

SUN2000-(12KTL, 15KTL, 17KTL, 20KTL)-M0

Quick Guide

Issue: 03

Part Number: 31509519

Date: 2019-06-06

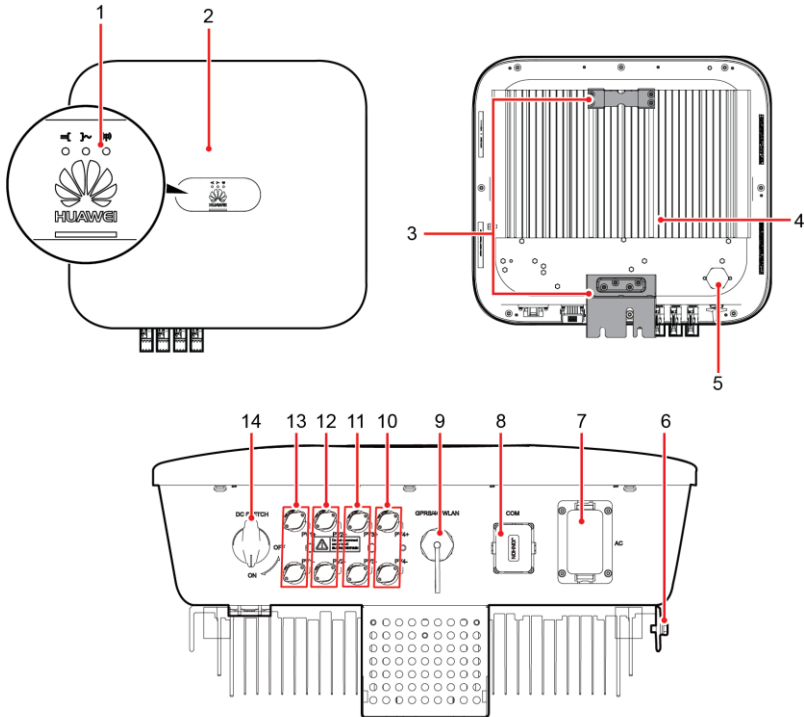
HUAWEI TECHNOLOGIES CO., LTD.



NOTICE

1. The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.
2. Carefully read the user manual before installing the equipment to get familiar with product information and safety precautions.
3. Only qualified and trained electrical technicians are allowed to operate the device. Operators should understand the components and functioning of a grid-tied PV power system, and they should be familiar with relevant local standards.
4. Before device installation, check that deliverables are intact and complete against the packing list. If any damage is found or any component is missing, contact your dealer.
5. Use insulated tools when installing the device. For personal safety, wear personal protective equipment (PPE).
6. Huawei shall not be liable for any consequence caused by violation of the storage, relocation, installation, and operation regulations specified in this document and the user manual.

1 Product Description



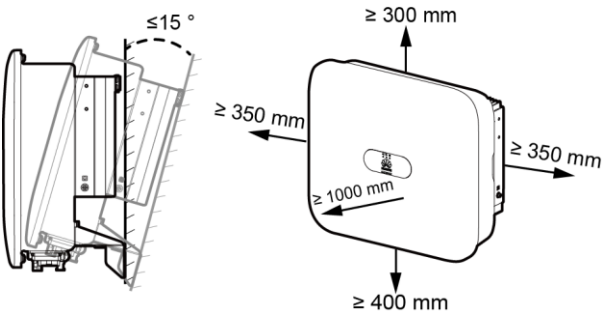
- | | |
|--------------------------------------|-------------------------------------|
| (1) LED | (2) Front panel |
| (3) Hanging kit | (4) Heat sink |
| (5) Ventilation valve | (6) Ground screw |
| (7) AC output port (AC) | (8) Communications port (COM) |
| (9) Smart Dongle port (GPRS/4G/WLAN) | (10) DC input terminals (PV4+/PV4-) |
| (11) DC input terminals (PV3+/PV3-) | (12) DC input terminals (PV2+/PV2-) |
| (13) DC input terminals (PV1+/PV1-) | (14) DC switch (DC SWITCH) |

IS10W00007

2 Installing the Equipment

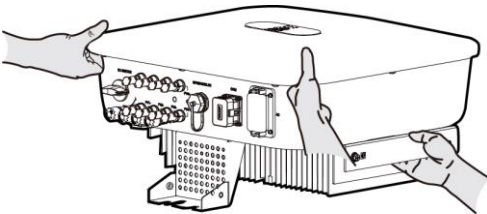
2.1 Installation Requirements

Tilt and Space



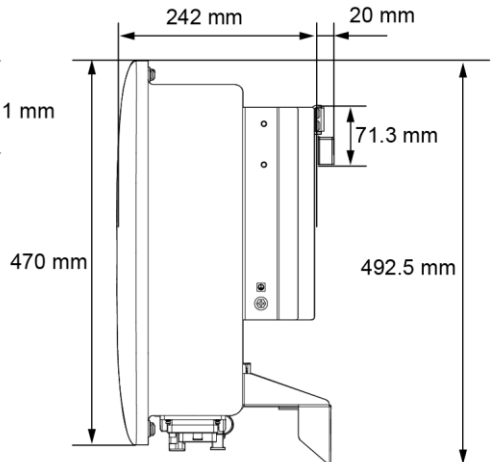
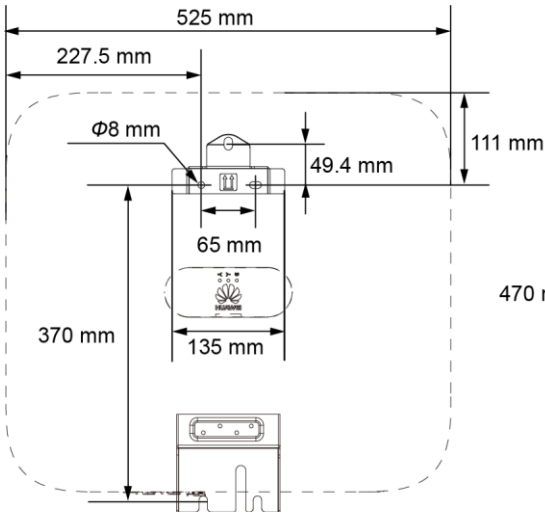
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Moving an Inverter



IS10H00018

Dimensions



IS10H00019

2.2 Installing the Inverter

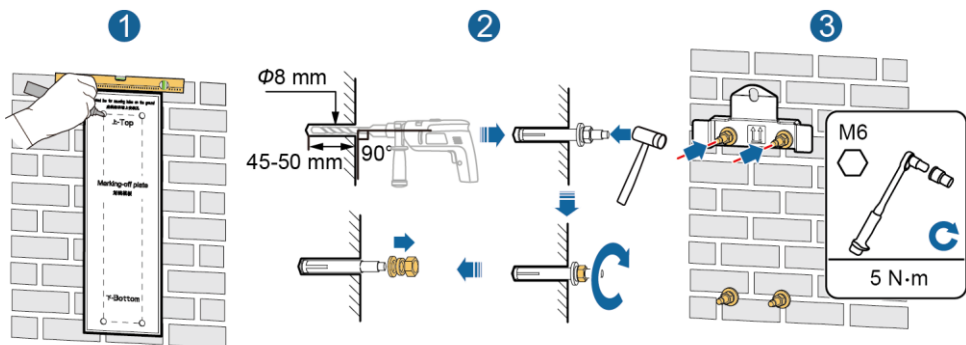
⚠ DANGER

When drilling holes, avoid the water pipes and power cables buried in the wall.

1. Install the mounting bracket.

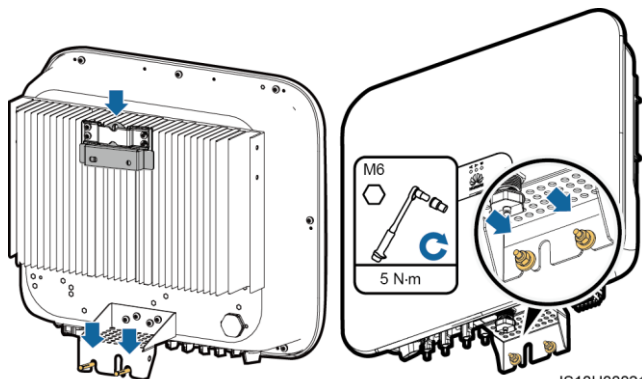
NOTE

- M6x60 expansion bolts are delivered with the inverter. If the length and number of the bolts do not meet installation requirements, prepare M6 stainless steel expansion bolts by yourself.
- The expansion bolts delivered with the inverter are used for solid concrete walls. For other types of walls, prepare bolts by yourself and ensure that the wall meets the load bearing requirements of the inverter.
- Loosen the nuts, flat washers, and spring washers of the two expansion bolts.



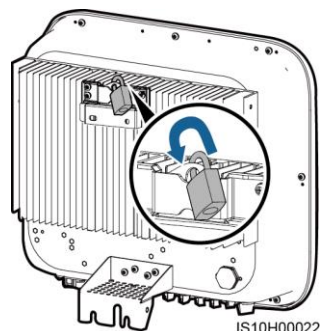
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2. Install the inverter on the mounting bracket.



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3. (Optional) Install an anti-theft lock.



IS10H00022

NOTE

Prepare an anti-theft lock suitable for the lock hole diameter ($\Phi 8$ mm) and ensure that the lock can be installed successfully. An outdoor waterproof lock is recommended.

3 Electrical Connections

3.1 Preparing for Installation

NOTICE

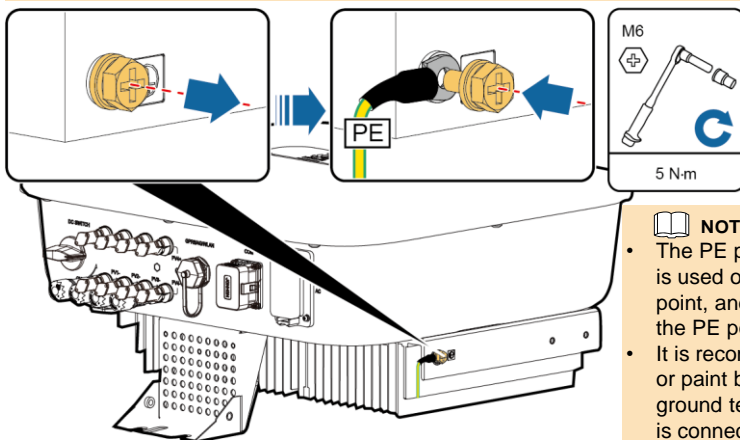
- Connect cables in accordance with the local installation laws and regulations.
- Before connecting cables, ensure that the DC switch on the inverter and all the switches connecting to the inverter are set to OFF. Otherwise, the high voltage of the inverter may result in electric shocks.

No.	Item	Type	Specifications
1	PE cable	Single-core outdoor copper cable	Conductor cross-sectional area: <ul style="list-style-type: none">• $\geq 6 \text{ mm}^2$ (SUN2000-12KTL-M0)• $\geq 10 \text{ mm}^2$ (SUN2000-15KTL-M0/SUN2000-17KTL-M0/SUN2000-20KTL-M0)
2	AC output power cable	Outdoor copper cable	Conductor cross-sectional area: <ul style="list-style-type: none">• $6\text{--}16 \text{ mm}^2$ (SUN2000-12KTL-M0)• $10\text{--}16 \text{ mm}^2$ (SUN2000-15KTL-M0/SUN2000-17KTL-M0/SUN2000-20KTL-M0) Cable outer diameter: 11–26 mm
3	DC input power cable	Standard outdoor PV cable in the industry (recommended model: PV1-F)	<ul style="list-style-type: none">• Conductor cross-sectional area: $4\text{--}6 \text{ mm}^2$• Cable outer diameter: 4.5–7.8 mm
4	(Optional) RS485 communications cable	Two-core outdoor shielded twisted pair cable	<ul style="list-style-type: none">• Conductor cross-sectional area: $0.2\text{--}1 \text{ mm}^2$ (0.5 mm^2 is recommended)• Cable outer diameter: 4–11 mm
5	(Optional) RS485 power meter signal cable	Two-core outdoor shielded twisted pair cable	
6	(Optional) Grid scheduling signal cable	Five-core outdoor cable	

3.2 Installing the PE Cable

DANGER

Do not connect the neutral wire to the enclosure as a PE cable. Otherwise, electric shocks may occur.

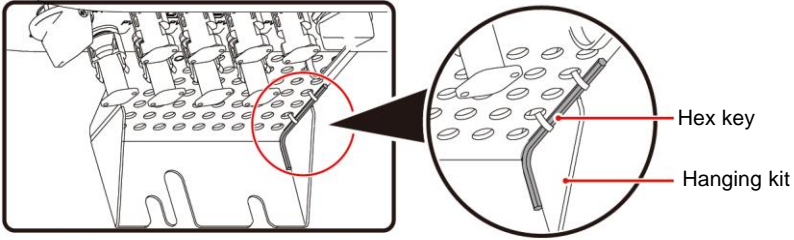


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3.3 Installing the AC Output Power Cable

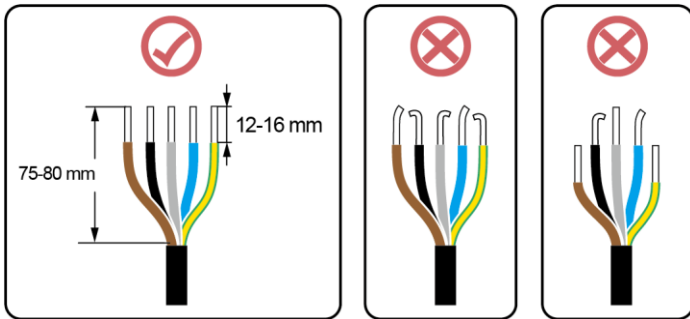
NOTICE

- Ensure that the protection layer of the AC output power cable is inside the connector, the core wires are totally inserted into the cable hole, and the cable is connected securely. Failing to do so may cause device malfunction or damage.
- The hex key is delivered with the inverter and bound to the hanging kit at the bottom of the inverter.



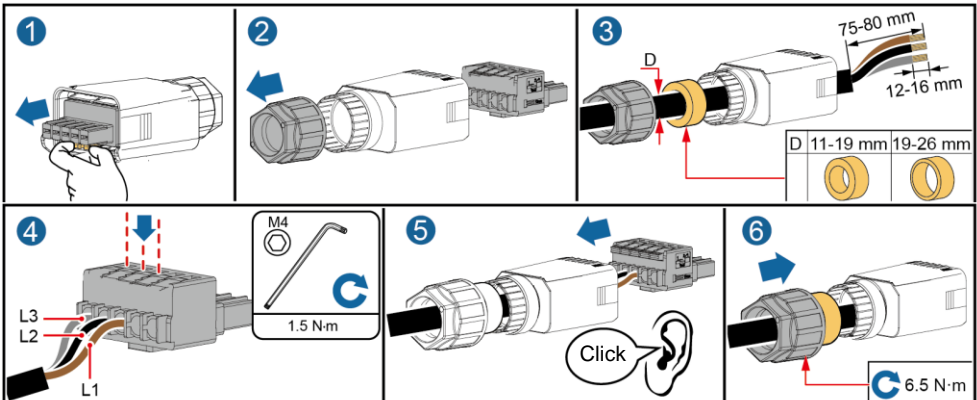
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1. Connect the AC output power cable to the AC connector.



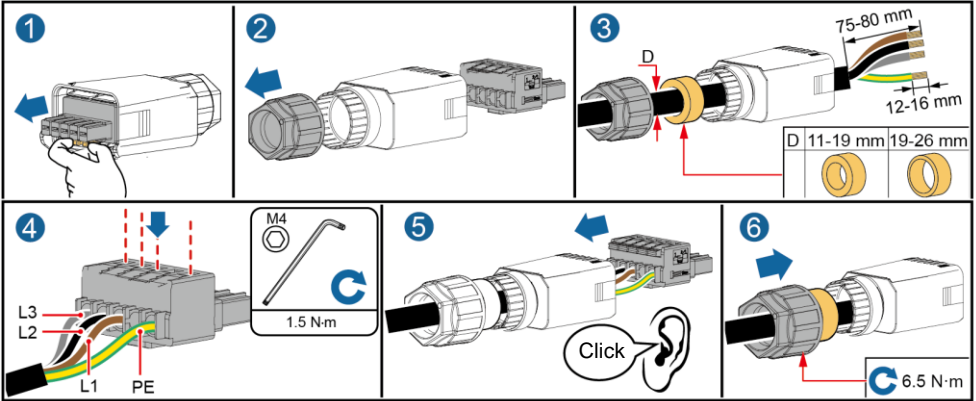
IS06120048

Three-Core Cable (L1, L2, and L3)



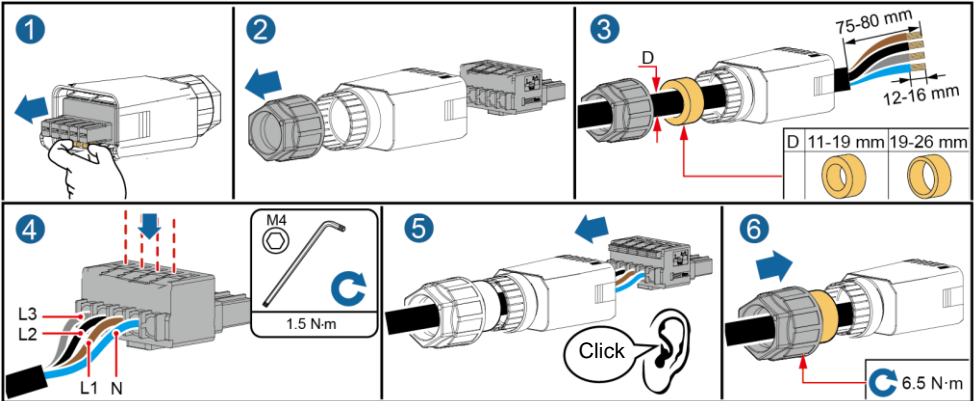
IS10I20016

Four-Core Cable (L1, L2, L3, and PE)



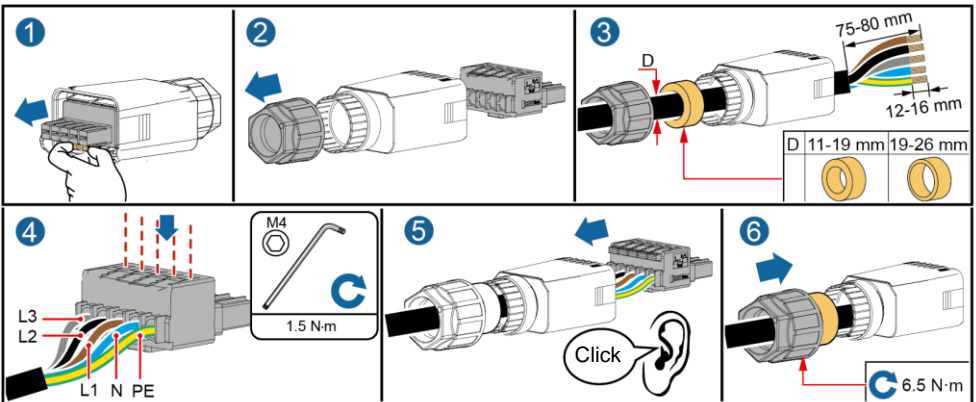
IS10120015

Four-Core Cable (L1, L2, L3, and N)



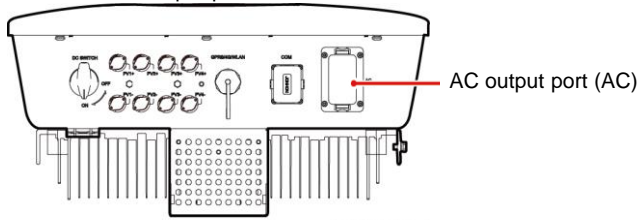
IS10120014

Five-Core Cable (L1, L2, L3, N, and PE)

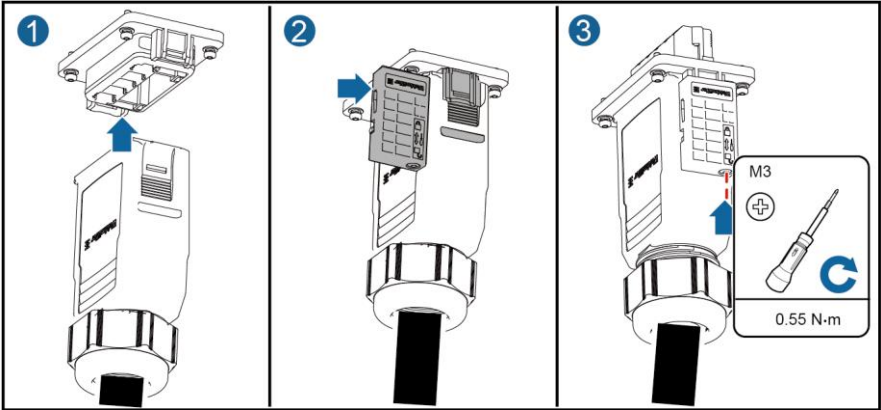


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2. Connect the AC connector to the AC output port.

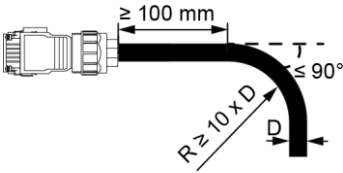


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3. Check the route of the AC output power cable.

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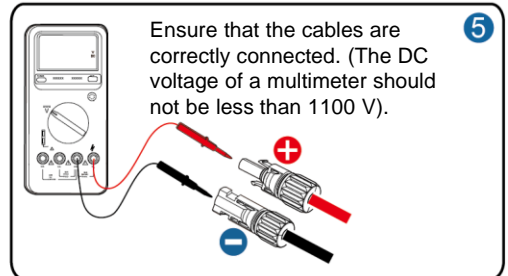
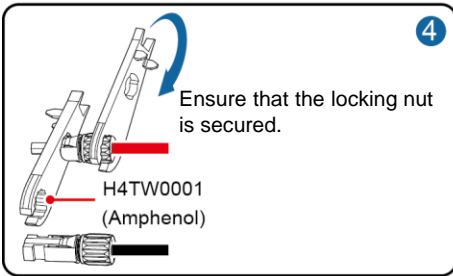
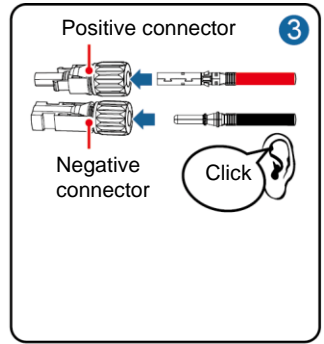
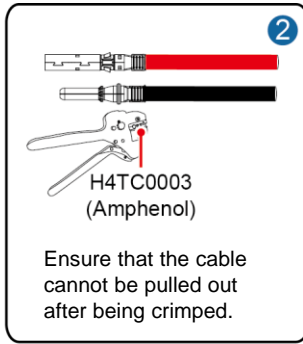
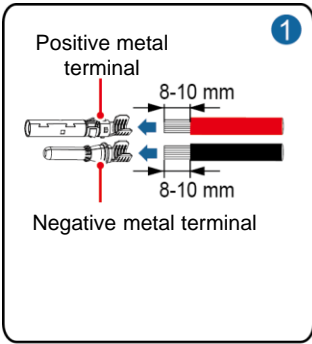


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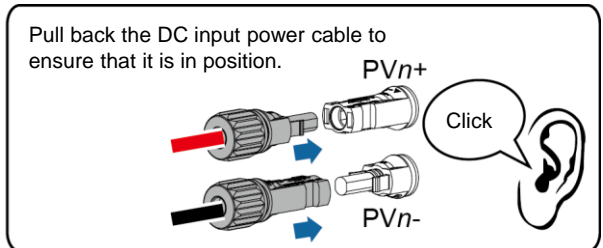
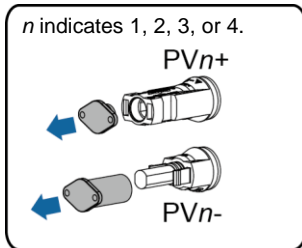
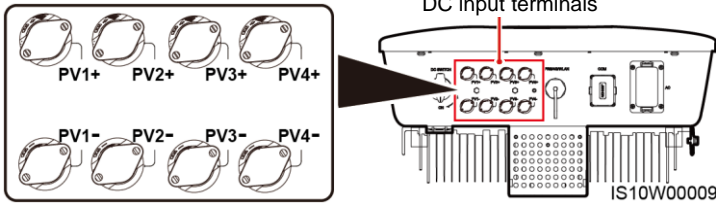
3.4 Installing the DC Input Power Cable

NOTICE

1. Use the Amphenol Helios H4 PV connectors supplied with the inverter. If the PV connectors are lost or damaged, purchase the connectors of the same model. The device damage caused by incompatible PV connectors is not covered under any warranty.
2. Crimp the metal stamping forming contacts using crimping tool H4TC0003 (Amphenol, recommended) or H4TC0002 (Amphenol).
3. Ensure that the PV module output is well insulated to ground.
4. The DC input voltage of the inverter shall not exceed 1080 V DC under any circumstance.
5. Before installing the DC input power cable, label the cable polarities to ensure correct cable connections.
6. If the DC input power cable is reversely connected, do not operate the DC switch as well as positive and negative connectors immediately. Failing to do so may cause device damage, which is not covered under any warranty. Wait until the night when solar irradiance declines and the PV string current drops to below 0.5 A. Then set the DC switch to the OFF position, remove the positive and negative connectors, and correct the polarities of the DC input power cable.



IH05130013

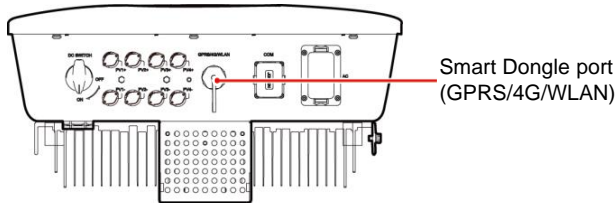


IH05130014

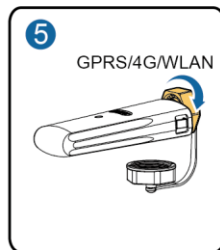
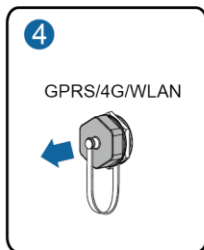
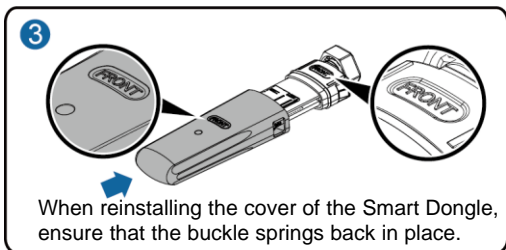
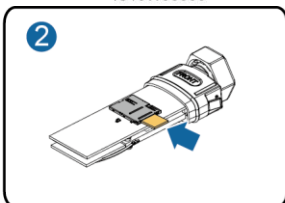
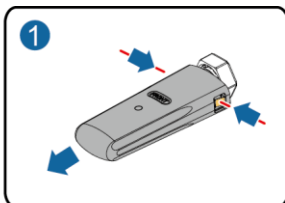
3.5 (Optional) Installing the Smart Dongle

NOTICE

- If you prepared a WLAN Smart Dongle or 4G Smart Dongle configured with a SIM card, skip this step.
- If you prepared a Smart Dongle without a SIM card, you need to prepare a standard SIM card (size: 25 mm x 15 mm) with the capacity greater than or equal to 64 KB.
- When installing the SIM card, determine its installation direction based on the silk screen and arrow on the card slot.
- Press the SIM card in place to lock it, indicating that the SIM card is correctly installed.
- When removing the SIM card, push it inwards to eject it.



IS10W00006



IS10H00016

NOTE

There are two types of Smart Dongle involved in this document:

- WLAN Smart Dongle: SDongleA-01
- 4G Smart Dongle: SDongleA-03

For details, see the quick guide that is delivered with the Smart Dongle.

You can also scan the QR code to obtain them.

SDongleA-01



SDongleA-03

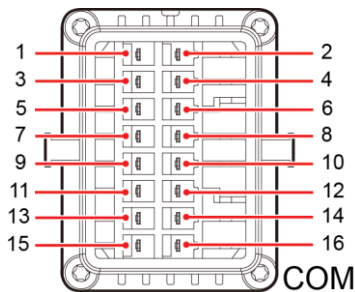


3.6 (Optional) Installing the Signal Cable

NOTICE

- Not all inverter models are delivered with the signal cable connector.
- When laying out the signal cable, separate it from the power cable and keep it away from strong interference sources to avoid strong communication interference.
- Ensure that the protection layer of the cable is inside the connector, surplus core wires are cut off from the protection layer, the exposed core wire is totally inserted into the cable hole, and that the cable is connected securely.
- If the Smart Dongle is configured, you are advised to install the Smart Dongle before connecting the signal cable.

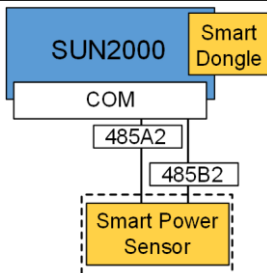
Communications Port Pin Definition



IS10W00002

Pin	Definition	Function	Description	Pin	Definition	Function	Description	
1	485A1-1	RS485 differential signal+	Used to cascade inverters or connect to the RS485 signal port on the SmartLogger1000A	2	485A1-2	RS485 differential signal+	Used to cascade inverters or connect to the RS485 signal port on the SmartLogger1000A	
3	485B1-1	RS485 differential signal-		4	485B1-2	RS485 differential signal-		
5	PE	Shielding ground	N/A	6	PE	Shielding ground	N/A	
7	485A2	RS485 differential signal+	Used to connect to an RS485 signal port on a Smart Power Sensor for export limitation	8	DIN1	Dry contact interface for grid scheduling	Connect to ripple control receiver. For details, see the user manual.	
9	485B2	RS485 differential signal-		10				DIN2
11	N/A	N/A		N/A	12			
13	GND	GND		N/A	14			DIN4
15	N/A	N/A	N/A	16	GND			

Single Inverter + Smart Dongle Networking



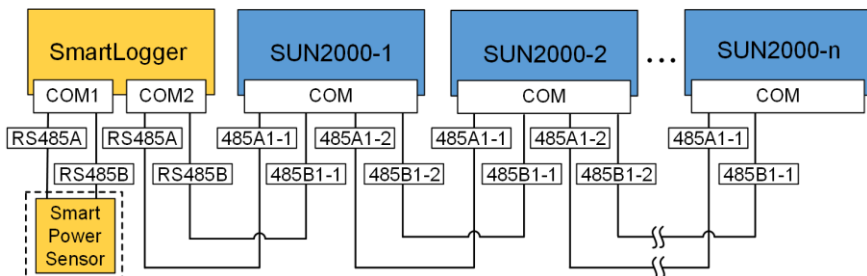
NOTICE

In the Smart Dongle networking scenario, the SmartLogger1000A cannot be connected.

NOTE

The Smart Power Sensor is necessary for export limitation. Only the DTSU666-H Smart Power Sensor (provided by Huawei) can be used.

Multiple Inverters + SmartLogger1000A Networking

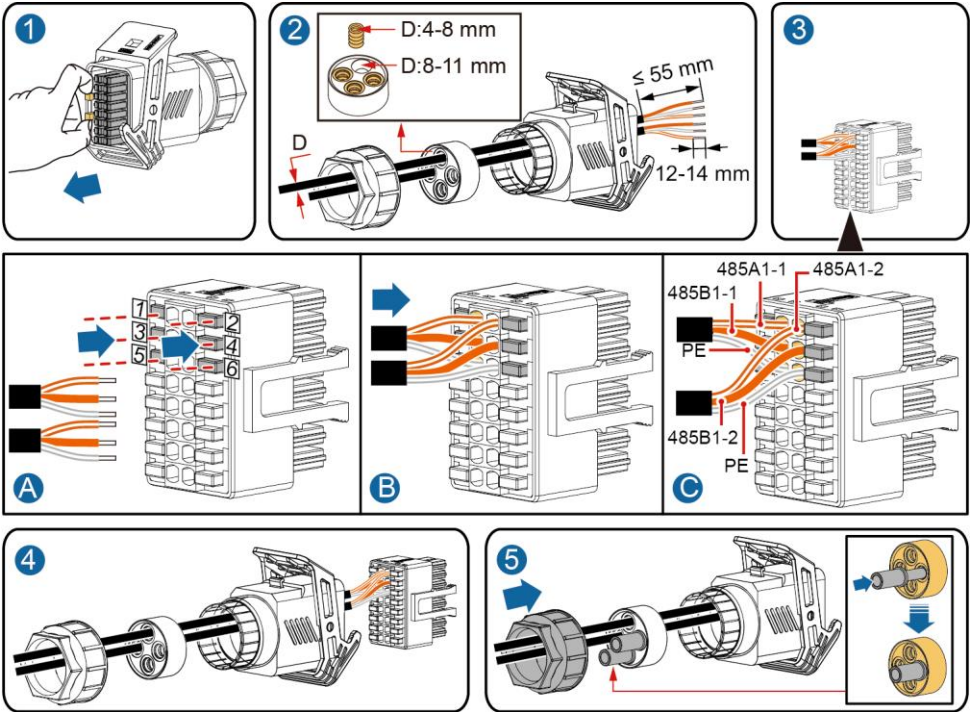


NOTE

- In the SmartLogger1000A networking scenario, the Smart Dongle cannot be connected.
- A maximum of 80 devices can connect to a single SmartLogger1000A, such as inverters, Smart Power sensor, and EMI. You are advised to connect fewer than 30 devices to each RS485 route.
- The Smart Power Sensor is a necessary export limitation. Select the Smart Power Sensor according to the actual project.
- To ensure the system response speed, the Smart Power Sensor is recommended to be connected to a COM port separately from inverter COM port.

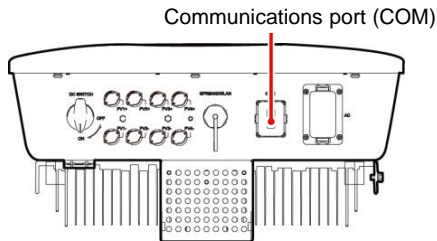
(Optional) Installing the RS485 Communications Cable (Inverter Cascading)

1. Connect the signal cable to the signal cable connector.

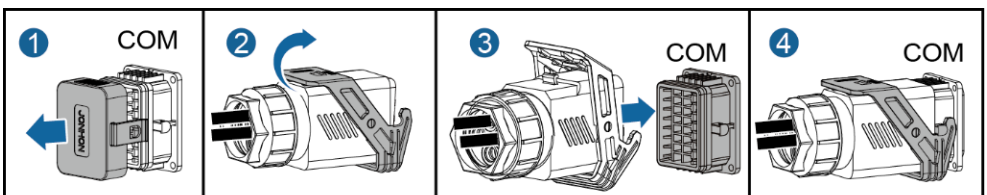


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2. Connect the signal cable connector to the communication port.



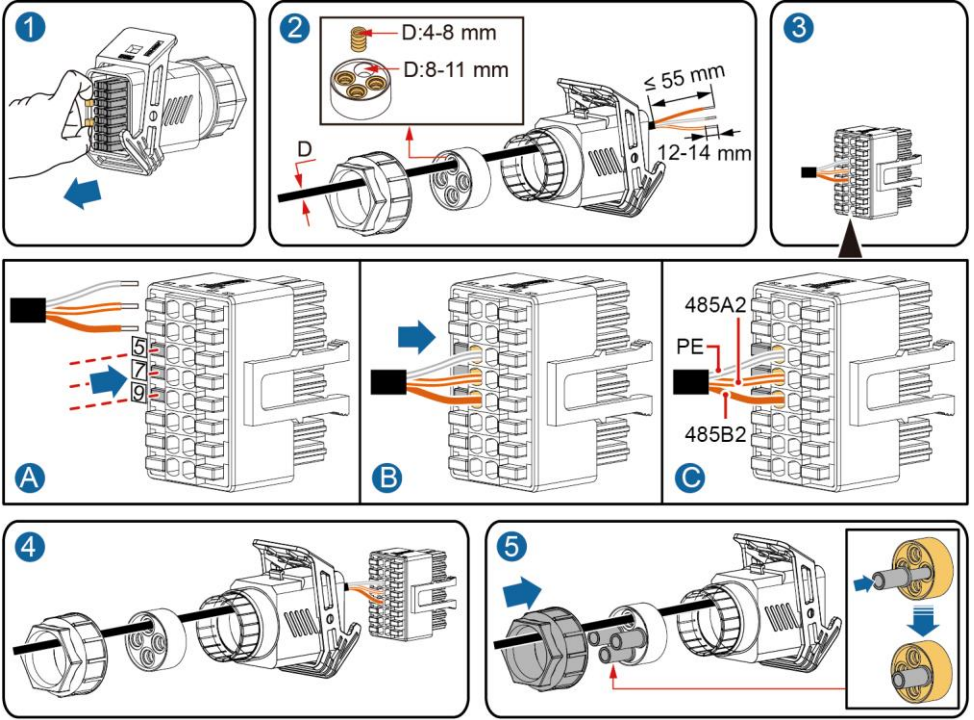
IS10W00006



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(Optional) Installing the Smart Power Sensor Signal Cable

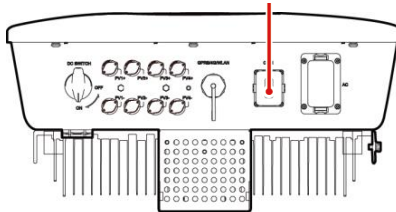
1. Connect the signal cable to the signal cable connector.



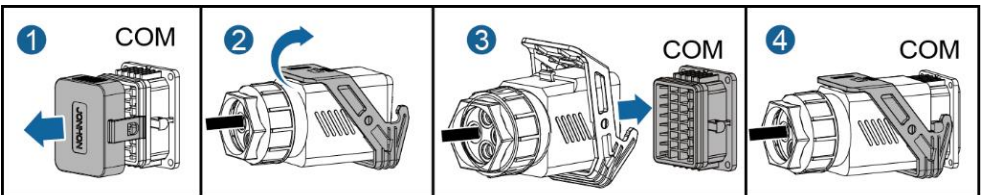
IS10I20008

2. Connect the signal cable connector to the Communication port.

Communications port (COM)



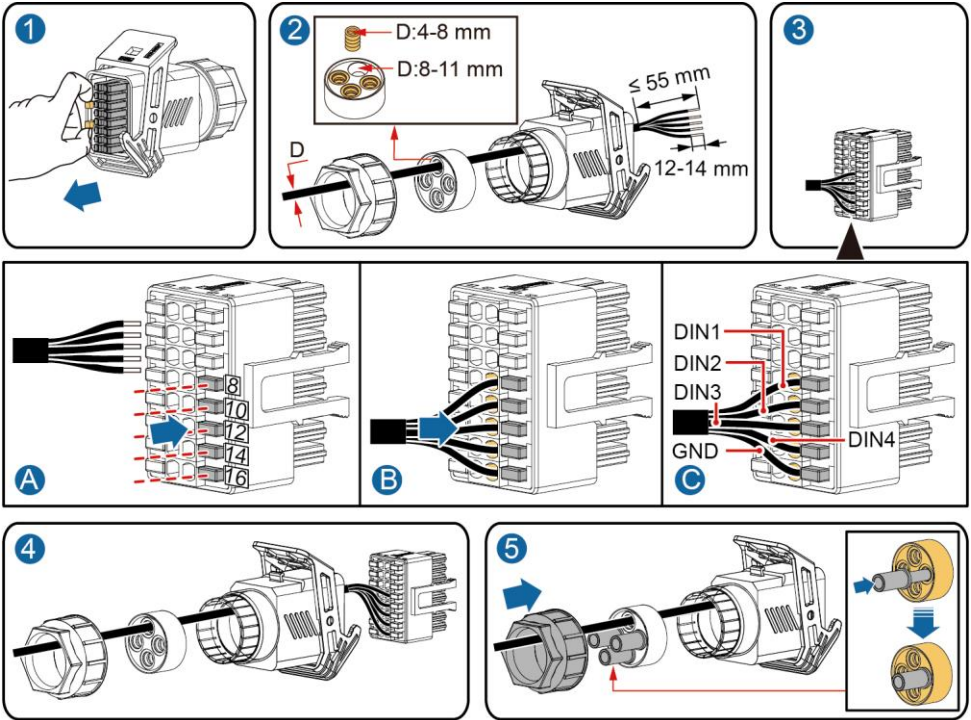
IS10W00006



IS10I20007

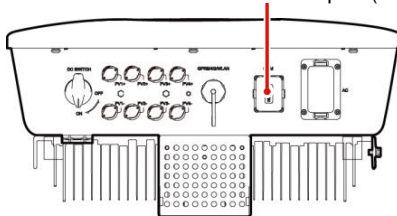
(Optional) Installing the Grid Scheduling Dry Contact Signal Cable

1. Connect the signal cable to the signal cable connector.

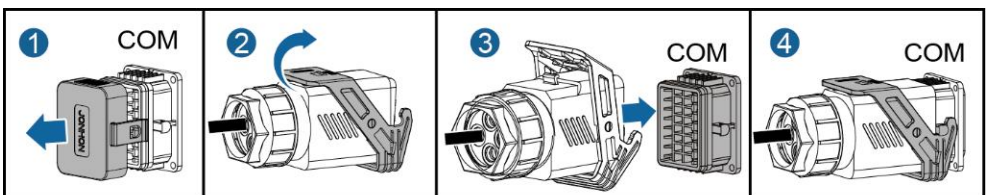


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2. Connect the signal cable connector to the Communication port.
Communications port (COM)



IS10W00006



IS10I20007

4 Verifying Installation

No.	Acceptance Criteria
1	The inverter is installed correctly and securely.
2	Cables are routed properly as required by the customer.
3	The Smart Dongle is installed correctly and securely.
4	Cable ties are evenly distributed and no burr exists.
5	The PE cable is connected correctly, securely, and reliably.
6	The DC switch and all the switches connected to the inverter are set to the OFF position.
7	The AC output power cable, DC input power cable, and signal cable are connected correctly, securely, and reliably.
8	Unused terminals and ports are locked by watertight caps.
9	The installation space is proper, and the installation environment is clean and tidy.

5 Powering On the System

NOTICE

Before turning on the AC switch between the inverter and the power grid, use a multimeter set to the AC position to check that the AC voltage is within the specified range.

1. Turn on the AC switch between the inverter and the power grid.
2. If there is a DC switch between the PV string and the inverter, turn on the DC switch.
3. Turn on the DC switch at the bottom of the inverter.
4. Observe the LEDs to check the operating status of the inverter.

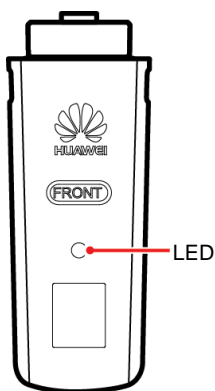


NOTE

Blinking at Long Intervals: On for 1s and then Off for 1s; Blinking at Short Intervals: On for 0.2s and then Off for 0.2s.

Category	Status		Meaning
Running indicator			N/A
	Steady green	Steady green	The inverter is operating in grid-tied mode.
	Blinking green at long intervals	Off	The DC is on and the AC is off.
	Blinking green at long intervals	Blinking green at long intervals	Both the DC and AC are on, and the inverter is not exporting power to the power grid.
	Off	Off	The DC is off, and the AC may be energized (Ensure that the external AC switch is OFF).
	Blinking red at short intervals	N/A	DC environmental alarm
	N/A	Blinking red at short intervals	AC environmental alarm
	Steady red	Steady red	Abnormal
Communication indicator			N/A
	Blinking green at short intervals		Communication is in progress. (When a mobile phone is connected to the inverter, the indicator first blinks green at long intervals, indicating that the phone is connected to the inverter.)
	Blinking green at long intervals		The mobile phone is connected to the inverter.
	Off		There is no communication.

5. (Optional) Observe the LED to check the operating status of the Smart Dongle.



WLAN Smart Dongle

LED		Description
Color	Status	
Yellow (blinking green and red simultaneously)	Steady on	The Dongle is secured and powered on.
Red	Blinking at short intervals (on for 0.2s and then off for 0.2s)	The parameters for connecting to the router are to be set.
Green	Blinking at long intervals (on for 0.5s and then off for 0.5s)	Connecting to the router
Green	Steady on	Successfully connected to the management system.
Blinking red and green alternatively	Blinking at short intervals (on for 0.2s and then off for 0.2s)	The inverter is communicating with the management system through the Dongle.

4G Smart Dongle

LED		Description
Color	Status	
Yellow (blinking green and red simultaneously)	Steady on	The Dongle is secured and powered on.
Green	Blinking in a 2-second cycle (on for 0.1s and then off for 1.9s)	Dialing (duration < 1 min)
	Blinking at long intervals (on for 1s and then off for 1s)	The dial-up connection is set up successfully (duration < 30s).
	Steady on	Successfully connected to the management system.
	Blinking at short intervals (on for 0.2s and then off for 0.2s)	The inverter is communicating with the management system through the Dongle.

6 Commissioning

6.1 Scenario 1: Single inverter + Smart Dongle

NOTE

The screenshots shown in the quick guide are from FusionSolar 2.3.0. Data in the screenshots is for reference only. The actual screens prevail.

1. Downloading the App

Search for "FusionSolar" from the following app stores or scan the corresponding QR code, download the installation package, and install the FusionSolar app by following the instructions.

- Google Play (Android)
- App Store (iOS)



Google Play
(Android)



App Store
(iOS)

NOTE

- In Britain, only the FusionHome app can be used for commissioning. This document uses the FusionSolar app as an example to describe the commissioning method. For the FusionHome app, perform operations as required.
- Search for "FusionHome" from the following app stores or scan the corresponding QR code, download the installation package, and install the FusionHome app by following the instructions.
 - Google Play (Android)
 - App Store (iOS)
- The initial password for connecting the inverter WiFi is **Changeme**
- Log in to the FusionHome app as **installer**. The initial password is **00000a**.
- Use the initial password upon first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.



Google Play
(Android)



App Store
(iOS)

2. (Optional) Installer Account Registration

NOTE

If you have an installer account, skip this step.

Creating the first installer account will generate a domain named after the company.

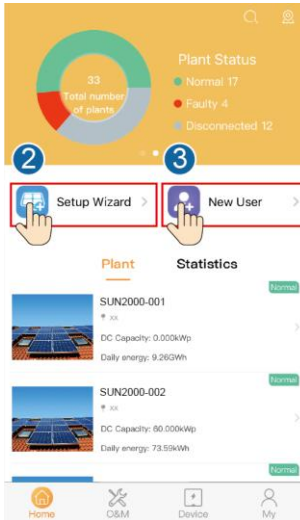
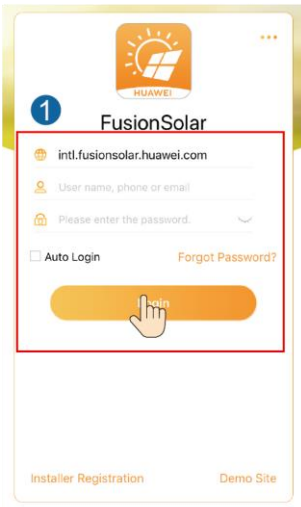
The image shows two panels of the FusionSolar app. The left panel is the login screen with the FusionSolar logo and the domain 'intl.fusionsolar.huawei.com' highlighted in a red box. Below the domain are fields for 'User name, phone or email' and 'Please enter the password.' There is an 'Auto Login' checkbox and a 'Forgot Password?' link. A red box highlights the 'Installer Registration' link at the bottom left. A blue arrow points from the left panel to the right panel. The right panel is the 'Installer Registration' form. It has a title bar with a back arrow and the text 'Installer Registration'. The form contains several input fields: 'Company Name', 'Please enter the email address', 'Please enter your email again', 'Please enter the password.', 'Please confirm the password.', and 'Please enter the verification code'. There is a '53jt' verification code displayed. Below the fields is a checkbox for 'I have read and agree to the Terms of Use and Privacy Policy'. A red box highlights the 'Registration' button at the bottom.

NOTICE

To create multiple installer accounts for the same company, log in to the FusionSolar app and tap **New User**.

The image shows three panels of the FusionSolar app. The left panel is the main dashboard with a 'New User' button highlighted. A blue arrow points from the 'New User' button to the middle panel. The middle panel is the 'New User' registration form. It has a title bar with a back arrow and the text 'New User'. The form contains several input fields: 'Role' (set to 'Installer'), 'Plant' (with a dropdown arrow), 'User name', 'Password', 'Phone', and 'Email'. A red box highlights the 'Confirm' button at the bottom. A black arrow points from the 'Plant' field to the right panel. The right panel is the 'Selecting Plant' screen. It has a title bar with a back arrow and the text 'Selecting Plant'. It contains a search bar with the text 'Please input the plant name'. Below the search bar is a message: 'Currently 3 power stations selected. Click to view'. There is a checkbox for 'Company Name'. A red box highlights the 'Confirm' button at the bottom.

3. Creating a PV Plant and an Account for User



NOTE

For details, see the *FusionSolar App Quick Guide*. You can scan the QR code to obtain it.



6.2 Scenario 2: Multiple Inverters + SmartLogger1000A

See the *Distributed PV Plants Connecting to Huawei Hosting Cloud Quick Guide (Distributed Solar Inverters + SmartLogger1000A + RS485 Networking)*.

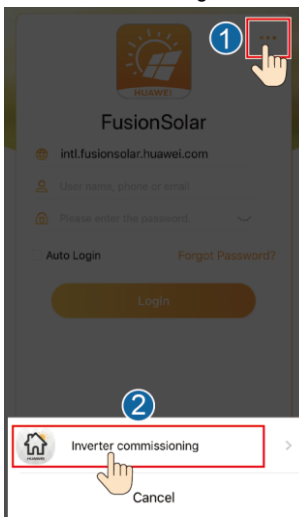
You can scan the QR code to obtain it.



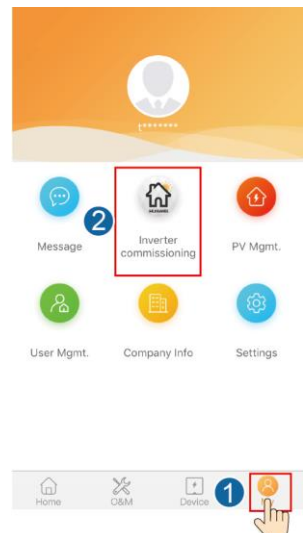
6.3 Other Scenarios

1. Access Inverter commissioning.

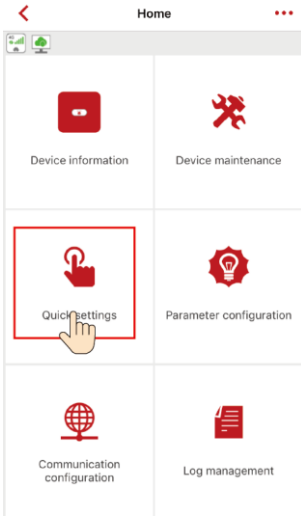
Method 1: before login



Method 2: after login



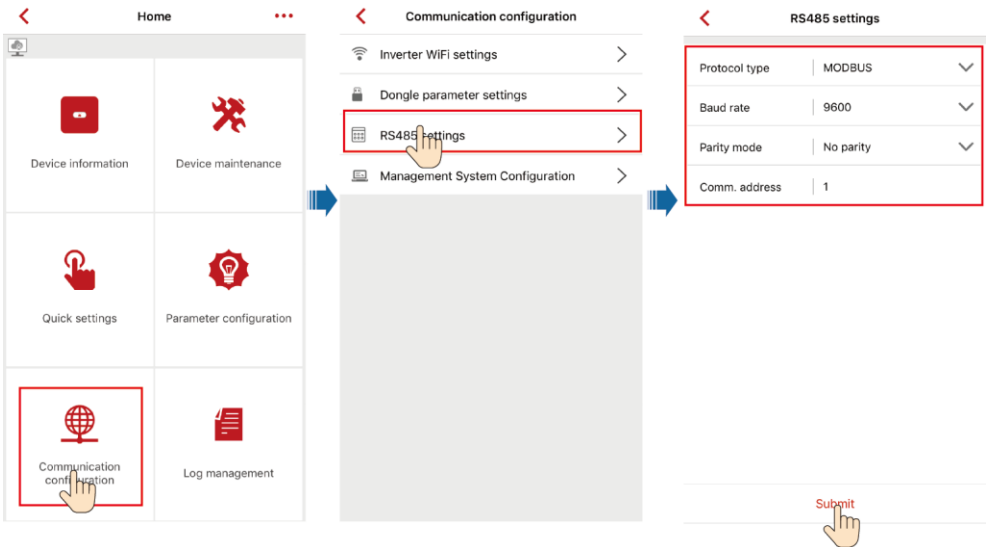
2. Connect to the inverter WiFi. Log in as **installer**, and perform **Quick settings**.



NOTE

- The initial password for connecting the inverter WiFi is **Changeme**
- The initial password of the **installer** is **00000a**
- Use the initial password upon first power-on and change it immediately after login. To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed. In these cases, the user is liable for any loss caused to the PV plant.
- To set more parameters, tap **Parameter configuration**.

3. (Optional) When multiple inverters are connected to a third-party data collector, set RS485 parameters.



NOTICE

The RS485 addresses of different inverters must be different.

7 Customer Service Contact

Customer Service Contact			
Region	Country	Service Support Email	Phone
Europe	France	eu_inverter_support@huawei.com	0080033888888
	Germany		
	Spain		
	Italy		
	UK		
	Netherlands		
	Other countries		
Asia Pacific	Australia	au_inverter_support@huawei.com	1800046639
	Turkey	tr_inverter_support@huawei.com	-
	Malaysia	apsupport@huawei.com	0080021686868 /1800220036 (+66) 26542662 (charged by local call)
	Thailand		1800290055 (free in Thailand)
	China	solarservice@huawei.com	4008229999
	Other countries	apsupport@huawei.com	0060-3-21686868
Japan	Japan	Japan_ESC@ms.huawei.com	0120258367
India	India	indiaenterprise_TAC@huawei.com	1800 103 8009
South Korea	South Korea	Japan_ESC@ms.huawei.com	-
North America	USA	na_inverter_support@huawei.com	1-877-948-2934
	Canada	na_inverter_support@huawei.com	1-855-482-9343
Latin America	Mexico	la_inverter_support@huawei.com	018007703456 /0052-442-4288288
	Argentina		0-8009993456
	Brazil		0-8005953456
	Chile		800201866 (only for fixed)
	Other countries		0052-442-4288288
Middle East and Africa	Egypt	mea_inverter_support@huawei.com	08002229000 /0020235353900
	UAE		08002229000
	South Africa		0800222900
	Saudi Arabia		8001161177
	Pakistan		0092512800019
	Morocco		0800009900
	Other countries		0020235353900

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