SmartLogger2000

User Manual

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HUAWEI

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

Symbol	Description
	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.

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

⚠️ **NOTICE**

Before installation, read this document carefully. Huawei shall not be liable for any consequence caused by violation of the regulations specified in this document.

- 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

About This Chapter

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°C to +60°C
  - 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)
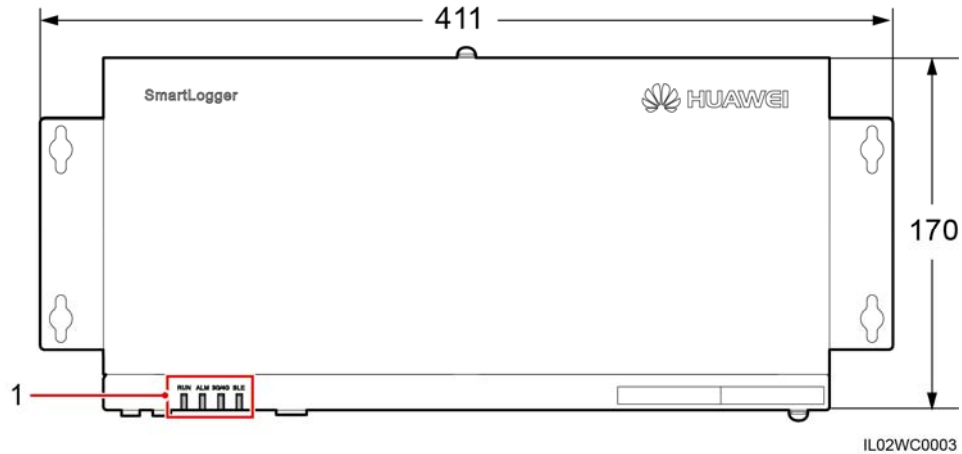
(1) Indicators

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.
	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	The SmartLogger or the

Indicator (Silk Screen)	Status		Meaning
		short intervals (on for 0.5s and then off for 0.5s)	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].
	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)
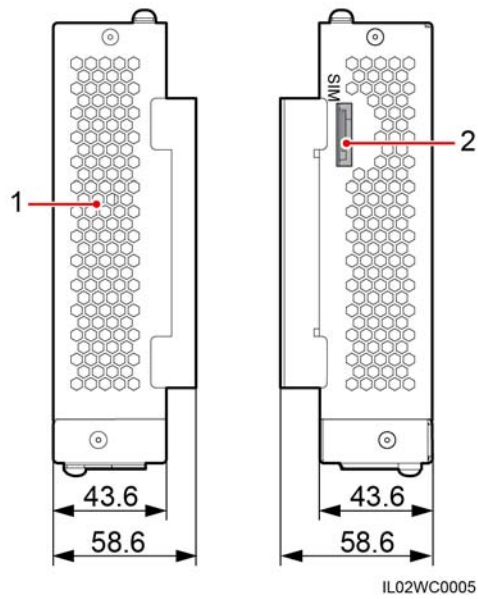
(1) Heat dissipation hole   (2) SIM card slot (reserved)

Rear View of the Shell

Figure 2-3 SmartLogger rear view (unit: mm)
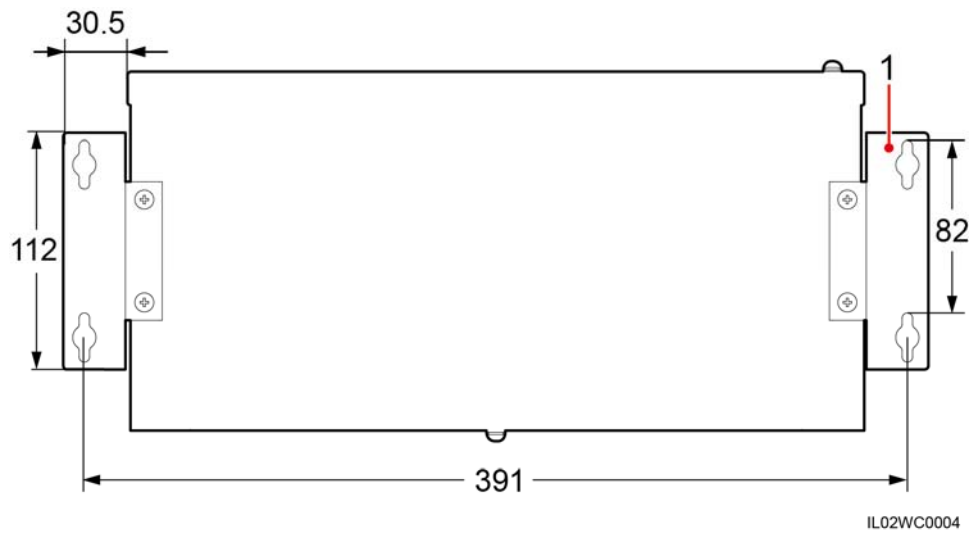
(1) Wall-mounting ears

Bottom of the Shell

Figure 2-4 Bottom view of the SmartLogger
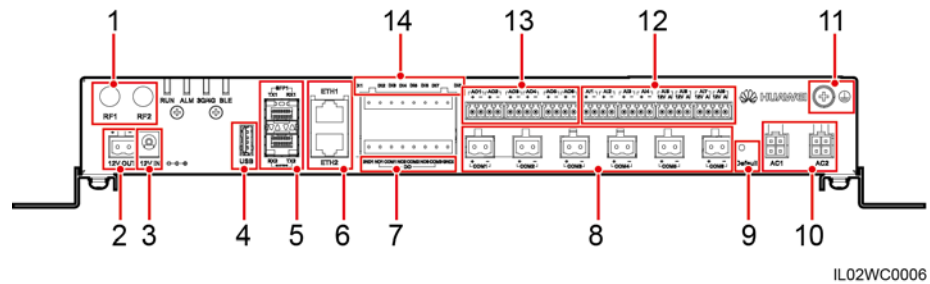
Table 2-2 describes the functions of ports on the SmartLogger.

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.
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–COM6	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	-

No.	Port (Silk Screen)	Function	Description
12	AI1–AI8	Analog input	• SmartLogger2000-10CN: 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

IL02WC0008
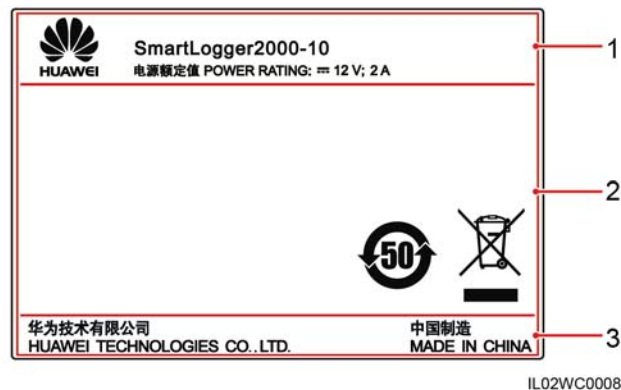
(1) Trademark, product model, and rated power supply specifications

(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 8 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
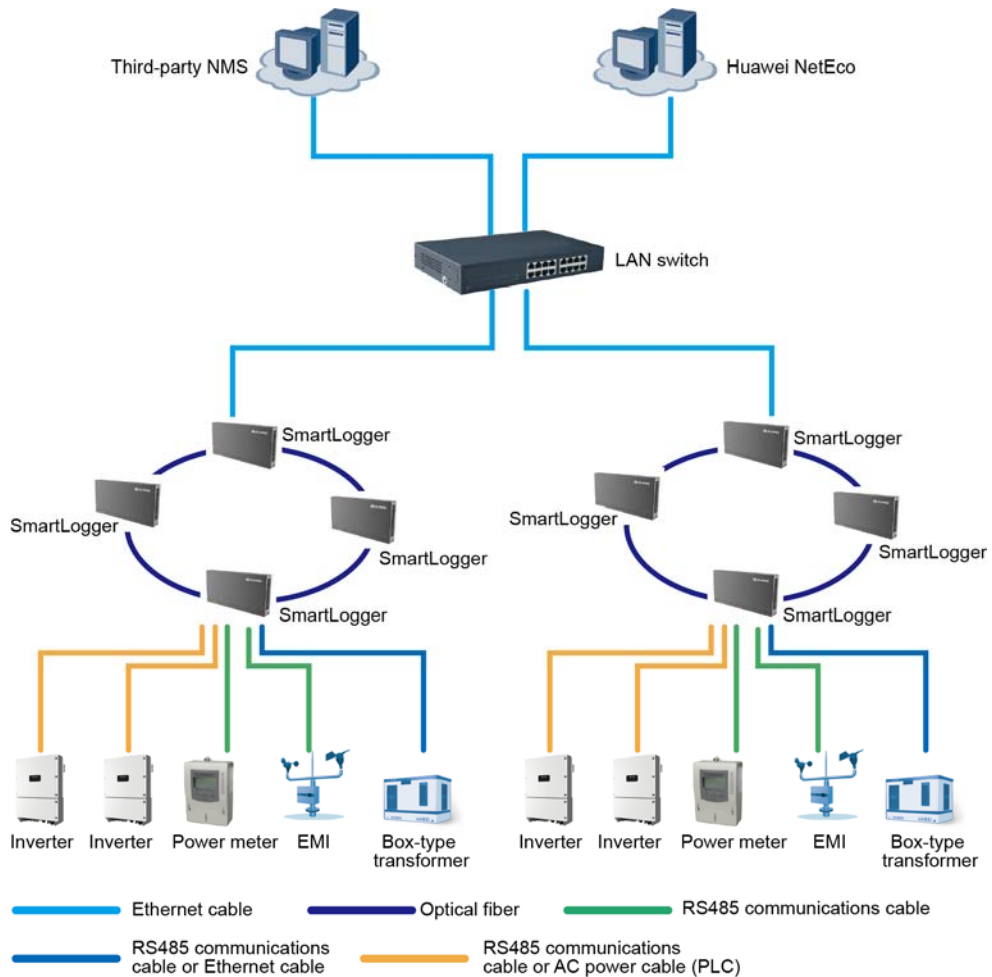
📖 **NOTE**

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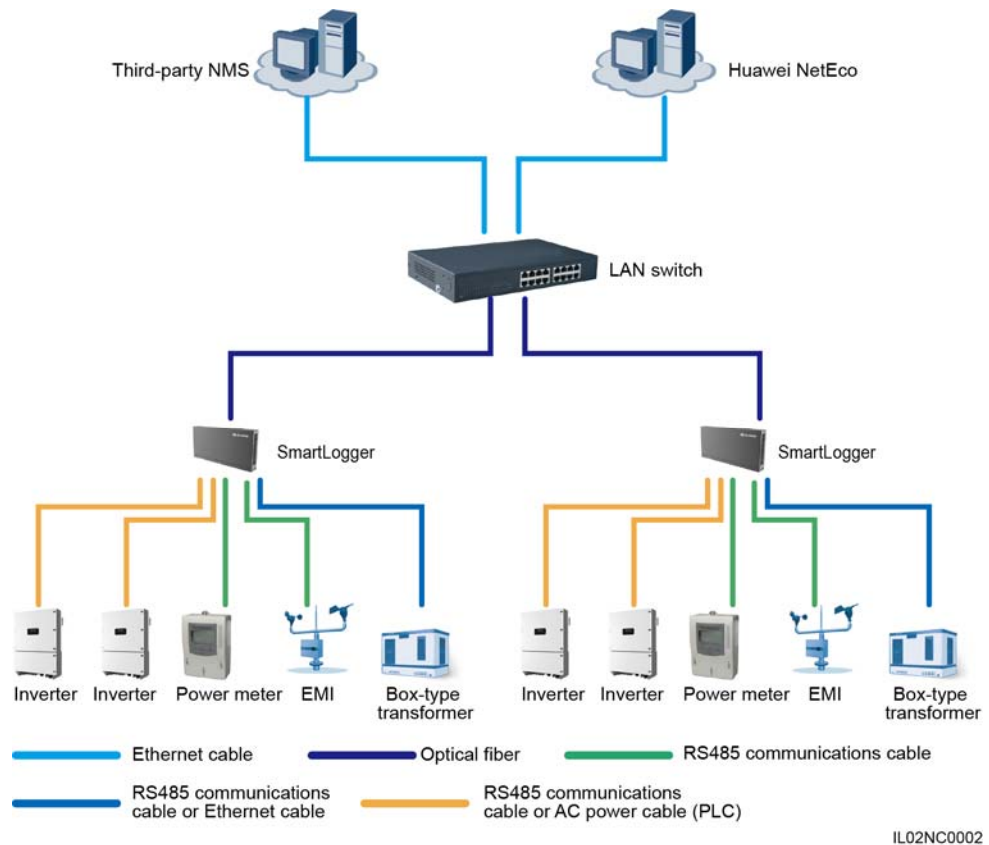
> **NOTE**
>
> - Multiple SmartLoggers can converge over an Ethernet switch and then connect to an NMS.
> - The SmartLogger connects to the Ethernet switch over optical fibers with the maximum communications distance of 12 km in between.

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

IL02NC0003
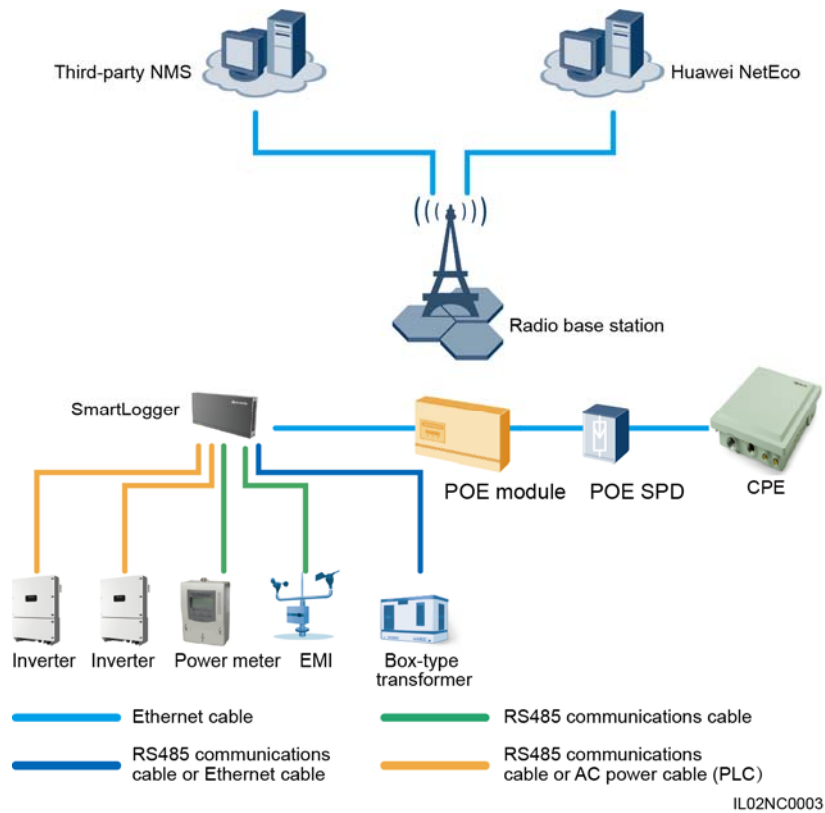
📖 **NOTE**

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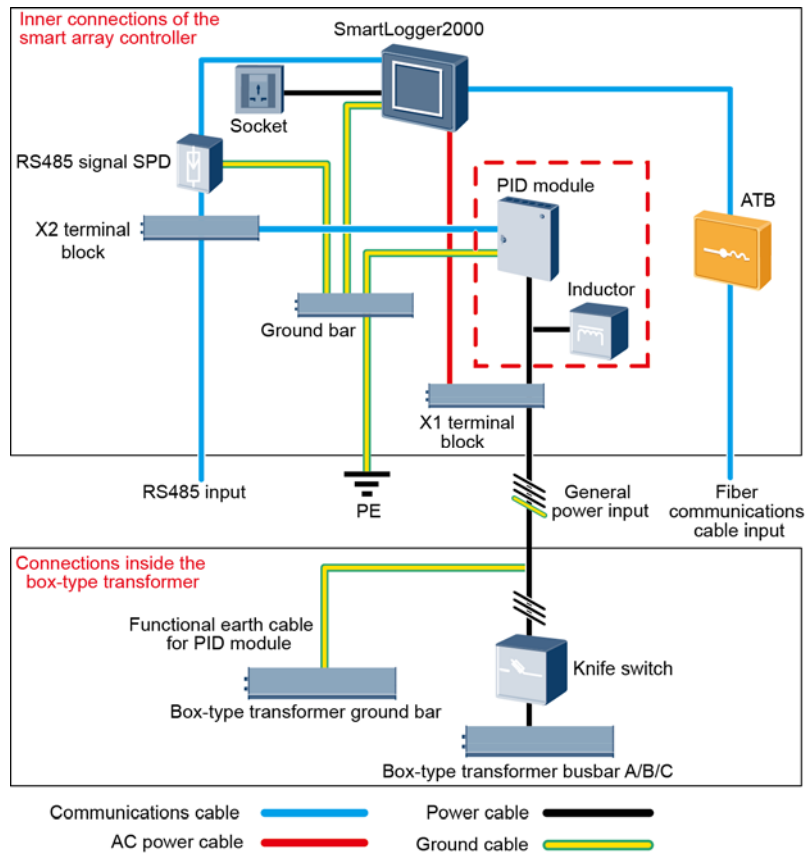
> **NOTE**
>
> The X1 terminal block (general power input and AC output) and X2 terminal block (RS485 communications port) are in the upper part on the rear of the smart array controller.

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
ATB	CT-GZF2PJ-8 or	Optional; can be	1 PCS

Component		Recommended Model or Specifications	Type	Quantity
		CT-GPH-A-8	purchased from Huawei	
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

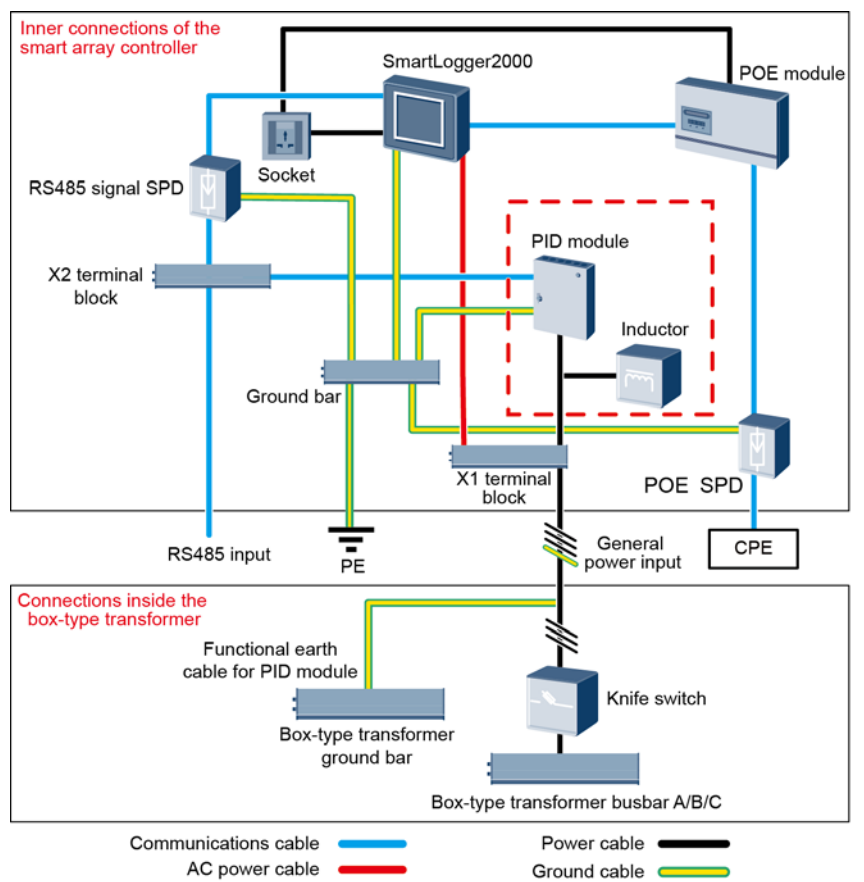| Component		Recommended Model or Specifications	Type	Quantity
PID module (optional)		PID01	Installed before delivery	1 PCS
PID inductor (working with the PID module)		EIFI50ohm	Installed before delivery	1 PCS
SmartLogger		SmartLogger2000	Installed before delivery	1 PCS
RS485 signal SPD		SPM01A	Installed 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
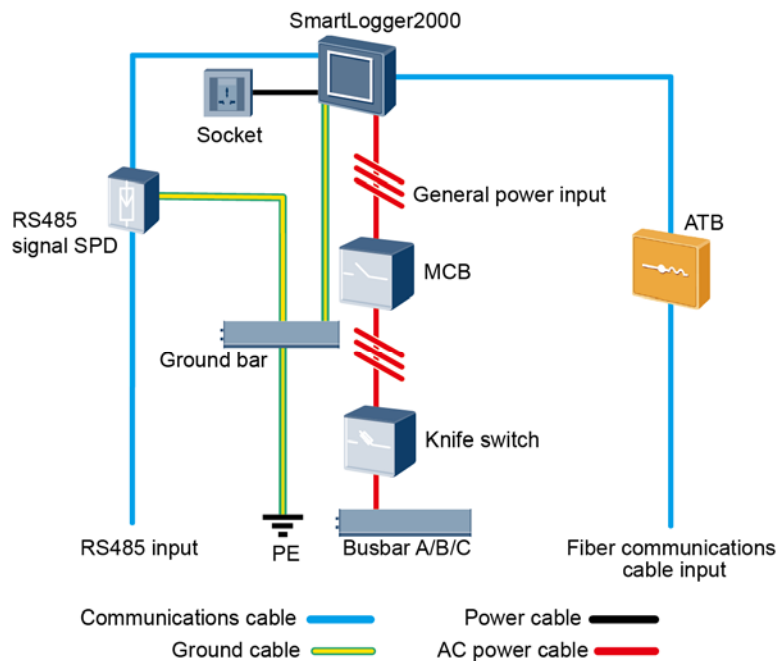
Table 2-6 lists the components required for the fiber+RS485/PLC networking mode in the scenario without a smart array controller.

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
Socket		Matching with the power	Prepared by the	1 PCS

Component	Recommended Model or Specifications	Type	Quantity
	adapter	customer	

📖 **NOTE**

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

Figure 2-12 LTE+RS485/PLC
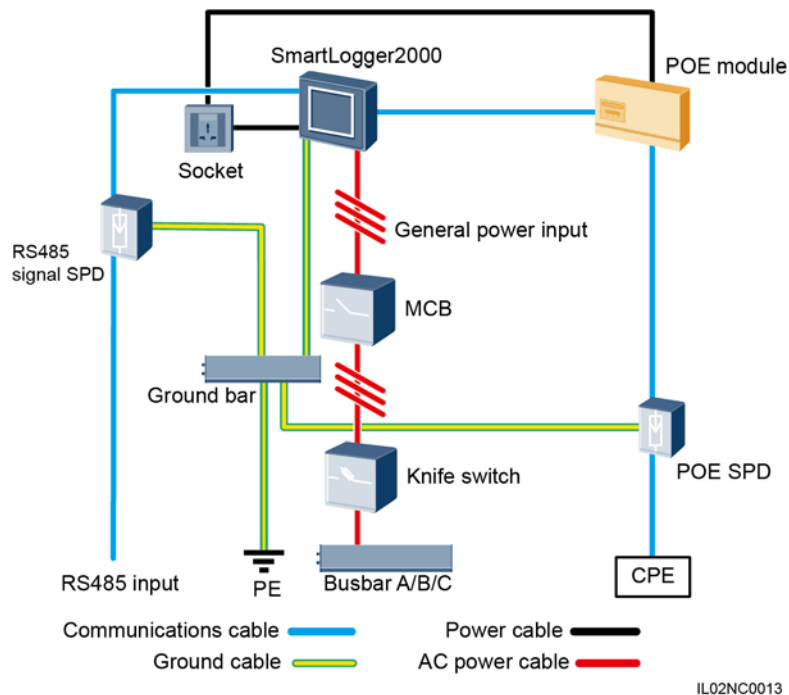
Table 2-7 lists the components required for the LTE+RS485/PLC networking mode in the scenario without a smart array controller.

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

About This Chapter

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

3.2 Preparing Tools

3.3 Determining the Installation Position

3.4 Installing the SmartLogger

3.5 Installing the RS485 signal SPD

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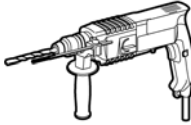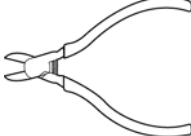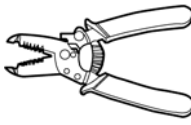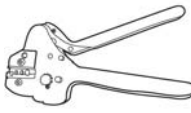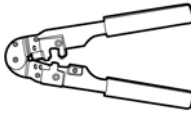
After unpacking the SmartLogger, check whether deliverables are intact and complete. If any damage is found or any component is missing, contact the dealer.
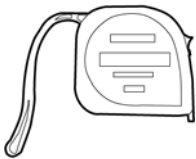
📖 **NOTE**

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
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.

Tools	Model	Function
Flat-head screwdriver	3x100	Tightens screws on the cable terminal block.
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.

Tools	Model	Function
Measuring tape	N/A	Measures distance
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°C to +60°C 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)
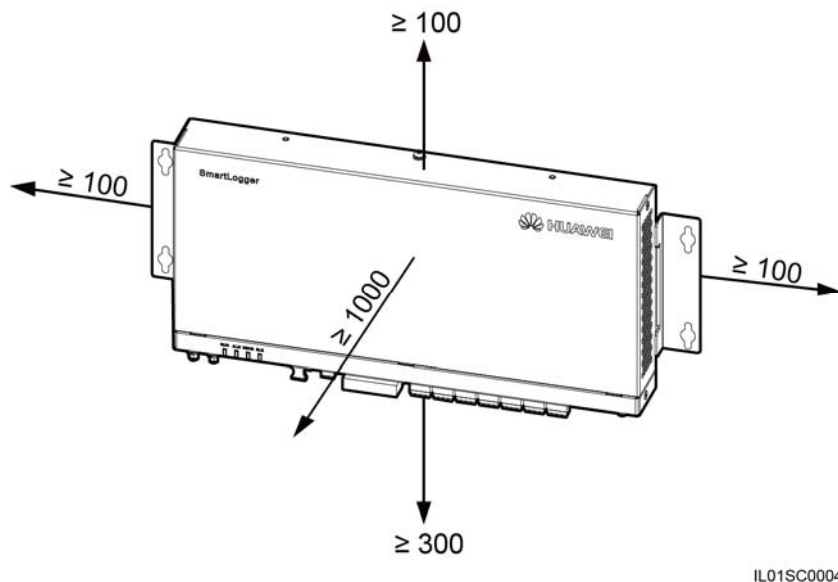
Figure 3-2 The minimum clearance for guide rail–mounting (unit: mm)
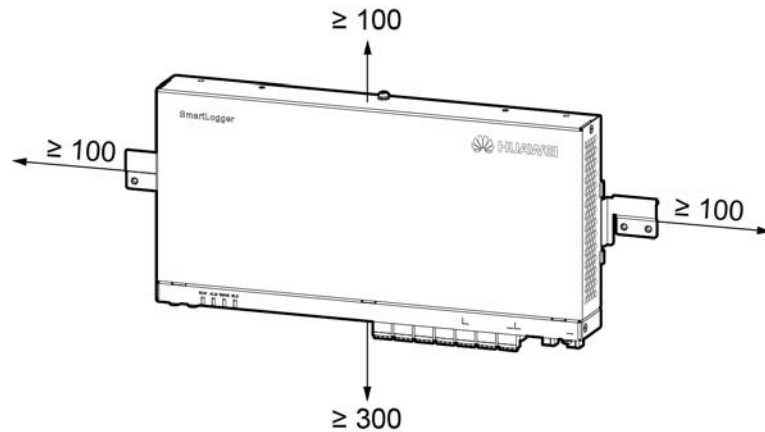
3.4 Installing the SmartLogger

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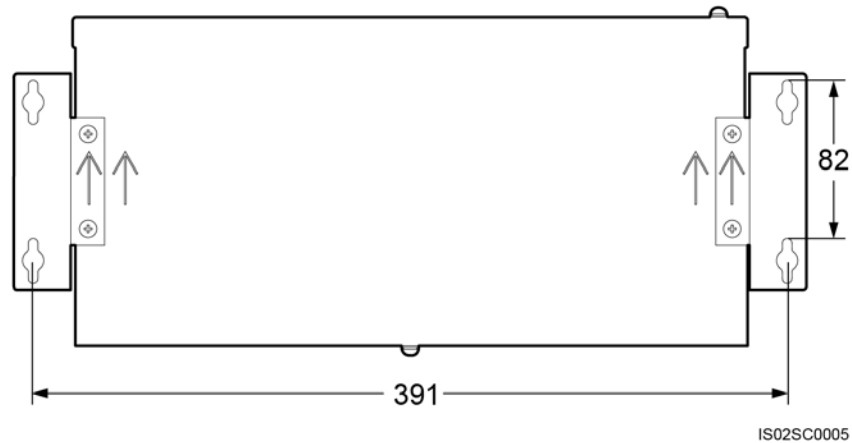
Figure 3-4 shows the screw assembly for wall-mounting:

Figure 3-4 Screw assembly for wall-mounting
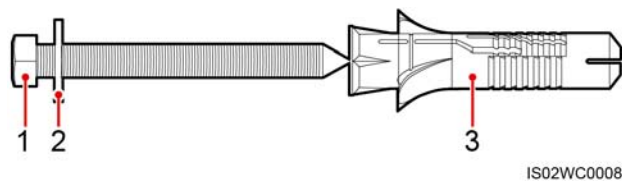
(1) ST3.5 tapping screw	(2) Washer	(3) Expansion sleeve

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)

IL02SC0001
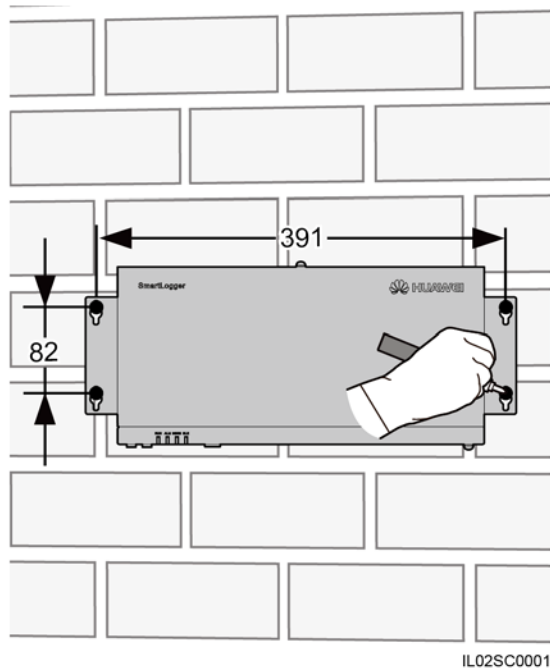
Step 2 Drill holes by using a hammer drill and install expansion sleeves, washers, and tapping screws, as shown in Figure 3-6.

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

IS01HC0073
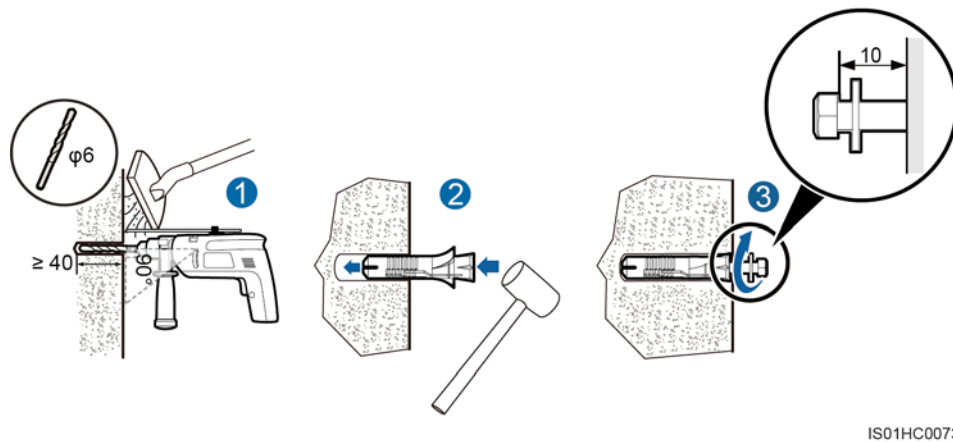
1. Put a hammer drill with a Φ6 mm drill bit on a marked hole position perpendicularly against the wall and drill to a depth greater than or equal to 40 mm.

⚠ **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
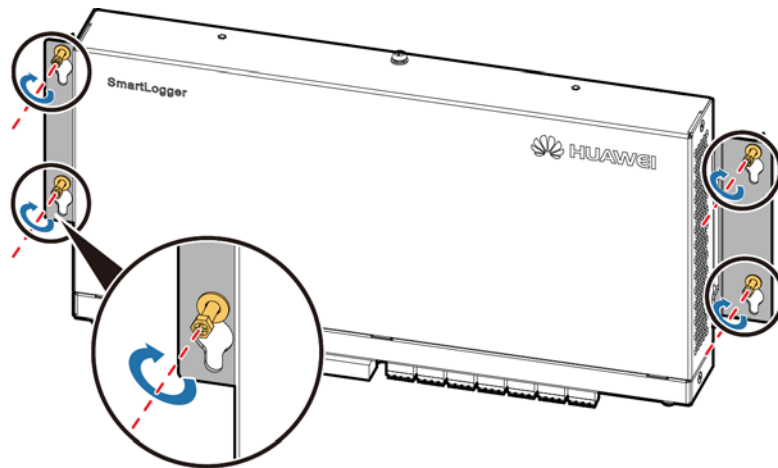
----End

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)

IP10SC0007
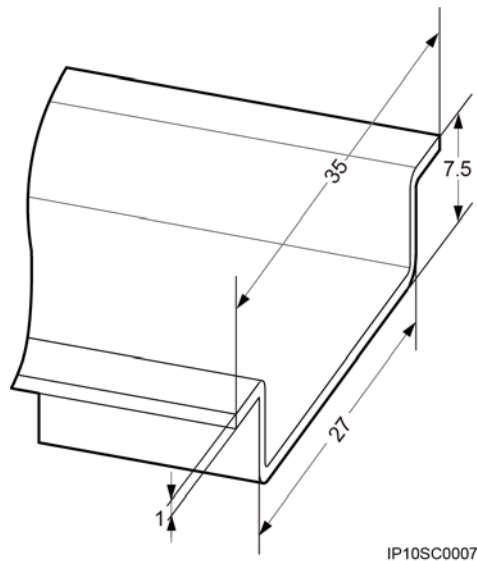
⚠️ **NOTICE**

● 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

IL02HC0001
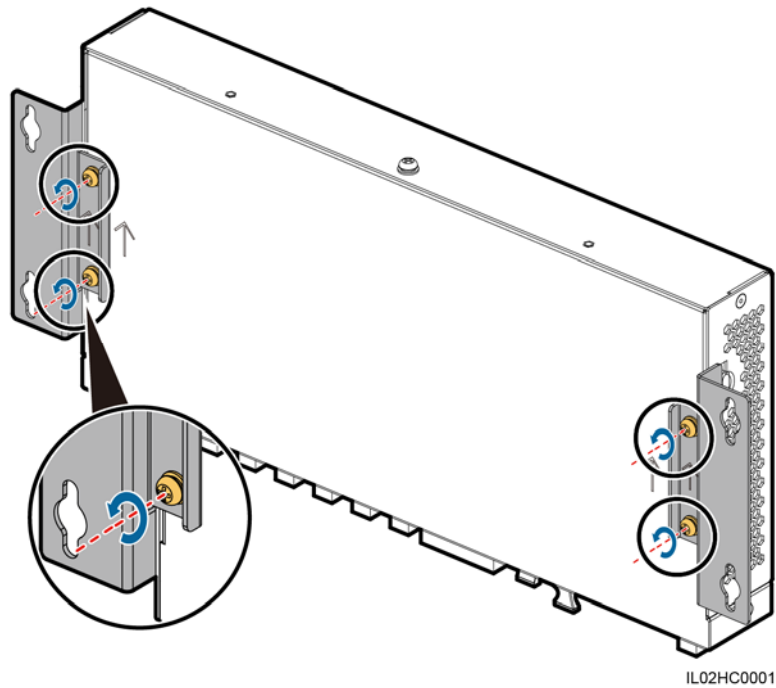
Step 2 Secure the guide rail clamps using M4x8 screws removed from the mounting ears, and tight the screws to a torque of 1.2 N·m, as shown in Figure 3-10.

⚠ **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
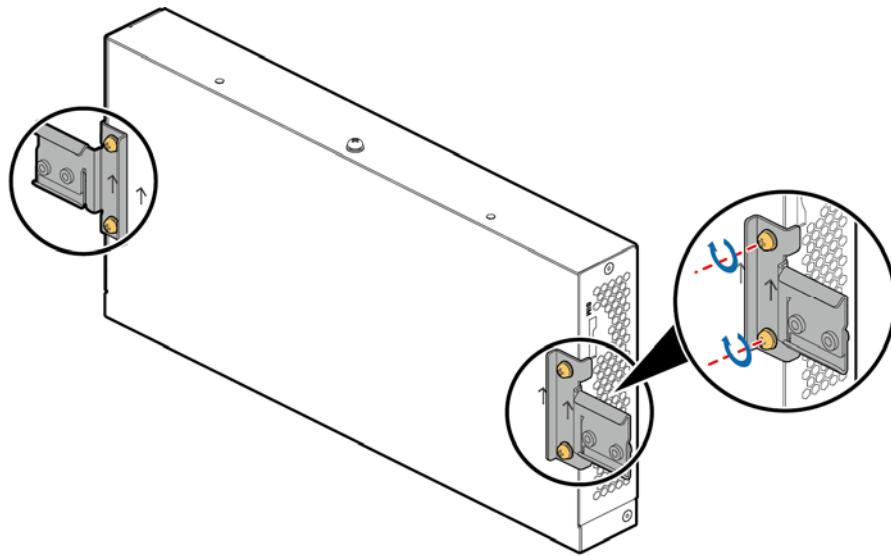
IL02HC0002

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
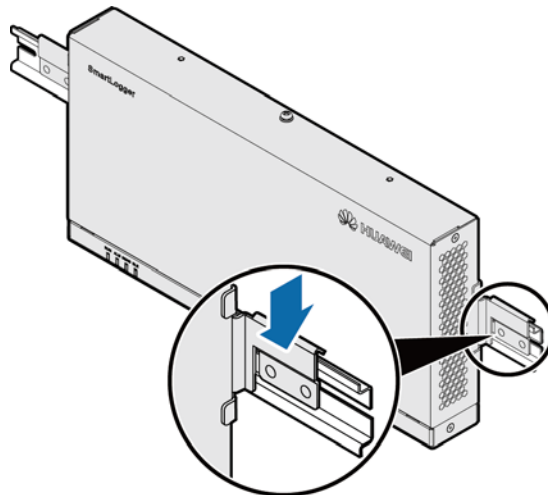
IS01HC0072

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
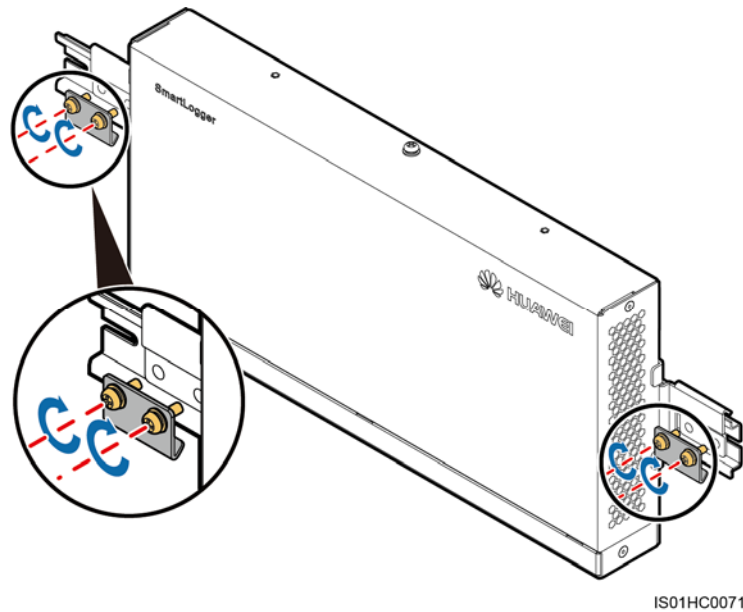
----**End**

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)

IP10SC0007
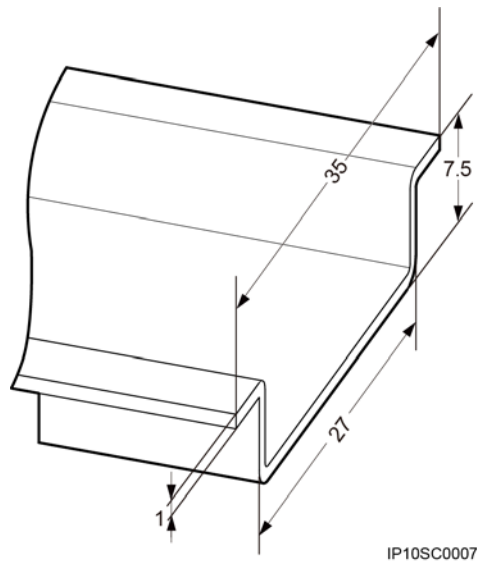
NOTICE

- 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

IL02HC0009
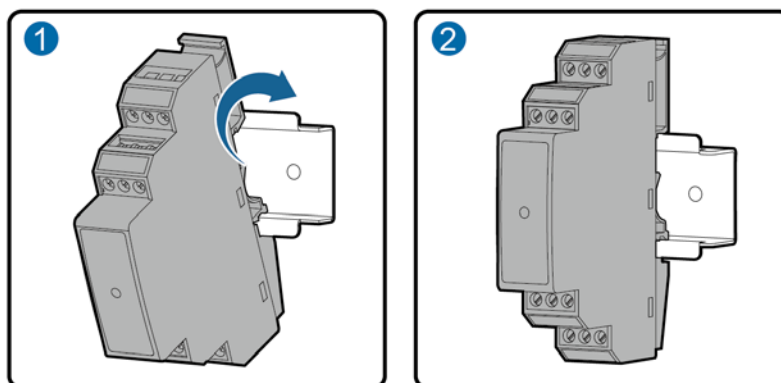
----End

4 Connecting Cables

About This Chapter

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 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

4.2 Connecting the PE Cable

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

4.3 Connecting the RS485 signal SPD

4.4 Connecting Inverters

4.5 Connecting an EMI

4.6 Connecting a Power Meter

4.7 Connecting the Box-type Transformer

4.8 Connecting a PID Module

4.9 Connecting a Ripple Control Receiver

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
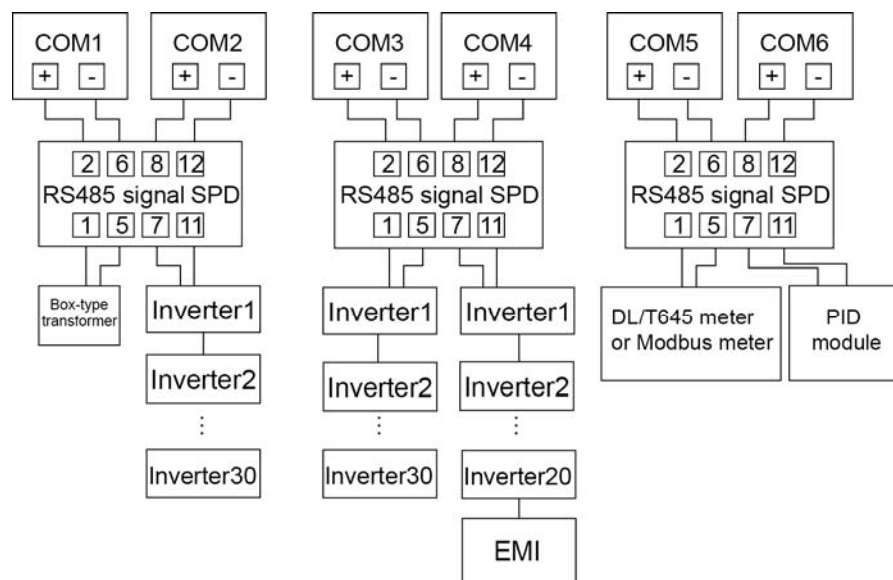
4.2 Connecting the PE Cable

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 (unit: mm)

IS01ZC0002
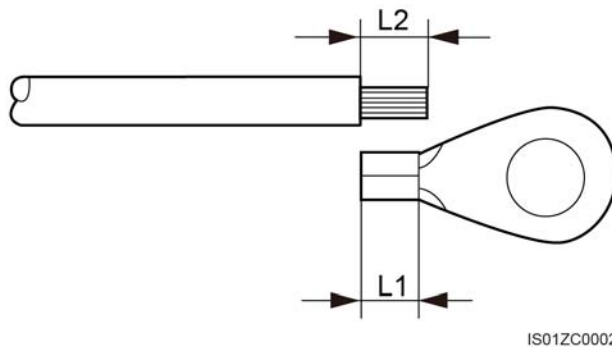
📖 **NOTE**

> The length of removed insulation layer (L2) must be 2–3 mm longer than the cable crimping length of the OT terminal (L1).

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)

IS01ZC0003
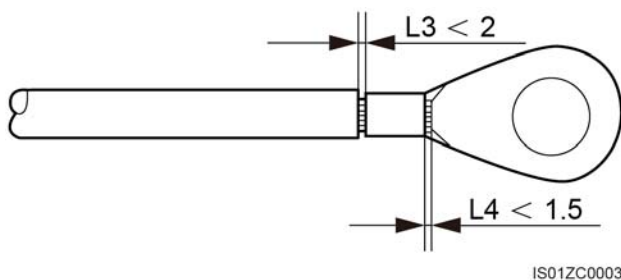
📖 **NOTE**

> 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
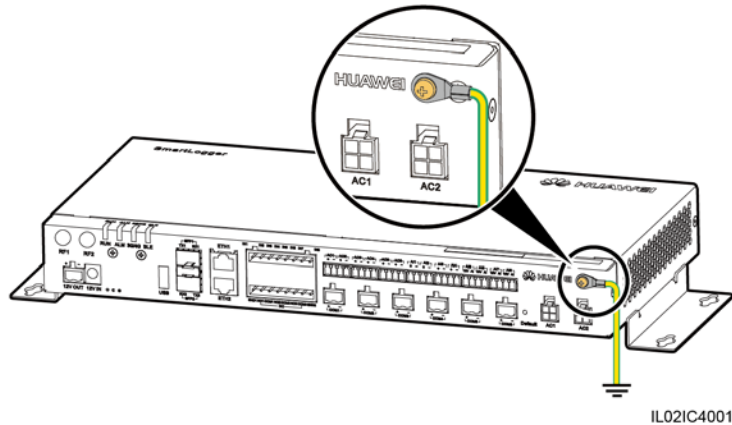
IL02IC4001

☐ 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

IL02IC1001
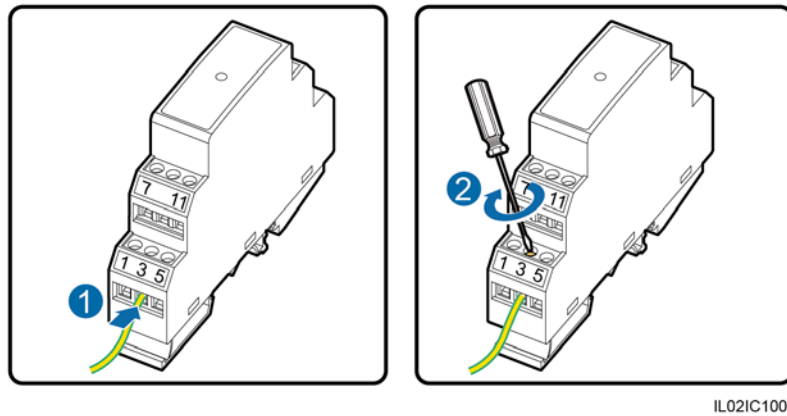
Step 3 Use a flat-head screwdriver to tighten the screws on port 3, as shown by (2) in Figure 4-5.

📖 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

IS02W00003
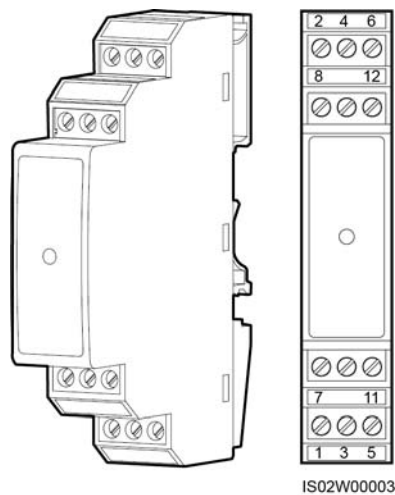
Table 4-1 describes the surge protection ports.

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)

IS01ZC0036

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

Figure 4-8 Connecting the terminal block
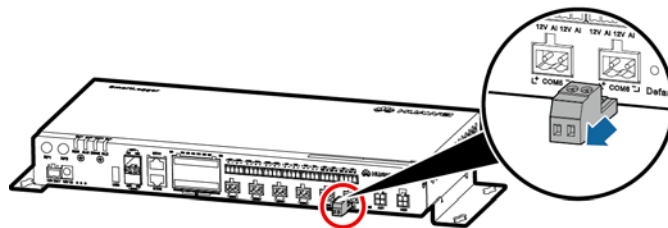
IL02H00004

📖 **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
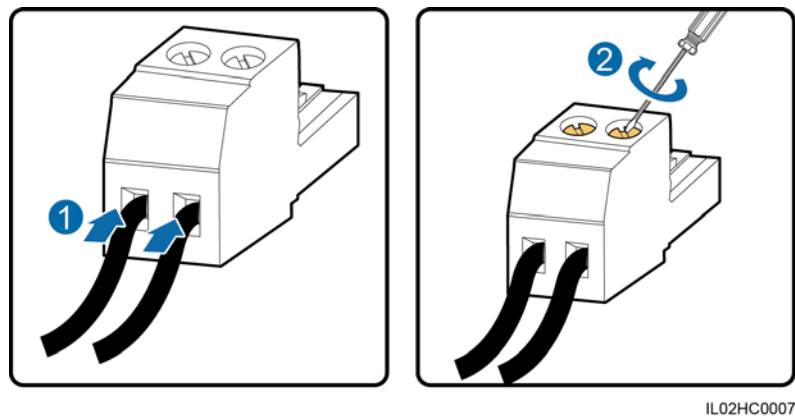
IL02HC0007

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

IL02IC1003
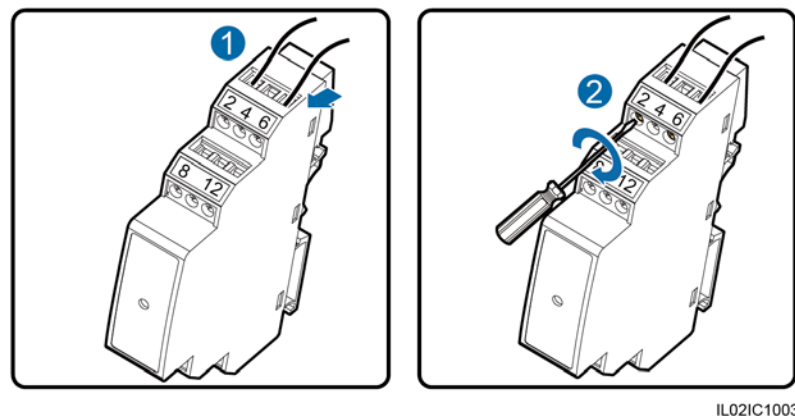
⚠ **NOTICE**

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
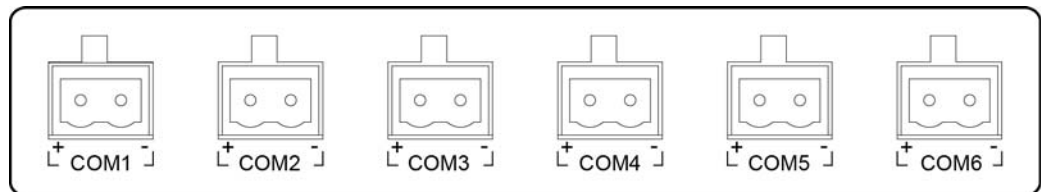
IL02WC0010

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 SUN2000-50KTL/50KTL-C1 is connected in a different way from the terminal blocks of other models of inverters.

  - **SUN2000-50KTL/50KTL-C1**

    Figure 4-12 shows the position of the terminal block in the SUN2000-50KTL/50KTL-C1. Figure 4-13 describes the functions.

    Figure 4-12 Position of the terminal block in the SUN2000
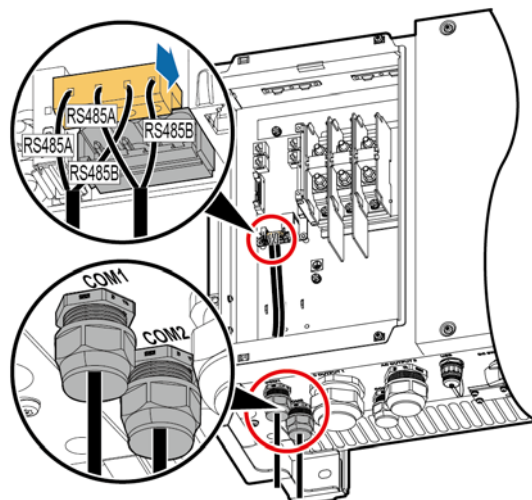
IS03IC1003

Figure 4-13 Terminal block

IS03WC0009
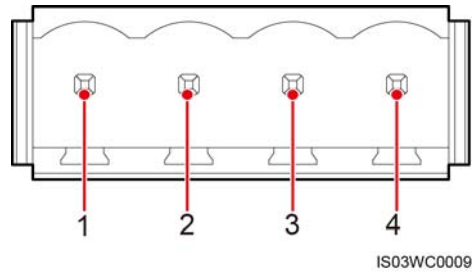
Table 4-3 Functions of the RS485 terminal block

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 4-14 shows the position of the terminal block in the SUN2000-33KTL/40KTL. Figure 4-15 describes the functions.

Figure 4-14 Position of the terminal block in the SUN2000
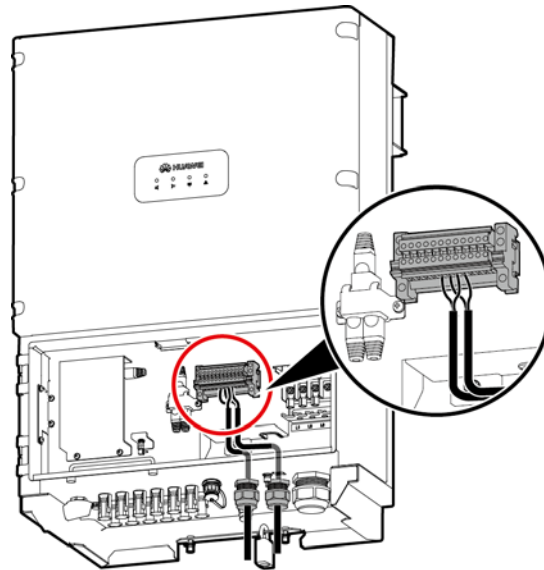
IS01IC0025

Figure 4-15 Terminal block
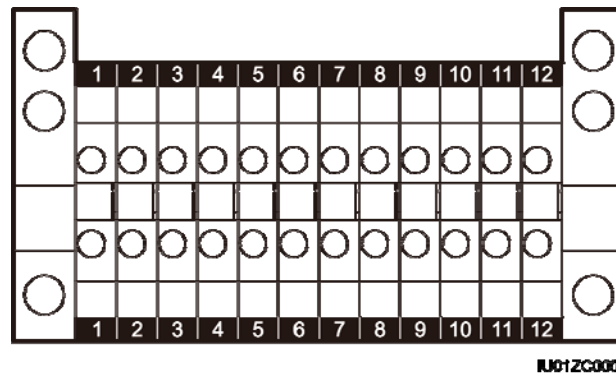
IU01ZC0001

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 4-16.

Figure 4-16 RS485 RJ45 connector of the SUN2000 (side view without the fastener)
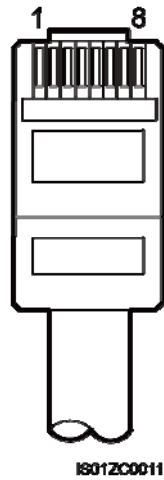
Table 4-5 lists the wire colors and functions.

Table 4-5 Wire colors and functions

No.	Color	Function
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 4-17 shows how to connect the SmartLogger to the SUN2000 through an RS485 signal SPD.

Figure 4-17 Connecting the SmartLogger to the SUN2000
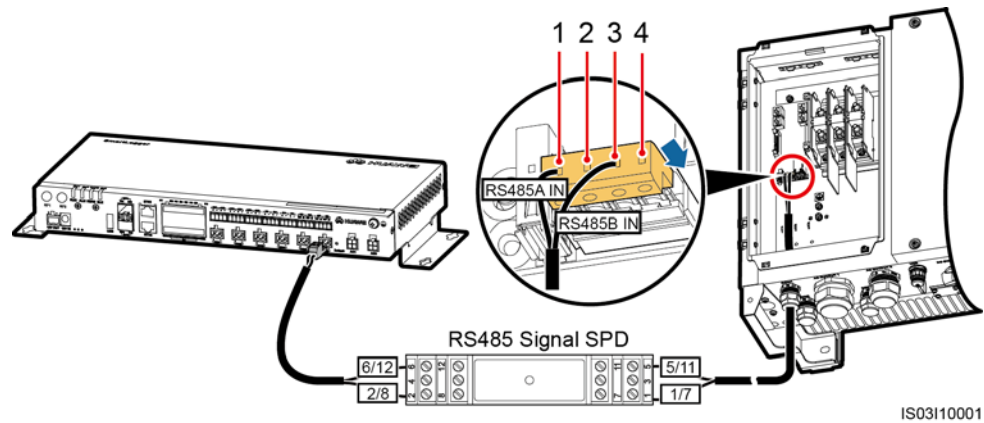
| (1) RS485A IN | (2) RS485A OUT | (3) RS485B IN | (4) RS485B OUT |

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 4-18.

Figure 4-18 Stripping an RS485 communications cable (unit: mm)
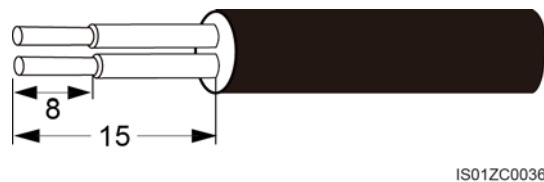
Step 3 Insert the bare cable cores into the Surge port of the RS485 signal SPD, as shown by (1) in Figure 4-19.

Figure 4-19 Connecting the Surge port of the RS485 signal SPD

IL02IC1002
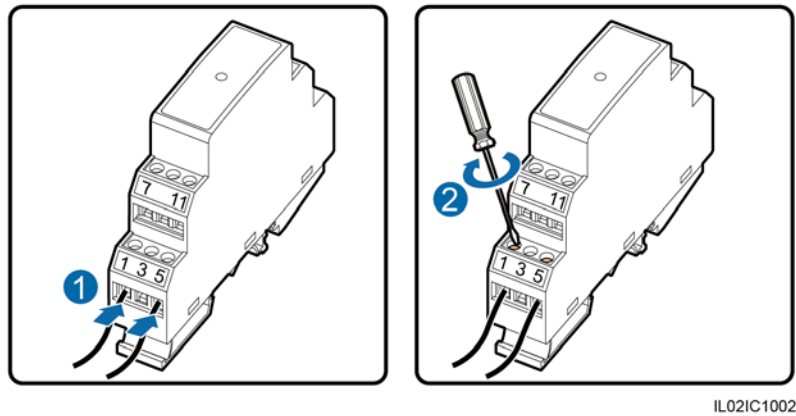
> ⚠️ **NOTICE**
>
> Verify that the **RS485A (IN)** port on the SUN2000 is connected to Surge port 1 or 7 on the RS485 signal SPD, and that the **RS485B (IN)** port on the SUN2000 is connected to Surge port 5 or 11 on the RS485 signal SPD.

Step 4 Use a flat-head screwdriver to tighten the screws on the Surge ports, as shown by (2) in Figure 4-19.

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 4-20.

Figure 4-20 Connecting an AC power cable to the SmartLogger
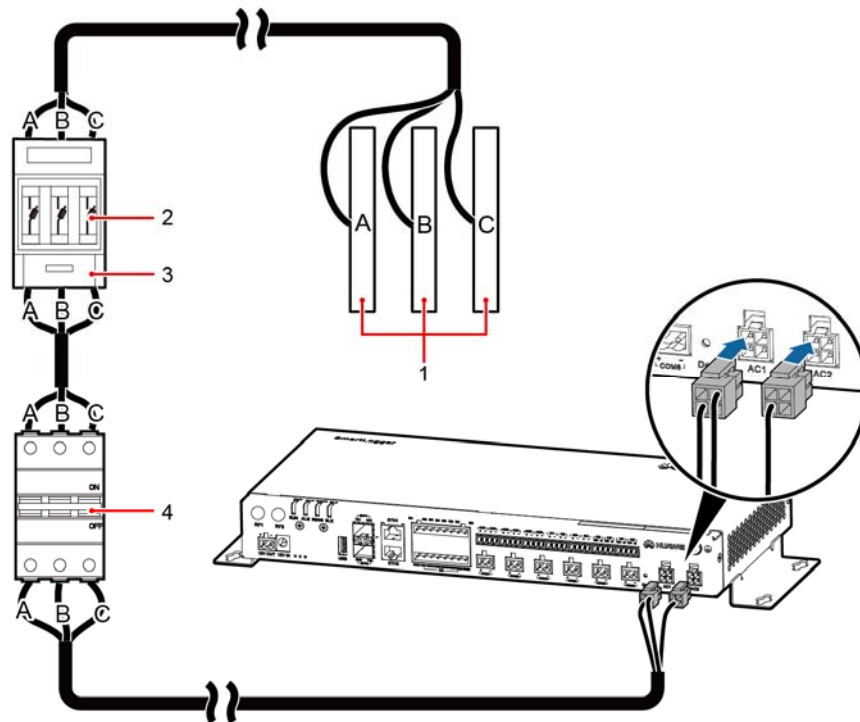
IP11ZC0006

Table 4-6 describes the components shown in Figure 4-20.

Table 4-6 Component

No.	Component	Item	Quantity
1	Busbar A/B/C	-	1 PCS
2	Fuse	Rated voltage: $\geq$ 500 V; rated current: 6 A	3 PCS
3	Knife switch box	Rated voltage: $\geq$ 500 V; rated current: $\geq$ 6 A; number of phases: three	1 PCS
4	MCB	Rated voltage: $\geq$ 500 V; rated current: $\geq$ 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 4-21 shows the wiring terminals of the RS485 ports of the SUN8000.

Figure 4-21 RS485 wiring terminals for the SUN8000
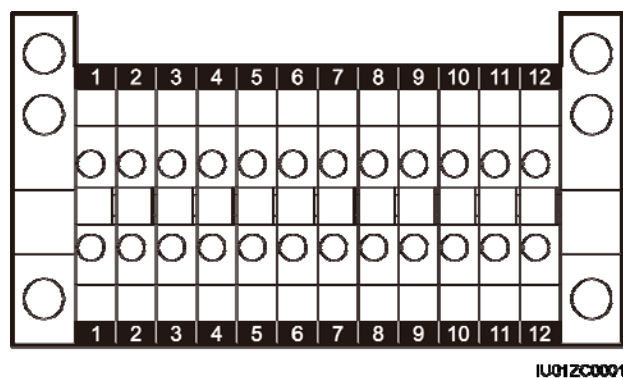
Ports 07, 08, 09, 10, 11, and 12 are communications ports. Table 4-7 describes the functions of these ports.

Table 4-7 Port description

No.	Function	Description
07	S485A	RS485A, RS485 differential signal + (reserved)
08	S485B	RS485B, RS485 differential signal - (reserved)
09	N485A_OUT	RS485A, RS485 differential signal +
10	N485A_IN	RS485A, RS485 differential signal +
11	N485B_OUT	RS485B, RS485 differential signal -
12	N485B_IN	RS485B, RS485 differential signal -

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 4-22 shows how to connect the SmartLogger to the SUN8000 through an RS485 signal SPD.

**Figure 4-22** Connecting the SmartLogger to the SUN8000
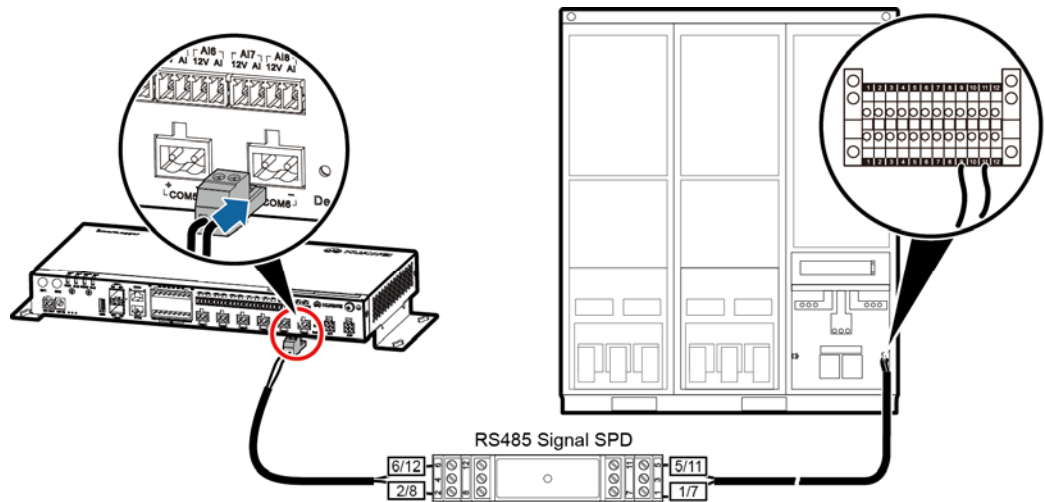
Procedure

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 4-23.

Figure 4-23 Connecting the Surge port of the RS485 signal SPD
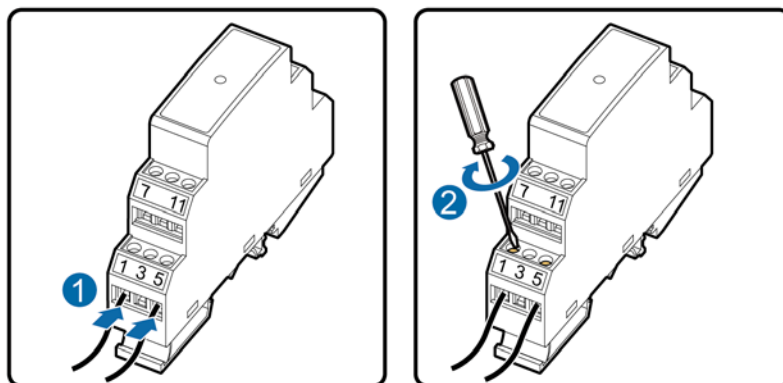
⚠ **NOTICE**

Verify that the **N485A_IN** port on the SUN8000 is connected to Surge port 1 or 7 on the RS485 signal SPD, and that the **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 4-23.

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 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 4-24 shows the connection.

Figure 4-24 Connecting the SmartLogger to multiple inverters
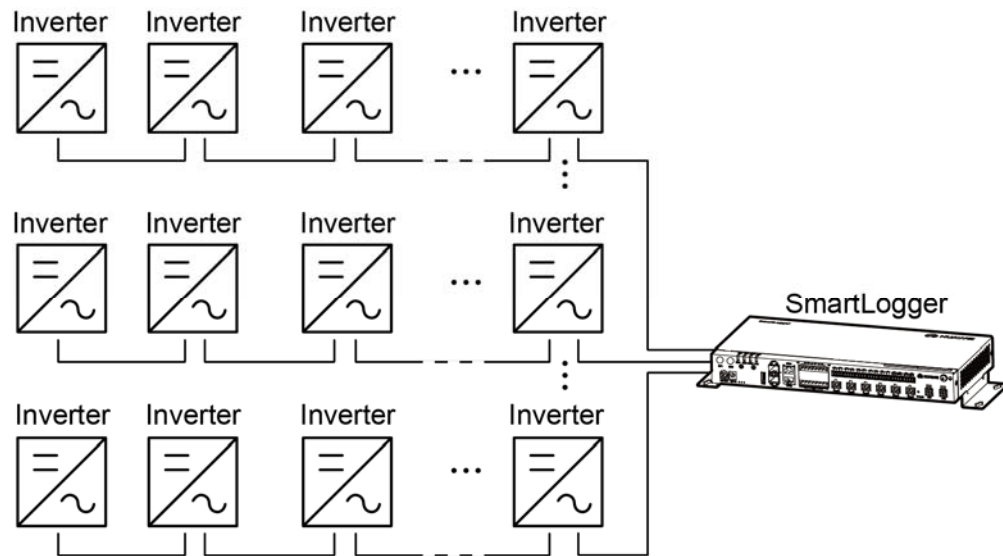
IL01NC0014

☐ 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 **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 4-25 shows the method for connecting the SmartLogger to multiple SUN2000s over an AC power cable.

Figure 4-25 PLC networking

IL01LC0003
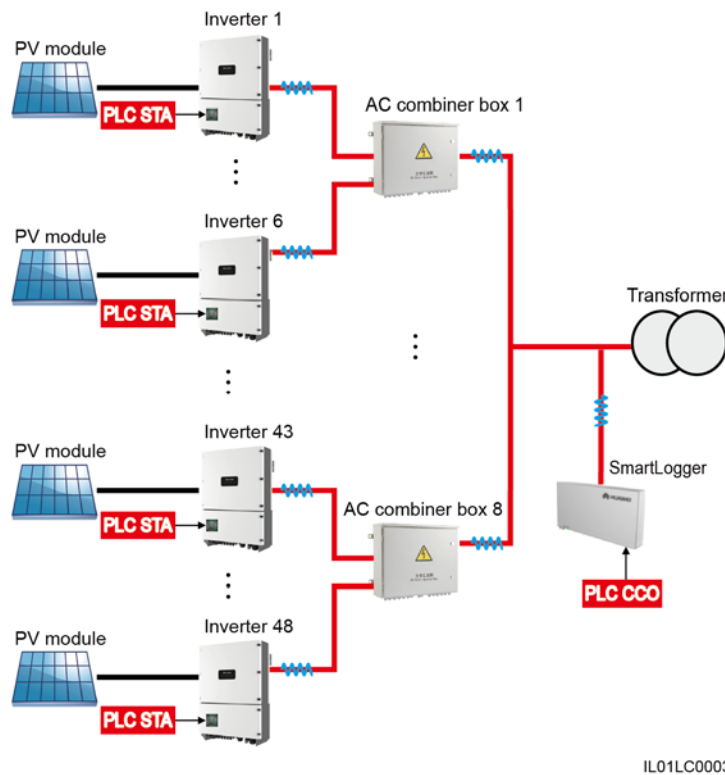
📖 **NOTE**

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 4-26 shows how to connect the SmartLogger to an EMI through an RS485 signal SPD.

Figure 4-26 Connecting the SmartLogger to the EMI
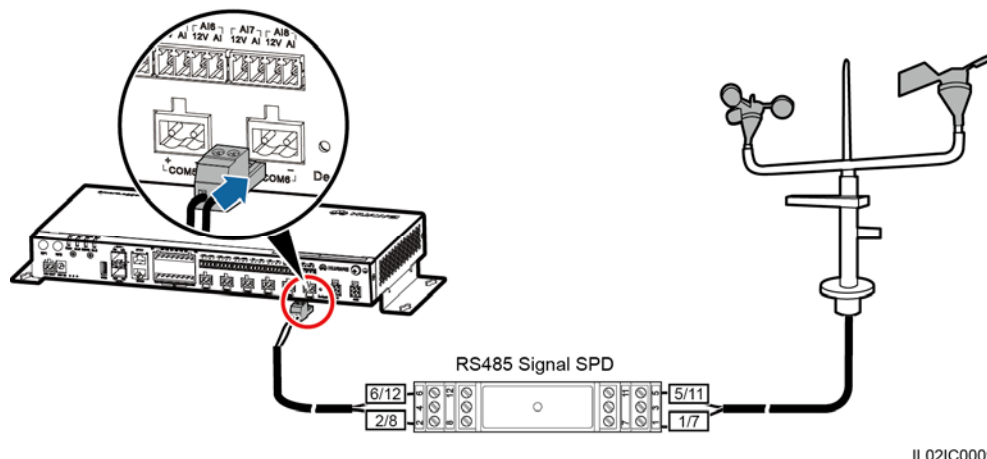
Procedure

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 4-27 shows how to connect the SmartLogger to a power meter.

Figure 4-27 Connecting a Power Meter
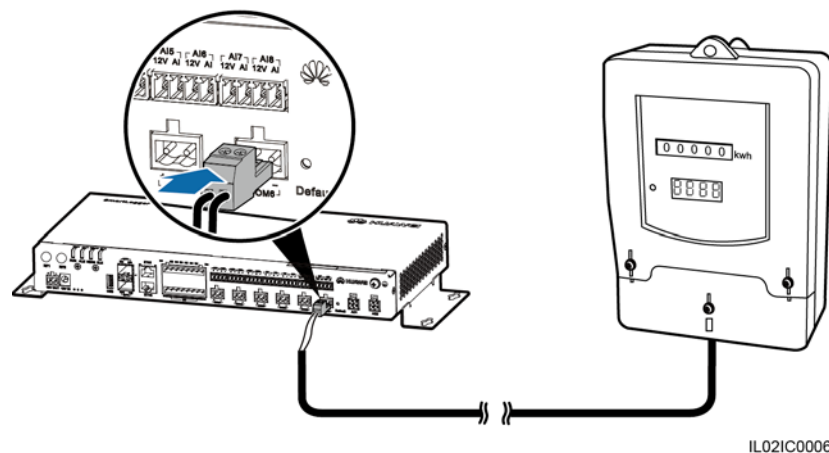
📖 **NOTE**

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 Setting 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 Setting RS485 Parameters.

- A power meter cannot be detected automatically. You need to add this device manually. For details, see Connecting a Device.

- 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.

----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 4-28 shows how to connect the SmartLogger to the box-type transformer through an RS485 signal SPD.

Figure 4-28 Connecting the SmartLogger to the box-type transformer
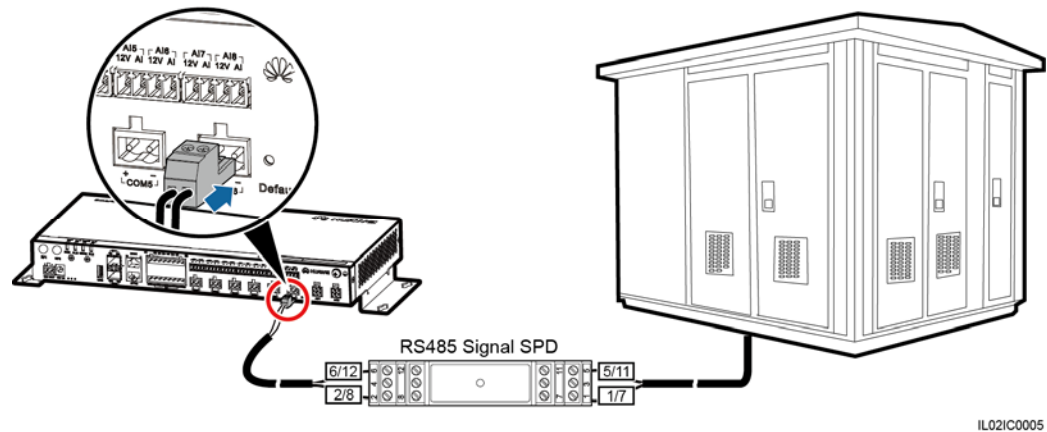
📖 **NOTE**

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 Custom 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 4-29 shows how to connect the SmartLogger to the PID module.

Figure 4-29 Connecting the SmartLogger to the PID module

IL02IC0005
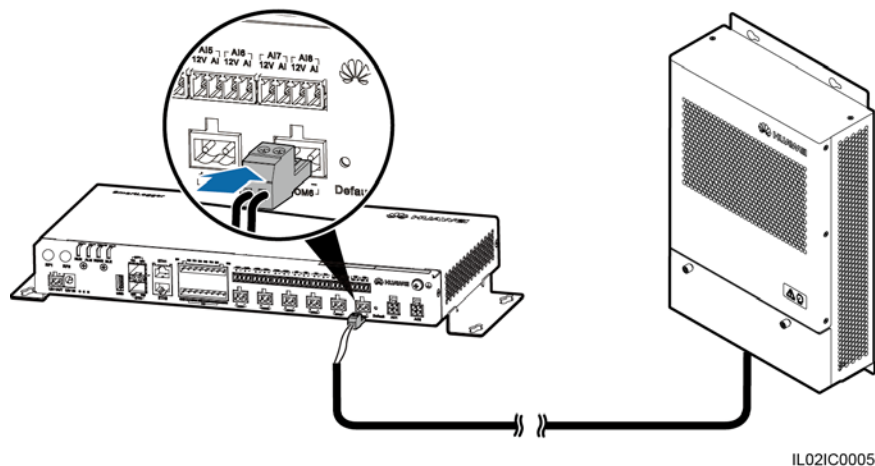
☐ NOTE

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 the COM port of the SmartLogger. For details about the operation, see Step 1–Step 5 in 4.3 Connecting the RS485 signal SPD.

![NOTICE icon]

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 PID.

- 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 Connecting a Device.

----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 4-30 shows the DI ports of the SmartLogger.

Figure 4-30 DI ports of the SmartLogger
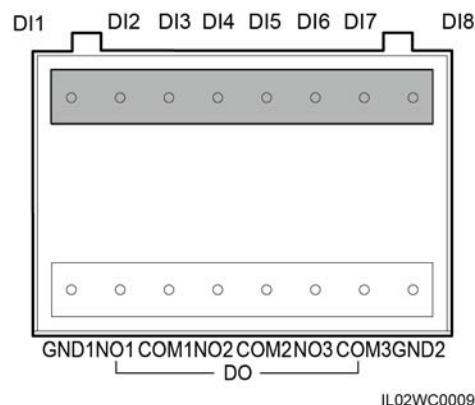
Table 4-8 describes the DI ports.

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 4-31 shows how to connect the SmartLogger to a Ripple Control Receiver.

Figure 4-31 Connecting a Ripple Control Receiver

IL02IC0012
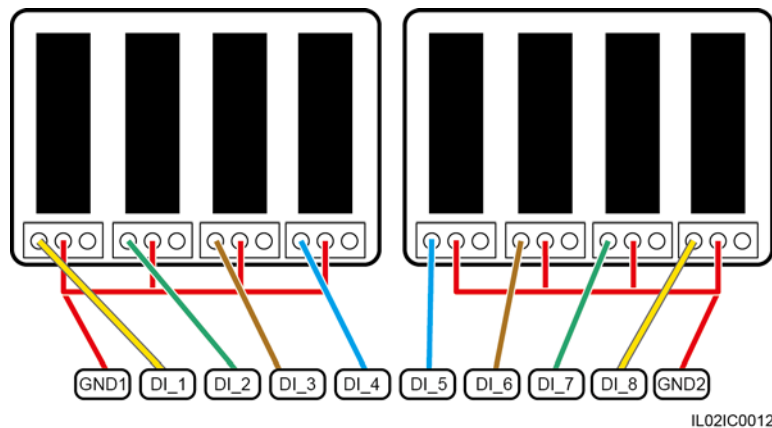
Procedure

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 4-32.

    Figure 4-32 Cable connection for the terminal block
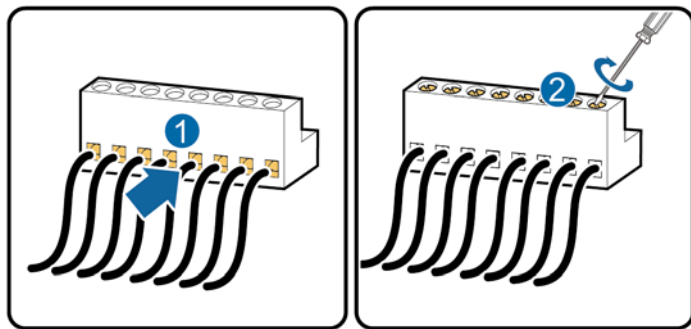
Step 5 Use a flat-head screwdriver to tighten the screws on the terminal block, as shown by (2) in Figure 4-32.

Step 6 Insert the terminal block into the SmartLogger DI port, as shown in Figure 4-33.

    Figure 4-33 Connecting the terminal block
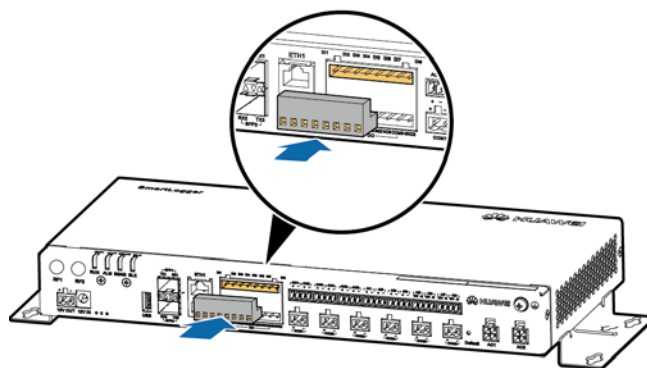
⚠ **NOTICE**

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 4-34.

Figure 4-34 Connecting an Ethernet network cable
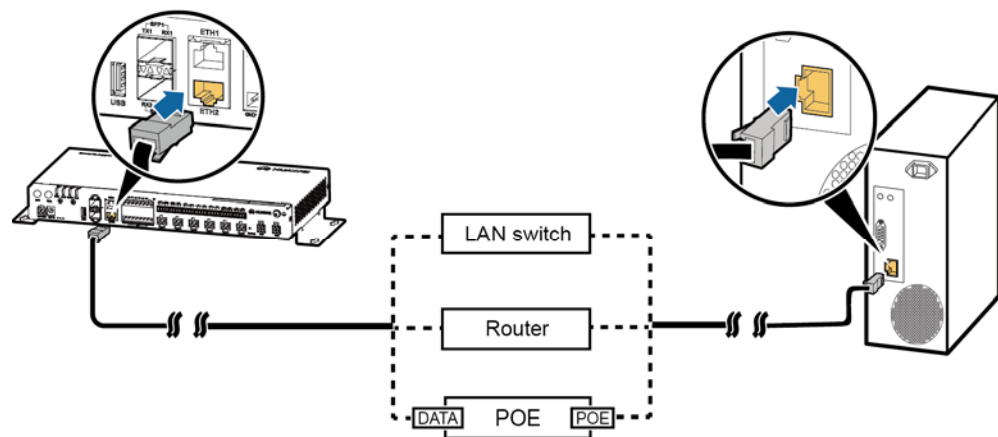
📖 **NOTE**

- 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 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.

⬚ NOTE
- An optical module is optional. An optical module with a transmission speed of 100 Mbps and an optical fiber length within 12 km is recommended.

- 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.

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 4-35.

Figure 4-35 Connecting an ATB
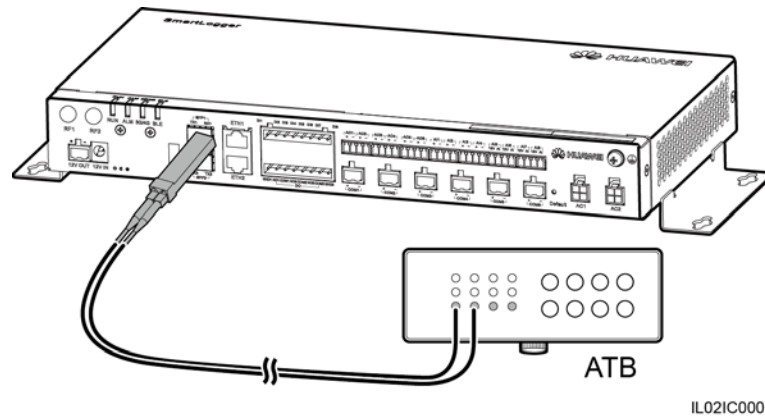
Step 4 Determine the operating status based on the Ethernet optical port indicators, as shown in Table 4-9.

Figure 4-36 Ethernet optical port indicators
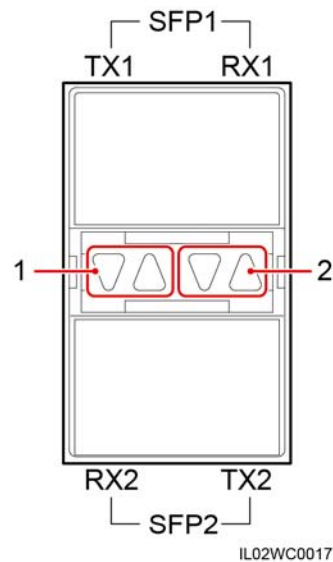
Table 4-9 Blinking status of the Ethernet optical port indicators

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.
	Green steady on and yellow blinking slowly (0.1s on and	Optical fiber communication is in progress.

Indicator	Status	Meaning
	1.9s off)	

----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

About This Chapter

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

No.	Check Item	Check Result
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**
> - 1. 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
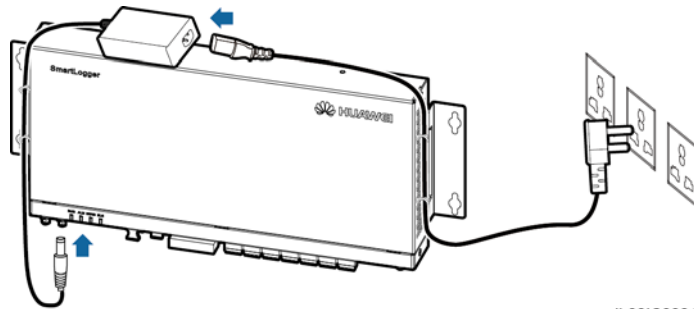
Step 4 Switch on the circuit breaker of the AC socket.

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

About This Chapter

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 *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 Maintenance

About This Chapter

This topic describes how to perform daily maintenance and troubleshooting to ensure long-term proper operation of the SmartLogger.

This topic describes the daily maintenance for the SmartLogger.

7.1 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.

7.2 Troubleshooting

Table 7-1 describes the common faults and the troubleshooting measures for the SmartLogger.

Table 7-1 Common fault list

No.	Symptom	Possible Cause	Measures
1	The SmartLogger cannot be powered	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	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

No.	Symptom	Possible Cause	Measures
	on.	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.	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.
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	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

No.	Symptom	Possible Cause	Measures
		changed. 4. The device is replaced. 5. The device is no longer connected.	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.
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.

7.3 Alarms

Table 7-2 describes the common alarms and the troubleshooting measures for the SmartLogger.

Table 7-2 Alarms

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	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**

Alarm ID	Alarm	Alarm Severity	Alarm Sub-ID	Causes	Measure
				currents beyond the configuration range.	**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.
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	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

Alarm ID	Alarm	Alarm Severity	Alarm Sub-ID	Causes	Measure
				four DI ports read commands beyond the configuration.	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.
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**.

8 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.

9 Certification Declaration

9.1 CE

Hereby, Huawei Technologies Co., Ltd., declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

9.2 FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

⚠ **NOTICE**

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

10 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	–40ºC to +60ºC
Storage temperature	–40ºC to +85ºC
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 1ºC 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

ETH   Ethernet

L

LED   Light-emitting Diode

P

PLC   Power Line Communication

R

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