Residential Smart PV Solution Quick Guide
(Three-Phase PV+ESS Scenario + Smart Dongle Networking)

Issue: 04
Date: 2023-11-13

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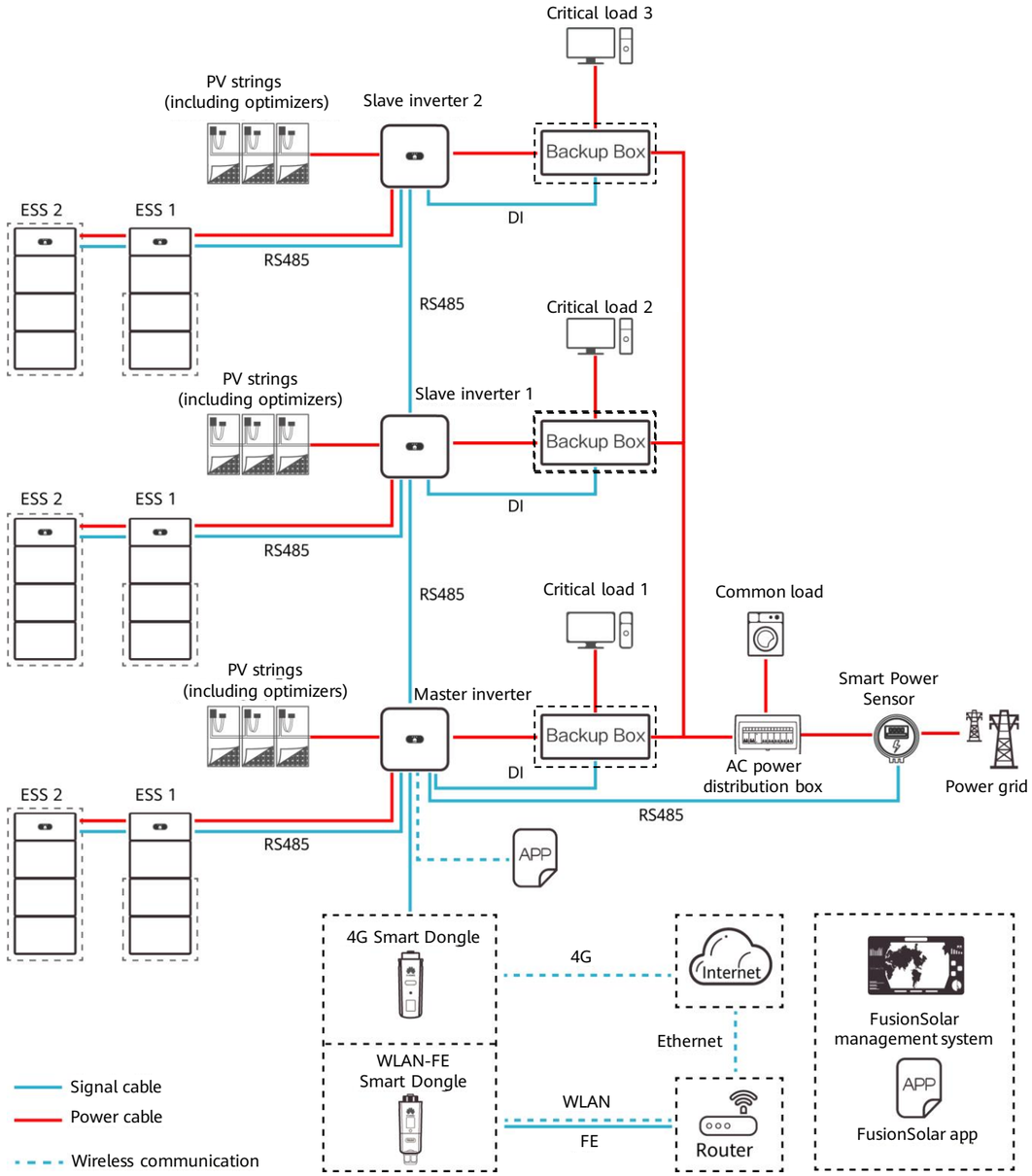
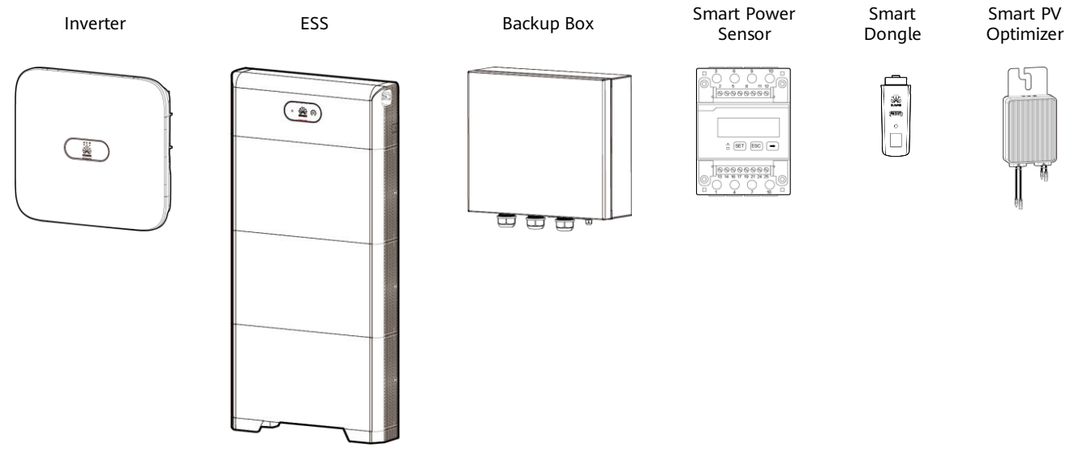
1 Networking



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.

2 Product Overview



Component	Model	Description
Inverter (master and slave)	SUN2000-(5KTL-12KTL)-M1 SUN2000-(12K-25K)-MB0 SUN2000-(15K-25K)-MB0-ZH	• A maximum of three inverters can be cascaded. • If the SUN2000-(12K-25K)-MB0 or SUN2000-(15K-25K)-MB0-ZH is connected to the ESS, the inverter cannot be cascaded.
Energy storage system (ESS)	LUNA2000-(5-30)-S0	• The capacity of a battery module is 5 kWh. A maximum of two ESSs can be cascaded and the maximum capacity is 30 kWh. • If there is only one ESS, it must be connected to the master inverter.
Backup Box	Backup Box-B1	• AC input voltage range: grid-tied (three-phase) 342–440 V; off-grid (single-phase) 220/230 V • If there is only one Backup Box, it must be connected to the master inverter. • The SUN2000-(12K-25K)-MB0 and SUN2000-(15K-25K)-MB0-ZH cannot be connected to the Backup Box.
Smart Power Sensor	DTSU666-H DTSU666-HW YDS60-80 YDS60-C24	• 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	SUN2000-(5KTL-12KTL)-M1: • SDongleA-03 (4G) • SDongleA-05 (WLAN-FE) SUN2000-(12K-25K)-MB0/MB0-ZH: • SDongleB-06 (4G) • SDongleA-05 (WLAN-FE) • SDongleB-03-CN (4G)	• The Smart Dongle must be connected to the master inverter. • It connects to the management system and performs power scheduling. • The SDongleB-03-CN supports one inverter only. When the SDongleB-06-CN (BOM number: 02314ALM-001) is used, a maximum of two inverters can be cascaded.
Smart PV Optimizer	SUN2000-450W-P 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.

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3 Cable Connections (Three-Phase Inverter M1 + ESS S0 + Backup Box B1 + Smart Dongle)

DANGER

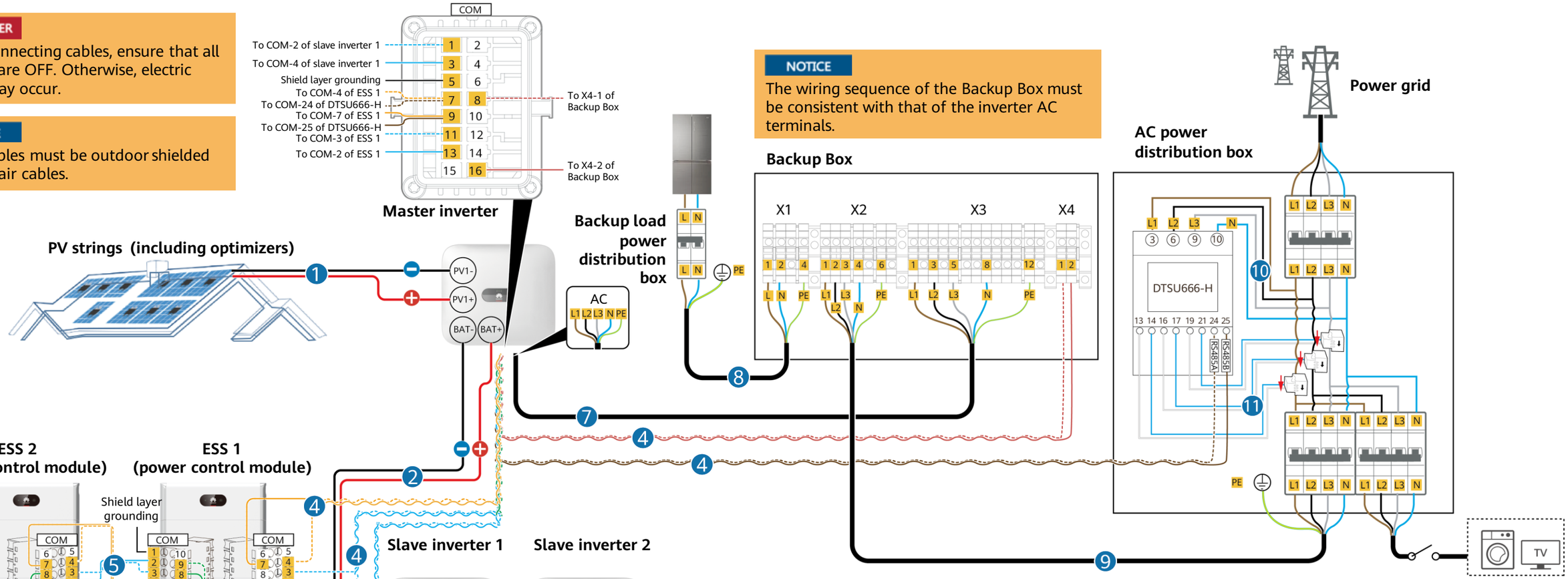
Before connecting cables, ensure that all switches are OFF. Otherwise, electric shocks may occur.

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.



NOTICE

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

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	DTSU666-H
				X4	Backup Box
	5	ESS 2	COM (right)	COM (left)	ESS 1
	6	Slave inverter 1	COM-1	COM-2	Slave inverter 2
			COM-3	COM-4	
AC power cable	7	Master inverter	AC-L1	X3-1 (L1)	Backup Box
			AC-L2	X3-3 (L2)	
			AC-L3	X3-5 (L3)	
			AC-N	X3-8 (N)	
			AC-PE	X3-12 (PE)	

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
AC power cable	8	Backup load power distribution box	L	X1-1	Backup Box
			N	X1-2	
			PE	X1-4	
	9	AC power distribution box	L1	X2-1	Backup Box
			L2	X2-2	
			L3	X2-3	
			N	X2-4	
			PE	X2-6	
	10	AC power distribution box	L1	3	DTSU666-H
			L2	6	
			L3	9	
			N	10	
	11	AC power distribution box	L1	13	DTSU666-H CT
				14	
			L2	16	
				17	
			L3	19	
				21	

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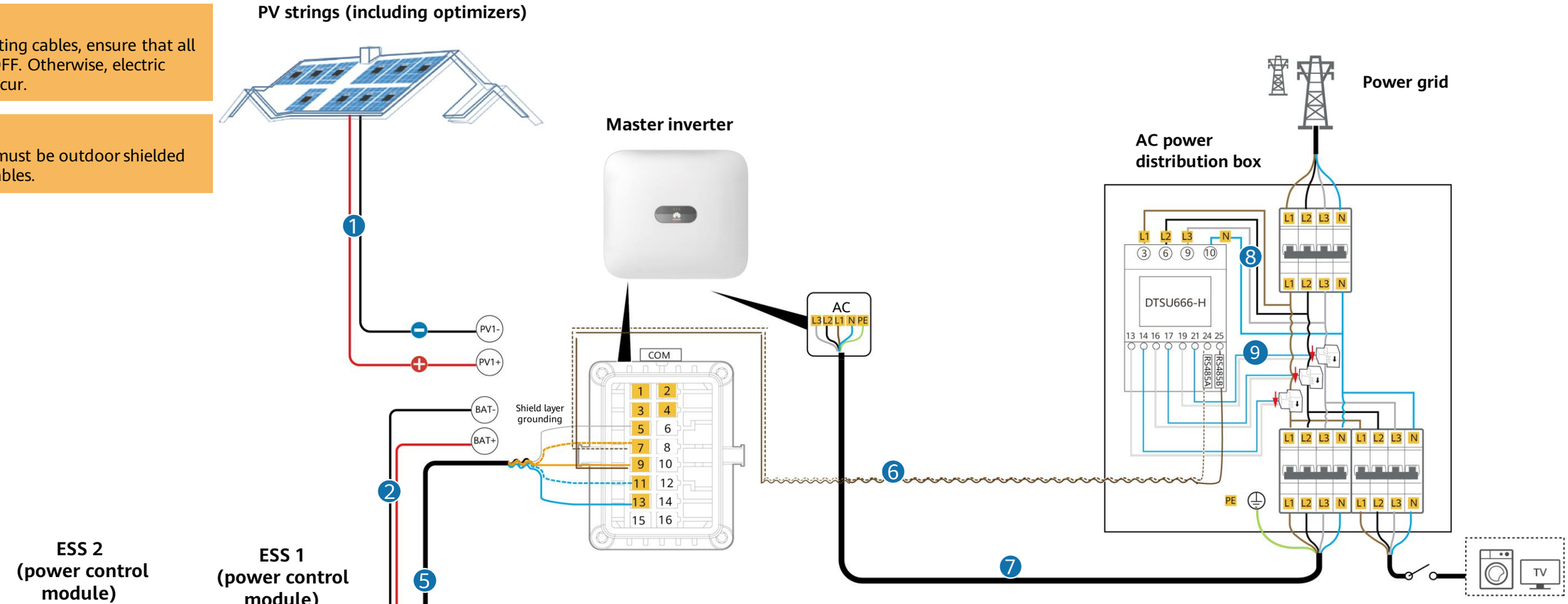
3 Cable Connections (Three-Phase Inverter MB0 + ESS S0 + Smart Dongle)

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.



Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
DC power cable	1	Master inverter	PV1+	Positive terminal	PV string
			PV1-	Negative terminal	
	2	Master inverter	BAT+	BAT+	ESS 1
			BAT-	BAT-	
	3	ESS 1	BAT+	BAT+	ESS 2
			BAT-	BAT-	
Signal cable	4	ESS 1	COM-2 (left)	COM-2 (right)	ESS 2
			COM-3 (left)	COM-3 (right)	
			COM-4 (left)	COM-4 (right)	
			COM-7 (left)	COM-7 (right)	
			COM-8 (left)	COM-8 (right)	
			COM-9 (left)	COM-9 (right)	
	5	Master inverter	COM-13	COM-2 (right)	ESS 1
			COM-11	COM-3 (right)	
			COM-7	COM-4 (right)	
			COM-9	COM-7 (right)	

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Componen
Signal cable	6	Master inverter	COM-7	24	DTSU666-H
			COM-9	25	

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
AC power cable	7	Master inverter	L1	L1	Power distribution box
			L2	L2	
			L3	L3	
			N	N	
			PE	PE	
	8	Power distribution box	L1	3	DTSU666-H
			L2	6	
			L3	9	
			N	10	
	9	Power distribution box	L1	13	DTSU666-H CT
				14	
			L2	16	
				17	
			L3	19	
				21	

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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

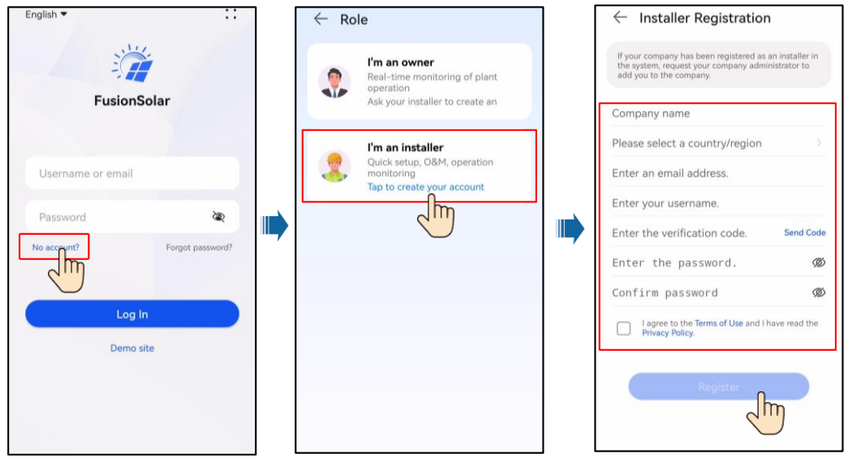
- Search for FusionSolar in the app store to download the app.
- Scan the QR code below to download the app.

FusionSolar

Installer Registration

Initial registration

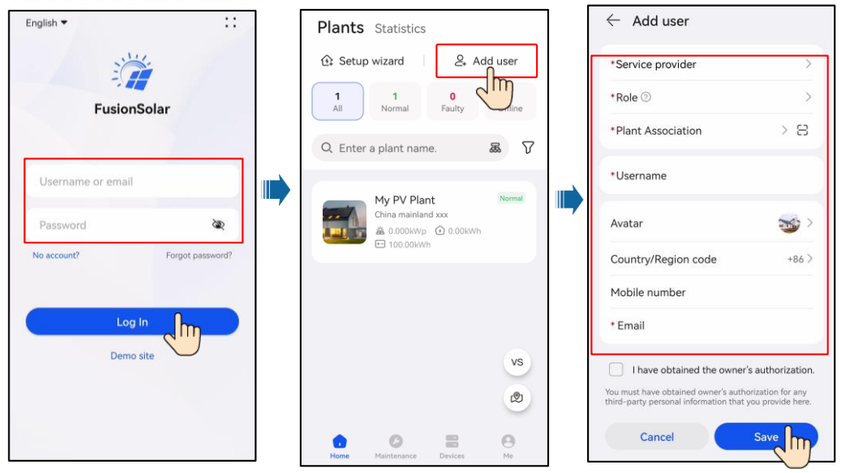
Create the first installer account, and generate a domain named after the company.



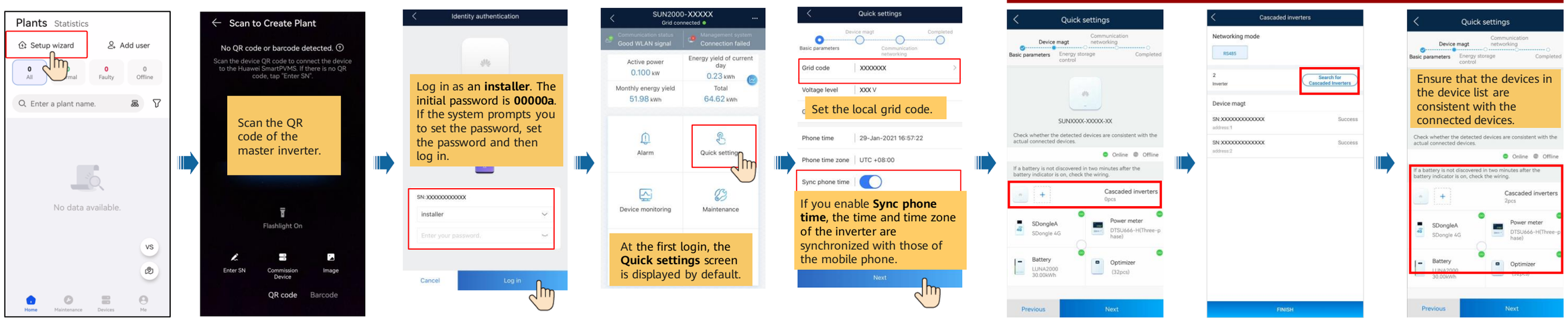
Or

Non-initial registration

If the company requires multiple installer accounts, log in to the FusionSolar app and tap **Add user** to create another installer account.



Setup Wizard (Connecting to the Inverter WLAN for Commissioning)



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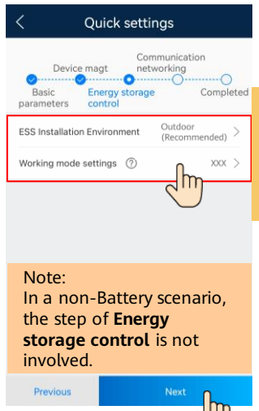
Set the energy storage working mode.

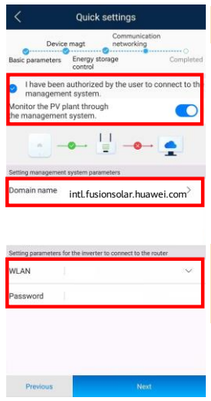


Select the **ESS Installation Environment** and **working mode settings** of the battery

You can tap to obtain the detailed working mode information.

Note:
In a non-Battery scenario, the step of **Energy storage control** is not involved.

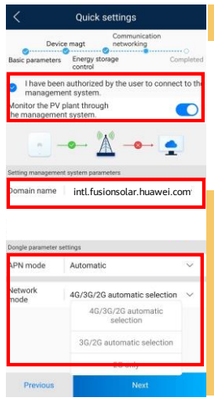
Set the communication networking.



WLAN communication

Select the desired router and enter the router password.

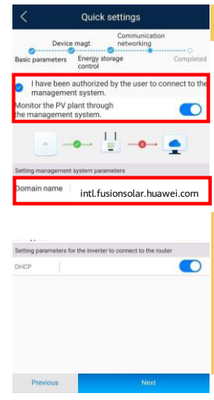
Or



4G communication

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

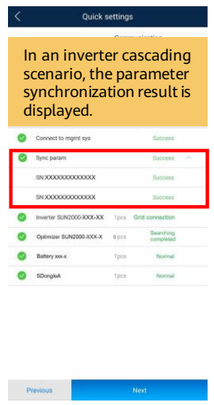
Or



FE communication

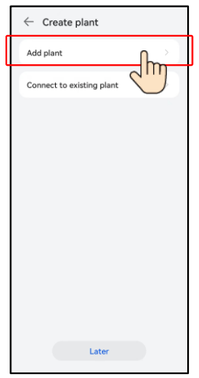
If the Ethernet parameter is displayed, the network cable is not connected. Reconnect the network cable.

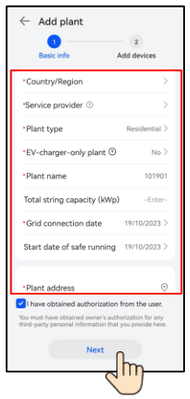
Ethernet

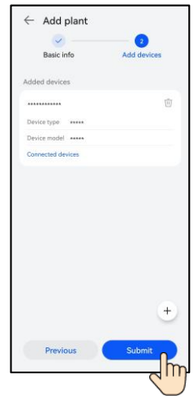


In an inverter cascading scenario, the parameter synchronization result is displayed.

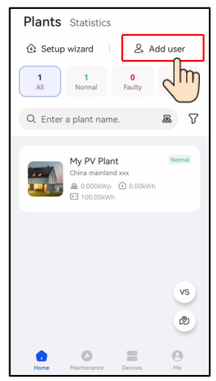
Add a plant.

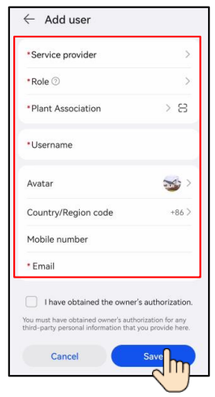




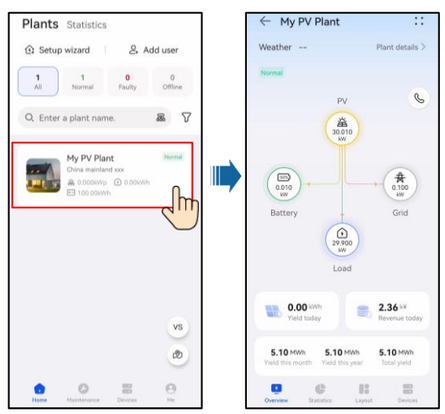


Create an owner account.





Checking the Plant Status



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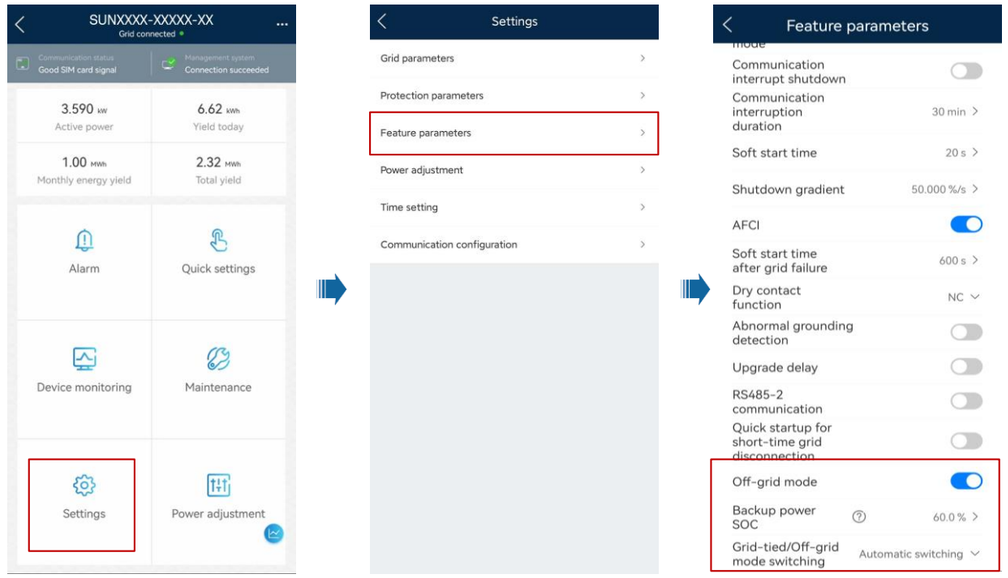
5 Off-Grid/Grid-tied Control Parameters

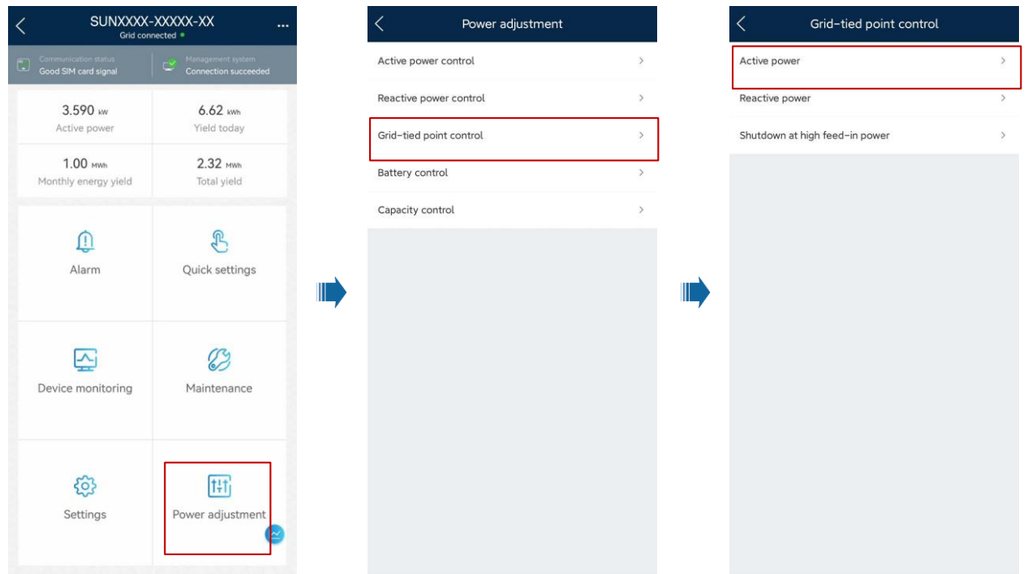
Enabling Off-Grid Mode

Settings
↓
Feature parameters
↓
- **Off-grid mode**
- **Backup power SOC**
- **Grid-tied/Off-grid mode switching**



Setting Grid-tied Point Control

Power adjustment
↓
Grid-tied point control
↓
Active power
↓
Control mode
- **Unlimited**
- **Grid connected with zero power**
- **Power-limited grid connected**



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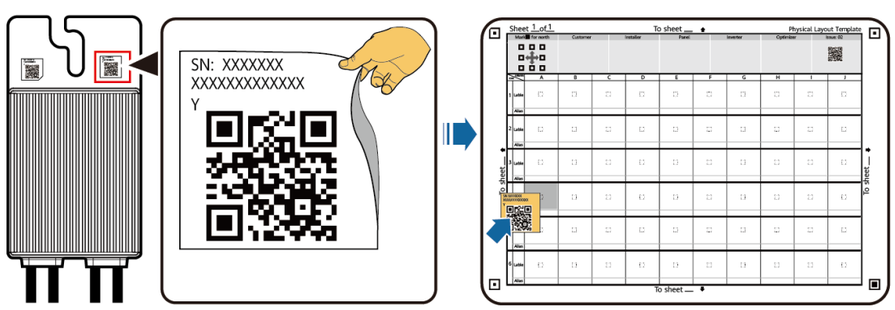
6 Physical Layout of Smart PV Optimizers

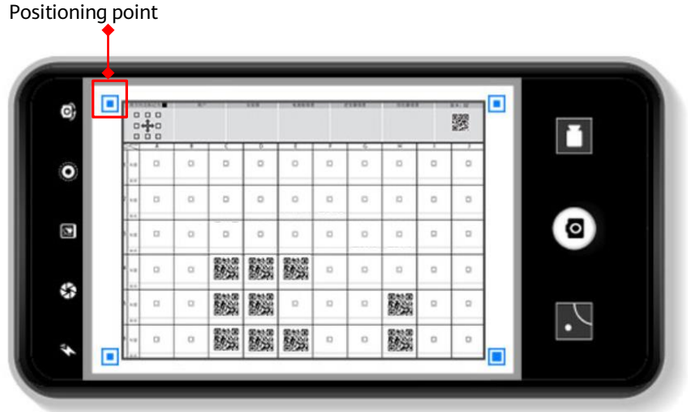
Attaching SN Labels

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.



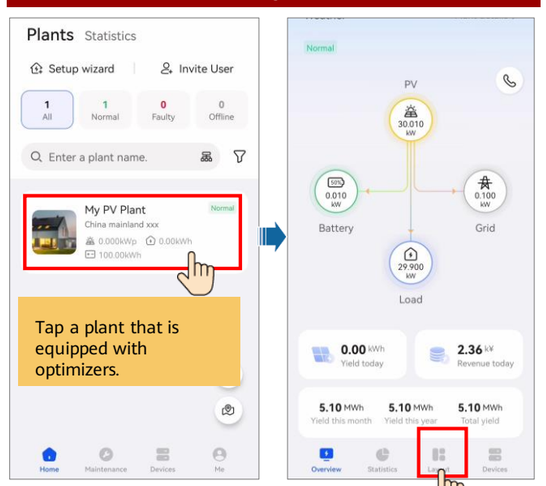
Taking a Photo of the Physical Layout Template

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



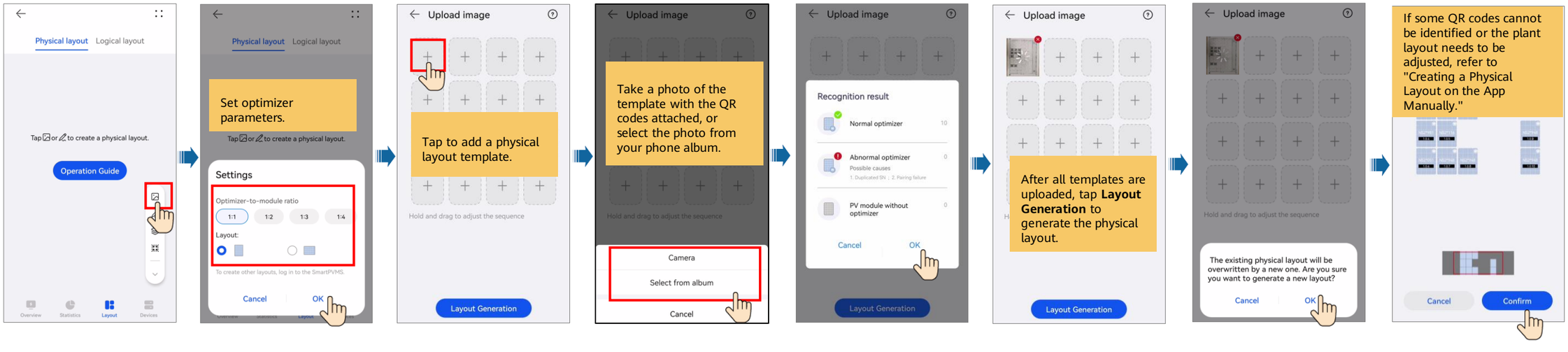
Generating a Physical Layout on the App

Enter the Layout screen.



Generating a Physical Layout on the App

Upload the template and generate a layout.



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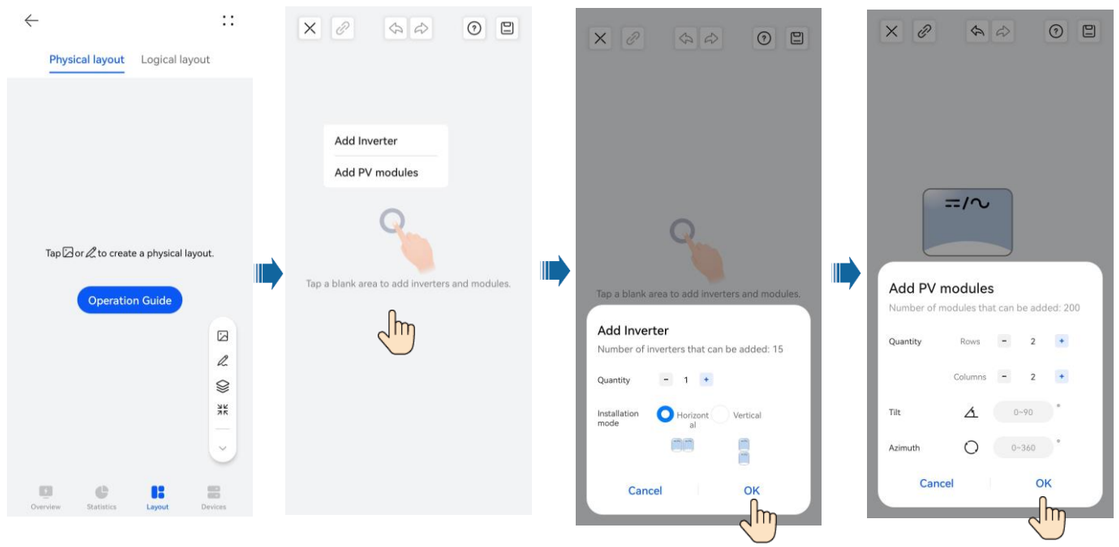
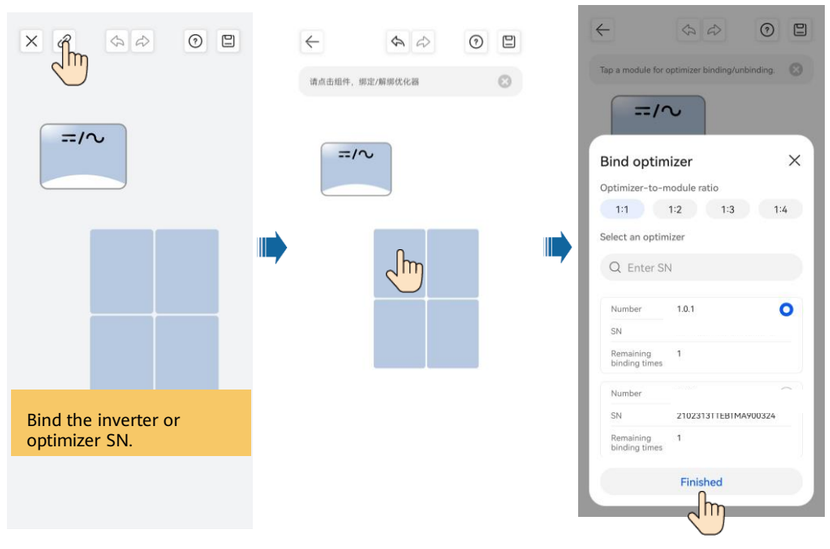
Creating a Physical Layout on the App Manually

Edit the physical layout and specify the quantity of inverters and PV modules as required.



Bind the inverter or optimizer SN.



Adjust the physical layout.