FusionSolar Residential Smart PV Quick Guide
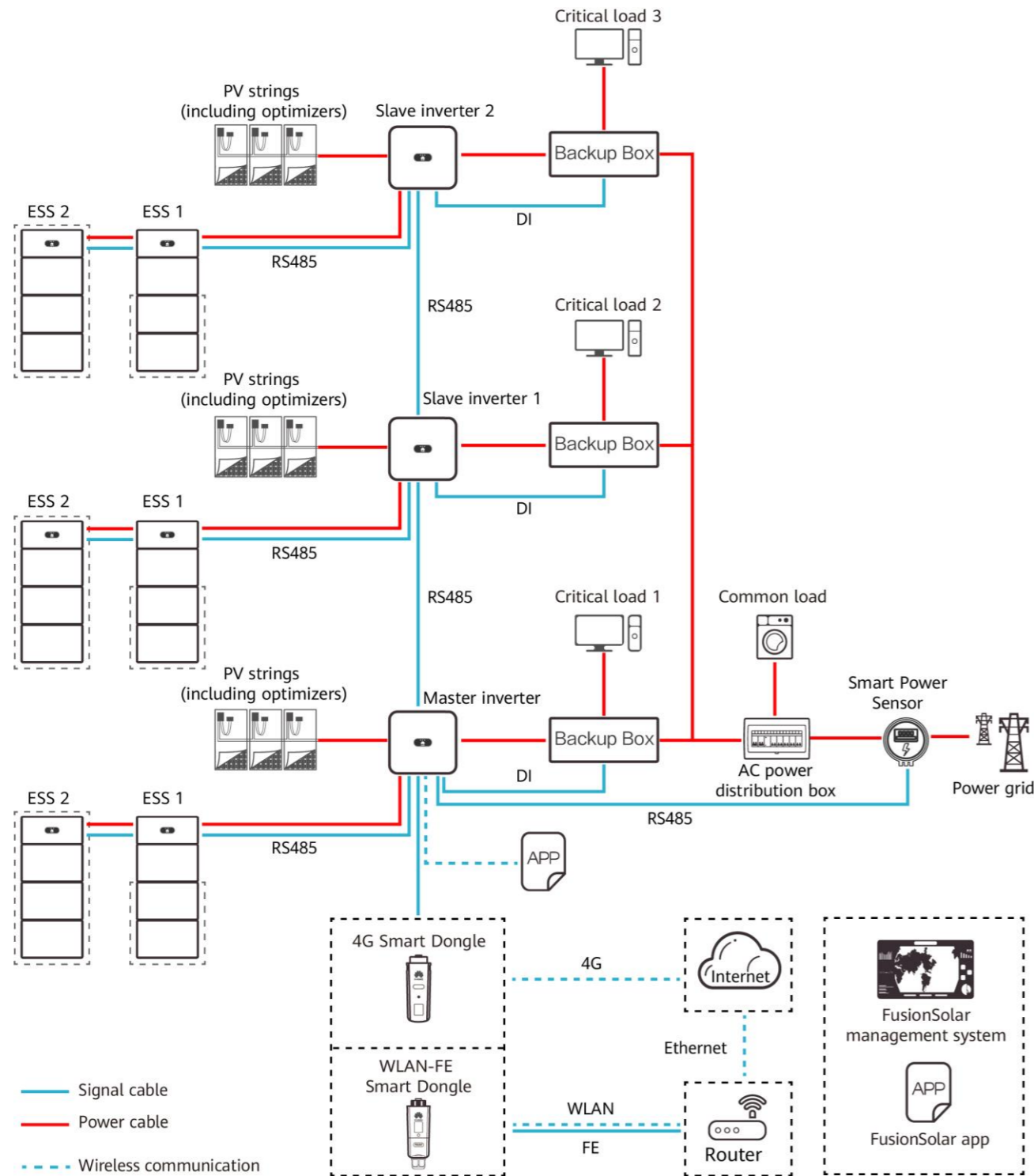## (Single-phase PV+Storage Scenario and Smart Dongle Networking)

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1 Networking

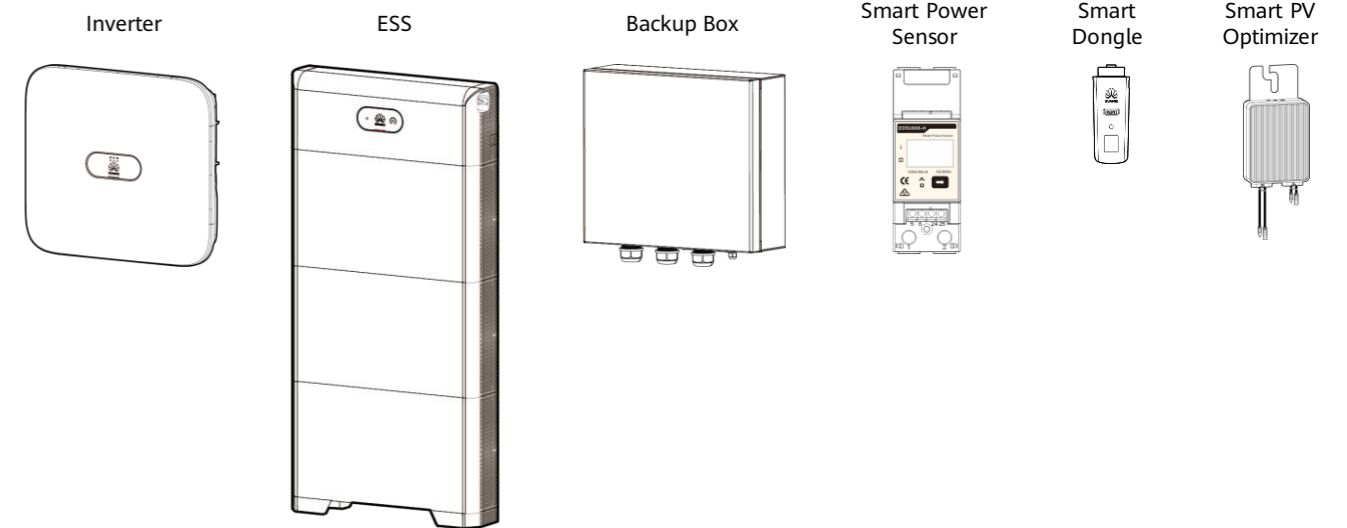- Signal cable
- Power cable
- - - - Wireless communication

2 Product Overview

Inverter | ESS | Backup Box | Smart Power Sensor | Smart Dongle | Smart PV Optimizer

Component	Model	Description
Inverter (master and slave)	SUN2000-2KTL-L1 SUN2000-3KTL-L1 SUN2000-3.68KTL-L1 SUN2000-4KTL-L1 SUN2000-4.6KTL-L1 SUN2000-5KTL-L1 SUN2000-6KTL-L1	A maximum of three inverters can be cascaded.
Energy storage system (ESS)	LUNA2000-(5-30)-S0	• 5 kWh per battery module, system capacity up to 30 kWh when two ESSs are cascaded • If there is only one ESS, it must be connected to the master inverter.
Backup Box	Backup Box-B0	• AC input voltage range: 198–253 V • If there is only one Backup Box, it must be connected to the master inverter.
Smart Power Sensor	DDSU666-H	• The Smart Power Sensor must be connected to the master inverter. • It connects to the inverter over RS485 for output power management and power limiting.
Smart Dongle	SDongleA-03 (4G) SDongleA-05 (WLAN-FE)	• The Smart Dongle must be connected to the master inverter. • It connects to the management system and performs power scheduling.
Smart PV Optimizer	SUN2000-450W-P2 SUN2000-600W-P	SUN2000-600W-P: Long and short input cables are available to connect to PV modules with different cable lengths.

📖 NOTE

1. The information in this document is subject to change due to version upgrade 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.
2. For details about the solution components, installation, and cable connections, see the corresponding user manuals and quick guides.
3. The cable colors involved in this document are for reference only. Select cables in accordance with local cable specifications.
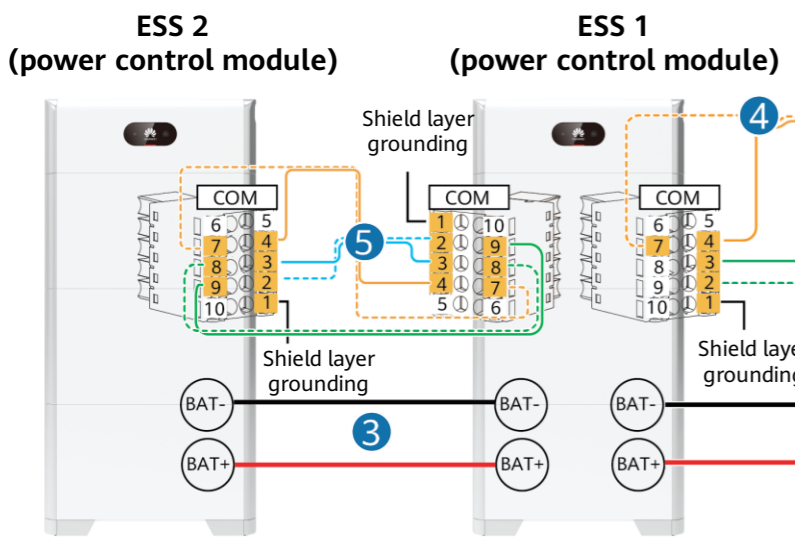
3 Cable Connections

⚠ **DANGER**

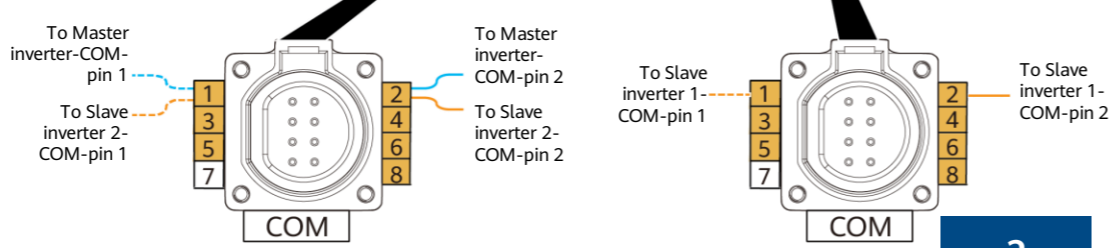Before connecting cables, ensure that all switches are OFF. Otherwise, electric shocks may occur.

NOTICE

Signal cables must be outdoor shielded twisted pair cables.
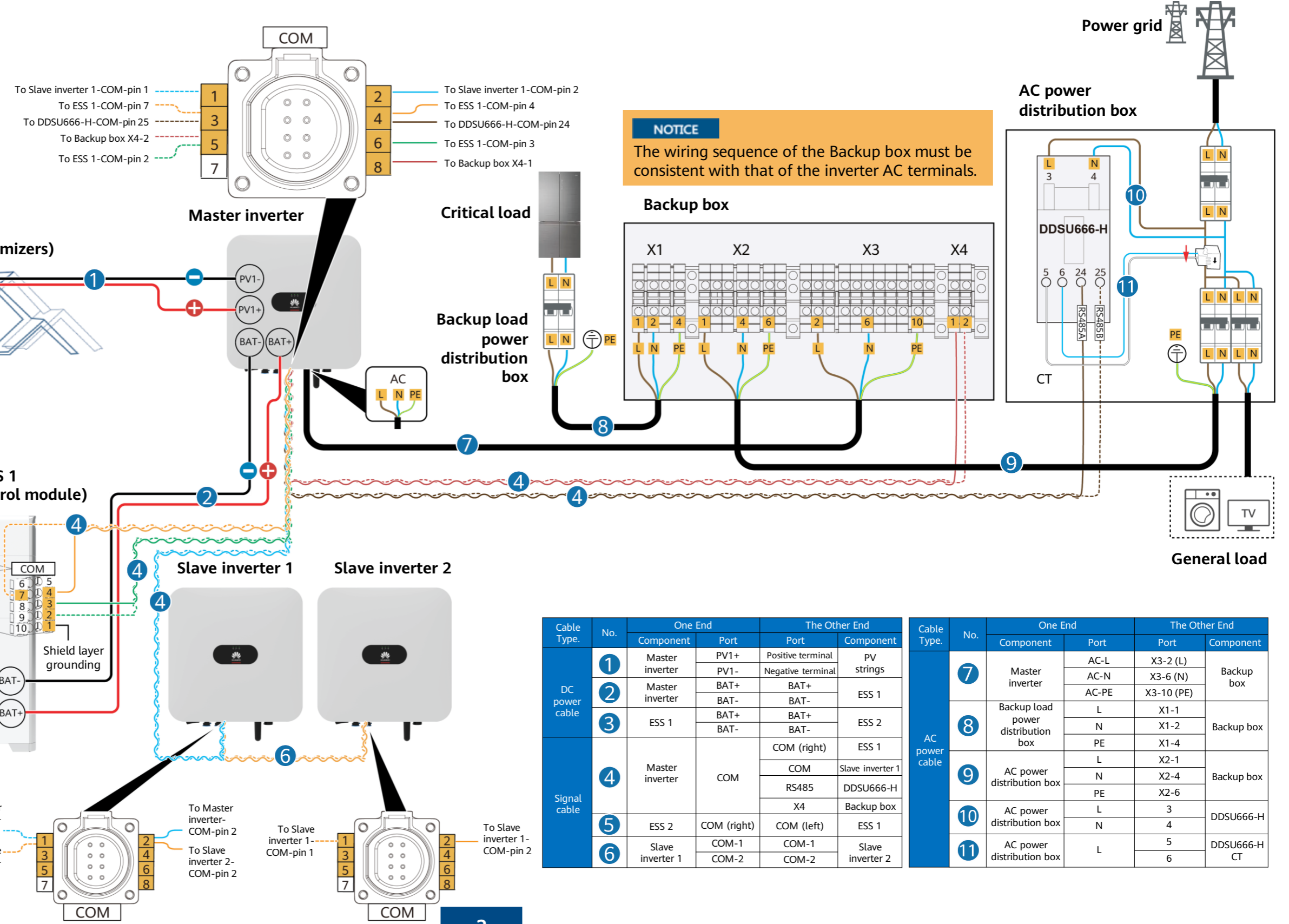
NOTICE

The wiring sequence of the Backup box must be consistent with that of the inverter AC terminals.

Power grid

AC power distribution box

DDSU666-H

Master inverter

COM

To Slave inverter 1-COM-pin 1
To ESS 1-COM-pin 7
To DDSU666-H-COM-pin 25
To Backup box X4-2
To ESS 1-COM-pin 2

To Slave inverter 1-COM-pin 2
To ESS 1-COM-pin 4
To DDSU666-H-COM-pin 24
To ESS 1-COM-pin 3
To Backup box X4-1

PV strings (including optimizers)

Critical load

Backup box

X1 X2 X3 X4

Backup load power distribution box

ESS 2 (power control module)

ESS 1 (power control module)

Shield layer grounding

Shield layer grounding

Shield layer grounding

General load

Slave inverter 1

Slave inverter 2

NOTICE

Connect other cables to slave inverters by referring to the connection method for the master inverter.

To Master inverter-COM-pin 1
To Slave inverter 2-COM-pin 1

To Master inverter-COM-pin 2
To Slave inverter 2-COM-pin 2

To Slave inverter 1-COM-pin 1

To Slave inverter 1-COM-pin 2

COM

COM

Cable Type.	No.	One End		The Other End	
		Component	Port	Port	Component
DC power cable	1	Master inverter	PV1+	Positive terminal	PV strings
			PV1-	Negative terminal	
	2	Master inverter	BAT+	BAT+	ESS 1
			BAT-	BAT-	
	3	ESS 1	BAT+	BAT+	ESS 2
			BAT-	BAT-	
Signal cable	4	Master inverter	COM	COM (right)	ESS 1
				COM	Slave inverter 1
				RS485	DDSU666-H
				X4	Backup box
	5	ESS 2	COM (right)	COM (left)	ESS 1
	6	Slave inverter 1	COM-1	COM-1	Slave inverter 2
			COM-2	COM-2	

Cable Type.	No.	One End		The Other End	
		Component	Port	Port	Component
AC power cable	7	Master inverter	AC-L	X3-2 (L)	Backup box
			AC-N	X3-6 (N)	
			AC-PE	X3-10 (PE)	
	8	Backup load power distribution box	L	X1-1	Backup box
			N	X1-2	
			PE	X1-4	
	9	AC power distribution box	L	X2-1	Backup box
			N	X2-4	
			PE	X2-6	
	10	AC power distribution box	L	3	DDSU666-H
			N	4	
	11	AC power distribution box	L	5	DDSU666-H CT
				6	

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4 System Commissioning

App-based Deployment Procedure

Download and install the FusionSolar app

↓

Sign up as an installer (optional, required for initial registration)

↓

Enter setup wizard

↓

Check the device status

Downloading and Installing the FusionSolar App

- Search for FusionSolar in the app store to download the app.
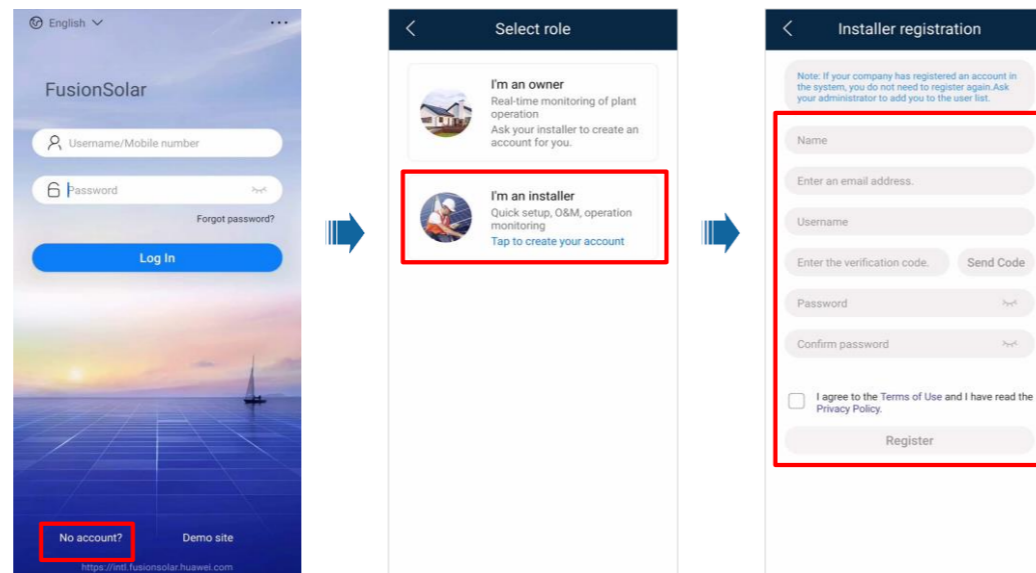- Scan the QR code below to download the app.

FusionSolar

Installer Registration
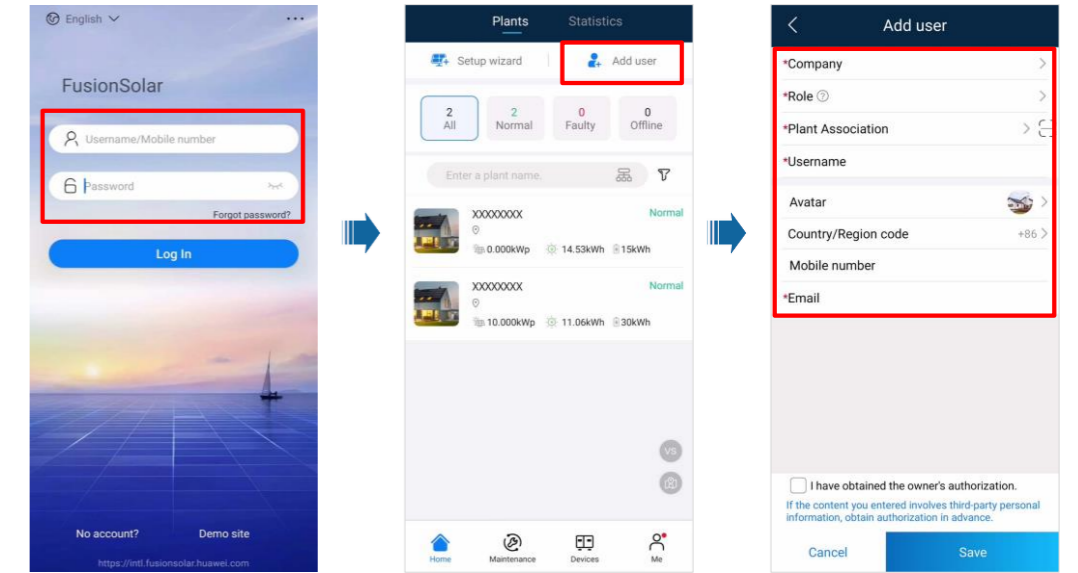
Initial registration

Create the first installer account, and generate a domain named after the company.

Or

Non-initial registration

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

Setup Wizard (Connecting to the Inverter WiFi for Commissioning)
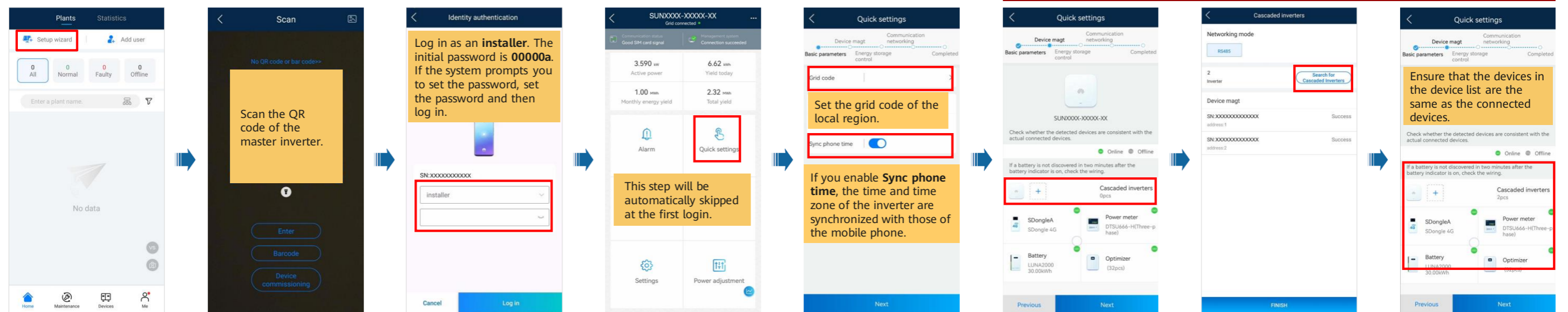
Scan the QR code of the master inverter.

Log in as an **installer**. The initial password is **00000a**. If the system prompts you to set the password, set the password and then log in.

This step will be automatically skipped at the first login.

Set the grid code of the local region.

If you enable **Sync phone time**, the time and time zone of the inverter are synchronized with those of the mobile phone.

(Optional) Cascade inverters.

Ensure that the devices in the device list are the same as the connected devices.

Set the energy storage working mode.

Working mode settings

Maximum self consumption: maximizes the PV energy yields for residential loads. When the PV energy yields are greater than the loads, batteries are charged to store energy. When the PV energy yields are less than the loads (such as nights when the PV modules do not generate power), the batteries discharge to supply power to the loads. This mode is used when the system is configured with PV modules.

TOU: allows the grid to charge batteries in low electricity price periods and discharge batteries to supply power to the loads during high electricity price periods, saving electricity fee. The charge from grid function must be enabled.

Fully fed to grid: maximizes the PV energy yields for grid connection. When the PV energy yields in the daytime are greater than the maximum output capability of the inverter, the batteries are charged to store energy. When the energy yields are less than the maximum output capability of the inverter, batteries discharge to maximize the output energy of the inverter to the grid. This mode is applicable to scenarios where the FIT is higher than the electricity price.

You can tap ⓘ on the screen for more information.

Select an energy storage working mode.

Set the communication networking.

WLAN communication

Select the router you want to connect and enter the router password.

Or

4G communication

By default, **APN mode** is set to **Automatic**. If you cannot access the Internet in the **Automatic** mode, set this to **Manual**. In this case, set the parameters related to the SIM card with the information obtained from the carrier.

Or

FE communication

If the Ethernet parameter is displayed, the network cable is not connected. Reconnect the network cable.

In an inverter cascading scenario, the parameter synchronization result is displayed.

Add a plant.

Add plant

Connect to existing plant

Tips

Connect your phone to the Internet:
Turn off WLAN, enable cellular mobile network, or connect to network:XXX

Add plant — Basic info / Add devices

- *Country/Region
- *Company ⓘ
- *Plant name
- Total string capacity(kWp)
- *Grid connection date
- *Plant address
- *Plant time zone
- Contact Person

Contact method

☐ I have obtained the owner's authorization.

If the content you entered involves third-party personal information, obtain authorization in advance.

Add plant — Add devices

Device SN   Scan the device SN

Added devices

Device SN XXXXXXXXXXXXX
Device type XXXX
Device model XXXX
Connected devices

Create an owner account.

Add user

- *Company
- *Role ⓘ   Owner
- *Plant Association
- *Username
- Avatar
- Country/Region code   +86
- Mobile number
- *Email

☐ I have obtained the owner's authorization.

If the content you entered involves third-party personal information, obtain authorization in advance.

Checking the Device Status
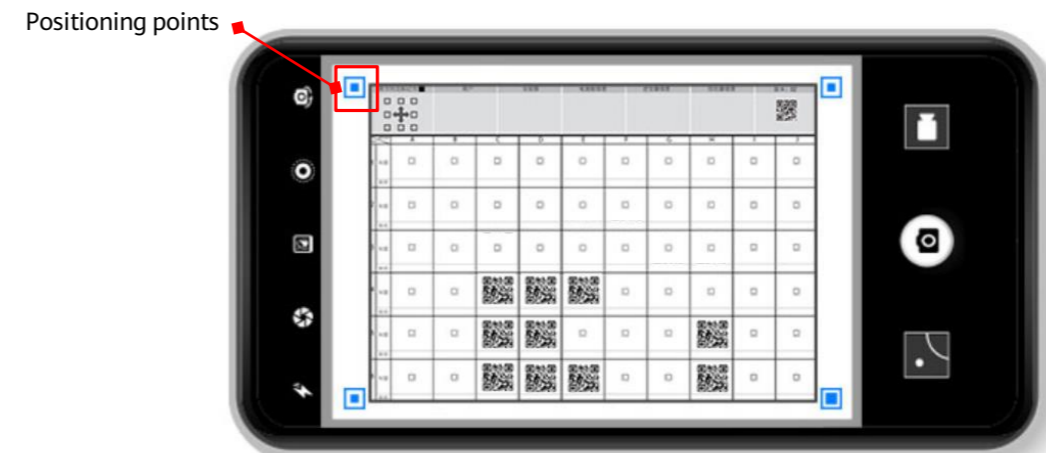
5 Physical Layout of Smart PV Optimizers

Attaching SN Labels

Remove the SN labels from optimizers and attach them to the physical layout template based on the actual positions of the optimizers in the plant.
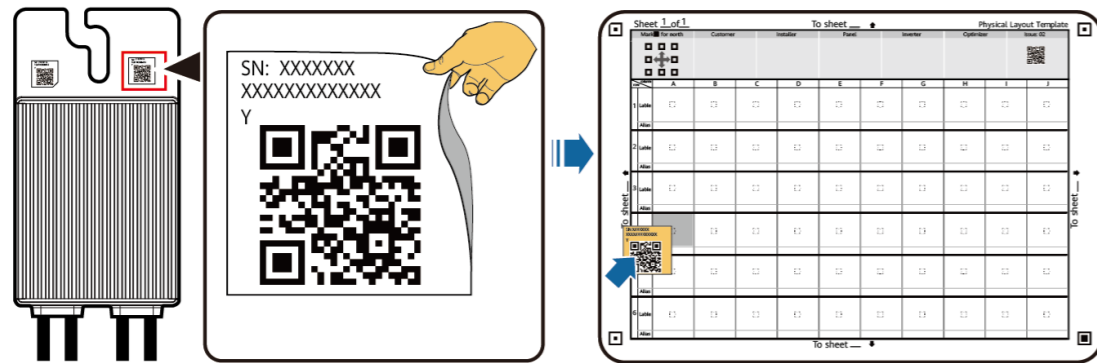
Taking a Photo of the Physical Layout Template

Ensure that the four positioning points on the template are within the frame.

Positioning points

Generating a Physical Layout on the App

Enter the Plant Layout screen.

Upload the template and generate a layout.

Upload the physical layout template.

Add the physical layout template.

After all templates are uploaded, tap **Layout Generation** to generate a physical layout.

If some QR codes cannot be identified or the plant layout needs to be adjusted, log in to the FusionSolar management system WebUI.
For details, see "Creating a Physical Layout on the WebUI Manually."

Generating a Physical Layout on the WebUI Automatically

Select the target PV plant on the home page.

Plant name: | Plant name | Region:
Grid connection date: | Start date | End da

Status	Plant Image	Plant Name
●		407-GJC-TEST

Click the Layout tab.

Overview | **Layout** | Report Management

🏠 station001

☀ 0.00 kWh Yield today

Upload the template and generate a layout.

Plant Layout ⓘ

Click to Upload | Click to Upload

← Back

Plant Layout ⓘ | Update | **Generate** | Move Drawing

IMG_20220428_10... | Click to Upload | Click to Upload | Click to Upload

Result

BT2***305 1.1.1	BT2***607 1.1.2	BT2***628 1.1.3
BT2***017 1.1.4	BT2***686 1.1.5	BT2***305 1.1.9
BT2***628 1.1.6	BT2***017 1.1.7	BT2***686 1.1.8	BT2***607 1.1.10

Cancel | Save

Creating a Physical Layout on the WebUI Manually

Select the target PV plant on the home page.

Plant name: | Plant name | Region:
Grid connection date: | Start date | End da

Status	Plant Image	Plant Name
●		407-GJC-TEST

Click the Layout tab.

Overview | **Layout** | Report Management

🏠 station001

☀ 0.00 kWh Yield today

Upload the physical layout.

Physical Layout

+ Click to Create

You have not created a physical layout. Click + to create now.

Drag module icons to the physical layout area. Add modules and adjust the angle based on the actual situation.

Layout Configuration

Configuration | Angle: | Snap Align

Select Device

Module

Quantity | Rows 3 | Columns 3
Tilt | 20
Azimuth | 45

Cancel | Save

Device List

Layout Configuration

Configuration | Angle: | Snap Align

Select Device

Inverter

Quantity | 1
Installation mode
Horizontal | Vertical

Cancel | Save

Device List

Select a device in the device list, drag the device to the corresponding icon position, and bind the device to the module.

Configuration

Select Device

Angle: | Snap Align

Device List

HV20B0031861(HV20B003

PV1

2102312LFHBTK49(

2102312LFHBTK49(

2102312LFHBTK39(

2102312LFHBTK39(

HV2***861
1

(Optional) Adjust the physical layout.

Right-click the module to adjust the setting.
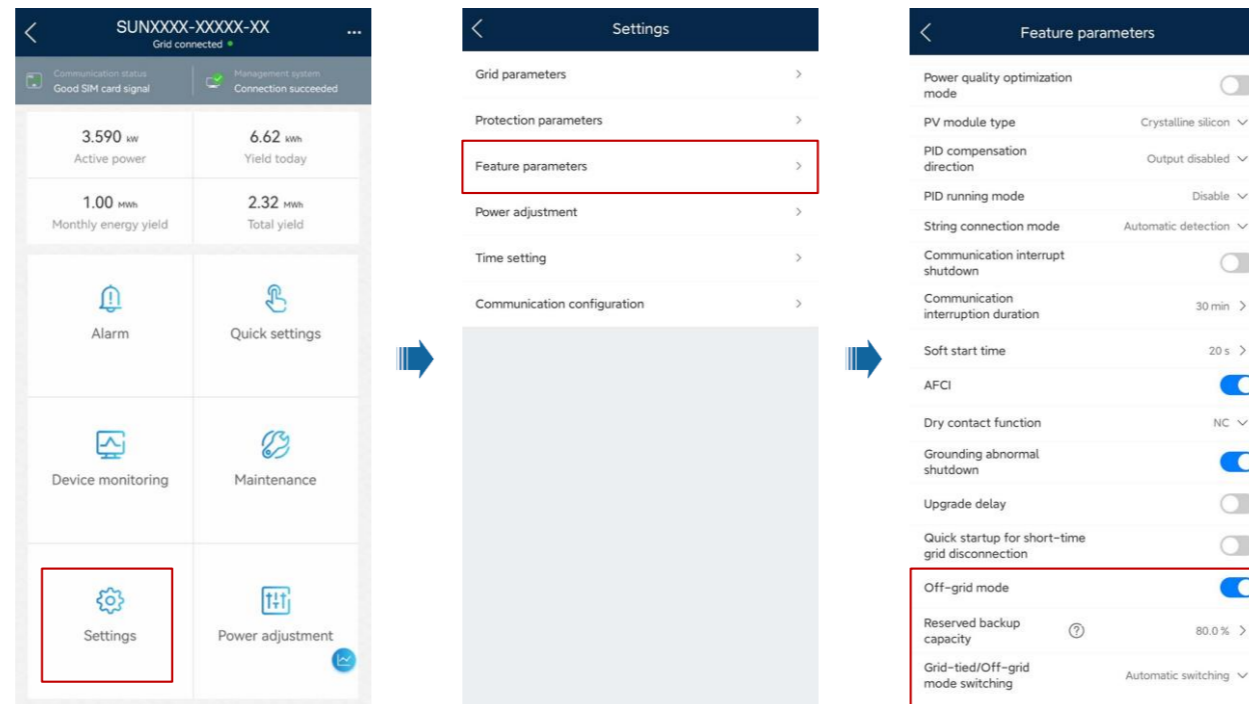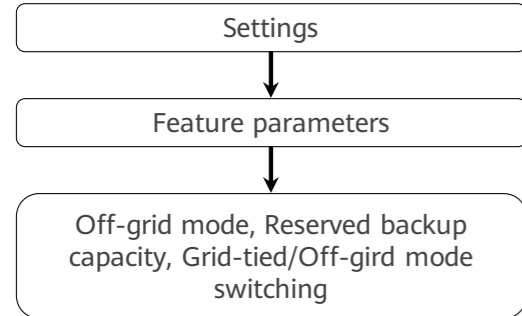
HV2***861
1

Copy
Unbind
Delete

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6 Off-Grid/Grid-tied Control Parameters

Enabling Off-Grid Mode

Settings

↓

Feature parameters

↓

Off-grid mode, Reserved backup capacity, Grid-tied/Off-gird mode switching

Setting Grid-Connection Point Control

Power adjustment

↓

Grid-tied point control

↓

Active power

↓

Control mode
- Unlimited
- Grid connected with zero power
- Power-limited grid connected