

SUN2000-(2KTL-5KTL)-L1 Quick Guide

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Huawei Technologies Co., Ltd

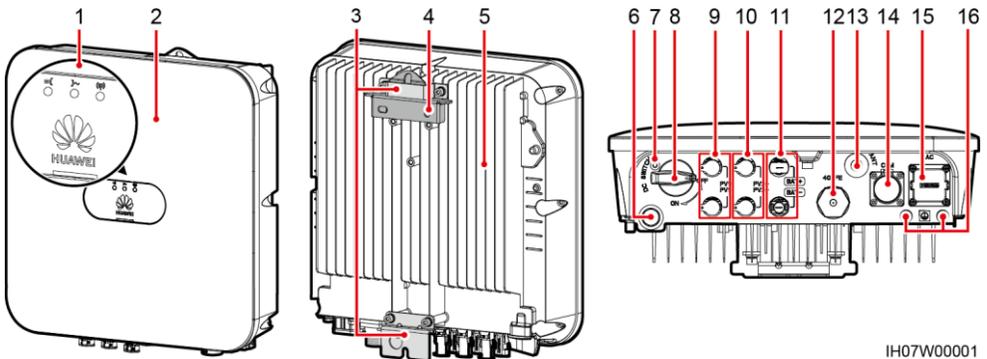


NOTICE

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. You can download this document by scanning the QR code.
2. Before installing the device, closely read the user manual to get familiar with product information and safety precautions.
3. Only certified electricians are allowed to operate the device. Operation personnel must wear proper personal protective equipment (PPE).
4. Before installing the device, check that the package contents are intact and complete against the packing list. If any damage is found or any component is missing, contact your dealer.
5. The device damage caused by the violation of instructions in this document is not covered under warranty.
6. The cable colors involved in this document are for reference only. Select cables in accordance with local cable specifications.



1 Overview



IH07W00001

- | | |
|---|--|
| (1) LED indicators | (2) Front panel |
| (3) Hanging kit | (4) Mounting bracket |
| (5) Heat sink | (6) Ventilation valve |
| (7) Screw hole for the DC switch ^a | (8) DC switch ^b (DC SWITCH) |
| (9) DC input terminals (PV1+/PV1-) | (10) DC input terminals (PV2+/PV2-) |
| (11) Battery terminals (BAT+/BAT-) | (12) Smart Dongle port (4G/FE) |
| (13) Antenna port (ANT) | (14) COM port (COM) |
| (15) AC output port (AC) | (16) Ground point |

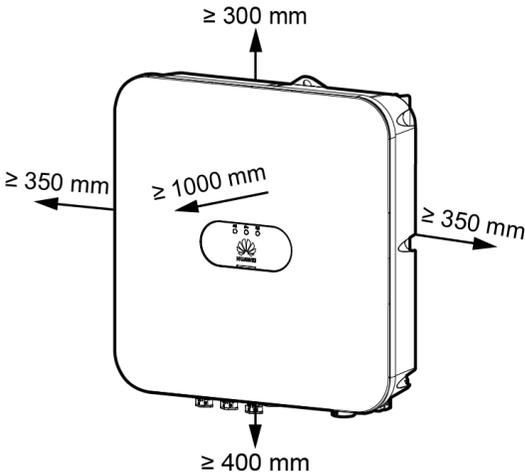
NOTE

- a: The screw is used to secure the DC switch to prevent accidental startup. The screw is delivered with the solar inverter.
- b: DC input terminals PV1 and PV2 are controlled by the DC switch.

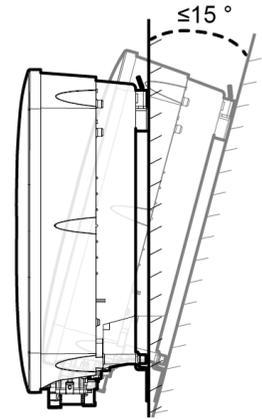
2 Installing the Device

2.1 Installation Requirements

Space

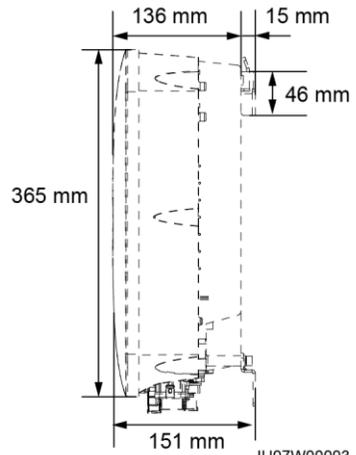
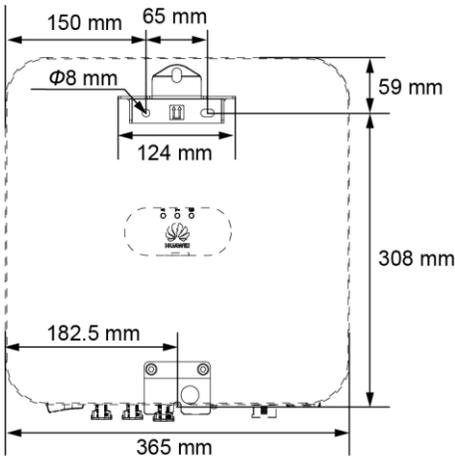


Angle



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Mounting Hole Dimensions



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2.2 Installing the Solar Inverter

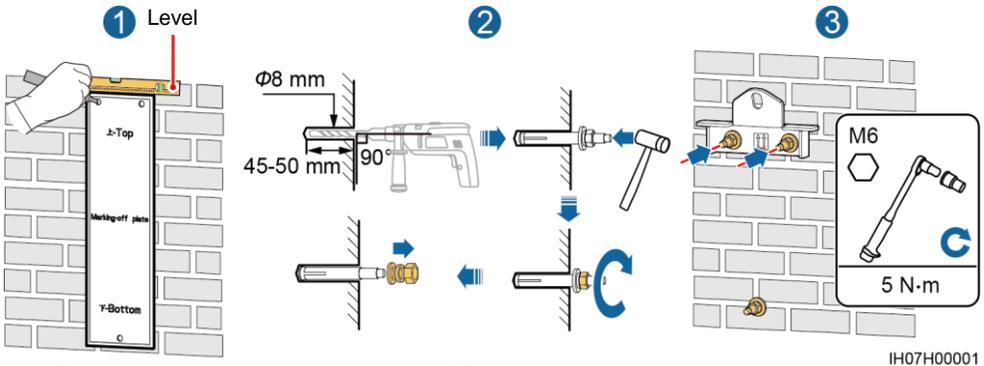
1. Install the mounting bracket.

⚠ DANGER

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

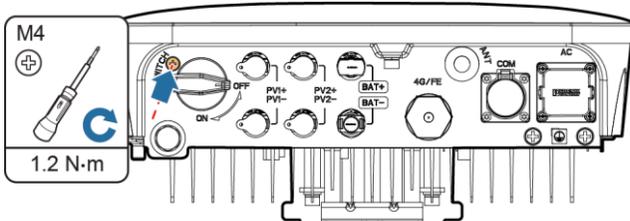
NOTE

- M6x60 expansion bolts are delivered with the solar 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 solar inverter are mainly 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 solar inverter.
- In residential areas, do not install the solar inverter on drywalls or walls made of similar materials which have a weak sound insulation performance because the noise generated by the solar inverter is noticeable.
- Loosen the nut, flat washer, and spring washer of the expansion bolt at the bottom.



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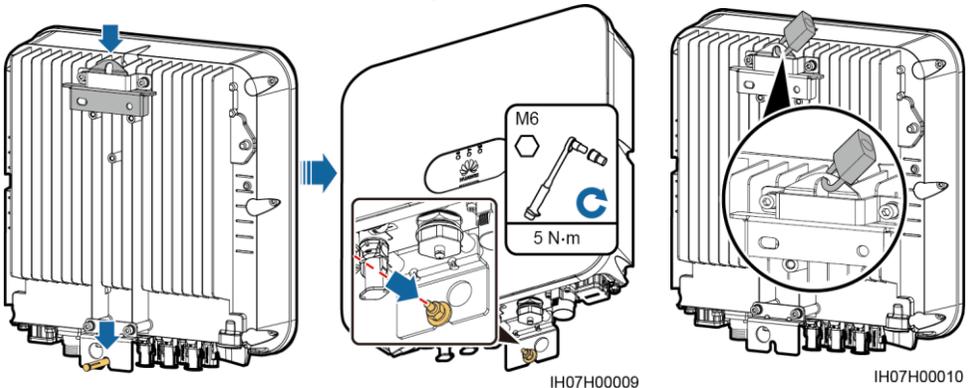
2. (Optional) Install the screw for locking the DC switch.



IH07H00020

3. Install the solar inverter onto the mounting bracket.

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



IH07H00009

IH07H00010

NOTE

Prepare an anti-theft lock by yourself. The lock should be suitable for the lock hole diameter ($\Phi 10$ mm) so that it can be installed successfully. An outdoor waterproof lock is recommended.

3 Connecting Cables

3.1 Preparing Cables

NOTICE

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

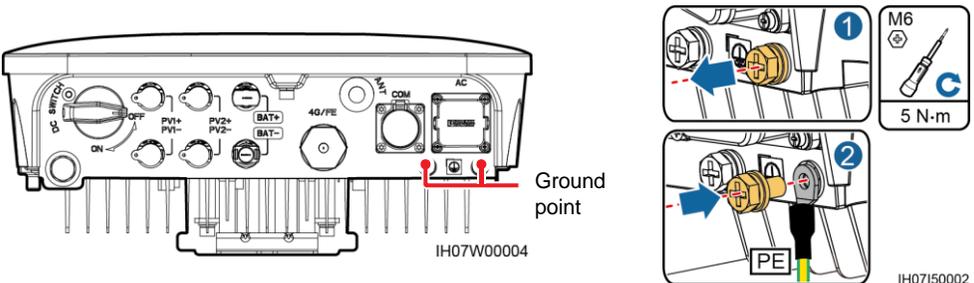
Prepare cables based on site requirements.

No.	Cable	Type	Conductor Cross-Sectional Area Range	Outer Diameter
1	Protective earthing (PE) cable	Single-core outdoor copper cable	4–10 mm ²	N/A
2	AC output power cable	Two-core (L and N) or three-core (L, N, and PE) outdoor copper cable	4–6 mm ²	10–21 mm
3	DC input power cable and (optional) battery cable	Standard outdoor PV cable in the industry	4–6 mm ²	5.9–8.8 mm
4	(Optional) Signal cable	Outdoor shielded twisted pair cable	When cables are crimped: 0.20–0.35 mm ² When cables are not crimped: 0.20–1 mm ²	<ul style="list-style-type: none"> • four-hole rubber plug: 4–8 mm • two-hole rubber plug: 8–11 mm

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.



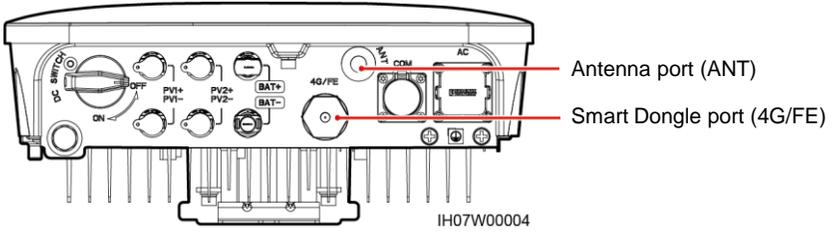
NOTE

- The PE point at the AC output port is used only as a PE equipotential point, and cannot substitute for the PE point on the enclosure.
- Silica gel or paint be applied around the ground terminal after the PE cable is connected.
- It is recommended that the right ground point be used for grounding. The other ground point is reserved.

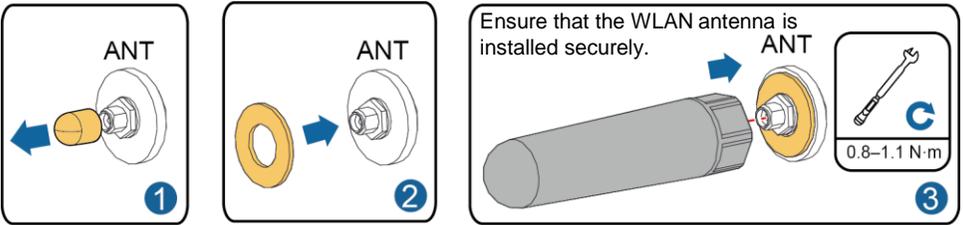
3.3 Installing a WLAN Antenna or Smart Dongle

NOTE

- If FE communication is used, install a WLAN-FE Smart Dongle (SDongleA-05). You need to purchase the WLAN-FE Smart Dongle by yourself.
- If 4G communication is used, install a 4G Smart Dongle (SDongleA-03). You need to purchase the 4G Smart Dongle by yourself.



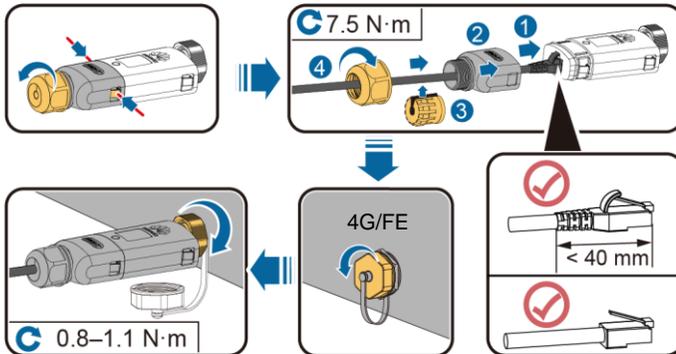
WLAN Antenna (WLAN Communication)



IH07H00021

(Optional) WLAN-FE Smart Dongle (FE Communication)

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.

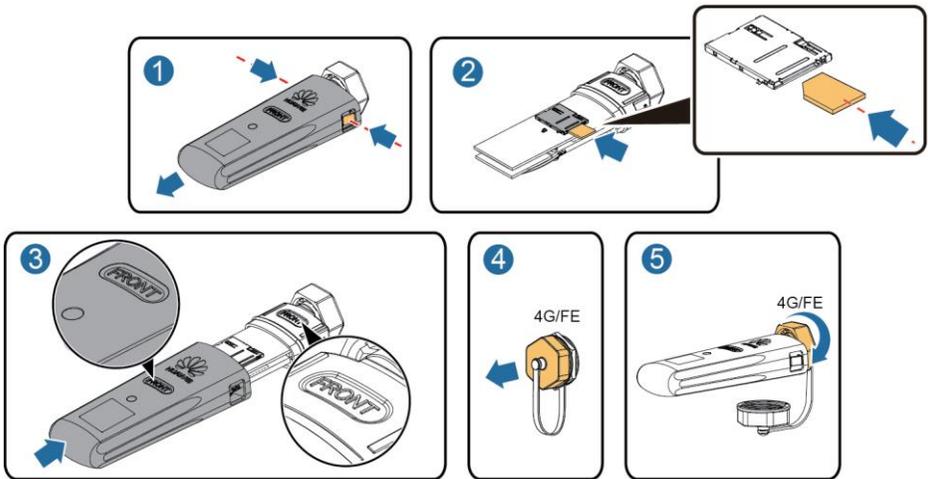


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(Optional) 4G Smart Dongle (4G Communication)

NOTICE

- If your Smart Dongle is configured with a SIM card, you do not need to install the SIM card. The configured SIM card can be used only on the Smart Dongle. The SIM card is a China Mobile card. Before installation, check whether the site is effectively covered by China Mobile signals. If not, prepare a SIM card of other carriers.
 - If your Smart Dongle is not equipped with a SIM card, prepare a standard SIM card (size: 25 mm x 15 mm) with the capacity greater than or equal to 64 KB.
-
- Install the SIM card in the arrow direction.
 - When reinstalling the cover of the Smart Dongle, ensure that the buckle springs back in place (you can hear a click).



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NOTE

- For details about how to operate the WLAN-FE Smart Dongle SDongleA-05, see *SDongleA-05 Quick Guide (WLAN-FE)*.
- For details about how to operate the 4G Smart Dongle SDongleA-03, see *SDongleA-03 Quick Guide (4G)*.
- The quick guide is delivered with the Smart Dongle. You can download them by scanning the QR code below.



WLAN-FE



4G

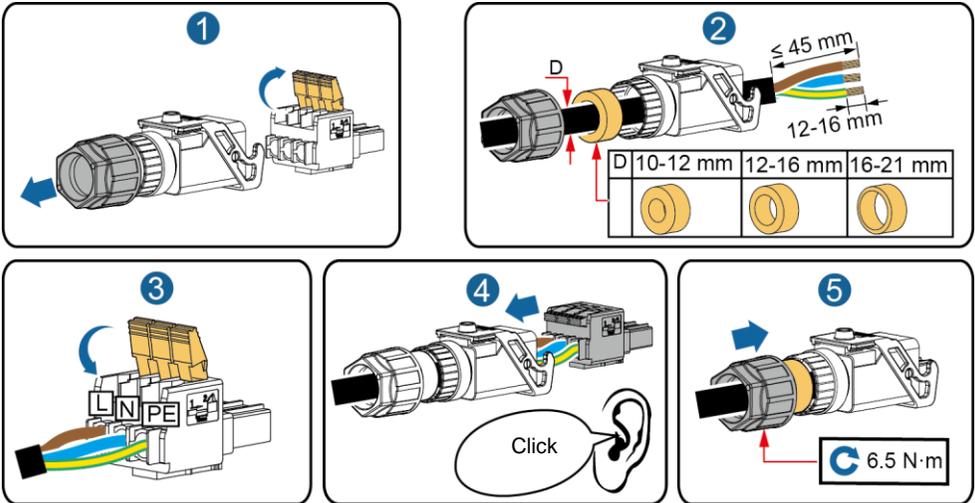
3.4 Installing the AC Output Power Cable

NOTICE

Ensure that the protective layer of the AC output power cable is inside the connector, that the core wires are totally inserted into the cable hole, and that the cable is connected securely. Failing to do so may cause device malfunction or damage.

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

Three-Core Cable (L, N, and PE)

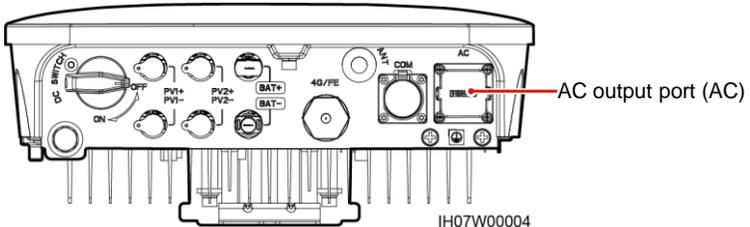


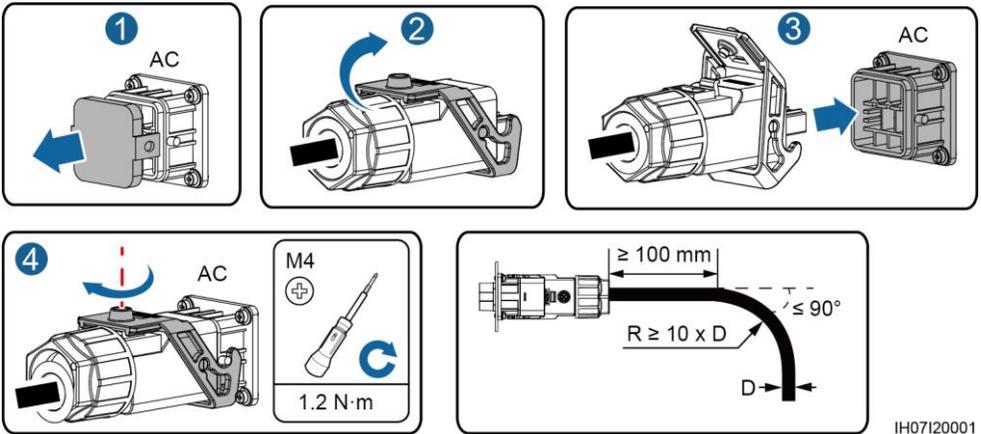
IH05120017

NOTE

The method for connecting a two-core AC output power cable is the same except that the cable is not connected to PE.

2. Connect the AC connector to the AC output port. Check the route of the AC output power cable.

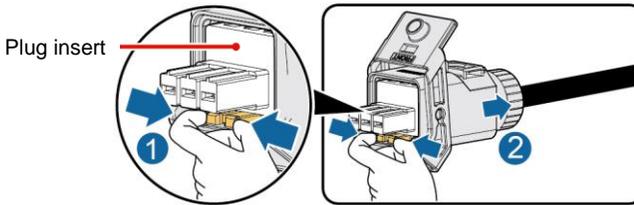




IH07120001

NOTE

To remove the AC connector, perform the operations in reverse order of installing the AC connector. Then, remove the plug insert, as shown in the following figure.



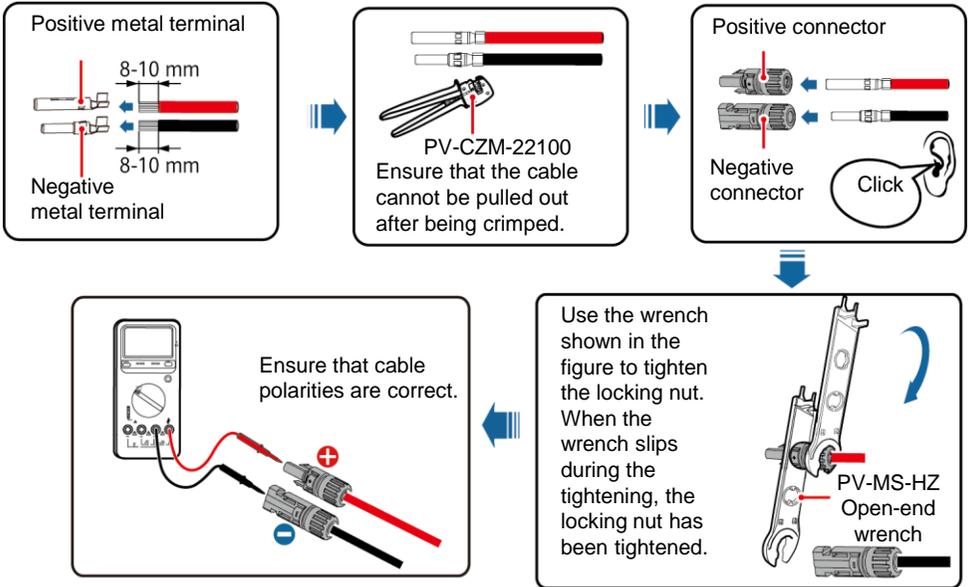
IH05120019

3.5 Installing DC Input Power Cables

NOTICE

1. Ensure that the PV module output is well insulated to ground.
2. Use the Staubli MC4 positive and negative metal terminals and DC connectors supplied with the solar inverter. Using incompatible positive and negative metal terminals and DC connectors may result in serious consequences. The caused device damage is not covered under warranty.
3. The DC input voltage of the solar inverter must not exceed maximum input voltage.
4. Before installing DC input power cables, label the cable polarities to ensure correct cable connections.
5. If DC input power cables are 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 warranty. Wait until the solar irradiance declines at night and the PV string current reduces to below 0.5 A, and then turn off the DC switch and remove the positive and negative connectors. Correct the string polarity before reconnecting the PV string to the solar inverter.

1. Assemble DC connectors.

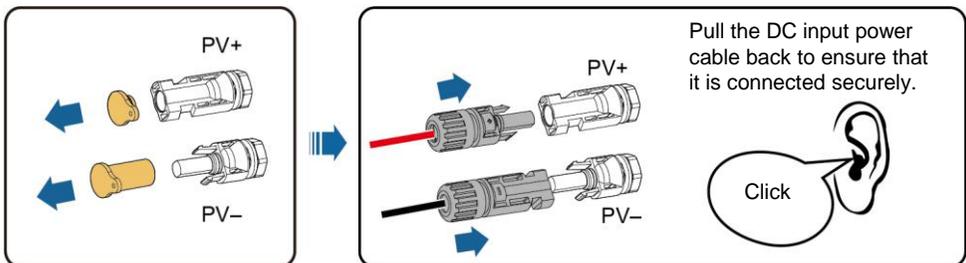
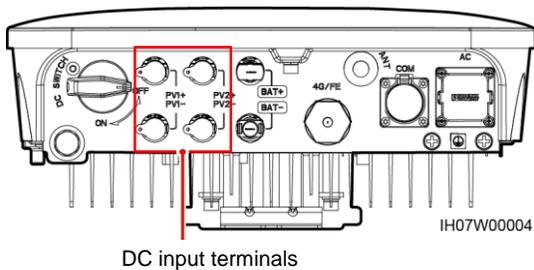


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NOTE

If the PV strings are configured with Smart PV Optimizers, refer to the *Smart PV Optimizer Quick Guide* to check the cable polarity.

2. Connect DC input power cables.



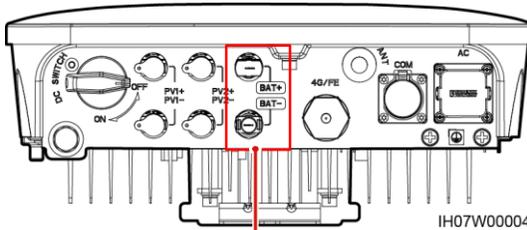
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3.6 (Optional) Installing Battery Cables

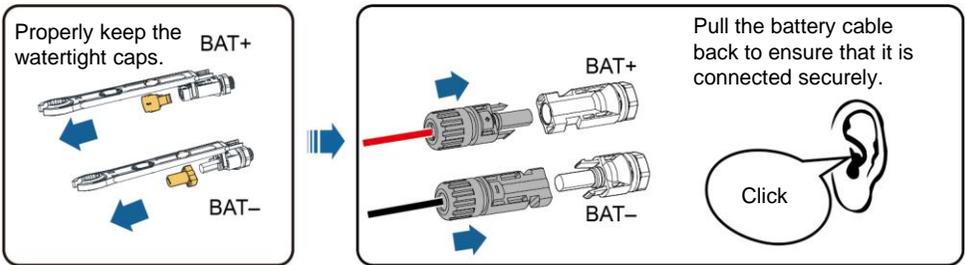
DANGER

- Use insulated tools when connecting cables.
- Connect battery cables with correct polarity. If battery cables are reversely connected, the solar inverter may be damaged.

Assemble the positive and negative connectors by following the instructions in section 3.5 "Installing DC Input Power Cables."



Battery terminals (BAT+/BAT-)

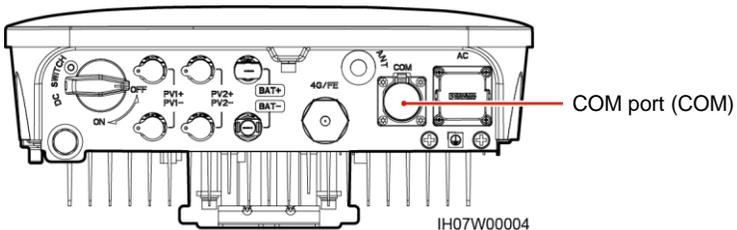


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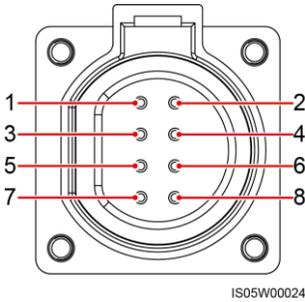
3.7 (Optional) Installing Signal Cables

NOTICE

- When laying out a signal cable, separate it from power cables to avoid strong signal interference.
- Ensure that the protective layer of the cable is inside the connector, that excess core wires are cut off from the protection layer, that the exposed core wire is totally inserted into the cable hole, and that the cable is connected securely.
- Block the unused cable hole using a cap and tighten the cable gland.
- If more than one signal cables are required, ensure that they have the same outer diameter.

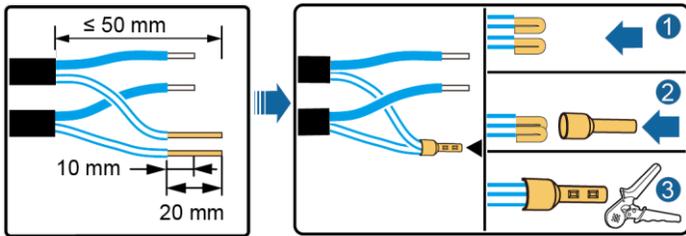


COM Port Pin Definitions



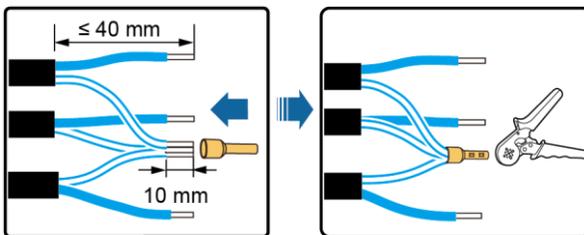
No.	Label	Definition	Description
1	485B1	RS485B, RS485 differential signal-	Solar inverters cascading scenario: used for connecting to the solar inverters.
2	485A1	RS485A, RS485 differential signal+	
3	485B2	RS485B, RS485 differential signal-	Used for connecting to the RS485 signal ports of the battery and power meter. When both battery and power meter are configured, they need be crimped to the 485B2 and 485A2 ports.
4	485A2	RS485A, RS485 differential signal+	
5	GND	GND of the enable signal/12V/DI1/DI2	Used for connecting to GND of the enable signal/12V/DI1/DI2.
6	EN+	Enable signal+/12V+	Used for connecting to the enable signal of the battery and the 12V positive signal.
7	DI1	Digital input signal 1+	Used for connecting to the DI1 positive signal. It can be used for connecting to the DRM0 scheduling signal or reserved for the rapid shutdown signal.
8	DI2	Digital input signal 2+	Used for connecting to the DI2 positive signal. It can be reserved for the feedback signal of the Backup device.

Crimping Two Signal Cables



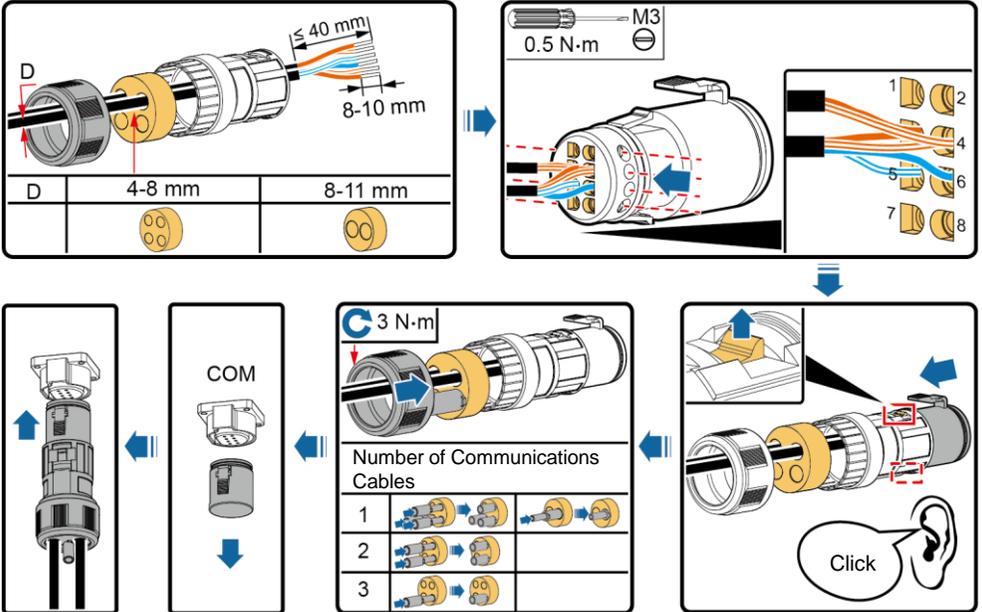
IH07140003

Crimping Three Signal Cables



IH07140004

Connecting Signal Cables



IH07140001

4 Verifying the Installation

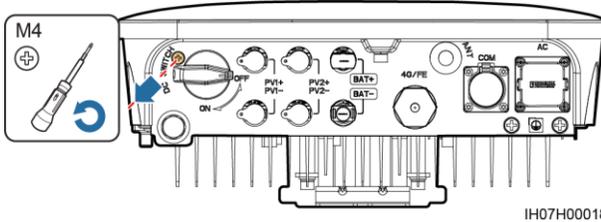
No.	Acceptance Criteria
1	The solar inverter is installed correctly and securely.
2	The WLAN antenna is installed correctly and securely.
3	Cables are routed properly as required by the customer.
4	Cable ties are evenly distributed and no burr exists.
5	The PE cable is connected correctly and securely.
6	The DC switch and all the switches connected to the solar inverter are set to the OFF position.
7	The AC output power cable, DC input power cables, and signal cable are connected correctly and securely.
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 solar inverter and the power grid, check that the AC voltage is within the specified range using a multimeter set to the AC position.
- If the solar inverter is connected to a battery, turn on the DC switch within 1 minute after turning on the AC switch. If you turn on the DC switch after more than 1 minute, the solar inverter will shut down and start again.

1. If a battery is connected, turn on the battery switch.
2. Turn on the AC switch between the solar inverter and the power grid.
3. (Optional) Remove the screw for locking the DC switch.



4. Turn on the DC switch (if any) between the PV string and the solar inverter.
5. Turn on the DC switch at the bottom of the solar inverter.
6. Observe the LED indicators to check the operating status of the solar inverter.

Type	Status (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)		Meaning
Running indication	LED1 	LED2 	N/A
	Steady green	Steady green	The solar 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 solar inverter is not exporting power to the power grid.
	Off	Blinking green at long intervals	The DC is off and the AC is on.
	Off	Off	Both the DC and AC are off.
	Blinking red at short intervals	-	There is a DC environmental alarm, such as an alarm indicating that High String Input Voltage, String Reverse Connection, or Low Insulation Resistance.
	-	Blinking red at short intervals	There is an AC environmental alarm, such as an alarm indicating Grid Undervoltage, Grid Overvoltage, Grid Overfrequency, or Grid Underfrequency.
	Steady red	Steady red	Fault.

Type	Status (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)	Meaning
Communication indication	LED3 	N/A
	Blinking green at short intervals	Communication is in progress.
	Blinking green at long intervals	A mobile phone is connected to the solar inverter.
	Off	There is no communication.

Type	Status			Meaning
Device replacement indication	LED1 	LED2 	LED3 	N/A
	Steady red	Steady red	Steady red	The solar inverter hardware is faulty. The solar inverter needs to be replaced.

6 Commissioning

NOTE

- The screenshots are for reference only. The actual screens prevail.
- Obtain the initial password for connecting to the solar inverter WLAN from the label on the side of the solar inverter.
- To ensure account security, change the password periodically and keep the new password in mind. Not changing the 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.

6.1 Downloading the App

Search for **FusionSolar** in Google Play or scan the corresponding QR code, download the latest installation package.



Google Play
(Android)



FusionSolar Server
(Android)

6.2 (Optional) Registering an Installer Account

NOTE

If you already have an installer account, skip this step.

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

English

FusionSolar

user name, phone or email

Please enter the password.

Auto Login Forgot Password?

Login

No Account? Demo Site

Role

Select your role.

Select your role type from the lower part to enjoy exclusive functions.

Owner Role

Real-time acquisition of the running status of the plant

Contact the installer to create an account for you.

Installer Role

Quick site deployment, plant O&M, and plant operation monitoring

Click here to create your account.

Installer Registration

Note: If your company has registered an account, you do not need to register the account again. Contact the administrator to add the registered account to the user list.

Company Name

Please enter the email address.

Please enter the email address again.

Please enter a user name

Please enter the password.

Please confirm the password.

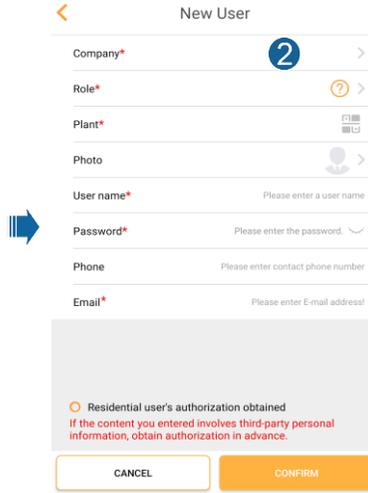
Please enter the verification code.

I have read and agree to the Terms of Use and Privacy Policy

Registration

NOTICE

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



6.3 Creating a PV Plant and a Plant Owner



NOTE
For details, see *FusionSolar App Quick Guide*, you can download it by scanning the QR code below.

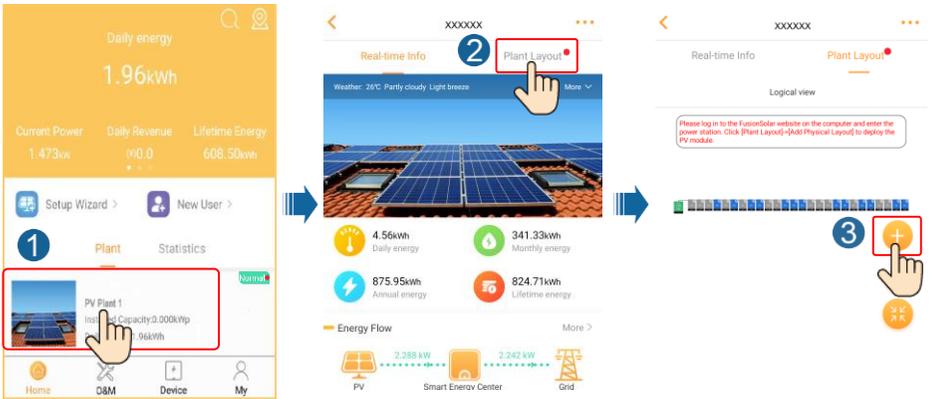


6.4 Setting the Physical Layout of Smart PV Optimizers

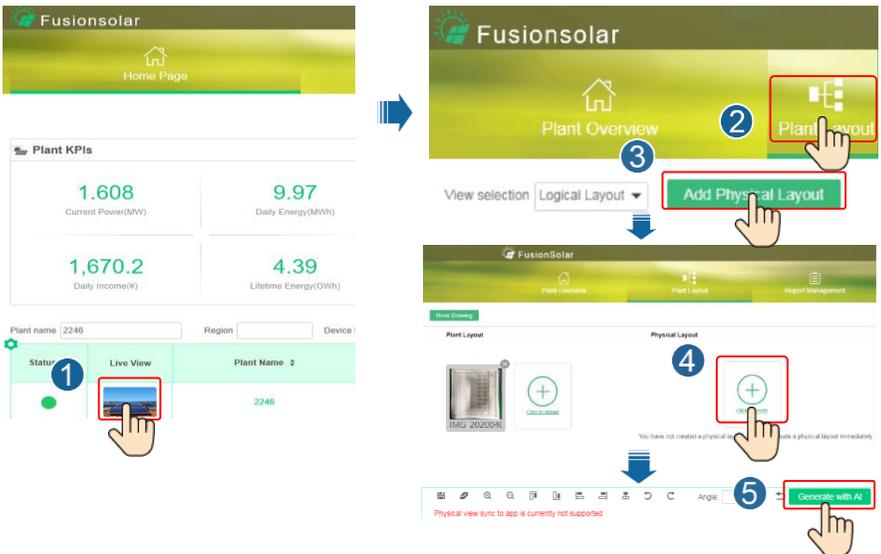
- NOTE**
- If Smart PV Optimizers are configured for PV strings, ensure that the Smart PV Optimizers have been successfully connected to the solar inverter before performing the operations in this section.
 - Check that the SN labels of Smart PV Optimizers are correctly attached to the physical layout template.
 - Take and save a photo of the physical layout template. Place the template on a flat surface. Keep your phone parallel to the template and take a photo in landscape mode. Ensure that the four positioning points in the corners are in the frame. Ensure that each QR code is attached within the frame.
 - For details about the physical layout of Smart PV Optimizers, see *FusionSolar App Quick Guide*.

Scenario 1: Setting on the FusionSolar Server Side (Solar Inverter Connected to the Management System)

1. Tap the plant name on the **Home** screen to access the plant screen. Select **Plant layout**, tap  and upload the physical layout template photo of the PV plant as prompted.

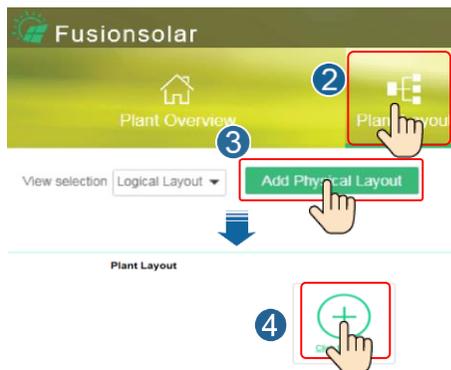
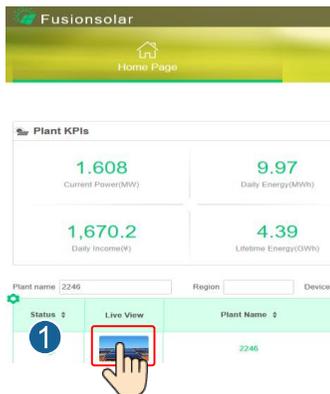


2. Log in to <https://intl.fusionsolar.huawei.com> to access the WebUI of the FusionSolar Smart PV Management System. On the **Homepage** page, click the plant name to go to the plant page. Select **Plant layout**. Choose  > **Generate with AI**, and create a physical layout as prompted. You can also manually create a physical location layout.



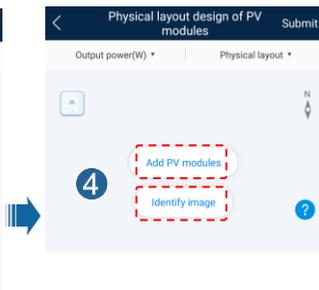
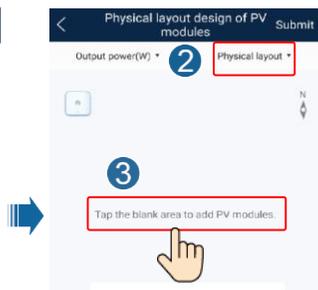
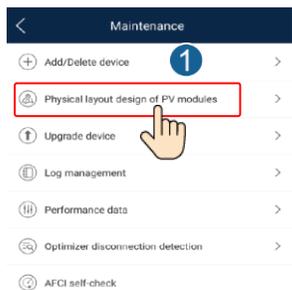
NOTE

You can also upload the physical layout template photo on the WebUI as follows: 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 go to the plant page. Choose **Plant layout**, click **Add Physical Layout** > , and upload the physical layout template photo.



Scenario 2: Setting on the Solar Inverter Side (Solar Inverter Not Connected to the Management System)

- If the solar inverter is not connected to the FusionSolar Smart PV Management System, access the **Device commissioning** screen (Refer to 7.1 Device Commissioning.) on the FusionSolar app to set the physical layout of Smart PV Optimizers.
 - Log in to the FusionSolar app. On the **Device commissioning** screen, choose **Maintenance > Physical layout design of PV modules**. The **Physical layout design of PV modules** screen is displayed.
 - Tap the blank area. The **Identify image** and **Add PV modules** buttons are displayed. You can use either of the following methods to perform operations as prompted:
 - Method 1: Tap **Identify image** and upload the physical layout template photo to complete the optimizer layout. (The optimizers that fail to be identified need to be manually bound.)
 - Method 2: Tap **Add PV modules** to manually add PV modules and bind the optimizers to the PV modules.

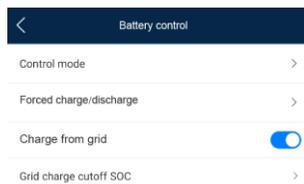


6.5 Setting Battery Parameters

NOTE

If the solar inverter connects to batteries, set battery parameters.

- Log in to the **FusionSolar** app and choose **My > Device commissioning**. The **Device commissioning** screen (Refer to 7.1 Device Commissioning.) is displayed.
- Choose **Power adjustment > Battery control** and set battery parameters, including **Charge from grid**, **Control mode (Fixed charge/discharge, Maximum self-consumption, Time-of-use)**, **Forced charge/discharge**, and so on.



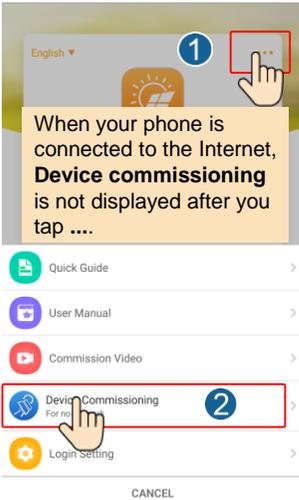
7 FAQ

7.1 Device Commissioning

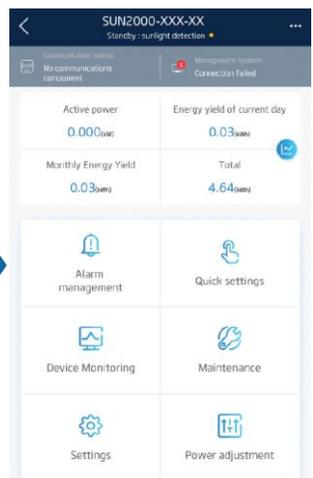
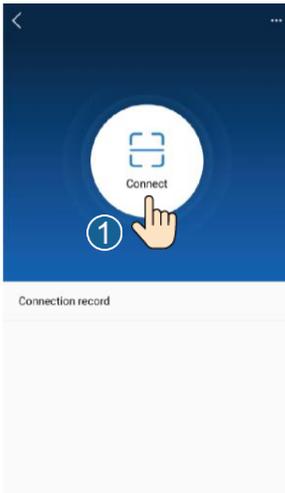
1. Access Device commissioning.

Scenario 1: Your phone is not connected to the Internet.

Scenario 2: Your phone is connected to the Internet.



2. Connect to the solar inverter WLAN and log in as installer to access the device commissioning screen.



7.2 Resetting the Password

1. Ensure that the SUN2000 connects to the AC and DC power supplies at the same time. Indicators  and  are steady green or blink at long intervals for more than 3 minutes.
2. Perform the following operations within 3 minutes:
 - a. Turn off the AC switch and set the DC switch at the bottom of the SUN2000 to OFF. If the SUN2000 connects to batteries, turn off the battery switch. Wait until all the LED indicators on the SUN2000 panel turn off.
 - b. Set the DC switch to ON and ensure that the AC power supply is not connected and the indicator  is blinking green at long intervals.
 - c. Set the DC switch to OFF and wait until all LED indicators on the SUN2000 panel are off.
 - d. Set the DC switch to ON. Ensure that the AC power supply is not connected.
3. Reset the password within 10 minutes. (If no operation is performed within 10 minutes, all inverter parameters remain unchanged.)
 - a. Wait until the indicator  blinks green at long intervals.
 - b. Obtain the initial WLAN hotspot name (SSID) and initial password (PSW) from the label on the side of the SUN2000 and connect to the app.
 - c. On the login screen, set a new login password and log in to the app.
4. Set router and management system parameters to implement remote management.

