# FusionSolar Smart PV Management System Connection

# User Manual (Inverters + SDongle)

| | |
|---|---|
| **Issue** | 10 |
| **Date** | 2025-09-30 |

**HUAWEI DIGITAL POWER TECHNOLOGIES CO., LTD.**

**Copyright © Huawei Digital Power Technologies Co., Ltd. 2025. All rights reserved.**

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Digital Power Technologies Co., Ltd.

### Trademarks and Permissions

and other Huawei trademarks are the property of Huawei Technologies Co., Ltd.
All other trademarks and trade names mentioned in this document are the property of their respective holders.

### Notice

The purchased products, services and features are stipulated by the contract made between Huawei Digital Power Technologies Co., Ltd. and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied. The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

## Huawei Digital Power Technologies Co., Ltd.

Address: Huawei Digital Power Antuoshan Headquarters

Futian, Shenzhen 518043

People's Republic of China

Website: https://digitalpower.huawei.com

**More Infomation**

Huawei Digital Power Information Experience Center

https://info.support.huawei.com/Energy/info

# About This Document

## Purpose

This document describes how to connect inverters to the FusionSolar 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.<br>NOTICE is used to address practices not related to personal injury. |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| Symbol | Description |
| --- | --- |
| NOTE | Supplements important information in the main text.<br>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 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**.
- 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**.

## 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**.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

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

## Issue 01 (2020-12-10)

This issue is the first official release.

# Contents

**About This Document** ii

**1 Safety Information** 1

1.1 Personal Safety 2

1.2 Electrical Safety 4

1.3 Environment Requirements 6

1.4 Mechanical Safety 7

**2 Solution Overview** 9

2.1 Communication Networking of the SDongleA-01 (WLAN) 10

2.2 Communication Networking of the SDongleA-03 (4G) 12

2.3 Communication Networking of the SDongleB-06 (4G) 20

2.4 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV) 31

2.5 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV-004) 34

**3 Cable Connections** 41

3.1 Connecting Cables for Cascaded Inverters 41

3.2 Installing the 4G/WLAN Smart Dongle 42

3.3 Installing the 4G (06) Smart Dongle 43

3.4 Installing the WLAN-FE Smart Dongle 43

**4 System Power-On and Commissioning** 45

4.1 Checking Before Power-On 45

4.2 Powering On the Inverter 45

**5 Plant Creation and Commissioning** 49

5.1 Creating a PV Plant 49

5.1.1 Creating a PV Plant over the App 49

5.1.2 Creating a PV Plant over the WebUI 51

5.2 Setting Grid-tied Control Parameters 56

5.2.1 Setting Parameters over the App 56

5.2.2 Setting Parameters over the WebUI 62

5.3 Connecting to the Smart Dongle and Setting Feed-in at Limited Current 68

5.4 Third-Party Management System Settings (Connecting to Two Management Systems) 71

5.5 Setting Parameters and Exporting Logs Through the WLAN of the Smart Dongle 77

**6 Maintenance** 79

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

6.1 Modifying Inverter Communications Parameters....79
6.1.1 WLAN Communication Networking....79
6.1.2 4G Communication Networking....82
6.1.3 FE Communication Networking....85
6.2 Exporting Inverter and Smart Dongle Logs....87
6.3 Upgrading the Inverter and Smart Dongle Software....88
6.4 Updating the Device List....94
6.5 Replacing the Smart Dongle and the Master Inverter....95
6.5.1 Replacing the Smart Dongle....95
6.5.2 Replacing the Master Inverter....96
6.6 Troubleshooting....97
**7 Acronyms and Abbreviations....99**
**A List of Models No Longer Placed on the Market (Europe)....100**

# 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:**

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

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

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

# 1.1 Personal Safety

**DANGER**

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

**DANGER**

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

**DANGER**

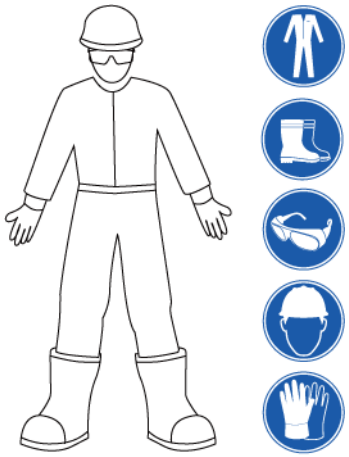
Before operations, remove conductive objects such as watches, bracelets, bangles, rings, and necklaces to prevent electric shocks.

**DANGER**

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

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

- 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, equipment short-circuits or damage, load power derating, power failure, or personal injury may occur.

**WARNING**

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

## General Requirements

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

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

- 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 work on the equipment in the absence of a properly installed ground conductor.
- Do not damage the ground conductor.
- For the equipment that uses a three-pin socket, ensure that the ground terminal in the socket is connected to the protective ground point.
- If high touch current may occur on the equipment, ground the protective ground terminal on the equipment enclosure before connecting the power supply; otherwise, electric shock as a result of touch current may occur.

## Cabling Requirements

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

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

# 1.3 Environment Requirements

**DANGER**

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

**DANGER**

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

**WARNING**

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

## General Requirements

- Ensure that the equipment is stored in a clean, dry, and well ventilated area with proper temperature and humidity and is protected from dust and condensation.
- 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.
- 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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

- 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 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**

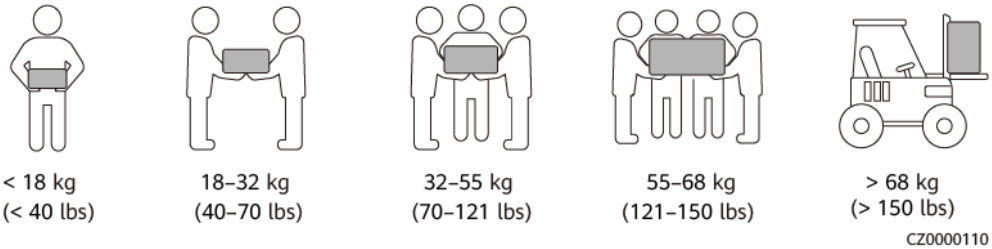
Do not drill holes into the equipment. Doing so may affect the sealing performance and electromagnetic containment of the equipment and damage components or cables inside. Metal shavings from drilling may short-circuit boards inside the equipment.

## 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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

# 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 FusionSolar 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 FusionSolar Smart PV Management System through an IP network. |
| SDongleA-03-CN[a]<br>SDongleA-03-EU<br>SDongleA-03-AU<br>SDongleA-03-JP<br>SDongleA-03-KR<br>SDongleB-06-CN[a]<br>SDongleB-06-EU<br>SDongleB-06-AU<br>SDongleB-06-NH | 4G | Connects to the FusionSolar 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 FusionSolar 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. | | |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

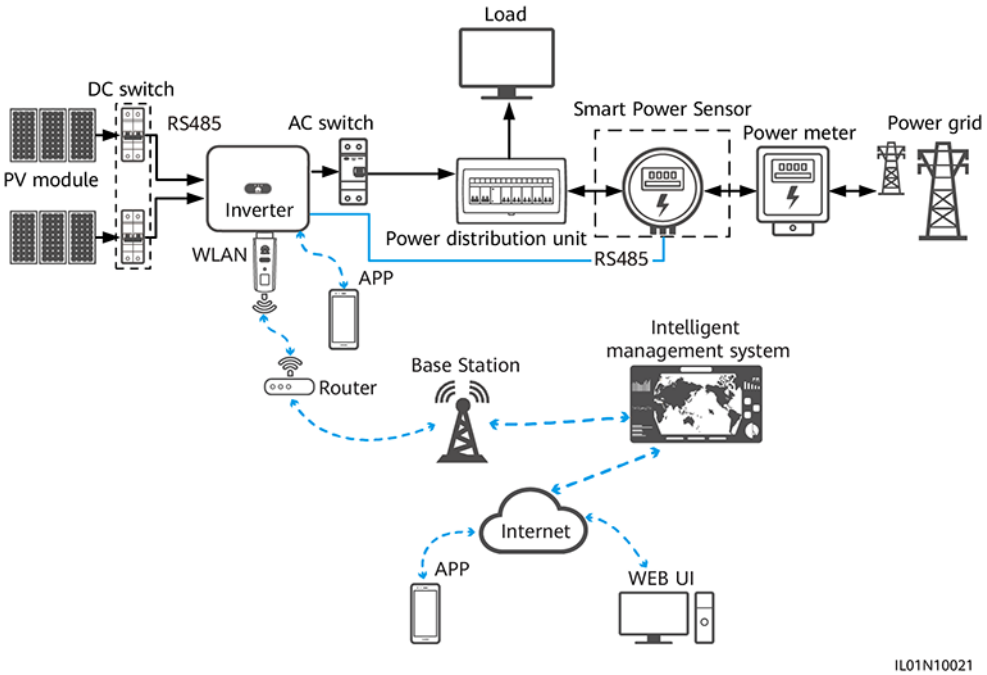
**Table 2-2** WLAN parameters

| 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 FusionSolar Smart PV Management System through the router.
- The inverter connects to the FusionSolar app through its WLAN. You can use the FusionSolar app to view the running information and settings of the inverter.
- You can remotely log in to the FusionSolar Smart PV Management System over the WebUI or FusionSolar 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 site 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.<br>Note b: If the number of inverters exceeds the limit, configure multiple Smart Dongles. The installation and commissioning 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. Only one inverter can be connected. | Huawei |
| Dongle | Purchased by the customer. The model should be 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.<br>• The WPA, WPA2, or WPA/WPA2 encryption mode is recommended.<br>• The Enterprise mode is not supported (such as airport WLAN and other public hotspots that require authentication).<br>• WEP and WPA TKIP encryption modes are not recommended because they have serious security vulnerabilities.<br>• 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 | FusionSolar Smart PV Management System. Software version: SmartPVMS V500R007C00SPC110 or later. | Huawei |
| App | FusionSolar app of 5.7.001 or a later version. The app can be locally connected to the inverter and remotely connected to the FusionSolar Smart PV Management System. | Huawei |
| Power distribution unit | Prepared by the customer | Device supplier |
| Smart Power Sensor | Recommended model: DTSU666-H | Huawei |
| Power meter | Prepared by the customer | Device supplier |

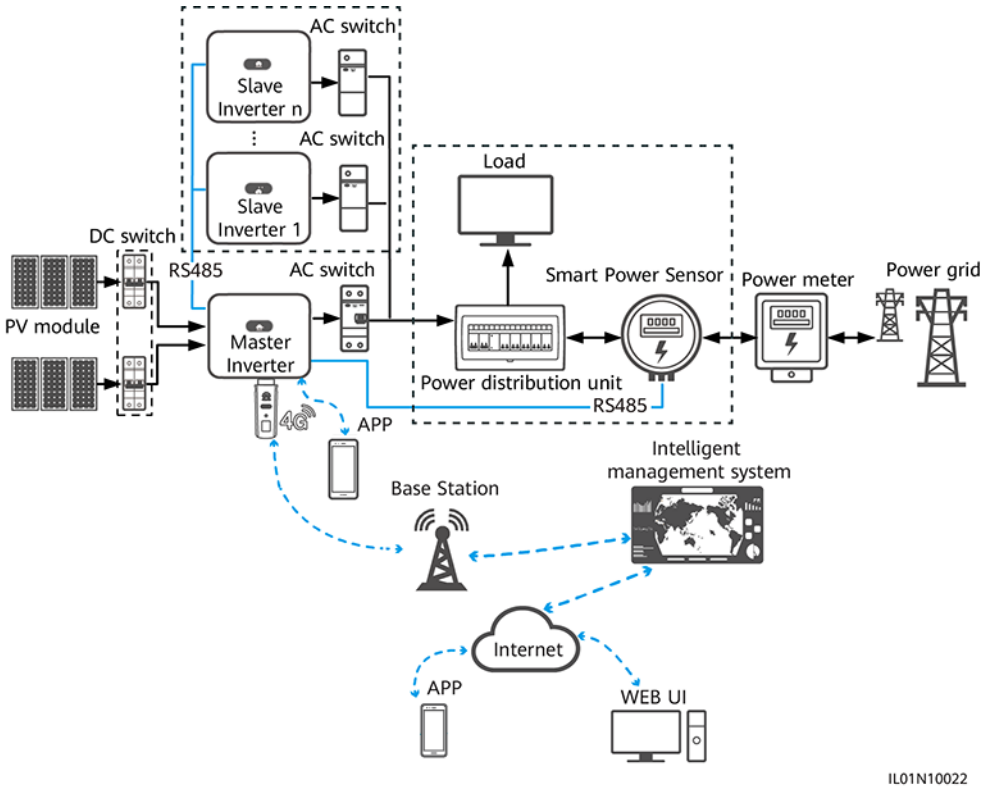
# 2.2 Communication Networking of the SDongleA-03 (4G)

- The inverter connects to the FusionSolar Smart PV Management System through the 4G Smart Dongle.
- The master inverter connects to the FusionSolar app. You can use the FusionSolar app to view the running information and settings of the inverter.
- You can remotely log in to the FusionSolar Smart PV Management System over the WebUI or FusionSolar app.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

## 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.<br>• SUN2000-(2KTL-6KTL)-L1. Software version: SUN2000L V200R001C00 or later.<br>• SUN2000-(3KTL-20KTL)-M0<br>• SUN2000-(3KTL-12KTL)-M1<br>• SUN2000-(8KTL-20KTL)-M2<br>• SUN2000-(20KTL, 29.9KTL, 30KTL, 36KTL, 40KTL)-M3 Series<br>• SUN2000-(50KTL-ZHM3, 50KTL-M3, 50KTL-BRM3)<br>• SUN2000-50KTL-NHM3<br>• SUN2000-(12KTL-25KTL)-M5 Series<br>• 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.<br>• SUN2000-100KTL/110KTL/125KTL-M0, SUN2000-75KTL/100KTL-M1, SUN2000-100KTL-INM0.<br>• 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<br>• SUN2000-29.9KTL/36KTL/42KTL/50KTL<br>• SUN2000-33KTL-A<br>• SUN2000-33KTL/40KTL-JP<br>• SUN2000-43KTL-IN-C1<br>• 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 |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| Device | Description | Service Owner |
| --- | --- | --- |
| Intelligent management system | • Huawei management system: FusionSolar Smart PV Management System with the software version of SmartPVMS V500R007C00SPC110 or later.<br>• Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation. | Huawei |
| App | • FusionSolar app of 5.7.001 or a later version. The app can be locally connected to the inverter and remotely connected to the FusionSolar Smart PV Management System.<br>• SUN2000 app of 3.2.00.005 or a later version for Android. The app can be locally connected to the inverter. | Huawei |
| 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<br>• Recommended model for single-phase inverters: DDSU666-H | Huawei |
| Power meter | Prepared by the customer | Device supplier |

## MBUS Communication Networking

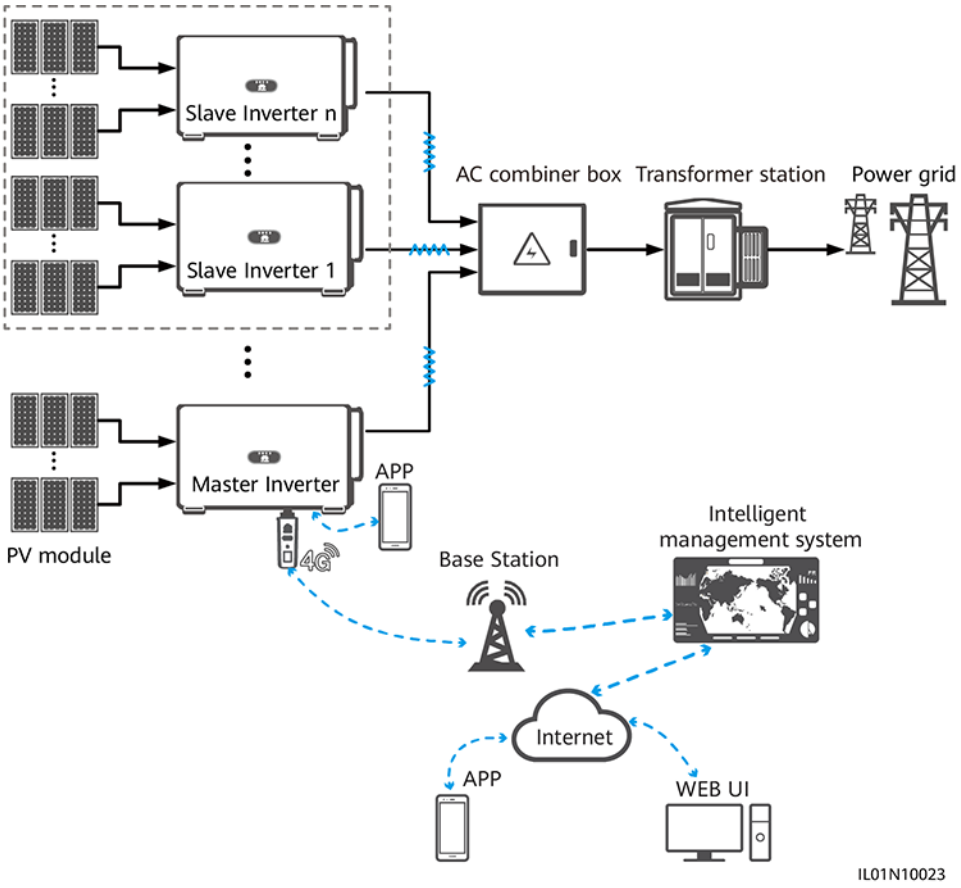
- The inverter connects to the FusionSolar Smart PV Management System through the 4G Smart Dongle.
- The master inverter connects to the FusionSolar app. You can use the FusionSolar app to view the running information and settings of the inverter.
- You can remotely log in to the FusionSolar Smart PV Management System over the WebUI or FusionSolar app.

**NOTICE**

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

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**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<br>• SUN2000-50KTL/60KTL-M0<br>• SUN2000-100KTL/110KTL/125KTL-M0 | Huawei |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| 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 | • Huawei management system: FusionSolar Smart PV Management System with the software version of SmartPVMS V500R007C00SPC110 or later.<br>• Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation. | • Huawei<br>• Device supplier |
| App | • FusionSolar app of 5.7.001 or a later version. The app can be locally connected to the inverter and remotely connected to the FusionSolar Smart PV Management System.<br>• SUN2000 app of 3.2.00.005 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 2-7** 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 |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| 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.<br>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.<br>Note c: A maximum of three SUN2000-(2KTL-6KTL)-L1 inverters can be cascaded.<br>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. | | |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**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<br>LTE TDD: B38, B39, B40, B41<br>DC-HSPA+/HSPA+/HSPA/UMTS: B1, B5, B8, B9<br>TD-SCDMA: B34, B39<br>GSM/GPRS/EDGE: 900 MHz, 1800 MHz | • Supports LTE-FDD (with receive diversity): B1/B3/B5/B8/.<br>• Supports LTE-TDD (with receive diversity): B34/B38/B39/B40/B41.<br>• Supports WCDMA: B1/B5/B8.<br>• Supports GSM: 900 MHz/1800 MHz.<br>• Supports digital audio. | LTE features:<br>• Supports a maximum of 3GPP R8 non-CA Cat 4 FDD and TDD.<br>• Supports 1.4 MHz/3 MHz/5 MHz/10 MHz/15 MHz/20 MHz RF bandwidth.<br>• Supports MIMO in the downlink.<br>• LTE-FDD: maximum downlink rate of 150 Mbit/s and maximum uplink rate of 50 Mbit/s<br>• LTE-TDD: maximum downlink rate of 130 Mbit/s and maximum uplink rate of 30 Mbit/s<br>UMTS features:<br>• Supports 3GPP R7 HSDPA+, HSDPA, HSUPA, and WCDMA.<br>• Supports QPSK and 16QAM modulation.<br>• HSDPA+: maximum downlink rate of 21 Mbit/s<br>• HSUPA: maximum uplink rate of 5.76 Mbit/s<br>• WCDMA: maximum downlink rate of 384 kbit/s and maximum uplink rate of 384 kbit/s<br>GSM features:<br>GPRS:<br>• Supports GPRS multislot class 12.<br>• Coding schemes: CS-1, CS-2, CS-3, and CS-4<br>• Maximum downlink rate: 85.6 kbit/s; maximum uplink rate: 85.6 kbit/s<br>EDGE:<br>• Supports EDGE multislot class 12.<br>• Supports GMSK and 8-PSK modulation and coding schemes.<br>• Downlink coding format: MCS 1–9<br>• Uplink coding format: MCS 1–9 | • Class 4 (33 dBm±2 dB), EGSM900 frequency band<br>• Class 1 (30 dBm±2 dB), DCS1800 frequency band<br>• Class E2 (27 dBm±3 dB), EGSM900 8-PSK<br>• Class E2 (26 dBm±3 dB), DCS1800 8-PSK<br>• Class 3 (24 dBm+1/–3 dB), WCDMA frequency band<br>• Class 3 (23 dBm±2 dB), LTE-FDD frequency band<br>• Class 3 (23 dBm±2 dB), LTE-TDD frequency band |
| SDongleA-03-EU | LTE FDD: B1, B3, B7, B8, B20<br>LTE TDD: B38, B40<br>WCDMA/HSDPA/HSUPA/HSPA+: B1, B8<br>GSM/GPRS/EDGE: 900 MHz, 1800 MHz | | | |
| SDongleA-03-AU | LTE FDD: B1, B2, B3, B4, B5, B7, B8, B28<br>LTE TDD: B40<br>WCDMA: B1, B2, B5, B8<br>GSM: 850 MHz, 900 MHz, 1800 MHz, 1900 MHz | | | |
| SDongleA-03-JP | LTE FDD: B1, B3, B8, B18, B19, B26<br>LTE TDD: B41 | | | |

| Model | Supported Frequency Bands and Systems | Protocols and Standards | Bandwidth | Maximum transmit power |
|---|---|---|---|---|
| SDongleA-03-KR | WCDMA: B1, B6, B8, B19<br>LTE FDD: B1, B3, B5, B7<br>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 |
|---|---|---|---|---|
| FusionSolar 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.<br>• 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)

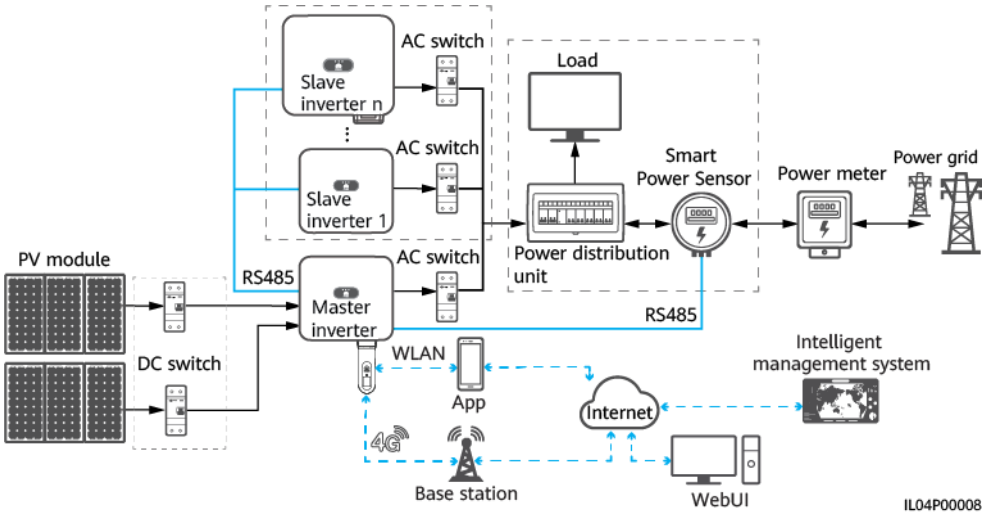
- The inverter connects to the FusionSolar Smart PV Management System through the 4G Smart Dongle.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

- The master inverter connects to the FusionSolar app. You can use the FusionSolar app to view the running information and settings of the inverter.
- The Smart Dongle can connect to a third-party management system.
- The Smart Dongle supports WLAN hotspots.
- You can remotely log in to the FusionSolar Smart PV Management System over the WebUI or FusionSolar 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

| 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.<br>• SUN2000-(2KTL-6KTL)-L1<br>• SUN2000-(8K,10K)-LC0 Series<br>• SUN2000-(3KTL-20KTL)-M0<br>• SUN2000-(3KTL-12KTL)-M1<br>• SUN2000-(5K-12K)-MAP0 Series<br>• SUN5000-(8K, 12K)-MAP0 Series<br>• SUN2000-(8KTL-20KTL)-M2<br>• SUN2000-(12K-25K)-MB0 Series<br>• SUN5000-(17K, 25K)-MB0 Series<br>• SUN2000-(20KTL, 29.9KTL, 30KTL, 36KTL, 40KTL)-M3 Series<br>• SUN2000-(12KTL-25KTL)-M5 Series<br>• SUN2000-(50KTL-ZHM3, 50KTL-M3, 50KTL-BRM3)<br>• SUN2000-50KTL-NHM3<br>• SUN2000-50K-MC0<br>• SUN2000-30K-MC0<br>• SUN2000-40K-MC0<br>• SUN2000-100KTL/110KTL/125KTL-M0, SUN2000-75KTL/100KTL-M1, SUN2000-100KTL-INM0.<br>• SUN2000-(75KTL-M1, 100KTL-M2, 110KTL-M2, 115KTL-M2)<br>• SUN2000-(50K, 75K, 80K, 150K)-MG Series<br>• SUN5000-(150K-MG0-ZH,150K-MG0) | 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 | 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 | | • Huawei management system: FusionSolar Smart PV Management System with the software version of SmartPVMS V500R007C00SPC110 or later.<br>• Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation. | Huawei |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| Device | Description | Service Owner |
| --- | --- | --- |
| App | • FusionSolar app of 5.7.001 or a later version. The app can be locally connected to the inverter and remotely connected to the FusionSolar Smart PV Management System.<br>• SUN2000 app of 3.2.00.005 or a later version for Android. The app can be locally connected to the inverter. | 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<br>• Recommended model for single-phase inverters: DDSU666-H | Huawei |
| Power meter | Prepared by the customer | Device supplier |

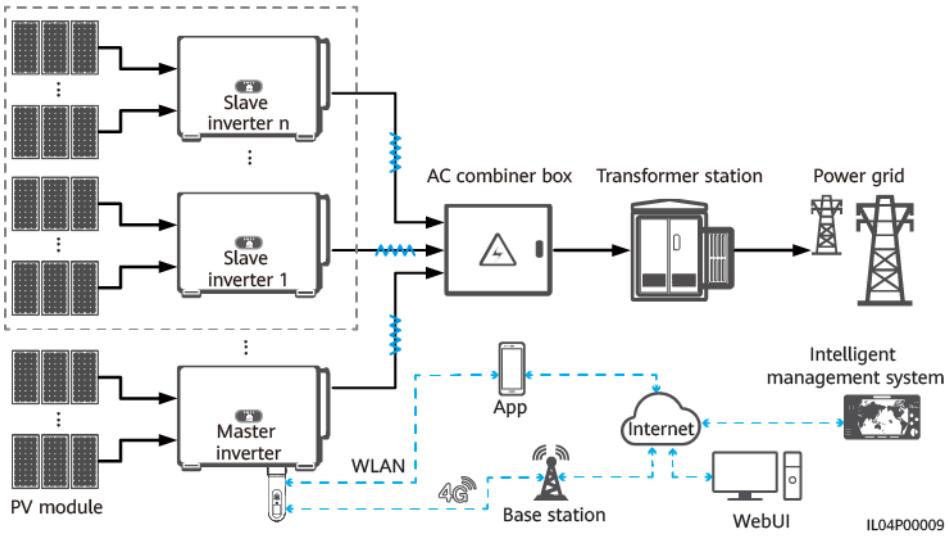
## MBUS Communication Networking

- The inverter connects to the FusionSolar Smart PV Management System through the 4G Smart Dongle.
- The master inverter connects to the FusionSolar app. You can use the FusionSolar app to view the running information and settings of the inverter.
- You can remotely log in to the FusionSolar Smart PV Management System over the WebUI or FusionSolar app.
- Procedure:
  a. Open the FusionSolar 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 2-11** Device or software description

| Device | Description | Service Owner |
|---|---|---|
| PV module | Prepared by the customer | Customer |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| 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<br>• SUN2000-(75KTL-M1, 100KTL-M2, 110KTL-M2, 115KTL-M2), with the software version of SUN2000ME V500R023C00SPC030B128 or later<br>• SUN2000-(50K, 75K, 80K, 150K)-MG Series<br>• 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 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 | | • Huawei management system: FusionSolar Smart PV Management System.<br>• Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation. | • Huawei<br>• Device supplier |
| App | | • FusionSolar app of 6.23.00.162 or a later version. The app can be locally connected to the inverter and remotely connected to the FusionSolar Smart PV Management System.<br>• 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 2-12** 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.<br>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.<br>Note c: A maximum of three SUN2000-(2KTL-6KTL)-L1 inverters can be cascaded.<br>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 2-13** 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<br>• 120 g |
| Ingress protection (IP) rating | IP65 |
| Operating temperature | –30°C to +65°C |
| Relative humidity | 5%–95% RH |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| Parameter | Description |
| --- | --- |
| Storage temperature | –40ºC to +70ºC |
| Maximum altitude | 4000 m |

**Table 2-14** 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<br>LTE TDD: B34, B39, B40, B41<br>GSM/GPRS/ EDGE: 900 MHz, 1800 MHz | • Supports LTE-FDD (with receive diversity): B1/B3/B5/B8.<br>• Supports LTE-TDD (with receive diversity): B34/B38/B39/B40/B41.<br>• Supports WCDMA: B1/B5/B8.<br>• Supports GSM: 900 MHz/1800 MHz.<br>• Supports digital audio. | LTE features:<br>• Supports a maximum of 3GPP R8 non-CA Cat 4 FDD and TDD.<br>• Supports 1.4 MHz/3 MHz/5 MHz/10 MHz/15 MHz/20 MHz RF bandwidth.<br>• Supports MIMO in the downlink.<br>• LTE-FDD: maximum downlink rate of 150 Mbit/s and maximum uplink rate of 50 Mbit/s<br>• LTE-TDD: maximum downlink rate of 130 Mbit/s and maximum uplink rate of 30 Mbit/s<br>UMTS features:<br>• Supports 3GPP R7 HSDPA+, HSDPA, HSUPA, and WCDMA.<br>• Supports QPSK and 16QAM modulation.<br>• HSDPA+: maximum downlink rate of 21 Mbit/s<br>• HSUPA: maximum uplink rate of 5.76 Mbit/s<br>• WCDMA: maximum downlink rate of 384 kbit/s and maximum uplink rate of 384 kbit/s<br>GSM features:<br>GPRS:<br>• Supports GPRS multislot class 12.<br>• Coding schemes: CS-1, CS-2, CS-3, and CS-4<br>• Maximum downlink rate: 85.6 kbit/s; | • Class 4 (33 dBm±2 dB), EGSM900 frequency band<br>• Class 1 (30 dBm±2 dB), DCS1800 frequency band<br>• Class E2 (27 dBm±3 dB), EGSM900 8-PSK<br>• Class E2 (26 dBm±3 dB), DCS1800 8-PSK<br>• Class 3 (24 dBm+1/–3 dB), WCDMA frequency band<br>• Class 3 (23 dBm±2.7 dB), LTE-FDD frequency band<br>• Class 3 (23 dBm±2.7 dB), LTE-TDD frequency band<br>SDongleB-06 (WiFi): ≤ 20 dBm E.I.R.P. |
| SDongleB-06-EU | LTE FDD: B1, B3, B7, B8, B20, B28, B31<br>LTE TDD: B38, B40, B41<br>GSM/GPRS/ EDGE: 850 MHz, 900 MHz, 1800 MHz, 1900 MHz | | | |
| SDongleB-06-AU | LTE FDD: B2, B4, B12<br>WCDMA: B1, B2, B5, B8<br>GSM: 850 MHz, 900 MHz, 1800 MHz, 1900 MHz | | | |
| SDongleB-06-NH | LTE FDD: B1, B3, B8, B18, B19, B26<br>LTE TDD: B41<br>WCDMA: B1, B6, B8, B19 | | | |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

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

**Table 2-15** Data requirements for the SIM card

| Management System Type | Monthly Data Requirement for the SIM Card | | | Data Capability |
|---|---|---|---|---|
| FusionSolar Smart PV 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.<br>• 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.<br>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. For details about how to switch the mode, see the ***FusionSolar App and SUN2000 App Device Commissioning Guide***. | | | |

NOTE

- If the inverter is connected to both the poverty alleviation monitoring center and the FusionSolar Smart PV 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 FusionSolar Smart PV 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

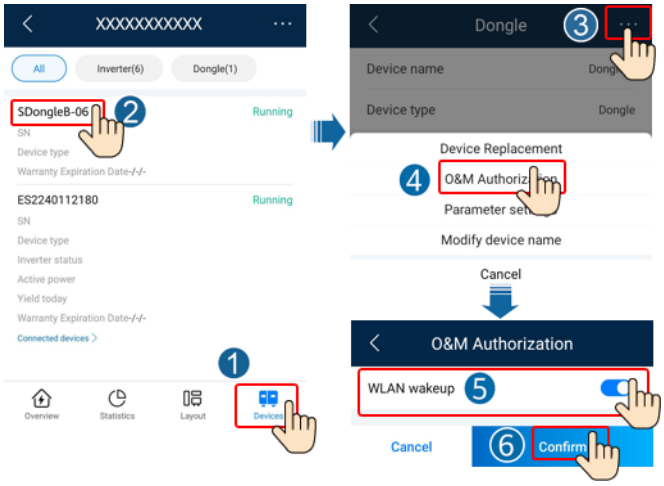
Commission the inverter locally via the Smart Dongle WLAN. If the Smart Dongle WLAN is disabled, log in to the FusionSolar app and tap the plant name on the **Home** screen to access the plant screen. Tap **Devices** and then tap **SDongleB-06**. Choose **O&M Authorization** > **WLAN wakeup** > **Confirm**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

NOTE

If the inverter has a 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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Figure 2-6** Enabling the Smart Dongle WLAN



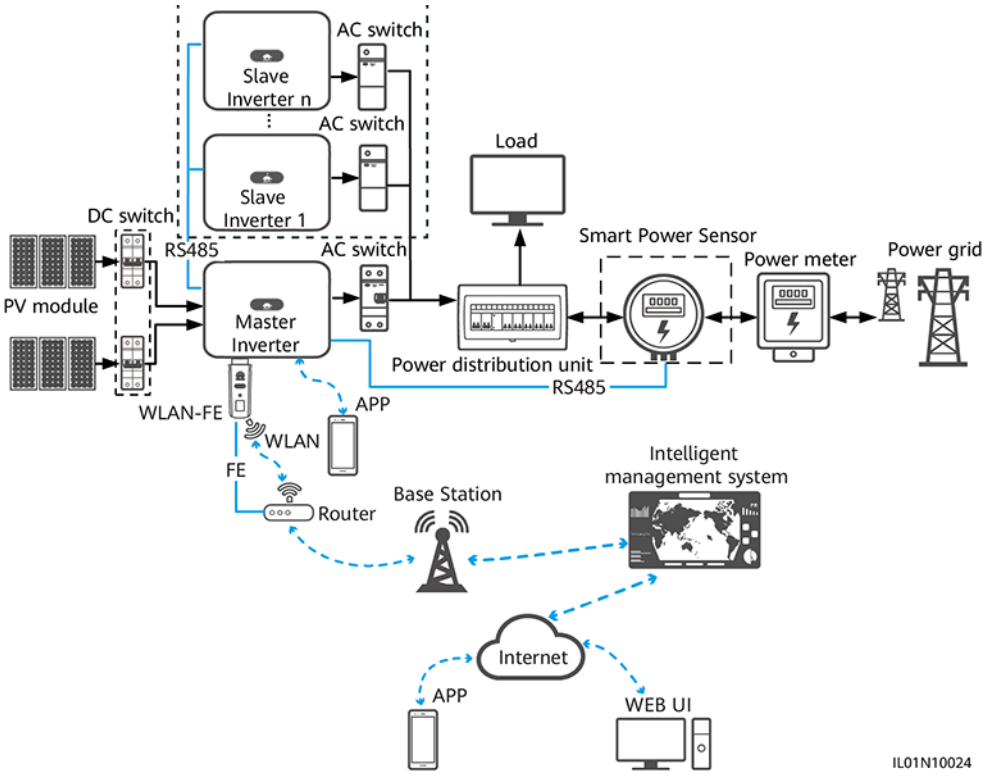

# 2.4 Communication Networking of the SDongleA-05 (WLAN-FE, 02312QMV)

## Smart Dongle (BOM Number: 02312QMV)

- The inverter connects to the router through the WLAN-FE Smart Dongle, and then connects to the FusionSolar Smart PV Management System through the router.
- The master inverter connects to the FusionSolar app. You can use the FusionSolar app to view the running information and settings of the inverter.
- You can remotely log in to the FusionSolar Smart PV Management System over the WebUI or FusionSolar app.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**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 2-16** 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.<br>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.<br>Note c: A maximum of three SUN2000-(2KTL-6KTL)-L1 inverters can be cascaded.<br>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 2-17** Device description

| Device | | Description | Service Owner |
|---|---|---|---|
| PV module | | Purchased by the customer | Device supplier |
| Inverter | Master inverter | • SUN2000-(2KTL-6KTL)-L1<br>• SUN2000-(8K,10K)-LC0 Series<br>• SUN2000-(3KTL-20KTL)-M0<br>• SUN2000-(3KTL-12KTL)-M1<br>• SUN2000-(8KTL-20KTL)-M2<br>• SUN2000-(12K-25K)-MB0 Series<br>• SUN5000-(17K, 25K)-MB0 Series<br>• SUN2000-(20KTL, 29.9KTL, 30KTL, 36KTL, 40KTL)-M3 Series<br>• SUN2000-(50KTL-ZHM3, 50KTL-M3, 50KTL-BRM3)<br>• SUN2000-(12KTL-25KTL)-M5 Series | Huawei |
| | Slave inverter | • The master inverter can be used as a slave inverter.<br>• SUN2000-33KTL<br>• SUN2000-29.9KTL/33KTL-A/36KTL<br>• SUN2000-50KTL/60KTL-M0<br>• 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.<br>• The WPA, WPA2, or WPA/WPA2 encryption mode is recommended.<br>• The Enterprise mode is not supported (such as airport WLAN and other public hotspots that require authentication).<br>• WEP and WPA TKIP encryption modes are not recommended because they have serious security vulnerabilities.<br>• 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 | FusionSolar Smart PV Management System. Software version: SmartPVMS V500R007C00SPC110 or later. | Huawei |
| App | FusionSolar app of 5.7.001 or a later version. The app can be locally connected to the inverter and remotely connected to the FusionSolar Smart PV 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<br>• Recommended model for single-phase inverters: DDSU666-H | 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)

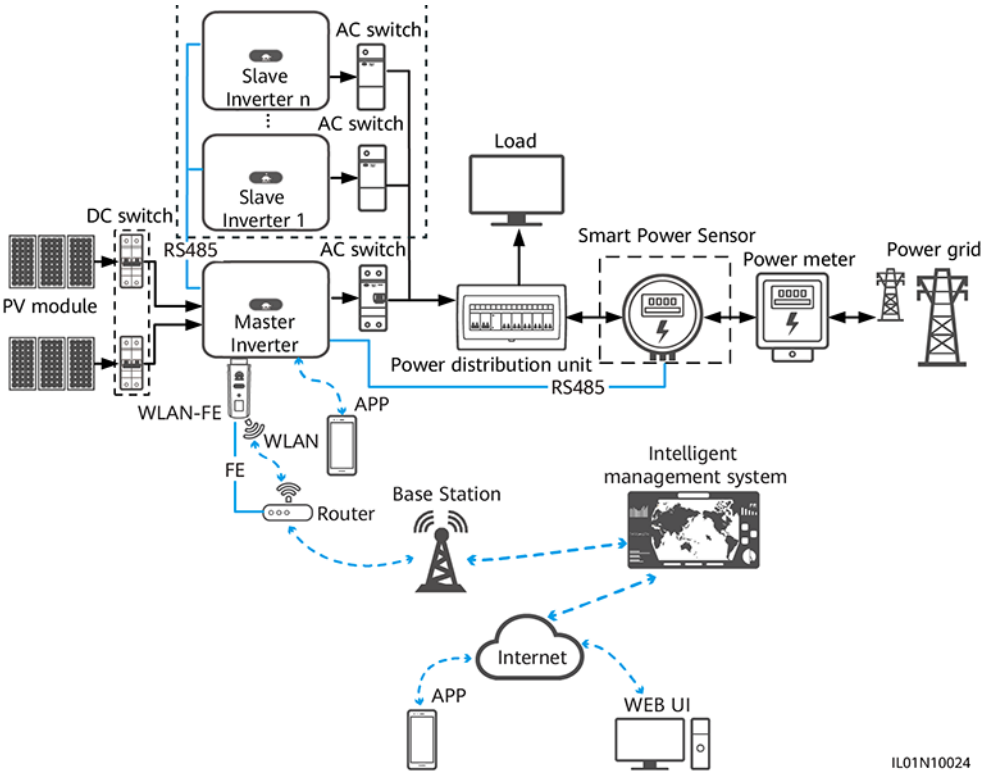
- The inverter connects to the router through the WLAN-FE Smart Dongle, and then connects to the FusionSolar Smart PV Management System through the router.
- The Smart Dongle can connect to a third-party management system.
- The Smart Dongle supports WLAN hotspots.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

- The master inverter connects to the FusionSolar app. You can use the FusionSolar app to view the running information and settings of the inverter.
- You can remotely log in to the FusionSolar Smart PV Management System over the WebUI or FusionSolar app.

## 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 2-18** Device description

| Device | Description | Service Owner |
|---|---|---|
| PV module | Purchased by the customer | Device supplier |

| Device | | Description | Service Owner |
| --- | --- | --- | --- |
| Inverter | Master inverter | • SUN2000-(2KTL-5KTL)-L0, SUN2000-(2KTL-6KTL)-L1. Software version: SUN2000L V200R001C00 or later. (All software versions of this inverter model are supported.)<br>• SUN2000-(8K,10K)-LC0 Series<br>• SUN2000-(3KTL-20KTL)-M0<br>• SUN2000-(3KTL-12KTL)-M1<br>• SUN2000-(5K-12K)-MAP0 Series<br>• SUN5000-(8K, 12K)-MAP0 Series<br>• SUN2000-(8KTL-20KTL)-M2<br>• SUN2000-(12K-25K)-MB0 Series<br>• SUN5000-(17K, 25K)-MB0 Series<br>• SUN2000-(20KTL, 29.9KTL, 30KTL, 36KTL, 40KTL)-M3 Series<br>• SUN2000-(50KTL-ZHM3, 50KTL-M3, 50KTL-BRM3)<br>• SUN2000-(12KTL-25KTL)-M5 Series<br>• SUN2000-(75KTL-M1, 100KTL-M2, 110KTL-M2, 115KTL-M2)<br>• SUN2000-(50K, 75K, 80K, 150K)-MG Series<br>• SUN2000-50K-MC0<br>• SUN2000-30K-MC0<br>• SUN2000-40K-MC0<br>• 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 |

| 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.<br>• The WPA, WPA2, or WPA/WPA2 encryption mode is recommended.<br>• The Enterprise mode is not supported (such as airport WLAN and other public hotspots that require authentication).<br>• WEP and WPA TKIP encryption modes are not recommended because they have serious security vulnerabilities.<br>• 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 | FusionSolar Smart PV Management System. Software version: SmartPVMS V500R007C00SPC110 or later. | Huawei |
| App | FusionSolar app of 5.7.001 or a later version. The app can be locally connected to the inverter and remotely connected to the FusionSolar Smart PV 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<br>• 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 router through the WLAN-FE Smart Dongle, and then connects to the FusionSolar Smart PV Management System through the router.
- The master inverter connects to the FusionSolar app. You can use the FusionSolar app to view the running information and settings of the inverter.
- You can remotely log in to the FusionSolar Smart PV Management System over the WebUI or FusionSolar app.
- Procedure:
  a. Open the FusionSolar app, log in using an installer account, and choose **Services > Device commissioning**. Then, scan the QR code on the Smart

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

Dongle or manually connect to the WLAN of the Smart Dongle to access the device commissioning screen.

b. Enter the login password.

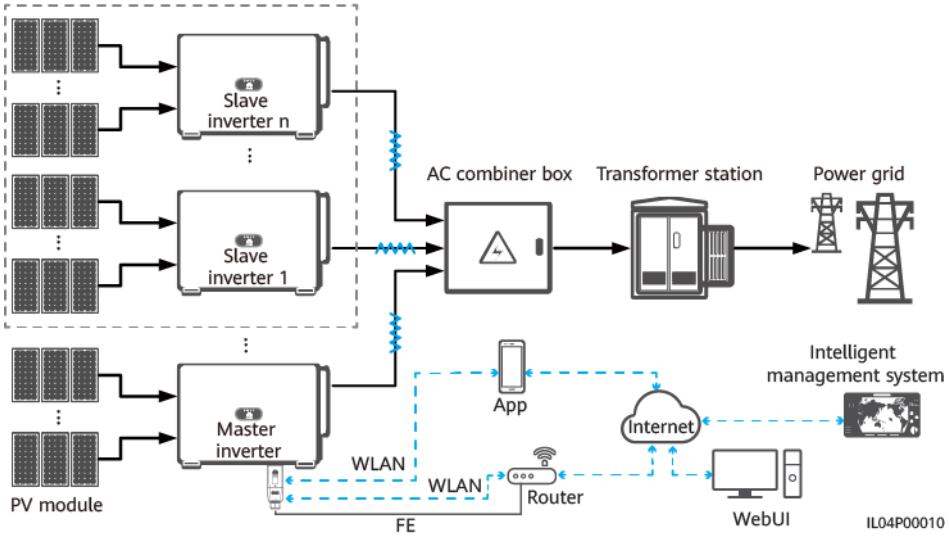
c. Tap **Log in** and go to the solar inverter screen. Choose **Settings > Communication configuration > Parallel system communication parameter settings > MBUS**. Insert the Dongle into the inverter whose parallel communication parameter is **MBUS**. Ensure that the parallel communication parameters 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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Table 2-19** Device or software description

| Device | | Description | Service Owner |
|---|---|---|---|
| PV module | | Prepared by the customer | Customer |
| Inverter | Master inverter | SUN2000-100KTL/110KTL/125KTL-M0 and SUN2000-75KTL/110KTL-M1, with the software version of SUN2000 V500R001C00SPC129B092 or later<br>• SUN2000-(75KTL-M1, 100KTL-M2, 110KTL-M2, 115KTL-M2), with the software version of SUN2000ME V500R023C00SPC030B128 or later<br>• SUN2000-(50K, 75K, 80K, 150K)-MG Series<br>• 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 | | • Huawei management system: FusionSolar Smart PV Management System.<br>• Third-party management system: A third-party management system is supported. For details, see the third-party management system documentation. | • Huawei<br>• Device supplier |
| App | | • FusionSolar app of 6.23.00.162 or a later version. The app can be locally connected to the inverter and remotely connected to the FusionSolar Smart PV Management System.<br>• 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

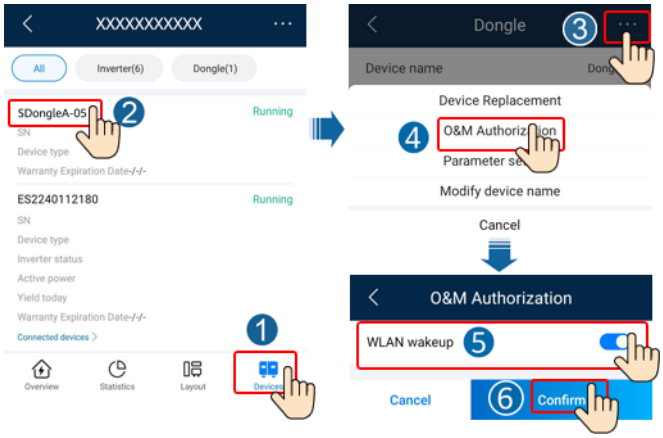
Commission the inverter locally via the Smart Dongle WLAN. If the Smart Dongle WLAN is disabled, log in to the FusionSolar app and tap the plant name on the **Home** screen to access the plant screen. Tap **Devices** and then tap **SDongleA-05**. Choose **O&M Authorization** > **WLAN wakeup** > **Confirm**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

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**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

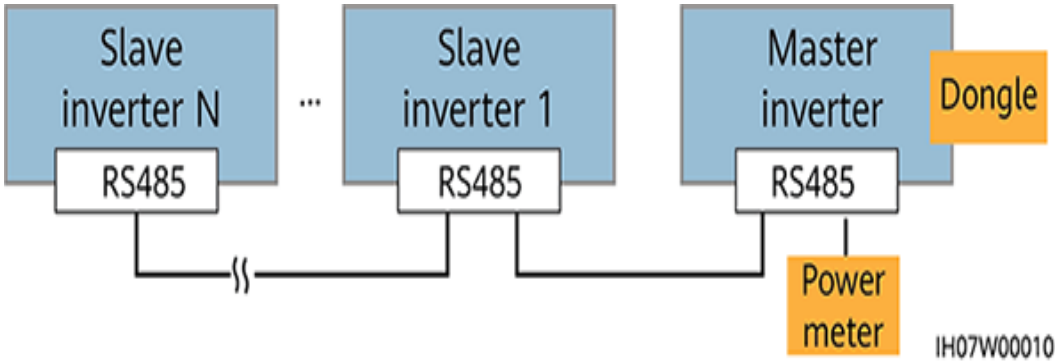


# 3 Cable Connections

## 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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

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

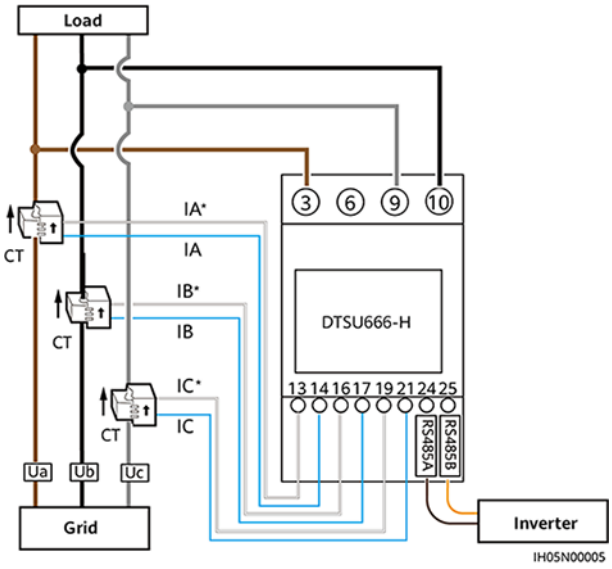
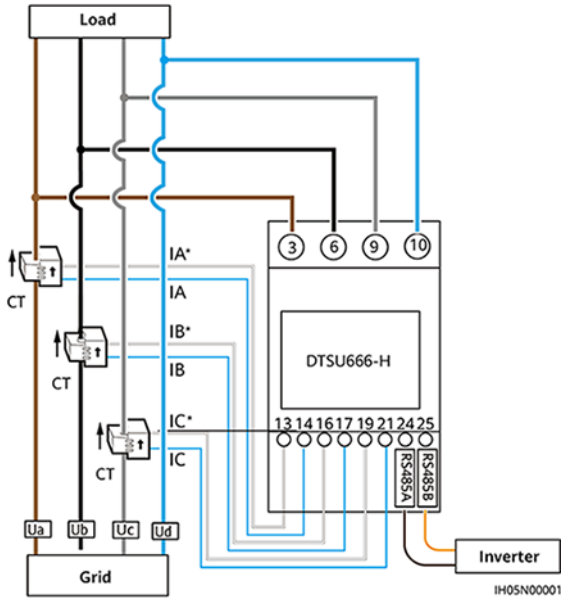



**Figure 3-3** Connecting cables to the DTSU666-H (three-phase four-wire)

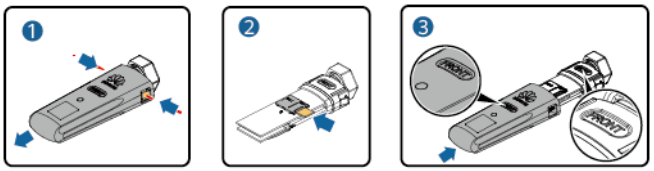



# 3.2 Installing the 4G/WLAN Smart Dongle

**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.)

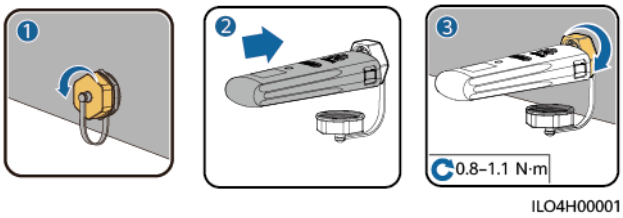
 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**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

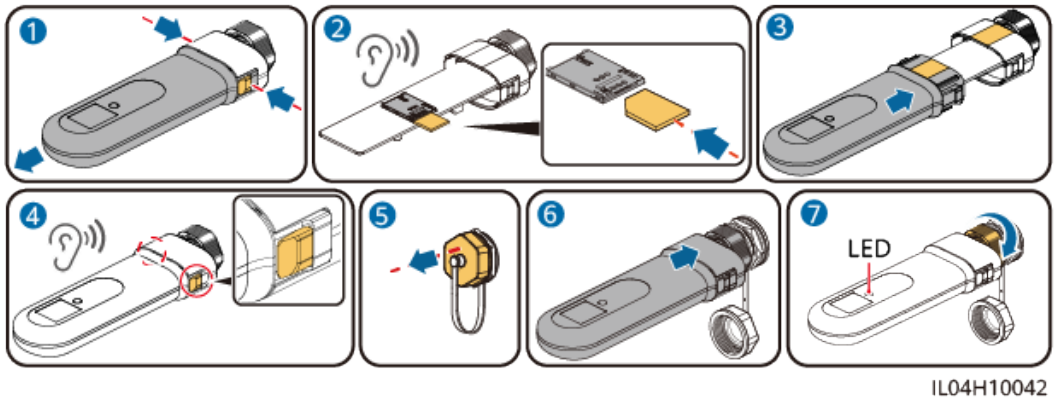



**----End**

# 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**

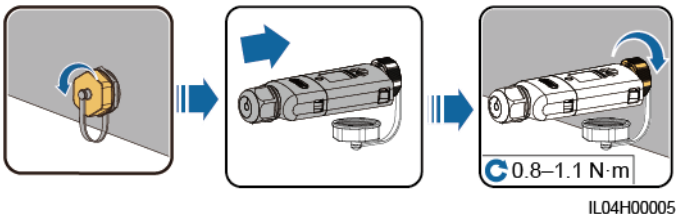
# 3.4 Installing the WLAN-FE Smart Dongle

## WLAN communication

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

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Figure 3-7** Installing a Smart Dongle

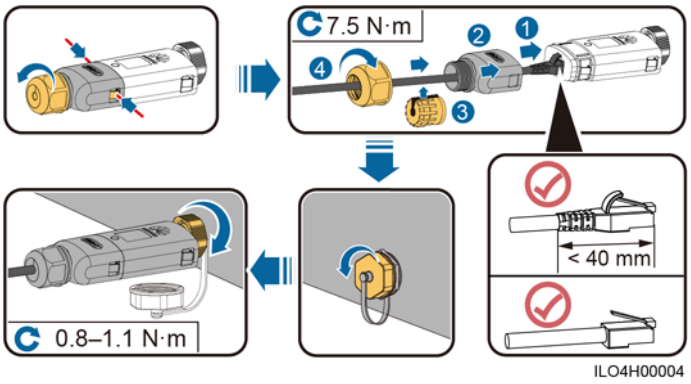



## FE Communication

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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

## 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.<br>● Remove and insert the Smart Dongle.<br>● Check that the inverter matches the Smart Dongle.<br>● 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. |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| 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.<br>• Remove and insert the Smart Dongle.<br>• Check that the inverter matches the Smart Dongle.<br>• 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

- FusionSolar app: Go to Huawei AppGallery and search for **FusionSolar** or scan the QR code to download and install the app.

  FusionSolar App
- 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 Huawei service engineer. If no account or password is available, create an account.

NOTE

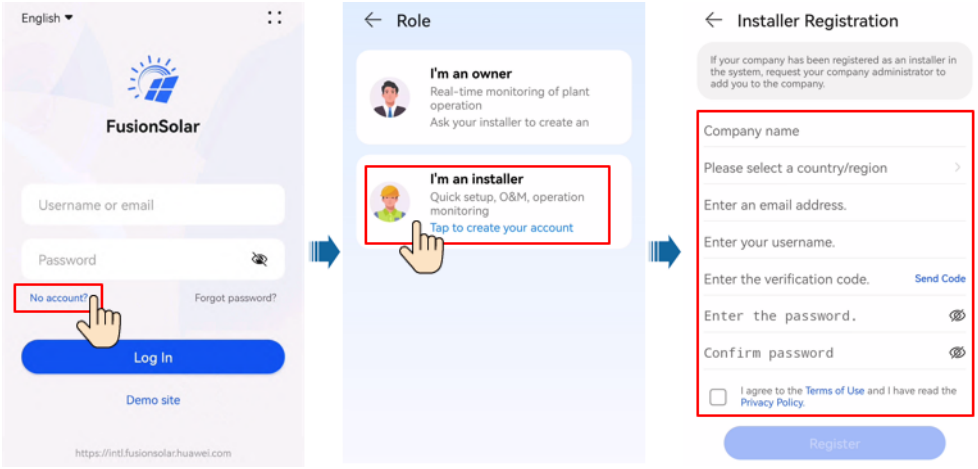
- The latest app version is required for device commissioning. You can search for **FusionSolar** in App Store or scanning the QR code to install the app for iOS.
- This section contains a large number of screenshots, which are only used to illustrate the operation method. The PV plant, device model, and parameters in the figures are for reference only.
- The version of the FusionSolar app is 5.7.001. 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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Figure 5-1** Registering an account




**Step 2** Log in to the app using the installer account, and tap **Setup wizard** to create a PV plant. For details, see the *FusionSolar App Quick Guide* by scanning the QR code.

**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**.

**Figure 5-2** Creating a PV plant

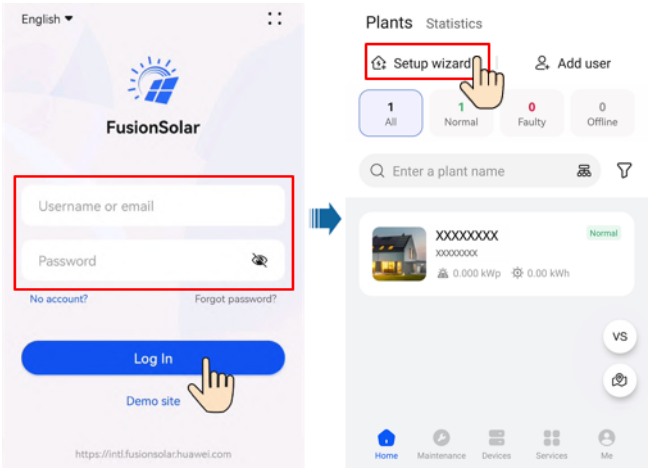



**Figure 5-3** App Quick Guide

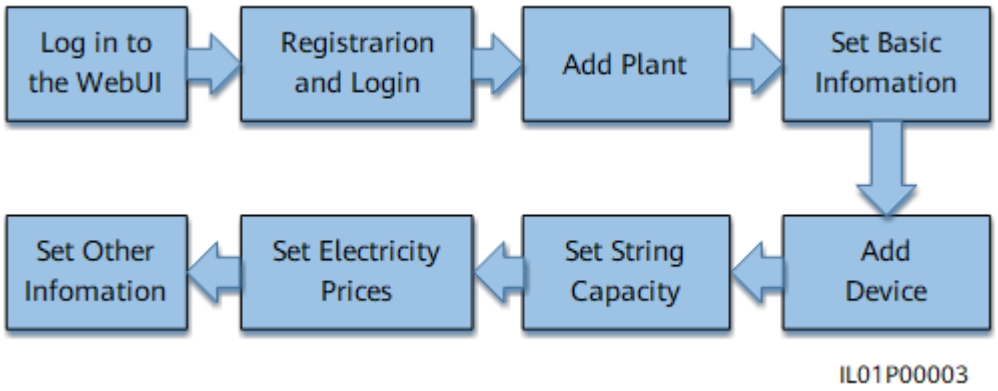
**----End**

# 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 5-4** Procedure for creating a PV plant




## Procedure

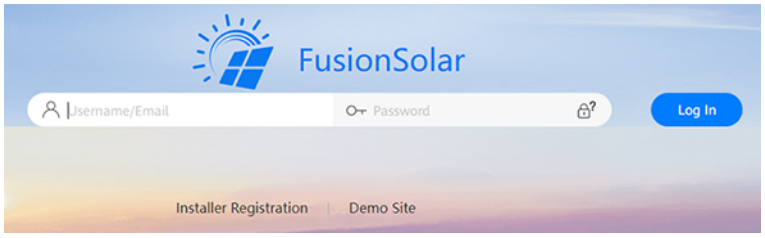
**Step 1** Enter the management system address **https://intl.fusionsolar.huawei.com** in the address box of the browser.

NOTE

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

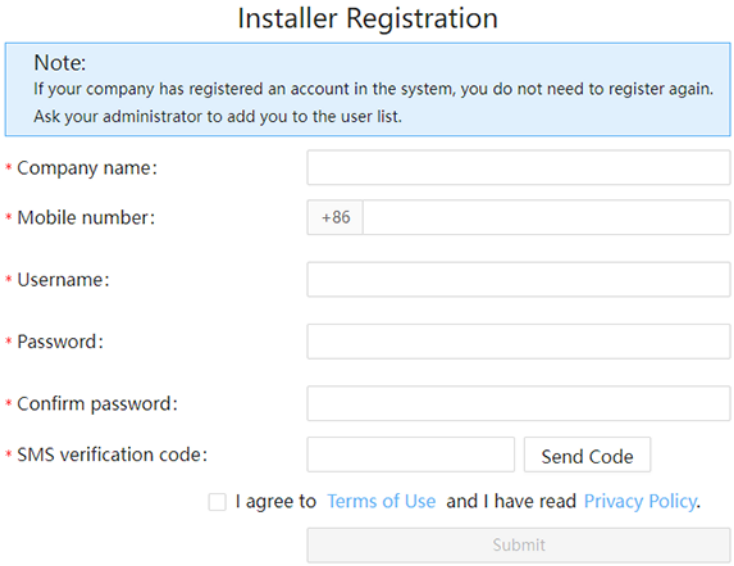
**Step 2** If you have obtained the login account and password from the installer or Huawei service engineer, enter them and click **Log In** to go to the home page. If you have not created an account and password, click **Installer Registration**, enter the registration information, and activate the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

**Figure 5-5** Login page




 Copyright © Huawei Digital Power Technologies Co., Ltd. 

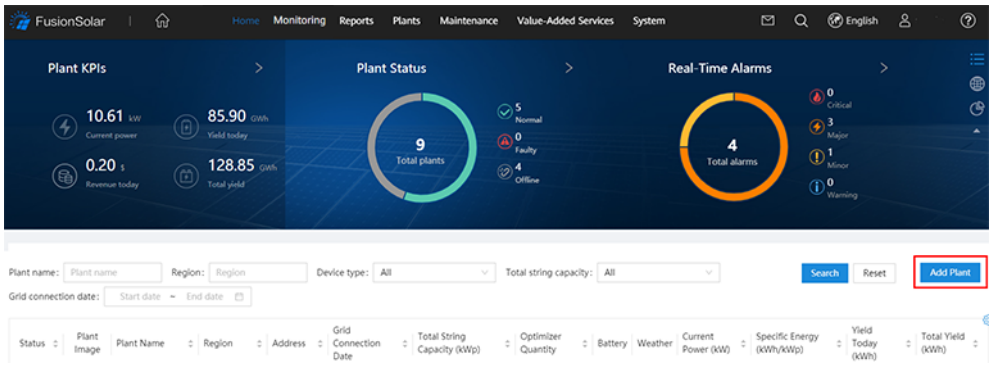
**Figure 5-6** Registering an account




**Step 3** Create a PV plant.

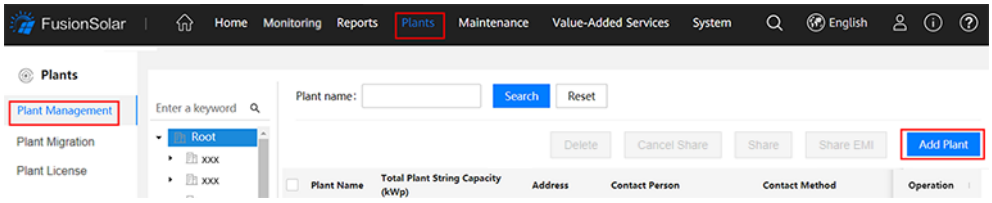
- Method 1: Click **Add Plant** on the home page.

**Figure 5-7** Creating a PV plant (method 1)




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

**Figure 5-8** Adding a PV plant (method 2)




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

**Figure 5-9** Basic information about the PV plant

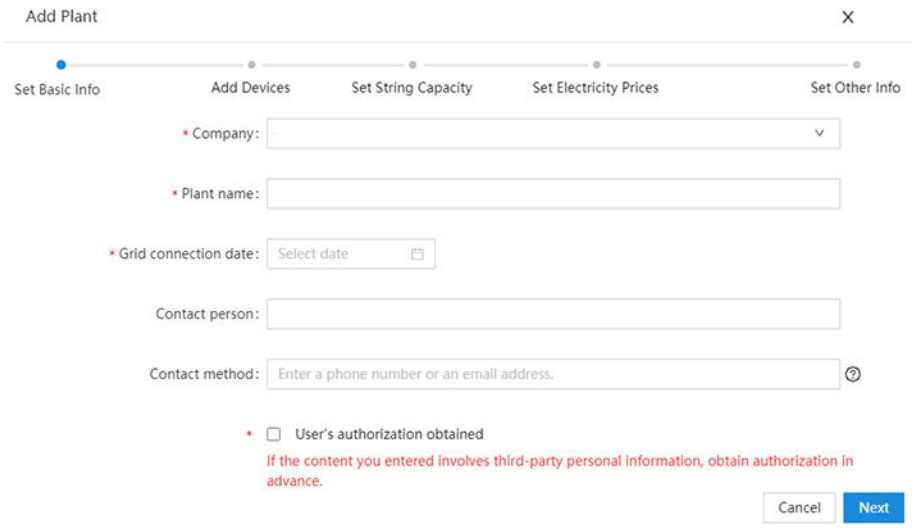


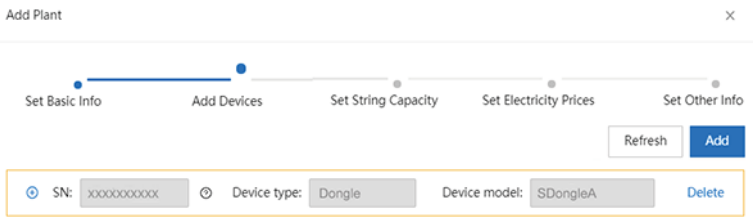

**Table 5-1** Description of basic information (* means mandatory fields)

| 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 5-10** Entering the device SN

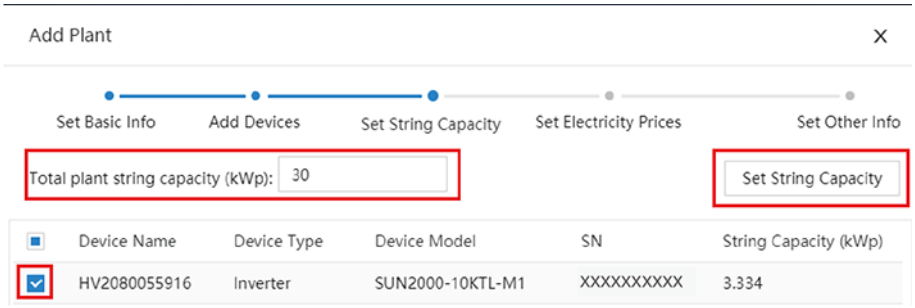



**Step 6** Click **Next**. The **Set String Capacity** tab page is displayed.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

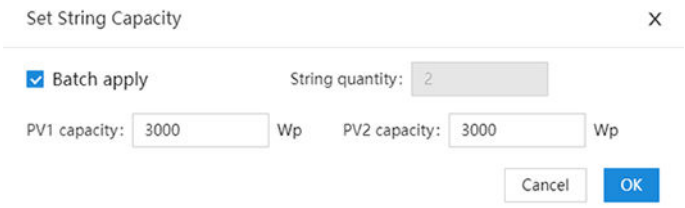
1. Set **Total plant string capacity (kWp)** (Total rated active power of the plant generator set) as required. In the device list, select one or more devices to be configured and click **Set String Capacity**. The **Set String Capacity** dialog box is displayed.

**Figure 5-11** Setting the string capacity




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

**Figure 5-12** Verifying the number of PV strings and the string capacity

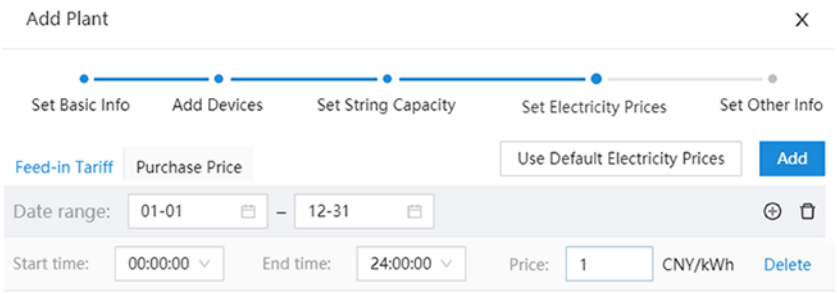



NOTE

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 5-13** Adding time-based prices



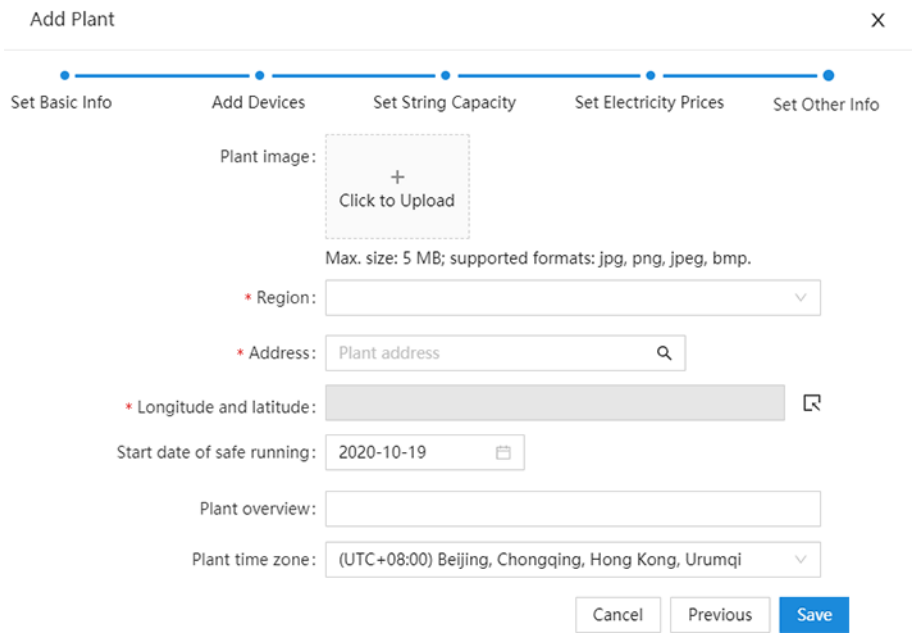
NOTE

- 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 5-14** 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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

# 5.2 Setting Grid-tied Control Parameters

## 5.2.1 Setting Parameters over the App

### Prerequisites

- The FusionSolar app is recommended when the inverter is connected to the FusionSolar Smart PV Management System. The SUN2000 app is recommended when the inverter is connected to other management systems.
- FusionSolar app: Go to Huawei AppGallery and search for **FusionSolar** or scan the QR code to download and install the app.

  FusionSolar App
- SUN2000 app: Go to Huawei AppGallery, search for **SUN2000**, and download the installation package of the latest version.

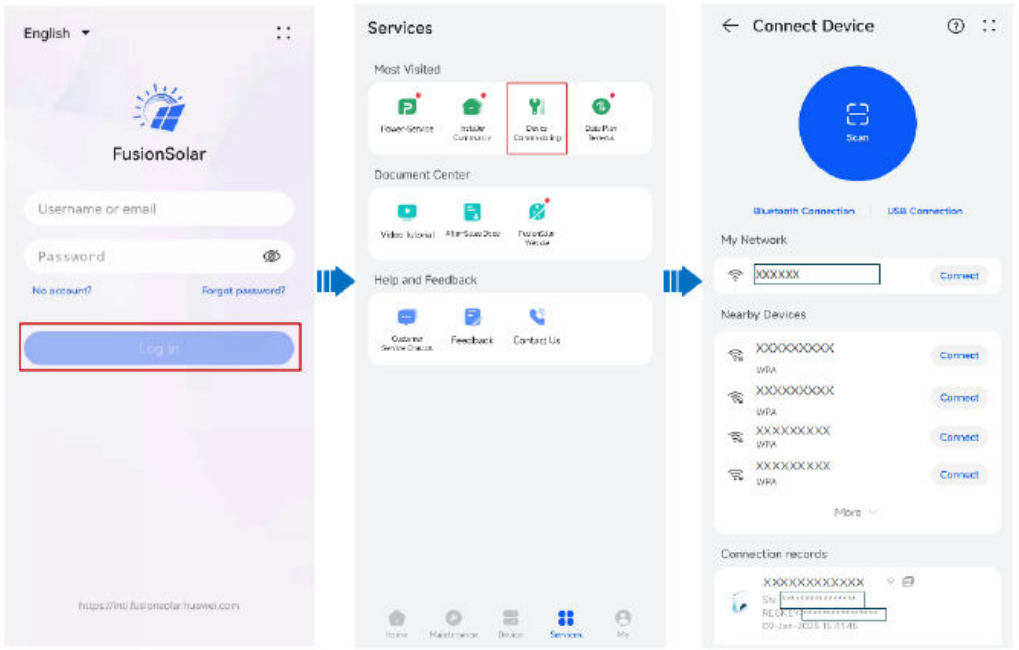
  NOTE

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

### Procedure

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

**Figure 5-15** Device commissioning




**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 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 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 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**

- 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 5-16** Parameter settings

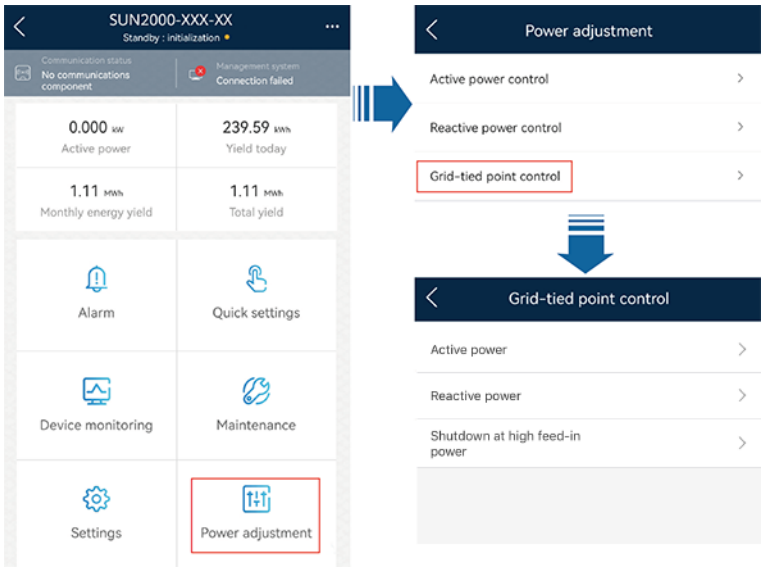



**Table 5-2** Control mode

| 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**.<br>• 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.)<br>• **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**.<br>• 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**.<br>• 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.)<br>• **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.<br>• 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**.<br>• 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. |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| 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**.<br>• 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.)<br>• **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.<br>• 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**.<br>• 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**.<br>• 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.<br>• When **High feed-in power duration threshold for triggering inverter shutdown** is set to **5**, **Shutdown at high feed-in power** takes precedence.<br>• 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 **https://intl.fusionsolar.huawei.com** in the address box of the browser.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

NOTE

- Browser: Chrome 67, Safari 9.0, Internet Explorer 11, or a later version is recommended.
- The software version corresponding to the UI snapshots is SmartPVMS 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 5-17** Login page

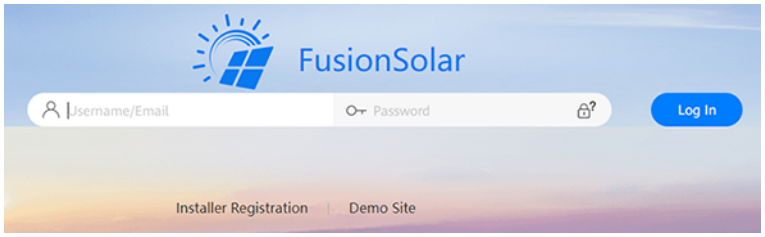
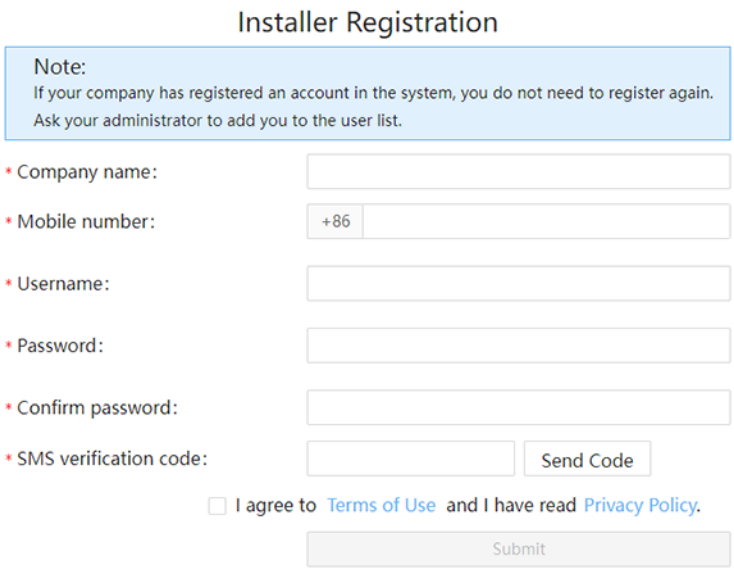
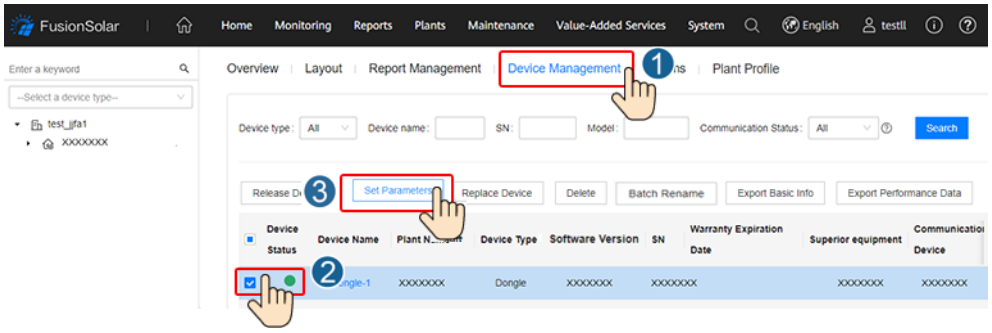



**Figure 5-18** Registering an account




**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 5-19** 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 5-20** Setting export limitation 2

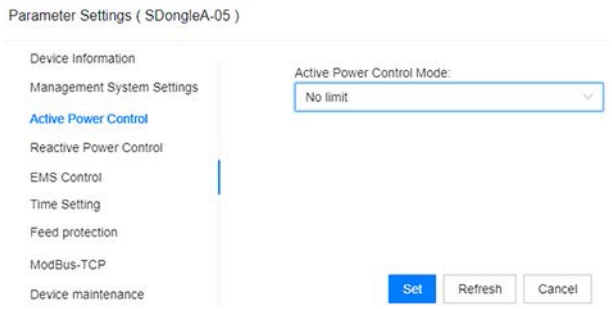



**Table 5-3** Active power control mode

| 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**.<br>• For multiple inverters, **Closed-loop controller** can only be set to **SDongle**. |

| 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.)<br>• **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.<br>• 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. |
| 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**.<br>• 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.)<br>• **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. |

| Parameter | | Description |
| --- | --- | --- |
| | 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.<br>• 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. |
| 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**.<br>• 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.)<br>• **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. |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| Parameter | | Description |
| --- | --- | --- |
| | 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.<br>• 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. |
| Shutdown at high feed-in power[a] | Shutdown at high feed-in power | • The default value is **Disable**.<br>• 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.<br>• When **High feed-in power duration threshold for triggering inverter shutdown** is set to **5**, **Shutdown at high feed-in power** takes precedence.<br>• 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

- FusionSolar app: Go to Huawei AppGallery and search for **FusionSolar** or scan the QR code to download and install the app.

  FusionSolar 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<br>• G99-TYPEB-LV<br>• G99-TYPEB-HV<br>• G99-TYPEB-HV-MV480<br>• 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) | | | |

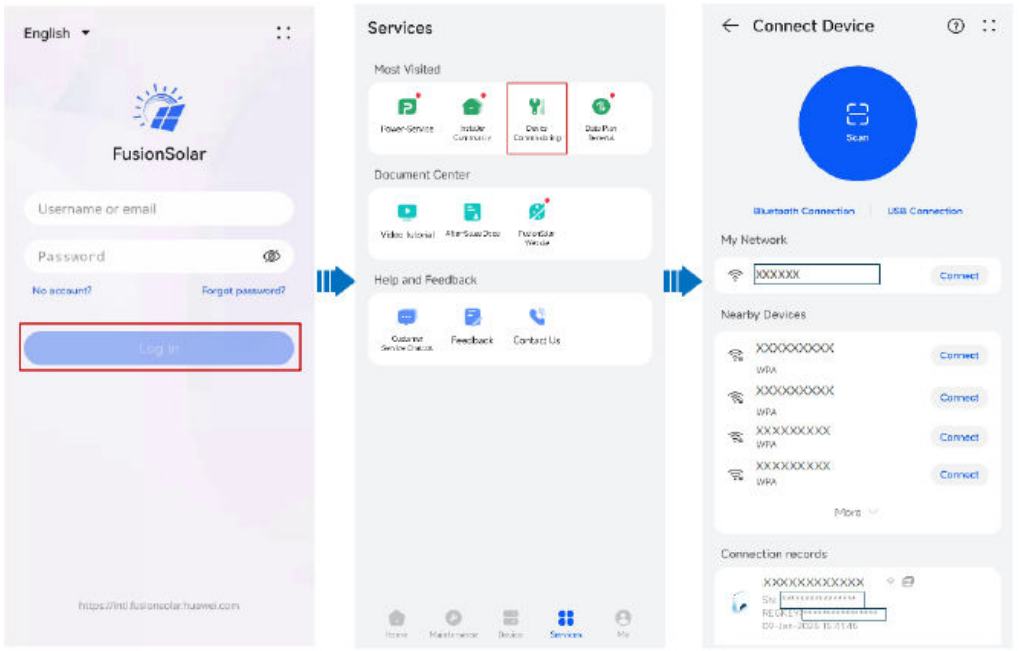
NOTE

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

## Procedure

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

**Figure 5-21** Device commissioning




**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 FusionSolar 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.
- 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 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 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 parameters for feed-in at limited current.

**Figure 5-22** Parameter settings

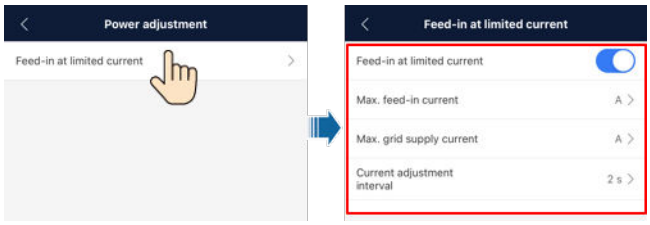



**Table 5-5** Parameter settings

| 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. |
| 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.<br>• 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. |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| Parameter | Value Range | Description |
| --- | --- | --- |
| Note a:<br>• 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.<br>• 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.
- FusionSolar app: Go to Huawei AppGallery and search for **FusionSolar** or scan the QR code to download and install the app.

  FusionSolar 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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

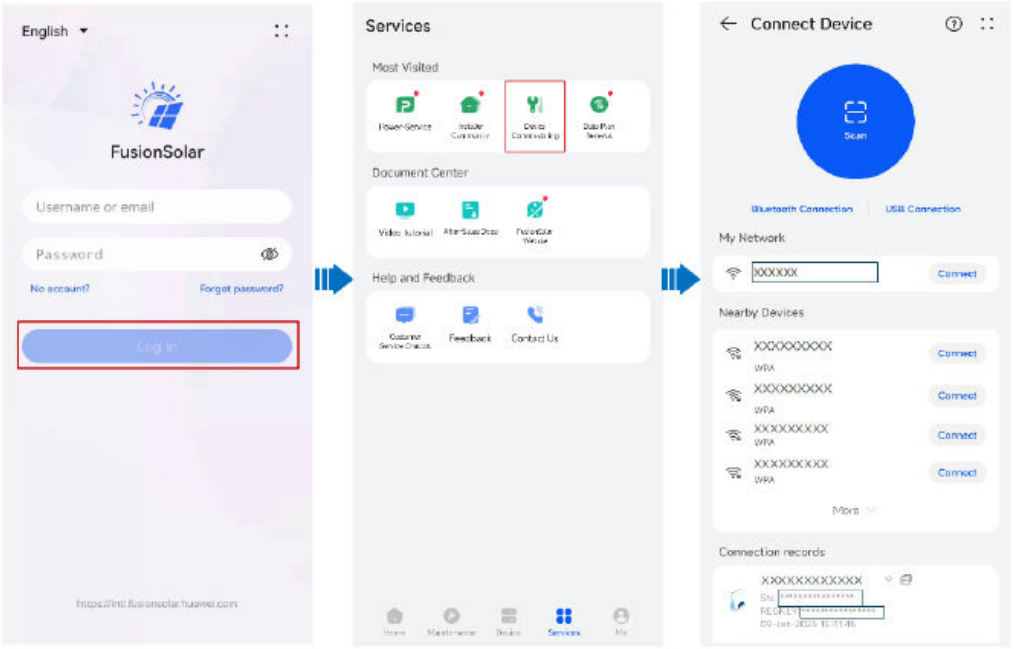
## Method 1: Connecting to the Inverter Built-in WLAN to Set Third-Party Management System Parameters

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 FusionSolar app. For other models of inverters, log in to the FusionSolar SmartPVMS to set the parameters.

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

**Figure 5-23** Device commissioning




**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 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 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 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

- 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.

**Figure 5-24** Parameter settings

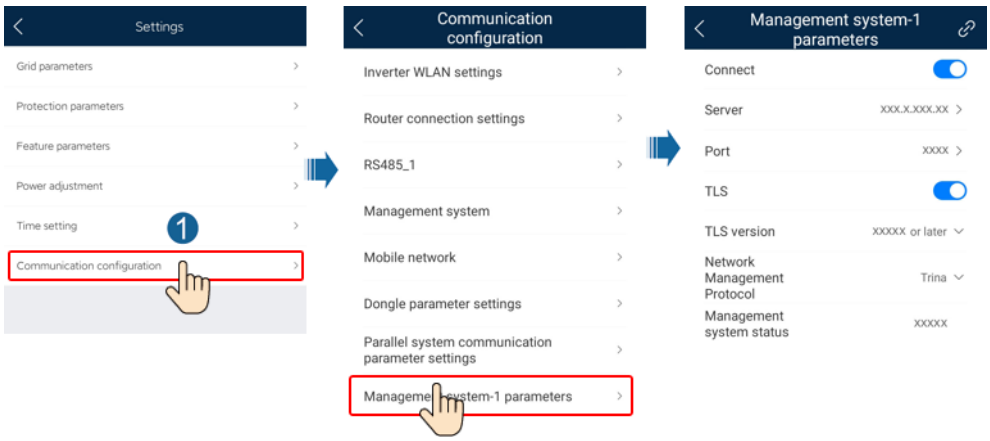


**Table 5-6** Parameter settings

| Parameter | Description | Value Range |
| --- | --- | --- |
| Connect | • The default value is **Disable**, meaning that a third-party management system cannot be connected.<br>• When this parameter is set to **Enable**, a third-party management system can be connected. | • Disable<br>• 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.<br>• If the third-party management system does not use the TLS encryption protocol, set this parameter to **Disable**. | • Disable<br>• Enable |
| TLS version | Select a version based on the TLS version of the third-party management system. | • TLS 1.0 or later<br>• TLS 1.1 or later<br>• TLS 1.2 or later<br>• TLS 1.3 |
| Network Management Protocol | The default value is standard Modbus. | Modbus |

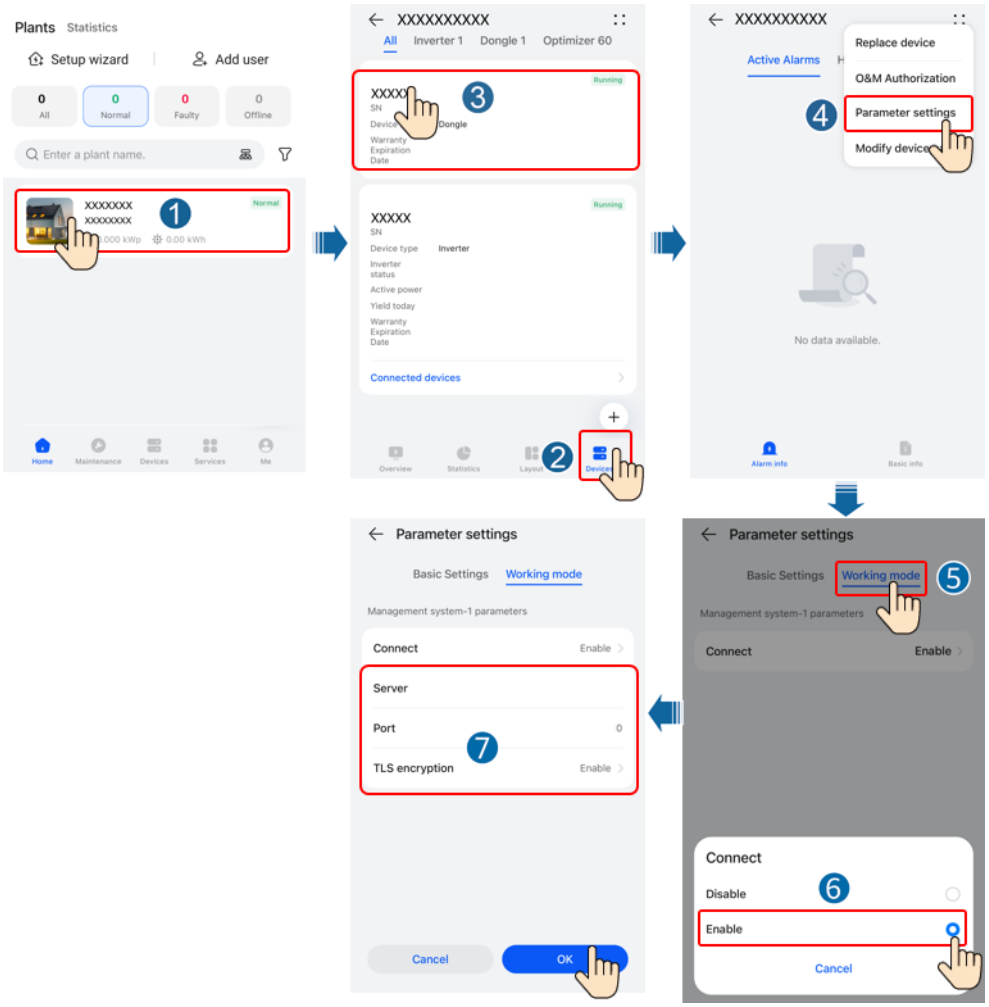
**----End**

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

- Log in to the FusionSolar 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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Figure 5-25** Setting the third-party management parameters




- Log in to https://intl.fusionsolar.huawei.com to access the WebUI of the FusionSolar 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.

**Figure 5-26** Setting the third-party management parameters

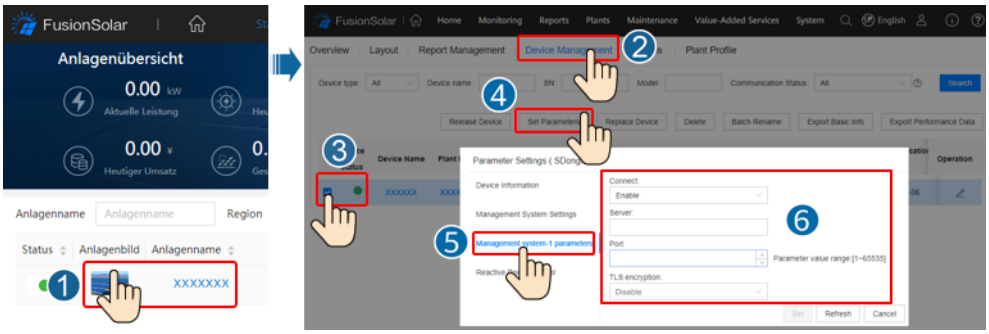


**Table 5-7** Parameter settings

| Parameter | Description | Value Range |
| --- | --- | --- |
| Connect | • The default value is **Disable**, meaning that a third-party management system cannot be connected.<br>• When this parameter is set to **Enable**, a third-party management system can be connected. | • Disable<br>• 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.<br>• If the third-party management system does not use the TLS encryption protocol, set this parameter to **Disable**. | • Disable<br>• Enable |
| Management system status | Connection status of the third-party management system. | • Not connected<br>• Internal error. Resources are insufficient.<br>• Connection Successful<br>• Connection deadlock<br>• The peer end is disabled<br>• Connection abnormal<br>• Failed to connect to the port<br>• Failed to verify the peer certificate<br>• The local certificate is abnormal<br>• Domain name resolution failed<br>• Failed to connect to the server<br>• Connecting…<br>• Second challenge authentication failed |

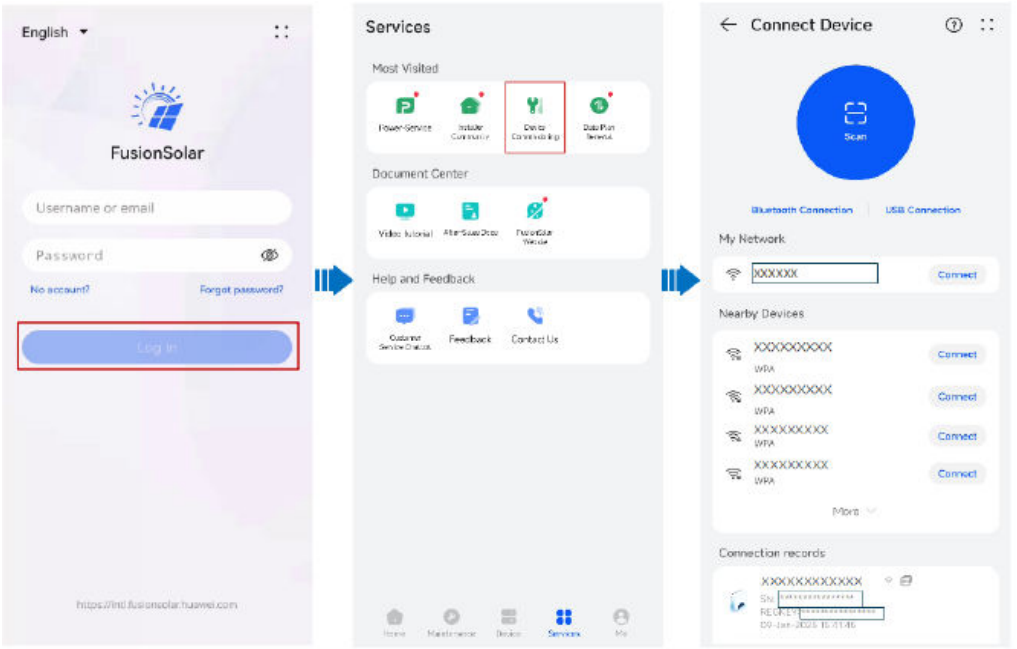
| Parameter | Description | Value Range |
| --- | --- | --- |
| Server IP address | IP address. | - |
| Deliver Trust Certificate | Import the CA certificate of the third-party management system to Huawei's device to ensure encrypted connection. Before import, ensure that the third-party management system is successfully connected. | - |

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

## Procedure

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

**Figure 5-27** Device commissioning




**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 FusionSolar 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.
- 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 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 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 parameters and export logs. For details, see the Smart Dongle section in the *FusionSolar App and SUN2000 App Device Commissioning Manual*. You can scan the following QR code to obtain the document.

**Figure 5-28** FusionSolar App and SUN2000 App Device Commissioning Manual

**----End**

# 6 Maintenance

## 6.1 Modifying Inverter Communications Parameters

### Prerequisites

- The FusionSolar app is recommended when the inverter is connected to the FusionSolar Smart PV Management System. The SUN2000 app is recommended when the inverter is connected to other management systems.
- FusionSolar app: Go to Huawei AppGallery and search for **FusionSolar** or scan the QR code to download and install the app.

  FusionSolar App
- SUN2000 app: Go to Huawei AppGallery, search for **SUN2000**, and download the installation package of the latest version.

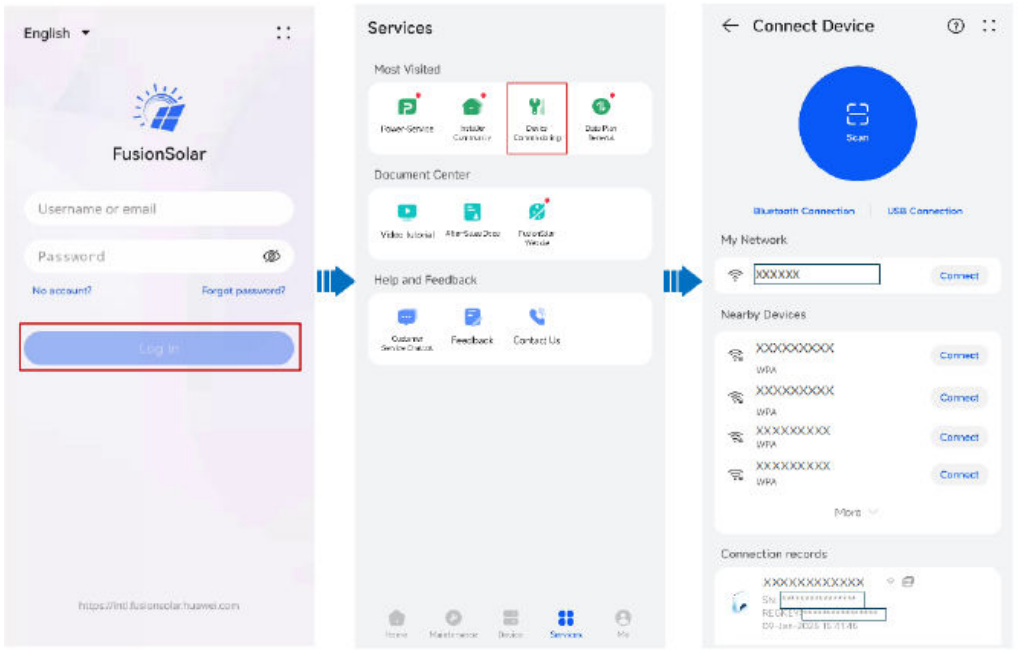
NOTE

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

## 6.1.1 WLAN Communication Networking

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

**Figure 6-1** Device commissioning




**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 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 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 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**.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**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**.

**Figure 6-2** Inverter communication settings

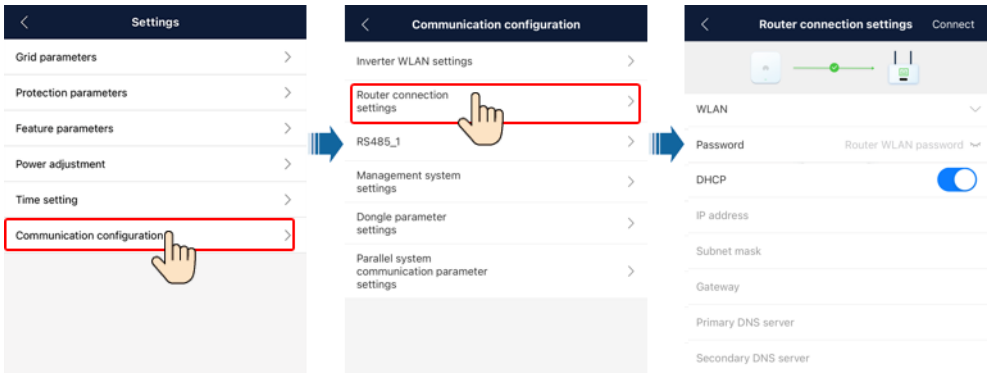



**Table 6-1** Parameter description

| 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. |
| | 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.<br>• 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. |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| Type | Parameter | Description |
| --- | --- | --- |
| | 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**

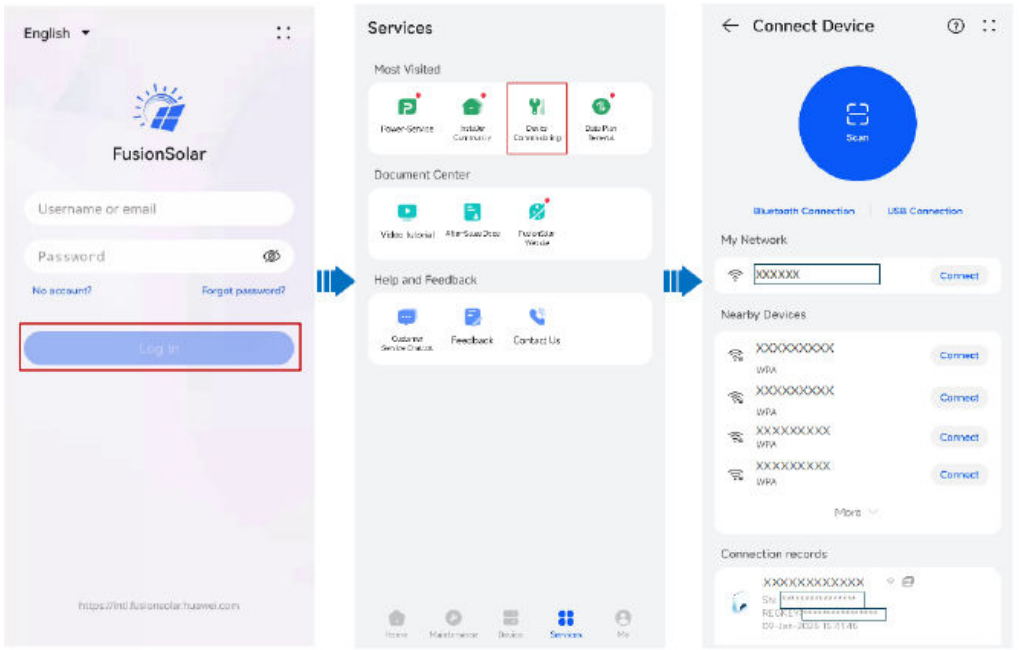
## 6.1.2 4G Communication Networking

### Procedure

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

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Figure 6-3** Device commissioning




**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 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 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 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**.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**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.

**Figure 6-4** Inverter communication settings

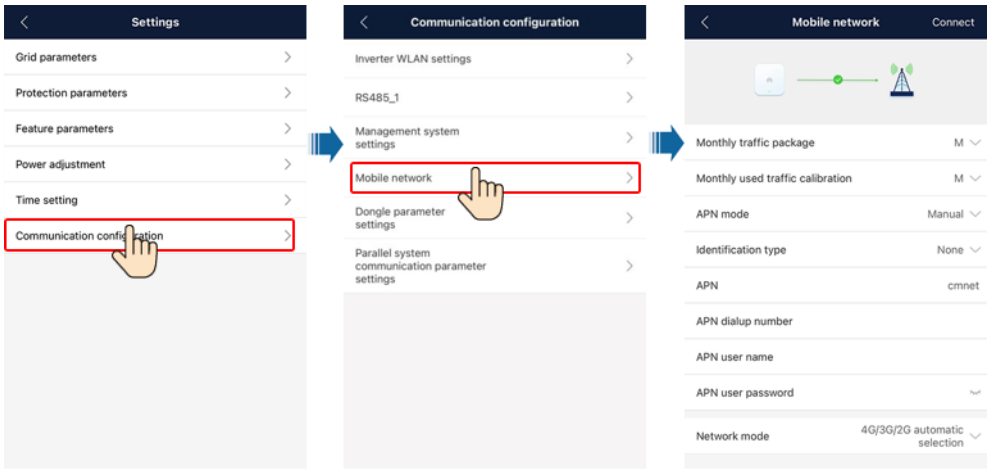
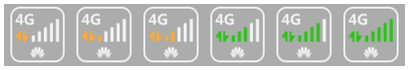



**Table 6-3** Parameter description

| Type | Parameter | Description |
|---|---|---|
| 4G | APN mode | • Set the parameters related to the SIM card based on the information provided by the SIM card carrier.<br>• 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 | |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Table 6-4** Description of icons

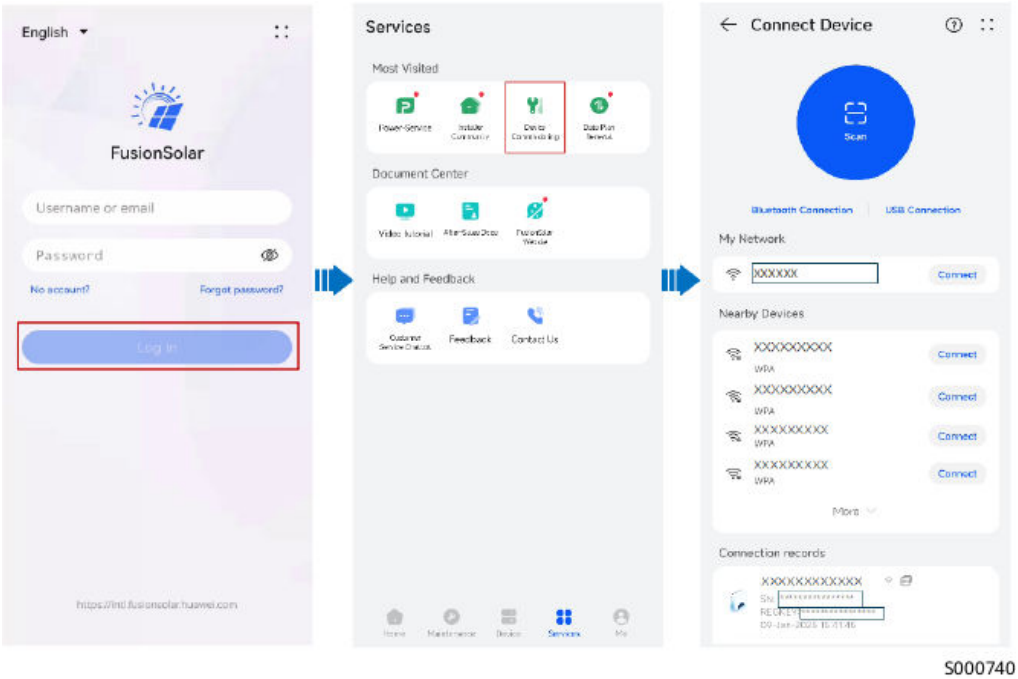
| Icon | SIM card | | | Management system | |
|---|---|---|---|---|---|
| | | | | | |
| **Meaning** | Enter the PIN. | No SIM card | Not connected; signal strength | Connection failed. | Connection is successful. |
| **Icon** | | |  | - | - |
| **Meaning** | Enter the PUK. | Failed to read the card.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

**----End**

## 6.1.3 FE Communication Networking

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

**Figure 6-5** Device commissioning



**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 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 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 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

- 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**.

**Figure 6-6** Inverter communication settings

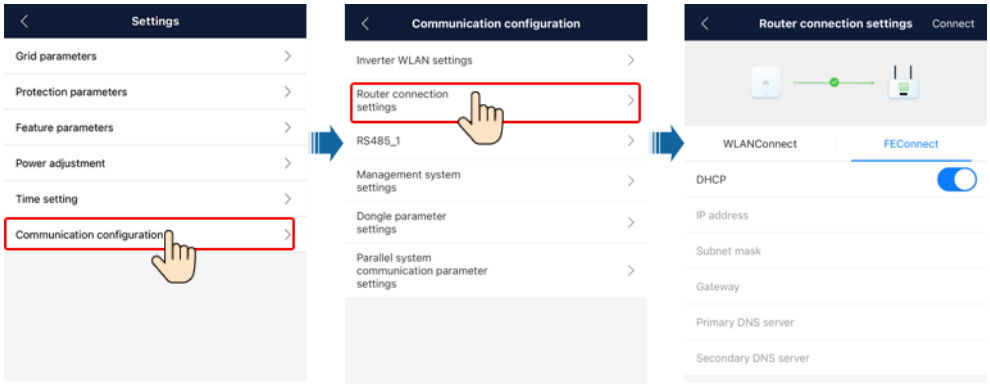


**Table 6-5** Parameter description

| 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.<br>• 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 | |
| --- | --- | --- | --- | --- | --- |
| | | | | | |
| **Meaning** | Connection failed. | Connecting ... | Connection is successful. | Connection failed. | Connection is successful. |

**----End**

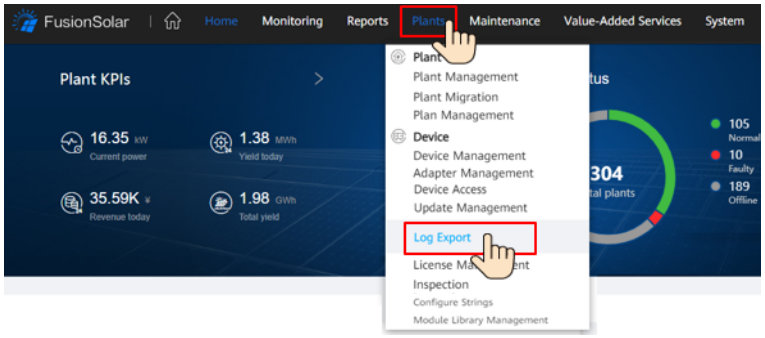
# 6.2 Exporting Inverter and Smart Dongle Logs

## Procedure

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

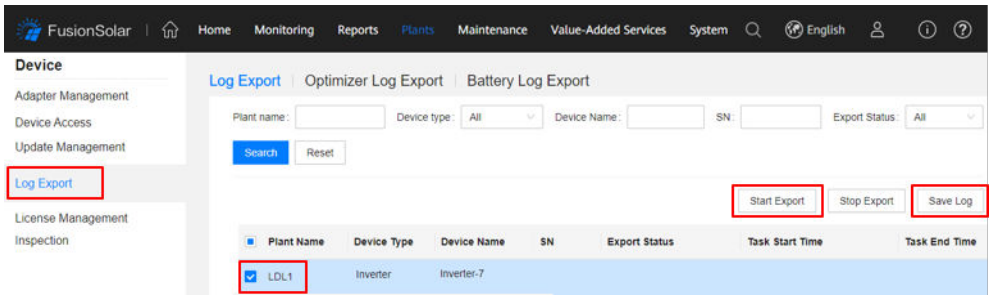
 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Figure 6-7** 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 6-8** 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 FusionSolar app is recommended when the inverter is connected to the FusionSolar Smart PV Management System. The SUN2000 app is recommended when the inverter is connected to other management systems.
- FusionSolar app: Go to Huawei AppGallery and search for **FusionSolar** or scan the QR code to download and install the app.

  FusionSolar App
- SUN2000 app: Go to Huawei AppGallery, search for **SUN2000**, and download the installation package of the latest version.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

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

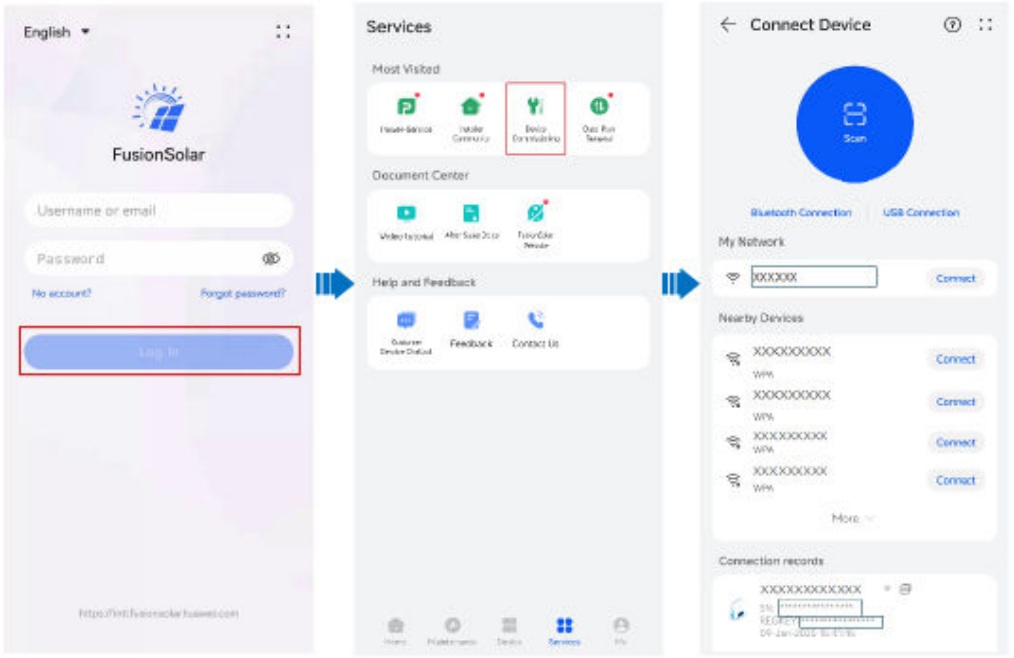
**Step 1** Ensure that the Smart Dongle to be upgraded is inserted into a running inverter. Wait for more than 2 minutes, remove the Smart Dongle, and connect the USB data cable to the inverter.

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 FusionSolar app and access **Device Commissioning**. (Perform this step only for the FusionSolar app.)

**Figure 6-9** Device commissioning




**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 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 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 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 4** 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.

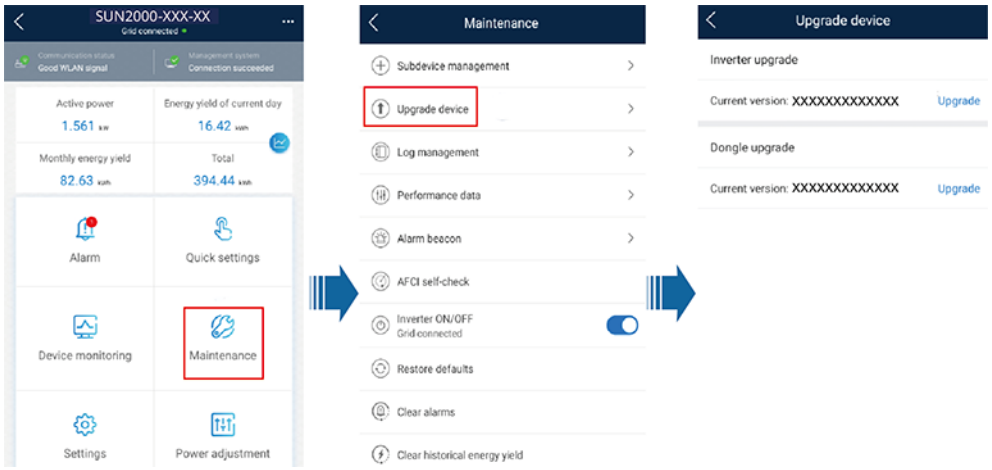
**Step 5** Upgrade a device as prompted.

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.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Figure 6-10** Upgrading a device




**----End**

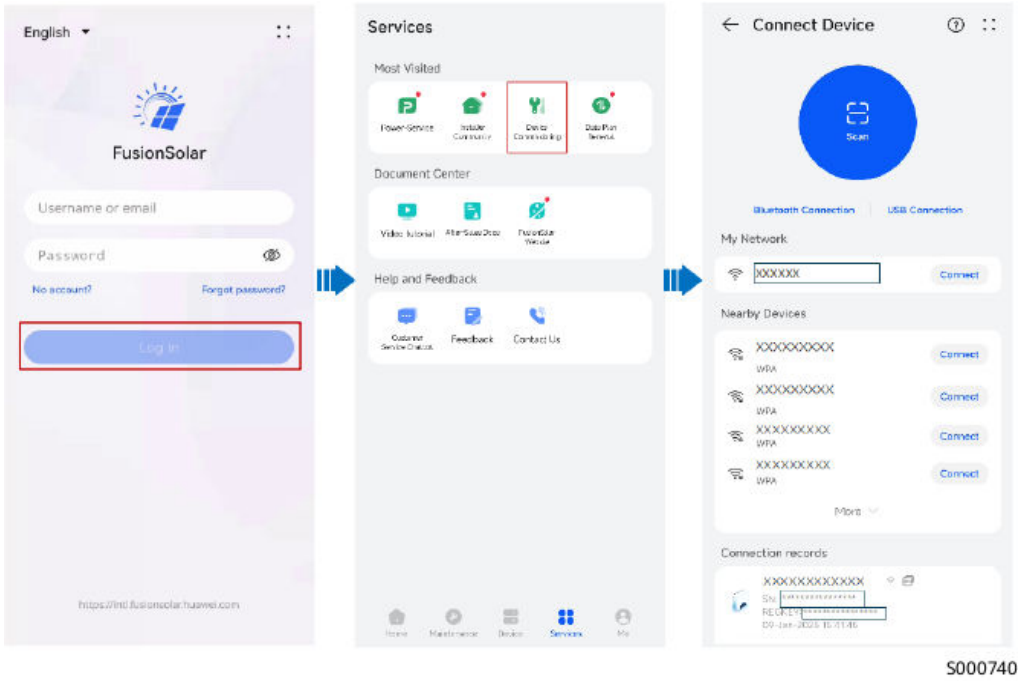
## Connecting to the Smart Dongle over the App

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 FusionSolar app and access **Device Commissioning**. (Perform this step only for the FusionSolar app.)

**Figure 6-11** Device commissioning




**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 FusionSolar 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.
- 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 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 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.

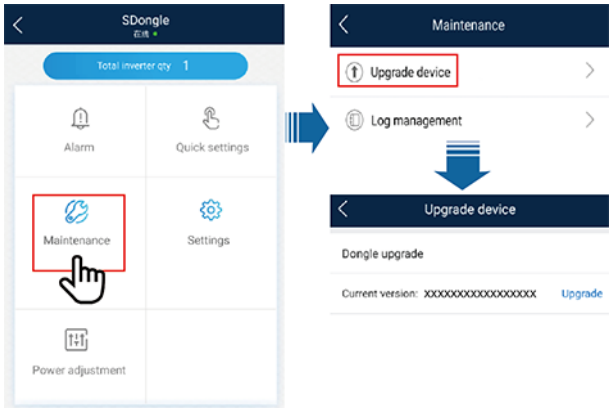
**Step 4** Upgrade a device as prompted.

NOTE

Prepare the upgrade package before upgrading the device.

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Figure 6-12** Upgrading a device

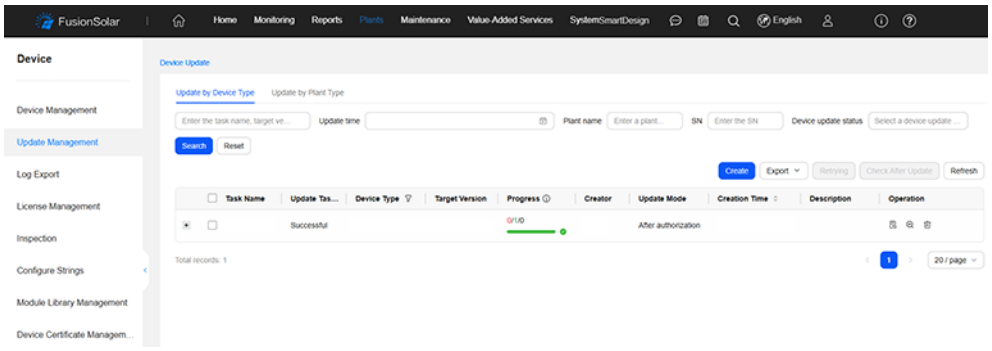



**----End**

## 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 6-13** Creating an upgrade task

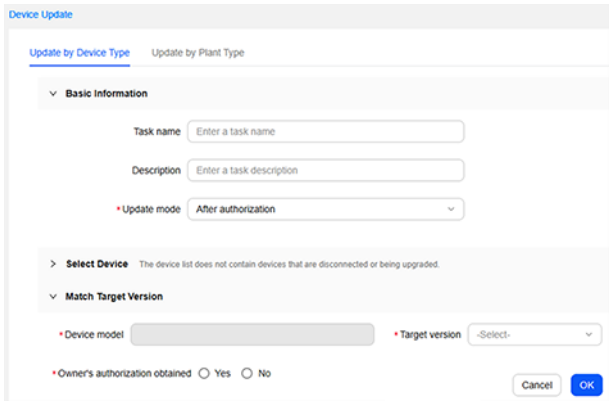



**Step 2** Select the upgrade mode, device type, target version, and device, and click **OK** to upgrade the device.

**NOTE**

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

**Figure 6-14** 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

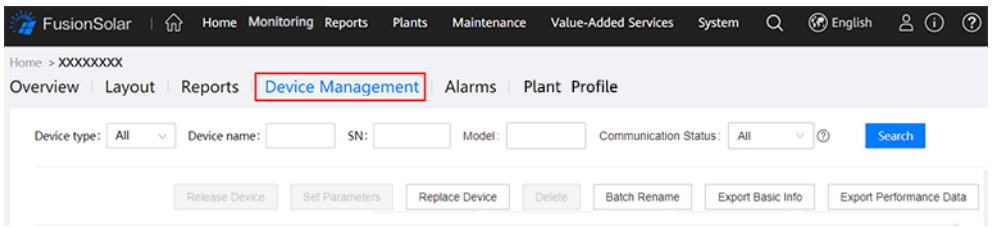
The PV plant to be updated communicates properly with the FusionSolar Smart PV Management System.

## 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 6-15** Device management




**NOTE**

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

**----End**

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

# 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.)

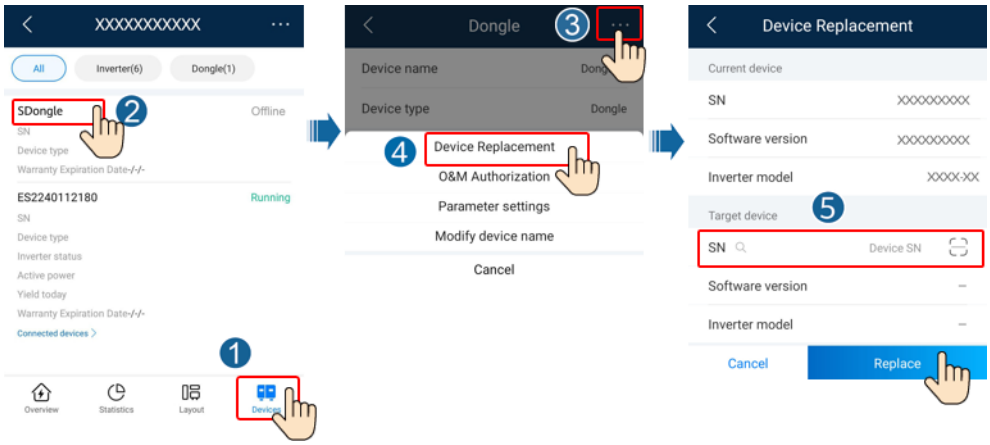
- If the purchased Smart Dongle has a built-in SIM card, replace the Smart Dongle without replacing the SIM card.
- If the purchased Smart Dongle does not have a built-in SIM card, use the SIM card in the faulty Smart Dongle.

**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 FusionSolar 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.

**Figure 6-16** Device replacement




**----End**

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

### 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.

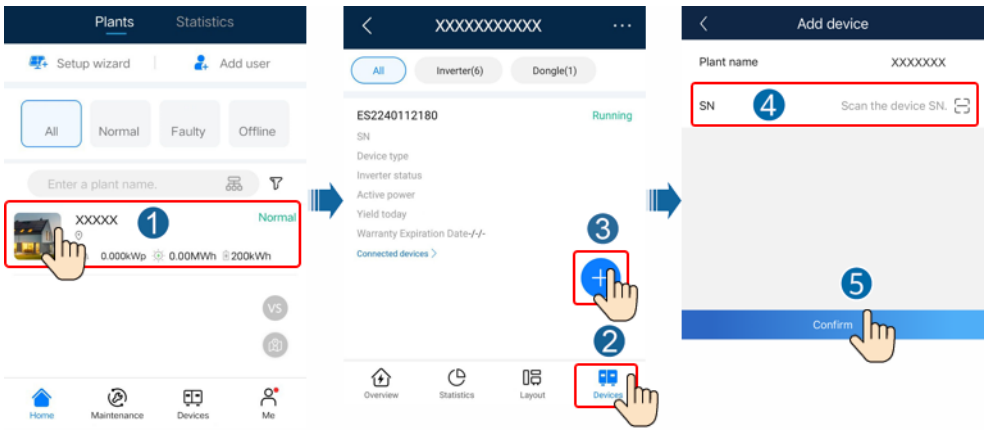
**Step 2** Remove the faulty Smart Dongle.

**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 FusionSolar app and tap the plant name on the **Home** screen to access the plant screen. Tap **Devices** and add a new Smart Dongle.

**Figure 6-17** Adding a device




**----End**

## 6.5.2 Replacing the Master Inverter

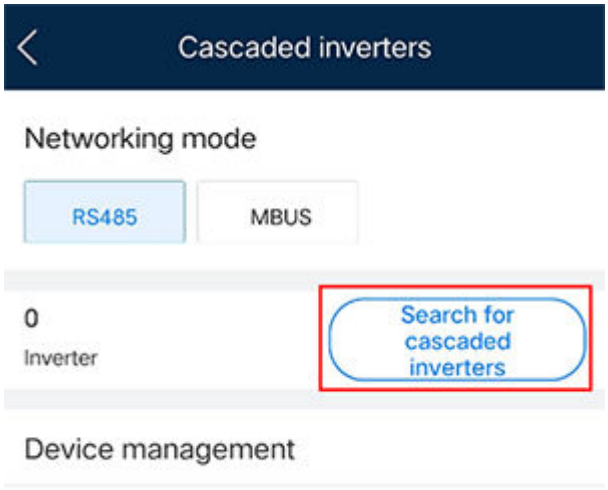
**Step 1** When the MBUS is used for networking, use the app to change the cascading mode of the original master inverter to RS485 through **Quick settings**.

NOTE

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

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

**Figure 6-18** Setting inverter cascading




**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 |
| --- | --- | --- |
| Huawei FusionSolar Smart PV Management System shows that the communication with the inverter is interrupted. | 1. The RS485 cables among inverters are loose or disconnected.<br>2. The PV string is not properly connected, and the inverter has no DC input.<br>3. The baud rate or RS485 address of the inverter is changed.<br>4. The Smart Dongle is faulty. | 1. If the RS485 cable between inverters is loose or disconnected, reconnect the cable securely.<br>2. Check that the inverter is correctly connected and power on the inverter.<br>3. Check that the baud rate and RS485 address of the inverter are set correctly.<br>4. Replace the Smart Dongle. |
| The SN of the Smart Dongle cannot be identified by the FusionSolar 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 FusionSolar app during deployment. |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

| Fault | Cause | Troubleshooting |
| --- | --- | --- |
| The devices connected to the Smart Dongle are not connected to the Huawei FusionSolar Smart PV Management System properly. | 1. Check whether the inverter software version meets the requirements. If not, upgrade the inverter to a specified version or later.<br>2. Check that the RS485 communications cables are connected properly.<br>3. Check that the RS485 communications parameters of the inverter are set correctly.<br>4. Check that the inverter communications parameters are correctly set. | If the inverters cannot be detected after troubleshooting, the Smart Dongle is faulty. Contact Huawei technical support. |
| 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**. |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

# 7 Acronyms and Abbreviations

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

 Copyright © Huawei Digital Power Technologies Co., Ltd. 

# 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 |

 Copyright © Huawei Digital Power Technologies Co., Ltd. 