PV Plant Management System Connection Solution

User Manual (Inverter + Smart Dongle)

Issue 12

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About This Document

Purpose

This document describes how to connect inverters to the smart PV management system through the Smart Dongle (SDongleA or SDongleB, also referred to as Dongle). For details about the installation of each device, see the corresponding user manual or quick guide. This document describes only cable connections between devices, power-on, commissioning, and maintenance.

Intended Audience

This document is intended for photovoltaic (PV) plant operators and qualified electricians.

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.

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Symbol	Description
NOTE	Supplements 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 the changes made in earlier issues.

Issue 12 (2026-06-30)

- Added the SUN2000-(3K-6K)-LB0 and SUN2000-(12K-25K)-MB0 series models to **2.4 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV)**.
- Added the SUN2000-(3K-6K)-LB0 and SUN2000-(12K-25K)-MB0 series models to **2.5 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV-004)**.

Issue 11 (2026-03-10)

Updated the app name.

Issue 10 (2025-09-30)

Updated **5.2.1 Setting Parameters over the App**.

Issue 09 (2025-08-15)

- Updated **2.2 Communication Networking of the SDongleA-03 (4G)**.
- Updated **2.3 Communication Networking of the SDongleB-06 (4G)**.
- Updated **2.4 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV)**.
- Updated **2.5 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV-004)**.
- Updated **3.1 Connecting Cables for Cascaded Inverters**.
- Updated **5.2 Setting Grid-tied Control Parameters**.
- Updated **5.3 Connecting to the Smart Dongle and Setting Feed-in at Limited Current**.
- Updated **5.4 Third-Party Management System Settings (Connecting to Two Management Systems)**.
- Updated **5.5 Setting Parameters and Exporting Logs Through the WLAN of the Smart Dongle**.

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- Updated **6.1 Modifying Inverter Communications Parameters**.
- Updated **6.3 Upgrading the Inverter and Smart Dongle Software**.
- Added **A List of Models No Longer Placed on the Market (Europe)**.

Issue 08 (2025-04-17)

- Updated **2.3 Communication Networking of the SDongleB-06 (4G)**.
- Updated **2.4 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV)**.
- Updated **2.5 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV-004)**.
- Updated **6.3 Upgrading the Inverter and Smart Dongle Software**.

Issue 07 (2024-09-05)

- Updated **2.3 Communication Networking of the SDongleB-06 (4G)**.
- Updated **2.5 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV-004)**.

Issue 06 (2024-05-06)

- Added **5.3 Connecting to the Smart Dongle and Setting Feed-in at Limited Current**.
- Updated **5.4 Third-Party Management System Settings (Connecting to Two Management Systems)**.

Issue 05 (2024-01-15)

- Updated **2.2 Communication Networking of the SDongleA-03 (4G)**.
- Updated **2.3 Communication Networking of the SDongleB-06 (4G)**.

Issue 04 (2023-08-14)

Updated **5.2 Setting Grid-tied Control Parameters**.

Issue 04 (2023-04-14)

- Updated **2 Solution Overview**.
- Updated **2.2 Communication Networking of the SDongleA-03 (4G)**.
- Added **2.3 Communication Networking of the SDongleB-06 (4G)**.
- Updated **2.4 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV)**.
- Added **3.3 Installing the 4G (06) Smart Dongle**.
- Updated **5.2.1 Setting Parameters over the App**.
- Added **5.4 Third-Party Management System Settings (Connecting to Two Management Systems)**.
- Added **5.5 Setting Parameters and Exporting Logs Through the WLAN of the Smart Dongle**.
- Updated **6.1 Modifying Inverter Communications Parameters**.

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Issue 03 (2022-03-15)

- Updated **2.2 Communication Networking of the SDongleA-03 (4G)**.
- Updated **2.4 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV)**.
- Updated **3.1 Connecting Cables for Cascaded Inverters**.

Issue 02 (2021-11-25)

- Updated **2.2 Communication Networking of the SDongleA-03 (4G)**.
- Updated **2.4 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV)**.
- Updated **3.2 Installing the 4G/WLAN Smart Dongle**.
- Updated **5.2 Setting Grid-tied Control Parameters**.

Issue 01 (2020-12-10)

This issue is the first official release.

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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 shall 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:

- Equipment damage 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
- Operation beyond the conditions specified in this document

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- Installation or use in environments that do not comply with international, national, or regional standards
- Installation or use by unqualified personnel
- Failure to follow the operation instructions or safety precautions on the product or in this document
- Unauthorized modifications to the product or software code or removal of the product
- Damage caused during transportation by you or a third party authorized by you
- Storage conditions that do not meet the requirements specified in this document
- Failure to comply with local laws, regulations, or related standards due to the materials and tools prepared by you
- Damage caused by your or a third party's negligence, intentional breach, gross negligence, or improper operations or damage not caused by 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

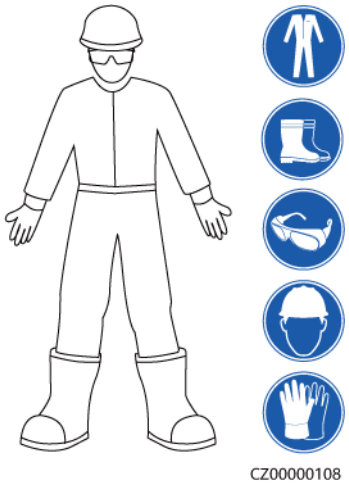
Before operations, remove conductive objects such as watches, bracelets, bangles, rings, and necklaces to prevent electric shocks.

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.

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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 must possess the required local qualifications.

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- 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

DANGER

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

DANGER

Prevent foreign matter from entering the equipment during operations. Otherwise, short circuits, 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.

CAUTION

The components (such as power distribution boxes, circuit breakers, and cables) used for electrical connections shall comply with fire resistance and flame retardance standards. The materials and structure shall meet fire safety requirements.

General Requirements

- Follow the procedures described in the document for installation, operation, and maintenance. Do not modify, retrofit, or alter the equipment without authorization (including, but not limited to, adding or removing components and cables), and do not change the installation sequence.
- 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.

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- 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 and wait until the equipment is completely powered off before performing operations on 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 operate 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 cables are protected from mechanical stress, overheating, and corrosion.
- Ensure that cables are not squeezed, torn, warped, or whitened.
- 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. Overheating 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.
- Keep the installation and operating environments of the equipment within the allowed ranges. 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.

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- Do not install the equipment in an area conducive to 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

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 a 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

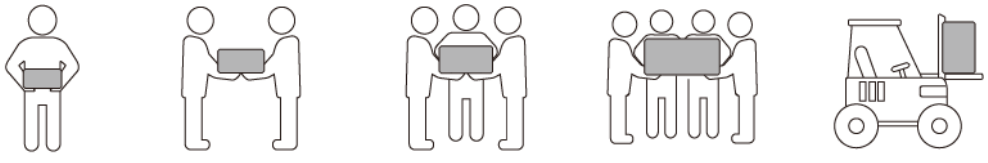
Do not drill holes into the equipment. Doing so may affect the sealing performance and electromagnetic containment of the equipment and damage components or cables inside. Metal shavings from drilling may short-circuit boards inside the equipment.

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.



- 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 Solution Overview

This solution mainly applies to residential or small-scale ground-mounted PV plants, in which the inverter and power meter are connected to the smart PV management system through the Smart Dongle.

Table 2-1 Smart Dongle model description

Model	Communications Mode	Description
SDongleA-01	WLAN	Connects to a router through a WLAN. The router is connected to the smart PV management system through an IP network.
SDongleA-03-CN[a] SDongleA-03-EU SDongleA-03-AU SDongleA-03-JP SDongleA-03-KR SDongleB-06-CN[a] SDongleB-06-EU SDongleB-06-AU SDongleB-06-NH	4G	Connects to the smart PV management system through a 4G network by using a SIM card.
SDongleA-05	WLAN and FE	Connects to a router through a WLAN or FE. The router is connected to the smart PV management system through an IP network.
Note a: The SDongleA-03-CN and SDongleB-06-CN are applicable only to the Chinese mainland. For other countries or regions, Huawei does not provide quality assurance.		

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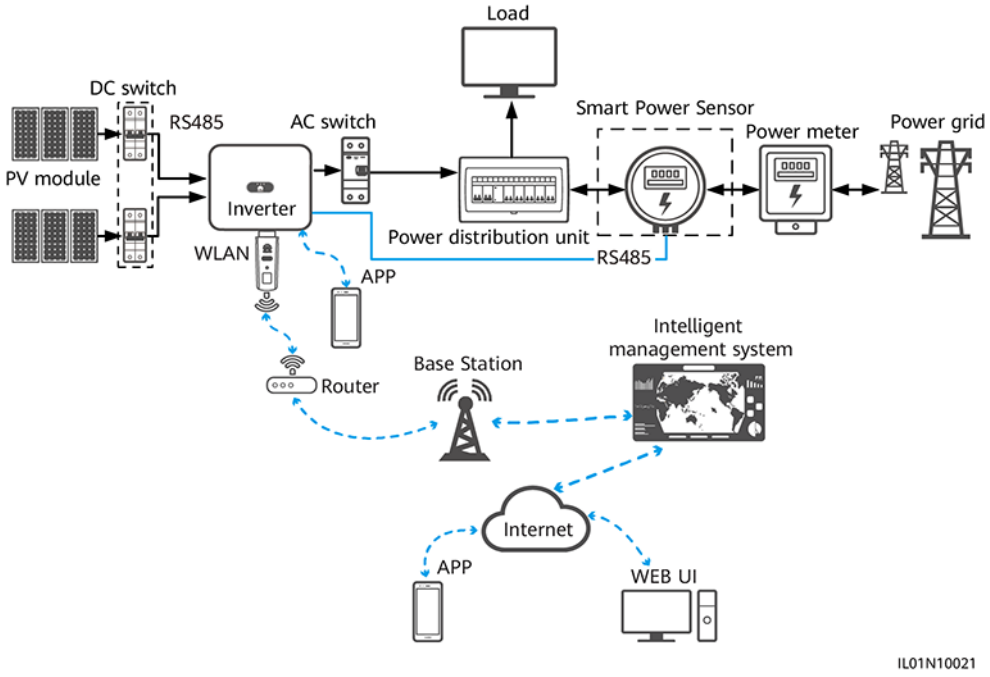
Table 2-2 WLAN parameters

Item	Value Range
Frequency	2400–2483.5 MHz
Protocols and standards	802.11b/g/n
Bandwidth	20M
Maximum transmit power	≤ 20 dBm E.I.R.P.

2.1 Communication Networking of the SDongleA-01 (WLAN)

- The inverter connects to the router through the WLAN Smart Dongle, and then connects to the smart PV management system through the router.
- The inverter connects to the app through its WLAN. You can use the app to locally view the running information and set parameters of the inverter.
- You can remotely manage the smart PV management system over the WebUI or app.

Figure 2-1 Networking description



NOTE

- The components in the dotted box are optional.
- The inverter model is subject to change. The model information and device appearance in this document are for reference only.
- When multiple inverters are cascaded, only one Smart Dongle or SmartLogger can be connected to the RS485 communications link.
- When the SDongleA-01 is used in China, it can be used for device cascading using RS485 communication (inverters cascading with inverters or other non-inverter devices). A maximum of 10 devices can be cascaded. In actual communication scenarios, the number of inverters that can be cascaded also depends on the inverter features. When this Smart Dongle is used in other areas, device cascading using RS485 communication is not supported.

Table 2-3 Number of cascaded inverters

Limit	**Actual Connection**	
Maximum Number of Devices That Can Be Connected to the Smart Dongle[ab]	**Number of Slave Inverters**	**Number of Other Devices (Such as Power Meters)**
10	n ≤ 9	≤ 9 – n
Note a: You can view the number of devices that can be connected to the Smart Dongle from the label on the external package. Note b: If the number of inverters exceeds the limit, configure multiple Smart Dongles. The installation and commissioning methods for each Smart Dongle are the same.		

Table 2-4 Device description

Device	**Description**	**Service Owner**
PV module	Prepared by the customer	Device supplier
Inverter	SUN2000-(3KTL-20KTL)-M0. Software version: SUN2000MA V100R001C00SPC100 or later	Huawei
Dongle	Purchased by the customer. The model is SDongleA-01.	Huawei

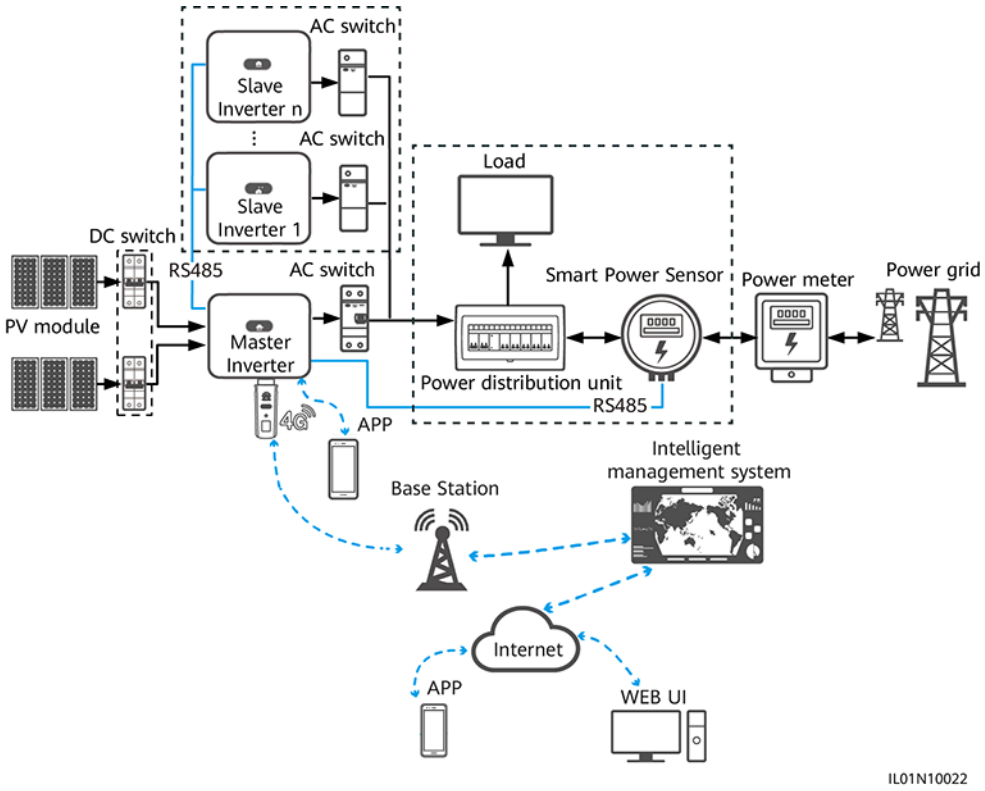
Device	Description	Service Owner
Router	• The router supports WLAN (IEEE 802.11 b/g/n, 2.4 GHz), and the inverters are within the WLAN signal coverage. • The WPA, WPA2, or WPA/WPA2 encryption mode is recommended. • The Enterprise mode is not supported (such as airport WLAN and other public hotspots that require authentication). • WEP and WPA TKIP encryption modes are not recommended because they have serious security vulnerabilities. • If the access fails in WEP or WPA TKIP mode, log in to the router and change the encryption mode of the router to WPA2 or WPA/WPA2.	Device supplier
Intelligent management system	Management system.	Huawei
App	Smart PV app. The app can be locally connected to the inverter and remotely connected to the management system.	Huawei
Power distribution unit (PDU)	Prepared by the customer	Device supplier
Smart Power Sensor	Recommended model: DTSU666-H	Huawei
Power meter	Prepared by the customer	Device supplier

2.2 Communication Networking of the SDongleA-03 (4G)

- The inverter connects to the smart PV management system through the 4G Smart Dongle.
- The master inverter connects to the smart PV app. You can use the app to locally view the running information and set parameters of the inverter.
- You can remotely manage the smart PV management system over the WebUI or smart PV app.

RS485 Networking

Figure 2-2 Networking description



NOTE

- The components in the dotted box are optional.
- The inverter model is subject to change. The model information and device appearance in this document are for reference only.
- In the networking, the inverter where the Dongle is installed is the master inverter, and other inverters are slave inverters. Slave inverters can communicate with the Dongle through cascading.
- If multiple inverters are cascaded, use either a Dongle or a SmartLogger for networking. You cannot use two networking methods at the same time.
- The Smart Power Sensor connects to the RS485-2 and RS485_2 ports, or 485B2 and 485A2 ports on the master inverter. The RS485-1 and RS485_1 ports, or 485B1 and 485A1 ports are used for inverter cascading.

Table 2-5 Device description

Device	Description	Service Owner
PV module	Prepared by the customer	Device supplier

Device		Description	Service Owner
Inverter	Master inverter	• SUN2000-(2KTL-5KTL)-CN or SUN2000-(2KTL-5KTL)-L0. Software version: SUN2000L V100R001C00SPC333 or later. • SUN2000-(2KTL-6KTL)-L1. Software version: SUN2000L V200R001C00 or later. • SUN2000-(3KTL-20KTL)-M0 • SUN2000-(3KTL-12KTL)-M1 • SUN2000-(8KTL-20KTL)-M2 • SUN2000-(20KTL, 29.9KTL, 30KTL, 36KTL, 40KTL)-M3 Series • SUN2000-(50KTL-ZHM3, 50KTL-M3, 50KTL-BRM3) • SUN2000-50KTL-NHM3 • SUN2000-(12KTL-25KTL)-M5 Series • SUN2000-70KTL/75KTL-C1 (optional), SUN2000-70KTL-INM0, SUN2000-50KTL/60KTL/65KTL-M0, SUN2000-50KTL/SUN2000-63KTL-JPM0, or SUN2000-50KTL-JPM1. Software version: SUN2000 V300R001C00SPC112 or later. • SUN2000-100KTL/110KTL/125KTL-M0, SUN2000-75KTL/100KTL-M1, SUN2000-100KTL-INM0. • SUN2000-(75KTL-M1, 100KTL-M2, 110KTL-M2, 115KTL-M2)	Huawei
	Slave inverter	• The master inverter can be used as a slave inverter. If the inverter does not support cascading, it cannot be used as a slave inverter. Examples: SUN2000-(2KTL-5KTL)-CN, SUN2000-(2KTL-5KTL)-L0 • SUN2000-29.9KTL/36KTL/42KTL/50KTL • SUN2000-33KTL-A • SUN2000-33KTL/40KTL-JP • SUN2000-43KTL-IN-C1 • SUN2000-50KTL-C1	Huawei
Dongle		Purchased by the customer. The model shall be SDongleA-03-XX. For details, see the Smart Dongle model description.	Huawei
SIM card		If the Smart Dongle is not configured with a SIM card, prepare a standard SIM card (size: 25 mm x 15 mm) of a local carrier.	Customer
Intelligent management system		• Smart PV management system. • Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation.	• Huawei • Device supplier

Device	Description	Service Owner
App	• Smart PV app. The app can be locally connected to the inverter and remotely connected to the smart PV management system. • SUN2000 app of 3.2.00.005 or a later version for Android. The app can be locally connected to the inverter. • Third-party app. For details, see the third-party app documentation.	• Huawei • Device supplier
Power distribution unit	Prepared by the customer	Device supplier
Energy storage system (ESS)	The LUNA2000 can be connected.	Huawei
Smart Power Sensor	• Recommended models for three-phase inverters: DTSU666-H, YDS60-C24 • Recommended model for single-phase inverters: DDSU666-H	Huawei
Power meter	Prepared by the customer	Device supplier

MBUS Communication Networking

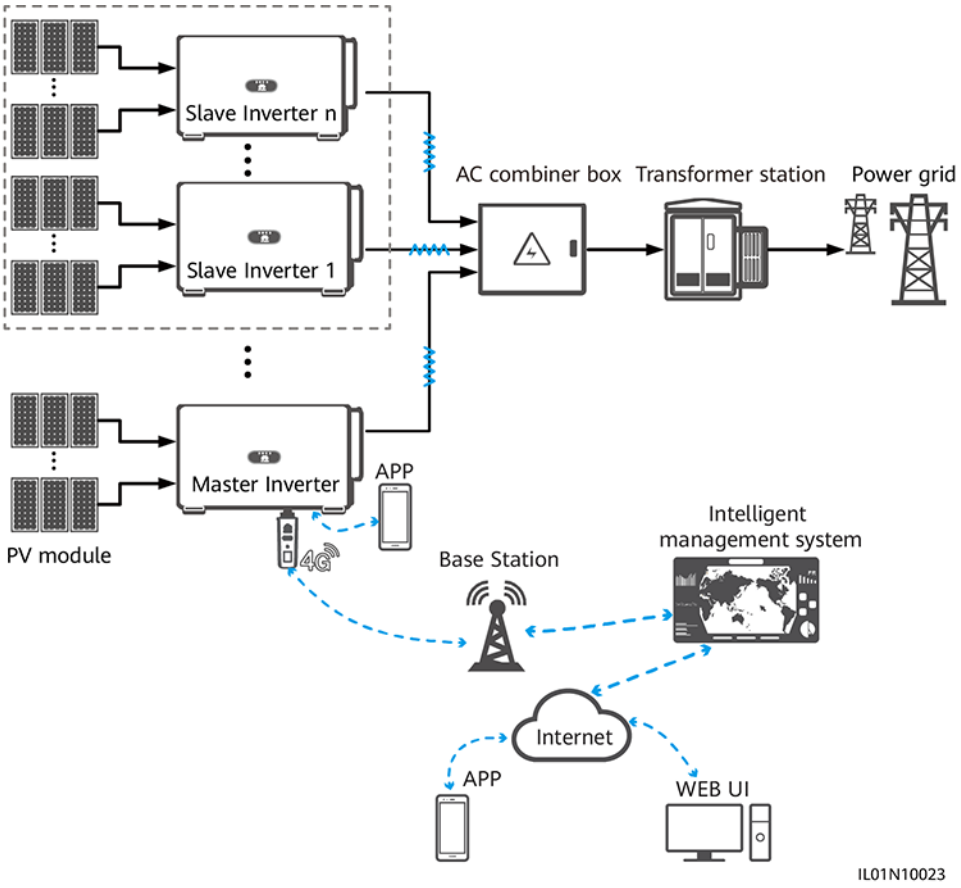
- The inverter connects to the smart PV management system through the 4G Smart Dongle.
- The master inverter connects to the smart PV app. You can use the app to locally view the running information and set parameters of the inverter.
- You can remotely manage the smart PV management system over the WebUI or smart PV app.

NOTICE

The MBUS communication is applicable to medium-voltage grid connection scenarios and non-low-voltage public grid connection scenarios (industrial environment).

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Figure 2-3 Networking description



NOTE

- The components in the dotted box are optional.
- The inverter model is subject to change. The model information and device appearance in this document are for reference only.
- In the networking, the inverter where the Dongle is installed is the master inverter, and other inverters are slave inverters. Slave inverters can communicate with the Dongle through cascading.
- If multiple inverters are cascaded, use either a Dongle or a SmartLogger for networking. You cannot use two networking methods at the same time.

Table 2-6 Device or software description

Device		Description	Service Owner
PV module		Prepared by the customer	Customer
Inverter	Master inverter	SUN2000-100KTL/110KTL/125KTL-M0. Software version: SUN2000 V500R001C00SPC100 or later.	Huawei
	Slave inverter	• SUN2000-36KTL • SUN2000-50KTL/60KTL-M0 • SUN2000-100KTL/110KTL/125KTL-M0	Huawei

Device	Description	Service Owner
Dongle	Purchased by the customer. The model shall be SDongleA-03-XX. For details, see the Smart Dongle model description.	Huawei
SIM card	If the Smart Dongle is not configured with a SIM card, prepare a standard SIM card (size: 25 mm x 15 mm) of a local carrier.	Customer
Intelligent management system	• Smart PV management system. • Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation.	• Huawei • Device supplier
App	• Smart PV app. The app can be locally connected to the inverter and remotely connected to the smart PV management system. • SUN2000 app of 3.2.00.005 or a later version for Android. The app is locally connected to the inverter. • Third-party app. For details, see the third-party app documentation.	• Huawei • Device supplier
AC combiner box	Prepared by the customer	Customer
Transformer station	Prepared by the customer	Customer
Power meter	Prepared by the customer	Device supplier

Smart Dongle Parameters

Table 2-7 Number of cascaded inverters

Limit		Actual Connection	
Maximum Number of Devices That Can Be Connected to the Smart Dongle[abcd]		**Number of Slave Inverters**	**Number of Other Devices (Such as Power Meters)**
10	10	n ≤ 9	≤ 9 – n
	3 (with an ESS)	n ≤ 2	≤ 2 – n
	3 (with single-phase inverters)	n ≤ 2	≤ 2 – n
2	2	n ≤ 1	≤ 1 – n

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Limit	Actual Connection	
Maximum Number of Devices That Can Be Connected to the Smart Dongle[abcd]	**Number of Slave Inverters**	**Number of Other Devices (Such as Power Meters)**
Note a: You can view the number of devices that can be connected to the Smart Dongle from the label on the external package. Note b: If the number of inverters exceeds the limit, configure multiple Smart Dongles. The installation and commissioning methods for each Smart Dongle are the same. Note c: A maximum of three SUN2000-(2KTL-6KTL)-L1 inverters can be cascaded. Note d: If RS485 communication is used and the device is connected to the RS485-2 and RS485_2 ports, or 485B2 and 485A2 ports on the master inverter, the device is not counted as a cascaded device.		

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Table 2-8 Frequency bands and systems of the Smart Dongle

Model	Supported Frequency Bands and Systems	Protocols and Standards	Bandwidth	Maximum transmit power
SDongleA-03-CN	LTE FDD: B1, B3, B8 LTE TDD: B38, B39, B40, B41 DC-HSPA+/HSPA+/HSPA/UMTS: B1, B5, B8, B9 TD-SCDMA: B34, B39 GSM/GPRS/EDGE: 900 MHz, 1800 MHz	• Supports LTE-FDD (with receive diversity): B1/B3/B5/B8/. • Supports LTE-TDD (with receive diversity): B34/B38/B39/B40/B41. • Supports WCDMA: B1/B5/B8. • Supports GSM: 900 MHz/1800 MHz. • Supports digital audio.	LTE features: • Supports a maximum of 3GPP R8 non-CA Cat 4 FDD and TDD. • Supports 1.4 MHz/3 MHz/5 MHz/10 MHz/15 MHz/20 MHz RF bandwidth. • Supports MIMO in the downlink. • LTE-FDD: maximum downlink rate of 150 Mbit/s and maximum uplink rate of 50 Mbit/s • LTE-TDD: maximum downlink rate of 130 Mbit/s and maximum uplink rate of 30 Mbit/s UMTS features: • Supports 3GPP R7 HSDPA+, HSDPA, HSUPA, and WCDMA. • Supports QPSK and 16QAM modulation. • HSDPA+: maximum downlink rate of 21 Mbit/s • HSUPA: maximum uplink rate of 5.76 Mbit/s • WCDMA: maximum downlink rate of 384 kbit/s and maximum uplink rate of 384 kbit/s GSM features: GPRS: • Supports GPRS multislot class 12. • Coding schemes: CS-1, CS-2, CS-3, and CS-4 • Maximum downlink rate: 85.6 kbit/s; maximum uplink rate: 85.6 kbit/s EDGE: • Supports EDGE multislot class 12. • Supports GMSK and 8-PSK modulation and coding schemes. • Downlink coding format: MCS 1–9 • Uplink coding format: MCS 1–9	• Class 4 (33 dBm±2 dB), EGSM900 frequency band • Class 1 (30 dBm±2 dB), DCS1800 frequency band • Class E2 (27 dBm±3 dB), EGSM900 8-PSK • Class E2 (26 dBm±3 dB), DCS1800 8-PSK • Class 3 (24 dBm+1/–3 dB), WCDMA frequency band • Class 3 (23 dBm±2 dB), LTE-FDD frequency band • Class 3 (23 dBm±2 dB), LTE-TDD frequency band
SDongleA-03-EU	LTE FDD: B1, B3, B7, B8, B20 LTE TDD: B38, B40 WCDMA/HSDPA/HSUPA/HSPA+: B1, B8 GSM/GPRS/EDGE: 900 MHz, 1800 MHz			
SDongleA-03-AU	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			
SDongleA-03-JP	LTE FDD: B1, B3, B8, B18, B19, B26 LTE TDD: B41			

Model	Supported Frequency Bands and Systems	Protocols and Standards	Bandwidth	Maximum transmit power
SDongleA-03-KR	WCDMA: B1, B6, B8, B19 LTE FDD: B1, B3, B5, B7 WCDMA: B1		• Maximum downlink rate: 236.8 kbit/s; maximum uplink rate: 236.8 kbit/s	

Table 2-9 Data requirements for the SIM card

Management System Type	Monthly Data Requirement for the SIM Card			Data Capability
Smart PV management system	Inverter	Without a power meter or ESS	10 MB + 4 MB x Number of inverters	• Device performance data can be updated every 5 minutes. • The Smart Dongle logs, inverter logs, and I-V diagnosis data can be exported monthly. The Smart Dongle and inverters can be upgraded monthly.
		With a power sensor	10 MB + 7 MB x Number of inverters	
		With an ESS[1]	13 MB + 7 MB x Number of inverters + 5 MB x Number of DC-DC converters	
		With a power sensor and ESS[1]	13 MB + 7 MB x Number of inverters + 5 MB x Number of DC-DC converters	
	With optimizers		Inverter data usage + 2 MB + 0.2 MB x Number of optimizers	
Poverty alleviation monitoring center	With inverters		4 MB + 15 MB x Number of inverters	-
Note 1: If an ESS are configured, it is recommended that the Smart Dongle that can communicate with a maximum of 10 devices be used.				

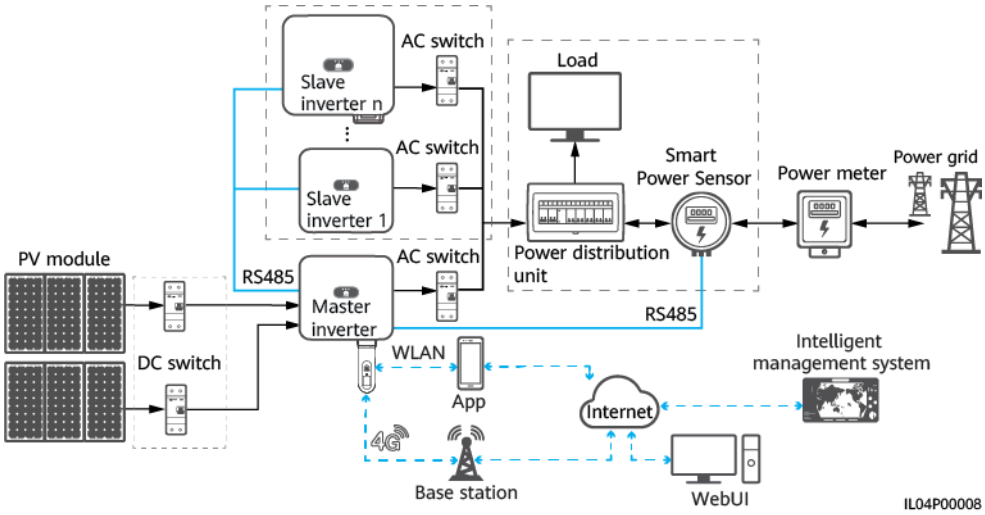
2.3 Communication Networking of the SDongleB-06 (4G)

- The inverter connects to the smart PV management system through the 4G Smart Dongle.

- The master inverter connects to the app. You can use the app to locally view the running information and set parameters of the inverter.
- The Smart Dongle can connect to a third-party management system.
- The Smart Dongle supports WLAN hotspots.
- You can remotely manage the smart PV management system over the WebUI or app.

RS485 Networking

Figure 2-4 Networking description



NOTE

- The components in the dotted box are optional.
- The inverter model is subject to change. The model information and device appearance in this document are for reference only.
- In the networking, the inverter where the Dongle is installed is the master inverter, and other inverters are slave inverters. Slave inverters can communicate with the Dongle through cascading.
- If multiple inverters are cascaded, use either a Dongle or a SmartLogger for networking. You cannot use two networking methods at the same time.
- The Smart Power Sensor connects to the RS485-2 and RS485_2 ports, or 485B2 and 485A2 ports on the master inverter. The RS485-1 and RS485_1 ports, or 485B1 and 485A1 ports are used for inverter cascading.

Table 2-10 Device description 1

Device	Description	Service Owner
PV module	Prepared by the customer	Device supplier
Optimizer	-	Purchased from the Company.

Device		Description	Service Owner
Inverter	Master inverter	• SUN2000-(20KTL, 29.9KTL, 30KTL, 36KTL, 40KTL)-M3 Series • SUN2000-(12KTL-25KTL)-M5 Series • SUN2000-(50KTL-ZHM3, 50KTL-M3, 50KTL-BRM3) • SUN2000-50KTL-NHM3 • SUN2000-50K-MC0 • SUN2000-30K-MC0 • SUN2000-40K-MC0 • SUN2000-100KTL/110KTL/125KTL-M0, SUN2000-75KTL/100KTL-M1, SUN2000-100KTL-INM0. • SUN2000-(75KTL-M1, 100KTL-M2, 110KTL-M2, 115KTL-M2) • SUN2000-(50K, 75K, 80K, 150K)-MG Series • SUN5000-(150K-MG0-ZH,150K-MG0) • SUN2000-(250KTL, 280KTL, 300KTL, 330KTL) series (only for China)	Huawei
	Slave inverter	The master inverter can be used as a slave inverter. (If the inverter does not support cascading, it cannot be used as a slave inverter.)	Huawei
Dongle		Purchased by the customer. The model shall be SDongleB-06-XX. For details, see the Smart Dongle model description.	Huawei
SIM card		If the Smart Dongle is not configured with a SIM card, prepare a standard SIM card (size: 25 mm x 15 mm) of a local carrier.	Customer
Intelligent management system		• Smart PV management system. • Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation.	• Huawei • Device supplier
App		• Smart PV app. The app can be locally connected to the inverter and remotely connected to the management system. • SUN2000 app of 3.2.00.005 or a later version for Android. The app can be locally connected to the inverter. • Third-party app. For details, see the third-party app documentation.	Huawei

Device	Description	Service Owner
Power distribution unit	Prepared by the customer	Device supplier
ESS	The LUNA2000 can be connected.	Huawei
Smart Power Sensor	DTSU666-H, DTSU666-HW, YDS60-80, YDS60-C24, DTSU71, DHSU1079-CT, DHSU1079-ZT, DTSU71C	Huawei
Power meter	Prepared by the customer	Device supplier

Table 2-11 Device description 2

Device	Description	Service Owner
PV module	Prepared by the customer	Device supplier
Optimizer	-	Purchased from the Company.
Inverter	• SUN2000-(2KTL-5KTL)-CN, SUN2000-(2KTL-5KTL)-L0, software version SUN2000L V100R001C00SPC333 or later • SUN2000-(2KTL-6KTL)-L1 • SUN2000-(8K,10K)-LC0 Series • SUN2000-(3KTL-20KTL)-M0 • SUN2000-(3KTL-12KTL)-M1 • SUN2000-(5K-12K)-MAP0 Series • SUN5000-(8K, 12K)-MAP0 Series • SUN2000-(3K-6K)-LB0 Series • SUN2000-(8KTL-20KTL)-M2 • SUN2000-(12K-25K)-MB0 Series • SUN5000-(17K, 25K)-MB0 Series For details about inverter mapping, see **Residential Smart PV Solution User Manual (Smart Dongle networking and direct inverter networking)**.	Huawei
Dongle	Purchased by the customer. The model shall be SDongleB-06-XX. For details, see the Smart Dongle model description.	Huawei
SIM card	If the Smart Dongle is not configured with a SIM card, prepare a standard SIM card (size: 25 mm x 15 mm) of a local carrier.	Customer

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Device	Description	Service Owner
Intelligent management system	• Smart PV management system. • Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation.	• Huawei • Device supplier
App	• Smart PV app. The app can be locally connected to the inverter and remotely connected to the management system. • SUN2000 app of 3.2.00.005 or a later version for Android. The app can be locally connected to the inverter. • Third-party app. For details, see the third-party app documentation.	Huawei
Power distribution unit	Prepared by the customer	Device supplier
ESS	The LUNA2000 can be connected.	Huawei
Smart Power Sensor	• Recommended models for three-phase inverters: DTSU666-H, YDS60-C24, DTSU71, DHSU1079-CT • Recommended models for single-phase inverters: DDSU666-H, YDS70-C16, DDSU71, DDSU1079-CT	Huawei
Power meter	Prepared by the customer	Device supplier

MBUS Communication Networking

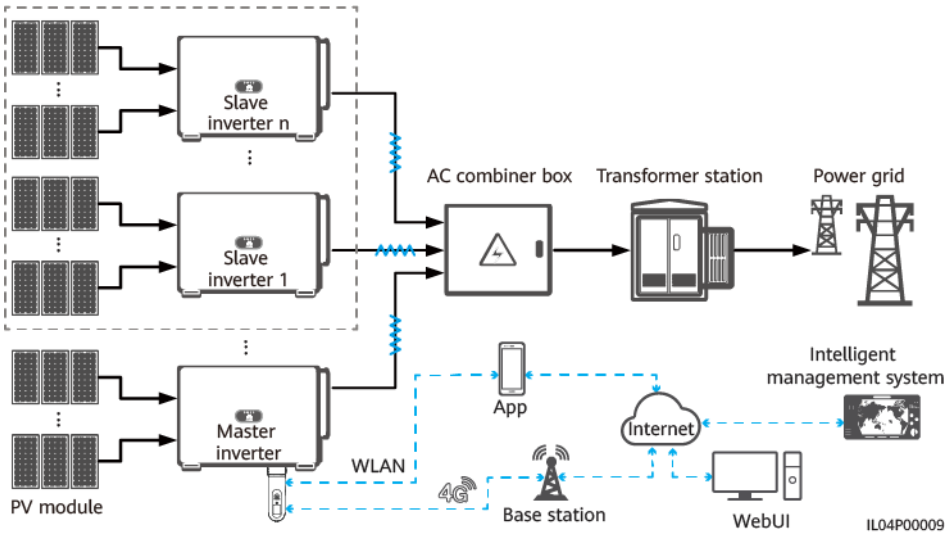
- The inverter connects to the smart PV management system through the 4G Smart Dongle.
- The master inverter connects to the app. You can use the app to locally view the running information and set parameters of the inverter.
- You can remotely manage the management system over the WebUI or app.
- Procedure:
  a. Open the app, log in using an installer account, and choose **Services > Device commissioning**. Then, scan the QR code on the Smart Dongle or manually connect to the WLAN of the Smart Dongle to access the device commissioning screen.
  b. Enter the login password.
  c. Tap **Log in** and go to the solar inverter screen. Choose **Settings > Communication configuration > Parallel system communication parameter settings > MBUS**. Insert the Dongle into the inverter whose parallel communication parameter is **MBUS**. Ensure that the parallel communication parameters of other inverters in the parallel system are **NA**.

d. When using the Dongle to perform quick settings, set **Networking mode** to **MBUS**.

NOTICE

- The MBUS communication is applicable to medium-voltage grid connection scenarios and non-low-voltage public grid connection scenarios (industrial environment).
- To enable the anti-crosstalk function, you need to load a whitelist. Ensure that the PLC CCO version is SmartMBUS V100R001C00SPC220B220 or later.

Figure 2-5 Networking description



NOTE

- The components in the dotted box are optional.
- The inverter model is subject to change. The model information and device appearance in this document are for reference only.
- In the networking, the inverter where the Dongle is installed is the master inverter, and other inverters are slave inverters. Slave inverters can communicate with the Dongle through cascading.
- If multiple inverters are cascaded, use either a Dongle or a SmartLogger for networking. You cannot use two networking methods at the same time.

Table 2-12 Device or software description

Device	Description	Service Owner
PV module	Prepared by the customer	Customer
Optimizer	-	Purchased from the Company.

Device		Description	Service Owner
Inverter	Master inverter	• SUN2000-100KTL/110KTL/125KTL-M0 and SUN2000-75KTL/110KTL-M1, with the software version of SUN2000 V500R001C00SPC129B092 or later • SUN2000-(75KTL-M1, 100KTL-M2, 110KTL-M2, 115KTL-M2), with the software version of SUN2000ME V500R023C00SPC030B128 or later • SUN2000-(50K, 75K, 80K, 150K)-MG Series • SUN5000-(150K-MG0-ZH,150K-MG0) • SUN2000-(250KTL, 280KTL, 300KTL, 330KTL) series (only for China)	Huawei
	Slave inverter	The master inverter can be used as a slave inverter.	Huawei
Dongle		Purchased by the customer. The model shall be SDongleB-06-XX. For details, see the Smart Dongle model description. Software version: SDongle V200R022C10SPC103B016 or later.	Huawei
SIM card		If the Smart Dongle is not configured with a SIM card, prepare a standard SIM card (size: 25 mm x 15 mm) of a local carrier.	Customer
Intelligent management system		• Smart PV management system. • Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation.	• Huawei • Device supplier
App		• Smart PV app. The app can be locally connected to the inverter and remotely connected to the management system. • SUN2000 app of 6.23.00.153 or a later version for Android. The app is locally connected to the inverter.	Huawei
AC combiner box		Prepared by the customer	Customer
Transformer station		Prepared by the customer	Customer
Power meter		Prepared by the customer	Device supplier

Smart Dongle Parameters

Table 2-13 Number of cascaded inverters

Limit		Actual Connection	
Maximum Number of Devices That Can Be Connected to the Smart Dongle[abcd]		**Number of Slave Inverters**	**Number of Other Devices (Such as Power Meters)**
10	10	n ≤ 9	≤ 9 – n
	3 (with an ESS)	n ≤ 2	≤ 2 – n
	3 (with single-phase inverters)	n ≤ 2	≤ 2 – n
2	2	n ≤ 1	≤ 1 – n
Note a: You can view the number of devices that can be connected to the Smart Dongle from the label on the external package. Note b: If the number of inverters exceeds the limit, configure multiple Smart Dongles. The installation and commissioning methods for each Smart Dongle are the same. Note c: A maximum of three SUN2000-(2KTL-6KTL)-L1 inverters can be cascaded. Note d: If RS485 communication is used and the device is connected to the RS485-2 and RS485_2 ports, or 485B2 and 485A2 ports on the master inverter, the device is not counted as a cascaded device.			

Table 2-14 Basic specifications

Parameter	Description
SIM card type	Standard SIM card (25 mm x 15 mm)
Indicator	LED
Typical power consumption	3.5 W
Dimensions (W x H x D)	48 mm x 28 mm x 162 mm
Net weight	• 87 g • 120 g
Ingress protection (IP) rating	IP65
Operating temperature	–30°C to +65°C
Relative humidity	5%–95% RH

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Parameter	Description
Storage temperature	–40°C to +70°C
Maximum altitude	4000 m

Table 2-15 Frequency bands and systems of the Smart Dongle

Model	Supported Frequency Bands and Systems	Protocols and Standards	Bandwidth	Maximum transmit power
SDongleB-06-CN	LTE FDD: B1, B3, B5, B8 LTE TDD: B34, B39, B40, B41 GSM/GPRS/EDGE: 900 MHz, 1800 MHz	• Supports LTE-FDD (with receive diversity): B1/B3/B5/B8. • Supports LTE-TDD (with receive diversity): B34/B38/B39/B40/B41. • Supports WCDMA: B1/B5/B8. • Supports GSM: 900 MHz/1800 MHz. • Supports digital audio.	LTE features: • Supports a maximum of 3GPP R8 non-CA Cat 4 FDD and TDD. • Supports 1.4 MHz/3 MHz/5 MHz/10 MHz/15 MHz/20 MHz RF bandwidth. • Supports MIMO in the downlink. • LTE-FDD: maximum downlink rate of 150 Mbit/s and maximum uplink rate of 50 Mbit/s • LTE-TDD: maximum downlink rate of 130 Mbit/s and maximum uplink rate of 30 Mbit/s UMTS features: • Supports 3GPP R7 HSDPA+, HSDPA, HSUPA, and WCDMA. • Supports QPSK and 16QAM modulation. • HSDPA+: maximum downlink rate of 21 Mbit/s • HSUPA: maximum uplink rate of 5.76 Mbit/s • WCDMA: maximum downlink rate of 384 kbit/s and maximum uplink rate of 384 kbit/s GSM features: GPRS: • Supports GPRS multislot class 12. • Coding schemes: CS-1, CS-2, CS-3, and CS-4 • Maximum downlink rate: 85.6 kbit/s;	• Class 4 (33 dBm±2 dB), EGSM900 frequency band • Class 1 (30 dBm±2 dB), DCS1800 frequency band • Class E2 (27 dBm±3 dB), EGSM900 8-PSK • Class E2 (26 dBm±3 dB), DCS1800 8-PSK • Class 3 (24 dBm+1/–3 dB), WCDMA frequency band • Class 3 (23 dBm±2.7 dB), LTE-FDD frequency band • Class 3 (23 dBm±2.7 dB), LTE-TDD frequency band SDongleB-06 (WiFi): ≤ 20 dBm E.I.R.P.
SDongleB-06-EU	LTE FDD: B1, B3, B7, B8, B20, B28, B31 LTE TDD: B38, B40, B41 GSM/GPRS/EDGE: 850 MHz, 900 MHz, 1800 MHz, 1900 MHz			
SDongleB-06-AU	LTE FDD: B2, B4, B12 WCDMA: B1, B2, B5, B8 GSM: 850 MHz, 900 MHz, 1800 MHz, 1900 MHz			
SDongleB-06-NH	LTE FDD: B1, B3, B8, B18, B19, B26 LTE TDD: B41 WCDMA: B1, B6, B8, B19			

Model	Supported Frequency Bands and Systems	Protocols and Standards	Bandwidth	Maximum transmit power
			maximum uplink rate: 85.6 kbit/s EDGE: • Supports EDGE multislot class 12. • Supports GMSK and 8-PSK modulation and coding schemes. • Downlink coding format: MCS 1–9 • Uplink coding format: MCS 1–9 • Maximum downlink rate: 236.8 kbit/s; maximum uplink rate: 236.8 kbit/s SDongleB-06 (WiFi): 20 MHz/40 MHz (optional)	

Table 2-16 Data requirements for the SIM card

Management System Type	Monthly Data Requirement for the SIM Card			Data Capability
Management system[2]	Inverter	Without a power meter or ESS	15 MB + 4 MB x Number of inverters	• Device performance data can be updated every 5 minutes. • The Smart Dongle logs, inverter logs, and I-V diagnosis data can be exported monthly. The Smart Dongle and inverters can be upgraded monthly.
		With a power sensor	15 MB + 7 MB x Number of inverters	
		With an ESS[1]	18 MB + 7 MB x Number of inverters + 5 MB x Number of DC-DC converters	
		With a power sensor and ESS[1]	18 MB + 7 MB x Number of inverters + 5 MB x Number of DC-DC converters	
	With optimizers		Inverter data usage + 2 MB + 0.2 MB x Number of optimizers	

Management System Type	Monthly Data Requirement for the SIM Card		Data Capability
Poverty alleviation monitoring center	With inverters	4 MB + 15 MB x Number of inverters	-
Note 1: If an ESS are configured, it is recommended that the Smart Dongle that can communicate with a maximum of 10 devices be used. Note 2: The SDongleB-06 communicates with the management system in single-port or double-port mode. To ensure security in data transmission, use the single-port mode for encrypted transmission.			

NOTE

- If the inverter is connected to both the poverty alleviation monitoring center and the management system, the recommended monthly data plan of the SIM card is 14 MB + 19 MB x Number of inverters.
- In China, a SIM card with a maximum data plan of 100 MB is provided. If the calculated data exceeds the maximum, you are advised to purchase a SIM card by yourself.
- The following are examples of recommended monthly data plans for a SIM card to be used with the management system:
  - If two inverters and a power meter are installed, the recommended monthly data plan is 15 MB + 7 MB x 2 = 29 MB.
  - If one inverter and two ESSs are installed, the recommended monthly data plan is 18 MB + 7 MB x 1 + 5 MB x 2 = 35 MB.
  - If one inverter, two ESSs, and 10 optimizers are installed, the recommended monthly data plan is 35 MB + 2 MB + 0.2 MB x 10 = 39 MB.

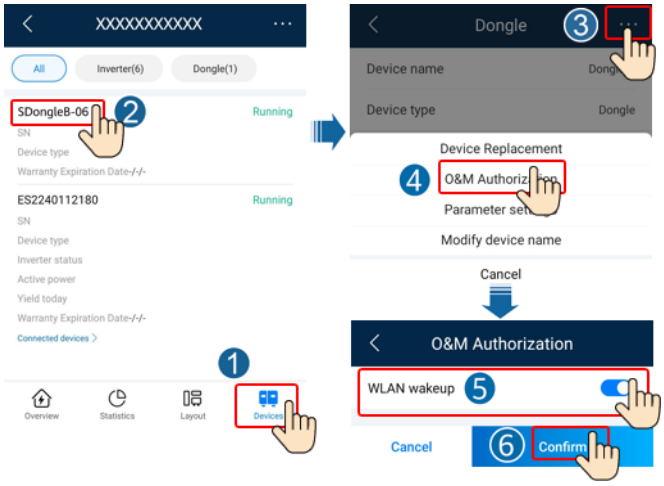
Smart Dongle WLAN

Commission the inverter locally via the Smart Dongle WLAN. If the Smart Dongle WLAN is disabled, log in to the app and tap the plant name on the **Home** screen to access the plant screen. Tap **Devices** and then tap **SDongleB-06**. Choose **O&M Authorization** > **WLAN wakeup** > **Confirm** to enable the Smart Dongle WLAN.

NOTE

If the inverter has a WLAN, the WLAN of the Smart Dongle is disabled by default. If the inverter does not have a WLAN, the WLAN of the Smart Dongle is enabled by default.

Figure 2-6 Enabling the Smart Dongle WLAN



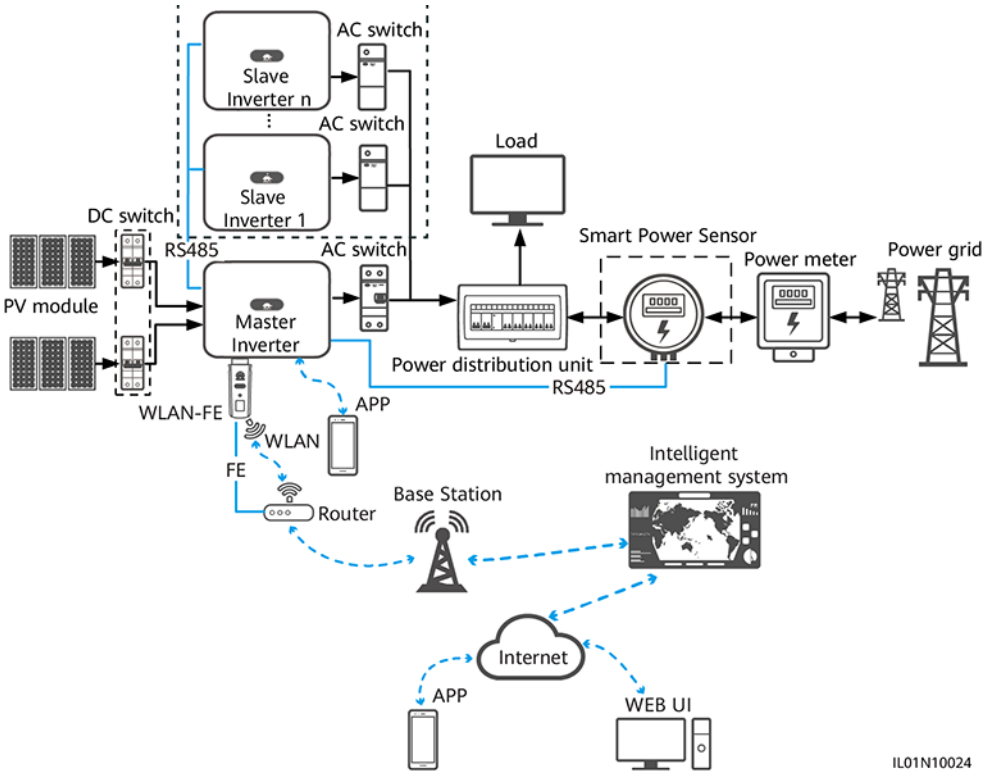
2.4 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV)

Smart Dongle (BOM Number: 02312QMV)

- The inverter connects to the router through the WLAN-FE Smart Dongle, and then connects to the management system through the router.
- The master inverter connects to the app. You can use the app to locally view the running information and set parameters of the inverter.
- You can remotely log in to the management system over the WebUI or app.

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Figure 2-7 Networking description (WLAN-FE)



NOTE

- The components in the dotted box are optional.
- The inverter model is subject to change. The model information and device appearance in this document are for reference only.
- In the networking, the inverter where the Dongle is installed is the master inverter, and other inverters are slave inverters. Slave inverters can communicate with the Dongle through cascading.
- If multiple inverters are cascaded, use either a Dongle or a SmartLogger for networking. You cannot use two networking methods at the same time.
- The Smart Power Sensor connects to the RS485-2 and RS485_2 ports, or 485B2 and 485A2 ports on the master inverter. The RS485-1 and RS485_1 ports, or 485B1 and 485A1 ports are used for inverter cascading.
- The SDongleA-05 (WLAN-FE, 02312QMV) is no longer placed on the market for PV scenarios.

Table 2-17 Number of cascaded inverters

Limit		Actual Connection	
Maximum Number of Devices That Can Be Connected to the Smart Dongle[abcd]		**Number of Slave Inverters**	**Number of Other Devices (Such as Power Meters)**
10	10	n ≤ 9	≤ 9 – n
	3 (with an ESS)	n ≤ 2	≤ 2 – n

Limit		Actual Connection	
Maximum Number of Devices That Can Be Connected to the Smart Dongle[abcd]		**Number of Slave Inverters**	**Number of Other Devices (Such as Power Meters)**
	3 (with single-phase inverters)	n ≤ 2	≤ 2 – n
Note a: You can view the number of devices that can be connected to the Smart Dongle from the label on the external package. Note b: If the number of inverters exceeds the limit, configure multiple Smart Dongles. The installation and commissioning methods for each Smart Dongle are the same. Note c: A maximum of three SUN2000-(2KTL-6KTL)-L1 inverters can be cascaded. Note d: If RS485 communication is used and the device is connected to the RS485-2 and RS485_2 ports, or 485B2 and 485A2 ports on the master inverter, the device is not counted as a cascaded device.			

Table 2-18 Device description 1

Device		Description	Service Owner
PV module		Purchased by the customer	Device supplier
Optimizer		-	Purchased from the Company.
Inverter	Master inverter	• SUN2000-(20KTL, 29.9KTL, 30KTL, 36KTL, 40KTL)-M3 Series • SUN2000-(50KTL-ZHM3, 50KTL-M3, 50KTL-BRM3) • SUN2000-(12KTL-25KTL)-M5 Series	Huawei
	Slave inverter	• The master inverter can be used as a slave inverter. • SUN2000-33KTL • SUN2000-29.9KTL/33KTL-A/36KTL • SUN2000-50KTL/60KTL-M0 • SUN2000-100KTL/110KTL-M0	Huawei
Dongle		Purchased by the customer. The model should be SDongleA-05.	Huawei

Device	Description	Service Owner
Router	• The router supports WLAN (IEEE 802.11 b/g/n, 2.4 GHz), and the inverters are within the WLAN signal coverage. • The WPA, WPA2, or WPA/WPA2 encryption mode is recommended. • The Enterprise mode is not supported (such as airport WLAN and other public hotspots that require authentication). • WEP and WPA TKIP encryption modes are not recommended because they have serious security vulnerabilities. • If the access fails in WEP or WPA TKIP mode, log in to the router and change the encryption mode of the router to WPA2 or WPA/WPA2.	Device supplier
Intelligent management system	Smart PV management system.	Huawei
App	Smart PV app. The app can be locally connected to the inverter and remotely connected to the management system.	Huawei
Power distribution unit	Prepared by the customer	Device supplier
ESS	The LUNA2000 can be connected.	Huawei
Smart Power Sensor	DTSU666-H, DTSU666-HW, YDS60-80, YDS60-C24, DTSU71, DHSU1079-CT, DHSU1079-ZT, DTSU71C	Huawei
Power meter	Prepared by the customer	Device supplier

Table 2-19 Device description 2

Device	Description	Service Owner
PV module	Purchased by the customer	Device supplier
Optimizer	-	Purchased from the Company.

Device	Description	Service Owner
Inverter	• SUN2000-(2KTL-6KTL)-L1 • SUN2000-(8K,10K)-LC0 Series • SUN2000-(3K-6K)-LB0 Series • SUN2000-(5K-12K)-MAP0 Series • SUN5000-(8K, 12K)-MAP0 Series • SUN2000-(3KTL-20KTL)-M0 • SUN2000-(3KTL-12KTL)-M1 • SUN2000-(8KTL-20KTL)-M2 • SUN2000-(12K-25K)-MB0 Series • SUN5000-(17K, 25K)-MB0 Series For details about inverter mapping, see **Residential Smart PV Solution User Manual (Smart Dongle networking and direct inverter networking)**.	Huawei
Dongle	Purchased by the customer. The model should be SDongleA-05.	Huawei
Router	• The router supports WLAN (IEEE 802.11 b/g/n, 2.4 GHz), and the inverters are within the WLAN signal coverage. • The WPA, WPA2, or WPA/WPA2 encryption mode is recommended. • The Enterprise mode is not supported (such as airport WLAN and other public hotspots that require authentication). • WEP and WPA TKIP encryption modes are not recommended because they have serious security vulnerabilities. • If the access fails in WEP or WPA TKIP mode, log in to the router and change the encryption mode of the router to WPA2 or WPA/WPA2.	Device supplier
Intelligent management system	Smart PV management system.	Huawei
App	Smart PV app. The app can be locally connected to the inverter and remotely connected to the management system.	Huawei
Power distribution unit	Prepared by the customer	Device supplier
ESS	The LUNA2000 can be connected.	Huawei

Device	Description	Service Owner
Smart Power Sensor	• Recommended models for three-phase inverters: DTSU666-H, YDS60-C24, DTSU71, DHSU1079-CT • Recommended models for single-phase inverters: DDSU666-H, YDS70-C16, DDSU71, DDSU1079-CT	Huawei
Power meter	Prepared by the customer	Device supplier

2.5 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV-004)

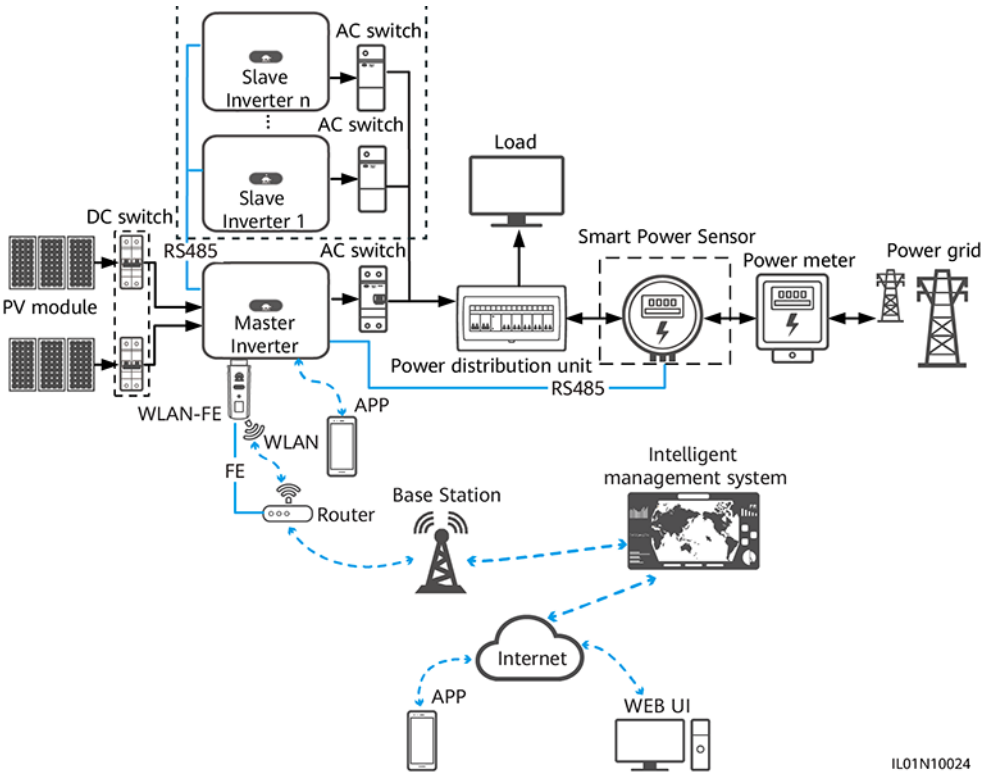
Smart Dongle (BOM Number: 02312QMV-004)

- The inverter connects to the router through the WLAN-FE Smart Dongle, and then connects to the management system through the router.
- The Smart Dongle can connect to a third-party management system.
- The Smart Dongle supports WLAN hotspots.
- The master inverter connects to the app. You can use the app to locally view the running information and set parameters of the inverter.
- You can remotely log in to the management system over the WebUI or app.

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RS485 Networking

Figure 2-8 Networking description (WLAN-FE)



NOTE

- The components in the dotted box are optional.
- The inverter model is subject to change. The model information and device appearance in this document are for reference only.
- In the networking, the inverter where the Dongle is installed is the master inverter, and other inverters are slave inverters. Slave inverters can communicate with the Dongle through cascading.
- If multiple inverters are cascaded, use either a Dongle or a SmartLogger for networking. You cannot use two networking methods at the same time.
- The Smart Power Sensor connects to the RS485-2 and RS485_2 ports, or 485B2 and 485A2 ports on the master inverter. The RS485-1 and RS485_1 ports, or 485B1 and 485A1 ports are used for inverter cascading.

Table 2-20 Device description 1

Device	Description	Service Owner
PV module	Purchased by the customer	Device supplier
Optimizer	-	Purchased from the Company.

Device		Description	Service Owner
Inverter	Master inverter	• SUN2000-(20KTL, 29.9KTL, 30KTL, 36KTL, 40KTL)-M3 Series • SUN2000-(50KTL-ZHM3, 50KTL-M3, 50KTL-BRM3) • SUN2000-(12KTL-25KTL)-M5 Series • SUN2000-(75KTL-M1, 100KTL-M2, 110KTL-M2, 115KTL-M2) • SUN2000-(50K, 75K, 80K, 150K)-MG Series • SUN2000-50K-MC0 • SUN2000-30K-MC0 • SUN2000-40K-MC0 • SUN5000-(150K-MG0-ZH,150K-MG0)	Huawei
	Slave inverter	The master inverter can be used as a slave inverter.	Huawei
Dongle		Purchased by the customer. The model should be SDongleA-05.	Huawei
Router		• The router supports WLAN (IEEE 802.11 b/g/n, 2.4 GHz), and the inverters are within the WLAN signal coverage. • The WPA, WPA2, or WPA/WPA2 encryption mode is recommended. • The Enterprise mode is not supported (such as airport WLAN and other public hotspots that require authentication). • WEP and WPA TKIP encryption modes are not recommended because they have serious security vulnerabilities. • If the access fails in WEP or WPA TKIP mode, log in to the router and change the encryption mode of the router to WPA2 or WPA/WPA2.	Device supplier
Intelligent management system		Smart PV management system.	Huawei
App		Smart PV app. The app can be locally connected to the inverter and remotely connected to the management system.	Huawei
Power distribution unit		Prepared by the customer	Device supplier

Device	Description	Service Owner
ESS	The LUNA2000 can be connected.	Huawei
Smart Power Sensor	DTSU666-H, DTSU666-HW, YDS60-80, YDS60-C24, DTSU71, DHSU1079-CT, DHSU1079-ZT, DTSU71C	Huawei
Power meter	Prepared by the customer	Device supplier

Table 2-21 Device description 2

Device	Description	Service Owner
PV module	Purchased by the customer	Device supplier
Optimizer	-	Purchased from the Company.
Inverter	• SUN2000-(2KTL-5KTL)-L0, SUN2000-(2KTL-6KTL)-L1. Software version: SUN2000L V200R001C00 or later. (All software versions of this inverter model are supported.) • SUN2000-(8K,10K)-LC0 Series • SUN2000-(3K-6K)-LB0 Series • SUN2000-(3KTL-20KTL)-M0 • SUN2000-(3KTL-12KTL)-M1 • SUN2000-(5K-12K)-MAP0 Series • SUN5000-(8K, 12K)-MAP0 Series • SUN2000-(8KTL-20KTL)-M2 • SUN2000-(12K-25K)-MB0 Series • SUN5000-(17K, 25K)-MB0 Series For details about inverter mapping, see **Residential Smart PV Solution User Manual (Smart Dongle networking and direct inverter networking)**.	Huawei
Dongle	Purchased by the customer. The model should be SDongleA-05.	Huawei

Device	Description	Service Owner
Router	• The router supports WLAN (IEEE 802.11 b/g/n, 2.4 GHz), and the inverters are within the WLAN signal coverage. • The WPA, WPA2, or WPA/WPA2 encryption mode is recommended. • The Enterprise mode is not supported (such as airport WLAN and other public hotspots that require authentication). • WEP and WPA TKIP encryption modes are not recommended because they have serious security vulnerabilities. • If the access fails in WEP or WPA TKIP mode, log in to the router and change the encryption mode of the router to WPA2 or WPA/WPA2.	Device supplier
Intelligent management system	Smart PV management system.	Huawei
App	Smart PV app. The app can be locally connected to the inverter and remotely connected to the management system.	Huawei
Power distribution unit	Prepared by the customer	Device supplier
ESS	The LUNA2000 can be connected.	Huawei
Smart Power Sensor	• Recommended models for three-phase inverters: DTSU666-H, YDS60-C24, DTSU71, DHSU1079-CT • Recommended models for single-phase inverters: DDSU666-H, YDS70-C16, DDSU71, DDSU1079-CT	Huawei
Power meter	Prepared by the customer	Device supplier

MBUS Communication Networking

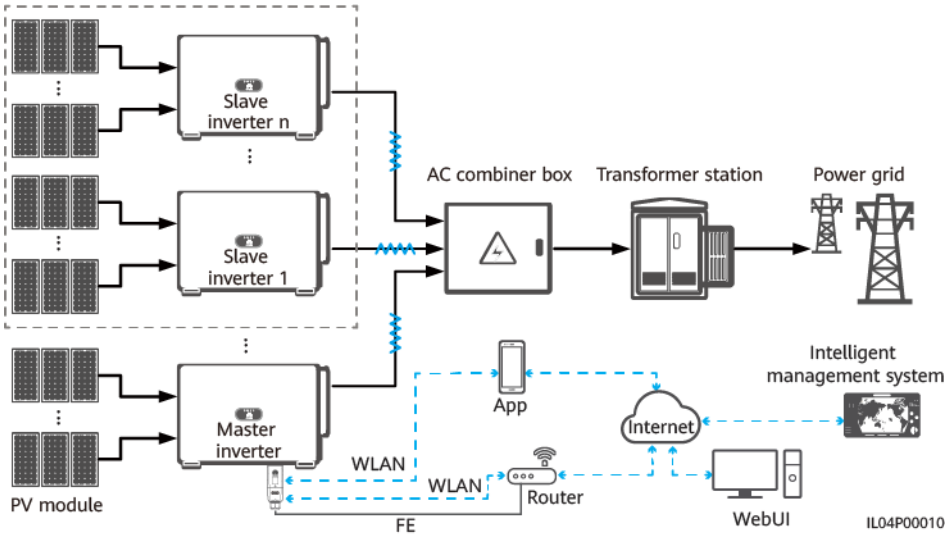
- The inverter connects to the router through the WLAN-FE Smart Dongle, and then connects to the management system through the router.
- The master inverter connects to the app. You can use the app to locally view the running information and set parameters of the inverter.

- You can remotely log in to the management system over the WebUI or app.
- Procedure:
  a. Open the app, log in using an installer account, and choose **Services > Device commissioning**. Then, scan the QR code on the Smart Dongle or manually connect to the WLAN of the Smart Dongle to access the device commissioning screen.
  b. Enter the login password.
  c. Tap **Log in** and go to the solar inverter screen. Choose **Settings > Communication configuration > Parallel system communication parameter settings > MBUS**. Insert the Dongle into the inverter whose parallel communication parameter is **MBUS**. Ensure that the parallel communication parameters of other inverters in the parallel system are **NA**.
  d. When using the Dongle to perform quick settings, set **Networking mode** to **MBUS**.

NOTICE

- The MBUS communication is applicable to medium-voltage grid connection scenarios and non-low-voltage public grid connection scenarios (industrial environment).
- To enable the anti-crosstalk function, you need to load a whitelist. Ensure that the PLC CCO version is SmartMBUS V100R001C00SPC220B220 or later.

Figure 2-9 Networking description (WLAN-FE)



NOTE

- The components in the dotted box are optional.
- The inverter model is subject to change. The model information and device appearance in this document are for reference only.
- In the networking, the inverter where the Dongle is installed is the master inverter, and other inverters are slave inverters. Slave inverters can communicate with the Dongle through cascading.
- If multiple inverters are cascaded, use either a Dongle or a SmartLogger for networking. You cannot use two networking methods at the same time.

Table 2-22 Device or software description

Device		Description	Service Owner
PV module		Prepared by the customer	Customer
Optimizer		-	Purchased from the Company.
Inverter	Master inverter	SUN2000-100KTL/110KTL/125KTL-M0 and SUN2000-75KTL/110KTL-M1, with the software version of SUN2000 V500R001C00SPC129B092 or later • SUN2000-(75KTL-M1, 100KTL-M2, 110KTL-M2, 115KTL-M2), with the software version of SUN2000ME V500R023C00SPC030B128 or later • SUN2000-(50K, 75K, 80K, 150K)-MG Series • SUN5000-(150K-MG0-ZH,150K-MG0)	Huawei
	Slave inverter	The master inverter can be used as a slave inverter.	Huawei
Dongle		Purchased by the customer. The model shall be SDongleA-05. For details, see the Smart Dongle model description. Software version: SDongle V200R022C10SPC103B016 or later.	Huawei
Intelligent management system		• Smart PV management system. • Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation.	• Huawei • Device supplier

Device	Description	Service Owner
App	• Smart PV app. The app can be locally connected to the inverter and remotely connected to the management system. • SUN2000 app of 6.23.00.153 or a later version for Android. The app is locally connected to the inverter.	Huawei
AC combiner box	Prepared by the customer	Customer
Transformer station	Prepared by the customer	Customer
Power meter	Prepared by the customer	Device supplier

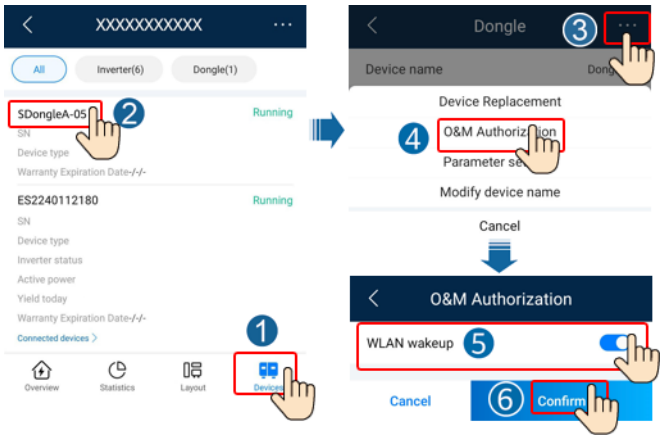
Smart Dongle WLAN

Commission the inverter locally via the Smart Dongle WLAN. If the Smart Dongle WLAN is disabled, log in to the app and tap the plant name on the **Home** screen to access the plant screen. Tap **Devices** and then tap **SDongleA-05**. Choose **O&M Authorization** > **WLAN wakeup** > **Confirm** to enable the Smart Dongle WLAN.

NOTE

If the inverter has a built-in WLAN module, the Smart Dongle WLAN is disabled by default. If the inverter does not have a WLAN module, the Smart Dongle WLAN is enabled by default.

Figure 2-10 Enabling the Smart Dongle WLAN

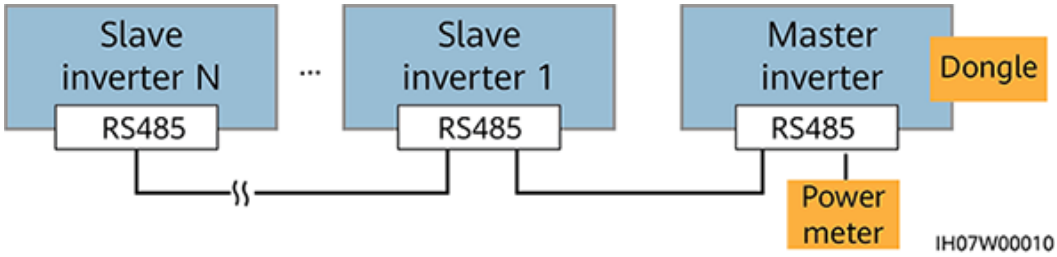


3 Cable Connections

3.1 Connecting Cables for Cascaded Inverters

This document provides only the schematic diagram of inverter cascading. For details about communications port definitions and cable connections, see the user manual of each inverter.

Figure 3-1 Cable connections for cascaded inverters



NOTICE

- Ensure that the shield layer is grounded when connecting the RS485 cable.
- When laying out communications cables, separate them from power cables and keep them away from strong interference sources to prevent communication interruption.

NOTE

The DTSU666-H and YDS60-C24 meters have similar appearances and cable connections. This section uses cable connections to the DTSU666-H as an example.

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Figure 3-2 Connecting cables to the DTSU666-H (three-phase three-wire)

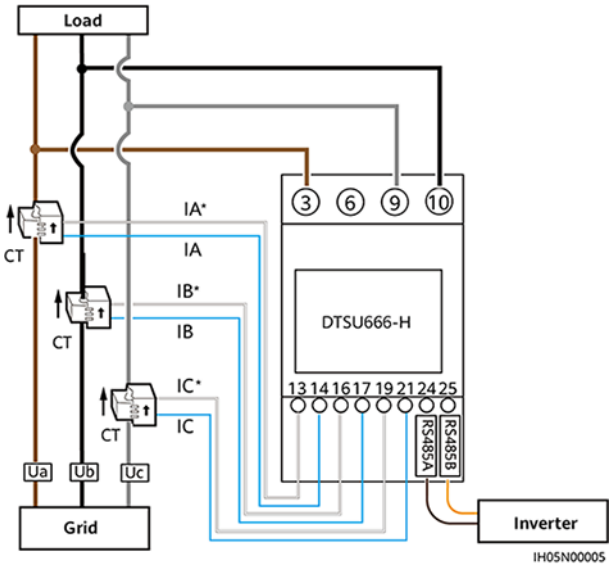
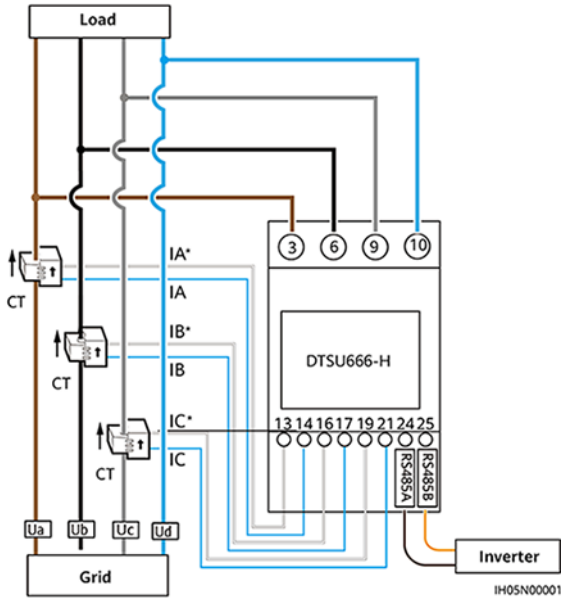


Figure 3-3 Connecting cables to the DTSU666-H (three-phase four-wire)

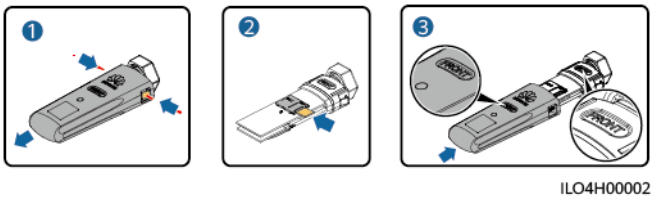


3.2 Installing the 4G/WLAN Smart Dongle

Step 1 Install a SIM card. (Skip this step for the WLAN Smart Dongle or the Smart Dongle that is configured with a SIM card.)

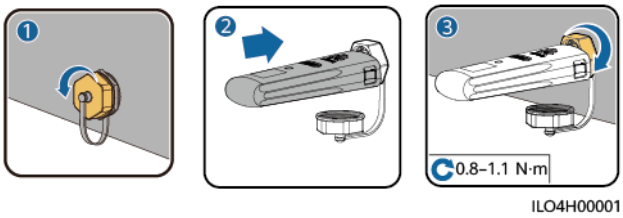
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Figure 3-4 Installing a SIM card



Step 2 Install the Smart Dongle onto the USB port on the master inverter.

Figure 3-5 Installing a Smart Dongle

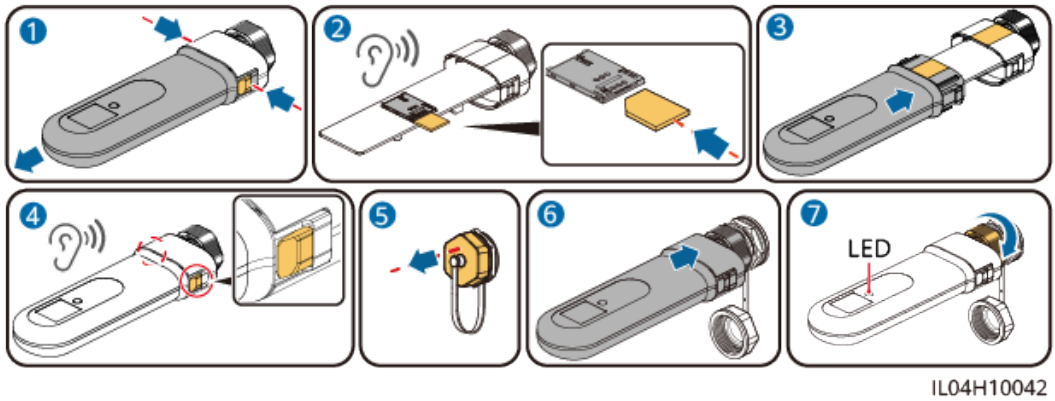


----End

3.3 Installing the 4G (06) Smart Dongle

Step 1 Install a SIM card (skip this step for the Smart Dongle that is configured with a SIM card). Install the Smart Dongle onto the USB port of the master inverter.

Figure 3-6 Installing the 4G Smart Dongle (SDongleB-06)



----End

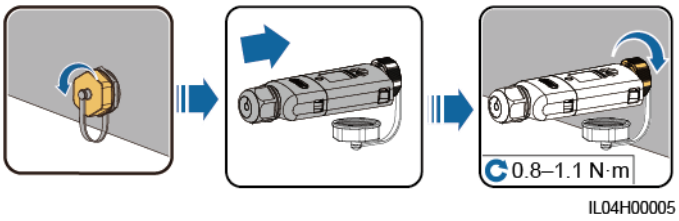
3.4 Installing the WLAN-FE Smart Dongle

WLAN communication

Install the Smart Dongle onto the USB port on the master inverter.

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Figure 3-7 Installing a Smart Dongle

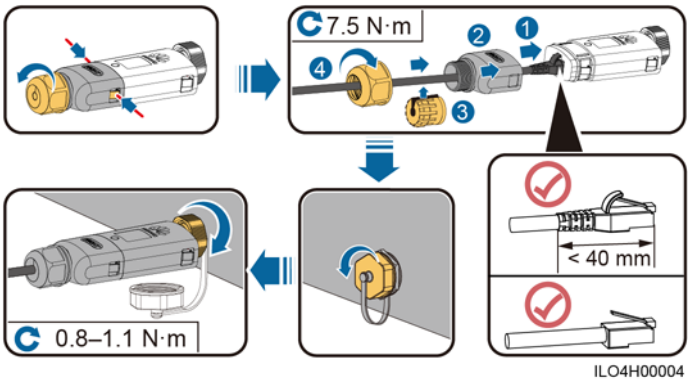


FE Communication

After connecting the FE cable, install the Smart Dongle onto the USB port on the master inverter.

You are advised to use a Cat 5e outdoor shielded network cable (outer diameter < 9 mm; internal resistance ≤ 1.5 ohms/10 m) and shielded RJ45 connectors.

Figure 3-8 Installing a Smart Dongle



4 System Power-On and Commissioning

DANGER

- Wear personal protective equipment and use dedicated insulated tools to avoid electric shocks or short circuits.
- Do not use wet cloth to clean exposed copper bars or other conductive parts.

WARNING

- Before performing maintenance, power off the equipment, follow the instructions on the delayed discharge label, and wait for a period of time as specified to ensure that the equipment is not energized.

NOTICE

Before the equipment is put into operation for the first time, ensure that the parameters are set correctly by professional personnel. Incorrect parameter settings may result in noncompliance with local grid connection requirements and affect the normal operations of the equipment.

4.1 Checking Before Power-On

1. Ensure that the ground cable of the inverter is securely connected.
2. Ensure that the inverter is properly installed and all cables are correctly and reliably connected.
3. Ensure that the Smart Dongle is properly installed.

4.2 Powering On the Inverter

Power on the inverter after cable connections are completed.

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Procedure

Step 1 Turn on the AC circuit breaker between the inverter and the power grid.

Step 2 Turn on the DC switch at the bottom of the inverter.

----End

Viewing the LED Indicator Status of the Smart Dongle

Table 4-1 LED indicator status (WLAN Smart Dongle and WLAN-FE Smart Dongle)

Operation	Indicator Color	Indicator Status	Remarks	Description
Installing the Smart Dongle	-	Off	Normal	The Smart Dongle is not secured or is not powered on.
	Yellow (blinking green and red simultaneously)	Steady on		The Smart Dongle is secured and powered on.
	Red	Blinking fast (on for 0.2s and then off for 0.2s)		The parameters for connecting to the router are to be set.
	Red	Steady on	Abnormal	Replace the Smart Dongle because it has an internal fault.
	Blinking red and green alternatively	Blinking slowly (red for 1s and then green for 1s)		Communication with the inverter fails. ● Remove and insert the Smart Dongle. ● Check that the inverter matches the Smart Dongle. ● Connect the Smart Dongle to another inverter. Check whether the Smart Dongle or the USB port of the inverter is faulty.
Upgrading the Smart Dongle	Blinking red and green alternatively	Blinking fast (red for 0.2s and then green for 0.2s)	Normal	The Smart Dongle is being upgraded locally.
Setting an inverter's connection to a router	Green	Blinking slowly (on for 0.5s and then off for 0.5s)	Normal	The device is connecting to the router.

Operation	Indicator Color	Indicator Status	Remarks	Description
	Red	Blinking fast (on for 0.2s and then off for 0.2s)	Abnormal	Failed to connect to the router. Check whether the parameters for connecting the Smart Dongle to the router are properly set. If not, set the parameters correctly.
Setting parameters in the management system	Green	Steady on	Normal	Successfully connected to the management system.
	Red	Blinking slowly (on for 1s and then off for 1s)	Abnormal	Failed to connect to the management system. Check whether the parameters for connecting inverters to the management system are properly set. If not, set the parameters correctly.
	Green	Blinking fast (on for 0.2s and then off for 0.2s)	Normal	The inverter is communicating with the management system through the Smart Dongle.

Table 4-2 LED indicator status (4G Smart Dongle)

Indicator		Remarks	Description
-	Off	Normal	The Smart Dongle is not secured or is not powered on.
Yellow (blinking green and red simultaneously)	Steady on		The Smart Dongle is secured and powered on.
Green	The indicator blinks at intervals of 2s, on for 0.1s and then off for 1.9s.	Normal	Dialing (duration < 1 min)
		Abnormal	If the duration is longer than 1 min, the 4G parameter settings are incorrect. Reset the parameters.
	Blinking slowly (on for 1s and then off for 1s)	Normal	The dial-up connection is set up successfully (duration < 30s).
		Abnormal	If the duration is longer than 30s, the settings of the management system parameters are incorrect. Reset the parameters.
	Steady on	Normal	Successfully connected to the management system.

Indicator		Remarks	Description
	Blinking fast (on for 0.2s and then off for 0.2s)		The inverter is communicating with the management system through the Smart Dongle.
Red	Steady on	Abnormal	Replace the Smart Dongle because it has an internal fault.
	Blinking fast (on for 0.2s and then off for 0.2s)		The Smart Dongle has no SIM card or the SIM card is in poor contact. Check whether the SIM card has been installed or is in good contact. If not, install the SIM card or remove and insert the SIM card.
	Blinking slowly (on for 1s and then off for 1s)		The Smart Dongle fails to connect to the management system because the SIM card runs out of the data quota or the signal strength is poor. If the Smart Dongle is reliably connected, check the SIM card signal through the app. If no signal is received or the signal strength is weak, contact the carrier. Check whether the tariff and data quota of the SIM card are normal. If not, top up the SIM card or purchase a data package.
Blinking red and green alternatively	Blinking slowly (red for 1s and then green for 1s)		Communication with the inverter fails. • Remove and insert the Smart Dongle. • Check that the inverter matches the Smart Dongle. • Connect the Smart Dongle to another inverter. Check whether the Smart Dongle or the USB port of the inverter is faulty.
	Blinking fast (red for 0.2s and then green for 0.2s)	Normal	The Smart Dongle is being upgraded locally.

5 Plant Creation and Commissioning

5.1 Creating a PV Plant

5.1.1 Creating a PV Plant over the App

Prerequisites

- App: The app has been downloaded and installed.
- The inverter is properly powered on and the Smart Dongle communicates with the management system properly.
- You have obtained the login account and password from the installer or service engineer. If no account or password is available, create an account.

NOTE

- The latest app version is required for device commissioning.
- This section contains a large number of screenshots, which are only used to illustrate the operation method. The PV plant, device model, and parameters in the figures are for reference only.
- The app version 5.7.001 is used for illustration. The actual screens may vary.

Procedure

Step 1 Register an installer account using a mobile number (only in China) or email address. If an installer account exists, skip this step.

Step 2 Log in to the app using the installer account, and tap **Setup wizard** to create a PV plant. For details, see the App quick guide.

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NOTE

- 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.
- To create multiple installer accounts for a company, log in to the app and create an installer account by choosing **Add user**.

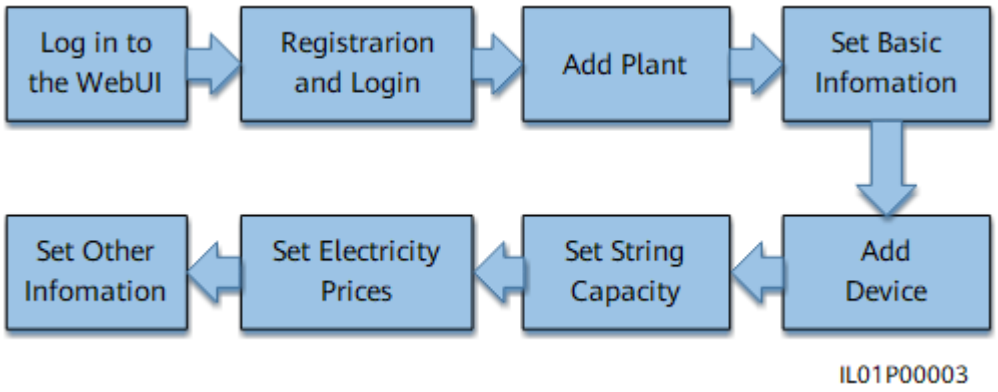
----End

5.1.2 Creating a PV Plant over the WebUI

Prerequisites

- You have matched PV plant devices with the PV plant with the help of the installer.
- The inverter and Smart Dongle have been powered on and communicate properly with the management system.
- You have obtained the login account and password from the installer or Huawei service engineer. If no account or password is available, create an account.

Figure 5-1 Procedure for creating a PV plant



Procedure

Step 1 Enter the management system address in the address box of the browser.

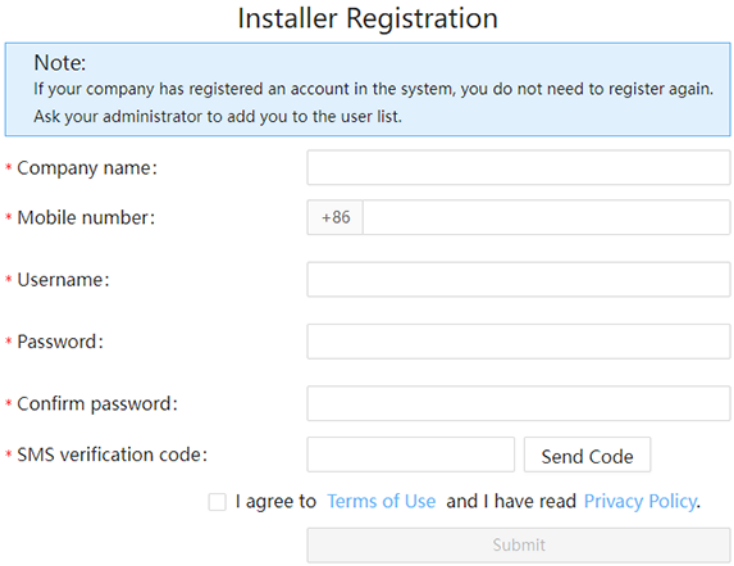
NOTE

- Browser: Chrome 67, Safari 9.0, Internet Explorer 11, or a later version is recommended.
- The software version corresponding to the UI screenshots is V500R007C00CP2101. The UI may vary by software versions and the screenshot is for reference only.

Step 2 If you have obtained the login account and password from the installer or Huawei service engineer, enter them and click **Log In** to go to the home page. If you have not created an account and password, click **Installer Registration**, enter the registration information, and activate the account with the verification code sent to your email.

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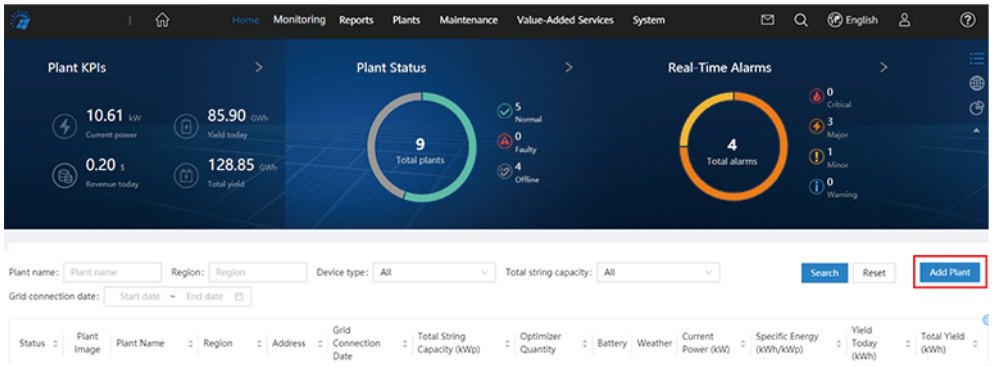
Figure 5-2 Registering an account



Step 3 Create a PV plant.

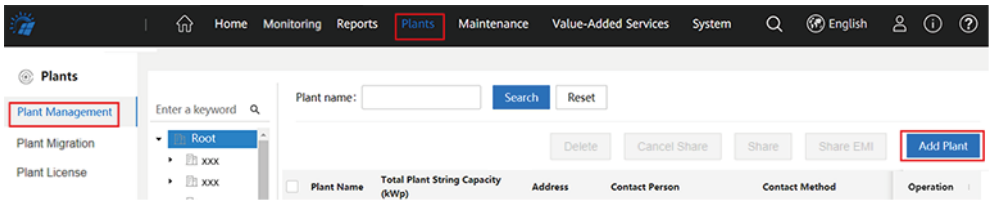
- Method 1: Click **Add Plant** on the home page.

Figure 5-3 Creating a PV plant (method 1)



- Method 2: Click **Plants** on the home page, choose **Plant Management** under **Plants**, and click **Add Plant**.

Figure 5-4 Adding a PV plant (method 2)



Step 4 Enter the basic information about the PV plant as required and click **Next**.

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Figure 5-5 Basic information about the PV plant

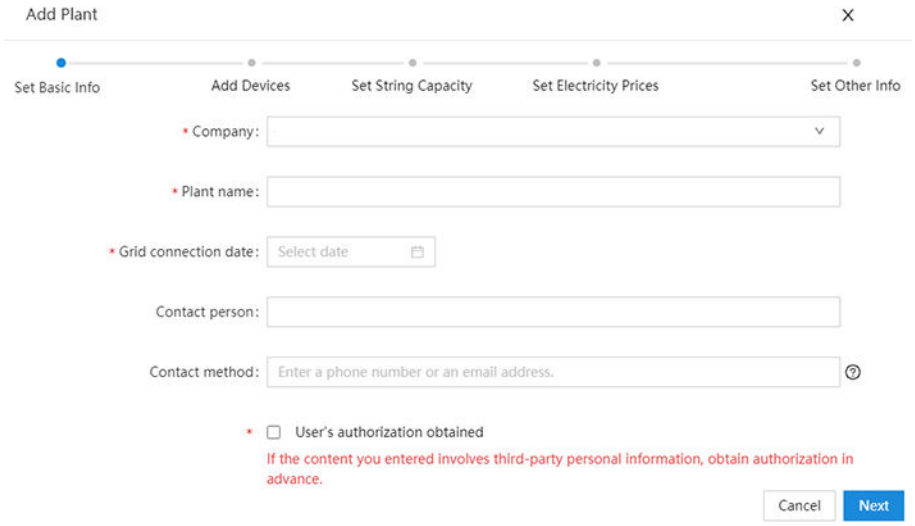


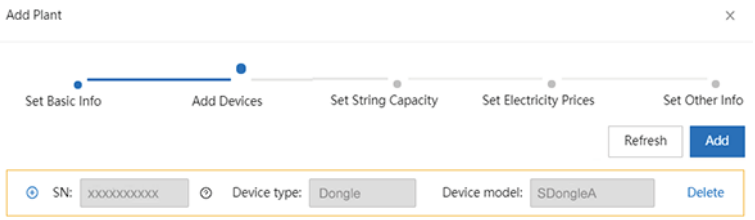
Table 5-1 Description of basic information (* means mandatory fields)

Parameter	Description
Company*	Company to which the new PV plant belongs.
Plant name*	Name of the new PV plant.
Grid connection date*	Start date of the safe operation of the PV plant.
Contact person	PV plant contact person. You are advised to set this parameter to facilitate troubleshooting.
Contact method	Contact information. You are advised to set this parameter to facilitate troubleshooting.

Step 5 On the **Add Devices** tab page, set the connected devices for the PV plant.

1. Enter the SN of the Smart Dongle, and click the blank area of **Device type**. The system automatically displays the device name and version. The connected devices such as inverters and meters are automatically added. Click + on the left of the SN to expand the device information. (The + icon becomes the – icon after the information is expanded.) Then, check whether the connected devices are correct.

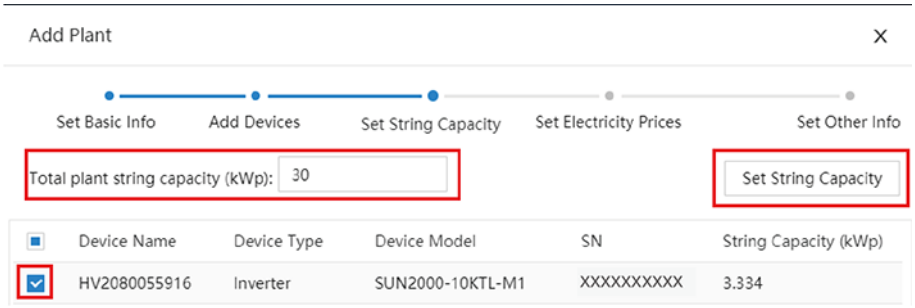
   Figure 5-6 Entering the device SN



Step 6 Click **Next**. The **Set String Capacity** tab page is displayed.

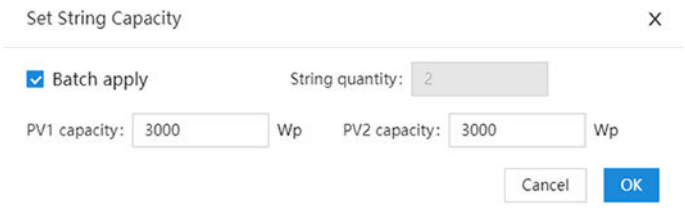
1. Set **Total plant string capacity (kWp)** (Total rated active power of the plant generator set) as required. In the device list, select one or more devices to be configured and click **Set String Capacity**. The **Set String Capacity** dialog box is displayed.

Figure 5-7 Setting the string capacity



2. Verify the number of PV strings and the string capacity, and click **OK**.

Figure 5-8 Verifying the number of PV strings and the string capacity

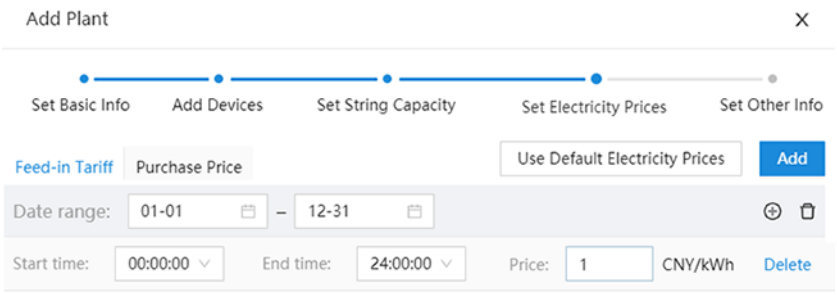


NOTE

If **Batch apply** is selected, the capacity of other strings to be configured is automatically set to the same value as that of PV1 after the PV1 capacity is configured.

Step 7 Click **Next**. On the **Set Electricity Prices** tab page, set the date range, time period, and electricity price.

Figure 5-9 Adding time-based prices



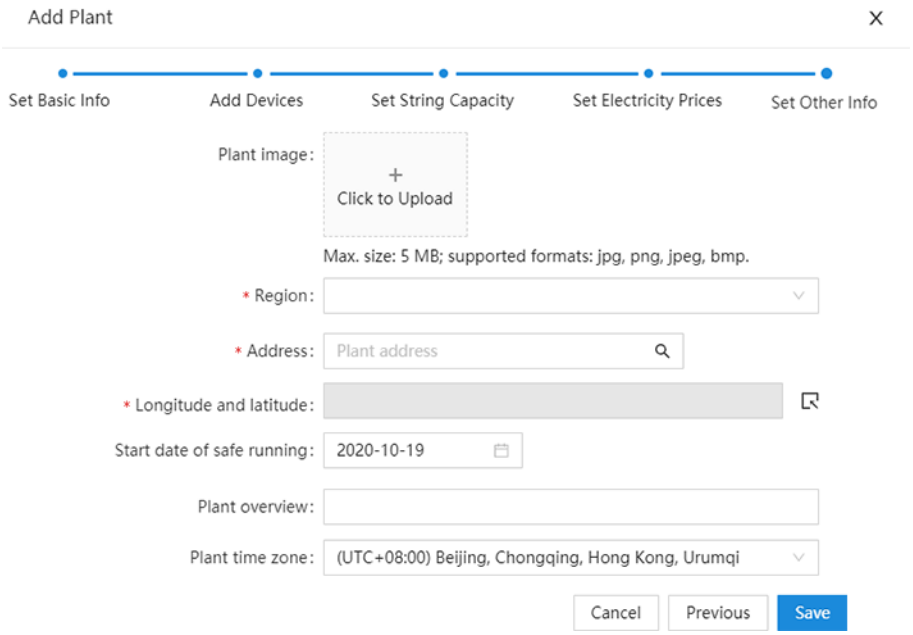
NOTE

- Click **Add** to add a date range. Multiple date ranges cannot overlap and must cover a full year.
- Click ⊕ to add a time period and price. Multiple time periods cannot overlap and must cover a full year.
- Click **Delete** to delete a time-based price.
- Click 🗑 to delete a date range.

Step 8 Click **Next** to go to the **Set Other Infon** tab page. Set other information about the PV plant,

including **Plant image**, **Address**, **Start date of safe running**, **Plant overview**, and **Plant time zone**. **Start date of safe running** refers to the date when the PV plant starts to generate electricity normally. It is mainly used to calculate the safe running days of the PV plant.

Figure 5-10 Other information



Step 9 Click **Save**. In the displayed dialog box, click **OK**. The PV plant is created successfully.

----End

Follow-up Procedure

- Modifying PV plant information: In the PV plant list, click **Modify** for the PV plant to be modified. In the **Modify** displayed dialog box, modify the PV plant information.
- Deleting a PV plant: In the PV plant list, select one or more PV plants to be deleted and click **Delete** to delete the selected PV plants.

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5.2 Setting Grid-tied Control Parameters

5.2.1 Setting Parameters over the App

Prerequisites

- The smart PV app is recommended when the inverter is connected to the smart PV management system. The SUN2000 app is recommended when the inverter is connected to other management systems.
- Smart PV app: Download and Install the app.
- SUN2000 app: Go to Huawei AppGallery, search for **SUN2000**, and download the installation package of the latest version.

NOTE

The SUN2000 app version must be 3.2.00.005 (Android) or later.

Procedure

Step 1 Run the smart PV app and access **Device Commissioning**. (Perform this step only for the smart PV app.)

Step 2 Connect to the inverter

Tap **Scan**. On the QR code scanning screen, align the QR code with the scanning box to automatically scan and connect to the WLAN of the inverter.

NOTE

- The WLAN name of a device consists of "Device name-Device SN." (The last six digits of the WLAN names of some devices are the same as the last six digits of the device SNs.)
- Use the initial password for the first connection. You can obtain the initial WLAN password from the label on the device. (For some products that have been discontinued, the initial password is **Changeme**.)
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.
- If the login screen is not displayed after you scan the QR code, check whether your phone is correctly connected to the device WLAN. If not, manually select and connect to the WLAN.
- If **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 3 Log in to the device commissioning screen as **installer**.

NOTICE

- Set the password as prompted at the first login. (For some products that have been discontinued, the initial password is **00000a**.)
- After completing the deployment settings, the installer should remind the owner to access the local commissioning screen of the device and set the login password of the owner account as prompted.
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.

Step 4 Set grid-tied control parameters.

NOTE

- To set **Grid-tied point control**, you need to enter the inverter login password. For details about the inverter login password, see the section about connecting to the inverter.

Figure 5-11 Parameter settings

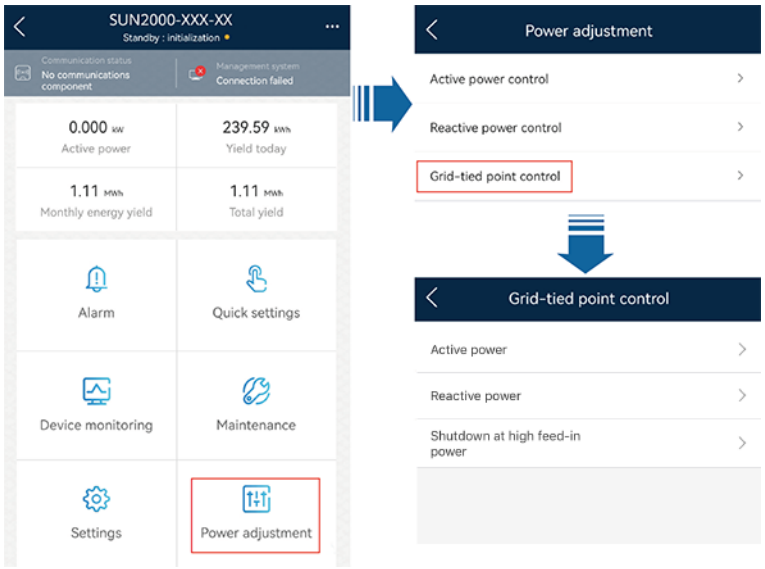


Table 5-2 Control mode

Parameter			Description
Active power	Unlimited	-	If this parameter is set to **Unlimited**, the inverter output power is not limited and the inverter can feed its rated power to the power grid.

Parameter			Description
	Grid connection with zero power	Closed-loop controller	• For a single inverter: When the Smart Dongle is connected, set **Closed-loop controller** to **Inverter**. When the inverter is directly connected, set **Closed-loop controller** to **Inverter**. • For multiple inverters, **Closed-loop controller** can only be set to **Controller**.
		Limitation mode	• **Total power** indicates export limitation of the total power at the grid-connection point. (When a single-phase meter is connected, only the **Total power** limitation mode can be selected.) • **Single-phase power** indicates export limitation of the power in each phase at the grid-connection point.
		Power adjustment period	Specifies the shortest interval for a single export limitation adjustment.
		Power raising threshold	Specifies the dead zone for adjusting the inverter output power. If the power fluctuates within the power control hysteresis, the power is not adjusted. The recommended value is 1% to 2% of the inverter output power.
		Communication disconnection fail-safe	In the inverter export limitation scenario, if this parameter is set to **Enable**, the inverter will derate according to the active power derating percentage when the communication between the inverter and the Smart Dongle is disconnected for a period longer than **Communication disconnection detection time**.
		Communication disconnection detection time	• Specifies the time for determining the communication disconnection between the inverter and the Smart Dongle. This parameter is displayed when **Communication disconnection fail-safe** is set to **Enable**. • You are advised to set **Communication disconnection detection time** to 5s.
		Active power output limit for fail-safe	Specifies the derating value of the inverter active power by percentage. If the Smart Dongle does not detect any power meter data or the communication between the Smart Dongle and the inverter is disconnected, the Smart Dongle delivers the derating value of the inverter active power by percentage.
	Grid connection with limited power (kW)	Closed-loop controller	• For a single inverter: When the Smart Dongle is connected, set **Closed-loop controller** to **Inverter**. When the inverter is directly connected, set **Closed-loop controller** to **Inverter**. • For multiple inverters, **Closed-loop controller** can only be set to **Controller**.

Parameter			Description
		Limitation mode	• **Total power** indicates export limitation of the total power at the grid-connection point. (When a single-phase meter is connected, only the **Total power** limitation mode can be selected.) • **Single-phase power** indicates export limitation of the power in each phase at the grid-connection point.
		Maximum grid feed-in power (kW)	Specifies the maximum active power transmitted from the grid-connection point to the power grid.
		Power adjustment period	Specifies the shortest interval for a single export limitation adjustment.
		Maximum protection time	• Specifies the time for detecting power meter data. If the Smart Dongle does not detect any power meter data within the preset time, the Smart Dongle delivers the preset value of the **Active power output limit for fail-safe** to the inverter for protection. • The recommended value is 5s or greater.
		Power raising threshold	Specifies the dead zone for adjusting the inverter output power. If the power fluctuates within the power control hysteresis, the power is not adjusted. The recommended value is 1% to 2% of the inverter output power.
		Communication disconnection fail-safe	In the inverter export limitation scenario, if this parameter is set to **Enable**, the inverter will derate according to the active power derating percentage when the communication between the inverter and the Smart Dongle is disconnected for a period longer than **Communication disconnection detection time**.
		Communication disconnection detection time	• Specifies the time for determining the communication disconnection between the inverter and the Smart Dongle. This parameter is displayed when **Communication disconnection fail-safe** is set to **Enable**. • You are advised to set **Communication disconnection detection time** to 5s.
		Active power output limit for fail-safe	Specifies the derating value of the inverter active power by percentage. If the Smart Dongle does not detect any power meter data or the communication between the Smart Dongle and the inverter is disconnected, the Smart Dongle delivers the derating value of the inverter active power by percentage.

Parameter			Description
	Grid connection with limited power (%)	Closed-loop controller	• For a single inverter: When the Smart Dongle is connected, set **Closed-loop controller** to **Inverter**. When the inverter is directly connected, set **Closed-loop controller** to **Inverter**. • For multiple inverters, **Closed-loop controller** can only be set to **Controller**.
		Limitation mode	• **Total power** indicates export limitation of the total power at the grid-connection point. (When a single-phase meter is connected, only the **Total power** limitation mode can be selected.) • **Single-phase power** indicates export limitation of the power in each phase at the grid-connection point.
		PV plant capacity	Specifies the total maximum active power in the inverter cascading scenario.
		Maximum grid feed-in power (%)	Specifies the percentage of the maximum active power of the grid-connection point to the PV plant capacity.
		Power adjustment period	Specifies the shortest interval for a single export limitation adjustment.
		Maximum protection time	• Specifies the time for detecting power meter data. If the Smart Dongle does not detect any power meter data within the preset time, the Smart Dongle delivers the preset value of the **Active power output limit for fail-safe** to the inverter for protection. • The recommended value is 5s or greater.
		Power raising threshold	Specifies the dead zone for adjusting the inverter output power. If the power fluctuates within the power control hysteresis, the power is not adjusted. The recommended value is 1% to 2% of the inverter output power.
		Communication disconnection fail-safe	In the inverter export limitation scenario, if this parameter is set to **Enable**, the inverter will derate according to the active power derating percentage when the communication between the inverter and the Smart Dongle is disconnected for a period longer than **Communication disconnection detection time**.
		Communication disconnection detection time	• Specifies the time for determining the communication disconnection between the inverter and the Smart Dongle. This parameter is displayed when **Communication disconnection fail-safe** is set to **Enable**. • You are advised to set **Communication disconnection detection time** to 5s.

Parameter			Description
		Active power output limit for fail-safe	Specifies the derating value of the inverter active power by percentage. If the Smart Dongle does not detect any power meter data or the communication between the Smart Dongle and the inverter is disconnected, the Smart Dongle delivers the derating value of the inverter active power by percentage.
Shutdown at high feed-in power[a]	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 (kW)		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 (s)		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**, **Grid connection with limited power** takes precedence (when **Active power control** is set to **Grid connection with limited power**).
Note a: This parameter is supported only for the AS4777 grid code.			

----End

5.2.2 Setting Parameters over the WebUI

Prerequisites

- You have matched PV plant devices with the PV plant with the help of the installer.
- The inverter and Smart Dongle have been powered on and communicate properly with the management system.
- You have obtained the login account and password from the installer or Huawei service engineer. If no account or password is available, create an account.

Procedure

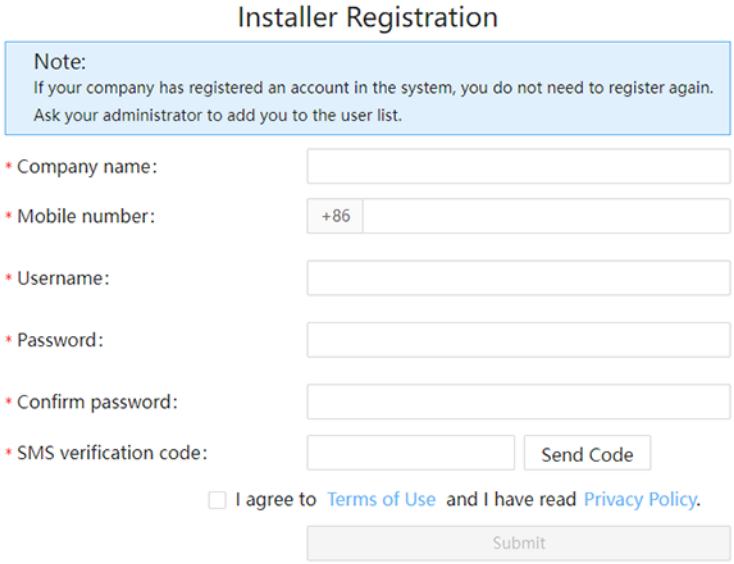
Step 1 Enter the management system address in the address box of the browser.

NOTE

- Browser: Chrome 67, Safari 9.0, Internet Explorer 11, or a later version is recommended.
- The software version corresponding to the UI screenshots is V500R007C00CP2101. The UI may vary by software versions and the screenshot is for reference only.

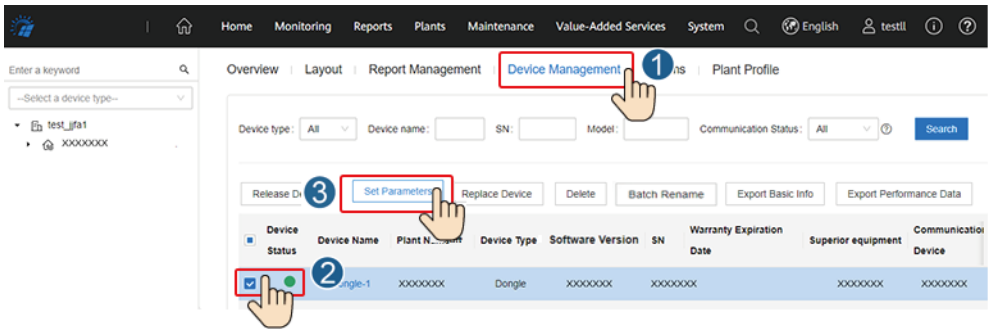
Step 2 If you have obtained the login account and password from the installer or Huawei service engineer, enter them and click **Log In** to go to the home page. If you have not created an account and password, click **Installer Registration**, enter the registration information, and activate the account with the verification code sent to your email.

Figure 5-12 Registering an account



Step 3 On the **Home** page, click the plant name to access the plant page. Choose **Device Management**, select Dongle, and click **Set Parameters**.

Figure 5-13 Setting export limitation 1



NOTE

If multiple inverters are changed to one inverter, you need to perform device search again. On the plant page, choose **Device Management**, click **Device Name** of the Dongle, and select **Search for Devices**.

Step 4 Choose **Active Power Control** and set related parameters.

Figure 5-14 Setting export limitation 2

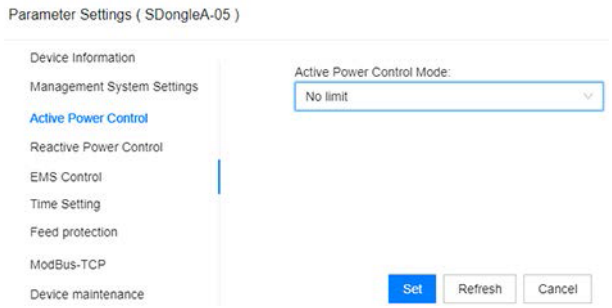


Table 5-3 Active power control mode

Parameter		Description
No limit	-	If this parameter is set to **No limit**, the inverter output power is not limited and the inverter can feed its rated power to the power grid.
Grid connection with zero power	Closed-loop controller	• For a single inverter: When the Smart Dongle is connected, set **Closed-loop controller** to **Inverter**. When the inverter is directly connected, set **Closed-loop controller** to **Inverter**. • For multiple inverters, **Closed-loop controller** can only be set to **SDongle**.
	Limitation mode	• **Total power** indicates export limitation of the total power at the grid-connection point. (When a single-phase meter is connected, only the **Total power** limitation mode can be selected.) • **Single-phase power** indicates export limitation of the power in each phase at the grid-connection point.
	Power lowering adjustment period	Specifies the shortest interval for a single export limitation adjustment.
	Maximum protection time	• Specifies the time for detecting power meter data. If the Smart Dongle does not detect any power meter data within the preset time, the Smart Dongle delivers the preset value of the **Fail-safe power threshold** to the inverter for protection. • The recommended value is 5s or greater.
	Power raising threshold	Specifies the dead zone for adjusting the inverter output power. If the power fluctuates within the power control hysteresis, the power is not adjusted. The recommended value is 1% to 2% of the inverter output power.

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Parameter		Description
	Fail-safe power threshold	Specifies the derating value of the inverter active power by percentage. If the Smart Dongle does not detect any power meter data or the communication between the Smart Dongle and the inverter is disconnected, the Smart Dongle delivers the derating value of the inverter active power by percentage.
Grid connection with limited power (kW)	Closed-loop controller	• For a single inverter: When the Smart Dongle is connected, set **Closed-loop controller** to **Inverter**. When the inverter is directly connected, set **Closed-loop controller** to **Inverter**. • For multiple inverters, **Closed-loop controller** can only be set to **SDongle**.
	Limitation mode	• **Total power** indicates export limitation of the total power at the grid-connection point. (When a single-phase meter is connected, only the **Total power** limitation mode can be selected.) • **Single-phase power** indicates export limitation of the power in each phase at the grid-connection point.
	Maximum grid feed-in power (kW)	Specifies the maximum active power transmitted from the grid-connection point to the power grid.
	Power lowering adjustment period	Specifies the shortest interval for a single export limitation adjustment.
	Maximum protection time	• Specifies the time for detecting power meter data. If the Smart Dongle does not detect any power meter data within the preset time, the Smart Dongle delivers the preset value of the **Fail-safe power threshold** to the inverter for protection. • The recommended value is 5s or greater.
	Power raising threshold	Specifies the dead zone for adjusting the inverter output power. If the power fluctuates within the power control hysteresis, the power is not adjusted. The recommended value is 1% to 2% of the inverter output power.
	Fail-safe power threshold	Specifies the derating value of the inverter active power by percentage. If the Smart Dongle does not detect any power meter data or the communication between the Smart Dongle and the inverter is disconnected, the Smart Dongle delivers the derating value of the inverter active power by percentage.

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Parameter		Description
Grid connection with limited power (%)	Closed-loop controller	• For a single inverter: When the Smart Dongle is connected, set **Closed-loop controller** to **Inverter**. When the inverter is directly connected, set **Closed-loop controller** to **Inverter**. • For multiple inverters, **Closed-loop controller** can only be set to **SDongle**.
	Limitation mode	• **Total power** indicates export limitation of the total power at the grid-connection point. (When a single-phase meter is connected, only the **Total power** limitation mode can be selected.) • **Single-phase power** indicates export limitation of the power in each phase at the grid-connection point.
	PV plant capacity	Specifies the total maximum active power in the inverter cascading scenario.
	Maximum grid feed-in power (%)	Specifies the percentage of the maximum active power of the grid-connection point to the PV plant capacity.
	Power lowering adjustment period	Specifies the shortest interval for a single export limitation adjustment.
	Maximum protection time	• Specifies the time for detecting power meter data. If the Smart Dongle does not detect any power meter data within the preset time, the Smart Dongle delivers the preset value of the **Fail-safe power threshold** to the inverter for protection. • The recommended value is 5s or greater.
	Power raising threshold	Specifies the dead zone for adjusting the inverter output power. If the power fluctuates within the power control hysteresis, the power is not adjusted. The recommended value is 1% to 2% of the inverter output power.
	Fail-safe power threshold	Specifies the derating value of the inverter active power by percentage. If the Smart Dongle does not detect any power meter data or the communication between the Smart Dongle and the inverter is disconnected, the Smart Dongle delivers the derating value of the inverter active power by percentage.

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Parameter		Description
Shutdown at high feed-in power[a]	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 (kW)	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 (s)	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**, **Grid connection with limited power** takes precedence (when **Active power control** is set to **Grid connection with limited power**).
Note a: This parameter is supported only for the AS4777 grid code.		

----End

5.3 Connecting to the Smart Dongle and Setting Feed-in at Limited Current

Prerequisites

- Smart PV app: Download and install the app.
- SUN2000 app: Go to Huawei AppGallery, search for **SUN2000**, and download the installation package of the latest version.
- Feed-in at limited current can be set by connecting to the WLAN of the Smart Dongle only in the following scenarios where only one inverter is deployed.

Table 5-4 Supported scenarios

Inverter	Smart Dongle	Networking Scenario	Feed-in at Limited Current	Grid Code
SUN2000-(30KTL, 36KTL, 40KTL)-M3	SDongleB-06-EU	Single device	Yes	• G99-TYPEA-LV • G99-TYPEB-LV • G99-TYPEB-HV • G99-TYPEB-HV-MV480 • G99-TYPEA-HV
	SDongleA-05 (BOM code: 02312QMV-004)			
SUN2000-(110KTL, 115KTL)-M2	SDongleB-06-EU	Single device	Yes	
	SDongleA-05 (BOM code: 02312QMV-004)			

NOTE

The SUN2000 app version must be 24.5.100.B001 (Android) or later.

Procedure

Step 1 Run the smart PV app and access **Device Commissioning**. (Perform this step only for the smart PV app.)

Step 2 Connect to the WLAN of the Smart Dongle.

Tap **Scan**. On the QR code scanning screen, align the QR code with the scanning box to automatically scan and connect to the WLAN of the Smart Dongle.

NOTE

- If the inverter has a WLAN, the WLAN of the Smart Dongle is disabled by default. If the inverter does not have a WLAN, the WLAN of the Smart Dongle is enabled by default.
- If the WLAN of the Smart Dongle is disabled, log in to the smart PV app, select the target plant on the home screen, tap **Device**, select the Smart Dongle card, choose **: :** > **O&M Authorization**, and enable **WLAN wakeup** to enable the WLAN of the Smart Dongle.

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NOTE

- The WLAN name of a product consists of "Device name-Product SN." (The last six digits of the WLAN name of some products are the same as the last six digits of the product SN.)
- Use the QR code for the first connection. The QR code can be obtained from the label on the device.
- 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.
- If the login screen is not displayed after you scan the QR code, check whether your phone is correctly connected to the device WLAN. If not, manually select and connect to the WLAN.
- If the message **This WLAN network has no Internet access. Connect anyway?** is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 3 Log in to the device commissioning screen as **Installer**.

NOTICE

- After completing the deployment settings, the installer shall remind the owner to access the local commissioning screen of the device and set the login password of the owner account as prompted.
- 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.

Step 4 Set parameters for feed-in at limited current.

Figure 5-15 Parameter settings

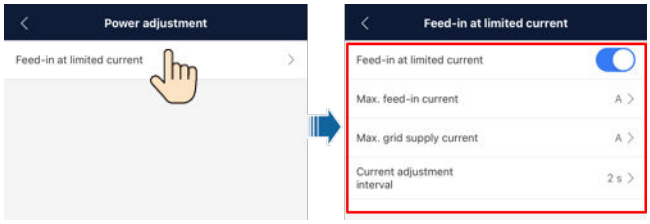


Table 5-5 Parameter settings

Parameter	Value Range	Description
Feed-in at limited current[a]	Disabled (default)	Disable the function of feed-in at limited current.
	Enabled	Enable the function of feed-in at limited current.

Parameter	Value Range	Description
Max. feed-in current[b]	[0, 30000 A]	• Due to external disturbances, the feed-in current may exceed the specified value by 2%. In this case, the inverter will adjust the current to a value within the range limit. • After the user changes the maximum feed-in current, the inverter will adjust the current to a value within the range limit.
Max. grid supply current	[0, 30000 A]	If the grid supply current exceeds the specified value by 2%, the inverter will adjust the current to a value within the range limit.
Current adjustment interval	[1, 5s]	The default value 2s is recommended. When the current at the grid connection point exceeds the allowed range, the inverter adjusts the current every 2s. A larger value indicates a lower current adjustment speed.
Note a: • If the SUN2000-(30KTL, 36KTL, 40KTL)-M3 inverter shuts down because the feed-in current adjustment is not complete within the specified time, the user needs to manually start the inverter. By default, the number of manual startups cannot exceed three within 30 days. If this limit is reached, you are not allowed to manually start the inverter again. • If the SUN2000-(110KTL, 115KTL)-M2 inverter shuts down because the feed-in current adjustment is not complete within the specified time, the user needs to manually start the inverter. By default, the user needs to wait for at least 4 hours before starting the inverter.		
Note b: If the maximum feed-in current is not adjusted to a value within the range limit within 15s, the inverter will shut down and report a **Power Control Abnormal at Grid Connection Point** alarm.		

----End

5.4 Third-Party Management System Settings (Connecting to Two Management Systems)

Prerequisites

- The inverter connects to a third-party management system and the Huawei management system.
- Smart PV app: Download and install the app.
- SUN2000 app: Go to Huawei AppGallery, search for **SUN2000**, and download the installation package of the latest version.

NOTE

- Only SDongleB-06 and SDongleA-05 (BOM number: 02312QMV-004) can connect to a third-party management system.
- The app version must be 6.24.00.008 or later.

Method 1: Connecting to the Inverter Built-in WLAN to Set Third-Party Management System Parameters

NOTE

Only the SUN2000-(12KTL–25KTL)-M5, SUN2000-(12K–25K)-MB0, SUN5000-(17K, 25K)-MB0, SUN2000-(5K–12K)-MAP0, SUN5000-(8K, 12K)-MAP0, and SUN600-(15KTL–25KTL)-ZHM0 series inverters can be set on the smart PV app. For other models of inverters, log in to the smart PV management system to set the parameters.

Step 1 Run the smart PV app and access **Device Commissioning**. (Perform this step only for the smart PV app.)

Step 2 Connect to the inverter WLAN.

Tap **Scan**. On the QR code scanning screen, align the QR code with the scanning box to automatically scan and connect to the WLAN of the inverter.

NOTE

- The WLAN name of a device consists of "Device name-Device SN." (The last six digits of the WLAN names of some devices are the same as the last six digits of the device SNs.)
- Use the initial password for the first connection. You can obtain the initial WLAN password from the label on the device. (For some products that have been discontinued, the initial password is **Changeme**.)
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.
- If the login screen is not displayed after you scan the QR code, check whether your phone is correctly connected to the device WLAN. If not, manually select and connect to the WLAN.
- If **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 3 Log in to the device commissioning screen as **installer**.

NOTICE

- Set the password as prompted at the first login. (For some products that have been discontinued, the initial password is **00000a**.)
- After completing the deployment settings, the installer should remind the owner to access the local commissioning screen of the device and set the login password of the owner account as prompted.
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.

Step 4 Set third-party management system parameters: Choose **Communication configuration**, select **Management system**, and set the parameters.

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Table 5-6 Parameter settings

Parameter	Description	Value Range
Connect	• The default value is **Disable**, meaning that a third-party management system cannot be connected. • When this parameter is set to **Enable**, a third-party management system can be connected.	• Disable • Enable
Server	Domain name or IP address.	-
Port	Server port.	[0, 65535]
TLS	• If the third-party management system uses the TLS encryption protocol, set this parameter to **Enable**. If this parameter is set to **Enable**, select a version based on the TLS version of the third-party management system. • If the third-party management system does not use the TLS encryption protocol, set this parameter to **Disable**.	• Disable • Enable
TLS version	Select a version based on the TLS version of the third-party management system.	• TLS 1.0 or later • TLS 1.1 or later • TLS 1.2 or later • TLS 1.3
Network Management Protocol	The default value is standard Modbus.	Modbus

----End

Method 2: Logging In to the Smart PV Management System to Set Third-Party Management System Parameters

- Log in to the smart PV app and tap the plant name on the **Home** screen to access the plant screen. Choose **Devices**, select the target SDongle, and choose **Parameter settings**. Set the parameters as prompted.
- Log in to the WebUI of the smart PV management system. On the **Home** page, click the plant name to access the plant page. Choose **Device Management**, select the Smart Dongle to be set, tap **Set Parameters**, and set parameters as prompted.

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Figure 5-16 Setting the third-party management parameters

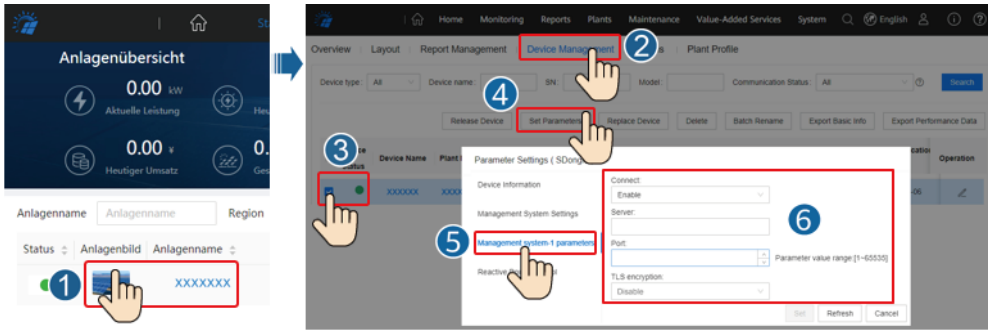


Table 5-7 Parameter settings

Parameter	Description	Value Range
Connect	• The default value is **Disable**, meaning that a third-party management system cannot be connected. • When this parameter is set to **Enable**, a third-party management system can be connected.	• Disable • Enable
Server	Domain name.	-
Port	Server port.	[0, 65535]
TLS encryption	• If the third-party management system uses the TLS encryption protocol, set this parameter to **Enable**. If this parameter is set to **Enable**, select a version based on the TLS version of the third-party management system. • If the third-party management system does not use the TLS encryption protocol, set this parameter to **Disable**.	• Disable • Enable

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Parameter	Description	Value Range
Management system status	Connection status of the third-party management system.	• Not connected • Internal error. Resources are insufficient. • Connection Successful • Connection deadlock • The peer end is disabled • Connection abnormal • Failed to connect to the port • Failed to verify the peer certificate • The local certificate is abnormal • Domain name resolution failed • Failed to connect to the server • Connecting… • Second challenge authentication failed
Server IP address	IP address.	-
Deliver Trust Certificate	Import the CA certificate of the third-party management system to Huawei's device to ensure encrypted connection. Before import, ensure that the third-party management system is successfully connected.	-

5.5 Setting Parameters and Exporting Logs Through the WLAN of the Smart Dongle

Procedure

Step 1 Run the smart PV app and access **Device Commissioning**. (Perform this step only for the smart PV app.)

Step 2 Connect to the WLAN of the Smart Dongle.

Tap **Scan**. On the QR code scanning screen, align the QR code with the scanning box to automatically scan and connect to the WLAN of the Smart Dongle.

NOTE

- If the inverter has a WLAN, the WLAN of the Smart Dongle is disabled by default. If the inverter does not have a WLAN, the WLAN of the Smart Dongle is enabled by default.
- If the WLAN of the Smart Dongle is disabled, log in to the smart PV app, select the target plant on the home screen, tap **Device**, select the Smart Dongle card, choose **: :** > **O&M Authorization**, and enable **WLAN wakeup** to enable the WLAN of the Smart Dongle.

NOTE

- The WLAN name of a product consists of "Device name-Product SN." (The last six digits of the WLAN name of some products are the same as the last six digits of the product SN.)
- Use the QR code for the first connection. The QR code can be obtained from the label on the device.
- 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.
- If the login screen is not displayed after you scan the QR code, check whether your phone is correctly connected to the device WLAN. If not, manually select and connect to the WLAN.
- If the message **This WLAN network has no Internet access. Connect anyway?** is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 3 Log in to the device commissioning screen as **Installer**.

NOTICE

- After completing the deployment settings, the installer shall remind the owner to access the local commissioning screen of the device and set the login password of the owner account as prompted.
- 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.

Step 4 Set parameters and export logs.

----End

6 Maintenance

6.1 Modifying Inverter Communications Parameters

Prerequisites

- The smart PV app is recommended when the inverter is connected to the smart PV management system. The SUN2000 app is recommended when the inverter is connected to other management systems.
- Smart PV app: Download and install the app.
- SUN2000 app: Go to Huawei AppGallery, search for **SUN2000**, and download the installation package of the latest version.

NOTE

The SUN2000 app version must be 3.2.00.005 (Android) or later.

6.1.1 WLAN Communication Networking

Step 1 Run the smart PV app and access **Device Commissioning**. (Perform this step only for the smart PV app.)

Step 2 Connect to the inverter WLAN.

Tap **Scan**. On the QR code scanning screen, align the QR code with the scanning box to automatically scan and connect to the WLAN of the inverter.

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NOTE

- The WLAN name of a device consists of "Device name-Device SN." (The last six digits of the WLAN names of some devices are the same as the last six digits of the device SNs.)
- Use the initial password for the first connection. You can obtain the initial WLAN password from the label on the device. (For some products that have been discontinued, the initial password is **Changeme**.)
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.
- If the login screen is not displayed after you scan the QR code, check whether your phone is correctly connected to the device WLAN. If not, manually select and connect to the WLAN.
- If **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 3 Log in to the device commissioning screen as **installer**.

NOTICE

- Set the password as prompted at the first login. (For some products that have been discontinued, the initial password is **00000a**.)
- After completing the deployment settings, the installer should remind the owner to access the local commissioning screen of the device and set the login password of the owner account as prompted.
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.

Step 4 Tap **Settings > Communication configuration** and set the parameters for **Router connection settings**.

Table 6-1 Parameter description

Type	Parameter	Description
Inverter's connection to a router	WLAN list	Specifies the name of the wireless network.
	Password	Specifies the password for logging in to the wireless network.

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Type	Parameter	Description
	DHCP	• Enable this parameter if you use the IP address automatically allocated by the router. In this case, the values of **IP address**, **Subnet mask**, **Gateway**, **Primary DNS server**, and **Secondary DNS server** are automatically allocated. • Disable this parameter if you do not use the IP address automatically allocated by the router. In this case, you need to set the values of **IP address**, **Subnet mask**, **Gateway**, **Primary DNS server**, and **Secondary DNS server**.
	IP address	Specifies the IP address for the router to which the inverter WLAN network connects. The IP address must be in the same network segment as the router IP address.
	Subnet mask	Specifies the router subnet mask.
	Gateway	Specifies the router gateway address.
	Primary DNS server	Specifies the address for the primary domain name service (DNS) server.
	Secondary DNS server	Specifies the address for the secondary DNS server.

Table 6-2 Description of icons

Icon	Router			Management system	
					
Meaning	Disconnected	Incorrect password	Connected; signal strength	Connection failed.	Connection is successful.

----End

6.1.2 4G Communication Networking

Procedure

Step 1 Run the smart PV app and access **Device Commissioning**. (Perform this step only for the smart PV app.)

Step 2 Connect to the inverter WLAN.

Tap **Scan**. On the QR code scanning screen, align the QR code with the scanning box to automatically scan and connect to the WLAN of the inverter.

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NOTE

- The WLAN name of a device consists of "Device name-Device SN." (The last six digits of the WLAN names of some devices are the same as the last six digits of the device SNs.)
- Use the initial password for the first connection. You can obtain the initial WLAN password from the label on the device. (For some products that have been discontinued, the initial password is **Changeme**.)
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.
- If the login screen is not displayed after you scan the QR code, check whether your phone is correctly connected to the device WLAN. If not, manually select and connect to the WLAN.
- If **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 3 Log in to the device commissioning screen as **installer**.

NOTICE

- Set the password as prompted at the first login. (For some products that have been discontinued, the initial password is **00000a**.)
- After completing the deployment settings, the installer should remind the owner to access the local commissioning screen of the device and set the login password of the owner account as prompted.
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.

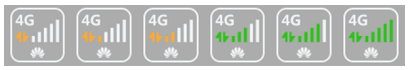
Step 4 Tap **Settings > Communication configuration** and set **Mobile network** parameters.

Table 6-3 Parameter description

Type	Parameter	Description
4G	APN mode	• Set the parameters related to the SIM card based on the information provided by the SIM card carrier. • When **APN mode** is set to **Manual**, **APN**, **APN dialup number**, **APN user name**, and **APN user password** are all displayed and configurable. When **APN mode** is set to **Automatic**, these parameters are not displayed.
	APN	
	APN dialup number	
	APN user name	
	APN user password	
	Network mode	
	PIN	

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Table 6-4 Description of icons

Icon	SIM card			Management system	
					
Meaning	Enter the PIN.	No SIM card	Not connected; signal strength	Connection failed.	Connection is successful.
Icon				-	-
Meaning	Enter the PUK.	Failed to read the card. The signal is poor or the subscriber is in arrears.	Connected; signal strength	-	-

----End

6.1.3 FE Communication Networking

Step 1 Run the smart PV app and access **Device Commissioning**. (Perform this step only for the smart PV app.)

Step 2 Connect to the inverter WLAN.

Tap **Scan**. On the QR code scanning screen, align the QR code with the scanning box to automatically scan and connect to the WLAN of the inverter.

NOTE

- The WLAN name of a device consists of "Device name-Device SN." (The last six digits of the WLAN names of some devices are the same as the last six digits of the device SNs.)
- Use the initial password for the first connection. You can obtain the initial WLAN password from the label on the device. (For some products that have been discontinued, the initial password is **Changeme**.)
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.
- If the login screen is not displayed after you scan the QR code, check whether your phone is correctly connected to the device WLAN. If not, manually select and connect to the WLAN.
- If **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 3 Log in to the device commissioning screen as **installer**.

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NOTICE

- Set the password as prompted at the first login. (For some products that have been discontinued, the initial password is **00000a**.)
- After completing the deployment settings, the installer should remind the owner to access the local commissioning screen of the device and set the login password of the owner account as prompted.
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.

Step 4 Tap **Settings > Communication configuration** and set the parameters for **Router connection settings**.

Table 6-5 Parameter description

Type	Parameter	Description
Inverter's connection to a router	DHCP	• Enable this parameter if you use the IP address automatically allocated by the router. In this case, the values of **IP address**, **Subnet mask**, **Gateway**, **Primary DNS server**, and **Secondary DNS server** are automatically allocated. • Disable this parameter if you do not use the IP address automatically allocated by the router. In this case, you need to set the values of **IP address**, **Subnet mask**, **Gateway**, **Primary DNS server**, and **Secondary DNS server**.
	IP address	Specifies the IP address for the router to which the inverter WLAN network connects. The IP address must be in the same network segment as the router IP address.
	Subnet mask	Specifies the router subnet mask.
	Gateway	Specifies the router gateway address.
	Primary DNS server	Specifies the address for the primary DNS server.
	Secondary DNS server	Specifies the address for the secondary DNS server.

Table 6-6 Description of icons

Icon	Router			Management system	
					

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Meaning	Connection failed.	Connecting...	Connection is successful.	Connection failed.	Connection is successful.

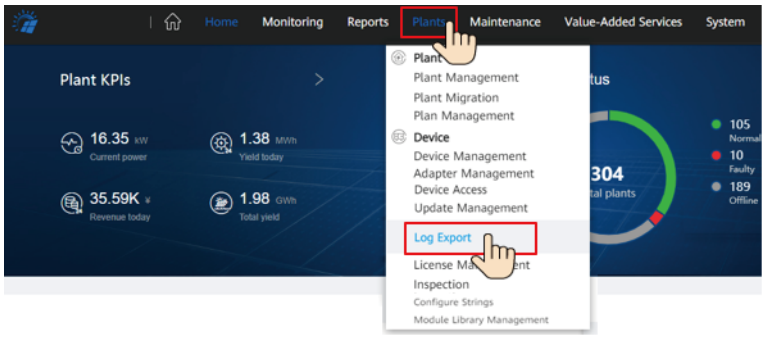
----End

6.2 Exporting Inverter and Smart Dongle Logs

Procedure

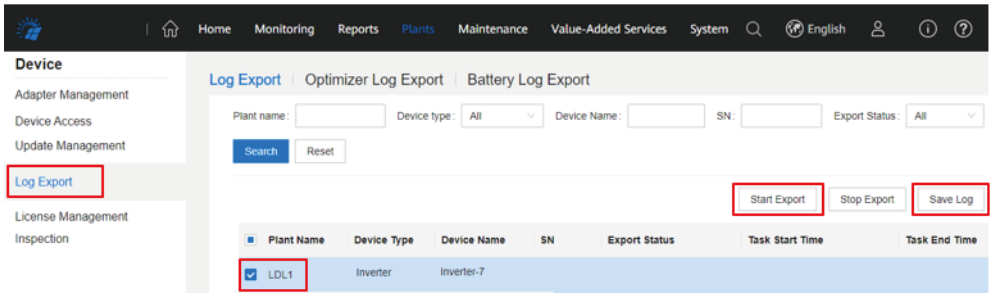
Step 1 Log in to the management system, click **Plants**, and choose **Log Export** under **Device**.

Figure 6-1 System Settings page



Step 2 Select devices and click **Start Export** to create an export task. When the export status is **Succeeded**, select the corresponding logs and click **Save Log** to save the logs locally.

Figure 6-2 Exporting and saving logs



----End

6.3 Upgrading the Inverter and Smart Dongle Software

Prerequisites

- You have contacted Huawei technical support engineers to upload the upgrade package of the software.

- The smart PV app is recommended when the inverter is connected to the smart PV management system. The SUN2000 app is recommended when the inverter is connected to other management systems.
- Smart PV app: Download and install the app.
- SUN2000 app: Go to Huawei AppGallery, search for **SUN2000**, and download the installation package of the latest version.

Connecting to the Inverter over the App (Not Applicable to Inverters with the Built-in WLAN Function)

Step 1 Ensure that the Smart Dongle to be upgraded is inserted into a running inverter. Wait for more than 2 minutes, remove the Smart Dongle, and connect the USB data cable to the inverter.

NOTE

Perform this step if communication with the inverter over a WLAN module, Bluetooth module, or USB data cable is required.

Step 2 Run the smart PV app and access **Device Commissioning**. (Perform this step only for the smart PV app.)

Step 3 Connect to the inverter WLAN.

Tap **Scan**. On the QR code scanning screen, align the QR code with the scanning box to automatically scan and connect to the WLAN of the inverter.

NOTE

- The WLAN name of a device consists of "Device name-Device SN." (The last six digits of the WLAN names of some devices are the same as the last six digits of the device SNs.)
- Use the initial password for the first connection. You can obtain the initial WLAN password from the label on the device. (For some products that have been discontinued, the initial password is **Changeme**.)
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.
- If the login screen is not displayed after you scan the QR code, check whether your phone is correctly connected to the device WLAN. If not, manually select and connect to the WLAN.
- If **This WLAN network has no Internet access. Connect anyway?** message is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 4 Log in to the device commissioning screen as **installer**.

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NOTICE

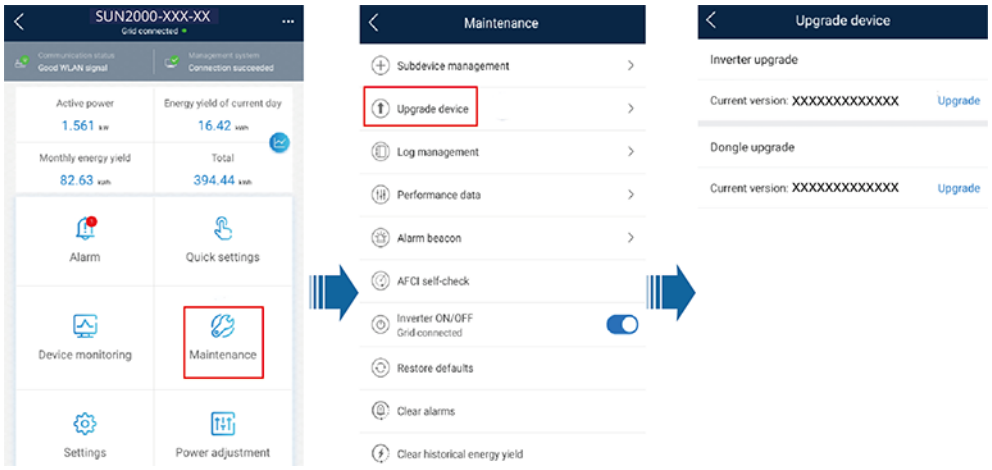
- Set the password as prompted at the first login. (For some products that have been discontinued, the initial password is **00000a**.)
- After completing the deployment settings, the installer should remind the owner to access the local commissioning screen of the device and set the login password of the owner account as prompted.
- Ensure account security by changing the password periodically. Your password might be stolen or cracked if it is left unchanged for extended periods. If a password is lost, the device cannot be accessed. In these cases, the Company shall not be liable for any loss.

Step 5 Upgrade a device as prompted.

NOTE

- Prepare the upgrade package before upgrading the device.
- Delivering an upgrade command to an inverter may cause power grid connection failure of the inverter and affect the energy yield.

Figure 6-3 Upgrading a device



----End

Connecting to the Smart Dongle over the App

NOTE

- Only SDongleA-05 and SDongleB-06 support this upgrade mode.
- The screenshots are for reference only. The actual screens may vary.

Step 1 Run the smart PV app and access **Device Commissioning**. (Perform this step only for the smart PV app.)

Step 2 Connect to the WLAN of the Smart Dongle.

Tap **Scan**. On the QR code scanning screen, align the QR code with the scanning box to automatically scan and connect to the WLAN of the Smart Dongle.

NOTE

- If the inverter has a WLAN, the WLAN of the Smart Dongle is disabled by default. If the inverter does not have a WLAN, the WLAN of the Smart Dongle is enabled by default.
- If the WLAN of the Smart Dongle is disabled, log in to the smart PV app, select the target plant on the home screen, tap **Device**, select the Smart Dongle card, choose **: :** > **O&M Authorization**, and enable **WLAN wakeup** to enable the WLAN of the Smart Dongle.

NOTE

- The WLAN name of a product consists of "Device name-Product SN." (The last six digits of the WLAN name of some products are the same as the last six digits of the product SN.)
- Use the QR code for the first connection. The QR code can be obtained from the label on the device.
- 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.
- If the login screen is not displayed after you scan the QR code, check whether your phone is correctly connected to the device WLAN. If not, manually select and connect to the WLAN.
- If the message **This WLAN network has no Internet access. Connect anyway?** is displayed when you connect to the built-in WLAN, tap **CONNECT**. Otherwise, you cannot log in to the system. The actual UI and messages may vary with mobile phones.

Step 3 Log in to the device commissioning screen as **Installer**.

NOTICE

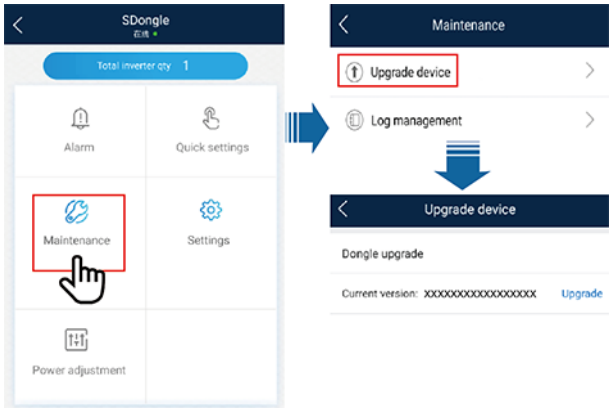
- After completing the deployment settings, the installer shall remind the owner to access the local commissioning screen of the device and set the login password of the owner account as prompted.
- To ensure account security, protect the password by changing it periodically, and keep it secure. Your 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.

Step 4 Upgrade a device as prompted.

NOTE

Prepare the upgrade package before upgrading the device.

Figure 6-4 Upgrading a device

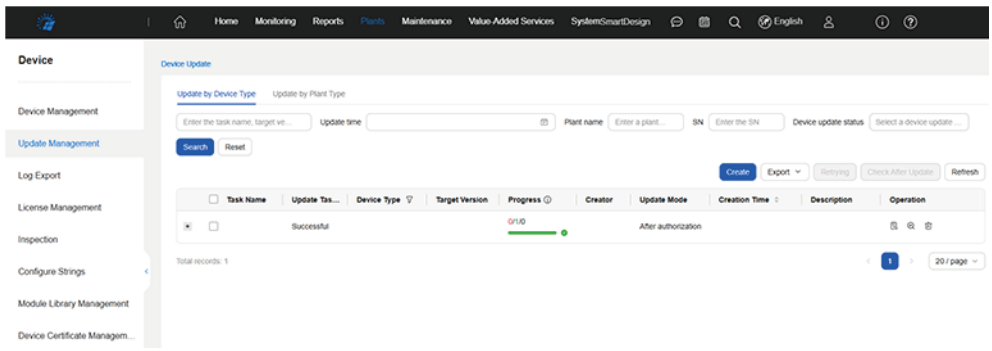


----End

Over the WebUI

Step 1 Log in to the management system, click **Plants** on the home page to go to the **Device** page, and choose **Update Management**. On the **Device Update** tab page, click **Create**, and create an upgrade task.

Figure 6-5 Creating an upgrade task



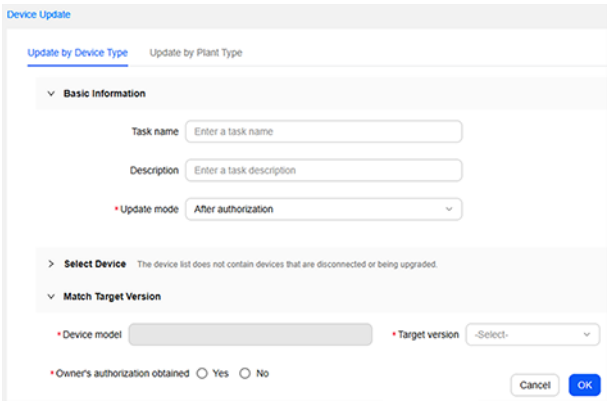
Step 2 Select the upgrade mode, device type, target version, and device, and click **OK** to upgrade the device.

NOTE

If the "update after authorization" mode is selected, the device can be upgraded only after the user's consent is obtained.

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Figure 6-6 Device upgrade



----End

6.4 Updating the Device List

When a plant device is deleted or replaced, you need to update the plant device information on the **Device Management** page.

Prerequisites

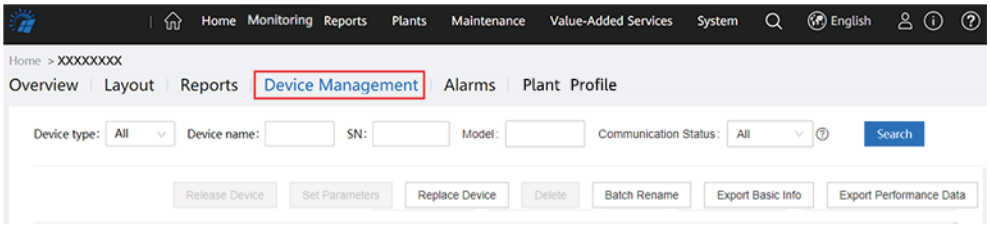
The PV plant to be updated communicates properly with the management system.

Procedure

Step 1 On the home page of the management system, select the plant to be modified from the plant list.

Step 2 On the **Device Management** page, select the target device, and then delete or replace the device.

Figure 6-7 Device management



NOTE

Replacing inverters does not affect the total energy yield of the PV plant.

----End

6.5 Replacing the Smart Dongle and the Master Inverter

6.5.1 Replacing the Smart Dongle

Replacing a Faulty Smart Dongle with a Smart Dongle of the Same Model

NOTE

If SDongleA-01, SDongleB-06, SDongleA-03, or SDongleA-05 is faulty, it must be replaced with a Smart Dongle of the same model.

Step 1 Remove the faulty Smart Dongle.

Step 2 Replace the SIM card. (Perform this step when the 4G communication mode is used.)

- If the purchased Smart Dongle has a built-in SIM card, replace the Smart Dongle without replacing the SIM card.
- If the purchased Smart Dongle does not have a built-in SIM card, use the SIM card in the faulty Smart Dongle.

Step 3 Install a new Smart Dongle onto the inverter where the faulty Smart Dongle was installed.

Step 4 Set the password for logging in to the WLAN. (Perform this step when the WLAN communication mode is used.)

Step 5 Log in to the smart PV app and tap the plant name on the **Home** screen to access the plant screen. Tap **Devices**, select the faulty Smart Dongle, tap **Device Replacement**, and replace the Smart Dongle as prompted.

----End

Replacing a Faulty Smart Mobile-4G with an SDongleA-03

NOTE

- Replace a faulty Smart Mobile-4G-CN with a SDongleA-03-CN.
- Replace a faulty Smart Mobile-4G-EU with a SDongleA-03-EU.

Step 1 Check that the software version of the master inverter supports the SDongleA-03. If the software version is not compatible, update the software version or replace the inverter.

Step 2 Remove the faulty Smart Dongle.

Step 3 Replace the SIM card. (Perform this step when the 4G communication mode is used.)

- If the purchased Smart Dongle has a built-in SIM card, replace the Smart Dongle without replacing the SIM card.
- If the purchased Smart Dongle does not have a built-in SIM card, use the SIM card in the faulty Smart Dongle.

Step 4 Log in to the smart PV app and tap the plant name on the **Home** screen to access the plant screen. Tap **Devices** and add a new Smart Dongle.

----End

6.5.2 Replacing the Master Inverter

Step 1 When the MBUS is used for networking, use the app to change the cascading mode of the original master inverter to RS485 through **Quick settings**.

NOTE

Tap **Search for cascaded inverters** and exit after 5s.

Step 2 Remove the Smart Dongle and install it on the new master inverter.

Step 3 Create a plant and commission the new master inverter.

----End

6.6 Troubleshooting

Table 6-7 Common faults and troubleshooting measures

Fault	Cause	Troubleshooting
The management system shows that the communication with the inverter is interrupted.	1. The RS485 cables among inverters are loose or disconnected. 2. The PV string is not properly connected, and the inverter has no DC input. 3. The baud rate or RS485 address of the inverter is changed. 4. The Smart Dongle is faulty.	1. If the RS485 cable between inverters is loose or disconnected, reconnect the cable securely. 2. Check that the inverter is correctly connected and power on the inverter. 3. Check that the baud rate and RS485 address of the inverter are set correctly. 4. Replace the Smart Dongle.
The SN of the Smart Dongle cannot be identified by the app during deployment.	The bar code is damaged and cannot be scanned.	Manually enter the SN of the Smart Dongle on the **Add Device** screen of the app during deployment.
The devices connected to the Smart Dongle are not connected to the management system properly.	1. Check whether the inverter software version meets the requirements. If not, upgrade the inverter to a specified version or later. 2. Check that the RS485 communications cables are connected properly. 3. Check that the RS485 communications parameters of the inverter are set correctly. 4. Check that the inverter communications parameters are correctly set.	If the inverters cannot be detected after troubleshooting, the Smart Dongle is faulty. Contact technical support.

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Fault	Cause	Troubleshooting
After the Smart Dongle is replaced, the connection to the management system using the original SIM card fails.	The SIM card is bound to the original Smart Dongle.	Contact the carrier of the SIM card to unbind the SIM card from the Smart Dongle.
In MBUS networking, the inverter found during the search is not in the SN list.	In MBUS networking, the inverter can be connected to the network using the SN list or the transformer station No. and winding No. of the inverter. If the inverter is connected to the network using the transformer station No. and winding No., the inverter may not be in the SN list.	Check the transformer station No. and winding No. of the master inverter (choose **Settings** > **Communication configuration** > **MBUS** on the app), and then set them to **0**.

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7 Certificate Management and Maintenance

7.1 Initial Certificate Risk Disclaimer

Huawei's initial certificates are mandatory identity credentials for Huawei devices before delivery. The disclaimer statements for using the certificates are as follows:

1. Huawei's initial certificates are used only to establish initial security channels for devices to access the customer network during deployment.
2. Initial certificates have a validity period. The validity period of Huawei's root certificates expires in 2041 and 2099, respectively, and the validity period of identity certificates expires earlier than that of root certificates.
3. After devices access the customer network, the management responsibilities of the devices and digital certificates are transferred to the customer. Huawei recommends that the customer replace the initial certificates used by devices on the live network with customer's own certificates, and use certificates with a short validity period and periodically replace the certificates in accordance with industry best practices. This helps mitigate the risk of private key leakage of digital certificates and prevent service interruption caused by certificate expiration.

For details about the rights and responsibilities related to initial certificates, see **Rights and Responsibilities of Initial Digital Certificates on Huawei Devices**.

7.2 Application Scenarios of Initial Certificates

Usage	Scenario	Replacement
Management system communication certificate	Authenticates the validity of a management system for communication through Modbus-TCP.	**7.3 Replacing a Certificate on the App**

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Usage	Scenario	Replacement
Third-party EMS/VPP communication certificate (management system-1 certificate)	Authenticates the validity of a third-party management system for communication through Modbus-TCP. **NOTICE** For communication with a third-party management system through Modbus-TCP, import the certificate from the third-party vendor.	

7.3 Replacing a Certificate on the App

Initial certificates are used only for commissioning and are not for commercial use. Replace the initial certificates with new ones to improve communication security. To prevent security risks caused by expired certificates, you are advised to periodically update certificates.

Prerequisites

You have applied for a new certificate from the CA and have obtained the new certificate files.

Table 7-1 Certificate requirements

Parameter	Requirement
Certificate signature algorithm	Use industry-leading security algorithms, such as sha256WithRSAEncryption or sha256ECDSA.
Key length	• For keys encrypted using RSA, the recommended length is 3072 bits or longer. • For keys encrypted using ECDSA, the length can be 256 or 384 bits. **NOTE** RSA keys shorter than 2048 bits or ECDSA keys shorter than 256 bits are insecure. For security purposes, ensure that the private key of the ER certificate is an RSA key of 3072 bits or longer or an ECDSA key of 256 bits or longer.

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Parameter	Requirement
Certificate storage format	.crt and .cer are supported. The certificate in .crt format must be encoded using Base64. ● The certificate file in .crt format is as follows: – **client.crt**: identity certificate file – **client_key.pem**: private key of the identity certificate ● The certificate file in .cer format is as follows: – **client.cer**: identity certificate file – **client_key.pem**: private key of the identity certificate
Private key file format	PKCS#8 format.
Password complexity of the private key file	Contain 8 to 64 characters, including at least two types of the following: ● Uppercase letters ● Lowercase letters ● Digits ● Special characters (excluding <>;+&/|%(),`$)

Step 1 Log in to the app using an installer account, connect to the device, and choose **Set** > **Communication configuration** > **Certificate management**.

Step 2 Select the certificate to be replaced, upload the corresponding certificates (root certificate, customer certificate, and key file), and enter the key password to replace the certificate.

Step 3 After the replacement is complete, tap **Replace current certificate**.

----End

8 Acronyms and Abbreviations

A	
app	Application
L	
LCD	liquid crystal display
S	
SN	Serial Number
U	
USB	Universal Serial Bus

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A List of Models No Longer Placed on the Market (Europe)

Table A-1 List of models no longer placed on the market (Europe)

List of Models No Longer Placed on the Market (Europe)
SDongleA-01
SDongleA-05 (WLAN-FE, 02312QMV)
SUN2000-(3KTL-20KTL)-M0
SUN2000-(2KTL-5KTL)-L0
SUN2000-(12KTL-25KTL)-M5
SDongleA-03-EU

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