V01

PARALLEL SOP OF ENERGY STORAGE SYSTEM STORION-H30/H50-G3

@AlphaEnergyStorageSystem @AlphaESS @alpha_ess @AlphaESS www.alphaess.com

Alpha ESS Co., Ltd.
+86 513 8060 6891
info@alpha-ess.com
www.alphaess.com
No. 1086 Bihua Road, Tongzhou District, Nantong City, Jiangsu Province, China

Alpha ESS International Pte. Ltd.
+65 6513 1125 / +65 6513 1126
Singapore@alpha-ess.com
2 Corporation Road #01-06A Corporation Place 618494 Singapore

Alpha ESS Europe GmbH
+49 6196 7863485
deutschland@alpha-ess.de
https://alphaess.de/
Alfred-Herrhausen-Allee 3-5, 65760 Eschborn, Germany

Alpha ESS Benelux B.V.
http://www.alphaess.nl/
mailto:contact@alphaess.nl
Room 113 F1, High Tech Campus 41.5656 AEEindhoven.Netherlands

Alpha ESS UK Co., Ltd
+44 330 043 2610
info@alpha-ess.co.uk
https://www.alpha-ess.co.uk/
Drake house, Long street, Dursley, gl11 4hh UK

Alpha ESS Italy S.r.l.
+39 339 462 4288
info@alphaess.it
https://www.alphaess.it
Via Del Molinuzzo 83, 59100 Prato (PO), Italy

Alpha ESS Australia Pty. Ltd.
+61 02 9000 7676
techsupport@alphaess.au
www.alphaess.au
8/15-21 Gibbes Street, Chatswood, NSW 2067 Australia

Alpha ESS NZ Ltd.
+64 0800 769 377
info@alpha-ess.com
www.alpha-ess.co.nz
19 Arrenway Drive, Albany, 0630, New Zealand

Alpha ESS South Africa (Pty.) Ltd.
+27 10-745-5653
info.sa@alpha-ess.com
Bryanston, Johannesburg, 2191

Alpha ESS West Africa Co., Ltd.
+234 706 235 1713
info.ng@alpha-ess.com
www.africa.alphaess.com
Lagos, Nigeria

Mult-Power AlphaESS (Kenya) Co., Ltd.
+254 0112 666 888
info.ke@alpha-ess.com
www.africa.alphaess.com
House No.5, Kirichwa Lane Court, Ngong Road, Nairobi, Kenya.

Copyright Statement

Please keep this manual safe and strictly follow all safety and operating instructions contained within this manual. Do not install or operate the system before reading this manual.

Note

The products, services, or features you purchase are subject to the AlphaESS commercial contract and terms. Some of the products, services, or features described in this document may not be within the scope of your purchase or use. Unless otherwise agreed in the contract, Alpha ESS makes no express or implied warranties regarding the content of this document.

Due to product version upgrades or other reasons, the content of this document may be updated periodically. This document is intended for guidance only and does not constitute any form of commitment. The actual product shall prevail.

Preface

Overview

The STORION-H30/H50-G3 energy storage system features high integration and high density design, with flexible expansion capabilities and strong grid connection performance. It is a high-quality, stable, and high-tech product used in today's power supply applications.

This manual is specifically designed to resolve operational issues, including safety notices, product functions, and product maintenance.

Symbol Convention

The following table describes the symbols that may appear in this manual and their meanings：

Symbol	Description
CAUTION	Indicates a potential risk; if not avoided, it may cause the system to fail to operate properly or report faults.
WARNING	Indicates a moderate potential hazard; if not avoided, it may lead to system damage or personal injury.
DANGER	Indicates a high potential hazard; if not avoided, it will result in death or serious injury.
NOTE	Provides additional explanations for key information in the text. "Explanations" are not safety warnings and do not involve information related to personal, system, or environmental harm.

Terminology

1. Battery Management System (BMS)

Monitors the operational information of battery cells, battery packs, and system units (such as voltage, current, temperature, and battery protection parameters), and intelligently assesses the state of charge (SOC), state of health (SOH), and total energy output to ensure battery safety.

2. Energy Management System (EMS)

Consists of data collection and monitoring systems and supports automatic power generation control, economic dispatch control, and power system status and safety analysis.

3. Battery Energy Storage System (BESS)

A combination of series- and parallel-connected batteries and the BMS, used to connect the DC side of PCS.

4. Energy Storage System (ESS)

A combination of a battery system and power conversion systems (PCSs) such as STORION-H30/H50-G3. An ESS can be used as an independent power source or be directly controlled by a monitoring system.

5. Photovoltaic (PV)

A PV power system is a new type of power generation system that utilizes the photovoltaic effect of semiconductor materials in solar cells to directly convert solar radiation energy into electrical energy.

6. On-Grid System

On-grid systems typically consist of PV strings, PCSs, battery systems, and the power grid. When the electricity generated by the PV strings is sufficient, the excessive electricity can be fed into the grid. When the electricity generated by the PV strings and battery system is insufficient, the grid can supply power to the load.

7. Off-Grid System

Terminology

Off-grid systems are suitable for areas without a grid or where the grid power is unstable. These systems typically consist of PV strings, energy storage inverters, battery systems, and generators. When the battery has sufficient energy, the load is powered by the PV system and the battery. If the battery energy is insufficient, the generator powers the load while charging the battery system.

Version Information

Version	Date	Content
V01	2025.10.15	First edition

Contents

Contents

1. Electrical Connection

1.1 Precautions

1. Make sure to perform the operation only when the power is off.
2. The following cables need to be prepared by yourself: Ethernet cables (for TCP communication between EMS units and CAN communication between inverters), and shielded twisted-pair cable (for dry contact communication between the Parallel Backup Box and the host inverter).

   Note: **In on-grid parallel applications,** the number of Ethernet cables required is (n − 1), where **n** refers to the total number of parallel systems. Example: Two systems in parallel require 1 Ethernet cable; three systems require 2 Ethernet cables.

   In off-grid parallel applications, the total number of Ethernet cables is (n − 1) × 2, where **n** refers to the total number of parallel systems.

   Example: Two systems in parallel require 2 Ethernet cables; three systems require 4 Ethernet cables.
3. Ensure that the PV capacity of the Host and Follower is the same.
4. Ensure that the communication distance between cabinets is ≤ 40 meters, and the communication distance between the Parallel Backup Box and the host inverter is ≤ 100 meters.
5. The power meter communication and functional wiring (RRCR, German 14A, load grading, etc.) should all be connected to the main cabinet.

1.2 Grid and Parallel Connection Wiring

1.2.1 Power Cable Connection

Connect the power cables for each cabinet as instructed in the Quick Installation Guide. Refer to Section 4.3 of the Installation Manual for detailed procedures.

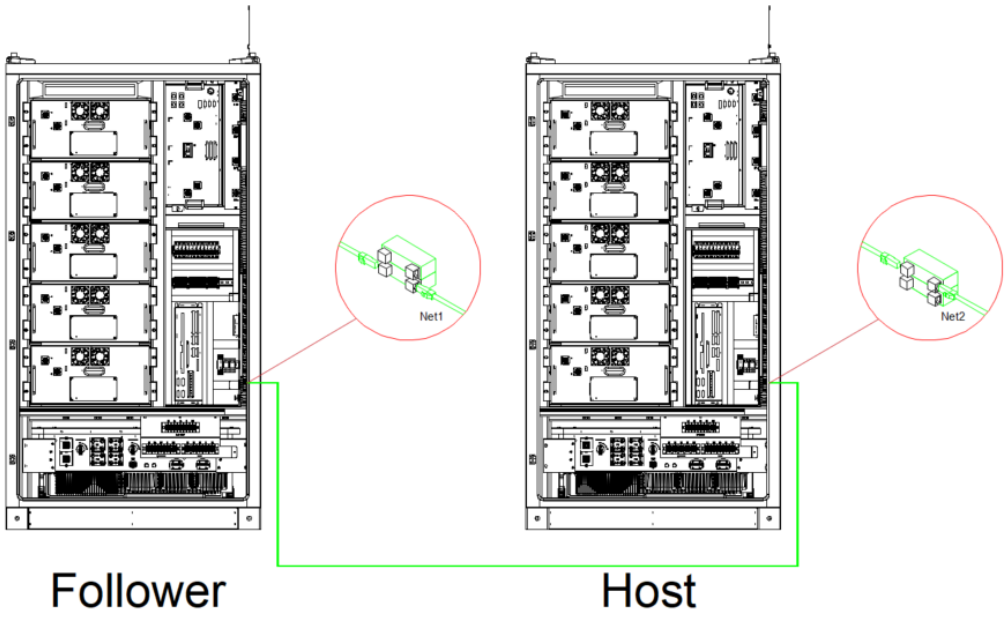
1.2.2 Communication Cable Connection

CAUTION

Once all setup wizards have been completed, connect the communication cables. Repeat the same procedure for each Follower cabinet.

Wiring Between Host and Follower Cabinets:

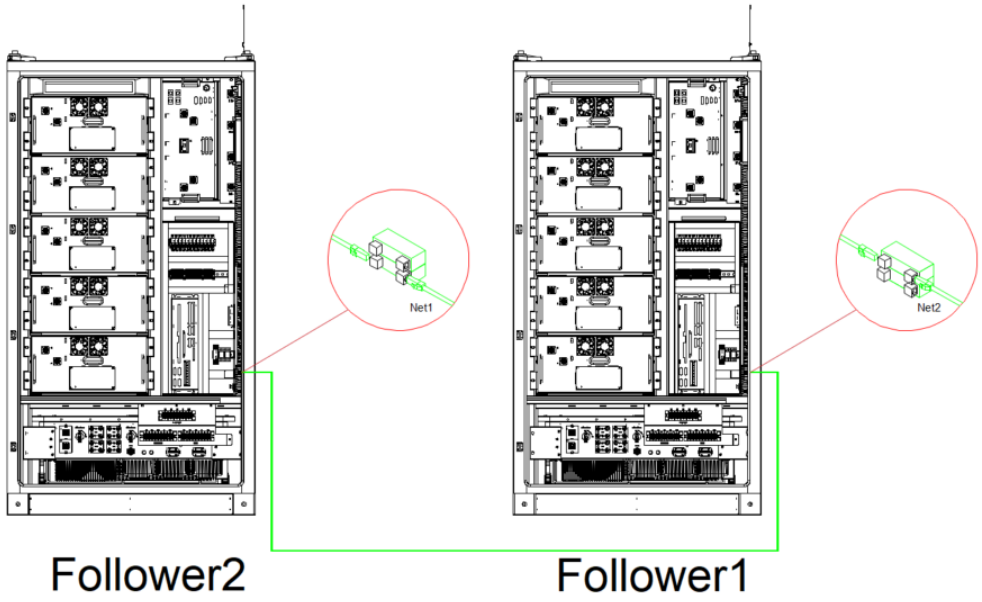
Route an Ethernet cable through the cable entry hole at the bottom of the cabinet, and connect the Net2 port on the Host cabinet terminal block to the Net1 port on the Follower cabinet terminal block.



Wiring Between Multiple Follower Cabinets:

The wiring between the Host cabinet and the first Follower cabinet (Follower 1) remains the same. Use an Ethernet cable to connect the Net2 port on the terminal block of Follower 1 to the Net1 port on the terminal block of Follower 2, routing the cable through the cable entry hole at the bottom of the cabinet. The other Follower cabinets are connected in sequence.

●●●

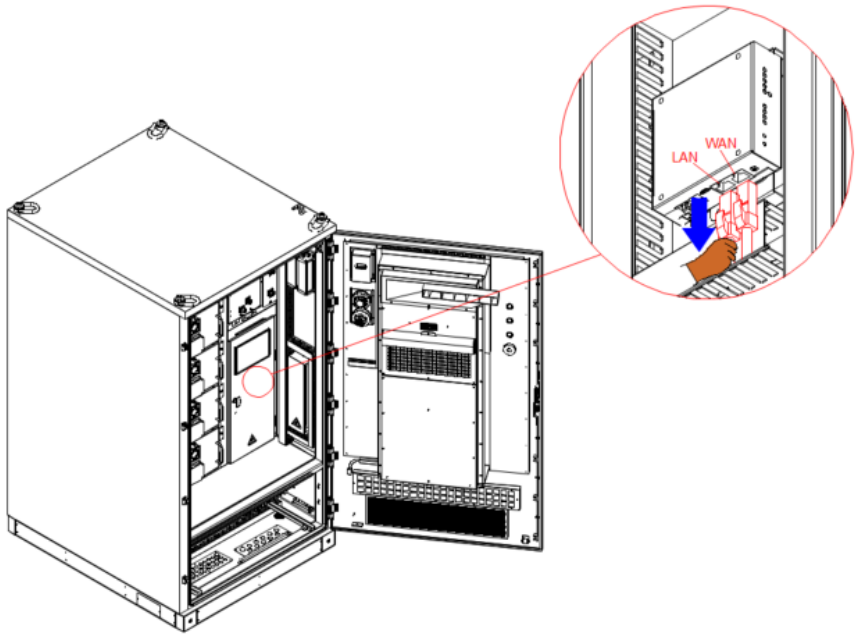


4G Router Rewiring：

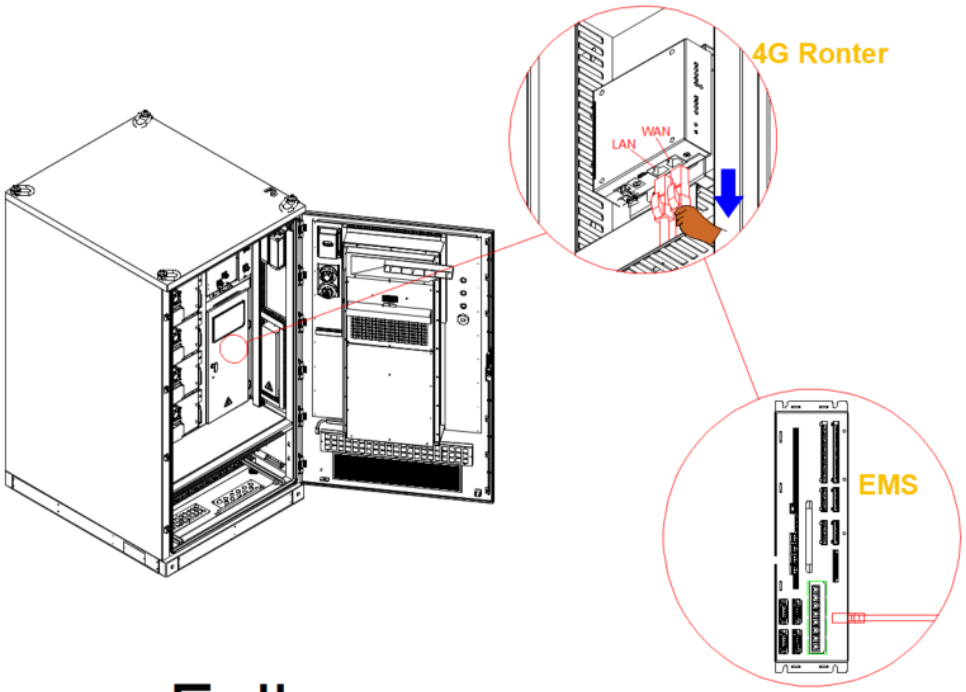
Open the distribution box of the Follower cabinet.

1. Disconnect the Ethernet cable from the LAN port of the 4G router inside the Follower cabinet. The disconnected cable can be left unconnected or secured inside the wiring duct.
   Note: This cable shall remain disconnected in parallel operation to prevent IP address conflicts.
2. Disconnect the Ethernet cable from the WAN port of the 4G router, and connect it to any available port on the EMS switch (port location: inside the green rectangular area on EMS).

After completing the wiring, close the cover of the Follower cabinet.



Follower



Follower

1. 3 Off-Grid Parallel Connection Wiring

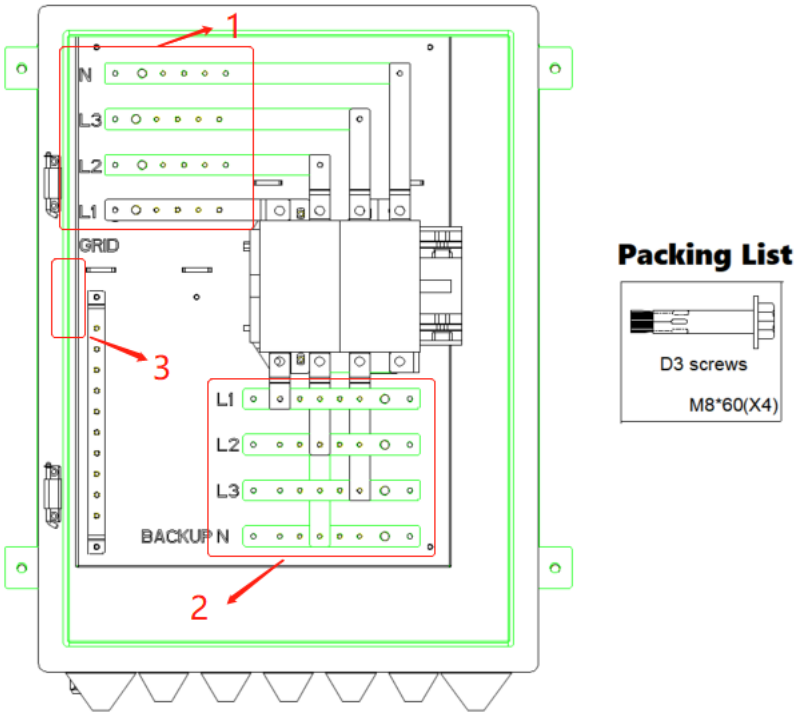
1. 3. 1 Parallel Backup Box Installation

The accessories of the Parallel Backup Box include four M8×60 expansion bolts. Both the incoming and outgoing cables are routed from the bottom of the box.

The layout of each area is described as follows:

Busbar Position	Function
Area 1	Input and output on the GRID side
Area 2	Input and output on the BACKUP side
Area 3 (Control PCB)	Connects a set of dry contact wires to the Host PCS

A schematic diagram of the Parallel Backup Box is shown below:



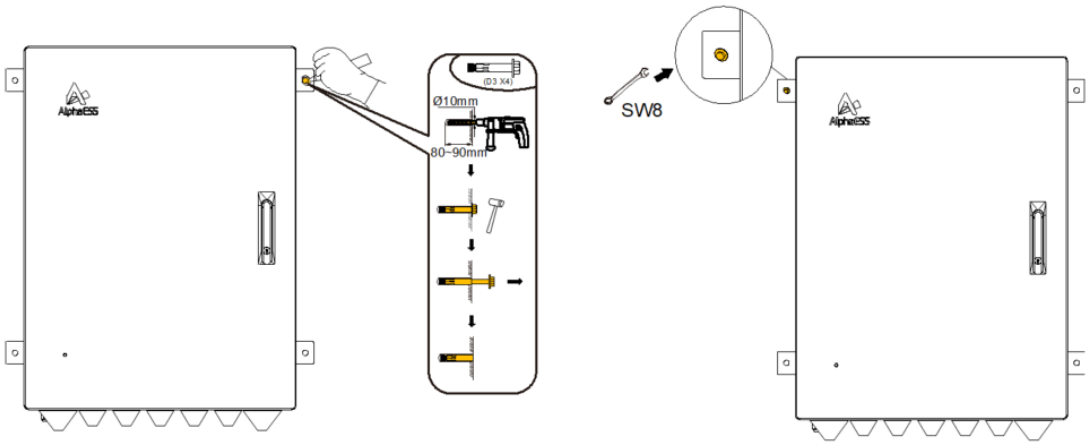
The recommended output cable size is shown below:

Number of Parallel Units	Rated Power	Maximum Current	Recommended Cable
2 units	100kW	166A	YJV 4*50mm²+1*25mm²
3 units	150kW	249A	YJV 4*70mm²+1*35mm²

4 units	200kW	332A	YJV 4*120mm²+1*70mm²

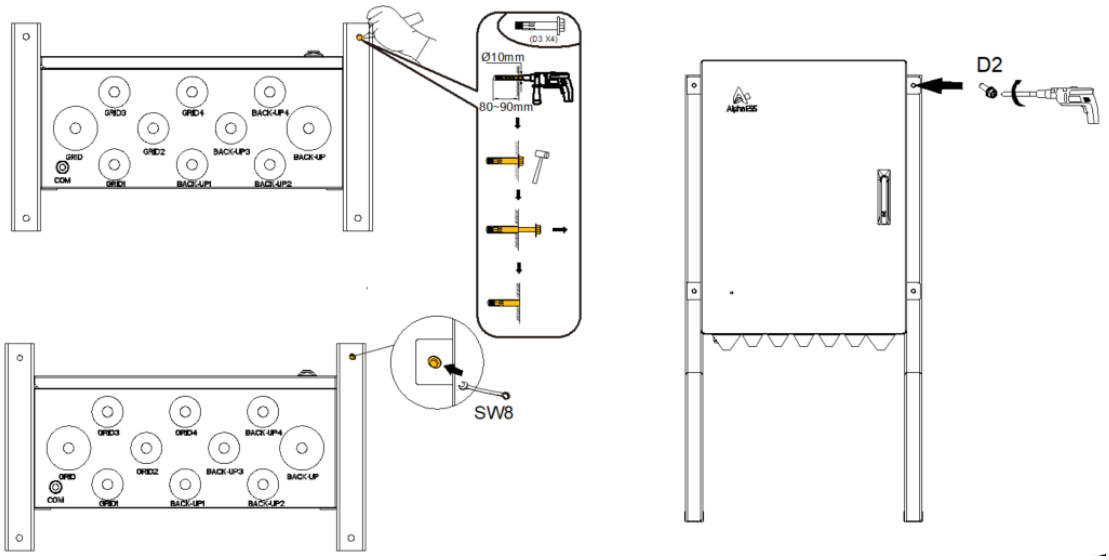
Installation of the Parallel Backup Box (Wall-mounted):

1. Mark the corresponding points on the wall according to the hole positions on the back of the Parallel Backup Box.
2. Drill holes in the wall using a 10 mm impact drill to a depth of 80–90 mm.
3. Insert the D3 expansion bolts into the mounting holes of the Parallel Backup Box, then hammer them into the corresponding holes on the wall.
4. Tighten the Parallel Backup Box using an 8 mm wrench with a torque of 35 N · m.



Installation of the Parallel Backup Box (Mounting Bracket):

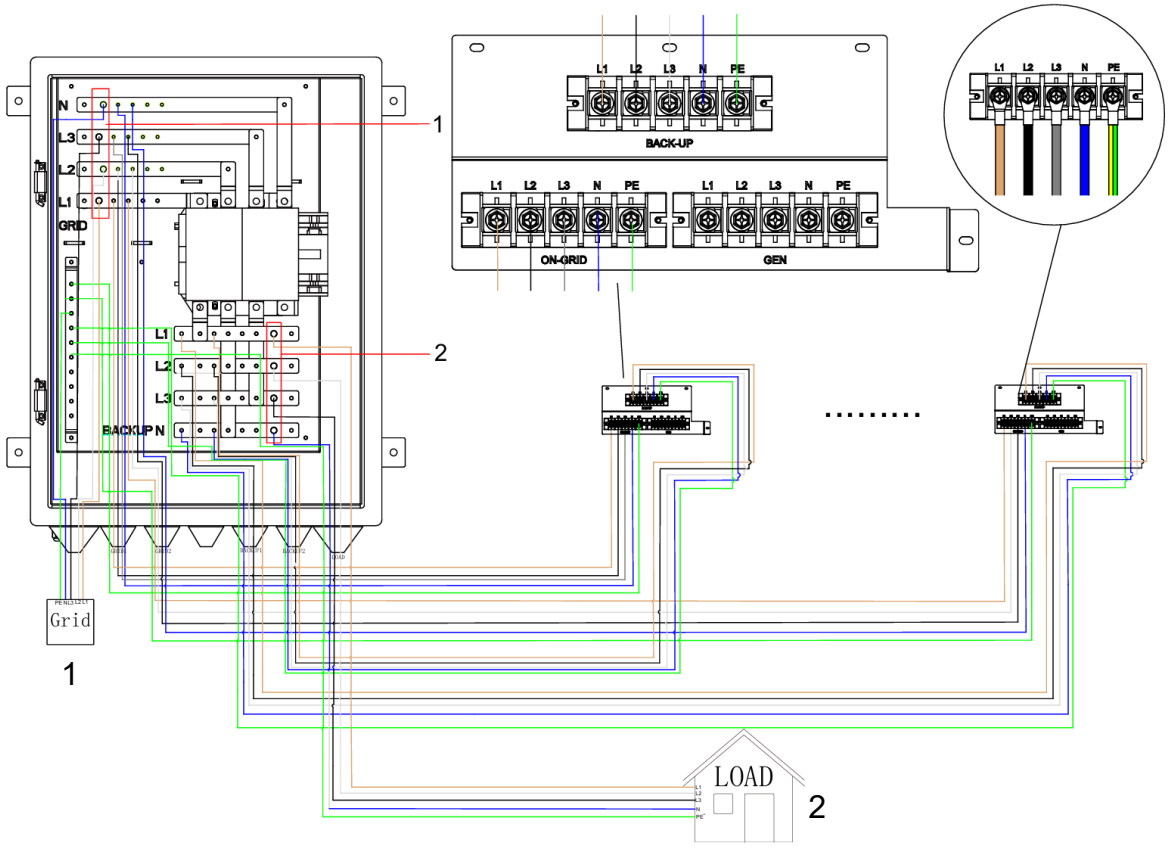
1. Mark the corresponding points on the ground according to the holes at the bottom of the mounting bracket.
2. Drill holes in the ground using a 10 mm impact drill.
3. Insert the D3 expansion bolts through the holes at the bottom of the bracket, and hammer them into the corresponding holes.
4. Tighten the bracket using an 8 mm wrench with a torque of 35 N · m.
5. Use D2 screws to secure the Parallel Backup Box onto the bracket.



1.3.2 Power Cable Connection

Connect the power cables of each cabinet according to the Quick Installation Manual, refer to Section 4.3 of the Installation Manual for detailed instructions.

Then, connect the power cables of the Parallel Backup Box, the wiring diagram is shown below (taking two units in parallel as an example).



1. The L1, L2, L3, and N terminals on the GRID side of both the Host and Follower PCS units are connected to the corresponding L1, L2, L3, and N terminals on the GRID side of the Parallel Backup Box.
2. The L1, L2, L3, and N terminals on the BACKUP side of both the Host and Follower PCS units are connected to the corresponding L1, L2, L3, and N terminals on the BACKUP side of the Parallel Backup Box.
3. The PE terminals on both the GRID side and BACKUP side of the Host and Follower PCS units are connected to the grounding bar of the Parallel Backup Box.
4. In the diagram, point 1 is connected to the grid, and point 2 is connected to the load.

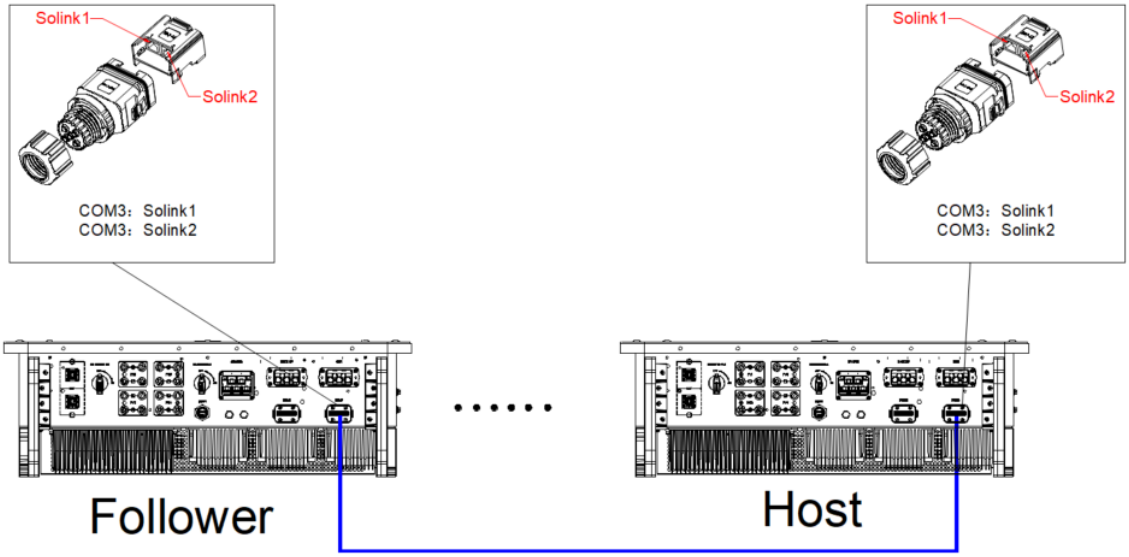
1.3.3 Communication Cable Connection

Refer to Section 1.2.2 to first complete the EMS communication cable connection and the 4G router rewiring.

1.3.3.1 PCS Communication Cable Connection

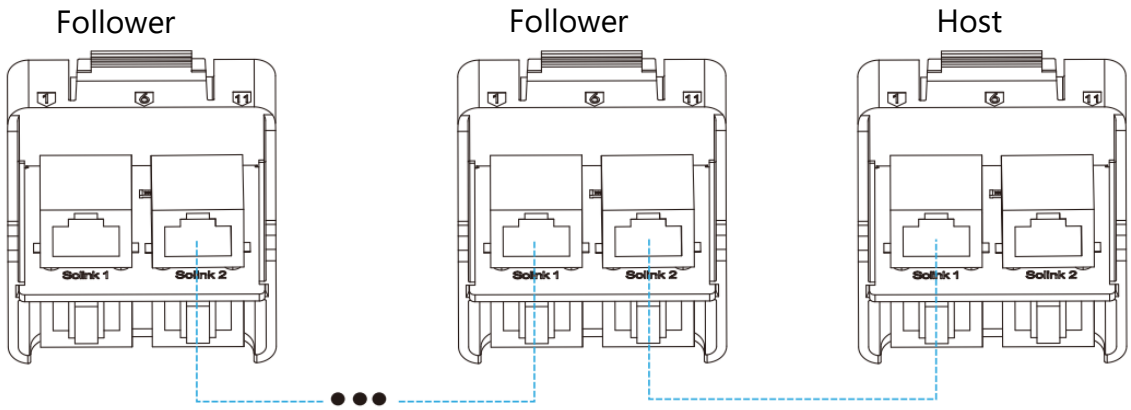
Wiring Between Host and Follower Cabinets:

Use an Ethernet cable to connect Solink1 of COM3 on the Host PCS to Solink2 of COM3 on the Follower PCS, routing the cable through the cable entry hole at the bottom of the cabinet.



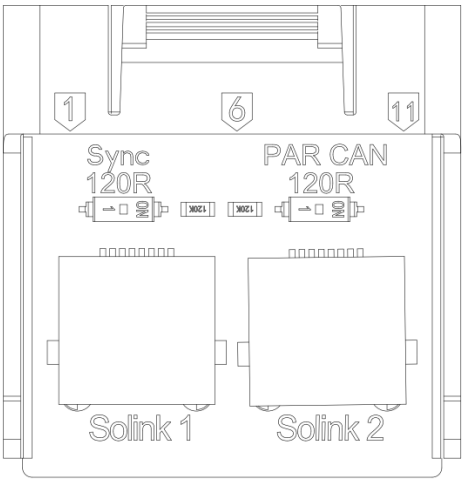
Wiring Between Multiple Follower Cabinets:

The wiring between the Host and the first Follower remains unchanged. Use an Ethernet cable to connect Solink1 of COM3 on Follower 1 to Solink2 of COM3 on Follower 2, routing the cable through the cable entry hole at the bottom of the cabinet. Connect the other Follower Cabinets in sequence.

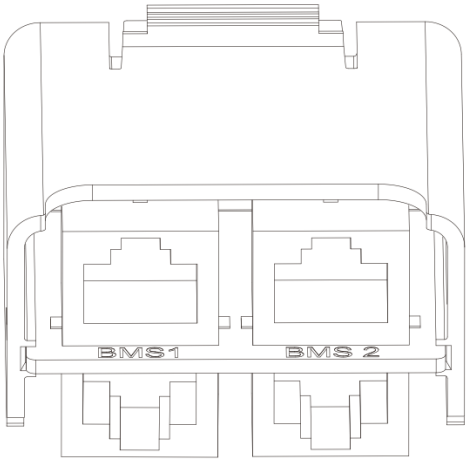


Configuring the Terminal Resistance Switches:

Set the DIP switches of the Sync 120R and PAR CAN 120R terminal resistors on the COM3 ports of the Host inverter and the last Follower inverter to the “ON” position.



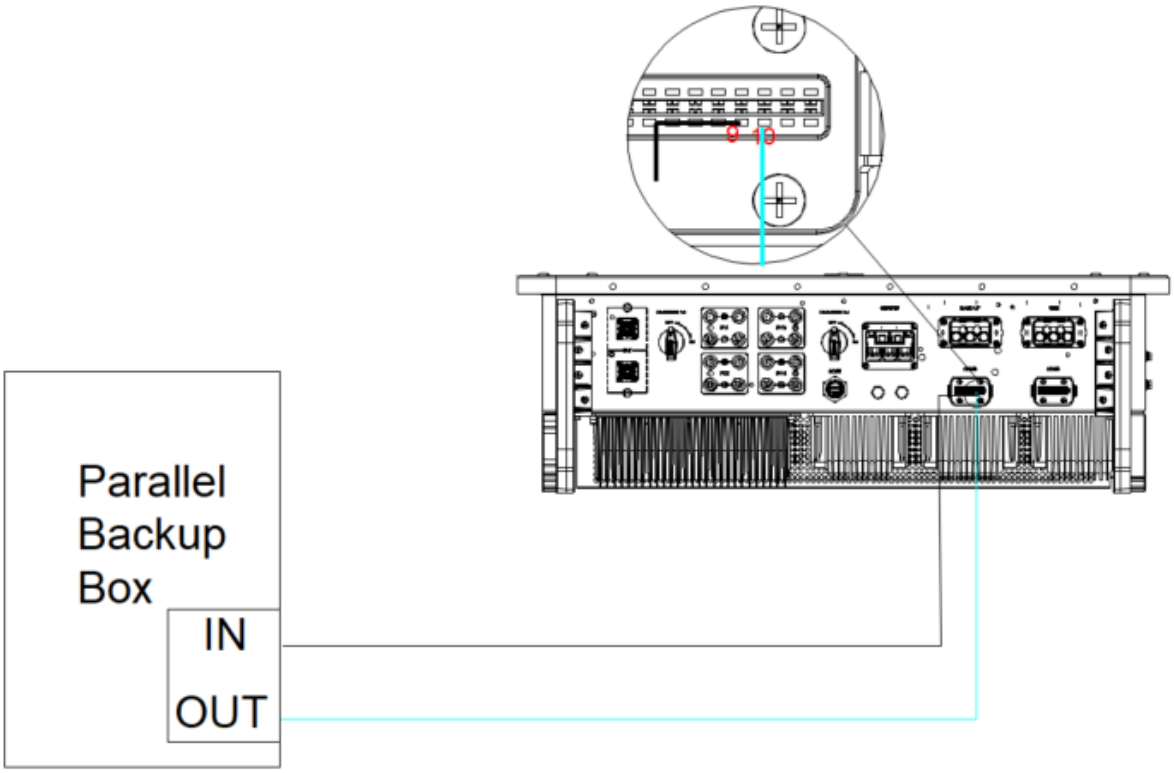
FRONT



BACK

1.3.3.2 Communication Connection Between the Parallel Backup Box and the PCS

Connect the IN terminal on the control board of the Parallel Backup Box to pin 9 of COM2 on the inverter, and connect the OUT terminal to pin 10 of COM2 on the inverter.



1.4 Dual Power Supply Wiring

When a dual power supply is available on site, complete the wiring as follows:

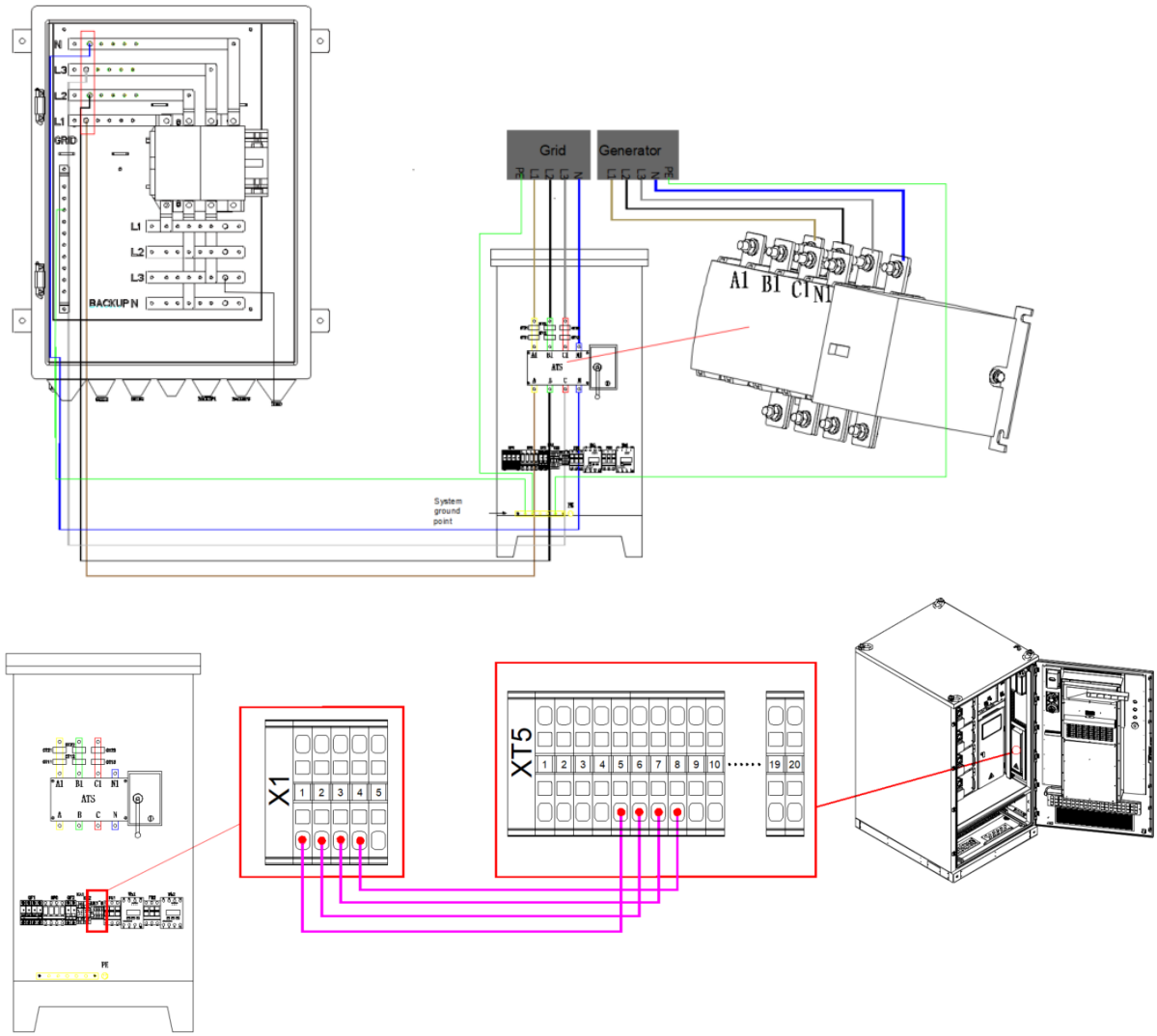
1. Connect the L1/L2/L3 phases and N from the grid side to the A1/B1/C1 phases and N1 at the AC input terminals of the ATS cabinet.
2. Connect the L1/L2/L3 phases and N from the diesel generator to the A2/B2/C2 phases and N2 at the AC input terminals of the ATS cabinet.
3. Connect the A/B/C/N/PE terminals of the ATS cabinet to the L1/L2/L3/N/PE terminals on the grid port of the PCS.
4. Establish dry contact communication between the ATS cabinet and the system cabinet by connecting the (X1:1/X1:2/X1:3/X1:4) terminals of the ATS cabinet to the (XT5:5B/XT5:6B/XT5:7B/XT5:8B) terminals of the system cabinet.

As described in the following table：

Dual Power Transfer Cabinet (ATS)	**STORION-H30/H50-G3**

X1:1	XT5:5B
X1:2	XT5:6B
X1:3	XT5:7B
X1:4	XT5:8B

The wiring diagram is shown below:



ATS cabinet

2. SCADA Commissioning

CAUTION

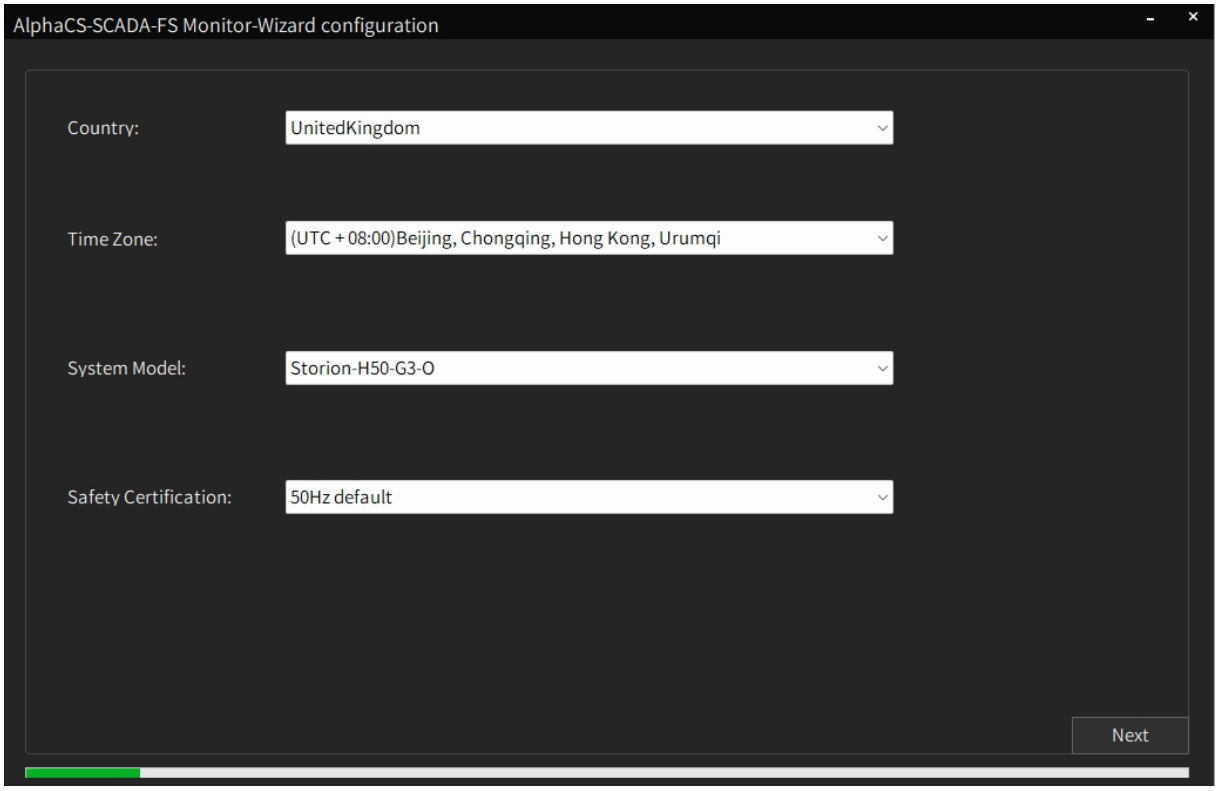
Before commissioning, ensure that all modules have been upgraded to the latest software version.

Before setting up the parallel configuration wizard, make sure that the communication cables between the EMS units are disconnected.

2. 1 Wizard Configuration

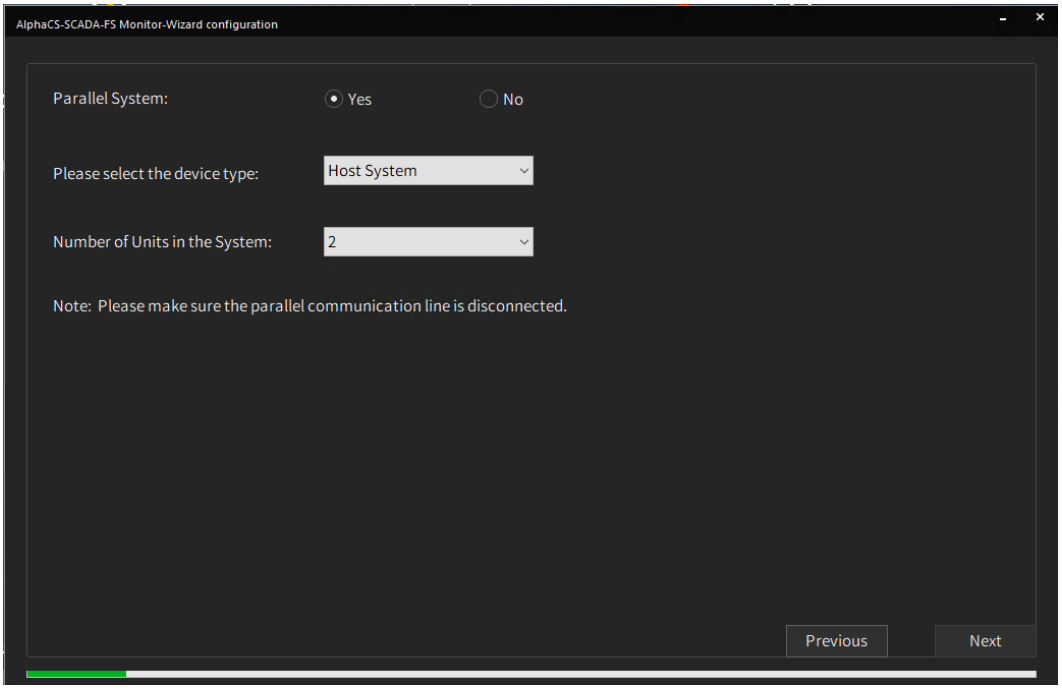
2. 1. 1 Host Wizard Configuration

1. Click Maintenance → Start Wizard Configuration.
2. Select the country, time zone, and safety certification (grid code)
   For the system model, select STORION-H30-G3-O or STORION-H50-G3-O, then click Next.



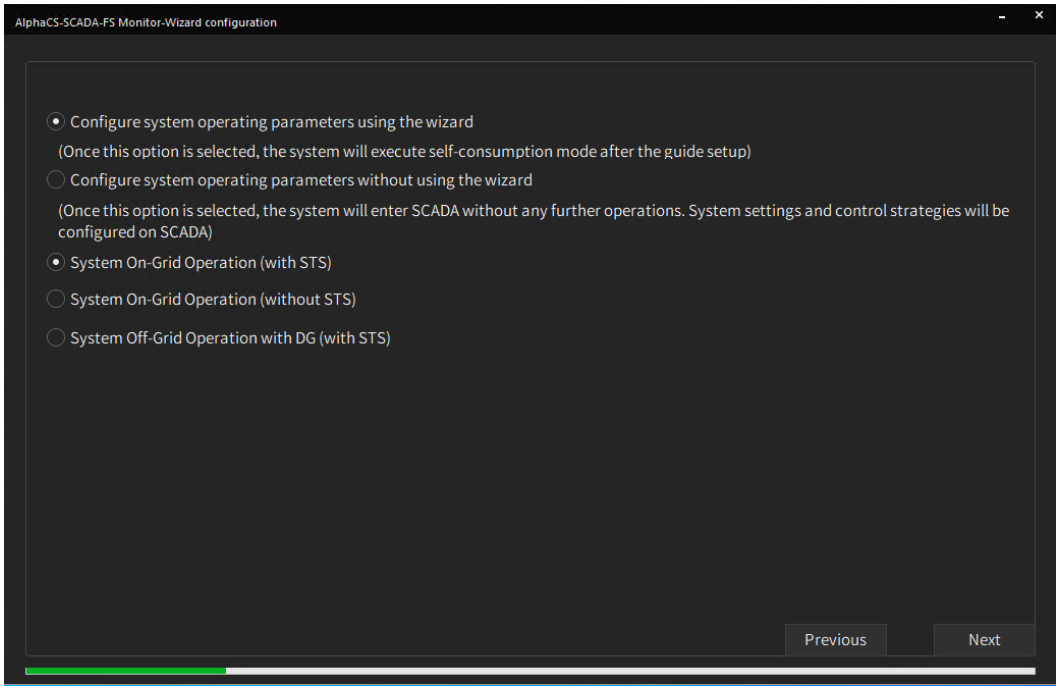
3. Is this a “Parallel System”, click “Yes.”
   Select the device type as Host, and set the “Number of Units in the System”

according to the site conditions. After completing the settings, click “Next.”



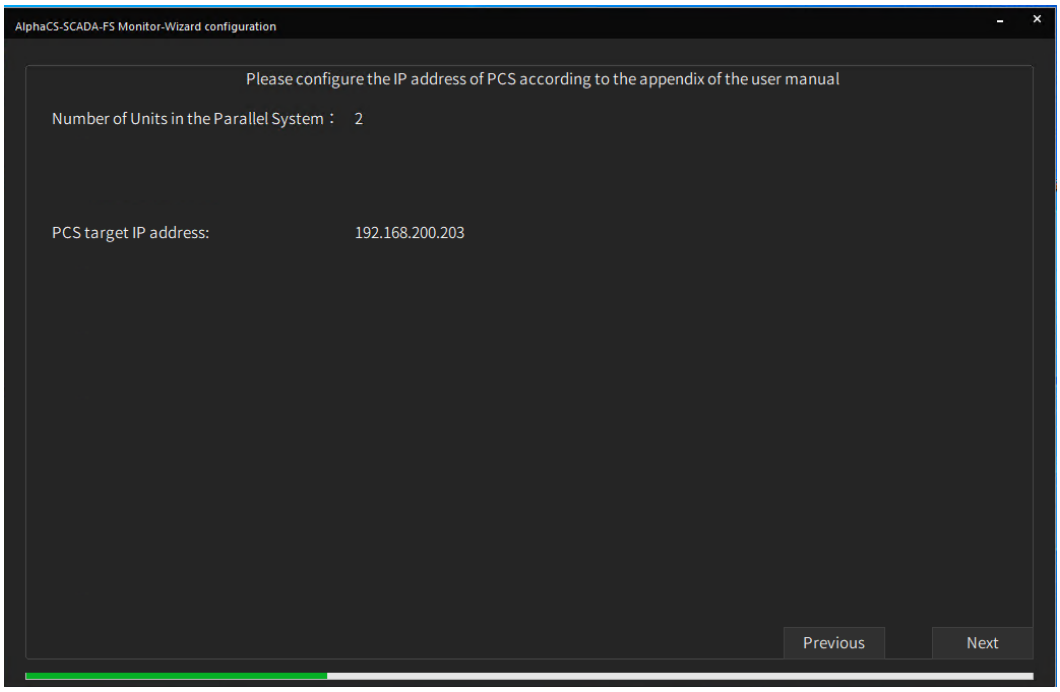
4. Select “Use Wizard for Configuration”, choose the system operation mode, and click “Next” after completing the settings.

System On-Grid Operation (with STS)	On-site system supports on-grid and off-grid parallel operation
System On-Grid Operation (without STS)	On-site system supports on-grid parallel operation only
System Off-Grid Operation with DG (with STS)	On-site system operates off-grid with a diesel generator



5. The wizard displays the Number of Units in the Parallel System and the IP addresses.

   For the G3 series, both the Host and Follower do not require manual IP address configuration — the wizard automatically assigns the corresponding IP addresses. Click “Next.”



The IP addresses corresponding to the Host are listed in the table below for verification.

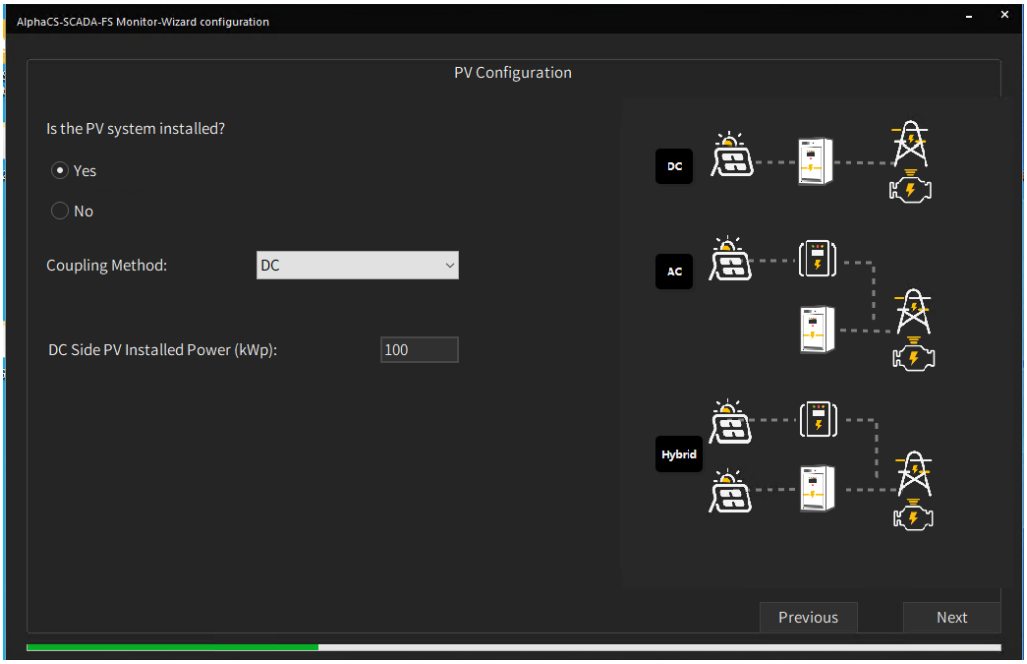
Host	192.168.200.203

6. PV Installation: If any cabinet in the parallel system is equipped with PV modules, select “Yes.” If none of the systems are equipped with PV modules, select “No.”

   Coupling Method: Configure the coupling method as DC, AC, or Hybrid according to the actual site conditions.；

   Generation Power: Enter the total PV installed Power of the entire site

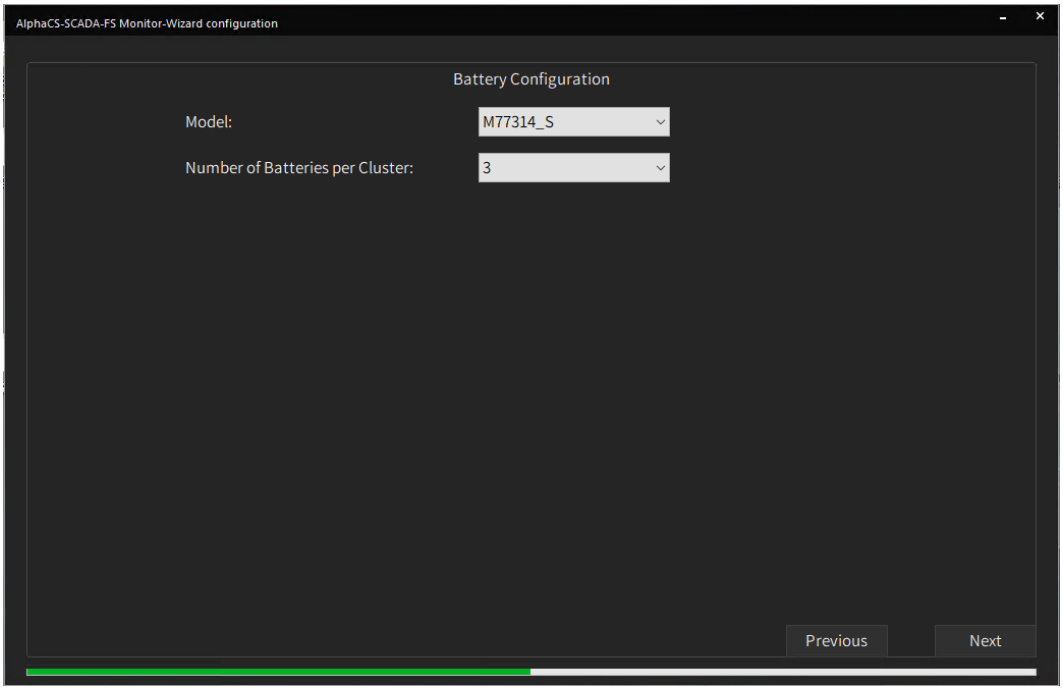
   After completing the settings, click “Next.” 。



7. Battery Model: Select “M77314-S.”

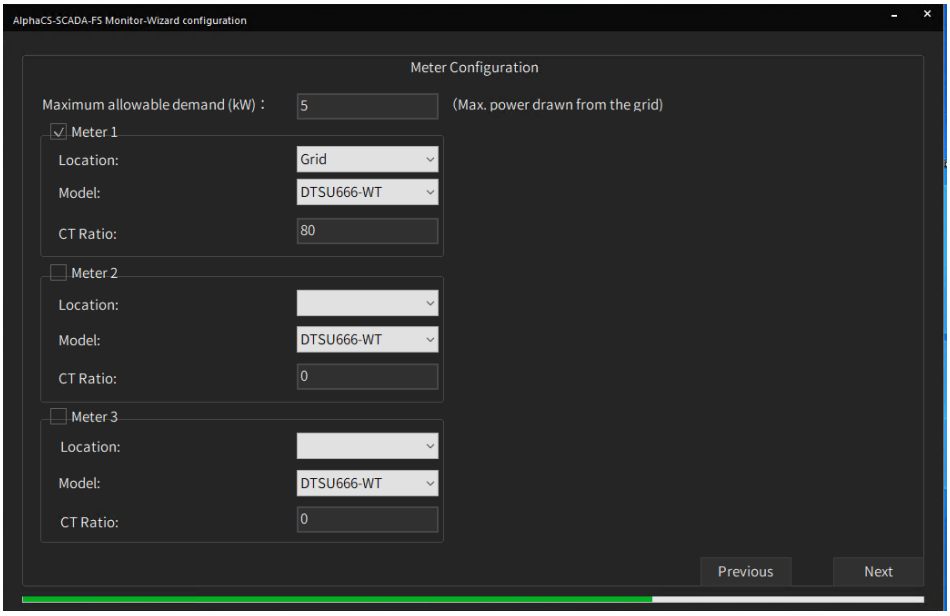
   Number of Batteries per Cluster: Set according to the actual system configuration.

   After completing the settings, click “Next.”



8. Maximum Allowed Demand: Set the capacity limit on the grid side, i.e., the maximum power that the parallel system can draw from the grid.

   Select the meter according to the actual site conditions, and configure its model and CT ratio.



CAUTION

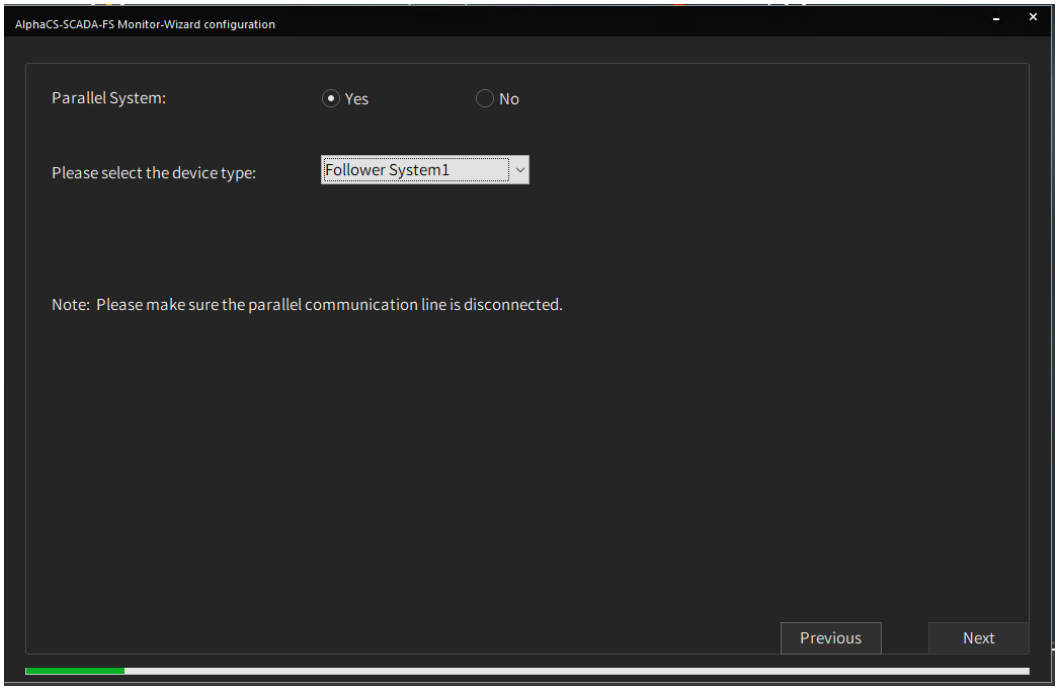
Do not click “Next” yet.

After completing all the Follower configurations and wiring, return to the Host and then click “Next.”

2.1.2 Follower Wizard Configuration

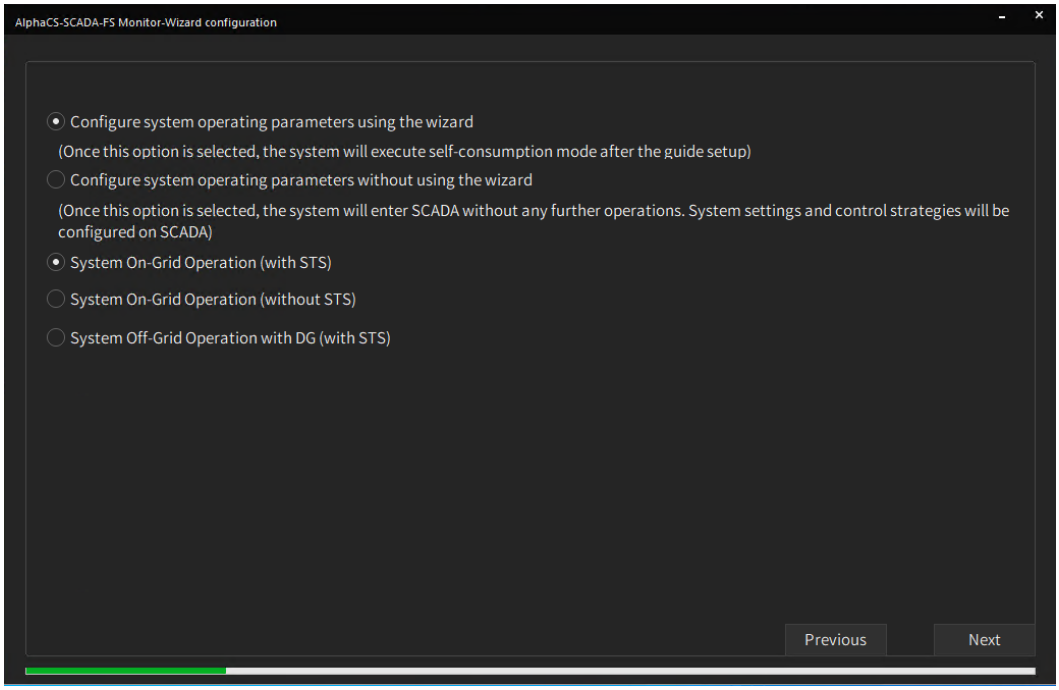
1. Click Maintenance → Start Wizard Configuration.
   Select the country, time zone, and safety certification.
   For the system model, select STORION-H30-G3-O or STORION-H50-G3-O, then click “Next.”

2. Is this a “Parallel System?”, click “Yes.”
   Select the device type as Follower n (n represents the index number of each follower cabinet, which is recommended to be named according to the physical arrangement of the cabinets.).
   Set the number of parallel units according to the actual site conditions.
   After completing the settings, click “Next.”

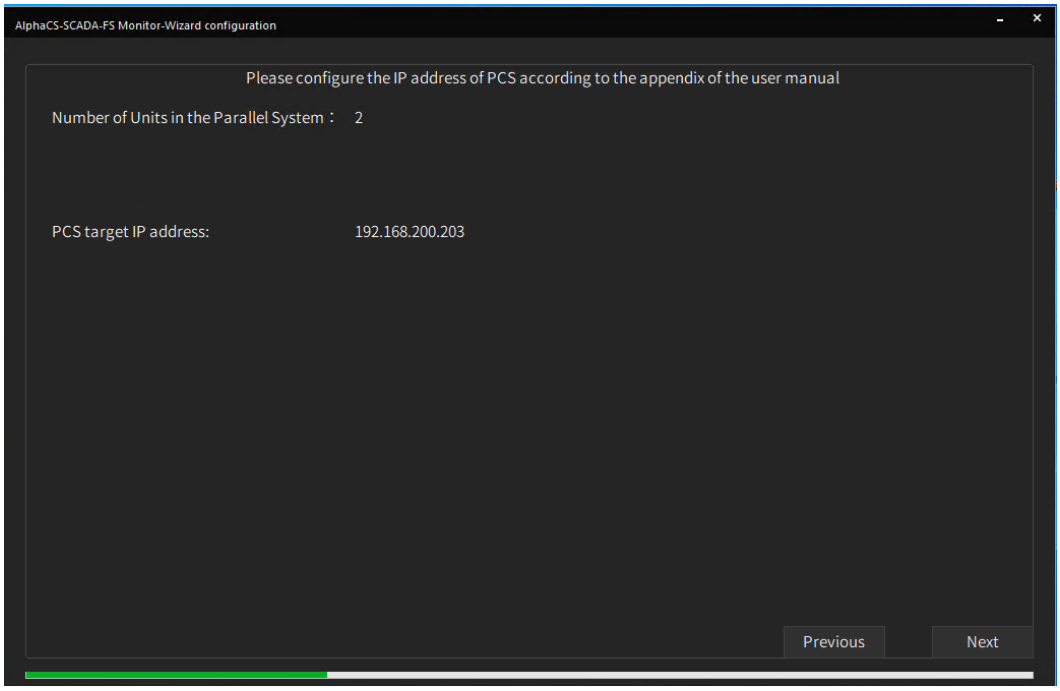


3. Select “Use Wizard for Configuration”, choose the system operation mode, and click “Next” after completing the settings.

System On-Grid Operation (with STS)	On-site system supports on-grid and off-grid parallel operation
System On-Grid Operation (without STS)	On-site system supports on-grid parallel operation only
System Off-Grid Operation with DG (with STS)	On-site system operates off-grid with a diesel generator



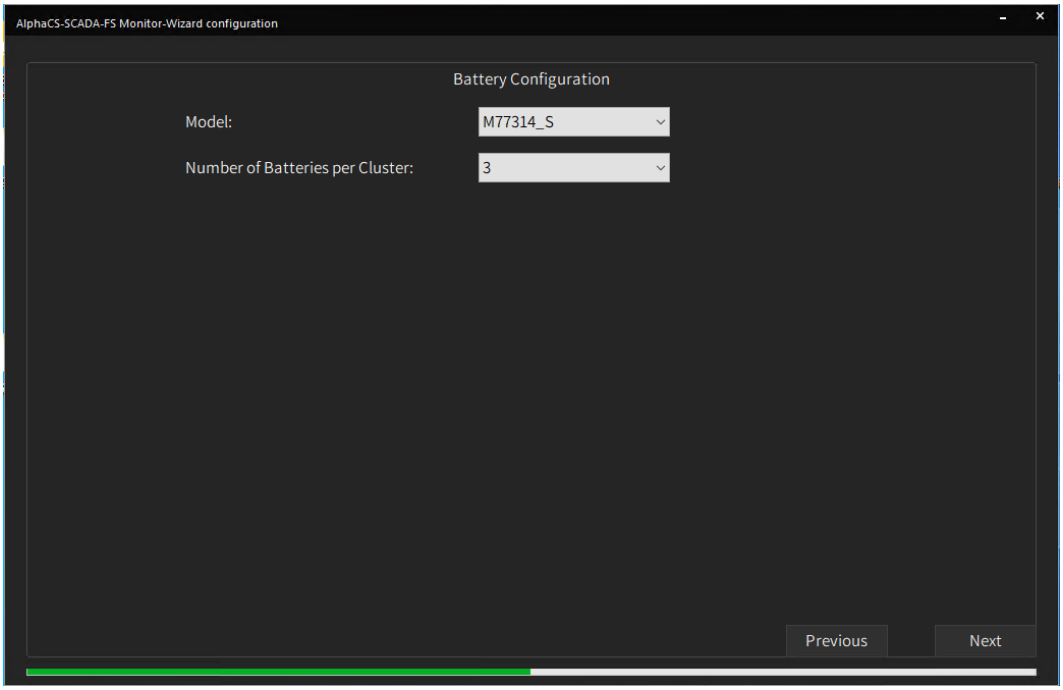
4. The wizard displays the IP addresses of the inverters.
   For the G3 series, both the Host and Follower do not require manual IP address configuration — the wizard automatically assigns the corresponding IP addresses.
   Click “Next.”



The IP addresses corresponding to each Follower are listed in the table below for verification.

Follower 1	192.168.200.204
Follower 2	192.168.200.205
Follower 3	192.168.200.206
Follower 4	192.168.200.207
Follower 5	192.168.200.208
Follower 6	192.168.200.209
Follower 7	192.168.200.210
Follower 8	192.168.200.211
Follower 9	192.168.200.212

5. Battery Model: Select “M77314-S.”
   Number of Batteries per Cluster: Set according to the actual system configuration.
   After completing the settings, click “Next.”



CAUTION

Do not click “Next” yet. After completing all Follower configurations and wiring, not after a single Follower unit, then click “Next.”

All Follower units must complete the wizard configuration according to the instructions in this section.

2.2 Self-Check

1. Complete the EMS communication cable connections according to Sections 1.2.2 and 1.3.3.
2. Return to each cabinet, click “Next”, and enter the self-check process.
3. After the self-check is passed, click “Finish.” The wizard commissioning is now complete.

3. Startup and Operation

After system wiring is completed, the following steps must be carried out before start-up:

1. Use a multimeter to measure the voltage at the high-voltage box input terminals; the acceptable range is given in the “System Normal Voltage Range” table at the end of this document.
2. With an insulation tester, check the insulation resistance at the high-voltage box input (B+ to ground and B– to ground); the resistance must be ≥ 1 MΩ.

For further details, refer to the Operation Manual.

4. Technical Contact

If you have any technical issues with our products, please contact us. The contact information can be found on the front page of this manual. To help us quickly resolve your issue, please provide the following information:

A. System configuration

B. Product serial number

C. Software version number

D. Fault information

E. Photovoltaic module information