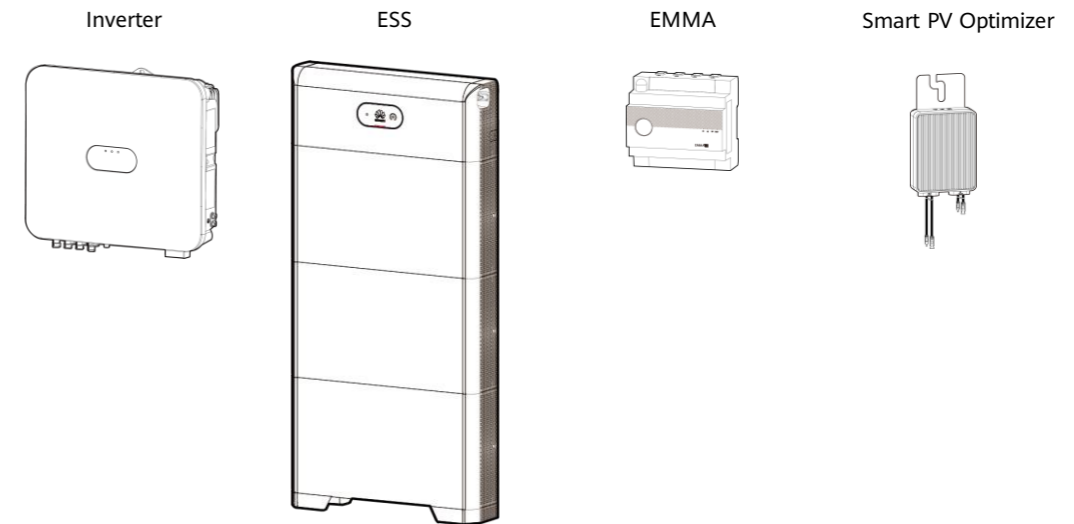
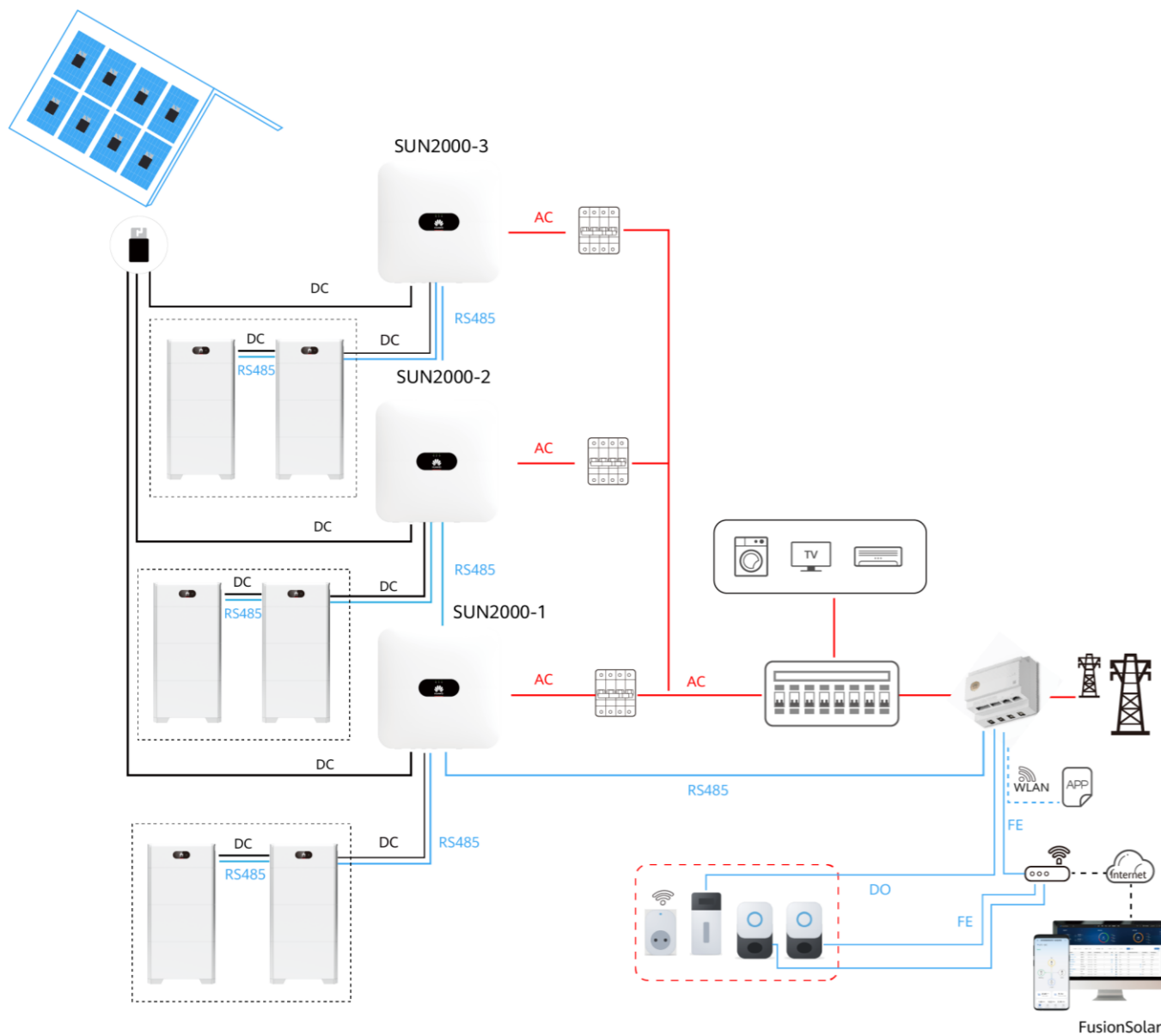


1 Networking

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	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
EMMA	EMMA-A01 EMMA-A02	<ul style="list-style-type: none"> A01: Only PV and ESS features are supported. A02: Features of PV, ESSs, smart chargers, and smart loads are supported.
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

- In inverter cascading scenarios, the SUN2000-(8K, 10K)-LC0 and SUN2000-(2KTL-6KTL)-L1 can be cascaded only with inverters of the same model, respectively.
- 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.
- For details about the solution components, installation, and cable connections, see the corresponding user manuals and quick guides.
- The cable colors involved in this document are for reference only. Select cables in accordance with local cable specifications.

Residential Smart PV Solution Quick Guide

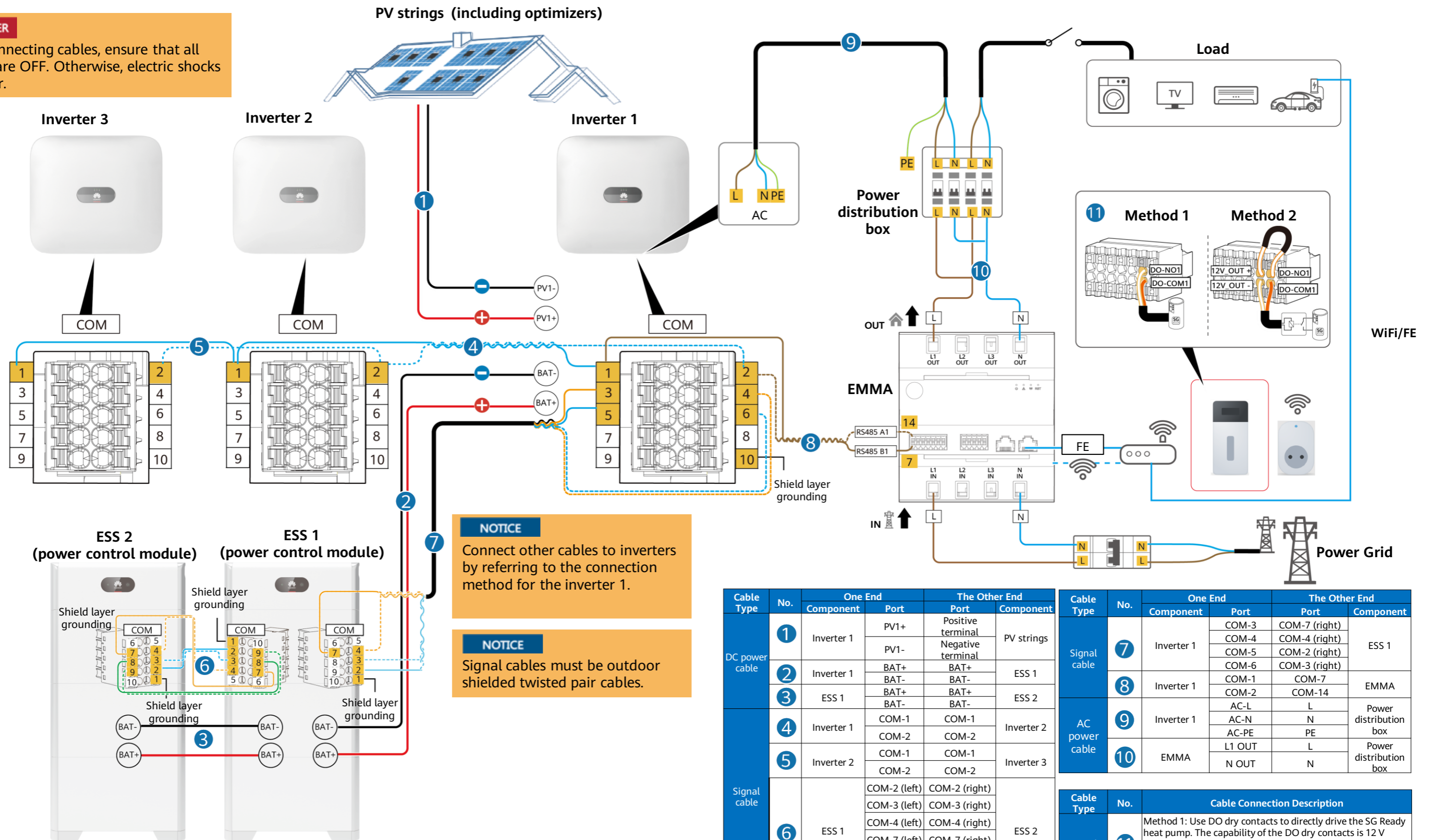
(Single-Phase PV+ESS Scenario + EMMA Networking)



3

Cable Connections (Single-Phase Inverter LC0 + ESS S0 + EMMA with an Internal CT)

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



NOTICE
Connect other cables to inverters by referring to the connection method for the inverter 1.

NOTICE
Signal cables must be outdoor shielded twisted pair cables.

Cable Type	No.	One End		The Other End		Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component			Component	Port	Port	Component
DC power cable	1	Inverter 1	PV1+	Positive terminal	PV strings	Signal cable	7	Inverter 1	COM-3	COM-7 (right)	ESS 1
			PV1-	Negative terminal					COM-4	COM-4 (right)	
	2	Inverter 1	BAT+	BAT+	ESS 1				COM-5	COM-2 (right)	
DC power cable	3	ESS 1	BAT-	BAT-	ESS 2	Signal cable	8	Inverter 1	COM-6	COM-3 (right)	
			BAT+	BAT+					COM-1	COM-7	
DC power cable	4	Inverter 1	COM-1	COM-1	Inverter 2	AC power cable	9	Inverter 1	AC-L	L	
			COM-2	COM-2					AC-N	N	
DC power cable	5	Inverter 2	COM-1	COM-1	Inverter 3	AC power cable	10	EMMA	AC-PE	PE	
			COM-2	COM-2					L1 OUT	L	
Signal cable	6	ESS 1	COM-2 (left)	COM-2 (right)	ESS 2	Signal cable	11	Cable Connection Description			
			COM-3 (left)	COM-3 (right)				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.			
			COM-4 (left)	COM-4 (right)				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.			
			COM-7 (left)	COM-7 (right)							
			COM-8 (left)	COM-8 (right)							
			COM-9 (left)	COM-9 (right)							

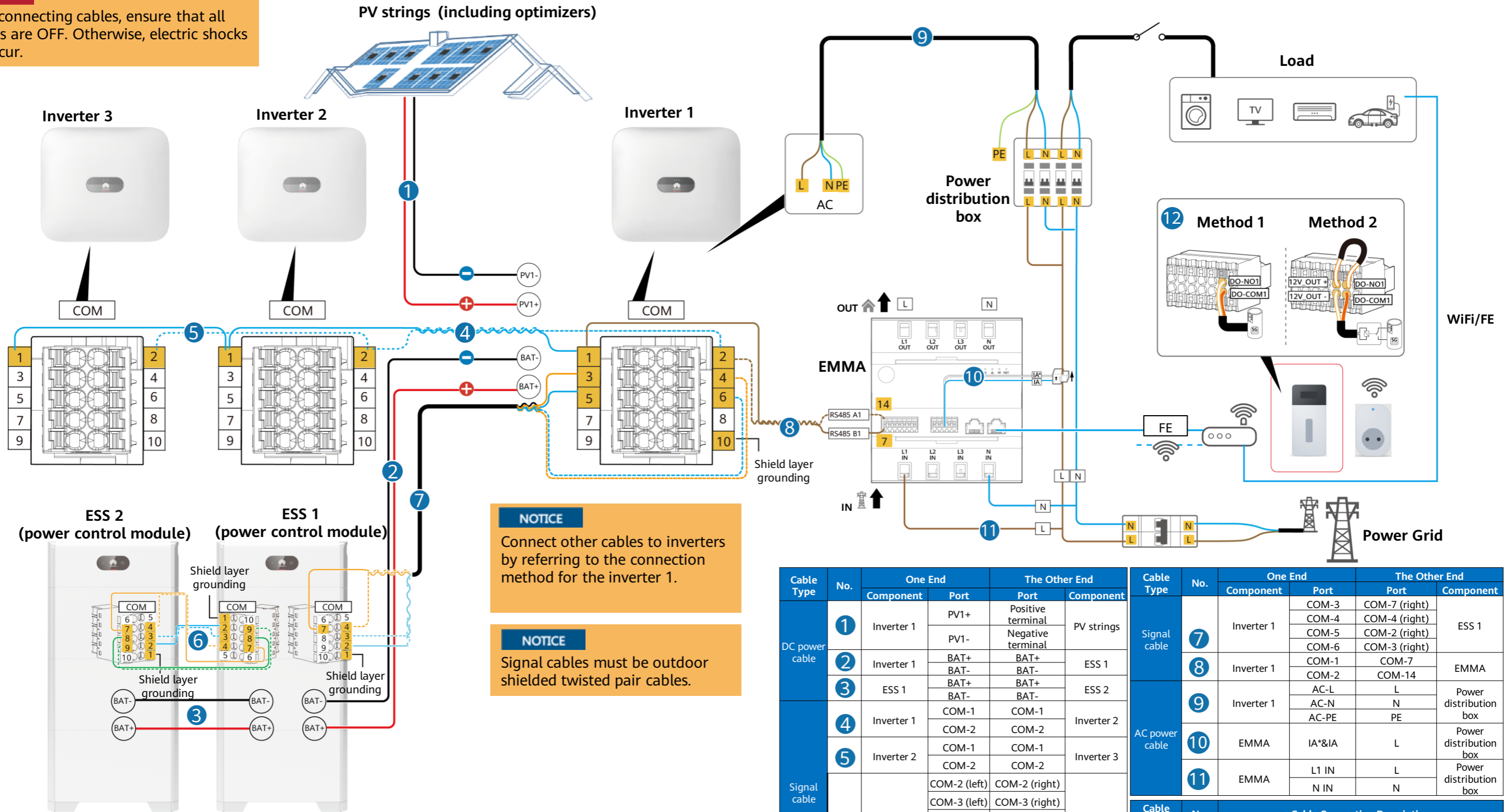
Residential Smart PV Solution Quick Guide

(Single-Phase PV+ESS Scenario + EMMA Networking)



3 Cable Connections (Single-Phase Inverter LC0 + ESS S0 + EMMA with an External CT)

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



NOTICE
Connect other cables to inverters by referring to the connection method for the inverter 1.

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	Inverter 1	PV1+	Positive terminal	PV strings
			PV1-	Negative terminal	
	2	Inverter 1	BAT+	BAT+	ESS 1
Signal cable	3	ESS 1	BAT+	BAT+	ESS 2
			BAT-	BAT-	
Signal cable	4	Inverter 1	COM-1	COM-1	Inverter 2
			COM-2	COM-2	
	5	Inverter 2	COM-1	COM-1	Inverter 3
			COM-2	COM-2	
Signal cable	6	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)	

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
Signal cable	7	Inverter 1	COM-3	COM-7 (right)	ESS 1
			COM-4	COM-4 (right)	
			COM-5	COM-2 (right)	
			COM-6	COM-3 (right)	
Signal cable	8	Inverter 1	COM-1	COM-7	EMMA
			COM-2	COM-14	
AC power cable	9	Inverter 1	AC-L	L	Power distribution box
			AC-N	N	
			AC-PE	PE	
AC power cable	10	EMMA	IA*&IA	L	Power distribution box
			L1 IN	L	
AC power cable	11	EMMA	N IN	N	Power distribution box

12 Method 1
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
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.

Residential Smart PV Solution Quick Guide

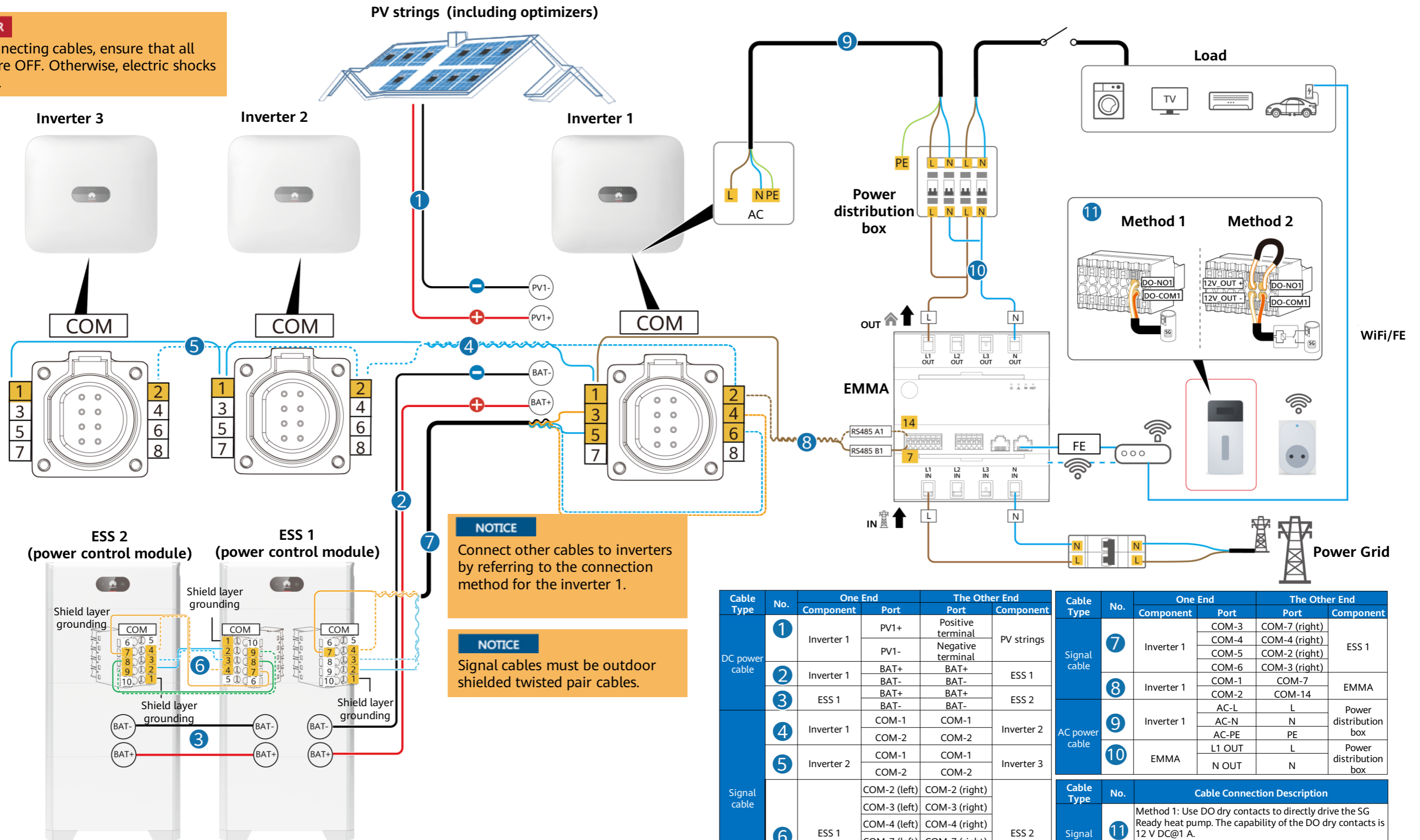
(Single-Phase PV+ESS Scenario + EMMA Networking)



3

Cable Connections (Single-Phase Inverter L1 + ESS S0 + EMMA with an Internal CT)

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



NOTICE
Connect other cables to inverters by referring to the connection method for the inverter 1.

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	Inverter 1	PV1+	Positive terminal	PV strings
			PV1-	Negative terminal	
	2	Inverter 1	BAT+	BAT+	ESS 1
Signal cable	3	ESS 1	BAT+	BAT+	ESS 2
			BAT-	BAT-	
AC power cable	4	Inverter 1	COM-1	COM-1	Inverter 2
			COM-2	COM-2	
Signal cable	5	Inverter 2	COM-1	COM-1	Inverter 3
			COM-2	COM-2	
Signal cable	6	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)	
Cable Type	No.	Component	Port	Port	Component
Signal cable	7	Inverter 1	COM-3	COM-7 (right)	ESS 1
			COM-4	COM-4 (right)	
			COM-5	COM-2 (right)	
Signal cable	8	Inverter 1	COM-6	COM-3 (right)	EMMA
			COM-2	COM-14	
AC power cable	9	Inverter 1	AC-L	L	Power distribution box
			AC-N	N	
			AC-PE	PE	
AC power cable	10	EMMA	L1 OUT	L	Power distribution box
			N OUT	N	
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.			

Residential Smart PV Solution Quick Guide

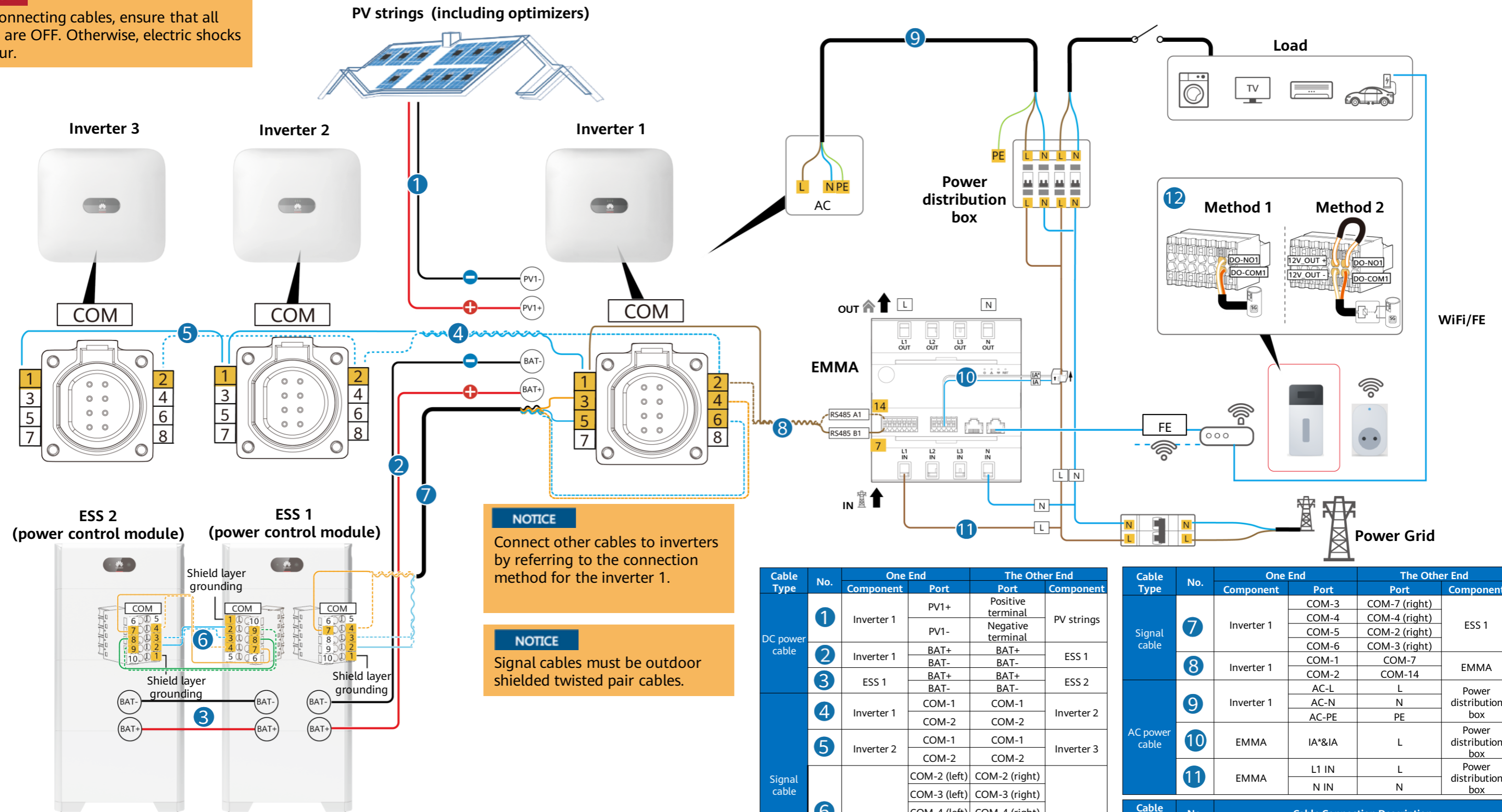
(Single-Phase PV+ESS Scenario + EMMA Networking)



3

Cable Connections (Single-Phase Inverter L1 + ESS S0 + EMMA with an External CT)

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



NOTICE
Connect other cables to inverters by referring to the connection method for the inverter 1.

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	Inverter 1	PV1+	Positive terminal	PV strings
			PV1-	Negative terminal	
	2	Inverter 1	BAT+	BAT+	ESS 1
3	ESS 1	BAT+	BAT+		
Signal cable	4	Inverter 1	COM-1	COM-1	Inverter 2
	5	Inverter 2	COM-2	COM-2	
	6	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)		

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
Signal cable	7	Inverter 1	COM-3	COM-7 (right)	ESS 1
			COM-4	COM-4 (right)	
			COM-5	COM-2 (right)	
AC power cable	9	Inverter 1	COM-6	COM-3 (right)	Power distribution box
			COM-1	COM-7	
			COM-2	COM-14	
Signal cable	12	ESS 1	COM-1	COM-7	EMMA
			COM-2	COM-14	

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.

Residential Smart PV Solution Quick Guide

(Single-Phase PV+ESS Scenario + EMMA Networking)



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.

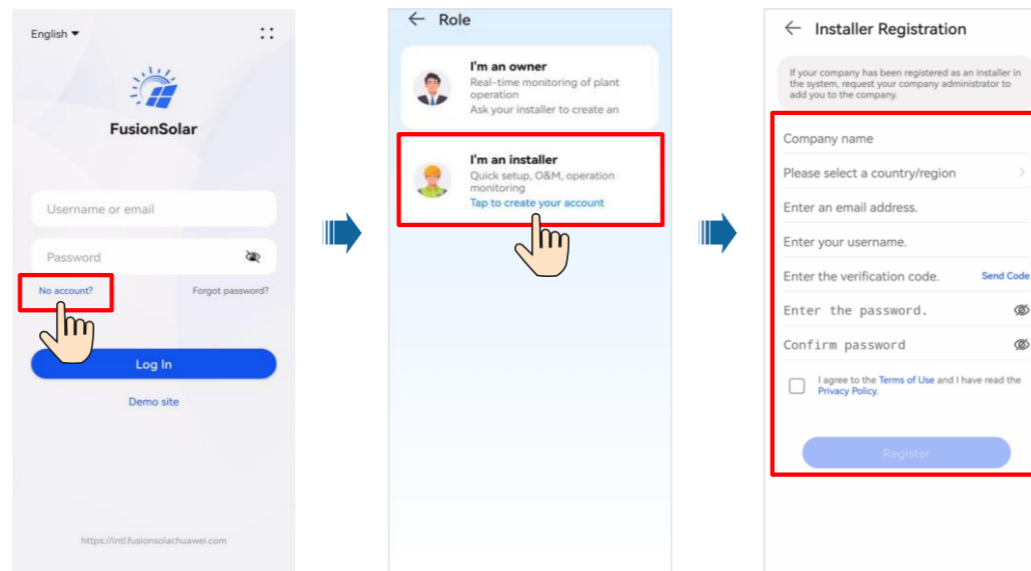


FusionSolar

Installer Registration

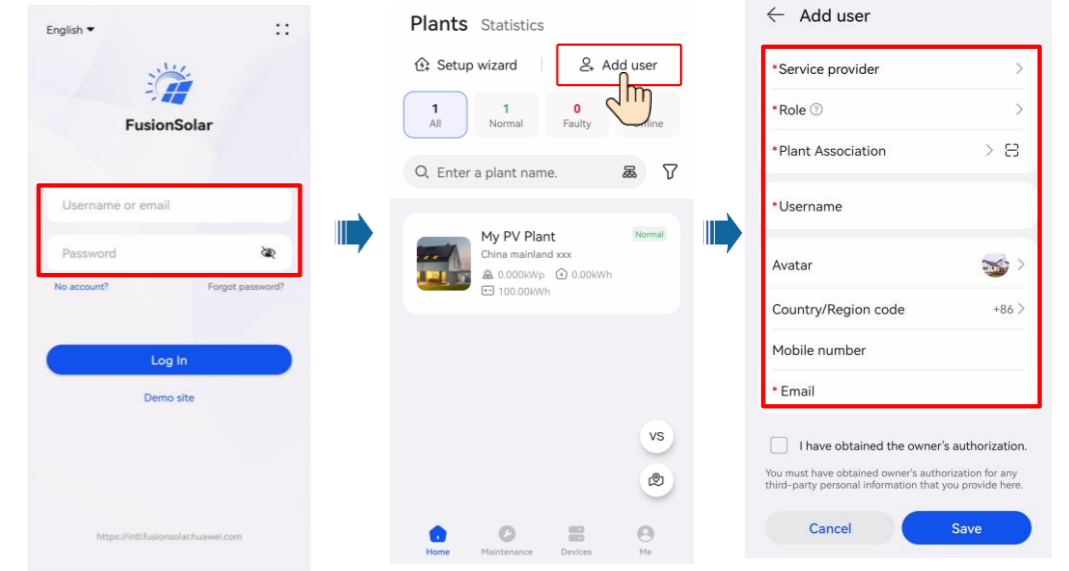
Initial registration

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



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.



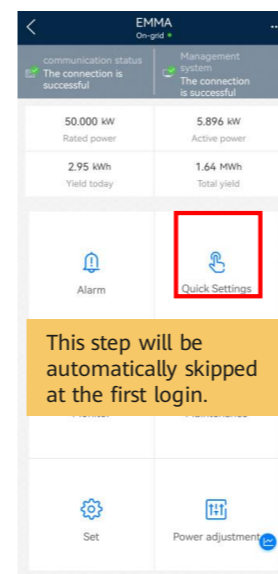
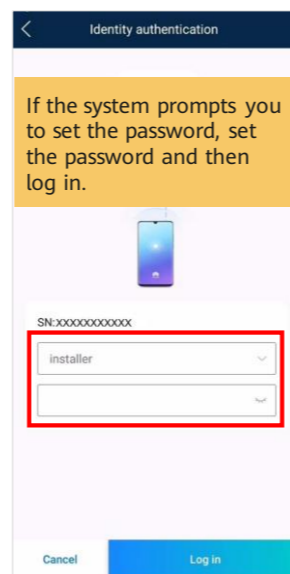
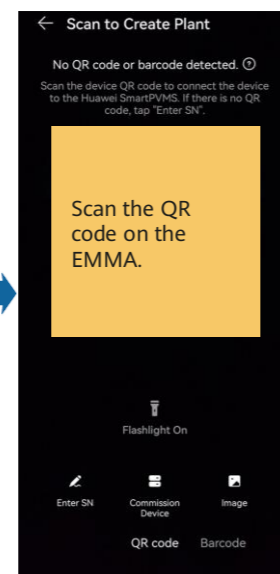
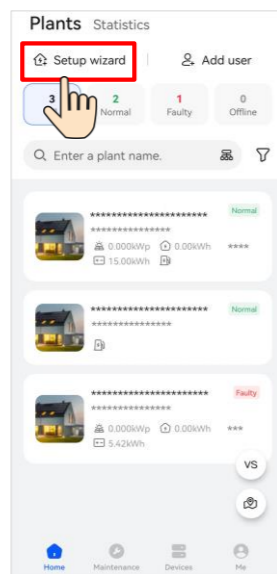
Or

Setup Wizard (Connecting to the Inverter WLAN for Commissioning)

Set the WLAN information of the charger.

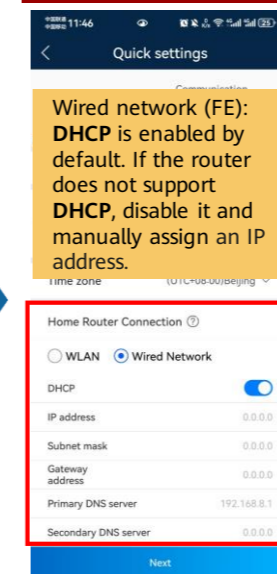


If the charger connects to the router through WLAN, you need to log in to the charger to set the WLAN information before deploying the EMMA.

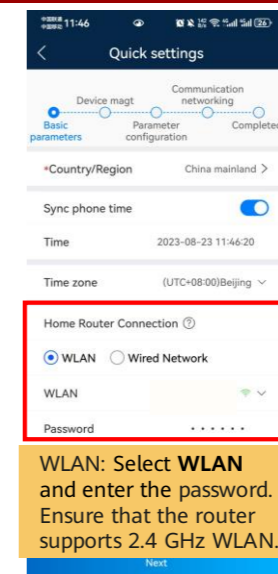


This step will be automatically skipped at the first login.

Set the route parameters.



Wired network (FE): DHCP is enabled by default. If the router does not support DHCP, disable it and manually assign an IP address.



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

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



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 key parameters.

Select EMMA configuration parameters.

Select ESS configuration parameters.

Set the communication networking.

I have been authorized by the user to connect to the management system.

Connection Test.

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

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.

I have obtained the owner's authorization.

Viewing the Plant Status

Residential Smart PV Solution Quick Guide

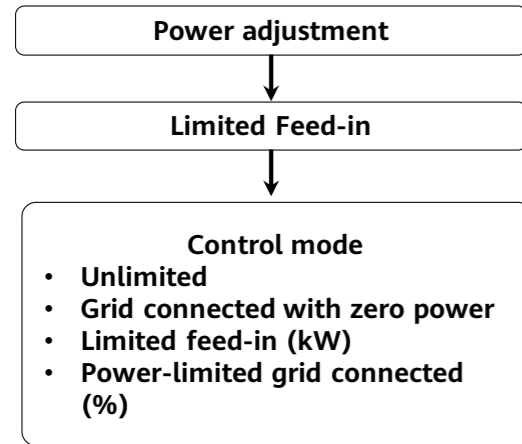
(Single-Phase PV+ESS Scenario + EMMA Networking)



5

Off-Grid/Grid-tied Control Parameters

Setting Grid-tied Point Control



The screenshot shows the EMMA mobile app interface. The main dashboard displays system status and power data. The navigation path is as follows:

- EMMA On-grid** (Main Dashboard)
- Power adjustment** (Menu Item)
- Limited Feed-in** (Sub-menu Item)
- Limited Feed-in** (Settings Screen)

The **Limited Feed-in** settings screen includes the following options:

- Control mode: Unlimited
- Limitation mode: Total power
- Power lowering adjustment interval: 0.5 s
- Maximum protection time: 5.0 s
- Power raising threshold: 0.500 kW
- Active power output limit when meter fails: 0.0 %

At the bottom of the screen, there are four selection options: Unlimited, Grid connected with zero power, Limited feed-in (kW), and Power-limited grid connected (%). A Cancel button is also present.

Residential Smart PV Solution Quick Guide

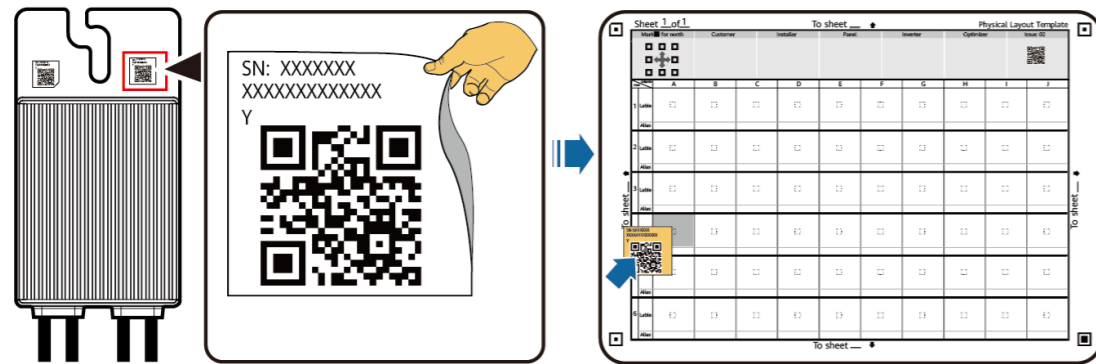
(Single-Phase PV+ESS Scenario + EMMA Networking)



6 Physical Layout of Smart PV Optimizers

Attaching SN Labels

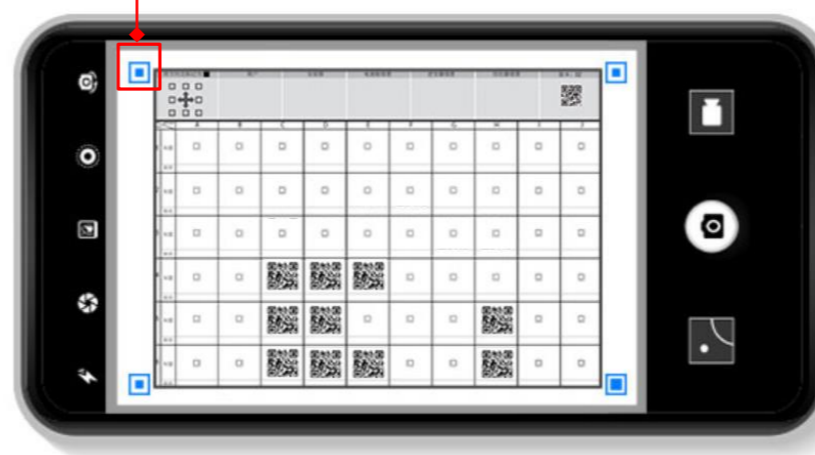
Remove the SN labels from optimizers and attach them to the physical layout template based on the actual positions of the optimizers in the plant.



Taking a Photo of the Physical Layout Template

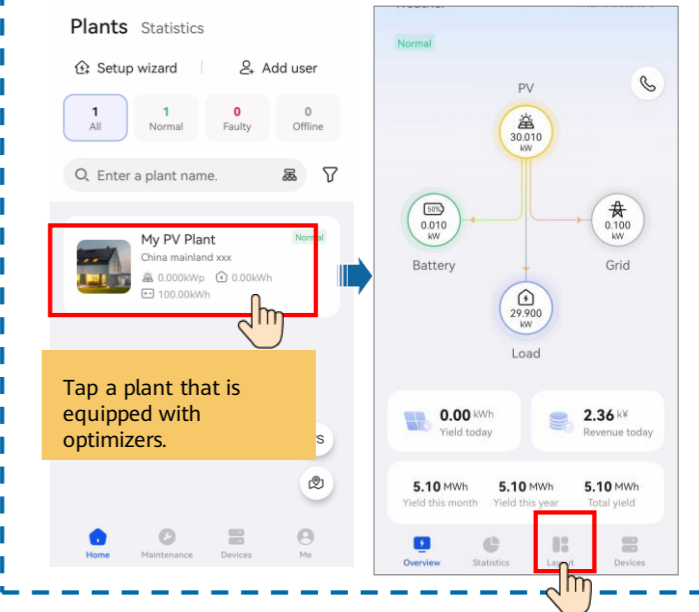
Ensure that the four positioning points on the template are within the frame.

Positioning point



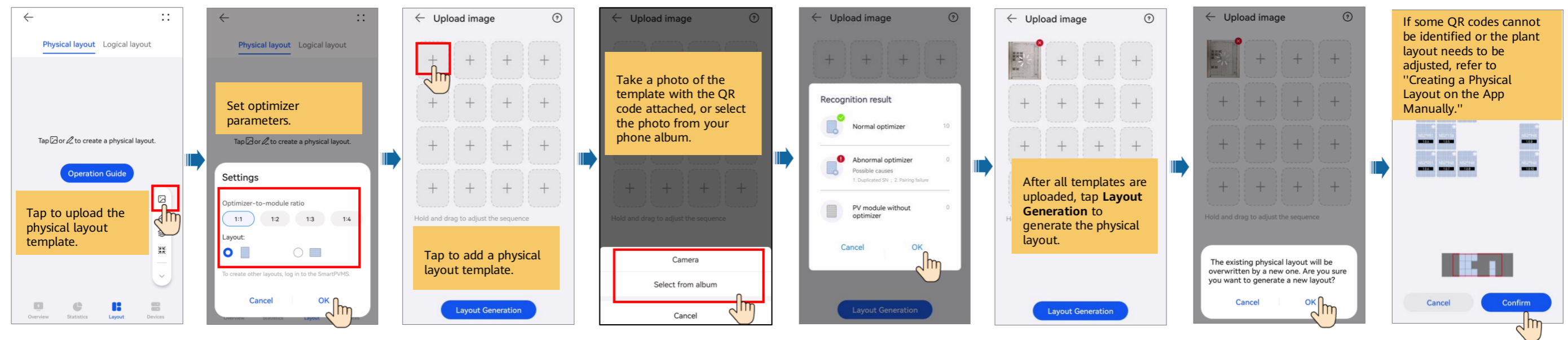
Generating a Physical Layout on the App

Enter the Plant Layout screen.



Generating a Physical Layout on the App

Upload the template and generate a layout.



If some QR codes cannot be identified or the plant layout needs to be adjusted, refer to "Creating a Physical Layout on the App Manually."

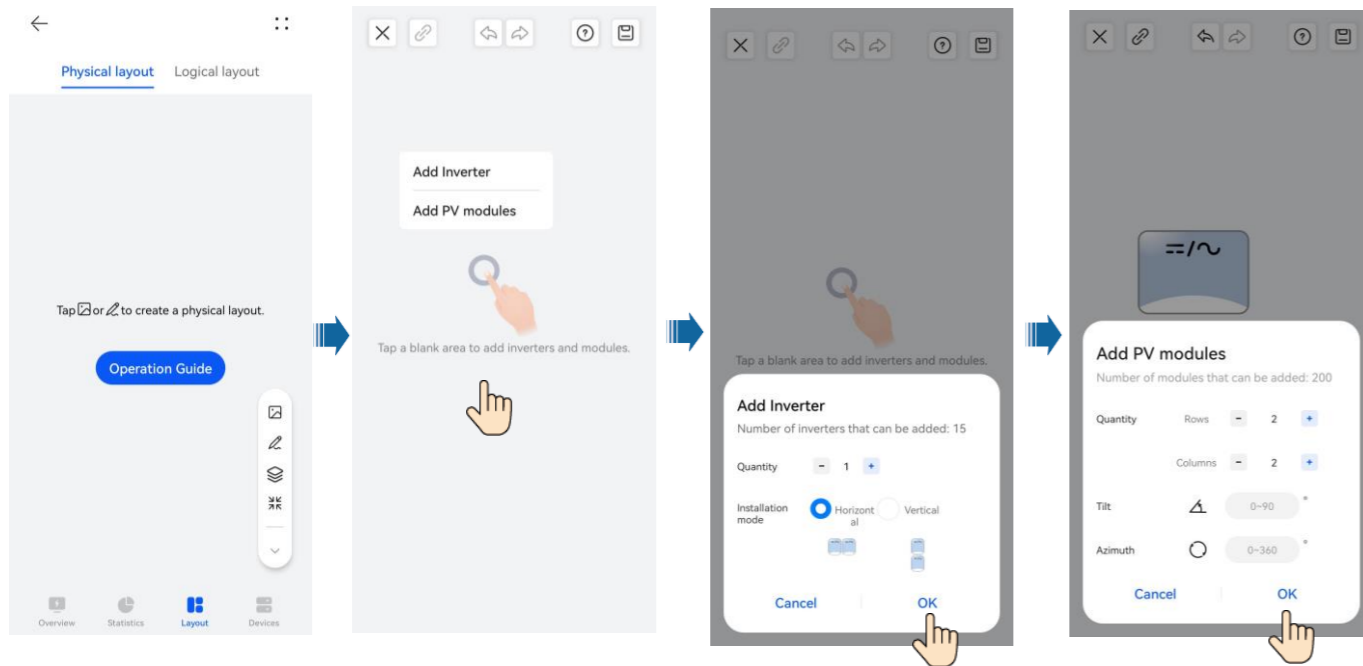
Residential Smart PV Solution Quick Guide

(Single-Phase PV+ESS Scenario + EMMA 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.

