Residential Smart PV Solution Quick Guide
(Single-Phase PV+ESS Scenario + SmartGuard Networking)

Issue: 02
Date: 2023-11-13

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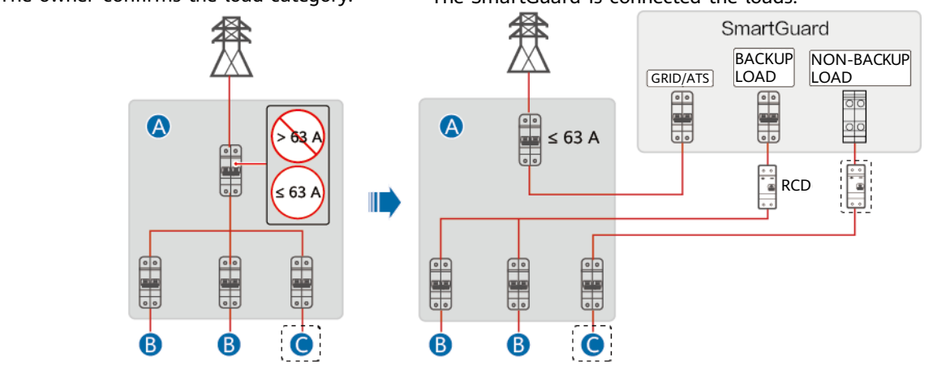
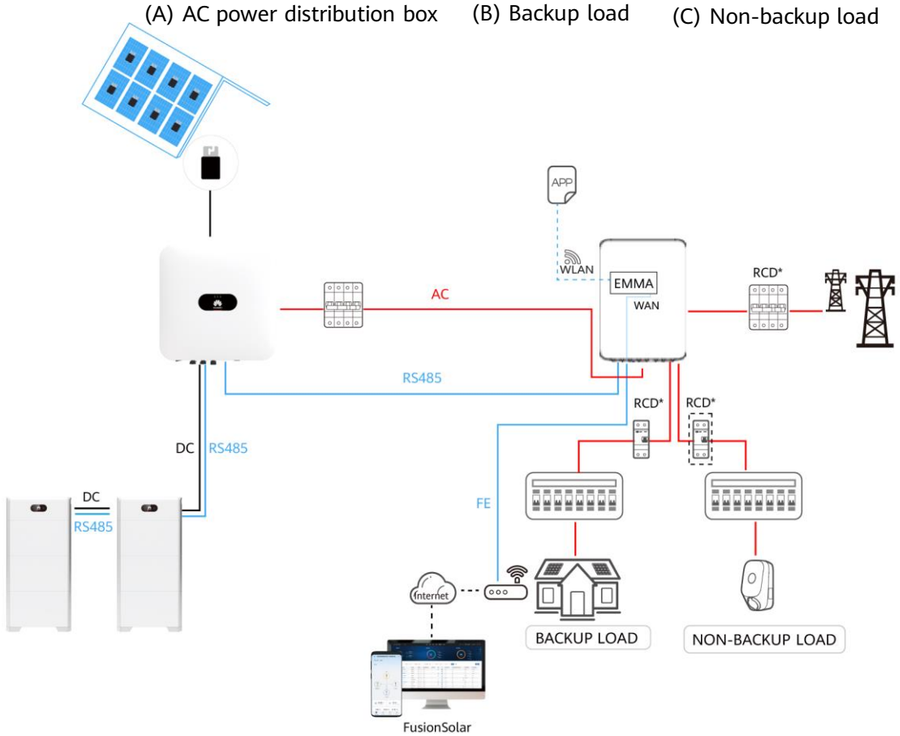
1 Networking

The owner confirms the load category.

The SmartGuard is connected the loads.



(A) AC power distribution box (B) Backup load (C) Non-backup load



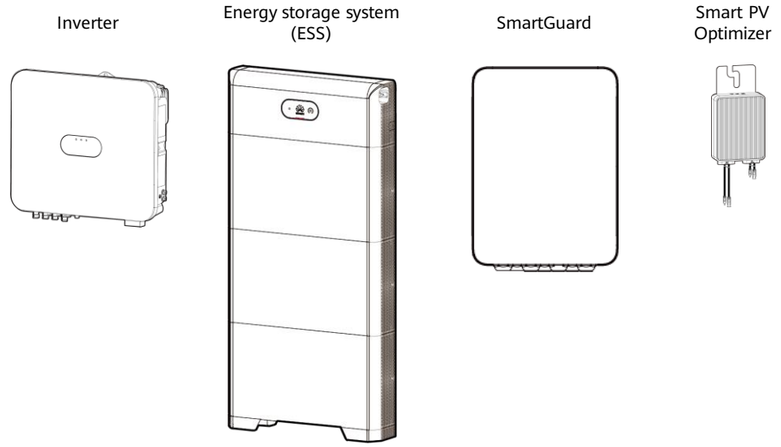
DANGER

Note*: A residual current device (RCD) must be installed before the backup load. During off-grid operation, the main circuit breaker does not provide protection. Electric leakage on the loads may result in electric shocks.An RCD is optional for the non-backup load. However, the main circuit breaker with the leakage protection function must be installed. The rated leakage current must be greater than or equal to the number of inverters multiplied by 100 mA.

NOTE

If a charger is configured, the charger must be installed on a non-backup power port.

2 Product Overview



Component	Model	Description
Inverter	SUN2000-8K-LC0 SUN2000-10K-LC0 SUN2000-8K-LC0-ZH SUN2000-10K-LC0-ZH SUN2000-(2KTL-6KTL)-L1	Only one inverter is supported.
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.
SmartGuard	SmartGuard-63A-S0 SmartGuard-63A-AUS0	Works with the inverter, ESS, grid, and home appliances to achieve smart management on home power consumption, grid detection, and on/off-grid switchover.
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.

NOTE

1. The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.
2. 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.

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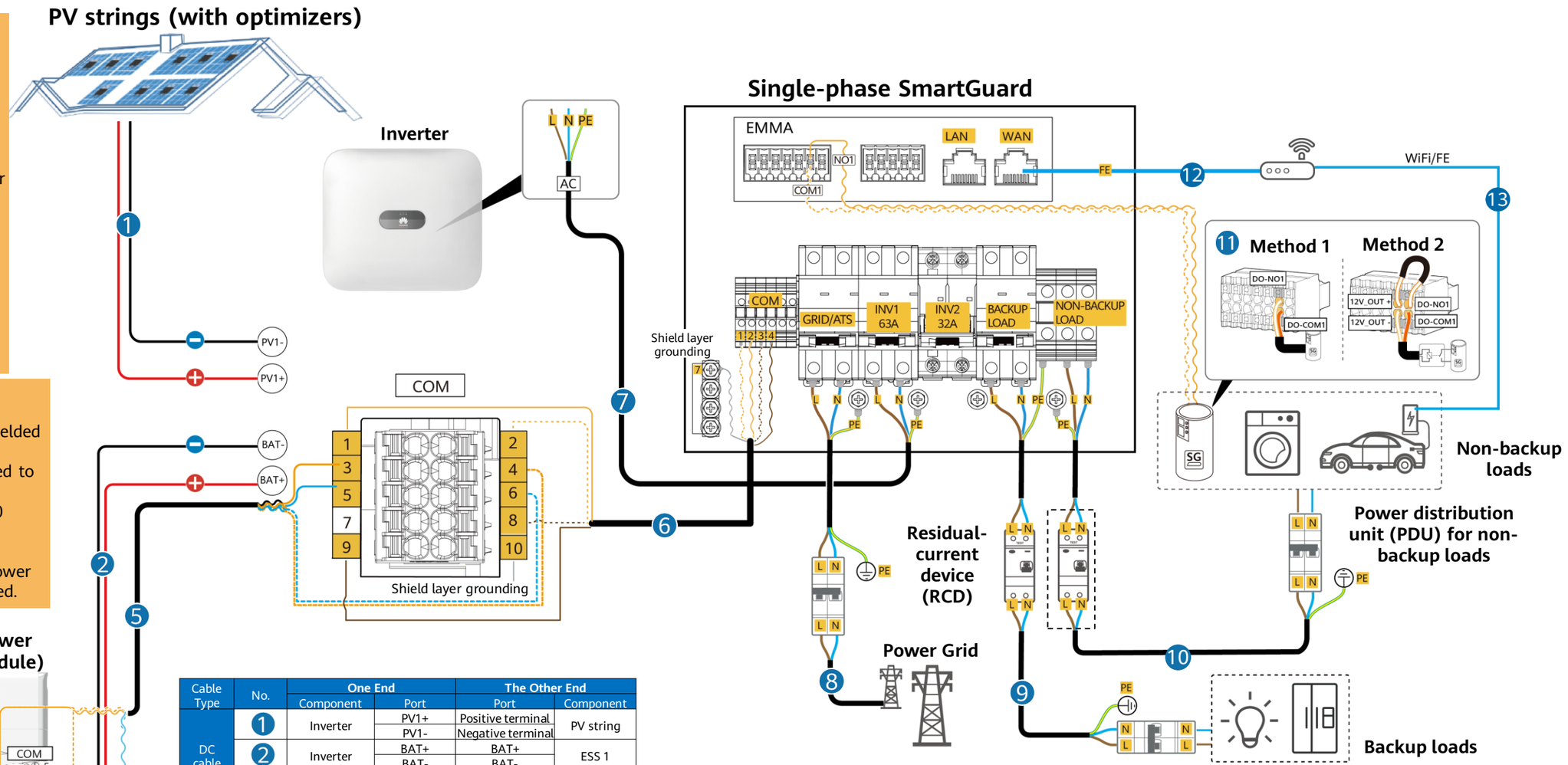
3 Cable Connections (Single-Phase Inverter LC0 + ESS S0 + SmartGuard)

DANGER

- Before connecting cables, ensure that all switches are OFF. Otherwise, electric shocks may occur.
- An RCD must be installed before the backup load. During off-grid operation, the main circuit breaker does not provide protection. Electric leakage on the loads may result in electric shocks.
- The main circuit breaker with the leakage protection function must be installed. The rated leakage current must be greater than or equal to the number of inverters multiplied by 100 mA.

NOTICE

- Signal cables must be outdoor shielded twisted pair cables.
- Only one inverter can be connected to the SmartGuard.
- The PE of the SmartGuard-63A-S0 backup power port needs to be connected, but the PE of the SmartGuard-63A-AUS0 backup power port does not need to be connected.



Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
DC cable	1	Inverter	PV1+	Positive terminal	PV string
			PV1-	Negative terminal	
	2	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	Inverter	COM-3	COM-7 (right)	ESS 1
			COM-4	COM-4 (right)	
			COM-5	COM-2 (right)	
			COM-6	COM-3 (right)	
	6	Inverter	COM-1	COM-2	SmartGuard
			COM-2	COM-1	
			COM-8	COM-3	
			COM-9	COM-4	

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
AC power cable	7	Inverter	AC-L	INV1-L	Smart Guard
			AC-N	INV1-N	
			AC-PE	INV1-PE	
	8	Grid	L	GRID/ATS-L	Smart Guard
			N	GRID/ATS-N	
			PE	GRID/ATS-PE	
	9	PDU for backup loads	L	BACKUP LOAD-L	Smart Guard
			N	BACKUP LOAD-N	
			PE	BACKUP LOAD-PE	
	10	PDU for non-backup loads	L	NON-BACKUP LOAD-L	Smart Guard
			N	NON-BACKUP LOAD-N	
			PE	NON-BACKUP LOAD-PE	

PDU for backup loads

Cable Type	No.	Cable Connection Description
Signal cable	11	Method 1: Use DO dry contacts to directly drive the SG Ready heat pump. The capability of the DO dry contacts is 12 V DC@1 A. Method 2: Use a 12 V@30 mA power supply to drive the external relay. Choose the proper contact capability of the external relay according to the SG Ready heat pump port.

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
Signal Cable	12	EMMA	WAN	LAN	Router
	13	Charger	FE	LAN	Router

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3 Cable Connections (Single-Phase Inverter L1 + ESS S0 + SmartGuard)

DANGER

- Before connecting cables, ensure that all switches are OFF. Otherwise, electric shocks may occur.
- An RCD must be installed before the backup load. During off-grid operation, the main circuit breaker does not provide protection. Electric leakage on the loads may result in electric shocks.
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NOTICE

- Signal cables must be outdoor shielded twisted pair cables.
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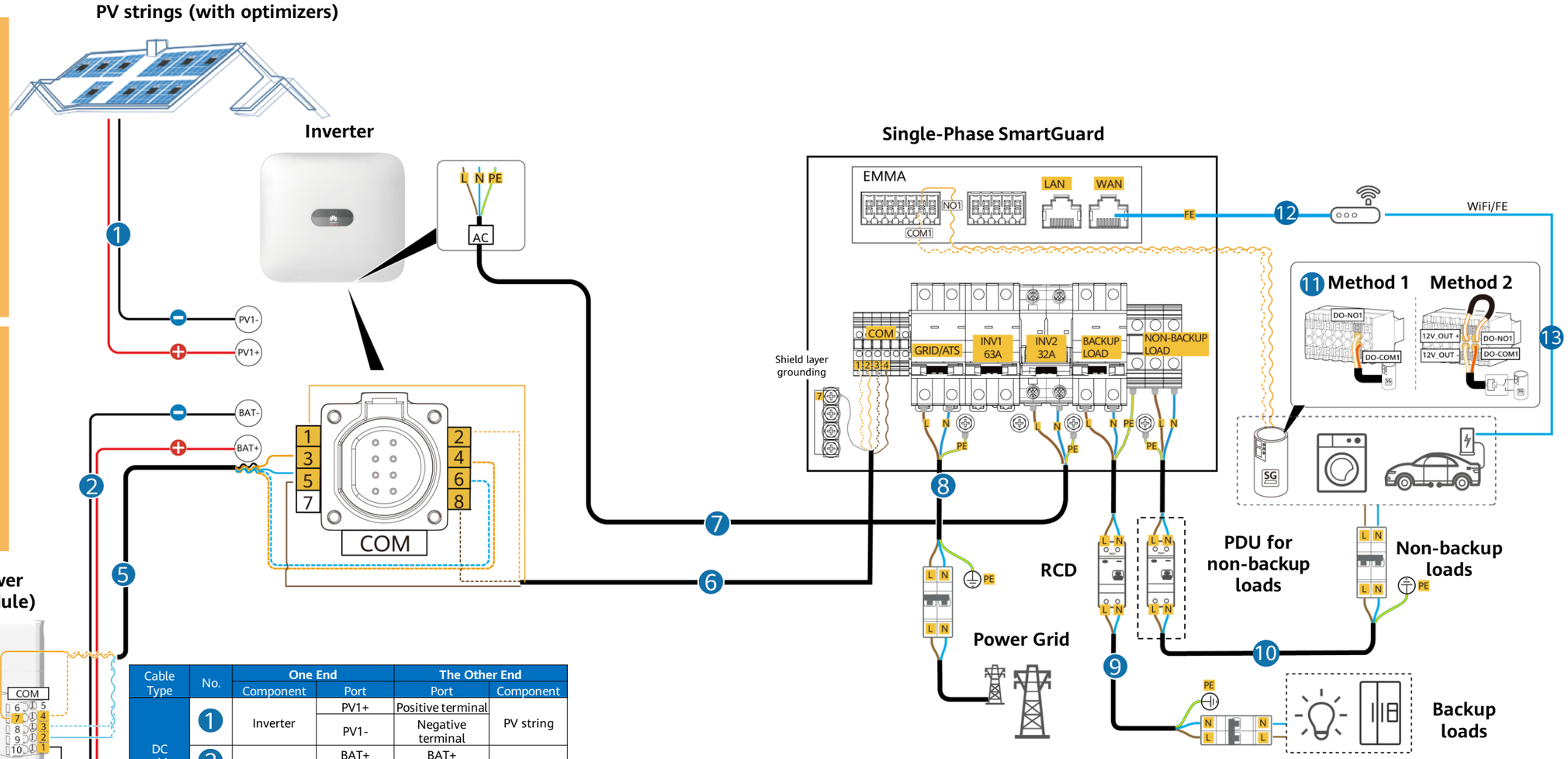
- The PE of the SmartGuard-63A-S0 backup power port needs to be connected, but the PE of the SmartGuard-63A-AUS0 backup power port does not need to be connected.



Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
DC cable	1	Inverter	PV1+	Positive terminal	PV string
			PV1-	Negative terminal	
	2	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	Inverter	COM-3	COM-7 (right)	ESS 1
			COM-4	COM-4 (right)	
			COM-5	COM-2 (right)	
			COM-6	COM-3 (right)	
	6	Inverter	COM-1	COM-2	SmartGuard
			COM-2	COM-1	
			COM-8	COM-3	
			COM-5	COM-4	

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
AC power cable	7	Inverter	AC-L	INV2-L	Smart Guard
			AC-N	INV2-N	
			AC-PE	INV2-PE	
	8	Grid	L	GRID/ATS-L	Smart Guard
			N	GRID/ATS-N	
			PE	GRID/ATS-PE	
	9	PDU for backup loads	L	BACKUP LOAD-L	Smart Guard
			N	BACKUP LOAD-N	
			PE	BACKUP LOAD-PE	
	10	PDU for non-backup loads	L	NON-BACKUP LOAD-L	Smart Guard
			N	NON-BACKUP LOAD-N	
			PE	NON-BACKUP LOAD-PE	

Cable Type	No.	Cable Connection Description
Signal cable	11	Method 1: Use DO dry contacts to directly drive the SG Ready heat pump. The capability of the DO dry contacts is 12 V DC@1 A. Method 2: Use a 12 V@30 mA power supply to drive the external relay. Choose the proper contact capability of the external relay according to the SG Ready heat pump port.

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
Signal Cable	12	EMMA	WAN	LAN	Router
	13	Charger	FE	LAN	Router

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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

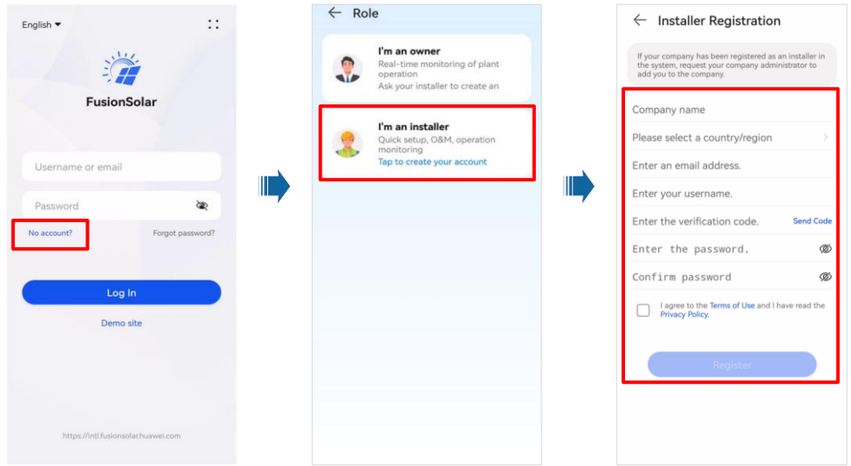
- Search for FusionSolar in the app store to download the app.
- Scan the QR code below to download the app.

FusionSolar

Installer Registration

Initial registration

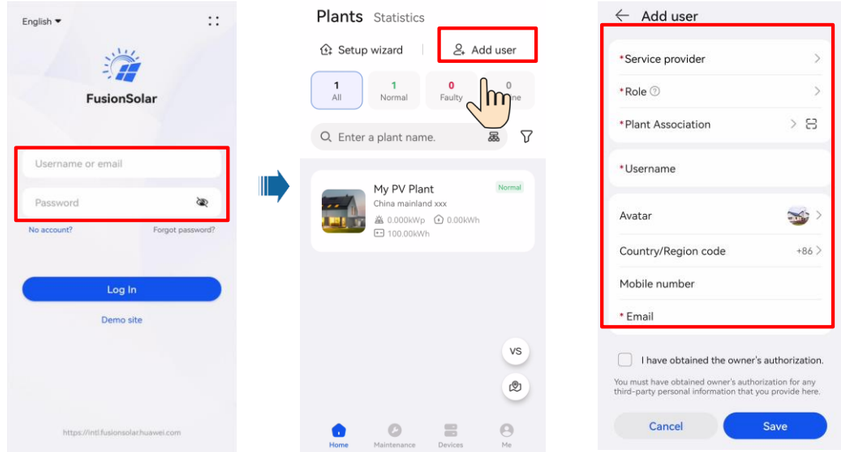
Create the first installer account, and generate a domain named after the company.



Or

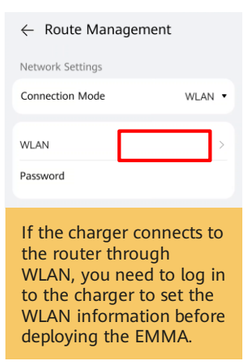
Non-initial registration

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

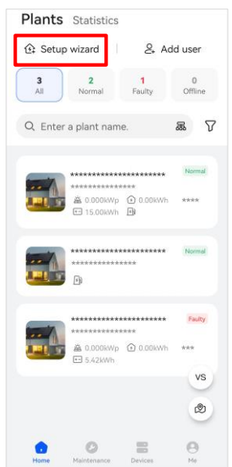


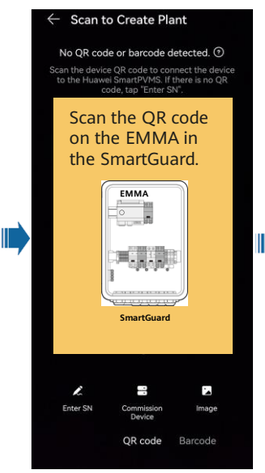
Setup Wizard (Connecting to the Inverter WLAN for Commissioning)

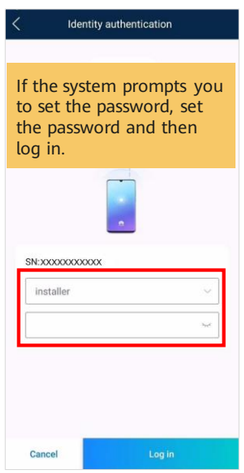
Set the WLAN information of the charger.

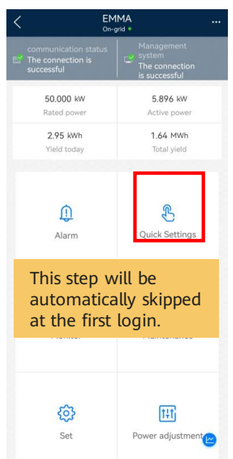


If the charger connects to the router through WLAN, you need to log in to the charger to set the WLAN information before deploying the EMMA.

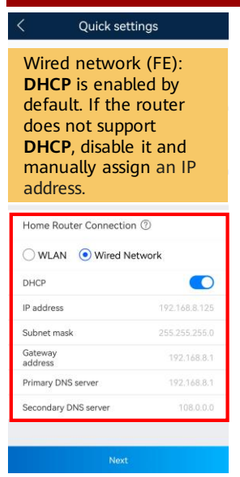


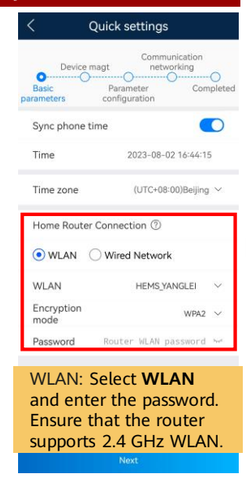






Set the route parameters.





WLAN: Select **WLAN** and enter the password. Ensure that the router supports 2.4 GHz WLAN.

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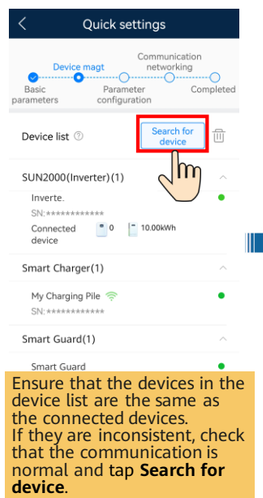
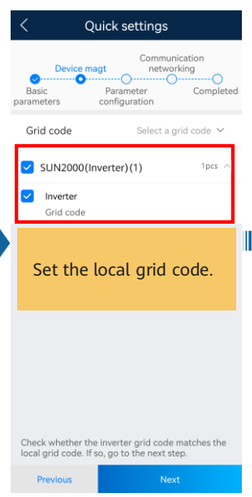
Device magt.

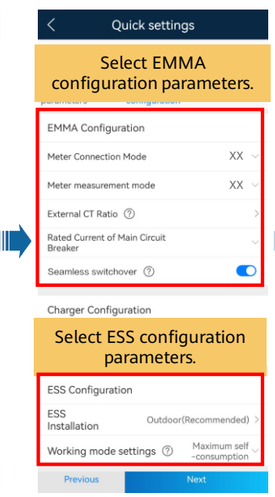


Ensure that the devices in the device list are the same as the connected devices.
If they are inconsistent, check that the communication is normal and tap **Search for device**.

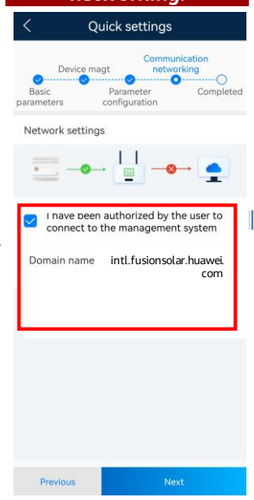


Set the local grid code.

Set the key parameters.

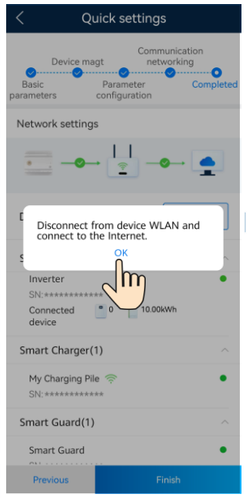


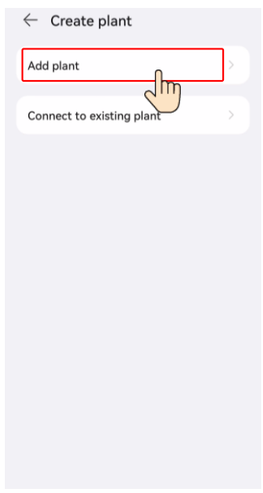
Set the communication networking.



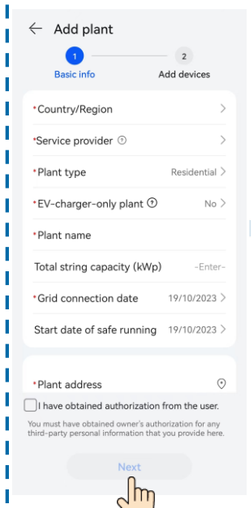
Connection Test.

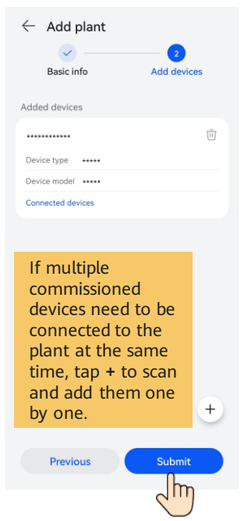
Create plant.





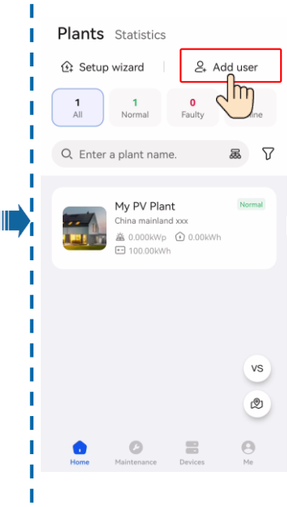
Add a plant.

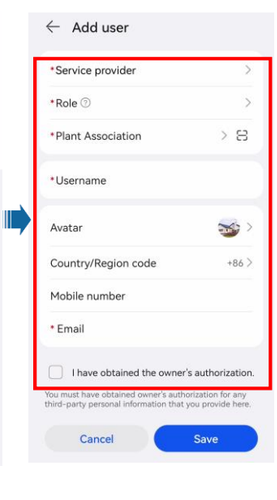




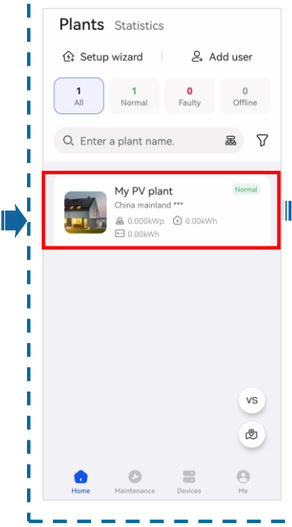
If multiple commissioned devices need to be connected to the plant at the same time, tap + to scan and add them one by one.

Create an owner account.





Viewing the Plant Status



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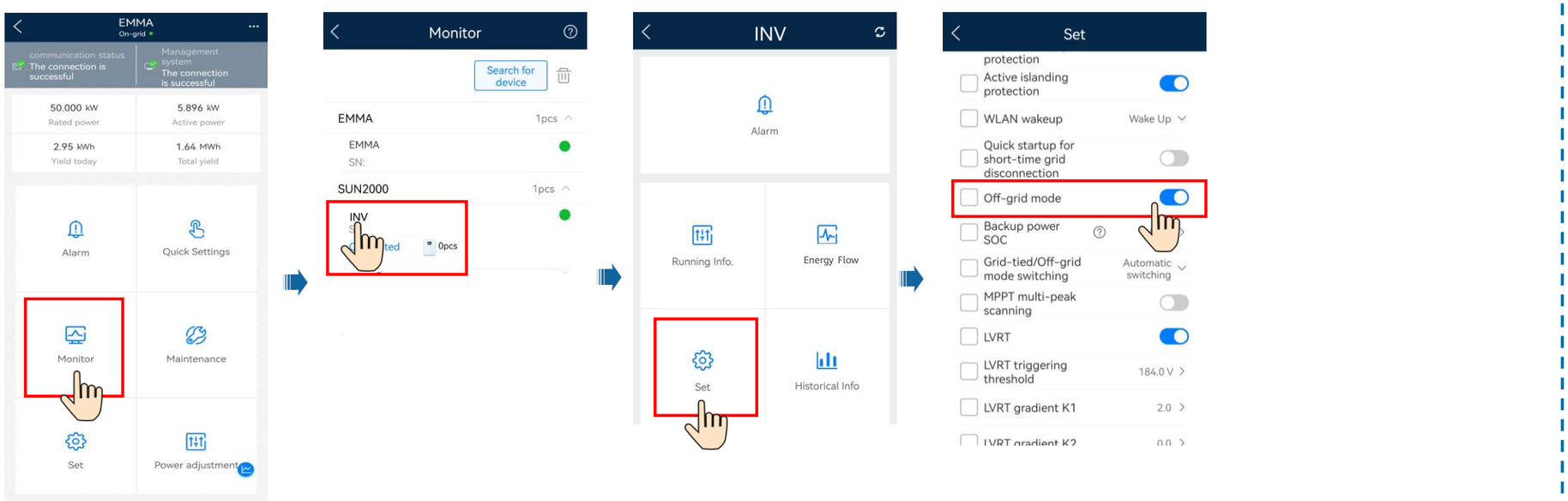
5 On/Off-Grid Control Parameters

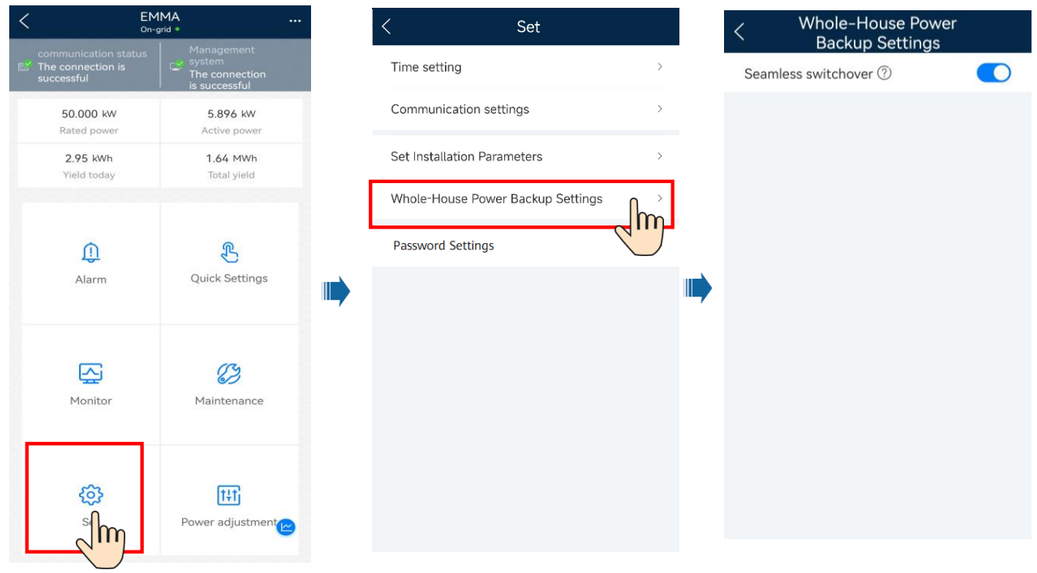
Enabling Off-Grid Mode

Monitor
↓
SUN2000 inverter
↓
Set
↓
Off-grid mode; Backup power SOC; Grid-tied/Off-grid mode switching



Setting Seamless Switchover

Set
↓
Full-house backup power settings
↓
Seamless switchover



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6 Grid-tied Point Parameters

Setting Grid-tied Point Control

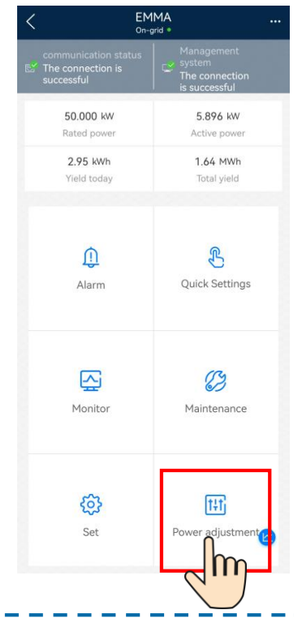
Power adjustment

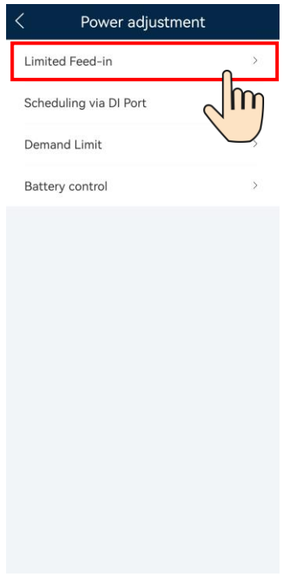
↓

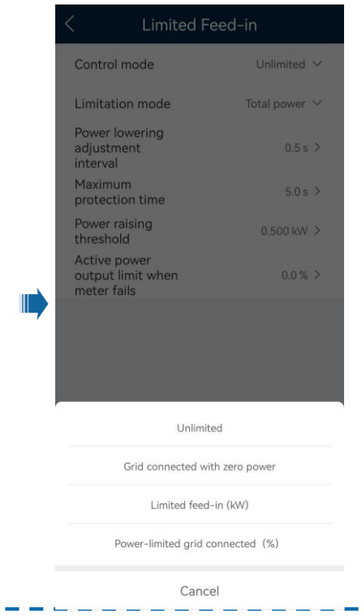
Limited Feed-in

↓

Control mode
- **Unlimited**
- **Grid connection with zero power**
- **Limited feed-in (kW)**
- **Power-limited grid connected (%)**







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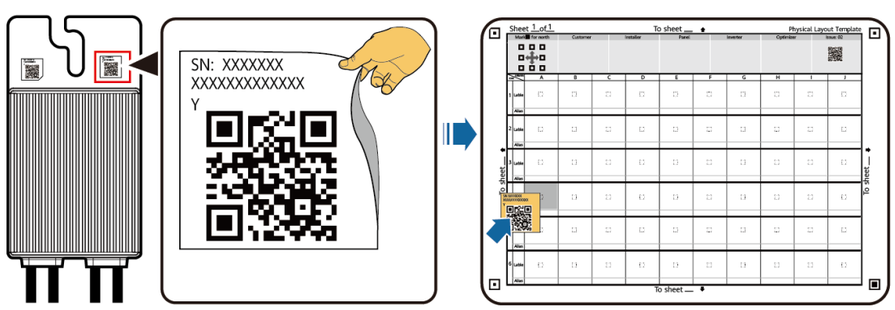
7 Physical Layout of Smart PV Optimizers

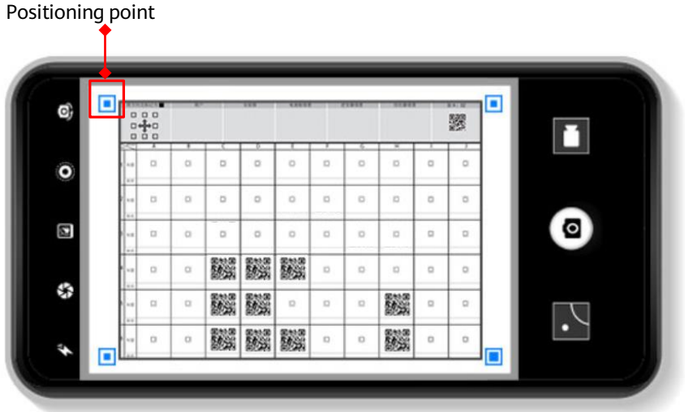
Attaching SN Labels

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.



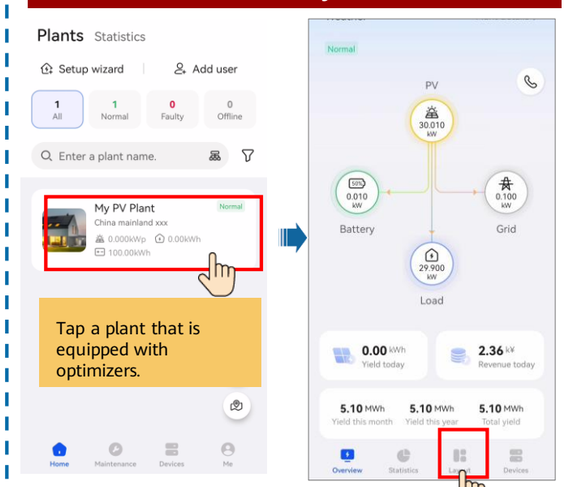
Taking a Photo of the Physical Layout Template

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



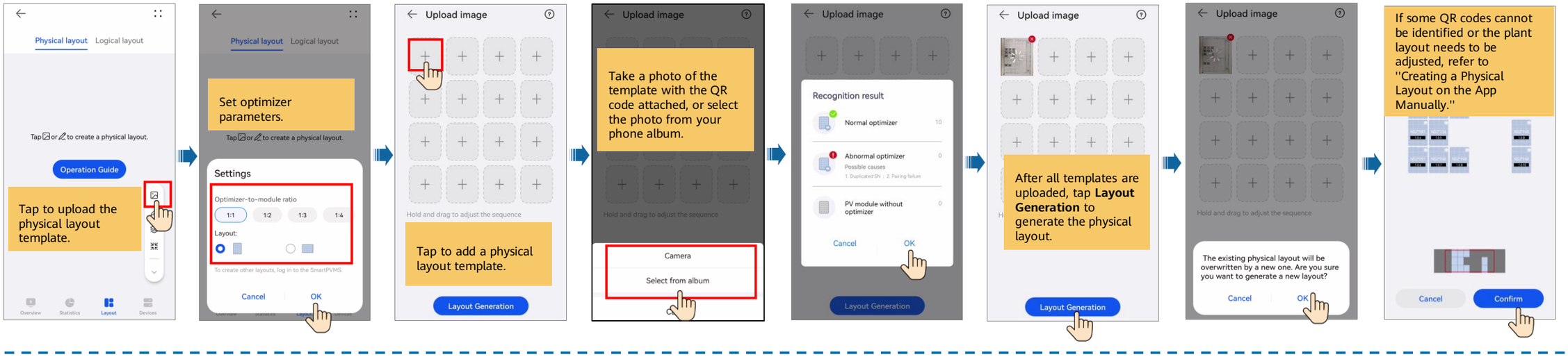
Generating a Physical Layout on the App

Enter the Plant Layout screen.



Generating a Physical Layout on the App

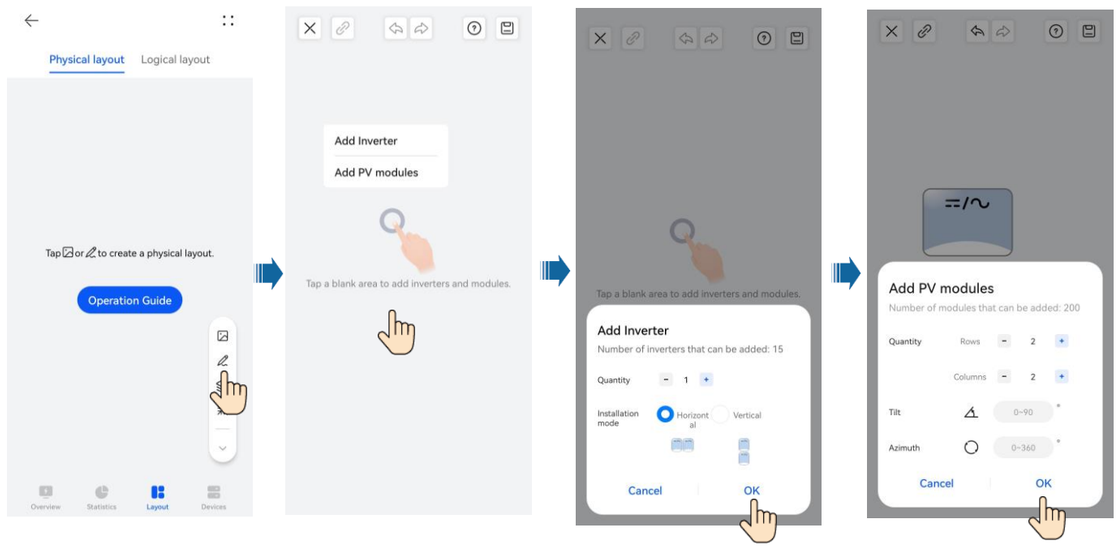
Upload the template and generate a layout.



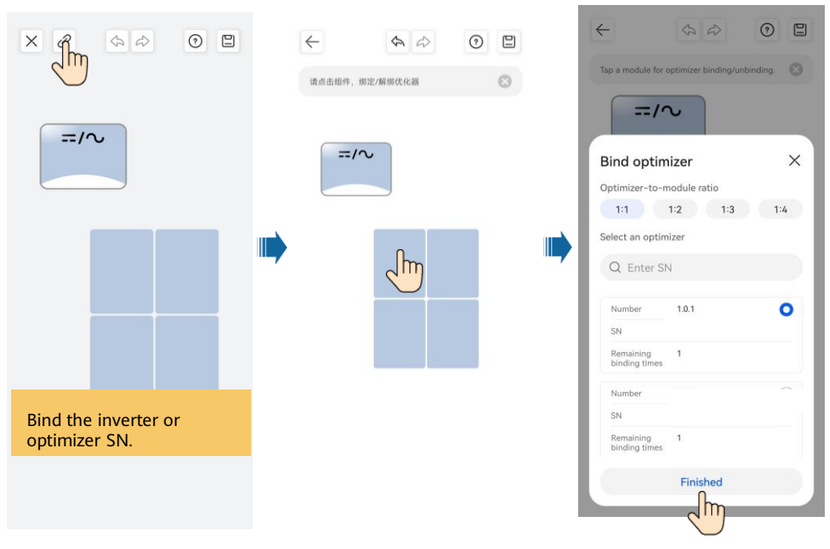
Residential Smart PV Solution Quick Guide
(Single-Phase PV+ESS Scenario + SmartGuard Networking)

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.