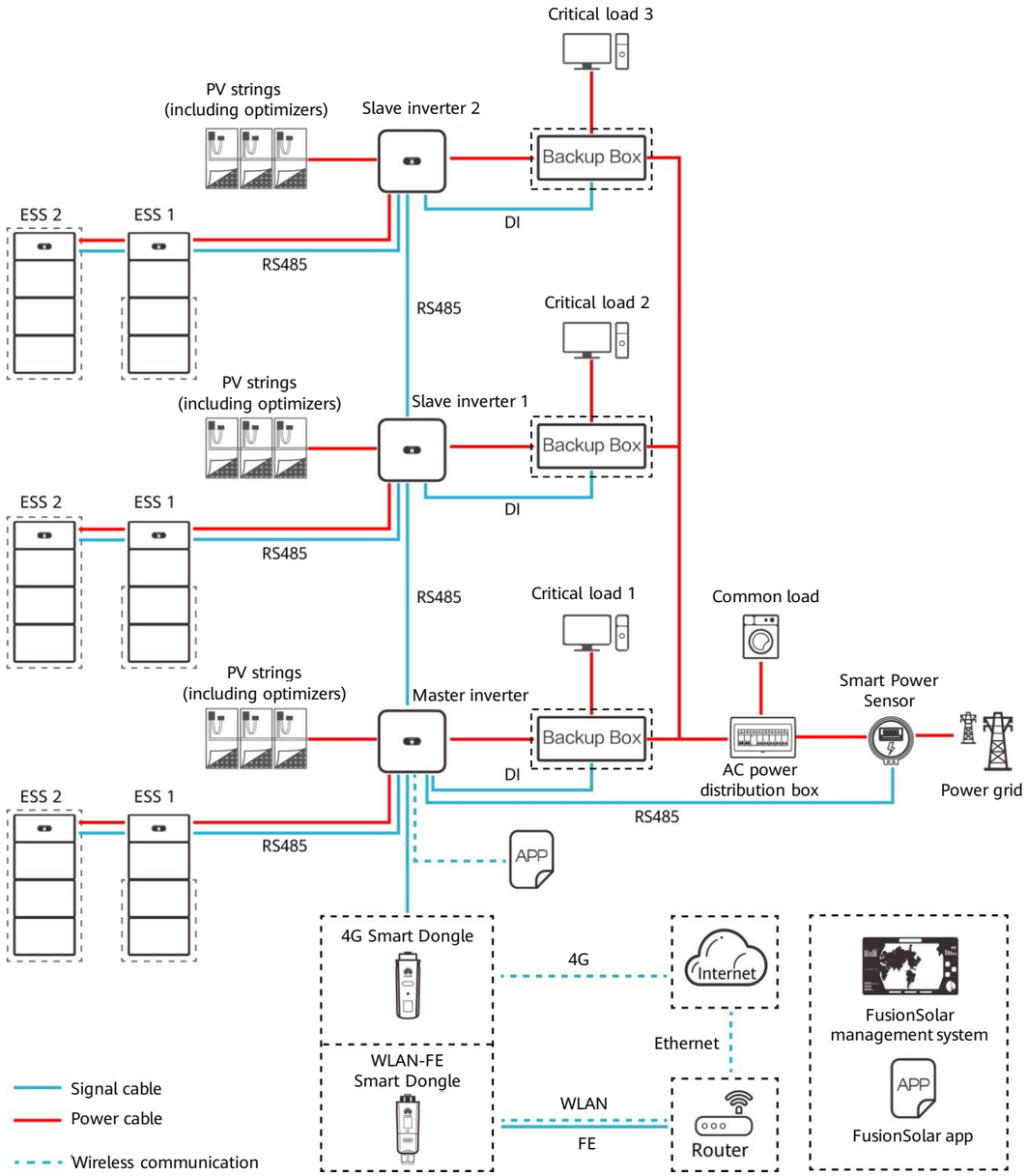
Residential Smart PV Solution Quick Guide
(Single-Phase PV+ESS Scenario + Smart Dongle Networking)

Issue: 06
Date: 2024-04-30

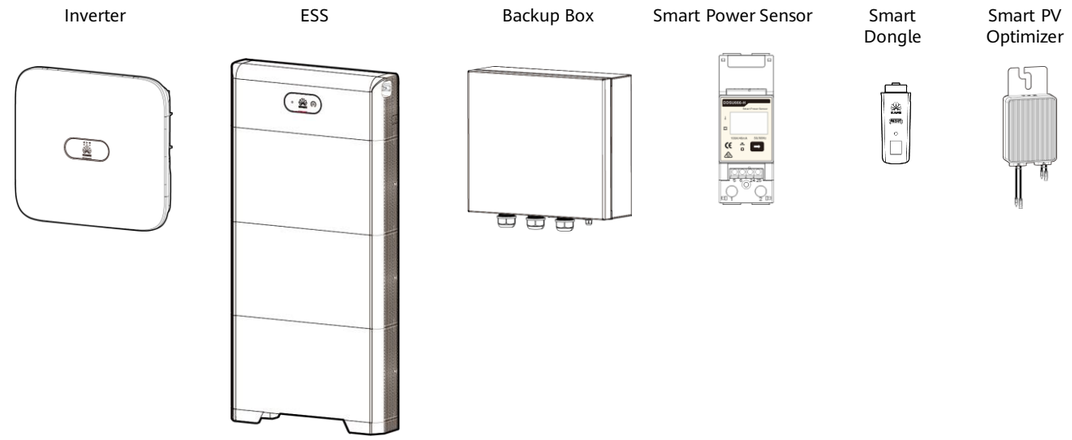
1 Networking



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.

2 Product Overview



Component	Model		Description
Inverter (master and slave)	SUN2000-(2KTL-6KTL) -L1 SUN2000-(8K, 10K)-LC0 SUN2000-(8K, 10K)-LC0-ZH		• A maximum of three inverters can be cascaded. • L1/LC0 inverters can be cascaded.
Energy storage system (ESS)	LUNA2000-(5-30)-S0 LUNA2000-(7, 14, 21)-S1		• If there is only one ESS, it must be connected to the master inverter. • Each inverter can connect to a maximum of two ESSs, each L1 can connect to a maximum of one ESS. • The LUNA2000-(5-30)-S0 and LUNA2000-(7, 14, 21)-S1 cannot connect to the same inverter in a parallel system. • If inverters are cascaded, the LUNA2000-(5-30)-S0 and LUNA2000-(7, 14, 21)-S1 cannot connect to different inverters.
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. • The SUN2000-(8K, 10K)-LC0, SUN2000-(8K, 10K)-LC0-ZH cannot be connected to the Backup Box.
Smart Power Sensor	**Single-Phase:** DDSU666-H YDS70-C16 DDSU71 DDSU1079-CT	**Three-Phase:** DTSU666-H DTSU666-HW YDS60-80 DTSU71 DHSU1079-CT	• 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. • Only L1 supports the three-phase smart power sensor.
Smart Dongle	SDongleA-03(4G) SDongleB-06(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. • The SDongleA-03 (4G) is compatible only with the SUN2000-(2KTL-6KTL)-L1.
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

In the Smart Dongle networking scenario, a maximum of three inverters and six ESSs can be connected.

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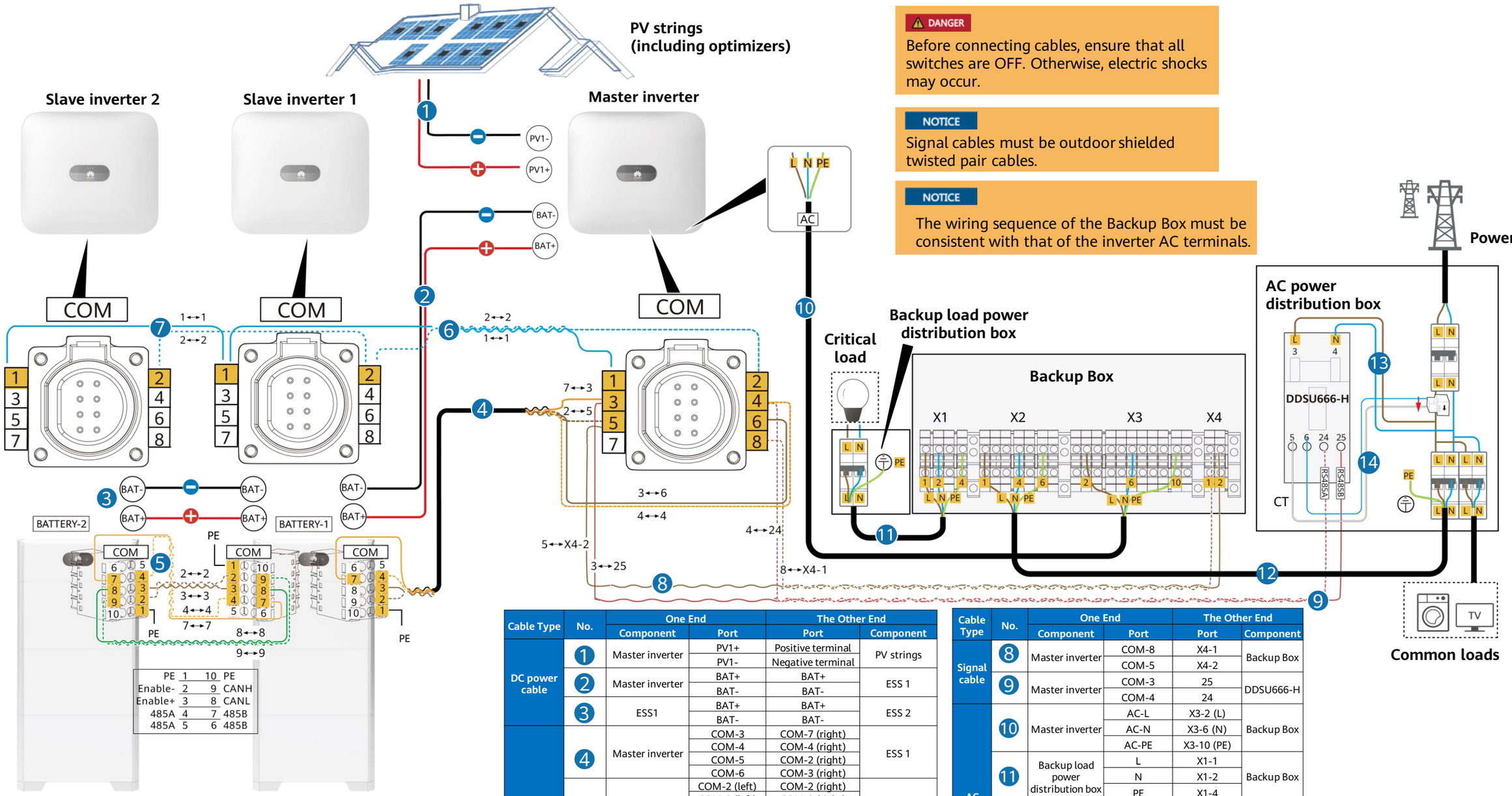
3 Cable Connections (Single-Phase Inverter L1 + ESS S0 + Backup Box B0)



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	ESS1	BAT+	BAT+	ESS 2
			BAT-	BAT-	
Signal cable	4	Master inverter	COM-3	COM-7 (right)	ESS 1
			COM-4	COM-4 (right)	
			COM-5	COM-2 (right)	
			COM-6	COM-3 (right)	
	5	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)	
	6	Master inverter	COM-1	COM-1	Slave inverter 1
			COM-2	COM-2	
	7	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
Signal cable	8	Master inverter	COM-8	X4-1	Backup Box
			COM-5	X4-2	
	9	Master inverter	COM-3	25	DDSU666-H
			COM-4	24	
AC power cable	10	Master inverter	AC-L	X3-2 (L)	Backup Box
			AC-N	X3-6 (N)	
			AC-PE	X3-10 (PE)	
	11	Backup load power distribution box	L	X1-1	Backup Box
			N	X1-2	
			PE	X1-4	
	12	AC power distribution box	L	X2-1	Backup Box
			N	X2-4	
			PE	X2-6	
	13	AC power distribution box	L	3	DDSU666-H
			N	4	
	14	AC power distribution box	L	5	DDSU666-H CT
				6	

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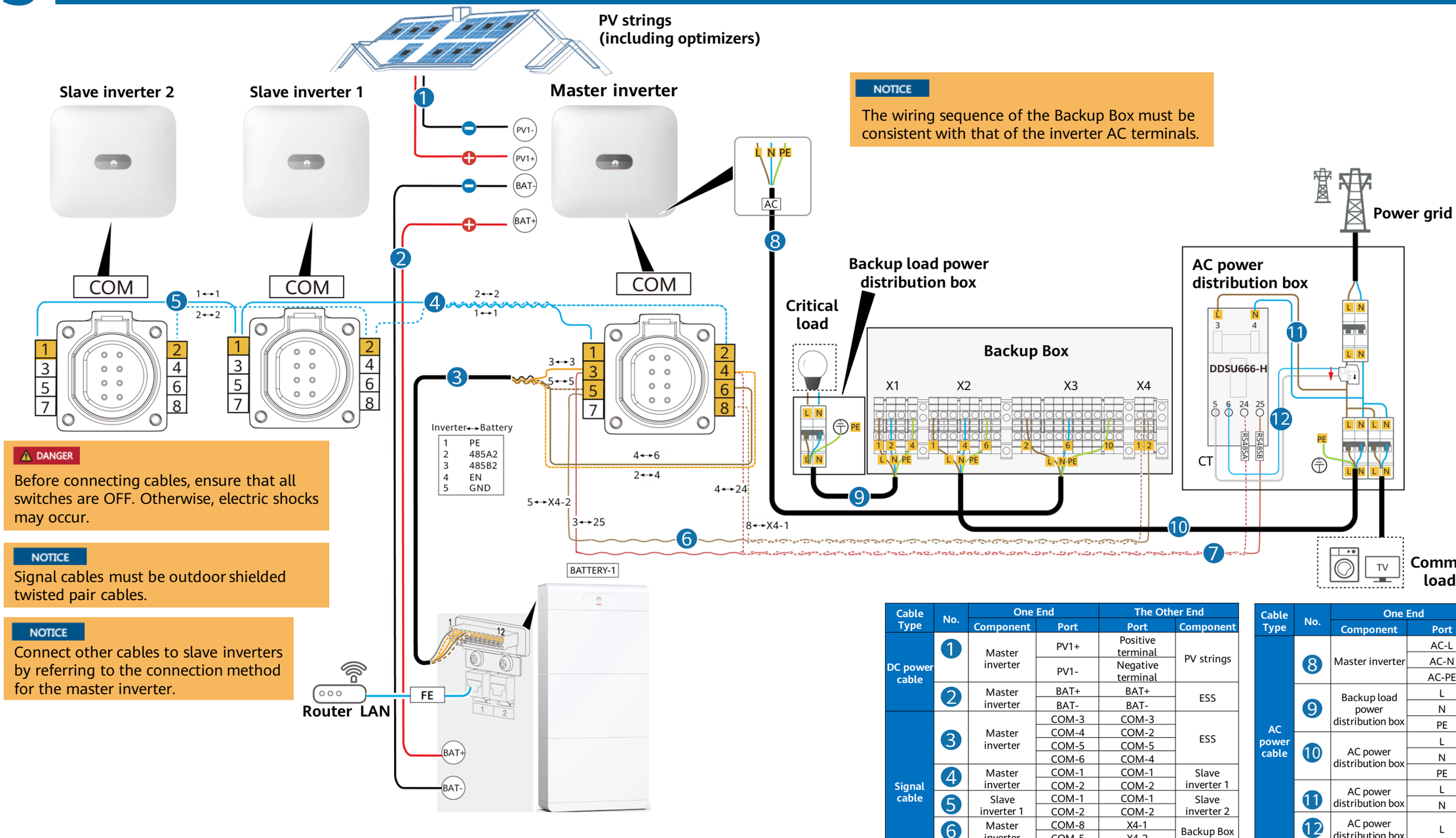
3 Cable Connections (Single-Phase Inverter L1 + ESS S1 + Backup Box B0)



NOTICE

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

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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

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
			BAT-	BAT-	
Signal cable	3	Master inverter	COM-3	COM-3	ESS
			COM-4	COM-2	
			COM-5	COM-5	
			COM-6	COM-4	
	4	Master inverter	COM-1	COM-1	Slave inverter 1
			COM-2	COM-2	
	5	Slave inverter 1	COM-1	COM-1	Slave inverter 2
			COM-2	COM-2	
	6	Master inverter	COM-8	X4-1	Backup Box
			COM-5	X4-2	
	7	Master inverter	COM-3	25	DDSU666-H
			COM-4	24	

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

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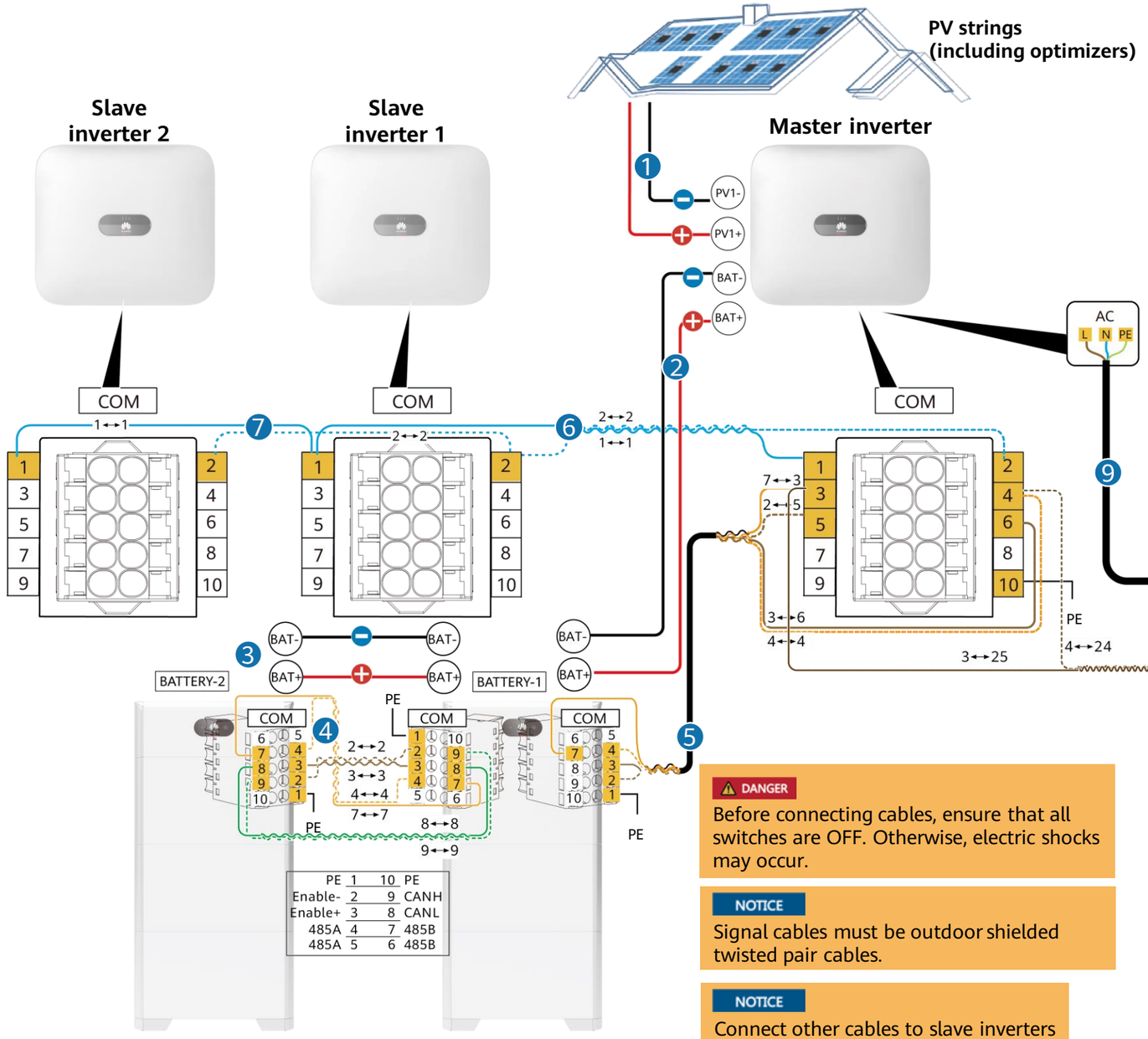
3 Cable Connections (Single-Phase Inverter LC0 + ESS S0)



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	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-3	COM-7 (right)	ESS 1
			COM-4	COM-4 (right)	
			COM-5	COM-2 (right)	
			COM-6	COM-3 (right)	

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
Signal cable	6	Slave inverter 1	COM-1	COM-1	Slave inverter 2
			COM-2	COM-2	
	7	Master inverter	COM-1	COM-1	Slave inverter 1
			COM-2	COM-2	
	8	Master inverter	COM-3	25	DDSU666-H
			COM-4	24	

Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
AC power cable	9	Master inverter	AC-L	L	AC power Power distribution box
			AC-N	N	
			AC-PE	PE	
	10	AC power distribution box	L	3	DDSU666-H
			N	4	
	11	AC power distribution box	L	5	DDSU666-H CT
				6	

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

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

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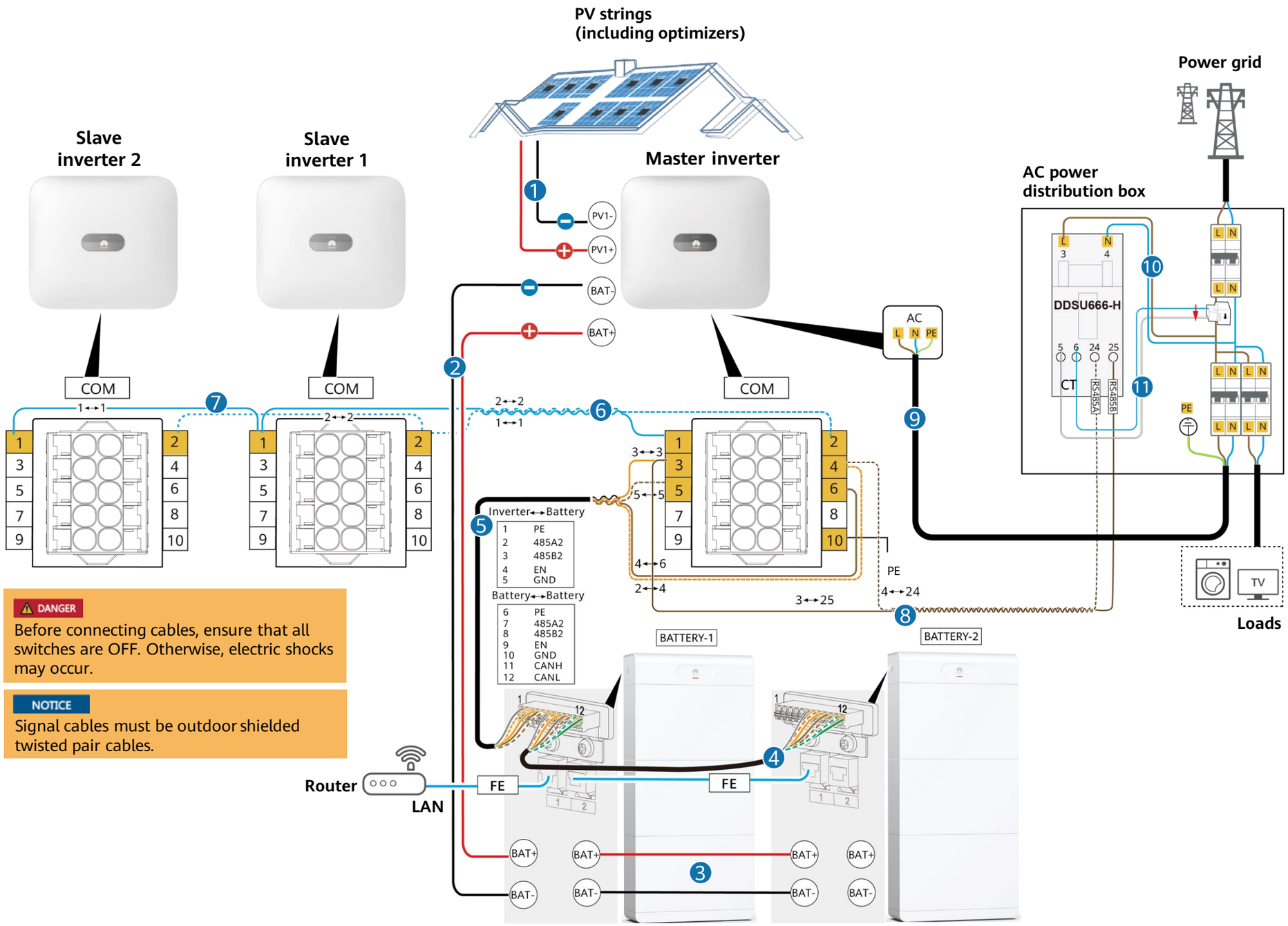
3 Cable Connections (Single-Phase Inverter LC0 + ESS S1)



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	ESS 1	COM-7	COM-7	ESS 2
			COM-8	COM-8	
			COM-9	COM-9	
			COM-10	COM-10	
			COM-11	COM-11	
			COM-12	COM-12	
	5	Master inverter	COM-3	COM-3	ESS 1
			COM-4	COM-2	
			COM-5	COM-5	
			COM-6	COM-4	
Signal cable	6	Slave inverter 1	COM-1	COM-1	Slave inverter 2
			COM-2	COM-2	
	7	Master inverter	COM-1	COM-1	Slave inverter 1
			COM-2	COM-2	
	8	Master inverter	COM-3	25	DDSU666-H
			COM-4	24	
AC power cable	9	Master inverter	AC-L	L	AC power Power distribution box
			AC-N	N	
			AC-PE	PE	
	10	AC power distribution box	L	3	DDSU666-H
			N	4	
	11	AC power distribution box	L	5	DDSU666-H CT
				6	

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.

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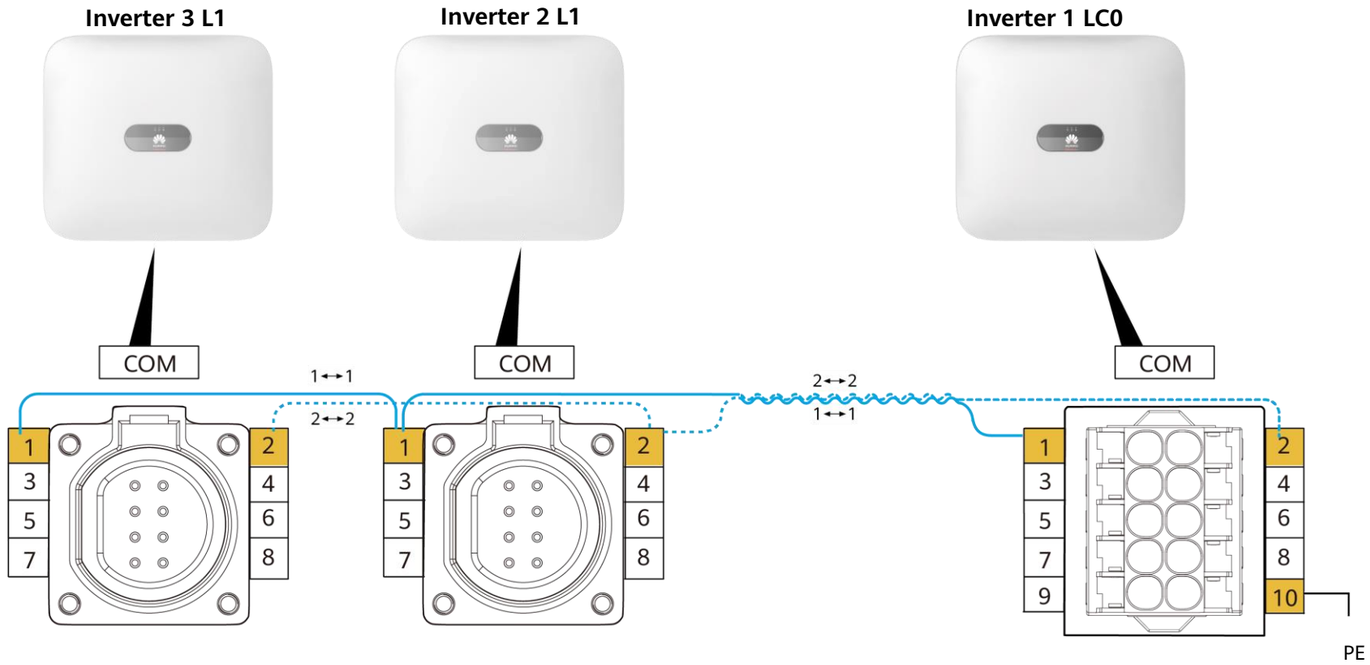
3 Cable Connections (Single-Phase Inverter LC0/L1 Cascading)

NOTE

The following figure shows the signal cable cascading of LC0/L1 single-phase inverters. For the complete networking wiring diagram, refer to the preceding cable connection diagrams.



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4 System Commissioning

App-based Deployment Procedure

Download and install the FusionSolar app

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

↓

Enter THE setup wizard

↓

Check the device status

Downloading and Installing the FusionSolar App

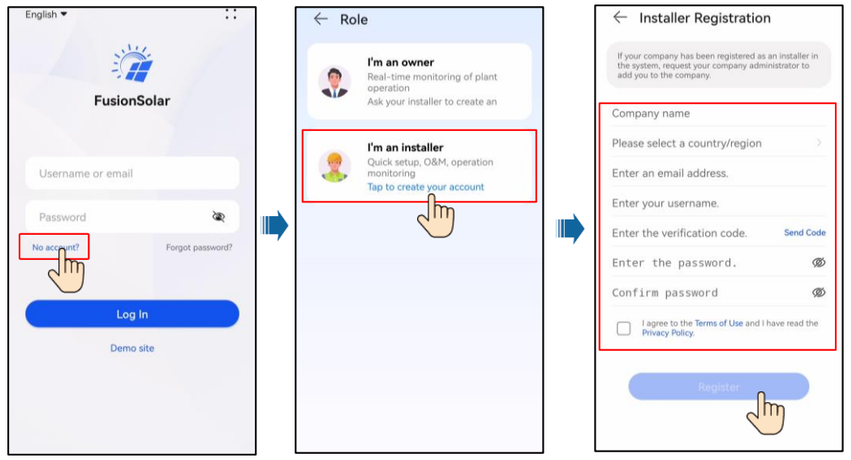
- Search for FusionSolar in the app store to download the app.
- Scan the QR code below to download the app.

FusionSolar

Installer Registration

Initial registration

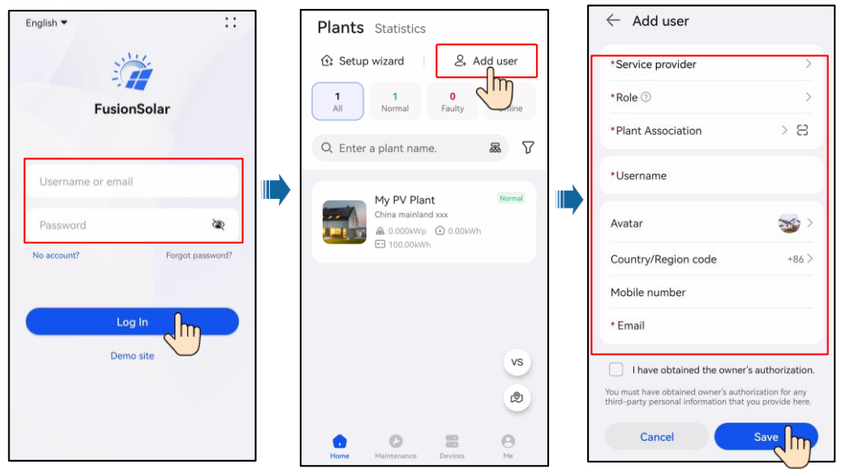
Create the first installer account, and generate a domain named after the company.



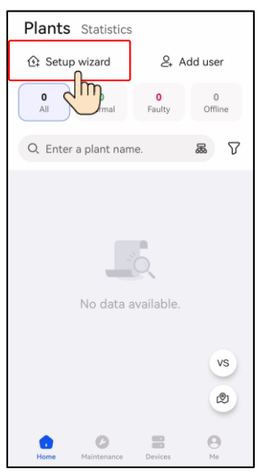
Or

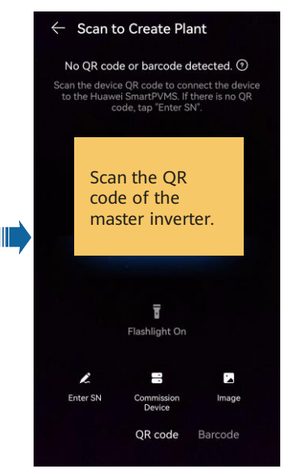
Non-initial registration

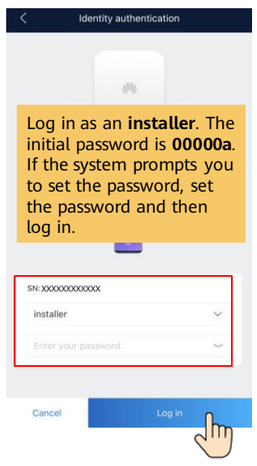
If the company requires multiple installer accounts, log in to the FusionSolar app and tap **Add user** to create another installer account.

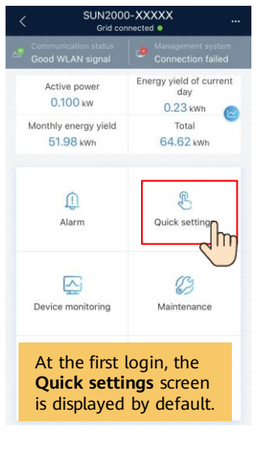


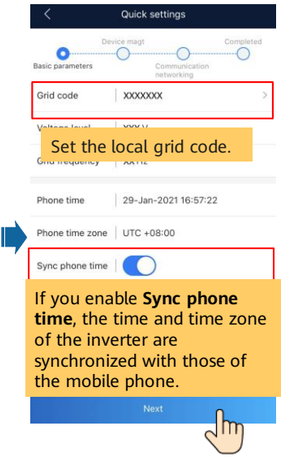
Setup Wizard (Connecting to the Inverter WLAN for Commissioning)



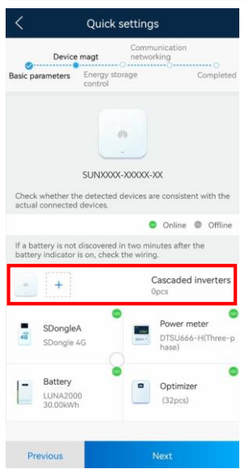


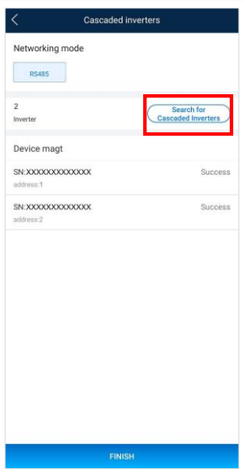


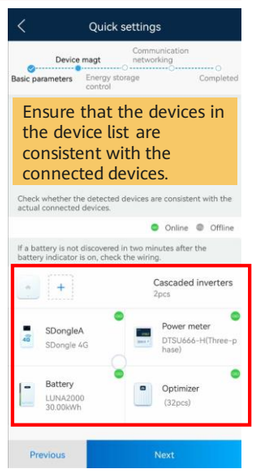




(Optional) Cascade inverters.







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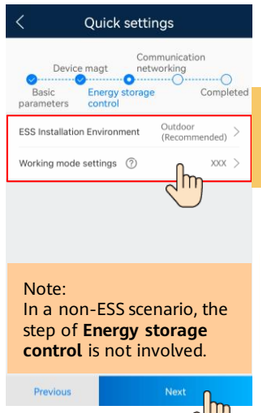
Set the ESS parameters.

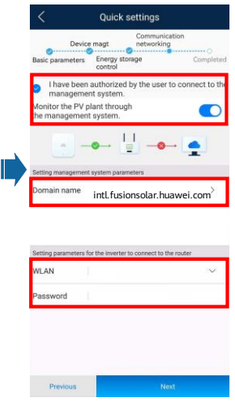


Set the ESS installation environment and working mode.

You can tap ⓘ to obtain the detailed working mode information.

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

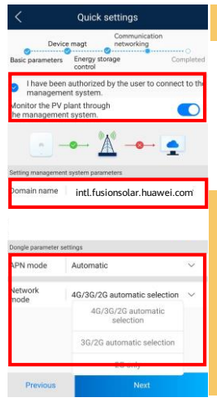
Set the communication networking.



WLAN communication

Select the desired router and enter the router password.

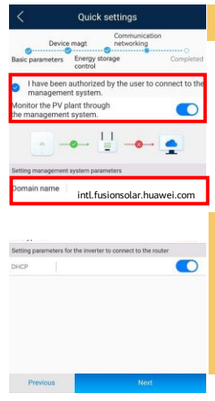
Or



4G communication

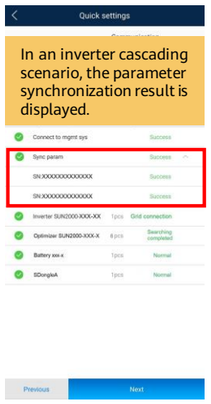
By default, **APN mode** is set to **Automatic**. If you cannot access the Internet in **Automatic** mode, set it to **Manual**. In this case, set the parameters related to the SIM card with the information obtained from the carrier.

Or



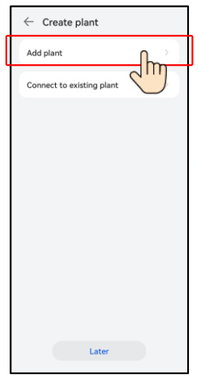
FE communication

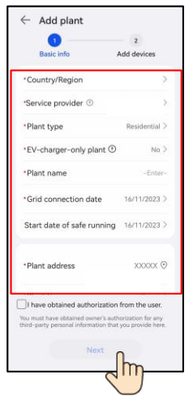
If the Ethernet parameter is displayed, the network cable is not connected. Reconnect the network cable.

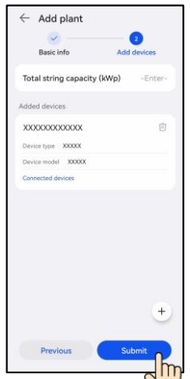


In an inverter cascading scenario, the parameter synchronization result is displayed.

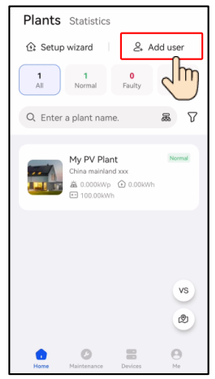
Add a plant.

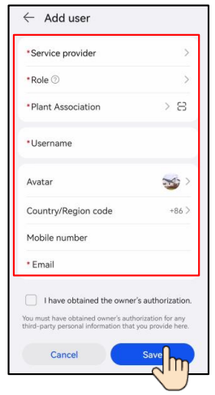




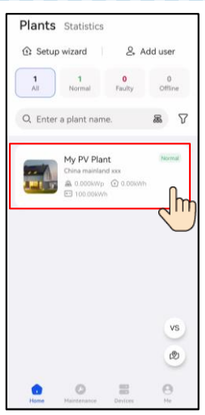


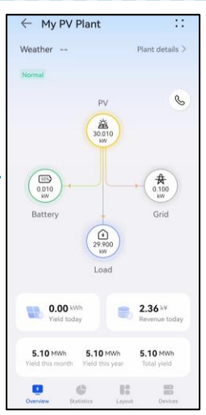
Create an owner account.





Checking the Plant Status





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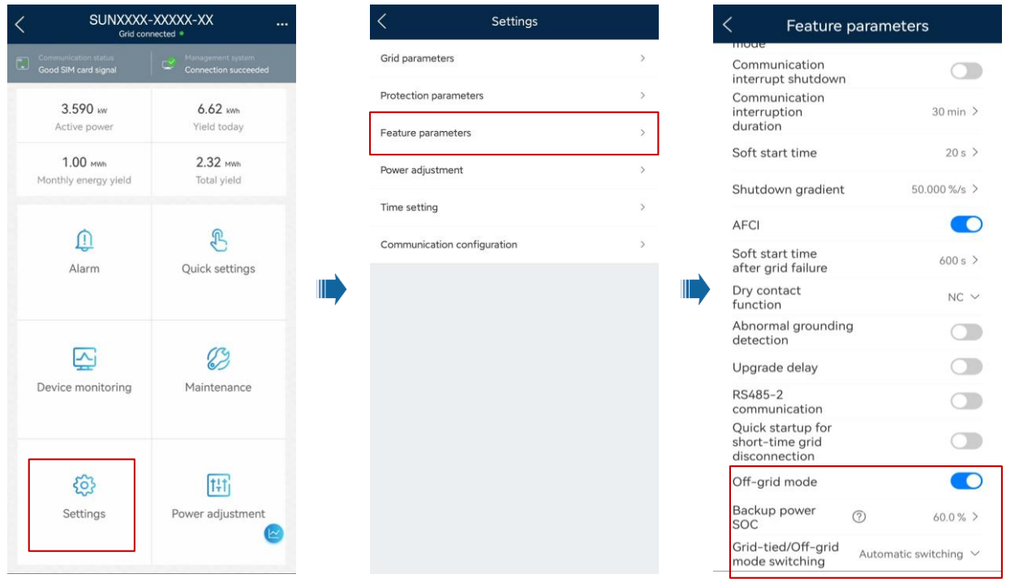
5 Off-Grid/Grid-tied Control Parameters

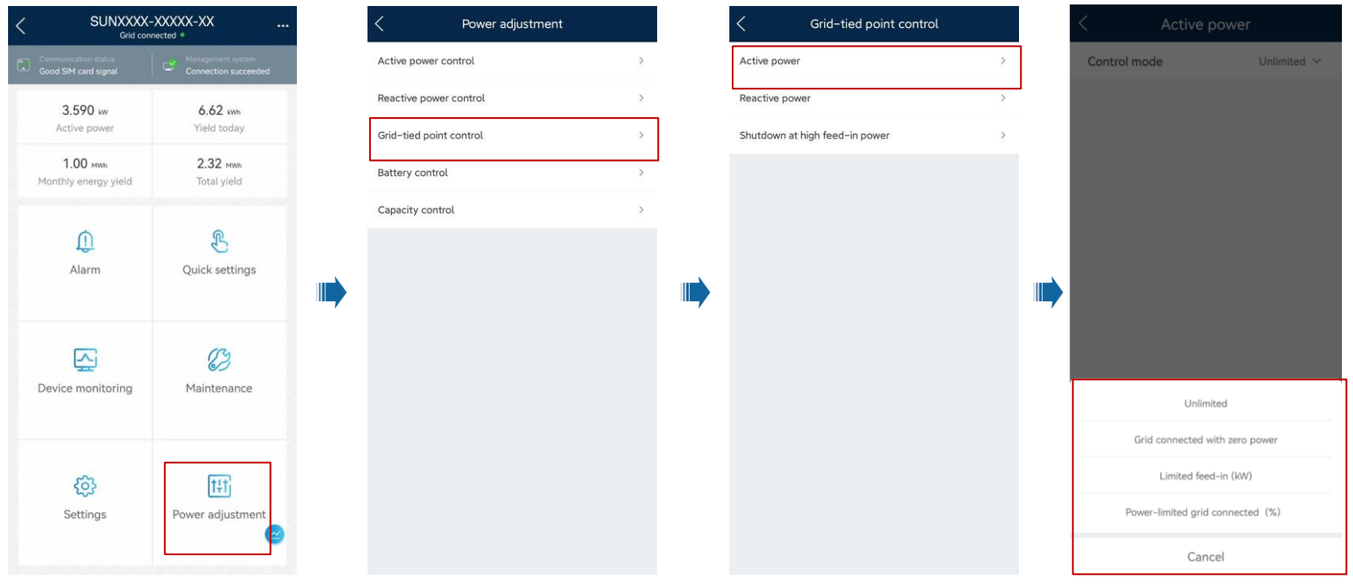
Enabling Off-Grid Mode

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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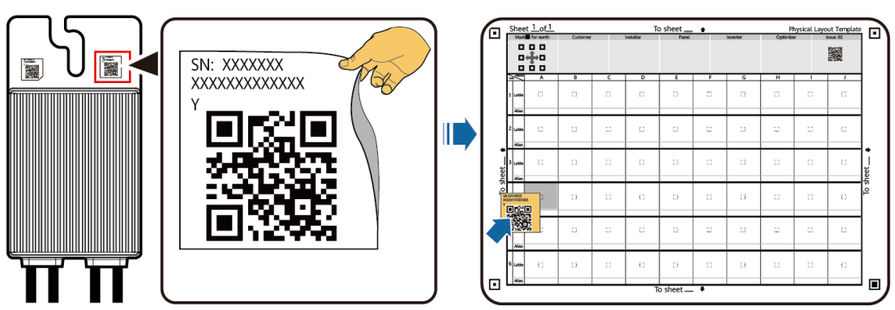
6 Physical Layout of Smart PV Optimizers

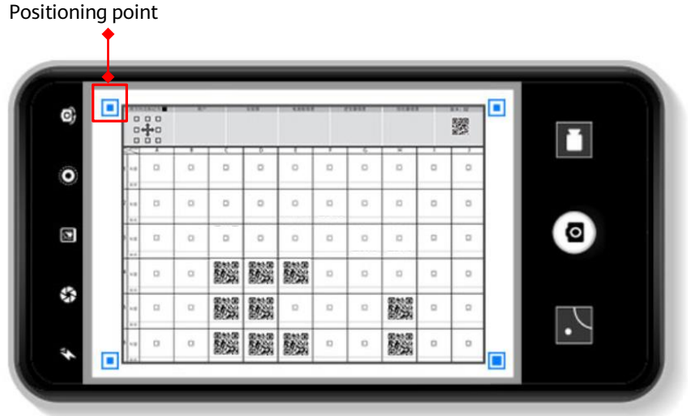
Attaching SN Labels

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.



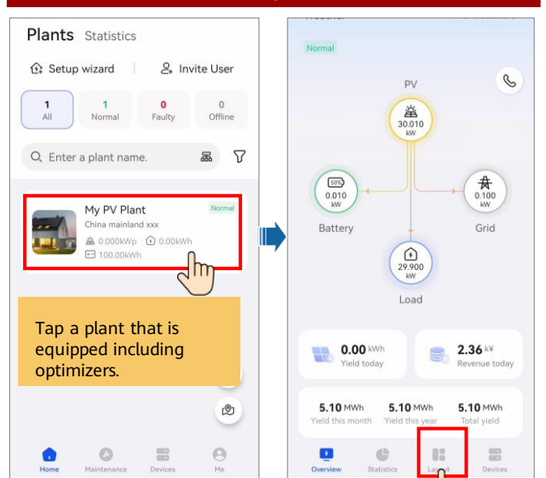
Taking a Photo of the Physical Layout Template

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



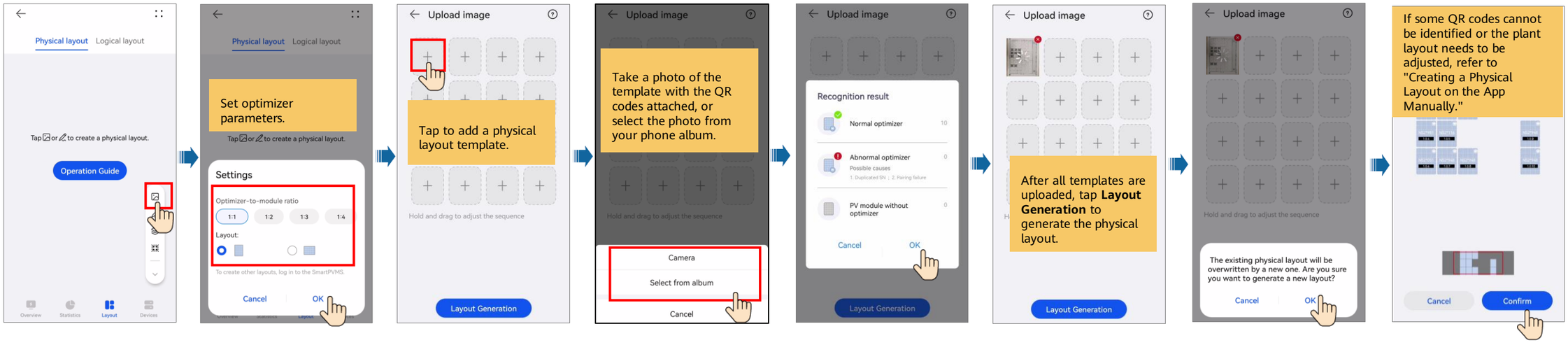
Generating a Physical Layout on the App

Enter the Layout screen.



Generating a Physical Layout on the App Automatically

Upload the template and generate a layout.



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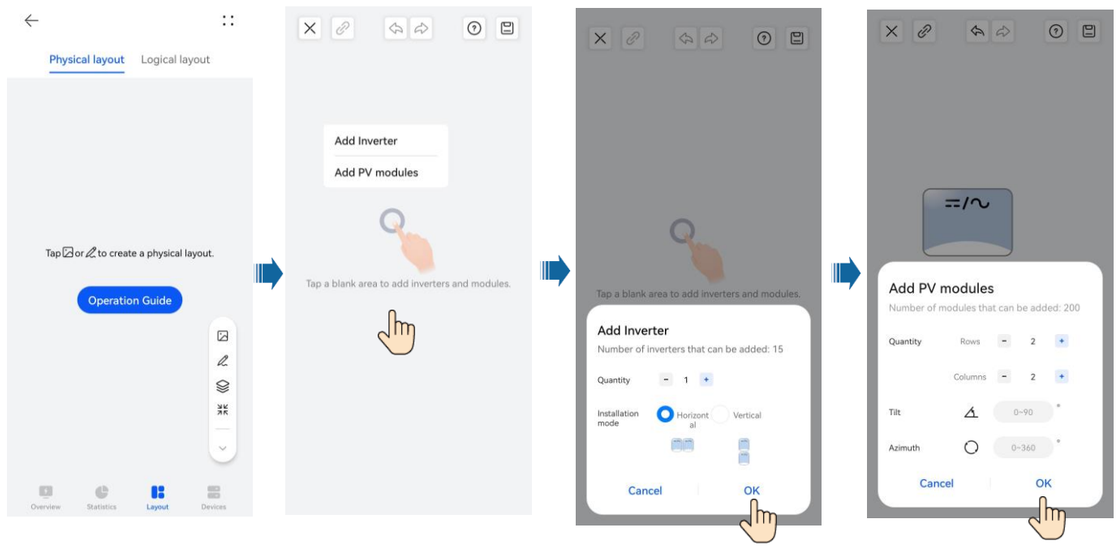
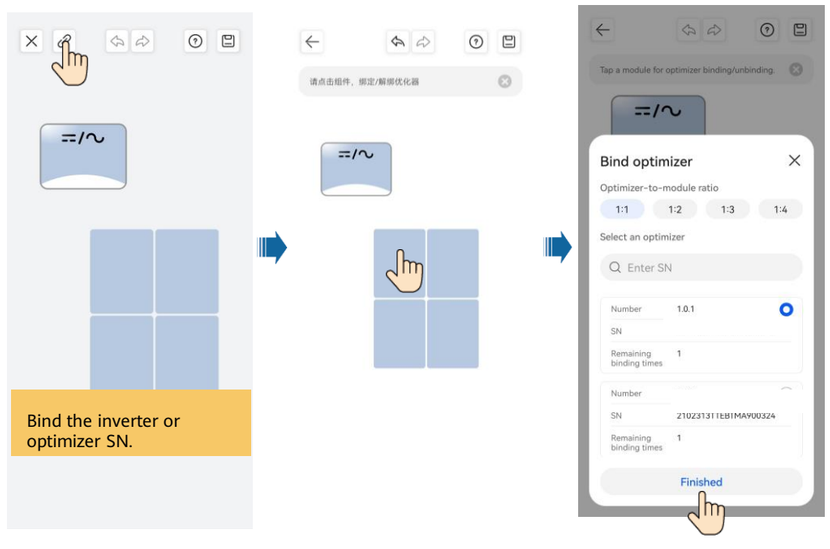
Creating a Physical Layout on the App Manually

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.