# SUN2000-(8KTL-20KTL)-M2

# **Quick Guide**

Issue: 07

Part Number: 31500BCA

Date: 2021-12-17



**HUAWEI TECHNOLOGIES CO., LTD.** 

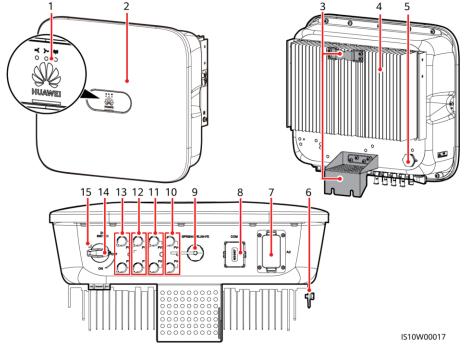
#### NOTICE

 The information in this document is subject to change due to version upgrades or other reasons. 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.



- Before installing the device, read the user manual carefully to get familiar with product information and safety precautions.
- Only qualified and trained electrical technicians are allowed to operate the device. Operation
  personnel should understand the composition and working principles of the grid-tied PV
  power system and local regulations.
- 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. Use insulating tools when installing the device. For personal safety, wear proper personal protective equipment (PPE).
- 6. Huawei shall not be liable for any consequences caused by the violation of the storage, transportation, installation, and operation regulations specified in this document and the user manual.



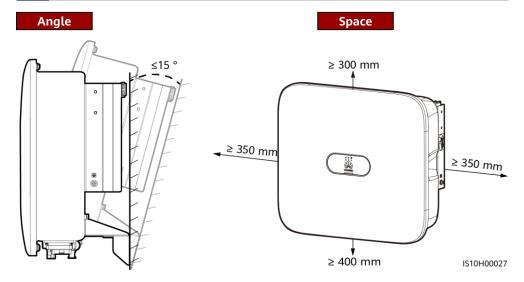


- (1) LED
- (3) Hanging kit
- (5) Ventilation valve
- (7) AC output port (AC)
- (9) Smart Dongle port (GPRS/4G/WLAN-FE)
- (11) DC input terminals (PV3+/PV3-)
- (13) DC input terminals (PV1+/PV1-)
- (15) Screw hole for the DC switch (for Australia only)

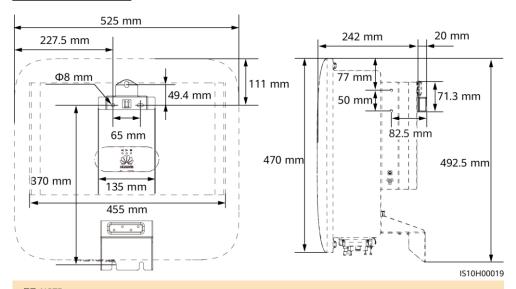
- (2) Front panel
- (4) Heat sink
- (6) Ground screw
- (8) Communications port (COM)
- (10) DC input terminals (PV4+/PV4-)
- (12) DC input terminals (PV2+/PV2-)
- (14) DC switch (DC SWITCH)

# 2 Installing the Equipment

# 2.1 Installation Requirements



### **Dimensions**



#### ☐ NOTE

Two M6 screw holes are reserved on both left and right sides of the inverter for installing an awning.

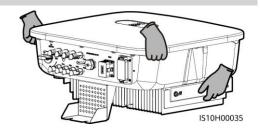
### 2.2 Installing the Inverter

#### **Moving an Inverter**

#### **⚠** DANGER

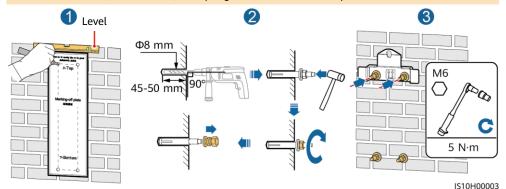
When drilling holes, avoid the water pipes and power cables buried in the wall.

1. Install the mounting bracket.



#### ☐ NOTE

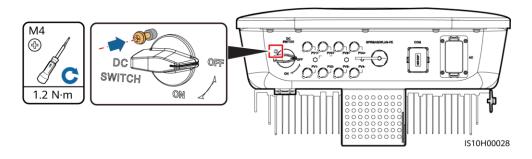
- M6x60 expansion bolts are delivered with the inverter. If the length and number of the bolts
  do not meet installation requirements, prepare M6 stainless steel expansion bolts by yourself.
- The expansion bolts delivered with the inverter are used for solid concrete walls. For other
  types of walls, 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.



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

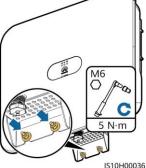
#### □ NOTE

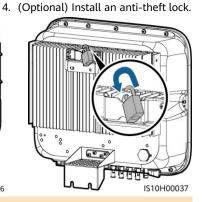
- The screws for DC switches are delivered with solar inverters. According to Australian standards, the screws are used to secure DC switches (DC SWITCH) to prevent them from being turned on by mistake.
- For the model used in Australia, perform this step to meet the local standards.



3. Install the inverter on the mounting bracket.







#### ☐ 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

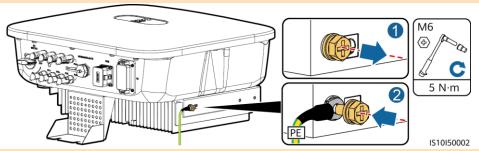
- Connect cables in accordance with the local installation laws and regulations.
- Before connecting cables, ensure that the DC switch on the inverter and all the switches
  connecting to the inverter are set to OFF. Otherwise, the high voltage of the inverter may
  result in electric shocks.

No.	Item	Туре	Specifications
1	PE cable	Single-core outdoor copper cable	Conductor cross-sectional area:  • ≥ 6 mm² (SUN2000-8KTL-M2/SUN2000- 10KTL-M2/SUN2000-12KTL-M2)  • ≥ 10 mm² (SUN2000-15KTL-M2/SUN2000- 17KTL-M2/SUN2000-20KTL-M2)
2	AC output power cable	Outdoor copper cable	Conductor cross-sectional area:  • 6–16 mm² (SUN2000-8KTL-M2/SUN2000- 10KTL-M2/SUN2000-12KTL-M2)  • 10–16 mm² (SUN2000-15KTL-M2/SUN2000- 17KTL-M2/SUN2000-20KTL-M2) Cable outer diameter: 11–26 mm
3	DC input power cable	Standard outdoor PV cable in the industry	<ul> <li>Conductor cross-sectional area: 4–6 mm<sup>2</sup></li> <li>Cable outer diameter: 5.5–9 mm</li> </ul>
4	(Optional) RS485 communications cable	Two-core outdoor shielded twisted	Conductor cross-sectional area: 0.2–1 mm <sup>2</sup> (0.5 mm <sup>2</sup> is recommended)
5	(Optional) RS485 power meter signal cable	pair cable	Cable outer diameter: 4–11 mm
6	(Optional) Rapid shutdown switch signal cable		
7	(Optional) Grid scheduling signal cable	Five-core outdoor cable	

### 3.2 Installing the PE Cable

#### **A** DANGER

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



#### NOTE

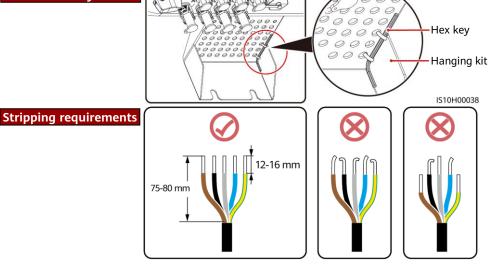
- The PE point at the AC output port is used only as a PE equipotential point, and cannot substitute for the PE point on the enclosure.
- It is recommended that silica gel or paint be used around the ground terminal after the PE cable is connected.

# 3.3 Installing the AC Output Power Cable

#### NOTICE

Hex key

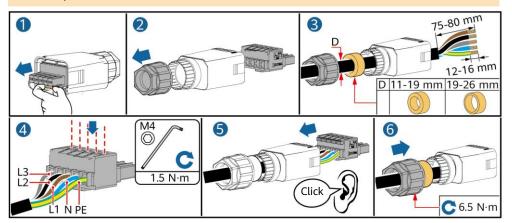
- Ensure that the protection layer of the AC output power cable is inside the connector, the core wires are totally inserted into the cable hole, and the cable is connected securely. Failing to do so may cause device malfunction or damage.
- The hex key is delivered with the inverter and bound to the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



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

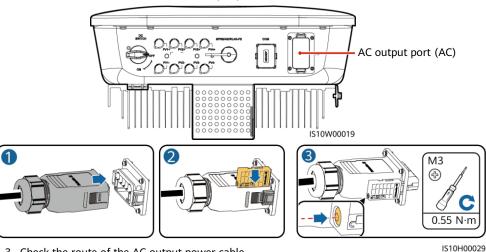
#### ☐ NOTE

- This section describes how to connect a five-core AC output power cable to an AC connector.
- A three-core AC output power cable can be connected similarly. The three-core cable (L1, L2, and L3) is not connected to the neutral wire or PE wire.
- A four-core or five-core AC output power cable can be connected similarly. The four-core cable (L1, L2, L3, and PE) is not connected to the N wire, and the four-core cable (L1, L2, L3, and N) is not connected to the PE wire.

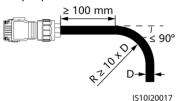


2. Connect the AC connector to the AC output port.

IS10I20013



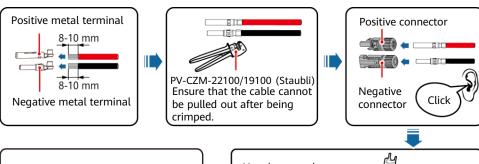
3. Check the route of the AC output power cable.

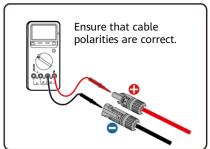


## 3.4 Installing the DC Input Power Cable

#### NOTICE

- 1. Ensure that the PV module output is well insulated to ground.
- 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 SUN2000 shall not exceed 1080 V DC under any circumstance.
- 4. Before installing the DC input power cable, label the cable polarities to ensure correct cable connections.
- 5. 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.
- 1. Assemble DC connectors.



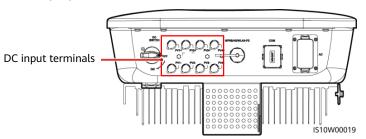


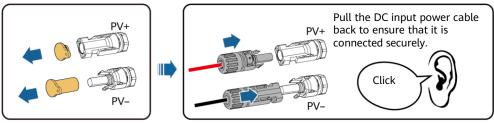
Use the wrench shown in the figure to tighten the locking nut. When the wrench slips during the tightening, the locking nut has been tightened.

PV-MS-HZ
Open-end Wrench (Staubli)

2. Connect DC input power cables.

IH07I30001





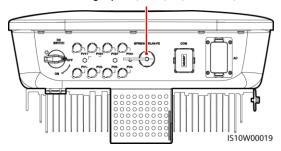
IH07I30002

### 3.5 (Optional) Installing the Smart Dongle

#### ☐ NOTE

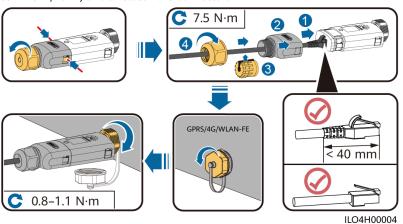
- If WLAN-FE communication is used, install a WLAN-FE Smart Dongle (SDongleA-05).
- If 4G communication is used, install a 4G Smart Dongle (SDongleA-03).
- You need to purchase the Smart Dongle by yourself.

#### Smart Dongle port (GPRS/4G/WLAN-FE)



## WLAN-FE Smart Dongle (FE Communication)

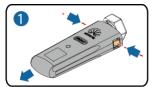
You are advised to use a CAT 5E outdoor shielded network cable (outer diameter < 9 mm; internal resistance  $\leq$  1.5  $\Omega/10$  m) and shielded RJ45 connectors.

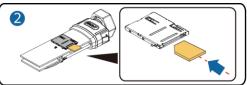


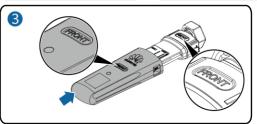
### 4G Smart Dongle (4G Communication)

#### NOTICE

- 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).











IS10H00016

#### ☐ 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.



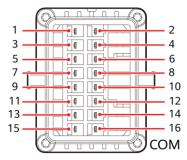


# 3.6 (Optional) Installing the Signal Cable

### 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.

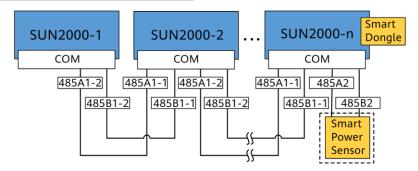
#### **Communications Port Pin Definition**



IS10W00002

Pin	Definition	Function	Description	Pin	Definition	Function	Description
1	485A1-1	RS485 differentia l signal+	Used to cascade inverters or connect to the RS485 signal	2	485A1-2	RS485 differential signal+	Used to cascade inverters or connect to the
3	485B1-1	RS485 differentia l signal-	port on the SmartLogger	4	485B1-2	RS485 differential signal–	RS485 signal port on the SmartLogger
5	PE	Shielding ground	N/A	6	PE	Shielding ground	N/A
7	485A2	RS485 differentia l signal+	Used to connect to an RS485 signal port on a Smart	8	DIN1	Dry contact interface for grid	N/A
9	485B2	RS485 differentia l signal–	Power Sensor for export limitation	10	DIN2	scheduling	
11	N/A	N/A	N/A	12	DIN3		
13	GND	GND	Used to connect to	14	DIN4		
15	DIN5	Rapid shutdown signal+ the rapid shutdow DI signal port or serve as a port for the signal cable of the NS protection.	16	GND			

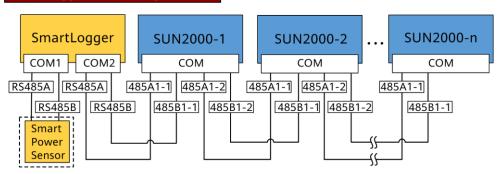
#### Smart Dongle Networking Scenario



#### 

- In the Smart Dongle networking scenario, the SmartLogger cannot be connected.
- The Smart Power Sensor is necessary for export limitation. Only the DTSU666-H Smart Power Sensor (provided by Huawei) can be used.

## **SmartLogger Networking Scenario**

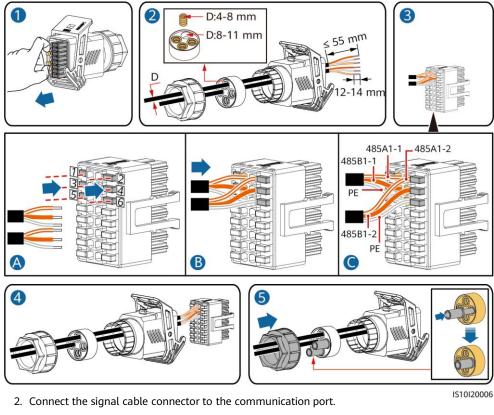


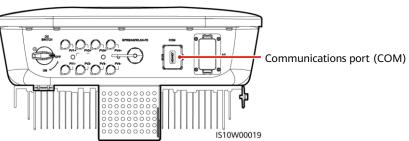
#### ∩ NOTE

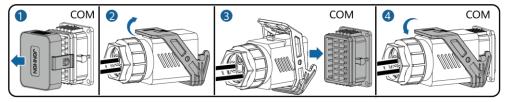
- In the SmartLogger networking scenario, the Smart Dongle cannot be connected.
- A maximum of 80 devices can connect to a single SmartLogger, such as inverters, Smart Power sensor, and EMI. You are advised to connect fewer than 30 devices to each RS485 route.
- The Smart Power Sensor is necessary for 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.



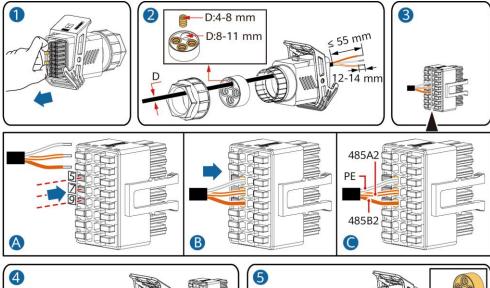


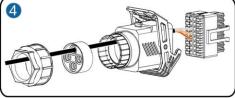


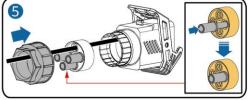
IS10I20007

### (Optional) Installing the Smart Power Sensor Signal Cable

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

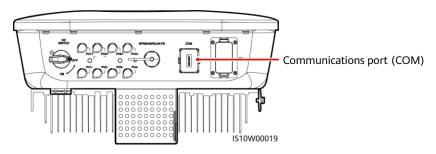


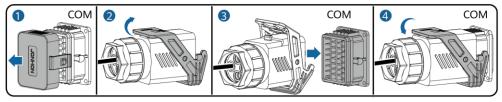




IS10I20008

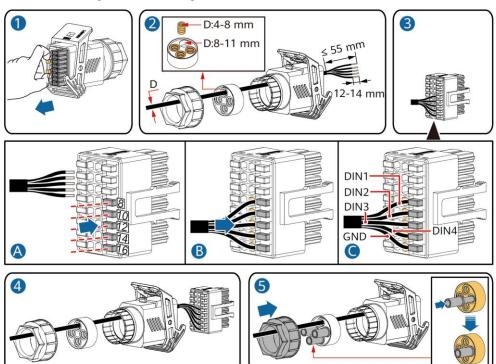
2. Connect the signal cable connector to the communication port.



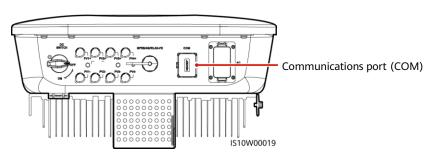


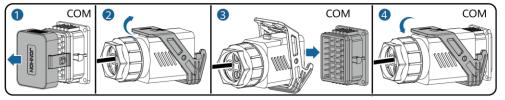
## (Optional) Installing the Grid Scheduling Dry Contact Signal Cable

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



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





IS10I20010

# 4 Verifying Installation

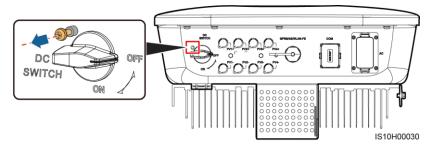
No.	Acceptance Criteria		
1	The inverter is installed correctly and securely.		
2	Cables are routed properly as required by the customer.		
3	The Smart Dongle is installed correctly and securely.		
4	Cable ties are evenly distributed and no burr exists.		
5	The PE cable is connected correctly, securely, 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. (Optional) Remove the screw for locking the DC switch.



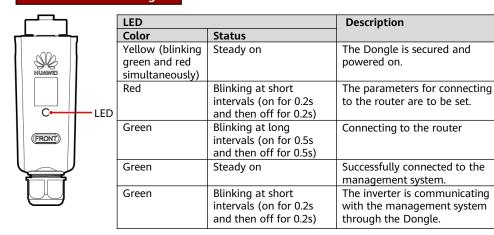
- 3. If there is a DC switch between the PV string and the inverter, turn on the DC switch.
- 4. Turn on the DC switch at the bottom of the inverter.

5. Observe the LEDs to check the operating status of the inverter.

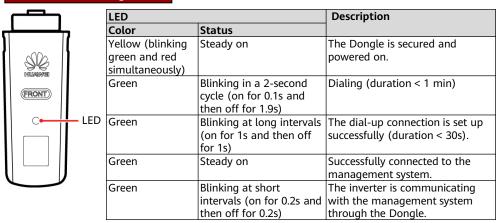
Туре	Status (Blinking at long intervals: On for 1s and then Off for 1s; Blinking at short Intervals: On for 0.2s and then Off for 0.2s)			Meaning	
Running indication			)~ O	N/A	
	Steady green	n Steady (	green	The solar inverter is operating in grid-tied mode.	
	Blinking gree at long intervals	en Off		The DC is on and the AC is off.	
	Blinking gree at long intervals	en Blinking long int	green at ervals	Both the DC and AC are on, and the solar inverter is not exporting power to the power grid.	
	Off	Blinking long int	green at ervals	The DC is off and the AC is on.	
	Off	Off		Both the DC and AC are off.	
	Blinking red short interva			There is a DC environmental alarm, such as an alarm indicating that High String Input Voltage, String Reverse Connection, or Low Insulation Resistance.	
	N/A	Blinking short in		There is an AC environmental alarm, such as an alarm indicating Grid Undervoltage, Grid Overvoltage, Grid Overfrequency, or Grid Underfrequency.	
	Steady red	Steady r	ed	Fault.	
Communication indication	(p)			N/A	
	Blinking green at short intervals			Communication is in progress.	
	Blinking green at long intervals			A mobile phone is connected to the sola inverter.	
	Off			There is no communication.	
Device replacement indication		]~ O	(P)	N/A	
marcation	Steady red	Steady red	Steady red	The solar inverter hardware is faulty. The solar inverter needs to be replaced.	

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

#### **WLAN-FE Smart Dongle**



#### 4G Smart Dongle



# **6** Commissioning

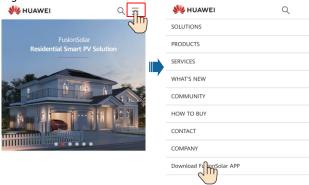
#### ☐ NOTE

- The screenshots are for reference only. The actual screens may vary.
- 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.
- Before maintaining the optimizers and PV strings, turn off the AC switch and set the DC switch to OFF. Otherwise, the PV strings may be energized, resulting in electric shocks.

# 6.1 Downloading the App

Method 1: Search for FusionSolar on Huawei AppGallery and download the latest installation package.

Method 2: Access https://solar.huawei.com using the mobile phone browser and download the latest installation package.



Method 3: Scan the following QR code and download the latest installation package.



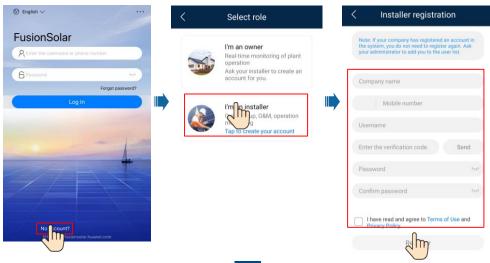
**FusionSolar** 

# 6.2 (Optional) Registering an Installer Account

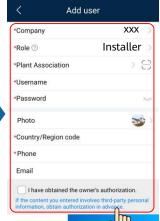
☐ NOTE

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

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







#### NOTICE

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

# 6.3 Creating a PV Plant and a Plant Owner





#### **™** NOTE

- In the quick settings, the grid code is set to N/A by default (automatic startup is not supported). Set the grid code based on the area where the PV plant is located.
- For details, see the FusionSolar App Quick Guide.
   You can scan the QR code to download the quick quide.



# 6.4 Setting the Physical Layout of Smart PV Optimizers

#### ∩ NOTE

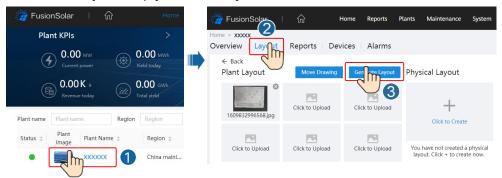
- If Smart PV Optimizers are configured for PV strings, ensure that the Smart PV Optimizers have been successfully connected to the solar inverter before performing the operations in this section
- The PV strings connecting to the same MPPT route should contain the same number and model of PV modules or Smart PV optimizers.
- 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 **layout**, tap and upload the physical layout template photo of the PV plant as prompted.

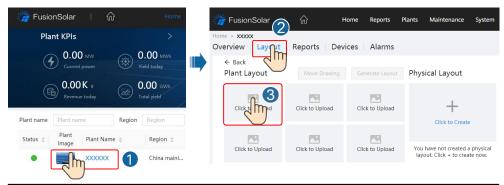


 Log in to https://intl.fusionsolar.huawei.com to access the WebUI of the FusionSolar Smart PV Management System. On the Home page, click the plant name to go to the plant page.
 Select layout. Choose Generate layout, and create a physical layout as prompted. You can also manually create a physical location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



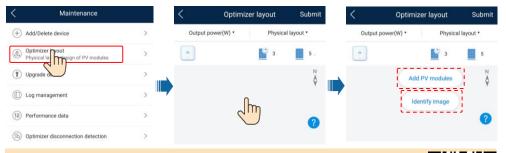
#### 

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 PV Monitor Smart PV Management System. On the **Home** page, click the plant name to go to the plant page. Select **layout**. Choose **Click to Upload**, 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
     Optimizer layout. The Optimizer layout screen is displayed.
  - b. 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.



#### ☐ NOTE

For details about the physical layout of optimizers on the FusionSolar app and FusionSolar WebUI, see the *FusionSolar App Quick Guide*. You can scan the QR code to download the quick guide.





## **6.5** SmartLogger Networking Scenario

For details, see the *Distributed PV Plants Connecting* to *Huawei Hosting Cloud Quick Guide (Distributed Solar Inverters + SmartLogger1000A + RS485 Networking)* and *PV Plants Connecting to Huawei Hosting Cloud Quick Guide (Inverters + SmartLogger3000 + RS485 Networking)*. You can scan the QR codes to obtain the documents.





SmartLogger1000A

SmartLogger3000

# 7 FAQ

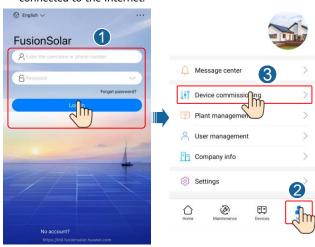
# 7.1 Device Commissioning

1. Access Device commissioning.

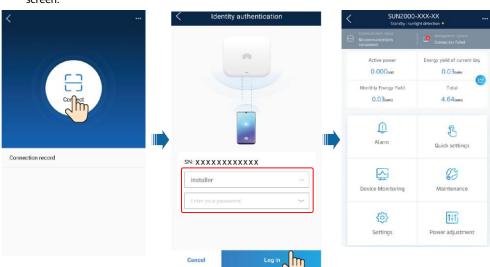
Scenario 1: Your phone is not connected to the Internet.



Scenario 2: Your phone is connected to the Internet.



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. Wait until all the LED indicators on the SUN2000 panel turn off.

  - Turn off the AC switch and set the DC switch to OFF. Wait until all LED indicators on the SUN2000 panel are off.
  - d. Turn on the AC switch and set the DC switch to ON.
- 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

# 8 Installation Video

**MOTE** 

You can scan the QR code below to obtain the installation video.



# 8 Customer Service Contact

Customer Service Contact						
Region	Country	Service Support Email	Phone			
	France					
	Germany		0080033888888			
	Spain					
Europe	Italy	eu_inverter_support@huawei.com				
	UK					
	Netherlands					
	Other countries	For details, see solar.huawei.com.				
	Australia	eu_inverter_support@huawei.com	1800046639			
	Turkey	eu_inverter_support@huawei.com	N/A			
	Malaysia		0080021686868 /1800220036			
Asia Pacific	Thailand	apsupport@huawei.com	(+66) 26542662 (charged by local call)			
			1800290055 (free in Thailand)			
	China	solarservice@huawei.com	400-822-9999			
	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	N/A			
North	USA	eu_inverter_support@huawei.com	1-877-948-2934			
America	Canada	eu_inverter_support@huawei.com	1-855-482-9343			
	Mexico		018007703456 /0052-442-4288288			
Latin America	Argentina	la_inverter_support@huawei.com	0-8009993456			
Latin America	Brazil	ta_inverter_support@ndawer.com	0-8005953456			
	Chile		800201866 (only for fixed)			
	Other countries		0052-442-4288288			
	Egypt		08002229000 /0020235353900			
	UAE		08002229000			
Middle East	South Africa		0800222900			
and Africa	Saudi Arabia	eu_inverter_support@huawei.com	8001161177			
	Pakistan		0092512800019			
	Morocco		0800009900			
	Other countries		0020235353900			