SmartLogger3000

User Manual

Issue 11

Date 2023-01-20





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About This Document

Purpose

This document introduces the SmartLogger3000 (SmartLogger for short) and SmartModule1000 (SmartModule for short) in terms of installation, electrical connections, system operation and maintenance, and troubleshooting. Understand the SmartLogger and SmartModule features, functions, and safety precautions provided in this document before installing and operating the SmartLogger and SmartModule.

Intended Audience

This document is intended for operating personnel and qualified electricians of photovoltaic (PV) and energy storage plants.

Symbol Conventions

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

Symbol	Description	
⚠ DANGER	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.	
⚠ WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.	
⚠ CAUTION	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.	
NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.	
	NOTICE is used to address practices not related to personal injury.	

Symbol	Description
☐ NOTE	Supplements the important information in the main text.
	NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Updates between document issues are cumulative. The latest document issue contains all changes made in previous issues.

Issue 11 (2023-01-20)

Updated 1 Safety Information.

Updated 6.3.16 Setting Meter Parameters.

Updated 6.3.11 Setting ESU Parameters.

Updated 6.3.16 Setting Meter Parameters.

Updated 6.4 Setting Battery Control Parameters.

Updated 6.7.8.2 Setting NS Protection Remote Shutdown.

Updated 7.4.11 Force Start.

Updated 7.5 Device Replacement.

Added 8.18 Resetting Password.

Updated 8.13 Which Models of Power Meters and EMIs Are Supported by the SmartLogger?.

Updated E Acronyms and Abbreviations.

Issue 10 (2022-08-20)

Updated 6.1.3 WebUI Menus.

Updated 6.2.1 Preparations and WebUI Login.

Added 6.2.4 Commissioning Using Deployment Wizard (V300R023C00 and Later Versions).

Updated 6.3.5 Setting Parameters for the Slave SmartLogger.

Added 6.3.6 Setting GOOSE Communications Parameters.

Updated 6.3.8 Setting Inverter Parameters.

Updated 6.3.9 Setting PCS Parameters.

Updated 6.3.10 Setting CMU Parameters.

Updated 6.3.11 Setting ESU Parameters.

Updated 6.3.14 Setting HVAC Parameters.

Updated 6.4 Setting Battery Control Parameters.

Updated 6.3.18 Setting STS Parameters.

Updated 6.7.2 Setting Active Power Control.

Updated 6.7.3 Setting Reactive Power Control.

Updated 7.3 Alarm List.

Updated **7.4.4 Exporting Device Logs**.

Updated **7.4.11 Force Start**.

Issue 09 (2022-01-07)

Updated **2.1.2 Networking**.

Updated 2.2.2 Networking.

Updated 6.1.1 WebUI Layout.

Updated 6.1.3 WebUI Menus.

Added 6.3.3 Setting Parameters for Connecting to the Management System.

Updated **6.3.9 Setting PCS Parameters**.

Updated **6.3.10 Setting CMU Parameters**.

Updated 6.3.11 Setting ESU Parameters.

Updated **6.3.14 Setting HVAC Parameters**.

Updated 6.4 Setting Battery Control Parameters.

Added 6.5 Setting Capacity Limit.

Updated 6.6 Setting EMS Control Parameters.

Updated 6.7.2 Setting Active Power Control.

Updated 6.7.3 Setting Reactive Power Control.

Updated 6.7.5 Setting Export Limitation Parameters.

Updated 7.4.1 Upgrading the Device Firmware Version.

Updated 7.4.3 Sending a System Maintenance Command.

Updated 7.4.4 Exporting Device Logs.

Added **7.4.8 Managing Users**.

Updated 7.4.9 Collecting Performance Data.

Updated 7.4.10 Adjusting the Total Energy Yield.

Updated 8.13 Which Models of Power Meters and EMIs Are Supported by the SmartLogger?.

Issue 08 (2021-10-15)

Updated 2.1.2 Networking.

Updated 2.2.2 Networking.

Updated 6.1.1 WebUI Layout.

Updated 6.1.3 WebUI Menus.

Updated 6.2 Device Commissioning.

Updated 6.2.1 Preparations and WebUI Login.

Added 6.2.3 Commissioning Using Deployment Wizard (V800R021C10).

Updated 6.3.1 Setting User Parameters.

Updated 6.3.2 Setting Parameters for Connecting to the Management System (V300R001C00).

Added 6.3.9 Setting PCS Parameters.

Added 6.3.10 Setting CMU Parameters.

Added 6.3.11 Setting ESU Parameters.

Added 6.3.12 Setting ESC Parameters.

Added **6.3.13 Setting ESR Parameters**.

Added 6.3.14 Setting HVAC Parameters.

Added 6.4 Setting Battery Control Parameters.

Updated 6.7.2 Setting Active Power Control.

Updated 6.7.5 Setting Export Limitation Parameters.

Updated **7.2 Troubleshooting**.

Updated 7.3 Alarm List.

Updated 7.4.1 Upgrading the Device Firmware Version.

Updated 7.4.4 Exporting Device Logs.

Updated C Port No. List.

Updated E Acronyms and Abbreviations.

Issue 07 (2021-06-30)

Updated 6.1 Introduction to WebUI.

Updated 6.1.3 WebUI Menus.

Updated 6.3.8.1 Running Parameters.

Added 6.3.8.4 Battery.

Added 6.6 Setting EMS Control Parameters.

Updated 6.7.2 Setting Active Power Control.

Updated 7.4.4 Exporting Device Logs.

Updated 7.4.5 Starting an Onsite Test.

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Issue 06 (2021-03-20)

Updated 6.3.2 Setting Parameters for Connecting to the Management System (V300R001C00).

Updated 6.3.8.1 Running Parameters.6.3.8.1 Running Parameters

Updated 6.3.8.2 Tracking System.

Updated 6.3.16.1 Setting DL/T645 Meter Parameters.

Updated 6.3.16.2 Setting Modbus-RTU Meter Parameters.

Updated 6.3.17.1 Setting Modbus-RTU EMI Parameters.

Added 6.3.23 Smart Tracking Algorithm.

Updated 6.7.2 Setting Active Power Control.

Updated 6.7.5 Setting Export Limitation Parameters.

Updated 6.7.6 Setting Parameters for Smart Reactive Power Compensation.

Added 6.7.8 Setting Remote Shutdown.

Updated 6.7.8.1 Setting Dry Contact Remote Shutdown.

Added 6.7.8.2 Setting NS Protection Remote Shutdown.

Added 7.4.3.1 Exporting Full Configuration Files.

Added 7.4.3.2 Importing Full Configuration Files.

Updated 8.15 How Do I Use Mobile Network Sharing?.

Added 8.16 WebUI Allows Login Only in Chinese and Prompts to Switch to Chinese.

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Updated 6.3.2 Setting Parameters for Connecting to the Management System (V300R001C00).

Updated 6.3.7 Setting MBUS Parameters.

Added 8.15 How Do I Use Mobile Network Sharing?.

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Updated 6.2.1 Preparations and WebUI Login.

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Added the description about the SmartModule.

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Updated 6 WebUI Operations.

Updated 9.1 Technical Specifications of the SmartLogger.

Issue 01 (2019-09-24)

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

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1 Safety Information

Statement

Before transporting, storing, installing, operating, using, and/or maintaining the equipment, read this document, strictly follow the instructions provided herein, and follow all the safety instructions on the equipment and in this document. In this document, "equipment" refers to the products, software, components, spare parts, and/or services related to this document; "the Company" refers to the manufacturer (producer), seller, and/or service provider of the equipment; "you" refers to the entity that transports, stores, installs, operates, uses, and/or maintains the equipment.

The Danger, Warning, Caution, and Notice statements described in this document do not cover all the safety precautions. You also need to comply with relevant international, national, or regional standards and industry practices. The Company shall not be liable for any consequences that may arise due to violations of safety requirements or safety standards concerning the design, production, and usage of the equipment.

The equipment should be used in an environment that meets the design specifications. Otherwise, the equipment may be faulty, malfunctioning, or damaged, which is not covered under the warranty. The Company shall not be liable for any property loss, personal injury, or even death caused thereby.

Comply with applicable laws, regulations, standards, and specifications during transportation, storage, installation, operation, use, and maintenance.

Do not perform reverse engineering, decompilation, disassembly, adaptation, implantation, or other derivative operations on the equipment software. Do not study the internal implementation logic of the equipment, obtain the source code of the equipment software, violate intellectual property rights, or disclose any of the performance test results of the equipment software.

The Company shall not be liable for any of the following circumstances or their consequences:

- The equipment is damaged due to force majeure such as earthquakes, floods, volcanic eruptions, debris flows, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, and other extreme weather conditions.
- The equipment is operated beyond the conditions specified in this document.

- The equipment is installed or used in environments that do not comply with international, national, or regional standards.
- You fail to follow the operation instructions and safety precautions on the product and in the document.
- You remove or modify the product or modify the software code without authorization.
- You or a third party authorized by you cause the equipment damage during transportation.
- The equipment is damaged due to storage conditions that do not meet the requirements specified in the product document.
- You fail to prepare materials and tools that comply with local laws, regulations, and related standards.
- The equipment is damaged due to your or a third party's negligence, intentional breach, gross negligence, or improper operations, or other reasons not related to the Company.

1.1 Personal Safety

⚠ DANGER

Ensure that power is off during installation. Do not install or remove a cable with power on. Transient contact between the core of the cable and the conductor will generate electric arcs or sparks, which may cause a fire or personal injury.

DANGER

Non-standard and improper operations on the energized equipment may cause fire, electric shocks, or explosion, resulting in property damage, personal injury, or even death.

⚠ DANGER

Before operations, remove conductive objects such as watches, bracelets, bangles, rings, and necklaces to prevent electric shocks.

⚠ DANGER

During operations, use dedicated insulated tools to prevent electric shocks or short circuits. The dielectric withstanding voltage level must comply with local laws, regulations, standards, and specifications.

CZ00000108

Figure 1-1 Personal protective equipment

General Requirements

- Do not stop protective devices. Pay attention to the warnings, cautions, and related precautionary measures in this document and on the equipment.
- If there is a likelihood of personal injury or equipment damage during operations, immediately stop, report the case to the supervisor, and take feasible protective measures.
- Do not power on the equipment before it is installed or confirmed by professionals.
- In the case of a fire, immediately leave the building or the equipment area and activate the fire alarm or call emergency services. Do not enter the affected building or equipment area under any circumstances.

Personnel Requirements

- Only professionals and trained personnel are allowed to operate the equipment.
 - Professionals: personnel who are familiar with the working principles and structure of the equipment, trained or experienced in equipment operations and are clear of the sources and degree of various potential hazards in equipment installation, operation, maintenance
 - Trained personnel: personnel who are trained in technology and safety, have required experience, are aware of possible hazards on themselves in certain operations, and are able to take protective measures to minimize the hazards on themselves and other people
- Personnel who plan to install or maintain the equipment must receive adequate training, be able to correctly perform all operations, and understand all necessary safety precautions and local relevant standards.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain the equipment.
- Only qualified professionals are allowed to remove safety facilities and inspect the equipment.
- Personnel who will perform special tasks such as electrical operations, working at heights, and operations of special equipment should possess the required local qualifications.

- Only authorized professionals are allowed to replace the equipment or components (including software).
- Only personnel who need to work on the equipment are allowed to access the equipment.

1.2 Electrical Safety

A DANGER

Non-standard and improper operations may result in fire or electric shocks.

DANGER

Prevent foreign matter from entering the equipment during operations. Otherwise, equipment damage, load power derating, power failure, or personal injury may occur.

WARNING

For the equipment that needs to be grounded, install the ground cable first when installing the equipment and remove the ground cable last when removing the equipment.

General Requirements

- Follow the procedures described in the document for installation, operation, and maintenance. Do not reconstruct or alter the equipment, add components, or change the installation sequence without permission.
- Obtain approval from the national or local electric utility company before connecting the equipment to the grid.
- Before installing or removing power cables, turn off the switches of the equipment and its upstream and downstream switches.
- If any liquid is detected inside the equipment, disconnect the power supply immediately and do not use the equipment.
- Before performing operations on the equipment, check that all tools meet the requirements and record the tools. After the operations are complete, collect all of the tools to prevent them from being left inside the equipment.
- Before installing power cables, check that cable labels are correct and cable terminals are insulated.
- When installing the equipment, use a torque tool of a proper measurement range to tighten the screws. When using a wrench to tighten the screws, ensure that the wrench does not tilt and the torque error does not exceed 10% of the specified value.
- If the equipment has multiple inputs, disconnect all the inputs before operating the equipment.

- Check equipment connections periodically, ensuring that all screws are securely tightened.
- Only qualified professionals can replace a damaged cable.
- Do not scrawl, damage, or block any labels or nameplates on the equipment. Promptly replace labels that have worn out.
- Do not use solvents such as water, alcohol, or oil to clean electrical components inside or outside of the equipment.

Grounding

- Ensure that the grounding impedance of the equipment complies with local electrical standards.
- Ensure that the equipment is connected permanently to the protective ground. Before operating the equipment, check its electrical connection to ensure that it is reliably grounded.
- Do not work on the equipment in the absence of a properly installed ground conductor.
- Do not damage the ground conductor.
- For the equipment that uses a three-pin socket, ensure that the ground terminal in the socket is connected to the protective ground point.
- If high touch current may occur on the equipment, ground the protective ground terminal on the equipment enclosure before connecting the power supply; otherwise, electric shock as a result of touch current may occur.

Cabling Requirements

- When selecting, installing, and routing cables, follow local safety regulations and rules.
- When routing power cables, ensure that there is no coiling or twisting. Do not join or weld power cables. If necessary, use a longer cable.
- Ensure that all cables are properly connected and insulated, and meet specifications.
- Ensure that the slots and holes for routing cables are free from sharp edges, and that the positions where cables are routed through pipes or cable holes are equipped with cushion materials to prevent the cables from being damaged by sharp edges or burrs.
- Ensure that cables of the same type are bound together neatly and straight and that the cable sheath is intact. When routing cables of different types, ensure that they are away from each other without entanglement and overlapping.

1.3 Environment Requirements

⚠ DANGER

Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.

DANGER

Do not place the equipment near heat sources or fire sources, such as smoke, candles, heaters, or other heating devices. Overheat may damage the equipment or cause a fire.

№ WARNING

Install the equipment in an area far away from liquids. Do not install it under areas prone to condensation, such as under water pipes and air exhaust vents, or areas prone to water leakage, such as air conditioner vents, ventilation vents, or feeder windows of the equipment room. Ensure that no liquid enters the equipment to prevent faults or short circuits.

General Requirements

- Ensure that the equipment is stored in a clean, dry, and well ventilated area with proper temperature and humidity and is protected from dust and condensation.
- Do not install or run the equipment beyond the technical specifications. Otherwise, its performance and safety will be compromised.
- Do not install, use, or operate outdoor equipment and cables (including but not limited to moving equipment, operating equipment and cables, inserting connectors to or removing connectors from signal ports connected to outdoor facilities, working at heights, performing outdoor installation, and opening doors) in harsh weather conditions such as lightning, rain, snow, and level 6 or stronger wind.
- Do not install the equipment in an environment with direct sunlight, dust, smoke, volatile or corrosive gases, infrared and other radiations, organic solvents, or salty air.
- Do not install the equipment in an environment with conductive metal or magnetic dust.
- Do not install the equipment in an area conducive for the growth of microorganisms such as fungus or mildew.
- Do not install the equipment in an area with strong vibration, noise, or electromagnetic interference.
- After installing the equipment, remove the packing materials such as cartons, foam, plastics, and cable ties from the equipment area.

1.4 Mechanical Safety

A DANGER

When working at heights, wear a safety helmet and safety harness or waist belt and fasten it to a solid structure. Do not mount it on an insecure moveable object or metal object with sharp edges. Make sure that the hooks will not slide off.

№ WARNING

Ensure that all necessary tools are ready and inspected by a professional organization. Do not use tools that have signs of scratches or fail to pass the inspection or whose inspection validity period has expired. Ensure that the tools are secure and not overloaded.

↑ WARNING

Do not drill holes into the equipment. Doing so may affect the sealing performance and electromagnetic containment of the equipment and damage components or cables inside. Metal shavings from drilling may short-circuit boards inside the equipment.

General Requirements

- Do not perform operations such as arc welding and cutting on the equipment without evaluation by the Company.
- Do not install other devices on the top of the equipment without evaluation by the Company.
- Use correct tools and operate them in the correct way.

Moving Heavy Objects

Be cautious to prevent injury when moving heavy objects.



< 18 kg (< 40 lbs)



18-32 kg (40-70 lbs)



32-55 kg (70-121 lbs)



55-68 kg (121-150 lbs)



> 68 kg (> 150 lbs) CZ0000110

- If multiple persons need to move a heavy object together, determine the manpower and work division with consideration of height and other conditions to ensure that the weight is equally distributed.
- If two persons or more move a heavy object together, ensure that the object is lifted and landed simultaneously and moved at a uniform pace under the supervision of one person.
- Wear personal protective gears such as protective gloves and shoes when manually moving the equipment.
- To move an object by hand, approach to the object, squat down, and then lift the object gently and stably by the force of the legs instead of your back. Do not lift it suddenly or turn your body around.
- Move or lift the equipment by holding its handles or lower edges. Do not hold the handles of modules that are installed in the equipment.
- Do not quickly lift a heavy object above your waist. Place the object on a workbench that is half-waist high or any other appropriate place, adjust the positions of your palms, and then lift it.

- Move a heavy object stably with balanced force at an even and low speed. Put
 down the object stably and slowly to prevent any collision or drop from
 scratching the surface of the equipment or damaging the components and
 cables.
- When moving a heavy object, be aware of the workbench, slope, staircase, and slippery places. When moving a heavy object through a door, ensure that the door is wide enough to move the object and avoid bumping or injury.
- When transferring a heavy object, move your feet instead of turning your waist around. When lifting and transferring a heavy object, ensure that your feet point to the target direction of movement.

2 Product Overview

2.1 SmartLogger

2.1.1 Model

Model Description

This document covers the following SmartLogger models:

- SmartLogger3000A01CN
- SmartLogger3000B01CN
- SmartLogger3000B03CN
- SmartLogger3000A01EU
- SmartLogger3000A03EU
- SmartLogger3000B02EU
- SmartLogger3000A01NH
- SmartLogger3000B00NH
- SmartLogger3000A01KR
- SmartLogger3000A01AU
- SmartLogger3000A00GL

Figure 2-1 Model



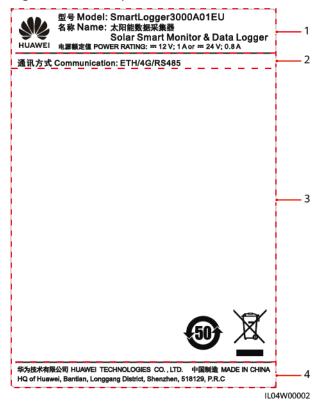
Table 2-1 Model Description

No.	Meaning	Description
1	Product family	SmartLogger3000: data collector
2	Hardware ID	 A: does not support fiber networking and can connect to a maximum of 80 solar inverters. B: supports fiber networking and a maximum of 150 solar inverters.
3	Feature ID	 00: does not support 4G networking or MBUS communication. 01: supports 4G networking, but
		not MBUS communication.
		02: supports MBUS communication, but not 4G networking.
		03: supports 4G networking and MBUS communication.
4	Region	CN: China
		EU: Europe
		NH: Japan
		KR: South Korea
		AU: Australia
		GL: Global

Model Identification

You can view the SmartLogger model and communication mode on the nameplate.

Figure 2-2 Nameplate



- (1) Trademark, product model, and power rating
- (2) Communications mode

(3) Compliance symbols

(4) Company name and place of manufacture

□ NOTE

The nameplate figure is for reference only.

2.1.2 Networking

Function

The SmartLogger monitors and manages PV and energy storage systems. It converges all ports, converts protocols, collects and stores data, and centrally monitors and maintains the devices in the systems.

Network Application

The SmartLogger is applicable to PV and energy storage systems. It supports the following:

- Local operations on the SmartLogger using the mobile phone app through the built-in WLAN
- RS485 networking, which enables the SmartLogger to connect to:
 - Huawei devices such as solar inverters and PID modules

- Third-party solar inverters, environment monitoring instruments (EMIs),
 Smart Transformer Stations (STSs), and power meters that use the
 Modbus-RTU protocol
- Power meters that use the DL/T645 protocol
- Devices that use the IEC103 protocol
- Ethernet networking, which connects to the solar inverter, Smart Power Control System (Smart PCS), Smart String Energy Storage System (ESS), MBUS CCO, and STS.
- MBUS networking, which enables the SmartLogger to connect to Huawei solar inverters and PID-PVBOXs that support MBUS communication
- Connection to management systems:
 - Connects to a management system that uses the Modbus TCP protocol over a wired or wireless network.
 - Connects to a management system that uses the IEC104 protocol in the LAN over a wired network.

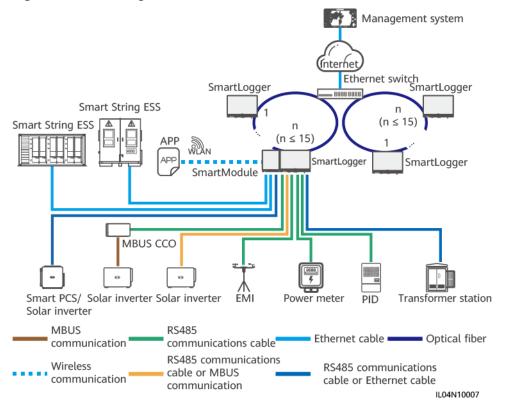
□ NOTE

The SmartLogger cannot be connected to a management system that uses the IEC104 protocol over a 4G/3G/2G or LTE dedicated network.

Typical Networking Scenarios

• The SmartLogger supports the following northbound wired networks: fiber ring network, fiber star network, and Ethernet star network.

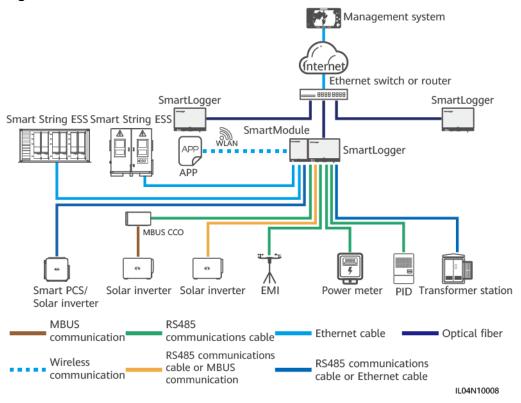
Figure 2-3 Fiber ring network



□ NOTE

- A maximum of 15 SmartLoggers can be connected to form a fiber ring network. Each SmartLogger can connect to devices such as solar inverters, EMIs, and power meters.
- Multiple fiber ring networks can be connected to the management system through an Ethernet switch.

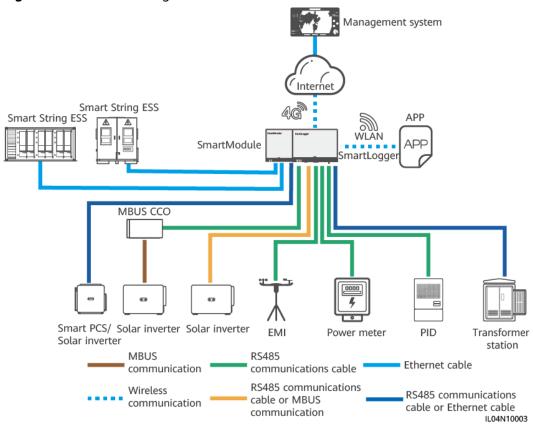
Figure 2-4 Fiber or Ethernet star network



○ NOTE

- Multiple SmartLoggers can be connected to the management system through an Ethernet switch.
- When the SmartLogger connects to an Ethernet switch over optical fibers, the maximum communication distance is 12 km (with the 100M optical module) or 10 km (with the 1000M optical module). The maximum communication distance is 100 m when an Ethernet cable is used for connection.
- The SmartLogger supports the following wireless networks: 4G/3G/2G networking and LTE dedicated networking.

Figure 2-5 4G networking



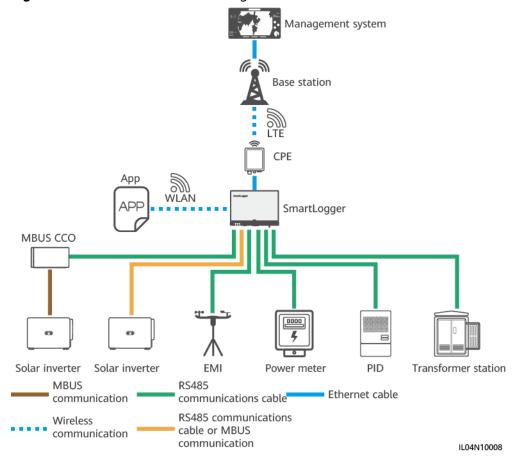


Figure 2-6 LTE dedicated networking

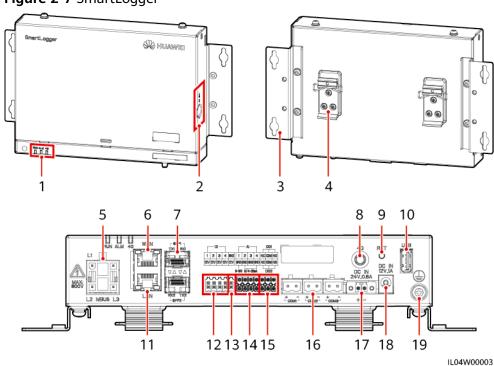
MOTE

- The WAN port of the SmartLogger connects to the customer-premises equipment (CPE) through the power over Ethernet (PoE) module and PoE SPD.
- The IP addresses of the SmartLogger and CPE must be on the same network segment.

2.1.3 Appearance

Appearance

Figure 2-7 SmartLogger



- (1) LED indicators
- (4) Guide rail clamp
- (7) SFP ports
- (10) USB port
- (13) 12 V output power port
- (16) COM ports
- (19) Protective ground point

- (2) SIM card slot
- (5) MBUS port
- (8) 4G antenna port
- (11) GE port (LAN)
- (14) Al ports
- (17) 24 V input power port
- point -

- (3) Mounting ear
- (6) GE port (WAN)
- (9) RST button
- (12) DI ports
- (15) DO ports
- (18) 12 V input power port

-

Indicators

Table 2-2 Indicators

Indicator	Status		Description
Running indicator	Green off Blinking green slowly (on for 1s and then off for 1s)		The SmartLogger is not powered on.
(RUN)			The communication with the management system is normal.
	Blinking green fast then off for 0.125s)		The communication with the management system is interrupted.
Alarm/	Alarm status	Red off	No system alarm is raised.
Maintenance indicator (ALM)		Blinking red slowly (on for 1s and then off for 4s)	The system raises a warning alarm.
		Blinking red fast (on for 0.5s and then off for 0.5s)	The system raises a minor alarm.
		Steady red	The system raises a major alarm.
	Maintenance	Green off	No local maintenance is in progress.
	status	Blinking green slowly (on for 1s and then off for 1s)	Local maintenance is in progress.
		Blinking green fast (on for 0.125s and then off for 0.125s)	Local maintenance fails or the connection to the app is to be set up.
		Steady green	Local maintenance succeeds.
4G indicator (4G)	Green off		The 4G/3G/2G networking function is not enabled.
	Blinking green slowly (on for 1s and then off for 1s) Blinking green fast (on for 0.125s and then off for 0.125s)		Dial-up through the 4G/3G/2G network is successful.
			The 4G/3G/2G network is not connected or the communication is interrupted.

□ NOTE

- Local maintenance refers to the 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, and by connecting the SmartLogger to the FusionSolar app or SUN2000 app over the built-in WLAN hotspot.
- If an alarm and local maintenance happen concurrently, the alarm/maintenance indicator shows the local maintenance state first. After local maintenance ends, the indicator shows the alarm state.

Communications Ports

• GE ports: Ethernet ports, including one WAN port and one LAN port

Appearance	GE Port		Description
WAN	Pins	Pin 1	1+
		Pin 2	1-
8 1 1 8		Pin 3	2+
		Pin 4	3+
LAN		Pin 5	3-
		Pin 6	2-
		Pin 7	4+
		Pin 8	4-
	Indicators	Green indicator	If the indicator is steady green, the line is normal.
		Yellow indicator	If the indicator blinks yellow, data communication is normal.

 SFP ports: include two Ethernet optical ports (SFP1 and SFP2), support access of 100M/1000M SFP or eSFP optical modules, and implement ring networking using RSTP or STP.

■ NOTE

- 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.
- The SFP1 and SFP2 ports are Ethernet optical ports and work on the same network segment as the WAN port.

Appearance	SFP Port		Description
SFP1 7	SFP1	TX1	Transmit port
		RX1	Receive port
VA VA	SFP2	RX2	Receive port
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		TX2	Transmit port
RX2 TX2 LSFP2	Indicators	Green indicator	If the indicator is steady green, the line is normal.
		Yellow indicator	If the indicator blinks yellow, data communication is normal.

• DI ports: digital input ports, which are used to connect to DI power grid scheduling commands or alarm signals.

Appearance	DI Port		Description
DI	DI1	1	Can connect to four passive
1 2 3 4 12V 12V 12V 12V		12 V	dry contact signals.
жжжж	DI2	2	
		12 V	
	DI3	3	
		12 V	
	DI4	4	
		12 V	

• Al ports: analog input ports, which are used to connect to Al power grid scheduling commands or environment monitoring sensors.

Appearance	Al Port		Description
AI 1 2 3 4 GND GND GND GND 0-10V 0/4-20mA 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Al1	1	Supports one channel of voltage-type (0–10 V) AI signals.
		GND	
	Al2	2	Support three channels of current-type (0–20 mA or 4–20 mA) AI signals.
		GND	
	AI3	3	
		GND	
	Al4	4	
		GND	

• DO ports: digital output ports, supporting two relay outputs. A DO port supports a maximum of 12 V signal voltage.

Appearance	DO Port		Description
NC COM NO NC COM NO DO2	DO1	NC	The NC/COM is a normally
		СОМ	closed contact.The NO/COM is a normally
		NO	open contact.
	DO2	NC	
		СОМ	
		NO	

• USB port: supports USB2.0 for connecting to a USB flash drive.

Appearance	USB Port	Description
USB The same of th	USB	After a USB flash drive is inserted into the USB port, you can perform local maintenance operations on the SmartLogger, such as firmware upgrade and data export.

 COM ports: RS485 communications port, supporting three independent RS485 channels and the access of devices that comply with the Modbus-RTU, IEC103, or DL/T645 protocol.

Appearance	COM Port		Description
	COM1, COM2, and	+	RS485A, RS485 differential signal+
+ □ COM3	_	RS485B, RS485 differential signal-	

Power Ports

Input power ports: There are two input power ports.

Appearance	Input Power Port		Description
DC IN	12 V input	DC IN	DC2.0 input port, which supports 12 V DC input and is used to connect to a power adapter.
12V,1A	power port	12 V, 1 A	
DC IN	24 V input	DC IN	2-pin cord end terminal, which supports 24 V DC input. When the device connects to the power supply through the 12 V input power port, this port can be used as the 12 V output power port.
24V,0.8A	power port	24 V, 0.8 A	

• 12 V output power port: There is one 12 V output power port. Its maximum output capability is 0.1 A. The port is used to drive the coil of the intermediate relay in the export limitation or audible and visual alarm scenario.

NOTICE

Select the intermediate relay with a free-wheeling diode in the coil. Otherwise, the device may be damaged.

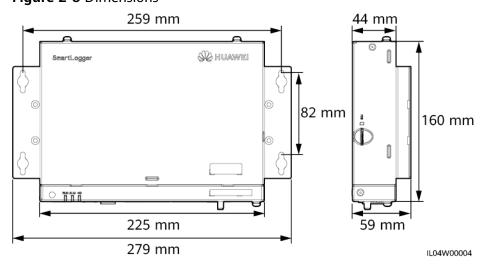
Appearance	Output Power Port		Description
GND	12 V output	GND	Power supply-
power port	power port	12 V	Power supply+

Button

Button	Operation	Function Description	
RST button	Hold down the button for 1s to 3s.	When WLAN is set to OFF in idle state, hold down the RST button for 1s to 3s to power on the WLAN module. The alarm/maintenance indicator (ALM) then blinks green quickly for 2 minutes (other indicators are off) and the SmartLogger waits for connecting to the app. If the app is not connected, the WLAN module is automatically powered off after it is powered on for 4 hours.	
	Button press duration 10s to 20s	If you hold down the RST button for 10s to 20s, the SmartLogger enters the safe mode. In this case, the device configuration parameters are retained, but personal privacy and sensitive data, including the login password and email address, are cleared.	
	Hold down the button for more than 60s.	Within 3 minutes after the SmartLogger is powered on, hold down the RST button for more than 60s to restart the SmartLogger and restore factory settings.	

Dimensions

Figure 2-8 Dimensions



2.2 SmartModule

2.2.1 Model

Model description

This document covers the following SmartModule model:

SmartModule1000A01

Figure 2-9 Model

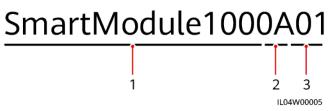


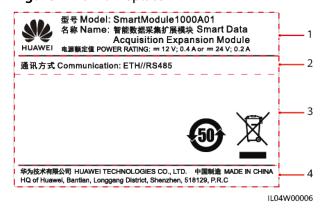
Table 2-3 Model description

No.	Meaning	Description
1	Product family	SmartModule1000: expansion module
2	Hardware ID	A: version A
3	Feature ID	01: SmartLogger scenario

Model Identification

You can view the SmartModule model on the nameplate.

Figure 2-10 Nameplate



- (1) Trademark, product model, and power rating
- (2) Communications mode

(3) Compliance symbols

(4) Company name and place of manufacture

◯ NOTE

The nameplate figure is for reference only.

2.2.2 Networking

Function

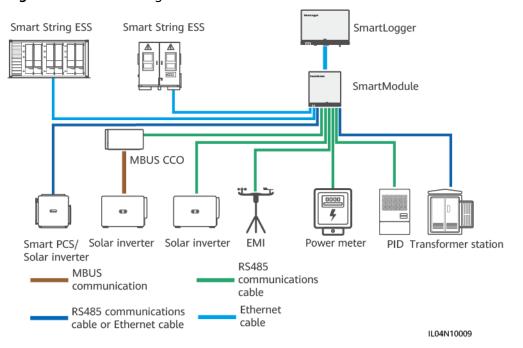
The SmartModule monitors and manages PV and energy storage systems. It converges ports, converts protocols, and collects data for devices in the systems, and extends ports for the SmartLogger.

Networking

The SmartModule is applicable to PV and energy storage systems. It supports the following:

- RS485 networking, which enables the SmartModule to connect to:
 - Huawei devices such as solar inverters and PID modules
 - Third-party solar inverters, environment monitoring instruments (EMIs),
 Smart Transformer Stations (STSs), and power meters that use the
 Modbus-RTU protocol
 - Power meters that use the DL/T645 protocol
 - Devices that use the IEC103 protocol
- Ethernet networking, which connects to the solar inverter, Smart Power Control System (Smart PCS), Smart String Energy Storage System (ESS), and STS.
- The SmartLogger can be connected over Ethernet.

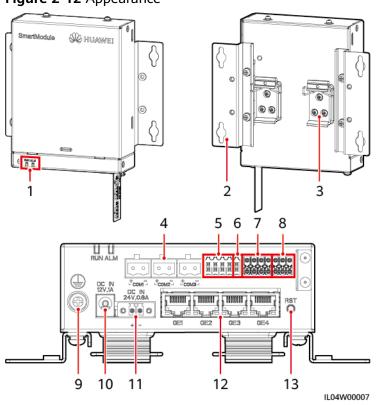
Figure 2-11 Networking



2.2.3 Appearance

Appearance

Figure 2-12 Appearance



- (1) LED indicators
- (4) COM ports
- (7) Al ports
- (10) 12 V power input port
- (13) RST button

- (2) Mounting ear
- (5) DI ports
- (8) PT ports
- (11) 24 V power input port
- _

- (3) Guide rail clamp
- (6) 12 V power output port
- (9) Protective ground point
- (12) GE ports
- _

Indicators

Indicator	Status		Description
Running indicator (RUN)	Green off		The SmartModule is not powered on.
RUN	Blinking green slowly (on for 1s and then off for 1s)		The communication with the SmartLogger is normal.
	Blinking green fast (on for 0.125s and then off for 0.125s)		The communication with the SmartLogger is interrupted.
Alarm/ Maintenance	Alarm status	Red off	No alarm is raised for the SmartModule.
indicator (ALM)		Blinking red slowly (on for 1s and then off for 4s)	The SmartModule is running in non-encryption status.
		Blinking red fast (on for 0.5s and then off for 0.5s)	The SmartModule digital certificate is invalid.
		Steady red	Reserved.

Communications Ports

• GE ports: four Ethernet electrical ports. Connect the LAN port of the SmartLogger to one GE port of the SmartModule using an Ethernet cable. The SmartModule obtains an IP address from the DHCP server and automatically registers with the SmartLogger. The SmartLogger can use all communications ports of the SmartModule.

Appearance	GE Port		Description
1 8	Pins	Pin 1	1+
		Pin 2	1-
		Pin 3	2+
		Pin 4	3+
		Pin 5	3-
		Pin 6	2-
		Pin 7	4+
		Pin 8	4-
	Indicators	Green indicator	If the indicator is steady green, the line is normal.
		Yellow indicator	If the indicator blinks yellow, data communication is normal.

• DI ports: digital input ports, which are used to connect to DI power grid scheduling commands or alarm signals.

Appearance	DI Port		Description
DI	DI1	1	Can connect to four passive
1 2 3 4 12V 12V 12V 12V		12 V	dry contact signals.
XXXXX EEEE EEEEE	DI2	2	
		12 V	
	DI3	3	
		12 V	
	DI4	4	
		12 V	

• Al ports: analog input ports, which are used to connect to Al power grid scheduling commands or environment monitoring sensors.

Appearance	Al Port		Description
Al	Al1	1	Supports one channel of
1 2 3 4 GND GND GND GND 0-40V 0/4-20mA		GND	voltage-type (0–10 V) Al signals.
	Al2	2	Support three channels of
		GND	current-type (0–20 mA or 4– 20 mA) Al signals.
	AI3	3	
		GND	
	Al4	4	
		GND	

PT ports: can connect to two PT100/PT1000 temperature sensors.

Appearance	PT Port		Description	
PTI	PT1	+	Can connect to a three-wire or	
+ - GND	PT2	_	two-wire PT100/PT1000 temperature sensor.	
PT2		GND	• Three-wire: cable length <	
	PT2	+	2 m for PT100; cable length < 20 m for PT1000	
		_	Two-wire: cable length < 2 m for a PT temperature	
		GND	sensor	

 COM ports: RS485 communications port, supporting three independent RS485 channels and the access of devices that comply with the Modbus-RTU, IEC103, or DL/T645 protocol.

Appearance	COM Port		Description	
	COM1, COM2, and	+	RS485A, RS485 differential signal+	
+ =	СОМ3	-	RS485B, RS485 differential signal-	

Power Ports

• Input power ports: There are two input power ports.

Appearance	Input Power Port		Description	
DC IN	12 V input	DC IN	DC2.0 input port, which supports 12 V DC input and is used to connect to a power adapter.	
12V,1A	power port	12 V, 1 A		
DC IN	24 V input	DC IN	2-pin cord end terminal, which supports 24 V DC input. When the device connects to the power supply through the 12 V input power port, this port can be used as the 12 V output power port.	
24V,0.8A	power port	24 V, 0.8 A		

• 12 V output power port: There is one 12 V output power port. Its maximum output capability is 0.1 A. The port is used to drive the coil of the intermediate relay in the export limitation or audible and visual alarm scenario.

NOTICE

Select the intermediate relay with a free-wheeling diode in the coil. Otherwise, the device may be damaged.

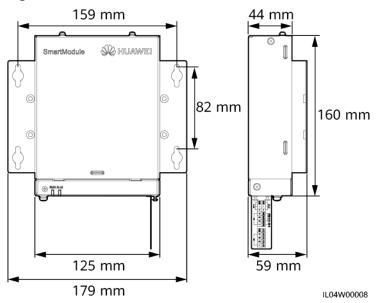
Appearance	Output Power Port		Description
GND	12 V output	GND	Power supply-
12V	power port	12 V	Power supply+

Button

Button	Operation	Function Description
RST button	Hold down the button for 3s to 10s.	If the Communication using expired certificate function is disabled for the SmartLogger and the digital certificate of the SmartModule becomes invalid, after enabling the function, press the RST button for 3s to 10s to enable the SmartModule to enter the mode of ignoring digital certificate expiration and restore the communication with the SmartLogger. The alarm/maintenance indicator (ALM) blinks red slowly.
		After the digital certificate of the SmartModule is reloaded through the SmartLogger, the SmartModule communication can recover.
	Hold down the button for more than 60s.	Within 3 minutes after the SmartModule is powered on after power-off, hold down the RST button for more than 60s to restart the SmartModule and restore factory settings.

Dimensions

Figure 2-13 Dimensions



3 Device Installation

3.1 Checking Before Installation

Check Item	Criteria
Outer packaging	The outer package is intact. If it is damaged or abnormal, do not unpack it and contact your dealer.
Deliverables	Check the quantity of deliverables against the <i>Packing List</i> in the packing case. If any component is missing or damaged, contact your dealer.

3.2 Tools

Туре	Tool			
	Hammer drill	Diagonal pliers	Wire stripper	Crimping tool
Installation				
	RJ45 crimping tool	Flat-head screwdriver	Torque screwdriver	Rubber mallet

Туре	Tool			
	10000			
	Utility knife	Cable cutter	Vacuum cleaner	Marker
				2000
	Measuring tape	Cable tie	Heat gun	Multimeter
		<u> </u>	-	-
	Heat shrink tubing	Level		
PPE				
	Insulated gloves	Safety goggles	Dust mask	Insulated shoes

3.3 Installation Requirements

NOTICE

- Do not install the SmartLogger in areas with flammable and explosive materials and direct sunlight.
- The SmartLogger should be installed at a proper height to facilitate operation and maintenance.

+60°C -40°C IP20 > 100 mm > 200 mm > 200 mm > 200 mm > 200 mm > 300 mm

Figure 3-1 Installation position

3.4 Installing the SmartLogger

The SmartLogger can be wall-mounted or guide rail-mounted.

Wall-mounted installation

⚠ WARNING

- Avoid drilling holes into the water pipes and power cables buried in the wall.
- Install a SmartLogger on a flat and secure interior wall.
- When wall-mounting the SmartLogger, ensure that the cable connection area faces downwards for ease of cable connection and maintenance.
- You are advised to use the tapping screws and expansion tubes delivered with the SmartLogger.

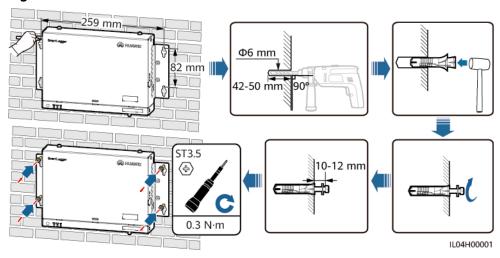


Figure 3-2 Wall-mounted installation

Guide Rail-mounted Installation

Prepare a 35 mm standard guide rail by yourself. Ensure that the guide rail:

- Has sufficient length for securing the SmartLogger. The recommended effective length is 230 mm or greater.
- Has been secured before you install the SmartLogger.

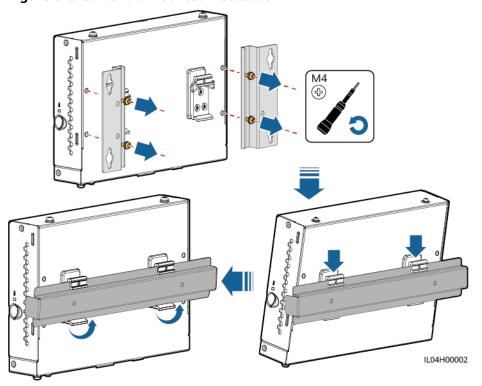


Figure 3-3 Guide rail-mounted installation

3.5 Installing the SmartLogger and SmartModule

Combine the SmartLogger and SmartModule and install them on a wall or along a guide rail.

Wall-mounted Installation

MARNING

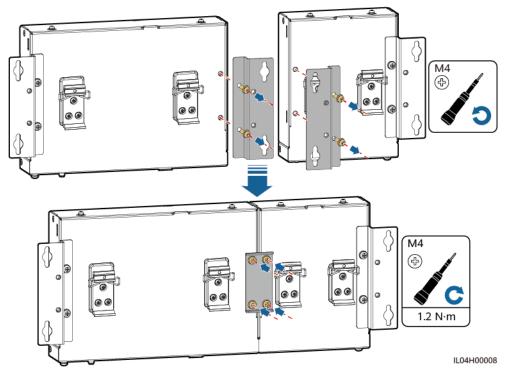
Avoid drilling holes into the water pipes and power cables buried in the wall.

Step 1 Combine the SmartLogger and SmartModule.

□ NOTE

If the SmartLogger and SmartModule have been combined before delivery, skip this step.

Figure 3-4 Connecting the SmartLogger to the SmartModule using a connecting plate



Step 2 Install the SmartLogger and SmartModule.

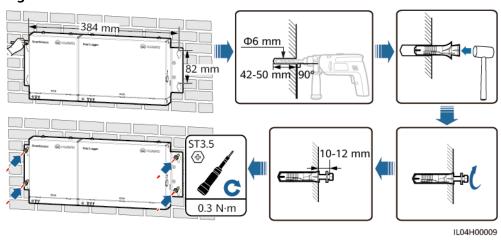


Figure 3-5 Wall-mounted installation

Guide Rail-mounted Installation (Stand-alone)

Prepare a 35 mm standard guide rail by yourself. Ensure that the guide rail:

- Has sufficient length for securing the SmartLogger and SmartModule. The recommended effective length is 360 mm or greater.
- Has been secured before you install the SmartLogger and SmartModule.
 - **◯** NOTE

Ensure that the SIM card slot on the SmartLogger is not blocked.

IL04H00007

Figure 3-6 Guide rail-mounted installation

Guide Rail-mounted Installation (Combined)

Prepare a 35 mm standard guide rail by yourself. Ensure that the guide rail:

- Has sufficient length for securing the SmartLogger and SmartModule. The recommended effective length is 360 mm or greater.
- Has been secured before you install the SmartLogger and SmartModule.

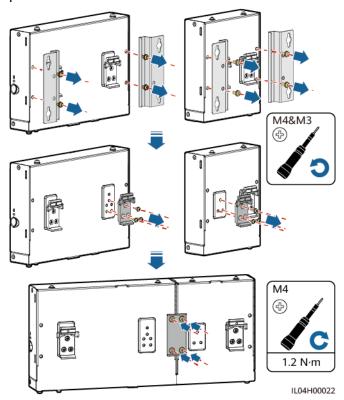
Ensure that the SIM card slot on the SmartLogger is not blocked.

Step 1 Combine the SmartLogger and SmartModule.

■ NOTE

If the SmartLogger and SmartModule have been combined before delivery, you only need to remove the mounting ears and guide rail clamps in the middle. You do not need to use a connecting plate to connect the SmartLogger and SmartModule.

Figure 3-7 Connecting the SmartLogger to the SmartModule using a connecting plate



Step 2 Install the SmartLogger and SmartModule.

----End

Figure 3-8 Guide Rail-mounted Installation

3.6 Installing a Power Adapter

A power adapter can be installed on a wall or flat surface.

If the SmartLogger requires a power adapter for power supply, install a power adapter.

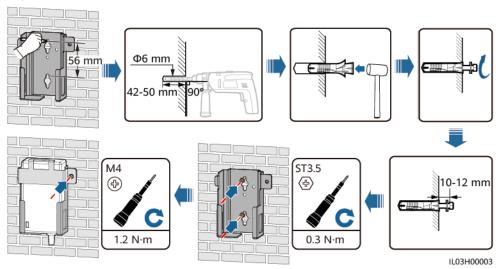
Wall-mounted installation

It is recommended that the power adapter be installed on the right side of the SmartLogger. Keep the AC power cable port upward.



Avoid drilling holes into the water pipes and power cables buried in the wall.

Figure 3-9 Wall-mounted Installation (Mode 1)



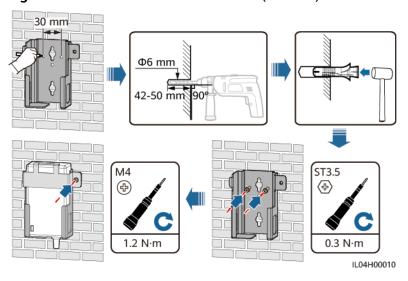


Figure 3-10 Wall-mounted Installation (Mode 2)

Flat Surface-mounted Installation

Install the power adapter on a flat surface. This section describes how to install the power adapter on the top of the SmartLogger.

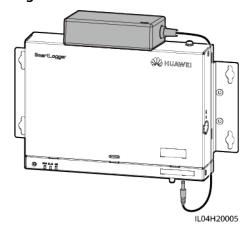
Step 1 Place the power adapter horizontally on the top of the SmartLogger.

NOTICE

- Ensure that the power adapter indicator faces upward or outward.
- Ensure that the adapter is securely installed.

Step 2 Plan the cable route of the power adapter to ensure that the SIM card can be installed properly.

Figure 3-11 Flat surface-mounted installation



----End

4 Cable Connections

4.1 Connecting Cables to the SmartLogger

4.1.1 Preparing Cables

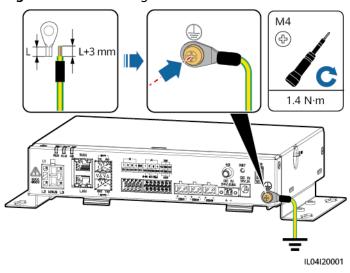
Туре	Recommended Cable Specifications	
PE cable	Outdoor copper-core cable with a cross-sectional area of 4–6 mm ² or 12–10 AWG	
RS485 communications cable	Two-core or multi-core outdoor shielded cable with a cross-sectional area of 0.2–2.5 mm ² or 24–14 AWG	
(Optional) MBUS cable	Delivered with the SmartLogger, 1.5 m long	
DI signal cable	Two-core or multiple-core cable with a cross-sectional area of 0.2–1.5	
Output power cable	mm ² or 24–16 AWG	
AI signal cable		
DO signal cable		
Network cable	Delivered with the SmartLogger, 2.2 m long. If the delivered network cable is too short, you are advised to prepare a network cable of Cat 5e or higher specifications and shielded RJ45 connectors.	
(Optional) 24 V input power cable	Two-core cable with a cross-sectional area of 0.2–1.5 mm ² or 24–16 AWG	

4.1.2 Connecting a PE Cable

Procedure

Step 1 Connect a PE cable.

Figure 4-1 Connecting a PE cable



----End

4.1.3 Connecting an RS485 Communications Cable

Context

- The SmartLogger can connect to RS485 communications devices, such as a solar inverter, an environmental monitoring instrument (EMI), a power meter, and a PID over the COM port.
- Ensure that RS485+ is connected to COM+ of the SmartLogger and RS485- is connected to the COM- of the SmartLogger.

Procedure

Step 1 Connect an RS485 communications cable.

7-8 mm

02.5 mm

0.4-0.5 N·m

ILO4I40001

Figure 4-2 Connecting an RS485 communications cable

Port Silk Screen Description

COM1, COM2, and COM3 + RS485A, RS485 differential signal+

RS485B, RS485 differential signal-

Step 2 If devices need to be cascaded, cascade the devices and then connect them to the SmartLogger.

NOTICE

- You are advised to connect fewer than 30 devices to each RS485 route.
- The baud rate, communications protocol, and parity mode of all devices on an RS485 cascading link must be the same as those of the COM port on the SmartLogger.

Solar inverter Solar inverter Solar inverter

SmartLogger

Solar inverter Solar inverter Solar inverter

Inverter Solar inverter Solar inverter

SmartLogger

ILO4N40001

Figure 4-3 Cascading connection

4.1.4 Connecting an MBUS Cable

Context

- If both the SmartLogger and the solar inverter support MBUS, the SmartLogger can be connected to the solar inverter through an AC power cable. In this case, you do not need to connect the RS485 communications cable to the solar inverter.
- If the SmartLogger uses an AC power cable as the communications cable, an MCB and a knife fuse switch need to be installed to prevent device damage in the case of short circuits.

NOTICE

The rated power of the PV system connected to the MBUS port on the SmartLogger must be greater than 75 kW.

Solar inverter

AC combiner box

Solar inverter

AC combiner station

Solar inverter

Solar inverter

AC combiner box

SmartLogger

IL04N10005

Figure 4-4 MBUS networking

Procedure

Step 1 Connect an MBUS cable.

Figure 4-5 Connecting an MBUS Cable

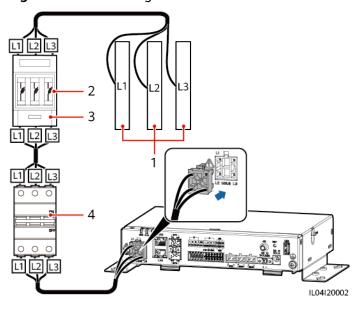


Table 4-1 Components

No.	Component	Specifications	Quantity
1	Busbar L1/L2/L3	N/A	1

No.	Component	Specifications	Quantity
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	3
		• When the rated AC voltage on the low-voltage side of the boxtype 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	Knife fuse 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	1
		• When the rated AC voltage on the low-voltage side of the boxtype 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; number of poles: 3	

No.	Component	Specifications	Quantity
4	МСВ	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	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 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	

4.1.5 Connecting a DI Signal Cable

Context

The SmartLogger can receive DI signals such as remote power grid scheduling commands and alarms over DI ports. It can only receive passive dry contact signals. It is recommended that the signal transmission distance be less than or equal to 10 m.

Procedure

Step 1 Connect a DI signal cable.

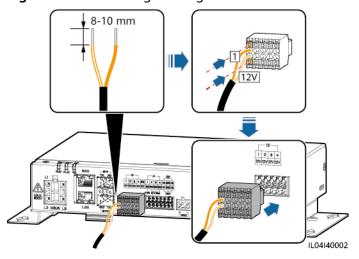


Figure 4-6 Connecting a DI signal cable

Port		Silk Screen	Description
DI	DI1	1	Can connect to four passive
		12 V	dry contact signals.
	DI2	2	
		12 V	
	DI3	3	
		12 V	
	DI4	4	
		12 V	

4.1.6 Connecting the Output Power Cable

Context

In the export limitation or audible and visual alarm scenario, the SmartLogger can drive the coil of the intermediate relay through the 12 V output power port. It is recommended that the transmission distance be less than or equal to 10 m.

Procedure

Step 1 Connect the output power cable.

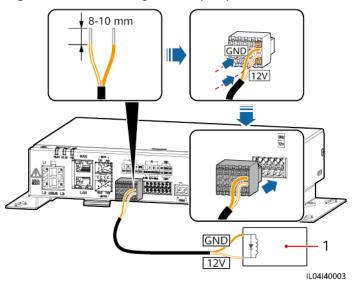


Figure 4-7 Connecting the output power cable

(1) Intermediate relay

----End

4.1.7 Connecting the AI Signal Cable

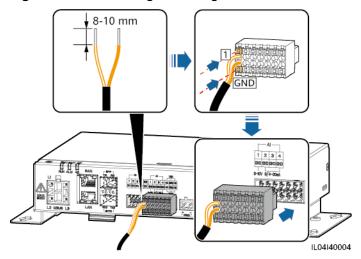
Context

The SmartLogger can receive AI signals from EMIs over AI ports. It is recommended that the signal transmission distance be less than or equal to 10 m.

Procedure

Step 1 Connect the AI signal cable.

Figure 4-8 Connecting the AI signal cable



Port		Silk Screen	Description
Al	Al1	1	Supports 0–10 V input voltage.
		GND	
	Al2	2	Support 0–20 mA or 4–20 mA
		GND	input current.
	Al3	3	
		GND	
	Al4	4	
		GND	

□ NOTE

Al ports 1, 2, 3, and 4 are for Al+ signals, and the GND port is for Al- signals.

----End

4.1.8 Connecting the DO Signal Cable

Context

The DO port supports a maximum of 12 V signal voltage. The NC/COM is a normally closed contact, while the NO/COM is a normally open contact. It is recommended that the signal transmission distance be less than or equal to 10 m.

Procedure

Step 1 Connect the DO signal cable.

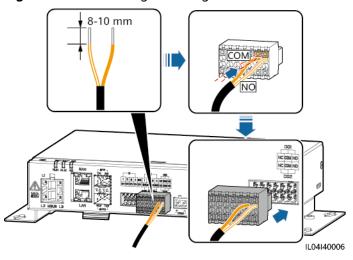


Figure 4-9 Connecting a DO Signal Cable

4.1.9 Connecting the Ethernet Cable

Context

- The SmartLogger can connect to an Ethernet switch, router, or PC over a WAN port.
- The SmartLogger can be connected to the SmartModule or a PC over the LAN port.

Procedure

Step 1 Connect the Ethernet cable.

□ NOTE

When crimping the network cable, ensure that the shielding layer of the cable is securely connected to the metal shell of the RJ45 connectors.

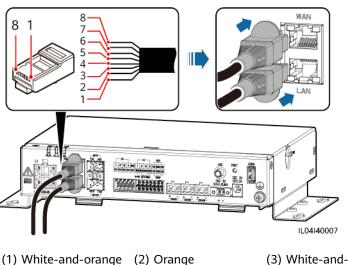


Figure 4-10 Connecting an Ethernet cable

(3) White-and-green

(4) Blue

(5) White-and-blue

(6) Green

(7) White-and-brown

(8) Brown

----End

4.1.10 Connecting Fiber Jumpers

Context

The SmartLogger can connect to devices such as the access terminal box through optical fibers.

Procedure

Step 1 Insert an optical module into the SFP1 or SFP2 port of the SmartLogger. If there are two modules, insert one into each port.

NOTICE

- Optical modules are optional. Configure the 100M or 1000M optical module based on the peer port of the optical switch. The optical module should use the SFP or eSFP encapsulation. The transmission distance supported by the 100M optical module should be greater than or equal to 12 km, and the transmission distance supported by the 1000M optical module should be greater than or equal to 10 km.
- When inserting an optical module into the SFP1 port, verify that the side with a label faces upward. When inserting an optical module into the SFP2 port, verify that the side with a label faces downward.
- **Step 2** Connect the fiber jumpers delivered with the optical module to the ports of the optical module.

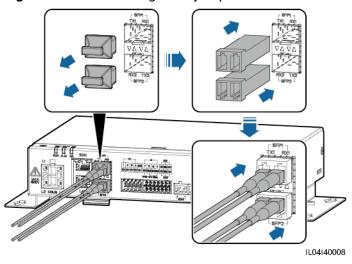


Figure 4-11 Connecting fiber jumpers

Follow-up Procedure

Disconnection can be performed in reverse order.

□ NOTE

- When removing an optical fiber, press the latch first.
- When removing an optical module, pull it out by the handle. Ensure that the interval between removing and inserting an optical module is greater than 0.2s.

4.1.11 Installing a SIM Card and a 4G Antenna

Context

The SmartLogger provides the 4G wireless communication function. A SIM card of the local carrier can be inserted for dial-up access.

Prepare a standard SIM card (dimensions: 25 mm x 15 mm; capacity \geq 64 KB). Monthly traffic of the SIM card \geq Monthly traffic of solar inverters + Monthly traffic of EMIs + Monthly traffic of optimizers. The model of the energy storage system in the following table is LUNA2000-(5-30)-S0. If other devices are connected to the SmartLogger in the network, the monthly traffic of the SIM card needs to be increased as required.

Access **Monthly Traffic Requirement of the SIM Traffic Baseline** NMS type Without a 10 MB + 4 MB x Fusion Solar • Device performance Solar invert Number of solar data can be updated power Smart inverters every 5 minutes. er sensor or PV energy • The solar inverter logs Manag storage and I-V curve ement diagnosis data can be 10 MB + 7 MB x With a System exported monthly. The Number of solar power solar inverters can be sensor inverters upgraded monthly. With energy 13 MB + 7 MB x storage Number of solar inverters + 5 MB x Number of power control modules (DCDC) EMI 3 MB x Number of **EMIs**

2 MB + 0.2 MB x Number of optimizers

Table 4-2 SIM card traffic description

Procedure

Step 1 Insert a SIM card into the SIM card slot.

Optimizer

NOTICE

- When installing the SIM card, determine its installation direction based on the silk screen.
- Press the SIM card in place to lock it. In this case, the SIM card is correctly installed.
- When removing the SIM card, push it inward to eject it.

Step 2 Install an antenna.

2 C 1.0-2.0 N·m 2

Figure 4-12 Installing the SIM card and antenna

4.1.12 Connecting the 24 V Input Power Cable

Context

The 24 V input power cable needs to be connected in the following scenarios:

- Scenario 1: The 24 V DC power supply is used.
- Scenario 2: The SmartLogger connects to the power supply through the 12 V input power port, and the 24 V input power port functions as the 12 V output power port to supply power to devices.

Procedure

Step 1 Connect the input power cable.

7-8 mm

02 mm

0.2-0.25 N·m

024V,0.8A

0.4-0.5 N·m

1L04l40013

Figure 4-13 Connecting the input power cable

4.2 Connecting Cables to the SmartModule

----End

4.2.1 Preparing Cables

Туре	Recommended Cable Specifications		
PE cable	Outdoor copper-core cable with a cross-sectional area of 4–6 mm ² or 12–10 AWG		
Network cable	The cable is delivered with the SmartModule and is 0.35 m long. If the delivered network cable is too short, you are advised to prepare a network cable of Cat 5e or higher specifications and shielded RJ45 connectors.		
12 V power input cable	The cable is delivered with the SmartModule and is 0.5 m long.		
RS485 communications cable	Two-core or multi-core outdoor shielded cable with a cross-sectional area of 0.2–2.5 mm ² or 24–14 AWG		
DI signal cable	Two-core or multiple-core cable with a cross-sectional area of 0.2–1.5		
Output power cable	mm ² or 24–16 AWG		
AI signal cable			
PT signal cable	For details about the cables and cable connection operations, see the documents delivered with the PT100/PT1000.		
(Optional) 24 V power input cable	Two-core cable with a cross-sectional area of 0.2–1.5 mm ² or 24–16 AWG		

4.2.2 Connecting the PE Cable

Procedure

Step 1 Connect the PE cable.

Figure 4-14 Connecting a PE cable

M4

1.4 N·m

ILO4120003

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If the SmartLogger is connected to the SmartModule over a connecting plate, connect a PE cable to the ground point of the SmartLogger or SmartModule based on site requirements.

----End

4.2.3 Connecting the Ethernet Cable

Context

- The SmartModule can be connected to the SmartLogger and a PC over the GE port.
- Connect the LAN port of the SmartLogger to one of the GE ports (GE1 and GE4 recommended) of the SmartModule through an Ethernet cable. The SmartModule obtains an IP address from the DHCP server and automatically registers with the SmartLogger.

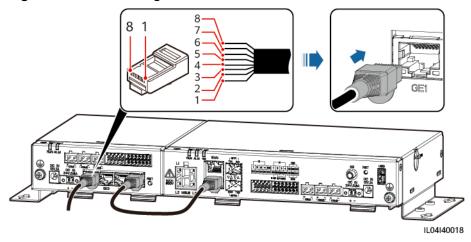
Procedure

Step 1 Connect the Ethernet cable.

Ⅲ NOTE

When crimping the network cable, ensure that the shielding layer of the cable is securely connected to the metal shell of the RJ45 connectors.

Figure 4-15 Connecting an Ethernet Cable



- (1) White-and-orange (2) Orange
- (3) White-and-green
- (4) Blue

- (5) White-and-blue
- (6) Green
- (7) White-and-brown
- (8) Brown

----End

4.2.4 Connecting the 12 V Power Input Cable

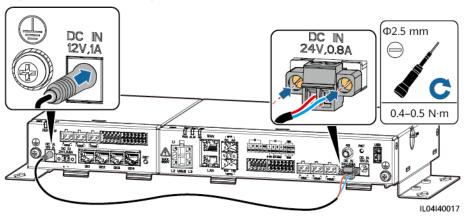
Context

The SmartLogger connects to the power supply through the 12 V power input port, and the 24 V power input port of the SmartLogger functions as the 12 V power output port to supply power to the SmartModule.

Procedure

Step 1 Connect the 12 V power input cable.

Figure 4-16 Connecting the 12 V power input cable



----End

4.2.5 Connecting the RS485 Communications Cable

Context

- The SmartModule can connect to RS485 communications devices, such as a solar inverter, an EMI, a power meter, and a PID over COM ports.
- Ensure that RS485+ is connected to COM+ of the SmartModule and RS485- is connected to the COM- of the SmartModule.

Procedure

Step 1 Connect the RS485 communications cable.

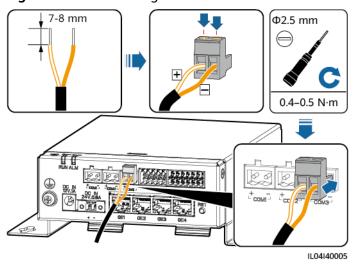


Figure 4-17 Connecting an RS485 communications cable

Port Silk Screen Description

COM1, COM2, and COM3 + RS485A, RS485 differential signal+

RS485B, RS485 differential signal-

Step 2 If devices need to be cascaded, cascade the devices and then connect them to the SmartModule.

NOTICE

- You are advised to connect fewer than 30 devices to each RS485 route.
- The baud rate, communications protocol, and parity mode of all devices on an RS485 cascading link must be the same as those of the COM port of the SmartModule.

Solar inverter Solar inverter Solar inverter

SmartModule

Solar inverter Solar inverter Solar inverter

Light Solar inverter Solar inverter Solar inverter

SmartModule

Light Solar inverter Solar inverter Solar inverter

Figure 4-18 Cascading connection

4.2.6 Connecting the DI Signal Cable

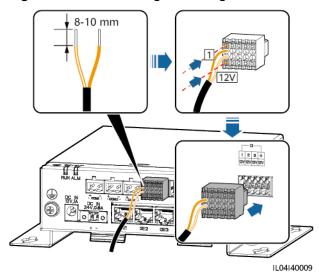
Context

The SmartModule can receive DI signals such as remote commands and alarms over DI ports. It can only receive passive dry contact signals. It is recommended that the signal transmission distance be less than or equal to 10 m.

Procedure

Step 1 Connect the DI signal cable.

Figure 4-19 Connecting the DI signal cable



Port		Silk Screen	Description
DI	DI1	1	Can connect to four passive
	DI2 2 dry contact signals.	dry contact signals.	
		12 V	
	DI3	3	
DI4 4	12 V		
	DI4	4	
		12 V	

----End

4.2.7 Connecting the Output Power Cable

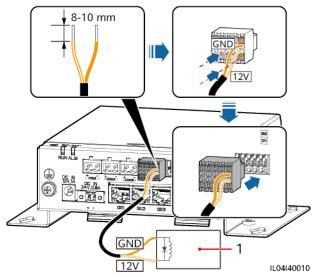
Context

In the export limitation or audible and visual alarm scenario, the SmartModule can drive the coil of the intermediate relay through the 12 V power output port. It is recommended that the transmission distance be less than or equal to 10 m.

Procedure

Step 1 Connect the power output cable.

Figure 4-20 Connecting the power output cable



(1) Intermediate relay

4.2.8 Connecting the AI Signal Cable

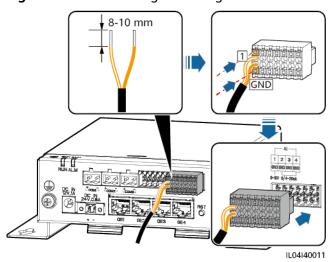
Context

The SmartModule can receive AI signals from EMIs over AI ports. It is recommended that the signal transmission distance be less than or equal to 10 m.

Procedure

Step 1 Connect the AI signal cable.

Figure 4-21 Connecting the AI signal cable



Port		Silk Screen	Description
Al	Al1	1	Supports 0–10 V input voltage.
		GND	
	Al2	2	Support 0–20 mA or 4–20 mA
		GND	input current.
	AI3	3	
		GND	
	Al4	4	
		GND	

□ NOTE

Al ports 1, 2, 3, and 4 are for Al+ signals, and the GND port is for Al- signals.

4.2.9 Connecting the PT Signal Cable

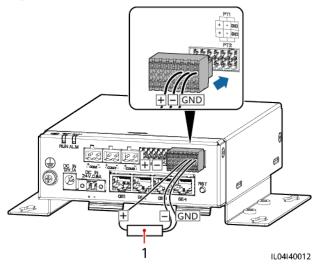
Context

- The SmartModule provides two PT ports, which can be used to connect to three-wire or two-wire PT100/PT1000 temperature sensors.
- When a PT port needs to be connected to a two-wire PT100/PT1000, use a short-circuit cable to short-circuit **GND** and of the port.

Procedure

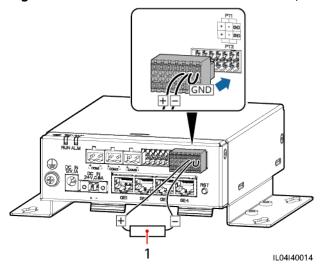
Step 1 Connect the PT signal cable.

Figure 4-22 Connection to a three-wire PT100/PT1000



(1) PT100/PT1000 temperature sensor

Figure 4-23 Connection to a two-wire PT100/PT1000



(1) PT100/PT1000 temperature sensor

4.2.10 Connecting the 24 V Power Input Cable

Context

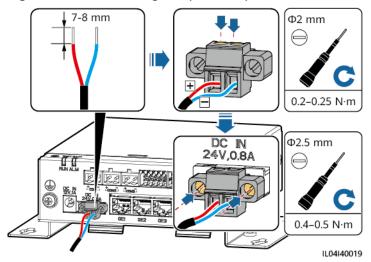
The 24 V power input cable needs to be connected in the following scenarios:

- Scenario 1: The 24 V DC power supply is used.
- Scenario 2: The SmartModule connects to the power supply through the 12 V power input port, and the 24 V power input cable functions as the 12 V power output port to supply power to a device.

Procedure

Step 1 Connect the power input cable.

Figure 4-24 Connecting the power input cable



5 System Operation

5.1 Check Before Power-on

No.	Check That
1	The SmartLogger and SmartModule are installed correctly and securely.
2	All cables are connected securely.
3	Routing for the power cables and signal cables meets the requirements for routing strong-current and weak-current cables and complies with the cable routing plan.
4	Cables are bound neatly, and cable ties are secured evenly and properly in the same direction.
5	There are no sundries such as unnecessary adhesive tape or cable ties on cables.

5.2 Powering On the System

Step 1 Connect the power supply.

• **Method 1**: When a power adapter is used, connect the power adapter cable and turn on the switch on the AC socket side.

MOTE

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

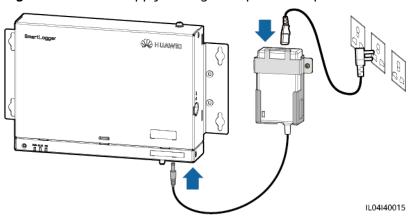


Figure 5-1 Power supply through the power adapter

- Method 2: When a DC power supply is used, check that the cable between the DC power supply and the SmartLogger as well as the SmartModule is connected properly, and turn on the upstream power switch of the DC power supply.
- **Step 2** When MBUS is used for communication, turn on all the upstream switches of the MBUS port.

6 WebUI Operations

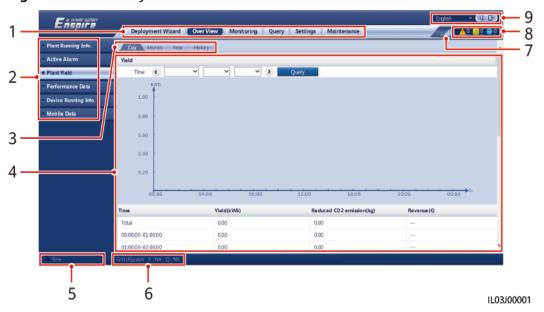
6.1 Introduction to WebUI

NOTICE

- The web software versions corresponding to the WebUI screenshots in this document are V300R001C00SPC050 and V300R023C00. The screenshots are for reference only.
- The parameter names, value ranges, and default values are subject to change. The actual display may vary.
- Delivering a reset, shutdown, or upgrade command to the inverter and Smart PCS may cause power grid connection failure, which affects the energy yield.
- Only professionals are allowed to set the grid parameters, protection
 parameters, feature parameters, and power adjustment parameters of the
 inverter and Smart PCS. If the power grid parameters, protection parameters,
 and feature parameters are incorrectly set, the inverter and Smart PCS may fail
 to connect to the power grid. If the power adjustment parameters are
 incorrectly set, the inverter and Smart PCS may fail to connect to the power
 grid as required. In these cases, the energy yield will be affected.
- Only professionals are allowed to set the power grid scheduling parameters of the SmartLogger. Incorrect settings may cause the plant to fail to connect to the power grid as required, which affects the energy yield.

6.1.1 WebUI Layout

Figure 6-1 WebUI layout



No.	Function	Description	
1	First-level menu	Choose the corresponding first-level menu before you perform any operation over the WebUI.	
2	Second-level menu	Under the first-level menu, choose the device to be queried or the parameter to be set under the second-level menu.	
3	Third-level menu	 After choosing a second-level menu, choose a third-level menu to access the query or setting page. There are no third-level menus under certain second-level menus. 	
4	Details page	Displays details of the queried information or parameter setting.	
5	System time	Displays the current system time.	
6	Power grid scheduling	Displays the current power grid scheduling mode and scheduling value of the system.	
7	Icon for SIM card signal strength	Displays the signal strength of the SIM card.	
8	Alarm icon	Displays the severities and number of active system alarms. You can click a number to access the alarm page.	
9	Display language	Selects the display language or chooses to log out.	



Figure 6-2 Plant running information (without battery or power meter)

No.	Parameter	Description	
1	Active power	Total active power of inverters	
2	Energy yield of current day	Total energy yield of inverters on the current day	
3	Total energy yield	Total energy yield of inverters	
4	Reduced CO2 emission	(Total energy yield – Total power supply from grid) \times CO ₂ emission reduction coefficient. If the result is negative, the value is zero.	
5	Revenue	(Total energy yield – Total power supply from grid) x Revenue coefficient. If the result is negative, the value is zero.	



Figure 6-3 Plant running information (with power meter but without battery)

No.	Parameter	Description	
1	Active power	Total active power of inverters	
2	Reactive power	Vector sum of the reactive power of inverters: Positive value indicates that power is transmitted to the grid and negative value indicates that power is transmitted from the grid.	
3	Load power	Vector sum of the active power and grid-tied active power	
4	Grid-tied active power	Active power of the feed-in meter: Positive value indicates purchasing electricity and negative value indicates selling electricity.	
5	Grid-tied reactive power	Reactive power of the feed-in meter: Positive value indicates that power is transmitted from the grid and negative value indicates that power is transmitted to the power grid.	
6	Energy yield of current day	Total energy yield of inverters on the current day	
7	Daily consumption	Energy yield of current day + Daily supply from grid – Daily feed- in to grid – Today's power supply from grid	
8	Daily feed-in to grid	Current total negative active energy of the feed-in meter – Total negative active energy at 00:00 on the current day	
9	Daily supply from grid	Current total positive active energy of the feed-in meter – Total positive active energy at 00:00 on the current day	
10	Total energy yield	Total energy yield of inverters	



Figure 6-4 Plant running information (with battery but without power meter)

No.	Parameter	Description	
1	Active power	Vector sum of the active power of inverters and Smart PCSs: Positive value indicates that energy is generated through the inverter and negative value indicates that energy is stored through the rectifier.	
2	Reactive power	Vector sum of the reactive power of inverters and Smart PCSs: Positive value indicates that power is transmitted to the grid and negative value indicates that power is transmitted from the grid.	
3	Energy yield of current day	Total energy yield of inverters and Smart PCSs of the current day	
4	Today's power supply from grid	Total power supplied from the grid to inverters and Smart PCSs of the current day	



Figure 6-5 Plant running information (with power meter and battery)

No.	Parameter	Description	
1	Active power	Vector sum of the active power of inverters and Smart PCSs: Positive value indicates that energy is generated through the inverter and negative value indicates that energy is stored through the rectifier.	
2	Reactive power	Vector sum of the reactive power of inverters and Smart PCSs: Positive value indicates that power is transmitted to the grid and negative value indicates that power is transmitted from the grid.	
3	Load power	Vector sum of the active power and grid-tied active power	
4	Grid-tied active power	Active power of the feed-in meter: Positive value indicates purchasing electricity and negative value indicates selling electricity.	
5	Grid-tied reactive power	Reactive power of the feed-in meter: Positive value indicates that power is transmitted from the grid and negative value indicates that power is transmitted to the power grid.	
6	Energy yield of the current day	Total energy yield of the inverter and Smart PCS on a day	
7	Today's power supply from grid	Total power supplied from the grid to the inverter and Smart PC on a day	
8	Daily consumption	Energy yield of current day + Daily supply from grid – Daily feed- in to grid – Today's power supply from grid	
9	Daily supply from grid	Current total positive active energy of the feed-in meter – Total positive active energy at 00:00 on the current day	

6.1.2 Icon Description

Icon	Description	Icon	Description
	Click the About icon to query the WebUI version information.	→	Click the Drop-down icon to select a parameter or time.
	Click the Exit icon to log out.	<u>^0 10 10 10 10 10 10 10 10 10 10 10 10 10</u>	Alarms are classified into major, minor, and warning ones. Click the Alarm icon to query an alarm.
	Click the Increase/ Decrease icon to adjust time.		Click the Start icon to start the device.
◎	The Select icon indicates that a parameter is selected.		Click the Stop icon to shut down the device.
	The Select icon indicates that a parameter is not selected. Click the icon to select a parameter.		Click the Reset icon to reset the device.
※ ≪	Hide icon and Display icon.		 The inverter and Smart PCS are in Running state. The device such as the EMI, power meter, slave SmartLogger, or MBUS is in Online state. The PID is in Running state.
	The device is in Disconnection state. If a device is in Disconnection state, its parameters cannot be set.		The inverter and Smart PCS are in Loading state.

Icon	Description	Icon	Description
	 The inverter and Smart PCS are in abnormal grid-tied power generation state, such as Initializing, Power-off, and Idle. The PID device is in Power-off, Idle or other state in which it is not running properly. 	•	Ascending order or descending order icon. Click the icon to sort the items in ascending or descending order for the corresponding column.
<u>▲</u> ⊕ <u>m</u> <u>∠</u> <u>m</u>	Icons during deployment, including Cable connection alarm, Add Devices, Remove Devices, Modify Device Info, and Topology view.	-	-

6.1.3 WebUI Menus

Table 6-1 WebUI menus

Main Menu	Second-Level Menu	Third-Level Menu	Function
Deployment Wizard	-	-	Supports the deployment wizard function. You can set deployment parameters, connect devices, and connect to the management system according to the wizard.
Overview	Plant Running Info.	-	Queries PV plant information.
	Active Alarm	-	Queries active alarms.

Main Menu	Second-Level Menu	Third-Level Menu	Function
	Yield	-	 Queries the energy generated, consumed, purchased, and sold. Daily data (at hourly granularity) can be stored for 30 days. Monthly data (at daily granularity) can be stored for one year. Yearly data (at monthly granularity) can be stored for 10 years. Historical data (at yearly granularity) can be stored for 25 years.
	Performance Data	-	Queries or exports performance data.
	Device Running Info.	-	Queries or exports device running information.
	Mobile Data	-	Queries mobile network data.
Monitoring	SmartLogger3000	Running Info.	Queries the running information.
		Active Alarm	Queries active alarms.
		Module(M1)	Queries the expansion module.
		About	Queries the version and communication information of the master SmartLogger.
	SmartLogger	About	Queries the version and communication information of the slave SmartLogger.
	Inverter	Running Info.	Queries the running information.
	NOTE SUN2000 is displayed for	Active Alarm	Queries active alarms.
	V300R001C00.	Performance Data	Queries or exports performance data.
		Yield	Queries the energy yield.
		Running Param.	Sets running parameters.
		Tracking System	Sets tracking system parameters.
		Battery	Queries or sets battery parameters.
		Characteristic Curve	Sets the characteristic curve.

Main Menu	Second-Level Menu	Third-Level Menu	Function
		About	Queries the version and communication information.
	PCS	Running Info.	Queries the running information.
		Active Alarm	Queries active alarms.
		Performance Data	Queries or exports performance data.
		Yield	Queries the energy yield.
		Running Param.	Sets running parameters.
		Characteristic Curve	Sets the characteristic curve.
		About	Queries the version information.
	СМИ	Running Info.	Queries the running information.
		Active Alarm	Queries active alarms.
		Performance Data	Queries or exports performance data.
		Yield	Queries the energy yield.
		Running Param.	Sets running parameters.
		About	Queries the version information.
	ESU	Running Info.	Queries the running information.
		Active Alarm	Queries active alarms.
		Running Param.	Sets running parameters.
		About	Queries the version information.
	ESC	Running Info.	Queries the running information.
		Performance Data	Queries or exports performance data.
		Running Param.	Sets running parameters.
		About	Queries the version information.
	ESR	Running Info.	Queries the running information.

Main Menu	Second-Level Menu	Third-Level Menu	Function
		Performance Data	Queries or exports performance data.
		Yield	Queries the energy yield.
		Running Param.	Sets running parameters.
		Optimizer status	Queries the working status of the battery pack optimizer.
	ESM	Running Info.	Queries the running information.
		Running Param.	Sets running parameters.
		About	Queries the version information.
	HVAC	Running Info.	Queries the running information.
		Running Param.	Sets running parameters.
		About	Queries the version information.
	TCU	Running Info.	Queries the running information.
		Active Alarm	Queries active alarms.
		About	Queries the version information.
	MBUS	Running Info.	Queries the running information.
		STA List	 Sets or synchronizes the baud rates of MBUS communication devices. Exports the STA list.
		Networking Settings	Sets running parameters.Manages the SN list.
		About	Queries the version and communication information.
	EMI	Running Info.	Queries the running information.
		Performance Data	Queries or exports performance data.
		Running Param.	Sets running parameters.
		About	Queries communication information.
	Meter	Running Info.	Queries the running information.

Main Menu	Second-Level Menu	Third-Level Menu	Function
P	NOTE Power Meter is displayed for V300R001C00.	Performance Data	Queries or exports performance data.
		Running Param.	Sets the running parameters of the DL/T645 power meter.
		Active Alarm	Queries active alarms.
		About	Queries communication information.
	PID	Running Info.	Queries the running information.
		Active Alarm	Queries active alarms.
		Performance Data	Queries or exports performance data.
		Running Param.	Sets running parameters.
		About	Queries the version and communication information.
STS	STS	Teleindication	Queries teleindication parameters.
		Telemetering	Queries telemetering parameters.
		Telecontrol	Sets telecontrol parameters.
		Performance Data	Queries or exports performance data.
		Running Param.	Sets running parameters.
		About	Queries communication information.
	Custom Device, IEC103	Running Info.	Queries the running information.
	Device, and IEC104 Device	Teleindication	Queries teleindication parameters.
		Telemetering	Queries telemetering parameters.
		Telecontrol	Sets telecontrol parameters.
		Teleadjust	Sets teleadjust parameters.
Query	Alarm History	-	Queries historical alarms.
	Operation Log	-	Queries operation logs.
	Export Data	-	Exports historical alarms, energy yield, operation logs, and power grid scheduling data.
	Security Events	-	Queries security events.

Main Menu	Second-Level Menu	Third-Level Menu	Function
Settings	User Param.	Date&Time	Sets the date and time.
		Plant	Sets plant information.
		Revenue	Sets the revenue parameters.
		Save Period	Sets the save period of performance data.
	Comm. Param.	Wireless Network	Sets parameters for the built-in WLAN.
			Sets mobile data (4G/3G/2G) parameters.
		Wired Network	Sets wired network parameters.
		RS485	Sets RS485 parameters.
		Management System	Sets management system parameters.
			Uploads a security certificate.
		Modbus TCP	Sets Modbus TCP parameters.
		IEC103	Sets IEC103 parameters.
		IEC104	Sets IEC104 parameters.
		FTP	Sets FTP parameters.
		Email	Sets email parameters.
		ESGCC	Sets the parameters related to the ESGCC.
		GOOSE	Sets GOOSE parameters.
	Power Adjustment	Active Power Control	Sets parameters for active power control.
		Reactive Power Control	Sets parameters for reactive power control.
		Export Limitation	Provides a wizard for export limitation. You can set parameters by following the wizard.
		Smart Reactive Power Compensation	Provides a wizard for smart reactive power compensation. You can set parameters by following the wizard.
		DRM	Sets DRM parameters.

Main Menu	Second-Level Menu	Third-Level Menu	Function
	EMS Control	-	Sets the working mode of battery control.
	Battery Control	Battery Control	Sets the working mode of battery control.
		Capacity Limit	Sets the working mode of capacity limit.
	Remote Shutdown	Dry Contact Remote Shutdown	Sets parameters for remote shutdown over dry contacts.
		NS Protection Remote Shutdown	Sets remote shutdown parameters for NS protection.
	DI	DI Port Configuration	Configures the DI port function.
		Startup Delay	Set the startup delay time.
	Alarm Output	-	Sets the mapping between inverter alarms and DO ports.
	Smart Tracking Algorithm	-	Sets the parameters related to the smart tracking algorithm.

Main Menu	Second-Level Menu	Third-Level Menu	Function
	Other Parameters	-	Enables or disables RS485 upgrade rate adaptation.
			Enables or disables data forwarding for unconnected devices.
			Sets the IEC104 data push period.
			Enables or disables AI1 SPD alarm detection.
			Enables or disables STS overtemperature protection.
			Sets the reset control port of the external router.
			Enables or disables mobile network sharing.
			Sets a third-party server.
			Sets target network.
			Enables or disables SSH.
			Sets collection interval of the built- in MBUS.
			Enables or disables no response from disconnected devices.
			Enables or disables local maintenance through WAN port.
			Sets battery log printout interval.
			Enables or disables load tracking.
			Enables or disables battery export limitation.
			Sets maximum grid power during battery discharge.
			Sets adjustment deadband.
			Enables or disables DER-AVM access.
Maintenance	Firmware Upgrade	-	Upgrades the firmware of the SmartLogger, inverter, MBUS, or PID.
	Product Information	-	Queries product information.

Main Menu	Second-Level Menu	Third-Level Menu	Function
	Security Settings		 Changes the user password. Sets the automatic logout time. Uploads a WebUI security certificate. Updates the key. Sets the certificate alarm time. Uploads a SmartModule security certificate. Enables or disables communication using an expired SmartModule certificate. Sets web TLS1.0, 1.1. Sets digital signature verification. Enables or disables intrusion detection.
	System Maint.	-	 Resets the system. Restores factory settings. Clears data. Exports all configuration files. Imports all configuration files. Clears cache.
	Device Log	-	Exports device logs.
	Onsite Test	Inspection	Starts the health check of inverters.
		Spot-check	Starts the spot-check of inverters.
		Alarm Test	Simulates or clears alarms of inverters.
	License Management	-	 Views the license information. Exports the license application file. Loads or revokes a license.
	User Management	-	Add, modify, or delete a user.
	Device Mgmt.	Connect Device	Adds or removes a device.Imports or exports configurations.
		SmartModule	Removes the SmartModule.Sets the authentication password.

Main Menu	Second-Level Menu	Third-Level Menu	Function
		Device List	Modifies device information.Imports or exports device information.
		Export Param.	Exports device parameters.
		Clear Alarm	Clears device alarms.
		Data Re- collection	Re-collects historical performance data and energy yield of devices.
		Adjust total energy yield	Adjusts the total energy yield.
		Force Start	Sends a force start command to all devices in the array.

□ NOTE

The third-level menu varies with the device model and grid code. The displayed menu may vary.

6.2 Device Commissioning

Prerequisites

- Device and cable installation has been checked according to the specifications and requirements of PV and energy storage plants.
- Devices in the PV and energy storage plants and SmartLogger are powered on.
- You have obtained the IP address of the SmartLogger as well as the user name and password used for logging in to the WebUI.

Context

After installing or replacing a device or SmartLogger, you need to set device parameters and add the device.

6.2.1 Preparations and WebUI Login

Prerequisites

- The operating system of Windows 7 or later is supported.
- Browser: Chrome 52, Firefox 58, or Internet Explorer 9, or a later version is recommended.
- The SmartLogger allows a maximum of two users to log in to the WebUI at the same time.

Procedure

- **Step 1** Connect the network cable between the network port of the PC and the WAN or LAN port of the SmartLogger. It is recommended that the PC be connected to the LAN port of the SmartLogger.
- **Step 2** Set the IP address for the PC on the same network segment as the SmartLogger IP address.

Connected Port	Item	SmartLogger Default Value	Example PC Setting
LAN port	IP address	192.168.8.10	192.168.8.11
	Subnet mask	255.255.255.0	255.255.255.0
	Default gateway	192.168.8.1	192.168.8.1
WAN port	IP address	192.168.0.10	192.168.0.11
	Subnet mask	255.255.255.0	255.255.255.0
	Default gateway	192.168.0.1	192.168.0.1

■ NOTE

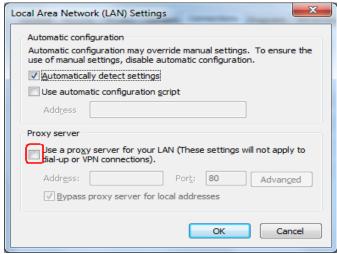
- When the IP address of the WAN port is in the network segment from 192.168.8.1 to 192.168.8.255, set the default gateway to 192.168.8.1 and the IP address of the LAN port to 192.168.3.10. If the connected port is a LAN port, you need to adjust the network configuration of the PC.
- It is recommended that the PC be connected to the LAN port of the SmartLogger or the GE port of the SmartModule. When the PC is connected to the GE port of the SmartModule, adjust the network configuration of the PC to the configuration mode when the PC is connected to the LAN port of the SmartLogger.

Step 3 Set LAN parameters.

NOTICE

- If the SmartLogger is connected to a LAN and a proxy server has been configured, you need to cancel the proxy server configurations.
- If the SmartLogger is connected to the Internet and the PC is connected to the LAN, do not cancel the proxy server configurations.
- 1. Open Internet Explorer.
- 2. Choose **Tools** > **Internet Options**.
- 3. Click the **Connections** tab and then click **LAN settings**.
- 4. Clear Use a proxy server for your LAN.

Figure 6-6 LAN settings



Click OK.

Step 4 Log in to the SmartLogger WebUI.

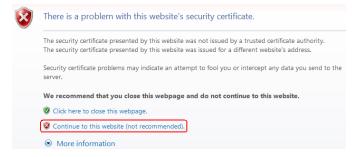
 In the address box of a browser, enter https://XX.XX.XX.XX (XX.XX.XX is the IP address of the SmartLogger) and press Enter. The login page is displayed.

If you log in to the WebUI for the first time, a security risk warning is displayed. Click **Continue to this website** to log in to the WebUI.

Ⅲ NOTE

- It is recommended that users use their own certificates. If the certificate is not replaced, the security risk warning will be displayed during each login.
- After logging in to the WebUI, you can import a certificate under Maintenance > Security Settings > Network Security Certificate.
- The imported security certificate needs to be bound to the SmartLogger IP address.
 Otherwise, the security risk warning will still be displayed during login.

Figure 6-7 Security risk warning



- 2. Select a desired language.
- 3. Select the **User Name** and enter the **Password** according to the following table, and then click **Log In**.

If	Then
On the login page, the User Name is	 Enter the initial password Changeme in the Password and click Log In.
admin by default.	2. Change the initial password as prompted and use the admin user name and new password to log in again.
On the login page, the User Name is empty by default.	Select installer in the User Name , set the login password as prompted, and click Log In .

□ NOTE

- Update the SmartLogger software as required.
- To ensure account security, protect the password by changing it periodically, and keep it secure. Your password might be stolen or cracked if it is left unchanged for extended periods. If you lose the password, the device must be restored to its factory settings. In these cases, the Company shall not be liable for any loss caused to the plant.
- You will be locked out for 10 minutes after five consecutive failed password attempts in 5 minutes.
- A dialog box with recent login information is displayed after login. Click **OK**.
- 4. Choose **Monitoring** > **Logger(Local)** > **About** to view the SmartLogger software version and check whether software upgrade is needed.
- (Optional) To upgrade the SmartLogger software version, contact the Company's engineers to obtain the upgrade package and guide and complete the upgrade accordingly.

□ NOTE

- After the software upgrade is complete, the SmartLogger automatically restarts.
 Log in to the SmartLogger WebUI again 3 minutes later.
- If the SmartLogger is upgraded from V300R001C00, the original admin user becomes an advanced user, and the login password remains unchanged. If administrator rights are required, log in to the SmartLogger as the installer user. The password is the same as that for logging in to the mobile app (the initial password is 00000a).

----End

Follow-up Procedure

If any page is blank or a menu cannot be accessed after you log in to the WebUI, clear the cache, refresh the page, or log in again.

6.2.2 Commissioning Using Deployment Wizard (V300R001C00)

Context

The deployment wizard allows you to set basic SmartLogger parameters, connect Huawei devices, power meters, and EMIs, configure Huawei NMS and third-party NMS, and implement interworking with third-party devices.

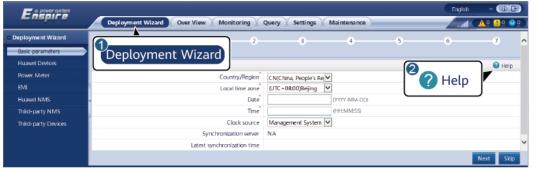
After the SmartModule communicates with the SmartLogger properly, the SmartLogger automatically identifies the SmartModule. The device name of the SmartModule is **Module(M1)**, and the corresponding port is **M1. port**.

Procedure

- **Step 1** Log in as user **admin** to access the deployment wizard page.
- **Step 2** Set parameters as prompted. For details, click **Help** on the page.

During parameter setting, click **Previous**, **Next**, or **Skip** as required.

Figure 6-8 Deployment wizard



IL03J00003

Step 3 After setting parameters, click **Finish**.

----End

6.2.3 Commissioning Using Deployment Wizard (V800R021C10)

Context

The deployment wizard allows you to set basic SmartLogger parameters, connect Huawei devices, power meters, and EMIs, configure Smart PCS, Huawei NMS, and third-party NMS, and implement interworking with third-party devices.

After the SmartModule communicates with the SmartLogger properly, the SmartLogger automatically identifies the SmartModule. The device name of the SmartModule is **Module(M1)**, and the corresponding port is **M1. port**.

Procedure

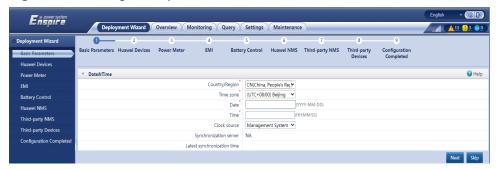
- **Step 1** Log in to the WebUI and access the deployment wizard page.
- **Step 2** Set corresponding parameters as prompted. For details, see **Help** on the page.

□ NOTE

During parameter setting, click **Previous**, **Next**, or **Skip** as required.

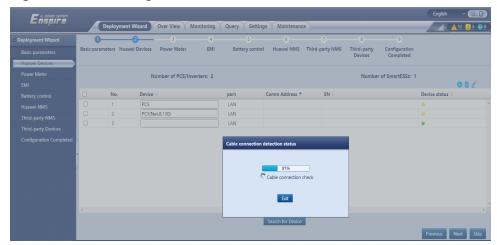
1. Set basic parameters.

Figure 6-9 Setting basic parameters



2. After Huawei devices are connected, click **Search for Device** to check the cable connections and allocate addresses.

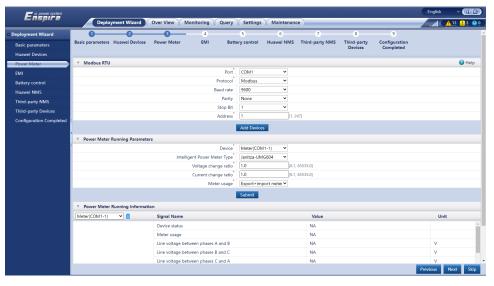
Figure 6-10 Searching for devices



□ NOTE

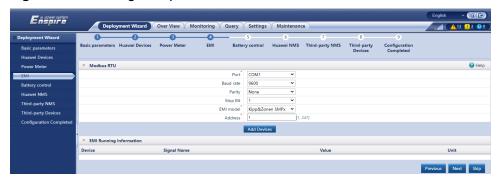
- During the process of **Search for Device**, do not perform upgrade operations (such as upgrading through the app, management system, or WebUI).
- When you click Search for Device, cable connections (DC and AC) will be checked before device search (not applicable to third-party devices), and device addresses will be automatically allocated.
- After the cable connection check and device search are complete, if a cable connection alarm is generated, you can click the alarm icon to view the corresponding alarm information.
- If an alarm is generated when the cable connection check fails, click the alarm icon to view the alarm cause and handling suggestions. After the fault is rectified, check the cable connection again.
- After the cable connection check and device search are complete, click to view the corresponding topology information.
- After a device is added or deleted, you need to click Search for Device again in Deployment Wizard. Otherwise, the system topology will not be updated.
- 3. Connect to power meters.

Figure 6-11 Setting power meter parameters



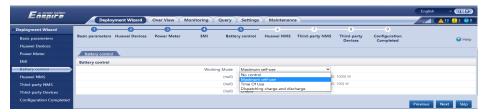
4. Connect to EMIs.

Figure 6-12 Setting EMI parameters



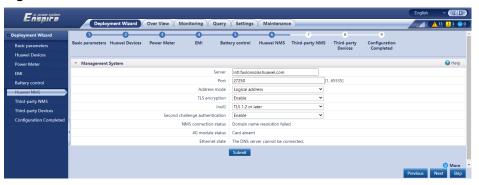
5. Set the battery working mode for battery control.

Figure 6-13 Working modes



6. Connect to the Huawei NMS.

Figure 6-14 Huawei NMS



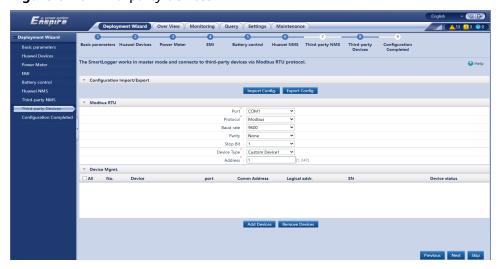
7. Connect to a third-party NMS, select **IEC104**.

Figure 6-15 Third-party NMS



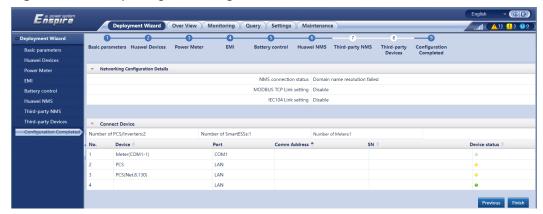
8. Connect to third-party devices.

Figure 6-16 Third-party devices



9. Complete the configuration.

Figure 6-17 Completing the configuration



----End

6.2.4 Commissioning Using Deployment Wizard (V300R023C00 and Later Versions)

Context

The deployment wizard allows you to set basic SmartLogger parameters, connect Huawei devices, power meters, and EMIs, configure energy storage control, Huawei NMS, and third-party NMS, and implement interworking with third-party devices.

After the SmartModule communicates with the SmartLogger properly, the SmartLogger automatically identifies the SmartModule. The device name of the SmartModule is **Module(M1)**, and the corresponding port is **M1. port**.

Procedure

- **Step 1** Log in to the WebUI and access the deployment wizard page.
- **Step 2** Set parameters following the deployment wizard. For details, see **Help** on the page.

◯ NOTE

During parameter setting, click **Previous**, **Next**, or **Skip** as required.

1. Set basic parameters.

Deployment Wizard

Deployment Wi

Figure 6-18 Setting basic parameters

- After Huawei devices are connected, click Search for Device to check the
 cable connections and allocate addresses. After searching for devices, set the
 Microgrid compatibility, Grid connection state, and Grid Code based on the
 site requirements.
 - In microgrid or off-grid scenarios, you are advised to set Microgrid compatibility to Enable.
 - In grid-tied scenarios, set Grid connection state to On-grid (PQ). In off-grid scenarios, set Grid connection state to Off-grid (VSG).

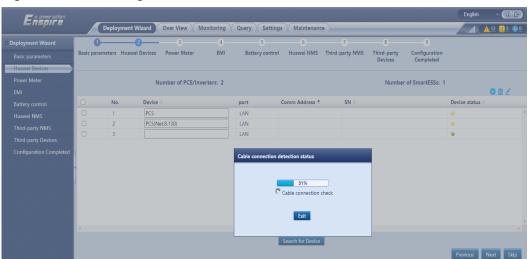


Figure 6-19 Searching for devices

□ NOTE

- During the process of Search for Device, do not perform upgrade operations (such as upgrading through the app, management system, or WebUI).
- When you click Search for Device, cable connections (DC and AC) will be checked before device search (not applicable to third-party devices), and device addresses will be automatically allocated.
- After the cable connection check and device search are complete, if a cable connection alarm is generated, you can click the alarm icon to view the corresponding alarm information.
- If an alarm is generated when the cable connection check fails, click the alarm icon to view the alarm cause and handling suggestions. After the fault is rectified, check the cable connections again.
- After the cable connection check and device search are complete, click to view the corresponding topology information.
- After a device is added or deleted, you need to click Search for Device again in Deployment Wizard. Otherwise, the system topology will not be updated.
- 3. Connect to power meters.

Enspire Help Modbu Baud rate 9600 Stop Bit Meter(COM1-1) Voltage change ratio Current change ratio Motor usage Power Meter Running Information Signal Name Meter usage NA Line voltage between phases B and C NA Line voltage between phases C and A

Figure 6-20 Setting meter parameters

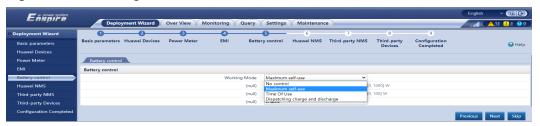
4. Connect to EMIs.

Figure 6-21 Setting EMI parameters



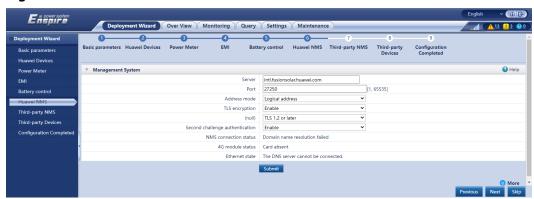
5. Set the energy storage working mode for energy storage control.

Figure 6-22 Working modes



6. Connect to the Huawei NMS.

Figure 6-23 Huawei NMS



7. Connect to a third-party NMS, select **IEC104**.

Figure 6-24 Third-party NMS



8. Connect to third-party devices.

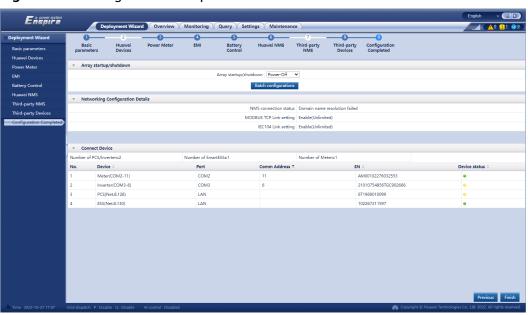
Deployment Wizard

Deployment Wi

Figure 6-25 Third-party devices

9. Set **Array startup/shutdown** based on the site requirements. The configuration is complete.

Figure 6-26 Configuration completed



6.3 Parameter Settings

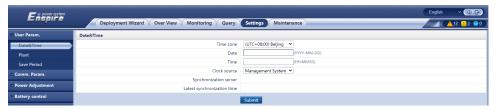
NOTICE

- If the parameters listed in this section have been set in **Deployment Wizard**, ignore the corresponding settings.
- If the PV and energy storage plants do not contain certain devices, such as power meters, EMIs, IEC103 devices, custom devices, and IEC104 devices, ignore the corresponding settings.

6.3.1 Setting User Parameters

Set user parameters and click Submit.

Figure 6-27 Setting user parameters



Date&Time

Parameter	Description
Local time zone	Select a time zone based on the region where the plant is located.
DST enable	Set this parameter as required. NOTE This parameter is unavailable for zones without DST.
Date	Set this parameter to the local date.
Time	Set this parameter to the local time.
Clock source	 Set this parameter as required. The value can be NTP, Management System, IEC104, or Modbus TCP. If there is no management system, ignore the corresponding setting.

NOTICE

- After the date and time are set, the date and time of all the inverters connected to the SmartLogger are updated accordingly. Ensure that the settings are correct.
- Changing the date and time affects the recording of system energy yield and performance data. Do not change the time zone or system time unless necessary.

Plant

Parameter	Description		
Plant name	Set this parameter as required.		
Plant address	NOTE In the English half-width status, you cannot enter any of the following characters: <>:, `'?()#&\\$ %+;~^"		
Plant owner			
Plant owner address			
Country/Region	Select a country/region based on the region where the PV plant is located.		

Revenue

□ NOTE

This parameter can be set only in the PV scenario.

Parameter	Description	
Currency	Set this parameter as required. The value can be EUR , GBP , USD , CNY , or JPY .	
Electricity price/kWh	Set this parameter to the local electricity price, which is used to calculate the converted revenue of the energy yield.	
CO2 emission reduction coefficient	Set this parameter based on the local standard.	

Save Period

Parameter	Description	
Performance data save period	Set this parameter to the save period of performance data. After the setting, the data will be displayed accordingly on the performance data page.	

6.3.2 Setting Parameters for Connecting to the Management System (V300R001C00)

Procedure

Step 1 Set up a network connection.

• **Method 1**: When the SmartLogger connects to the management system over the 4G/3G/2G network, set mobile data parameters and click **Submit**.

Figure 6-28 Setting mobile data parameters



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Parameter	Description	
Monthly traffic package	Set this parameter based on the SIM card traffic package.	
Network mode	Set this parameter based on the SIM card network mode.	
APN mode	The default value is Automatic . Set this parameter to Manual if the dial-up connection cannot be set up in Automatic mode.	
Authentication type	When APN mode is set to Manual, you need to set	
APN	the parameters related to the SIM card. Obtain the information about the parameters from the SIM card	
APN dialup number	operator.	
APN user name		
APN user password		

 Method 2: When the SmartLogger connects to the management system over a wired network, set the wired network parameters and click Submit.

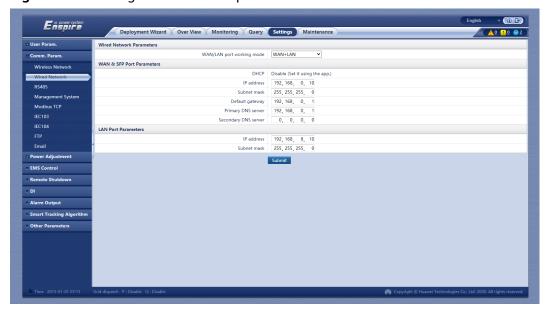


Figure 6-29 Setting wired network parameters

Parameter	Description	
WAN/LAN port working mode	Three working modes are supported: WAN+LAN , LAN +LAN , and WAN+WAN .	
	 If WAN+LAN is selected, the functions and IP addresses of the SmartLogger WAN and LAN ports remain unchanged. 	
	• If LAN+LAN is selected, the SmartLogger WAN and LAN ports function as LAN ports, and the SmartLogger WAN and LAN ports share a LAN IP address.	
	 If WAN+WAN is selected, the SmartLogger WAN and LAN ports function as WAN ports, and the SmartLogger WAN and LAN ports share a WAN IP address. 	
	NOTICE When the working mode of the WAN/LAN port is switched, the web page may be interrupted or the SmartModule may be powered off.	
DHCP	The WAN port of the SmartLogger supports IP address obtaining using DHCP and automatic registration. NOTE	
	After the SmartLogger connects to the SUN2000 app or FusionSolar app, tap More > Settings > Comm. Param. > Ethernet to access the Ethernet parameter setting screen and set DHCP to Enable.	
IP Address	Set this parameter based on the plant plan. NOTE If the IP address is changed, use the new IP address to log in again.	

Parameter	Description	
Subnet mask	Set this parameter based on the actual subnet mask of the LAN where the SmartLogger is located.	
Default gateway	Set this parameter based on the actual gateway of the LAN where the SmartLogger is located.	
Primary DNS server	 You can ignore this parameter if the SmartLogger connects to the LAN. Set this parameter to the IP address of the LAN router when the SmartLogger connects to the public network (for example, connecting to the hosting cloud server, email server, or third-party 	
Secondary DNS server	 FTP server). In normal cases, you can ignore this parameter. If the primary DNS server cannot resolve the domain name, the secondary DNS server is used. 	

Step 2 Set management system parameters.

 Method 1: When the SmartLogger connects to a Huawei or third-party management system using the encrypted Modbus TCP protocol, set management system parameters and click Submit.

◯ NOTE

After a Huawei NMS or a third-party NMS is connected to the SmartLogger in **Management System**, another third-party NMS can be connected through **Management System-1** to obtain data from the SmartLogger and configure the SmartLogger.

Figure 6-30 Setting management system parameters



IL04J00003

Table 6-2 Management System

Parameter	Description	
Server	Set this parameter to the IP address or domain name of the Management System .	
Port	Set this parameter based on the connected Management System.	

Parameter	Description	
Address mode	The value can be Comm. Address or Logical address . If the communications address of the device connected to the SmartLogger is unique, you are advised to select Comm. Address . In other cases, you must select Logical address .	
SSL encryption	Retain the default value Enable . NOTE If this parameter is set to Disable , data exchange between the SmartLogger and the management system will not be encrypted, which poses security risks.	
Second challenge authentication	Set this parameter based on the connected management system. NOTE If this parameter is set to Disable , the second challenge authentication result is not checked, and user data may be stolen. Therefore, exercise caution when setting this parameter.	
Security certificate	Optional. Set this parameter only when the certificate has expired or the customer needs to use their own certificate.	

Figure 6-31 Setting management system-1 parameters



Table 6-3 Management system-1 parameters

Parameter	Description	
Server	Set this parameter to the IP address or domain name of Management System-1 .	
Port	Set this parameter based on the connected Management System-1.	
Address mode	The value can be Comm. Address or Logical address . If the communications address of the device connected to the SmartLogger is unique, you are advised to select Comm. Address . In other cases, you must select Logical address .	

Parameter	Description	
TLS encryption	Retain the default value Enable .	
	NOTE If this parameter is set to Disable , data exchange between the SmartLogger and the management system will not be encrypted, which poses security risks.	
TLS version	Set this parameter based on the connected Management System-1 . TLS1.2 or a later version is recommended.	
Remote permission	Monitoring only, Management (permanent authorization), and Management (temporary authorization) are supported.	
	When the remaining authorization time becomes 0, the system automatically switches to the monitoring-only mode.	
Authorization time	Set this parameter based on the actual authorization time.	

• **Method 2**: When the SmartLogger connects to a third-party management system using the unencrypted Modbus TCP protocol, set Modbus TCP parameters and click **Submit**.

Figure 6-32 Setting Modbus TCP parameters



Parameter	Description	
Link setting	Modbus TCP is a universal standard protocol used to connect to a third-party management system. Because there is no security authentication mechanism, data transmitted by Modbus TCP is not encrypted. To reduce network security risks, the function of connecting to a third-party management system using Modbus TCP is disabled by default. This protocol can transmit the running data and control commands of PV plants, which may cause user data breach and control permission theft. Therefore, exercise caution when using this protocol. Users are liable for any loss caused by the use of this protocol to connect to a third-party management system (non-secure protocol). Users are advised to take measures at the plant level to reduce security risks, or use Huawei management system to mitigate the risks.	
	To use this function, set this parameter to Enable(Limited) or Enable(Unlimited) .	
	 If this parameter is set to Enable(Limited), the SmartLogger can connect to a maximum of five preset third-party management systems. If this parameter is set to Enable(Unlimited), the SmartLogger can connect to a maximum of five third-party management systems with a valid IP 	
	address.	
Client N IP Address NOTE N is 1, 2, 3, 4, or 5.	If Link setting is set to Enable(Limited) , set this parameter based on the IP address of the third-party management system.	
Address mode	The value can be Comm. Address or Logical address .	
	If the communications address of the device connected to the SmartLogger is unique, you are advised to select Comm. Address . In other cases, you must select Logical address .	
SmartLogger address	Set this parameter to the communication address of the SmartLogger.	

• **Method 3**: When the SmartLogger connects to a third-party management system over IEC104, set IEC104 parameters and click **Submit**.

Deployment Wizard Over View Monitoring Query Settings

User Param.

Comm. Param.

Wiredess Network

Wired Network

RS485

Power Moter

Management System

Modbus TCP

IEC103

IEC104

IEC105

Figure 6-33 Setting IEC104 parameters

IL04J00004

Tab	Parameter	Description
Basic parameters Link setting	Link setting	IEC104 is a universal standard protocol used to connect to a third-party management system. Because there is no security authentication mechanism, data transmitted by IEC104 is not encrypted. To reduce network security risks, the function of connecting to a third-party management system using IEC104 is disabled by default. This protocol can transmit the running data and control commands of PV plants, which may cause user data breach and control permission theft. Therefore, exercise caution when using this protocol. Users are liable for any loss caused by the use of this protocol to connect to a third-party management system (non-secure protocol). Users are advised to take measures at the PV plant level to reduce security risks, or use Huawei management system to mitigate the risks.
		To use this function, set this parameter to Enable(Limited) or Enable(Unlimited).
		• If this parameter is set to Enable(Limited) , the SmartLogger can connect to a maximum of five preset third-party management systems.
		 If this parameter is set to Enable(Unlimited), the SmartLogger can connect to a maximum of five third-party management systems with a valid IP address.
	Public IP address	Set these parameters as required.

Tab	Parameter	Description
IEC104-N NOTE N is 1, 2, 3, 4, or 5.	IEC104-N IP	If Link setting is set to Enable(Limited) , set this parameter based on the IP address of the third-party management system.
	Teleindication default segment	Set these parameters as required. NOTE
	Telemetry default segment	After the IEC104 configuration file exported from the SmartLogger and the IEC104 information files delivered with devices are correctly configured in a third-party management system, the third-party management system will be able to monitor devices connected to the SmartLogger over the IEC104 protocol.
	Forwarding Table	
Common Configuration	Teleindication default segment	If Link setting is set to Enable(Unlimited), set these
	Telemetry default segment	parameters as required. NOTE After the IEC104 configuration file exported
	Forwarding Table	from the SmartLogger and the IEC104 information files delivered with devices are correctly configured in a third-party management system, the third-party management system will be able to monitor devices connected to the SmartLogger over the IEC104 protocol.

■ NOTE

Choose **Settings** > **Other Parameters**, and set **IEC104 Push Data Period** to specify the interval for the SmartLogger to push data to a third-party management system over IEC104. If **IEC104 Push Data Period** is set to 0s, there is no limit on the interval at which the SmartLogger sends IEC104 data.

----End

6.3.3 Setting Parameters for Connecting to the Management System

Procedure

Step 1 Set up a network connection.

 Method 1: If the SmartLogger connects to the management system over a 4G/3G/2G network, choose Settings > Comm. Param. > Wireless Network, set mobile data parameters, and click Submit.

Parameter	Description	
Monthly traffic package	Set this parameter based on the SIM card traffic package.	
Network mode	Set this parameter based on the SIM card network mode.	
APN mode	The default value is Automatic . Set this parameter to Manual if the dial-up connection cannot be set up in Automatic mode.	
Authentication type	When APN mode is set to Manual , you need to set	
APN	the parameters related to the SIM card. Obtain the information about the parameters from the SIM card	
APN dialup number	operator.	
APN user name		
APN user password		

• **Method 2**: If the SmartLogger connects to the management system over a wired network, choose **Settings > Comm. Param. > Wired Network**, set wired network parameters, and click **Submit**.

Parameter	Description
WAN/LAN/SFP port	Supports five configurations: Ethernet1/Ethernet2/ Ethernet1, Ethernet2/Ethernet2/Ethernet1, Ethernet1/ Ethernet1/Ethernet1, Ethernet1/Ethernet2/Ethernet2, and Ethernet1/Ethernet2/Ethernet3.
	• Ethernet1/Ethernet2/Ethernet1 is used for a fiber ring network between the SACUs or an FE network between southbound devices and the SACUs, indicating that the WAN/SFP port is Ethernet1 and the LAN port is Ethernet2.
	Ethernet2/Ethernet1 is used to connect the LAN port of a third-party device or for a northbound network of the SACUs through the optical port, indicating that the WAN/LAN port is Ethernet2 and the SFP port is Ethernet1.
	Ethernet1/Ethernet1/Ethernet1 is used for communication between the WAN/LAN/SFP port, indicating that the WAN/LAN/SFP port is Ethernet1.
	• Ethernet1/Ethernet2/Ethernet2 is used for a northbound network of the SACUs through the WAN port when the optical port is directly connected to the CMU, indicating that the WAN port is Ethernet1 and the LAN/SFP port is Ethernet2.
	• Ethernet1/Ethernet2/Ethernet3 is used when the three networks are isolated and different network segments are configured, indicating that the WAN port is Ethernet1, the LAN port is Ethernet2, and the SFP port is Ethernet3.
RSTP root node	This parameter is displayed when WAN/LAN/SFP port is set to Ethernet1/Ethernet2/Ethernet2 for a northbound network of the SACUs through the WAN port when the optical port is directly connected to the CMU. Set this parameter to Enabled. NOTE After this parameter is set to Enabled or Disabled, the SmartLogger automatically restarts. If this parameter is set to Disabled, the communication network may be unstable. Exercise caution when setting this parameter.
DHCP	The WAN port of the SmartLogger supports IP address obtaining using DHCP and automatic registration.
	NOTE After the SmartLogger connects to the SUN2000 app or FusionSolar app, tap More > Settings > Comm. Param. > Ethernet to access the Ethernet parameter setting screen and set DHCP to Enable.

Parameter	Description
IP Address	Set this parameter based on the plant plan.
	NOTE If the IP address is changed, use the new IP address to log in again.
Subnet mask	Set this parameter based on the actual subnet mask of the LAN where the SmartLogger is located.
Default gateway	Set this parameter based on the actual gateway of the LAN where the SmartLogger is located.
Primary DNS server	You can ignore this parameter if the SmartLogger connects to the LAN.
	Set this parameter to the IP address of the LAN router when the SmartLogger connects to the public network (for example, connecting to the hosting cloud server, email server, or third-party FTP server).
Secondary DNS server	In normal cases, you can ignore this parameter.
	If the primary DNS server cannot resolve the domain name, the secondary DNS server is used.

Step 2 Choose **Settings > Comm. Param. > Management System** and set management system parameters.

 Method 1: When the SmartLogger connects to a Huawei or third-party management system using the encrypted Modbus TCP protocol, set management system parameters and click Submit.

After a Huawei NMS or a third-party NMS is connected to the SmartLogger in **Management System**, another third-party NMS can be connected through **Management System-1** to obtain data from the SmartLogger and configure the SmartLogger.

Figure 6-34 Setting management system parameters

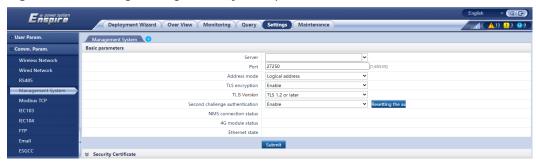


Table 6-4 Management system parameters

Parameter	Description
Server	Set this parameter to the IP address or domain name of the Management System .
Port	Set this parameter based on the connected Management System.
Address mode	The value can be Comm. Address or Logical address . If the communications address of the device connected to the SmartLogger is unique, you are advised to select Comm. Address . In other cases, you must select Logical address .
TLS encryption	Retain the default value Enable . NOTE If this parameter is set to Disable , data exchange between the SmartLogger and the management system will not be encrypted, which poses security risks.
TLS version	Set this parameter based on the connected Management System. TLS1.2 or a later version is recommended.
Second challenge authentication	Set this parameter based on the connected management system. NOTE If this parameter is set to Disable , the second challenge authentication result is not checked, and user data may be stolen. Therefore, exercise caution when setting this parameter.
Security certificate	Optional. Set this parameter only when the certificate has expired or the customer needs to use their own certificate.

Figure 6-35 Setting management system-1 parameters



Table 6-5 Management system-1 parameters

Parameter	Description
Server	Set this parameter to the IP address or domain name of Management System-1 .
Port	Set this parameter based on the connected Management System-1.
Address mode	The value can be Comm. Address or Logical address . If the communications address of the device connected to the SmartLogger is unique, you are advised to select Comm. Address . In other cases, you must select Logical address .
TLS encryption	Retain the default value Enable . NOTE If this parameter is set to Disable , data exchange between the SmartLogger and the management system will not be encrypted, which poses security risks.
TLS version	Set this parameter based on the connected Management System-1. TLS1.2 or a later version is recommended.
Remote permission	Monitoring only, Management (permanent authorization), and Management (temporary authorization) are supported.
	When the remaining authorization time becomes 0, the system automatically switches to the monitoring-only mode.

 Method 2: When the SmartLogger connects to a third-party management system using the unencrypted Modbus TCP protocol, set Modbus TCP parameters and click Submit.

Figure 6-36 Setting Modbus TCP parameters



Parameter	Description
Link setting	Modbus TCP is a universal standard protocol used to connect to a third-party management system. Because there is no security authentication mechanism, data transmitted by Modbus TCP is not encrypted. To reduce network security risks, the function of connecting to a third-party management system using Modbus TCP is disabled by default. This protocol can transmit the running data and control commands of PV plants, which may cause user data breach and control permission theft. Therefore, exercise caution when using this protocol. Users are liable for any loss caused by the use of this protocol to connect to a third-party management system (non-secure protocol). Users are advised to take measures at the PV plant level to reduce security risks, or use Huawei management system to mitigate the risks.
	To use this function, set this parameter to Enable(Limited) or Enable(Unlimited) .
	If this parameter is set to Enable(Limited) , the SmartLogger can connect to a maximum of five preset third-party management systems.
	 If this parameter is set to Enable(Unlimited), the SmartLogger can connect to a maximum of five third-party management systems with a valid IP address.
Client N IP Address NOTE N is 1, 2, 3, 4, or 5.	If Link setting is set to Enable(Limited) , set this parameter based on the IP address of the third-party management system.
Address mode	The value can be Comm. Address or Logical address . If the communications address of the device connected to the SmartLogger is unique, you are advised to select Comm. Address . In other cases, you must select Logical address .
SmartLogger address	Set this parameter to the communication address of the SmartLogger.

• **Method 3**: When the SmartLogger connects to a third-party management system over IEC104, set IEC104 parameters and click **Submit**.

Deployment Wizard Over View Monitoring Query Settings

- User Param.

- Comm. Param.

Wireless Network
Wired Network
Wired Network
Management System
Management System
Modbus TCP
IEC103

IEC104

Figure 6-37 Setting IEC104 parameters

IL04J00004

Tab	Parameter	Description
Basic parameters Lin	Link setting	IEC104 is a universal standard protocol used to connect to a third-party management system. Because there is no security authentication mechanism, data transmitted by IEC104 is not encrypted. To reduce network security risks, the function of connecting to a third-party management system using IEC104 is disabled by default. This protocol can transmit the running data and control commands of PV plants, which may cause user data breach and control permission theft. Therefore, exercise caution when using this protocol. Users are liable for any loss caused by the use of this protocol to connect to a third-party management system (non-secure protocol). Users are advised to take measures at the PV plant level to reduce security risks, or use Huawei management system to mitigate the risks.
		To use this function, set this parameter to Enable(Limited) or Enable(Unlimited).
		 If this parameter is set to Enable(Limited), the SmartLogger can connect to a maximum of five preset third-party management systems.
		 If this parameter is set to Enable(Unlimited), the SmartLogger can connect to a maximum of five third-party management systems with a valid IP address.
	Public IP address	Set these parameters as required.

Tab	Parameter	Description
IEC104-N NOTE N is 1, 2, 3, 4, or 5.	IEC104-N IP	If Link setting is set to Enable(Limited) , set this parameter based on the IP address of the third-party management system.
	Teleindication default segment	Set these parameters as required. NOTE
	Telemetry default segment	After the IEC104 configuration file exported from the SmartLogger and the IEC104 information files delivered with devices are correctly configured in a third-party management system, the third-party management system will be able to monitor devices connected to the SmartLogger over the IEC104 protocol.
	Forwarding Table	
Common Configuration	Teleindication default segment	If Link setting is set to Enable(Unlimited), set these
	Telemetry default segment	parameters as required. NOTE After the IEC104 configuration file exported
	Forwarding Table	from the SmartLogger and the IEC104 information files delivered with devices are correctly configured in a third-party management system, the third-party management system will be able to monitor devices connected to the SmartLogger over the IEC104 protocol.

□ NOTE

Choose **Settings** > **Other Parameters**, and set **IEC104 Push Data Period** to specify the interval for the SmartLogger to push data to a third-party management system over IEC104. If **IEC104 Push Data Period** is set to 0s, there is no limit on the interval at which the SmartLogger sends IEC104 data.

----End

6.3.4 Setting RS485 Communications Parameters

Set RS485 parameters and click Submit.

Figure 6-38 Setting RS485 parameters



MOTE

When the SmartModule is connected to the SmartLogger, the device name of the SmartModule is **Module(M1)**, and the corresponding port is **M1.COM**.

RS485

Protocol, **Baud rate**, **Parity**, and **Stop Bit** must be set to the same values for the devices connected to the same COM port.

Parameter	Description	
Protocol	Set this parameter based on the protocol type of the connected device.	
	The value can be Modbus , IEC103 , DL/T645 , Modbus-Slave , or Modbus-Control .	
	NOTE	
	 When the SmartLogger serves as a slave node to interconnect with a third-party device over Modbus-RTU, set Protocol to Modbus-Slave. 	
	When the connected inverter performs rapid power grid scheduling using both MBUS and RS485, set Protocol to Modbus-Control .	
Baud rate	Set this parameter based on the baud rate of the connected device.	
	The value can be 1200 , 2400 , 4800 , 9600 , 19200 , or 115200 .	
Parity	Set this parameter based on the parity mode of the connected device.	
	The value can be None , Odd parity , or Even parity .	
Stop Bit	Set this parameter based on the stop bit of the connected device.	
	The value can be 1 or 2 .	
Start address	1 ≤ Start address ≤ Communication address of the	
End address	connected device ≤ End address ≤ 247 The address segments of COM ports can overlap.	
	NOTE The start and end addresses have no impact on the devices that have been connected.	

Night Communication Settings

If device information query is not required at night, enable Night silent.

Parameter	Description
Night silent	Specifies whether the night silent mode is enabled.

Parameter	Description
Enter time	Specifies the time for entering the night silent mode.
Exit time	Specifies the time for exiting the night silent mode.
Wakeup period	Specifies the wakeup period for the night silent mode.

Records

The SmartLogger supports exporting of MBUS and RS485 communication packets.

Set **Choose port** and click **Start** to start packet recording. Then, click **Export** to stop packet recording and export the packets.

Parameter	Description	
Choose port	Specifies the port for recording packets.	
Record time	Sets the record time.	

6.3.5 Setting Parameters for the Slave SmartLogger

Step 1 Log in to the slave SmartLogger WebUI, set Modbus TCP parameters, and click **Submit**.

Figure 6-39 Setting Modbus TCP parameters



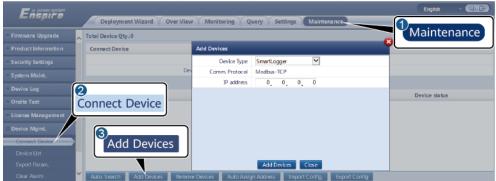
Parameter	Description	
Link setting	Set this parameter to Enable(Limited) .	
Client N IP Address	Set this parameter to the IP address of the master SmartLogger.	
Address mode	The value can be Comm. Address or Logical address . If the communications address of the device connected to the SmartLogger is unique, you are advised to select Comm. Address . In other cases, you must select Logical address .	

Parameter	Description	
SmartLogger address	Set this parameter to the communications address of the slave SmartLogger.	
Fast scheduling ^[1]	 The default value is Enable. Set this parameter to Enable to enable the fast scheduling function of the SmartLogger Modbus TCP interface. 	
	 Set this parameter to Disable to disable the fast scheduling function of the SmartLogger Modbus TCP interface. 	

Note [1]: This parameter can be set only for V300R023C00 and later versions. The fast scheduling function of the Modbus TCP interface is mutually exclusive with the GOOSE fast scheduling function. The fast scheduling function of only one protocol takes effect at a time.

Step 2 Log in to the WebUI of the master SmartLogger, set access parameters for the slave SmartLogger, and click **Add Devices**.

Figure 6-40 Setting access parameters



IL03J00011

Parameter	Description	
Device Type	Set this parameter to SmartLogger .	
IP address	Set this parameter to the IP address of the slave SmartLogger.	

----End

6.3.6 Setting GOOSE Communications Parameters

■ NOTE

The GOOSE parameters can be configured only for V300R023C00 and later versions.

Choose **Settings > Comm. Param. > GOOSE**, set the GOOSE parameters, and click **Submit**.

Basic Parameters

Parameter	Description	Remarks
Connection	 The default value is Disable. Set this parameter to Enable to enable GOOSE communication for the SmartLogger. Set this parameter to Disable to disable GOOSE communication for the SmartLogger. 	-
Data reporting	 Set this parameter to Enable to enable the function of reporting GOOSE messages from the SmartLogger to the peer device. Set this parameter to Disable to disable the function of reporting GOOSE messages from the SmartLogger to the peer device. 	This parameter is displayed when Connection is set to Enable .
Data receiving	 The default value is Disable. Set this parameter to Enable to enable the GOOSE message receiving function of the SmartLogger. Set this parameter to Disable to disable the GOOSE message receiving function of the SmartLogger. 	
Network port	WAN or SPF is supported. The default value is WAN. This parameter specifies the type of the network port used by the SmartLogger to send and receive GOOSE messages. Set this parameter based on the actual networking scenario.	

Parameter	Description	Remarks
Fast scheduling ^[1]	 The default value is Disable. Set this parameter to Enable to enable the fast scheduling function of the SmartLogger GOOSE interface. 	
	 Set this parameter to Disable to disable the fast scheduling function of the SmartLogger GOOSE interface. 	

Note [1]: The GOOSE fast scheduling function is mutually exclusive with the fast scheduling function of the Modbus TCP interface. The fast scheduling function of only one protocol takes effect at a time.

Configuration File Import/Export

- This parameter is displayed when **Connection** is set to **Enable**.
- You can contact the vendor to obtain the CID files of the SmartLogger and the peer controller. Compress the CID files of the SmartLogger and the peer controller into a .zip configuration package, and click Import Config. Import the configuration package. After the configuration is parsed successfully, the Device name, Controller type, Controller name, Configuration status, and Last import time are displayed. For details about GOOSE interconnection and interfaces, see the SmartLogger IEC61850 GOOSE Protocol Interface Description.

If the configuration file is imported and parsed successfully, the configuration status is **Configured**. If the configuration file import fails, contact the vendor of the peer controller to obtain the correct CID file.

Message Indicating Failed Configuration	Description	Suggestion
Import failed. The configuration file is incomplete.	The CID file of the local or peer device is missing.	Contact the vendor of the peer controller to obtain the correct CID file.
Import failed. The configuration file is not for this device.	The file does not match the vendor or the device type.	

Message Indicating Failed Configuration	Description	Suggestion
Import failed. Unable to parse the configuration file.	The CID file format is incorrect. Parsing failed or no matching signal is found.	

• Click **Export Config.** to obtain the ICD file of the current SmartLogger version. The CID file is exported at the same time if it has been imported successfully.

6.3.7 Setting MBUS Parameters

Procedure

Step 1 Set access parameters.

Set parameters for the built-in MBUS and click Submit.

Figure 6-41 Setting parameters for the built-in MBUS



Parameter	Description	
Built-in MBUS	 If the SmartLogger communicates with the solar inverter using a built-in MBUS, set this parameter to Enable. 	
	 If only RS485 communication is used between the SmartLogger and the solar inverter and third-party device, set this parameter to Disable. 	
Device disconnection time	Specifies the duration for determining device disconnection.	

- Set access parameters for an external MBUS.
 - Method 1: Click Auto. Search to connect the MBUS.
 - Method 2: Click Add Devices, set access parameters, and click Add Devices.

Firmware Upgrade

Product Information

Security Settings

System Maint.

Device Log

Orisite Test

License Management

Device Mgmt.

Connect Device

Device Mgmt.

Add Devices

Add Devices

Add Devices

Connect Device

Connect Device

Add Devices

Device Mgmt.

Add Devices

Add Devices

System Maint.

Device Nam.

Connect Device

Device Mgmt.

Add Devices

Add Devices

Add Devices

Add Devices

Ergith

Maintenance

Maintenance

Device Type

MBUS

Comm Protocol

Modbus-RTU

Port number

COMM

Device status

Connect Device

Device Mgmt.

System Add Devices

Device Mgmt.

System Add Devices

Device Mgmt.

System Config

Ergith

Add Devices

Import Config

Expert Config

Figure 6-42 Setting access parameters for an external MBUS

IL03J00013

Parameter	Description	
Device type	Set this parameter to MBUS .	
Port number	Set this parameter to the serial number of the COM port connected to the MBUS.	

Step 2 Set networking parameters.

• Set parameters for the built-in MBUS networking.

Figure 6-43 Setting the built-in MBUS networking



Category	Parameter	Description
Running Param.	Anti-crosstalk	Set this parameter to Enable . When the transformer substation number and winding number of the solar inverter are the same as those of the MBUS, or the solar inverter SN is in the SN list, the solar inverter can connect to the SmartLogger over an MBUS network.
	Network frequency band	Set this parameter as required.

Category	Parameter	Description
	Box-type transformer No.	Set this parameter based on the number of the transformer substation connected to the SmartLogger.
	Winding No.	In multi-split transformer substation scenarios, set this parameter based on the number of the winding of the transformer station connected to the SmartLogger.
	Networking	 When the SmartLogger communicates with the solar inverter over MBUS, set Networking to Enable. When the SmartLogger communicates with the solar inverter only over RS485, set Networking to Disable.
	Power settings	This parameter is used to adjust the transmit power of MBUS signals. A larger value indicates a higher transmit power and better networking capability. The default value is 8 (NA is displayed). You can set this parameter based on actual requirements.
	Transmit mode ^[1]	 Set this parameter to Single-phase in the power grid fast control scenario and to Three-phase in other scenarios. If this parameter is set to Single-phase, ensure that the MBUS three-phase AC power cable connection of the SmartLogger is the same as that of the inverter. Otherwise, the inverter communication may be disconnected or some commands may be lost.
	Fast control frame type ^[2]	 Frame type used by the MBUS module for power grid fast control. The MBUS module adaptively selects FC frame or Common frame.
SN List	N/A	 Maintain the solar inverter SN list. You can click Synchronize to synchronize the transformer substation number and winding number of the MBUS to the solar inverters in the SN list.

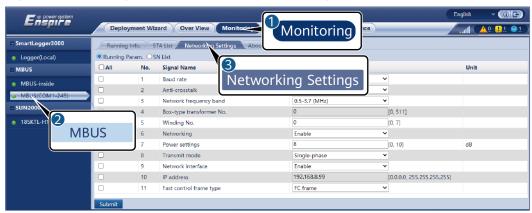
|--|

Note [1]: SmartMBUS V100R001C00SPC212 and later versions support the setting of the transmit mode.

Note [2]: SmartMBUS V100R001C00SPC212 and later versions support the setting of the fast control frame type.

Set parameters for the external MBUS networking.

Figure 6-44 Setting the external MBUS networking



Category	Parameter	Description
Running Param.	Baud rate	Retain the default value 115200 for optimal communications performance.
	Anti-crosstalk	Set this parameter to Enable . When the transformer substation number and winding number of the solar inverter are the same as those of the MBUS, or the solar inverter SN is in the SN list, the solar inverter can connect to the SmartLogger over an MBUS network.
	Network frequency band	Set this parameter as required.
	Box-type transformer No.	Set this parameter based on the number of the transformer substation connected to the SmartLogger.
	Winding No.	In multi-split transformer substation scenarios, set this parameter based on the number of the winding of the transformer station connected to the SmartLogger.

Category	Parameter	Description
	Networking	 When the SmartLogger communicates with the solar inverter over MBUS, set Networking to Enable. When the SmartLogger communicates with the solar inverter only over RS485, set Networking to Disable.
	Power settings	This parameter is used to adjust the transmit power of MBUS signals. A larger value indicates a higher transmit power and better networking capability. The default value is 8 (NA is displayed). You can set this parameter based on actual requirements.
	Transmit mode ^[1]	 Set this parameter to Single-phase in the power grid fast control scenario and to Three-phase in other scenarios. If this parameter is set to Single-phase, ensure that the MBUS three-phase AC power cable connection of the SmartLogger is the same as that of the inverter. Otherwise, the inverter communication may be disconnected or some commands may be lost.
	Network interface	 This parameter is used to enable communication between the MBUS module and the SmartLogger network interface. The default value is Disable. Set this parameter to Enable only in the power grid fast control scenario. Ensure that the LAN interface on the SmartLogger or SmartModule is connected to the network interface on the MBUS module.
	IP address	IP address of the MBUS module. The default value is 192.168.8.249 . Change the value only when an IP address conflict occurs.
	Fast control frame type ^[2]	 Frame type used by the MBUS module for power grid fast control. The MBUS module adaptively selects FC frame or Common frame.

Category	Parameter	Description
SN List	N/A	 Maintain the solar inverter SN list. You can click Synchronize to synchronize the transformer substation number and winding number of the MBUS to the solar inverters in the SN list.

Note [1]: SmartMBUS V100R001C00SPC212 and later versions support the setting of the transmit mode.

Note [2]: SmartMBUS V100R001C00SPC212 and later versions support the setting of the fast control frame type.

----End

6.3.8 Setting Inverter Parameters

SUN2000 is displayed for V300R001C00.

Procedure

- **Step 1** Choose **Maintenance** > **Connect Device** and set access parameters.
 - Method 1: Click Auto. Search to connect to the solar inverter.
 - Method 2: Click Add Devices, set access parameters, and click Add Devices.

Figure 6-45 Setting access parameters



Parameter	Description
Device type	Set this parameter to SUN2000 .

Parameter	Description
Connection mode	 If the solar inverter uses the MBUS for communication, set this parameter to MBUS. If the solar inverter uses RS485 for communication, set this parameter to the COM port connected to the solar inverter.
Address	Set this parameter to the communication address of the solar inverter.

Step 2 Choose **Monitoring > Inverter > Running Param.** and set running parameters, click **Submit**.

NOTICE

Before setting the running parameters of the solar inverter, ensure that the DC side of the solar inverter is energized.

----End

6.3.8.1 Running Parameters

Grid Parameters

Parameter	Description
Grid Code	Set this parameter based on the grid code of the country or region where the inverter is used and the inverter application scenario.
Isolation settings	Set the working mode of the inverter based on the grounding status at DC side and the connection to the power grid.
Output mode	Specifies whether the inverter output has a neutral wire based on the application scenario.
V-phase grounded	The default value is Disable . Set this parameter to Enable when the phase wire from the transformer to the inverter is grounded.
PQ mode	If this parameter is set to PQ mode 1 , the maximum AC output power equals the maximum apparent power. If this parameter is set to PQ mode 2 , the maximum AC output power equals the rated output power.

Parameter	Description
Automatically start upon grid recovery	Specifies whether to allow the inverter to automatically start after the power grid recovers.
	Enable: The inverter automatically starts when the power grid recovers from a fault or outage.
	Disable: The inverter does not automatically start when the power grid recovers from a fault or outage. The inverter starts only after a startup command is delivered.
Grid connected recovery time from grid faults (s)	Specifies the time after which the inverter begins restarting after the power grid recovers.
Grid reconnection voltage upper limit (V)	The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid voltage is higher than Grid reconnection voltage upper limit , the inverter is not allowed to reconnect to the grid.
Grid reconnection voltage lower limit (V)	The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid voltage is lower than Grid reconnection voltage lower limit , the inverter is not allowed to reconnect to the grid.
Grid reconnection frequency upper limit (Hz)	The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid frequency is higher than Grid reconnection frequency upper limit , the inverter is not allowed to reconnect to the grid.
Grid reconnection frequency lower limit (Hz)	The standards of certain countries and regions require that after the inverter shuts down for protection due to a fault, if the power grid frequency is lower than Grid reconnection frequency lower limit , the inverter is not allowed to reconnect to the grid.
Reactive power compensation (cosφ-P) trigger voltage (%)	Specifies the voltage threshold for triggering reactive power compensation based on the cosφ-P curve.
Reactive power compensation (cosφ-P) exit voltage (%)	Specifies the voltage threshold for exiting reactive power compensation based on the cosφ-P curve.

Protection Parameters

Parameter	Description
Insulation resistance protection threshold (M Ω)	To ensure device safety, the inverter detects the insulation resistance of the input side with respect to ground when it starts a self-check. If the detected value is less than the preset value, the inverter does not connect to the grid.
Voltage unbalance protection threshold (%)	Specifies the inverter protection threshold when the power grid voltage is unbalanced.

Parameter	Description
Phase protection point (°)	The Japanese standard requires that during passive islanding detection, protection should be triggered if an abrupt voltage phase change is detected.
Phase angle offset protection	The standards of certain countries and regions require that the inverter needs to be protected when the phase angle offset of the power grid three phases exceeds a certain value.
10-min overvoltage protection threshold (V)	Specifies the 10-minute overvoltage protection threshold.
10-min overvoltage protection duration (ms)	Specifies the 10-minute overvoltage protection duration.
Level-N OV protection (V)	Specifies the level-N grid overvoltage protection threshold.
Level-N OV protection time (ms)	Specifies the level-N grid overvoltage protection duration.
Level-N UV protection (V)	Specifies the level-N grid undervoltage protection threshold.
Level-N UV protection time (ms)	Specifies the level-N grid undervoltage protection duration.
Level-N OF protection (Hz)	Specifies the level-N grid overfrequency protection threshold.
Level-N OF protection time (ms)	Specifies the level-N grid overfrequency protection duration.
Level-N UF protection (Hz)	Specifies the level-N grid underfrequency protection threshold.
Level-N UF protection time (ms)	Specifies the level-N grid underfrequency protection duration.

□ NOTE

N is 1, 2, 3, 4, 5, or 6.

Feature Parameters

Parameter	Description	Remarks
MPPT multi-peak scanning	When the inverter is used in scenarios where PV strings are greatly shaded, set this parameter to Enable , and then the inverter will perform MPPT scanning at regular intervals to locate the maximum power.	
MPPT multi-peak scan interval (min)	Specifies the MPPT scanning interval.	This parameter is displayed when MPPT multi-peak scanning is set to Enable.

Parameter	Description	Remarks
RCD enhancement	RCD refers to the residual current of the inverter to the ground. To ensure device and personal safety, RCD should be limited to the specified value in the standard. If an AC switch with a residual current detection function is installed outside the inverter, this function should be enabled to reduce the residual current generated when the inverter is running, thereby preventing the AC switch from misoperations.	
Night-time reactive power output	In some specific application scenarios, a power grid company requires that the inverter can perform reactive power compensation at night to ensure that the power factor of the local power grid meets requirements.	This parameter is displayed when Isolation settings is set to Input ungrounded, with TF .
PID protection at night	When the inverter outputs reactive power at night and this parameter is set to Enable , the inverter will shut down automatically if it detects abnormal status of the PID compensation.	-
Strong adaptability	If the power grid short-circuit capacity or PV plant installed capacity is less than 3, the power grid quality will be affected if the power grid impedance is too high, which may cause the inverter to malfunction. In this case, if the inverter is required to work properly, set this parameter to Enable .	-
Power quality optimization mode	If this parameter is set to Enable , the inverter output current harmonics will be optimized.	-

Parameter	Description	Remarks
PV module type	This parameter is used to set different types of PV modules and the shutdown time of the concentration PV module. If the concentration PV modules are shaded, the power drops drastically to 0 and the inverter shuts down. The energy yield would be affected since it takes too long for the power to resume and inverter to restart. The parameter does not need to be set for crystalline silicon and filmy PV modules.	 If this parameter is set to Crystalline silicon or Film, the inverter automatically detects the power of PV modules when they are shaded and shuts down if the power is too low. When concentration PV modules are used: If this parameter is set to CPV 1, the inverter can quickly restart in 60 minutes if the input power of PV modules drops drastically due to shading.
PID compensation direction	When the external PID module compensates the PID voltage for the PV system, set PID compensation direction to the actual compensation direction of the PID module so that the inverter can output reactive power at night.	PID compensation direction must be consistent with PV module compensation voltage direction of the PID module.
Built-in PID running mode	Specifies the operation mode of the inverter built-in PID.	-
PID nighttime off-grid repair	Specifies whether to enable the PID nighttime off-grid repair.	If PID running mode is not set to Disable , the parameter can be set.
PID daytime off- grid repair	Specifies whether to enable the PID daytime off-grid repair.	

Parameter	Description	Remarks
String connection mode	Specifies the connection mode of PV strings.	 When PV strings connect to the inverter separately (All PV strings separated), there is no need to set this parameter. The inverter can automatically detect the connection mode of the PV strings. When PV strings connect to one another in parallel outside the inverter and then connect to it independently (All PV strings connected), set this parameter to All PV strings connected.
Automatic OFF due to communication interrupted	The standards of certain countries and regions require that the inverter must shut down after the communication is interrupted for a certain time.	If Automatic OFF due to communication interrupted is set to Enable and the inverter communication is interrupted for a specified time (set by Communication interruption duration), the inverter will automatically shut down.
Communication interruption duration (min)	Specifies the duration for determining communication interruption. Used for automatic shutdown for protection in case of communication interruption.	-
Automatic ON due to communication resumed	If this parameter is set to Enable , the inverter automatically starts after communication recovers. If this parameter is set to Disable , the inverter needs to be started manually after communication recovers.	This parameter is displayed when Automatic OFF due to communication interrupted is set to Enable.
Soft start/boot time (s)	Specifies the duration for the power to gradually increase when the inverter starts.	-
Shutdown gradient (%/s)	Specifies the power change speed when the inverter shuts down.	-
AFCI	The North American standard requires that the inverter should have DC arc detection function.	-
AFCI detection adaptive mode	Adjusts the sensitivity of arc detection.	This parameter is displayed only when AFCI is set to Enable .
AFCI self-test	Send the AFCI self-check command manually.	-

Parameter	Description	Remarks
Current error during the scan (A)	To prevent inaccurate scanning caused by sunlight change, the current change of PV strings operating properly should be monitored when the I-V curves of PV strings are being scanned. When the current exceeds the specified value, it is determined that the sunlight changes. The I-V curves should be scanned again.	-
OVGR associated shutdown	If this parameter is set to Enable , the inverter shuts down after receiving the OVGR signal. If this parameter is set to Disable , the inverter does not shut down after receiving the OVGR signal.	This parameter is displayed if the Japanese grid code is selected.
Dry contact function	Identifies the dry contact signals from the SmartLogger.	Set this parameter to OVGR for OVGR signals, and set it to NC for other signals. This parameter is displayed if the Japanese grid code is selected.
Commanded shutdown hold after power recovery	The standards of certain countries and regions require that if the inverter is shut down after receiving a command and powered on again after power recovers, it should still be in commanded shutdown state.	-
Night-time hibernation	The inverter monitors PV strings at night. If this parameter is set to Enable , the monitoring function of the inverter will hibernate at night to reduce power consumption.	-
MBUS communication	For inverters that support RS485 communication and MBUS communication, you are advised to set this parameter to Disable to reduce power consumption.	-
RS485-2 communication	If this parameter is set to Enable , the RS485-2 port can be used. If the port is not used, you are advised to set this parameter to Disable to reduce power consumption.	-
Delay upgrade	This parameter is mainly used in the upgrade scenarios where the PV power supply is disconnected at night due to no sunlight or unstable at dawn or dusk due to poor sunlight.	After the inverter starts to upgrade, if Delay upgrade is set to Enable , the upgrade package is loaded first. After the PV power supply recovers and the activation conditions are met, the inverter automatically activates the upgrade.

Parameter	Description	Remarks
String monitor	The inverter monitors PV strings in real time. If any PV string is abnormal (such as the PV string is shaded or the electric energy yield decreases), the inverter generates an alarm to remind maintenance personnel to maintain the PV string in a timely manner.	If PV strings are often shaded, you are advised to set String monitor to Disable to prevent false alarms.
String detection reference asymmetric coefficient	Specifies the threshold for determining PV string exception. The false alarms caused by fixed shadow shading can be controlled by changing this parameter.	This parameter is displayed when String monitor is set to Enable .
String detection starting power percentage (%)	Specifies the threshold for starting PV string exception detection. The false alarms caused by fixed shadow shading can be controlled by changing this parameter.	
OFF at 0% power limit	If this parameter is set to Enable , the inverter shuts down after receiving the 0% power limit command. If this parameter is set to Disable , the inverter does not shut down after receiving the 0% power limit command.	-
Maximum apparent power (kVA)	Specifies the output upper threshold for the maximum apparent power to adapt to the capacity requirements of standard and customized inverters.	If the maximum active power equals the value of Smax_limit, this parameter is not displayed.
Maximum active power (kW)	Specifies the output upper threshold for the maximum active power to adapt to different market requirements.	For 1000 V inverters, this parameter is configurable only for the SUN2000-25KTL-US, and the maximum value is 27.5 kW.
Tracker controller	Selects a controller vendor.	-
Adjust total energy yield (kWh)	Specifies the initial energy yield of the inverter. This parameter is used in inverter replacement scenarios. Set the initial energy yield of the new inverter to the total energy yield of the old inverter to ensure continuous statistics of cumulative energy yield.	-
Duration for determining short-time grid disconnection (ms)	The standards of certain countries and regions require that the inverter should not disconnect from the power grid if the power grid experiences a short-time failure. After the fault is rectified, the inverter output power needs to be quickly restored.	-

Parameter	Description	Remarks
Buzzer	If this parameter is set to Enable , the buzzer sounds when the DC input cable is incorrectly connected. If this parameter is set to Disable , the buzzer does not sound when the DC input cable is incorrectly connected.	-
LVRT	LVRT is short for low voltage ride-through. When the grid voltage is abnormally low for a short time, the inverter cannot disconnect from the power grid immediately and has to work for some time.	-
Threshold for triggering LVRT (V)	Specifies the threshold for triggering LVRT. The threshold settings should meet the local grid standard.	This parameter is displayed when LVRT is set to Enable .
LVRT compensation power factor of reactive power in positive sequence	During LVRT, the solar inverter needs to generate positive-sequence reactive power to support the power grid. This parameter is used to set the positive-sequence reactive power generated by the solar inverter.	
	For example, if you set LVRT compensation power factor of reactive power in positive sequence to 2, the increment of positive-sequence reactive current generated by the solar inverter is 20% of the rated current when the AC voltage decreases by 10% during LVRT. If you set LVRT compensation power factor of reactive power in positive sequence to 0, the increment of positive-sequence reactive current generated by the solar inverter is 0 regardless of how much the AC voltage decreases during LVRT.	

Parameter	Description	Remarks
LVRT compensation power factor of reactive power in negative sequence	During LVRT, the solar inverter needs to generate negative-sequence reactive power to support the power grid. This parameter is used to set the negative-sequence reactive power generated by the solar inverter.	
	For example, if you set LVRT compensation power factor of reactive power in negative sequence to 2, the increment of negative-sequence reactive current generated by the solar inverter is 20% of the rated current when the AC voltage decreases by 10% during LVRT. If you set LVRT compensation power factor of reactive power in negative sequence to 0, the increment of negative-sequence reactive current generated by the solar inverter is 0 regardless of how much the AC voltage decreases during LVRT.	
Percentage of LVRT reactive current limiting	During LVRT, the device needs to limit the reactive current.	
current unitarity	For example, if you set Percentage of LVRT reactive current limiting to 50 , the reactive current upper limit of the device is 50% of the rated current during LVRT.	
Threshold of LVRT zero- current mode	When Zero current due to power grid fault is set to Enable, if the power grid voltage is less than the value of Threshold of LVRT zero-current mode during LVRT, the zero current mode is used. Otherwise, the mode configured in LVRT mode is used.	
LVRT mode	Sets LVRT mode. The options are Zero- current mode , Constant current mode , Reactive power priority mode , and Active power priority mode .	
HVRT	HVRT is short for high voltage ride- through. When the grid voltage is abnormally high for a short time, the inverter cannot disconnect from the power grid immediately and has to work for some time.	-
Threshold for triggering HVRT (V)	Specifies the threshold for triggering HVRT. The threshold settings should meet the local grid standard.	This parameter is displayed when HVRT is set to Enable .

Parameter	Description	Remarks
HVRT compensation power factor of reactive power in positive sequence	During HVRT, the solar inverter needs to generate positive-sequence reactive power to support the power grid. This parameter is used to set the positive-sequence reactive power generated by the solar inverter. For example, if you set HVRT compensation power factor of reactive power in positive sequence to 2, the increment of positive-sequence reactive current generated by the solar inverter is	
	20% of the rated current when the AC voltage increases by 10% during HVRT.	
LVRT undervoltage protection shield	Specifies whether to shield the undervoltage protection function during LVRT.	This parameter is displayed when LVRT is set to Enable .
Grid voltage protection shield during VRT	Specifies whether to shield the undervoltage protection function during LVRT or HVRT.	This parameter is displayed when LVRT or HVRT is set to Enable.
VRT active current limiting (%)	Specifies the percentage of the maximum active current to the rated current during fault ride-through (FRT).	-
VRT active power recovery gradient	Specifies the recovery rate when the active current recovers to the value at the moment before FRT.	-
Grid voltage jump triggering threshold (%)	Specifies the LVRT or HVRT threshold for triggering a transient voltage jump of a power grid. A transient voltage jump indicates that the inverter cannot immediately disconnect from the power grid when the power grid is abnormal due to transient changes.	This parameter is available when Grid code is set to VDE 4120 .
Zero current due to power grid fault	Certain countries and regions have requirements on the output current during high/low voltage ride-through. In this case, set this parameter to Enable . After this parameter is set to Enable , the output current is less than 10% of the rated current during high/low voltage ride-through.	This parameter is displayed when LVRT or HVRT is set to Enable.
Active islanding protection	Specifies whether to enable the active islanding protection function.	-
Passive islanding protection	Specifies whether to enable the passive islanding protection function.	This parameter is displayed if the Japanese grid code is selected.

Parameter	Description	Remarks
Voltage rise suppression	The standards of certain countries and regions require that when the output voltage exceeds a certain value, the inverter must suppress voltage rise by outputting reactive power and reducing active power.	-
Voltage rise suppressing reactive power adjustment point (%)	The standards of certain countries and regions require that the inverter generate a certain amount of reactive power when the output voltage exceeds a certain value.	 This parameter is displayed when Voltage rise suppression is set to Enable. The value of Voltage rise suppressing active power
Voltage rise suppressing active power derating point (%)	The standards of certain countries and regions require that the active power of the inverter be derated according to a certain slope when the output voltage exceeds a certain value.	derating point must be greater than that of Voltage rise suppressing reactive power adjustment point.
Voltage rise suppression P-U curve	The standards of certain countries and regions require that the P-U curve be set.	This parameter is displayed when Voltage rise suppression is set to Enable .
Voltage rise suppression Q-U curve	The standards of certain countries and regions require that the Q-U curve be set.	
Frequency change rate protection	Set this parameter to Enable to protect the inverter when the grid frequency changes too fast.	-
Frequency change rate protection threshold (Hz/s)	Specifies the frequency change rate protection threshold.	This parameter is displayed if Frequency change rate protection is set to Enable.
Frequency change rate protection duration (s)	The inverter is protected when the grid frequency change duration exceeds the value.	
Soft start time after grid failure (s)	Specifies the time for the power to gradually increase when the inverter restarts after the power grid recovers.	-
CT anomaly detection	If this parameter is set to Enable , the inverter automatically checks whether CT cables are disconnected or connected in reverse polarity and reports an alarm to the SmartLogger.	-

Parameter	Description	Remarks
Churn mode	If this parameter is set to Enable , the Backup Box switches to this mode (off-grid mode) when the grid fails.	-
Reserved backup capacity	When Churn mode (off-grid mode) is set to Enable and the battery SOC reaches this value, the battery stops discharging to ensure that the SOC is above this value.	The association is displayed when Churn mode (off-grid mode) is set to Enable .
Grid-tied/Off- grid switching mode	If this parameter is set to Automatic , the system switches to the off-grid mode when the grid fails, and switches to the grid-tied mode when the grid recovers.	
Switch to off-grid	This parameter is displayed only when Grid-tied/Off-grid switching mode is set to Manual . To manually switch to off-grid mode, select the box on the left and click Submit .	
Voltage in independent operation	AC operating voltage level of the inverter in off-grid mode can be 101 V or 202 V .	
Microgrid compatibility	The default value is Disable . If the inverter and diesel generator run in parallel, set this parameter to Enable . When Microgrid compatibility is set to Enable , the grid-connected current source inverter supports a higher ratio of PV to energy storage in addition to the feature of the original country grid code.	If this parameter is set incorrectly, the inverter may run abnormally.

Power Adjustment Parameters

Parameter	Description	Remarks
Remote power schedule	If this parameter is set to Enable , the inverter responds to the scheduling instruction from the remote port. If this parameter is set to Disable , the inverter does not respond to the scheduling instruction from the remote port.	
Schedule instruction valid duration (s)	Specifies the time for maintaining the scheduling instruction. When this parameter is set to 0, the scheduling instruction takes effect permanently.	When this parameter is set to 0, the scheduling instruction takes effect permanently.

Parameter	Description	Remarks
Maximum apparent power (kVA)	Specifies the output upper threshold for the maximum apparent power to adapt to the capacity requirements of standard and customized inverters.	If the maximum active power equals the value of Smax_limit, this parameter is not displayed.
Maximum active power (kW)	Specifies the output upper threshold for the maximum active power to adapt to different market requirements.	-
OFF at 0% power limit	If this parameter is set to Enable , the inverter shuts down after receiving the 0% power limit command. If this parameter is set to Disable , the inverter does not shut down after receiving the 0% power limit command.	-
Active power change gradient (%/s)	Specifies the change speed of the inverter active power.	-
Derated by fixed active power (kW)	Adjusts the active power output of the inverter by fixed value.	This parameter is displayed if Remote power schedule is set to Enable .
		For 1000 V inverters, the maximum value of this parameter for the SUN2000-25KTL-US is 27.5 kW.
Derated by active power % (%)	Adjusts the active power output of the inverter by percentage. If this parameter is set to 100 , the	This parameter is displayed if Remote power schedule is set to Enable .
	inverter outputs based on the maximum output power.	If this parameter is set to 100 , the inverter outputs based on the maximum output power.
Reactive power change gradient (%/s)	Specifies the change speed of the inverter reactive power.	-
Plant active power gradient (min/100%)	Specifies the rate of active power rise due to sunlight changes.	-
Average active power filtering time (ms)	Specifies the period of active power rise due to sunlight changes. This parameter is used with Plant active power gradient .	-
PF (U) voltage detection filtering time (s)	Specifies the time for filtering the grid voltage in the PF-U curve.	-
Reactive power adjustment time (s)	Specifies the adjustment time for the reactive power to reach the target value during reactive power adjustment.	-

Parameter	Description	Remarks
Power factor	Specifies the power factor of the inverter.	This parameter is displayed if Remote power schedule
Reactive power compensation (Q/S)	Specifies the reactive power output by the inverter.	is set to Enable .
Night-time reactive power compensation (Q/S)	During the reactive power compensation at night, the reactive power is scheduled by percentage.	-
Night-time reactive power output	In some specific application scenarios, a power grid company requires that the inverter can perform reactive power compensation at night to ensure that the power factor of the local power grid meets requirements.	This parameter is displayed when Isolation settings is set to Input ungrounded , with TF.
Enable reactive power parameters at night	When this parameter is set to Enable , the inverter outputs reactive power based on the setting of Reactive power compensation at night . Otherwise, the inverter executes the remote scheduling command.	This parameter is displayed when Night-time reactive power output is set to Enable .
Night-time reactive power compensation (kVar)	During the reactive power compensation at night, the reactive power is scheduled by fixed value.	This parameter is displayed when Night-time reactive power output and Enable reactive power parameters at night are set to Enable.
Overfrequency derating	If this parameter is set to Enable , the active power of the inverter will be derated according to a certain slope when the grid frequency exceeds the frequency that triggers overfrequency derating.	-
Frequency for triggering overfrequency derating (Hz)	The standards of certain countries and regions require that the output active power of inverters be derated when the power grid frequency exceeds a certain value.	 This parameter is displayed when Overfrequency derating is set to Enable. When setting this parameter, ensure that the following condition is met: Frequency for exiting overfrequency derating ≤ Frequency for triggering overfrequency derating < Cutoff frequency derating.
Frequency for exiting overfrequency derating (Hz)	Specifies the frequency threshold for exiting overfrequency derating.	
Cutoff frequency of overfrequency derating (Hz)	Specifies the frequency threshold for cutting off overfrequency derating.	

Parameter	Description	Remarks
Cutoff power of overfrequency derating (%)	Specifies the power threshold for cutting off overfrequency derating.	
Frequency detection filtering time (ms)	Specifies the frequency detection filter time.	
Overfrequency derating power drop gradient (%/s)	Specifies the decrease rate of the overfrequency derating power.	
Power recovery gradient of overfrequency derating (%/min)	Specifies the recovery rate of the overfrequency derating power.	
Voltage derating	If this parameter is set to Enable , the active power of the inverter will be derated according to a certain slope when the grid voltage exceeds the voltage that triggers overfrequency derating.	
Voltage derating start point (V)	Specifies the start point for voltage derating.	 This parameter is displayed when Voltage derating is set to Enable. When setting this parameter, ensure that the following condition is met: Voltage derating start point < Voltage derating stop point.
Cut-off point of voltage derating (V)	Specifies the stop point for voltage derating.	
Voltage derating cut-off power (V)	Specifies the power threshold for cutting off voltage derating.	
Communication disconnection fail-safe	In the inverter export limitation scenario, if this parameter is set to Enable , the inverter will perform active power derating by percentage when the communication between the inverter and the SmartLogger or Smart Dongle is disconnected for more than the time specified by Communication disconnection detection time .	N/A
Communication disconnection detection time (s)	Specifies the fail-safe detection time for the disconnection between the inverter and the SmartLogger or Smart Dongle.	This parameter is displayed when Communication disconnection fail-safe is set to Enable .
Active power output limit for fail-safe (%)	Specifies the derating value of the inverter active power by percentage.	
Apparent power baseline (kVA)	Adjusts the apparent output baseline of the inverter.	-

Parameter	Description	Remarks
Active power baseline (kW)	Adjusts the active output baseline of the inverter.	-
Frequency modulation control	The standards of certain countries and regions require that if the power grid frequency fluctuates around a certain value, the inverter needs to fine-tune the active power output based on Frequency modulation control droop to help stabilize the power grid frequency. In this case, set this parameter to Enable	-
Adjustment ratio of frequency modulation control	Specifies the droop of the active power output.	This parameter is displayed when Frequency modulation control is set to Enable .
Underfrequency rise power	The standards of certain countries and regions require that if the power grid frequency is lower than Frequency for triggering of underfrequency rise power, the inverter needs to increase the active power output to help increase the power grid frequency. In this case, set this parameter to Enable.	
Frequency for triggering of underfrequency rise power (Hz)	Specifies the frequency threshold of Underfrequency rise power.	This parameter is displayed when Underfrequency rise power is set to Enable .
Power recovery gradient of underfrequency rise (%/min)	Specifies the recovery rate of Underfrequency rise power.	
Cutoff frequency of underfrequency rise power (Hz)	Specifies the cutoff frequency of Underfrequency rise power.	
Cutoff power of underfrequency rise power (%)	Specifies the cutoff power of Underfrequency rise power.	
Frequency for exiting of underfrequency rise power (Hz)	Specifies the exit frequency of Underfrequency rise power.	

PV String Access Detection

 PV string access detection applies to large-scale commercial ground PV plants with PV strings facing the same direction.

- In AC or DC power limiting scenarios:
 - If the PV string access type has not been identified, PV string N access status will be displayed as Disconnection. The PV string access type can be identified only when the solar inverters restore to the non-power limiting state and the current of all connected PV strings reaches the startup current.
 - If the PV string access type has been identified, when a certain PV string connected to the 2-in-1 terminals is lost, no alarm will be generated. If a certain PV string connected to the 2-in-1 terminals is restored, the access type cannot be identified. You can determine whether both 2-in-1 PV strings are restored only when the PV string current reaches Startup current for 2-in-1 detection.
- After setting the parameters, you can go to the **Running Info.** tab page to check whether the PV string connection status is normal.

Table 6-6 Parameter description

Parameter	Parameter Description
PV String Access Detection	PV String Access Detection is set to Disable by default. After solar inverters are connected to the power grid, set PV String Access Detection to Enable.
Startup current	When the current of all connected PV strings reaches the preset value, the PV string access detection function is enabled. NOTE Startup current setting rules: • Startup current = I _{sc} (S _{tc}) x 0.6 (rounded up). For details about I _{sc} (S _{tc}), see the PV module nameplate. • Default startup current (5 A): applicable to the scenarios where the short-circuit current I _{sc} (S _{tc}) is greater than 8 A for the monocrystalline and polycrystalline PV modules.
Startup current for 2-in-1 detection	When the current of a PV string reaches Startup current for 2-in-1 detection , the PV string is automatically identified as 2-in-1 . You are advised to retain the default settings.
PV string N access type NOTE N is the DC input terminal number of the solar inverter.	Set this parameter based on the type of the PV string connected to DC input terminal N of the solar inverter. Currently, the options are as follows: Automatic identification (default value), Disconnection, Single PV string, and 2-in-1.
	You are advised to retain the default value. If the value is incorrectly set, the PV string access type may be incorrectly identified and alarms may be generated by mistake for the PV string access status.

6.3.8.2 Tracking System

- The web software versions corresponding to the WebUI screenshots in this document are V300R001C00SPC050. The screenshots are for reference only.
- If a PV string uses a tracking system with a controller, set tracking system parameters on the **Tracking System** tab page.

Procedure

 Before setting the tracking system parameters, you need to set Tracker Controller in Feature Parameters on the Running Param. tab page. Select the corresponding vendor based on the information about the tracker controller. If the vendor is not in the list, select Other vendors.

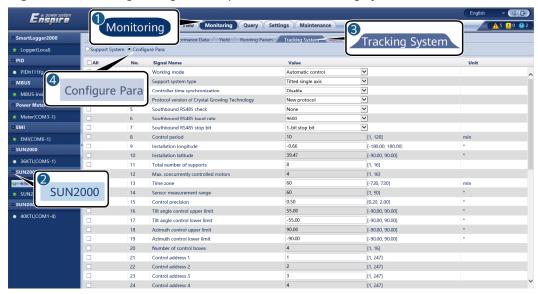
This section uses **Other vendors** as an example.

Figure 6-46 Setting tracking system controller



2. On the **Tracking System** tab page, select **Config Para**.

Figure 6-47 Setting configuration parameters (tracking system)



Parameter	Description
Working mode	Six working modes are supported: Automatic control, Manual control, Maintenance mode, Wind mode, Snow mode, and Rain mode. Set Working mode based on the actual operating
	status of the inverter.
Support system type	Four types of support systems are supported: Tilted single axis, Horizontal single axis, Vertical single axis, and Dual axis. NOTE The support system type can be set only when Tonking or Crystal Growing Technology is selected. For other vendors, the support system type is automatically selected based on the inverter configuration.
Controller time synchronization	This parameter can be set to Enable or Disable . After this parameter is set to Enable , the time is synchronized with the tracking system every 15 minutes.
Protocol version of Crystal Growing Technology	When Crystal Growing Technology is selected, you can set this parameter to New protocol or Old protocol based on the site requirements.
Southbound RS485 check	This parameter can be set to None , Odd parity , and Even parity .
Southbound RS485 baud rate	This parameter can be set to 4800 , 9600 , 19200 , or 115200 .
Southbound RS485 stop bit	This parameter can be set to 1-bit stop bit and 2-bit stop bit .
Control period	When Tonking is selected, you can set the period for refreshing the target angle.
Installation longitude	The longitude and latitude can be set.
Installation latitude	
Total number of supports	The inverter obtains the number of supports under each control box based on the configured number and addresses of the control boxes, and calculates and obtains the total number of supports. NOTE This parameter can be set only when Tanking or Crustal.
	This parameter can be set only when Tonking or Crystal Growing Technology is selected.
Max. concurrently controlled motors	When Tonking is selected, this parameter can be set.
Time zone	The time zone can be set.
Sensor measurement range	When Tonking is selected, this parameter can be set.

Parameter	Description	
Control precision	When Tonking is selected, this parameter can be set.	
Tilt angle control upper limit	These parameters can be set only when Work mode is set to Manual control .	
Tilt angle control lower limit		
Azimuth control upper limit		
Azimuth control lower limit		
Number of control boxes	Set this parameter based on the number of control boxes connected to the inverter. NOTE This parameter can be set only when Other vendor is selected.	
Control address 1-16	Set this parameter based on the communication address of the control box. NOTE	
	This parameter can be set only when Other vendor is selected.	

 On the Tracking System tab page, click Support System and check Total number of supports and check whether Access Status and System Status are normal.

□ NOTE

- Check whether the value of Total number of supports is the same as that in Config Para.
- If Working mode in Config Para is set to Manual control, you can manually set parameters such as Starting, Stop, Clr Fault, and Azimuth in Support System.

Figure 6-48 Support system (tracking system)

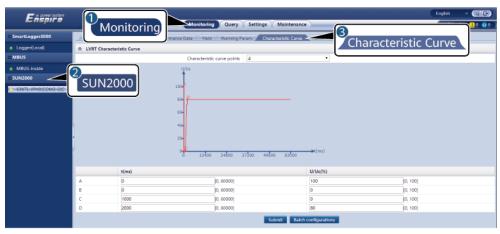


6.3.8.3 Characteristic Curves

The web software versions corresponding to the WebUI screenshots in this document are V300R001C00SPC050. The screenshots are for reference only.

Step 1 Set characteristic curve parameters and click **Submit**.

Figure 6-49 Characteristic curves



IL04J00026

Characteristic Curve Name	Description	
LVRT Characteristic Curve	Configure this characteristic curve based on the power grid standard.	
	NOTE The SmartLogger supports only the 60-second LVRT characteristic curve configuration. If the power grid standard requires that the duration of LVRT be greater than 60s, LVRT Characteristic Curve is not displayed for the grid code.	
[Voltage Rise	1. Set Voltage Rise Suppression to Enable.	
Suppression]Q-U curve	Configure this characteristic curve based on the power grid standard.	
[Voltage Rise	1. Set Voltage Rise Suppression to Enable.	
Suppression]P-U curve	Configure this characteristic curve based on the power grid standard.	

----End

6.3.8.4 Battery

This section describes how to query or set battery parameters when the inverter is connected to a battery.

Battery Information

Parameter	Description
Working status	Indicates the current working status of the battery, which can be Offline , Idle , Running , Faulty , or Hibernating .
Working mode	Indicates the current working mode of the inverter battery control.
Charge/Discharge power	Total charge and discharge power of all batteries connected to the inverter.
SOC	Indicates the power status of all batteries connected to the inverter.
Bus voltage	Indicates the voltage on the DC bus of the battery.
Bus current	Indicates the current on the DC bus of the battery.
Rated capacity	Total rated capacity of all batteries connected to the inverter. The rated capacity refers to the total amount of energy discharged by the batteries in normal conditions.
Current-day charge capacity	Total energy charged into the batteries on the current day.
Current-day discharge capacity	Total energy discharged from the batteries on the current day.
Total charge	Total energy charged into the batteries.
Total discharge	Total energy discharged from the batteries.

Energy Storage Unit

Parameter	Description	
Firmware version	Software version of the DC/DC module.	
SN	Serial number of the DC/DC module.	
Working status	Indicates the current working status of the energy storage unit, which can be Offline , Idle , Running , Faulty , or Hibernating .	
Rated capacity	Total amount of energy discharged by the energy storage unit in normal conditions.	
Voltage	Voltage of the energy storage unit.	
Current	Current of the energy storage unit.	

Parameter		Description	
Internal temperature		Temperature inside the energy storage unit.	
SOC		Indicates the power status of the energy storage unit.	
Charge/Disch	narge power	Indicates the charge or discharge power of the energy storage unit.	
Current-day capacity	charge	Total energy charged into the energy storage unit on the current day.	
Current-day capacity	discharge	Total energy discharged from the energy storage unit on the current day.	
Total charge		Total energy charged into the energy storage unit.	
Total discharge		Total energy discharged from the energy storage unit.	
Battery model		Models of the energy storage unit, including LG-RESU and LUNA2000.	
Battery pack	Firmware version	Software version of the battery pack.	
	SN	Serial number of the battery pack.	
status battery pack		ndicates the current working status of the pattery pack, which can be Offline , Idle , Running , Faulty , or Hibernating .	
	Voltage	Voltage of the battery pack.	
	Charge/ Discharge power	Indicates the charge or discharge power of the energy storage unit.	
	Highest temperature	Indicates the highest temperature detected in the battery pack.	
	Lowest temperature	Indicates the lowest temperature detected in the battery pack.	
	SOC	Power status of the battery pack.	
	Total discharge	Total energy discharged from the battery pack.	

Configurable Parameters

Parameter	Description
Energy Storage Unit	Displays or sets the battery model. The system automatically identifies and displays the correct model. Generally, you do not need to manually modify the information.
Maximum charge power	Sets the maximum power for battery charging.
Maximum discharge power	Sets the maximum power for battery discharging.
Charge from AC	If this parameter is set to Enable , the batteries can be charged from the power grid.
Maximum charge power of grid	Sets the maximum power for charging the batteries from the power grid.
Charge cutoff capacity	When the SOC of the battery reaches this value, charging stops.
Max. depth of discharge	When the SOC of the battery reaches this value, discharging stops.
Grid charge cutoff SOC	When the SOC of the battery reaches this value, the grid stops charging the battery.

Charge/Discharge

Parameter	Description	
Charge/Discharge	Forced charge/discharge operation, which can be Charge , Discharge , or Stop .	
Mode Settings	To enter the forced charge/discharge mode, set Duration or Target SOC .	
Duration	Sets the duration of forced charge/discharge. When the time is reached, the forced charge/discharge stops automatically. This parameter is displayed when Mode Settings is set to Duration .	
Charged energy	Sets the target SOC for forced charge/ discharge. When the SOC reaches this value, the forced charge/discharge stops automatically. This parameter is displayed when Mode Settings is set to Target SOC .	
Discharged energy	Current charged energy in this forced charge/ discharge	

6.3.9 Setting PCS Parameters

This section does not apply to V300R001C00.

Procedure

Step 1 Choose **Monitoring > PCS > Running Param.** and set running parameters, click **Submit**.

NOTICE

Before setting the running parameters of the Smart PCS, ensure that the DC side is energized.

----End

6.3.9.1 Running Parameters

Grid Parameters

Parameter	Description	
Grid code	Set this parameter based on the grid code of the country or region where the device is used.	
Output mode	Specifies the supported power grid types.	
Isolation settings	Specifies the device grounding status at DC side and the connection to the power grid.	
Auto start upon grid recovery	Specifies whether to allow the device to automatically start after the power grid recovers.	
On-grid recovery time (s)	Specifies the time after which the device begins restarting after the power grid recovers.	
Quick startup for short- time grid disconnection	Specifies whether to allow the device to quickly start after the power grid recovers from a short-time failure.	
Duration for determining short-time grid disconnection (ms)	The standards of certain countries and regions require that the device should not disconnect from the power grid if the power grid experiences a short-time failure. After the fault is rectified, the device output power needs to be quickly restored.	
Soft start time after grid failure (s)	Specifies the time for the power to gradually increase when the device restarts after the power grid recovers.	
Upper voltage threshold (V) for grid connection	According to the standards of certain countries and regions, initial grid connection is not allowed when the grid voltage is higher than the maximum voltage for grid connection.	

Parameter	Description	
Lower voltage threshold (V) for grid connection	According to the standards of certain countries and regions, initial grid connection is not allowed when the grid voltage is below the minimum voltage for grid connection.	
Upper frequency threshold (Hz) for grid connection	According to the standards of certain countries and regions, initial grid connection is not allowed when the grid frequency is higher than the maximum frequency for grid connection.	
Lower frequency threshold (Hz) for grid connection	According to the standards of certain countries and regions, initial grid connection is not allowed when the grid frequency is below the minimum frequency for grid connection.	
Grid reconnection voltage upper limit (V)	According to the standards of certain countries and regions, grid reconnection is not allowed when the grid voltage is higher than the maximum voltage for grid reconnection.	
Grid reconnection voltage lower limit (V)	According to the standards of certain countries and regions, grid reconnection is not allowed when the grid voltage is below the minimum grid voltage for grid reconnection.	
Grid reconnection frequency upper limit (Hz)	According to the standards of certain countries and regions, grid reconnection is not allowed when the grid frequency is higher than the maximum grid frequency for grid reconnection.	
Grid reconnection frequency lower limit (Hz)	According to the standards of certain countries and regions, grid reconnection is not allowed when the grid frequency is below the minimum grid frequency for grid reconnection.	
Grid automatic reconnection time	Specifies the time after which the device begins restarting after the power grid recovers.	

Protection Parameters

Parameter	Description	
Insulation resistance protection threshold (M Ω)	To ensure device safety, the device detects the insulation resistance of the DC side to the ground when it starts a self-check. If the detected value is less than the preset value, the device does not connect to the grid nor start.	
Active islanding protection	Specifies whether to enable the active islanding protection function.	
Passive islanding protection	Specifies whether to enable the passive islanding protection function.	
Unbalance voltage protection (%)	Specifies the device protection threshold when the power grid voltage is unbalanced.	
Phase protection threshold (°)	The Japanese standard requires that during passive islanding detection, the protection should be triggered if an abrupt voltage phase change is detected.	

Parameter	Description	
Phase angle offset protection	The standards of certain countries and regions require that the device needs to be protected when the phase angle offset of the power grid three phases exceeds a certain value.	
10-minute UV protection	Specifies the 10-minute undervoltage protection threshold.	
10-minute UV protection time	Specifies the 10-minute undervoltage protection duration.	
10 minute OV protection (V)	Specifies the 10-minute overvoltage protection threshold.	
10 minute OV protection time (ms)	Specifies the 10-minute overvoltage protection duration.	
Level-N OV protection (V)	Specifies the level-N grid overvoltage protection threshold.	
Level-N OV protection time (ms)	Specifies the level-N grid overvoltage protection duration.	
Level-N UV protection (V)	Specifies the level-N grid undervoltage protection threshold.	
Level-N UV protection time (ms)	Specifies the level-N grid undervoltage protection duration.	
Frequency change rate protection	If this parameter is set to Enable , the device is protected when the power grid frequency changes too fast.	
Frequency change rate threshold (Hz/s)	Specifies the frequency change rate protection threshold.	
Duration threshold (s) for frequency change rate protection	The device is protected when the grid frequency change duration exceeds the value.	
Level-N OF protection (Hz)	Specifies the level-N grid overfrequency protection threshold.	
Level-N OF protection time (ms)	Specifies the level-N grid overfrequency protection duration.	
Level-N UF protection (Hz)	Specifies the level-N grid underfrequency protection threshold.	
Level-N UF protection time (ms)	Specifies the level-N grid underfrequency protection duration.	

N can be 1, 2, 3, 4, 5, or 6.

Feature Parameters

Parameter	Description	Remarks
Communication interruption duration	Specifies the duration for determining communication interruption between the device and the SmartLogger.	-
Shutdown on communication failure	The standards of certain countries and regions require that the device shut down after the communication is interrupted for a certain time.	If this parameter is set to Enable , the device automatically shuts down after the Communication interruption duration is reached.
Automatic startup upon communication recovery	If this parameter is set to Enable , the device automatically starts after communication recovers. If this parameter is set to Disable , the device needs to be started manually after communication recovers.	This parameter is displayed when the Shutdown on communication failure is set to Enable.
Protection in the case of communication failure	In reverse current prevention scenarios, if this parameter is set to Enable , the device performs active power percentage derating when the communication between the device and the SmartLogger or Smart Dongle is interrupted for a period longer than Communication disconnection detection time . The device performs protection according to the set power.	
Communication disconnection detection time (s)	Specifies the fail-safe detection time for the disconnection between the device and the SmartLogger or Smart Dongle.	This parameter is displayed when the Protection in the case of communication failure is set to Enable.
Active power mode when communication fails	Specifies the protection threshold of the active power after the communication is interrupted. The value can be a percentage or a fixed value.	This parameter is displayed when the Protection in the case of communication failure is set to Enable.
Active power limit when communication fails (%)	Specifies the active power threshold in percentage.	This parameter is displayed when the Protection in the case of communication failure is set to Enable and Active power threshold when communication fails is set to a percentage.

Parameter	Description	Remarks
Active power limit when communication fails (kW)	Specifies the active power threshold as a fixed value.	This parameter is displayed when the Protection in the case of communication failure is set to Enable and Active power threshold when communication fails is set to a fixed value.
Reactive power mode when communication fails	Specifies the protection threshold of the reactive power after the communication is interrupted, including Q/S and power factor.	This parameter is displayed when the Protection in the case of communication failure is set to Enable.
Reactive power limit when communication fails (%)	Specifies the Q/S threshold of the reactive power (%).	This parameter is displayed when Protection in the case of communication failure is set to Enable and Reactive power mode when communication fails is set to Power factor.
Reactive power limit when communication fails	Specifies the power factor threshold of the reactive power.	This parameter is displayed when the Protection in the case of communication failure is set to Enable and Reactive power mode when communication fails is set to Q/S.
Soft start time (s)	Specifies the duration for the power to gradually increase when the device starts.	-
Shutdown gradient (%/s)	Specifies the power change rate when the device shuts down.	-
Shutdown at 0% power limit	If this parameter is set to Enable , the device shuts down after receiving the 0% power limit command. If this parameter is set to Disable , the device does not shut down after receiving the 0% power limit command.	-
Hibernate at night	The device performs the monitoring function at night. If this parameter is set to Enable , the monitoring function of the device will hibernate at night to reduce power consumption.	-

Parameter	Description	Remarks
Delayed upgrade	This parameter is mainly used in the upgrade scenarios where the power supply at DC side is disconnected.	After the upgrade starts, if Delayed upgrade is set to Enable , the upgrade package is loaded first. After the DC side power supply recovers and the activation conditions are met, the device automatically activates the upgrade.
HVRT	HVRT is short for high voltage ride-through. When the grid voltage is abnormally high for a short time, the device cannot disconnect from the power grid immediately and has to work for some time.	-
HVRT threshold (V)	Specifies the threshold for triggering HVRT. The threshold settings should meet the local grid standard.	This parameter is displayed when HVRT is set to Enable .
Positive- sequence reactive power compensation factor in HVRT	During HVRT, the device needs to generate positive-sequence reactive power to support the power grid. This parameter is used to set the positive-sequence reactive power generated by the device. For example, if you set this parameter to 2, the increment of positive-sequence reactive current generated by the device is 20% of the rated current when the AC voltage increases by 10% during HVRT.	
Negative- sequence reactive power compensation factor in HVRT	During HVRT, the device needs to generate negative-sequence reactive power to support the power grid. This parameter is used to set the negative-sequence reactive power generated by the device. For example, if you set this parameter to 2, the increment of negative-sequence reactive current generated by the device is 20% of the rated current when the AC voltage increases by 10% during HVRT.	
LVRT	LVRT is short for low voltage ride-through. When the grid voltage is abnormally low for a short time, the device cannot disconnect from the power grid immediately and has to work for some time.	-
LVRT threshold (V)	Specifies the threshold for triggering LVRT. The threshold settings should meet the local grid standard.	This parameter is displayed when LVRT is set to Enable .

Parameter	Description	Remarks
Positive- sequence reactive power compensation factor in LVRT	During LVRT, the device needs to generate positive-sequence reactive power to support the power grid. This parameter is used to set the positive-sequence reactive power generated by the device. For example, if you set this parameter to 2, the increment of positive-sequence reactive current generated by the device is 20% of the rated current when the AC voltage decreases by 10% during LVRT.	
Negative- sequence reactive power compensation factor in LVRT	During LVRT, the device needs to generate negative-sequence reactive power to support the power grid. This parameter is used to set the negative-sequence reactive power generated by the device. For example, if you set this parameter to 2, the increment of negative-sequence reactive current generated by the device is 20% of the rated current when the AC voltage decreases by 10% during LVRT.	
LVRT active current maintenance coefficient	Specifies the active current proportional coefficient before and during LVRT.	
Percentage of LVRT reactive current limiting	During LVRT, the device needs to limit the reactive current. For example, if you set Percentage of LVRT reactive current limiting to 50 , the reactive current upper limit of the device is 50% of the rated current during LVRT.	
Threshold of LVRT zero- current mode	When Zero current due to power grid fault is set to Enable, if the power grid voltage is less than the value of Threshold of LVRT zero-current mode during LVRT, the zero current mode is used. Otherwise, the mode configured in LVRT mode is used.	
LVRT mode	Sets LVRT mode. The options are Zero-current mode, Constant current mode , Reactive power priority mode , and Active power priority mode .	
LVRT characteristic curve	Specifies the low voltage ride-through capability of the device.	-
Deactivate grid voltage protection during HVRT/ LVRT	Specifies whether to shield the undervoltage protection function during LVRT or HVRT.	This parameter is displayed when LVRT or HVRT is set to Enable.

Parameter	Description	Remarks
VRT exit hysteresis threshold	Specifies the LVRT/HVRT recovery threshold.	 This parameter is displayed when LVRT or HVRT is set to Enable.
		 LVRT recovery threshold = LVRT threshold + VRT exit hysteresis threshold
		HVRT recovery threshold = HVRT threshold - VRT exit hysteresis threshold
VRT active current limiting (%)	Specifies the percentage of the maximum active current to the rated current during fault ridethrough (FRT).	-
VRT active power recovery gradient	Specifies the recovery rate when the active current recovers to the value at the moment before FRT.	-
Zero current due to power grid fault	Specifies whether to enable the Zero current due to power grid fault function.	-
Grid voltage jump triggering threshold	This parameter can be set only for the VDE4120.	-
Voltage rise suppression	The standards of certain countries and regions require that when the output voltage exceeds a certain value, the device must suppress voltage rise by outputting reactive power and reducing active power.	-
Reactive power adjustment threshold (%) for voltage rise suppression	The standards of certain countries and regions require that the device generate a certain amount of reactive power when the output voltage exceeds a certain value.	 This parameter is displayed when Voltage rise suppression is set to Enable.
		• The value of Voltage rise suppression active derating point must be greater than that of Reactive power adjustment threshold for voltage rise suppression.

Parameter	Description	Remarks
Active power derating threshold (%) for voltage rise suppression	The standards of certain countries and regions require that the active power of the device be derated by a certain slope when the output voltage exceeds a certain value.	
P-U characteristic curve	The device adjusts P/Pn (the ratio of the active power to the rated power) in real time based on U/Un(%) (the ratio of the actual power grid voltage to the rated power grid voltage).	-
P-U characteristic curve adjustment time	Specifies the time from the response to the end of the adjustment based on the P-U curve.	-
Frequency regulation	The standards of certain countries and regions require that if the power grid frequency fluctuates around a certain value, the device needs to finetune the active power output based on the frequency regulation ratio to help stabilize the power grid frequency. In this case, set this parameter to Enable .	-
Adjustment ratio of frequency modulation control	Specifies the adjustment ratio of the active power output.	This parameter is displayed when the Frequency regulation is set to Enable .
Response deadband of frequency- based control	Specifies the threshold for triggering the frequency modulation control. For example, if this parameter is set to 0.1 Hz, the frequency modulation control is not triggered when the frequency is within reference frequency±0.1 Hz.	
Power change gradient of frequency- based control	Specifies the active power change gradient of frequency modulation.	-
Power change limit of frequency- based control	Specifies the upper limit for active power adjustment of frequency modulation.	-
Delay response time of frequency- based control	Specifies the delay response time of frequency modulation.	-

Parameter	Description	Remarks
Power derating caused by overfrequency	If this parameter is set to Enable , the active power of the device will be derated according to a certain slope when the grid frequency exceeds the frequency that triggers overfrequency derating.	-
Cutoff frequency of overfrequency derating (Hz)	Specifies the frequency threshold for cutting off overfrequency derating.	This parameter is displayed when the Power derating caused by
Cutoff power of overfrequency derating (%)	Specifies the power threshold for cutting off overfrequency-caused derating.	 overfrequency is set to Enable. The parameter setting should meet the
Trigger frequency of overfrequency derating (Hz)	The standards of certain countries and regions require that the output active power of devices be derated when the power grid frequency exceeds a certain value.	following condition: Quit frequency of overfrequency derating ≤ Trigger frequency of
Quit frequency of overfrequency derating (Hz)	Specifies the frequency threshold for exiting overfrequency derating.	overfrequency derating < Cutoff frequency of overfrequency
Power drop gradient of overfrequency derating (%/s)	Specifies the decrease rate of the overfrequency derating power.	derating.
Power recovery gradient of overfrequency derating (%/ min)	Specifies the recovery rate of the overfrequency derating power.	
Frequency detection filter time (ms)	Specifies the frequency detection filter time.	-
Recovery delay of frequency- based active power derating	Specifies the exiting delay time after the frequency reaches the quit frequency of overfrequency derating.	-
Execution delay of frequency- based active power derating	Specifies the effective delay time of overfrequency derating when the frequency reaches the trigger frequency of overfrequency derating.	-
Hysteresis of frequency-based active power derating	Specifies whether to enable overfrequency derating hysteresis.	-

Parameter	Description	Remarks
Power raising caused by underfrequency	The standards of certain countries and regions require that when the power grid frequency is lower than Trigger frequency of underfrequency rise power , the device needs to increase the active power output to help increase the power grid frequency. In this case, set this parameter to Enable .	-
Recovery gradient of underfrequency rise power (%/ min)	Specifies the power recovery rate of underfrequency-caused raising.	This parameter is displayed when the Power raising caused by underfrequency is set to Enable .
Cutoff power of underfrequency rise power (Hz)	Specifies the frequency threshold for stopping underfrequency-caused raising.	
Cutoff power of underfrequency rise power (%)	Specifies the cutoff power of the power raising caused by underfrequency.	
Trigger frequency of underfrequency rise power (Hz)	Specifies the frequency threshold for underfrequency-caused power raising.	
Quit frequency of underfrequency rise power (Hz)	Specifies the quit frequency of the power raising caused by underfrequency.	
O&M via USB connection	Specifies the USB O&M port status: Permanently Enabled, Disabled in Idle State , or Permanently Disabled .	-
USB wakeup	Used to remotely wake up the USB O&M port. After being idle for 4 hours, the port is automatically disabled.	-
Quick startup for short-time grid disconnection	The default value is Disable . Specifies whether to allow the device to quickly start after the power grid recovers from a short-time failure.	-
Microgrid compatibility	The default value is Disable . If the PCS and diesel generator run in parallel and the PCS works in PQ mode, set this parameter to Enable . When Microgrid compatibility is set to Enable , the grid-connected current source PCS supports a higher ratio of PV to energy storage in addition to the feature of the original country grid code.	If this parameter is set incorrectly, the Smart PCS may run abnormally.

Parameter	Description	Remarks
Working mode	The default value is PQ . You need to set the working mode during deployment. Set Working mode to VSG in off-grid scenarios and PQ in gridtied scenarios.	After this parameter is set, the device shuts down.
Per unit armature resistance	The default value is 2 . Specifies the resistance per unit value for armature windings of the virtual synchronous generator.	This parameter is displayed when Working mode is set to
Per unit armature inductive reactance	The default value is 1 . Specifies the inductive reactance per unit value for armature windings of the virtual synchronous generator.	VSG. NOTE This parameter must be set by professional personnel. Improper settings may cause device exceptions.
VSG inertia time constant	The default value is 1 . Specifies the time required for the virtual rotor of the virtual synchronous generator to reach the rated speed from the static state under the rated torque.	
P-F adjustment coefficient	The default value is 1 . Specifies the frequency deviation corresponding to the rated active power of the virtual synchronous generator.	
Q-V adjustment coefficient	The default value is 3 . Specifies the voltage deviation corresponding to the rated reactive power of the virtual synchronous generator.	
P-V adjustment coefficient	The default value is 0 . Specifies the voltage deviation corresponding to the rated active power of the virtual synchronous generator.	
Q-F adjustment coefficient	The default value is 0 . Specifies the frequency deviation corresponding to the rated reactive power of the virtual synchronous generator.	
VSG output voltage correction coefficient	The default value is 100 . Corrects the deviation caused by the transformer ratio error.	
VSG output frequency correction coefficient	The default value is 100 . Corrects the PCS output frequency deviation.	
VSG frequency damping coefficient	The default value is 7.2 . Specifies the power factor that prevents the frequency change of the virtual synchronous generator.	
VSG excitation time constant	The default value is 0 . Specifies the time required for the excitation of the virtual synchronous generator to reach the rated voltage.	

Parameter	Description	Remarks
VSG excitation damping coefficient	The default value is 0 . Specifies the power factor that prevents the voltage change of the virtual synchronous generator.	
Wired carrier synchronization	Enables or disables wired carrier synchronization. The default value is Disable .	-
Delay compensation for wired carrier synchronization	The default value is 0 . Specifies the value of delay compensation for wired carrier synchronization.	This parameter is displayed when Wired carrier synchronization is set to Enable.
Wired power frequency synchronization	Enables or disables wired power frequency synchronization. The default value is Disable .	-
Delay compensation for wired power frequency synchronization	The default value is 0 . Specifies the value of delay compensation for wired power frequency synchronization.	This parameter is displayed when Wired power frequency synchronization is set to Enable.
Voltage adjustment value for VSG synchronous control (%)	The default value is 0 . Specifies the adjustment value of the PCS control output voltage in VSG mode.	 Value range: [-10.0, 10.0] The value is adjusted based on the offset per unit value. For example, if the rated output voltage is 800 V and the output voltage needs to be adjusted to 805 V, the adjustment value is 5/800 x 100%.
Frequency adjustment value for VSG synchronous control (%)	The default value is 0 . Specifies the adjustment value of the PCS output frequency in VSG mode.	 Value range: [-10.0, 10.0] The value is adjusted based on the offset per unit value. For example, if the rated output frequency is 50 Hz and the output frequency needs to be adjusted to 50.5 Hz, the adjustment value is 0.5/50 x 100%.

Power Adjustment Parameters

Parameter	Description	Remarks
Remote power scheduling	If this parameter is set to Enable , the device responds to the scheduling instruction from the remote port. If this parameter is set to Disable , the device does not respond to the scheduling instruction from the remote port.	-
Schedule instruction valid duration (s)	Specifies the validity period of the scheduling instruction.	When this parameter is set to 0, the scheduling instruction takes effect permanently.
Active power change gradient (%/s)	Specifies the change rate of the device active power.	This parameter is displayed when Remote power
Active power (kW)	Adjusts the active power output of the device by fixed value.	scheduling is set to Enable .
Active power (%)	Adjusts the active power output of the device by percentage.	
Reactive power change gradient (%/s)	Specifies the change rate of the device reactive power.	
Power factor	Specifies the power factor of the device.	
Reactive power compensation (Q/S)	Specifies the reactive power of the device.	
Reactive power at night	In some specific application scenarios, a power grid company requires that the device can perform reactive power compensation at night to ensure that the power factor of the local power grid meets requirements.	This parameter is displayed when Isolation is set to Input ungrounded (with TF) .
Enable reactive power parameters at night	When this parameter is set to Enable , the device outputs reactive power based on the setting of Reactive power output at night . Otherwise, the device executes the remote scheduling command.	This parameter is displayed when Reactive power at night is set to Enable .
Fixed nighttime reactive power	The device outputs reactive power based on this value if there is no remote scheduling command, Reactive power at night is set to Enable , and the DC input is disconnected.	-

Parameter	Description	Remarks
Q-U characteristic curve	The device adjusts Q/S (the ratio of the output reactive power to apparent power) in real time based on U/Un(%) (the ratio of the actual power grid voltage to the rated power grid voltage).	-
Q-U characteristic curve mode	Specifies the reactive power compensation mode of the device output.	-
Delay for Q-U characteristic curve to take effect	Specifies the delay time for Q-U adjustment.	-
Power percentage for triggering Q-U scheduling	Specifies the reference apparent power in percentage. When the actual apparent power of the device is greater than the value of this parameter, the Q-U characteristic curve scheduling function is enabled.	-
Power percentage for exiting Q-U scheduling	Specifies the P/Pn when the device exits the Q-U scheduling.	-
Minimum PF of Q-U characteristic curve	Specifies the minimum power factor for Q-U adjustment.	-
Q-P characteristic curve	The device adjusts Q/Pmax (the ratio of the reactive power to the maximum active power) in real time based on P/Pmax (the ratio of the active power to the maximum active power).	-
PF-U characteristic curve	The device adjusts the power factor in real time based on U/Un(%) (the ratio of the actual power grid voltage to the rated power grid voltage).	-
PF-U voltage detection filter time	Specifies the time for filtering the grid voltage in the PF-U curve.	-
cosф-P/Pn characteristic curve	The device adjusts the output power factor cos in real time based on P/Pn(%).	-
cosφ-P/Pn triggering voltage	Specifies the voltage threshold for triggering reactive power compensation based on the cosφ-P curve.	-

Parameter	Description	Remarks
cosφ-P/Pn exit voltage	Specifies the voltage threshold for exiting reactive power compensation based on the cosφ-P curve.	-
Reactive power adjustment time	Specifies the adjustment time for the reactive power to reach the target value during reactive power adjustment.	-

Reference Power Parameters

Parameter	Setting Description
Apparent power baseline	Set the apparent power baseline for power scheduling. The value cannot be greater than the maximum apparent power.
Active power baseline	Set the active power baseline for power scheduling. The value cannot be greater than the maximum active power.

Calibrating the Energy Yield

Parameter	Setting Description
Total energy yield adjustment	A calibrating coefficient for the total energy yield to ensure that the reported energy yield is consistent with the actual energy yield at the grid-connection point
Adjustment of total power supply from grid	A calibrating coefficient for the total power supply from the grid to ensure that the reported energy yield is consistent with the actual power supply from grid

6.3.9.2 Characteristic Curve

Step 1 Choose **Monitoring > PCS > Characteristic Curve**, set characteristic curve parameters, and click **Submit**.

Characteristic Curve Name	Setting Description
LVRT characteristic curve	Configure this characteristic curve based on the power grid standard.
	NOTE The SmartLogger supports only the curve configuration for LVRT that lasts no more than 60s. If a power grid standard requires that LVRT be longer than 60s, LVRT characteristic curve is not displayed for the grid code.

Characteristic Curve Name	Setting Description
Voltage rise suppression P- U curve	 This parameter is displayed when Voltage rise suppression is set to Enable.
	Configure this characteristic curve based on the power grid standard.

----End

6.3.10 Setting CMU Parameters

This section does not apply to V300R001C00.

Procedure

Choose **Monitoring > ESS > CMU > Running Param.**, set running parameters and click **Submit**.

Temperature and Humidity Control

-	-
Parameter	Setting Description
Control mode	Automatic (default): The running status and running mode of the air conditioner are automatically controlled by the T/H control module.
	Manual: You can manually set the running status and running mode of the air conditioner for commissioning. After the commissioning is complete, switch back to the automatic mode. Otherwise, the temperature and humidity may be out of control.
Forced dehumidification control	At the first startup after deployment or long-term storage, you are advised to start forced dehumidification to reduce the risk of equipment damage caused by condensation.

Exhaust Control

Parameter	Setting Description
Exhaust fan control module self-test time	Time when the exhaust function is self-checked every day
Exhaust fan control module self-test	After the exhaust function self-check is started, the exhaust fan will turn on for a period of time and the exhaust fan will be check. If the exhaust fan does not meet the exhaust function requirements, the system cannot start.

Parameter	Setting Description
Exhaust fan control	After started, the exhaust fan will automatically stop in 1 hour. If a combustible gas alarm is generated, the exhaust fan cannot be stopped. The exhaust fan cannot be manually started after the fire response is triggered until the fire alarm is cleared or 24 hours later.

Fire Suppression

□ NOTE

Only the LUNA2000-2.0MWH Series Smart String ESS supports DC output power distribution.

Parameter	Setting Description
DC output distribution	• Starting up : Enable the DC output power distribution to supply 48 V DC power to the battery pack fan, BMU, and ESC monitoring system.
	• Stop : Disable the DC output power distribution to stop supplying 48 V DC power to the battery pack fan, BMU, and ESC monitoring system.

□ NOTE

Only the LUNA2000-200KWH Series Smart String ESS supports the temperature alarm threshold settings.

Parameter	Setting Description
Temperature alarm threshold	Specifies the temperature threshold for triggering a fire alarm and processing fire response logic.

6.3.11 Setting ESU Parameters

This section does not apply to V300R001C00.

Procedure

Choose **Monitoring > ESS > ESU > Running Param.**, set running parameters, and click **Submit**.

Running Parameters

Parameter	Description
Enable delayed update	• The default value is Enable . When delayed upgrade is set, after the upgrade package is uploaded, the ESU will perform the upgrade automatically when the SOC is greater than or equal to 30%, the rack voltage is greater than or equal to 400 V, and the ESC and ESM communicate properly.
	 If this parameter is set to Disable, the upgrade can be performed immediately. The upgrade may fail if the upgrade conditions are not met.
Delete invalid battery packs	Delete battery packs that are not connected. This function is used when replacing battery packs.
Battery pack shutdown delay	After this parameter is set, the system can still monitor the battery for a period of time after power-off.
Shutdown due to communication interruption between the rack controller and PCS	The default value is Disable .
	• If this parameter is set to Enable , the ESS shuts down when the communication between the PCS and the rack controller is interrupted.

6.3.12 Setting ESC Parameters

This section does not apply to V300R001C00.

Procedure

Choose **Monitoring > ESS > ESU > ESC > Running Param.**, set running parameters and click **Submit**.

Running Parameters

Parameter	Setting Description
Insulation resistance protection threshold	To ensure device safety, the device detects the insulation resistance of the DC side to the ground when it starts a self-check. If the detected value is less than the preset value, the device does not start.

6.3.13 Setting ESR Parameters

This section does not apply to V300R001C00.

Procedure

Choose **Monitoring > ESS > ESU > ESR > Running Param.**, set running parameters and click **Submit**.

Parameters Settings

Parameter	Setting Description
Battery working mode	Set the battery to Running or Hibernation .
Charging cutoff SOC	Set the charging stop threshold of battery modules in a battery rack.
Discharge cutoff SOC	Set the discharging stop threshold of battery modules in a battery rack.
Quantity of battery packs	Set the quantity of battery packs in a battery rack. If the number is inconsistent with the actual number, the system cannot start.
Insulation resistance diagnosis	Action or stop the detection for power insulation resistance of the battery rack.
Battery pack position detection	Start or stop the identification for battery pack positions in a battery rack.

Energy Yield Calibration

Parameter	Setting Description
Total charged energy calibration	Calibrate the total charged energy.
Total discharged energy calibration	Calibrate the total discharged energy.

6.3.14 Setting HVAC Parameters

This section does not apply to V300R001C00.

Procedure

Choose **Monitoring > ESS > HVAC > Running Param.**, set running parameters and click **Submit**.

Parameters Settings

Parameter	Setting Description
Working mode	The default value is Auto . The air conditioner working mode can be Auto , Dry , Heat , or Cool . CAUTION
	The working mode of the air conditioner is adjusted intelligently. Non-professional personnel are not allowed to set the running mode.
	The air conditioner dehumidification mode is used for system protection. Do not set the air conditioner to dehumidification mode manually.
	The heating and cooling modes of the air conditioner are used only for equipment commissioning. Do not set them manually.
Refrigeration start temperature	Set the target temperature for cooling when the air conditioner works in automatic mode.
	CAUTION This parameter affects the system charge/discharge power and cell lifespan. Non-professional personnel are not allowed to set this parameter.
Refrigeration stop temperature	Specifies the target temperature when the air conditioner stops cooling in automatic mode. CAUTION
	This parameter affects the system charge/discharge power and cell lifespan. Non-professional personnel are not allowed to set this parameter.
Heating start temperature	Set the target temperature for heating when the air conditioner works in automatic mode.
	CAUTION This parameter affects the system charge/discharge power and cell lifespan. Non-professional personnel are not allowed to set this parameter.
Heating stop temperature	Specifies the target temperature when the air conditioner stops heating in automatic mode.
	CAUTION This parameter affects the system charge/discharge power and cell lifespan. Non-professional personnel are not allowed to set this parameter.
High temperature alarm threshold	Set the indoor high temperature alarm threshold for the air conditioner.
Low temperature alarm threshold	Set the indoor low temperature alarm threshold for the air conditioner.
AC overvoltage alarm threshold	Set the upper threshold for the AC input voltage of the air conditioner.
	NOTE This parameter applies only to air conditioners in the battery cabin of the LUNA2000-2.0MWH Series Smart String ESS.
AC undervoltage alarm threshold	Set the lower threshold for the AC input voltage of the air conditioner.
	NOTE This parameter applies only to air conditioners in the battery cabin of the LUNA2000-2.0MWH Series Smart String ESS.

Parameter	Setting Description
DC overvoltage alarm threshold	Set the upper threshold for the DC input voltage of the air conditioner.
	NOTE This parameter applies only to in-cabinet air conditioners of the LUNA2000-200KWH Series Smart String ESS and air conditioners in the control unit cabin of the LUNA2000-2.0MWH Series Smart String ESS.
DC undervoltage alarm threshold	Set the lower threshold for the DC input voltage of the air conditioner.
	NOTE This parameter applies only to in-cabinet air conditioners of the LUNA2000-200KWH Series Smart String ESS and air conditioners in the control unit cabin of the LUNA2000-2.0MWH Series Smart String ESS.

6.3.15 Setting PID Module Parameters

Procedure

- **Step 1** Set access parameters.
 - Method 1: Click Auto. Search to connect the PID.
 - Method 2: Click Add Devices, set access parameters, and click Add Devices.

Figure 6-50 Setting access parameters



IL03J00017

Parameter	Description
Device Type	Set this parameter to PID .
Port number	If the PID-PVBOX uses the MBUS for communication, set this parameter to MBUS.
	• If the PID uses RS485 for communication, set this parameter to the COM port connected to the PID.
Address	Set this parameter to the communications address of the PID.

Step 2 Set running parameters and click Submit.

Figure 6-51 Setting running parameters



IL03J00018

----End

6.3.15.1 PID Module Running Parameters

◯ NOTE

The parameter list provided in this document includes all configurable parameters. Configurable parameters vary depending on the device model. The actual display may vary.

Parameter	Description
Offset mode	Specifies the offset mode of the PID module.
	Select Disabled if the PID module is not required.
	• Select N/PE if the PID module is required to use voltage output from the inductor virtual midpoint.
	Select PV/PE if the PID module is required to use voltage output from the negative PV terminal. This mode is applicable only to Huawei SUN8000.
	In the SUN2000 scenario, Automatic indicates the N/PE offset mode.
Output enabled	Specifies whether PID module output is enabled.
PV type	Specifies the type of the PV module used in the PV plant. For details about the PV module type, consult the manufacturer.
PV/PE offset voltage	Specifies the DC output voltage when the offset mode is set to PV/PE.
	If the PV module type is P, set this parameter to P-type . In this case, the output voltage of the PID module is positive.
	If the PV module type is N, set this parameter to N-type . In this case, the output voltage of the PID module is negative.

Parameter	Description
Operation Mode	 Specifies the working mode of the PID module. Manual mode: If Offset mode is set to N/PE or PV/PE, and Output enabled is set to Enable, the PID module outputs data based on Output voltage (manual).
	Automatic mode: After the PID module and solar inverter communicate with the SmartLogger properly, the PID module automatically runs.
	NOTE To check whether the PID module functions properly, it is recommended
	that Operation Mode be set to Manual upon first power-on.
	After checking that the PID module functions properly, set Operation Mode to Automatic.
Output voltage (manual)	Specifies the output voltage.
	NOTE After this parameter is set and the output from the PID module becomes stable, use a multimeter that is set to the DC position to measure the three-phase (A, B, and C) voltages of the power grid to the ground, and check whether the voltages are the same as the configured values.
Maximum system DC-to- ground withstand voltage	Specifies the PV-PE voltage when the normal operation mode is used.
	If the PV module type is P, the parameter value indicates the highest DC voltage between PV+ and PE. If the PV module type is N, the parameter value indicates the highest DC voltage between PV- and PE.
Maximum output voltage	Specifies the maximum output voltage of the PID module.
	If the offset mode is PV/PE , the parameter value indicates the highest DC output voltage between PV and PE. If the offset mode is N/PE , the parameter value indicates the highest DC output voltage between N and PE.
IMD access	Specifies whether the PID module and insulation monitor device (IMD) can operate in cycle mode.
	Only the IMDs of mainstream suppliers such as DOLD and BENDER are supported, and the IMDs must have enabled dry contacts. NOTICE
	You can set Periodic PID runtime , Periodic IMD runtime , and IMD control dry contact only when IMD access is set to Enable .
Periodic PID runtime	Specifies the operating time segment of the PID module when the PID module and IMD operate in cycle mode.
	The IMD is shut down when the PID module is operating.
Periodic IMD runtime	Specifies the operating time segment of the IMD when the PID module and IMD operate in cycle mode.
	The PID module is standby when the IMD is operating.

Parameter	Description
IMD control dry contact	Specifies the dry contact No. over which the SmartLogger controls the IMD.
	Set appropriate ports based on the cable connections between the IMD and the SmartLogger.
PV module compensation	Specifies the offset direction of the PID module.
voltage direction	PV- positive offset refers to raising the voltage between PV- and the ground to above 0 V through voltage compensation. Select PV- positive offset for P-type PV modules or the N-type PV modules that comprise the solar cells whose positive and negative polarities are on different sides. For example, P-type PV modules, HIT, CIS, thin-film PV modules, and CdTe PV modules meet the requirement for PV- positive offset.
	PV+ negative offset refers to lowering the voltage between PV + and ground to below 0 V through voltage compensation. Select PV+ negative offset for the N-type PV modules that comprise the solar cells whose positive and negative polarities are on the same side.
	NOTE When designing a PV plant, the design institute or user should ask the PV module vendor about the direction of voltage compensation for resisting the PID effect.
Working mode	Specifies the working mode of the PID module.
	 Manual mode: The PID module provides output based on Output voltage (manual).
	Automatic mode: The PID module operates automatically after the PID module, solar inverter, and SmartLogger communicate with each other properly. NOTE
	To check whether the PID module functions properly, it is recommended that Operation Mode be set to Manual upon first power-on.
	 After checking that the PID module functions properly, set Operation Mode to Automatic.
Maximum system DC-to- ground withstand voltage	Specifies the voltages between the PV side and PE and between the AC side and ground in normal mode.
	Specifies the lower thresholds of the maximum voltage ranges between the inverter DC side (including the inverter, PV module, cable, SPD, and switch) and ground in a PV power system.
	The default value is 1000 V. For the 1500 V inverter, the recommended value is 1500 V.
AC-to-ground resistance alarm threshold	Specifies the alarm threshold for the impedance between the AC side of the PID module and ground.
	You can set an alarm threshold for the impedance between the AC grid and ground for the PID module. If the detected impedance is below the threshold, the PID module will generate an alarm.

Parameter	Description
Compensation offset voltage	Specifies the compensation offset voltage between PV and PE after the PID module operates stably.
	The value ranges from 0–500 V, and the default value is 50 V .
	 If the PV module compensation voltage direction is set to PV-positive offset, the value indicates the positive voltage between PV- and the ground, and the compensation range is 0-500 V.
	 If PV module compensation voltage direction is set to PV+ negative offset, the value indicates the negative voltage between PV+ and ground, and the compensation -500 V to 0 V.
	NOTE
	If Compensation offset voltage is set to 500 V, the PID module provides the maximum output to enhance the voltage compensation effect. The output voltage amplitude of the PID module is automatically capped to ensure the safety of a PV power plant. The output voltage amplitude is also related to the maximum system DC-to-ground withstand voltage and maximum output voltage.
	 After this parameter is set and the PID module works properly, use a multimeter that is set to the DC position to measure the voltage between the PV input terminal of the SUN2000 and ground. (For PV- positive offset, check whether the voltage between PV- and ground is greater than or equal to 0 V. For PV+ negative offset, check whether the voltage between PV+ and ground is equal to or less than 0 V.)
Clear data	Clears the active alarms and historical alarms stored on the PID module.
	You can select Clear data to clear active alarms and historical alarms for the PID module.

6.3.15.2 PID-PVBOX Running Parameters

Parameter	Description
Operation mode	Specifies the current working mode of the PID module.
	Before setting this parameter to Manual , ensure that inverters in a PV array are powered off and their DC switches are turned off. This working mode is used during commissioning after deployment or fault locating. In this case, the PID-PVBOX delivers the output voltage based on the value of the commissioned output voltage.
	Set this parameter to Automatic after ensuring that the PID module works normally.
Output voltage (manual)	Specifies the output voltage when the PID module works in commissioning mode.
Repair time	Set the recovery time for each day.

Parameter	Description
Voltage to be repaired	Specifies the output voltage when the PID module works in normal mode.

6.3.15.3 PID-SSC Running Parameters

Parameter	Description
Operation mode	Specifies the current working mode of the PID module.
	 Set this parameter to Manual during commissioning after deployment or fault locating. In this case, the PID-SSC delivers the output voltage based on the value of the commissioned output voltage.
	Set this parameter to Automatic after ensuring that the PID module works normally.
Output voltage (manual)	Specifies the output voltage when the PID module works in commissioning mode. It is recommended that Output voltage (manual) be set to a value greater than 250 V.

6.3.16 Setting Meter Parameters

6.3.16.1 Setting DL/T645 Meter Parameters

Procedure

Step 1 Set access parameters and click **Add Devices**.

Figure 6-52 Setting access parameters



IL03J00019

Parameter	Description
Device Type	Set this parameter to Power Meter .
Comm. Protocol	Set this parameter to DL/T645 .
Port number	Set this parameter to the COM port connected to the meter.
Address	Set this parameter to the communication address of the meter.
Table ID	Set this parameter to the meter ID.

Step 2 Choose **Monitoring > Meter > Running Param.**, set running parameters, and click **Submit**.

Parameter	Description
Protocol version	Select DL/T645-2007 or DL/T645-1997 based on the protocol version of the meter.
Number of lead bytes	Retain the default value unless otherwise specified.
Voltage change ratio	Set this parameter to 1 if the meter uploads the
Current change ratio	 primary value. Set this parameter based on the actual transformer ratio if the meter uploads the secondary value.
Meter usage	Meter usage: Meters include export+import meters, production meters, consumption meters, and external production meters. Export+import meter: used for grid-tied point control. Each array allows only one export+import meter to be connected. Production meter: PV output meter. Multiple production meters can be connected. Consumption meter: load consumption meter. Multiple consumption meters can be connected. External production meter: third-party PV output meter. Multiple external production meters can be connected.

Parameter	Description
Meter access direction ^[1]	This switch is used when the physical wiring of the meter is reversely connected. You can adjust the software switch to avoid wiring reconstruction of the meter. Only the following three scenarios are supported. If the Meter access direction is incorrectly set, data will be incorrectly reported.
	 Positive: The default value is Positive, which applies to the scenario where cables are correctly connected to the meter.
	 Reverse: If the meter is reversely connected and the NMS does not support reverse connection, set this parameter to Reverse. The SmartLogger automatically adjusts the power and other data of the meter to ensure data accuracy for the plant and meter.
	• Reverse_Report raw data: If the meter is reversely connected and the NMS supports reverse connection ^[2] , set this parameter to Reverse_Report raw data. This parameter is valid only for Export+import meter. The SmartLogger reports the original data of the meter to the NMS, and the NMS adjusts the data such as power.

Note [1]: **Meter access direction** can be configured only in V300R001C00SPC609 and later, V800R021C10SPC140 and later, and V300R023C00 and later.

Note [2]: If cables are reversely connected to the meter and the NMS can correctly display the real-time data of the meter, it is considered that the NMS supports reverse connection. That is, the NMS reverses the active power, reactive power, power factor, phase A active power, phase B active power, and phase C active power, replaces the total positive active energy and total negative active energy with each other, and replaces the total positive reactive power and total negative reactive power with each other.

□ NOTE

- When Meter access direction is set to Positive or Reverse, Electric meter power direction must be set to Positive. Electric meter power direction is set in the grid connection with limited power under active power control and power closed-loop control under reactive power control.
- When Meter access direction is set to Reverse_Report raw data, Electric meter
 power direction must be set to Reverse. Electric meter power direction is set in the
 grid connection with limited power under active power control and power closed-loop
 control under reactive power control.

----End

6.3.16.2 Setting Modbus-RTU Meter Parameters

Procedure

Step 1 Set access parameters and click **Add Devices**.

Figure 6-53 Setting access parameters



IL03J00022

Parameter	Description
Device Type	Set this parameter to Power Meter .
Comm. Protocol	Set this parameter to Modbus-RTU .
Port number	Set this parameter to the COM port connected to the meter.
Address	Set this parameter to the communication address of the meter.

Step 2 Choose **Monitoring > Meter > Running Param.**, set meter parameters, and click **Submit**.

When the model of the connected meter is in the Intelligent Power Meter
 Type drop-down list, set the parameters as follows.

Parameter	Description
Intelligent Power Meter Type	Set this parameter to the corresponding meter model.
Voltage change ratio	 Set this parameter to 1 if the meter uploads the primary value. Set this parameter based on the actual transformer ratio if the meter uploads the secondary value.
Current change ratio	
	ratio if the meter uploads the secondary value.

Parameter	Description
Meter usage	Meter usage: Meters include export+import meters, production meters, consumption meters, and external production meters. Export+import meter: used for grid-tied point control. Each array allows only one export+import meter to be connected. Production meter: PV output meter. Multiple production meters can be connected. Consumption meter: load consumption meter. Multiple consumption meters can be connected. External production meter: third-party PV output meter. Multiple external production meters can be connected.
Meter access direction ^[1]	This switch is used when the physical wiring of the meter is reversely connected. You can adjust the software switch to avoid wiring reconstruction of the meter. Only the following three scenarios are supported. If the Meter access direction is incorrectly set, data will be incorrectly reported. • Positive : The default value is Positive , which
	applies to the scenario where cables are correctly connected to the meter.
	Reverse: If the meter is reversely connected and the NMS does not support reverse connection, set this parameter to Reverse. The SmartLogger automatically adjusts the power and other data of the meter to ensure data accuracy for the plant and meter.
	• Reverse_Report raw data: If the meter is reversely connected and the NMS supports reverse connection ^[2] , set this parameter to Reverse_Report raw data. This parameter is valid only for Export+import meter. The SmartLogger reports the original data of the meter to the NMS, and the NMS adjusts the data such as power.

Note [1]: **Meter access direction** can be configured only in V300R001C00SPC609 and later, V800R021C10SPC140 and later, and V300R023C00 and later.

Note [2]: If cables are reversely connected to the meter and the NMS can correctly display the real-time data of the meter, it is considered that the NMS supports reverse connection. That is, the NMS reverses the active power, reactive power, power factor, phase A active power, phase B active power, and phase C active power, replaces the total positive active energy and total negative active energy with each other, and replaces the total positive reactive power and total negative reactive power with each other.

■ NOTE

- When Meter access direction is set to Positive or Reverse, Electric meter power direction must be set to Positive. Electric meter power direction is set in the grid connection with limited power under active power control and power closed-loop control under reactive power control.
- When Meter access direction is set to Reverse_Report raw data, Electric meter
 power direction must be set to Reverse. Electric meter power direction is set in the
 grid connection with limited power under active power control and power closed-loop
 control under reactive power control.
- If the connected meter is of another model, set the parameters as follows.

Parameter	Description
Intelligent Power Meter Type	Set this parameter to Other .
Read function code	Read holding register 03H and Read input register 04H are supported. Set this parameter based on the vendor's protocol.
Read mode	Multiple read and Single read are supported.
Word order	Big endian and Little endian are supported. Set this parameter based on the vendor's protocol.
Start address	When Read mode is set to Multiple read , set the start address.
End address	When Read mode is set to Multiple read , set the end address.
Voltage change ratio	Set this parameter to 1 if the meter uploads the
Current change ratio	 primary value. Set this parameter based on the actual transformer ratio if the meter uploads the secondary value.
Signal parameters NOTE Signal parameters include Signal Name, Signal address, Number of Registers, Gain, Data Type, and Unit.	Set this parameter based on the vendor's protocol. NOTE If the power meter can collect a certain signal, set Signal address to the address of the corresponding register. If not, set Signal address to 65535.

----End

6.3.17 Setting EMI Parameters

6.3.17.1 Setting Modbus-RTU EMI Parameters

Procedure

Step 1 Set access parameters and click **Add Devices**.

Figure 6-54 Setting access parameters



IL03J00023

Parameter	Description
Device Type	Set this parameter to EMI .
Connection mode	Set this parameter to Modbus-RTU .
Port number	Set this parameter to the serial number of the COM port connected to the EMI.
Address	Set this parameter to the communication address of the EMI.

Step 2 Choose **Monitoring > EMI > Running Param.**, set running parameters and click **Submit**.

• If the model of the connected EMI is displayed in the **EMI model** drop-down list box, set parameters as follows.

Parameter	Description
EMI model	Set this parameter to the model of the connected EMI.
Synchronize Environment Data	You are advised to retain the default value Disable . NOTE When this parameter is set to Enable , the SmartLogger transmits the wind speed and direction data to the solar inverter in a PV plant with the tracking system.

Parameter	Description
Threshold of fast synchronization of wind speeds	 This parameter can be manually set. The value ranges from 15.0 to 30.0. When the actual wind speeds collected by all running EMIs are within the threshold of fast synchronization of wind speeds, all EMIs synchronize the real-time wind speeds to inverters every minute by default. The inverters forward the real-time wind speeds to trackers. When the actual wind speed collected by any running EMI exceeds the threshold, all running EMIs will send the real-time wind speeds five times at an interval of 10s. After that, the real-time wind speeds are synchronized to the inverters every minute.
Master/Slave	When the SmartLogger connects to multiple EMIs, set one of them to master mode . The solar inverter performance data displayed is the data of the EMI in master mode .

• If the connected EMI is a split EMI that supports Modbus-RTU, set parameters as follows.

Parameter	Description
EMI model	Set this parameter to Sensor(ADAM) .
Synchronize Environment Data	You are advised to retain the default value Disable . NOTE When this parameter is set to Enable , the SmartLogger transmits the wind speed and direction data to the solar inverter in a PV plant with the tracking system.
Master/Slave	When the SmartLogger connects to multiple EMIs, set one of them to master mode . Both the inverter performance data and plant performance data pages display data on the EMI in master mode . NOTE
	If a single EMI is set to master mode or slave mode , the EMI data is displayed in both the inverter performance data and plant performance data pages.
	 When the SmartLogger connects to multiple EMIs, only one EMI can be set to master mode. If multiple EMIs are set to master mode, only the last configuration takes effect, that is, the last EMI is set to master mode and the other EMIs are automatically switched to slave mode.
	If multiple EMIs are connected to the SmartLogger and these EMIs are set to slave mode , the performance data of the first connected EMI is displayed in both the inverter performance data and plant performance data pages.

Parameter	Description
Read function code	Set this parameter to Read holding register 03H or Read holding register 04H based on the protocol adopted by the vendor.
Data reporting mode	Set this parameter to Integer or Floating point based on the protocol adopted by the vendor.
Word ordering	Set this parameter to Big endian or Little endian based on the protocol adopted by the vendor.
Read mode	The value can be Multiple read or Single read .
Start address	If Read mode is set to Multiple read , set the start address for reading.
End address	If Read mode is set to Multiple read , set the end address for reading.
Signal parameters NOTE Signal parameters include Signal Name, Signal address, Lower Thres., Upper Thres., Spec, Start (mV/mA), End (mV/mA), and Unit.	Set these parameters based on the vendor protocol. NOTE If the EMI can collect a signal, set Signal address for the signal to the corresponding register address. If the EMI cannot collect a signal, set Signal address for the signal to 65535.

• If the connected EMI is of another model, set parameters as follows.

Parameter	Description
EMI model	Set this parameter to Other .
Synchronize Environment Data	You are advised to retain the default value Disable . NOTE When this parameter is set to Enable , the SmartLogger transmits the wind speed and direction data to the solar inverter in a PV plant with the tracking system.
Master/Slave	When the SmartLogger connects to multiple EMIs, set one of them to master mode . The solar inverter performance data displayed is the data of the EMI in master mode .
Read function code	Set this parameter to Read holding register 03H or Read holding register 04H based on the protocol adopted by the vendor.
Data reporting mode	Set this parameter to Integer or Floating point based on the protocol adopted by the vendor.
Word ordering	Set this parameter to Big endian or Little endian based on the protocol adopted by the vendor.

Parameter	Description
Read mode	The value can be Multiple read or Single read .
Start address	If Read mode is set to Multiple read , set the start address for reading.
End address	If Read mode is set to Multiple read , set the end address for reading.
Signal parameters NOTE Signal parameters include Signal Name, Signal address, Gain, Offset, and Unit.	Set these parameters based on the vendor protocol. NOTE If the EMI can collect a signal, set Signal address for the signal to the corresponding register address. If the EMI cannot collect a signal, set Signal address for the signal to 65535.

----End

6.3.17.2 Setting AI EMI Parameters

Procedure

Step 1 Set access parameters and click **Add Devices**.

Figure 6-55 Setting access parameters



IL03J00025

Parameter	Description
Device Type	Set this parameter to EMI .
Connection mode	Set this parameter to AI .
Address	Set this parameter to the communication address of the EMI.

Step 2 Choose **Monitoring > EMI > Running Param.**, set running parameters and click **Submit**.

Parameter	Description
Synchronize Environment Data	You are advised to retain the default value Disable . NOTE When this parameter is set to Enable , the SmartLogger transmits the wind speed and direction data to the solar inverter in a PV plant with the tracking system.
Master/Slave	When the SmartLogger connects to multiple EMIs, set one of them to master mode. The solar inverter performance data displayed is the data of the EMI in master mode.
Signal parameters NOTE Signal parameters include Signal Name, Port number, Lower Thres., Upper Thres., Start (V/mA), End (V/mA), and Unit.	Set these parameters as required. NOTE When you need to change the configured port number, set Port number to No first, then to the required port number.

Step 3 If **Port number** is set to the number of the connected PT port, click **PT T Correction** to correct the temperature.

----End

6.3.18 Setting STS Parameters

The STS can be connected to the SmartLogger over RS485 or FE. If the STS is connected to the SmartLogger over RS485, you need to manually add devices and set access parameters. If the STS is connected over FE, the SmartLogger automatically identifies the STS.

Procedure

Step 1 (Optional) If the STS connects to the SmartLogger over RS485, click **Add Device** and set access parameters.



IL04J00006

Parameter	Description
Device Type	Set this parameter to STS .
Port number	Set this parameter to the number of the COM port connected to the STS.
Address	Set this parameter to the communications address of the STS.

Step 2 Choose **Monitoring > STS**, set device monitoring parameters and click **Submit**.

Tab	Function	Description
Teleindication	Views the status parameters of the device, such as the switched-on or switched-off state.	N/A
Telemetering	Views the real-time data of the device, such as the voltage.	N/A
Telecontrol	Sets status control parameters, such as the parameter for controlling switch-on or switch-off.	Set this parameter as required.
Performance Data	Views or exports the performance data of the device.	N/A
Running Param.	Sets the standby signals for teleindication, telemetering, and teleadjust.	Set this parameter as required.
Active Alarm	Queries active alarms.	N/A
About	Queries communication information.	N/A

Step 3 Choose **Settings** > **Other Parameters** and set **STS overtemperature protection** as required.

----End

6.3.19 Setting IEC103 Device Parameters

Description

An IEC103 device supports two data transmission modes:

• **Transparent transmission mode**: When connecting to the management system, the SmartLogger transparently transmits the IEC103 device

- information to the management system. The SmartLogger does not parse the IEC103 device data.
- **Parsing mode**: The IEC103 device is connected to the SmartLogger, and the SmartLogger parses the IEC103 device data.

Transparent Transmission Mode

Step 1 Set IEC103 parameters and click **Submit**.

Figure 6-56 Setting IEC103 parameters



IL03J00027

Parameter	Description
IEC103 port No.	Set this parameter based on the COM port connected to the device.
IEC103 address	Set this parameter to the IEC103 device address.
IEC103 IP	Set this parameter to the IP address of the management system.

Step 2 Choose **Settings** > **Other Parameters** and check that **Data forwarding** is set to **Enable**.

NOTICE

- If **Data forwarding** is set to **Enable**, the SmartLogger transparently transmits information about unconnected devices to the management system without parsing device data.
- If **Data forwarding** is set to **Disable**, the SmartLogger does not transmit information about unconnected devices to the management system.

----End

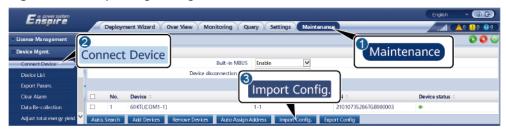
Parsing Mode

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

The supported device types are IEC103 device 1 to IEC103 device 5. The corresponding configuration file names are **iec103_equip_custom_1.cfg** to **iec103_equip_custom_5.cfg**. Multiple devices of the same type can be connected.

Step 1 Configure a protocol information point file in **.cfg** format and import the file to the SmartLogger.

Figure 6-57 Importing configuration



IL03J00028

Step 2 Set access parameters and click **Add Devices**.

Figure 6-58 Setting access parameters



IL03J00029

Parameter	Description
Device Type	The value can be IEC103 Device 1 to IEC103 Device 5 .
	Select a value based on the configuration file. For example, if iec103_equip_custom_1.cfg needs to be imported, select IEC103 Device 1.
Port number	Set this parameter to the COM port connected to the IEC103 device.
Address	Set this parameter to the communication address of the IEC103 device.

Step 3 Set device monitoring parameters and click **Submit**.

Figure 6-59 Device monitoring



IL03J00030

Tab	Function	Description
Running Info.	View the running information about the IEC103 device.	N/A
Teleindication	View the device status, such as the switch status.	N/A
Telemetering	View the real-time analog data of the device, such as the voltage.	N/A
Telecontrol	Set the status control parameters, such as the parameters for turning on or off switches.	Set the parameters on the tab page as required.
Teleadjust	Set analog parameters, for example, set voltage protection parameters.	Set the parameters on the tab page as required.

----End

6.3.20 Setting Parameters for a Custom Device

Context

The SmartLogger can connect to third-party devices supporting the Modbus-RTU protocol, such as the transformer substation and EMI. The protocol information points vary depending on vendors. Therefore, you need to configure a protocol information file in .cfg format and import the file into the SmartLogger for successfully connecting to a custom device.

The supported device types are custom device 1 to custom device 10. The corresponding configuration file names are **modbus_equip_custom_1.cfg** to **modbus_equip_custom_10.cfg**. Multiple devices of the same type can be connected.

Procedure

Step 1 Configure a protocol information point file in **.cfg** format and import the file to the SmartLogger.

Figure 6-60 Importing configuration



IL03J00028

Step 2 Set access parameters and click **Add Devices**.

Figure 6-61 Setting access parameters



IL03J00031

Parameter	Description
Device Type	The value can be Custom Device 1 to Custom Device 10 .
	Select a value based on the imported configuration file. For example, if modbus_equip_custom_1.cfg is imported, select Custom Device 1 .
Port number	Set this parameter to the number of the COM port connected to the custom device.
Address	Set this parameter to the communications address of the custom device.

Step 3 Set device monitoring parameters and click **Submit**.

Figure 6-62 Device monitoring



IL03J00032

Tab	Function	Description
Running Info.	View the running information about the custom device.	N/A
Teleindication	View the device status, such as the switch status.	N/A
Telemetering	View the real-time analog data of the device, such as the voltage.	N/A
Telecontrol	Set the status control parameters, such as the parameters for turning on or off switches.	Set the parameters on the tab page as required.
Teleadjust	Set analog parameters, for example, set voltage protection parameters.	Set the parameters on the tab page as required.

----End

6.3.21 Setting IEC104 Device Parameters

Context

The SmartLogger can connect to third-party devices that support IEC104, such as the relay protection or monitoring device like the transformer substation. Protocol information points vary with vendors. Therefore, you need to configure a protocol information point file in .cfg format and import the file to the SmartLogger for connecting to a third-party device.

The supported device types are IEC104 device 1 to IEC104 device 5. The corresponding configuration file names are **iec104_equip_custom_1.cfg** to **iec104_equip_custom_5.cfg**. Multiple devices of the same type can be connected.

Procedure

Step 1 Configure a protocol information point file in **.cfg** format and import the file to the SmartLogger.

Figure 6-63 Importing configuration



IL03J00028

Step 2 Set access parameters and click Add Devices.

Figure 6-64 Setting access parameters



IL04J00012

Parameter	Description
Device Type	The value can be IEC104 Device 1 to IEC104 Device 5 .
	Select a value based on the imported configuration file. For example, if iec104_equip_custom_1.cfg is imported, select IEC104 Device 1.
IP address	Set this parameter to the IP address of the IEC104 device.
Common address	Set this parameter to the common address of the IEC104 device.
Address	Set this parameter to the communications address of the IEC104 device.

Step 3 Set device monitoring parameters and click **Submit**.

Monitoring

| Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Monitoring | Moni

Figure 6-65 Device monitoring

IL04J00013

Tab	Function	Description
Running Info.	View the running information about the custom device.	N/A
Teleindication	View the device status, such as the switch status.	N/A
Telemetering	View the real-time analog data of the device, such as the voltage.	N/A
Telecontrol	Set the status control parameters, such as the parameters for turning on or off switches.	Set the parameters on the tab page as required.
Teleadjust	Set analog parameters, for example, set voltage protection parameters.	Set the parameters on the tab page as required.

----End

6.3.22 Setting Parameters for Poverty Alleviation Monitoring Center

Context

The SmartLogger can be connected to the poverty alleviation monitoring center in either of the following modes:

- Method 1: The SmartLogger connects to the poverty alleviation monitoring center through the FusionSolar hosting cloud. Method 1 (recommended): Use the FusionSolar hosting cloud to import the PV plant information configuration package provided by the poverty alleviation monitoring center to the SmartLogger.
- Method 2: The SmartLogger directly connects to the poverty alleviation monitoring center. Method 2: Based on the PV plant information configuration package provided by the poverty alleviation monitoring center,

choose **Settings** > **Poverty Alleviation Monitoring Center** and set the parameters of the SmartLogger poverty alleviation monitoring center. Internet Explorer 8 is used as an example.

Procedure

Step 1 Set parameters for the poverty alleviation monitoring center and click Submit.

Figure 6-66 Poverty alleviation monitoring center



IL03J00019

Parameter		Setting Description
Basic Information	Server	Set this parameter to the address of the poverty alleviation monitoring center server.
	Port	Set this parameter to the port number of the poverty alleviation monitoring center server.
	User Name	Configure the power station
	Password	information package based on the power station
	Device SN:	information provided by the poverty alleviation
	PV plant ID	monitoring center.
	This object indicates the name of a CA certificate file.	
Forwarding table	Solar inverter	

----End

6.3.23 Smart Tracking Algorithm

Context

- Before using the smart tracking algorithm, check whether the plant meets the requirements for using this function based on the onsite smart tracking algorithm delivery checklist, and check whether the Modbus protocol versions between the plant networking devices are compatible.
- The smart tracking algorithm can be configured only after a license is purchased and loaded.
- For details about how to load a license, see **7.4.6 Managing Licenses**.

Procedure

After the trackers are commissioned during onsite delivery, their parameters can be intelligently controlled by the smart tracking algorithm.

 Choose Settings > Smart Tracking Algorithm, set Tracker working mode to Automatic and Smart tracking algorithm to Enable. Then, the smart tracking algorithm automatically adjusts tracker parameters such as the angle based on sunlight to maximize energy yield.

Figure 6-67 Smart tracking algorithm parameters



6.4 Setting Battery Control Parameters

This section does not apply to V300R001C00.

Procedure

Click **Settings** > **Battery control** to set the battery working mode and automatic calibration.

Table 6-7 Automatic calibration parameters

Parameter	Description
Automatic SOC calibration	 Enable: Automatic SOC calibration is enabled. If the total charge and discharge energy reaches the threshold or the calibration function has not been triggered for 30 days, the SOC automatic calibration is performed in battery racks. During calibration, the cut-off SOC settings will be ineffective and the response of the charge/discharge power may be impacted temporarily. Disable: Automatic SOC calibration is disabled.
Automatic SOH calibration	 The default value is Disable. If this parameter is set to Enable, the ESS calibrates the SOH precision and fully charges and discharges each ESR in turn.

No Control

SmartLogger directly delivers the external scheduling power limit. No other power scheduling control is performed. The power is automatically controlled by the device.

Maximum Self-Consumption

- This mode applies to areas where the electricity price is high, or areas where the feed-in-tariff (FIT) subsidy is low or unavailable.
- Excess PV energy is stored in batteries. When PV power is insufficient or no PV power is generated at night, batteries discharge to supply power to the loads, improving the system self-consumption rate and energy self-sufficiency rate, and reducing electricity costs.
- The SmartLogger performs battery scheduling based on the external scheduling power limit and the preceding policies.

Paramet er	Description	Remarks
Load tracking	 Enable: The device output changes with the load so that the output is approximately equal to the load. Disable: The device outputs power as much as possible. However, the output power is still affected by parameters such as external scheduling. 	This parameter is displayed only when the Japanese grid code is selected.
Battery backflow protectio n	 Enable: If the battery feeds power to the grid while discharging, the system sends a standby command to the battery to eliminate the reverse power. When the battery needs to be discharged, the system sends a running command to the battery. Disable: If reverse battery power is detected at the grid-connection point, the reverse power is eliminated by reducing the battery output power. The battery standby command is not delivered. 	This parameter is displayed only when the Japanese grid code is selected.
Active power threshold of grid during battery discharge	Control the maximum target grid power when the grid-connection point has zero power.	-
Adjustme nt deadban d	Allowed fluctuation of the target grid power for the grid-connection point	-

TOU

- This mode applies to scenarios where the electricity price difference between peak and off-peak hours is large.
- You can manually set the charge and discharge time segments to lower the
 electricity cost. When the electricity price is low at night, you need to enable
 Fed to grid in Battery control so that the power grid charges the batteries at
 the maximum power. When the electricity price is high, the batteries
 discharge to supply power to the loads.
- Click Add to set the charge and discharge time segments. A maximum of 14 time segments are allowed. During the charge time, the power grid charges the batteries, and during the discharge time, the batteries discharge to supply power to the loads. In other time segments that are not set, the batteries do not discharge, and the PV modules and grid supply power to the loads. (In grid-tied/off-grid mode, if the grid fails, the batteries can discharge at any time.)

- In some countries, the grid is not allowed to charge batteries. In such case, this mode cannot be used.
- The SmartLogger performs battery scheduling based on the external scheduling power limit and the preceding policies.

Paramet er	Description	Remarks
Load tracking	 Enable: The device output changes with the load so that the output is approximately equal to the load. Disable: The device outputs power as much as possible. However, the output power is still affected by parameters such as external scheduling. 	This parameter is displayed only when the Japanese grid code is selected.
Battery backflow protectio n	 Enable: If the battery feeds power to the grid while discharging, the system sends a standby command to the battery to eliminate the reverse power. When the battery needs to be discharged, the system sends a running command to the battery. Disable: If reverse battery power is detected at the grid-connection point, the reverse power is eliminated by reducing the battery output power. The battery standby command is not delivered. 	This parameter is displayed only when the Japanese grid code is selected.
Preferred use of surplus PV power	 Charge: When the generated PV energy is greater than the loads, excess PV energy is used to charge the batteries. After the maximum charge power is reached or the batteries are fully charged, the excess PV energy is fed to the grid. Fed to grid: When the generated PV energy is greater than the loads, the excess PV energy is preferentially fed to the grid. When the maximum output power of the device is reached, the excess energy is used to charge the batteries. This setting is applicable to the scenario where the FIT is higher than the electricity price. Batteries are used only for backup power. 	
Maximu m power for charging batteries from grid	Set the maximum power of the grid during battery charging.	-

Paramet er	Description	Remarks
Active power threshold of grid during battery discharge	Control the maximum target grid power when the grid-connection point has zero power.	-
Adjustme nt deadban d	Allowed fluctuation of the target grid power for the grid-connection point	-
Start time	Set the charge/discharge time. A maximum of 14 time segments are allowed. You can set a	The Charge/ Discharge period
End time	cycle by week by clicking the buttons corresponding to Mon. through Sun. in the	is determined based on the
Charge/ Discharg e	Repeat box. The buttons are blue by default, indicating being selected. After you click it, the button turns gray.	SmartLogger time. When DST enable is set to Yes , the charge/discharge
Repeat		period is shortened by one hour when the DST starts, and is extended by one hour when the DST ends.

Scheduled Charge/Discharge

- This mode applies to ground power plant scheduling scenarios.
- In scheduled discharge, the AC output aims to reach the target value of the scheduled active power: PV power supply is prioritized. If the PV power is insufficient, the batteries supply power to loads; if the PV power is sufficient, the system outputs at the target value and the excess PV power is used to charge the batteries.
- In scheduled charge, the AC output aims to reach the target value of the scheduled active power: If the battery power is insufficient or the Smart PCS is limiting power, the system gets power from the grid as much as possible; if the scheduling target is met and the battery has excessive power, the PV power is used to charge the batteries.

6.5 Setting Capacity Limit

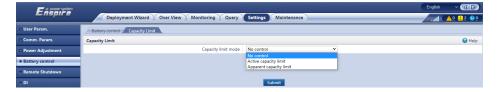
Context

- Capacity limit scenarios in **TOU** mode:
 - When **Capacity Limit** is enabled in **TOU** mode, the charge/discharge duration set in the **TOU** window must be 24 hours. **Capacity Limit** is not supported in non-charge/discharge time.
- Other capacity limit scenarios:
 - If the capacity limit is met 24 hours a day, the ratio of the ESS/Smart PCS to the load power must be properly set to ensure that the ESS/Smart PCS have sufficient capacity to meet the capacity limit.
 - When the ESS is used only for capacity limit, you can set the charge window to 24 hours by setting **TOU**. Do not set the discharge window and non-charge/discharge window.
 - The overload capacity of transformers, power distribution switches, and lines must be greater than the sum of the maximum charge current and maximum load current of the ESSs.

Procedure

Choose **Settings** > **Battery control** > **Capacity Limit** to set the capacity limit.

Figure 6-68 Setting Capacity Limit



Parameter	Setting Description
No control	If this parameter is set, the capacity of the grid-connection point is not limited. The inverter and PCS run according to the preset control policy.
Active capacity limit	If this parameter is set, the active power of the grid-connection point for purchasing or feeding power cannot exceed the preset capacity limit.
Apparent capacity limit	If this parameter is set, the apparent power of the grid- connection point for purchasing or feeding power cannot exceed the preset capacity limit.

Active Capacity Limit

Parameter	Setting Description
Maximum active capacity	Set this parameter according to the charging capacity in the demand contract of the power grid company. Once set, the active power of the grid-connection point for purchasing or feeding power cannot exceed the preset value.
PV power limit when power meter fails	Specifies the active power limit of the inverter when the feed-in meter communication is abnormal. You can manually change the active power percentage of the inverter as required.
PCS power limit when power meter fails	Specifies the active power limit of the PCS when the feed-in meter communication is abnormal. You can manually change the active power percentage of the PCS as required.

Apparent Capacity Limit

Parameter	Setting Description
Maximum apparent capacity	Set this parameter according to the charging capacity in the demand contract of the power grid company. Once set, the apparent power of the grid-connection point for purchasing or feeding power cannot exceed the preset value.
PV power limit when power meter fails	Specifies the active power limit of the inverter when the feed-in meter communication is abnormal. You can manually change the active power percentage of the inverter as required.
PCS power limit when power meter fails	Specifies the active power limit of the PCS when the feed-in meter communication is abnormal. You can manually change the active power percentage of the PCS as required.

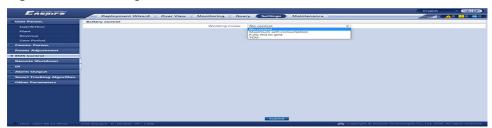
6.6 Setting EMS Control Parameters

This section applies to V300R001C00.

Procedure

To set the battery working mode, choose **Settings** > **EMS Control**.

Figure 6-69 Working mode



No Control

The SmartLogger directly delivers the external scheduling power limit. No other power scheduling control is performed. The power is automatically controlled by the inverter.

Maximum Self-Consumption

- This mode applies to areas where the electricity price is high, or areas where the FIT subsidy is low or unavailable.
- Excess PV energy is stored in batteries. When PV power is insufficient or no PV power is generated at night, batteries discharge to supply power to the loads, improving the self-consumption rate of the PV system and the self-sufficiency rate of residential energy, and reducing electricity costs.
- The SmartLogger performs battery scheduling based on the external scheduling power limit and the preceding policies.

You are advised to retain the default values of the following parameters. If needed, choose **Settings** > **Other Parameters** and set the parameters as required.

Parameter	Description
Tracking load	Enable (default): Adjusts the inverter output to ensure that the output is approximately equal to the load.
	Disabled: Maximizes the inverter output power. However, the output power is still affected by parameters such as external scheduling.
Battery reverse current protection	Enable: If the battery feeds power to the grid while discharging, the system sends a standby command to the battery to eliminate the reverse power. When the battery needs to be discharged, the system sends a running command to the battery.
	Disabled (default): If reverse battery power is detected at the grid-connection point, the reverse power is eliminated by reducing the battery output power. The battery standby command is not delivered.

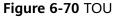
Parameter	Description
Active power threshold of grid during battery discharge	Control the maximum target grid power when the grid-connection point has zero power.
Adjustment deadband	Allowed fluctuation of the target grid power for the grid-connection point

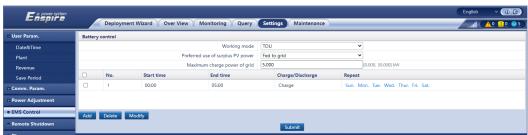
Fully Fed to Grid

- The SmartLogger directly delivers the external scheduling power limit.
- This mode maximizes the feed-in power. When the generated PV energy in the daytime is greater than the maximum output capability of the inverter, the batteries are charged to store energy. When the PV energy is less than the maximum output capability of the inverter, batteries are discharged to maximize the energy fed to the grid.

TOU

- This mode applies to scenarios where the electricity price difference between peak and off-peak hours is large.
- You can manually set the charge and discharge time segments to lower the
 electricity cost. When the electricity price is low at night, you need to enable
 Fed to grid in Battery control so that the power grid charges the batteries at
 the maximum power. When the electricity price is high, the batteries
 discharge to supply power to the loads.
- Click Add to set the charge and discharge time segments. A maximum of 14 time segments can be set. During the charge time, the power grid charges the batteries, and during the discharge time, the batteries discharge to supply power to the loads. In other time segments that are not set, the batteries do not discharge, and the PV modules and grid supply power to the loads. (In grid-tied/off-grid mode, if the grid fails, the batteries can discharge at any time.)
- In some countries, the grid is not allowed to charge batteries. Therefore, this mode cannot be used.
- The SmartLogger performs battery scheduling based on the external scheduling power limit and the preceding policies.





Parameter	Description
Preferred use of surplus PV power	Charge: When the generated PV energy is greater than the loads, excess PV energy is used to charge the batteries. After the maximum charge power is reached or the batteries are fully charged, the excess PV energy is fed to the grid.
	Fed to grid: When the generated PV energy is greater than the loads, the excess PV energy is preferentially fed to the grid. When the maximum output power of the inverter is reached, the excess energy is used to charge the batteries. This setting is applicable to the scenario where the FIT is higher than the electricity price. Batteries are used only for backup power.
Maximum charge power of grid	Sets the maximum power for charging the batteries from the power grid.
Start time	Set the charge/discharge time. A maximum
End time	of 14 time segments can be set. You can set a cycle by week by clicking the buttons
Charge/Discharge	corresponding to Mon. through Sun. in the Repeat box. The buttons are blue by
Repeat	default, indicating selected. After you click it, the color turns gray.
	The Charge/Discharge period is determined based on the SmartLogger time. When DST enable is set to Yes, the charge/discharge period is shortened by one hour when the DST starts, and is extended by one hour when the DST ends.

You are advised to retain the default values of the following parameters. If needed, choose **Settings** > **Other Parameters** and set the parameters as required.

Parameter	Description
Tracking load	Enable (default): Adjusts the inverter output to ensure that the output is approximately equal to the load.
	 Disabled: Maximizes the inverter output power. However, the output power is still affected by parameters such as external scheduling.

Parameter	Description
Battery reverse current protection	Enable: If the battery feeds power to the grid while discharging, the system sends a standby command to the battery to eliminate the reverse power. When the battery needs to be discharged, the system sends a running command to the battery.
	Disabled (default): If reverse battery power is detected at the grid-connection point, the reverse power is eliminated by reducing the battery output power. The battery standby command is not delivered.
Active power threshold of grid during battery discharge	Control the maximum target grid power when the grid-connection point has zero power.
Adjustment deadband	Allowed fluctuation of the target grid power for the grid-connection point

6.7 Power Grid Scheduling

6.7.1 Power Adjustment Description

According to standard requirements, the SmartLogger can reliably adjust power for the connected solar inverters/Smart PCS in real time to ensure that the plant can respond to requirements of the power grid company in a timely manner.

NOTICE

- To ensure that the SmartLogger will deliver scheduling commands to the connected solar inverters or Smart PCS, you must select the active or reactive power control mode before adjusting the active or reactive power for a PV plant.
- If Active power control mode is set to No limit or Reactive power control mode is set to No output, the SmartLogger does not send scheduling commands to the connected solar inverters or Smart PCS.

6.7.2 Setting Active Power Control

If the plant has requirements of power limitation, the power grid scheduling personnel should limit the active power or disable all the active power for the plant, that is, to enable the active power derating mode.

- Step 1 Choose Monitoring > Inverter/PCS > Running Param. > Power Adjustment. On the page that is displayed, check that Remote power schedule is set to Enable.
- **Step 2** Set the parameters for active power control and click **Submit**.

Figure 6-71 Active power control



IL04J00008

----End

No Limit

Parameter	Description
Active power control mode	If this parameter is set to No limit , the device operates at full load, and the Smart PCS limits the power based on the energy storage control policy.

DI Active Scheduling

NOTICE

- When setting this function, ensure that the user-defined DI port is not occupied. Otherwise, the setting will fail.
- When setting this function, ensure that the SmartLogger is correctly connected
 to a ripple control receiver. (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.)
- When both **Remote communication scheduling** and **DI** are enabled, the control with a lower active power percentage value is preferentially responded.

Parameter	Description
Active power control mode	Set this parameter to DI active scheduling .
Remote communication scheduling	Set this parameter to Start-up , DI active scheduling and remote communication scheduling work at the same time.

Parameter	Description
DI NOTE DI parameters include DI1, DI2, DI3, DI4, and Percentage(%).	 Sixteen levels are supported for the active power derating percentage. "√" indicates a low level. When the four DI ports of the SmartLogger are connected, the ports are low-level ports. When not connected, the ports are high-level ports.
	 The percentage levels of DI1-DI4 should differ from each other. Otherwise, an abnormal command will be generated.
	 If the actual input DI signal is inconsistent with that configured on the WebUI, the SmartLogger controls the solar inverter to work at full load and the Abnormal Active Schedule alarm is raised.

Percentage Fixed-Value Limitation (Open Loop)

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

Parameter	Description
Active power control mode	Set this parameter to Percentage fixed-value limitation (open loop) to control the maximum output power of the devices by time segment.
Start time	If the device is required to run with specified
Percentage(%)	maximum power in certain periods of a day, add records based on site requirements.
	When multiple time points are set, the device will run with the maximum power specified for the time point that is earlier than and the closest to the current system time. For example, if you add 00:00:00 and 12:00:00 on the WebUI and the current system time is 14:30:00, the device will run with the maximum power specified for 12:00:00.

Remote communication scheduling

The management system or independent power adjustment device sends scheduling commands over the communications port that supports Modbus-TCP, GOOSE, or IEC104, without the need of user configuration or operation. The SmartLogger can automatically switch between scheduling modes and send scheduling commands.

Parameter	Description
Active power control mode	Set this parameter to Remote communication scheduling .
	The SmartLogger parses the scheduling command delivered by the upper-layer management system to valid instruction data that can be identified by the devices in the plant and delivers the data to all devices connected to the SmartLogger.
	As the Remote communication scheduling mode has a higher priority, the SmartLogger automatically changes Active power control mode to Remote communication scheduling after receiving a scheduling command from the upper-layer management system.

Parameter	Description
Schedule strategy	The value can be Disable , Strategy 1 , Strategy 2 or Strategy 3 . The default value is Strategy 1 .
	Disable: The SmartLogger controls the device to work at full load and will not receive scheduling commands sent by the management system.
	• Strategy 1: Open-loop scheduling policy. That is, the SmartLogger evenly allocates the power value from the scheduling and delivers the average value to each device, which then operates with the specific power. The adjustment value delivered by the SmartLogger is constant. If Adjustment coefficient is set, the power value will be sent to the device after being multiplied by the preset coefficient.
	 Strategy 2: Customized functions for specific plants. Set Overshoot, Adjustment period, and Adjustment deadband based on the scheduling requirements of the power plant.
	 Overshoot: Indicates the maximum overshoot percentage during adjustment. If a plant cannot reach the preset target value due to factors such as insufficient sunlight, the set target value is the current value plus the overshoot.
	 Adjustment period: Indicates the time required from adjustment instruction delivery, device response to the instruction, to the detection of the preceding actions by the SmartLogger.
	 Adjustment deadband: Indicates the percentage of the adjustment deviation value to the rated output capacity. In the adjustment deadband, strategy 2 does not deliver control instructions but still detects the deviation in real time. Strategy 2: Customized functions for specific plants. Set Overshoot, Adjustment period, and Adjustment deadband based on the scheduling requirements of the power plant.
	• Strategy 3 : In the feed-in limitation scenario of the master and slave SmartLoggers, set this parameter to Strategy 3 for the slave SmartLogger.
Adjustment coefficient	Coefficient for calculating the target value of active power adjustment. The default value is 1.000.
Shutdown upon communication exceptions	The default value is Disable . If this parameter is set to Enable , the SmartLogger shuts down the device when the communication between the SmartLogger and the scheduling backend is interrupted for a period longer than the set value of Time for communication exception detection .

Parameter	Description
Time for communication exception detection (s)	The default value is 300 . This parameter is used only for shutdown protection when the communication between the SmartLogger and the scheduling backend is abnormal. If the communication is interrupted for a period longer than the set value, it is determined as abnormal.
Automatic startup upon communication recovery	The default value is Enable . If this parameter is set to Enable , the device automatically starts if the communication recovers after an exception.
Limit solar inverter power upon active power scheduling timeout	 The default value is Disable. If this parameter is set to Enable, the SmartLogger controls the device in the following ways after the communication between the SmartLogger and the scheduling backend is interrupted for a period longer than the set value of Active power scheduling timeout threshold for triggering solar inverter power limiting. Limit the active power of the inverter based on the value of Power (in percentage of rated power) of solar inverter in case of active power scheduling timeout. Limit the active power of the Smart PCS based on the value of Power (in percentage of rated power) of ESS in case of active power scheduling timeout.
Active power scheduling timeout threshold for triggering solar inverter power limiting (s)	The default value is 300.0 . This parameter is used only for active power limiting protection when the communication between the SmartLogger and the scheduling backend is abnormal. If the communication is interrupted for a period longer than the set value, active power limiting protection is started.
Power (in percentage of rated power) of solar inverter in case of active power scheduling timeout (%)	The default value is 0.0 . After Limit solar inverter power upon active power scheduling timeout is enabled, if the communication between the SmartLogger and the scheduling backend is interrupted for a period longer than the set value of Active power scheduling timeout threshold for triggering solar inverter power limiting, the SmartLogger limits the active power of the inverter based on the set value of this parameter.

Parameter	Description
Power (in percentage of rated power) of ESS in case of active power scheduling timeout (%)	The default value is 0.0 . After Limit solar inverter power upon active power scheduling timeout is enabled, if the communication between the SmartLogger and the scheduling backend is interrupted for a period longer than the set value of Active power scheduling timeout threshold for triggering solar inverter power limiting, the SmartLogger limits the active power of the Smart PCS based on the set value of this parameter.

Export Limitation (kW)

NOTICE

- You are advised to choose **Settings** > **Export Limitation** and enable the function of limiting feed-in power.
- To enable this function, you need to set meter, inverter/Smart PCS, and export limitation parameters. This section describes how to set export limitation parameters.
- Before setting the parameters, ensure that the power meter is correctly connected to the SmartLogger.

Step 1 Set export limitation parameters and click **Submit**.

Parameter	Description
Active power control mode	Set this parameter to Export Limitation(kW) .
Start control	When this parameter is set to Yes , the power limiting function takes effect.
Electric meter power direction	 Positive: default value. Cables are correctly connected to the meter. If cables are reversely connected to the meter and the NMS does not support reverse connection^[1], set Meter access direction^[2] to Reverse and Electric meter power direction to Positive.
	Reverse: applicable to export+import meters. If cables are reversely connected to the meter and the NMS supports reverse connection, set Meter access direction to Reverse_Report raw data and Electric meter power direction to Reverse.

Parameter	Description
Limitation mode	Total power: controls the total power at the grid- connection point to limit the power fed to the power grid.
	 Single-phase power: controls the power of each phase at the grid-connection point to limit the power fed to the power grid.
Maximum grid feed-in power	Indicates the maximum power that the device can feed into the power grid.
	Suggestion: Set this parameter based on the feed-in threshold allowed by the power grid company.
Power lowering adjustment period	Specifies the period for lowering the device output power.
Maximum protection time	Specifies the maximum duration from the time when the SmartLogger detects feed-in to the time when the device output power reaches 0.
	Suggestion: Set this parameter based on the maximum feed-in duration allowed by the power grid company.
Power raising threshold	When the power supply from the grid reaches this threshold, the devices start to raise their output power. The recommended value of this parameter is 1% to 2% of Pn.
	Pn is the total rated output power of devices and can be queried on the overview page of the SmartLogger.
Fail-safe power threshold	Device output power percentage is controlled by the SmartLogger when communication between the SmartLogger and the meter is abnormal.
Switch-off with 0% power limit	Set whether the DO port is allowed to control switch-off.
Switch-off control port	Set this parameter to the DO port that controls switch-off.
Switch-on control port	Set this parameter to the DO port that controls switch-on.
Switch-off state feedback port	Set this parameter to the DI port that reports the switch-off status.
Switch-on state feedback port	Set this parameter to the DI port that reports the switch-on status.

Parameter	Description
N 547 16 11	

Note [1]: If cables are reversely connected to the meter and the NMS can correctly display the real-time data of the meter, it is considered that the NMS supports reverse connection. That is, the NMS reverses the active power, reactive power, power factor, phase A active power, phase B active power, and phase C active power, replaces the total positive active energy and total negative active energy with each other, and replaces the total positive reactive power and total negative reactive power with each other.

Note [2]: **Meter access direction** is set in the meter running parameters.

- **Step 2** Verify that the SmartLogger can remotely turn on and off circuit breakers in scenarios with circuit breakers.
 - Click **Switch off** and check that the circuit breaker is switched off properly.
 - Click Switch on and check that the circuit breaker is switched on properly.

----End

Remote Output Control

Step 1 Synchronize the clock source of the server.

Path	Parameter	Description
Settings > User	Clock source	Set this parameter to NTP .
Param. > Date&Time	Synchronization server	Set this parameter to the IP address or domain name of the server for time synchronization.
	NTP synchronization test	You can click this button to check the time synchronization status.

Step 2 Set remote output control parameters.

Path	Parameter	Description
Settings > Active Power	Active power control mode	Set this parameter to Remote output control.
Control Control area	Control area	Set this parameter to the area where the remote output control function is used. To enable the function in some areas, the license needs to be imported and enabled.
	Output control duration	Set this parameter to the time required for the device to change its output power from 0% to 100% or from 100% to 0%.

Path	Parameter	Description
	PV plant ID	Set this parameter to the PV plant ID.
	Remote output control server	Set this parameter to the IP address or domain name of the server.
	Enable certificate	Determine whether to import and enable a certificate based on the actual situation.
	Selling surplus power	 Disable: The inverter output power is controlled by the SmartLogger according to the remote output control command issued by the power company. The output power of the PV plant cannot exceed the active power scheduling value issued by the power company. Enable: When the load power is less than or equal to the remote output control command, the inverter output power is determined according to the remote output control command. Power can be bought or sold at the grid-connection point. When the load power is greater than the remote output control command, the SmartLogger automatically adjusts the inverter output power to achieve zero-power at the grid-connection point, that is, power cannot be sold at the grid-connection point.
	PV module capacity	Set this parameter to the capacity of PV modules connected to the plant.
	Plant AC capacity	Set this parameter to the AC capacity of the limited feed-in power from the plant.

□ NOTE

- If the connection between the SmartLogger and the server is abnormal, obtain the output control file in .data format from the website of the power company and import the file.
- After the SmartLogger connects to the server, you can export the relevant file.

----End

6.7.3 Setting Reactive Power Control

Large-scale plants are required to adjust the voltage at the grid-connection point. Power grid scheduling personnel enable a plant to absorb or add reactive power

at the grid-connection point, that is, to enable the reactive power compensation, based on the real-time reactive power transmission status in the power grid.

- Step 1 Choose Monitoring > Inverter/PCS > Running Param. > Power Adjustment. On the page that is displayed, check that Remote power schedule is set to Enable.
- **Step 2** Set the parameters for reactive power control and click **Submit**.

Figure 6-72 Reactive power control



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----End

No Output

Parameter	Description
Reactive power control mode	If the plant is not required to adjust the voltage at the grid-connection point or perform reactive power compensation, device can run with pure active power output. In this case, set this parameter to No output .

DI Reactive Scheduling

NOTICE

- When setting this function, ensure that the user-defined DI port is not occupied. Otherwise, the setting will fail.
- SmartLogger scenario: Before setting this function, ensure that the SmartLogger is properly connected to the ripple control receiver.
- SmartLogger+SmartModule scenario: Before setting this function, ensure that the SmartModule is properly connected to the ripple control receiver.

Table 6-8 SmartLogger scenario

Parameter	Description
Reactive power control mode	Set this parameter to DI reactive scheduling .

Parameter	Description
DI NOTE DI parameters include DI1, DI2, DI3, DI4, and Power factor.	 Sixteen levels are supported for power factors. "√" indicates a low level. When the four DI ports of the SmartLogger are connected, the ports are low-level ports. When not connected, the ports are high-level ports. The percentage levels of DI1-DI4 should differ from each other. Otherwise, an abnormal command is generated. If the actual input DI signal is inconsistent with that configured on the WebUI, the SmartLogger controls the device to work at full power and the Reactive Power Scheduling Instruction Exception alarm is raised.

Table 6-9 SmartLogger+SmartModule scenario

Parameter	Description
Reactive power control mode	Set this parameter to DI reactive scheduling .
NOTE The DI parameters include M1.DI1, M1.DI2, M1.DI3, M1.DI4, and Percentage.	 Supports 16 levels of percentages. "√" indicates a low level. When the four DI ports of the SmartModule are connected, the ports are low-level ports. When not connected, the ports are high-level ports. The percentage levels of M1.DI1 to M1.DI4 should differ from each other. Otherwise, an exception will occur during command parsing. If the actual input DI signal is inconsistent with that configured on the WebUI, the SmartLogger controls the device to work at full power and the Reactive Power Scheduling Instruction Exception alarm is raised.

□ NOTE

- Before connecting the SmartModule to the SmartLogger, if **DI reactive scheduling** has been configured for the DI port and the scheduling signal needs to be connected to the SmartModule, delete the DI configuration and reconfigure it.
- In the scenario where the SmartLogger and SmartModule are combined, if the SmartModule is removed and the scheduling signal needs to be connected to the SmartLogger, delete the DI configuration and reconfigure it.

Reactive Power Fix Control

Parameter	Description
Reactive power control mode	If the PV array is required to generate constant reactive power at a specified time, set this parameter to Reactive power fix control .
Start time	If the device is required to run with specified maximum power in certain periods of a day, add records based on site requirements.
Reactive power (kVar)	
	When multiple time points are set, the device will run with the maximum power specified for the time point that is earlier than and the closest to the current system time. For example, if you add 00:00:00 and 12:00:00 on the WebUI and the current system time is 14:30:00, the device will run with the maximum power specified for 12:00:00.

Power Factor Fix Control

Parameter	Description
Reactive power control mode	If the plant is required to generate a constant power factor at the grid-connection point and the device is required to adjust the real-time reactive power based on the preset power factor, set this parameter to Power factor fix control .
Start time	If the device is required to run with specified power in certain periods of a day, add records based on site requirements.
Power factor	
	When multiple time points are set, the device will run with the power specified for the time point that is earlier than and the closest to the current system time. For example, if you add 00:00:00 and 12:00:00 on the WebUI and the current system time is 14:30:00, the device will run with the maximum power specified for 12:00:00.

Q-U Characteristic Curve

If the remote reactive power control command is not available, you can configure the characteristic curve as a substitute. The SmartLogger delivers the values configured for the characteristic curve to the inverter or Smart PCS, which then operates according to the configuration. The SmartLogger no longer adjusts the values.

NOTICE

Configure the characteristic curve under instructions from professionals to ensure that the inverter or Smart PCS works properly.

In the Q-U characteristic curve control mode, the inverter or Smart PCS dynamically adjusts the ratio Q/S of output reactive power to apparent power in accordance with the ratio U/Un(%) of the actual grid voltage to the rated grid voltage.

Parameter	Description	
Reactive power control mode	Set this parameter to Q-U characteristic curve .	
Reactive power adjustment time	Specifies the change interval of the reactive power for a grid-tied point.	
Percents of trigger frequency	Under a specific grid code, the characteristic curve takes effect only when the actual output active power of the device is greater than the specified value.	
Exit power percentage	Under a specific grid code, the characteristic curve becomes invalid when the actual output active power of the device is less than the specified value.	
Limit value for minimum PF	Limits the actual minimum PF when the Q-U characteristic curve takes effect.	
Characteristic curve points	Specifies the number of characteristic curve points. The characteristic curve supports a maximum of 10 valid points.	
U/Un(%)	When configuring the curve, ensure that the U/Un(%)	
Q/S	value of a point is greater than the U/Un(%) value of the previous point. Otherwise, the message indicating invalid input will be displayed.	

cosφ-P/Pn Characteristic Curve

If the remote reactive power control command is not available, you can configure the characteristic curve as a substitute. The SmartLogger delivers the values configured for the characteristic curve to the inverter or Smart PCS, which then operates according to the configuration. The SmartLogger no longer adjusts the values.

NOTICE

Configure the characteristic curve under instructions from professionals to ensure that the inverter or Smart PCS works properly.

In the $cos\phi$ -P/Pn characteristic curve control mode, the inverter or Smart PCS dynamically adjusts the power factor $cos\phi$ in accordance with the P/Pn (%) based on the VDE-4105 and BDEW German standards.

Parameter	Description
Reactive power control mode	Set this parameter to cosφ-P/Pn characteristic curve .
Reactive power adjustment time	Specifies the change interval of the reactive power at the grid-connection point.
Characteristic curve points	Specifies the number of characteristic curve points. The characteristic curve supports a maximum of 10 valid points.
U/Un(%)	When configuring the curve, ensure that the P/Pn(%) value of a point is greater than the P/Pn(%) value of the previous point. Otherwise, the message indicating invalid input will be displayed.
соѕф	

Q-U Hysteresis Curve (CEI0-16)

If the remote reactive power control command is not available, you can configure the characteristic curve as a substitute. The SmartLogger delivers the values configured for the characteristic curve to the inverter or Smart PCS, which then operates according to the configuration. The SmartLogger no longer adjusts the values.

NOTICE

Configure the characteristic curve under instructions from professionals to ensure that the inverter or Smart PCS works properly.

The Q-U hysteresis curve (CEI0-16) control mode is the Italian standard CEI0-16 version of the Q-U characteristic curve. It dynamically adjusts the output reactive power of the inverter or Smart PCS in accordance with the ratio of the actual voltage to the rated voltage. The target value of reactive power adjustment should be in the form of Q/S.

Parameter	Description
Reactive power control mode	Set this parameter to Q-U hysteresis curve(CEI0-16) .
Reactive power adjustment time	Specifies the change interval of the reactive power for a grid-tied point.
Percents of trigger frequency	Under a specific grid code, the characteristic curve takes effect only when the actual output active power of the device is greater than the specified value.

Parameter	Description
Exit power percentage	Under a specific grid code, the characteristic curve becomes invalid when the actual output active power of the device is less than the specified value.
Limit value for minimum PF	Limits the actual minimum PF when the Q-U characteristic curve takes effect.
U/Un(%)	When configuring the curve, ensure that the U/Un(%) value of a point is greater than the U/Un(%) value of the previous point. Otherwise, the message indicating invalid input will be displayed.
Q/S	
	When configuring the curve, ensure that the Q/S values at points A and B are the same and set in sequence, and that the Q/S values at points C and D are the same and set in sequence. Otherwise, a message indicating invalid input is displayed.

Remote Communication Scheduling

The management system or independent power adjustment device sends scheduling commands over the communications port that supports Modbus-TCP or IEC104, without the need of user configuration or operation. The SmartLogger can automatically switch between scheduling modes and send scheduling commands.

Parameter	Description
Reactive power control mode	As the Remote communication scheduling mode has a higher priority, the SmartLogger automatically changes Reactive power control mode to Remote communication scheduling after receiving a scheduling command from the upper-layer management system.
	If this parameter is set to Remote communication scheduling , the SmartLogger parses the scheduling command delivered by the upper-layer management system to valid instruction data that can be identified by the devices in the plant and delivers the data to all devices connected to the SmartLogger.
Shut down solar inverter upon reactive power scheduling timeout	The default value is Disable . If this parameter is set to Enable , the SmartLogger shuts down the device when the communication between the SmartLogger and the scheduling backend is interrupted for a period longer than the set value of Reactive power scheduling timeout threshold for triggering solar inverter shutdown .

Parameter	Description
Reactive power scheduling timeout threshold for triggering solar inverter shutdown	The default value is 300 . This parameter is used only for shutdown protection for reactive power scheduling when the communication between the SmartLogger and the scheduling backend is abnormal. If the communication is interrupted for a period longer than the set value, it is determined as abnormal.
Start up solar inverter upon recovery from reactive power scheduling timeout	The default value is Enable . If this parameter is set to Enable , after a reactive power signal timeout occurs, if the reactive power signal recovers, the device automatically starts.
Limit solar inverter power upon reactive power scheduling timeout	 The default value is Disable. If this parameter is set to Enable, the SmartLogger controls the device in the following ways after the communication between the SmartLogger and the scheduling backend is interrupted for a period longer than the set value of Reactive power scheduling timeout threshold for triggering solar inverter power limiting. Limit the reactive power of the inverter based on the value of Q/S during power limiting of solar inverter in case of reactive power scheduling timeout. Limit the reactive power of the Smart PCS based on the value of Q/S during power limiting of ESS in case of reactive power scheduling timeout.
Reactive power scheduling timeout threshold for triggering solar inverter power limiting (s)	The default value is 300.0 . This parameter is used only for reactive power limiting protection when the communication between the SmartLogger and the scheduling backend is abnormal. If the communication is interrupted for a period longer than the set value, reactive power limiting protection is started.
Q/S during power limiting of solar inverter in case of reactive power scheduling timeout (%)	The default value is 0.000 . After Limit solar inverter power upon reactive power scheduling timeout is enabled, if the communication between the SmartLogger and the scheduling backend is interrupted for a period longer than the set value of Reactive power scheduling timeout threshold for triggering solar inverter power limiting, the SmartLogger limits the active power of the inverter based on the set value of this parameter.

Parameter	Description
Q/S during power limiting of ESS in case of reactive power scheduling timeout (%)	The default value is 0.000 . After Limit solar inverter power upon reactive power scheduling timeout is enabled, if the communication between the SmartLogger and the scheduling backend is interrupted for a period longer than the set value of Reactive power scheduling timeout threshold for triggering solar inverter power limiting , the SmartLogger limits the reactive power of the Smart PCS based on the set value of this parameter.

Power Factor Closed-Loop Control (Old Policy)

NOTICE

Before setting the parameters, ensure that the power meter is correctly connected to the SmartLogger.

Parameter	Description
Reactive power control mode	Set this parameter to Power factor closed-loop control (old policy) .
Target power factor	Specifies the target value for the adjustment power factor of the power meter.
Adjustment period	Specifies the interval for sending adjustment commands by the SmartLogger.
Adjustment deadband	Specifies the adjustment power factor precision. NOTICE This parameter is valid only when the power factor of the power meter is greater than 0.9.

Power Factor Closed-Loop Control

To improve the revenue, a distributed plant needs to reduce or avoid the power factor surcharge by performing distributed reactive power compensation. To enable the function, set the related parameters.

NOTICE

- You are advised to choose **Settings** > **Smart Reactive Power Compensation** to enable smart reactive power compensation.
- Before setting the parameters, ensure that the license for smart reactive power compensation has been loaded on the **Maintenance** > **License Management** page.
- Before setting the parameters, ensure that the power meter is correctly connected to the SmartLogger.

Parameter	Description
Reactive power control mode	Set this parameter to Power factor closed-loop control .
Electric meter power direction	 Positive: default value. Cables are correctly connected to the meter. If cables are reversely connected to the meter and the NMS does not support reverse connection^[1], set Meter access direction^[2] to Reverse and Electric meter power direction to Positive. Reverse: applicable to export+import meters. If cables are reversely connected to the meter and the NMS supports reverse connection, set Meter access direction to Reverse_Report raw data and
Power meter	Electric meter power direction to Reverse. Set this parameter to Smart meter.
Target power factor	Specifies the target value for the adjustment power factor of the power meter. The target value should be larger than the appraisal value of the PV plant power factor.
Adjustment period	Specifies the interval for sending adjustment commands by the SmartLogger.
Adjustment deadband	Specifies the adjustment power factor precision. NOTICE This parameter is valid only when the power factor of the power meter is greater than 0.9.
Reactive compensation delay	Specifies the delay time for starting the distributed power factor compensation if the current power factor is lower than the target power factor.

Parameter Description

Note [1]: If cables are reversely connected to the meter and the NMS can correctly display the real-time data of the meter, it is considered that the NMS supports reverse connection. That is, the NMS reverses the active power, reactive power, power factor, phase A active power, phase B active power, and phase C active power, replaces the total positive active energy and total negative active energy with each other, and replaces the total positive reactive power and total negative reactive power with each other.

Note [2]: **Meter access direction** is set in the meter running parameters.

NOTICE

When the SmartLogger receives a remote reactive power scheduling command from the plant, it automatically changes **Reactive power control mode** to **Remote communication scheduling**. If power factor closed-loop control is required, set **Reactive power control mode** to **Power factor closed-loop control** and set the target power factor correctly.

PF-U Characteristic Curve

If the remote reactive power control command is not available, you can configure the characteristic curve as a substitute. The SmartLogger delivers the values configured for the characteristic curve to the inverter or Smart PCS, which then operates according to the configuration. The SmartLogger no longer adjusts the values.

NOTICE

Configure the characteristic curve under instructions from professionals to ensure that the inverter or Smart PCS works properly.

In the PF-U characteristic curve control mode, the inverter or Smart PCS dynamically adjusts the PF at the device port based on the ratio U/Un(%) of the actual grid voltage to the rated grid voltage.

Parameter	Description
Reactive power control mode	Set this parameter to PF-U characteristic curve .
Characteristic curve points	 Specifies the number of points on the characteristic curve. The characteristic curve supports a maximum of 10 valid points.
U/Un(%)	When configuring the curve, ensure that the U/Un(%) value of a point is greater than that of the previous

Parameter	Description
PF	point. Otherwise, the "Invalid input" message will be displayed.

Q-P Characteristic Curve

If the remote reactive power control command is not available, you can configure the characteristic curve as a substitute. The SmartLogger delivers the values configured for the characteristic curve to the inverter or Smart PCS, which then operates according to the configuration. The SmartLogger no longer adjusts the values.

NOTICE

Configure the characteristic curve under instructions from professionals to ensure that the inverter or Smart PCS works properly.

In the control mode of the Q-P characteristic curve, the inverter or Smart PCS adjusts the ratio Q/Pn of the output reactive power to the rated power based on the ratio P/Pn of the current active power to the rated power.

Parameter	Description
Reactive power control mode	Set this parameter to Q-P characteristic curve .
Reactive power adjustment time	Specifies the change interval of the reactive power at the grid-connection point.
Characteristic curve points	 Specifies the number of points on the characteristic curve. The characteristic curve supports a maximum of 10 valid points.
P/Pn	When configuring the curve, ensure that the P/Pn
Q/Pn	value of a point is greater than that of the previous point. Otherwise, the "Invalid input" message will be displayed.

6.7.4 Setting Parameters For Shutdown at High Feed-in Power

∩ NOTE

This section applies to V300R001C00 only.

The power grid company requires plants to limit or reduce the output power of a PV system when it is too high. If the output power cannot be limited to the range within the specified time, all inverters must be shut down.

Step 1 Set parameters for shutdown at high feed-in power and click **Submit**.

Figure 6-73 Shutdown at high feed-in power



----End

Shutdown at high feed-in power

Parameter	Description
Shutdown at high feed- in power	 The default value is Disable. If this parameter is set to Enable, the inverter shuts down for protection when the grid-connection point power exceeds the threshold and remains in this condition for the specified time threshold.
Upper feed-in power threshold for inverter shutdown	The default value is 0 . This parameter specifies the power threshold of the grid-connection point for triggering inverter shutdown.
High feed-in power duration threshold for triggering inverter shutdown	The default value is 20 . This parameter specifies the duration threshold of high feed-in power for triggering inverter shutdown.
	 When High feed-in power duration threshold for triggering inverter shutdown is set to 5, Shutdown at high feed-in power takes precedence.
	 When High feed-in power duration threshold for triggering inverter shutdown is set to 20, Export Limitation(kW) takes precedence (when Active power control is set to Export Limitation(kW)).

6.7.5 Setting Export Limitation Parameters

Context

When the PV and energy storage plant generates power for self-consumption, countercurrent may feed into the power grid if the loads cannot consume all the power. In this case, you can set the export limitation parameters on the WebUI to prevent countercurrent.

 Scenario without a circuit breaker: The reverse current feeding into the power grid can be eliminated by sending a command from the SmartLogger to adjust the inverter/Smart PCS output power.

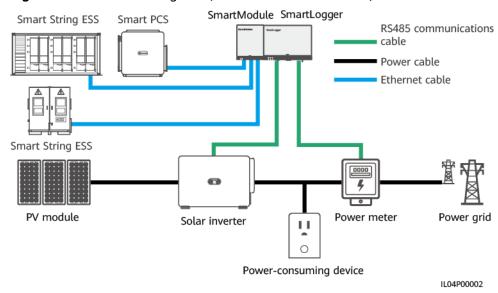


Figure 6-74 Network diagram (without a circuit breaker)

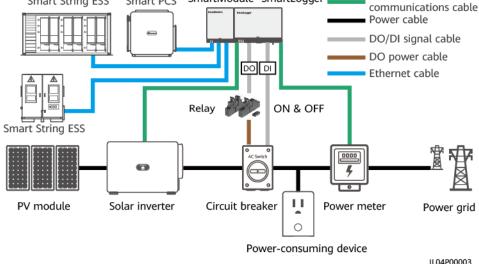
Scenario with a circuit breaker: When the reverse current feeding into the power grid cannot be eliminated by sending a command from the SmartLogger to adjust the inverter or Smart PCS output power, and the **Maximum protection time** is exceeded, the SmartLogger drives the relay to switch off the circuit breaker by controlling the DO port. When the DI port detects that the circuit breaker is open, the DO port and relay on the SmartLogger will be switched off, and the SmartLogger will restore to the initial state.

Ⅲ NOTE

Connect the DO ports in series to the 12 V power supply loop of the relay coils. You are advised to use the 12 V power output port on the SmartLogger to power the relay coils. You can also prepare a 12 V power supply.

Smart PCS SmartModule SmartLogger Smart String ESS Power cable

Figure 6-75 Network diagram (with a circuit breaker)



<u>A</u> CAUTION

In the scenario with a circuit breaker, place the power supply of the SmartLogger before the circuit breaker to avoid the SmartLogger power-off after the DO switches off the circuit breaker.

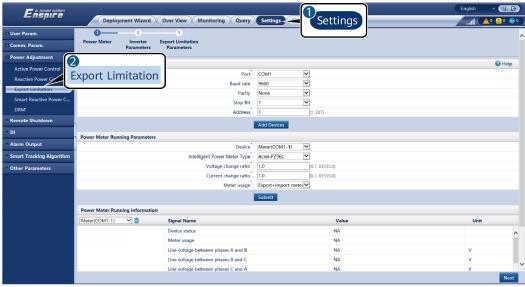
Procedure

Step 1 Set parameters as prompted. For details, click **Help** on the page.

Ⅲ NOTE

- Click Previous and Next as required.
- For details about the running parameters of power meters, see 6.3.16.2 Setting Modbus-RTU Meter Parameters.

Figure 6-76 Setting export limitation parameters



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□ NOTE

To set Export Limitation Parameters for limited feed-in for the master and slave SmartLoggers, perform the following steps:

- 1. Set **Inverter Parameters** on all slave SmartLoggers by referring to this section.
- 2. Choose **Maintenance > Device Mgmt. > Connect Device** on the master SmartLogger to add slave SmartLoggers.
- 3. Set parameters for **Power Meters**, **Inverter Parameters**, and **Export Limitation Parameters** on the master SmartLogger by referring to this section.

----End

6.7.6 Setting Parameters for Smart Reactive Power Compensation

Context

The smart reactive power compensation algorithm obtains the power data of the power meter at the grid-connection point through the SmartLogger, performs intelligent algorithm analysis, adjusts the reactive power output of the solar inverter or Smart PCS, optimizes the power factor of the grid-connection point, and reduces or avoids power factor charge to increase the energy yield of the PV plant.

□ NOTE

- Before setting the parameters, ensure that the devices are connected to the SmartLogger.
- If a power meter is connected to the SmartLogger, the power meter access procedure in the wizard is only used as a check guide. If no power meter is connected to the SmartLogger, add a power meter by following the wizard.
- Before setting the parameters, ensure that the license for smart reactive power compensation has been loaded on the **Maintenance** > **License Management** page.

Procedure

Step 1 Set parameters as prompted. For details, click **Help** on the page.

Figure 6-77 Setting parameters for smart reactive power compensation (Scenario Selection)



NOTICE

When the SmartLogger receives a remote reactive power scheduling command from the plant, it automatically changes **Reactive power control mode** to **Remote communication scheduling**. If power factor closed-loop control is required, set **Reactive power control mode** to **Power factor closed-loop control** and set the target power factor correctly.

◯ NOTE

For details about the running parameters of power meters, see **6.3.16.2 Setting Modbus-RTU Meter Parameters**.

Settings Enspire User Param Comm. Param **Export Limitation** > > > > > None Parity Address Smart Tracking Algorit Intelligent Power Meter Type Acrel-PZ96L Current change ratio er(COM1-1) NA NA NA Meter usage Line voltage between phases A and B Line voltage between phases B and C Line voltage between phases C and A

Figure 6-78 Setting parameters for smart reactive power compensation (Power Meter)

----End

6.7.7 Setting DRM Parameters

Context

According to an Australian standard, the inverters must comply with demand response modes (DRM).

DI_1

DI_2

S5

DI_3

DI_4

S8

S8

IL04P00001

Figure 6-79 Wiring diagram for the DRM function

Table 6-10 DRM requirements

Mode	Corresponding Port on the SmartLogger	Requirements	Remarks	
DRM0	AI2-AI4	 When S0 is turned on, the inverters shut down. When S0 is turned off, the inverters are connected to the power grid. 	N/A	
DRM5	DI1	When S5 is turned on, the inverters do not output active power.	When two or more DRM modes are	
DRM6	DI2	When S6 is turned on, the output active power of the inverters does not exceed 50% of the rated power.	used at the same time, the strictest requirement must be met.	
DRM7	DI3	When S7 is turned on, the output active power of the inverters does not exceed 75% of the rated power, and the inverters consume the maximum reactive power.		
DRM8	DI4	When S8 is turned on, the output active power of inverters recovers. NOTE The inverters output active power based on the percentage set on the		

Procedure

- Step 1 Click Settings and ensure that Active Power Control Mode is set to No limit, Reactive Power Control Mode is set to No output, and connection port for Remote Shutdown is set to No.
- Step 2 Set DRM parameters and click Submit.

Figure 6-80 Setting DRM parameters



IL04J00015

Parameter	Description
connection port	Set the parameter to the AI port for DRM signals.
Startup current range	If the current of the AI port is within the setting range, inverters are turned on. Otherwise, inverters are turned off.
Power Control	Set DI parameters based on the DRM requirements.

----End

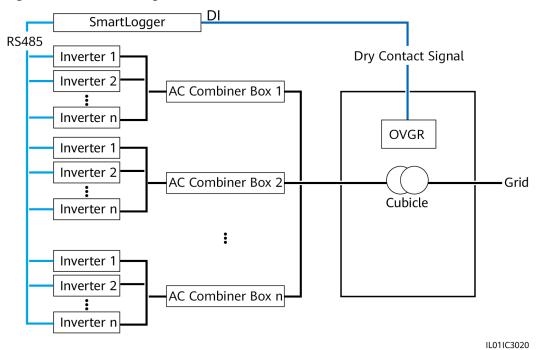
6.7.8 Setting Remote Shutdown

6.7.8.1 Setting Dry Contact Remote Shutdown

Context

The SmartLogger has four DI ports, and the OVGR can connect to any DI port. The SmartLogger shuts down the inverter over OVGR signals.

Figure 6-81 Networking



NOTICE

When setting this function, ensure that the user-defined DI port is not occupied. Otherwise, the setting will fail.

Procedure

Step 1 Set dry contact remote shutdown parameters.

Figure 6-82 Dry contact remote shutdown



IL04J00010

Parameter	Description
Access port	Set the parameter to the DI port connected to OVGR signals.
Effective dry contact status	The value can be Open or Close . NOTE If OVGR shutdown is enabled and this parameter is set to Close , the SmartLogger sends an inverter shutdown command only when the corresponding DI port is in the Close state.
OVGR shutdown	Specifies whether to enable shutdown over OVGR.
Cubicle alarm enabling	If this parameter is set to Enable , the Abnormal Cubicle alarm is generated when the dry contact signal is effective and the Cubicle is abnormal.

----End

6.7.8.2 Setting NS Protection Remote Shutdown

Context

- The NS protection function applies to areas complying with the VDE 4105 standard. Choose **Monitoring > Running Param. > Grid Parameters** and set **Grid Code** to **VDE-AR-N-4105** or **SWITZERLAND-NA/EEA:2020-LV230**.
- The NS protection device is connected to the Al1 port and 12V power output port. The SmartLogger shuts down the inverter over the voltage change detected at the Al1 port. When the NS protection device is disconnected, the Al1 port voltage is 0 V, and the inverter shuts down. When the NS protection device is connected again, the Al1 port voltage is 12 V, and you need to start the inverter manually.

GND GND COM₁ **NS Protection** S Modbus Modbus-Control Modbus Modbus-Control Modbus Modbus-Control RS485-2 RS485-RS485-2 RS485-1 RS485-2 RS485-Inverter 1 Inverter 2 Inverter n IL04P00006

Figure 6-83 Networking

Procedure

1. Set NS protection remote shutdown parameters.

Figure 6-84 NS protection remote shutdown



Parameter Description

Access port Set the parameter to Al1 port connected to Al signals. The SmartLogger shuts down the inverter over the voltage change detected at the A1 port.

- Set the protocol type of the RS485 communications parameters. Protocol of the COM1 port is set to Modbus by default, and that of the COM2 port should be set to Modbus-Control. Set Baud rate, Parity, Stop bit, Start address, and End address based on the actual situation.
 - a. If only one inverter is connected to the SmartLogger, connect the COM1 port on the SmartLogger to the RS485-1 port on the inverter, and connect the COM2 port on the SmartLogger to the RS485-2 port on the inverter.

b. If inverters are cascaded, connect the COM1 port on the SmartLogger to the RS485-1 port on the inverter, and connect the COM2 port on the SmartLogger to the RS485-2 port on the inverter. Connect the RS485-1 and RS485-2 ports on one inverter to the RS485-1 and RS485-2 ports on the other inverter, respectively.

Because there are many types of inverters, the RS485-1 port may be named RS485_1, 485B1, or 485A1. The RS485-2 port may be named RS485_2, 485B2, or 485A2.

Figure 6-85 Setting RS485 parameters



7 Device Maintenance

7.1 Routine Maintenance

- Ensure that the SmartLogger is free from strong electromagnetic interference.
- Ensure that the SmartLogger is away from heat sources.
- Regularly clean the SmartLogger.
- Regularly check that cables are secured.

7.2 Troubleshooting

No.	Fault	Cause	Suggestions
1	The SmartLogge r cannot be powered on.	The DC output power cable for the power adapter is not connected the 12V IN port of the SmartLogger.	Connect the DC output power cable for the power adapter to the 12V IN port of the SmartLogger.
		2. The power cable is not connected to the AC power input port of the power adapter.	2. Check that the power cable is connected to the AC power input port of the power adapter.
		3. The AC input power cable is not connected to the AC socket.	3. Check that the power cable is connected to the AC socket.
		4. The power adapter is faulty.	4. Replace the power adapter.
		5. The SmartLogger is faulty.	5. Contact the dealer or Huawei technical support.

No.	Fault	Cause	Suggestions
2	The SmartLogge r cannot find any device.	 The COM ports are not connected to devices, or the cables are loose, disconnected, or reversely connected. The RS485 communications parameters are not correctly set, and the solar inverter address is beyond the search range preset on the SmartLogger. The devices that cannot be detected automatically, such as the EMI and power meter, are not manually added. There are devices with duplicate addresses. The network port does not connect to any devices or the network cables are loose. 	 Check the RS485 cable connection. If the cable is loose, disconnected, or reversely connected, reconnect it firmly. Check the RS485 communications parameter settings. Ensure that the baud rate and communication address are set correctly and that the solar inverter address is within the search range of the SmartLogger. Manually add the devices that cannot be detected automatically, such as the EMI and power meter. Addresses are automatically assigned to all devices to ensure that no duplicate address exists. Then restart the automatic search. Check the network cable connection. If the cable is loose, reconnect it firmly. Contact the dealer or Huawei technical support.
3	The communicat ion for MBUS networking failed.	 The solar inverter and SmartLogger do not support MBUS. The AC power cable is loose, disconnected, or reversely connected. The upstream circuit breaker for the AC power cable is turned off. In MBUS networking, Built-in MBUS or Networking is set to Disable. The SmartLogger is faulty. 	 Check whether the solar inverter and SmartLogger support MBUS. Check the AC power cable. If it is loose, disconnected, or reversely connected, reconnect it firmly. Check that the upstream circuit breaker for the AC power cable is turned on. Set Built-in MBUS and Networking to Enable. Contact the dealer or Huawei technical support.

No.	Fault	Cause	Suggestions
4	The device status is displayed as disconnecte d on the SmartLogge r.	 The cable between the solar inverter and the SmartLogger is loose or disconnected. The solar inverter is powered off. The baud rate or RS485 address of the solar inverter is changed. The solar inverter is replaced. The solar inverter is removed and not reconnected. 	 Check the communications cable and network cable between the device and the SmartLogger. If the cables are loose, reconnect them firmly. Check the solar inverter connection and power on the solar inverter. Check that the baud rate and RS485 address of the solar inverter are set correctly. If any device is replaced, search for the device again or manually add the device. If the device has been removed, perform the Remove Devices operation on the Device Mgmt. page.
5	The EMI fails in communicat ion.	 The RS485 communications cable between the EMI and the SmartLogger is connected incorrectly, loose, or disconnected. The EMI is not powered on. The EMI and SmartLogger use different RS485 communications parameter settings. The EMI parameters are incorrectly set. 	 Check the cable connection. If the cable is loose or disconnected, reconnect it firmly. Power on the EMI. Check that the RS485 communications parameters of the EMI are correctly. Log in to the WebUI and ensure that the EMI parameters are set correctly.
6	The SmartLogge r cannot communicat e with the managemen t system.	 The SmartLogger is not connected to the PC, or the cable is loose or disconnected. The parameters of the wired or wireless network are incorrectly set. The management system parameters are incorrectly set. 	 Check that the Ethernet port of the SmartLogger is correctly connected to the PC or a router. Check that the parameters of the wired or wireless network are set correctly. Check that the management system parameters are correctly set.

No.	Fault	Cause	Suggestions
7	The communicat ion for RS485 networking	 The RS485 communications cable is incorrectly connected, loose, or disconnected. The SmartLogger is not powered on. 	Terminal block connection: Check that the RS485 communications cable is connected to the correct port of the terminal block.
	failed.	The RS485 communications parameters are incorrectly set.	2. RJ45 network port connection: Check that the RJ45 connector is properly crimped and that each wire is connected to the correct pin.
			3. Check that the RS485 ports of other devices are connected to the correct ports of the SmartLogger.
			4. Check the RS485 cable connection. If the cable is loose, disconnected, or reversely connected, reconnect it firmly.
			5. Power on the SmartLogger and its connected device.
			6. Check the RS485 communications parameter settings.
			7. Contact the dealer or Huawei technical support.
cor	The 4G communicat ion is abnormal.	 The SIM card is not inserted or it is in arrears or damaged. The 4G antenna is not tightened or is damaged. The management system parameters and wireless network parameters are incorrectly set. 	 Insert or replace the SIM card. Tighten or replace the 4G antenna.
	aonomia.		3. Check that the management system parameters and wireless network parameters are set correctly.
		4. The SIM card registration failed.	4. Contact the SIM card carrier or Huawei technical support.

7.3 Alarm List

Alarm ID	Alarm Name	Alarm Severity	Alarm Sub-ID	Cause	Suggestions
1100	1100 Active Power Scheduling Instruction Exception	Major	4	In DI active scheduling mode of the active power, the four DI ports read command combinations that are not configured.	 Check that cables are connected correctly to the DI ports. Enter the configuration page of the DI active scheduling mode for active power control, and view the current DI signal configuration mapping table. Contact the power grid company and verify that the combination configurations in the table are complete and meet the requirements of the company.
		Major	5	In the remote active power scheduling mode, the SmartLogger cannot receive the active power scheduling command, or the received active power scheduling command is abnormal.	 Check whether the communication network between the SmartLogger and the plant scheduling control system is normal. Check whether the active power scheduling commands received by the SmartLogger from the plant scheduling control system are correct, such as the command format and protocol type.
1101	Reactive Power Scheduling Instruction Exception	Major	4	In DI reactive scheduling mode of the reactive power, the four DI ports read command combinations that are not configured.	 Check that cables are connected correctly to the DI ports. Enter the configuration page of the DI reactive scheduling mode for reactive power control, and view the current DI signal configuration mapping table. Contact the power grid company and verify that the combination configurations in the table are complete and meet the requirements of the company.

Alarm ID	Alarm Name	Alarm Severity	Alarm Sub-ID	Cause	Suggestions
		Major	5	In the remote reactive power scheduling mode, the SmartLogger cannot receive the reactive power scheduling command, or the received reactive power scheduling command is abnormal.	 Check whether the communication network between the SmartLogger and the plant scheduling control system is normal. Check whether the reactive power scheduling commands received by the SmartLogger from the plant scheduling control system are correct, such as the command format and protocol type.
1103	General Circuit Breaker Disconnected	Major	1	The general circuit breaker at the grid connection point is disconnected.	Check whether the disconnection is a normal. If it is abnormal, contact service engineers to reconnect the circuit breaker.
1104	Abnormal Cubicle	Major	1	The Cubicle device has detected an exception at the grid connection 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 solar inverter.
1105	Device Address Conflict	Major	1	The communicati on address of the the current device conflicts with that of the device to be connected.	Change the local address or the address of the device to be connected.

Alarm ID	Alarm Name	Alarm Severity	Alarm Sub-ID	Cause	Suggestions
1106	AC SPD Fault	Major	1	The SPD in the smart array controller is faulty.	 Check whether the cable to the SPD in the smart array controller is loose, disconnected, or reversely connected. If so, reconnect the cable firmly. Check whether the SPD in the smart array controller is faulty. If so, replace the faulty SPD.
1107– 1114	DI1 user- defined alarm to DI8 user- defined alarm	Major	1	The dry contact signal from the peripheral to the corresponding DI port of the SmartLogger is abnormal.	 Check the DI port cable connection. If the cable is loose, disconnected, or reversely connected, reconnect it firmly. Check that the relevant device works properly.
1115	24 V Power Failure	Major	1	The 24 V power supply in the smart array controller is faulty.	 Check whether the cable to the 24 V power supply in the smart array controller is loose, disconnected, and connected in reverse. If so, reconnect the cable securely. Check whether the 24 V power supply in the smart array controller is faulty. Replace the faulty power module.
1116	WebUI Server Certificate Invalid	Warning	1	WebUI Server Digital Signature Certificate Invalid	Check the time or change the digital signature certificate.
1117	WebUI Server Certificate to Expire	Warning	1	WebUI Server Digital Signature Certificate to Expire	Change the digital signature certificate in time.
1118	WebUI Server Certificate Expired	Major	1	WebUI Server Digital Signature Certificate Expired	Change the digital signature certificate immediately.

Alarm ID	Alarm Name	Alarm Severity	Alarm Sub-ID	Cause	Suggestions
1119	License Expired	Warning	1	 The privilege license has entered the grace period. The privilege feature will be invalid soon. 	Apply for a new license and replace the current one.
1120	Management System Certificate Invalid	Warning	1	Management System Digital Signature Certificate Invalid	Check the time or change the digital signature certificate.
1121	Management System Certificate to Expire	Warning	1	Management System Digital Signature Certificate to Expire	Change the digital signature certificate in time.
1122	Management System Certificate Expired	Major	1	Management System Digital Signature Certificate Expired	Change the digital signature certificate immediately.
1123	Remote Output Control Certificate Invalid	Warning	1	Remote Output Control Digital Signature Certificate Invalid	Check the time or change the digital signature certificate.
1124	Remote Output Control Certificate to Expire	Warning	1	Remote Output Control Digital Signature Certificate to Expire	Change the digital signature certificate in time.

Alarm ID	Alarm Name	Alarm Severity	Alarm Sub-ID	Cause	Suggestions
1125	Remote Output Control Certificate Expired	Major	1	Remote Output Control Digital Signature Certificate Expired	Change the digital signature certificate immediately.
1126	Poverty Alleviation Monitoring Center Certificate Invalid	Warning	1	Poverty Alleviation Monitoring Center Digital Signature Certificate Invalid	Check the time or change the digital signature certificate.
1127	Poverty Alleviation Monitoring Center Certificate to Expire	Warning	1	Poverty Alleviation Monitoring Center Digital Signature Certificate to Expire	Change the digital signature certificate in time.
1128	Poverty Alleviation Monitoring Center Certificate Expired	Major	1	Poverty Alleviation Monitoring Center Digital Signature Certificate Expired	Change the digital signature certificate immediately.
1129	SmartLogger Certificate Invalid	Warning	1	The SmartLogger digital signature certificate is invalid.	Check the time or change the digital signature certificate.
1130	SmartLogger Certificate About to Expire	Warning	1	The SmartLogger digital signature certificate is about to expire.	Change the digital signature certificate in time.

Alarm ID	Alarm Name	Alarm Severity	Alarm Sub-ID	Cause	Suggestions
1131	SmartLogger Certificate Expired	Major	1	The SmartLogger digital signature certificate has expired.	Change the digital signature certificate immediately.
1132	Storage not Match Alarm	Major	1	There exists a Smart Battery ESC that is not completely connected to the DC bus.	 Referring to the cable connection check topology view, locate the Smart Battery ESC that has the cabling problem. Turn off the battery input switch, the DC and AC switches in the LV panel. Wait for 5 minutes. Verify that no electricity is present using a multimeter before checking the DC bus cable connection of the battery.
1133	SDS bracket uncontroled	Major	1	One or more trackers in the array are not controlled by the smart tracking algorithm.	 Check the following items: Whether the communication link between the SmartLogger and the TCU is normal. Whether the tracker settings are correct. Whether the TCU is running normally. If the preceding items are normal, contact the vendor.
1134	PCS not Match Alarm	Major	1	There exists a Smart Battery PCS that is not completely connected to the DC bus.	 Referring to the cable connection check topology view, locate the Smart Battery PCS that has the cabling problem. Turn off the battery input switch, the DC and AC switches in the LV panel. Wait for 5 minutes. Verify that no electricity is present using a multimeter before checking the DC bus cable connection of the battery.

Alarm ID	Alarm Name	Alarm Severity	Alarm Sub-ID	Cause	Suggestions
1135	The SDS license capacity is insufficient	Major	1	The license capacity of the smart tracker is insufficient.	Contact your dealer to apply for a license file and reload the license file. Ensure that the license capacity of the intelligent tracing algorithm is greater than or equal to the actual rated power of the subarray.
1136	Abnormal communicati ons	Major	1	The communicati ons cable is abnormal.	Stop the cable connection check, turn off the DC and AC switches in the power distribution cabinet. Wait for 5 minutes. Verify that no electricity is present with a multimeter before checking the FE communications cable connection.
1251	SmartModule Certificate Invalid	Warning	1	The SmartModule digital signature certificate is invalid.	Check the time or change the digital signature certificate.
1252	SmartModule Certificate About to Expire	Warning	1	The SmartModule digital signature certificate is about to expire.	Change the digital signature certificate in time.
1253	SmartModule Certificate Expired	Major	1	The SmartModule digital signature certificate has expired.	Change the digital signature certificate immediately.
1140	Black Start Fail	Minor	1	The black start command is not delivered in the correct time sequence.	The sequence of the black start instructions does not comply with the black start implementation of the array. Contact the microgrid controller vendor to correct the sequence of black start instructions.

Alarm ID	Alarm Name	Alarm Severity	Alarm Sub-ID	Cause	Suggestions
		Minor	2	The array running status does not meet the condition for a black start.	The current running status of the array does not meet the conditions for a black start. Before black start, the devices in the array must be shut down. You need to issue a shutdown command to the array.
		Minor	3	No available ESS.	 Check the auxiliary power supply to the CMU in the ESS. Check whether the communication between the ESS and the SmartLogger is normal.
		Minor	4	The ESS does not support black start.	Check whether the models and software versions of all ESSs in the array support black start. If the software version does not meet the requirement, upgrade the ESS software.
		Minor	5	The PCS does not support black start.	Check whether the models and software versions of all PCSs in the array support black start. If the software version does not meet the requirement, upgrade the PCS software.
		Minor	6	The black start of the ESS failed.	 Check whether the communication between the ESS and the SmartLogger is normal. View the ESS alarms of the array, determine the failure cause, and rectify the fault according to the corresponding handling suggestions.

Alarm ID	Alarm Name	Alarm Severity	Alarm Sub-ID	Cause	Suggestions
		Minor	7	No available PCS.	Check whether the DC cable connection of the PCS is normal.
					2. Check whether the connection box switch on the DC side of the PCS is turned on.3. Check whether the communication between the
					PCS and the SmartLogger is normal.
		Minor	8	The black start of the PCS failed.	Check the PCS device alarms and handle them based on the alarm clearance suggestions.

7.4 WebUI Maintenance Operations

7.4.1 Upgrading the Device Firmware Version

Context

You can upgrade the software of the SmartLogger, inverter, Smart PCS, Smart String ESS, MBUS module, or PID module on the WebUI.

Procedure

Step 1 Perform an upgrade.

Figure 7-1 Upgrade



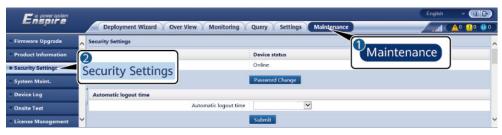
■ NOTE

- The **Stop Upgrade** function applies only to the devices waiting to be upgraded.
- If the active power control mode is set to **Grid connection with limited power** or **Remote communication scheduling**, and the reactive power control mode is set to **Power factor closed-loop control** or the working mode of **Battery Control** is enabled, you are advised to upgrade software when inverters and Smart PCSs are disconnected from the grid. Otherwise, power control may be abnormal or the upgrade may fail.

----End

7.4.2 Setting Security Parameters

Figure 7-2 Security settings



IL03J00038

Parameter	Description
Change Password	Change the password for the current login user to log in to the WebUI.
Automatic logout time	After this parameter is set, a user is automatically logged out if the user does not perform any operation within the period specified by this parameter.
WebUI Security Certificate	You are advised to use the existing network security certificate and key.
Update Key	Update the key for saving the password.
SmartModule Security Certificate	Load the network security certificate of the SmartModule.
	If the private key file has a password, select Enable key password and enter the key password obtained from the certificate provider.
SmartModule Communication Setting	Specifies whether to enable communication using an expired certificate.
	If this parameter is set to Enable , the SmartLogger can communicate with the SmartModule. After the certificate expires, set this parameter to Disable to prevent the SmartLogger from communicating with the SmartModule to ensure network security.
WEB TLS Setting ^[1]	Enables or disables the TLS1.0 and 1.1 function.

Parameter	Description			
Digital Signature Verification	If this parameter is set to Enable , the upgrade package must contain the digital signature file and the upgrade package must not be modified.			
	 If this parameter is set to Disable, the digital signature of the upgrade package is not verified. 			
Intrusion Detection If this parameter is set to Starting up , when intrusion events such as abnormal user login and key file tampering are detected, you can choose Query > Security Events to query the exception records.				
Note [1]: This parameter	Note [1]: This parameter can be set only for V300R001C00 version.			

7.4.3 Sending a System Maintenance Command





Function	Description
Reset System	Resets the SmartLogger, which will automatically shut down and restart.
Restore Factory Settings	Only accounts with the administrator permission (installer) can restore the factory settings.
	 After the factory settings are restored, all configured parameters (except the current date, time, and communication parameters) are restored to their factory default values. The running information, alarm records, and system logs are not changed. Exercise caution when deciding to perform this operation.
Clear Data	Clears all historical data of the SmartLogger.
Full profile export	Before replacing the SmartLogger, export the SmartLogger configuration file to a local PC.

Function	Description
Full profile import	After replacing the SmartLogger, import the local configuration file to the new SmartLogger. After the import is successful, the SmartLogger restarts for the configuration file to take effect. Ensure that the parameters on the Settings tab page and the parameters for the built-in MBUS are correctly set.
Clear Cache	You can clear the temporary files and upgrade package files stored on the SmartLogger through Clear Cache.

7.4.3.1 Exporting Full Configuration Files

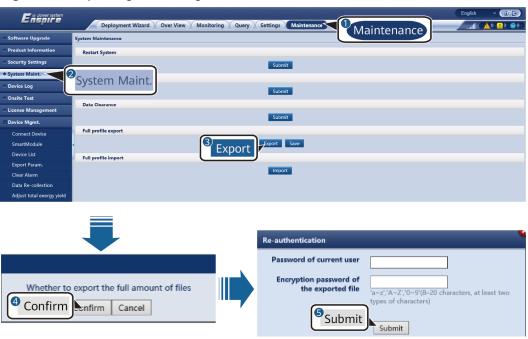
Procedure

1. Choose **Maintenance > System Maint.** and click **Export** under **Full profile export**.

□ NOTE

During the export of the full configuration files, you need to enter **Password of the current user** and set **Encryption password of the exported file** in the **Reauthentication** dialog box.

Figure 7-4 Exporting full configuration files



 After the export is successful, click Confirm. Click Save under Full profile export to save the full configuration files.

7.4.3.2 Importing Full Configuration Files

Procedure

 Choose Maintenance > System Maint. and click Import under Full profile import.

□ NOTE

During the import of the full configuration files, you need to enter **Password of the current user** and **Decryption password of the imported file** in the **Reauthentication** dialog box.

NOTICE

- If Encryption password of the exported file has not been set for the
 exported full configuration files, deselect Decryption password of the
 imported file in the Re-authentication dialog box when importing the
 files.
- If Encryption password of the exported file has been set for the exported full configuration files, you need to set Decryption password of the imported file in the Re-authentication dialog box when importing the files.
- When a faulty SmartLogger3000 is replaced, certificate-related files are not exported. After the full configuration files are imported, you need to reload a third-party certificate if required.

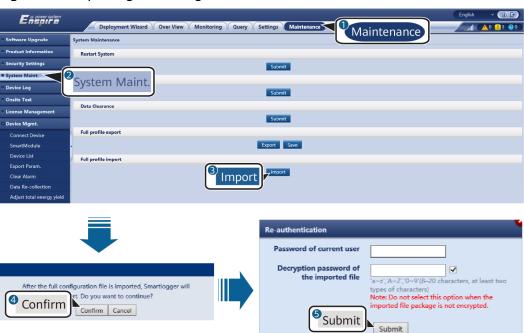


Figure 7-5 Importing full configuration files

2. Click Choose File, select all exported files, and click Import.

7.4.4 Exporting Device Logs

Procedure

Step 1 Access the device log page.

Figure 7-6 Exporting logs



Step 2 Select the device whose logs are to be exported and click **Export Log**.

- Logs of two or more types of devices cannot be exported at a time. For example, you cannot select both SUN2000 and MBUS.
- Logs can be exported for a maximum of six devices of the same type at a time.
- Battery Log: Select the device and click **Export Log**. On the Select Upload File Type dialog box that is displayed, select **Battery logs**. You can click the plus sign to select batteries.
- If the active power control mode is set to Grid connection with limited power or Remote
 communication scheduling, and the reactive power control mode is set to Power factor
 closed-loop control or the working mode of Battery Control is enabled, you are advised to
 export logs when inverters and Smart PCSs are disconnected from the grid. Otherwise, power
 control may be abnormal or the log export may fail.
- For an STS connected over RS485, only performance data can be exported, and device logs cannot be exported.
- **Step 3** Observe the progress bar and wait until the log export is complete.
- **Step 4** After the export is successful, click **Log archiving** to save the logs.

----End

7.4.5 Starting an Onsite Test

Context

After an inverter is put into use, you need to periodically check its health to detect potential risks and problems.

Procedure

Step 1 Start an onsite test.

Figure 7-7 Onsite test



IL03J00041

Tab	Function	Operation Description
Inspection	Check the health status of the inverter.	If Single Inspection is selected, select the device to be inspected. If Batch Inspection is selected, you do not need to select a device.
		2. Set Inspection type.
		3. Click Start Inspection .
		4. Observe the progress bar and wait until the inspection is complete.
		5. After the inspection is successful, click Log archiving to download the inspection log.
Spot-check	Start a spot-check.	1. Select the device to be spot-checked.
	NOTE	2. Click Start Spot-Check.
	The spot-check function is available only for a device whose grid code is set to the Japanese standard.	3. Perform a spot-check test onsite.
		4. After the spot-check test is complete, click Stop Spot-Check .
Alarm Test	Simulates an inverter alarm.	Choose Device model > Device name to select the device for which the alarm test is to be performed.
JPH0, SUN2000-501 63KTL-JPM0, SUN2000-125 JPH0 support	SUN2000-63KTL- JPH0, SUN2000-50KTL/ 63KTL-JPM0, and	Click an alarm name to deliver an alarm command. The alarm icon is green by default and turns red after the command is delivered.
	SUN2000-125KTL- JPH0 support the alarm test function.	3. Click Clear Alarm to clear all alarms of the SUN2000-63KTL-JPH0, SUN2000-50KTL/63KTL-JPM0, and SUN2000-125KTL-JPH0.
		NOTE After the alarm is cleared, the SmartLogger collects alarm data again.

----End

7.4.6 Managing Licenses

Context

- The smart I-V curve diagnosis, smart PV string monitoring, smart tracking algorithm, and smart reactive power compensation functions can be used only after a license is purchased.
- The license files for smart I-V curve diagnosis and smart PV string monitoring need to be stored in the solar inverter, and the license files for smart tracking algorithm and smart reactive power compensation need to be stored in the SmartLogger. The matching between the SN of a device and a license is unique.

- License management allows you to view the license information about the solar inverter and obtain the current license status. Before a device is replaced, the current device license needs to be revoked so that the revocation code can be generated and used for applying for a new device license.
- The size of the license file imported to the SmartLogger must be less than 1 MB. Otherwise, the page will be abnormal.

Procedure

Step 1 Access the license management page.

Figure 7-8 License management



IL03J00042

Tab	Function	Operation Description
License information	Views the license information.	 Select the name of the device whose license details are to be exported. Click Export Details.
License application	Exports the license application file.	 Select the name of the device for which you want to apply for a license. Click Export License Appli File. Purchase a license from Huawei and obtain the license file from Huawei technical support engineers.
License loading	Loads the obtained license to the corresponding device.	 Click Upload License. Select the name of the device whose license is to be loaded. Click Load License.
License revocation	Revokes a license or exports the revocation code file.	 Select the name of the device whose license is to be revoked. Click Revoke License. Click Export Revo Code File.

Ensure that the extension of the license file to be imported is .dat or .zip.

----End

7.4.7 Managing the SmartModule

Context

When replacing the SmartModule, you need to manually remove the device on the WebUI.

Procedure

- 1. Choose Maintenance > Device Mgmt. > SmartModule.
- 2. Select the device to be removed and click to remove it.
 - **◯** NOTE

is used to change the secondary authentication password of the SmartModule.

7.4.8 Managing Users

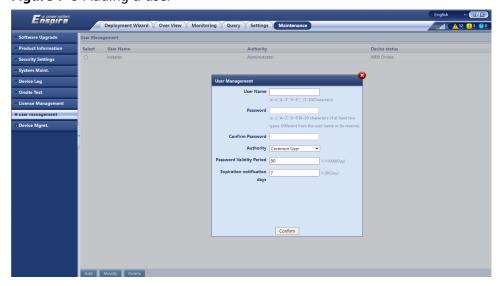
Context

- After the SmartLogger is upgraded from V300R001C00, **installer** has the administrator permission, and **admin** becomes an advance user.
- You can add, modify, and delete users after logging in as installer.

Procedure

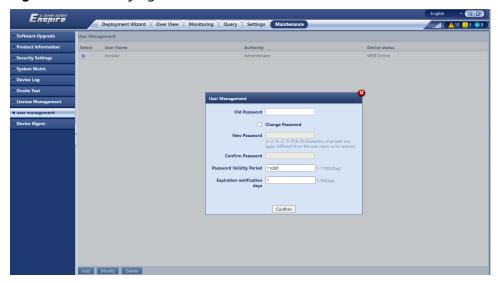
Step 1 Add a user.

Figure 7-9 Adding a user



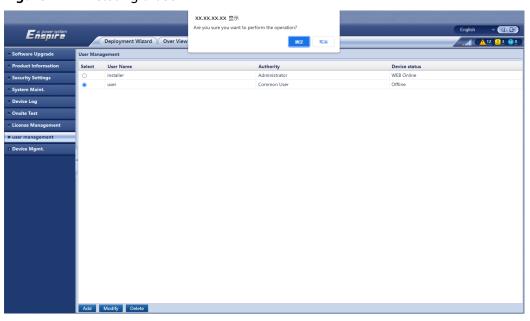
Step 2 Modify a user.

Figure 7-10 Modifying a user



Step 3 Delete a user.

Figure 7-11 Deleting a user



----End

7.4.9 Collecting Performance Data

Context

You can re-collect performance data of the solar inverter, Smart PCS, CMU, and ESU as well as daily, monthly, and yearly energy yields (also referred to as data re-collection).

Procedure

- **Step 1** Choose **Maintenance** > **Device Mgmt.** > **Data Re-Collection**.
- **Step 2** Select the type of the data to be collected and set the collection period.
- **Step 3** Select the name of the device whose data is to be collected and click **Collect Data**.
- **Step 4** Wait until all data is gathered. On the **Monitoring** page, query the collection result.

----End

7.4.10 Adjusting the Total Energy Yield

This section applies to V300R001C00.

Procedure

- Step 1 Choose Maintenance > Device Mgmt. > Adjust total energy yield.
- **Step 2** Set **Adjust total energy yield(kWh)**, select the name of the device whose total energy yield needs to be adjusted, and click **Submit**.

----End

7.4.11 Force Start

This section does not apply to V300R001C00.

Context

- The force start function is mainly used in the scenario where the ESS cannot be deployed due to long-time low battery voltage and batteries need to be charged.
- During the force start operation, each Smart PCS charges the ESS at 50 kW power. Ensure that the AC power meets the requirement. If the AC power is restricted, you are advised to charge the ESS in batches and disconnect the auxiliary power supply and power circuits of the devices that do not need to be charged.
- When you force start the ESS, the ESS functions are restricted because no deployment operation is performed. In this case, the ESS supports only battery charging and cannot be scheduled by the upper-layer controller.

Procedure

Step 1 Choose **Maintenance** > **Device Mgmt.** > **Force Start** and click **Starting up**. This operation will interrupt ongoing services in the array. Exercise caution when performing this operation.

□ NOTE

- The array-level force start operation lasts 180 minutes. The SmartLogger needs to maintain the array-level force start state. The default status is idle. After a force start task is started, the SmartLogger periodically collects the SOC value of each battery rack. If the SOC value is lower than 50%, the SmartLogger remains in the **Force starting...** state. If the SOC value of each battery rack exceeds 50% or the protection duration for force start exceeds the upper limit, the SmartLogger restores the force start state to idle.
- You can stop a force start task. In this case, devices in the array stop force start and
 return to the original status. If the system does not need to be started, shut down the
 system.
- After an array-level force start task is started, if new devices are connected and cannot
 be automatically started or some devices restart, the SmartLogger delivers a force start
 command at an interval of 5 minutes to ensure that the devices can identify the force
 start state.

----End

7.5 Device Replacement

7.5.1 Exporting Configuration Files from the SmartLogger WebUI

- **Step 1** Before replacing the SmartLogger, export its configuration files to a local PC. Perform operations by referring to **7.4.3.1 Exporting Full Configuration Files**.
- **Step 2** Power off the SmartLogger, remove its cables, and label the cables.
- **Step 3** Install a new SmartLogger, reconnect the cables, and power on the SmartLogger.
- **Step 4** Log in to the WebUI and import the exported configuration files from the local PC to the new SmartLogger. Perform operations by referring to **7.4.3.2 Importing Full Configuration Files**.
- **Step 5** After the import is successful, the SmartLogger restarts for the configuration files to take effect. Ensure that the parameters on the settings tab page and the parameters for the built-in MBUS are correctly set.

----End

7.5.2 Exporting Configuration Files from the SUN2000 App

NOTICE

Do not power off the SmartLogger3000 when exporting all configuration files.

- **Step 1** Before replacing the SmartLogger, export its configuration files to a USB flash drive.
 - 1. Insert the USB flash drive into the USB port at the bottom of the SmartLogger3000.
 - 2. Run the SUN2000 app and select a connection mode. On the operation screen, tap **Manual connection**, and select **WLAN**. The initial name of the



□ NOTE

Use the initial password **Changeme** of the WLAN hotspot for the first login and change it immediately after login. To ensure account security, protect the password by changing it periodically, and keep it secure. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, devices cannot be accessed. In these cases, the Company shall not be liable for any loss caused to the plant.

3. After connecting the WLAN, log in to the device and access the main menu screen.

- When you log in to the device for the first time, set the login password. To ensure account security, protect the password by changing it periodically, and keep it secure. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, devices cannot be accessed. In these cases, the Company shall not be liable for any loss caused to the plant.
- You will be locked out for 10 minutes after five consecutive failed password attempts (the interval between two consecutive entries is less than 2 minutes).
- 4. Choose Maintenance > Export All Files, set Encryption password of the exported file, and tap Confirm to export the configuration files.
- 5. After the export is complete, tap **OK** and remove the USB flash drive.
- **Step 2** Power off the SmartLogger, remove its cables, and label the cables.
- **Step 3** Install a new SmartLogger, reconnect the cables, and power on the SmartLogger.
- **Step 4** Run the SUN2000 app, log in to the new device, and import the configuration files.
 - 1. Insert the USB flash drive into the USB port at the bottom of the new SmartLogger3000.
 - 2. Start the SUN2000 app and log in to the new device. On the operation screen, tap **Manual connection**, and select **WLAN**. The initial name of the WLAN hotspot is **Logger-SmartLogger SN**. You can view the device SN on the SmartLogger3000 label.

Use the initial password **Changeme** of the WLAN hotspot for the first login and change it immediately after login. To ensure account security, protect the password by changing it periodically, and keep it secure. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, devices cannot be accessed. In these cases, the Company shall not be liable for any loss caused to the plant.

3. After connecting the WLAN, log in to the device and access the main menu screen.

□ NOTE

- When you log in to the device for the first time, set the login password. To ensure
 account security, protect the password by changing it periodically, and keep it
 secure. Your password might be stolen or cracked if it is left unchanged for
 extended periods. If a password is lost, devices cannot be accessed. In these cases,
 the Company shall not be liable for any loss caused to the plant.
- You will be locked out for 10 minutes after five consecutive failed password attempts (the interval between two consecutive entries is less than 2 minutes).
- 4. Choose Maintenance > Import All Files, enter Decryption password of the imported file, and tap Confirm to import the configuration files.
- 5. After the import is complete, tap **OK** and remove the USB flash drive.
- **Step 5** After the import is successful, the SmartLogger restarts for the configuration files to take effect. Ensure that the parameters on the settings tab page and the parameters for the built-in MBUS are correctly set.

----End

7.6 Device Disposal

If the service life of the SmartLogger expires, dispose of the SmartLogger according to the local disposal act for waste electric appliances.

8 FAQ

8.1 How Do I Connect the SmartLogger to the SUN2000 App or FusionSolar App?

Prerequisites

- The SmartLogger has been powered on.
- The WLAN function has been enabled on the SmartLogger.

◯ NOTE

- By default, WLAN is set to OFF in idle state.
- When **WLAN** is set to **OFF in idle state**, the WLAN function is available within 4 hours after the SmartLogger is powered on. In other cases, hold down the RST button (for 1s to 3s) to enable the WLAN function.
- If WLAN is set to Always OFF, choose Settings > Wireless Network on the SmartLogger WebUI and set WLAN to Always ON or OFF in idle state.
- The FusionSolar app is recommended when the SmartLogger is connected to the FusionSolar hosting cloud. The SUN2000 app is recommended when the SmartLogger is connected to other management systems.
- The SUN2000 app or FusionSolar app has been installed on the mobile phone.

Context

- The SUN2000 app or FusionSolar app communicates with the SmartLogger through the WLAN to provide functions such as alarm query, parameter settings, and routine maintenance.
- Mobile phone operating system: Android 4.0 or later
- Access the Huawei app store (https://appstore.huawei.com), search for SUN2000 or FusionSolar, and download the app installation package.

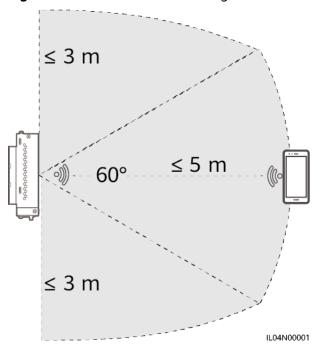


Figure 8-1 WLAN connection range

Procedure

Step 1 Log in to the app.

- (Connecting the SmartLogger to the FusionSolar Hosting Cloud) Open the FusionSolar app, log in to intl.fusionsolar.huawei.com as installer account, and choose Me > Device commissioning to connect to the WLAN hotspot of the SmartLogger.
- 2. (Connecting the SmartLogger to Other Management Systems) Open the SUN2000 app and connect to the WLAN hotspot of the SmartLogger.
- 3. Select **installer** and enter the login password.
- 4. Tap **Log in** and go to the **Quick Settings** screen or **SmartLogger** screen

□ NOTE

- The screenshots in this document correspond to the FusionSolar app version 6.22.10.118 (Android) and SUN2000 app version 6.22.10.117 (Android).
- The initial WLAN hotspot name of the SmartLogger is **Logger_5N** and the initial password is **Changeme**. The SN can be obtained from the SmartLogger label.
- The initial passwords of **installer** and **user** are both **00000a** for the SUN2000 app and FusionSolar app device commissioning.
- 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,
 the device cannot be accessed. In these cases, the user is liable for any loss caused to
 the PV plant.
- If the SmartLogger is powered on for the first time or the factory defaults are restored and parameter configuration is not performed on the WebUI, the quick settings screen is displayed after you log in to the app. You can set parameters based on site requirements.

Connection record

Shart copper 3000

Connection record

Shart copper 3000

Connection record

Sync phone time

Sync phone time

Cancel

Log in

Cancel

Cancel

Cancel

Connections

Con

Figure 8-2 Logging in to the app

----End

8.2 How Do I Set FTP Parameters?

Context

- The FTP function is used to access a third-party NMS. The SmartLogger can report the configuration information and running data of the managed PV plant system through FTP. A third-party NMS can access Huawei devices after being configured.
- FTP is a universal standard protocol without any security authentication mechanism. Data transmitted by FTP is not encrypted. To reduce network security risks, the IP address of the connected third-party FTP server is left blank by default. This protocol can transmit the running data of PV plants, which may cause user data breach. Therefore, exercise caution when using this protocol. Users are liable for any loss caused by the enabling of the FTP protocol (non-secure protocol). Users are advised to take measures at the PV plant level to reduce security risks, or use Huawei management system to mitigate the risks.

Procedure

Step 1 Choose **Settings > Comm. Param. > FTP**, set FTP parameters, and click **Submit**.

Parameter	Description
FTP server	Set this parameter to the domain name or IP address of the FTP server.
User name	Set this parameter to the user name for logging in to the FTP server.
Password	Set this parameter to the password for logging in to the FTP server.
Remote directory	After you set this parameter, a subdirectory of the same name is created in the default data upload directory (specified by the FTP server).

Parameter	Description
Data export	Specifies whether data can be reported.
File format	Format 1, Format 2, Format 3, and Format 4 are supported. NOTE Format 2 has two more information points than Format 1: E-Day (current-day energy yield) and E-Total (total energy yield). Format 3 has more information points than Format 1 and Format 2: power meter, PID module, user-defined device, and SmartLogger data. Format 4 has more information points than Format 3: active and reactive power of power meters.
File name	Set this parameter to the format of the file name.
Time format	Set this parameter to the time format.
Export mode	 Cyclic: Periodically reports data. Export interval specifies the period for reporting data. File mode specifies whether all data or only the incremental data of a day is reported each time. Fixed time: Reports data at a specified time. Fixed time specifies the time for reporting data.

◯ NOTE

You can click **Start report test** to check whether the SmartLogger can report data to the FTP server.

----End

Troubleshooting

NOTICE

If the error code is not listed in the following table, provide SmartLogger run logs and contact Huawei technical support.

Error Code	Troubleshooting Suggestion	Error Code	Troubleshooting Suggestion
0x1002	Configure the FTP server address.	0x1003	Check whether the DNS server address is correctly configured.
			2. Check whether the domain name of the third-party FTP server is correctly configured.

Error Code	Troubleshooting Suggestion	Error Code	Troubleshooting Suggestion
0x1004	Configure the user name of the FTP account.	0x1005	Configure the user name of the FTP account.
0x3001	Check whether the FTP server address is correctly configured.	0x3002	Check whether the user name of the FTP account is correctly configured.
	Check whether the third- party FTP server is working properly.		2. Check whether the password of the FTP account is correctly configured.
0x3007	Check whether the third-party FTP server allows the client to upload data.	0x3008	Ensure that the SmartLogger data upload directory exists on the third-party FTP server.
Other Codes	Provide SmartLogger run logs and contact Huawei technical support.	N/A	N/A

8.3 How Do I Set Email Parameters?

Context

- The SmartLogger can send emails to inform users of the current energy yield information, alarm information, and device status about the PV plant system, helping users know the running conditions of the PV plant system in time.
- When using this function, ensure that the SmartLogger can connect to the configured email server and the Ethernet parameters and email parameters are correctly set for the SmartLogger.

Procedure

Step 1 Choose **Settings > Comm. Param. > Email**, set Email parameters, and click **Submit**.

Parameter	Description
SMTP server	Set this parameter to the domain name or IP address of the SMTP server.
Encryption mode	Set this parameter to the email encryption mode.
SMTP port	Set this parameter to the email sending port.
User name	Set this parameter to the user name for logging in to the SMTP server.
Password	Set this parameter to the password for logging in to the SMTP server.
Email language	Set this parameter to the language for sending emails.

Parameter	Description
Send address	Set this parameter to the email address for sending emails.
Receive address N NOTE N is 1, 2, 3, 4, or 5.	Set this parameter to the email address for receiving emails.
Yield	Specifies whether to send energy yield data by email and the time for sending emails.
Alarms	Specifies whether to send alarms by email and the severity of the alarms to be sent.

◯ NOTE

You can click **Send test mail** to check whether the SmartLogger can successfully send emails to users.

----End

Troubleshooting

NOTICE

If the error code is not listed in the following table, provide SmartLogger run logs and contact Huawei technical support.

Error Code	Troubleshooting Suggestion	Error Code	Troubleshooting Suggestion
0x2002	 Check whether the DNS server address is correctly configured. Check whether the domain name and the IP address of the SMTP server are correct. Check whether the network communication between the management system and the DNS server is normal. 	0x2003	Try again later. Check whether the domain name and the IP address of the SMTP server are correct.

Error Code	Troubleshooting Suggestion	Error Code	Troubleshooting Suggestion
0x200b	 Check whether the DNS server address is correct. Check whether the domain name and the IP address of the SMTP server are correct. 	0x4016	 Try again later. Check whether the DNS server address is correctly configured. Check whether the domain name and the IP address of the SMTP server are correct.
0x406e	Confirm the encryption mode and port supported by the email box, and check whether they are correct.	0x8217	 Check whether the user name and password are correct. Log in to the email box of the email sender and start the SMTP service. Log in to the email box of the email sender and start the third-party client license code function.
0xa003	Check whether the domain name and the IP address of the SMTP server are correct.	0xa005	Enter the user name correctly.
0xa006	Enter the password correctly.	0xe002	Configure the domain/IP of the SMTP server correctly.
0xe003	Configure the addresses for sending and receiving emails correctly.	Others	Please provide SmartLogger running logs and contact Huawei Service Center.

8.4 How Do I Change the SSID and Password of the Built-in WLAN?

Procedure

Step 1 Choose **Settings** > **Wireless Network**, set parameters for the built-in WLAN, and click **Submit**.

Parameter	Description
WLAN	Specifies the status of the built-in WLAN.
	Always ON: The WLAN module is powered on.
	 OFF in idle state: The WLAN module is automatically powered off when idle. You can hold down the RST button for 1s to 3s to power on the WLAN module and wait for connecting to the SUN2000 app. If the SUN2000 app is not connected, the WLAN module is automatically powered off after it is powered on for 4 hours.
	 Always OFF: The WLAN module is not powered on and cannot be powered on by holding down the button.
SSID	Specifies the name of the built-in WLAN.
	 The default name of the built-in WLAN is Logger_SN.
Password	Specifies the password for accessing the built-in WLAN.
	 The initial password of the built-in WLAN is Changeme.
	 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, the device needs to be restored to factory settings. In these cases, the user is liable for any loss caused to the PV plant.

----End

8.5 How Do I Use DI Ports?

- The SmartLogger provides four DI ports, which support DI active scheduling, DI reactive scheduling, DRM, remote shutdown, and input of correlated alarms.
- For details about DI active scheduling, DI reactive scheduling, DRM and remote shutdown, see **6.7 Power Grid Scheduling**.

NOTICE

Before setting the corresponding function, ensure that the DI port is not set for other purposes. Otherwise, the setting will fail.

Alarm Input

When a valid level is delivered into a DI port, an alarm is raised. You can set the alarm name and severity.

Step 1 Choose **Settings** > **DI** and associate alarms with DI ports.

Parameter	Description
Activation status	If this parameter is set to Activated for a DI port, you can set the function of the DI port. Otherwise, you cannot set the function of the DI port.
Dry contact status	Specifies the valid input status of a DI port.
Alarm generation	Specifies whether to allow alarm generation.
Alarm severity	Specifies the alarm severity.
Trigger shutdown	Specifies whether to deliver a solar inverter remote shutdown command.
Trigger startup	Specifies whether to deliver a solar inverter remote startup command.
Alarm name	Specifies the alarm name.
Startup delay	Specifies the delay time for the automatic startup of the solar inverter after Trigger startup is set to Enable .

----End

8.6 How Do I Use DO Ports?

The SmartLogger provides two DO ports, which support the reset of external routers, audible and visual alarming for grounding faults, and output of correlated alarms.

NOTICE

Before setting the corresponding function, ensure that the DO port is not set for other purposes. Otherwise, the setting will fail.

Resetting an External Router

Connect one DC power cable of the 3G router to a DO port on the SmartLogger, and power on or off the wireless module by connecting or disconnecting the DO dry contact to control the reset of the 3G router.

Step 1 Cut off a DC power cable of the router, and connect the DC power cable to a DO port on the SmartLogger.

Adapter DC Power Cable

AC Input

JU04/00001

Figure 8-3 Connecting to a DO port

Step 2 Choose **Settings** > **Other parameters** and set **Reset the external router** to the DO port.

----End

Audible and Visual Alarm for Grounding Fault

Connect one DC power cable of the audible and visual alarm to a DO port on the SmartLogger, and power on or off the audible and visual alarm by connecting or disconnecting the DO dry contact to implement audible and visual alarming for grounding faults.

- **Step 1** Connect one DC power cable of the audible and visual alarm to the DO port (COM/NO) on the SmartLogger.
- **Step 2** Choose **Settings** > **Alarm Output** and associate **Low Insulation Resistance** with the DO port.

----End

Alarm Output

After a solar inverter alarm is associated with a DO port, the alarm signal is delivered from the DO port when the solar inverter raises the alarm.

Step 1 Choose **Settings** > **Alarm Output** and associate solar inverter alarms with the DO port.

If the SmartLogger is restarted or powered off after the function is enabled, the DO port status may change and the alarm output may be abnormal.

----End

8.7 How Do I Use the USB Port?

The SmartLogger has a USB port, which provides 5 V/1 A power supply.

• The USB port can connect to a 3G router to supply power to the router, and the power supply of the USB port is disconnected when communication is disconnected, implementing 3G router reset control.

NOTICE

If the maximum operating current of the 3G router is greater than 1 A, it cannot be connected through the USB port.

• The USB port can connect to a USB flash drive for local maintenance, device log export, and device upgrade.

Ⅲ NOTE

It is recommended that you use a SanDisk, Netac, or Kingston USB flash drive to ensure compatibility.

Connecting to a 3G Router

If the DC power cable of the 3G router has a standard USB connector with the maximum operating current of less than 1 A, it can be directly connected to the USB port on the SmartLogger.

- **Step 1** Connect the USB connector of the DC power cable for the 3G router to the USB port on the SmartLogger.
- **Step 2** If you need to use the reset function of the external router, choose **Settings** > **Other Parameters** and set **Reset the external router** to **USB**.

----End

Connecting to a USB Flash Drive for Local Maintenance

- **Step 1** Insert the USB flash drive into the USB port at the bottom of the SmartLogger.
- **Step 2** Log in to the app as **installer**, choose **More** > **System Maintenance** on the SmartLogger screen, and perform the local maintenance.

Local Maintenance	Description	Prerequisites
Offline Configuration	After the power station deployment configuration file is imported through Offline Configuration, the SmartLogger automatically completes the deployment configuration.	The power station deployment configuration file has been saved in the root directory of the USB flash drive.

Local Maintenance	Description	Prerequisites
Exporting All Files	Before replacing the SmartLogger, export the SmartLogger configuration file to a local PC.	N/A
Importing All Files	After replacing the SmartLogger, import the local configuration file to the new SmartLogger. After the import is successful, the SmartLogger restarts for the configuration file to take effect. Ensure that the parameters on the Settings tab page and the parameters for the built-in MBUS are correctly set.	All exported files have been saved in the root directory of the USB flash drive.

Step 3 After the local maintenance is complete, remove the USB flash drive.

NOTICE

After files are imported, the SmartLogger automatically restarts.

----End

Connecting to a USB Flash Drive to Export Device Logs

- **Step 1** Connect the USB flash drive to the USB port on the SmartLogger.
- **Step 2** Log in to the app as **installer**, choose **More** > **Device Logs**, select the device whose logs you want to export, and tap **Next**.
- **Step 3** Select the types of logs to be exported and tap **Confirm** to start exporting device logs.
- **Step 4** After the logs are exported, remove the USB flash drive.

----End

Connecting to a USB Flash Drive for Device Upgrade

You can upgrade the SmartLogger, solar inverter, MBUS module, or PID module using a USB flash drive.

Step 1 Save the device upgrade package to the USB flash drive.

Do not decompress the upgrade package.

- **Step 2** Connect the USB flash drive to the USB port on the SmartLogger.
- **Step 3** Log in to the app as **installer**, choose **More** > **Upgrade**, select a single device or multiple devices of the same type, and tap **Next**.
- **Step 4** Select the upgrade package and tap **Next**.
- **Step 5** Confirm the upgrade package and the device to be upgraded, and tap **Finish** to start upgrading the device.

NOTE

After the upgrade is complete, the device automatically restarts.

Step 6 After the upgrade is complete, remove the USB flash drive.

----End

8.8 How Do I Change a Device Name?

Procedure

- **Step 1** Choose **Maintenance** > **Device Mgmt** > **Device List**.
- **Step 2** Modify the device name based on the actual situation, select the modified entry, and click **Modify Device Info**.

You can also export device information to a .csv file, modify the file, and import the modified file to modify device information.

----End

8.9 How Do I Change the Communications Address?

The SmartLogger allows you to change the communications addresses of Huawei devices on the **Connect Device** or **Device List** page.

Changing the Communications Address on the Connect Device Page

- **Step 1** Choose **Maintenance** > **Device Mgmt.** > **Connect Device**.
- **Step 2** Click **Auto Assign Address**, set the start address for assignment, and confirm the address assignment.
- **Step 3** Confirm the address adjustment, adjust the device address as required, and click **Address Adjustment**.
- **Step 4** Confirm to search for the device again.
- **Step 5** After the search is complete, click **Close**.

----End

Changing the Communications Address on the Device List Page

- **Step 1** Choose **Maintenance** > **Device Mgmt.** > **Device List**.
- **Step 2** Change the device communications address and device name based on the site requirements, select the modified entries, and click **Modify Device Info**.
- **Step 3** Choose **Maintenance** > **Device Mgmt.** > **Connect Device** and click **Auto. Search**.
- **Step 4** After the search is complete, click **Close**.

----End

8.10 How Do I Export Inverter Parameters?

Context

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

Procedure

- **Step 1** Choose **Maintenance** > **Device Mgmt** > **Export Param**.
- **Step 2** Select the name of the device whose parameters are to be exported, and click **Export**.
- **Step 3** Observe the progress bar and wait until the export is complete.
- **Step 4** After the export is successful, click **Log archiving** to save the file.

----End

8.11 How Do I Clear Alarms?

Context

You can clear all active and historical alarms for the selected device and re-collect alarm data.

Procedure

- **Step 1** Choose **Maintenance** > **Device Mgmt.** > **Clear Alarm**.
- **Step 2** Select the name of the device whose alarms are to be cleared, click **Submit**, and choose **All**, **Locally synchronized alarms**, or **Alarms stored on devices** to clear alarms.

If alarms are cleared for the SmartLogger, you must reset alarms on the management system. Otherwise, the management system cannot obtain the alarm information collected by the SmartLogger after the alarms are cleared.

----End

8.12 How Do I Enable the Al1 Port to Detect SPD Alarms?

Context

In the smart array controller application scenario, the AI1 port on the SmartLogger can be connected to the SPD alarm output to raise an alarm when the SPD is faulty.

Procedure

Step 1 Choose **Settings** > **Other Parameters** and set **Al1 SPD detection alarm** to **Enable**.

----End

8.13 Which Models of Power Meters and EMIs Are Supported by the SmartLogger?

Table 8-1 Supported power meters

Vendor	Model	Export Limitation
ABB	A44	-
Acrel	PZ96L	Supported
Algodue	UPM209	Supported NOTE When the power meter connects to the SmartLogger, an external 120-ohm resistor needs to be connected to the RS485 bus of the power meter. For details, see the user manual of the power meter.
-	BackUp-CT	Supported
CHNT	DTSU666	-
-	DTSU666-H	Supported
-	DTSU666-HW	Supported
Elster	A1800ALPHA	-

Vendor	Model	Export Limitation
GAVAZZI	EM210	-
Janitza	UMG103-CBM	Supported
Janitza	UMG604	Supported
Lead	LD-C83	-
MingHua	CRDM-830	-
Mitsubishi	EMU4-BD1-MB	Supported NOTE Not applicable to single-phase power scenarios. When the power meter connects to the SmartLogger, an external 120-ohm resistor needs to be connected to the RS485 bus of the power meter. For details, see the user manual of the power meter.
Mitsubishi	ME110NSR-MB	-
Mitsubishi	ME110SR-MB	-
Mitsubishi	ME110SSR-MB	-
Mitsubishi	M8FM-N3LTR	-
Mitsubishi	ME110SSR-4APH	-
NARUN	PD510	-
NetBiter	CEWE	-
People	RM858E	-
Schneider	PM2xxx	-
Schneider	PM5100	-
Schneider	PM5300	-
SFERE	PD194Z	-
Socomec	COUNTIS E43	Supported NOTE Not applicable to single-phase power scenarios. When the power meter connects to the SmartLogger, an external 120-ohm resistor needs to be connected to the RS485 bus of the power meter. For details, see the user manual of the power meter.
Toshiba	S2MS	-

Vendor	Model	Export Limitation
Wave Energy	PWM-72	-
WEG	MMW03-M22CH	Supported
YDS	YDS60-80	Supported NOTE Applicable only to three-phase power scenarios.
	YDS70-C16	Supported NOTE Applicable only to single-phase power scenarios.
	YDS60-C24	Supported NOTE Applicable only to three-phase power scenarios.

Table 8-2 Supported EMIs

Vendor	Model	EMI Information
АВВ	VSN800-12	Total irradiance, ambient temperature, and PV module temperature
	VSN800-14	Total irradiance, ambient temperature, PV module temperature, wind direction, and wind speed
Gill MetPak Pro	Gill MetPak Pro	Total irradiance, ambient temperature, PV module temperature, wind direction, and wind speed
Hukseflux SRx	Hukseflux SRx	Total irradiance and ambient temperature
Ingenieurbüro Si- RS485TC	Ingenieurbüro Si- RS485TC	Total irradiance, ambient temperature, PV module temperature, and wind speed
Kipp&Zonen	SMPx series	Total irradiance and ambient temperature

Vendor	Model	EMI Information
Lufft	WSx-UMB	Total irradiance, ambient temperature, wind direction, and wind speed
	WSx-UMB(external sensors)	Total irradiance, ambient temperature, PV module temperature, wind direction, and wind speed
Meier-NT ADL-SR	Meier-NT ADL-SR	Total irradiance, ambient temperature, PV module temperature, and wind speed
MeteoControl	SR20-D2	Total irradiance and ambient temperature
RainWise	PVmet-150	Total irradiance, ambient temperature, and PV module temperature
	PVmet-200	Total irradiance, ambient temperature, PV module temperature, wind direction, and wind speed
Soluzione Solare	SunMeter	Total irradiance and ambient temperature
Jinzhou Licheng	Jinzhou Licheng	Total irradiance, ambient temperature, PV module temperature, wind direction, and wind speed
Jinzhou Solargiga	PC-4	Total irradiance, ambient temperature, PV module temperature, wind direction, and wind speed
Handan	RYQ-3	Total irradiance, ambient temperature, PV module temperature, wind direction, and wind speed

Vendor	Model	EMI Information
Sensor ADAM	-	-
NOTE The sensor-type EMI (current-type or voltage- type) communicates with the SmartLogger through the ADAM analog-to- digital converter.		

8.14 How Do I Check the SIM Card Status?

Choose Over View > Mobile Data to view the SIM card status.

Table 8-3 SIM card status

Parameter	Status	Description
4G module	Card absent	No SIM card is detected. Insert a SIM card.
status	Failed to register the card.	 Check whether the SIM card account is in arrears. If yes, top up the account. Check whether the network quality is poor. If yes, use a SIM card of another carrier with good signal quality. Check whether the SIM card has been bound to another device. If yes, unbind the SIM card from the device or replace the SIM card.
	Not connectedThe card is in position.	The SmartLogger is trying to set up a dial-up connection. Wait for the connection to be set up.
	Connected	The dial-up connection is set up successfully.
	Enter the PIN.	The SIM card has been set to require a personal identification number (PIN). Contact the carrier of the SIM card for the PIN, choose Settings > Wireless Network , and enter the correct PIN.
	Enter the PUK.	If the number of incorrect PIN attempts exceeds the upper limit, you need to enter the PIN unblocking key (PUK). Contact the carrier of the SIM card for the PUK. Choose Settings > Wireless Network and enter the correct PUK.

Parameter	Status	Description
Traffic status	Normal	The used traffic does not exceed the monthly traffic package, and the remaining traffic is sufficient.
	Warning	The used traffic exceeds 80% of the monthly traffic package, and the remaining traffic is insufficient.
	Used up	The used traffic exceeds the monthly traffic package. Traffic is used up. Top up the SIM card account immediately.
	No package configured	Choose Settings > Wireless Network and configure a monthly traffic package.

8.15 How Do I Use Mobile Network Sharing?

Remotely Accessing the WebUI over a Mobile Network

Ⅲ NOTE

A 4G SmartLogger supports remote access to the SmartLogger WebUI over the built-in 4G wireless communication.

- **Step 1** Insert a SIM card with a fixed IP address into the SIM card slot of the SmartLogger. Choose **Over View > Mobile Data** to check the SIM card status and ensure that the 4G wireless communication is normal.
- **Step 2** Choose **Settings** > **Other Parameters** and set **Mobile network sharing** to **Enable**.

NOTICE

After this function is enabled, the SmartLogger is directly exposed to the public network and is vulnerable to network attacks.

Figure 8-4 Other parameters



Step 3 Open a web browser, enter **https://**XX.XX.XX (XX.XX.XX is the fixed IP address of the SIM card) in the address box, and press **Enter**. The login page is displayed.

----End

Sharing a Mobile Network with Other Devices

◯ NOTE

A 4G SmartLogger supports the sharing of the built-in 4G network with other devices for Internet access.

- **Step 1** Connect the network cable of another device to the WAN port of the SmartLogger.
- **Step 2** Choose **Settings** > **Other Parameters** and set **Mobile network sharing** to **Enable**.

NOTICE

After this function is enabled, the SmartLogger is directly exposed to the public network and is vulnerable to network attacks.

Figure 8-5 Other parameters



- **Step 3** Choose **Settings > Comm. Param. > Wired Network**, set network parameters for third-party devices.
 - 1. IP address of the third-party device: This parameter must be in the same network segment as that of the SmartLogger and must be different from that of other devices.
 - 2. Subnet mask of the third-party device: Set this parameter to the subnet mask of the SmartLogger.
 - 3. Third-party device gateway: Set this parameter to the IP address of the SmartLogger.
 - 4. (Optional) Third-party DNS server: If the third-party device needs to connect to the server address in domain name format, you need to set the DNS server address, which can be set to a public DNS server address, for example, 8.8.8.8. (The DNS server address of the wired network of the SmartLogger with mobile network sharing enabled cannot be the same as that of the third-party device. You are advised to set the DNS server address to 0.0.0.0 or 10.129.0.84.)

□ NOTE

To query the network parameters of the SmartLogger, choose **Settings** > **Comm. Param.** > **Wired Network**.

----End

8.16 WebUI Allows Login Only in Chinese and Prompts to Switch to Chinese

If the WebUI uses a language other than Chinese and the SmartLogger detects that an inverter sold only in Chinese Mainland is connected, a message is displayed indicating that the WebUI allows login only in Chinese and the language will be switched to Chinese after login.

Figure 8-6 WebUI allows login only in Chinese



Figure 8-7 WebUI prompts to switch to Chinese



8.17 How Do I Identify the Meter Wiring Direction on the SmartLogger?

- Correct wiring: When the plant feeds electricity to the grid, the active power
 of the meter is a negative value. When the plant draws electricity from the
 grid, the active power of the meter is a positive value.
- Reverse wiring: When the plant feeds electricity to the grid, the active power
 of the meter is a positive value. When the plant draws electricity from the
 grid, the active power of the meter is a negative value. Negative wiring may
 occur.

8.18 Resetting Password

Role	Description
Adminis trator	If you hold down the RST button for 10s to 20s, the SmartLogger enters the safe mode. In this case, the device configuration parameters are retained, but personal privacy and sensitive data, including the login password and email address, are cleared.
Non- adminis trator	The password of a non-administrator account must be reset using the administrator account. The administrator resets the password and enters the initial password. The user logs in to the system using the initial password provided by the administrator. After the login, the user is forced to change the password.

9 Technical Specifications

9.1 Technical Specifications of the SmartLogger

Device Management

Parameter	Specifications
Number of solar inverters	 SmartLogger3000A: can connect to a maximum of 80 solar inverters. SmartLogger3000B: can connect to a maximum of 150 solar inverters.
Communications mode	RS485, ETH, MBUS (optional), 4G (optional), and SFP (optional)
Maximum communication distance	 RS485: 1000 m ETH: 100 m MBUS (multi-core cable): 1000 m; MBUS (single-core cable): 400 m (The three-phase cables must be bound at 1 m intervals) Optical fiber (single-mode, 1310 nm optical module): 10,000 m (with the 1000M optical module); 12,000 m (with the 100M optical module)

Common Specifications

Parameter	Specifications
Power adapter	• AC input: 100–240 V, 50/60 Hz
	DC output: 12 V, 2 A
DC power supply	24 V, 0.8 A
Power consumption	 SmartLogger3000A: 8 W (typical) SmartLogger3000B: 9 W (typical) SmartLogger3000B + SmartModule1000A: 10 W (typical) 15 W (maximum)
Dimensions (W x H x D)	 259 mm x 160 mm x 59 mm (including mounting ears) 225 mm x 160 mm x 44 mm (excluding mounting ears)
Net weight	2 kg
Operating temperature	-40°C to +60°C
Storage temperature	-40°C to +70°C
Relative humidity	5%-95% RH
IP rating	IP20
Installation mode	Installed on a wall or guide rail
Highest operating altitude	4000 m
Pollution degree	2
Corrosion level	Class B

Ports

Parameter	Specifications
Ethernet electrical port (WAN and LAN)	2 PCS; 10M/100M/1000M auto-sensing
Ethernet optical port (SFP)	2 PCS; supports 100 M/1000 M SFP/eSFP optical modules
MBUS port	1 PCS; supports a maximum AC input voltage of 800 V
RS485 (COM) port	3 PCS; supported baud rates: 1200 bit/s, 2400 bit/s, 4800 bit/s, 9600 bit/s, 19,200 bit/s, and 115,200 bit/s

Parameter	Specifications
USB port	USB2.0
Power output port	1 PCS; DC output: 12 V, 0.1 A
Digital input (DI) port	4 PCS; supports only the access from relay dry contacts
Digital output (DO) port	2 PCS; relay dry contact output ports, supporting NO or NC contacts; supports 12 V, 0.5 A signal voltage
Analog input (AI) port	4 PCS; Al1: supports 0–10 V voltage (passive); Al2–Al4: support 4–20 mA or 0–20 mA input current (passive)
4G antenna port (4G)	1 PCS; SMA-K (external screw inner hole) port, used with the antenna with the SMA-J (internal screw inner pin) port

Wireless Communication

Parameter	Specifications
4G/3G/2G	The SmartLogger3000A01CN supports 2G, 3G, and 4G networks of China Mobile and China Unicom as well as 4G networks of China Telecom.
	The following frequency bands are supported:
	• LTE FDD: B1, B3, B8
	• LTE TDD: B38, B39, B40, B41
	• WCDMA: B1, B5, B8, B9
	• TD-SCDMA: B34, B39
	• GSM: 900 MHz/1800 MHz
	The SmartLogger3000A01EU and SmartLogger3000A03EU support the following frequency bands:
	• LTE FDD: B1, B3, B5, B7, B8, B20
	• LTE TDD: B38, B40, B41
	• WCDMA: B1, B5, B8
	• GSM: 900 MHz/1800 MHz

Parameter	Specifications	
	SmartLogger3000A01NH: Supports 3G/4G of Docomo and SoftBank.	
	The following frequency bands are supported:	
	LTE FDD: B1, B3, B8, B18, B19, B26 (only Tokyo, Nagoya, and Osaka support B3)	
	LTE TDD: B41	
	• WCDMA: B1, B6, B8, B19	
	The SmartLogger3000A01KR supports networks of SK Telecom.	
	The following frequency bands are supported:	
	LTE FDD: B1, B3, B5, B7WCDMA: B1	
	The SmartLogger3000A01AU supports the following frequency bands:	
	• LTE FDD: B1, B2, B3, B4, B5, B7, B8, B28	
	LTE TDD: B40	
	• WCDMA: B1, B2, B5, B8	
	• GSM: 850 MHz/900 MHz/1800 MHz/ 1900 MHz	
WLAN (local maintenance using app)	2.4G	

RF Bands of the 4G Module (SmartLogger3000A01EU and SmartLogger3000A03EU)

Frequency Band	Тх	Rx
WCDMA Band 1	1920–1980 MHz	2110-2170 MHz
WCDMA Band 5	824-849 MHz	869-894 MHz
WCDMA Band 8	880-915 MHz	925-960 MHz
GSM 900	880-915 MHz	925-960 MHz
GSM 1800	1710-1785 MHz	1805–1880 MHz
LTE Band 1	1920-1980 MHz	2110-2170 MHz
LTE Band 3	1710-1785 MHz	1805–1880 MHz
LTE Band 5	824-849 MHz	869-894 MHz

Frequency Band	Тх	Rx
LTE Band 7	2500-2570 MHz	2620-2690 MHz
LTE Band 8	880-915 MHz	925-960 MHz
LTE Band 20	832-862 MHz	791–821 MHz
LTE Band 38	2570–2620 MHz	
LTE Band 40	2300-2400 MHz	
LTE Band 41	2555-2655 MHz	

Output Power of the 4G Module (SmartLogger3000A01EU and SmartLogger3000A03EU)

Frequency Band		Standard Value (Unit: dBm)	Remarks (Unit: dB)
GSM 900	GSM 900 GMSK (1Tx Slot)		±2
	8PSK (1Tx Slot)	27	±3
GSM 1800	GMSK (1Tx Slot)	30	±2
	8PSK (1Tx Slot)	26	±3
WCDMA Band 1		24	+1/-3
WCDMA Band 5		24	+1/-3
WCDMA Band 8		24	+1/-3
LTE Band 1		23	±2
LTE Band 3		23	±2
LTE Band 5		23	±2
LTE Band 7		23	±2
LTE Band 8		23	±2
LTE Band 20		23	±2
LTE Band 38		23	±2
LTE Band 40		23	±2
LTE Band 41		23	±2

WLAN

Parameter	Specifications
Frequency band	2.4 GHz: 2.4–2.4835 GHz
Gain	2.4 GHz: 2.85 dBi
Transmit power	2.4 GHz: 1 x 100 mW
Maximum throughput	2.4 GHz: 65 Mbit/s
Single/Dual band mode	Single
MIMO	2.4 GHz frequency band: 1T1R
Maximum number of online users	6
Polarization mode	Linear
Directivity	Multi-dimensional

9.2 Technical Specifications of the SmartModule

Device Management

Parameter	Specifications	
Communications mode	RS485, ETH	
Maximum communication distance	RS485:1000 mETH: 100 m	

Common Specifications

Parameter	Specifications	
DC power supply	 DC 12 V: DC 2.0 power socket male connector DC 24 V: cord end terminal 	
Power consumption	Typical: 4 W; maximum: 5 W	
Dimensions (H x W x D)	Including mounting ears: 160 mm x 179 mm x 59 mm	
	Without mounting ears: 160 mm x 125 mm x 44 mm	
Net weight	1 kg	
Operating temperature	-40°C to +60°C	

Parameter	Specifications
Storage temperature	-40°C to +70°C
Humidity	5%-95% RH
Ingress protection rating	IP20
Installation mode	Installed on a wall or guide rail
Maximum operating altitude	4000 m
Pollution level	Level 2
Corrosion level	Class B

Ports

Parameter	Specifications
Ethernet electrical port (GE)	4 PCS; 10M/100M/1000M auto-sensing
RS485 port (COM)	3 PCS; supported baud rates: 1200 bit/s, 2400 bit/s, 4800 bit/s, 9600 bit/s, 19,200 bit/s, and 115,200 bit/s
Power output port	1 PCS; DC output: 12 V, 0.1 A
Digital input (DI) port	4 PCS; supports only the access from relay dry contacts
PT port (PT)	Two PCS; supports the access of signals from a 3-wire or 2-wire PT100/PT1000 temperature sensor
Analog input (AI) port	4 PCS; Al1: supports 0–10 V voltage (passive); Al2–Al4: support 4–20 mA or 0–20 mA input current (passive)

A Product User Lists

Table A-1 User list

Login Mode	SmartLogger Version	User Name	Initial Password
Арр		Installer	00000a
	earlier than V300R023C00	User	00000a
	Updated to	installer	00000a
	V300R023C00 or later	user	
Factory version		installer	None. You need to set a
	V300R023C00 or later	user	password upon the initial login.
WebUI	Factory version earlier than V300R023C00	admin	Changeme
V la Fo	Updated to V300R023C00 or later	installer	00000a (same as the mobile app login password)
		admin	Changeme
	Factory version V300R023C00 or later	installer	None. You need to set a password upon the initial login.

Table A-2 Second challenge authentication

Authentication Mode	User Name	Initial Password
SmartLogger authentication by the management system	emscomm	/EzFp+2%r6@lxSCv
SmartModule authentication by the SmartLogger	SmoduleAdmin	/EzFp+2%r6@lxSCv

Table A-3 Operating system user list

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

B Domain Name List of Management Systems

□ NOTE

The list is subject to change.

Table B-1 Domain names of management systems

Domain Name	Data Type	Scenario
intl.fusionsolar.huawei.co m	Public IP address	FusionSolar hosting cloud NOTE The domain name is compatible with cn.fusionsolar.huawei.com (Chinese mainland).
neteco.alsoenergy.com	Public IP address	Partner management system
re-ene.kyuden.co.jp	Public IP address	Remote output control server of Kyushu Electric Power Company
re-ene.yonden.co.jp	Public IP address	Remote output control server of Shikoku Electric Power Company

C Port No. List

Table C-1 Port No.

Type of Connected Access Management	Management System Setting Port No.	Open Port No. of Router (Firewall)	Remarks
NetEco	16100	16100, 2121, 11000–11500	 16100: used to query and set data between the SmartLogger and the management system. 2121 and 11000–11500: used to upload and download data or files between the SmartLogger and the management system using FTPS.
FusionSolar Smart PV Hosting Cloud Center	16100	16100, 2121, 2122, 10000– 12000	 The device performance data is updated in real time. Each device requires 3 MB traffic per day. 16100: used to query and set data between the SmartLogger and the management system. 2121, 2122 and 10000–12000: used to upload and download data or files between the SmartLogger and the management system using FTPS.

Type of Connected Access Management	Management System Setting Port No.	Open Port No. of Router (Firewall)	Remarks
	27250	27250, 27251, 2122, 10000– 12000	Traffic-saving port. This port is recommended when the SmartLogger connects to the management system in wireless mode. The device performance data is updated every 5 minutes.
			27250 and 27251: used to query and set data between the SmartLogger and the management system.
			2122 and 10000–12000: used to upload and download data or files between the SmartLogger and the management system using FTPS.

□ NOTE

- If a third-party management system connects to the SmartLogger over Modbus TCP, the SmartLogger port No. is 502, which is used to query and set data between the SmartLogger and the third-party management system.
- If a third-party management system connects to the SmartLogger over IEC104, the SmartLogger port No. is 2404, which is used to query and set data between the SmartLogger and the third-party management system.
- If the SmartLogger connects to a third-party FTP server over FTP, the common port No.
 is 21, which is used to periodically upload performance data to the third-party FTP
 server.
- If the SmartLogger connects to a third-party email server over SMTP, the common port No. is 25, 465, or 587, which is used to send emails to the email server.
- If the SmartLogger connects to a third-party NTP server over NTP, the common port No. is 123, which is used for time synchronization with the NTP server.
- If the SmartLogger connects to a remote output server of Japan Electric Power Company over HTTPS, the common port No. is 443, which is used to synchronize the scheduling table with the electric power company.

Certificate Management and Maintenance

D.1 Preconfigured Certificate Risk Disclaimer

The Huawei-issued certificates preconfigured on Huawei devices during manufacturing are mandatory identity credentials for Huawei devices. The disclaimer statements for using the certificates are as follows:

- 1. Preconfigured Huawei-issued certificates are used only in the deployment phase, for establishing initial security channels between devices and the customer's network. Huawei does not promise or guarantee the security of preconfigured certificates.
- 2. The customer shall bear consequences of all security risks and incidents arising from using preconfigured Huawei-issued certificates as service certificates.
- 3. A preconfigured Huawei-issued certificate is valid from the manufacturing date until May 2041.
- 4. Services using a preconfigured Huawei-issued certificate will be interrupted when the certificate expires.
- 5. It is recommended that customers deploy a PKI system to issue certificates for devices and software on the live network and manage the lifecycle of the certificates. To ensure security, certificates with short validity periods are recommended.

D.2 Application Scenarios of Preconfigured Certificates

File Path and Name	Application Scenario	Replacement
/mnt/log/smodule_ca.crt	Authenticates the validity of the peer extension module for communication with	For details about how to replace a certificate, contact technical support engineers to obtain

File Path and Name	Application Scenario	Replacement	
/mnt/log/smodule_server.crt	the TLS extension module.	the corresponding security maintenance	
/mnt/home/cert/web/server.crt	Authenticates the validity of the peer web module to be connected.	manual.	
/mnt/log/ca_1.crt	Authenticates the		
/mnt/log/client_1.crt	validity of the peer NMS for		
/mnt/log/ca_2.crt	communication through Modbus-TCP.		
/mnt/log/client_2.crt			
/mnt/log/client2_ca.crt			
/mnt/log/client2.crt			
/mnt/log/ca_new.crt			
/mnt/log/client_new.crt			
/mnt/log/tcpmb_server_cert/ ca.crt	Authenticates the validity of the peer	Certificates for communication between the Company's products cannot be replaced.	
/mnt/log/tcpmb_server_cert/ tomcat_client.crt	mobile app for communication through Modbus-TCP.		
/mnt/log/cmu_ca.crt	Authenticates the		
/mnt/log/cmu_client.crt	validity of the peer CMU for communication through Modbus-TCP.		
/mnt/log/ca_new.crt	Authenticates the		
/mnt/log/client_new.crt	validity of the peer STS, PCS, or inverter for communication through Modbus-TCP.		

Acronyms and Abbreviations

Α

AC Alternating Current

AI Analog Input

AO Analog Output

APP Application

В

BMU Battery Monitoring Unit

C

COM Communication

CPE Customer Premises

Equipment

CMU Central Monitoring Unit

D

DC Direct Current

DI Digital Input

DO Digital Output

Ε

EMI Environmental Monitoring

Instrument

ETH Ethernet

ESU Energy Storage Unit

ESC Smart Rack Controller

ESR Battery Rack

ESM Battery Pack

G

GE Gigabit Ethernet

GND Ground

Н

HVAC Heating, Ventilation and

Air Conditioning

L

LAN Local Area Network

LED Light-emitting Diode

LTE Long Term Evolution

М

MBUS Monitoring bus

N

NC Normally Closed

NO Normally Open

Ρ

POE Power over Ethernet

PCS Smart PCS

R

RST Reset

RSTP Rapid Spanning Tree

Protocol

S

SFP Small Form-factor

Pluggable

STP Spanning Tree Protocol

SOC State of Charge

SOH State of Health

Т

TCU Temperature Control Unit

U

USB Universal Serial Bus

W

WAN Wide Area Network

WEEE Waste Electrical and

Electronic Equipment