Manuals+ — User Manuals Simplified.

HUAWEI YDS60-C24 FusionSolar SmartPVMS Smart Dongle

HUAWEI YDS60-C24 FusionSolar SmartPVMS Smart Dongle User Guide

Contents

HUAWEI YDS60-C24 FusionSolar SmartPVMS Smart Dongle

Specifications

- **Inverter:** SUN2000-(5KTL-12KTL)-M1, SUN2000-(12K-25K)-MB0 series, SUN2000-(8KTL-20KTL)-M2, SUN2000-(12KTL-25KTL)-M5 series, SUN2000-(5K-12K)-MAP0 series
- **ESS:** LUNA2000-(5-30)-S0, LUNA2000-(7, 14, 21)-S1
- **Backup Box:** Backup Box-B1
- **Smart Power Sensor:** DTSU666-H, DTSU666-HW, YDS60-80, YDS60-C24, DTSU71, DHSU1079-CT
- **Smart Dongle:** SDongleB-06 (4G), SDongleA-05 (WLAN-FE)
- **Smart PV Optimizer:** SUN2000-450W-P2, SUN2000-600W-P, MERC-600W-PA0, MERC-(1300W, 1100W)-P

Product Overview
The Residential Smart PV Solution consists of various components including inverters, energy storage systems (ESS), backup boxes, smart power sensors, smart dongles, and smart PV optimizers. These components work together to provide a comprehensive smart energy management solution for residential applications.

Networking
The system involves networking between PV strings (including optimizers), slave inverters, critical loads, and various other components to ensure efficient energy distribution and utilization.

Cable Connections
Before connecting cables, ensure that all switches are OFF to prevent electric shocks. The wiring sequence of the Backup Box must be consistent with that of the inverter AC terminals.

Product Usage Instructions

Inverter Setup

1. Install the master and slave inverters according to the provided user manuals.
2. Connect the DC power cable from the PV strings to the inverter terminals following the specified positive and negative terminal connections.

ESS Configuration

1. Connect the ESS to the master inverter using the AC power cables and ensure proper connection to the AC terminals.
2. Configure the ESS settings as per the user manual guidelines for optimal performance.

Smart Dongle Networking

1. Install the Smart Dongle (4G or WLAN-FE) to enable wireless communication with the FusionSolar SmartPVMS and FusionSolar app.
2. Ensure proper positioning for signal reception and follow the setup instructions provided with the dongle.

FAQ

- **Q: Can I connect more than two ESSs to the master inverter?**
  A: Yes, you can connect multiple ESSs to the master inverter. Refer to the user manual for supported meter models and baud rate negotiation details.
- **Q: What should I do if I encounter issues with cable connections?**
  A: If you face any problems with cable connections, double-check the wiring sequence and ensure all switches are turned off beforemaking any connections.

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

Networking
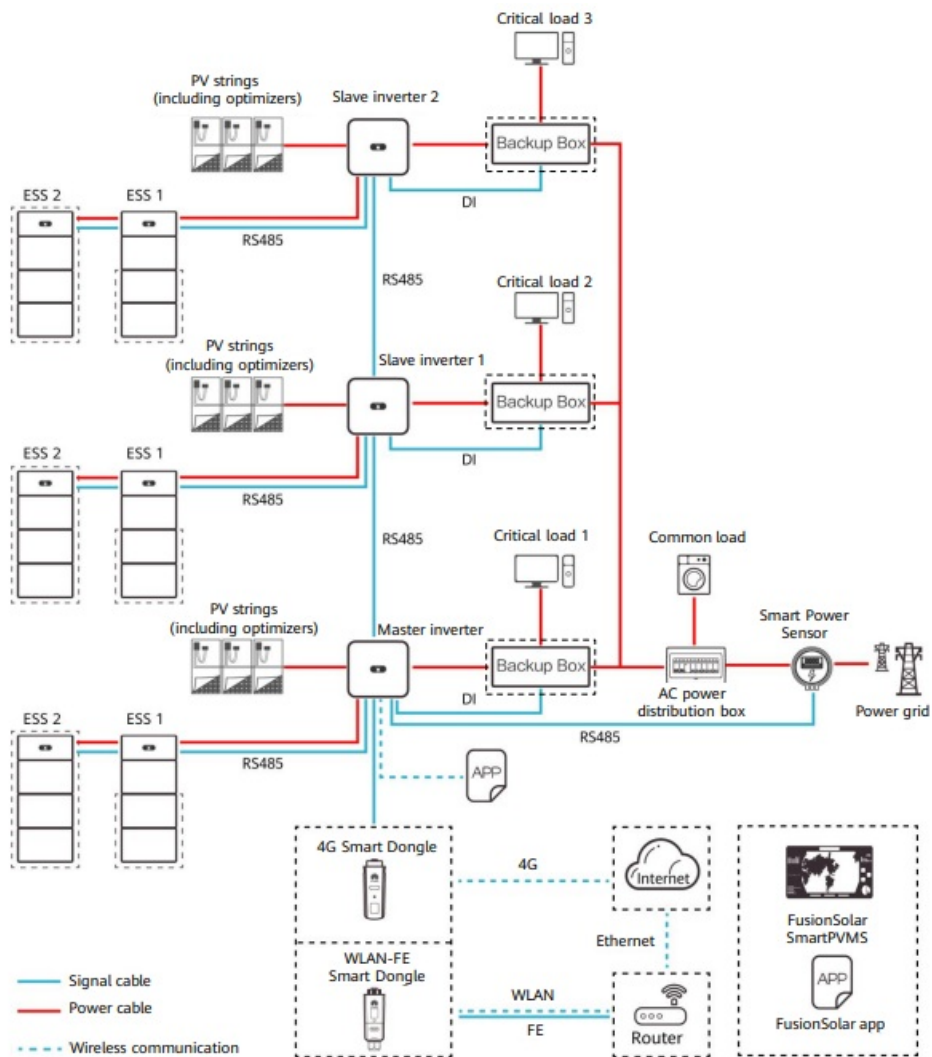
Note

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.

Product Overview
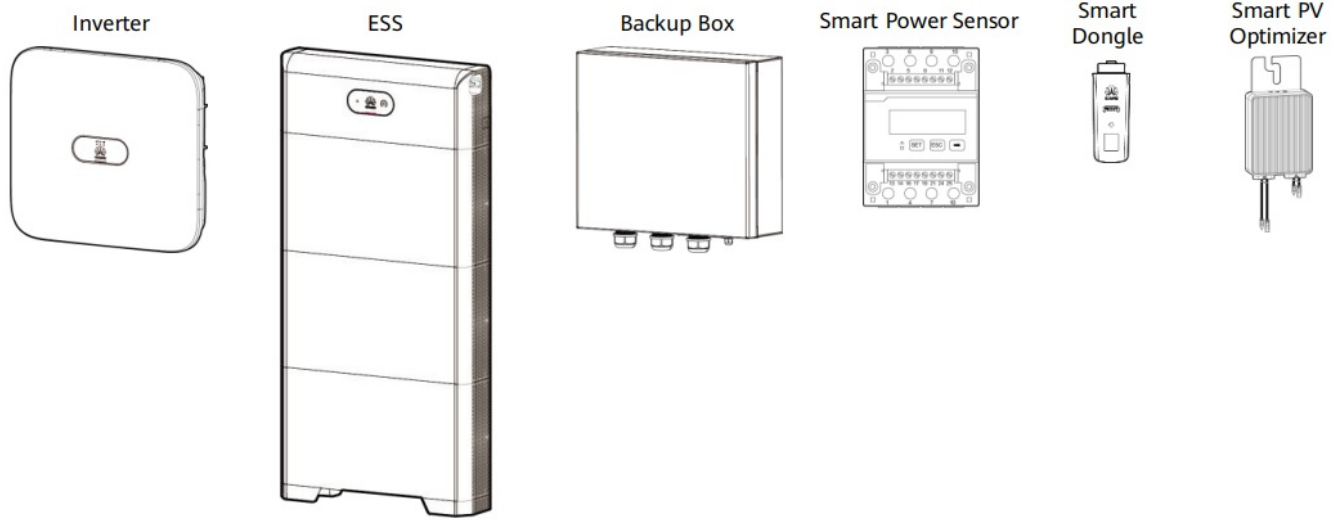
Component	Model		Description
Inverter (master and slave)	• SUN2000-(5KTL-12KTL)-M1 SUN2000-(12K-25K)-MB0 series • SUN2000-(8KTL-20KTL)-M2 • SUN2000-(12KTL-25KTL)-M5 series • SUN2000-(5K-12K)-MAP0 series	• SUN5000-(8KTL, 12KTL)-MAP0 series • SUN5000-(17K, 25K)-MB0 series	• A maximum of three inverters can be cascaded. • M1/M2/M5/MB0 inverters can be cascaded. • The SUN2000-(5K-12K)-MAP0 cannot be cascaded with other inverters. • SUN5000 inverters cannot be cascaded with SUN2000 inverters. • Optimizers must be configured for all PV modules connected to a SUN5000 inverter. Otherwise, the inverter cannot be started. • In the Smart Dongle networking scenario, a maximum of three inverters and six ESSs can be connected.
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 M1/MAP0 can connect to a maximum of two ESSs, and each MB0 can connect to a maximum of four ESSs(each battery terminal can connect to a maximum of two batteries). • 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-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. - Only M1 can be connected to the Backup Box-B1.
Smart Power Sensor	DTSU666-H DTSU666-HW YDS60-80 YDS60-C24 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.
Smart Dongle	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.
Smart PV Optimizer	SUN2000-450W-P2 SUN2000-600W-P MERC-600W-PA0 MERC-(1300W, 1100W)-P	For details about the optimizer supported by the inverter, see: - SUN2000 Smart PV Optimizer User Manual - MERC-600W-PA0 Smart PV Optimizer User Manual - MERC-(1300W, 1100W)-P Smart PV Optimizer User Manual

Note
When MB0 functions as the master inverter and needs to connect to both a power meter and ESS, if more than two ESSs are connected, select one of the following meter models: DTSU666-HW, YDS60-80, YDS60-C24, DTSU71, and DHSU1079-CT. The DTSU666-H is not supported. Ensure that the baud rate for RS485-2 is negotiated to 115200 bit/s. For details about baud rate negotiation, see Baud Rate Negotiation.

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

Cable Connections (Three-Phase Inverter M1 + ESS S1 + Backup Box B1 + Smart Dongle)

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

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.

NOTICE — Signal cables must be outdoor shielded twisted pair cables.

PV strings (with optimizers) · Slave inverter 2 · Slave inverter 1 · Master inverter · Backup load power distribution box · Backup Box · AC power distribution box · Power grid · DTSU666-H · TV

PE 1 10 PE
Enable+ 2 9 CANH
Enable+ 3 8 CANL
485A 4 7 485B
485A 5 6 485B

Cable Type	No.	One End Component	One End Port	The Other End Port	The Other End 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-13	COM-2(right)	ESS 1
			COM-11	COM-3(right)	
			COM-7	COM-4(right)	
			COM-9	COM-7(right)	
			COM-1	COM-2	Slave inverter 1
			COM-3	COM-4	
			COM-8	X4-1	Backup Box
			COM-16	X4-2	
			COM-9	25	DTSU666-H
			COM-7	24	
	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	Slave inverter 1	COM-1	COM-2	Slave inverter 2
			COM-3	COM-4	

Cable Type	No.	One End Component	One End Port	The Other End Port	The Other End Component
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)	
	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 / 14	DTSU666-H CT
			L2	16 / 17	
			L3	19 / 21	

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 — 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.

NOTICE — Signal cables must be outdoor shielded twisted pair cables.

PV strings (with optimizers) · Slave inverter 2 · Slave inverter 1 · Master inverter · Backup load power distribution box · Backup Box · AC power distribution box · Power grid · DTSU666-H · BATTERY-1 · BATTERY-2 · TV

Inverter↔Battery
1 PE
2 485A2
3 485B2
4 EN
5 GND

Battery↔Battery
6 PE
7 485A2
8 485B2
9 EN
10 GND
11 CANH
12 CANL

Cable Type	No.	One End Component	One End Port	The Other End Port	The Other End 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-13	COM-5	ESS 1
			COM-11	COM-1	
			COM-7	COM-2	
			COM-9	COM-3	
			COM-8	X4-1	Backup Box
			COM-16	X4-2	
			COM-9	25	DTSU666-H
			COM-7	24	
	5	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	
	6	Slave inverter 1	COM-1	COM-2	Slave inverter 2
			COM-3	COM-4	

Cable Type	No.	One End Component	One End Port	The Other End Port	The Other End Component
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)	
	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 / 14	DTSU666-H CT
			L2	16 / 17	
			L3	19 / 21	

PV strings (with optimizers)

Slave inverter 2 Slave inverter 1 Master inverter AC power distribution box Power grid

DTSU666-H

PE 1 10 PE
Enable- 2 9 CANH
Enable+ 3 8 CANL
485A 4 7 485B
485A 5 6 485B

Cable Type	No.	One End Component	One End Port	The Other End Port	The Other End 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-9	COM-7 (right)	ESS 1
			COM-7	COM-4 (right)	
			COM-13	COM-2 (right)	
			COM-11	COM-3 (right)	
	⑥	Master inverter	COM-1	COM-2	Slave inverter 1
			COM-3	COM-4	
	⑦	Slave inverter 1	COM-1	COM-2	Slave inverter 2
			COM-3	COM-4	
	⑧	Master inverter	COM-7	24	DTSU666-H
			COM-9	25	

Cable Type	No.	One End Component	One End Port	The Other End Port	The Other End Component
AC power cable	⑨	Master inverter	L1	L1	AC power distribution box
			L2	L2	
			L3	L3	
			N	N	
			PE	PE	
	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	

Cable Connections (Three-Phase Inverter MB0 + ESS S1 + Smart Dongle)

PV strings (with optimizers)

Slave inverter 2 Slave inverter 1 Master inverter AC power distribution box Power grid

DTSU666-H

Inverter↔Battery
1 PE
2 485A2
3 485B2
4 EN
5 GND
Battery↔Battery
6 PE
7 485A2
8 485B2
9 EN
10 GND
11 CANH
12 CANL

BATTERY-1 BATTERY-2

Cable Type	No.	One End Component	One End Port	The Other End Port	The Other End 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-9	COM-3	ESS 1
			COM-7	COM-2	
			COM-13	COM-5	
			COM-11	COM-4	
	⑥	Master inverter	COM-1	COM-2	Slave inverter 1
			COM-3	COM-4	
	⑦	Slave inverter 1	COM-1	COM-2	Slave inverter 2
			COM-3	COM-4	
	⑧	Master inverter	COM-7	24	DTSU666-H
			COM-9	25	

Cable Type	No.	One End Component	One End Port	The Other End Port	The Other End Component
AC power cable	⑨	Master inverter	L1	L1	AC power distribution box
			L2	L2	
			L3	L3	
			N	N	
			PE	PE	
	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	

Cable Connections (Three-Phase Inverter MAP0 + ESS S0 + Smart Dongle)

Cable Connections (Three-Phase Inverter MAP0 + ESS S1 + Smart Dongle)

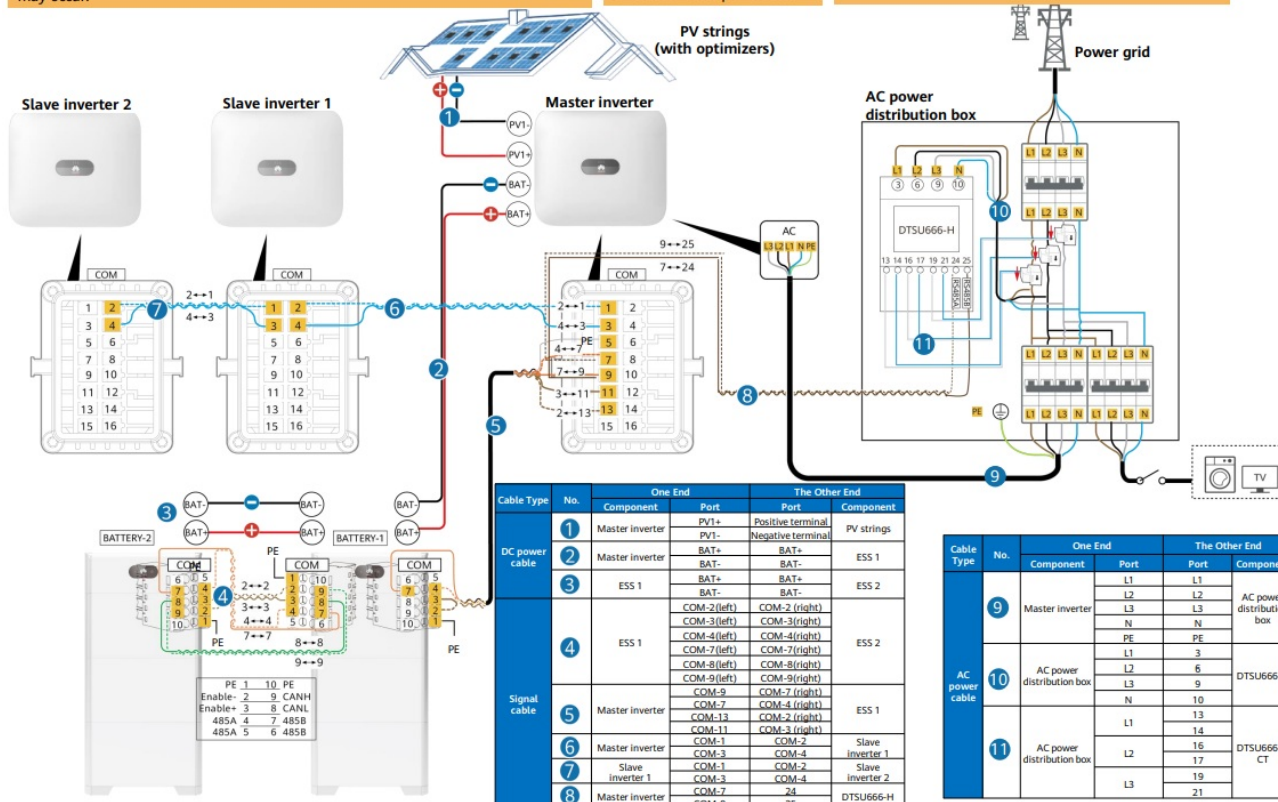Labels (top diagram): Slave inverter 2, Slave inverter 1, Master inverter, PV strings (with optimizers), PV1-, PV1+, BAT-, BAT+, AC, PE N L1 L2 L3, COM, 485A, 485B, EN/Enable+, GND/Enable-, DTSU666-H, TV, BATTERY-2, BATTERY-1, PE

⚠ DANGER
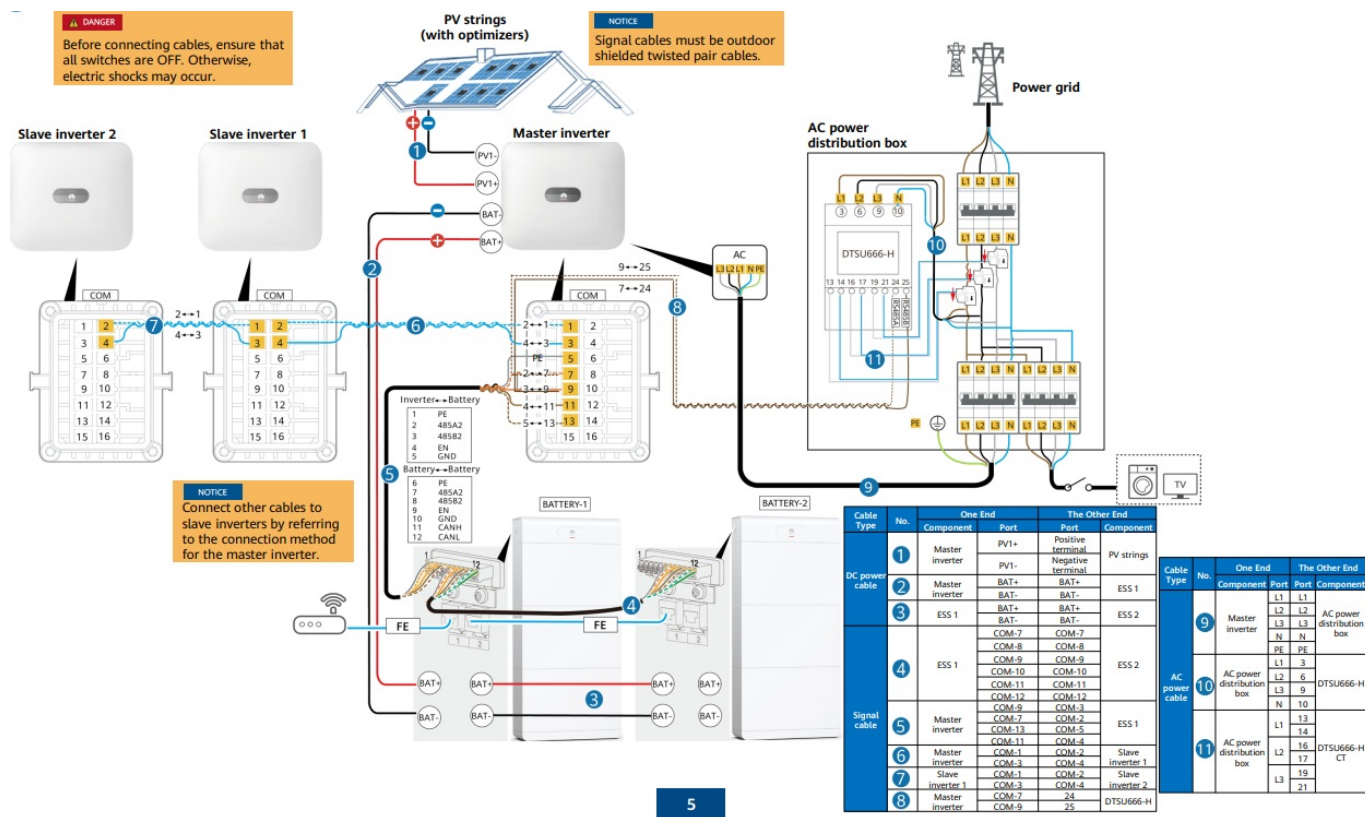Before connecting cables, ensure that all switches are OFF. Otherwise, electric shocks may occur.
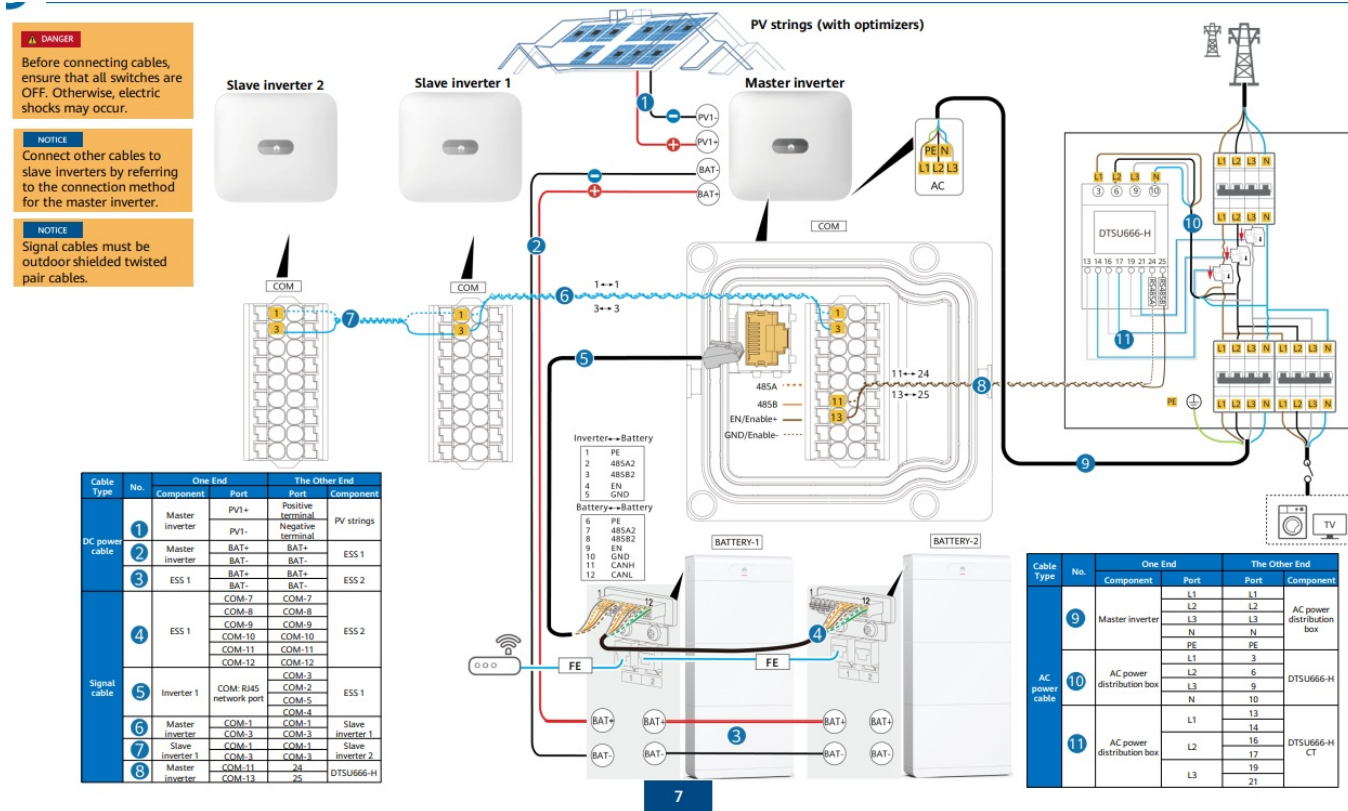
NOTICE
Connect other cables to slave inverters by referring to the connection method for the master inverter.

NOTICE
Signal cables must be outdoor shielded twisted pair cables.

PE 1 — 10 PE
Enable+ 2 — 9 CANH
Enable+ 3 — 8 CANL
485A 4 — 7 485B
485A 5 — 6 485B

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	Inverter 1	COM: RJ45 network port	COM-2	ESS 1
				COM-3	
				COM-4	
				COM-7	
	6	Master inverter	COM-1	COM-3	Slave inverter 1
			COM-3	COM-3	
	7	Slave inverter 1	COM-1	COM-1	Slave inverter 2
			COM-3	COM-3	
	8	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	9	Master inverter	L1	L1	AC power distribution box
			L2	L2	
			L3	L3	
			N	N	
			PE	PE	
	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	

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

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

NOTICE
Signal cables must be outdoor shielded twisted pair cables.

Labels: Slave inverter 2, Slave inverter 1, Master inverter, PV strings (with optimizers), PV1-, PV1+, BAT-, BAT+, AC, PE N L1 L2 L3, COM, 485A, 485B, EN/Enable+, GND/Enable-, DTSU666-H, TV, BATTERY-1, BATTERY-2, FE

Inverter↔Battery
1 PE
2 485A2
3 485B2
4 EN
5 GND

Battery↔Battery
6 PE
7 485A2
8 485B2
9 EN
10 GND
11 CANH
12 CANL

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	Inverter 1	COM: RJ45 network port	COM-3	ESS 1
				COM-2	
				COM-5	
				COM-4	
	6	Master inverter	COM-1	COM-1	Slave inverter 1
			COM-3	COM-3	
	7	Slave inverter 1	COM-1	COM-1	Slave inverter 2
			COM-3	COM-3	
	8	Master inverter	COM-11	24	DTSU666-H
			COM-13	25	

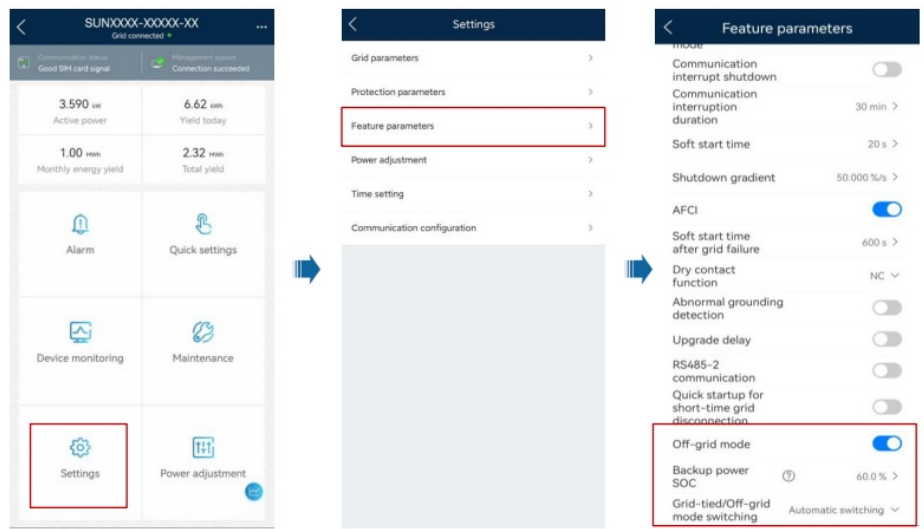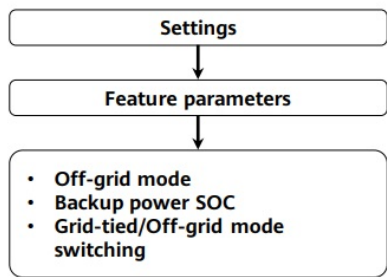| Cable Type	No.	One End		The Other End	
		Component	Port	Port	Component
AC power cable	9	Master inverter	L1	L1	AC power distribution box
			L2	L2	
			L3	L3	
			N	N	
			PE	PE	
	10	AC power distribution box	L1	3	DTSU666-H
			L2	6	
			L3	9	
			N	10	
	11	AC power distribution box	L1	13	DTSU666-H CT
			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

System Commissioning

Installer Registration

Setup Wizard (Connecting to the Inverter WLAN for Commissioning)

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.

WLAN communication

4G communication

FE communication

Or

Or

Select the desired router and enter the router password.

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.

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.

Checking the Plant Status

Off-Grid/Grid-tied Control Parameters

Enabling Off-Grid Mode

Setting Grid-tied Point Control
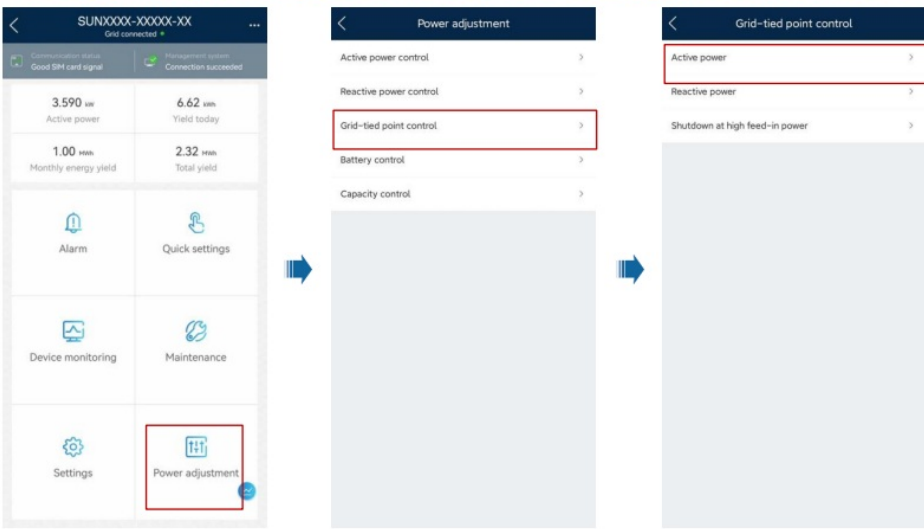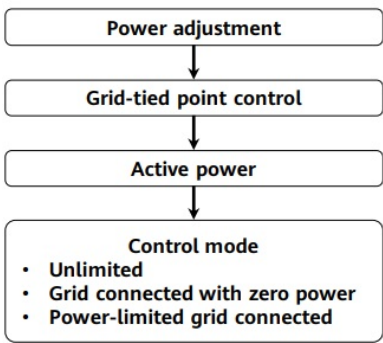
Physical Layout of Smart PV Optimizers

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.
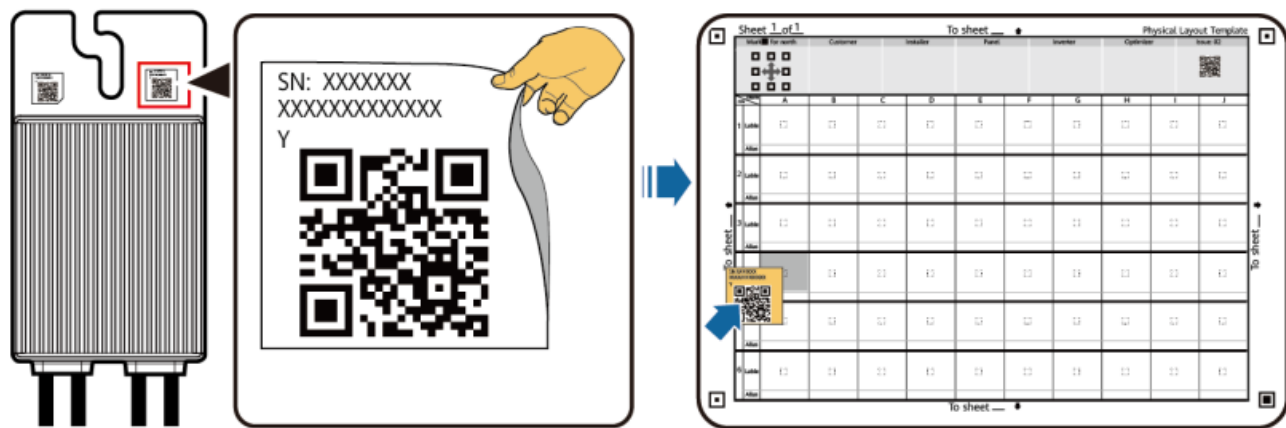
Taking a Photo of the Physical Layout Template

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

Generating a Physical Layout on the App

Enter the Layout screen.

Tap a plant that is equipped with optimizers.
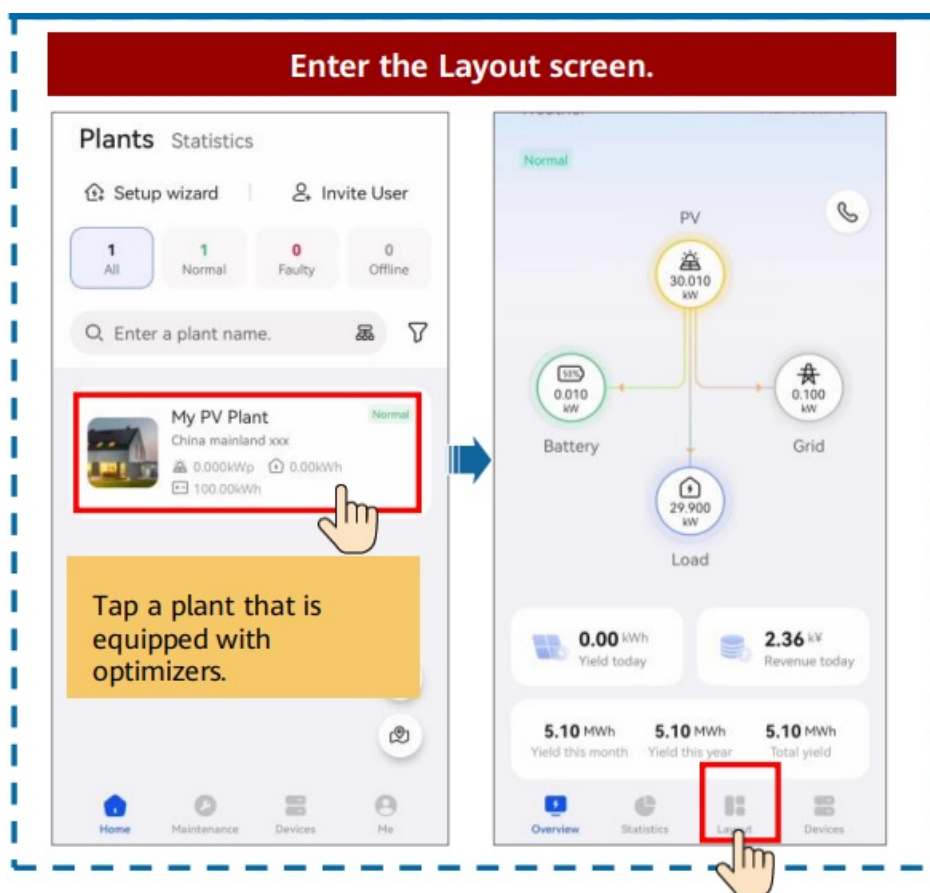
Generating a Physical Layout on the App Automatically

Upload the template and generate a layout.
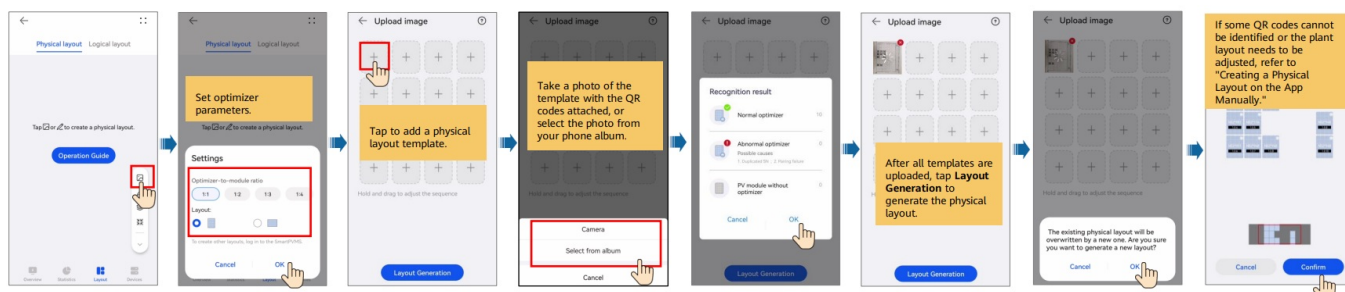
Creating a Physical Layout on the App Manually

Edit the physical layout and specify the quantity of inverters and PV modules as required.
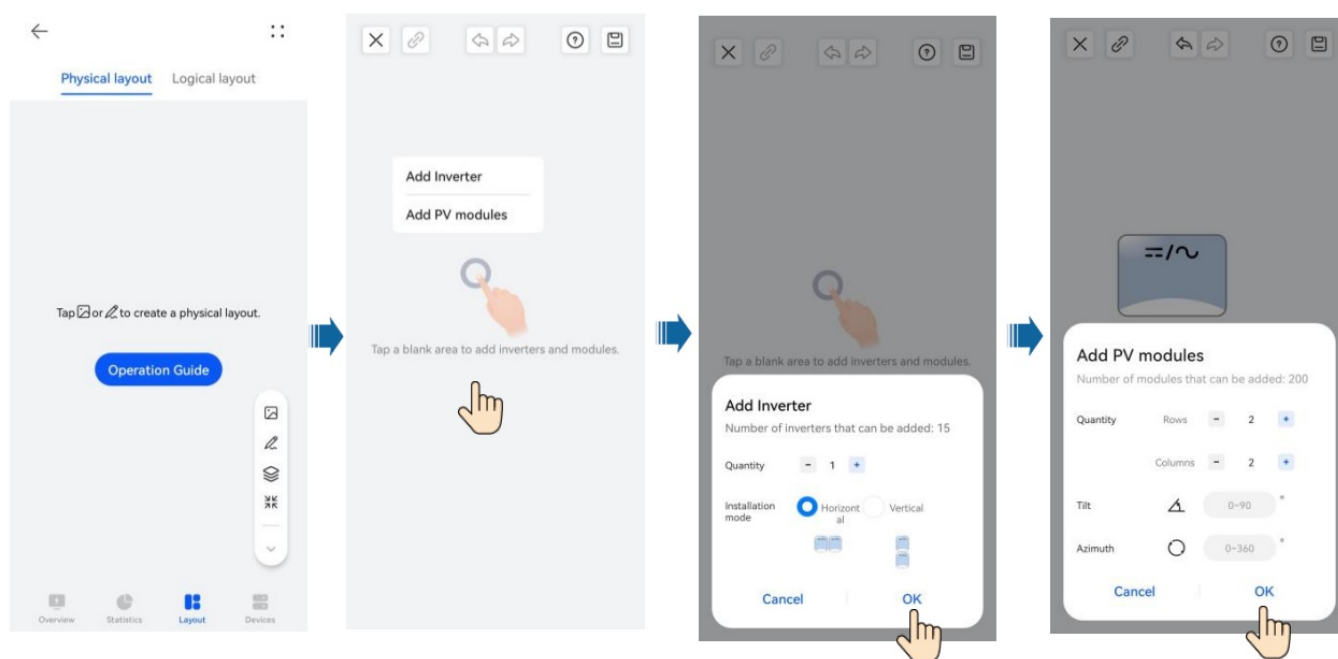
Bind the inverter or optimizer SN.

Bind the inverter or optimizer SN.

Bind optimizer

Optimizer-to-module ratio

1:1   1:2   1:3   1:4

Select an optimizer

🔍 Enter SN

Number	1.0.1	●
SN		
Remaining binding times	1	

Number		
SN	210231311EB1MAY00324	
Remaining binding times	1	

Finished

Adjust the physical layout.

Select the PV modules that need to have the azimuth adjusted.

Azimuth Adjustment

○   20 °

Cancel   OK

Documents / Resources
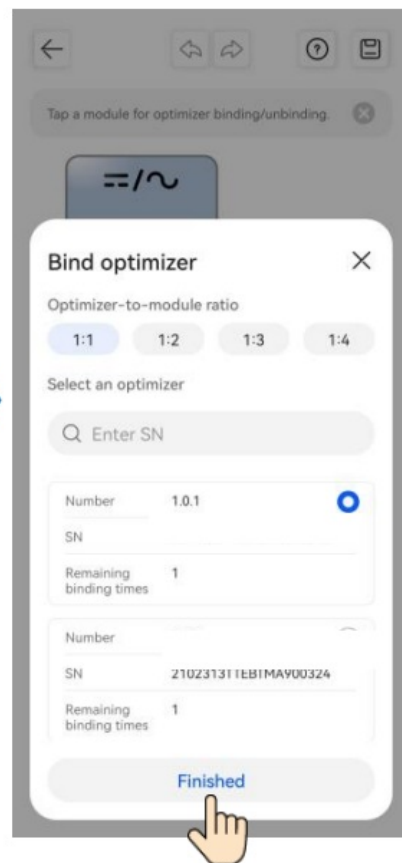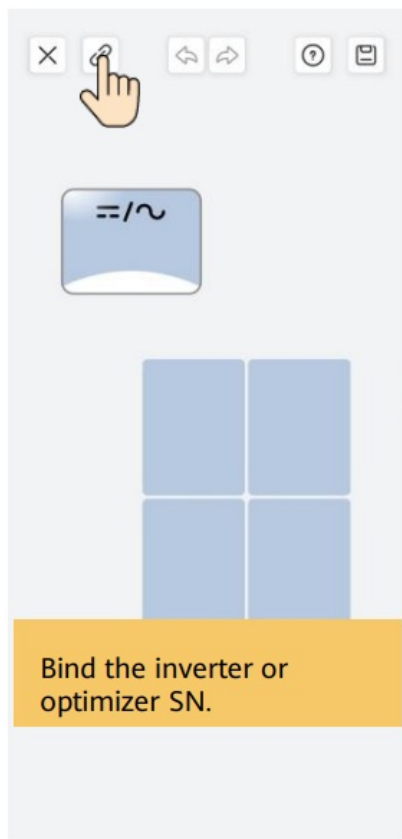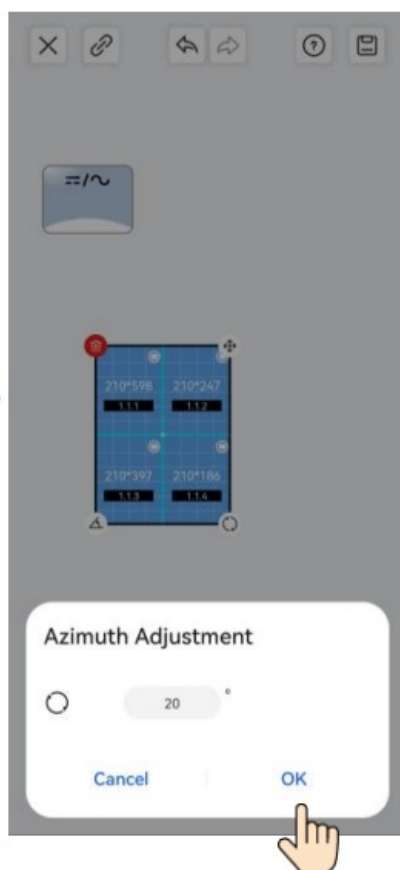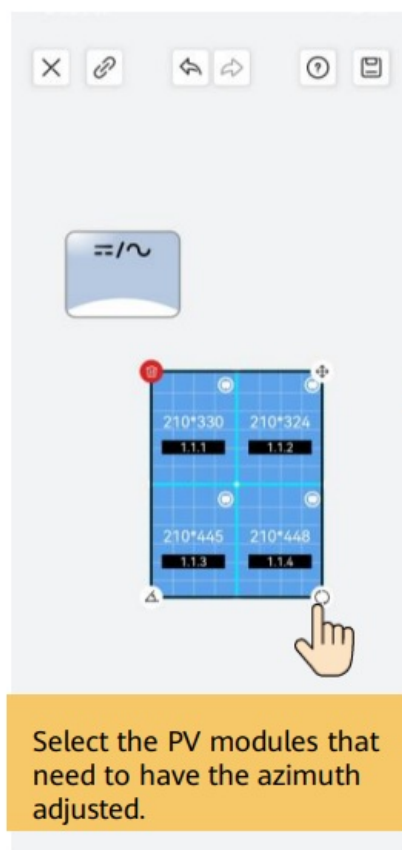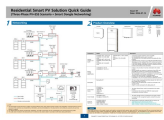
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YDS60-C24, YDS60-C24 FusionSolar SmartPVMS Smart Dongle, FusionSolar SmartPVMS Smart Dongle, SmartPVMS Smart Dongle, Smart Dongle, Dongle

References

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- **support.huawei.com/enterprise/en/doc/EDOC1100303087/1e1cedea**
- **support.huawei.com/enterprise/en/doc/EDOC1100366800/e0fa13b5**
- **User Manual**