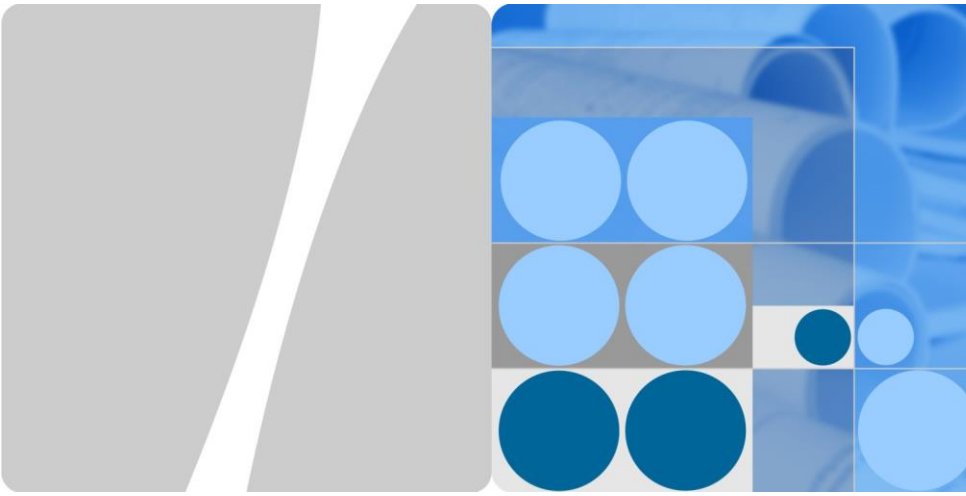


SmartLogger2000
Quick Guide

Issue: 05
Part number: 31508122
Date: 2019-06-30

HUAWEI TECHNOLOGIES CO., LTD.

HUAWEI

NOTICE

1. The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents. However, all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.
2. Before installing the device, carefully read the *SmartLogger2000 User Manual* to get familiar with the product information and precautions. SmartLogger is short for SmartLogger2000 in the following text.
3. Install and use the device according to this document and the user manual. Otherwise, the device may be damaged. Use insulated tools when installing the device.
4. When the SmartLogger is applied in a non-Huawei smart array controller (smart array controller for short), install it in the third-party cabinet. This section describes the installation and cable connection operations using the SmartLogger in non-Huawei smart array controller scenario as an example.

1 Overview

1.1 Model Description

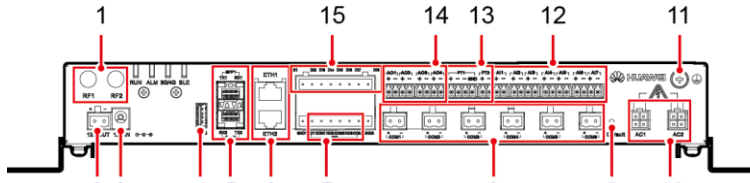
Model	Description	Model	Description
SmartLogger2000-10	10: with a built-in 500 V AC PLC (MBUS) central coordinator (CCO)	SmartLogger2000-10-C	• 10-C: with a built-in 800 V AC PLC (MBUS) central coordinator (CCO) • 11-C: with no built-in PLC (MBUS) CCO
SmartLogger2000-10-B	• 10-B: with a built-in 500 V AC PLC (MBUS) central coordinator (CCO) • 11-B: with no PLC (MBUS) CCO	SmartLogger2000-11-C	
SmartLogger2000-11-B		N/A	N/A

NOTE

- The SmartLogger with a built-in PLC (MBUS) CCO can work with the SUN2000 integrated with the PLC (MBUS) station (STA) to implement PLC (MBUS) networking.
- If the SmartLogger with no built-in PLC (MBUS) CCO needs to work with the SUN2000 integrated with the PLC (MBUS) STA to implement PLC (MBUS) networking, an external PLC (MBUS) CCO needs to be connected.
- The Bluetooth module embedded in the SmartLogger2000-10 supports only the Android app. The Bluetooth modules embedded in other models of SmartLoggers support both the Android app and the iOS app.
- This document uses the SmartLogger2000-10-C as an example to describe typical scenarios and cable connections.

1.2 Port Description

SmartLogger2000-10-C/11-C

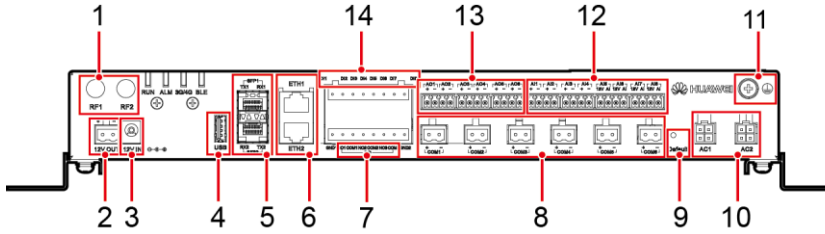


IL02W00005

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 the 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 LAN switch, router, POE or PC device.
7	DO	Digital output (DO)	Relay output supports 12 V voltage and 0.5 A current.
8	COM1–COM6	RS485 communications	Six RS485 ports that can be connected to devices such as the SUN2000, 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 (valid within 5 minutes). The default IP address is 192.168.0.10.
10	AC1, AC2[a]	AC power cable ports	SmartLogger2000-10-C: Connects to three-phase (A, B, and C) inputs, and is used for PLC (MBUS) with the SUN2000 over AC power cables. SmartLogger2000-11-C: disabled
11		Shell ground point	N/A
12	AI1–AI7	Analog input	AI1 supports 0–10 V input voltage (passive[b]); AI2–AI7 support 0–20 mA and 4–20 mA input current (passive).
13	PT1, PT2	Analog input	• PT1 supports the connection to a three-wire or two-wire PT100/PT1000 temperature sensor. • PT2 supports the connection to only a two-wire PT100/PT1000 temperature sensor.
14	AO1–AO4	Analog output (AO)	4–20 mA and 0–20 mA output current
15	DI1–DI8	Digital input (DI)	Connects to a dry contact input. GND1 and GND2 are ground ports for DI signals.

Note a: When the SmartLogger is applied in a non-smart array controller, connect the AC1 and AC2 ports to the SPD with the delivered cables. The residue voltage of the SPD should be less than 6 kV.
Note b: Passive means that the AI port can connect to a sensor that needs to be energized separately.

SmartLogger2000-10/10-B/11-B



IL02WC0006

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 the 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 LAN switch, router, POE or PC device.
7	DO	Digital output (DO)	Relay output supports 12 V voltage and 0.5 A current.
8	COM1–COM6	RS485 communications	Six RS485 ports that can be connected to devices such as the SUN2000, 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 (valid within 5 minutes). The default IP address is 192.168.0.10.
10	AC1, AC2	AC power cable ports	• SmartLogger2000-10/10-B: Connects to the A/B/C three-phase input, and used for PLC (MBUS) with the SUN2000 over AC power cables. • SmartLogger2000-11-B: disabled
11		Shell ground point	N/A
12	AI1–AI8	Analog input	• SmartLogger2000-10: AI1–AI4: 4–20 mA and 0–20 mA input current (passive[a]); AI5–AI8: 4–20 mA and 0–20 mA input current (active[b]) • SmartLogger2000-10-B/11-B: 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 (AO)	4–20 mA and 0–20 mA output current
14	DI1–DI8	Digital input (DI)	Connects to a dry contact input. GND1 and GND2 are ground ports for DI signals.

Note a: Passive means that the AI port can connect to a sensor that needs to be energized separately.
Note b: Active means that the AI port can connect to a sensor that need not be energized separately.

2 Typical Cable Connection Scenarios

2.1 Smart Array Controller Scenario

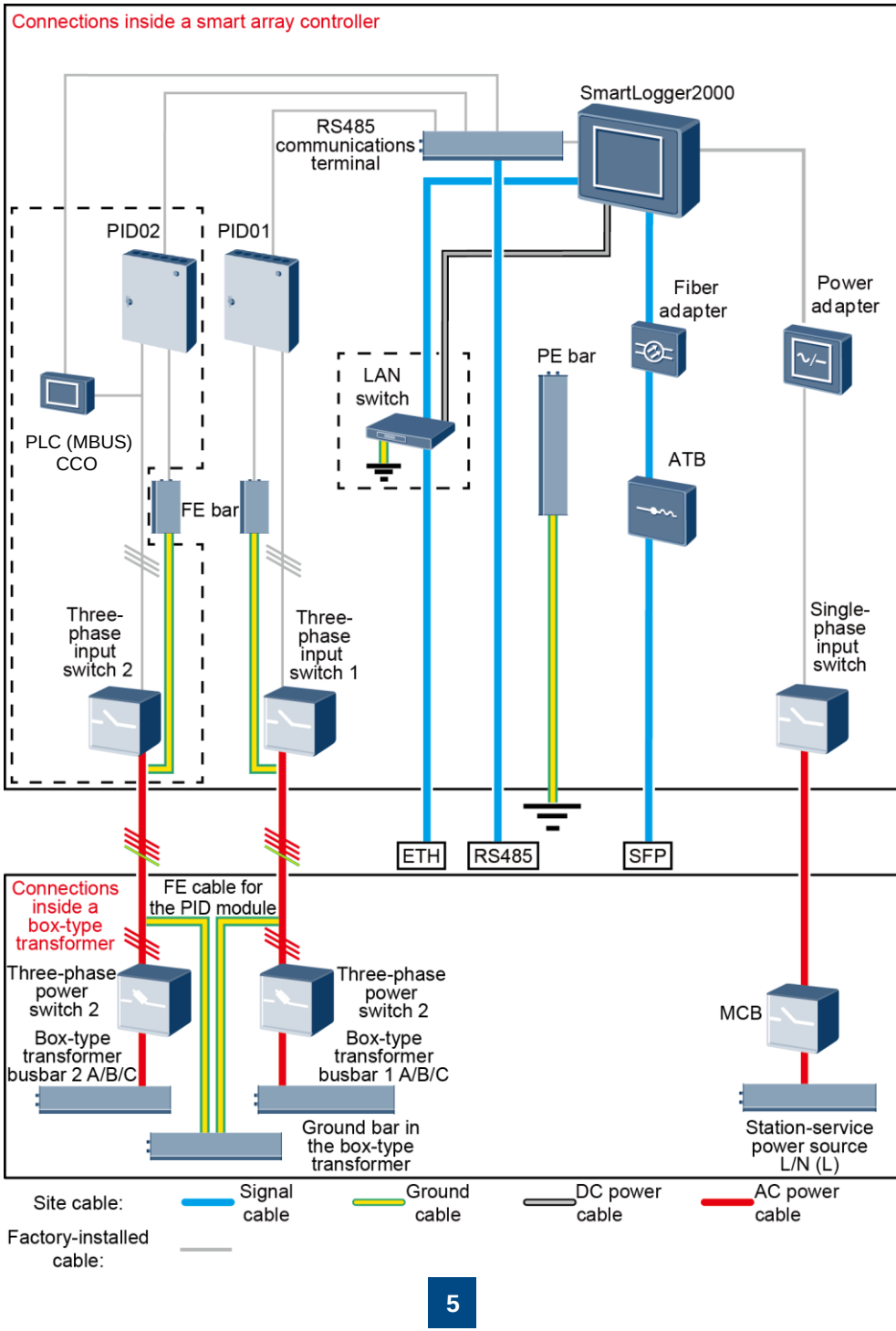
NOTE

- This document describes the application scenario where the SmartLogger is inside the smart array controller SmartACU2000B-D-2PID/2PLC.
- The tables under figures list only the components to be configured by the customer in the corresponding scenario.

NOTICE

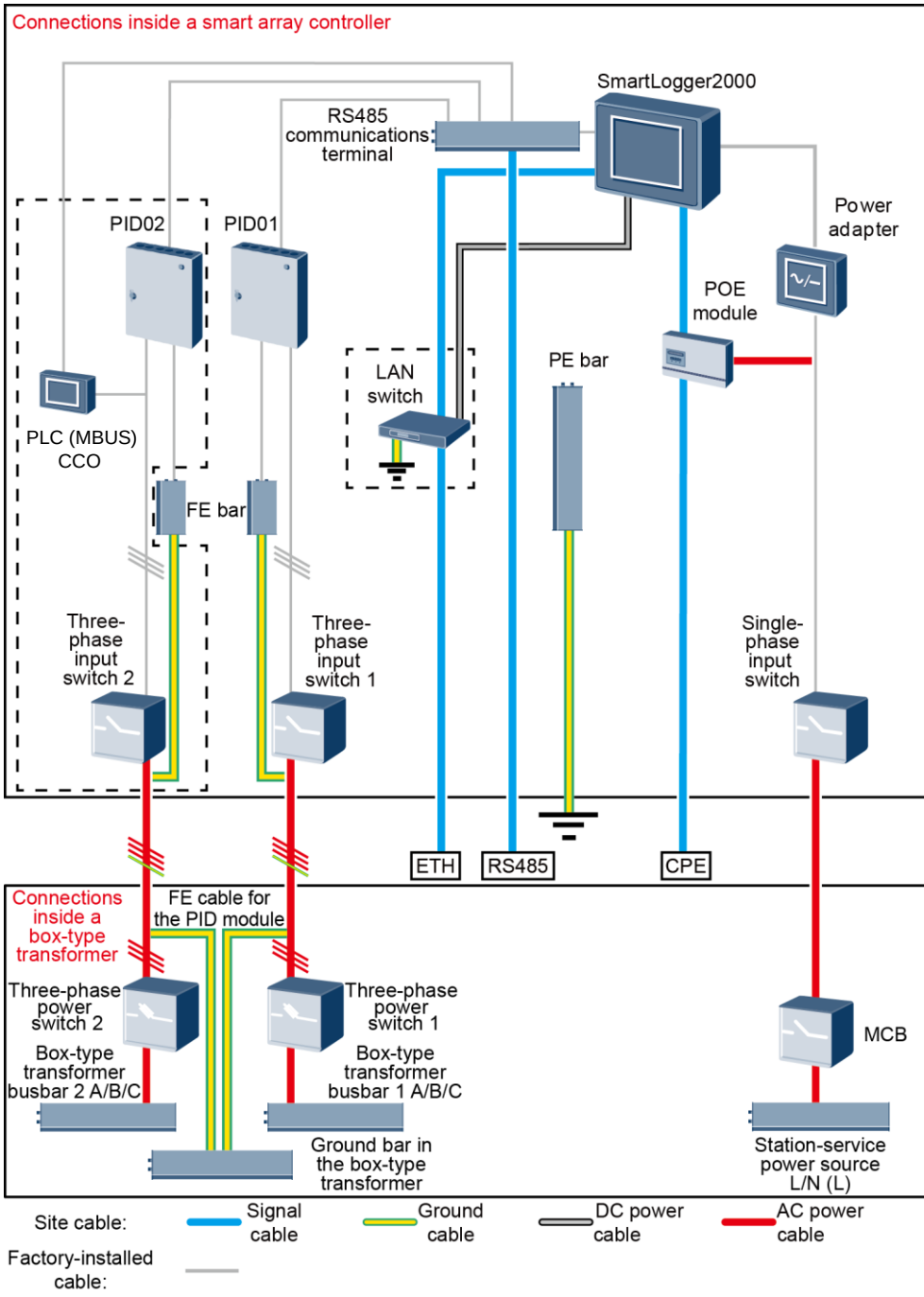
1. Prepare the single-phase AC power cable for the smart array controller by yourself. Recommended: a two-core outdoor armor copper cable with an operating voltage to the ground greater than or equal to 300 V and a cross-sectional area of 4 mm^2 for each core wire
2. Prepare the power cable from the miniature circuit breaker (MCB) to the station-service power source by yourself. Recommended: a two-core outdoor armor copper cable with an operating voltage to the ground greater than or equal to 300 V and a cross-sectional area of 4 mm^2 for each core wire
3. Prepare the three-phase AC power cable for the smart array controller by yourself. Recommended: a four-core (L1, L2, L3, and functional earthing) outdoor armor copper cable with a cross-sectional area of 10 mm^2 for each core wire. When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the operating voltage between the three-phase AC power cable and the ground should be greater than or equal to 600 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the operating voltage between the three-phase AC power cable and the ground should be greater than or equal to 1000 V.
4. Prepare the power cable from the busbar to the Three-phase power switch by yourself. Recommended: a four-core (L1, L2, L3, and functional earthing) outdoor armor copper cable with a cross-sectional area of 10 mm^2 for each core wire. When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the operating voltage to the ground should be greater than or equal to 600 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the operating voltage to the ground should be greater than or equal to 1000 V.

Optical Fiber



Location	Component		Recommended Model or Specifications	Component Source	Quantity
Smart array controller	LAN switch (optional)		UT-H605 or ES1000	Can be purchased from Huawei	1
	Fitting bag for optical ring switching	Low-speed optical module	FTLF1323P1BTR-HW	Can be purchased from Huawei	2
		Optical jumper	PLCLC5S-ST3P302-HW, LC-LC-S2-L2, 3ECA1031LCLC002-01-F, or LP-LP-2S-P-SM-002		8
Box-type transformer	MCB		Rated current: 32 A, number of poles: 2	Prepared by the customer	1
	Three-phase power switch	Knife fuse switch (solution 1)	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • Rated current of the fuse: 32 A; rated current of the knife fuse switch box ≥ 32 A; number of poles: 3 (3 fuses for each knife fuse switch box)	Prepared by the customer	• Scenario with a double-column transformer: 1 • Scenario with a dual-split transformer: 2
		MCCB (solution 2)	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • Let-through energy ≤ 1.26 x 10^6 A^2s • Rated current: 32 A; number of poles: 3	Prepared by the customer	

4G LTE


Connections inside a smart array controller
SmartLogger2000
RS485 communications terminal
Power adapter
PID02
PID01
POE module
LAN switch
PE bar
PLC (MBUS) CCO
FE bar
Three-phase input switch 2
Three-phase input switch 1
Single-phase input switch
ETH
RS485
CPE
Connections inside a box-type transformer
FE cable for the PID module
Three-phase power switch 2
Three-phase power switch 1
MCB
Box-type transformer busbar 2 A/B/C
Box-type transformer busbar 1 A/B/C
Ground bar in the box-type transformer
Station-service power source L/N (L)
Site cable:
Signal cable
Ground cable
DC power cable
AC power cable
Factory-installed cable:

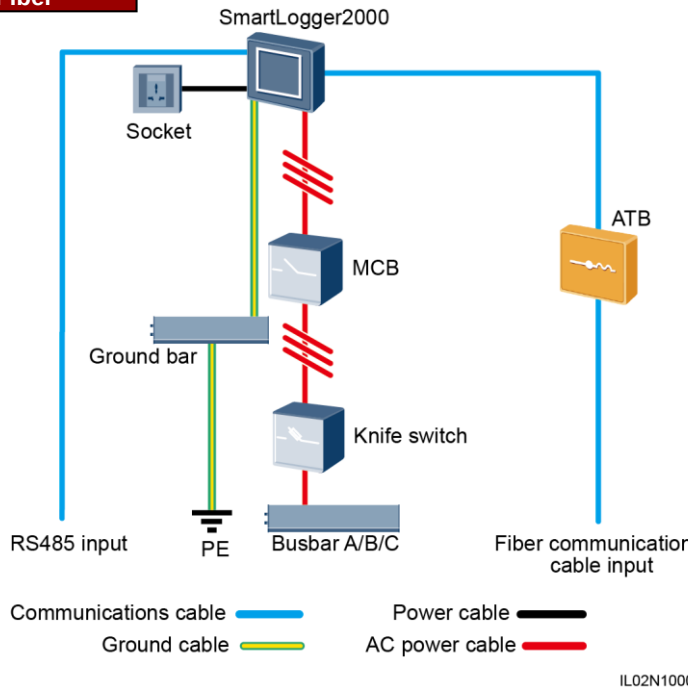
Location	Component		Recommended Model or Specifications	Component Source	Quantity
Smart array controller	LAN switch (optional)		UT-H605 or ES1000	Can be purchased from Huawei	1
	Fitting bags for the POE module and customer-premises equipment (CPE)	POE module	N/A	Can be purchased from Huawei	1
Outside the smart array controller and box-type transformer		CPE	N/A	Can be purchased from Huawei	1
Box-type transformer	MCB		Rated current: 32 A, number of poles: 2	Prepared by the customer	1
	Three-phase power switch	Knife fuse switch (solution 1)	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • Rated current of the fuse: 32 A; rated current of the knife fuse switch box ≥ 32 A; number of poles: 3 (3 fuses for each knife fuse switch box)	Prepared by the customer	• Scenario with a double-column transformer: 1 • Scenario with a dual-split transformer: 2
		MCCB (solution 2)	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • Let-through energy ≤ 1.26 x 10^6 A^2s • Rated current: 32 A; number of poles: 3	Prepared by the customer	

2.2 Non-Smart Array Controller Scenario

NOTICE

1. If the SmartLogger communicates with a SUN2000 over an AC power cable, an MCB and a knife switch need to be installed to prevent device damage in the case of short circuits.
2. If the SmartLogger communicates with the SUN2000 over an AC power cable, prepare the cable from the knife fuse switch to the MCB and the cable from the busbar to the knife fuse switch by yourself. Recommended: a three-core outdoor armor cable with a cross-sectional area of 10 mm^2 for each core wire. When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the operating voltage between the AC power cable and the ground should be greater than or equal to 600 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the operating voltage between the AC power cable and the ground should be greater than or equal to 1000 V.
3. The SmartLogger can connect to the SUN2000 through an RS485 communications cable or AC power cable. If RS485 is used, there is no need to connect an AC power cable between the SmartLogger and the MCB in the scenario without a smart array controller.
4. The power cable delivered with the SmartLogger is 1 meter long, the power adapter cable is 1.5 meters long, the network cable is 2.2 meters long, and the AC power cable is 1.5 meters long. Reserve the installation positions for components based on the cable lengths.

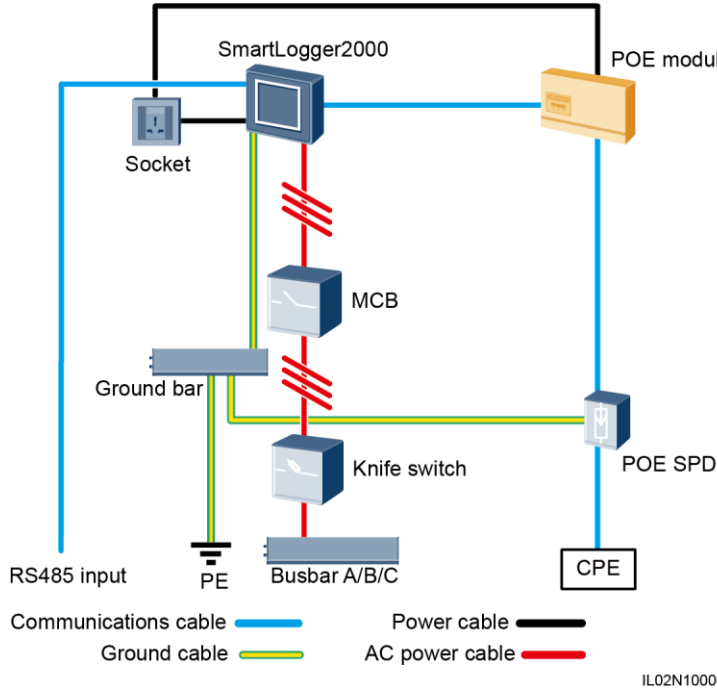
Optical Fiber



Component		Recommended Model or Specifications	Component Source	Quantity
SmartLogger		SmartLogger2000	Can be purchased from Huawei	1
Fitting bag for fiber ring switching	Low-speed optical module	FTLF1323P1BTR-HW	Can be purchased from Huawei	2
	Optical jumper	PLCLC5S-ST3P302-HW, LC-LC-S2-L2, 3ECA1031LCLC002-01-F, or LP-LP-2S-P-SM-002		8
ATB		CT-GZF2PJ-8, CT-GPH-A-8, or an ATB of a local model	Prepared by the customer	1
Knife switch	Fuse	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated current should be greater than or equal to 6 A. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated current should be greater than or equal to 32 A.	Prepared by the customer	3
	Knife switch box	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated current should be greater than or equal to 6 A. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated current should be greater than or equal to 32 A. The number of poles is 3.	Prepared by the customer	1

Component	Recommended Model or Specifications	Component Source	Quantity
MCB	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated current is greater than or equal to 6 A and less than or equal to 32 A. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated current is 32 A.	Prepared by the customer	1
Socket	Connects to the power adapter.	Prepared by the customer	1

4G LTE



Component	Recommended Model or Specifications	Component Source	Quantity
SmartLogger	SmartLogger2000	Can be purchased from Huawei	1
POE module	POE35-54A or POE85-56A		1
POE SPD	POE-2		1
CPE	EG860V2-C71		1

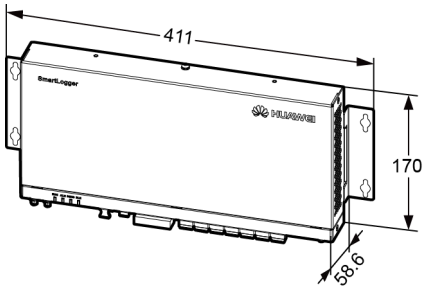
Component		Recommended Model or Specifications	Component Source	Quantity
Knife switch	Fuse	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated current should be greater than or equal to 6 A. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated current should be greater than or equal to 32 A.	Prepared by the customer	3
Knife switch	Knife switch box	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated current should be greater than or equal to 6 A. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated current should be greater than or equal to 32 A. The number of poles is 3.	Prepared by the customer	1
MCB		• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated current is greater than or equal to 6 A and less than or equal to 32 A. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated current is 32 A.	Prepared by the customer	1
Socket		Connects to the power adapter.	Prepared by the customer	1

3 Installing the SmartLogger

3.1 Installation Space (Unit: mm)

Wall-mounting

Chassis dimensions (including mounting ears)



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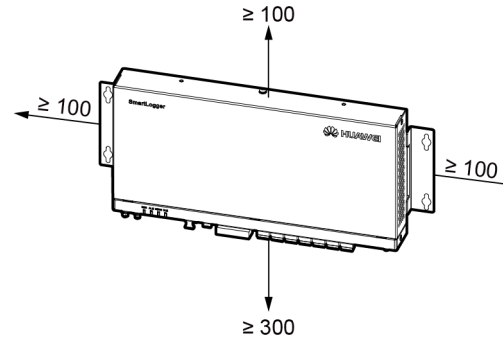
Installation clearances



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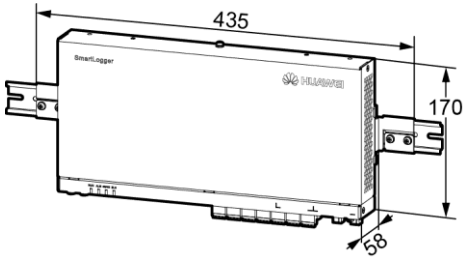
Guide rail-mounting

Chassis dimensions
(including the guide rail mounting brackets)



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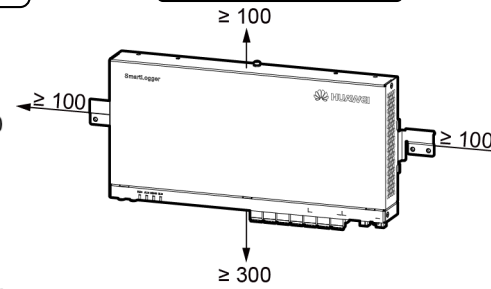
Installation clearances



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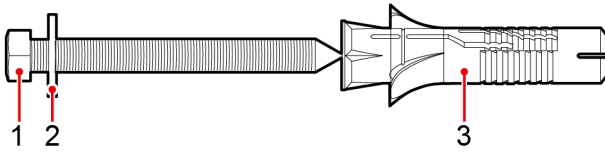
3.2 Installation Mode

Wall-mounting

NOTICE

Install the SmartLogger on a wall that is flat and has the bearing capacity to securely hold the SmartLogger.



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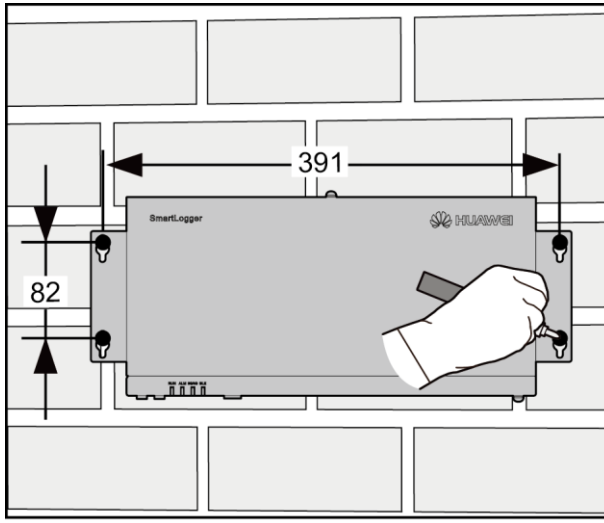
Screw assembly for wall-mounting:
(1) ST3.5 tapping screw
(2) Washer
(3) Expansion sleeve

1. Determine mounting holes based on the hole positions in the mounting ears, and mark the mounting holes using a marker.



IL02SC0001

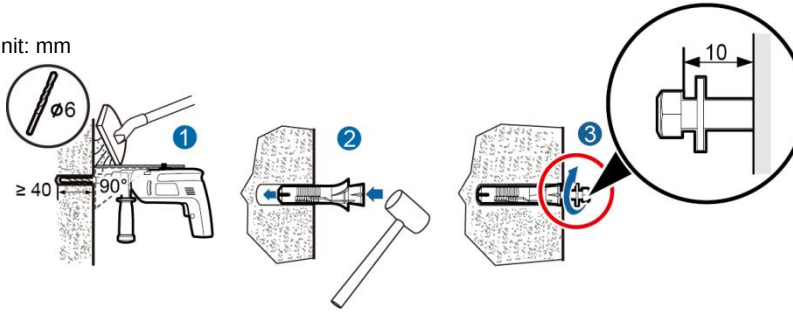
Unit: mm

NOTICE

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

2. Drill holes by using a hammer drill and install expansion sleeves, washers, and tapping screws.

Unit: mm



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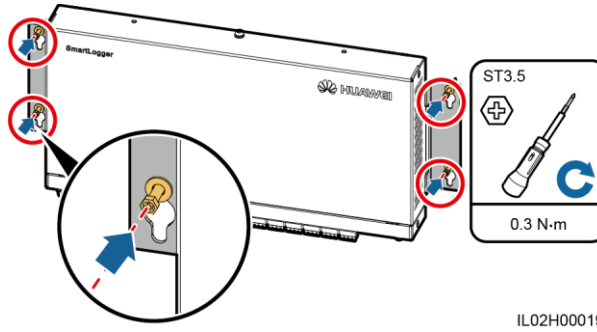
3. Put the tapping screws through the SmartLogger mounting ears and washers into the mounting holes in the wall.

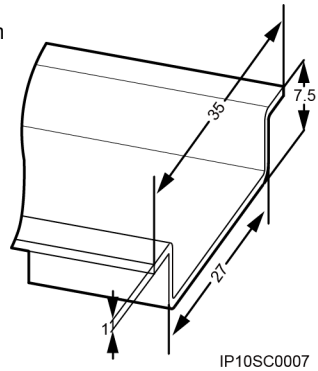
4. Tighten the tapping screws using a torque screwdriver.



Guide rail-mounting

Huawei does not provide the SmartLogger guide rail. If the customer chooses this installation mode, the customer must prepare a 35 mm standard guide rail.

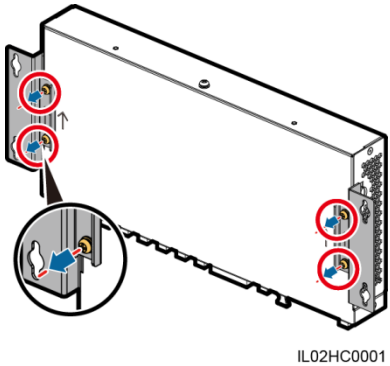
Unit: mm



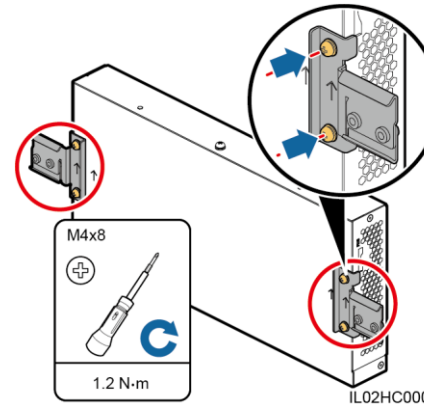
NOTE

1. Secure the guide rail before mounting the SmartLogger.
2. Verify that the length of the guide rail is sufficient for securing the SmartLogger. The recommended length is 450 mm or greater.

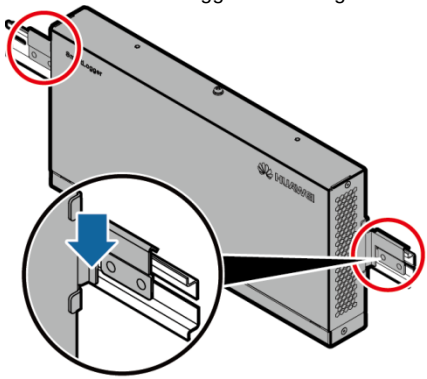
1. Remove the mounting ears from the SmartLogger using a Phillips screwdriver.



2. Secure the guide rail clamps using the screws that are removed from the mounting ears.

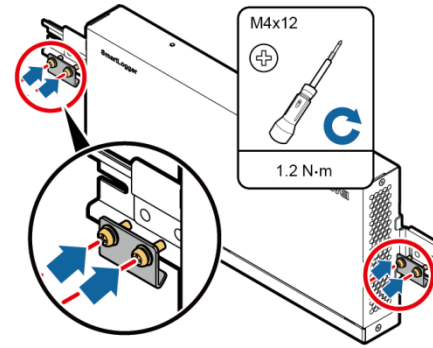


3. Mount the SmartLogger onto the guide rail.



IS01HC0072

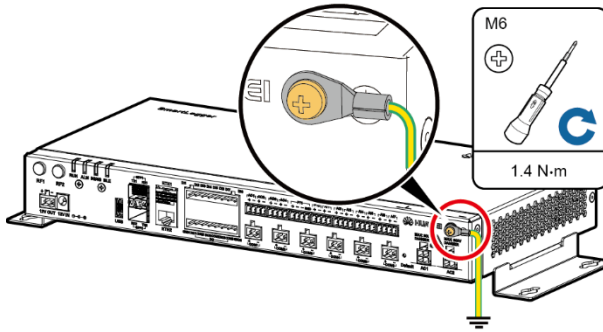
4. Install guide rail fasteners.

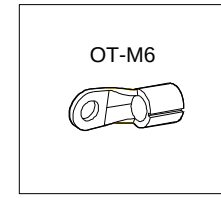


IS01HC0071

4 Installing Ground Cable

4.1 Installing the SmartLogger Ground Cable





IL02I10015

NOTE

1. It is recommended that 4–6 mm^2 or 12–10 AWG outdoor copper-core cables be used as ground cables. Ground cables must be securely connected.
2. To enhance the corrosion resistance of the ground terminal, apply silica gel or paint on it after connecting the PGND cable.

5 Connecting Cables to COM Ports

NOTE

- The SmartLogger can connect to a SUN2000, an EMI, a power meter, a box-type transformer, and a PID module through its COM ports.
- If the SmartLogger2000-10/10-B/11-B connects to a device over the COM port, you are advised to connect an external RS485 signal SPD. For details about how to install and connect the RS485 signal SPD, see section 15.6 "How Should I Install the RS485 Signal SPD?" and section 15.7 "How Should I Connect the RS485 Signal SPD?"
- If the SmartLogger2000-10-C/11-C connects to a device over the COM port, there is no need to connect an external RS485 signal SPD. This document uses the SmartLogger2000-10-C as an example to describe cable connections.

5.1 Port Definitions

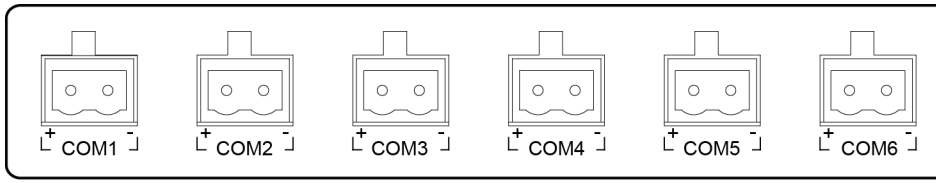
NOTICE

For the definitions of the communications ports on the devices such as the EMI, power meter, and box-type transformer, see the documents delivered with the devices. When connecting cables, ensure that RS485+ connects to the COM+ port on the SmartLogger and that RS485– connects to the COM– port on the SmartLogger.

NOTE

For ease of operation, this document describes only the ports that need to be wired.

COM Port (SmartLogger)



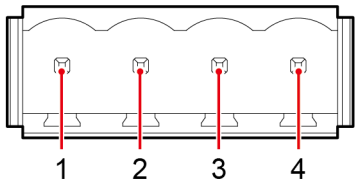
IL02WC0010

No.	Port	Symbol	Function
1	COM1	+	RS485A, RS485 differential signal+
		–	RS485B, RS485 differential signal–
2	COM2	+	RS485A, RS485 differential signal+
		–	RS485B, RS485 differential signal–
3	COM3	+	RS485A, RS485 differential signal+
		–	RS485B, RS485 differential signal–
4	COM4	+	RS485A, RS485 differential signal+
		–	RS485B, RS485 differential signal–
5	COM5	+	RS485A, RS485 differential signal+
		–	RS485B, RS485 differential signal–
6	COM6	+	RS485A, RS485 differential signal+
		–	RS485B, RS485 differential signal–

NOTE

- Terminal block of types 1 and 2 are located in different models of SUN2000s.
- The RJ45 network port is located in all models of SUN2000s.

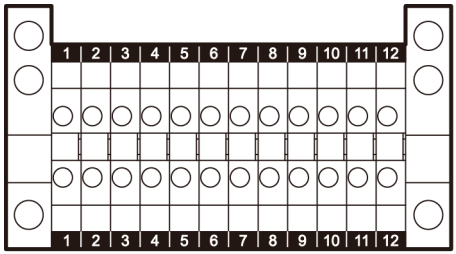
Terminal Block Type 1 (SUN2000)



IS03WC0009

No.	Port Definition	Function
1	RS485A IN	RS485A, RS485 differential signal+
2	RS485A OUT	RS485A, RS485 differential signal+
3	RS485B IN	RS485B, RS485 differential signal–
4	RS485B OUT	RS485B, RS485 differential signal–

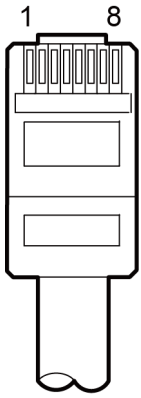
Terminal Block Type 2 (SUN2000)



IU01ZC0001

No.	Port Definition	Function
5	RS485A IN	RS485A, RS485 differential signal+
6	RS485A OUT	RS485A, RS485 differential signal+
7	RS485B IN	RS485B, RS485 differential signal–
8	RS485B OUT	RS485B, RS485 differential signal–

RJ45 Network Port (SUN2000)



IS01ZC0011

No.	Color	Function
1	White orange	RS485A, RS485 differential signal+
2	Orange	RS485B, RS485 differential signal–
3	White green	N/A
4	Blue	RS485A, RS485 differential signal+
5	White blue	RS485B, RS485 differential signal–
6	Green	N/A
7	White brown	N/A
8	Brown	N/A

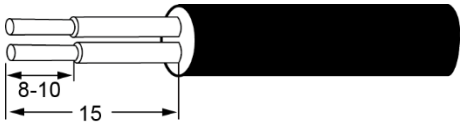
5.2 Connecting an RS485 Communications Cable

NOTE

1. Ensure that the RS485 communication distance is within 1000 meters.
2. The SmartLogger cable terminal block can connect to a cable with the maximum cross-sectional area of 2.5 mm^2.
3. A terminal block is recommended for connecting cables to the SUN2000. The following uses the SUN2000-50KTL/50KTL-C1 terminal block as an example to describe cable connection.
4. When you connect a terminal block to the SUN2000, you are advised to use a computer cable (DJYP2VP2-22 2x2x1) or a communications cable with the conductor cross-sectional area of 1 mm^2 and the cable outer diameter in the range of 14 mm to 18 mm.
5. When you connect the RJ45 network port to the SUN2000, you are advised to use the CAT 5E outdoor shielded network cable.

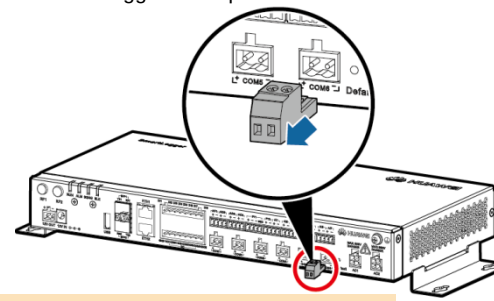
1. Remove an appropriate length of the steel armor and insulation layer from both ends of the cable using a wire stripper.

Unit: mm



IS01ZC0036

2. Remove the terminal block from the SmartLogger COM port.

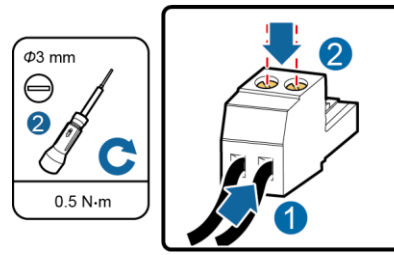


IL02H00009

NOTE

Remove the terminal block using a flat-head screwdriver.

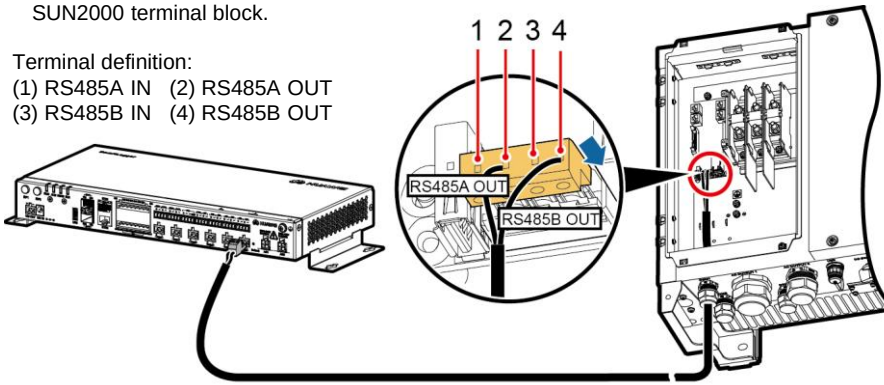
3. Connect one end of the cable to the SmartLogger terminal block.



IL02HC0007

4. Insert the terminal block into the SmartLogger COM port.
5. Strip an appropriate length from the other end of the cable and connect the end to the SUN2000 terminal block.

Terminal definition:
(1) RS485A IN (2) RS485A OUT
(3) RS485B IN (4) RS485B OUT



NOTICE

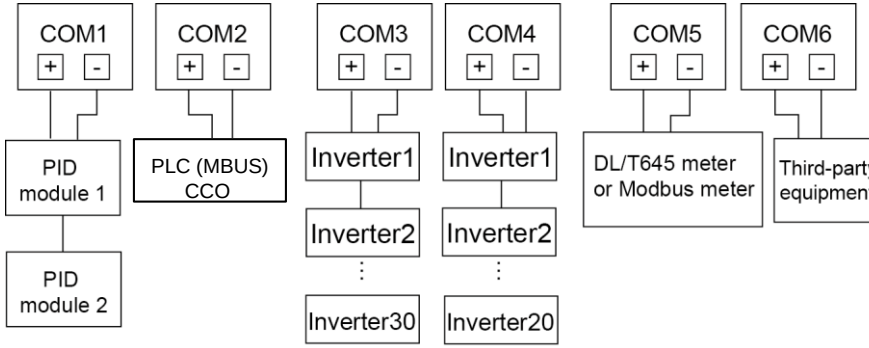
- The RS485 IN and RS485 OUT ports on the SUN2000 can both connect to the SmartLogger. This document uses the RS485 OUT port as an example to describe the connection between the SUN2000 and the SmartLogger.
- Ensure that the SmartLogger COM+ (RS485A) port connects to the 2 (RS485A OUT) terminal on the SUN2000 terminal block, and that the SmartLogger COM– (RS485B) port connects to the 4 (RS485B OUT) terminal on the SUN2000 terminal block.

5.3 Connecting Multiple Devices

NOTICE

1. Each SmartLogger can connect to a maximum of 200 devices. You are advised to connect fewer than 30 devices to each RS485 route.
2. Each SmartLogger2000-10/10-B/11-B connects to a maximum of 80 SUN2000s. Each SmartLogger2000-10-C/11-C connects to a maximum of 150 SUN2000s.
3. Huawei equipment and third-party equipment need to be connected, you are advised to connect them to different COM ports. If only Huawei equipment or third-party equipment needs to be connected, connect it to any idle COM port.
4. Verify that devices using the same protocol are connected to the same COM port. Devices using different protocols (for example, the box-type transformer which uses the IEC103 protocol and the power meter which uses the DL/T645 protocol) need to be connected to separate COM ports.
5. If the model of the PID module connecting to the SmartLogger is SmartPID2000, one SmartLogger can connect to two PID modules.

Recommended Connection Mode



IL02I10019

6 Connecting Cables to AC Ports

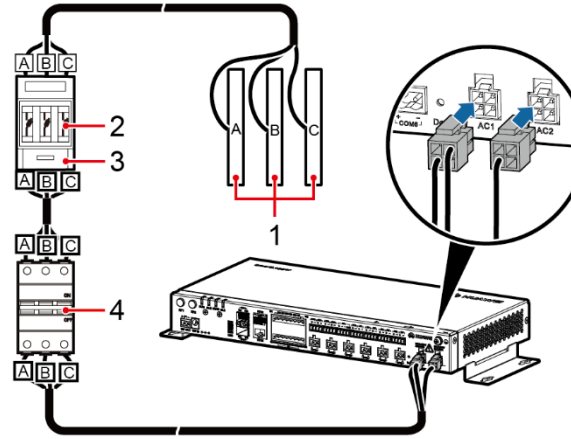
NOTE

1. If the SUN2000 is equipped with a PLC (MBUS) device, the SmartLogger can communicate with the SUN2000 through an AC power cable.
2. If the SmartLogger2000-10-C communicates with the SUN2000 over PLC (MBUS), each SmartLogger2000-10-C can connect to a maximum of 80 SUN2000s over the AC port, and can connect to a maximum of 150 SUN2000s over the AC and COM ports when an external PLC (MBUS) CCO is connected.
3. 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.
4. If the SmartLogger is connected to the SUN2000 through an AC power cable, no RS485 communications cable needs to be connected.

⚠ WARNING

Before connecting the AC power cable, ensure that the upstream switch of the AC power cable is turned off.

1. Connect one end of the delivered AC power cable to an MCB.
2. Connect the AC1 and AC2 terminals at the other end of the cable to the **AC1** and **AC2** ports on the SmartLogger respectively.

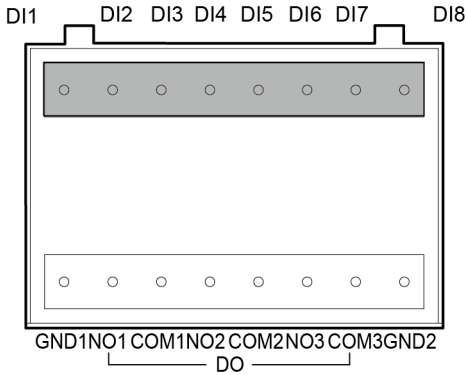


No.	Material	Model/Specifications	Quantity
1	Busbar A/B/C	N/A	1
2	Fuse	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated current should be greater than or equal to 6 A. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated current should be greater than or equal to 32 A.	3
3	Knife switch	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated current should be greater than or equal to 6 A. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated current should be greater than or equal to 32 A. The number of poles is 3.	1
4	MCB	• When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated voltage should be greater than or equal to 500 V. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated voltage should be greater than or equal to 800 V. • When the rated AC voltage on the low-voltage side of the box-type transformer is less than or equal to 500 V, the rated current is greater than or equal to 6 A and less than or equal to 32 A. When the rated AC voltage on the low-voltage side of the box-type transformer is greater than 500 V and less than or equal to 800 V, the rated current is 32 A.	1

7 Connecting a Cable to the DI Port

NOTE

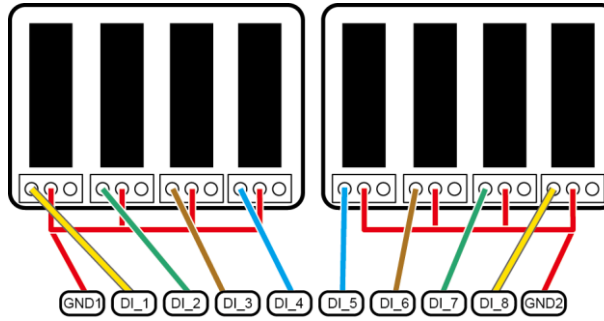
1. In Germany and some other European areas, a ripple control receiver is used to convert a power grid scheduling signal to a dry contact signal, in which a dry contact is needed.
2. Two-core or multiple-core cables with a cross sectional area of 1.5 mm^2 are recommended.



IL02WC0009

No.	Port	Function
1	GND1	Dry contact input common terminal 1, used for active power derating for DI1–DI4
2	DI1	DI_1
3	DI2	DI_2
4	DI3	DI_3
5	DI4	DI_4
6	DI5	DI_5
7	DI6	DI_6
8	DI7	DI_7
9	DI8	DI_8
10	GND2	Dry contact input common terminal 2, used for reactive power compensation for DI5–DI8

1. Prepare a cable with an appropriate length, strip a part of the insulation layer, and connect the stripped cable core to the ripple control receiver.

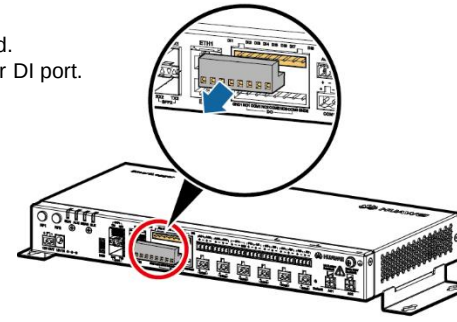


IL02IC0012

2. Strip 8 mm of the insulation layer at the other end.
3. Remove the terminal block from the SmartLogger DI port.

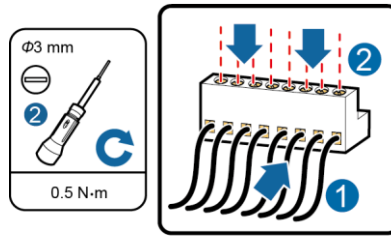
NOTE

Remove the terminal block using a flat-head screwdriver.



IL02H00010

4. Connect the stripped cable core to the terminal block of the DI port on the SmartLogger.



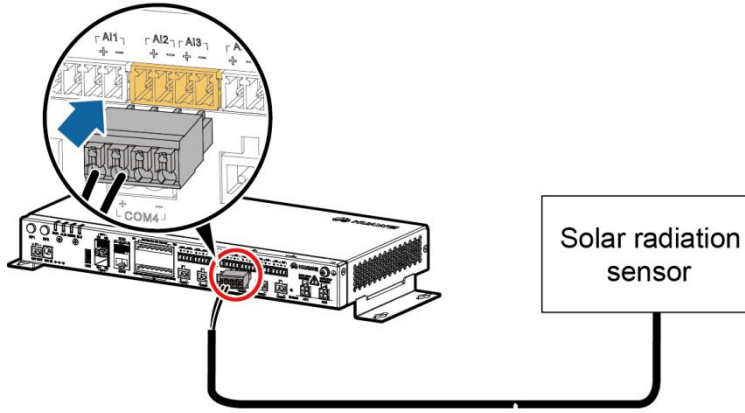
IL02HC0010

5. Insert the terminal block into the SmartLogger DI port.

8 Connecting Cables to the AI Port

NOTE

1. The EMI used in Europe and Southeast Asia is composed of sensors that need to connect to the SmartLogger separately.
2. The SmartLogger can connect to a current-type or voltage-type sensor through an AI port.
3. One sensor connects to one AI port. This document describes only the connection between the solar radiation sensor and the SmartLogger. Connections between other sensors and the SmartLogger are the same.
4. For details about the cables and cable connection operations, see the documents delivered with the sensors. The AI port on the SmartLogger is marked + and –. Connect cables correctly according to the silk screens.

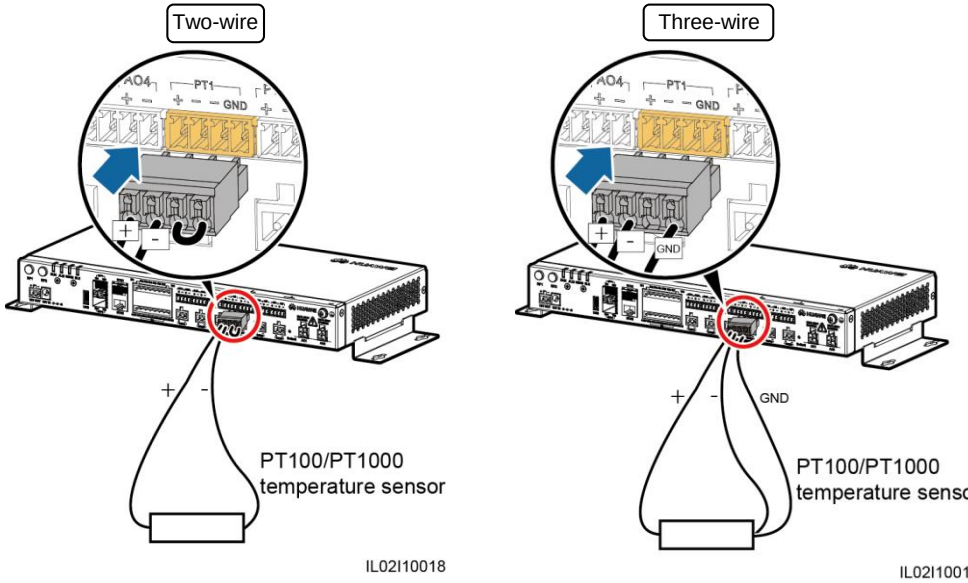


IL02I10010

9 Connecting Cables to the PT Port

NOTE

1. The EMI used in Europe and Southeast Asia is composed of sensors that need to connect to the SmartLogger separately.
2. The SmartLogger2000-10-C/11-C can connect to a PT100/PT1000 temperature sensor through a PT port.
3. If the AI port has connected to a temperature sensor, the PT port can be reserved.
4. The PT1 port can connect to a three-wire or two-wire PT100/PT1000 temperature sensor, whereas the PT2 port can connect to only a two-wire PT100/PT1000 temperature sensor.
5. If the PT1 port connects to a two-wire PT100/PT1000 temperature sensor, you need to short-circuit the GND port to one – port using the delivered short-circuit cable.
6. For details about the cables and cable connection operations, see the documents delivered with the PT100/PT1000 temperature sensor. The PT port on the SmartLogger is marked + and –. Connect cables correctly according to the silk screens.

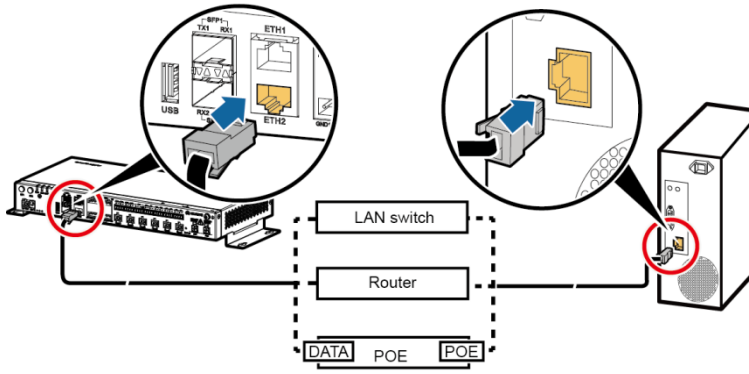


10 Connecting Network Cables to the Ethernet Electrical Port

NOTE

1. The SmartLogger provides two Ethernet electrical ports, through which the SmartLogger can connect to a third-party device.
2. The SmartLogger can be connected to an Ethernet LAN switch, router, or POE device, and then connected to a PC. It can also be directly connected to a PC. Select the connection device based on the actual networking scenario.
3. If the cable between the SmartLogger and the PC over the devices such as a POE is routed outdoors, connect a POE SPD to the POE to enhance the surge protection function. Connect the POE port on the POE to the PROTECT port on the POE SPD.
4. Verify that the Ethernet communications cable is no longer than 100 m.

1. Connect one end of the delivered network cable to the Ethernet electrical port of a device.
2. Connect the other end of the network cable to the **ETH1** or **ETH2** port of the SmartLogger.



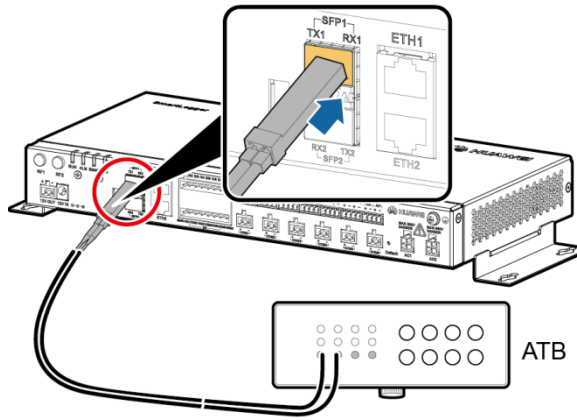
IL02I10012

11 Connecting Optical Fibers to the Ethernet Optical Port

NOTE

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.

1. Insert the optical module into the **SFP1** or **SFP2** port of the SmartLogger.
2. Connect the two cables delivered with the optical module to the ports on the optical module.
3. Connect the other ends of the cables to the ports of the device on the other side (such as an ATB).



IL02I10011

12 Verifying the Installation

No.	Check That	Check Result
1	The SmartLogger is properly installed.	☐ Passed ☐ Failed
2	All cables are properly connected, without open circuits or short circuits.	☐ Passed ☐ Failed
3	Unused ports (such as RF1, RF2, Ethernet optical port, and Ethernet electrical port) are protected by dustproof plugs.	☐ Passed ☐ Failed
4	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.	☐ Passed ☐ Failed
5	Cables are bound neatly, and cable ties are secured evenly and properly in the same direction.	☐ Passed ☐ Failed
6	There is no unnecessary adhesive tape or cable tie on cables.	☐ Passed ☐ Failed

13 Powering On the System

13.1 Power-on Procedure

1. Insert the output terminal of the power adapter into the **12V IN** port of the SmartLogger.
2. Insert the power cable into the power adapter.
3. Insert the power cable plug into an AC socket.

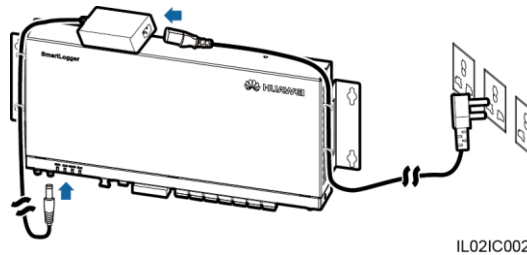
NOTE

- The rated input of the power adapter is 100–240 V AC, 50 Hz or 60 Hz.
- Select an AC socket that matches the power adapter.

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

NOTE

- Step 5 needs to be performed only in the PLC (MBUS) networking scenario.
- In a scenario without a smart array controller, place the power adapter on the top of the SmartLogger and secure the power adapter using a cable tie.
- The adapters and sockets vary in different regions. The following figure is for reference only. The actual objects prevail.



IL02IC0024

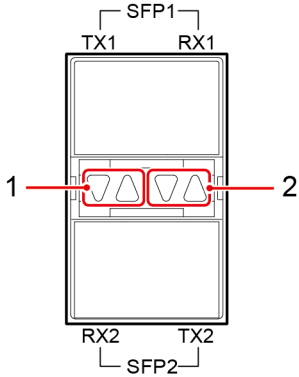
13.2 LED Indicators (from Left to Right)

Indicator (Silk Screen)	Status		Meaning
Running indicator (RUN)	Green off		The SmartLogger is not powered on.
	Blinking green quickly (on for 0.125s and then off for 0.125s)		The SmartLogger and NMS (Huawei NMS or a third-party NMS) are not connected or the communication between them is interrupted.
	Blinking green slowly (on for 1s and then off for 1s)		The SmartLogger properly communicates with the NMS (Huawei NMS or a third-party NMS).
Alarm/maintenance indicator (ALM)	Alarm status	Red off	The SmartLogger and the devices connected to it do not generate any alarm.
		Blinking red at long intervals (on for 1s and then off for 4s)	The SmartLogger or the devices connected to it generate warnings.
		Blinking red at short intervals (on for 0.5s and then off for 0.5s)	The SmartLogger or the devices connected to it generate minor alarms.
		Steady red	The SmartLogger or the devices connected to it generate major alarms.
	Maintenance status	Green off	No near-end maintenance.
		Blinking green slowly (on for 1s and then off for 1s)	Near-end maintenance is in progress.
		Steady green	The near-end maintenance is successful.
		Blinking green quickly (on for 0.125s and then off for 0.125s)	The near-end maintenance failed.
3G/4G indicator (3G/4G)	N/A		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.
	Blinking green slowly (on for 1s and then off for 1s)		You have successfully logged in to the app.

NOTE

- 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.
- Log in to the built-in WebUI or app of the SmartLogger to view its running status and device connections. For details, see the *SmartLogger2000 User Manual* or *SUN2000 APP User Manual*.

13.3 Optical Port Indicators



Indicator	Status	Meaning
(1) Upper optical port (2) Lower optical port	Green and yellow off	No optical module is inserted into the Ethernet optical port.
	Green steady on and yellow blinking quickly (0.1s on and 0.1s off)	The fiber link is being set up.
	Green steady on and yellow blinking intermittently	The data is being transmitted.
	Green steady on and yellow blinking slowly (0.1s on and 1.9s off)	The fiber link is normal.

14 System Commissioning

The SmartLogger can commission devices by connecting to the SUN2000 app, embedded WebUI, and NMS. This document uses the SUN2000 app as an example to describe major commissioning operations.

Login Mode	User Name	Initial Password
SUN2000 app	Common user	00000a
	Advanced user	
	Special user	
Web UI[a]	Common user	Changeme
	Advanced user	
	Special user	
Note a: If the SmartLogger connects to the WebUI, enter https://XX.XX.XX.XX (XX.XX.XX.XX is the SmartLogger IP address and is 192.168.0.10 by default) in the address bar of the browser. The SmartLogger IP address can be queried through the SUN2000 app. For details, see section 14.1 "Connecting the SUN2000 App."		

NOTE

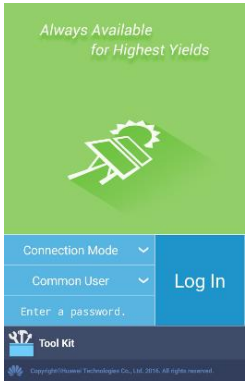
Use the initial password upon first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.

14.1 Connecting the SUN2000 App

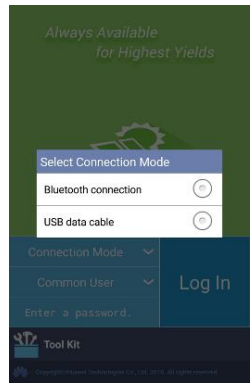
NOTE

1. The SUN2000 app is a convenient maintenance platform that communicates with the monitoring system for you to query alarms, configure parameters, and perform routine maintenance. The app name is displayed as **SUN2000**.
2. Mobile phone operating system: Android 4.0 or later, or iOS 7.0 or later.
3. To download the SUN2000 app software package available for Android, access Huawei app store (http://appstore.huawei.com) or Google Play (https://play.google.com), and search for **SUN2000**.
4. To download the SUN2000 app software package available for iOS, access App Store and searches for **SUN2000**.
5. The Android-oriented app connects to the monitoring system over Bluetooth or USB data cable. The iOS-oriented app connects to the monitoring system over Bluetooth. The app connects to the SmartLogger only over Bluetooth.
6. This document uses the WebUIs of Android-oriented SUN2000 app V200R001C00SPC020 as an example.

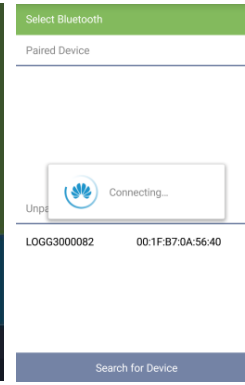
Login screen



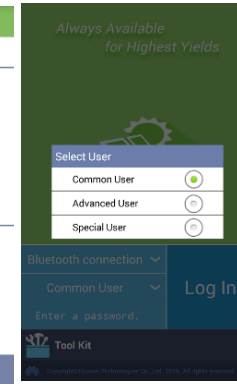
Select Bluetooth connection



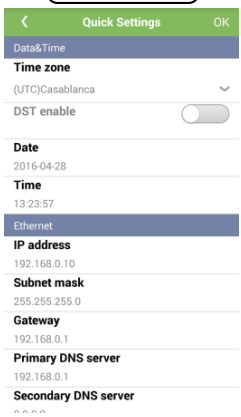
Connecting Bluetooth



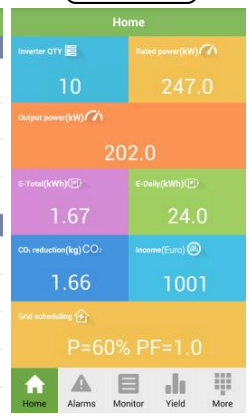
Switching between users



Quick settings



Main menu



NOTICE

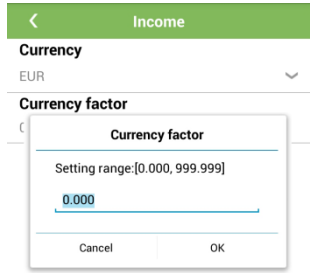
1. The SmartLogger Bluetooth is named as LOG+the last eight figures of the SN of the SmartLogger.
2. The login password is the same as that for the SmartLogger connected to the app and is used only when the SmartLogger connects to the app.
3. The preset password for **Common User**, **Advanced User**, and **Special User** is **00000a**.
4. Use the initial password upon first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.

NOTE

1. If the SmartLogger is powered on for the first time or the factory defaults are restored and parameter configuration is not performed on the embedded WebUI, the **Quick Settings** screen is displayed when the SmartLogger connects to the app. You can set parameters based on site requirements. After parameters are set, the main menu is displayed when the SmartLogger connects to the app again.
2. On the **Quick Settings** screen, tap  to return to the login screen. Then tap **OK** to confirm the settings and enter the main menu.
3. In the **Income** pane**,** when **Currency factor** is **0** (default value), **Income** is **--**. You can set **Currency factor** on the app.
4. In the Grid scheduling pane, if there is no active power scheduling, P = NA is displayed. If there is no reactive power scheduling, PF = NA is displayed. For operations related to grid scheduling, see the *SmartLogger2000 User Manual*.
5. You can modify the parameters based on site requirements. For details about parameter configuration, see the *SUN2000 APP User Manual*.

14.2 Setting Currency Factor

At the bottom of the main menu, choose **More** > **Settings** > **User Param** > **Income**. Then set **Currency factor** according to the actual situation.

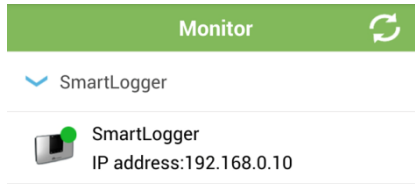


NOTE

Because of the permission restriction, log in to the app as a common user or an advanced user to set **Currency factor**.

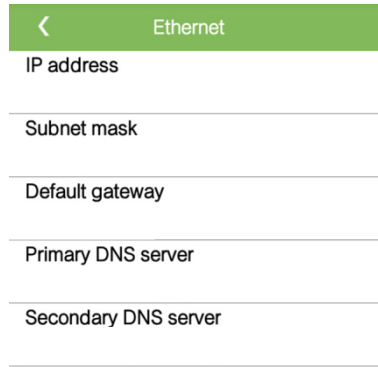
14.3 Querying the SmartLogger IP Address

Select **Monitor** at the bottom of the main menu and tap **SmartLogger**.



14.4 Setting the IP Address

At the bottom of the main menu, choose **More** > **Settings** > **Comm. Param.** > **Ethernet** and set parameters based on site requirements.



15 FAQ

15.1 The SmartLogger cannot be powered on.

1. Check that the DC output power cable for the power adapter connects to the **12V IN** port on the SmartLogger.
2. Check whether the power cable is connected to the power adapter.
3. Check whether the power cable is inserted into an AC socket.
4. Replace the power adapter.
5. Contact the supplier or Huawei technical support.

15.2 The communication fails in RS485 networking.

1. RJ45 network port connection: Check whether the RJ45 connector is correctly crimped with shielded cable wires of various colors connected to the correct pins.
2. Terminal block connection: Check whether the RS485 communications cable is connected to the correct port of the terminal block.
3. Verify that the RS485 ports of other devices are connected to the correct ports on the SmartLogger.
4. Check the RS485 communications cable connection. If any cable is loose, drops off, or is reversely connected, rectify the connection.
5. Power on the SmartLogger and other devices.
6. Check the settings of the RS485 communications parameters.
7. Contact the supplier or Huawei technical support.

15.3 The communication fails in PLC (MBUS) networking.

1. Verify whether the SUN2000s are equipped with a PLC (MBUS) STA.
2. Verify that the power cable of the SmartLogger is properly connected. If the cable is loose or drops off, reconnect the cable.
3. Check whether the upstream circuit breaker of the AC power cable to the SmartLogger is switched on.
4. If the built-in PLC (MBUS) module is networked, set **Built-in PLC (MBUS)** to **Enable**.
5. Contact the supplier or Huawei technical support.

15.4 The SmartLogger cannot find devices.

1. Check the RS485 communications cable and power cable connections. If any cable is loose, drops off, or is reversely connected, rectify the connection.
2. Check the settings of the RS485 communications parameters, such as the baud rate and communications address, are correctly set, and that the SUN2000 address is within the search range preset on the SmartLogger.
3. Add devices such as the EMI and power meter manually.
4. Contact the supplier or Huawei technical support.

15.5 The SmartLogger fails to communicate with the optical port of the LAN switch.

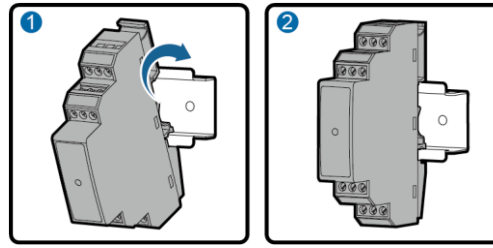
1. Check whether the remote LAN switch is powered on. If no, power it on.
2. Check whether the optical module is inserted based on the status of the indicator for the SmartLogger optical port. If the module is not inserted, insert or reseat it.
3. Check whether the optical jumper is securely connected. If the jumper is loose or disconnected, reconnect and secure it.
4. Check whether the TX of the SmartLogger optical port connects to the RX of the optical port on the LAN switch. If the optical jumper is reversely connected, correct the connection.

15.6 How Should I Install the RS485 Signal SPD?

NOTE

1. In the smart array controller embedded with the SmartLogger2000-10/10-B/11-B, the RS485 signal SPD has been factory installed. In a non-smart array controller, an RS485 signal SPD is recommended if the SmartLogger2000-10/10-B/11-B connects to an outdoor device over the COM port to enhance the surge protection capability of the SmartLogger. Huawei PowerSA-5KA-15V RS485 signal SPD is recommended.
2. Each RS485 signal SPD can connect to two COM ports. Each SmartLogger can be configured with a maximum of three RS485 signal SPDs.
3. When an RS485 signal SPD is to be installed in a non-smart array controller, you are advised to install it on a guide rail.
4. When determining the installation position, verify that the direct distance between the RS485 signal SPD and the SmartLogger is not greater than 500 mm.
5. 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.
6. Secure the guide rail before mounting the RS485 signal SPD.

Clamp the RS485 signal SPD to the guide rail.



15.7 How Should I Connect the RS485 Signal SPD?

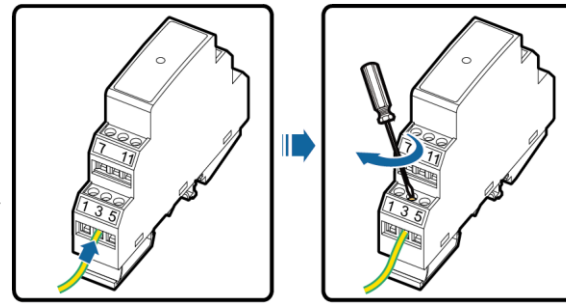
NOTE

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

Connecting the Ground Cable

Recommended: an outdoor copper cable with a cross-sectional area of 4 mm^2 (12 AWG)

Strip 8 mm of the cable insulation layer from one end, and secure the cable to port 3 on the RS485 signal SPD.



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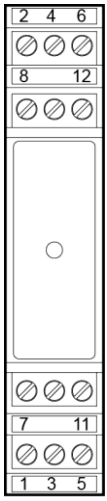
NOTICE

- Connect the other end of the ground cable to the ground bar.
- Recommendation: To enhance the corrosion resistance of a ground terminal, silica gel or paint might be needed.

Connecting the Communications Cable



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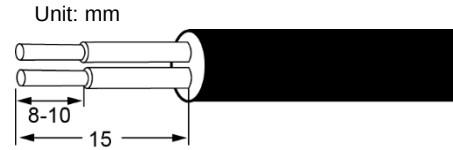
RS485 Surge Protection Port	Protection Port	Function	Surge Port	Function
RS485 surge protection port 1	2	RS485A, RS485 differential signal+	1	RS485A, RS485 differential signal+
	6	RS485B, RS485 differential signal–	5	RS485B, RS485 differential signal –
RS485 surge protection port 2	8	RS485A, RS485 differential signal+	7	RS485A, RS485 differential signal+
	12	RS485B, RS485 differential signal–	11	RS485B, RS485 differential signal–

NOTE

1. Protection ports connect to the COM ports on the SmartLogger. Port 4 is not connected.
2. Surge ports connect to RS485 ports on other devices. Port 3 is the ground port.
3. Protection ports and surge ports must not be confused.
4. One RS485 signal SPD can protect two COM ports.
5. 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.

Recommended: two-core or multiple-core cable with a cross-sectional area of 0.5–2.5 mm^2

1. Strip armor from the cable and insulation layer from the core wires from both ends.
2. Connect one end of one cable to the terminal block on the COM port of the SmartLogger.



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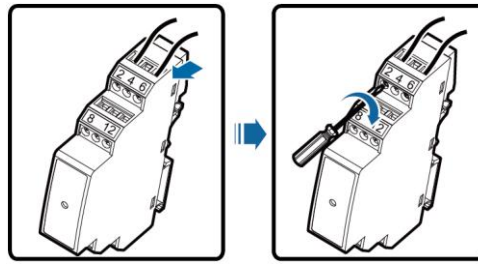
3. Connect the other end of the cable to the protection port of the RS485 signal SPD.

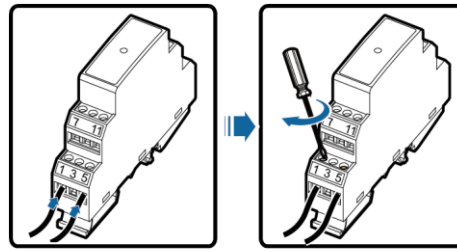


IL02IC1003

NOTICE

Verify that the COM+ port on the SmartLogger connects to protection port 2 or 8 on the RS485 signal SPD, and that the COM– port on the SmartLogger connects to protection port 6 or 12 on the RS485 signal SPD.

4. Connect one end of the other cable to the surge port of the RS485 signal SPD.



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5. Connect the other end of the cable to the communications port on the device.

NOTICE

Verify that RS485A on the device connects to surge port 1 or 7 on the RS485 signal SPD, and that RS485B on the device connects to surge port 5 or 11 on the RS485 signal SPD. For the detailed cable connections, see the instructions about the connected device.

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