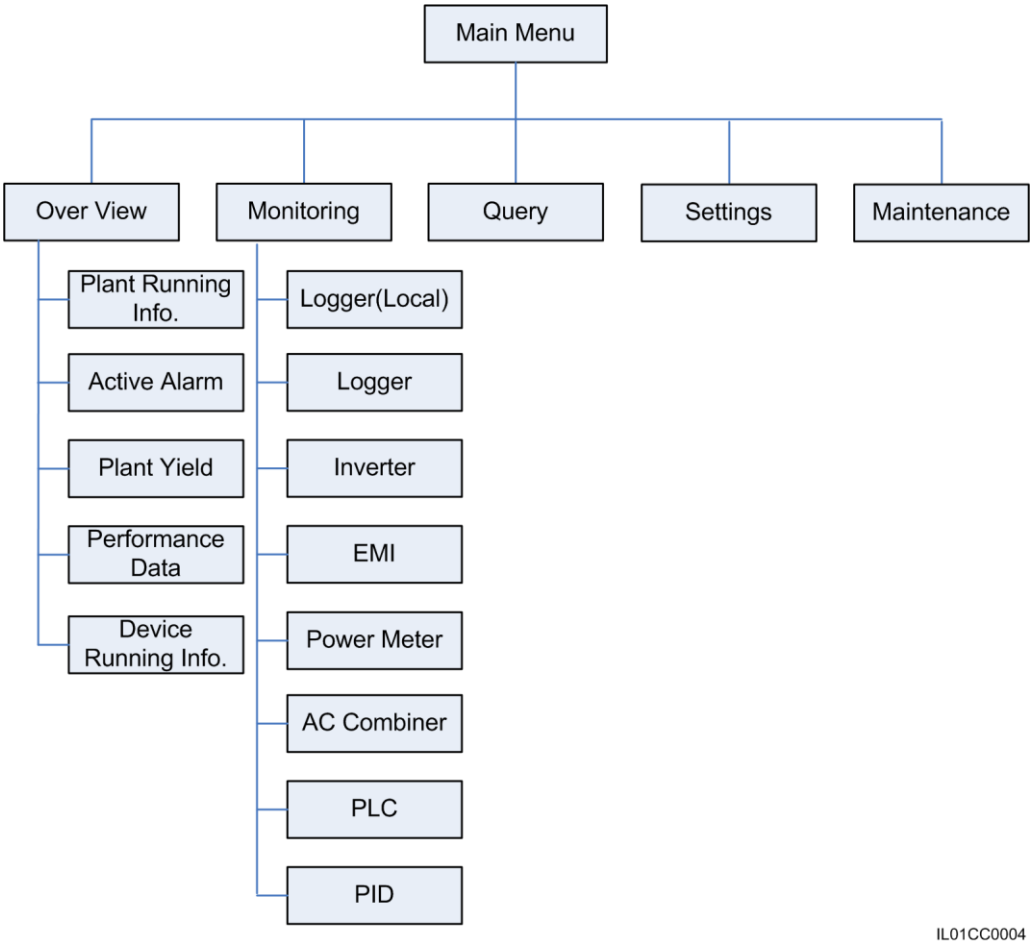


Figure 7-15 shows the information available in the **Query** menu based on user rights.

Figure 7-15 Permission for the Query menu

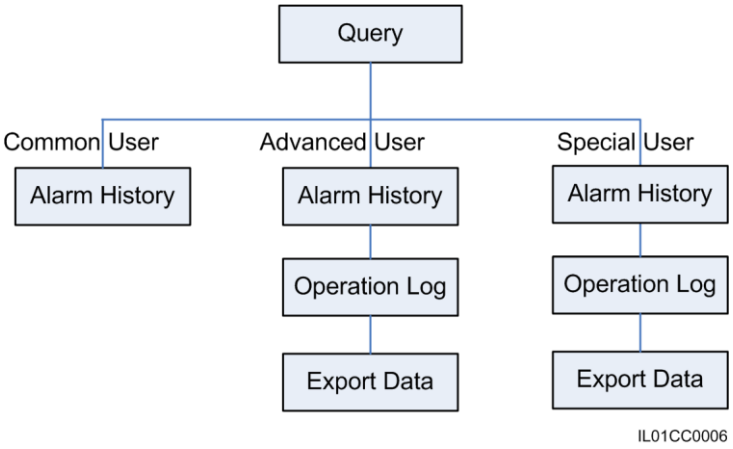


Figure 7-16 shows the information available in the **Settings** menu based on user rights.

Figure 7-16 Permission for the Settings menu

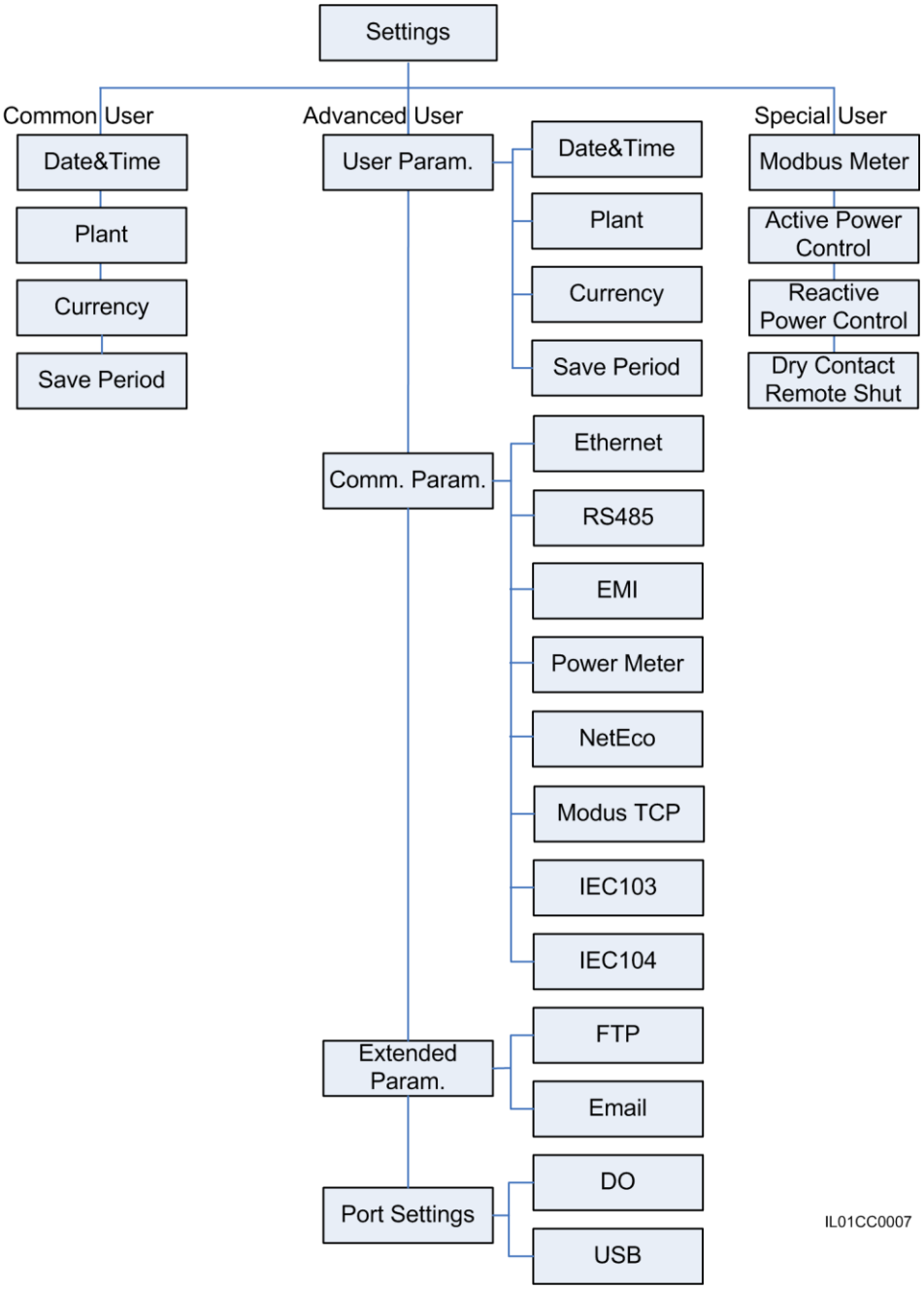
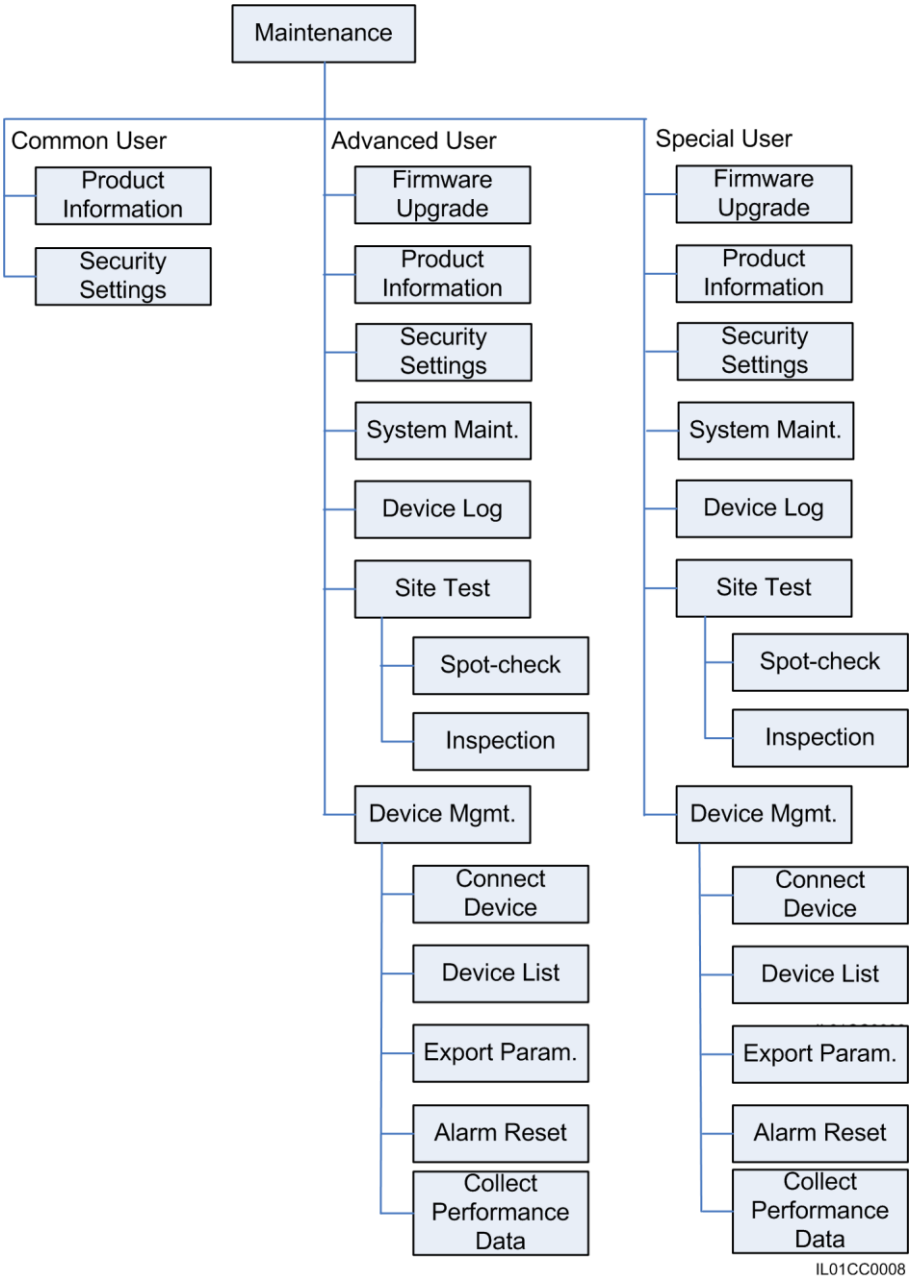


Figure 7-17 shows the information available in the **Maintenance** menu based on user rights.

Figure 7-17 Permission for the Maintenance menu



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

NOTE

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

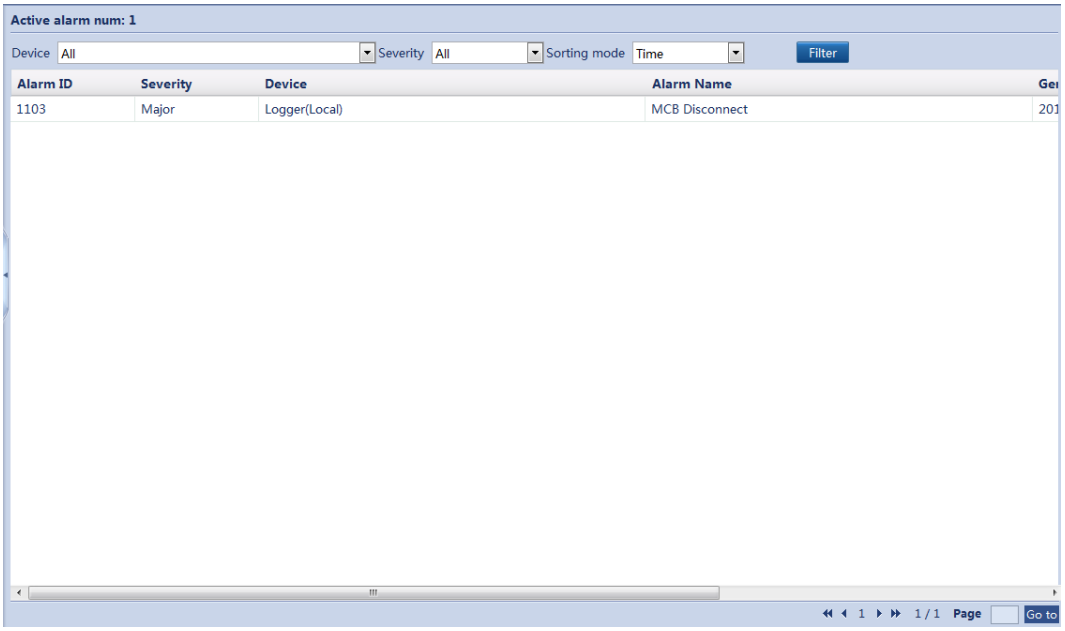
7.6 Querying Current Active Alarms in the System

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



NOTE

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.

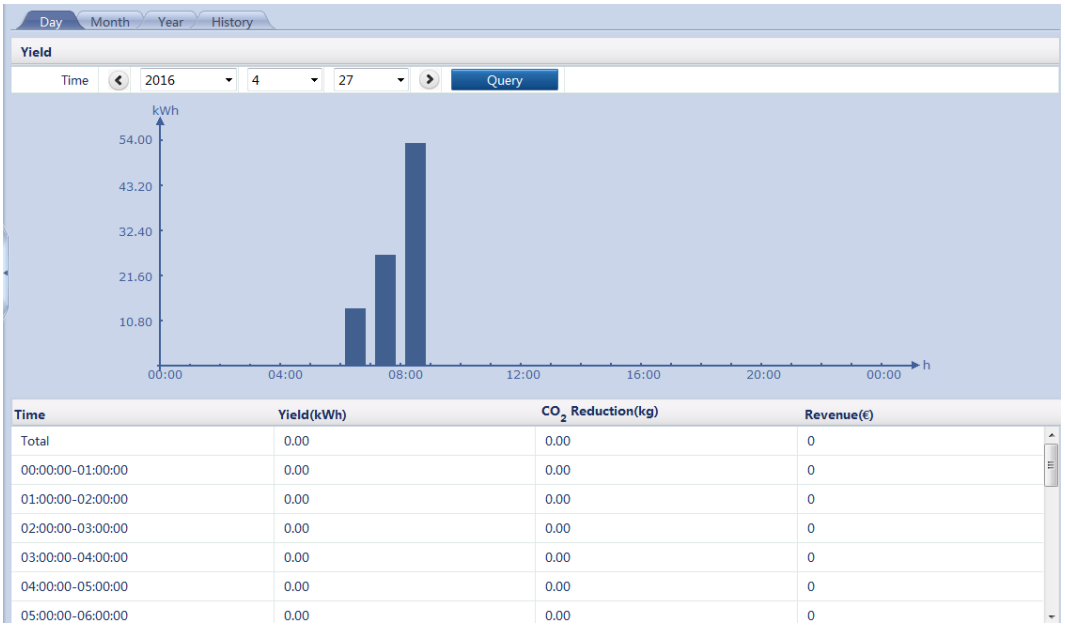
NOTE

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.

Figure 7-20 Daily energy yield



Time	Yield(kWh)	CO_2 Reduction(kg)	Revenue(€)
Total	0.00	0.00	0
00:00:00-01:00:00	0.00	0.00	0
01:00:00-02:00:00	0.00	0.00	0
02:00:00-03:00:00	0.00	0.00	0
03:00:00-04:00:00	0.00	0.00	0
04:00:00-05:00:00	0.00	0.00	0
05:00:00-06:00:00	0.00	0.00	0

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

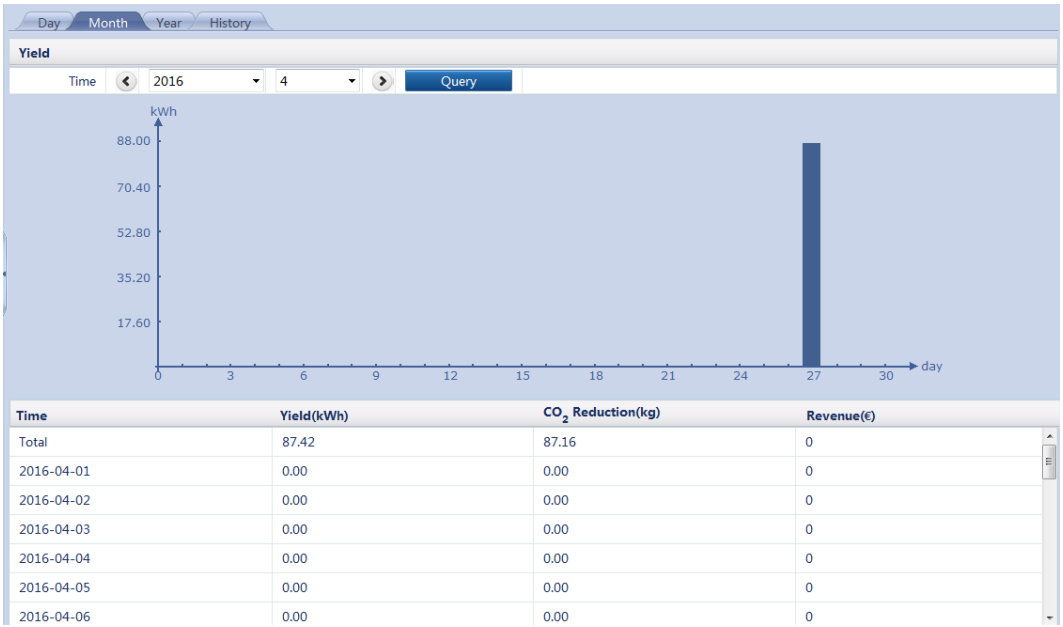
NOTE

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



Time	Yield(kWh)	CO_2 Reduction(kg)	Revenue(€)
Total	87.42	87.16	0
2016-04-01	0.00	0.00	0
2016-04-02	0.00	0.00	0
2016-04-03	0.00	0.00	0
2016-04-04	0.00	0.00	0
2016-04-05	0.00	0.00	0
2016-04-06	0.00	0.00	0

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

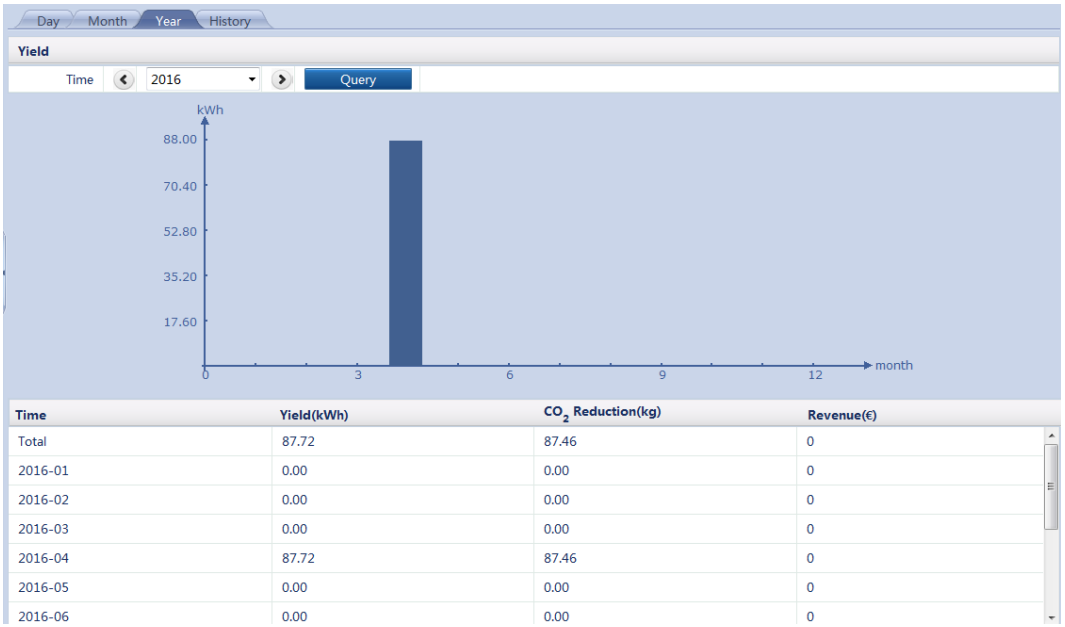
NOTE

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, CO_2 emission reduction, and revenue.

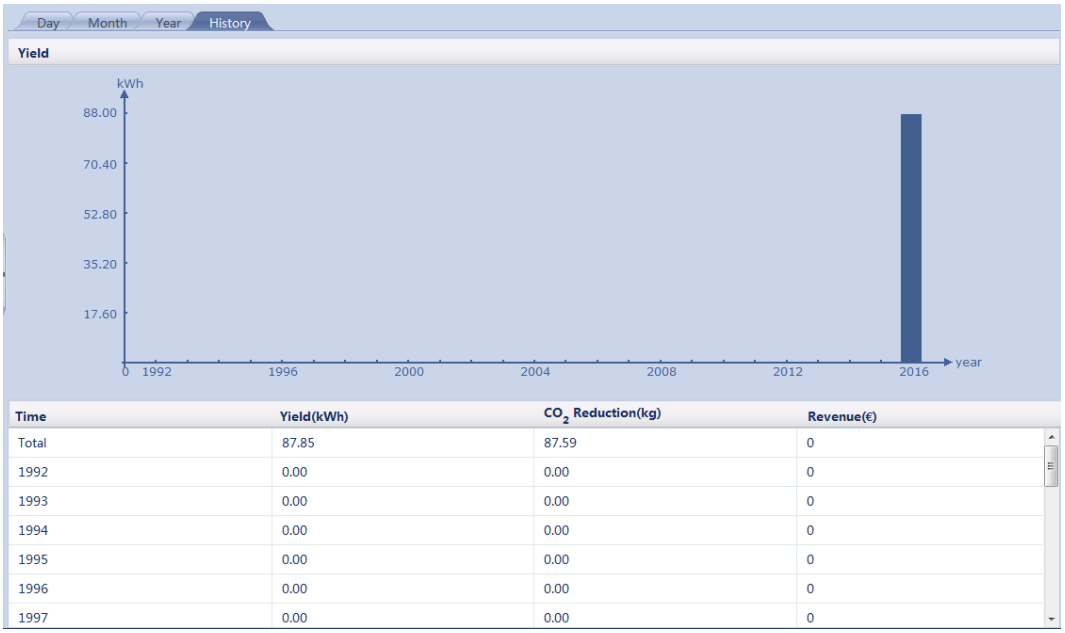
NOTE

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 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, CO_2 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.

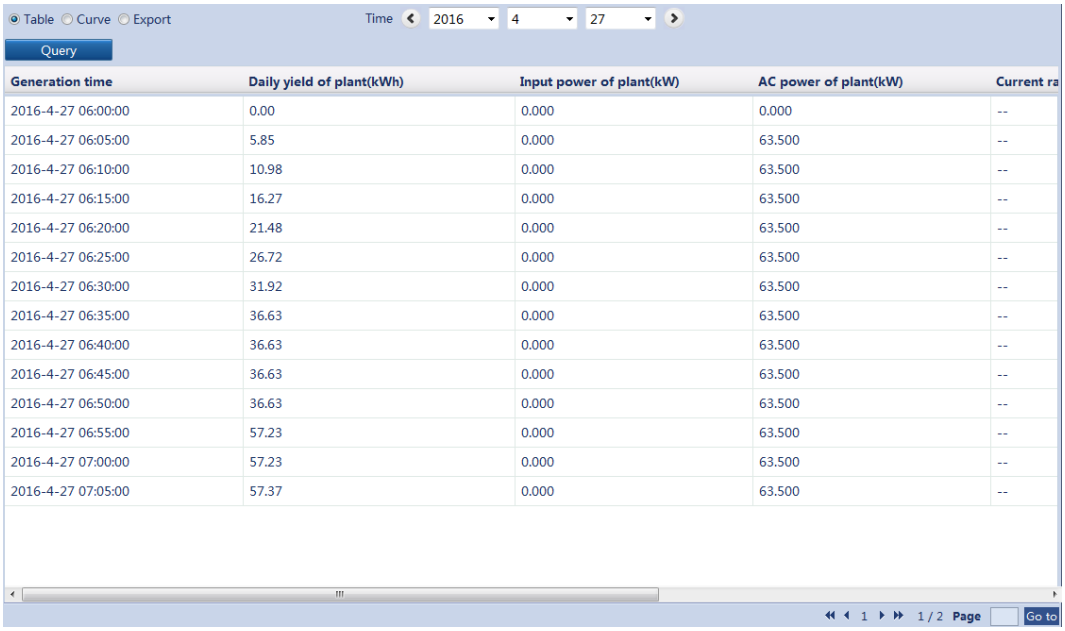
On the **Over View** tab page, click **Performance Data** to enter the performance data query page.

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.

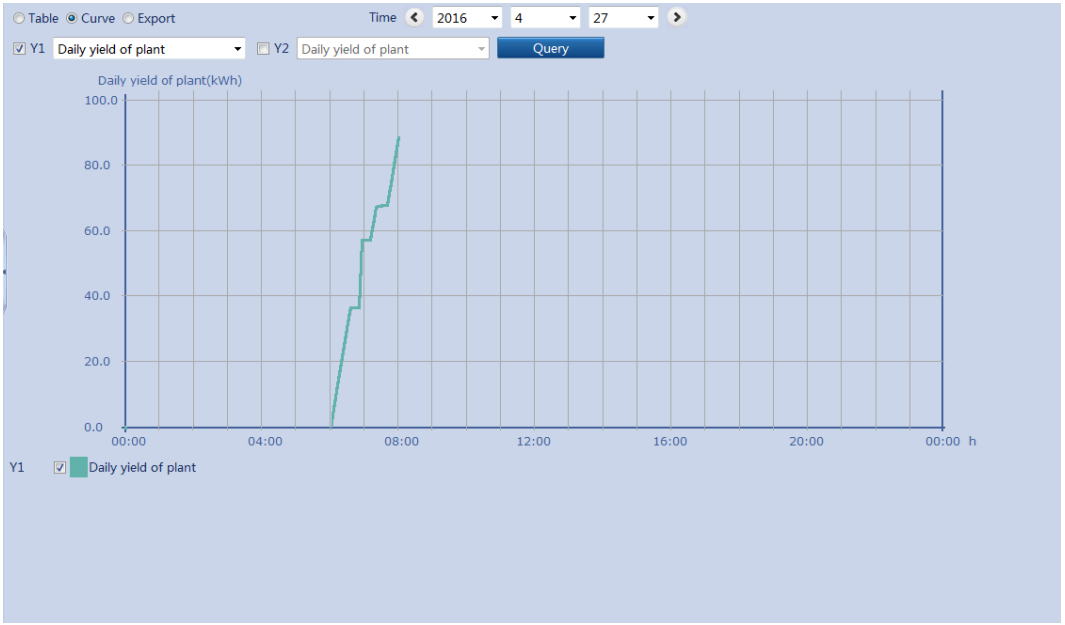
Select **Table**, set **Time**, and click **Query**. You can query the values of various performance parameters, such as **Generation time**, **Daily yield of plant**, and **Input power of plant**, as shown in Figure 7-25.

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

NOTE

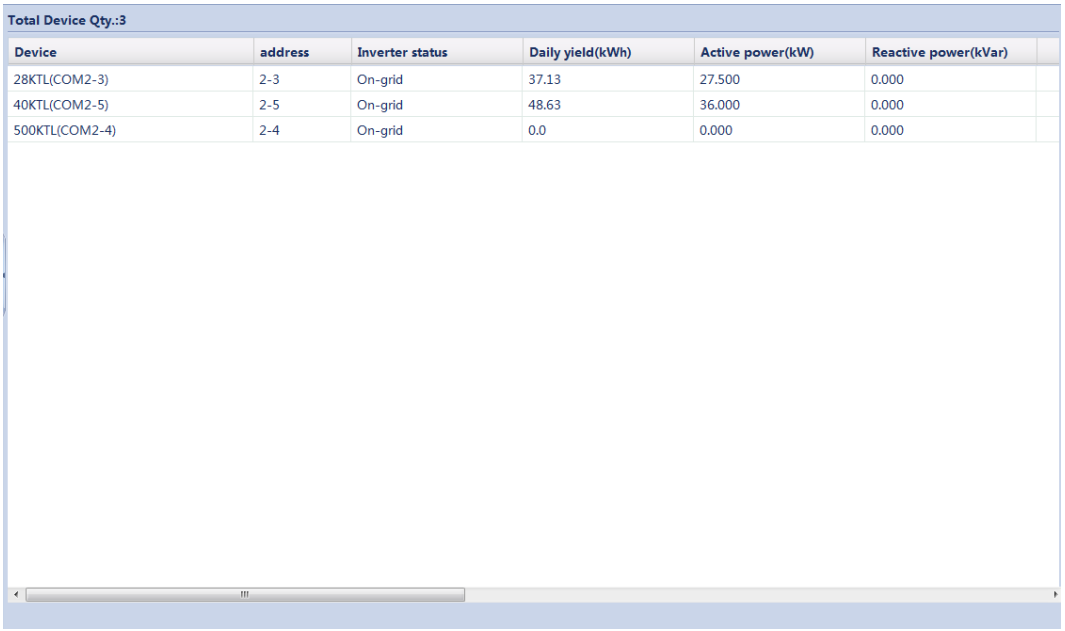
When changing the name of the exported file, retain the extension **.tar.gz**. Otherwise, the file cannot be functional.

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



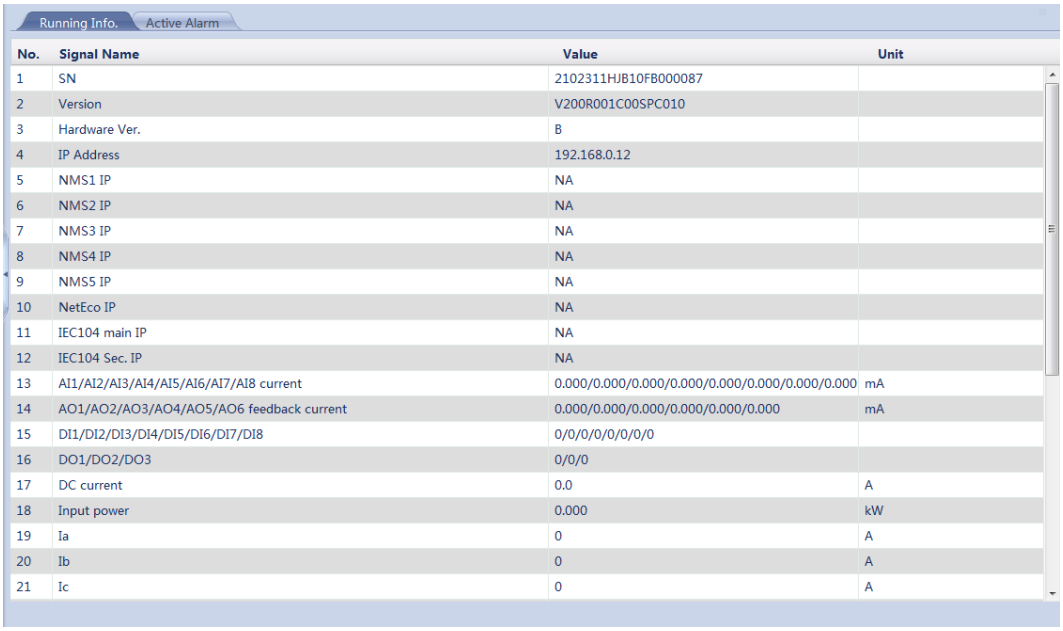
7.10 SmartLogger

7.10.1 Querying the Master SmartLogger Running Information

You can query the master SmartLogger running information over the WebUI.

On the **Monitoring** tab page, select the Logger (Local) to be queried, and click **Running Info.**. The corresponding **SN**, **Firmware Version**, and **Hardware Version**, and **IP address** of the master SmartLogger are displayed, as shown in Figure 7-28.

Figure 7-28 Master SmartLogger running information



No.	Signal Name	Value	Unit
1	SN	2102311HJB10FB000087	
2	Version	V200R001C00SPC010	
3	Hardware Ver.	B	
4	IP Address	192.168.0.12	
5	NMS1 IP	NA	
6	NMS2 IP	NA	
7	NMS3 IP	NA	
8	NMS4 IP	NA	
9	NMS5 IP	NA	
10	NetEco IP	NA	
11	IEC104 main IP	NA	
12	IEC104 Sec. IP	NA	
13	AI1/AI2/AI3/AI4/AI5/AI6/AI7/AI8 current	0.000/0.000/0.000/0.000/0.000/0.000/0.000/0.000	mA
14	AO1/AO2/AO3/AO4/AO5/AO6 feedback current	0.000/0.000/0.000/0.000/0.000/0.000	mA
15	DI1/DI2/DI3/DI4/DI5/DI6/DI7/DI8	0/0/0/0/0/0/0/0	
16	DO1/DO2/DO3	0/0/0	
17	DC current	0.0	A
18	Input power	0.000	kW
19	Ia	0	A
20	Ib	0	A
21	Ic	0	A

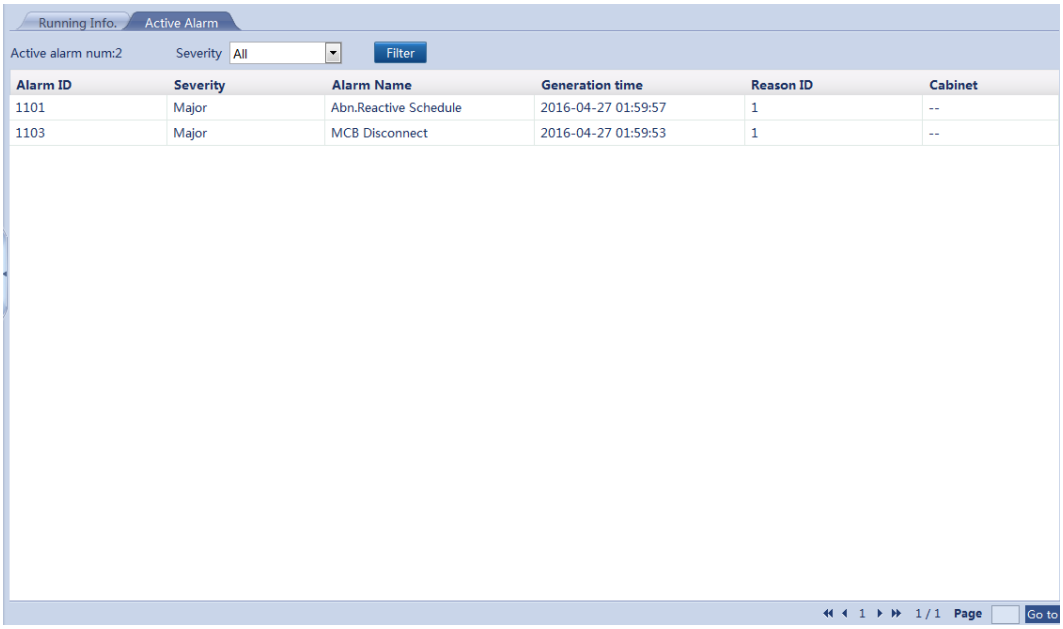
7.10.2 Querying the Active Alarms of the Master SmartLogger

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

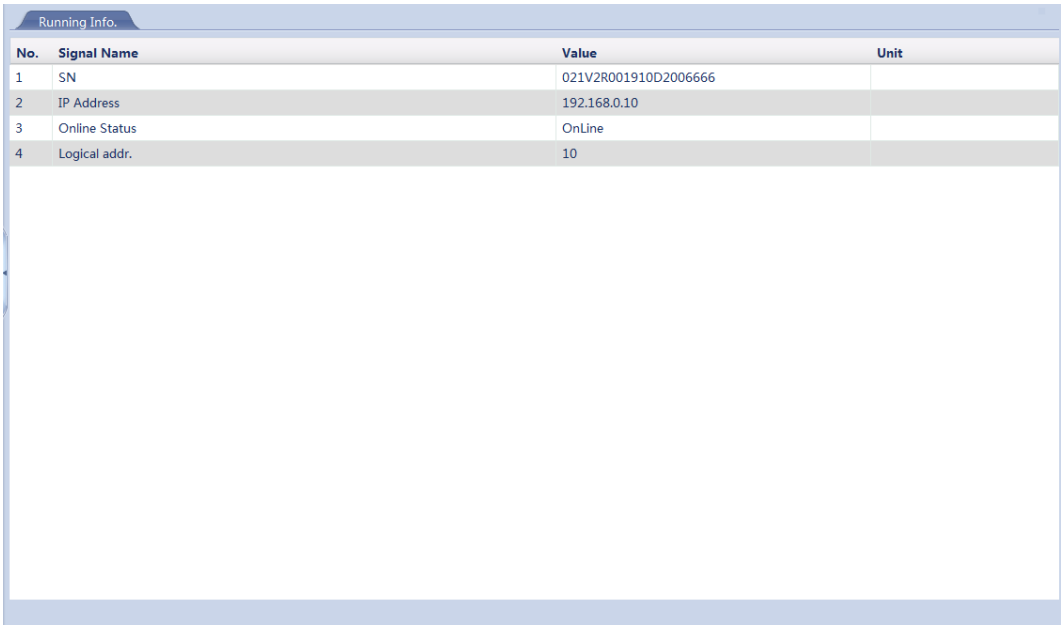


7.10.3 Querying the Slave SmartLogger Running Information

You can 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 Inverter

7.11.1 Querying Inverter Running Information

You can query operating information, including SN, firmware version, and 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.

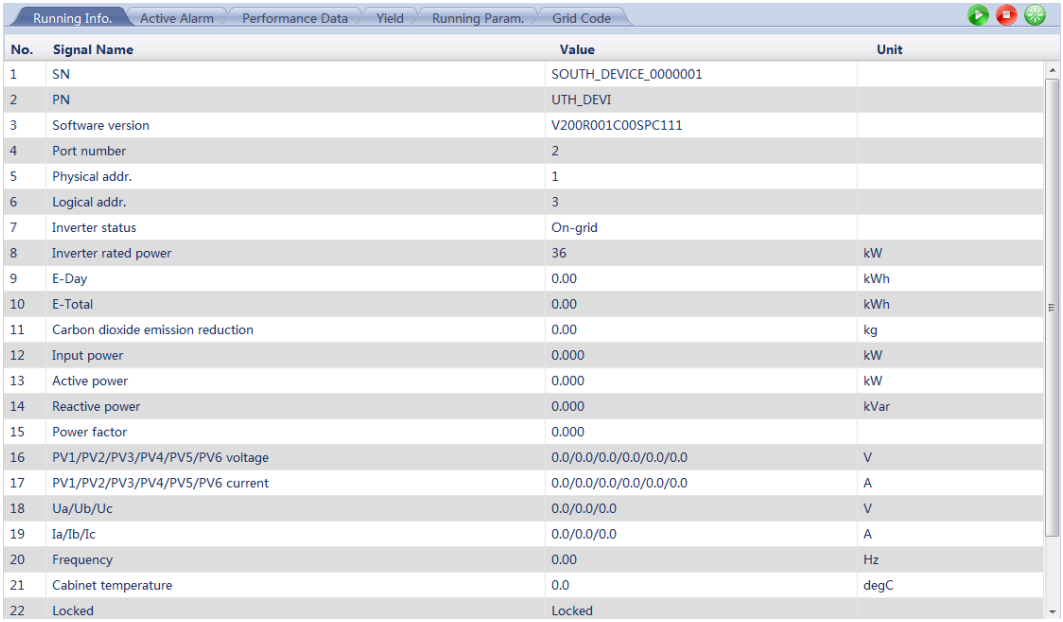
The indicator in front of the device name indicates the current status of a device.

- If the indicator is , the inverter is in the **On-grid** state, and the EMI, power meter, AC combiner box, slave SmartLogger, PLC module, or PID module is in the **Online** state.
- If the indicator is , the inverter, EMI, power meter, AC combiner box, slave SmartLogger, PLC module, or PID module is in the **Link broken** state.
- If the indicator is , the inverter is in the **Loading** state.
- If the indicator is , the inverter is in the **Initializing**, **Power-Off**, or **Idle** state, and is not feeding power to the power grid.

Querying running information

On the **Monitoring** tab page, select an inverter, and click **Running Info.** to query the **SN**, **Firmware Version**, and **Devices Status** information, as shown in Figure 7-31.

Figure 7-31 Running information of an inverter



No.	Signal Name	Value	Unit
1	SN	SOUTH_DEVICE_0000001	
2	PN	UTH_DEVI	
3	Software version	V200R001C00SPC111	
4	Port number	2	
5	Physical addr.	1	
6	Logical addr.	3	
7	Inverter status	On-grid	
8	Inverter rated power	36	kW
9	E-Day	0.00	kWh
10	E-Total	0.00	kWh
11	Carbon dioxide emission reduction	0.00	kg
12	Input power	0.000	kW
13	Active power	0.000	kW
14	Reactive power	0.000	kVar
15	Power factor	0.000	
16	PV1/PV2/PV3/PV4/PV5/PV6 voltage	0.0/0.0/0.0/0.0/0.0/0.0	V
17	PV1/PV2/PV3/PV4/PV5/PV6 current	0.0/0.0/0.0/0.0/0.0/0.0	A
18	Ua/Ub/Uc	0.0/0.0/0.0	V
19	Ia/Ib/Ic	0.0/0.0/0.0	A
20	Frequency	0.00	Hz
21	Cabinet temperature	0.0	degC
22	Locked	Locked	

7.11.2 Manually Sending Powering On, Powering Off or Reset Instructions to an Inverter

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

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

Figure 7-32 Manually powering on, powering off or reset the inverter

NOTE

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

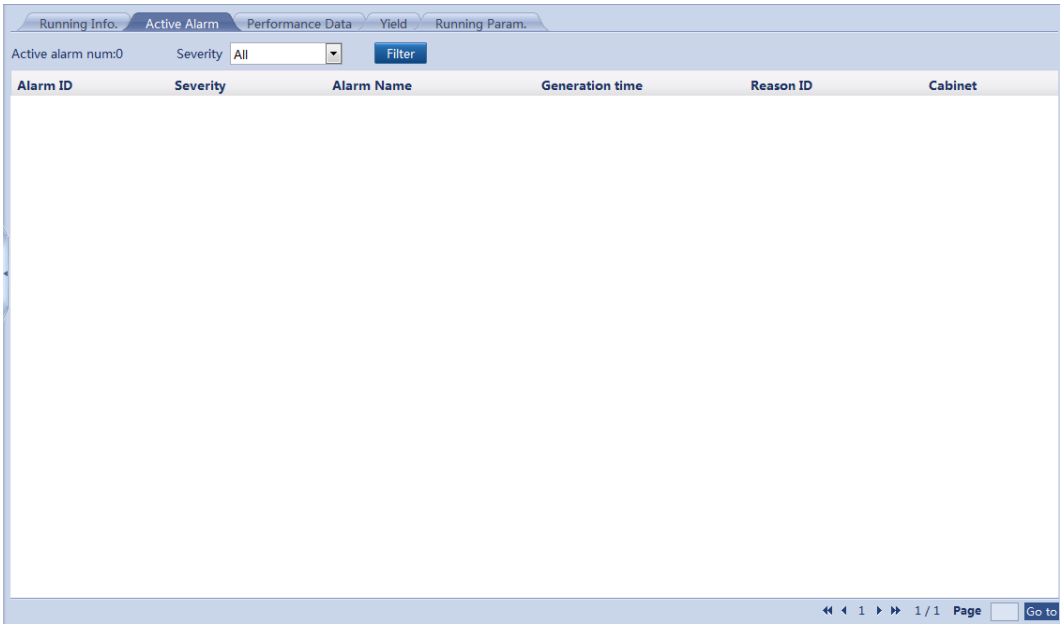
7.11.3 Querying the Active Alarms of an Inverter

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.

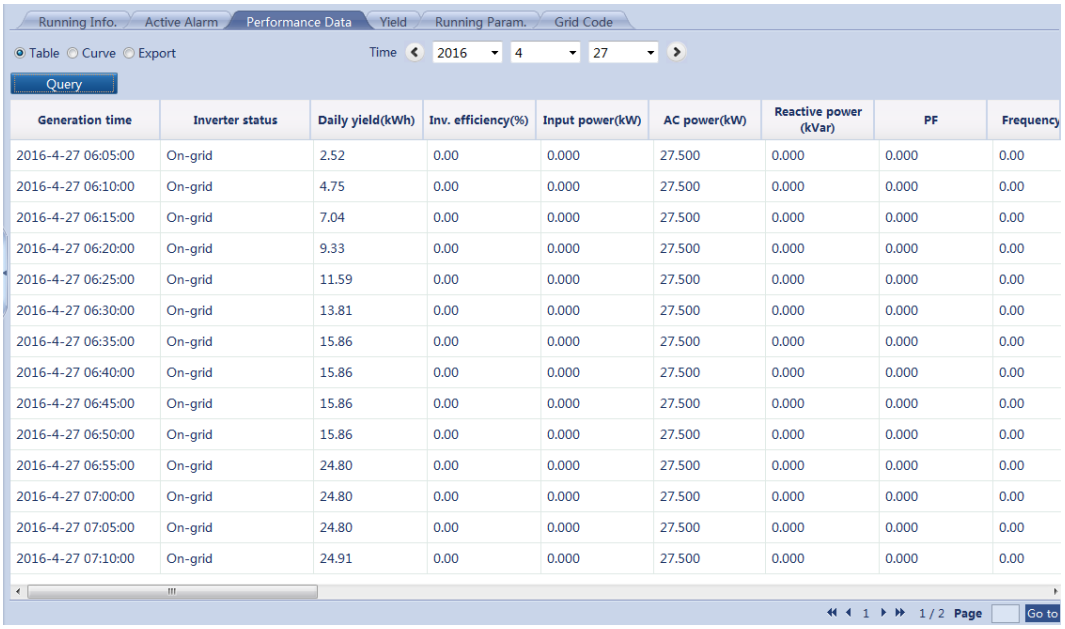
On the **Monitoring** tab page, choose the inverter to be queried and click **Performance Data** to access the performance data query page.

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.

Figure 7-34 Performance data displayed in a table

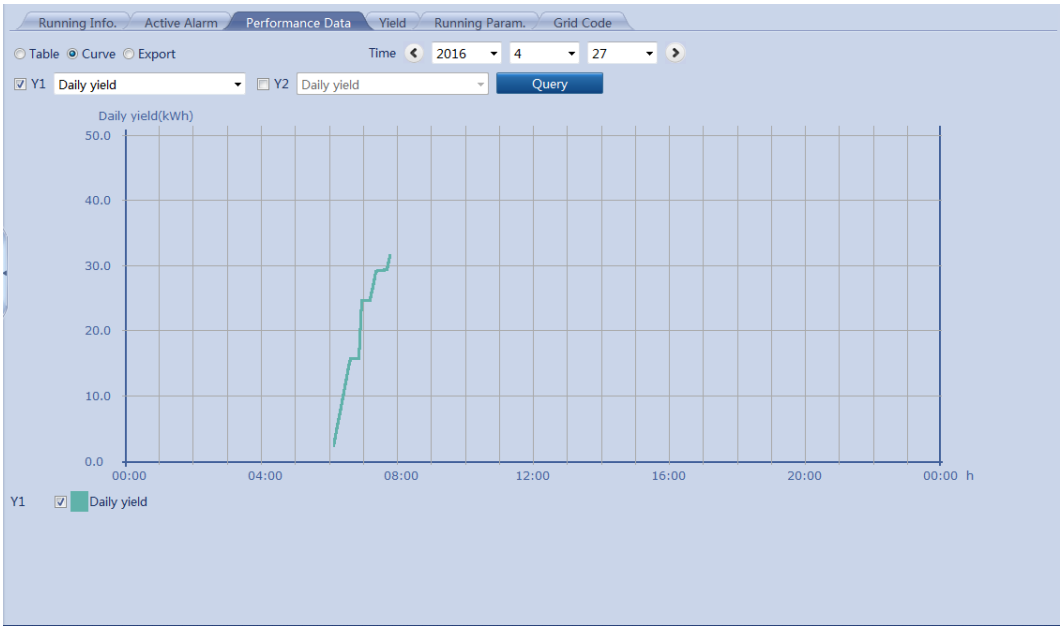


Select **Curve**, set **Time**, **Y1**, and **Y2**, and click **Query**, as shown in Figure 7-35.

NOTICE

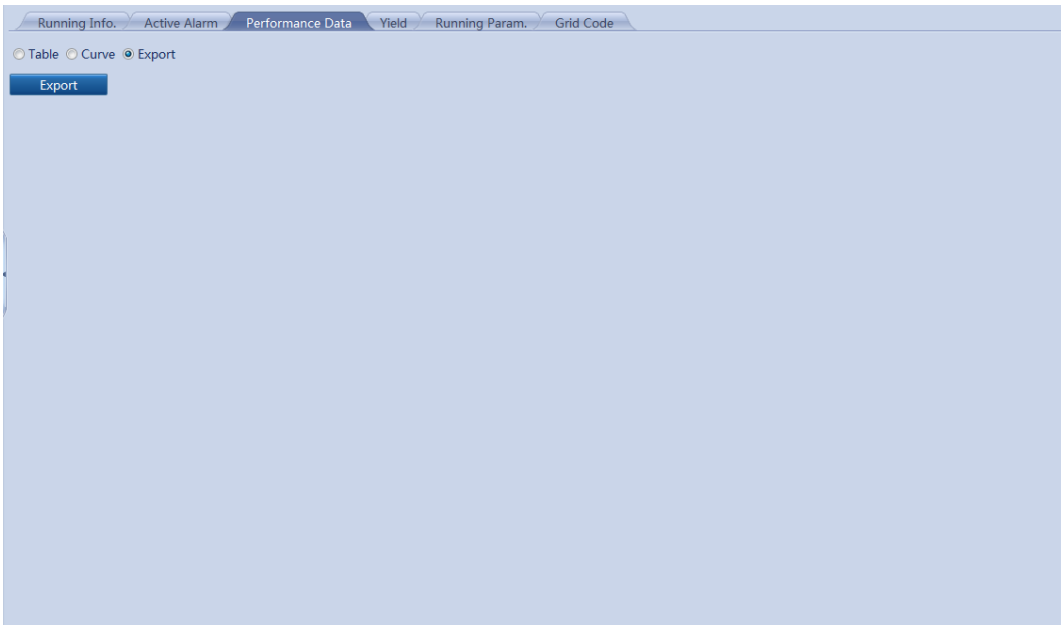
You can compare the curves of two parameters by selecting Y1 and Y2 at the same time. However, the values of Y1 and Y2 must be different.

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 **Yields** to query the information about the electric energy yields of the inverter.

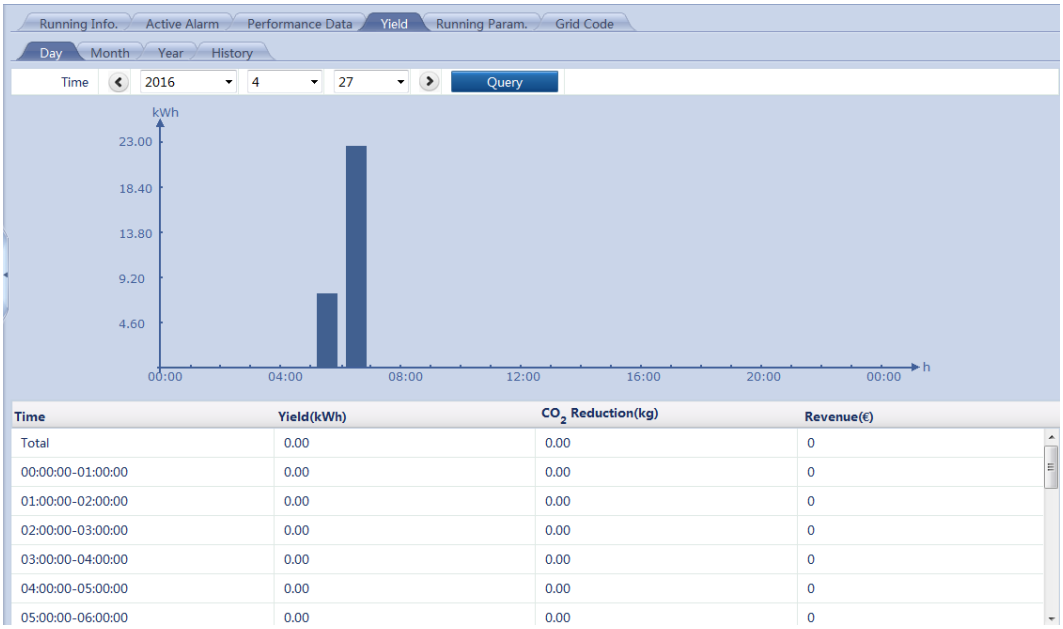
NOTE

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.

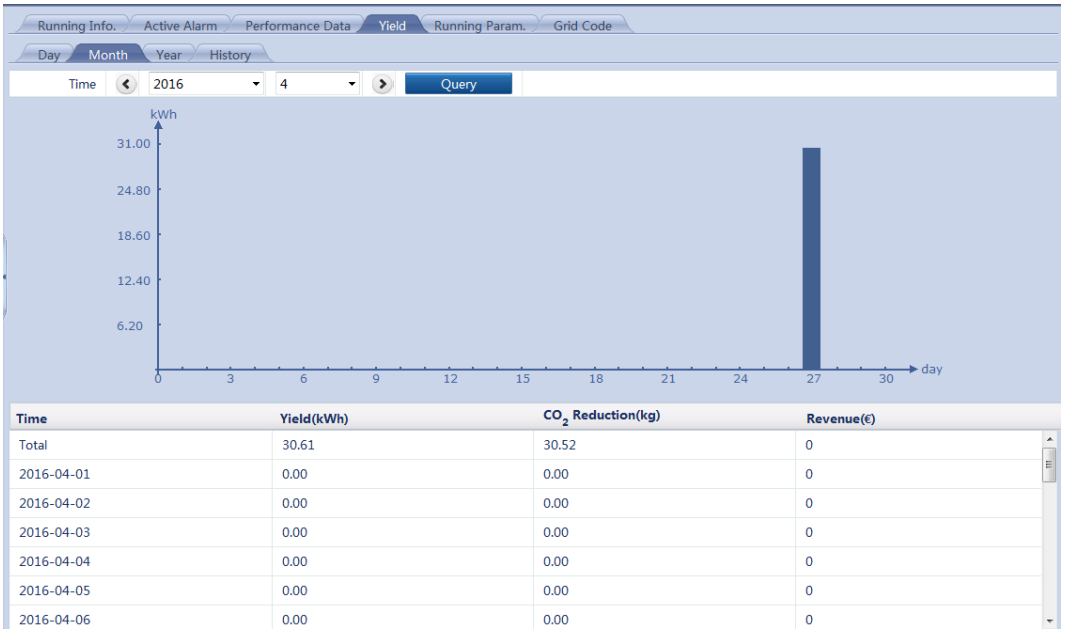
NOTE

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, CO_2 emission reduction, and revenue.

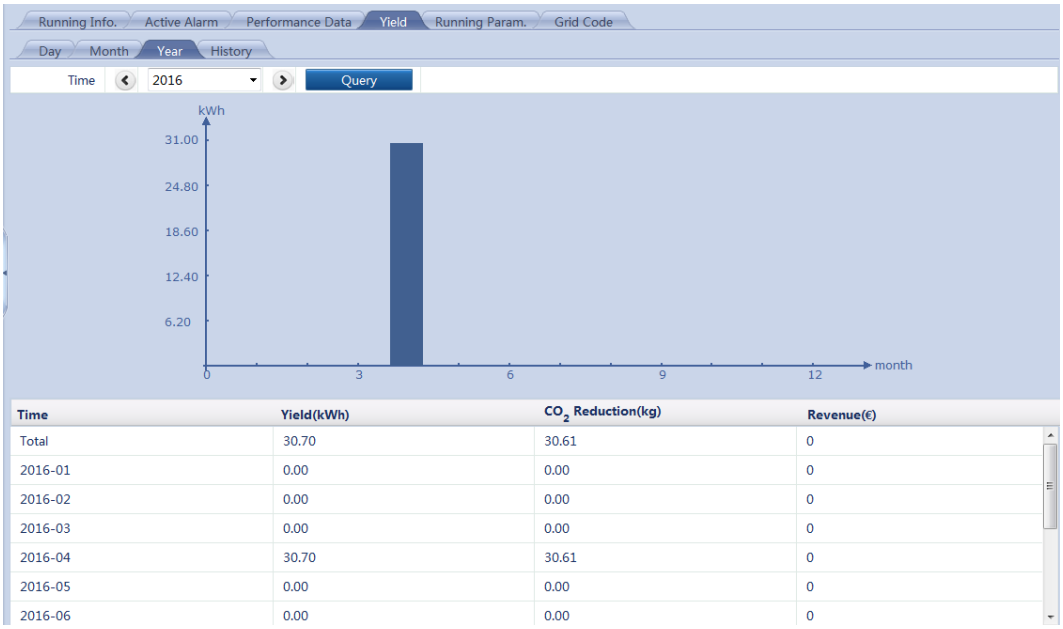
NOTE

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, CO_2 emission reduction, and revenue.

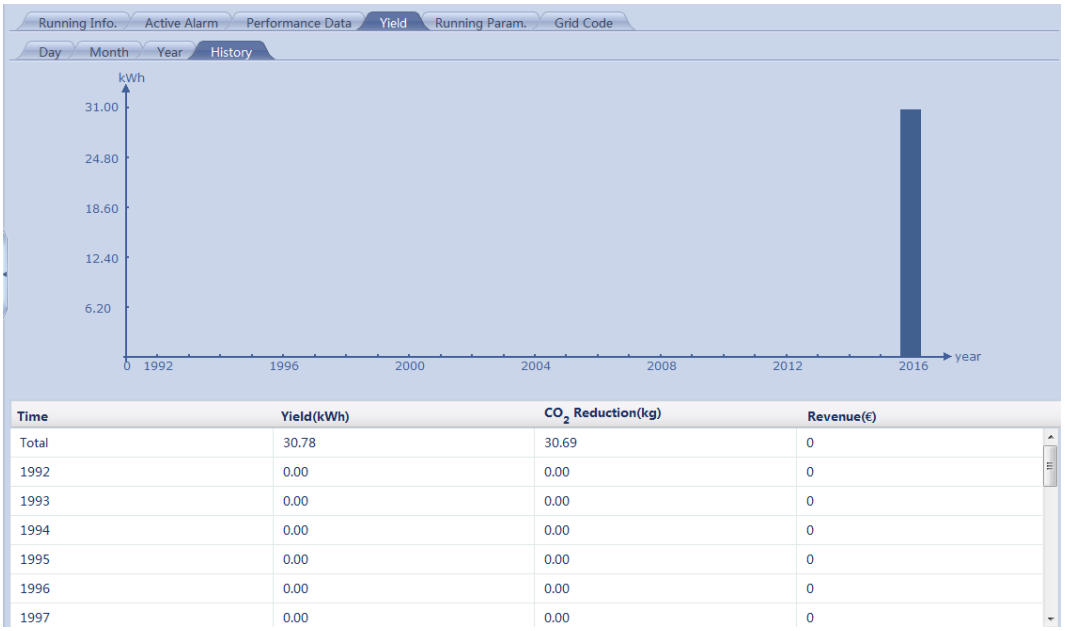
NOTE

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, CO_2 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.

7.11.6 Setting the Running Parameters of an Inverter

You can set the inverter running parameters over the WebUI. Parameter settings for Advanced Users and Special Users vary due to permission restrictions.

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 permission restriction, log in as **Advanced User** or **Special User**.

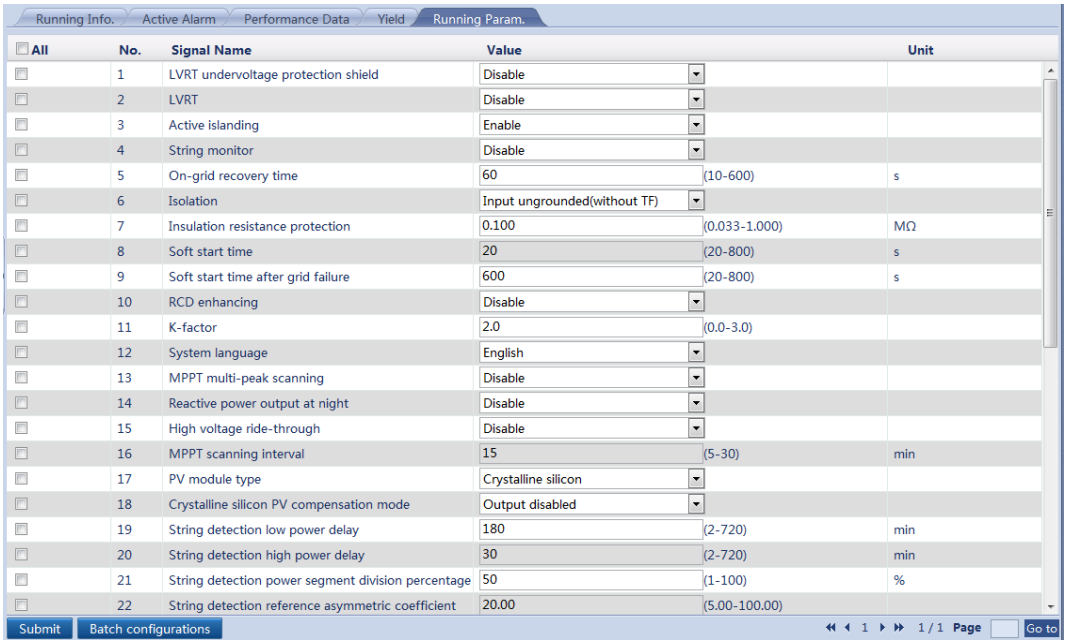
NOTICE

- If the SUN8000 status is **Disconnection**, you cannot set or synchronize parameters.
- You can set a single parameter or a batch of parameters for the SUN2000 only when it is in the **On-grid** or **Power-Off** state.

Running Parameters (1)

After logging in as **Advanced User**, you can set the **LVRT undervolt.protec.shield**, **LVRT**, **Anti-islanding**, or **String monitor** parameters, as shown in Figure 7-41.

Figure 7-41 Inverter running parameters (1)



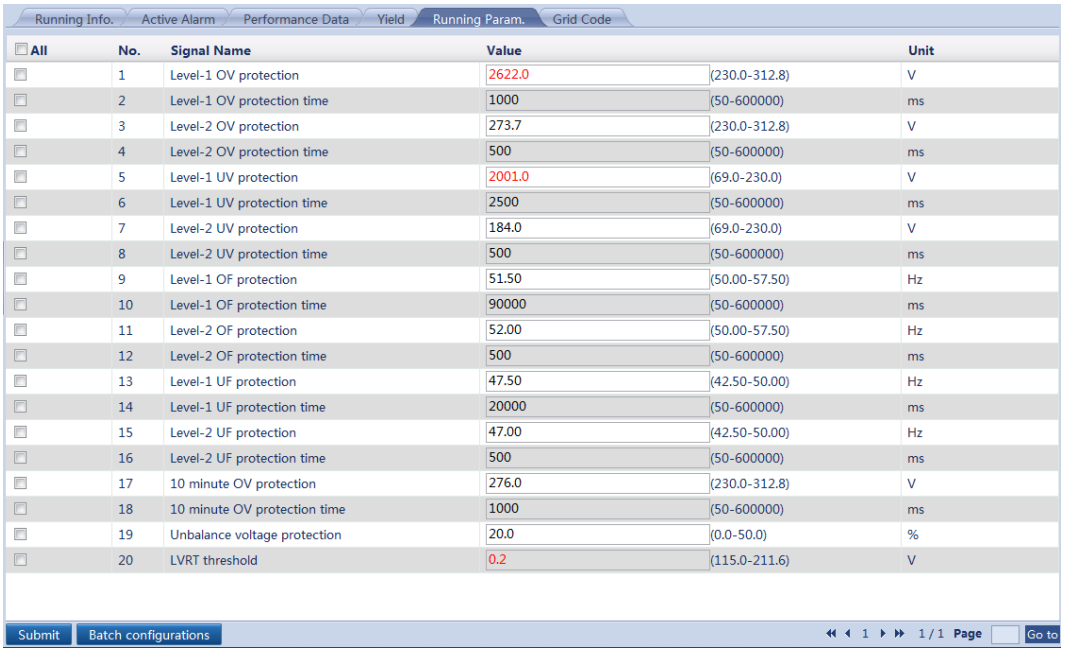
NOTE

The **Strong adaptability** mode allows inverters to better work in a harsh power grid environment. If you want to enable this mode, confirm with Huawei technical support first.

Running Parameters (2)

After logging in as **Special User**, you can set the **protection** and **protection time** parameters, as shown in Figure 7-42.

Figure 7-42 Inverter running parameters (2)



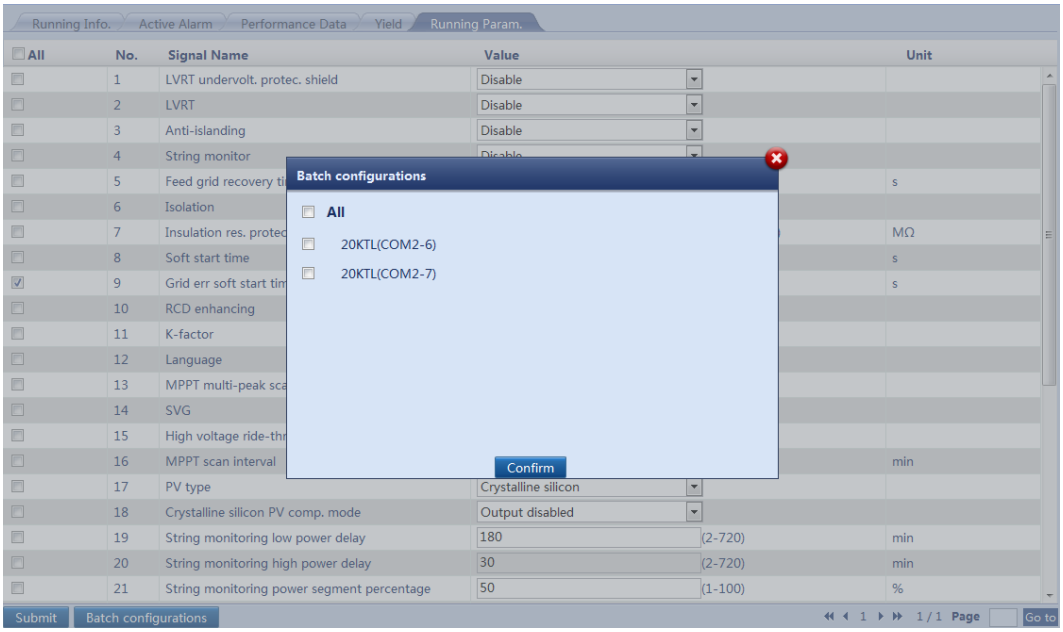
NOTE

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 you set the running parameters for an inverter, press **Batch configurations** to synchronize the 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

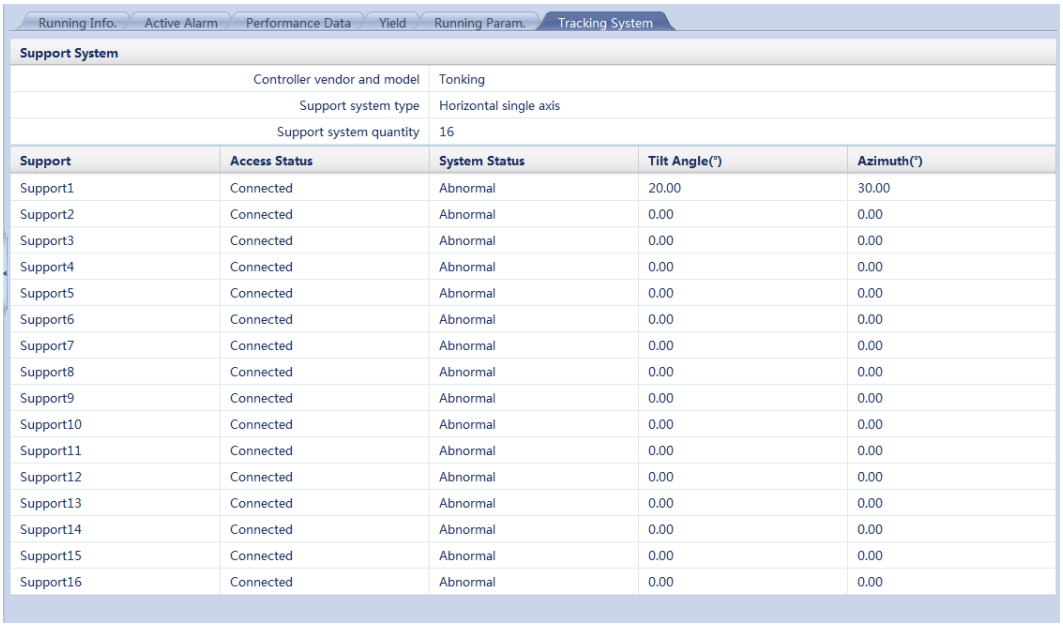
If the PV string uses a support system with controllers, you can query the tracking system over the WebUI.

NOTE

All types of inverters have this function except the SUN2000 (8KTL-28KTL) and SUN2000-50KTL.

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

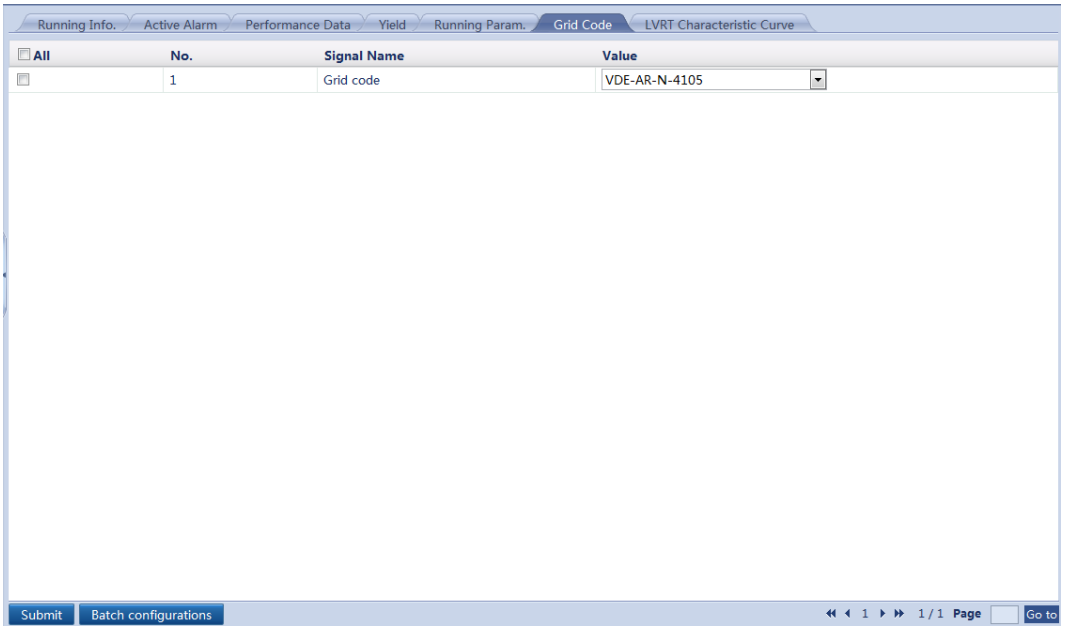
Normal inverter feedback to the power grid can be ensured only if the power grid standard code is set properly.

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



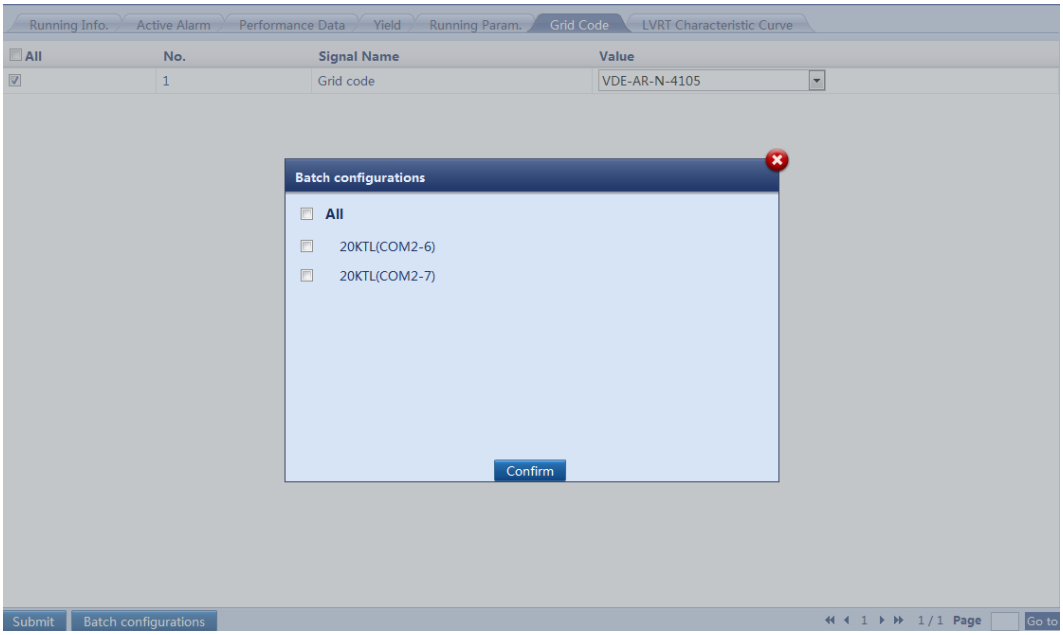
NOTICE

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.

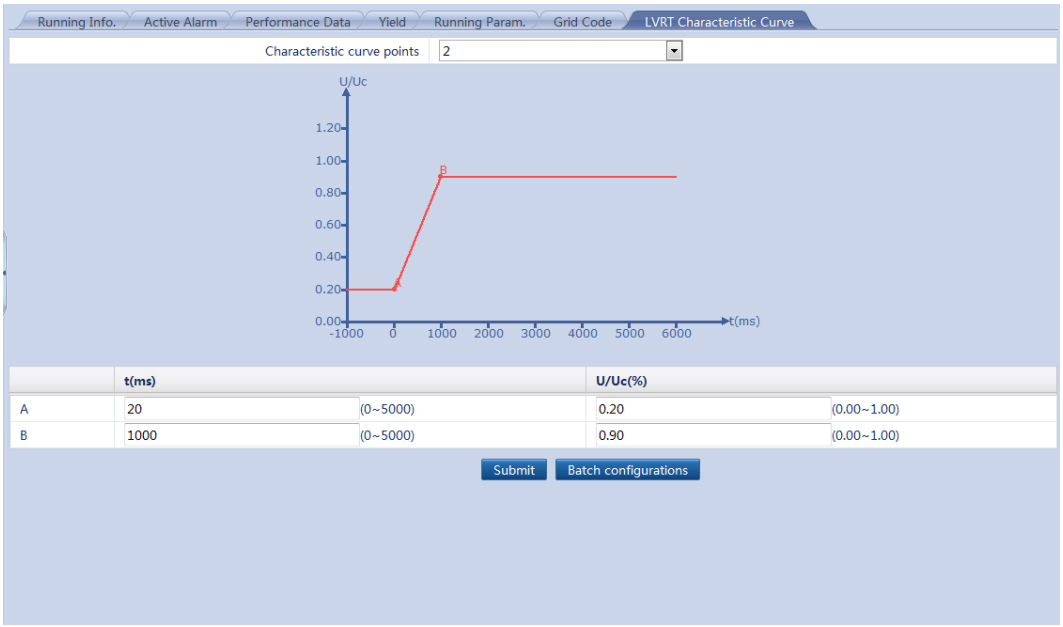
Setting the LVRT Characteristic Curve

NOTE

Only the SUN2000–46KTL supports 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**.

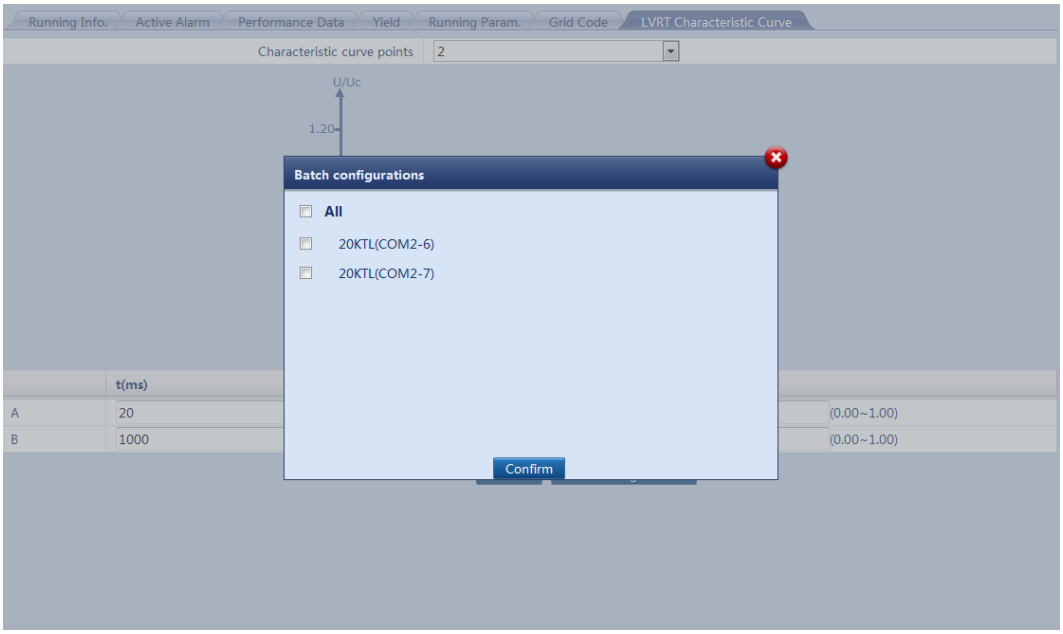
Figure 7-47 LVRT characteristic curve



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 PLC

The SmartLogger is integrated with the PLC CCO and connected to the SUN2000 that supports the PLC function over an AC power cable. Data is transmitted over the power cable to implement PLC networking.

You can query the running information, running parameters, STA list, and anti-crosstalk list of the PLC module embedded in the SmartLogger over the WebUI.

NOTE

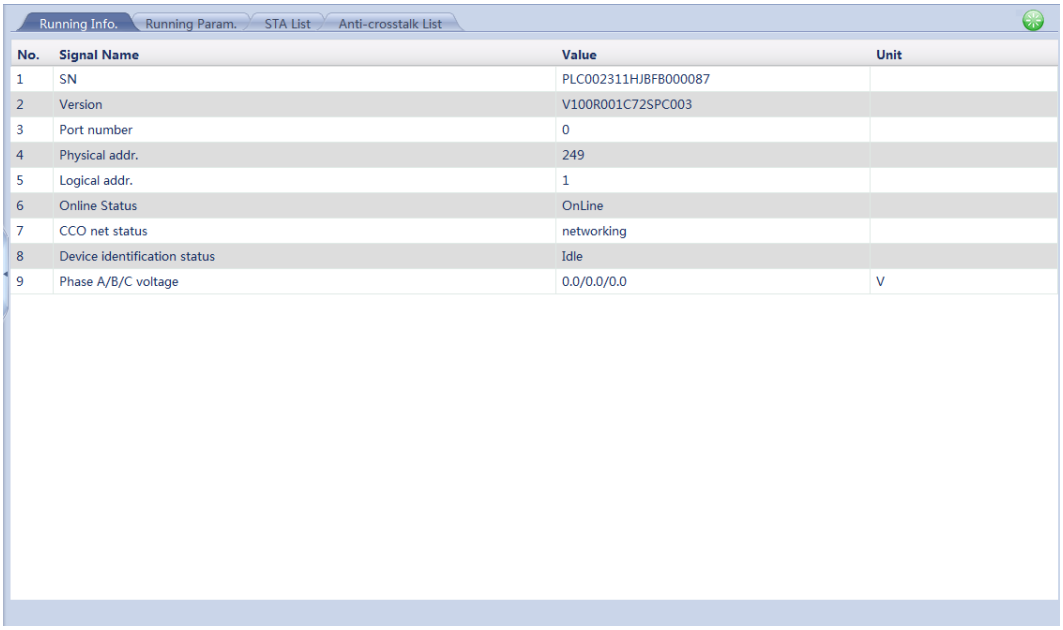
After connecting the SmartLogger AC power cable, choose **Maintenance** > **Device Mgmt.** > **Connect Device** and enable the embedded PLC module.

7.12.1 Querying PLC Module Running Information

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

On the **Monitoring** tab page, select the PLC module to be queried and click **Running Info.**. The corresponding **SN**, **Firmware Version**, and **Port number** are displayed, as shown in Figure 7-49.

Figure 7-49 PLC module running information



No.	Signal Name	Value	Unit
1	SN	PLC002311HJBFB000087	
2	Version	V100R001C72SPC003	
3	Port number	0	
4	Physical addr.	249	
5	Logical addr.	1	
6	Online Status	OnLine	
7	CCO net status	networking	
8	Device identification status	Idle	
9	Phase A/B/C voltage	0.0/0.0/0.0	V

7.12.2 Setting PLC Module Running Parameters

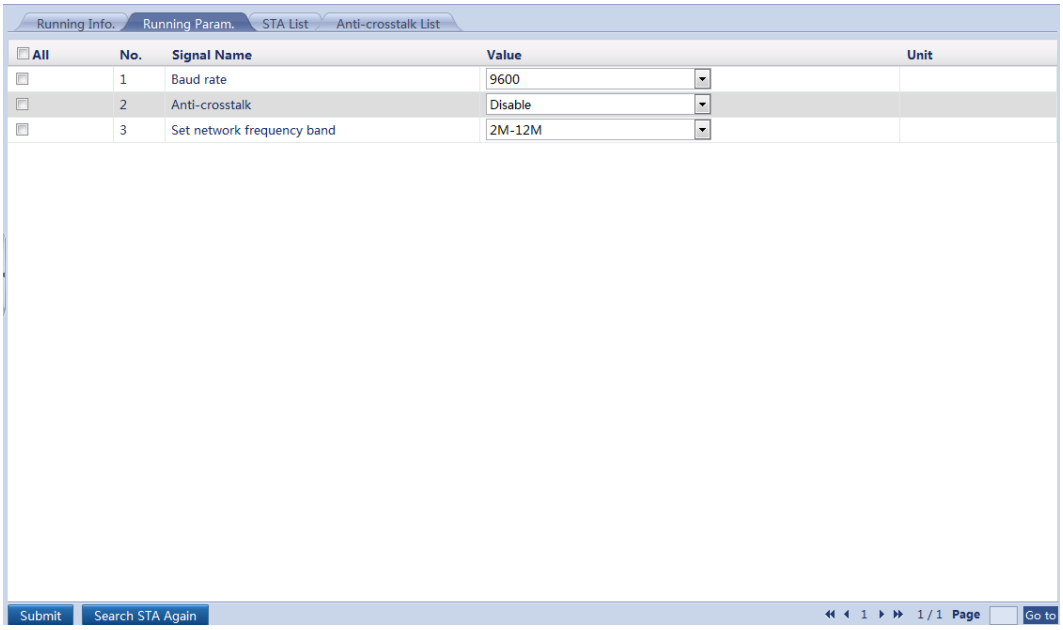
You can set the PLC module running parameters over the WebUI.

On the **Monitoring** tab page, choose the PLC module to be set and click **Running Param.** to access the page for setting running parameters, as shown in Figure 7-50. Because of the permission restriction, log in as **Advanced User**.

NOTICE

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

Figure 7-50 Setting running parameters



NOTE

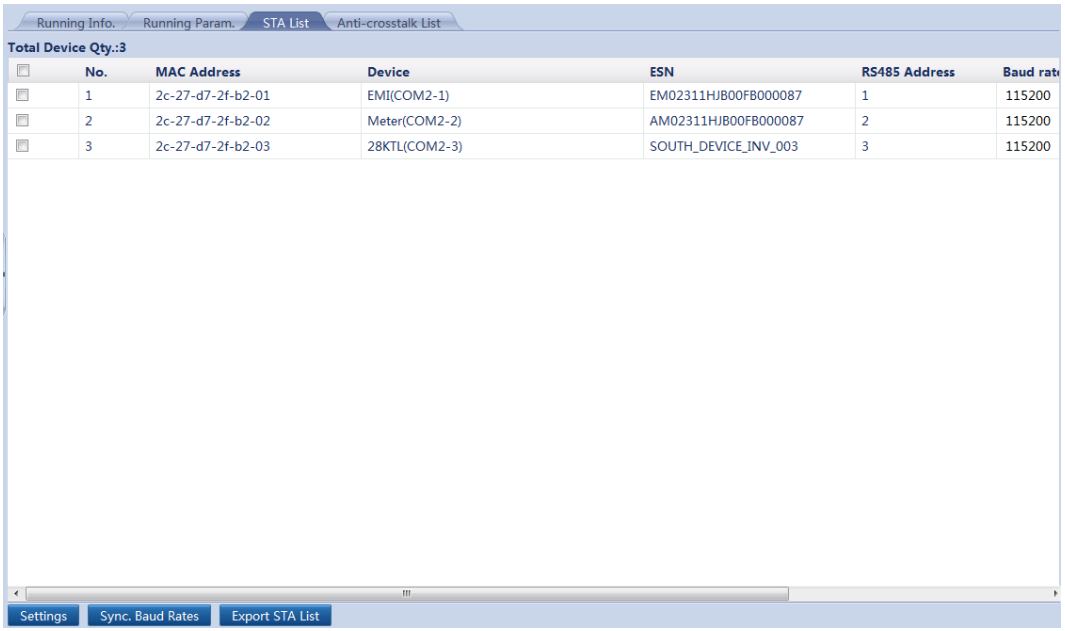
- **Baud rate** is set to **115200** by default, which can provide optimal communications performance.
- Set **Anti-crosstalk** to **Enable** to make devices in the anti-crosstalk list take effect.
- Set **Set network frequency band** as required.

7.12.3 Setting the PLC STA List

You can set the PLC STA list over the WebUI.

On the **Monitoring** tab page, select PLC and click **STA List**. Then you can set **Baud rate** for listed devices, as shown in Figure 7-51.

Figure 7-51 STA list



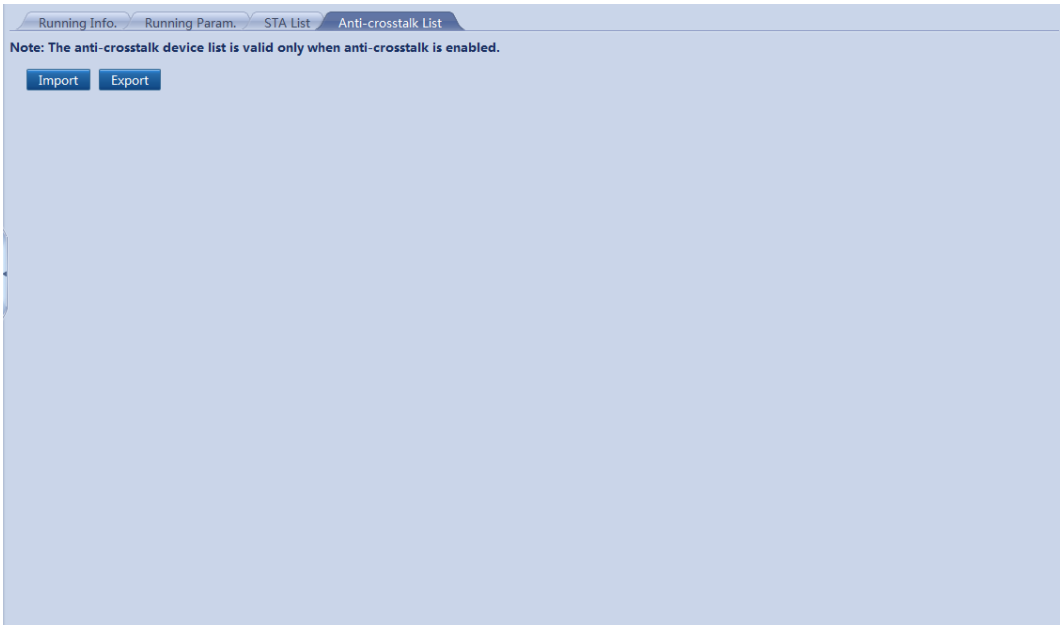
NOTE

- 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.

7.12.4 Managing the Anti-Crosstalk List of the PLC Module

On the **Monitoring** tab page, select the PLC module to be set, click **Anti-crosstalk**, and click **Import** or **Export**, as shown in Figure 7-52.

Figure 7-52 Anti-crosstalk list



NOTE

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

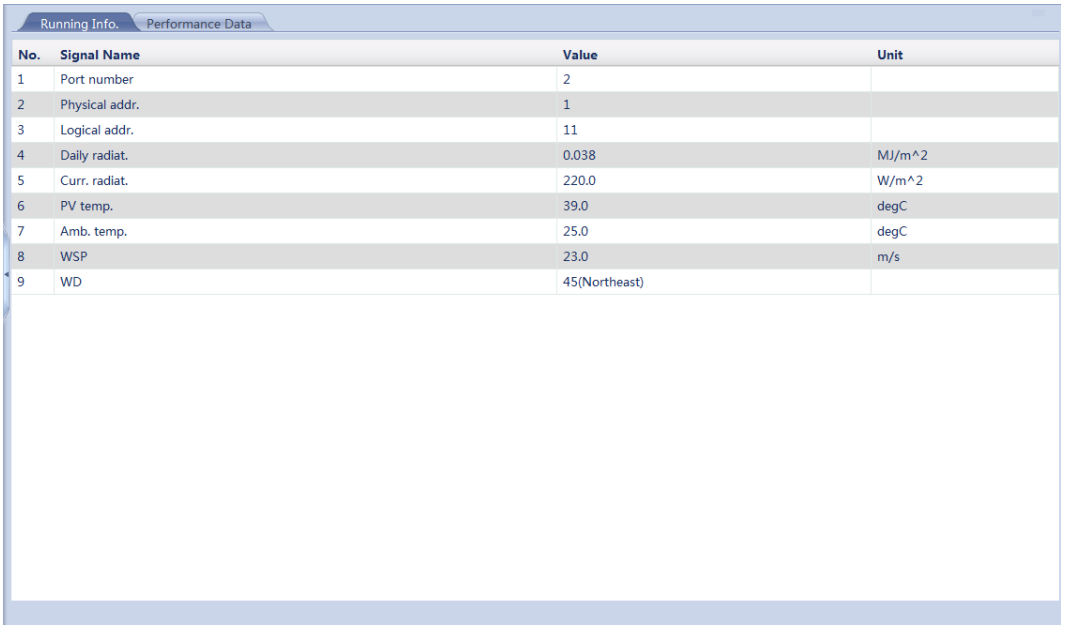
7.13 EMI

7.13.1 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 7-53.

Figure 7-53 EMI running information



No.	Signal Name	Value	Unit
1	Port number	2	
2	Physical addr.	1	
3	Logical addr.	11	
4	Daily radiat.	0.038	MJ/m^2
5	Curr. radiat.	220.0	W/m^2
6	PV temp.	39.0	degC
7	Amb. temp.	25.0	degC
8	WSP	23.0	m/s
9	WD	45(Northeast)	

7.13.2 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.

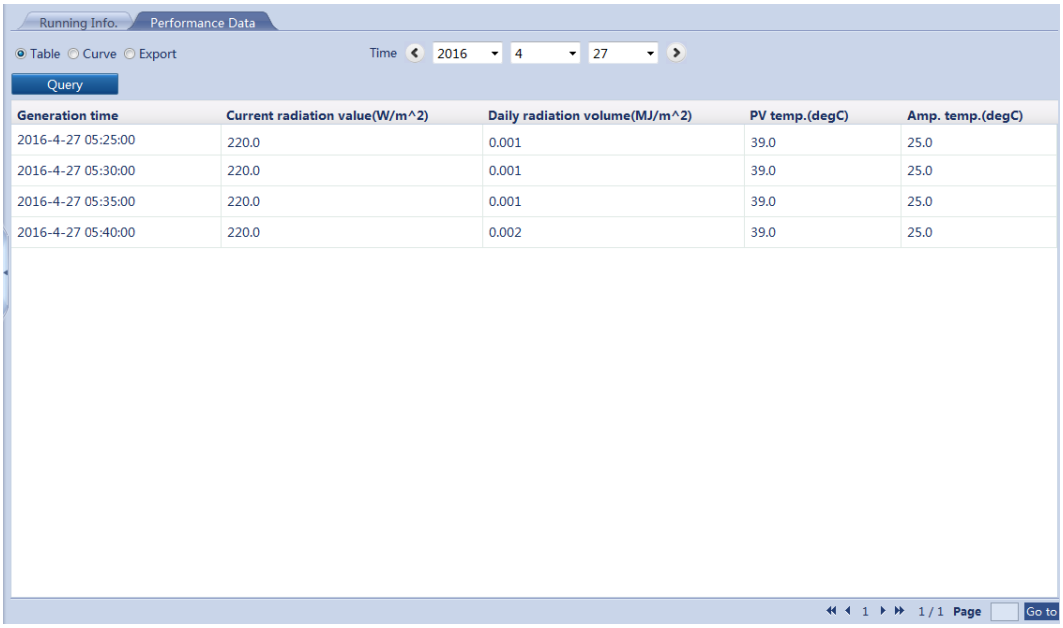
On the **Monitoring** tab page, choose the EMI to be queried and click **Performance Data** to access the performance data query page.

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 7-55.

Figure 7-54 Performance data displayed in a table



Select **Curve**, set **Time**, **Y1**, and **Y2**, and click **Query**, as shown in Figure 7-55.

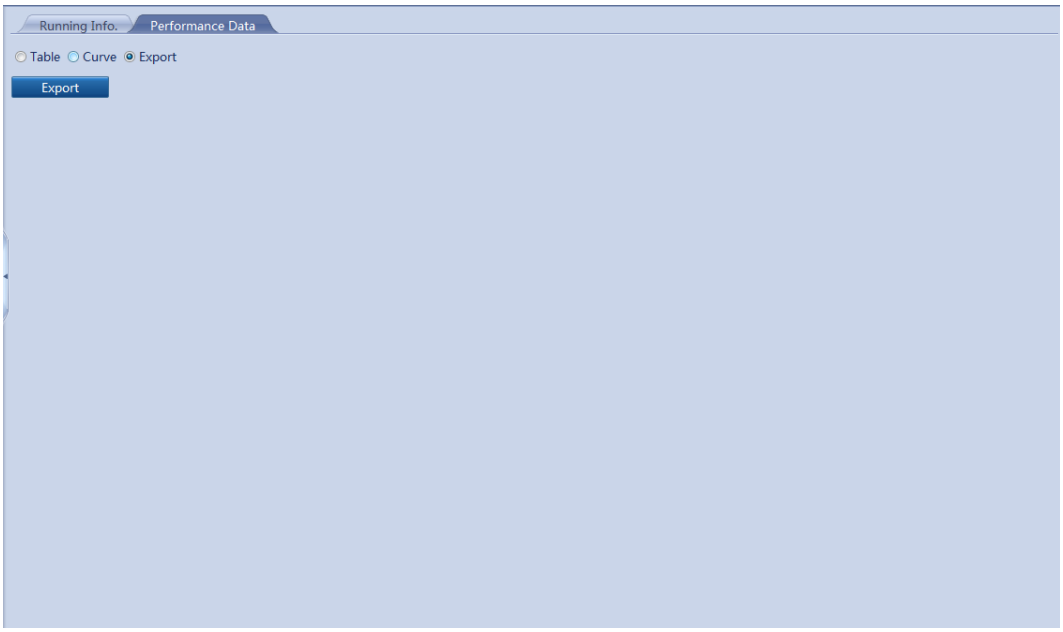
NOTICE

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 7-55 Performance data displayed in a curve

Select **Export** 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 file, retain the extension **.tar.gz**. Otherwise, the file cannot be functional.

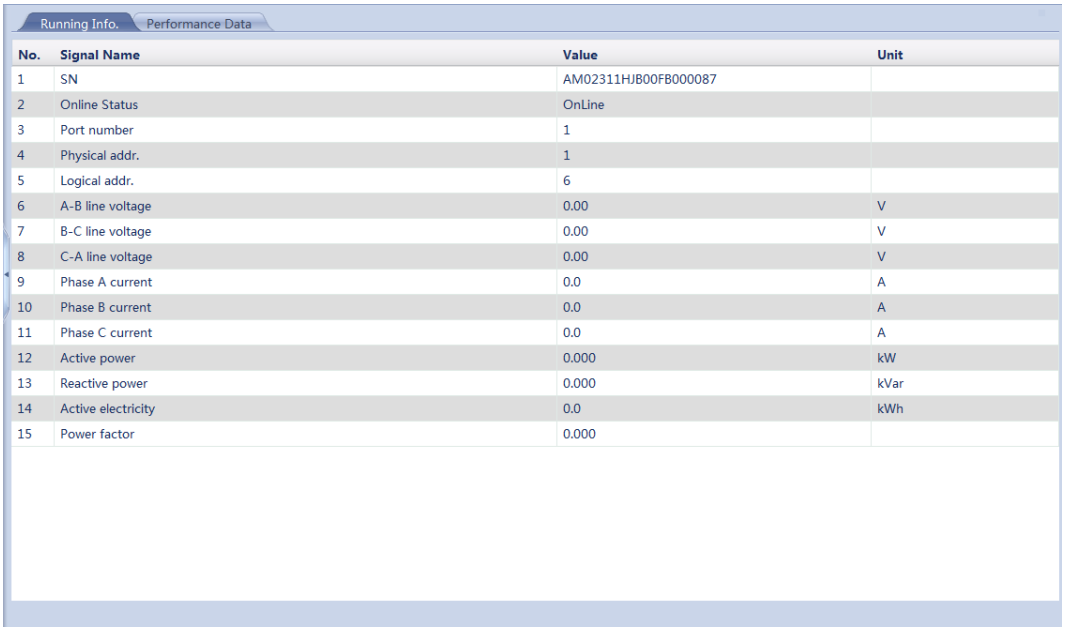
7.14 Modbus Power Meter

7.14.1 Querying the Modbus Power Meter Running Information

You can query the Modbus power meter running information over the WebUI.

On the **Monitoring** tab page, select the Modbus 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 Modbus power meter running information



No.	Signal Name	Value	Unit
1	SN	AM02311HJB00FB000087	
2	Online Status	OnLine	
3	Port number	1	
4	Physical addr.	1	
5	Logical addr.	6	
6	A-B line voltage	0.00	V
7	B-C line voltage	0.00	V
8	C-A line voltage	0.00	V
9	Phase A current	0.0	A
10	Phase B current	0.0	A
11	Phase C current	0.0	A
12	Active power	0.000	kW
13	Reactive power	0.000	kVar
14	Active electricity	0.0	kWh
15	Power factor	0.000	

7.14.2 Querying the Modbus Power Meter Performance Data

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

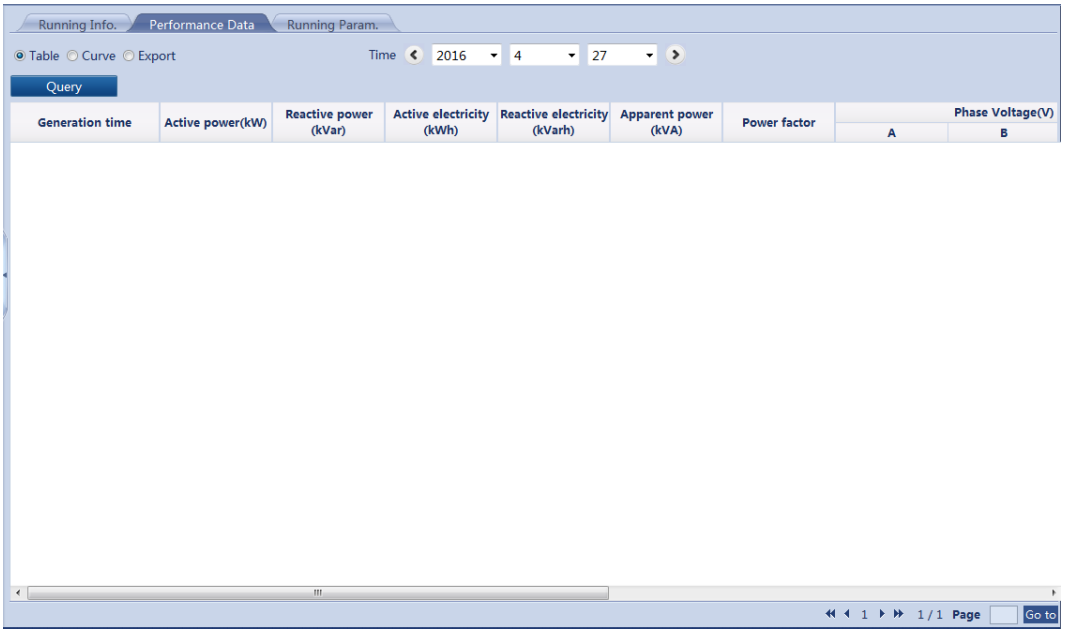
On the **Monitoring** tab page, choose the power meter to be queried and click **Performance Data** to access the performance data query page.

NOTE

When you query the Modbus 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

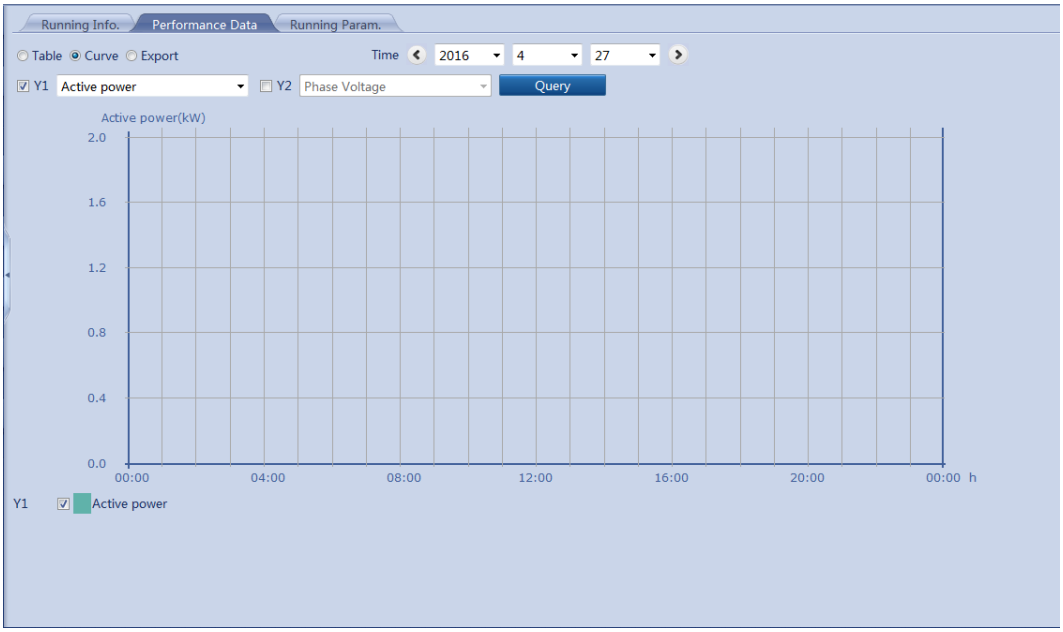


Select **Curve**, set **Time**, **Y1**, and **Y2**, and click **Query**, as shown in Figure 7-59.

NOTICE

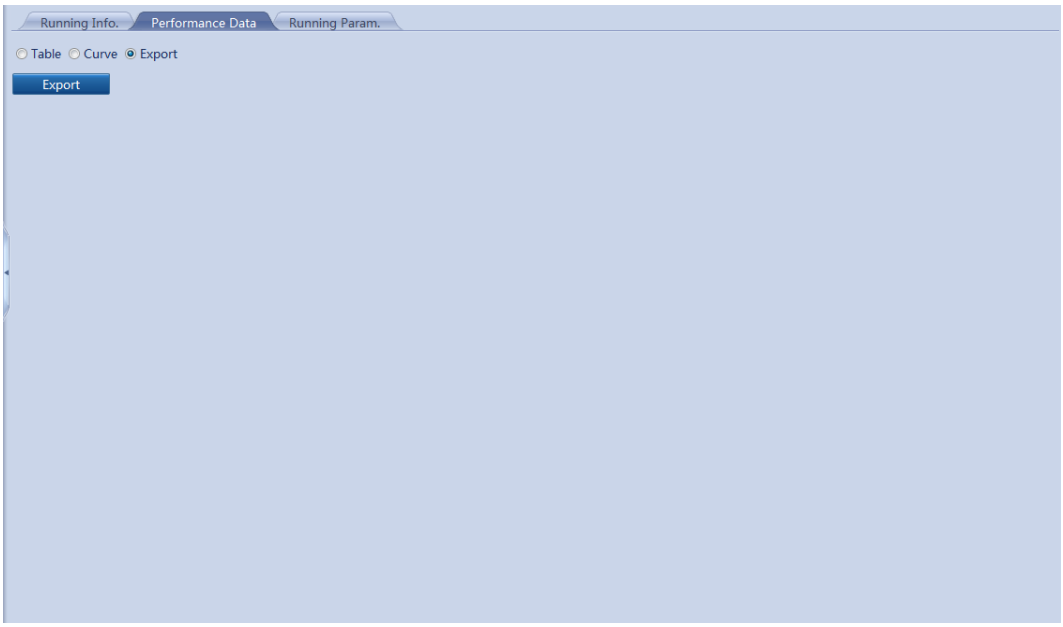
You can compare the curves of two parameters by selecting **Y1** and **Y2** at the same time. However, the values of **Y1** and **Y2** must be different.

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



NOTE

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

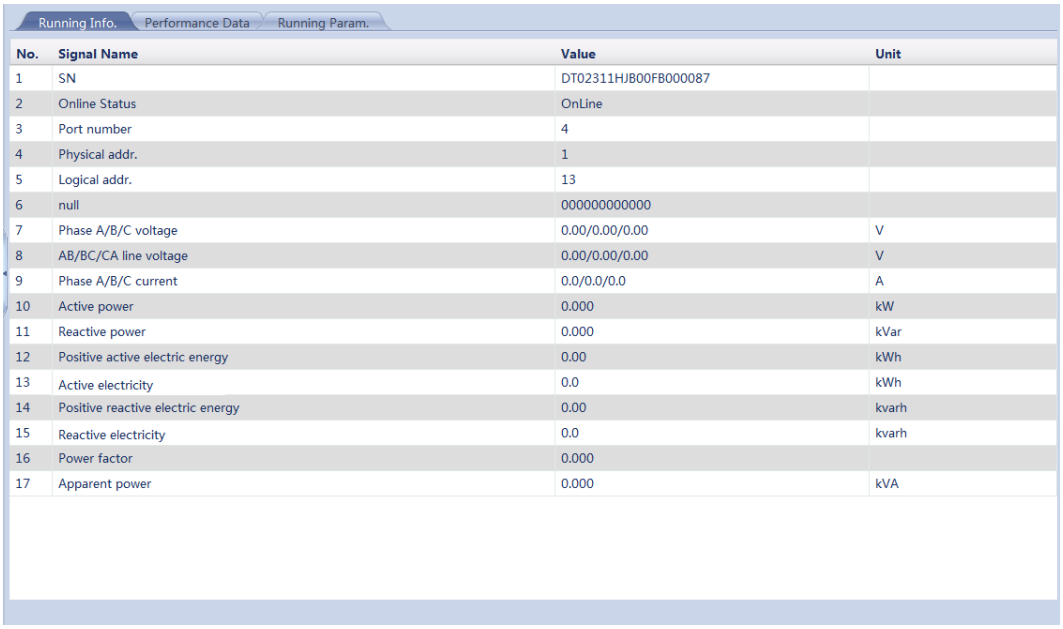
7.15 DL/T645 Power Meter

7.15.1 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 7-61.

Figure 7-61 DL/T645 power meter running information



No.	Signal Name	Value	Unit
1	SN	DT02311HJB00FB000087	
2	Online Status	OnLine	
3	Port number	4	
4	Physical addr.	1	
5	Logical addr.	13	
6	null	000000000000	
7	Phase A/B/C voltage	0.00/0.00/0.00	V
8	AB/BC/CA line voltage	0.00/0.00/0.00	V
9	Phase A/B/C current	0.0/0.0/0.0	A
10	Active power	0.000	kW
11	Reactive power	0.000	kVar
12	Positive active electric energy	0.00	kWh
13	Active electricity	0.0	kWh
14	Positive reactive electric energy	0.00	kvarh
15	Reactive electricity	0.0	kvarh
16	Power factor	0.000	
17	Apparent power	0.000	kVA

7.15.2 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.

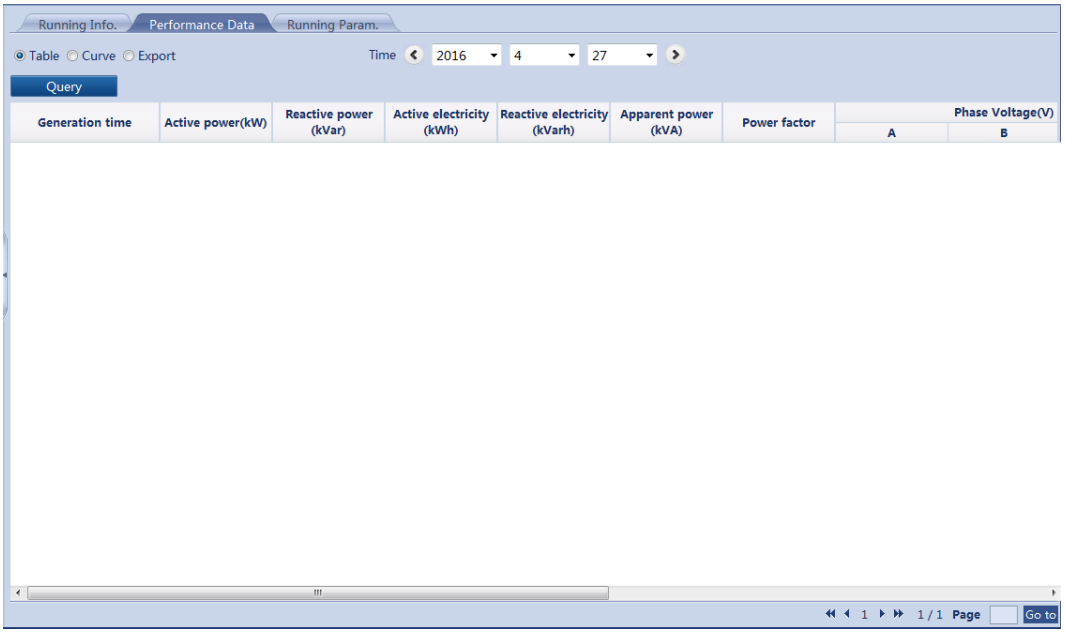
On the **Monitoring** tab page, choose the power meter to be queried and click **Performance Data** to access the performance data query page.

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 7-62.

Figure 7-62 Performance data displayed in a table

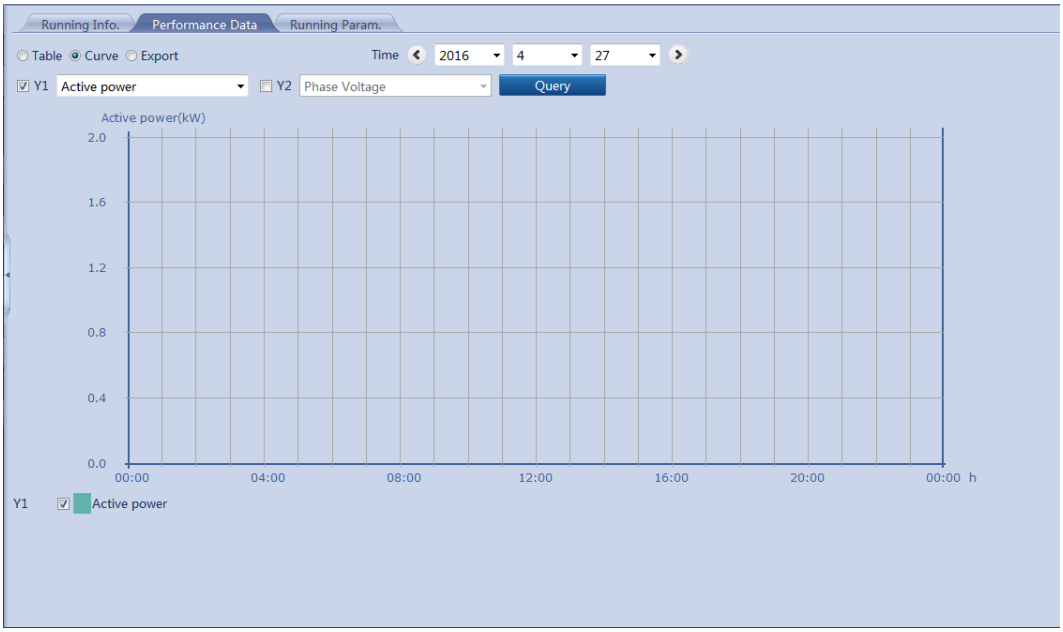


Select **Curve**, set **Time**, **Y1**, and **Y2**, and click **Query**, as shown in Figure 7-63.

NOTICE

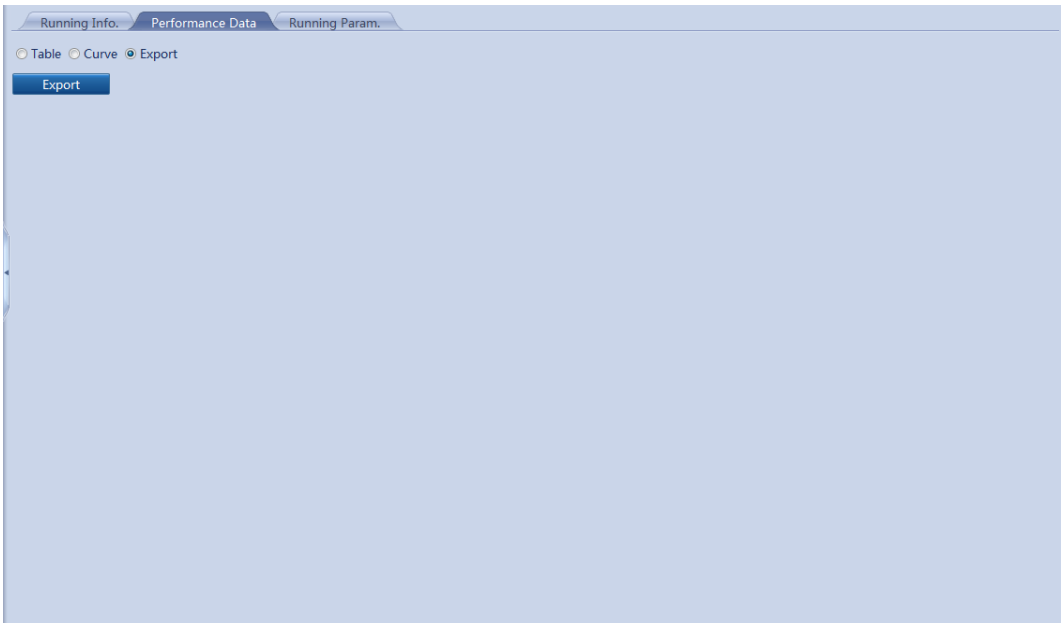
You can compare the curves of two parameters by selecting **Y1** and **Y2** at the same time. However, the values of **Y1** and **Y2** must be different.

Figure 7-63 Performance data displayed in a curve



Select **Export** and click **Export** to export the performance data, as shown in Figure 7-64.

Figure 7-64 Exporting performance data



NOTE

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

7.15.3 Setting DL/T645 Power Meter Running Parameters

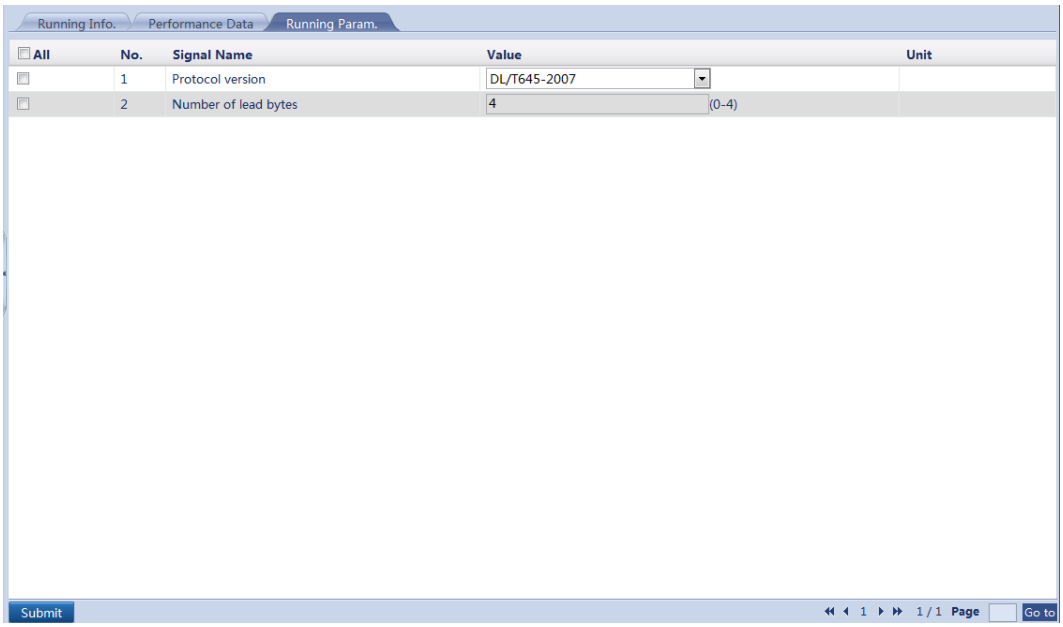
You can set the DL/T645 power meter running parameters over the WebUI.

On the **Monitoring** tab page, choose the power meter to be set and click **Running Info.** to access the page for setting running parameters, as shown in Figure 7-65. 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 7-65 Setting running parameters



NOTE

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

7.16 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.

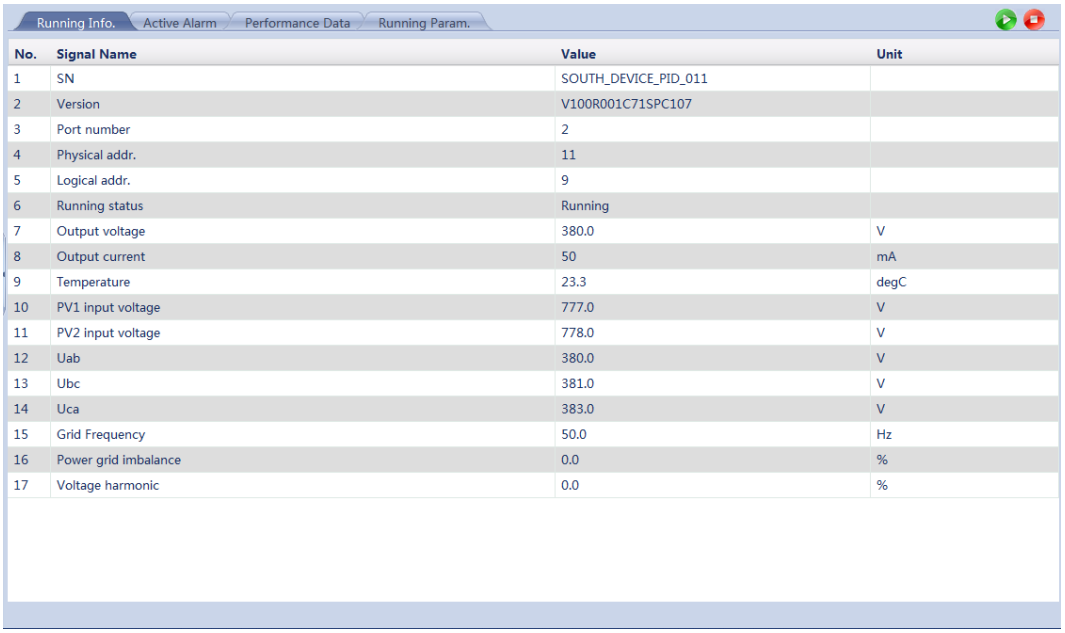
The PID module must work with the devices such as Huawei inverters, SmartLogger, and PID inductors. It can automatically switch between the N/PE offset mode and the PV/PE offset mode based on the PV voltage and inverter status.

7.16.1 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**, **Firmware Upgrade**, and **Port number** are displayed, as shown in Figure 7-66.

Figure 7-66 PID module running information



No.	Signal Name	Value	Unit
1	SN	SOUTH_DEVICE_PID_011	
2	Version	V100R001C71SPC107	
3	Port number	2	
4	Physical addr.	11	
5	Logical addr.	9	
6	Running status	Running	
7	Output voltage	380.0	V
8	Output current	50	mA
9	Temperature	23.3	degC
10	PV1 input voltage	777.0	V
11	PV2 input voltage	778.0	V
12	Uab	380.0	V
13	Ubc	381.0	V
14	Uca	383.0	V
15	Grid Frequency	50.0	Hz
16	Power grid imbalance	0.0	%
17	Voltage harmonic	0.0	%

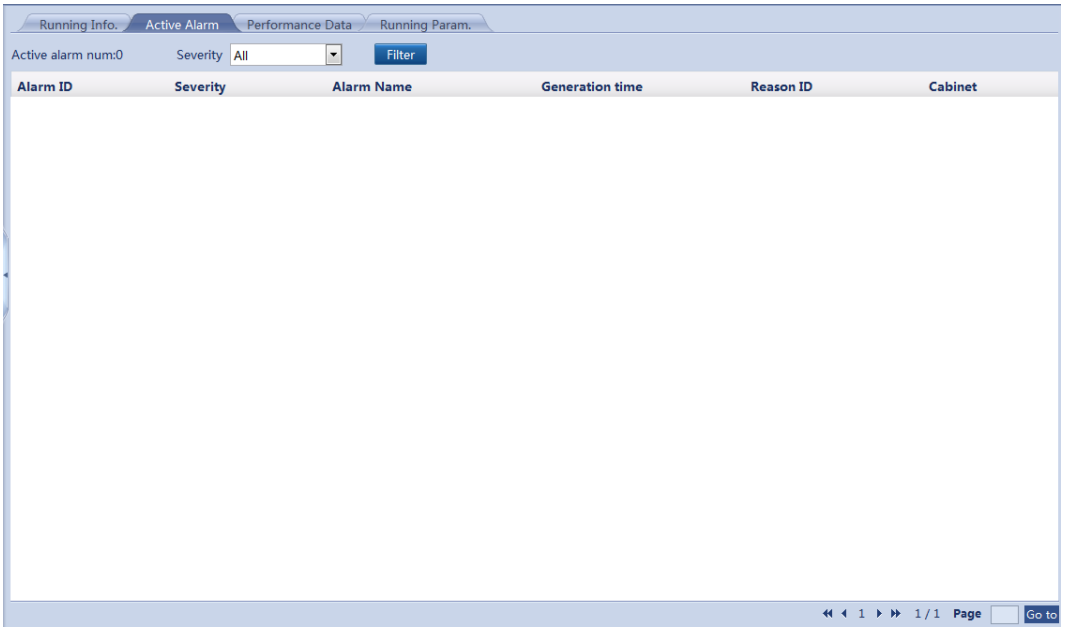
7.16.2 Querying PID Module Active Alarms

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 7-67.

Figure 7-67 PID module active alarms



7.16.3 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.

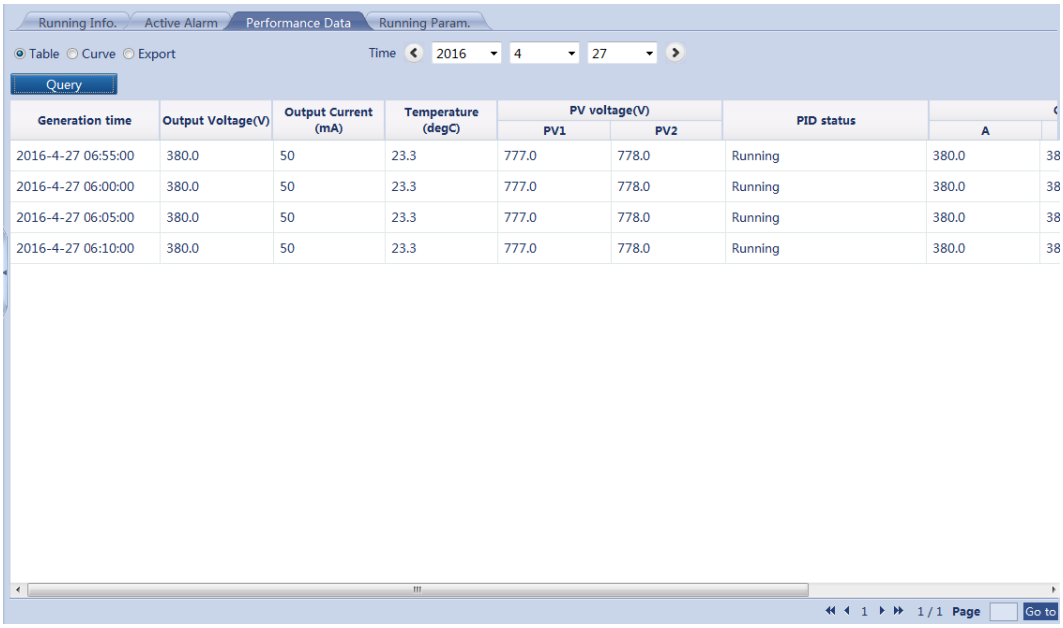
On the **Monitoring** tab page, click **Performance Data** to access the page for querying performance data.

NOTE

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.

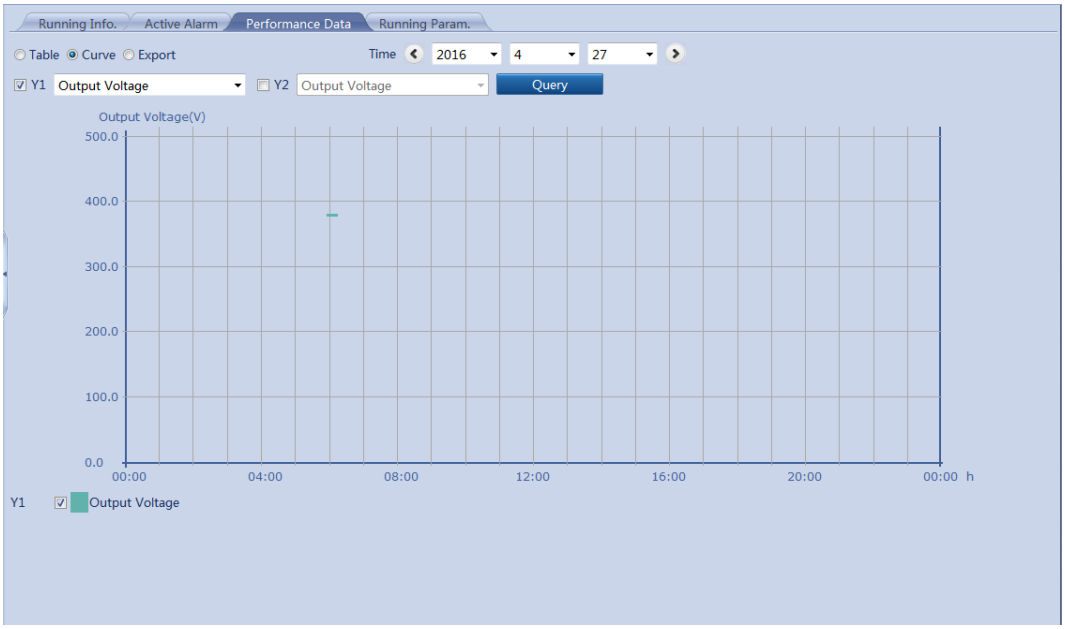
Select **Table**, set **Time**, and click **Query**. You can query the values of various performance parameters, such as **Generation time**, **Output Voltage**, and **Output Current**, as shown in Figure 7-68.

Figure 7-68 Performance data displayed in a table



Select **Curve**, set **Time**, **Y1**, and **Y2**, and click **Query**, as shown in Figure 7-69.

Figure 7-69 Performance data displayed in a curve



Select **Export** and click **Export** to export the performance data, as shown in Figure 7-70.

Figure 7-70 Exporting performance data

NOTE

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

7.16.4 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 7-71. Because of the permission restriction, log in as **Advanced User**.

NOTE

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

Figure 7-71 Setting running parameters

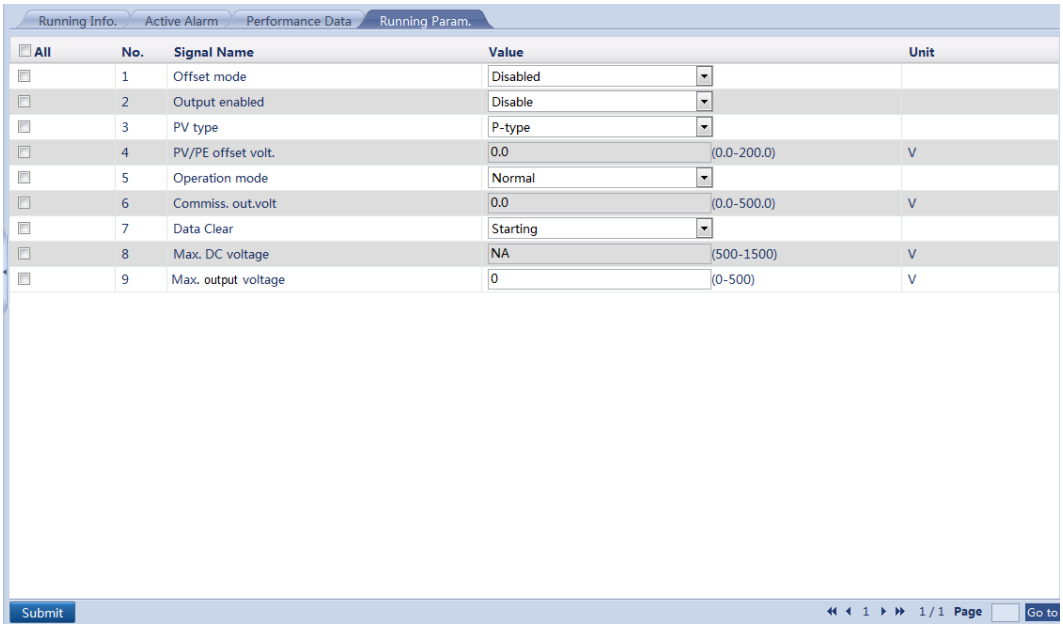


Table 7-2 describes the PID module running parameters.

Table 7-2 Running parameter descriptions

No.	Parameter Name	Function	Parameter 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.
			Automatic	• 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.	Parameter Name	Function	Parameter 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.	Commissioning	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.

7.17 User-Defined 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.

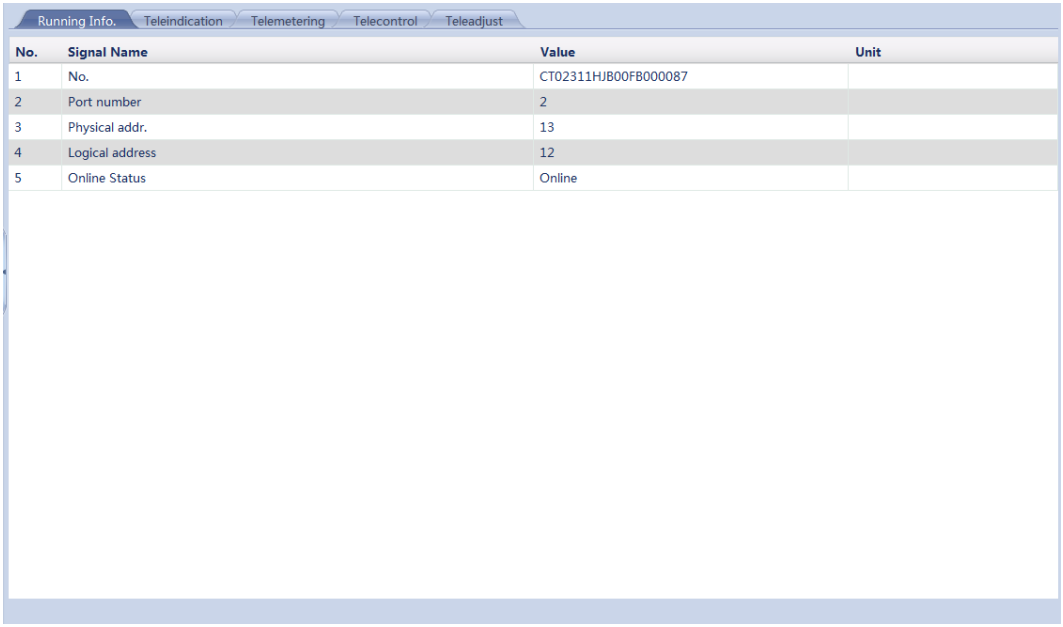
NOTE

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

7.17.1 Querying the User-Defined Device Running Information

On the **Monitoring** tab page, select the user-defined device to be queried and click **Running Info.**, as shown in Figure 7-72.

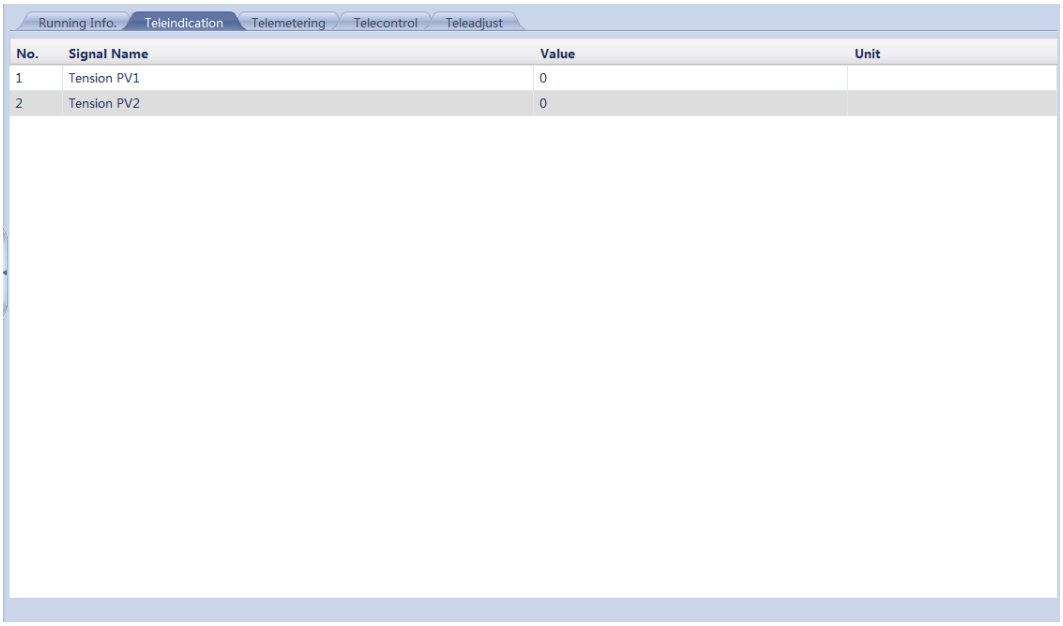
Figure 7-72 Querying running information



7.17.2 Querying the User-Defined Device Teleindication Information

On the **Monitoring** tab page, select the user-defined device whose teleindication information needs to be queried and click **Teleindication**, as shown in Figure 7-73.

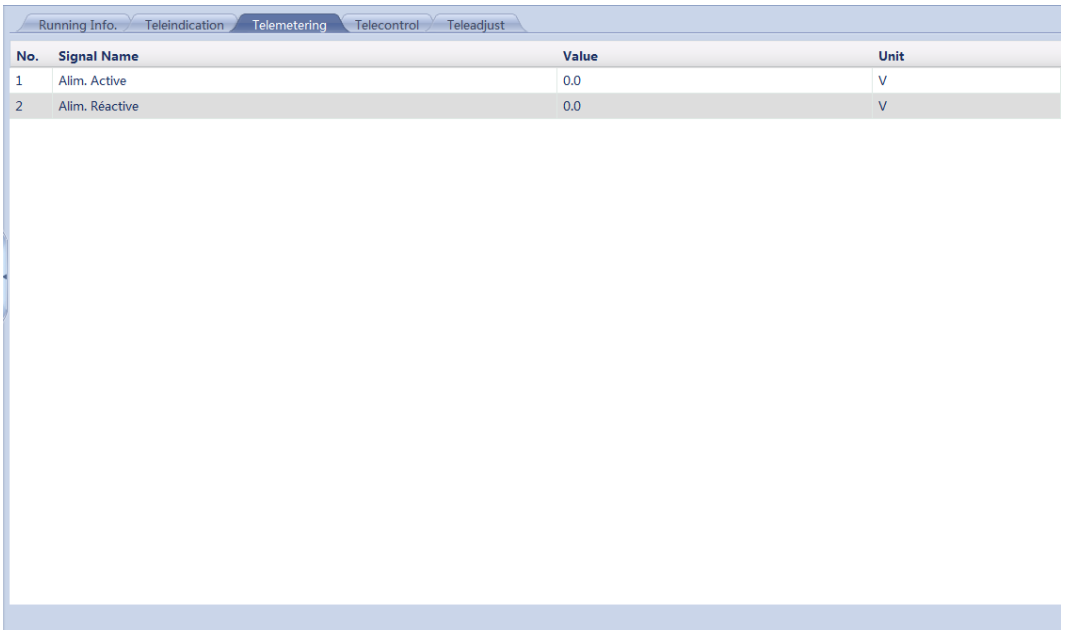
Figure 7-73 Querying teleindication information



7.17.3 Querying the User-Defined Device Telemetering Information

On the **Monitoring** tab page, select the user-defined device whose telemetering information needs to be queried and click **Telemetering**, as shown in Figure 7-74.

Figure 7-74 Querying telemetering information



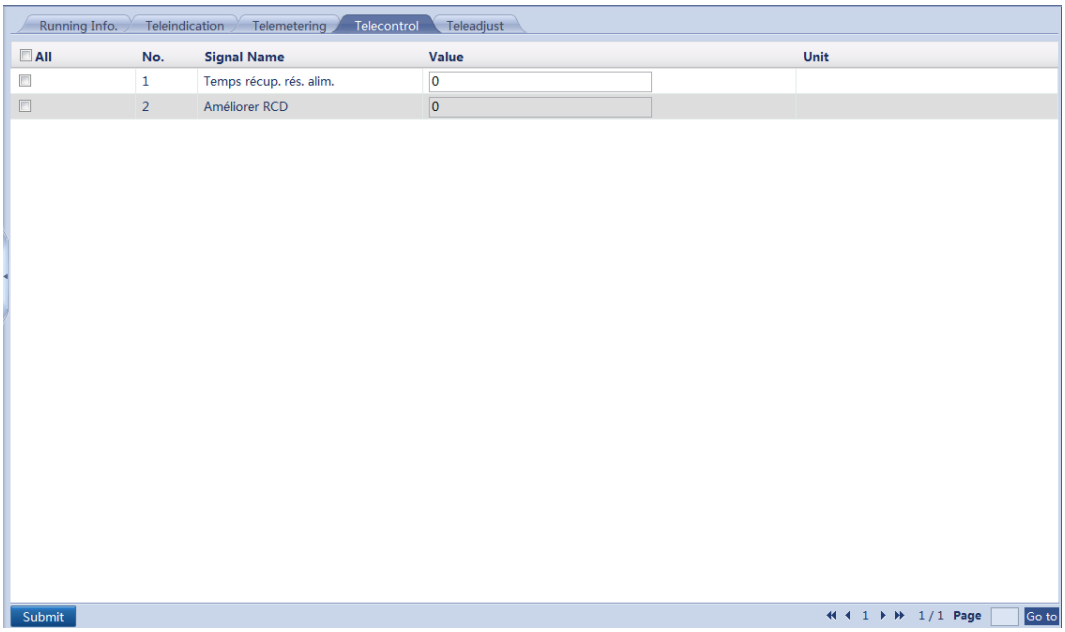
7.17.4 Setting Telecontrol Parameters for User-Defined Devices

On the **Monitoring** tab page, choose the device to be set and click **Telecontrol**. The page for setting telecontrol parameters is displayed, as shown in Figure 7-75. Because of the permission restriction, log in as **Advanced User**.

NOTICE

Telecontrol parameters cannot be set for a user-defined device in the **Disconnection** status.

Figure 7-75 Setting telecontrol parameters



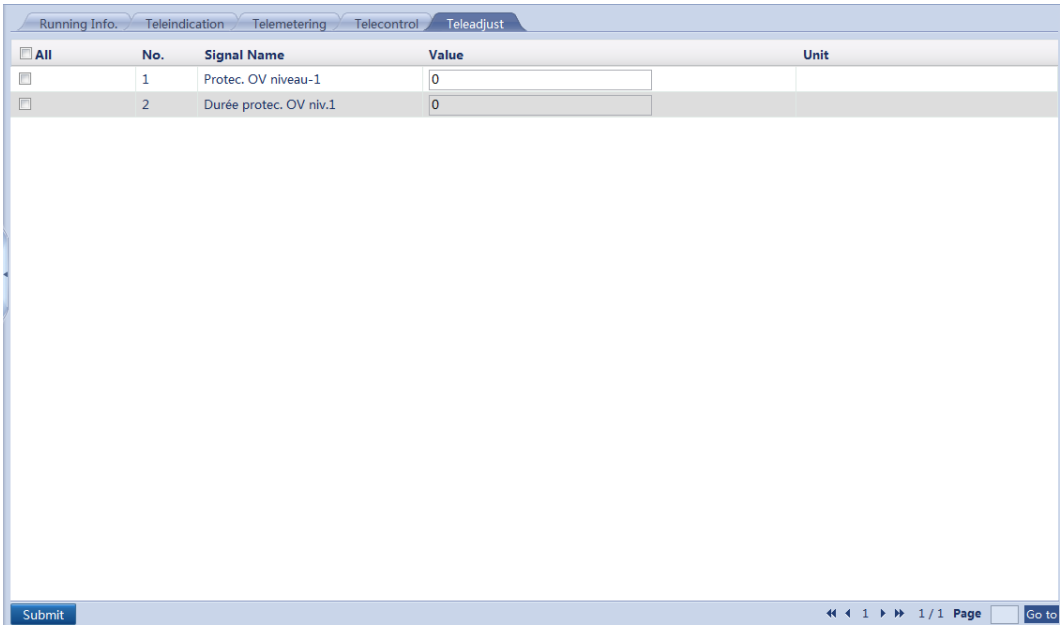
7.17.5 Setting Teleadjust Parameters for User-Defined Devices

On the **Monitoring** tab page, choose the user-defined device to be set and click **Teleadjust** to access the page for setting teleadjust parameters, as shown in Figure 7-76. Because of the permission restriction, log in as **Advanced User**.

NOTICE

Teleadjust parameters cannot be set for a user-defined device in the **Disconnection** status.

Figure 7-76 Setting teleadjust parameters



7.18 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.

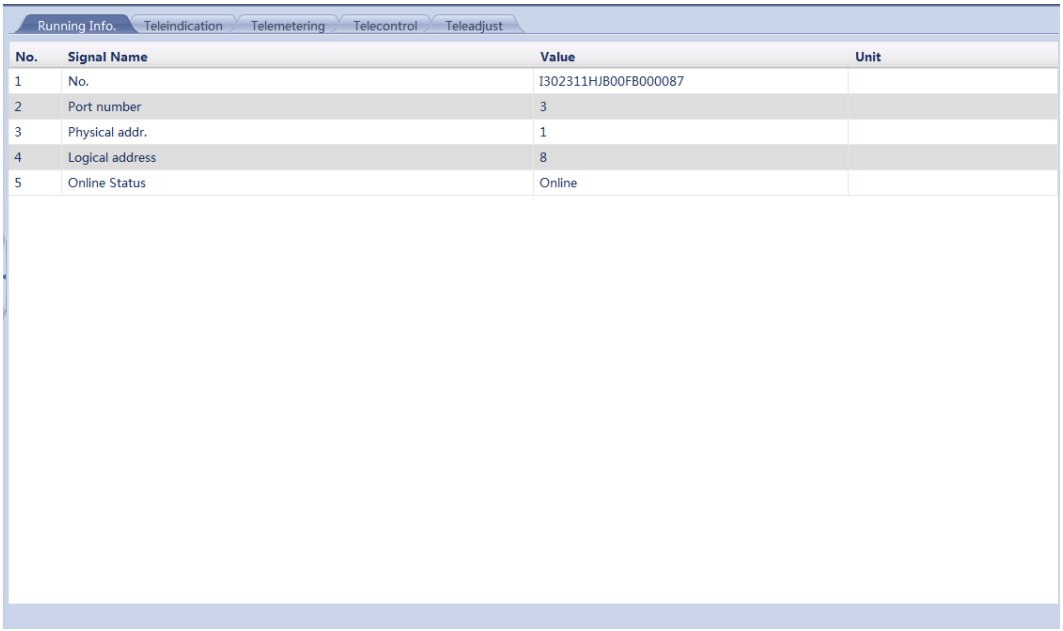
NOTE

- 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.

7.18.1 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 7-77.

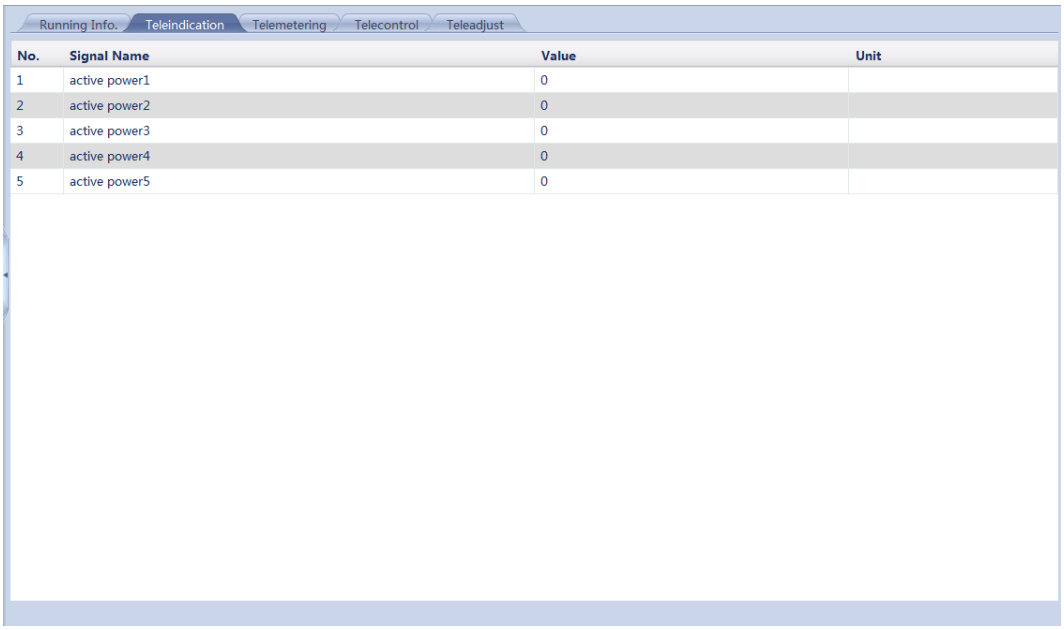
Figure 7-77 Querying running information



7.18.2 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 7-78.

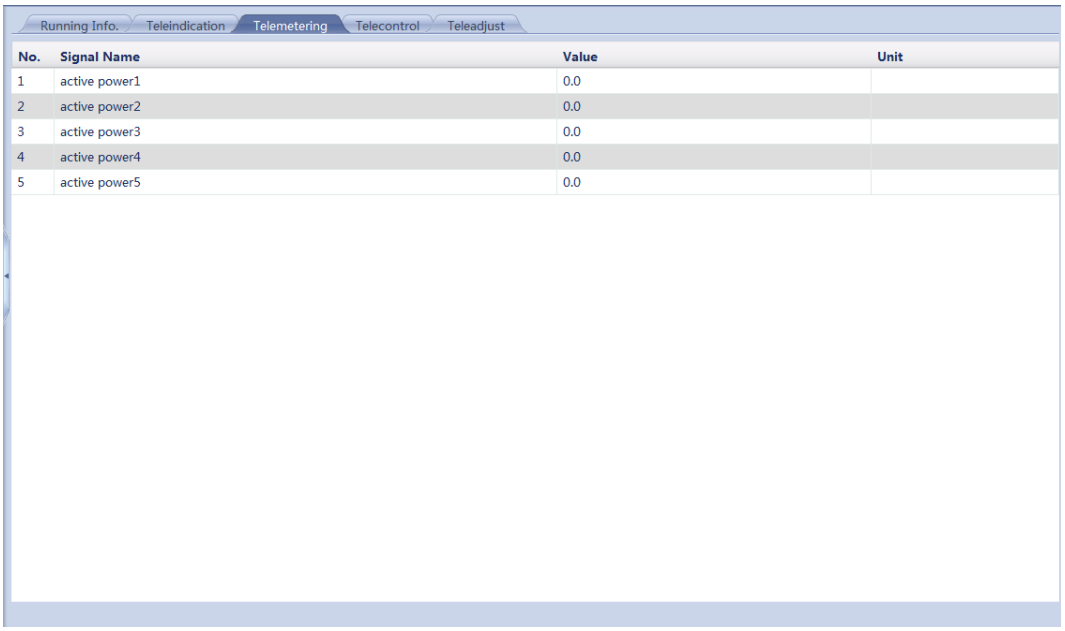
Figure 7-78 Querying teleindication information



7.18.3 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 7-79.

Figure 7-79 Querying telemetering information



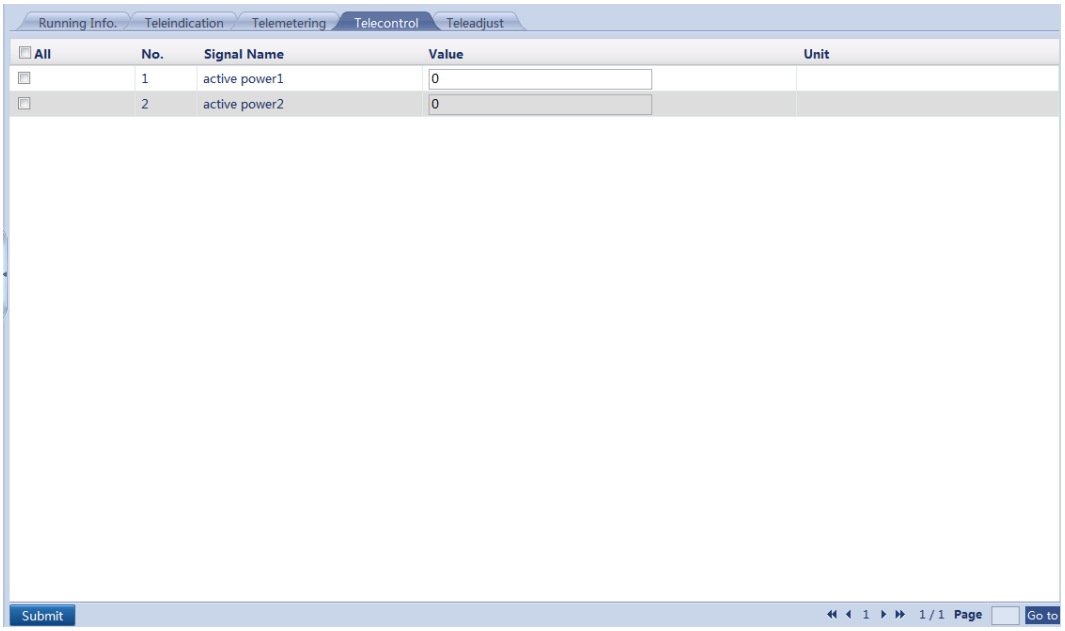
7.18.4 Setting the IEC103 Device Telecontrol Parameters

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 7-80. 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 7-80 Setting telecontrol parameters



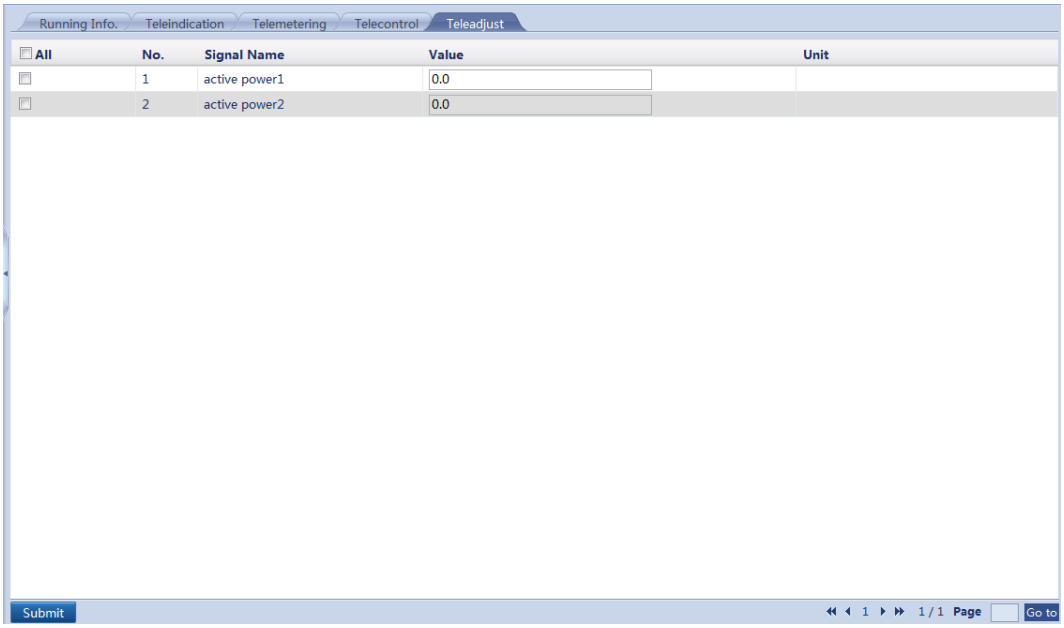
7.18.5 Setting the IEC103 Device Teleadjust Parameters

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 7-81. 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 7-81 Setting teleadjust parameters



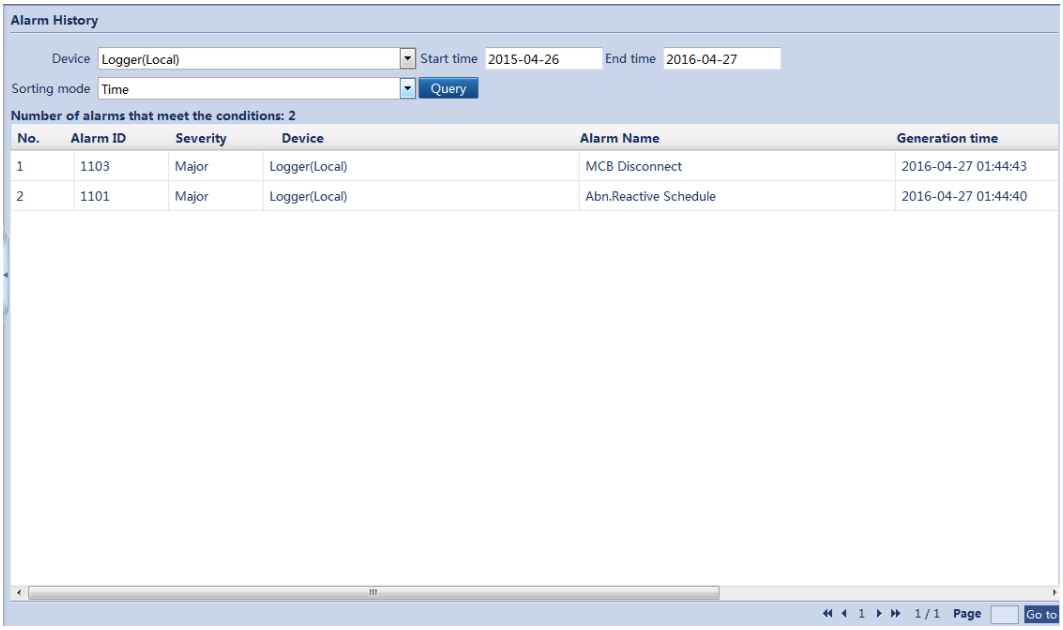
7.19 Querying Historical Alarms

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 7-82.

Figure 7-82 Historical alarms

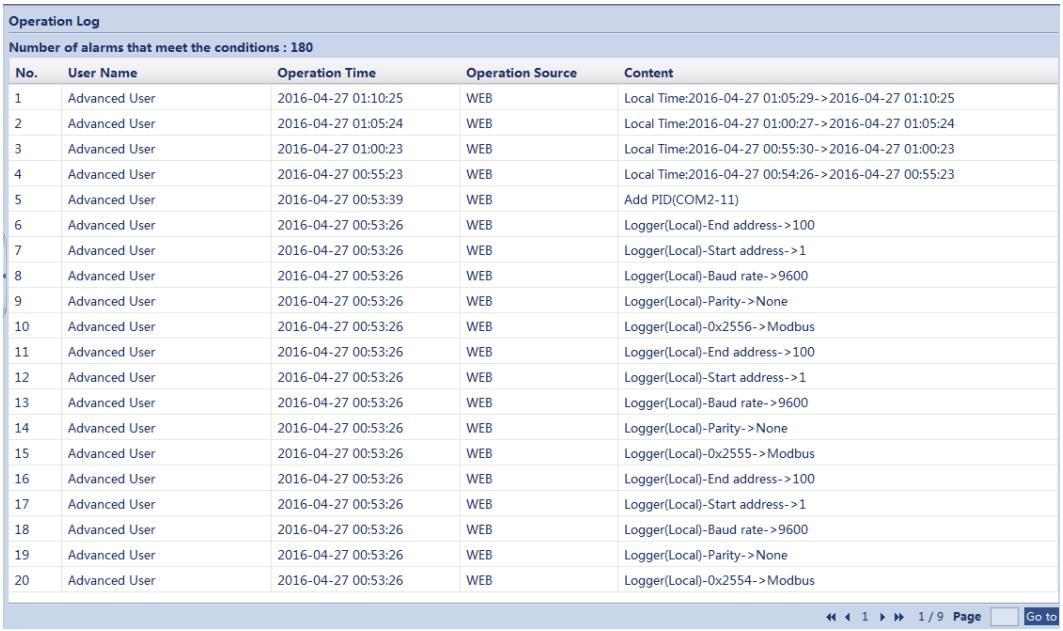


7.20 Querying Operation Logs

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 7-83. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-83 Operation log



Operation Log

Number of alarms that meet the conditions : 180

No.	User Name	Operation Time	Operation Source	Content
1	Advanced User	2016-04-27 01:10:25	WEB	Local Time:2016-04-27 01:05:29->2016-04-27 01:10:25
2	Advanced User	2016-04-27 01:05:24	WEB	Local Time:2016-04-27 01:00:27->2016-04-27 01:05:24
3	Advanced User	2016-04-27 01:00:23	WEB	Local Time:2016-04-27 00:55:30->2016-04-27 01:00:23
4	Advanced User	2016-04-27 00:55:23	WEB	Local Time:2016-04-27 00:54:26->2016-04-27 00:55:23
5	Advanced User	2016-04-27 00:53:39	WEB	Add PID(COM2-11)
6	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-End address->100
7	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-Start address->1
8	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-Baud rate->9600
9	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-Parity->None
10	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-0x2556->Modbus
11	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-End address->100
12	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-Start address->1
13	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-Baud rate->9600
14	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-Parity->None
15	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-0x2555->Modbus
16	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-End address->100
17	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-Start address->1
18	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-Baud rate->9600
19	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-Parity->None
20	Advanced User	2016-04-27 00:53:26	WEB	Logger(Local)-0x2554->Modbus

1 1 / 9 Page Go to

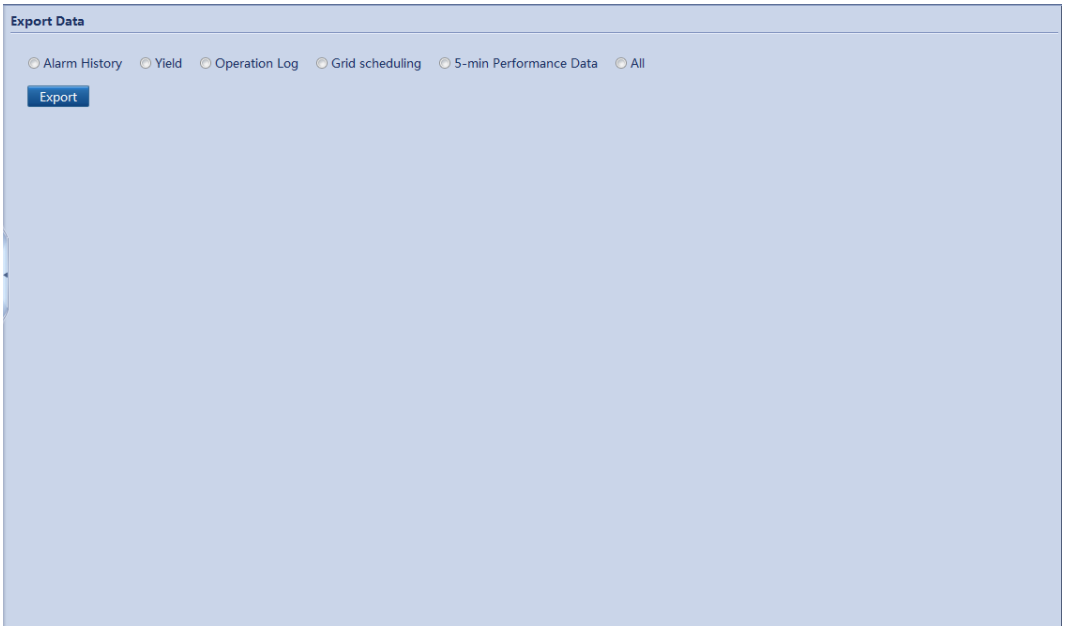
7.21 Exporting Data

You can export historical alarms, electric energy yields, operation logs, and power grid dispatch logs over the WebUI.

Exporting Data

In the **Data Export** window, you can export **Alarm History**, **Yield**, **Operation Log**, or **Grid Dispatch**, **5min Performance Data** or **All** in CSV format, as shown in Figure 7-84. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-84 Exporting data



NOTE

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

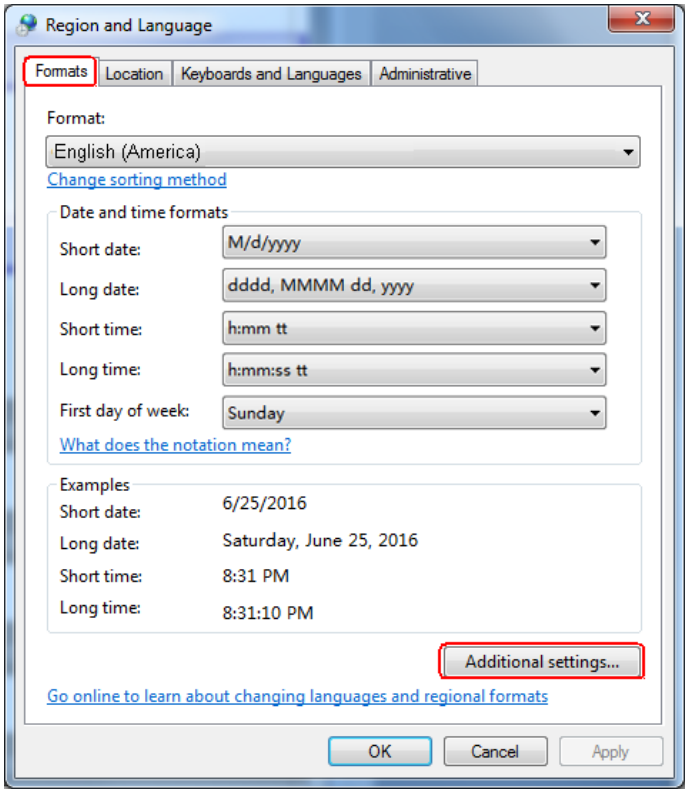
Opening the Exported File

The exported files are in CSV format and can be opened as an Excel. After opening the file as an Excel, the cells may not be neatly organized. Check whether **List separator** is set to **,**. If **List separator** is not **,**, change it to **,**.

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

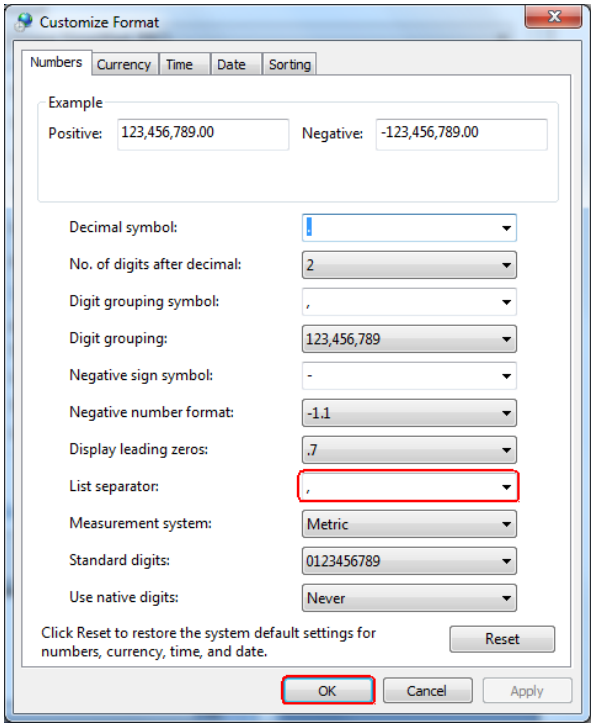
1. Open **Control Panel** and choose **Region and Language**.
2. Under **Formats**, click **Additional settings**, as shown in Figure 7-85.

Figure 7-85 Viewing and changing List separator (1)



3. View and change List separator, as shown in Figure 7-86.
   - If **List separator** is **,**, click **OK**.
   - If **List separator** is not **,**, change it to **,** and click **OK**.

Figure 7-86 Viewing and changing List separator (2)

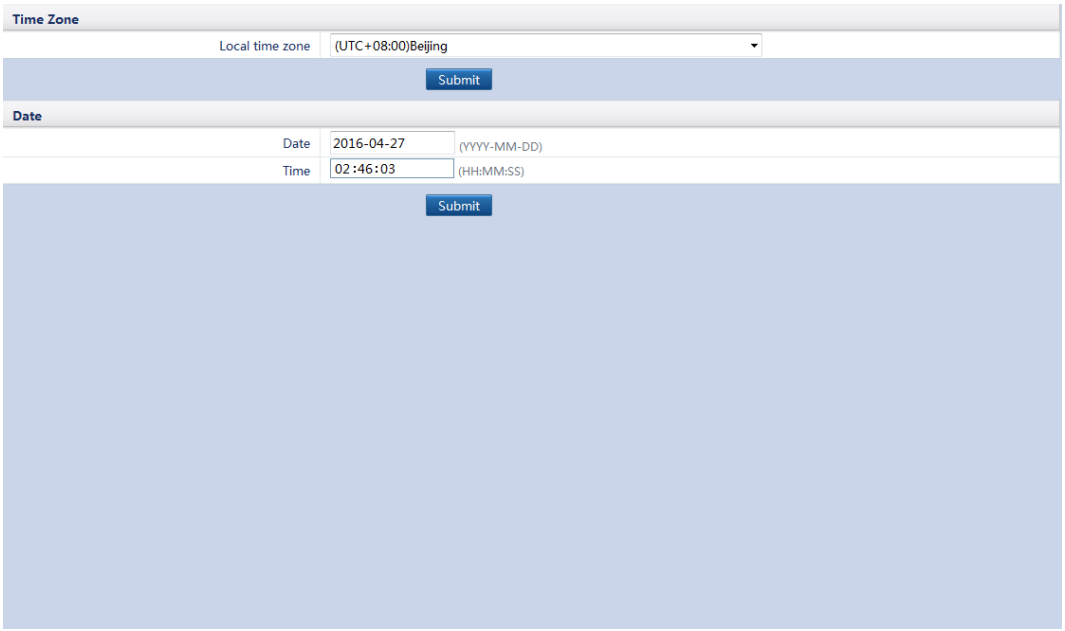


7.22 Set the Data and Time

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 7-87. Because of the permission restriction, log in as **Common User** or **Advanced User**.

Figure 7-87 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.

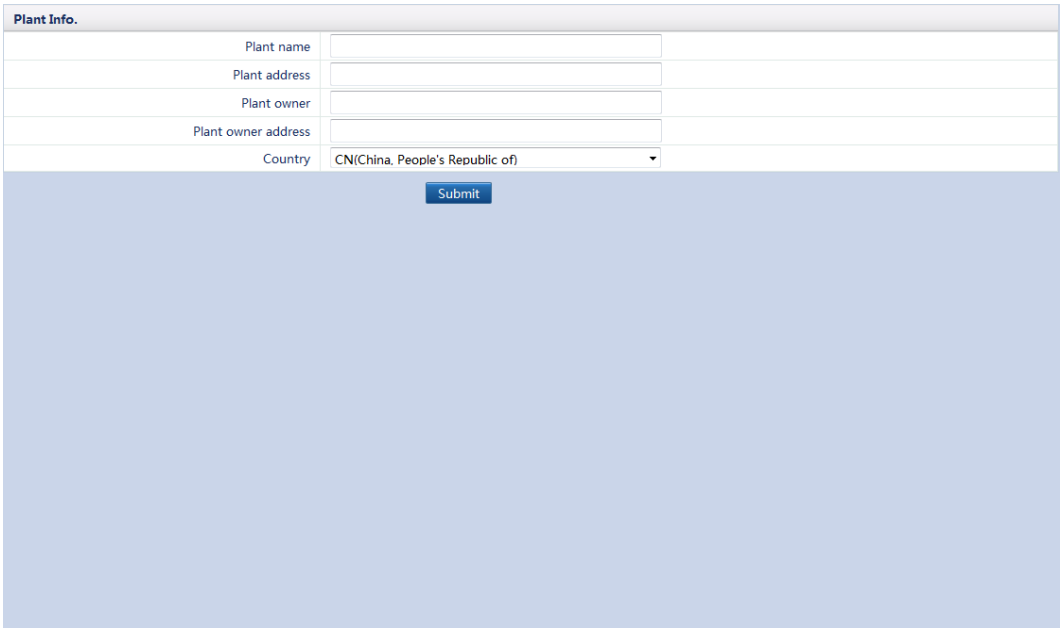
7.23 Setting Plant Information

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 7-88. Because of the permission restriction, log in as **Common User** or **Advanced User**.

Figure 7-88 Power plant information

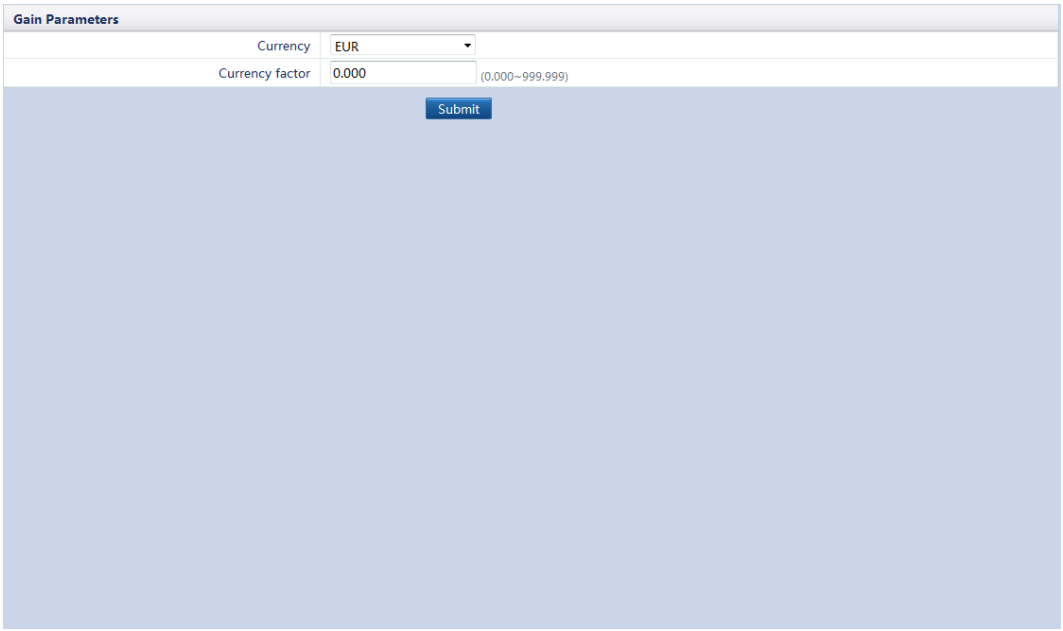


7.24 Setting Currency Parameters

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 7-89. Because of the permission restriction, log in as **Common User** or **Advanced User**.

Figure 7-89 Currency parameters



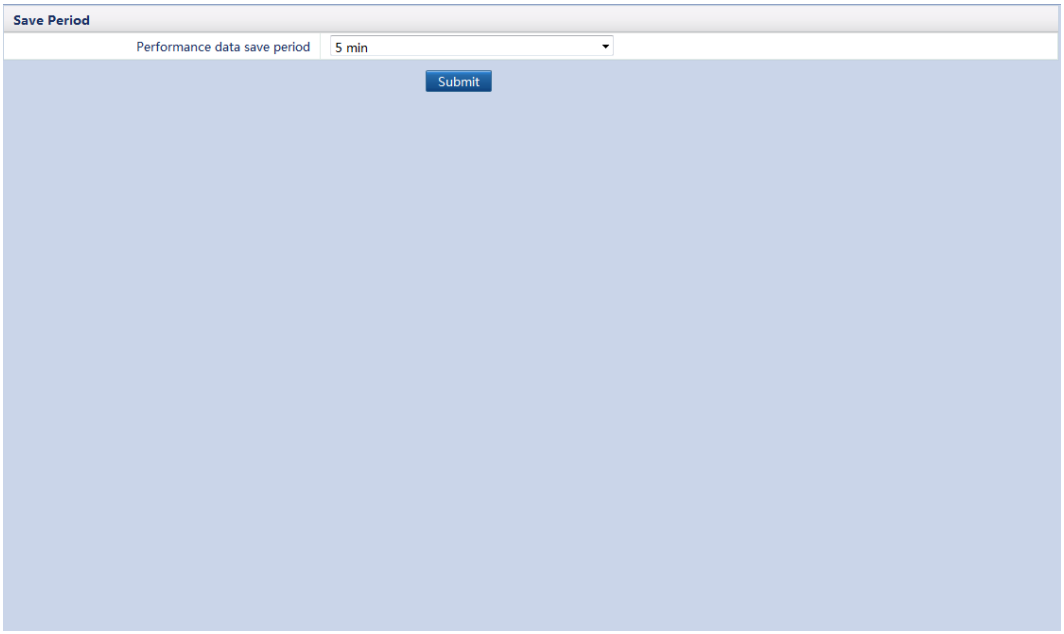
NOTE

- 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.

7.25 Setting the Save Period

On the **Settings** tab page, choose **User Param.** > **Save Period**, and set **Performance data save period**, as shown in Figure 7-90. Because of the permission restriction, log in as **Common User** or **Advanced User**.

Figure 7-90 Save period



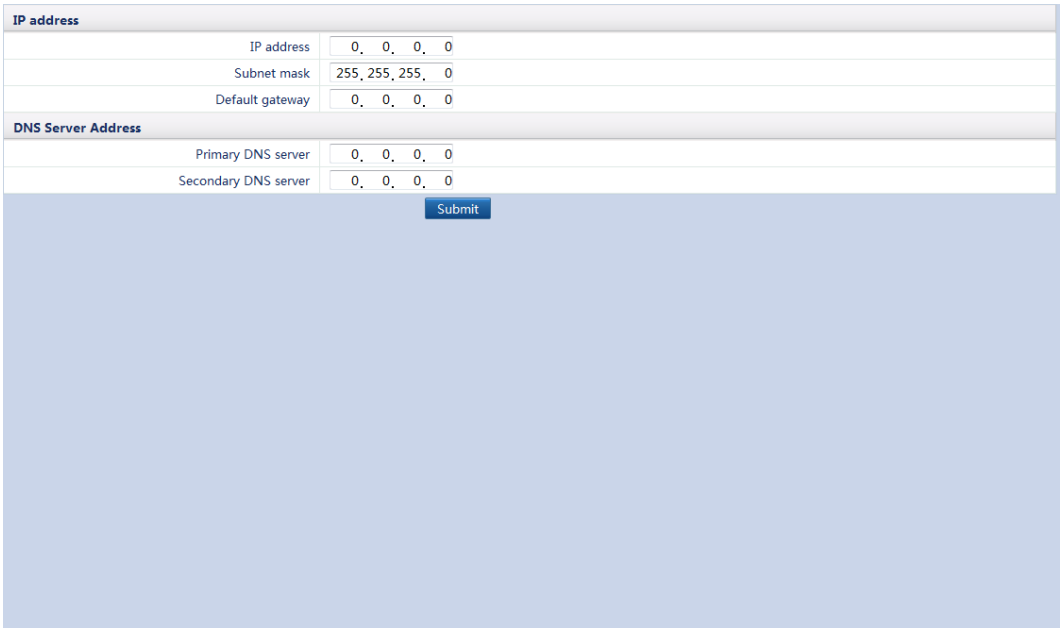
7.26 Setting Ethernet Parameters

You can use the WebUI to set the Ethernet parameters, including the IP address, subnet mask, gateway, and DNS server address.

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. Param.** > **Ethernet** and set **IP address**, **Subnet mask**, **Default gateway**, and **DNS server address**, as shown in Figure 7-91. Because of the permission restriction, log in as **Advanced User**.

Figure 7-91 Ethernet port



NOTICE

If the SmartLogger connects to the Internet through a router, note the following when setting Ethernet parameters:

- 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.

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

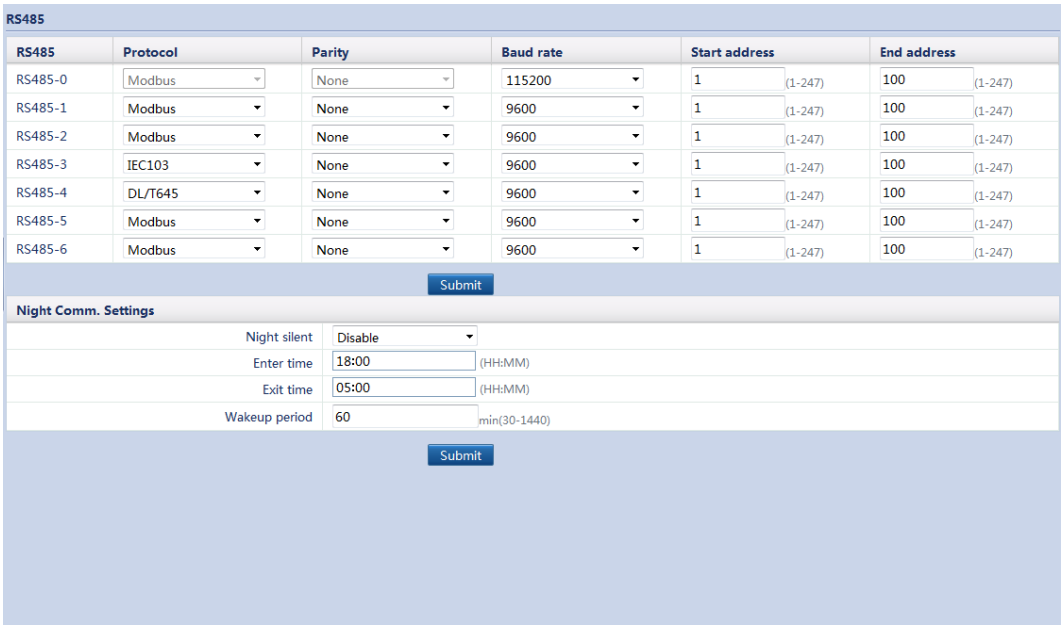
7.27 Setting RS485 Parameters

You can use the WebUI to set RS485 parameters, including the baud rate, start address, and end address.

Set RS485 parameters to ensure the normal communications between the Smart Logger and devices such as the inverter, environmental monitoring instrument (EMI), and power meter.

On the **Settings** tab page, choose **Comm. Param.** > **RS485** and set **Protocol type**, **Parity**, and **Baud rate**, as shown in Figure 7-92. Because of the permission restriction, log in as **Advanced User**.

Figure 7-92 RS485 parameters



NOTE

- **RS485-0** corresponds to communications ports **AC1** and **AC2** of the PLC in the SmartLogger. **RS485-1**, **RS485-2**, **RS485-3**, **RS485-4**, **RS485-5**, and **RS485-6** respectively correspond to the communications ports **COM1**, **COM2**, **COM3**, **COM4**, **COM5**, and **COM6**.
- **Protocol type** and **Parity** must be set to the same values for all devices connected to the same RS485 port.
- **Baud rate** can be set to **4800bps**, **9600bps**, **19200bps**, and **115200bps**.
- The default baud rate of **RS485–0** is 115,200 bps. The default baud rates of **RS485–1** to **RS485–6** is 9600 bps. The baud rates of RS485 ports of the SmartLogger must be the same.
- 1 ≤ start address ≤ end address ≤ 247. The address range of the six ports can overlap.

  Set the address range as required. A larger address range requires a longer searching time.
- On the **Night communication Settings** page, you can configure night silent parameters such as **Enter time**, **Exit time**, and **Wakeup period**.

7.28 Setting Parameters for the EMI

The SmartLogger can be connected to an EMI that supports the standard Modbus-RTU 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 over the WebUI of the SmartLogger based on the document delivered by the vendor.

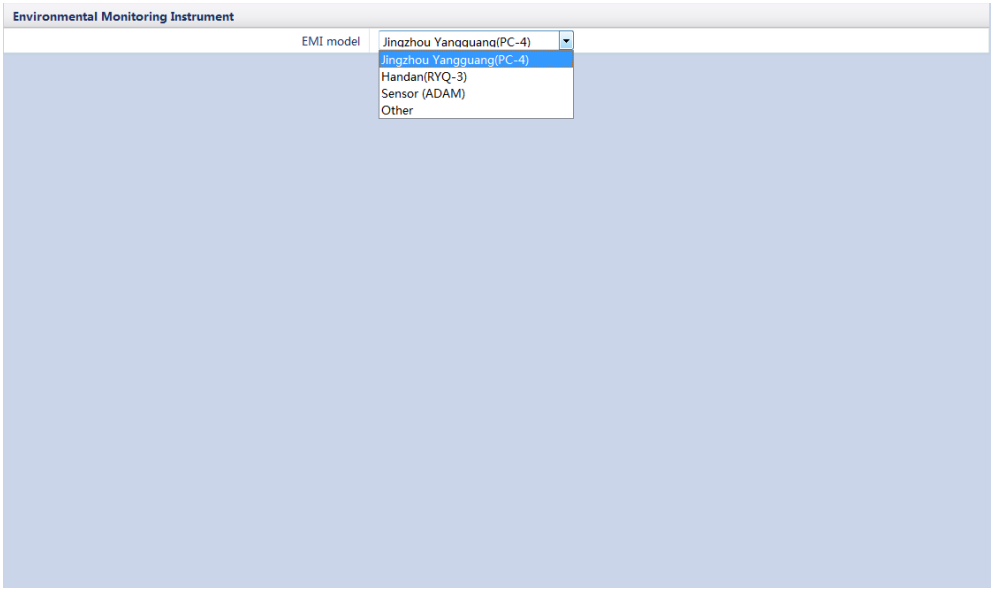
NOTE

After setting the EMI parameters, you can manually add devices. For details, see 7.44.1 Connecting Devices.

On the **Settings** tab page, choose **EMI** under **Comm. Parameters** to set the EMI parameters. Because of the permission restriction, log in as **Advanced User**.

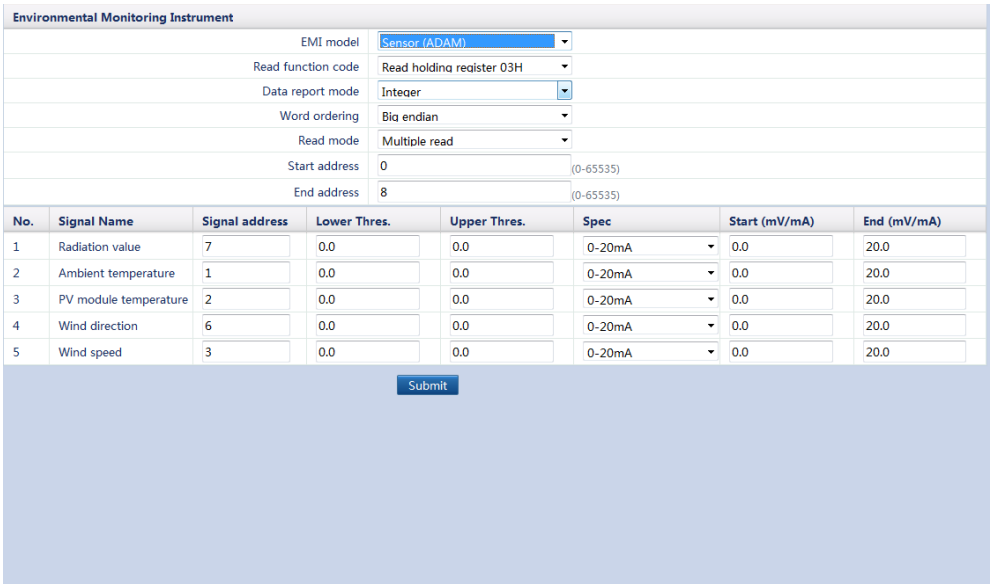
- If you use the **Jinzhou Yangguang (PC-4)** or **Handan (RYQ-3)** EMI, select the corresponding option from the EMI model drop-down list box, as shown in Figure 7-93.

Figure 7-93 EMI (1)



- If you use the **Sensor (ADAM)** EMI, select **Sensor (ADAM)** from the drop-down list box, as shown in Figure 7-94.

Figure 7-94 EMI (2)



NOTE

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

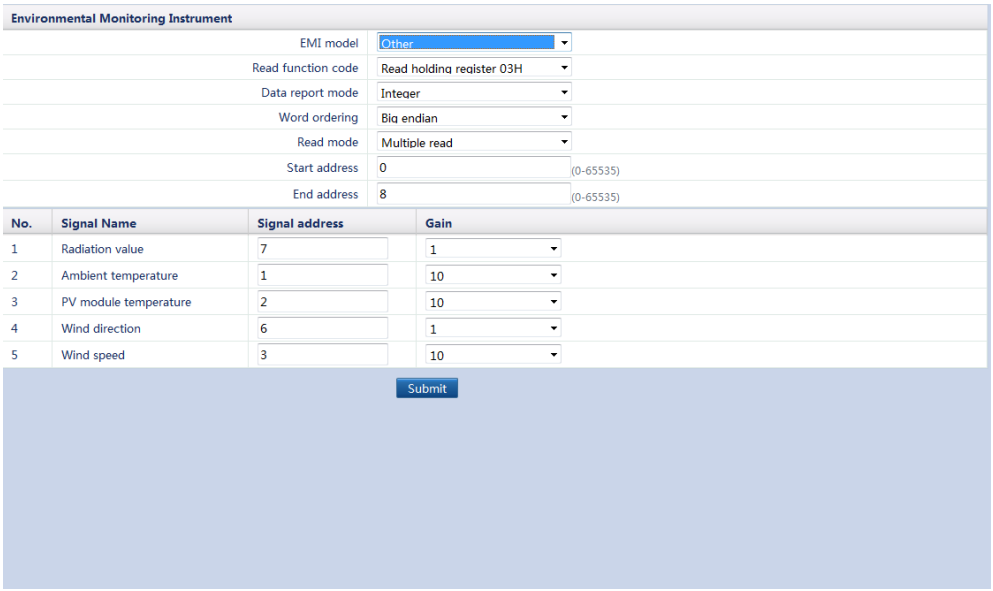
- Based on the mode supported by the EMI, set **Read function code** to **Read holding register 03H** or **Read input register 04H**.
- Set **Data reporting mode** and **word ordering** based on site requirements.
- Based on the mode supported by the EMI, set **Read code** to **Single read** or **Multiple 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**, **Lower Thres.**, and **Upper Thres.** of parameters like **Radiation value** and **Ambient temperature** should be set to values provided by the manufacturer.

  If the EMI can collect a signal, set **Signal address** to **0xFFFF** for the signal. If the EMI cannot collect a signal, set **Signal address** to **65535** for the signal.

- If you use another EMI, select **Other** from the drop-down list box and set the parameters of the EMI, as shown in Figure 7-95.

Figure 7-95 EMI (3)



NOTE

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 **Radiation value** and **Ambient temperature** should be set to values provided by the manufacturer.

  If the EMI cannot collect a signal, set **Signal address** to **65535** for the signal.

7.29 Setting Modbus Power Meter Parameters

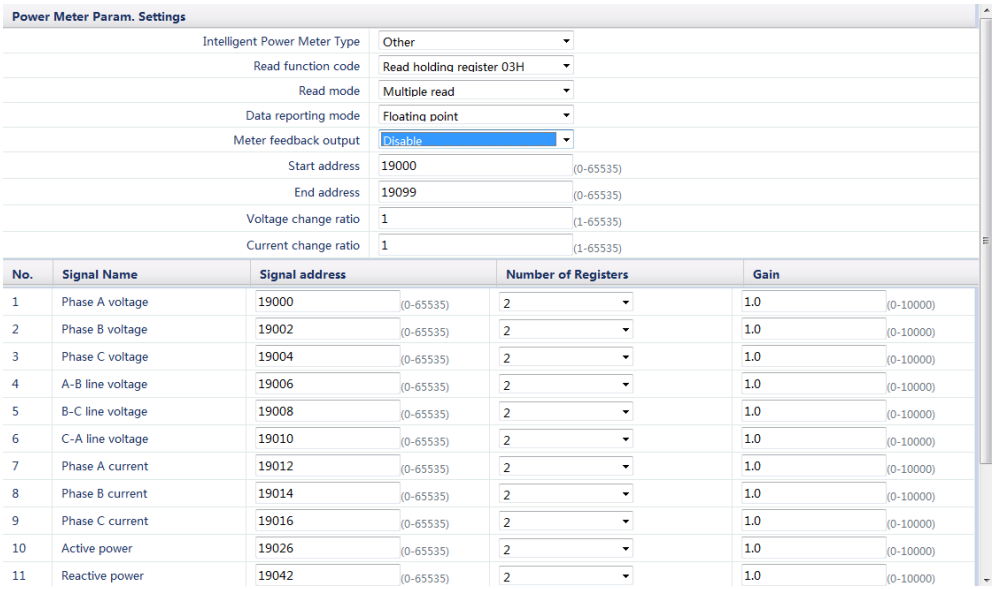
On the **Settings** tab page, choose **Modbus Meter** under **Comm. Param.** to set the power meter parameters. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Power Meter Without Feedback of Grid-tied Data

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

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

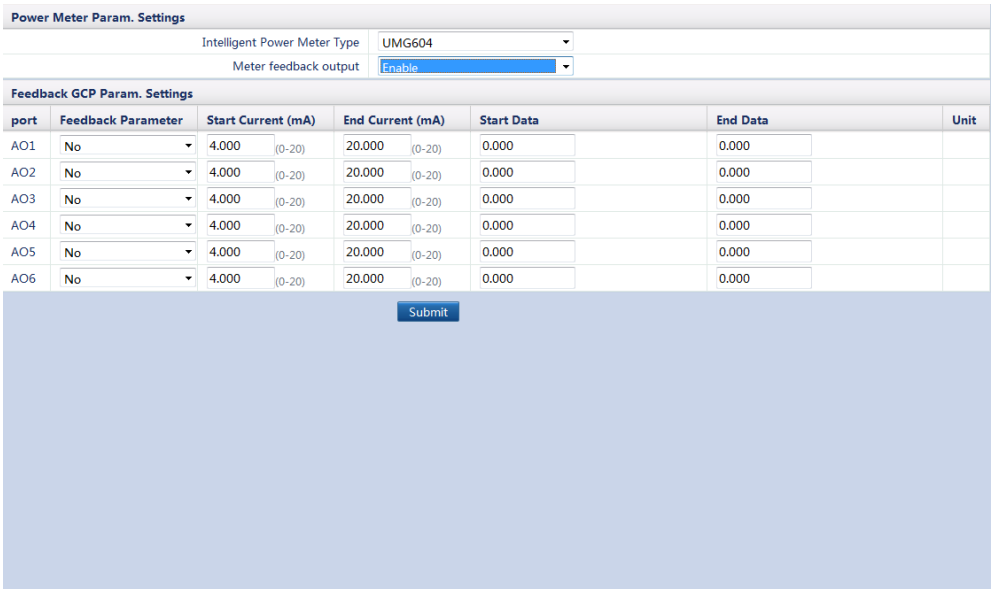
Figure 7-96 Power meter



Power Meter With Feedback of Grid-tied Data

If a power meter is connected to a power plant and needs to report the grid-tied data through the AO port on the SmartLogger, set **Meter feedback output** on the **Modbus Meter** tab page to **Enable**, and set the port parameters as required, as shown in Figure 7-97.

Figure 7-97 Feedback parameter configuration of the grid-tied point



NOTE

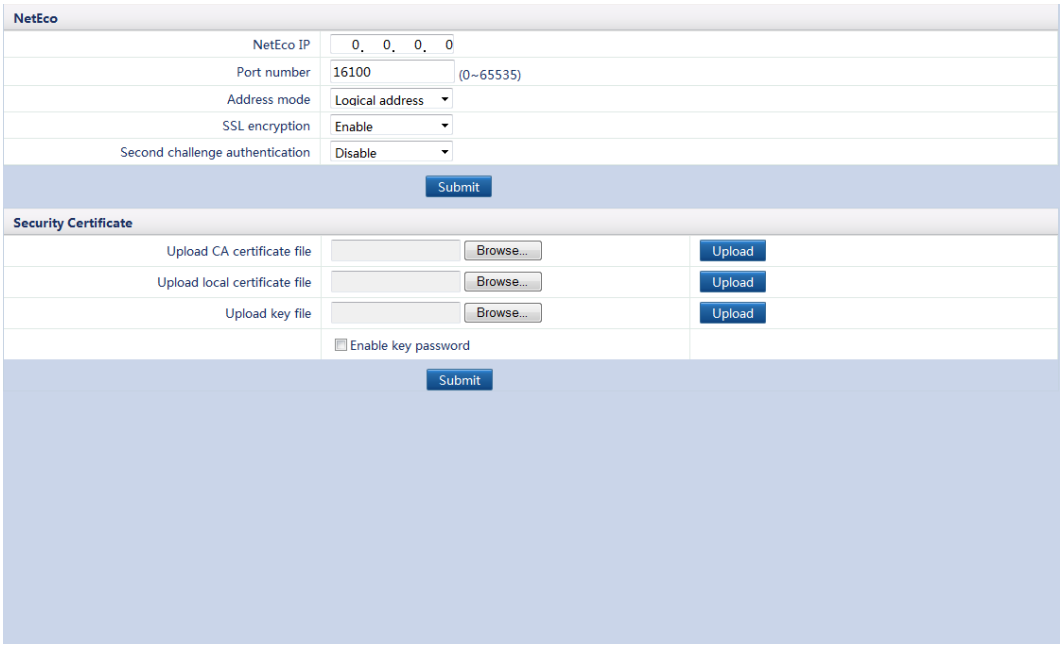
- A maximum of six AO ports can concurrently provide feedback of the grid-tied point data.
- In the **Feedback Parameter** drop-down list box, select the parameter to be reported. One parameter can be selected only for one AO port.
- **Start Current** and **End Current** indicate the valid value range 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, false input and output may be generated.

7.30 Setting NetEco Parameters

Set NetEco parameters correctly 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 7-98. Because of the permission restriction, log in as **Advanced User**.

Figure 7-98 NetEco



NOTE

- Set **NetEco IP** correctly.
- In most cases, set **Address mode** to **Physical address**. If the devices connected to the six RS485 ports of the SmartLogger have duplicate addresses, you must set **Address mode** to **Logical address**.
- If **SSL encryption** is set to **Disable**, data will be transmitted without being encrypted, which may result in user data theft. Therefore, exercise caution when deciding to set **SSL encrytion** to **Disable**.
- If **Second challenge authentication** is set to **Disable**, the second challenge authentication result will not be verified, which may result in user data theft. Therefore, exercise caution when deciding to set **Second challenge authentication** to **Disable**.

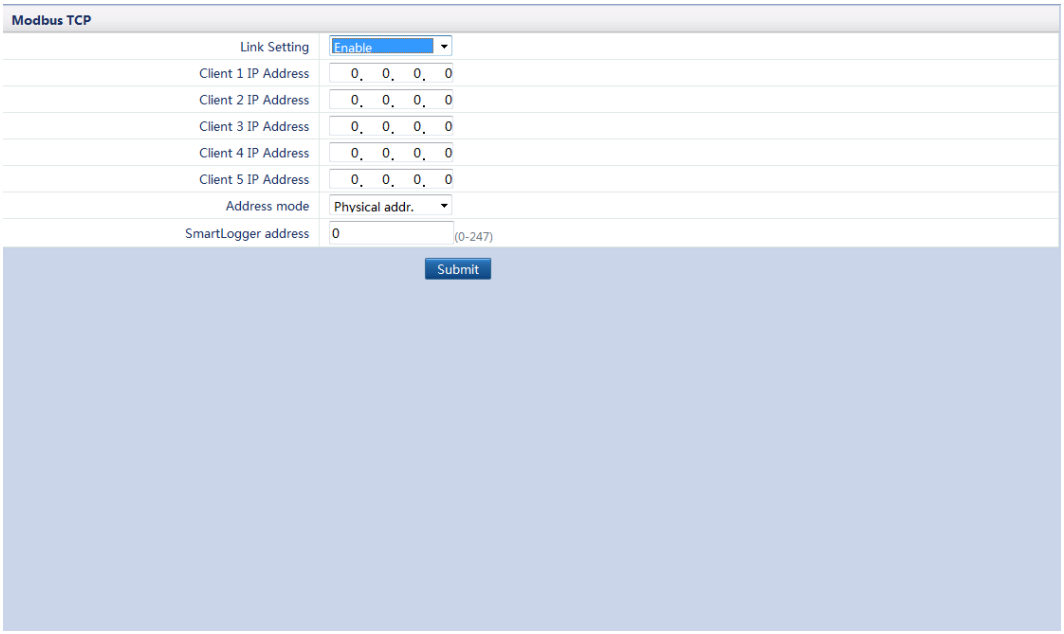
7.31 Setting Modbus-TCP Parameters

You can set Modbus TCP parameters over 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. Param.** > **Modbus TCP**, set **Modbus TCP**, and upload a **Security Certificate**, as shown in Figure 7-99. Because of the permission restriction, log in as **Advanced User**.

Figure 7-99 Modbus TCP



NOTE

- 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 being encrypted, which may result in user data theft. Therefore, exercise caution when deciding to enable this function.
- In most cases, set **Address mode** to **Physical address**. If the devices connected to the six RS485 ports of the SmartLogger have duplicate addresses, you must set **Address mode** to **Logical address**.
- Set the client and SmartLogger IP addresses correctly.

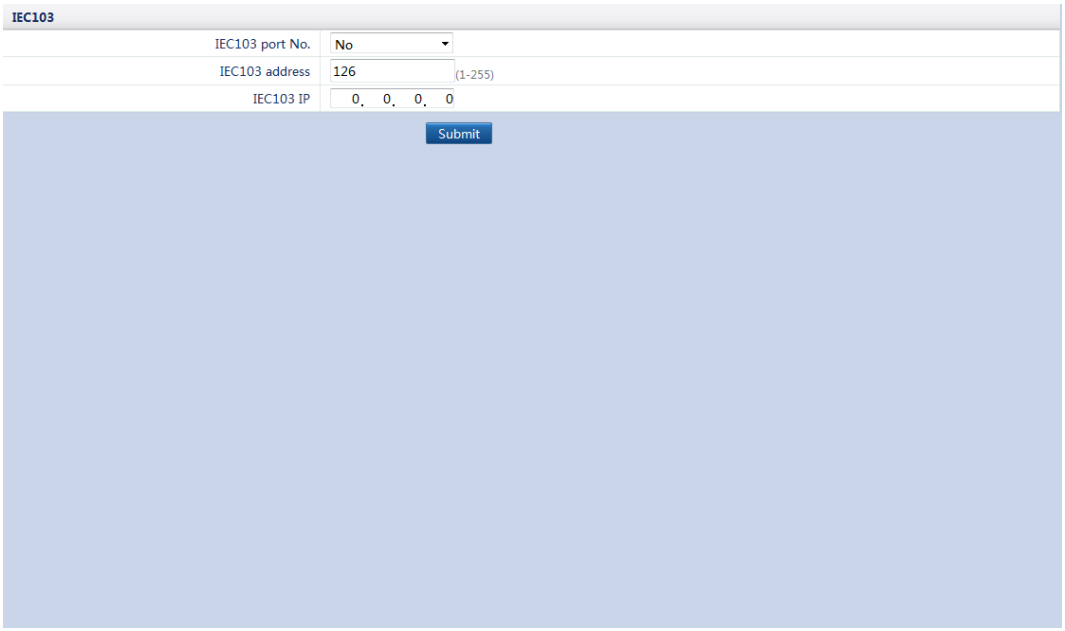
7.32 Setting IEC103 Parameters

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 7-100. Because of the permission restriction, log in as **Advanced User**.

Figure 7-100 IEC103



NOTE

- 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.

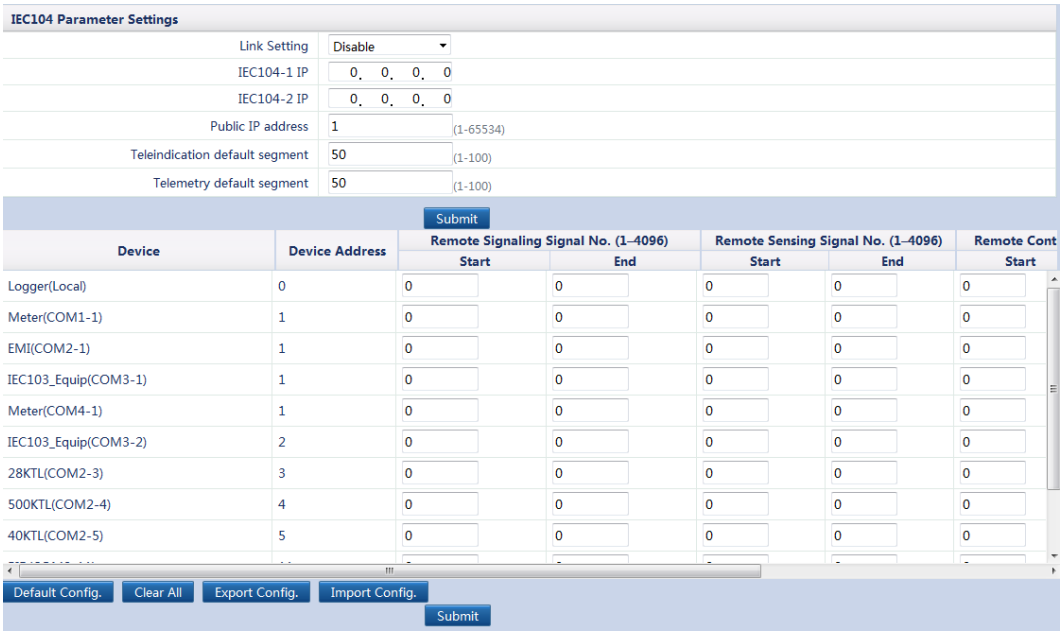
7.33 Setting IEC104 Parameters

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**, **IEC104 IP**, and **Public IP address**, as shown in Figure 7-101. Because of the permission restriction, log in as **Advanced User**.

Figure 7-101 IEC104



NOTE

- 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 **IEC104 IP**, **Public IP address**, and **Default segment**.
- If you click **Default Config.**, the **Start** and **End** values of **Remote Signaling Signal No.**, **Remote Sensing Signal No.**, **Remote Control Signal No.**, and **Remote Regulating Signal No.** will be set to their default values.
- If you click **Clear All**, the **Start** and **End** values of **Remote Signaling Signal No.**, **Remote Sensing Signal No.**, **Remote Control Signal No.**, and **Remote Regulating Signal No.** will be set to **0**.
- If you click **Export Config.**, the configuration data will be exported as a .CSV file.

  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 over the IEC104 protocol.

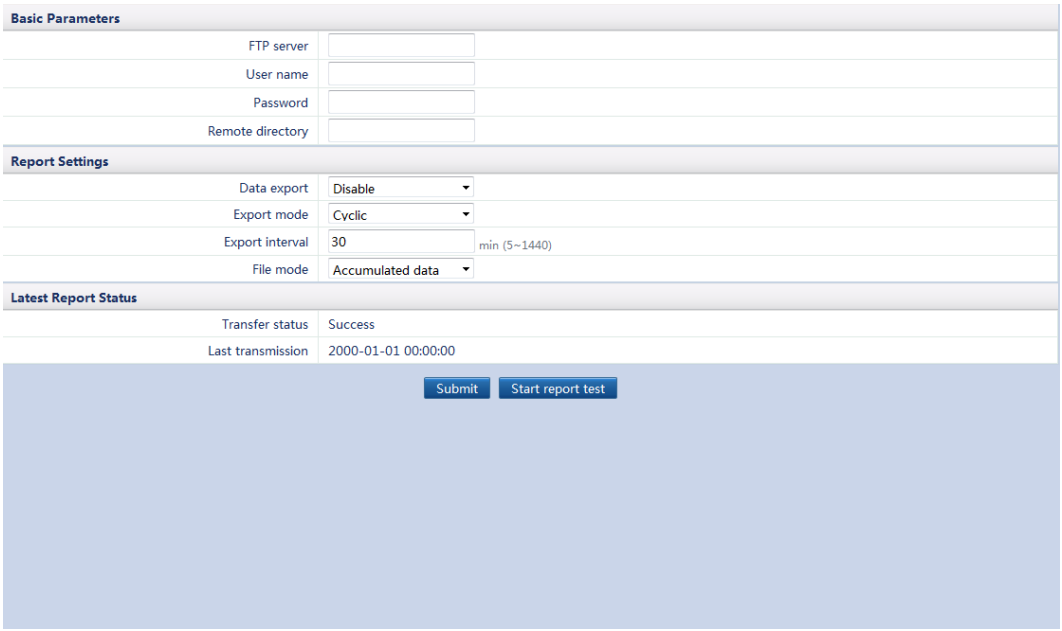
7.34 Setting FTP Parameters

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

The FTP function is used to access a third-party element management system (EMS). The SmartLogger can report the configuration information and running data of the managed plant system through the FTP. A third-party EMS 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 7-102. Because of the permission restriction, log in as **Advanced User**.

Figure 7-102 FTP



NOTE

- **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 EMS.
- 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.

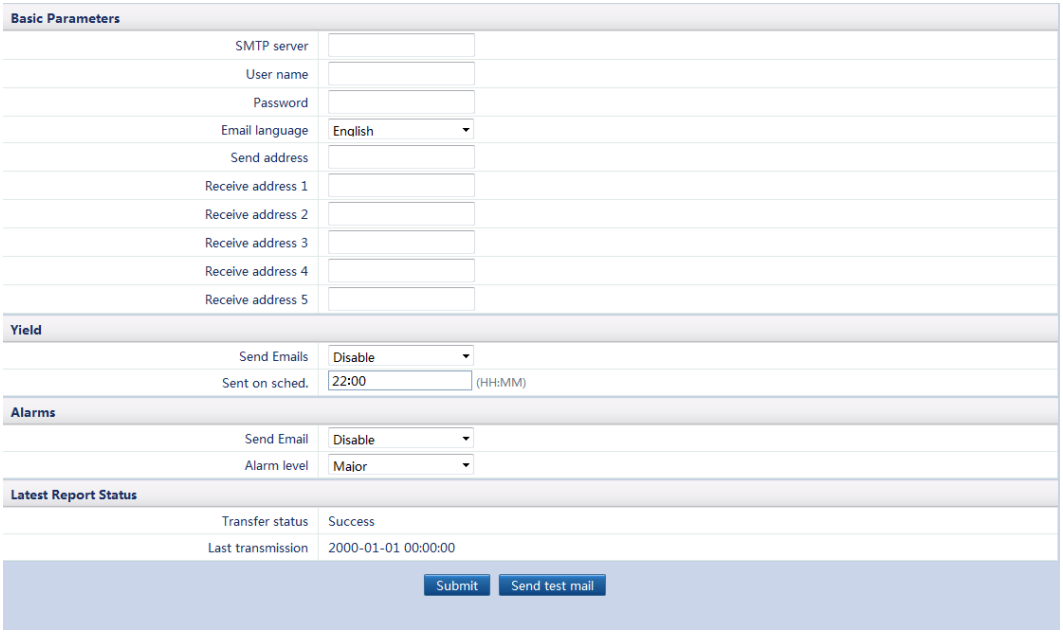
The SmartLogger can send emails to inform users of the current electric energy yield information of the power station system, alarm information, and equipment status, helping users to know the running conditions of the power station system in time.

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 7-103. Because of the permission restriction, log in as **Advanced User**.

Figure 7-103 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.

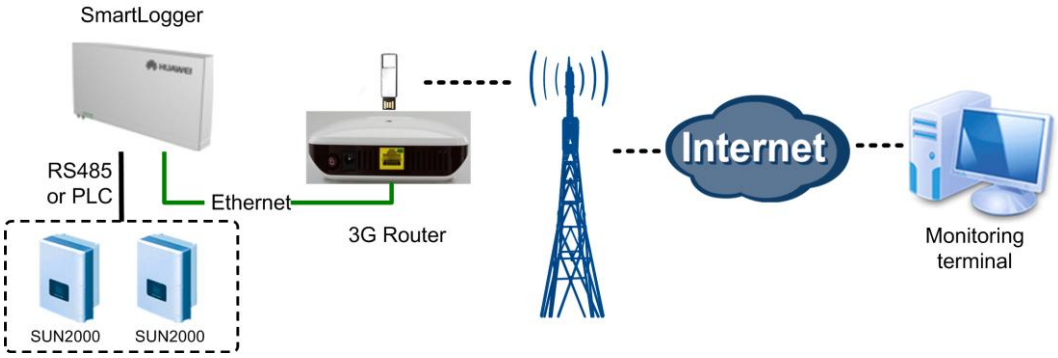
7.36 Port Settings

You can reset a 3G router by configuring a DO port or USB port.

When the photovoltaic (PV) plant and the element management system (EMS) are not in the same area, the SmartLogger needs to be connected to the EMS to implement remote monitoring on the PV plant. After you connect the SmartLogger to a router and set the Ethernet parameters, the SmartLogger can be connected to the remote EMS, 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 7-104.

Figure 7-104 3G router networking



3G routers is a civil communications device and has limited reliability. You can connect the DC power cable of the 3G router to the SmartLogger, so that the SmartLogger can reset the 3G router when the router is disconnected. This increases the connection reliability.

7.36.1 Setting DO Parameters

You can set DO parameters for resetting an external 3G router over the WebUI.

Context

The SmartLogger provides three DO ports. Connect one DC power cable of the 3G router to one of the DO ports, 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).

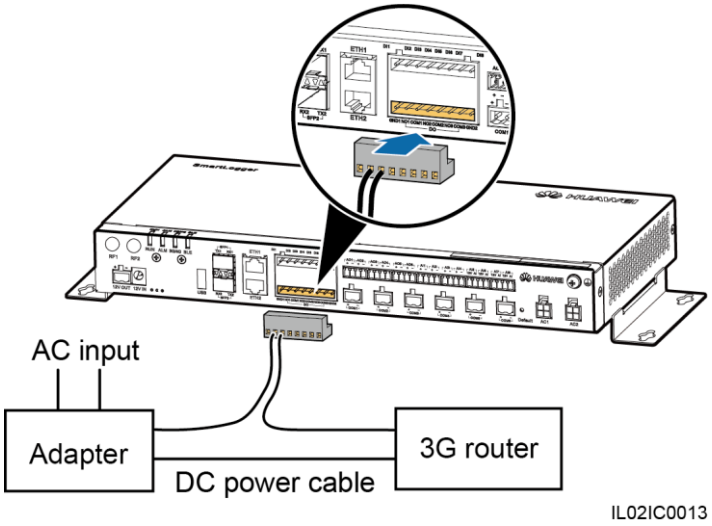
- When the power supply current is smaller than 1 A, use one DO port.
- When the power supply current is larger than 1 A but smaller than 1.6 A, use two DO ports.
- When the power supply current is larger than 1.6 A but smaller than 2.4 A, use three DO ports.
- When the power supply current is larger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

Connecting a 3G Router over a DO Port

When connecting a 3G router, cut off one DC power cable of the router, and connect the cable to a DO port of the SmartLogger.

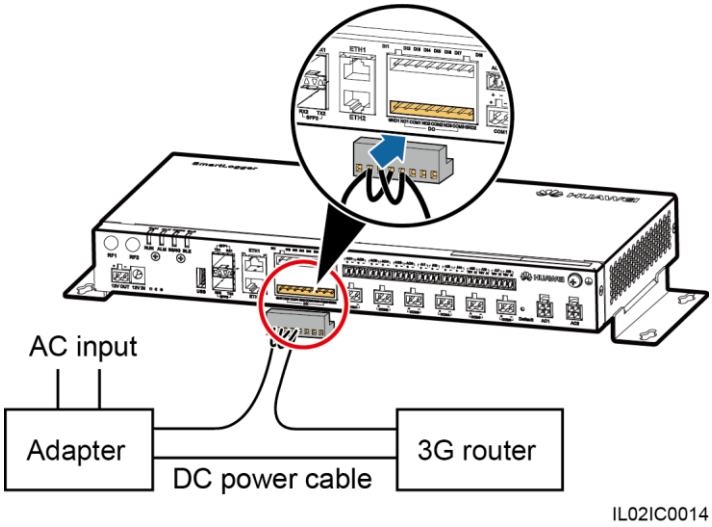
- Figure 7-105 shows the connection when one DO port is used.

Figure 7-105 Connecting one DO port



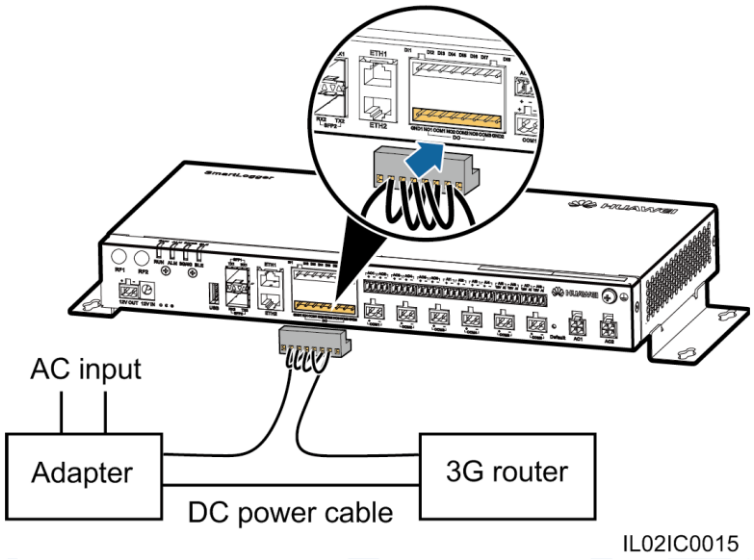
- Figure 7-106 shows the connection when two DO ports are used.

Figure 7-106 Connecting two DO ports



- Figure 7-107 shows the connection when three DO ports are used.

Figure 7-107 Connecting three DO ports

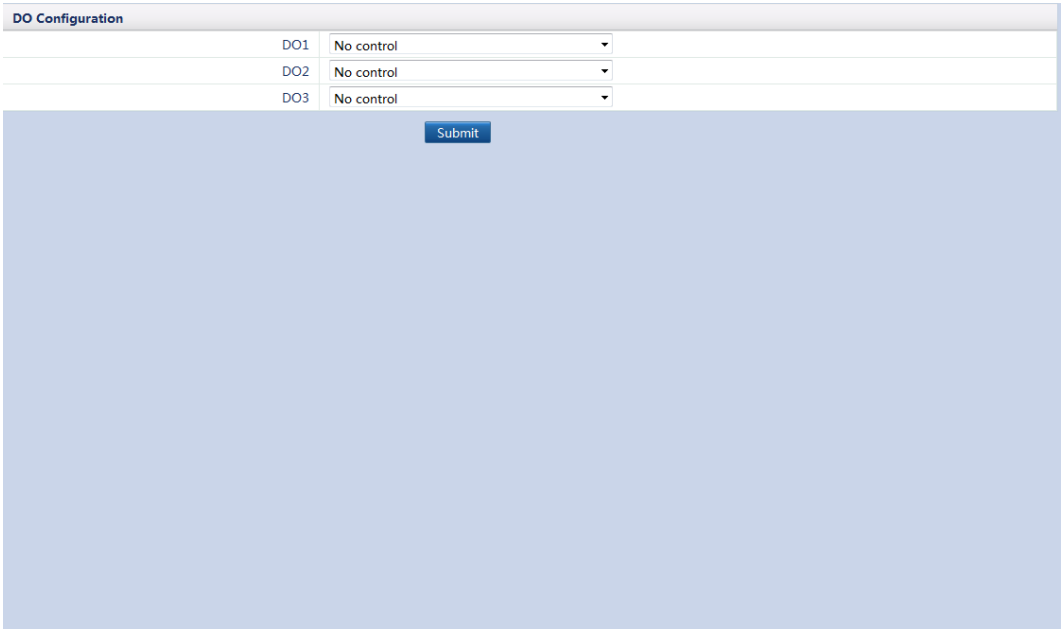


DO Configuration

After connecting the 3G router to the SmartLogger properly, you can set DO parameters over the WebUI to make the external 3G router automatically reset if the SmartLogger fails to connect to the NetEco, email server, or 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 7-108. Because of the permission restriction, log in as **Advanced User**.

Figure 7-108 DO Configuration



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

Context

The SmartLogger has a USB port, which provides 5 V/1 A power supply. If the DC power cable of the 3G router has a standard USB connector with a maximum current of less than 1 A, it can directly connect to the USB port on the SmartLogger, power the 3G router over the SmartLogger, and disconnect the USB port power supply when the communication fails.

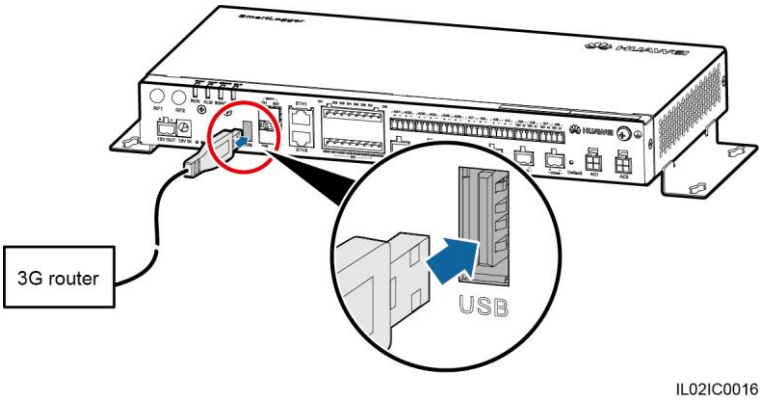
NOTICE

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 7-109.

Figure 7-109 Connecting the 3G router and the SmartLogger

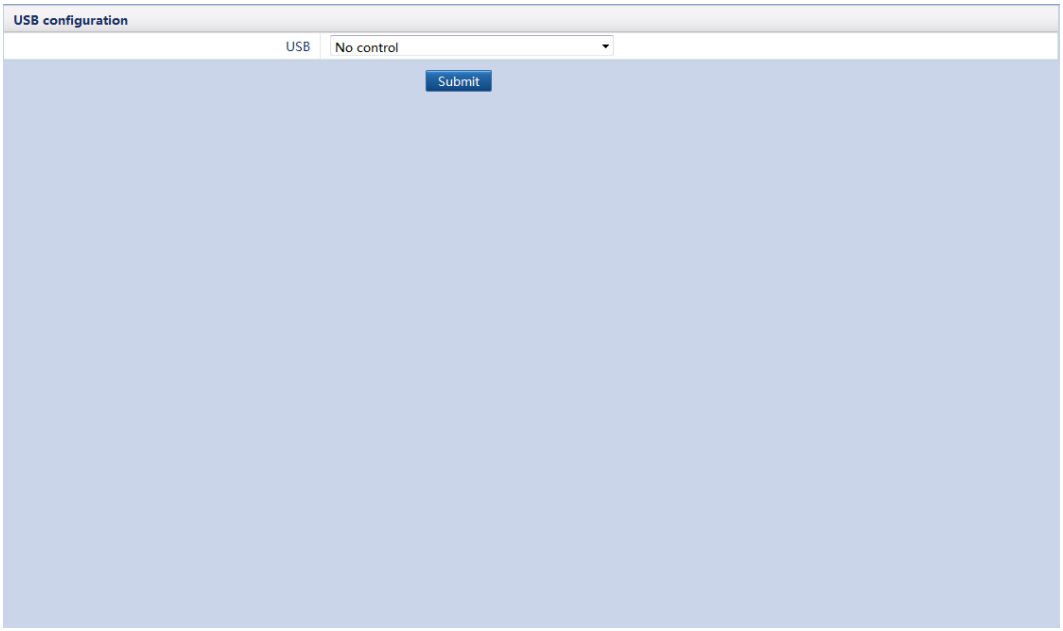


USB Configuration

After connecting the 3G router to the SmartLogger properly, you can set USB parameters over the WebUI to make the external 3G router automatically reset if the SmartLogger fails to connect to the NetEco, email server, or 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 7-110. Because of the permission restriction, log in as **Advanced User**.

Figure 7-110 USB configuration



7.37 Remotely Shutting Down Inverters in Dry Contact Mode

The SmartLogger can connect to inverters over dry contacts and shut down the inverters over OVGR signals.

The SmartLogger provides eight DI ports, that is, DI1 (GND1) to DI4 (GND1) and DI5 (GND2) to DI8 (GND2). OVGR can be connected to any DI port, as shown in Figure 7-111.

Figure 7-111 Networking

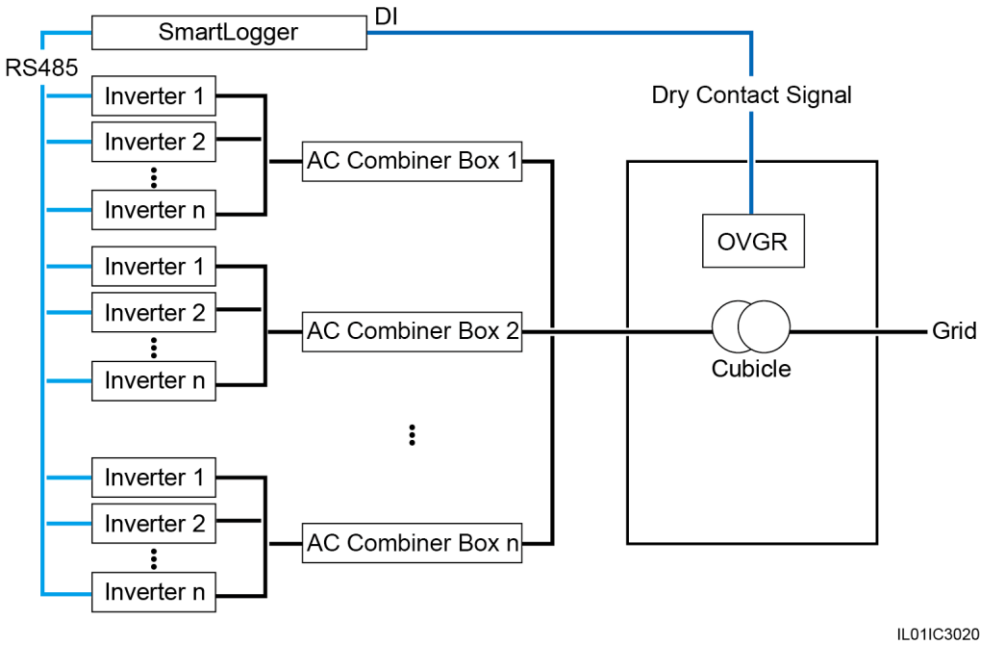


Figure 7-112 shows the DI ports of the SmartLogger.

Figure 7-112 DI ports of the SmartLogger

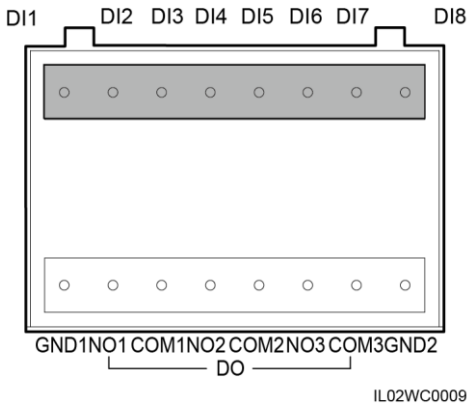


Table 7-3 describes the DI ports.

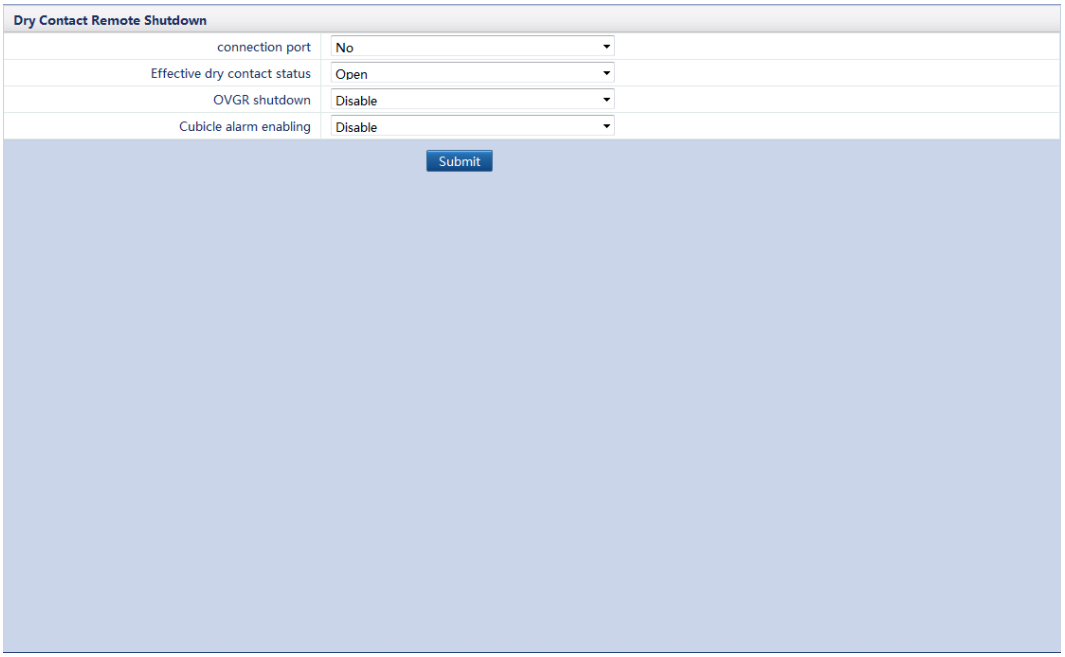
Table 7-3 DI port description

Port	Function
GND1	Dry contact input common terminal 1, used for active power derating for DI1–DI4
DI1	DI_1
DI2	DI_2

Port	Function
DI3	DI_3
DI4	DI_4
DI5	DI_5
DI6	DI_6
DI7	DI_7
DI8	DI_8
GND2	Dry contact input common terminal 2, used for reactive power compensation for DI5–DI8

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 7-113. Because of the permission restriction, log in as **Special User**.

Figure 7-113 Remotely shutting down inverters in dry contact mode



NOTE

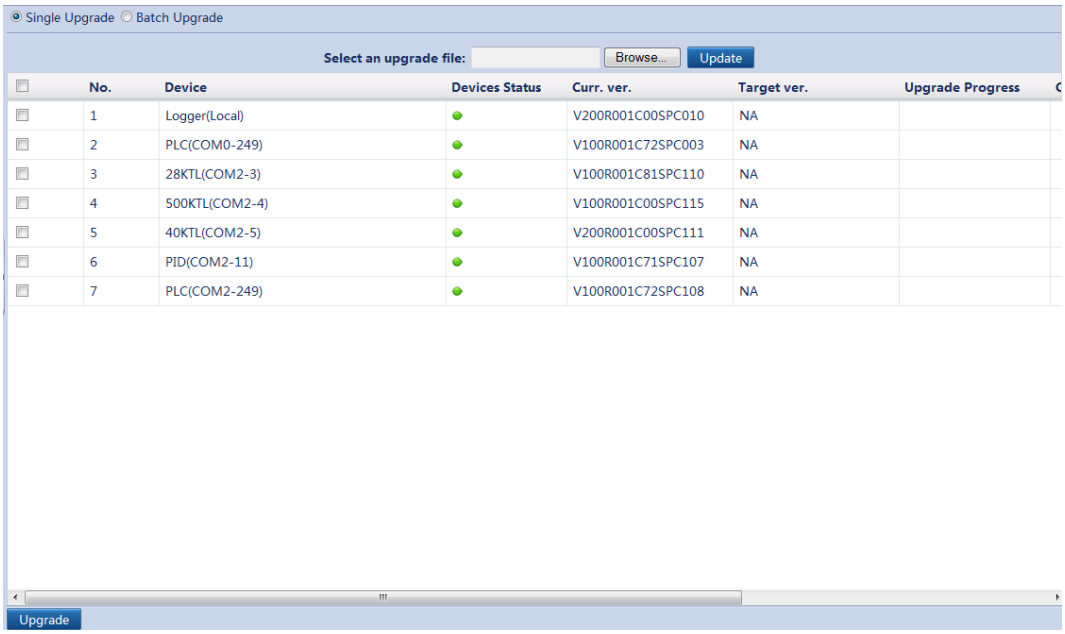
- OVGR sends dry contact signals and can be connected to any DI of the SmartLogger. Set related parameters based on the actual connection. Otherwise, the functions cannot be implemented.
- Set **Connection port** based on the actual connection between the OVGR and the SmartLogger.
- **Effective dry contact status** can be set to **connection port** or **Open**. If **OVGR shutdown** 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 closed.
- **OVGR shutdown** can be set to **Enable** or **Disable**. Set **OVGR shutdown** as required.
- **Cubicle alarm enabling** can be set to **Enable** or **Disable**. If **Cubicle alarm enabling** is set to **Enable**, the **Abnormal Cubicle** alarm is generated when the dry contact signal is effective and the Cubicle is abnormal.

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 7-114. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-114 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

NOTE

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

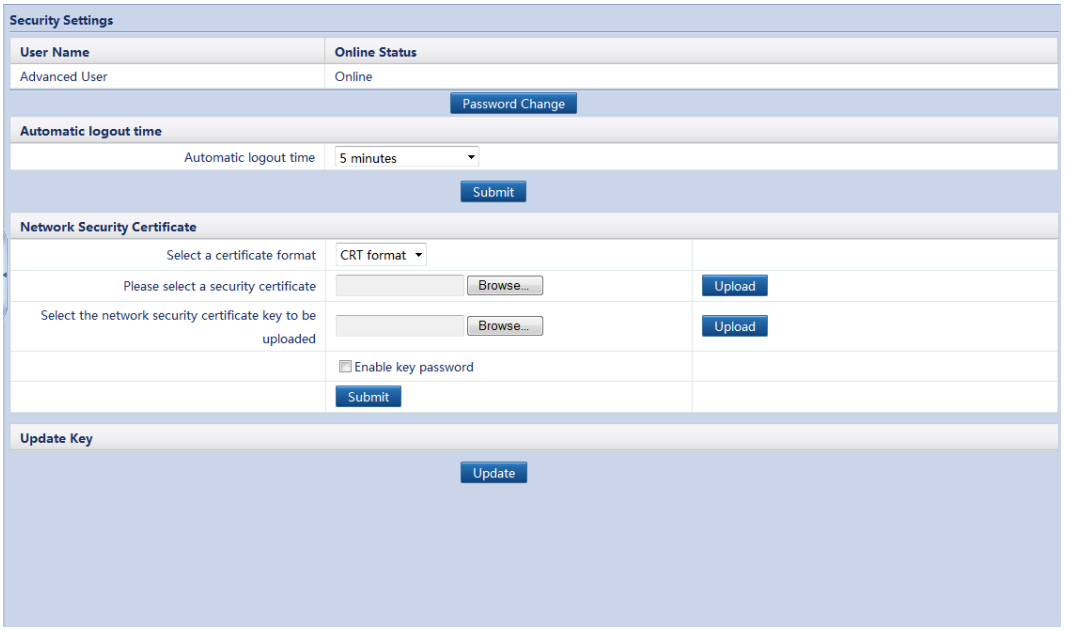
On the **Maintenance** tab page, click **Product Information**. **SN**, **Device Type**, and **Firmware Version** are displayed, as shown in Figure 7-115.

Figure 7-115 Product information

7.40 Setting Security Parameters

On the **Maintenance** tab page, select **Security Settings** to view the user names and online status, modify the user passwords, set the automatic logout time, upload the network security certificate, or update the key, as shown in Figure 7-116.

Figure 7-116 Setting security parameters



NOTE

- The initial password is *Changeme* for system users **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 a year to prevent unauthorized use of your account and impact on system security.
- After the **Automatic logout time** parameter is configured, a user is automatically logged out if the user does not perform any operation within the specified time period.
- Your are advised to use the existing network security certificate and key. If a network security certificate is not available, you can export the root certificate and import the certificate to the browser.

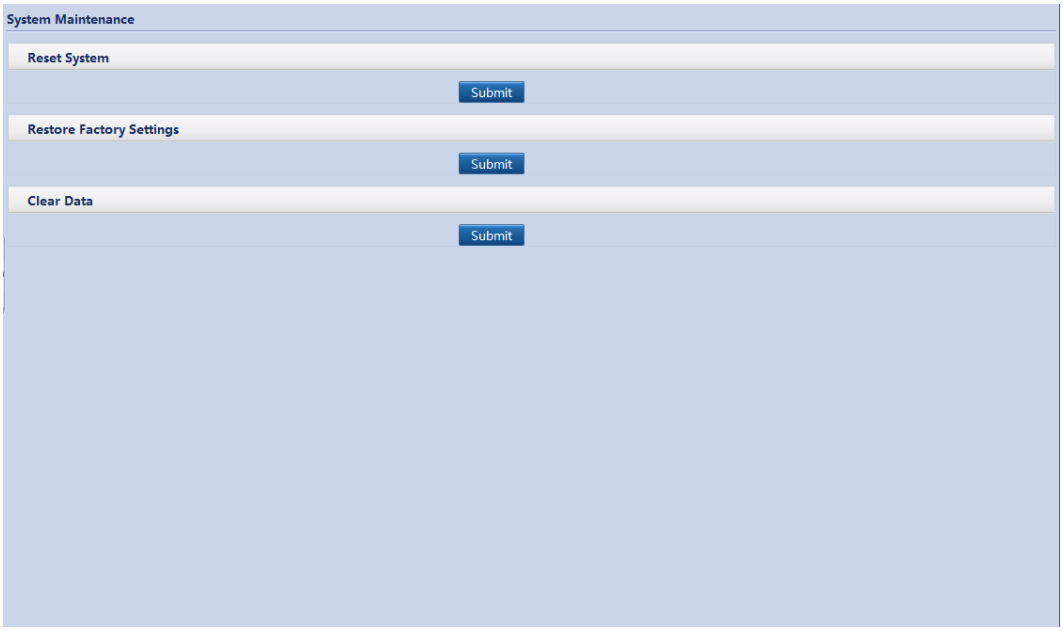
Change the password in compliance with the following rules:

- A password contains 6 to 20 characters.
- A combination of at least two types of digits, uppercase letters, and lowercase letters
- Differs from the original password in at least two characters.

7.41 Maintenance

On the **Maintenance** tab page, select **System Maint.** to restart the SmartLogger, restore the factory defaults, and clear data, as shown in Figure 7-117.

Figure 7-117 Maintenance

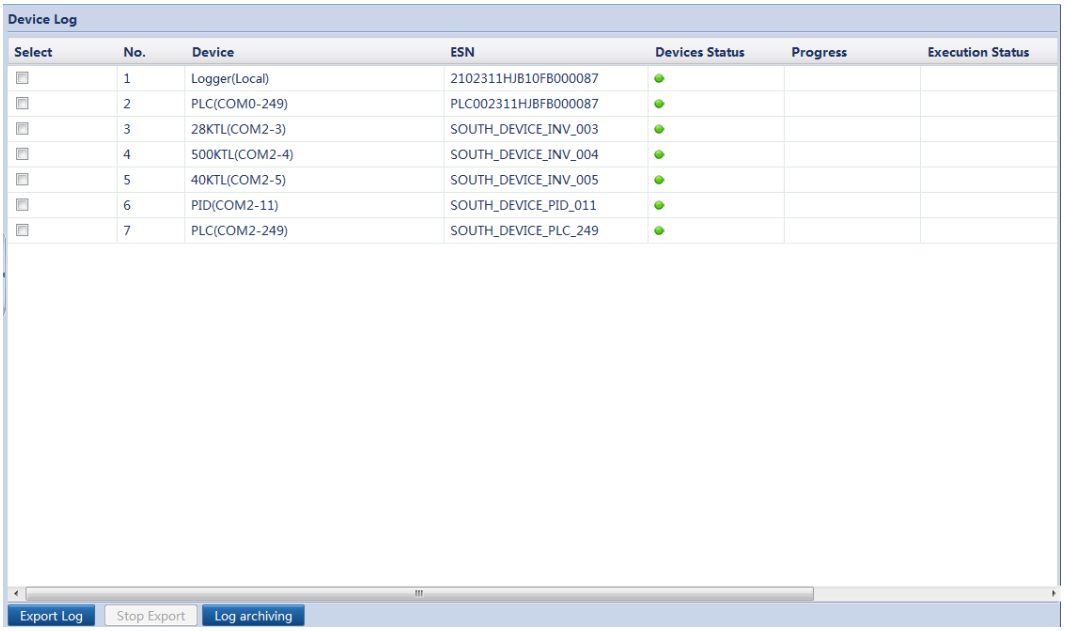


7.42 Exporting Device Logs

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 7-118. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-118 Device logs



NOTE

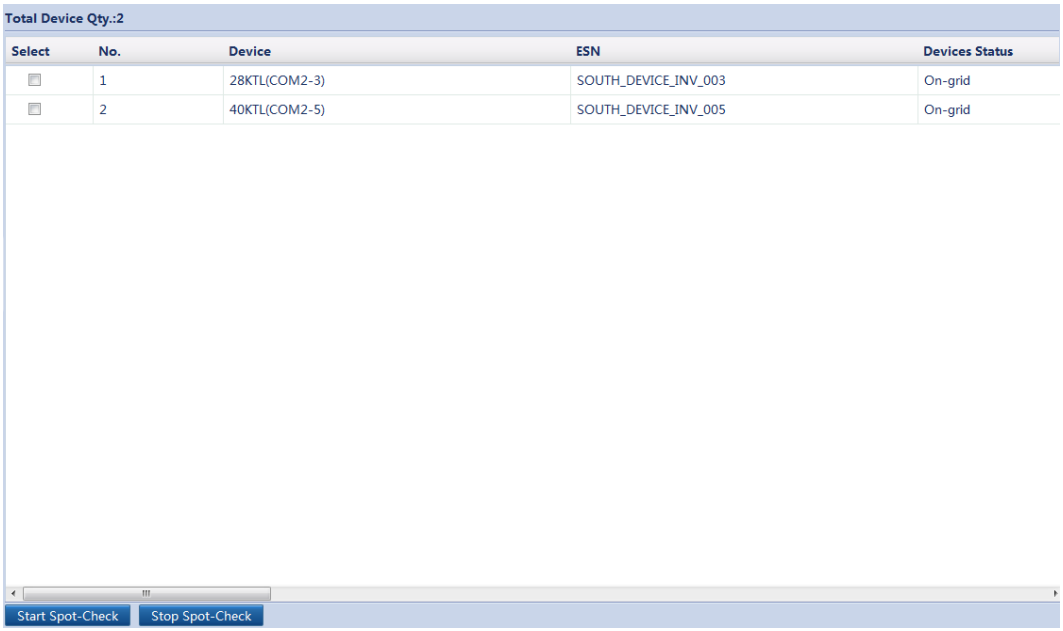
- You can click **Stop Export** to cancel the export when logs are being exported.
- After logs are exported, click **Log archiving** to open or save the log file.

7.43 Performing Onsite Tests

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 7-119.

Figure 7-119 Spot-check

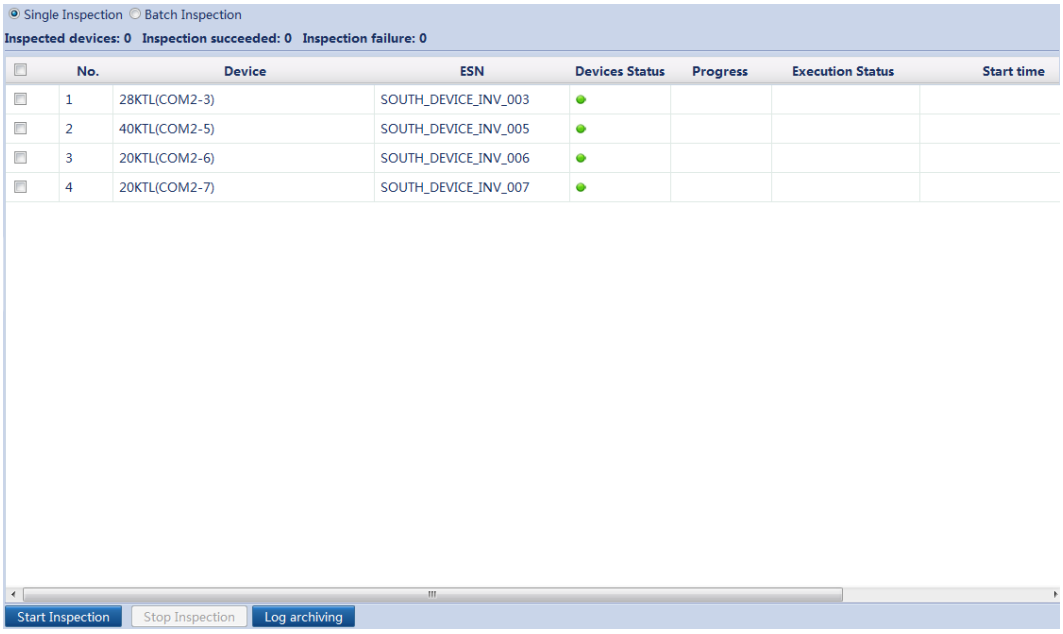


Inspection

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 7-120.

Figure 7-120 Inspection



NOTE

- 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

You can manage devices over the WebUI.

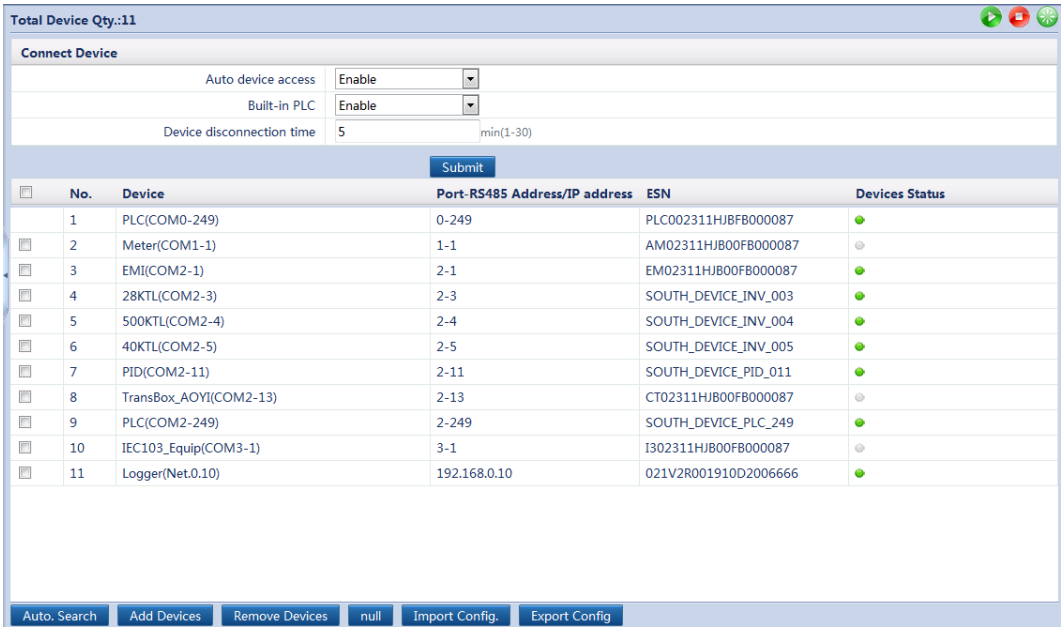
7.44.1 Connecting Devices

You can manage devices over the WebUI.

Connecting Devices

On the **Maintenance** tab page, choose **Device Mgmt.** > **Connect Device**, as shown in Figure 7-121. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-121 Connecting Devices



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

NOTE

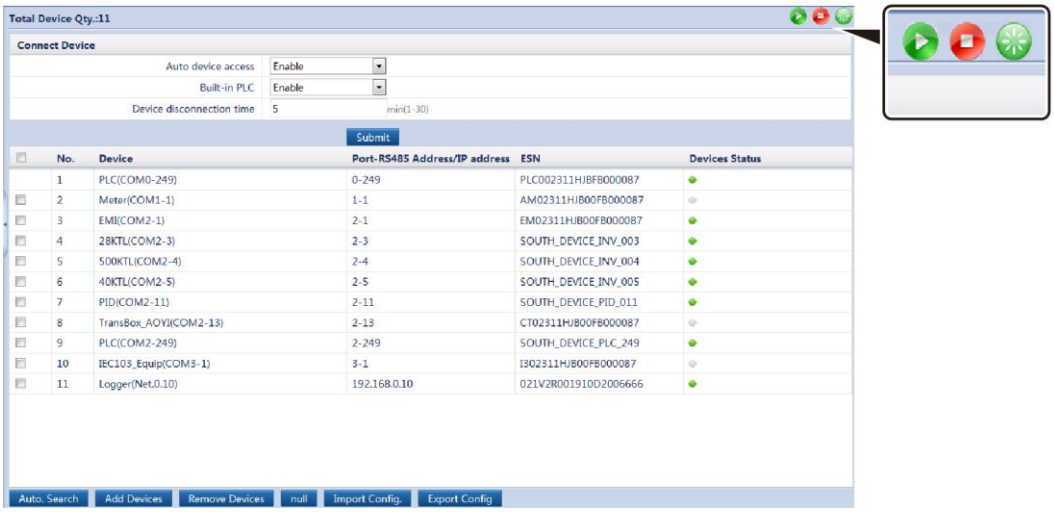
- If **Auto device access** is set to **Enable**, the SmartLogger will detect the system every 10 minutes if the SmartLogger connects to an inverter over an RS485 communications cable in non-grid-tied status from 0:00 a.m. to 4:00 a.m. or the SmartLogger connects to no device. If a new device is found, 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 Parameters for the EMI.
- Before adding a power meter manually, correctly set the meter parameters. For details, see 7.29 Setting Modbus Power Meter Parameters.
- After the setting of **Auto Assign Address** is complete, device addresses can be adjusted based on serial 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/Power-Off and Batch Reset

On the **Connect Device** page, you can issue power-on, power-off or reset commands to all the inverters connected to the SmartLogger. The power-on button (green), power-off button (red) and reset button (green) are located in the upper right corner of the tab shown in Figure 7-122.

Figure 7-122 Batch power-on/power-off and batch reset



NOTE

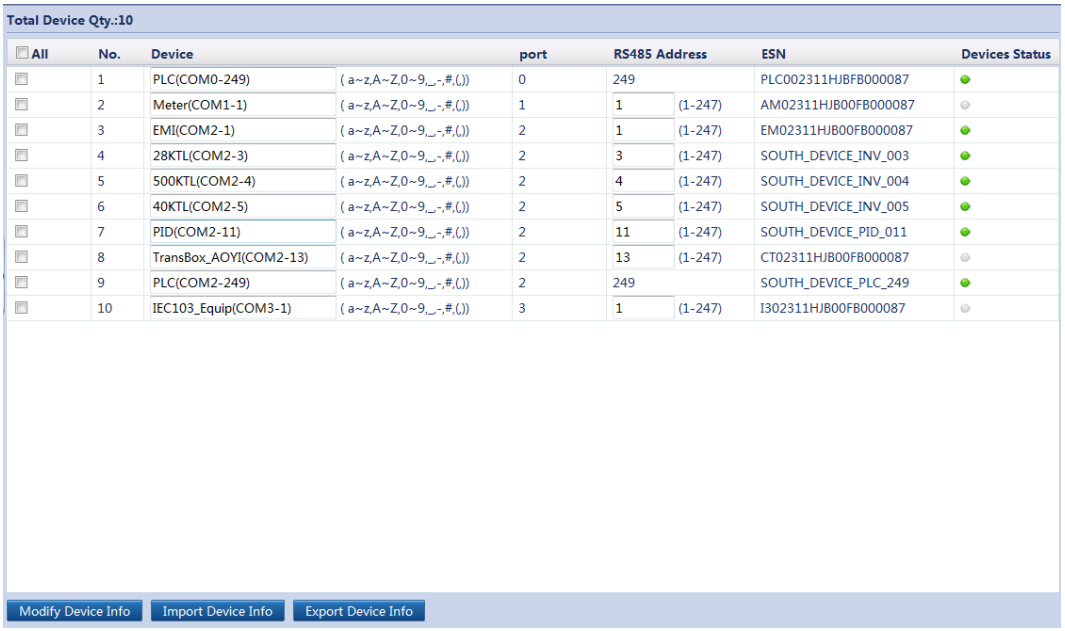
- When you click **Batch power on**, **Batch power off** or **Batch Reset**, the system displays a prompt asking whether to power on or off the inverter. If you are sure, click **OK**.
- If a slave SmartLogger is configured in a power station, when the batch power-on/off command is sent to the master 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 List

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 page, choose **Device Mgmt.** > **Device list**, as shown in Figure 7-123. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-123 Device list



NOTE

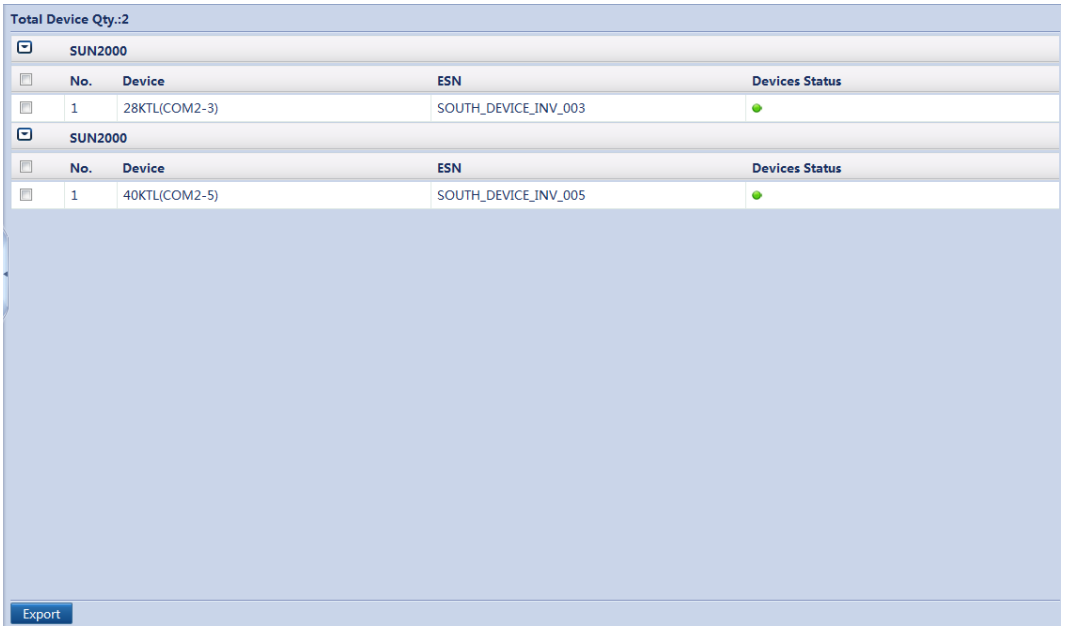
- To customize the device information, click **Modify Device Info**.
- To import a .csv file that contains device information, click **Import Device Info**.
- To export the current device information as a .csv file, click **Export Device Info**.

7.44.3 Exporting Parameters

You can export parameters over the WebUI.

On the **Maintenance** tab page, choose **Device Mgmt.** > **Export Param.**, as shown in Figure 7-124. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-124 Exporting parameters



NOTE

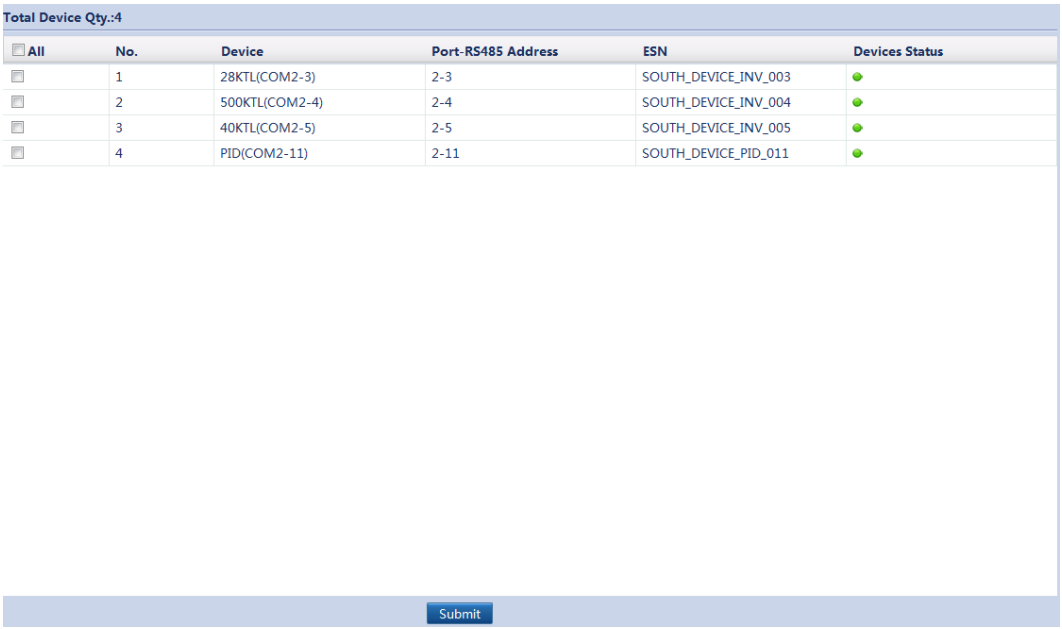
You can click **Export** to export configuration parameters of multiple SUN2000s to a .csv file. Site engineers can then check whether the inverter configurations are correct in the exported file.

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 7-125. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-125 Resetting alarms



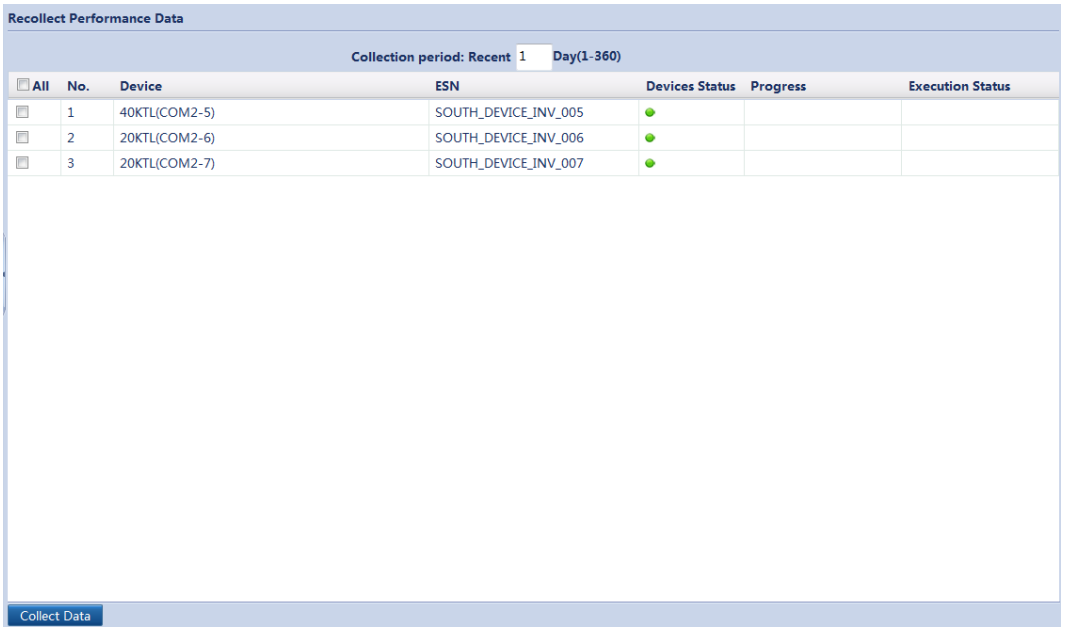
NOTICE

- Resetting alarms over 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** is performed on the SmartLogger.

7.44.5 Collecting Performance Data

On the **Maintenance** tab page, choose **Device Management** > **Recollect Performance Data**, as shown in Figure 7-126. Because of the permission restriction, log in as **Advanced User** or **Special User**.

Figure 7-126 Collecting performance data



8 Power Grid Scheduling

This section describes the power grid scheduling function.

In a PV power 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 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 and reactive power control commands to ensure secure power grid running.

As the core device in the communications system of the PV power station, the 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 over the WebUI to meet different customers' requirements.

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

8.1 Power Grid Scheduling Modes

This topic describes the power grid scheduling modes.

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

8.1.1 Active Power Control

You can set the active power control mode over the WebUI.

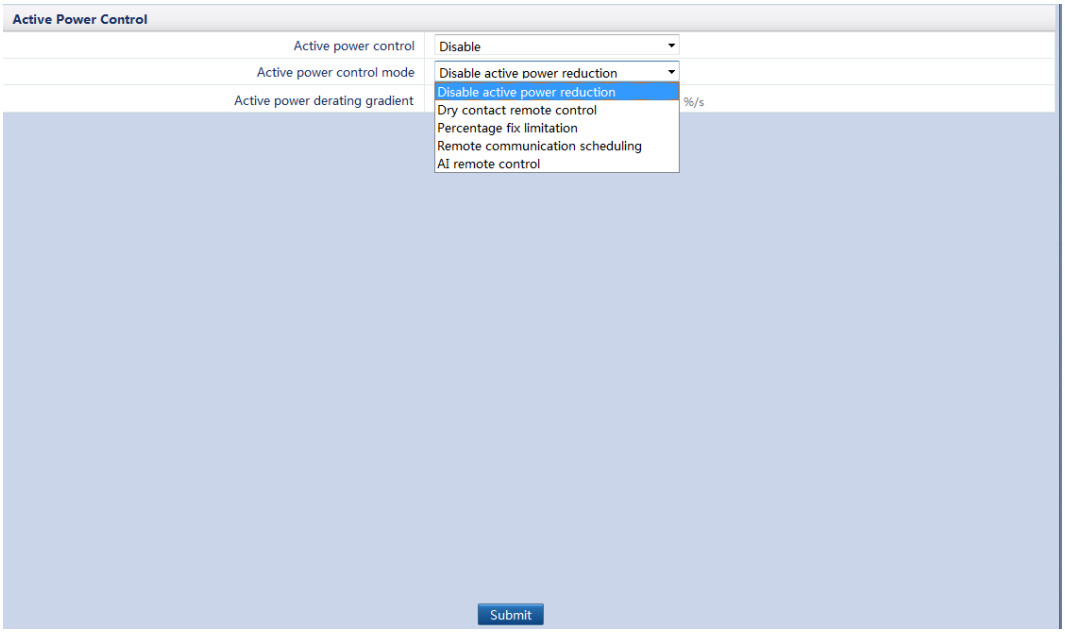
According to standard requirements, the SmartLogger shall reliably deliver remote scheduling instructions to all connected inverters in real time to ensure that the PV plant can respond to requirements of the power grid company in a timely manner.

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 derating mode.

NOTICE

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

Figure 8-1 Active power control



8.1.2 Reactive Power Control

You can set the reactive power control mode over the WebUI.

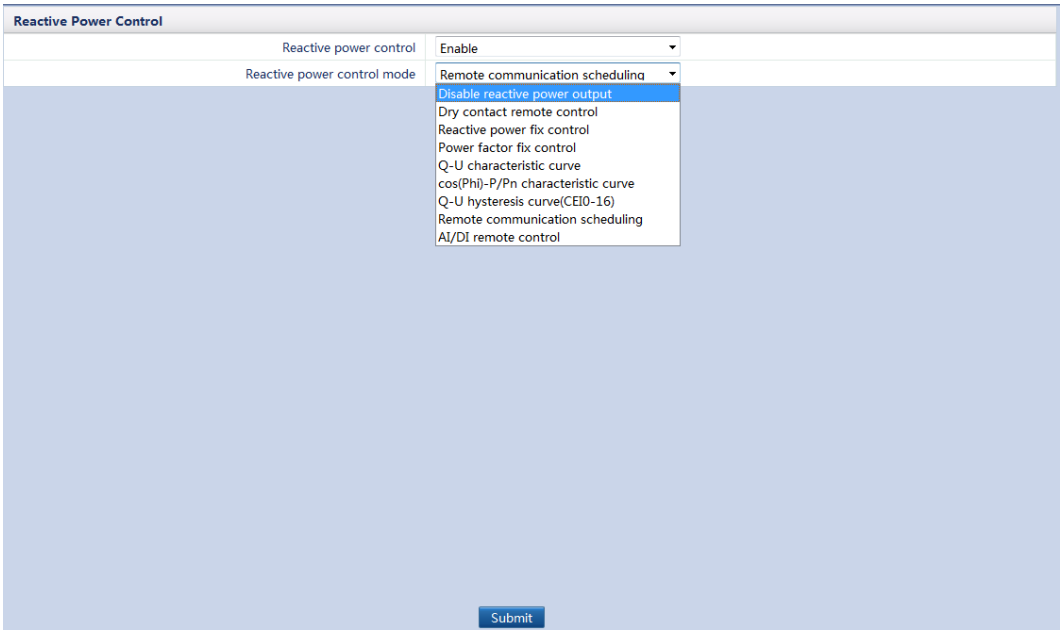
The Smart Logger can send remote dispatching commands in real time to connected inverters, which ensures that the PV power station can quickly respond to the requirements of the power grid company.

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.

NOTICE

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

Figure 8-2 Reactive power control



8.2 Application Scenario

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

Requirements of power grid companies for power grid scheduling vary in different countries. Networking of the monitoring system also varies based on the power level of each PV plant and the number of inverters. Each networking type involves a different type of data sources for power grid scheduling, as well as the communication mode with the SmartLogger. There are four application scenarios of the power grid scheduling: local scheduling, dry contact scheduling, AI/DI scheduling, and communication scheduling.

8.2.1 Local Scheduling

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

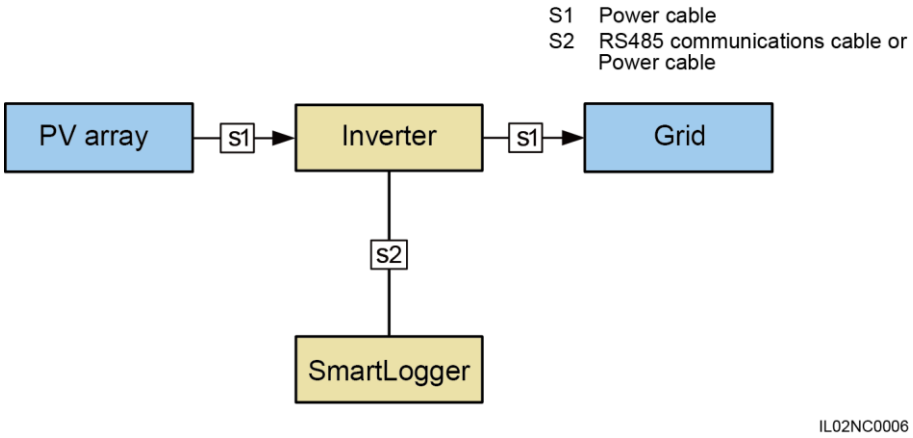
Local scheduling applies to a PV plant with the rated power no greater than 100 KW and less than five grid-tied inverters. Because the power system is small, power grid companies have low requirements on power adjustment, which can be achieved by local control.

Some power grid companies do not require remote reactive power control for a PV plant, but require local reactive power adjustment in various modes.

Users can set the control mode over the WebUI based on the actual output characteristics of each PV plant. The SmartLogger can continuously control power output of inverters according to user configurations.

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

Figure 8-3 Local scheduling



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 derating percentage in different periods of the day.

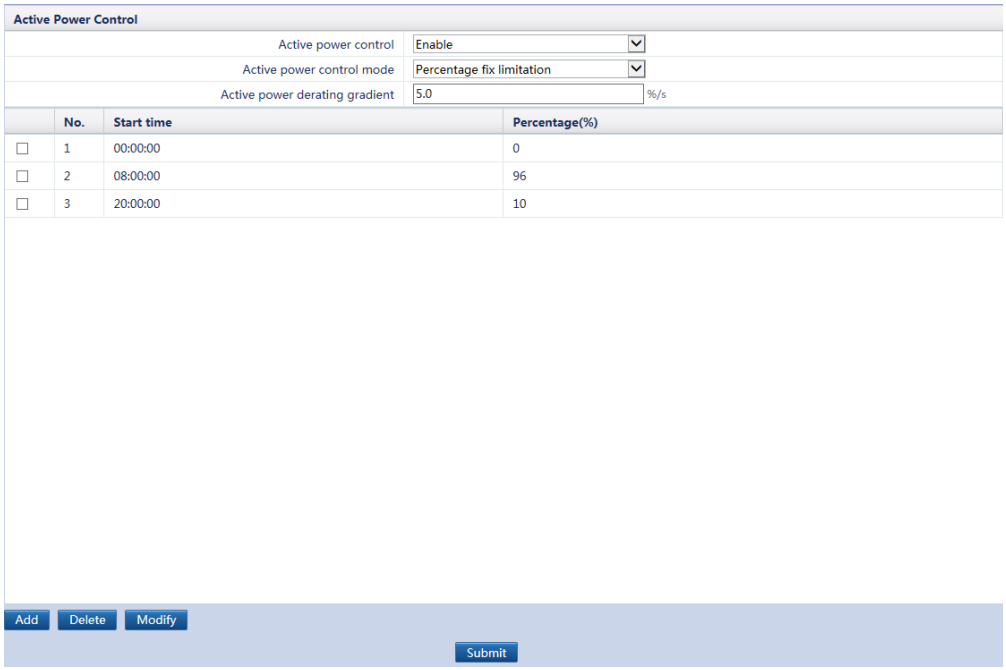
- If the inverters are allowed to run overloaded, set **Active Power Control Mode** to **Disable active power reduction**.

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 Limit by percentage



NOTE

- 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 a 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 at the 70% derated power, set **Active Power Control Mode** to **Percentage fix limitation**, add one 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.

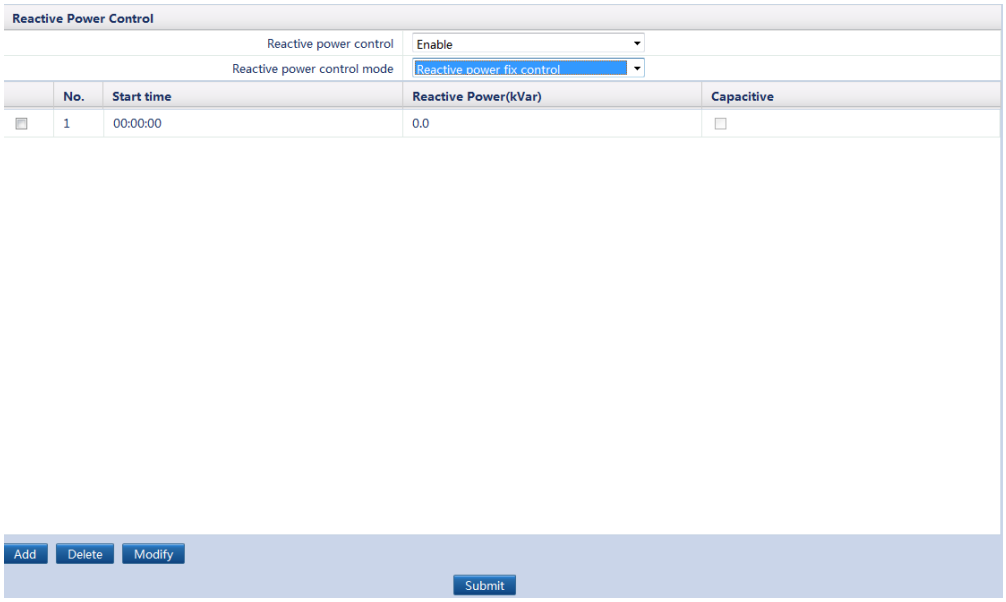
- If the power station is not required to adjust the voltage at the grid-tied point or perform reactive power compensation, inverters can run with pure active power output. In this case, set **Reactive Power Control Mode** to **Disable reactive power output**.

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 **Power factor fix control**, add records, and set **Start time** and **Reactive Power** corresponding to a certain period.

Figure 8-5 Reactive power control by fixed value

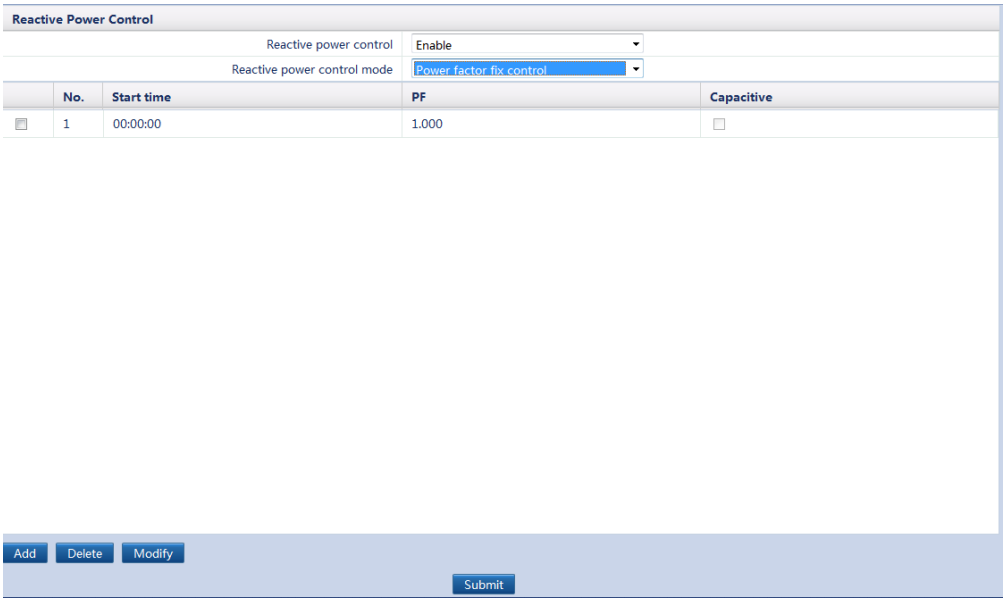


NOTE

- 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 a 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.
- 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 **Reactive power fix control**, add records, and set **Start time** and **PF** corresponding to a certain period.

Figure 8-6 Power factor fix control



NOTE

- 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 a 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 is not available, the Smart Logger provides the Q-U characteristic curve, cos(Phi)-P/Pn characteristic curve, and Q-U Hysteresis curve(CEI0-16) as a 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), **cos(Phi)-P/Pn characteristic curve** (as shown in Figure 8-8), or **Q-U hysteresis curve(CEI0-16)** (as shown in Figure 8-9).

NOTE

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

NOTICE

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

Figure 8-7 Q-U characteristic curve

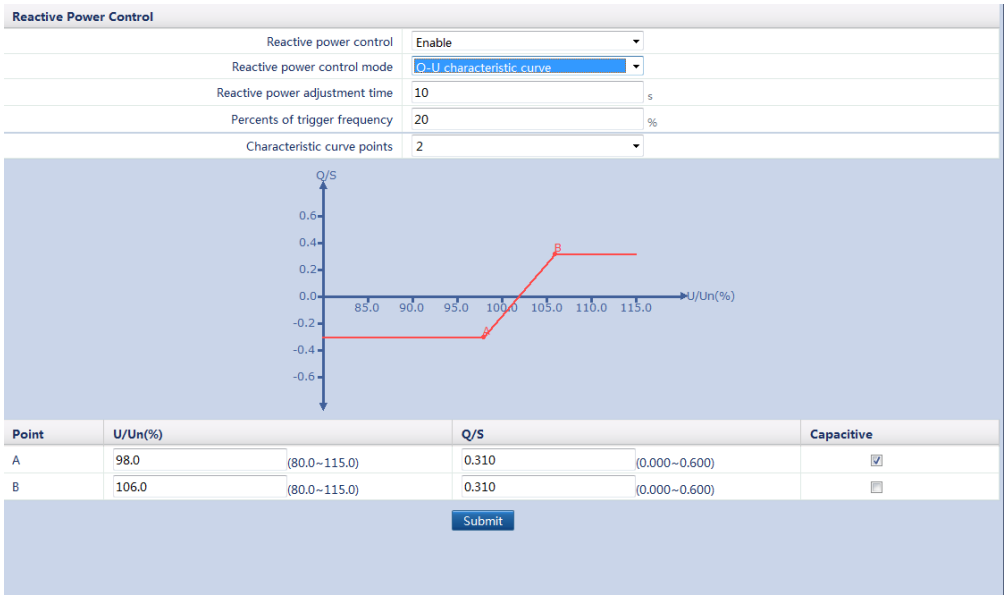


Figure 8-8 cos(Phi)-P/Pn characteristic curve

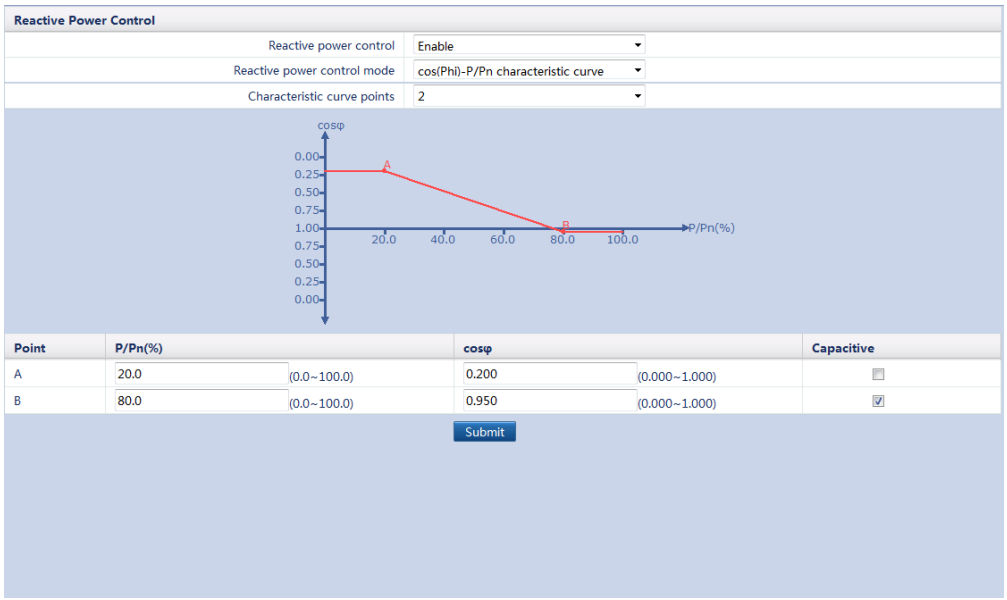
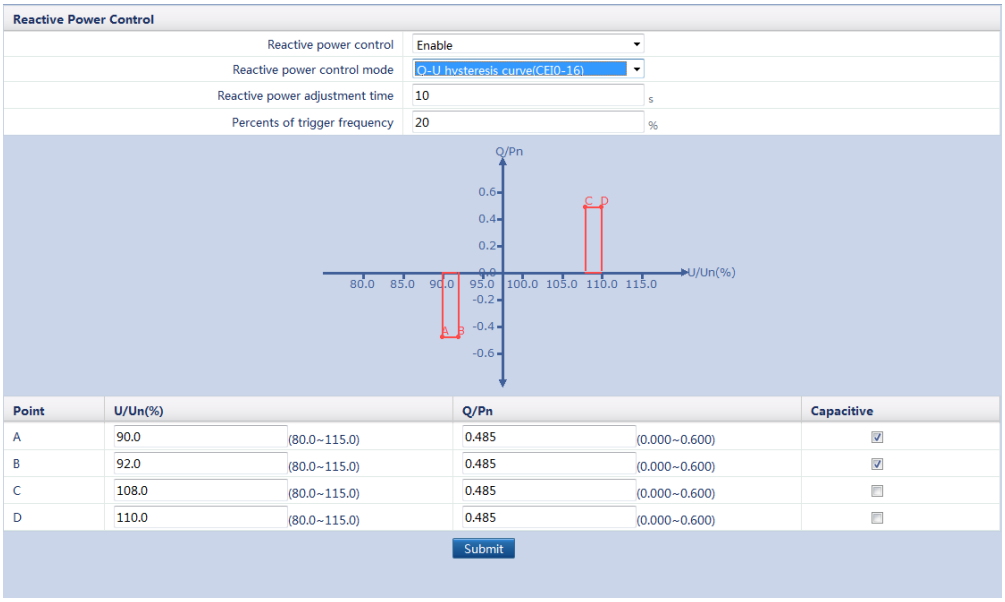


Figure 8-9 Q-U hysteresis curve (CEI0-16)



NOTICE

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.

NOTE

- When you set the curve, ensure that the **U/Un(%)** or **Q/Pn(%)** value of a point is larger than the **U/Un(%)**or **Q/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 for a grid-tied point. The range is 5 to 120s.
- When adding data points for the curve, refer to the provided range on the right of the text box.

8.2.2 Dry Contact Scheduling

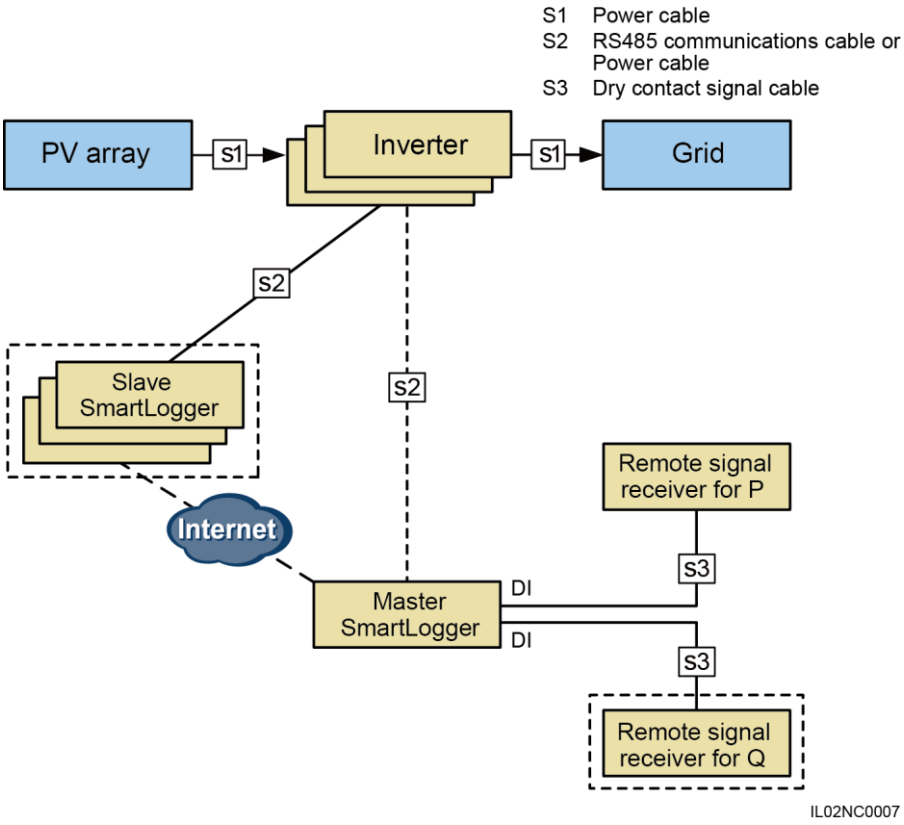
This topic describes the compositions and application of the dry contact scheduling.

Dry-contact scheduling applies to a PV plant with the rated power greater than 100 KW, where active power and reactive power are remotely adjusted in real time, and the power grid company requires the dry-contact mode.

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 scheduling.

Figure 8-10 Dry contact 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 scheduling command.

NOTE

- Slave SmartLogger and remote signal receiver Q are optional access devices.

  If a slave SmartLogger is to be connected, manually add the slave SmartLogger on the LCD or WebUI of the master SmartLogger.
- The master SmartLogger connects to the 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.
- The 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 P receives the active power scheduling commands. Remote signal receiver Q receives the reactive power scheduling commands.

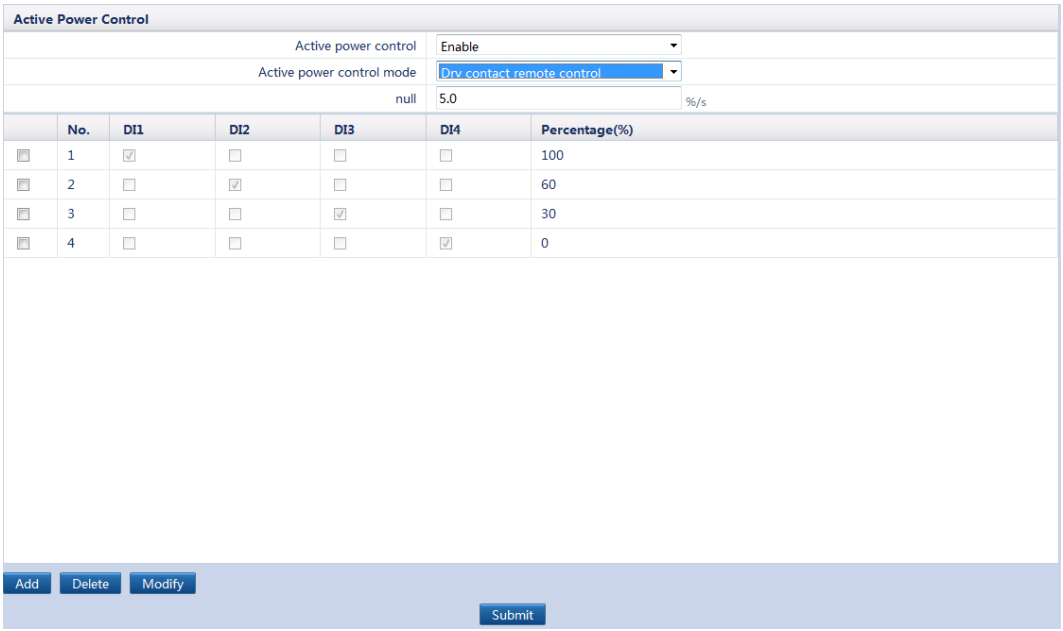
Active Power Control

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

NOTICE

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 Connecting a Ripple Control Receiver.

Figure 8-11 Dry contact remote control



NOTE

- The active power derating is represented by percentage. Four levels are recommended: 100%, 60%, 30%, and 0%.
- A maximum of 16 levels is supported for the active power derating 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–DI4 should differ from each other. Otherwise, an abnormal command is generated.
- If **Reactive power control mode** is set to **AI/DI remote control**, **Active Power Control** cannot be set to **Dry contact remote control**.

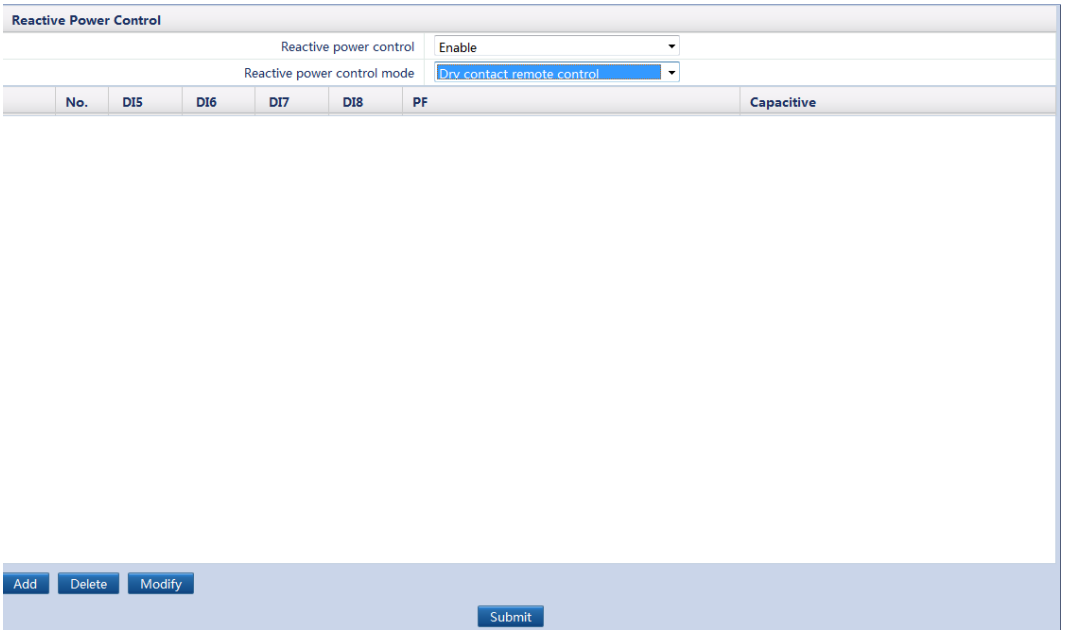
Reactive Power Control

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

NOTICE

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 Connecting a Ripple Control Receiver.

Figure 8-12 Dry contact remote control



NOTE

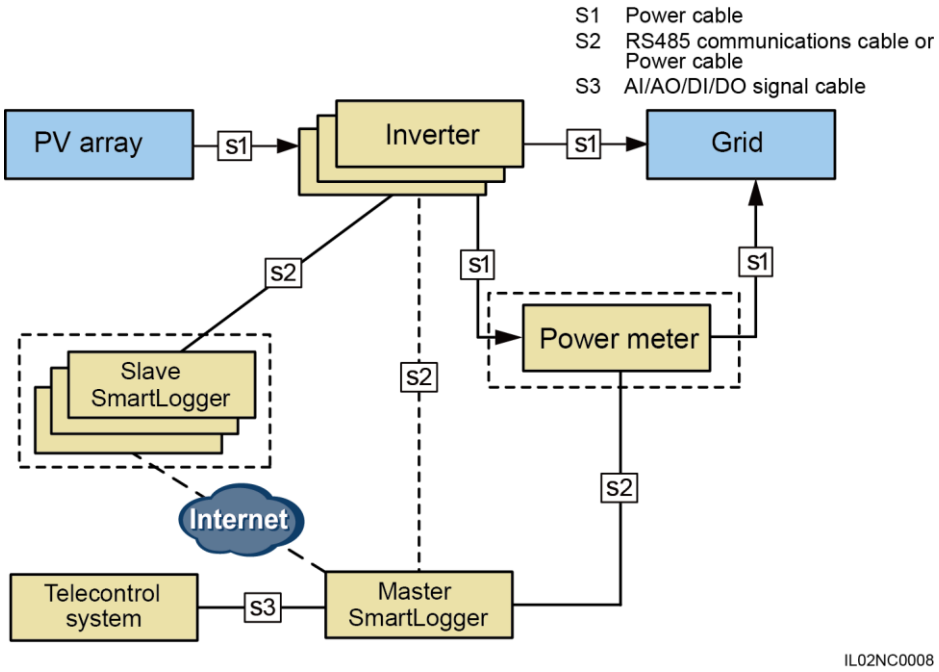
- A maximum of 16 levels is supported for power factors.
- "√" indicates low level. When connecting to GND2, the four DI ports of the SmartLogger are low-level ports. If not connected, the ports are high-level ports.
- The percentage levels of DI5–DI8 should differ from each other. Otherwise, an abnormal command is generated.
- If a "√" is under **Capacitive**, the power factor is a negative value, indicating that the power grid supplies reactive power to the PV power station. If no "√" is under **Capacitive**, the power factor is a positive value, indicating that the PV power station supplies reactive power to the power grid.
- If **Active Power Control** is set to **AI remote control**, **Reactive power control mode** cannot be set to **Dry contact remote control**.

8.2.3 AI/DI Scheduling

AI/DI scheduling applies to a PV plant with highly rated output power and complex networking. Power grid companies have high requirements on power adjustment in terms of remote real-time adjustment modes, precision of adjustment instructions, and communication reliability. Besides power adjustment, power grid companies also requires each PV plant to provide key sampling data of grid connection points in time.

Each SmartLogger can be connected to a maximum of 200 devices, among which the number of inverters cannot exceed 80. If there are too many inverters to be handled by one SmartLogger, a certain amount of slave SmartLoggers are required. The master SmartLogger receives a remote scheduling instruction from a power grid company over the AI/DI port, and then sends it to all slave SmartLoggers. These slave SmartLoggers broadcast the instruction to all inverters. Figure 8-13 shows the networking application of the AI/DI scheduling.

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 scheduling command.

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 LCD or WebUI of the master SmartLogger.
- The master SmartLogger forwards the scheduling commands sent by the remote terminal management 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 electricity 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.

Electricity Meter Parameters and grid-tied feedback Parameters Configuration

To configure the electricity parameters and grid-tied feedback parameters, see 7.29 Setting Modbus Power Meter Parameters.

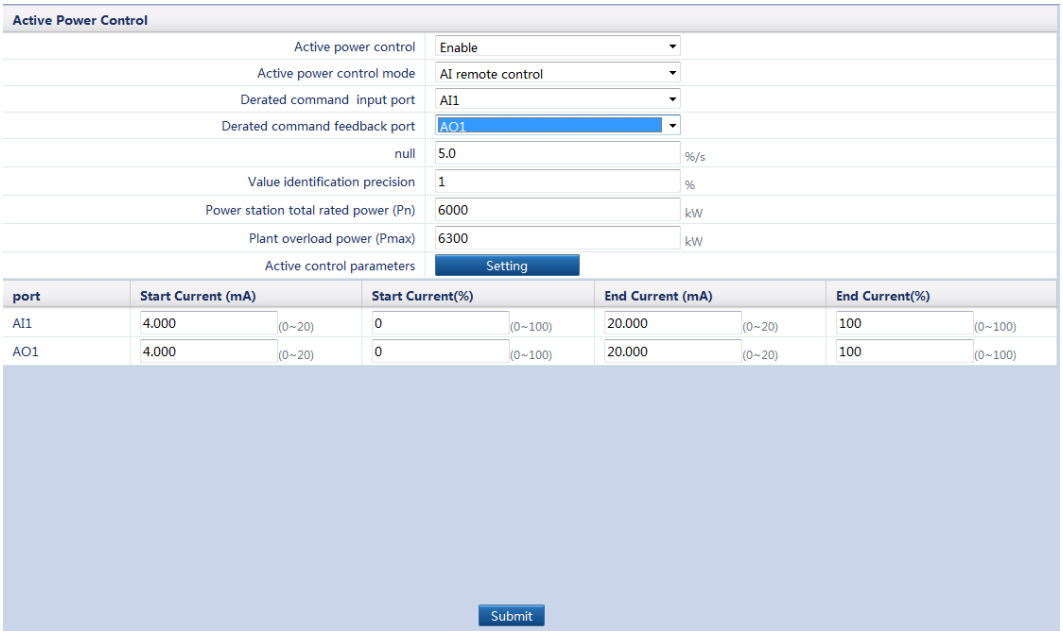
Active Power Control

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 8-14.

NOTICE

Before you set **Active Power Control Mode** to **AI remote control**, ensure that connections between the SmartLogger and the remote terminal control system are correct.

Figure 8-14 AI remote control



NOTE

- 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.
- If **Reactive power control mode** is set to **Dry contact remote control**, **Active Power Control** cannot be set to **AI remote control**.

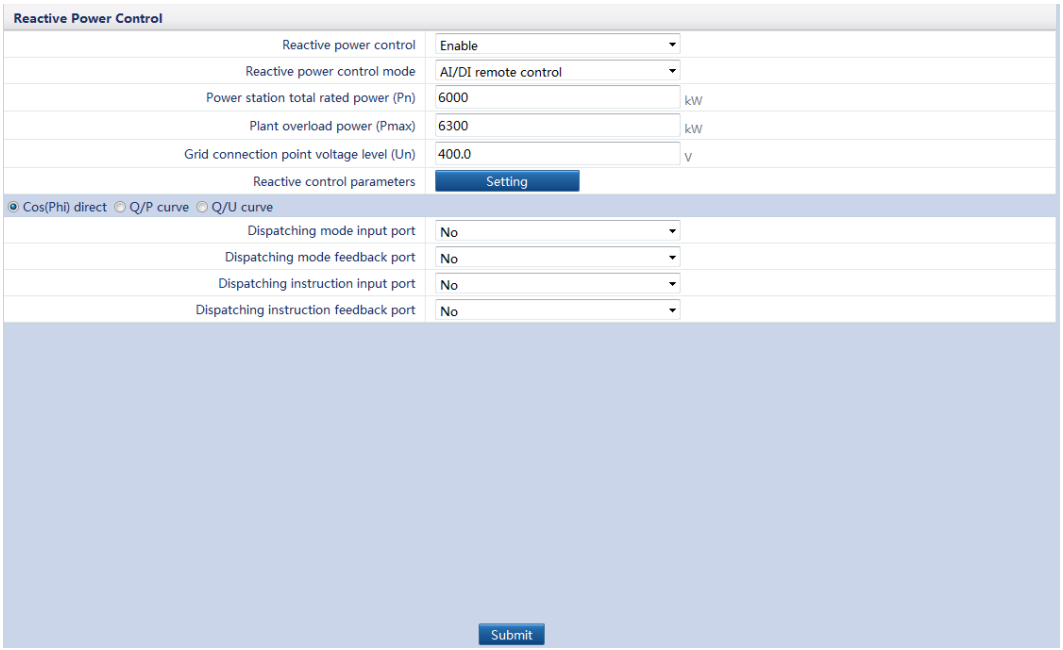
Reactive Power Control

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 8-15.

NOTICE

Before you set **Reactive Power Control Mode** to **AI/DI remote control**, ensure that connections between the SmartLogger and the remote terminal control system are correct.

Figure 8-15 AI/DI remote control



NOTE

- **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.
- If **Active Power Control** is set to **Dry contact remote control**, **Reactive power control mode** cannot be set to **AI/DI remote control**.

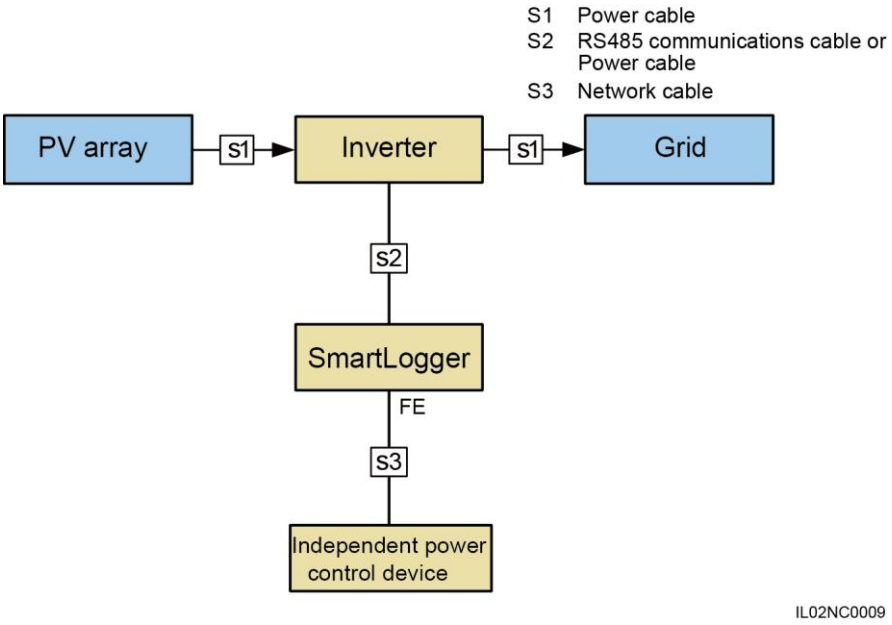
8.2.4 Communication Scheduling

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 8-16 shows the networking application of the communication scheduling.

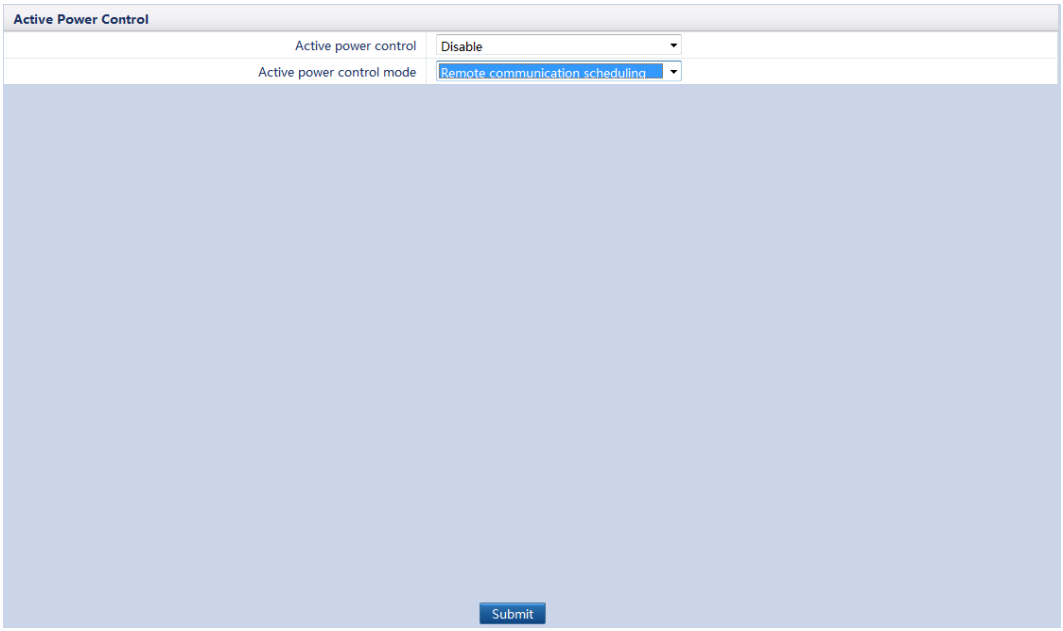
Figure 8-16 Communication scheduling



Active Power Control

When **Active Power Control Mode** is set to **Remote comm.sched.** (as shown in Figure 8-17), the SmartLogger receives the scheduling commands from the upstream NMS, converts them into valid command data identifiable to 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.

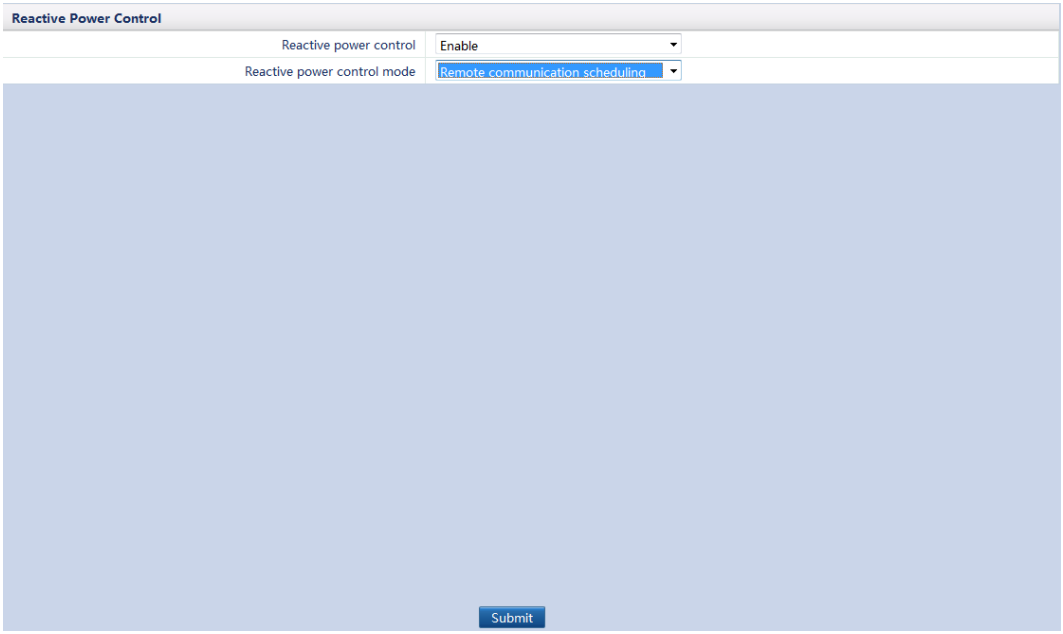
Figure 8-17 Remote communication scheduling



Reactive Power Control

When **Reactive Power Control Mode** is set to **Remote comm.sched.** (as shown in Figure 8-18), the SmartLogger receives the scheduling commands from the upstream NMS, converts them into valid command data identifiable to 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 8-18 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.

9.2 Troubleshooting

Table 9-1 describes the common faults and the troubleshooting measures for the SmartLogger.

Table 9-1 Common fault list

No.	Symptom	Possible Cause	Measures
1	The SmartLogger cannot be powered on.	1. The DC output power cable for the power adapter does not connect to the 12V IN port of the SmartLogger. 2. The power cable does not connect to the AC power receiving port of the power adapter. 3. The AC input power cable does not connect to the AC socket. 4. Power adapter is faulty. 5. The SmartLogger is faulty.	1. Connect the DC output power cable for the power adapter to the 12V IN port of the SmartLogger. 2. Connect the power cable to the AC power receiving port of the power adapter. 3. Connect the power cable to the AC socket. 4. Replace the power adapter. 5. Contact the vendor or Huawei technical support.

No.	Symptom	Possible Cause	Measures
2	Devices cannot be searched.	1. The COM port does not connect to any device, or the cable is loose, disconnected, or reversely connected. 2. The communications parameters for the RS485 port are incorrect. 3. The devices that cannot be detected automatically, such as the EMI and power meter, are not manually added. 4. The EMI parameters are not set correctly. 5. The address for the inverter is not within the search address segment set for the SmartLogger.	1. Check the RS485 communications cable connection. If any cable is loose, drops off, or is reversely connected, rectify the connection. 2. Correctly set the RS485 communications parameters, and ensure that the baud rate and the communications address are correctly set. 3. Manually add the devices that cannot be detected automatically, such as the EMI and power meter. 4. Correctly set the EMI parameters 5. Set the address of the inverter to be within the search address segment set for the SmartLogger.
3	The communication for PLC networking fails.	1. The AC power cable is loose, disconnected, or reversely connected. 2. The upstream circuit breaker for the AC power cable is OFF. 3. The SmartLogger is faulty.	1. Reconnect the AC power cable securely. 2. Switch on the upstream circuit breaker for the AC power cable. 3. Contact the vendor or Huawei technical support.
4	The communication for optical fiber networking fails.	1. The optical fiber jumper is loose, disconnected, or reversely connected. 2. The Ethernet optical port indicator is faulty. 3. The Ethernet optical port is faulty.	1. Reconnect the optical fiber jumper securely. 2. Contact the vendor or Huawei technical support. 3. Contact the vendor or Huawei technical support.
5	Devices Status is Disconnection on the SmartLogger.	1. The cable between the device and the SmartLogger is loose or disconnected. 2. The device is powered off. 3. The baud rate or RS485 address of the device is changed. 4. The device is replaced. 5. The device is no longer connected.	1. Verify that the cable between the device and the SmartLogger is properly connected and tightened. 2. Power on the device. 3. Verify the baud rate and RS485 address of the device. 4. If a device is replaced, search for or manually add the device. 5. If the device is removed, remove the device on the SmartLogger.

No.	Symptom	Possible Cause	Measures
6	The EMI cannot be added.	1. The RS485 communications cable between the EMI and the SmartLogger is not properly connected, or the RS485 communications cable is loose or disconnected. 2. The EMI is powered off. 3. The baud rate of the EMI is inconsistent with that of the SmartLogger. 4. Parameter settings of the EMI are incorrect.	1. Verify that the RS485 communications cable is properly connected and tightened. 2. Power on the EMI. 3. Verify the baud rate of the EMI. 4. Log in to the WebUI and verify the parameter settings of the EMI.
7	The SmartLogger cannot communicate with the NetEco in the PC.	1. The SmartLogger does not connect to the PC, or the cable between the SmartLogger and the PC is loose or disconnected. 2. Ethernet parameters are not properly set. 3. NetEco parameters are not properly set.	1. Verify that the Ethernet electrical port or optical port of the SmartLogger correctly connects to a PC or router. 2. Check that the Ethernet parameters are correctly set. 3. Check that the NetEco parameters are correctly set.

9.3 Alarms

Table 9-2 describes the common alarms and the troubleshooting measures for the SmartLogger.

Table 9-2 Alarms

Alarm ID	Alarm	Alarm Severity	Alarm Sub-ID	Causes	Measure

Alarm ID	Alarm	Alarm Severity	Alarm Sub-ID	Causes	Measure
1100	Abnormal P-Control	Major	1	Under the active power **AI remote control** mode, the AI port receives currents beyond the configuration range.	1. Verify that the port corresponding to the AI No. in use connects to a cable properly. If the cable is loose, disconnected, or reversely connected, reconnect it firmly and correctly. 2. 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. 3. Contact the power grid company to check whether the command data sent is correct.
			4	Under the active power **Dry contact remote control** mode, the four DI ports read commands beyond the configuration.	1. Check whether the cable connections to the DI ports are correct. 2. 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.

Alarm ID	Alarm	Alarm Severity	Alarm Sub-ID	Causes	Measure
1101	Abnormal Q-Control	Major	1	Under the reactive power **AI remote control** mode, the AI port receives currents beyond the configuration range.	1. Verify that the port corresponding to the AI No. in use connects to a cable properly. If the cable is loose, disconnected, or reversely connected, reconnect it firmly and correctly. 2. Enter the 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. 3. Contact the power grid company to check whether the command data sent is correct.
			4	Under the reactive power **Dry contact remote control** mode, the four DI ports read commands beyond the configuration.	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.
1103	Breaker Disconnect	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.
1104	Abnormal Cubicle	Major	1	The Cubicle device has detected an exception at the grid-tied point.	When the Cubicle alarm is enabled, check whether the DI signal received by the SmartLogger is consistent with the dry contact status. If yes, restart the inverter.

Alarm ID	Alarm	Alarm Severity	Alarm Sub-ID	Causes	Measure
1105	Device Address Conflict	Major	1	The SmartLogger RS485 address conflicts with the physical address (RS485 address) or logical address for the connected southbound device.	1. If the SmartLogger RS485 address conflicts with the physical address for the connected southbound device, choose **Settings** > **Comm. Param.** > **Modbus TCP** and modify **SmartLogger address**, or choose **Maintenance** > **Device Mgmt.** > **Connect Device** to change the southbound device address. If the southbound device is a SUN2000, you can change its address on the APP. 2. If the SmartLogger RS485 address conflicts with the logical address for the connected southbound device, choose **Settings** > **Comm. Param.** > **Modbus TCP** and modify **SmartLogger address**.

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. You can also return it to Huawei, with the related expenses paid.

11 Technical Specifications

Device management

Specifications	SmartLogger2000
Number of managed devices	200
Number of managed inverters	80
Communications mode	Six RS485 ports, two Ethernet electrical ports, two Ethernet optical ports, and PLC
The maximum communication distance	RS485: 1000 m; Ethernet: 100 m; optical fiber: 12,000 m

Display

Specifications	SmartLogger2000
Bluetooth	Connected through the SUN2000 APP
LED	Four LED indicators
WebUI	Embedded

Common parameters

Specifications	SmartLogger2000
Power supply	100–240 V AC, 50 Hz/60 Hz
Power consumption	Normal: 8 W; maximum: 15 W
Language	English, Chinese, German, Italian, Japanese, French, and Russian
Dimensions (H x W x D, including mounting ears)	350 mm x 170 mm x 44 mm

Specifications	SmartLogger2000
Weight	3800 g
Operating temperature	–40 ℃ to +60 ℃
Storage temperature	–40 ℃ to +85 ℃
Relative humidity (non-condensing)	5%-95%
Protection level	IP20
Installation mode	Installed in Huawei communication box, on a wall, or on guide rails
Altitude	4000 m[e]
e: When the altitude is between 3000 meters and 4000 meters, the temperature decreases by 1 ℃ for each additional 200 meters.	

Port

Specifications	SmartLogger2000
Ethernet electrical port	10/100M
Ethernet optical port	100M
PLC port	1
RS485	6, supported baud rates: 4800 bit/s, 9600 bit/s, 19,200 bit/s, and 115,200 bit/s
USB	USB2.0
Digital input	8
Digital output	3
Analog input	8
Analog output	6

A Product User Lists

Table A-1 Monitoring user list

Login Mode	User Name	Initial Password
APP	Common User	00000a
	Advanced User	00000a
	Special User	00000a
WebUI	Common User	Changeme
	Advanced User	Changeme
	Special User	Changeme
NetEco	emscomm	/EzFp+2%r6@IxSCv

Table A-2 Operating system user list

User Name	Initial Password
enspire	Changeme
root	Changeme
prorunacc	No preset password
bin	No preset password
daemon	No preset password
nobody	No preset password
sshd	No preset password

B Acronyms and Abbreviations

A	
AC	Alternating Current
AI	Analog Input
AO	Analog Output
APP	Application
C	
CCO	Central Coordinator
COM	Communication
D	
DI	Digital Input
DO	Digital Output
E	
EMI	Environmental Monitoring Instrument
ETH	Ethernet
L	
LED	Light-emitting Diode
P	
PLC	Power Line Communication

R	
RSTP	Rapid Spanning Tree Protocol
S	
SFP	Small Form-factor Pluggable
SPD	Surge Protective Device
STA	Station
STP	Spanning Tree Protocol
W	
WEEE	Waste Electrical and Electronic Equipment