Smart Energy Controller

SEC3000C

User Manual

Copyright Statement

NOTICE
The information in this document is subject to change due to product updates or other reasons. This document cannot replace the product labels or the safety precautions unless otherwise specified. All descriptions in the manual are for guidance only.

1. About This Manual

1.1. Overview

This document describes the product information, installation, electrical connection, commissioning, troubleshooting, and maintenance. Read through this document before installing and operating the product. All the installers and users have to be familiar with the product features, functions, and safety precautions. This manual is subject to update without notice. For more product details and latest documents, visit https://en.goodwe.com/.

1.2. Applicable Products

This document applies to the Smart Energy Controller SEC3000C (SEC for short).

1.3. Symbol Definition

DANGER
Indicates a high-level hazard that, if not avoided, will result in death or serious injury.
WARNING
Indicates a medium-level hazard that, if not avoided, could result in death or serious injury.
CAUTION
Indicates a low-level hazard that, if not avoided, could result in minor or moderate injury.
NOTICE
Highlights key information and supplements the texts. Or some skills and methods to solve product-related problems to save time.

2. Safety Precautions

Please strictly follow these safety instructions in the user manual during the operation.

WARNING

The equipment is designed and tested strictly in compliance with related safety rules. Read and follow all the safety instructions and cautions before any operations. Improper operation might cause personal injury or property damage as the equipments are electrical equipment.

2.1. General Safety

NOTICE

- The information in this document is subject to change due to product updates or other reasons. This document cannot replace the product labels or the safety precautions unless otherwise specified. All descriptions in the manual are for guidance only.
- Before installations, read through this document to learn about the product and the precautions.
- All installations should be performed by trained and knowledgeable technicians who are familiar with local standards and safety regulations.
- Use insulating tools and wear personal protective equipment (PPE) when operating the equipment to ensure personal safety. Wear anti-static gloves, wrist strips, and cloths when touching electronic devices to protect the equipment from damage.
- Unauthorized disassembly or modification may cause damage to the equipment, which is not covered within the warranty scope.
- Strictly follow the installation, operation, and configuration instructions in this document. The manufacturer shall not be liable for equipment damage or personal injury if you do not follow the instructions. For more warranty details, visit:https://en.goodwe.com/warranty.

2.2. Personnel Requirements

NOTICE

- Personnel who install or maintain the equipment must be strictly trained, learn about safety precautions and correct operations.
- Only qualified professionals or trained personnel are allowed to install, operate, maintain, and replace the equipment or parts.

2.3. Grounding Safety

WARNING

Make sure the equipment is reliably grounded before operation.

2.4. Personal Safety

DANGER

- Use insulating tools and wear personal protective equipment (PPE) when operating the equipment to ensure personal safety.
- Do not touch the equipment when it is short-circuited. Keep away from the equipment, and turn off the power immediately.
- Before wiring, disconnect all upstream switches to ensure the equipment is not powered on.

2.5. Equipment Safety

DANGER

Make sure the equipment is installed at a solid and reliable place.

WARNING

- Use appropriate tools for proper installation, maintenance, etc.
- Observe local standards and safety regulations when operating the equipment.
- Unauthorized disassembly or modification may cause damage to the equipment, which is not covered within the warranty scope.

2.6. Safety Symbols and Certification Marks

DANGER

- All labels and warning marks must be clear and distinct after the installation. Do not block, alter, or damage any label.
- The following descriptions are for reference only.

No.	Symbol	Description
1		Potential risks exist during the operation of the devices. Wear proper PPE during operations.

2		High voltage hazard. High voltage exist during the operation of the devices. Disconnect all incoming power and turn off the product before working on it.
3		Read through the user manual before any operations.
4		Do not dispose of the equipment as household waste. Discard the product in compliance with local laws and regulations, or send it back to the manufacturer.
5		CE marking

2.7. EU Declaration of Conformity

2.7.1. Equipment with Wireless Communication Modules

The equipment with wireless communication modules sold in the European market meets the requirements of the following directives:

- Radio Equipment Directive 2014/53/EU (RED)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

2.7.2.Equipment without Wireless Communication Modules

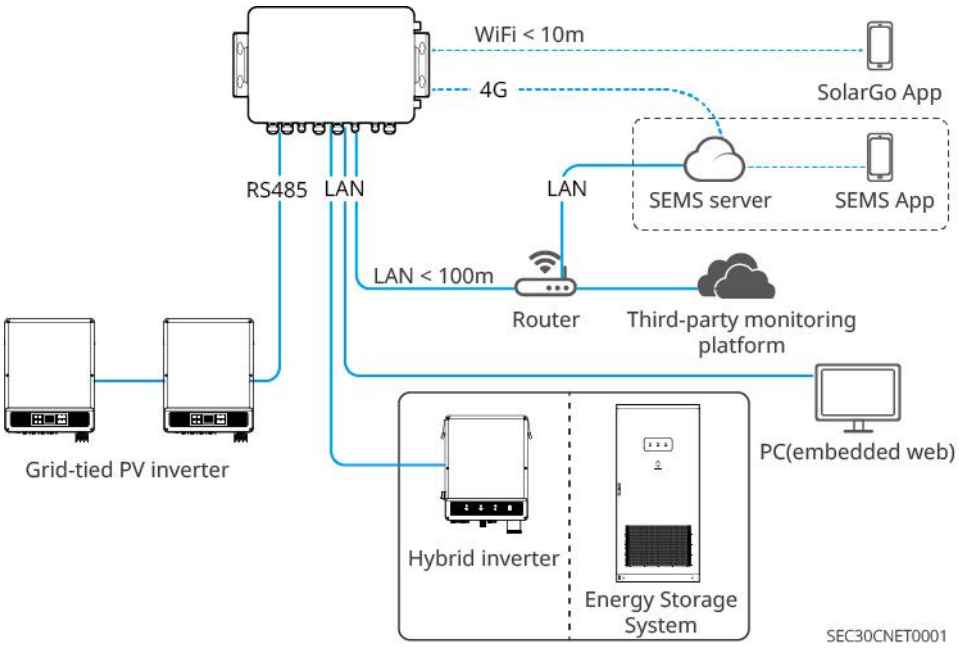
The equipment without wireless communication modules sold in the European market meets the requirements of the following directives:

- Electromagnetic compatibility Directive 2014/30/EU (EMC)
- Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

3. System Introduction

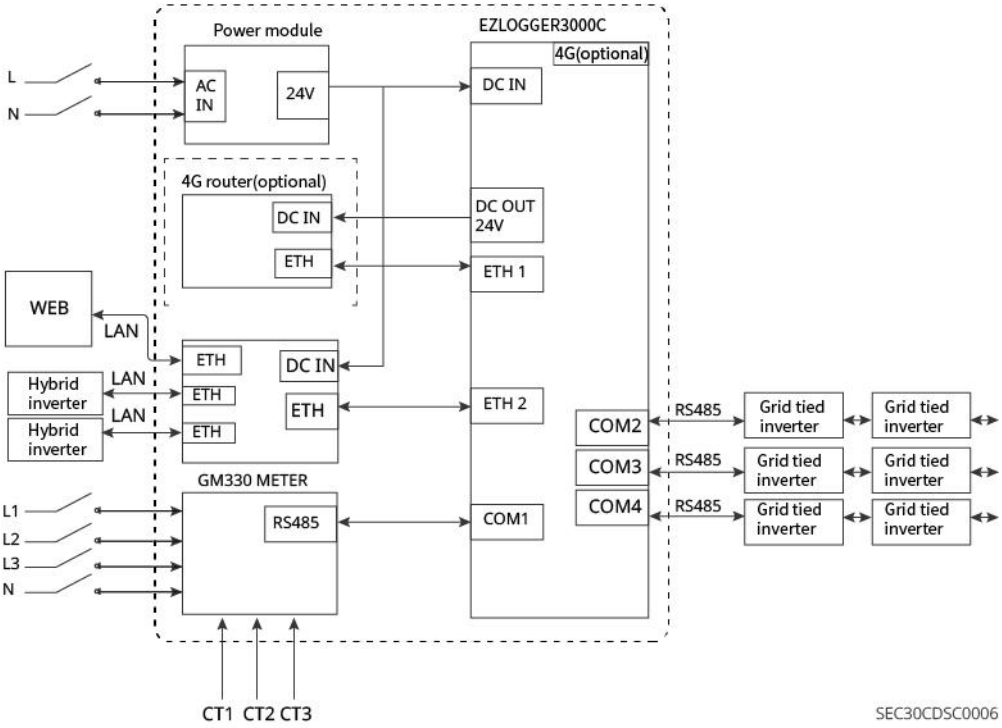
3.1. Function Description

SEC is a dedicated device for the monitoring and management platform of photovoltaic and energy storage power generation systems. It can be applied to collect data from devices in the power generation system, such as grid-tied PV inverters, hybrid inverters, smart meters, etc., store logs, and send data to the monitoring management platform for centralized monitoring, operation, and maintenance of the system.



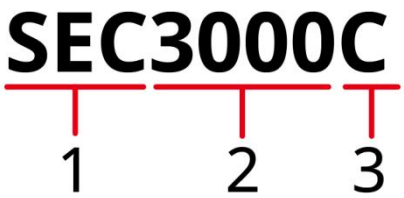
- A maximum of 20 inverters can be connected to one RS485 communication cable.
- A maximum of 10 hybrid inverters or 15 energy storage systems could be connected via LAN cable.

3.2. Circuit Diagram



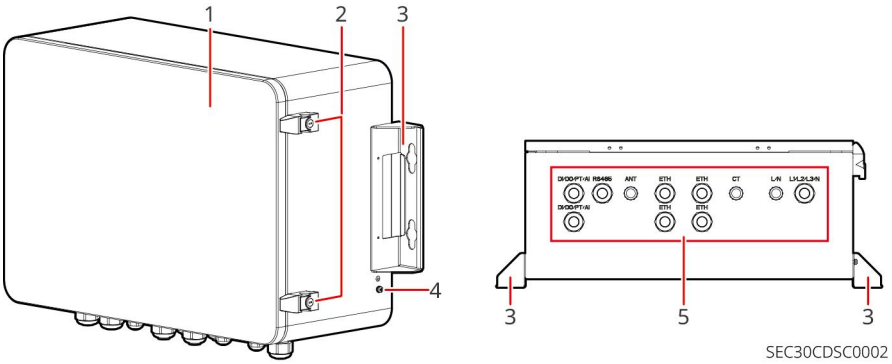
3.3. Model

The following model is involved in the document:



No.	Definition	Explanation
1	Product function	SEC: Smart Energy Controller
2	Code for generation	3000: the third generation
3	Application Scenarios	C: Photovoltaic energy storage system in commercial and industrial applications

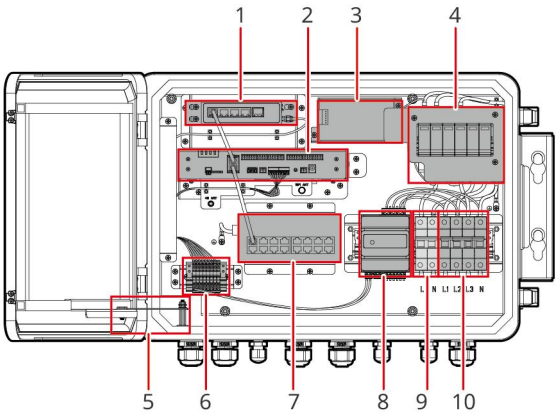
3.4. Appearance



SEC30CDSC0002

No.	Parts	No.	Parts
1	Cabinet door	2	Lock
3	Mounting plate	4	Grounding point
5	Cable hole	-	-

3.5. Parts Introduction



SEC30CDSC0003

No.	Name	Description
1	4G router	● Optional parts support purchase from GoodWe or be prepared by customers. ● A reserved DIN rail allows a self-purchased 4G router to be installed inside the SEC3000C enclosure. Recommended maximum dimensions: 185*80*155 mm; power supply: 24 V.
2	Datalogger	● In-built smart data logger: EzLogger3000C. ● Collect the third-party equipment to the EzLogger for RCR and remote shutdown.

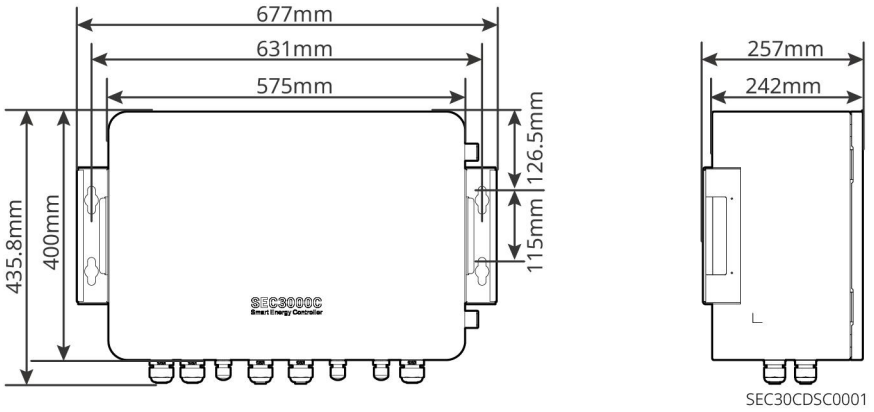
		• ETH1 is designated for external network communication, e.g., with a 4G router. ETH2 is used to connect to a network switch. • 4G is optional.
3	24V power module	For powering EzLogger3000C and switch inside SEC3000C.
4	Lightning protection module	If the module is damaged, contact the after-sales service.
5	Limit lever	For fixing the cabinet door.

6	RS485 communication terminal	• Connected to grid-tied PV inverters via the RS485 communication cable. A maximum of 20 inverters can be connected to one RS485 communication cable.
		• Connect to the on-grid inverter energy meter via RS485 communication cables for detecting the AC output power of the grid-tied inverter.
		• Currently supported equipment:
		  ○ Grid-tied PV inverter: GT series, SMT G2 series, SDT-G3 series, HT series, SMT G1 series, UT series, etc. To check compatible inverters visit Compatibility list of GoodWe inverters and IoT products.
		  ○ Smart meter: GM330 or smart meters support high voltage power limit, like DTSD1352.
		• A1 / B1 ports are occupied, and are connected to internal smart meters of SEC3000C in default. The cable can be removed if the inbuilt smart meter is not to be used.

7	Switch	• Connected to smart dongles of hybrid inverters or energy storage systems via network cables. A maximum of 10 hybrid inverters or 15 energy storage systems could be connected.
		• Currently supported equipment:
		  ○ Hybrid inverters: ET40-50kW series inverters with ARM version higher than 10 and DSP version higher than 02.
		  ○ Smart dongle: WiFi/LAN Kit-20 and the firmware version is V2.5.49 and later. The first three serial numbers are 721.
		  ○ Energy storage systems: GW125/261-ESA-LCN-G10.

		Ensure the energy storage system's ARM version is no lower than 53 and DSP version is no lower than 18. ● Connected to the computer via the network cable and login to the embedded web, and commission the device.
8	Smart meter	● In-built GoodWe smart meter: GM330. ● For checking data of the on-grid point, and adjusting the power feed into the grid.
9	Single-phase circuit breaker	● It is connected to the power grid via an AC cable to power on/off the SEC3000C system. ● Input voltage: 100 - 240 Vac.
10	Three-phase circuit breaker	● It is connected to the power grid via an AC cable to power on/off smart meter inside the SEC3000C. ● When connected to a three-phase four-wire power grid: Supported input voltage range: 172~817Vac (line voltage). ● When connected to a three-phase three-wire power grid: Supported input voltage range: 100~472Vac (line voltage).

3.6. Dimensions



3.7. Indicators

Check the in-built data logger of SEC3000C and LED indicators of the smart meter.

Datalogger

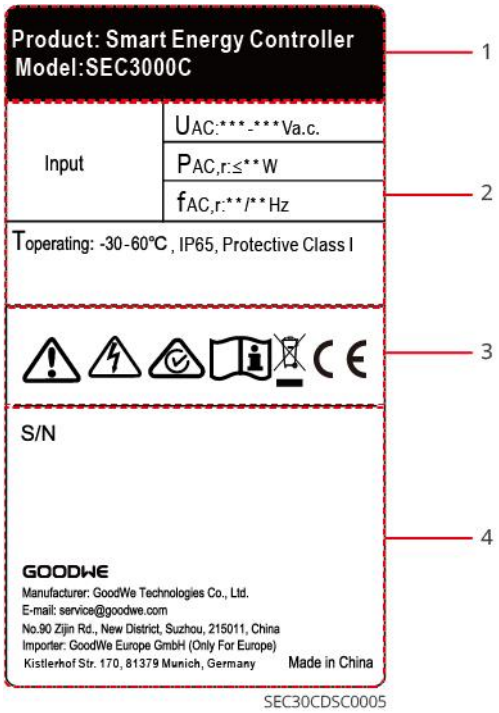
Indicator	Indicator status	Description
PWR		Steady green: power supply is normal..
		Green off: power off or abnormal power supply..

RUN		Steady green/Green off: The device fails to work.
		Slow blinking green: The device is working properly.
NET		Steady green: Communication between the device and the server is normal.
		Fast blinking green: Communication between the device and the router is normal, but communication between the device and the server fails.
		Slow blinking green: Communication between the device and the router fails.
ALM		Steady red: All the connected inverters are in fault status.
		Fast blinking red: the equipment is being upgraded.
		Red off: At least one inverter in the system is working properly.

Smart meter

Type	Status	Description
Power Indicator 	On	The smart meter is powered on. No RS485 communication.
	Blink	The smart meter is powered on. Normal RS485 communication.
	Off	The smart meter is powered off.
Communication indicator 	Off	Reserved.
	Blink	Press the Reset button for at least more than 5 seconds, power light, purchasing or selling electricity indicator light flash: reset the meter.
Importing or exporting indicator 	On	Import from the grid.
	Blink	Export to the grid.
	Off	Neither importing nor exporting power.
	Reserved.	

3.8. Nameplate



SEC30CDSC0005

No.	Description
1	Product type and model.
2	Technical parameters.
3	Safety symbols and certification marks.
4	GW trademark, contact information and serial number.

4. Check and Storage

4.1. Check Before Receiving

Check the following items before receiving the product.

1. Check the outer packing box for damage, such as holes, cracks, deformation, and others signs of equipment damage. Do not unpack the package and contact the supplier as soon as possible if any damage is found.
2. Check the product model. If the product model is not what you requested, do not unpack the product and contact the supplier.

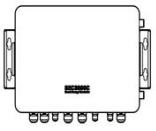
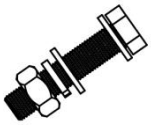
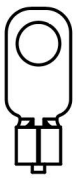
4.2. Deliverables

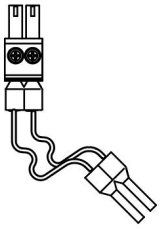
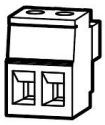
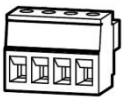
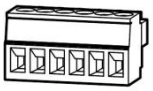
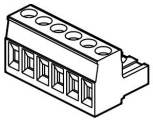
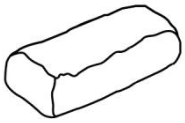
⚠ WARNING

- Check the package content to make sure that the correct model is provided and there is no damage, and if nothing is missing. If that is not the case, contact the supplier.
- After being taken out of the package, it is forbidden to put deliverables in rough, uneven or sharp places to prevent peeling paint.

NOTICE

*4G antenna: optional. N=0 or N=1.

Parts	Description	Parts	Description
	Smart Energy Controller x 1		M12 expansion bolt x 4
	M10 assembly bolt and nut x 4		PIN terminal x 20
	PIN terminal x 6 L1/L2/L3/N		Grounding OT terminal x 1

	Key x 4		4G router power cable x 1 Applicable only to scenarios where the 4G router is not selected.
	2PIN communication terminal x 4		4PIN communication terminal x 4
	6PIN communication terminal x 2		6PIN terminal x 1 Applicable to smart meter CT.
	4G antenna x 1 (optional)		Fireproofing mud x 1
	Document x 1	-	-

4.3. Device Storage

If the equipment is not to be installed or used immediately, please ensure that the storage environment meets the following requirements. After being stored for a long period, the equipment needs to be checked by professionals before use.

Time requirements:

- If the equipment has been stored for more than two years or has not been in operation for more than six months after installation, it is recommended to be inspected and tested by professionals before being put into

  use.
- To ensure good electrical performance of the internal electronic components of the equipment, it is recommended to power it on every 6 months during storage. If it has not been powered on for more than 6 months, it is recommended to be inspected and tested by professionals before being put into use.

Packing requirements:

Do not unpack the outer package or throw the desiccant away.

Environment Requirements:

- Place the equipment in a cool place away from direct sunlight.
- Store the equipment in a clean place. Make sure the temperature and humidity are appropriate and no condensation. Do not install the equipment if the ports or terminals are condensed.

- Keep the equipment away from flammable, explosive, and corrosive matters.

Stacking Requirements:

- Stack the equipment complying with the labels and requirements on the packing box.
- The equipment must be stacked with caution to prevent them from falling.

5. Installation

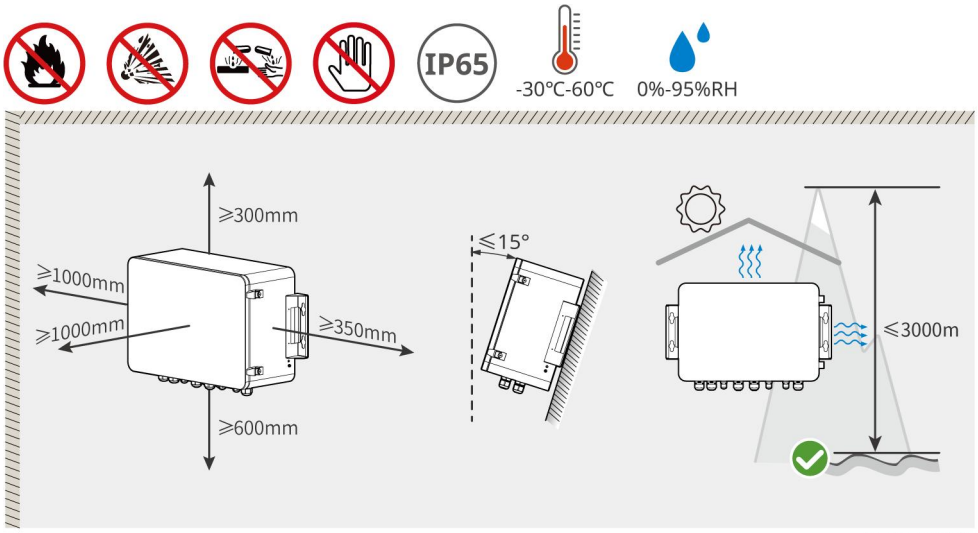
DANGER

Install and connect the equipment with the deliverables included in the package. Otherwise, the manufacturer shall not be liable for the damage.

5.1. Installation Requirements

5.1.1. Installation Environment Requirements

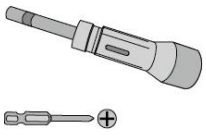
1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. The temperature and humidity at the installation site should be within the appropriate range.
3. The installation site should be out of the reach of children and away from areas that are easily accessible.
4. Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. Build a sunshade if it is needed.
5. Install the equipment in a well-ventilated place to ensure good dissipation. Also, the installation space should be large enough for operations.
6. The equipment with a high ingress protection rating can be installed outdoors.
7. Install the equipment at a height that is convenient for operation and maintenance, ensure that the device indicators, all labels are easy to view, and the terminal blocks are easy to operate.
8. Equipment installation altitude needs to be lower than the maximum working altitude.
9. Install the inverter away from high magnetic field to avoid electromagnetic interference. If there are radio stations or wireless communication equipment below 30 MHz near the installation location, the distance between the equipment and the wireless electromagnetic interference equipment needs to exceed 30m.

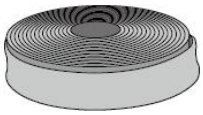


5.1.2. Installation Tool Requirements

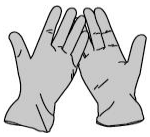
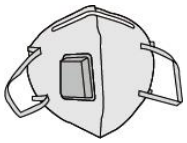
NOTICE
The following tools are recommended when installing the equipment. Use other auxiliary tools on site if necessary.

Installation Tools

Tool Type	Description	Tool Type	Description
	Diagonal pliers		Crimping tool
	Wire stripper		Open-end wrench
	Hammer drill (Φ15mm)		Torque screwdriver M4/M5/M7
	Rubber hammer		Socket wrench

	Marker		Multimeter Range ⩽1100V
	Heat shrink tube		Heat gun
	Cable tie		Vacuum cleaner
	Level	-	-

Personal Protective Equipment

Tool type	Description	Tool Type	Description
	Insulation gloves and safety gloves		Dust mask
	Goggles		Safety shoes

5.2. Installation

CAUTION

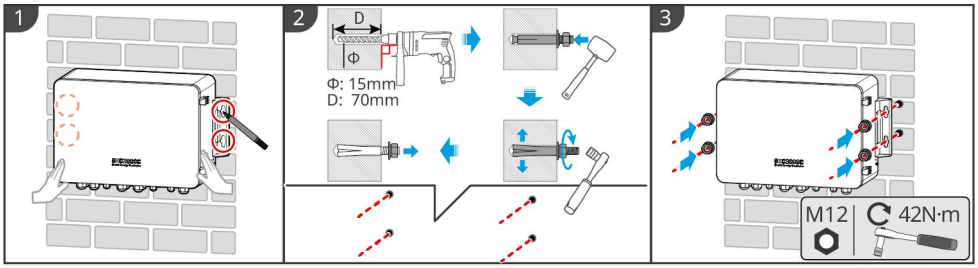
- Avoid the water pipes and cables buried in the wall when drilling holes.
- Wear goggles and a dust mask to prevent the dust from being inhaled or contacting eyes when drilling holes.
- Make sure the device is firmly installed in case of falling down.

Wall-mounted Installation

Step 1: Put the equipment on the wall horizontally and mark positions for drilling holes.

Step 2: Drill holes with hammer drill, and install expansion bolts.

Step 3: Mount the equipment onto the expansion bolt, and use torque wrench to tighten the expansion bolts.



SEC30CINT0003

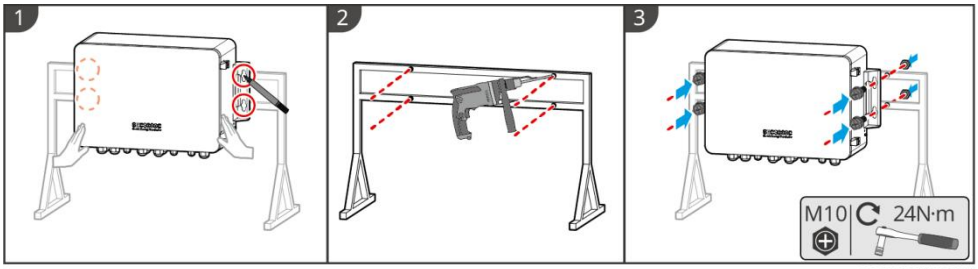
Bracket-mounted Installation

NOTICE
For bracket mounting, the user shall prepare appropriate-sized brackets by themselves.

Step 1: Confirm the mounting hole position of the bracket and mark positions for drilling holes.

Step 2: Drill holes with hammer drill.

Step 3: Mount the equipment onto the bracket with assembly bolts and nuts, and use torque wrench to tighten the bolts.



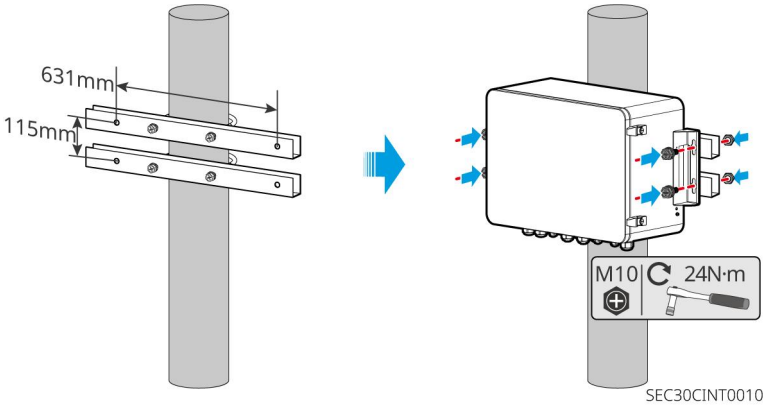
SEC30CINT0004

Pole-mounted Installation

NOTICE
For pole mounting, the user shall prepare appropriate-sized pole mounting accessories by themselves.

Step 1: Fix the pole mounting accessories to the mounting pole and tighten the bolts with a torque wrench.

Step 2: Mount the equipment onto the pole with assembly bolts and nuts, and use torque wrench to tighten the bolts



SEC30CINT0010

6. System Wiring

DANGER

- Perform electrical connections in compliance with local laws and regulations. Including operations, cables, and component specifications.
- Before electrical connections, disconnect all upstream switches to ensure the device is not energized. Do not work with POWER ON. Otherwise, an electric shock may occur.
- Tie the same type cables together, and place them separately from cables of different types. Do not place the cables entangled or crossed.
- If the cable bears too much tension, the connection may be poor. Reserve a certain length of the cable before connecting it to the equipment.
- When crimping the terminals, ensure that the conductor part of the cable is in full contact with the terminals. Do not crimp the cable jacket with the terminal. Otherwise the equipment may not operate, or its terminal block may be damaged due to heating because of unreliable connection after operation.

NOTICE

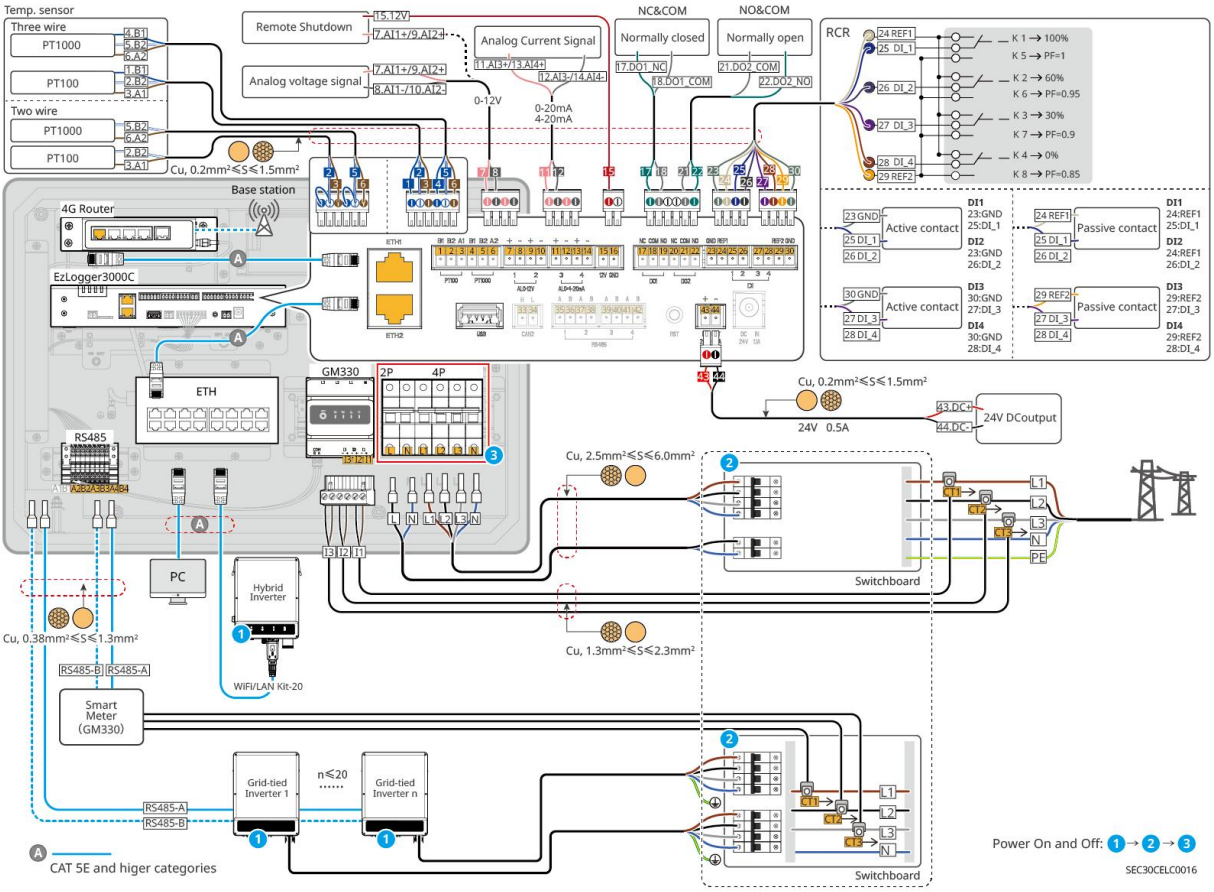
- Wear personal protective equipment like safety shoes, safety gloves, and insulating gloves during electrical connections.
- All electrical connections should be performed by qualified professionals.
- Cable colors in this document are for reference only, the cable specifications shall meet local laws and regulations.

6.1. System Wiring Diagram

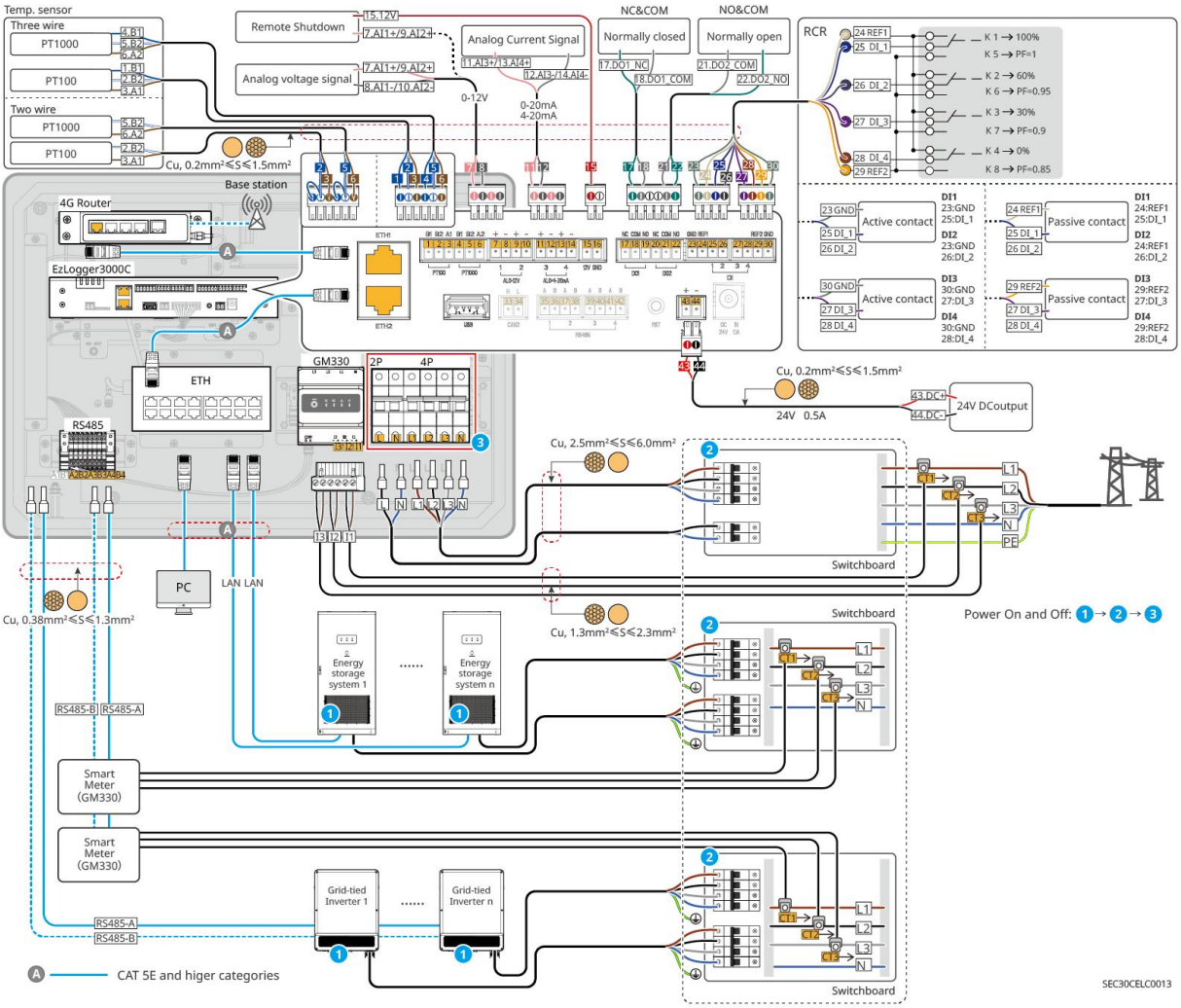
NOTICE

- When the built-in GM330 meter and other types of meters are used simultaneously in the system, they must be connected to separate RS485 communication terminals. Failure to do so may result in data transmission issues.
- The active and reactive power adjustment values for the RCR device shown in the wiring diagram are default settings. The specific values must be configured according to the actual requirements of the grid company.

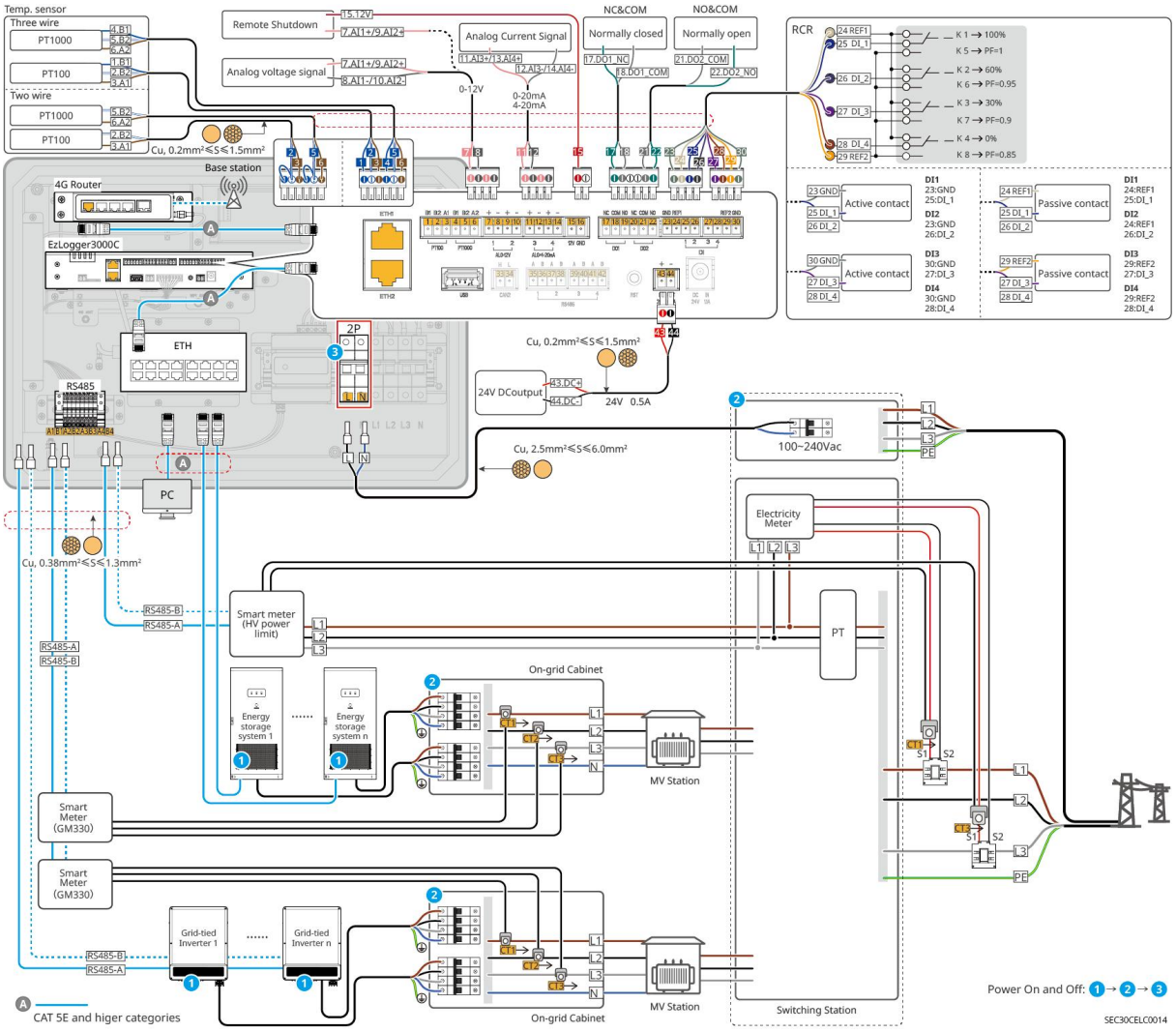
System Configuration 1: SEC3000C + ET40-50kW+Grid-tied Inverter + WiFi/LAN Kit-20



System Configuration 2: SEC3000C + GW125/261-ESA-LCN-G10 + Grid-tied Inverter(LV Power Limit Scenario)



System Configuration 3: SEC3000C + GW125/261-ESA-LCN-G10 + Grid-tied Inverter(HV Power Limit Scenario)



- Supported high-voltage power limit meter: Acrel DTSD1352-CT/C.

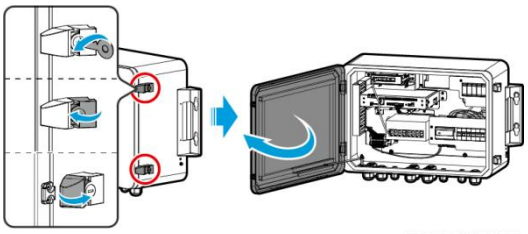
6.2. Prepare Materials

Preparing Cables

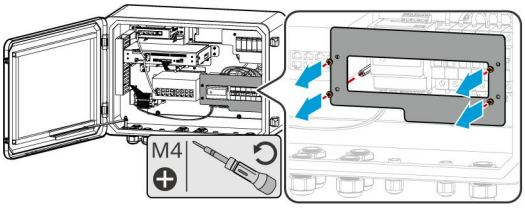
No.	Cable	Recommended specifications	Acquisition method
1	Protective earth wire	• Outdoor single core copper cable • Cross-sectional area: 2.5 - 10 mm² • Outer diameter: 2.5-4.5mm	Prepared by customers
2	Smart meter CT cable	• Outdoor single core copper cable • Cross-sectional area: 1.3 - 2.3 mm² • Outer diameter: 2.0-3.0mm	Prepared by customers
3	Single-phase AC cable	• Outdoor single core copper cable • Cross-sectional area: 2.5 - 6.0 mm²	Prepared by customers

4	Three-phase AC cable	• Outer diameter: 2.5-4.0mm	Prepared by customers
5	RS485 communication cable for external equipment	• Shielded twisted pair cable that meets local standards • Cross-sectional area: 0.07mm²-1.3mm² • Outer diameter: 1.0-2.5mm	Prepared by customers
6	Ethernet cable for external equipment	• Shielded network cable: CAT 5 and above standard network cable and RJ45 shielded connector • Length of network cable: no more than 100 m	Prepared by customers

Open the cabinet door and remove plate in wiring area



SEC30CINT0006

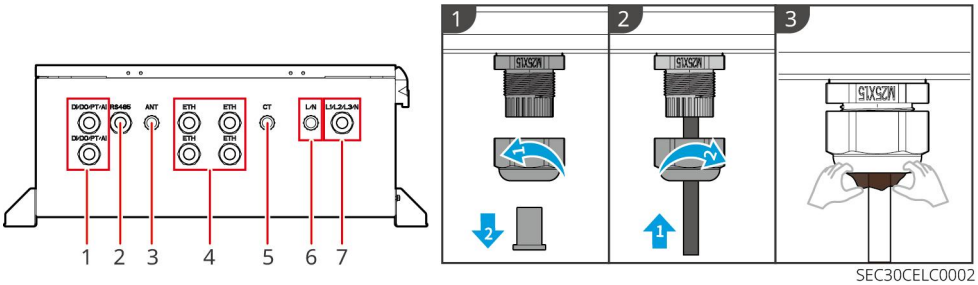


SEC30CINT0007

Cable hole

NOTICE

To ensure sealing performance, use fireproof putty to seal the cable gland after installation.



SEC30CELC0002

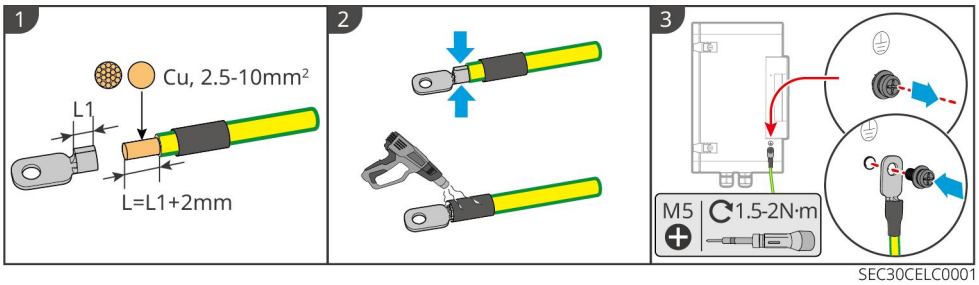
No.	Silkscreen	Description
1	DI/DO/PT/AI	Cable hole of DI/DO/PT/AI communication cable
2	RS485	Cable hole of the RS485 communication cable

3	ANT	Cable hole of antenna
4	ETH	Cable hole of the network cable
5	CT	Cable hole of smart meter CT cable
6	L/N	Single-phase AC cable hole
7	L1/L2/L3/N	Three-phase AC cable hole

6.3. Connecting the PE Cable

WARNING

- When installing the equipment, the grounding cable must be installed first; when removing the equipment, the grounding cable must be removed last.
- To improve the corrosion resistance of the terminal, it is recommended to apply silica gel or paint on the ground terminal after installing the PE cable.

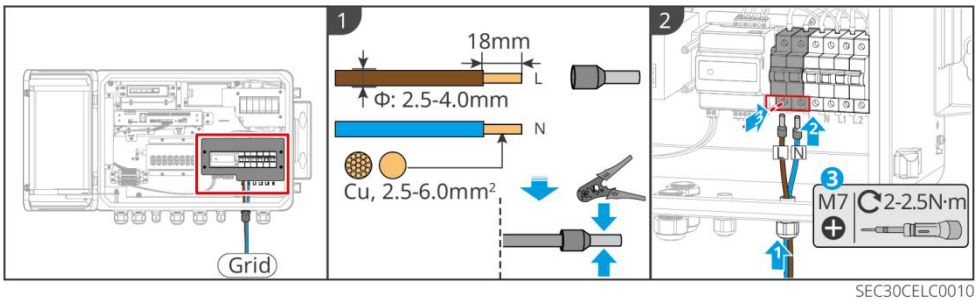


SEC30CELC0001

6.4. Connecting Single-phase AC cable

NOTICE

Input voltage: 100 - 240 Vac.

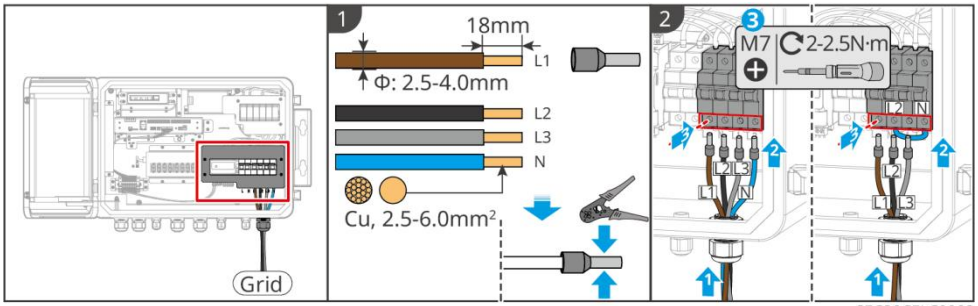


SEC30CELC0010

6.5. Connecting Three-phase AC Cable

NOTICE

- Support connecting three-phase three wire system or three-phase four wire system. For three-phase three-wire connection, short-circuit ports L2 and N.
- If the built-in GM330 meter is not used, the three-phase AC wiring becomes optional.



SEC30CELC0003

6.6. Connecting Smart Meter CT Cable

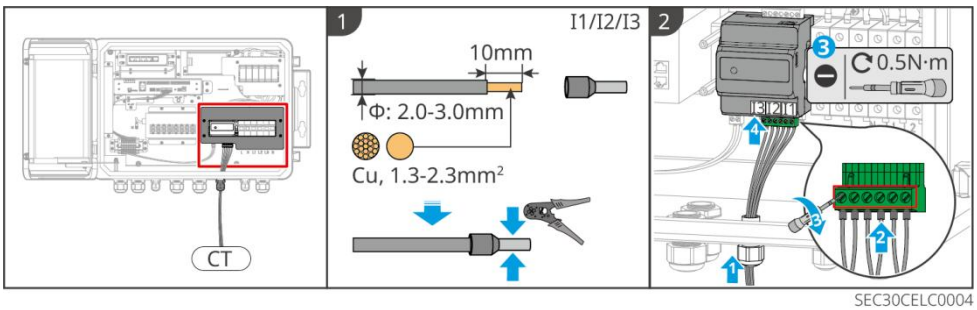
WARNING

In areas at risk of lightning, if the meter cable exceeds 10m and the cables are not wired with grounded metal conduits, it is recommended to use an external lightning protection equipment.

NOTICE

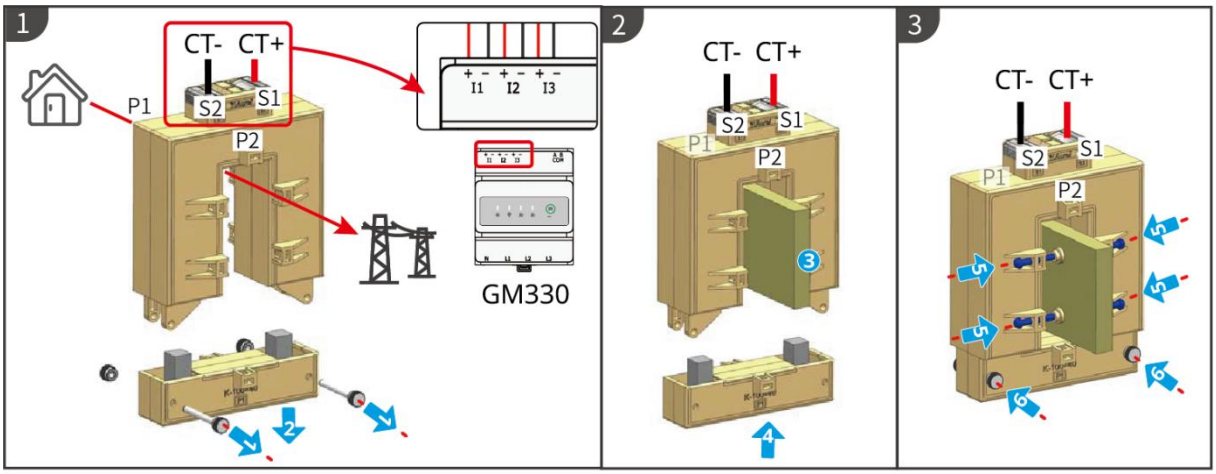
- Only for GM330 smart meter. Refer to the meter manual if a third party smart meter is used.
- Purchase CT from GoodWe or prepare them yourself. CT ratio requirement: nA /5A.
  - nA: primary current input of the CT; the range of n is 200-5000.
  - 5A: secondary current output of theCT.
- Ensure that the CT is connected in the correct direction and phase sequences, otherwise the monitoring data will be incorrect.
- Outer diameter of the AC cable should be smaller than the holes diameter of the CT, so that the AC cable can be routed through the CT.
- To ensure accurate current detection of the CT, the CT cable is recommended to be no more than 30m.
- Do not use network cable as the CT cable. Otherwise the smart meter may be damaged due to high current.
- CTs vary slightly in dimensions and appearance depending on the model, but they are installed and wired in the same way.

Connection Method



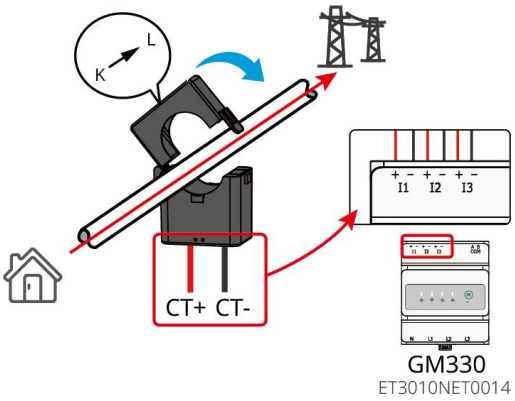
SEC30CELC0004

Installing the CT (Type I)



ET3010NET0013

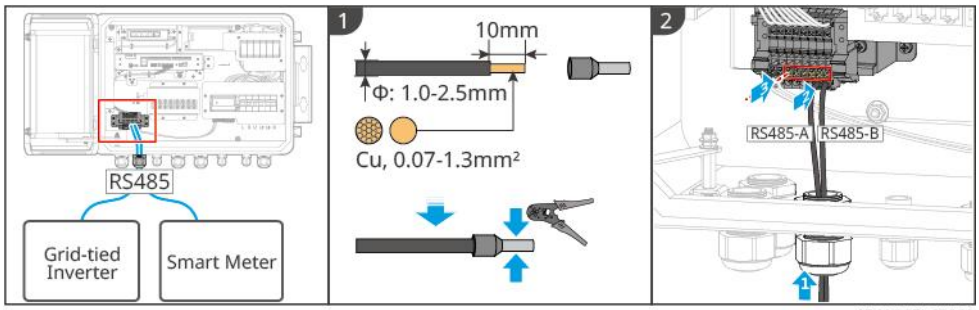
Installing the CT (Type II)



ET3010NET0014

6.7. Connecting the RS485 Communication Cable

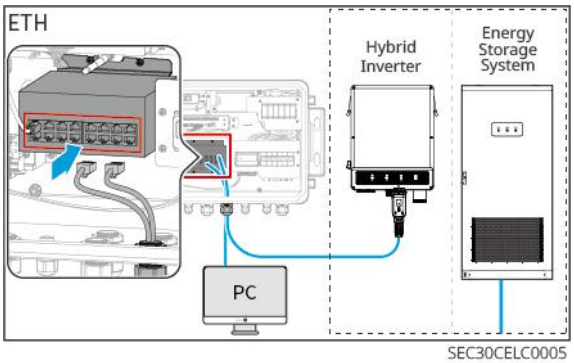
NOTICE
• Supports Connecting On-Grid Inverters: GT Series, SMT G2 Series, SDT-G3 Series, HT Series, SMT G1 Series, UT Series, etc. To check compatible inverters visit Compatibility list of GoodWe inverters and IoT products. • Supports smart meter for grid-tied inverter. The smart meter can be used to detect the AC output power of the grid-tied PV inverter. Currently supported device: GM330. • A maximum of 20 inverters can be connected to one RS485 communication cable. • SEC provides 3 available RS485 communication cable to any one of the RS485 terminal groups.



SEC30CELC0008

6.8. Connecting the Network Cable

NOTICE
• Supports connection to hybrid inverters via the smart dongle, currently supporting models: ET40-50kW series inverters. And support connection to energy storage systems, currently supporting models: GW125/261-ESA-LCN-G10. • Please provide your own WiFi/ LAN Kit-20 smart dongle for connecting the hybrid inverter, ensuring that the dongle version is no lower than V2.5.49. • Supports connection to a computer. After connecting the device to the computer via Ethernet cable, you can log into the embedded web configuration system to adjust relevant parameters. • If the computer only provides USB, Type-C, or other ports when connecting via Ethernet cable, please prepare your own Ethernet adapter. • The smart energy control box provides 15 available network ports. Connect the Ethernet cable to any network port according to actual needs.



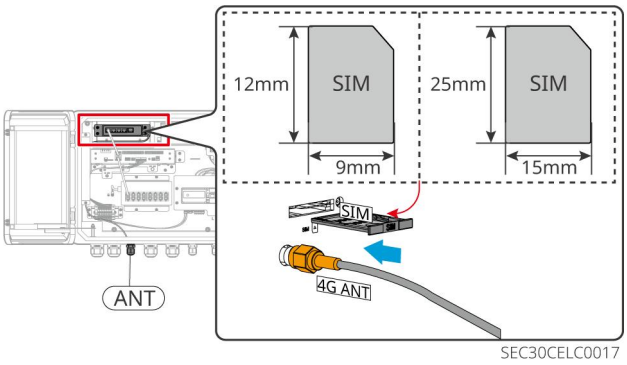
SEC30CELC0005

6.9. Installing the 4G Antenna (Optional)

NOTICE
• If the GoodWe 4G router is selected, it will be installed before shipment. • Routers from other manufacturers are also supported. If selected, the 4G router needs to

be installed manually.

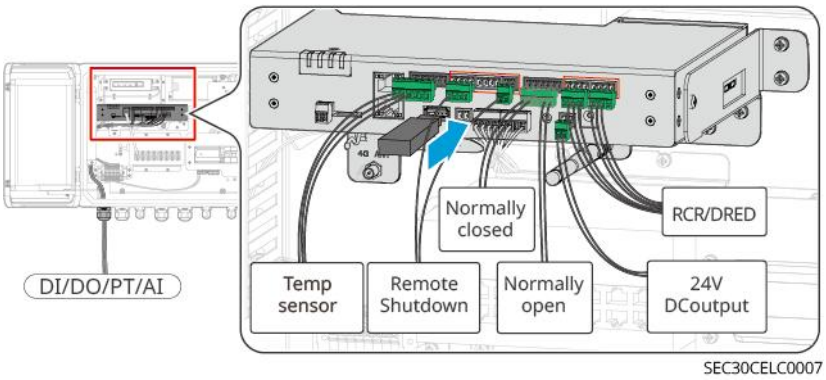
- If it is necessary to install a 4G antenna extension cable, do not place the extension cable crosswise with other communication cables, as this may affect the signal.
- The SIM card needs to be prepared by the client according to the card slot size. Recommended standard SIM card (size: 25 mm × 15 mm, capacity ⩾ 64 KB) or NANO card (size: 12 mm × 9 mm, capacity ⩾ 64 KB).
- Recommended data plan:
  - For a system with N grid-tied inverters, the required Data Plan = 200 + 100*N MB/month.
  - For a system with N energy storage systems, the required Data Plan = 200 + 600*N MB/month.
  - For a system with M grid-tied inverters and N energy storage systems, the required Data Plan = 200 + 100*M+600*N MB/month.



6.10. Connecting DO/DI/AI/PT Cables

NOTICE

- SEC has a built-in data logger. To enable functions such as RCR, remote shutdown or to connect external equipments such as temperature sensors, connect the corresponding cables.
- SEC has reserved wiring holes for DI/DO/AI/PT connections. If corresponding cables need to be connected, they should be routed through the designated wiring holes.
- If using a self-provided 4G router, connect it to the 24V DC output port of the data logger to supply power to the router.
- For corresponding cable and specific connection steps, refer to**EzLogger3000C User Manual**.



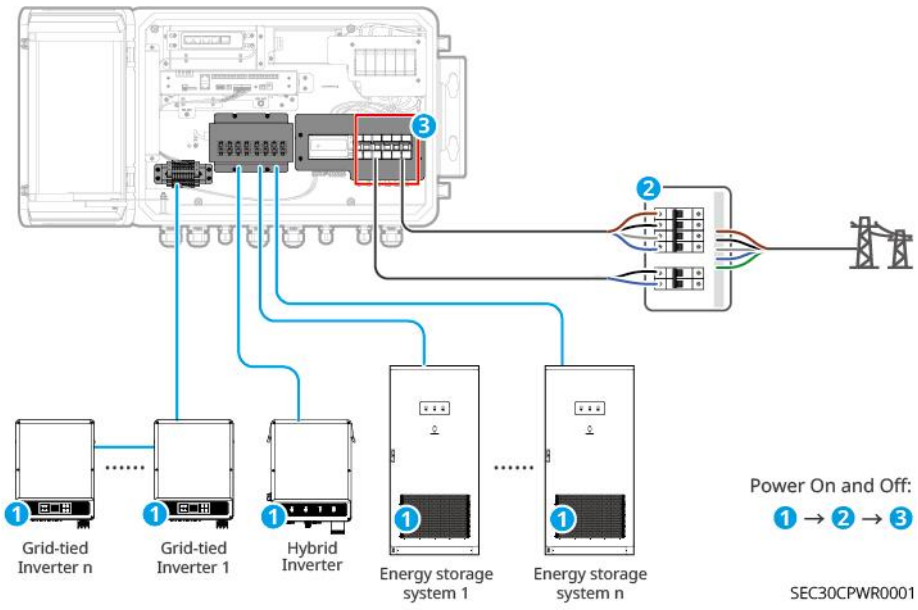
SEC30CELC0007

7. System Trial Operation

7.1. Check before Power ON

No.	Check Item
1	The equipment is firmly installed in a clean place where is well-ventilated and easy to operate.
2	The PE cable, AC output cable, and communication cable are connected correctly and securely.
3	Cable ties are routed properly and evenly, and no burrs.
4	Unused wire holes are sealed with waterproof covers.
5	The used cable holes are sealed.

7.2. System Power ON



7.3. Indicators

Check the in-built data logger of SEC3000C and LED indicators of the smart meter.

Datalogger

Indicator	Indicator status	Description
PWR		Steady green: power supply is normal..

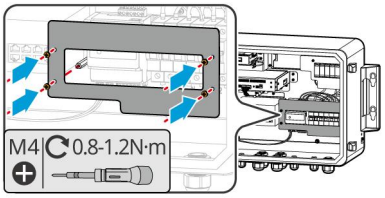
		Green off: power off or abnormal power supply..
RUN		Steady green/Green off: The device fails to work.
		Slow blinking green: The device is working properly.
NET		Steady green: Communication between the device and the server is normal.
		Fast blinking green: Communication between the device and the router is normal, but communication between the device and the server fails.
		Slow blinking green: Communication between the device and the router fails.
ALM		Steady red: All the connected inverters are in fault status.
		Fast blinking red: the equipment is being upgraded.
		Red off: At least one inverter in the system is working properly.

Smart meter

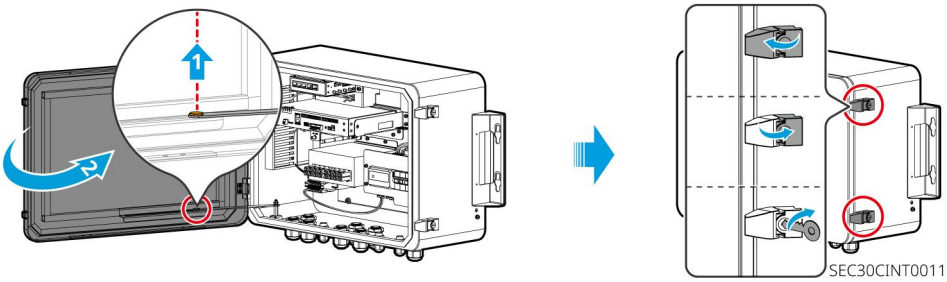
Type	Status	Description
Power Indicator 	On	The smart meter is powered on. No RS485 communication.
	Blink	The smart meter is powered on. Normal RS485 communication.
	Off	The smart meter is powered off.
Communication indicator 	Off	Reserved.
	Blink	Press the Reset button for at least more than 5 seconds, power light, purchasing or selling electricity indicator light flash: reset the meter.
Importing or exporting indicator 	On	Import from the grid.
	Blink	Export to the grid.
	Off	Neither importing nor exporting power.
	Reserved.	

7.4. Close the Cabinet Door

Install plate in wiring area and close the cabinet door



SEC30CINT0008



8. System Commissioning

8.1. Introduction to the WEB Interface

Log into the embedded web to set parameters of the device, check running information and alarms to get the system status information in time.

WARNING

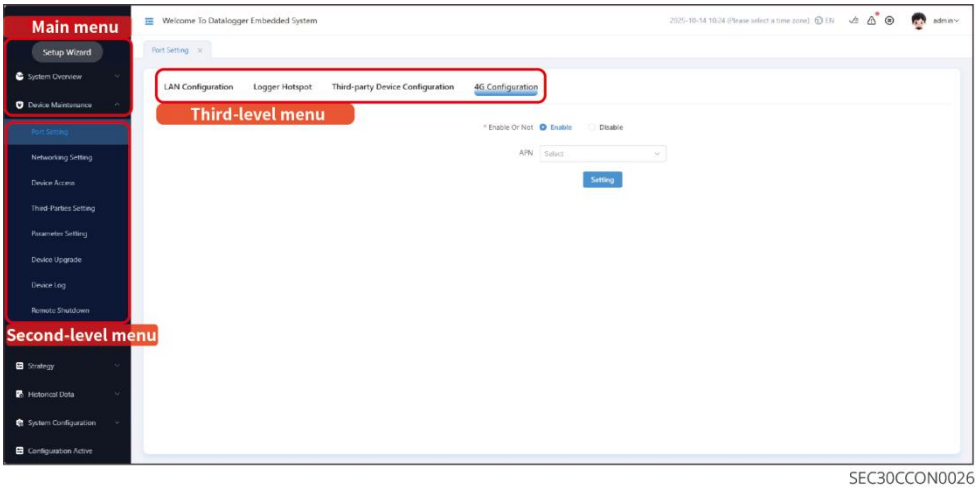
- The web firmware version shown in this document is V4.3.11. The screenshots are for reference only. The actual display may differ.
- The name, range, and default value of the parameters are subject to change. The actual display prevails.
- The configurable items available in the web interface vary depending on the types of devices connected to the system. Please refer to the actual interface display.
- When issuing reset, shutdown and upgrade commands to the inverter, the inverter may fail to connect to the utility grid, which will affect the power generation.
- The grid parameters, protection parameters, characteristic parameters, and power regulation parameters of the grid-connected inverter, as well as the frequency parameters, connection parameters, protection parameters, and other safety regulation parameters of the hybrid inverter, shall be set by professionals. Improper settings may cause the inverter's failure to connect to the grid, thus affecting the power generation.

8.1.1.WEB Interface Layout

No.	Function	Description
1	Menu list	● Menu on the interface. Choose the main menu, then the second-level menu will be displayed. Under some main menus, there are no second-level menu. ● When logging in for the first time, the interface will prompt the user to quickly configure the system via Start Guide. If the user exits start guide, click and enter again.
2	Menu list button	Click to hide or show the menu list.
3	Tag list	Displays the opened menu tags.
4	System Status	● Displays the system time. ● Switches the system language. ● Displays the alarming information. Click it to check the real-time alarms. ● Displays the version of the product. ● Displays the log in status. Click it to log out.
5	PV	Displays information about PV power generation. ● PV Installed capacity: it refers to the total rated capacity of all inverters in the system and needs to be manually set. ● Online Photovoltaic Device: the number of hybrid inverters that are currently online. ● Today's Generation: the overall power generation of all inverters on the PV side on this day. ● Total Historical Generation: the overall power generation previously of all inverters on the PV side.

		● PV Power generation in the last 7 days: histogram for power generation per day in the last 7 days. ● PV Power in the Last 24 Hours: power generation capacity curve in the last 24 hours displayed by hour.
6	Common Functions	Displays commonly used functions and can be directed to corresponding setting page.
7	Power Station Overview	Energy flow diagram and power information of the current power station.
8	Energy Storage	Displays energy storage information about the current system. ● Online Photovoltaic Device: the number of hybrid inverters that are currently online. ● Daily Charge: The charging power of the battery for the current day. If there is cyclical charging, the cumulative charging power is displayed. ● Daily Discharge: The discharging power of the battery for the current day. If there is cyclical discharging, the cumulative discharging power is displayed. ● Total Historical Charge: the cumulative charging power of the battery. ● Total Historical Discharge: the cumulative discharging power of the battery. ● Charging / Discharging Status in the Last 7 Days: a bar chart displaying the daily charging or discharging power for the last 7 days. ● Average Battery SOC in the Last 24 hours: display SOC changes of the battery in the last 24 hours by hour.

8.1.2. WEB Menu on the Interface



SEC30CCON0026

Main	Second-lev	Third-level	Description

menu	el menu	menu	
Start guide	-	-	Quickly complete the basic configuration, such as networking.
System Overview	Basic Information	-	● Displays information including PV power generation, installed capacity of the system. ● Configure common functions, including: Port Settings, Device Access, Forwarding Service Configuration, and System Maintenance. ● Displays energy flow chart of the power plant. ● Displays daily and historical charging and discharging of the hybrid inverter.
	Real-Time Alarm	-	Displays alarm name, device SN and production time. Click the manual refresh button to update and display the latest alarm list.
Device Maintenance	Port Setting	LAN Configuration	Set LAN communication parameters.
		Wi-Fi Configuration	Set WiFi name and password of the controller.
		RS485 Configuration	Set RS485 parameters. Support connection to the third party device via RS485.
	Networking Settings	-	Set the system networking.
	Device Access	-	Add grid-tied inverters, hybrid inverters, energy storage systems, meters, and others.
	Third-Parties Setting	Modbus-TCP	Set Modbus-TCP parameters.
	Parameter Setting	Datalogger	Set log parameters of the EzLogger.
		Hybrid inverter	Set parameters of hybrid inverters. ● Quick configuration: quick configuration of the safety countries and the battery connection mode of hybrid inverters.

			• Wiring mode: only applicable to inverters of ET40-50kW series. Set the wiring mode of inverters. • Basic parameters: Set parameters of hybrid inverters. • Advanced settings: Set advanced parameters of hybrid inverters. • Grid code settings: set advanced safety regulation parameters of hybrid inverters. • Generator settings: only applicable to inverters of ET40-50kW series. Set parameters of generator connected to inverters.
		Meter	Set meter parameters, such as CT ratio, PT ratio, connection method.
		Grid-tied inverter	Set grid parameters, protection parameters, characteristics parameters and power adjustment parameters of the grid-tied inverters.
		Energy Storage All-in-one Cabinet	Set parameters of energy storage all-in-one cabinet. • Select grid code: set the safety country of the cabinet. • Basic parameters: Set parameters of the cabinet. • Advanced settings: Set advanced parameters of the cabinet. • Grid code settings: set advanced safety regulation parameters of the cabinet.
	Device Upgrade	Datalogger	Upgrade the version of EzLogger.
		Inverters	Upgrade the version of inverters, including DSP, ARM, module versions.
	Device Log	-	Check device operation log, such as log in / out of the web, modify the password.
	Remote Shutdown	Remote Shutdown	Set remote shutdown parameters. Only applicable to Germany.
Device Monitoring	-	-	• View information such as the operating status, device SN, version, and real-time data of devices in the system.

			• Currently supports viewing grid-tied inverters, energy storage inverters (including batteries), all-in-one energy storage cabinets, smart meters, and other devices.
Strategy	Operating Mode	-	• Set the working mode of hybrid inverters. Currently supported: Self-use mode, Smart charging mode, Back-up mode, TOU mode, Peak shaving mode. • Set the EMS working mode of the SEC. Supports local or third party management mode. • Set SOC Working Mode of the energy storage all-in-one cabinet.
	Power Control	-	Set RCR parameter or active/reactive power parameters.
	Power Limit	-	Set on-grid power limit parameters.
	Communication Error Handling		Handling measures for abnormal communication.
Historical Data	Historical Faults and Alarms	-	Check historical faults and alarms.
System Configuration	System Maintenance	-	• Reset Logger • Restore Factory Settings • Import All Configuration Files • Export All Configuration Files
	System Time	-	Set the clock source. Supported: Goodwe Cloud Platform Time Synchronization, NTP, Modbus-TCP, manual synchronization.
	Safety Settings	-	Set security parameters, such as account and password.
	Version	-	View data logger version details, such as SN, main program version, and firmware version.
Configuration Active	-	-	Save the configured parameters. Click Configuration Active to save the settings after configuration

			adjustments.

8.1.3. Log into the WEB

NOTICE
● All the equipment in the system are installed properly and powered on. ● Before login, ensure that the equipment meets the following requirements: ○ Supported operating systems: Windows 7 or later. ○ Recommended browsers: Chrome 52, Firefox 58 or later. ○ The computer's network port is connected to switch's network port with a network cable. ● Remove the ETH network cable after configuration.

Log into the web using the default IP

Step 1: Connect the computer to any switch port of the control box using an Ethernet cable.

Step 2: Select "Network and Internet" > "Change Adapter" on your computer system. In the network connections dialog box that appears, right-click and click **Properties** to configure the IP address of the computer and the device on the same network segment.

No.	IP Parameter	Default Value	Example value of the Computer
1	IP Address	172.18.0.12	172.18.0.22
2	Subnet Mask	255.255.255.0	255.255.255.0
3	Default Gateway	172.18.0.1	172.18.0.1

Step 3: Enter http://172.18.0.12or https://172.18.0.12:443in the address bar of the web browser and press Enter.

Step 4: Set the languages based on actual needs. Log in to the WEB interface with the default account. Initial account: admin; password:123456.

Log into the web using the dynamic IP address.

Step 1: Connect the PC and the controller to a router at the same time.

Step 2: Check the IP address assigned to the controller on the router management page.

Step 3: Enter distributed IP in the address bar of the web browser and log in.

Step 4: Set the languages based on actual needs. Log in to the WEB interface with the default account. Initial account: admin; password:123456.

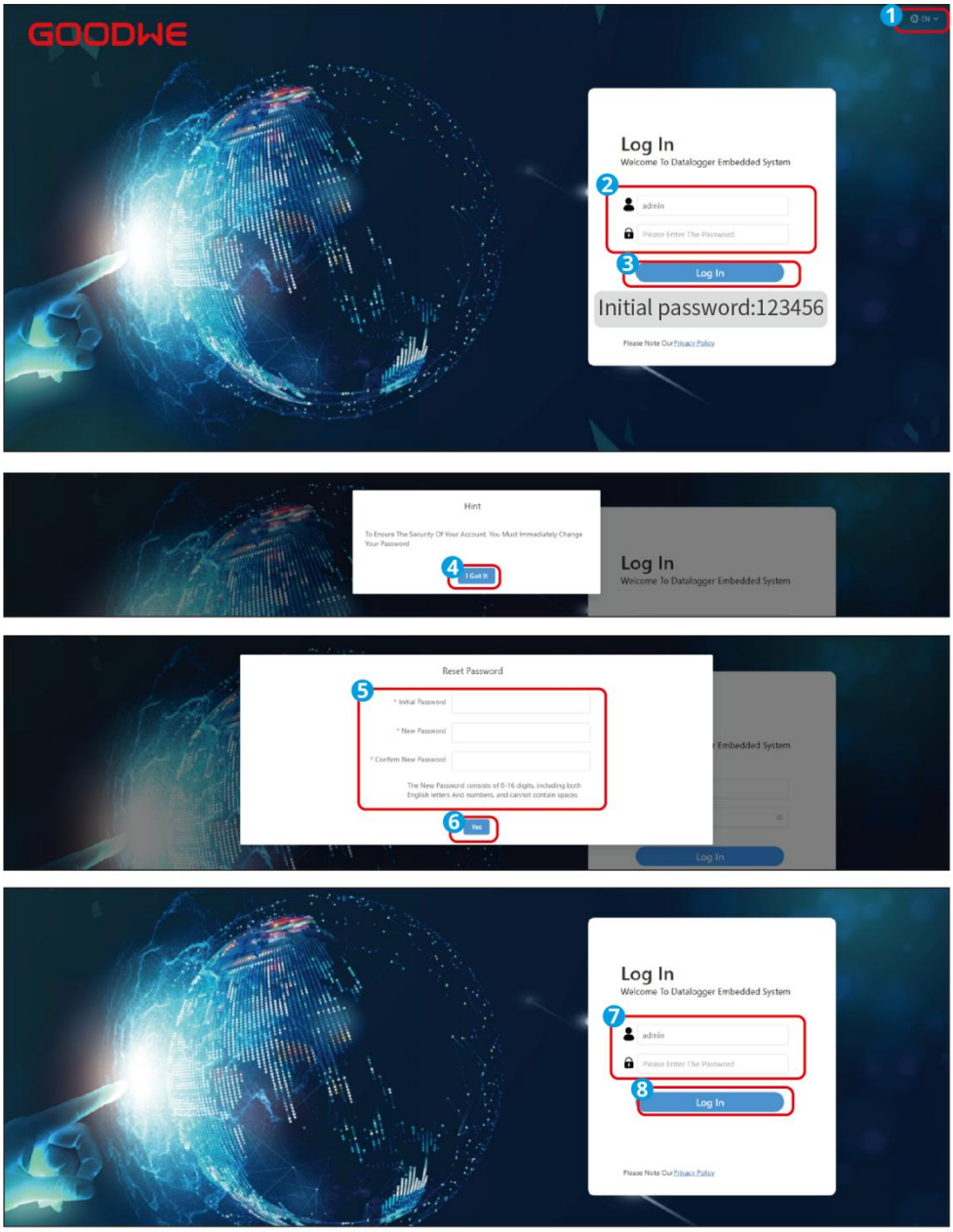
Log into the web with WiFi

Step 1: Connect to the default WiFi name of the EzLogger. Default WiFi: Log-***， *** means serial number of the EzLogger. Initial password: 12345678.

Step 2: Enter http://172.18.0.12or https://172.18.0.12:443in the address bar of the web browser and press Enter.

Step 3: Set the languages based on actual needs. Log in to the WEB interface with the default account. Initial account: admin; password:123456.

NOTICE
Log in using the initial password for the first time and change the password as soon as possible. To ensure account security, you are advised to change the password periodically and keep the new password in mind.



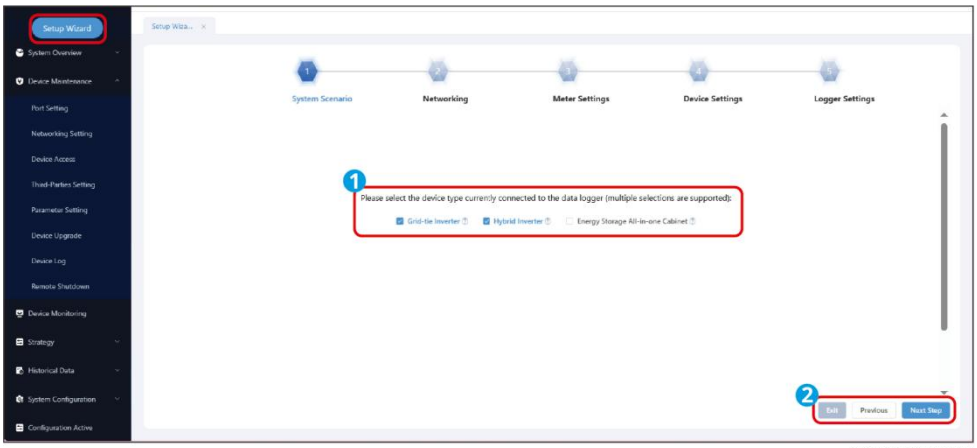
EZU30CON0014

8.2. Start guide

- When logging in for the first time, the interface will prompt you to quickly configure the system via the Setup Wizard. Configure according to the on-screen prompts and actual requirements. Functions supported include device networking, smart meter management, device parameter configuration, etc.
- If system configuration is not needed temporarily, click "Exit"; if configuration of a specific function is not required temporarily, click "Skip".
- For detailed information about functions, refer to the corresponding chapters in the manual for function explanations.

Step 1: When logging in for the first time, you will enter the Setup Wizard interface immediately after logging in. If you have exited the wizard interface, click "Setup Wizard" to re-enter.

Step 2: During the parameter configuration process, click "Previous" or "Next" as needed to perform the corresponding settings.



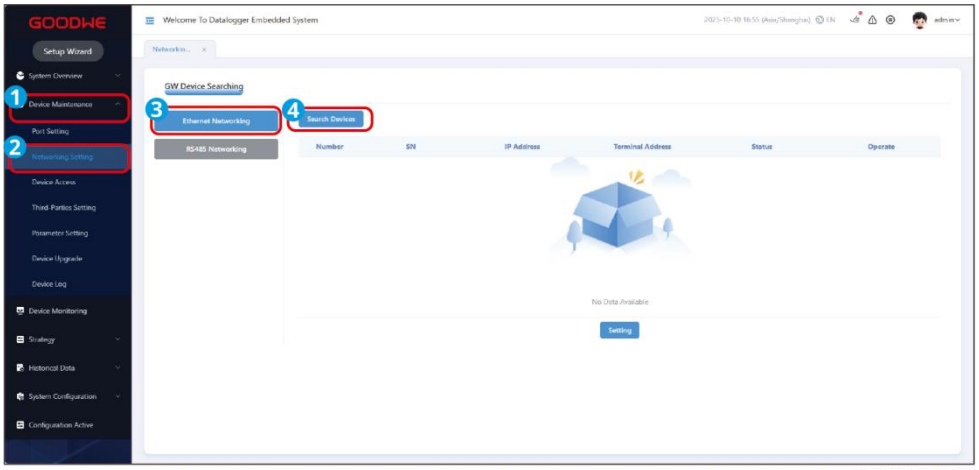
SEC30CCON0027

8.3. Managing the Equipments

8.3.1. Automatically Search for and Add Devices

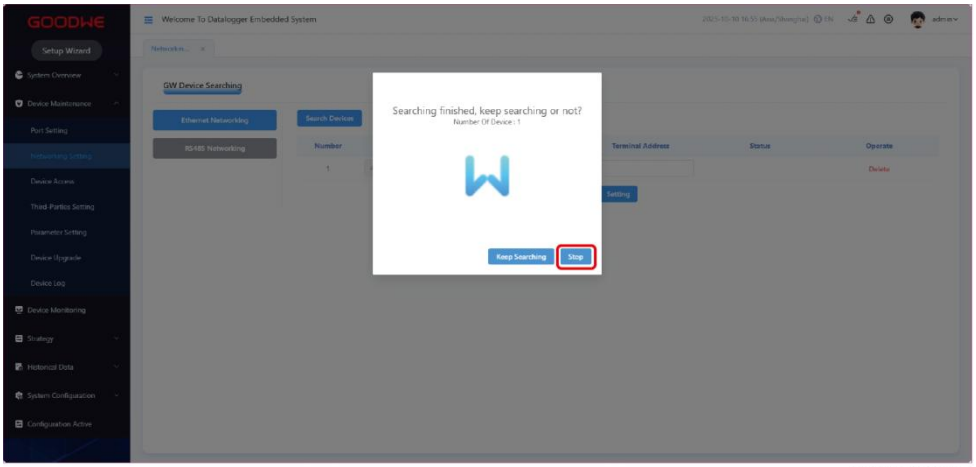
NOTICE
• After successful RS485 networking, if you need to identify a newly connected inverter, you can directly click "Re-network" to search. The data collector will restart at this time. Restart the inverter immediately or wait for 15 minutes, then click "Start Search" again to re-search for devices in the network. • After successful networking, if you need to add devices that were not searched, you can add them via "Device Access". • If third-party smart meters are used in the system, they must be added manually and cannot be added through automatic search.

Step 1: Go to "Device Maintenance" > "Networking Setting" > "Ethernet Networking". Click "Search Devices" to start searching for online energy storage inverters or all in one cabinets.



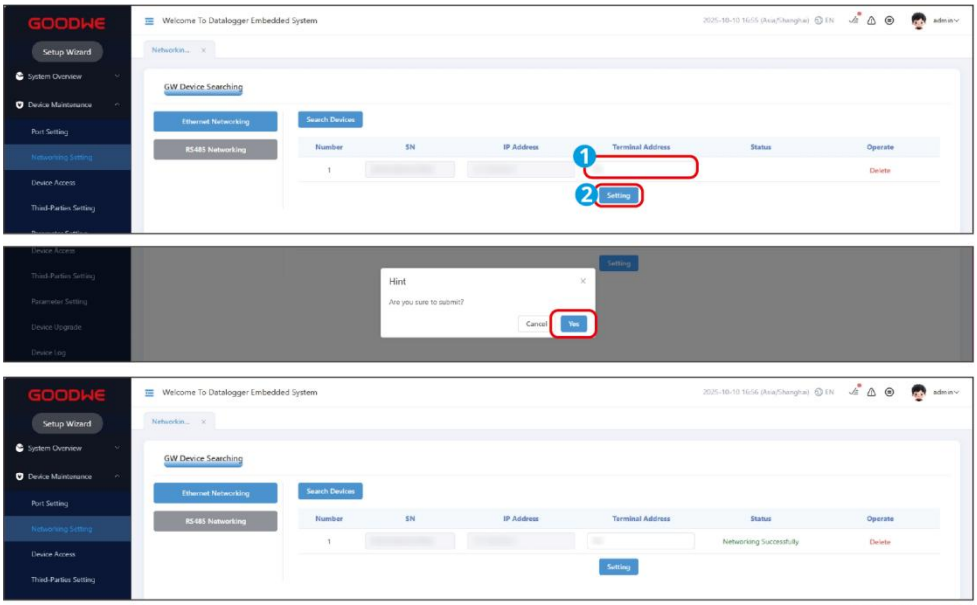
SEC30CCON0028

Step 2: Check the number of currently searched devices on the device search interface. When the number of devices matches the actual quantity, click "Stop".



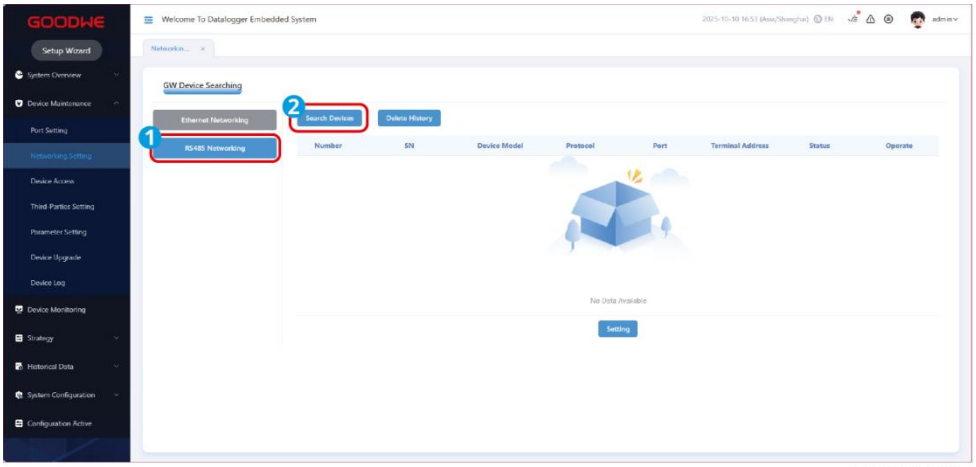
SEC30CCON0029

Step 3: After the device search is completed, return to the device networking interface and set the device terminal address according to actual requirements. Terminal address range: 1-99. If multiple inverters are used, ensure that the terminal addresses are not duplicated. Click "Setting" to complete Ethernet networking.



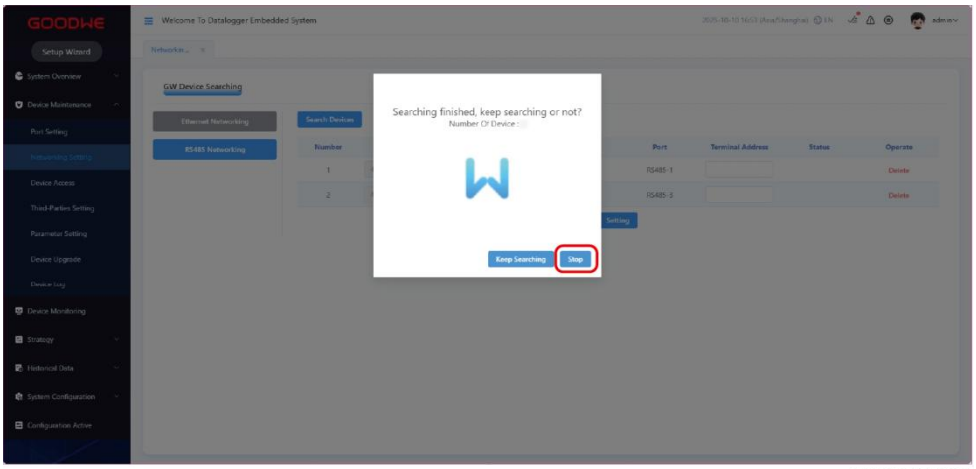
SEC30CCON0030

Step 4: Go to "Device Maintenance" > "Networking Settings" > "RS485 Networking". Click "Search Devices" to start searching for online on-grid inverters and smart meters.



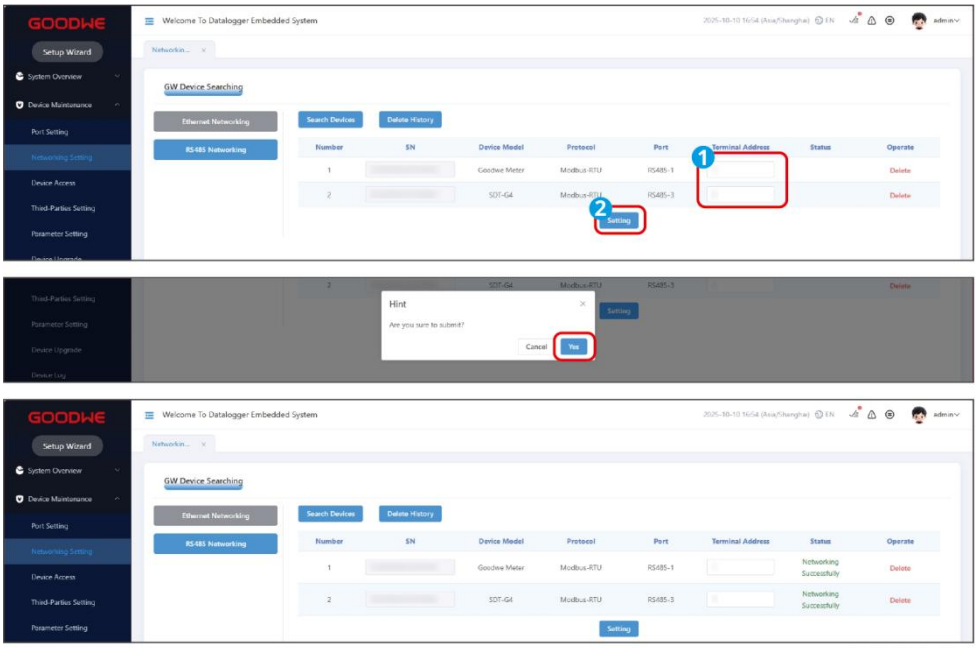
SEC30CCON0031

Step 5: Check the number of currently searched devices on the device search interface. When the sum of the number of inverters and smart meters matches the actual quantity, click "Stop".



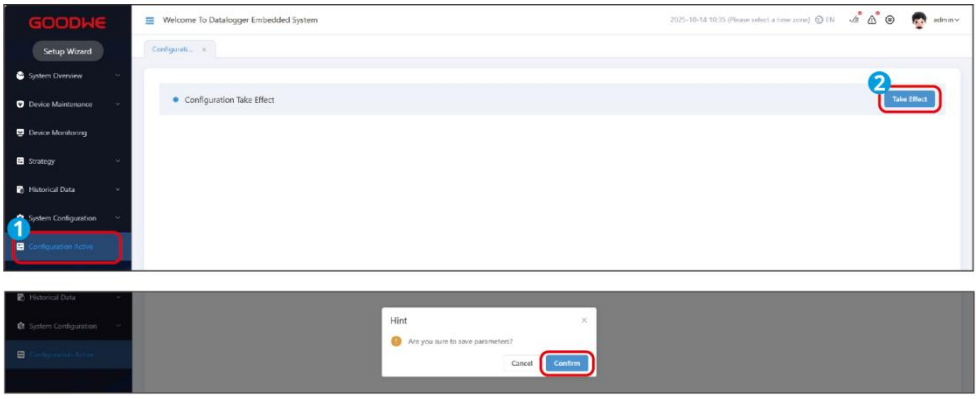
SEC30CCON0032

Step 6: After the device search is completed, return to the device networking interface and set the terminal addresses of the inverters and smart meters according to actual requirements. Inverter address range: 1-99, smart meter address range: 120-200 If multiple inverters are used, ensure that the terminal addresses are not duplicated. Click "Setting" to complete RS485 networking.



SEC30CCON0033

Step 7: Confirm the networking configuration by clicking "Configuration Active".



SEC30CCON0034

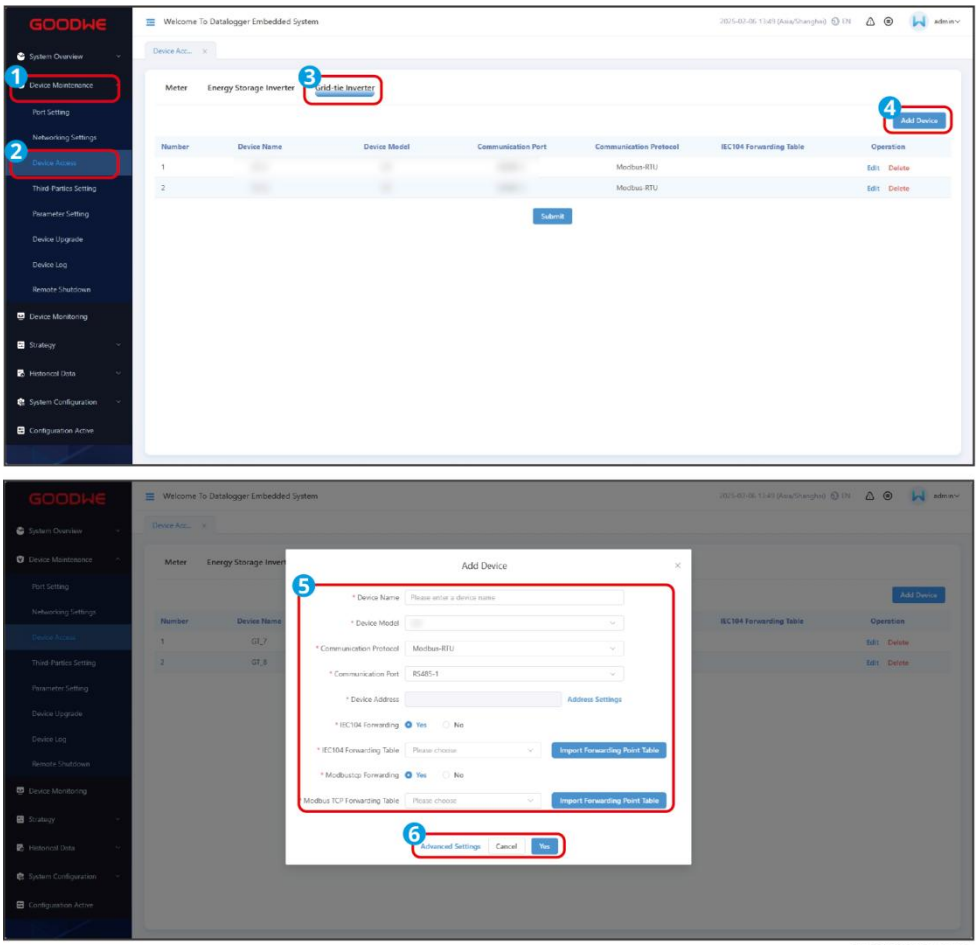
8.3.2. Manually Add Devices

NOTICE
● After successful networking, if you need to add devices that were not searched, you can add them via "Device Access". ● Click "Edit" or "Delete" to modify or remove the parameters of added devices.

Adding Grid-tied Inverters

Step 1: Go to "Device Maintenance">"Device Access">"Grid-tie Inverter">"Add Device".

Step 2: Set device parameters according to actual needs. Click "Submit" to complete the device addition.



SEC30CCON0037

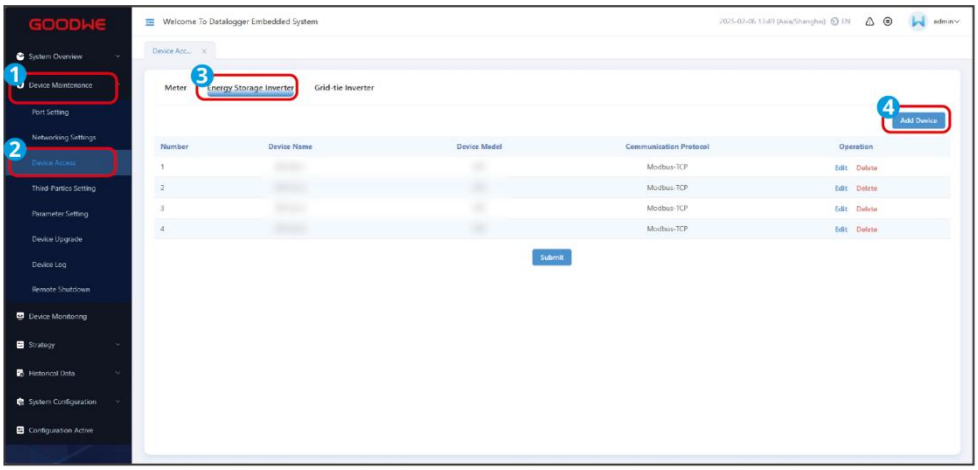
No.	Parameters	Description
1	Device Name	Define the device name based on actual needs.
2	Device Model	Select the model of the inverter that is connected to.
3	Communication Protocol	Select based on the communication protocol of the device. Currently supported: Modbus RTU
4	Communication Port	Select the actual connected port on the SEC
5	Device Address	● Set the terminal address of inverters based on the actual power plant planning. Select Auto-Generate when there is no need to set the parameters based on the actual settings. ● Make sure that the terminal addresses of different devices are

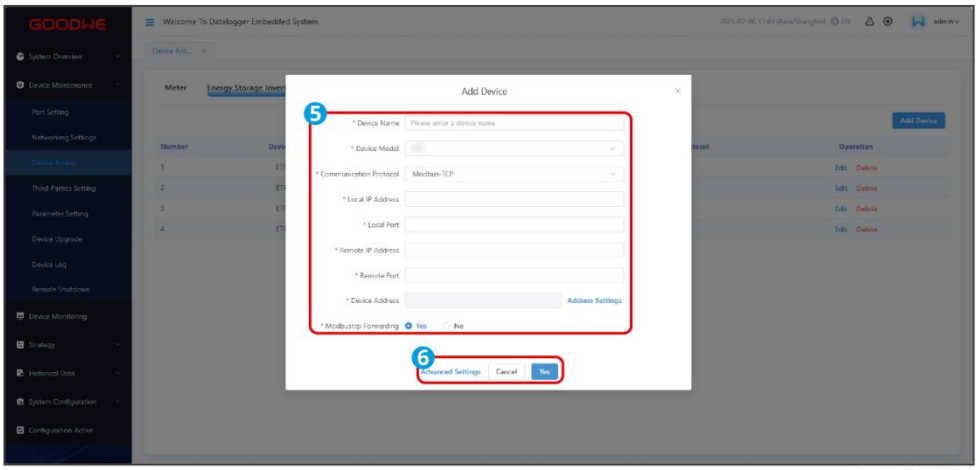
		different.

Add Energy Storage Inverters/Energy Storage All-in-one Cabinets

Step 1: Go to "Device Maintenance">"Device Access">"Energy Storage Inverter"/"Energy Storage All-in-one Cabinet">"Add Device".

Step 2: Set device parameters according to actual needs. Click "Submit" to complete the device addition.





SEC30CCON0036

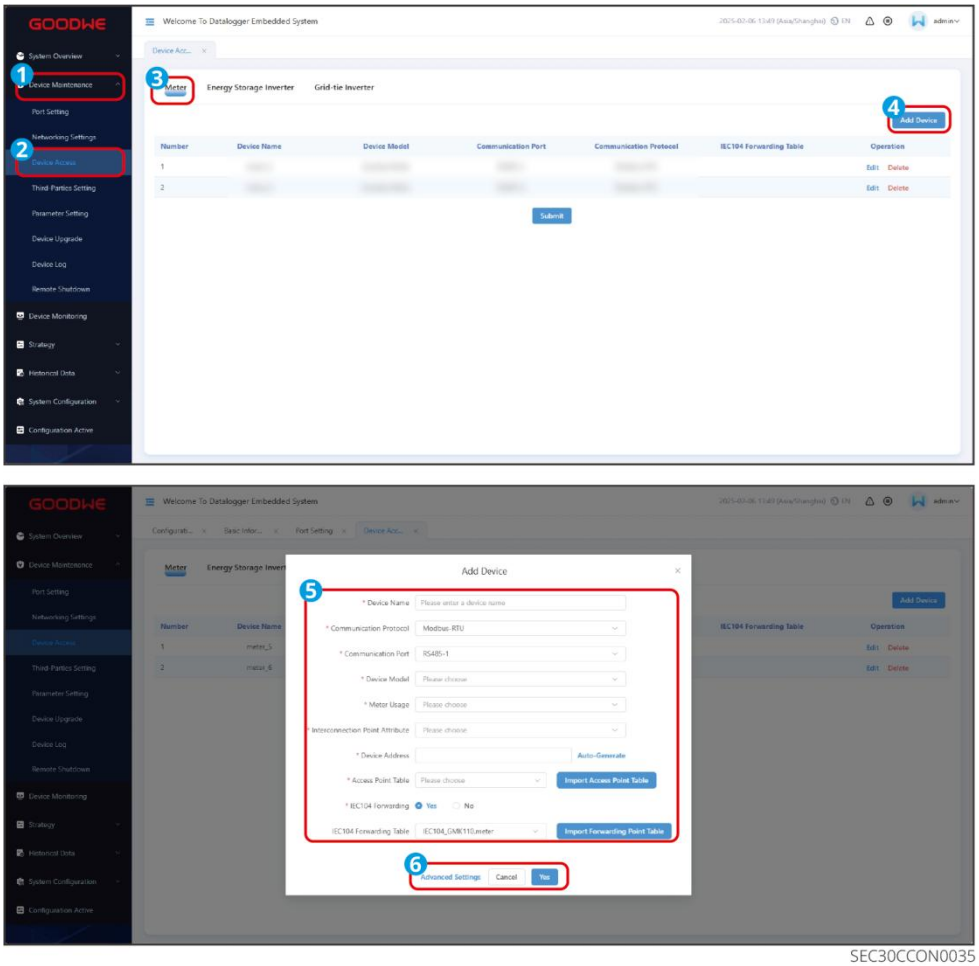
No.	Parameters	Description
1	Name	Define the device name based on actual needs.
2	Device Model	Select the model of the actually connected inverter.
3	Communication Protocol	Select based on the communication protocol of the device. Currently supported: Modbus TCP
4	Local IP Address	Set the corresponding IP address of the network port of other added devices.

5	Local Port	Set the port number of the controller. Default port number: 0.
6	Remote IP Address	Set the IP address of the WiFi / LAN Kit-20 connected to the hybrid inverter.
7	Remote Port	Set the port number of other connected devices. Default port number: 502.
8	Device Address	Set the terminal address of inverters based on the actual power plant planning. Select Auto-Generate when there is no need to set the parameters based on the actual settings.

Add Smart Meter

Step 1: Go to "Device Maintenance" > "Device Access" > "Meter">"Add Device".

Step 2: Set device parameters according to actual needs. Click "Confirm" to complete the device addition.



SEC30CCON0035

No.	Parameters	Description
1	Device Name	Define the device name based on actual needs.

2	Communication Protocol	Set according to the actual wiring method of the smart meter. Currently supported: Modbus RTU
3	Communication Port	Select based on the communication protocol of the smart meter. Supported: RS485-1, RS485-2, RS485-3, RS485-4.
4	Device Model	Select the model of the actually connected smart meter. Supported: GoodWe smart meter, UGM604PRO, Acrel-DTSD1352, Schneider-IEM3255, Janitza DPM680, etc.
5	Smart Meter Usage	Select based on the actual usage of the smart meter. ● Grid-Side Meter: the meter's CT is installed on the grid-connection point for power limiting. ● Generation-Side PV Storage Meter: the meter's CT is installed at the upstream of both the grid-tied inverter and hybrid inverter to monitor the power consumption information of both. ● Generation-Side PV Meter: the meter's CT is installed on the grid-tied inverter side to monitor the power generation data of the grid-tied inverter. ● Generation-Side PV Meter: the meter's CT is installed on the hybrid inverter side to monitor the power generation data of the hybrid inverter.
6	Interconnection Point Attribute	Select according to the transformer number to which the inverter is connected.
7	Device Address	● Set the terminal address of smart meters based on the actual power plant planning. Select Auto-Generate when there is no need to set the parameters based on the actual settings. ● Do not set the smart meter address to the same as the inverter address.
8	Access Point Table	Import the access point list based on the actual scenario.
9	IEC104 Forwarding Table	Default: No. If "Yes" is selected, import the IEC104 forwarding point list according to actual requirements.
When the communication protocol is set to DLT654-1997/DLT645-2007, set the following parameters:		
10	Communicat	Select based on the communication protocol of the smart meter.

	ion Port	Supported: RS485-1, RS485-2, RS485-3, RS485-4.
11	Device Address	Set the terminal address of smart meters based on the actual power plant planning. Select Auto-Generate when there is no need to set the parameters based on the actual settings. Do not set the smart meter address to the same as the inverter address.
12	IEC104 Forwarding Table	Default: No. If "Yes" is selected, import the IEC104 forwarding point list according to actual requirements.

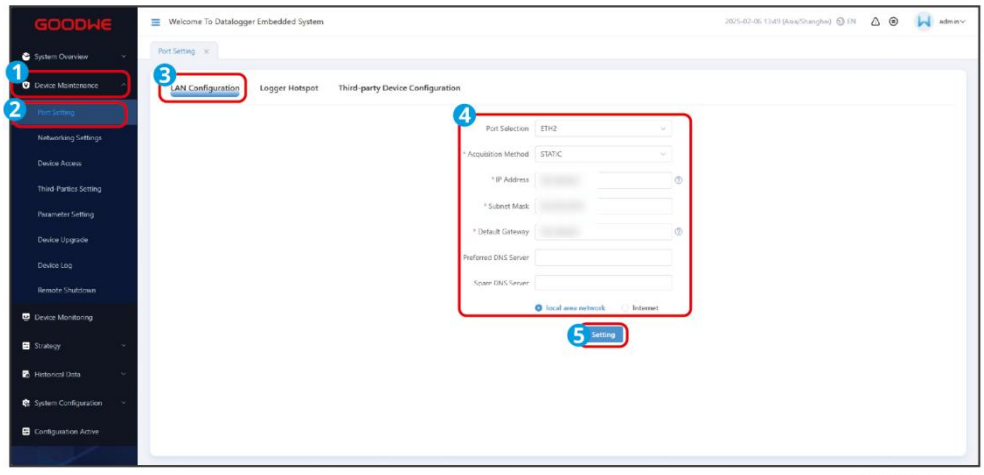
8.4. Setting Port Parameters

8.4.1. Setting LAN Communication Parameters

NOTICE
• Before configuring the LAN parameters, ensure the network cable is correctly connected to the controller. • After the system network configuration completes, the ETH1 and ETH2 ports will automatically complete the LAN configuration, no additional configuration is required. At this time, the ETH1 port defaults to DHCP status, and the ETH2 port defaults to STATIC status. • The switch is by default connected to the data collector's ETH2 port, and setting the ETH2 port parameters will configure the switch's network port settings.

Step 1: Go to "Device Maintenance" > "Port Setting" > "LAN Configuration ".

Step 2: Set the ETH Parameters according to actual needs.



SEC30CCON0038

No.	Parameters	Description

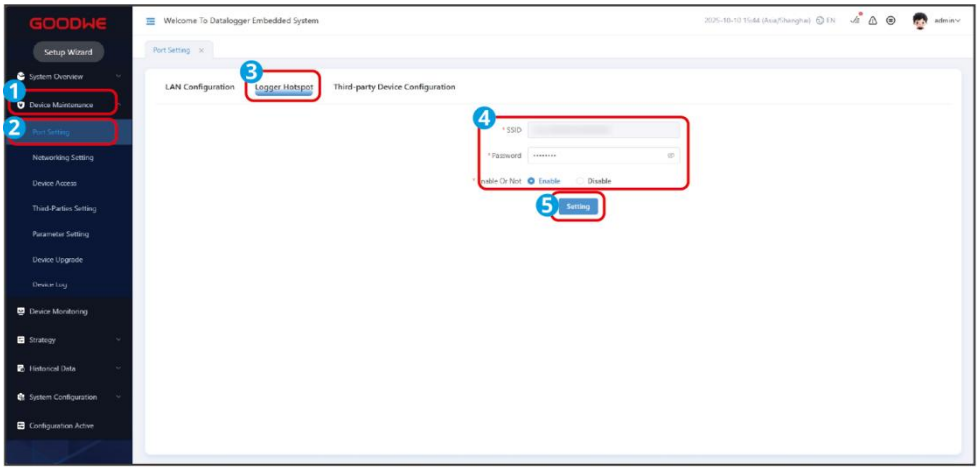
1	Port Selection	Select the connected network port of the EzLogger. Supported: ETH1, ETH2.
2	Acquisition method	● Manually set the fixed network parameters based on actual situation when selecting STATIC mode. ● The IP address can be obtained automatically when selecting DHCP mode.
3	IP Address	Set the IP address of the controller. Set the IP address on the same network segment as the router IP address, and based on the power plant planning. If the IP address is modified, log in with the new IP address.
4	Subnet Mask	Set the subnet mask of the controller. Set the parameter based on the actual subnet mask of the router connected to the device.
5	Default Gateway	Set the default gateway of the controller. Set the parameter based on the actual gateway of the router connected to the device.
6	Preferred DNS Server	Set the parameter as the IP address of the LAN's router when connecting to a public network, for example, connecting to GoodWe server, using a domain name for the server address.
7	Spare DNS Server	Ignore this parameter in common situations. When the preferred DNS server fails to resolve a domain name, use the alternate DNS server.
8	Local Area Network/Internet	● If data needs to be transmitted to GoodWe Cloud via a server, select Internet. ● If forwarding parameters need to be configured to connect to third-party monitoring platforms, etc., select Local Area Network (LAN).

8.4.2. Setting the WiFi Password and SSID

NOTICE
● The in-built EzLogger of the controller provides a WiFi hotspot signal for local configuration. After connecting a computer to the WiFi hotspot, you can access the web commissioning interface via a web browser. ● The WiFi signal SSID and password of the hotspot can be changed. After the change, log in to the web again using the new SSID and password.

Step 1: Go to "Device Maintenance" > "Port Settings" > "Logger Hotspot".

Step 2: Change the WiFi hotspot password according to your actual needs.



SEC30CCON0039

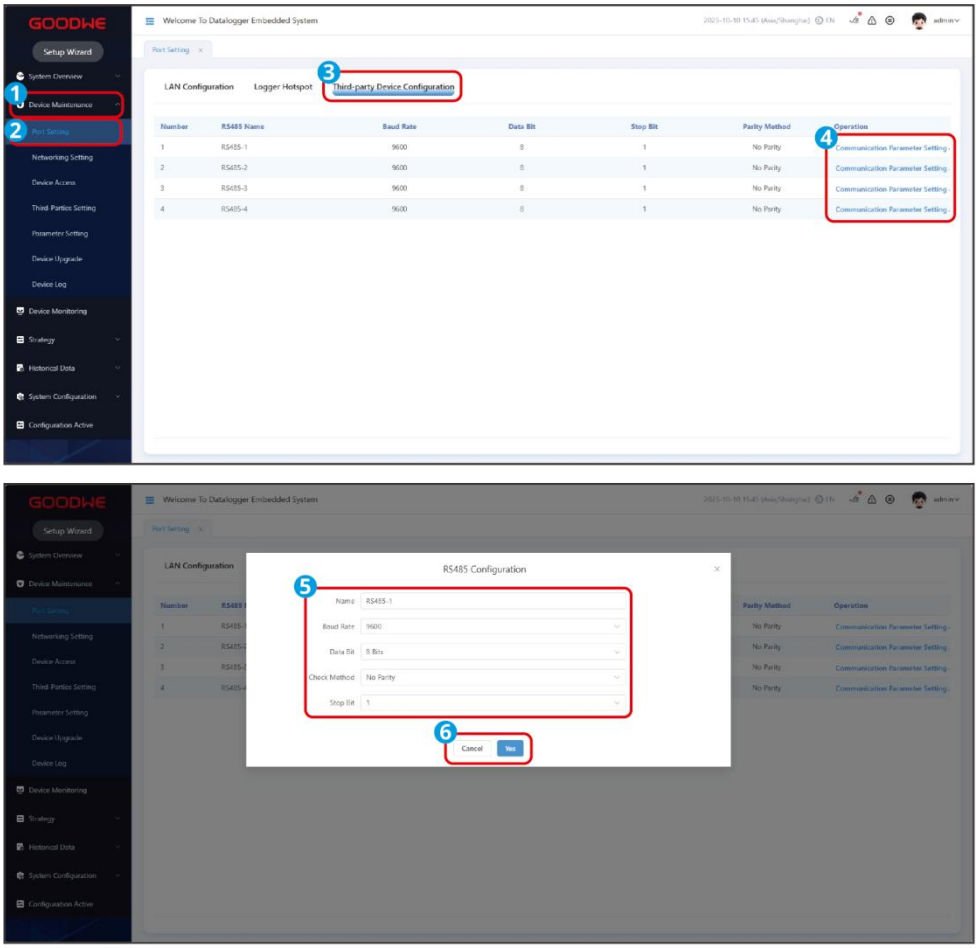
No.	Parameters	Description
1	SSID	WiFi signal name of the controller. Initial name: Log-***
2	Password	Hotspot password of the controller. Initial password: 12345678
3	Enable or Not	Turn on or off the hotspot signal.

8.4.3. Configuring RS485 Parameters

NOTICE
RS485 parameter needs to be configured when connecting the controller to the third-party device.

Step 1: Go to "Device Maintenance" > "Port Settings" > "Third-party Device Configuration ".

Step 2: Set communication parameters according to actual needs.



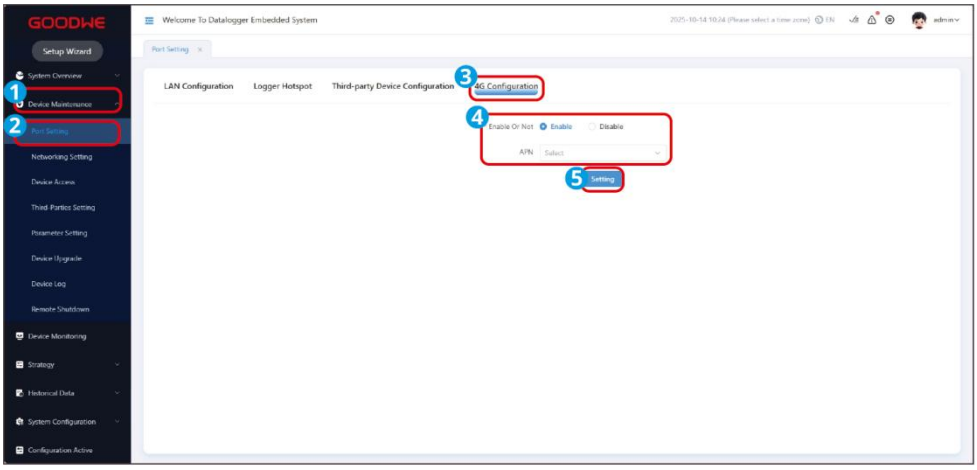
SEC30CCON0040

No.	Parameters	Description
1	Name	Select the actual connected RS485 port of the device.
2	Baud Rate	Set according to the baud rate of the connected equipment. Currently supported: 300/1200/2400/4800/9600/19200.
3	Data Bit	Currently supported: 7 bits or 8 bits.
4	Check Mode	Set according to the check method of the connected equipment. Currently supported: No Parity, Odd Parity, Even Parity, 1 Parity, or 0 Parity.
5	Stop Bit	Set according to the stop bit of the connected equipment. Currently supported: 1, 1.5 and 2.

8.4.4.Setting 4G Parameters

Step 1: Go to "Device Maintenance" > "Port Settings" > "4G Configuration".

Step 2: Set the APN Parameters according to actual needs.



SEC30CCON0041

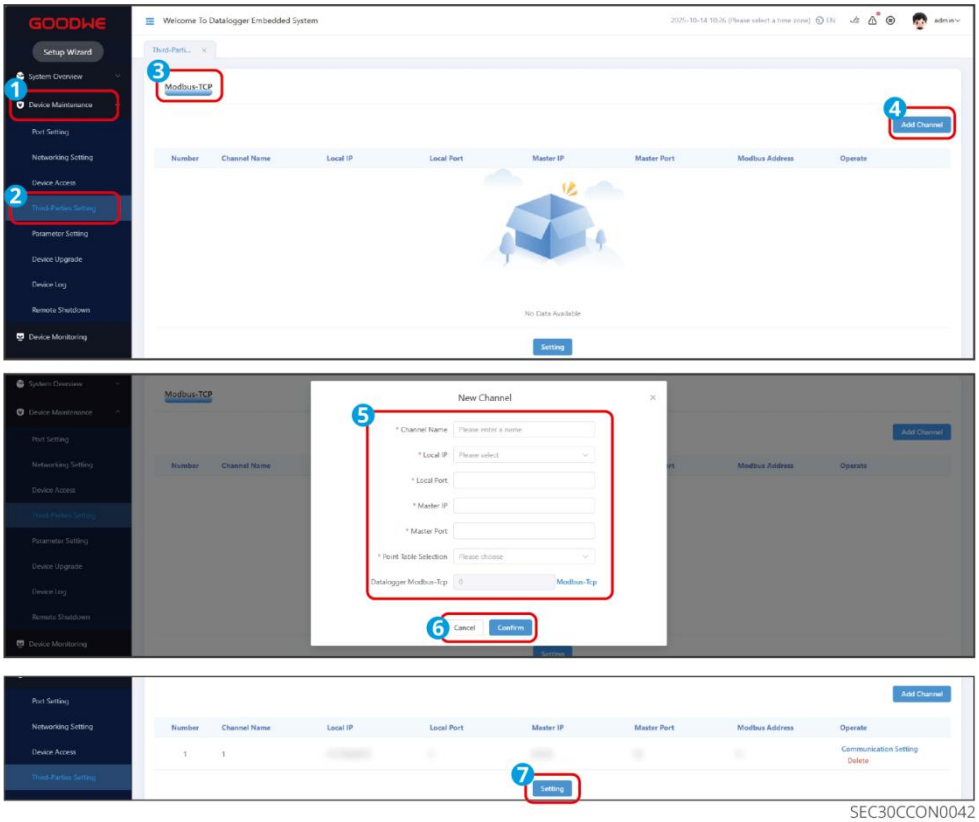
No.	Parameters	Description
1	Enable/Disable	Turn on or off the 4G settings. Applicable only when the EzLogger is connected to the system via a 4G network.
2	APN	Select the operator based on actual conditions.

8.5. Setting Modbus-TCP Parameters

Set third-parties parameters to forward the data collected by the controller to a third party management platform via the Modbus-TCP protocol.

Step 1: Go to "Device Maintenance" > "Third-Parties Setting" >"Modbus-TCP".

Step 2: Set communication parameters according to actual needs.



SEC30CCON0042

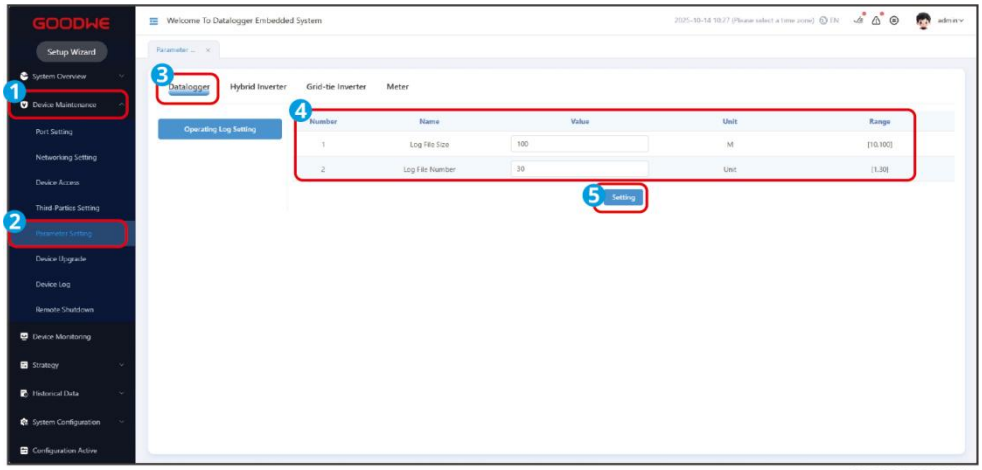
No.	Parameters	Description
1	Channel Name	Define the device name based on actual needs.
2	Local IP	Set the IP address of the controller.
3	Local Port	Set the port number of the controller. Default port number: 502.
4	Master IP	Set the IP address of the Modbus-TCP management system.
5	Master Port	Set the port number of the Modbus-TCP management system.
6	Point Table Selection	Import the point table according to actual requirements.
7	Datalogger Mobus-TCP	Set the address of the Modbus-TCP management system.

8.6. Setting Device Parameters

8.6.1. Setting EzLogger Parameters

Step 1: Go to "Device Maintenance" > "Parameter Setting" > "Datalogger".

Step 2: Set the "Log File Size" and "Log File Number" according to actual needs.



SEC30CCON0043

No.	Parameters	Description
1	Log File Size	Set the size and quantity of stored log files as needed.
2	Log File Number	

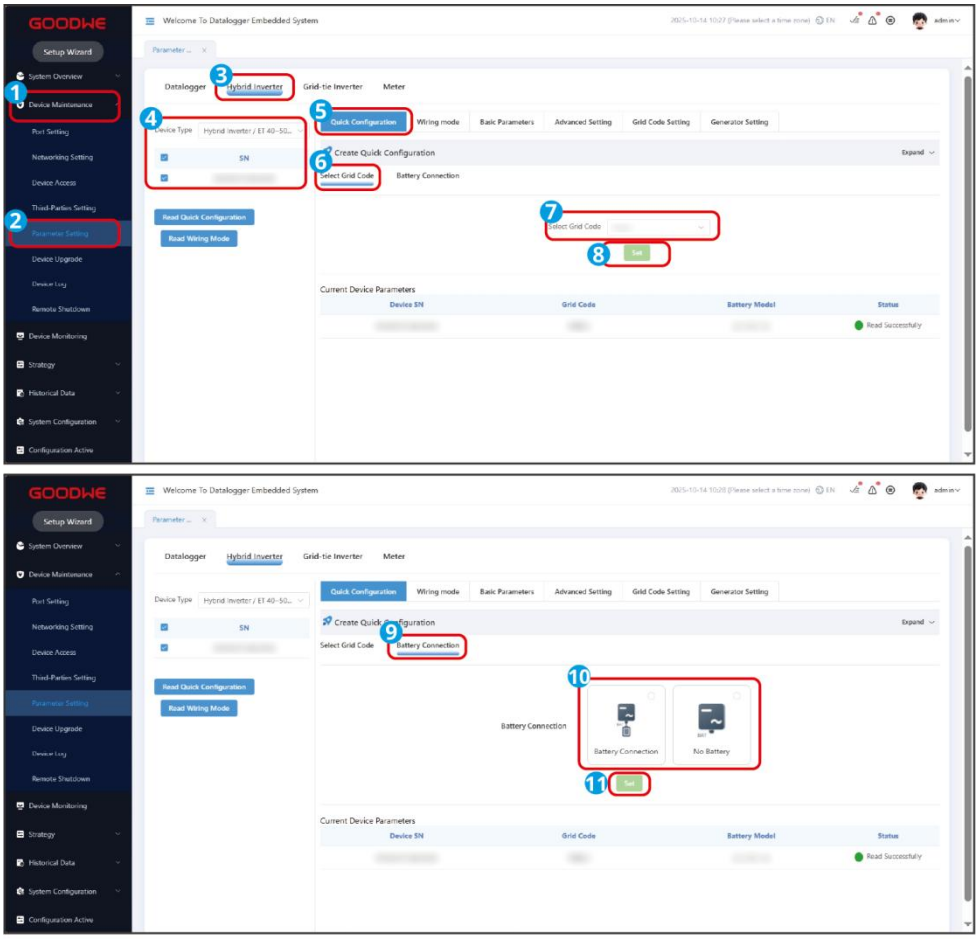
8.6.2. Setting Hybrid Inverter Parameters

8.6.2.1. Hybrid Inverter Quick Configuration

Step 1: Go to "Device Maintenance" > "Parameter Setting" > "Hybrid Inverter".

Step 2: Select the device type and click the SN of the inverter to be viewed or configured.

Step 3: Click "Create Quick Configuration" on the Quick Configuration tab, select the grid code and set the battery model based on actual needs. Click "Set" to finish configuration.



SEC30CCON0044

No.	Parameters	Description
1	Select Grid Code	Select the corresponding safety code based on the country or region where the equipment is located.
2	Battery Connection	Select the actual connection mode of the battery to the inverter. If no battery is connected to the system, there is no need to configure the battery model or operating mode, and the device will operate in the self-consumption mode by default.

8.6.2.2. Setting Wiring Mode of Hybrid Inverters

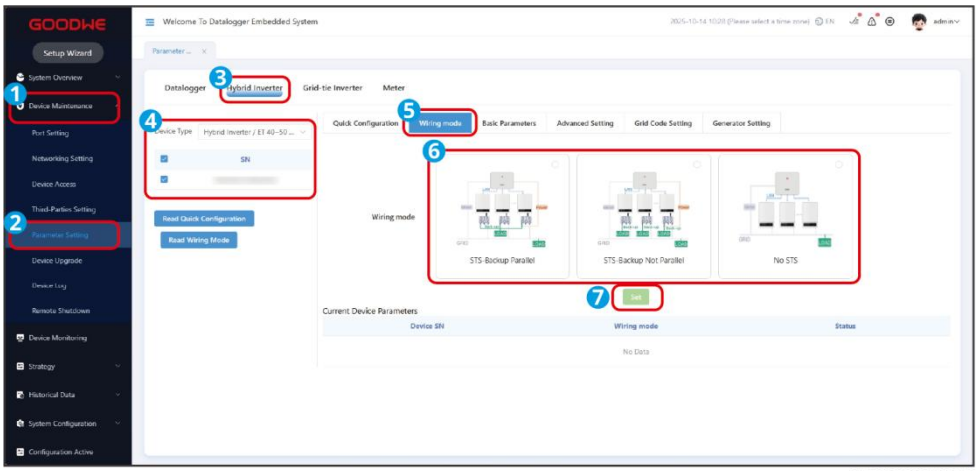
Step 1: Go to "Device Maintenance" > "Parameter Setting" > "Hybrid Inverter".

Step 2: Select the device type and click the SN of the inverter to be viewed or configured.

Step 3: Click "Wiring Mode", choose the mode based on actual needs, click “Set” to finish commissioning.

NOTICE
Only applicable to inverters of ET40-50kW series. Set this parameter when multiple inverters

are in parallel.



SEC30CCON0045

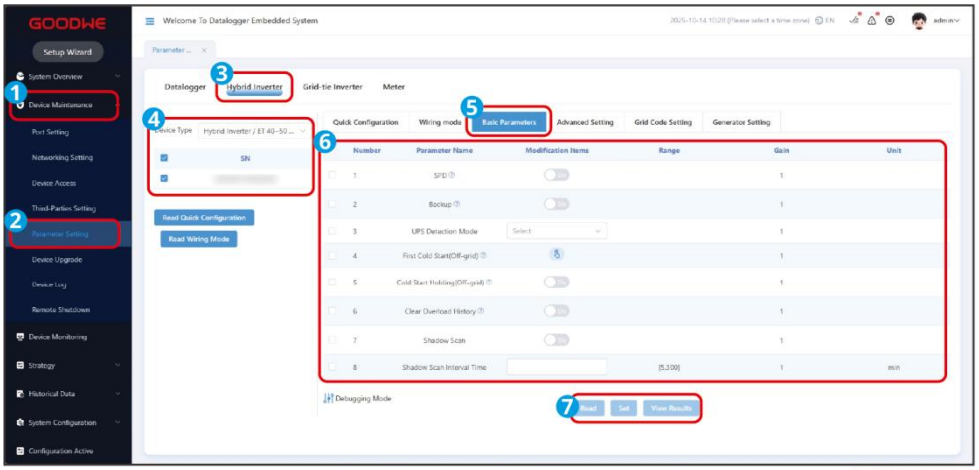
No.	Parameters	Description
1	STS-Backup Parallel	When the hybrid inverters are connected in parallel, both on-grid and off-grid, select “STS-Backup Parallel”.
2	STS-Backup Not Parallel	If the hybrid inverters are connected in parallel when the system is on-grid, and separately when the system is off-grid, select “STS-Backup Not Parallel”.
3	No STS	When the hybrid inverters are not connected to an STS, select “No STS”.

8.6.2.3. Setting Basic Parameters of Hybrid Inverters

Step 1: Go to "Device Maintenance" > "Parameter Setting" > "Hybrid Inverter".

Step 2: Select the device type and click the SN of the inverter to be viewed or configured.

Step 3: Check the parameters to be viewed or configured, then click "Query" to retrieve the current values of the selected parameters. If modification is required, enter the "Modification Item" and click "Modification", then click "View Result" to check whether the modification is successful.



SEC30CCON0046

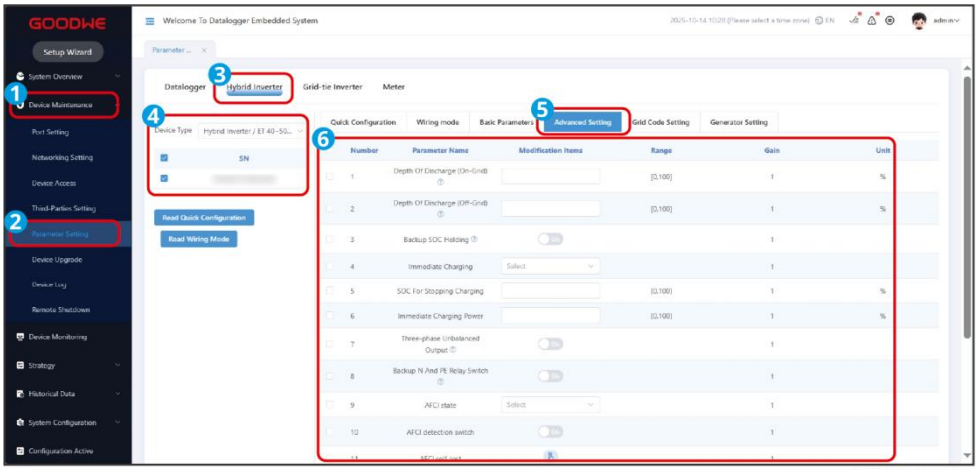
No.	Parameters	Description
1	SPD	After enabling SPD, when the SPD module is abnormal, there will be SPD module exception alarm prompt.
2	Backup	After enabling Backup, the battery will power the load connected to the BACKUP port of the inverter to ensure Uninterrupted Power Supply when the power grid fails.
3	UPS Detection Mode	● UPS Mode - Full-Wave Detection: Detect whether the grid voltage is too high or too low. ● UPS Mode - Half-Wave Detection: Detect whether the grid voltage is too low. ● EPS Mode - Support LVRT: Disable the grid voltage detection function.
4	First Cold Start (Off - grid)	Take effect once. In off-grid mode, enable First Cold Start (Off-grid) to output backup supply with battery or PV.
5	Cold Start Holding (Off-grid)	Take effect multiple times. In off-grid mode, enable First Cold Start (Off-grid) to output backup supply with battery or PV.
6	Clear Overload Fault	Once the power of loads connected to the BACK- UP exceeds the rated load power, the inverter will restart and detect the power again. The inverter will perform restart and detection several times until the overloading problem is solved. Time increases between each reboot. Click Clear Overload History to clear the restart time interval after the power of the loads connected to the BACK-UP ports meets the requirements.
7	Shadow Scan	When PV panels are severely shadowed, enable this function to optimize power generation efficiency of the inverter. Set the Shadow Scan interval and MPPT shadow scan if the inverter supports.

8.6.2.4. Setting Advanced Parameters of Hybrid Inverters

Step 1: Go to "Device Maintenance" > "Parameter Setting" > "Hybrid Inverter".

Step 2: Select the device type and click the SN of the inverter to be viewed or configured.

Step 3: Check the parameters to be viewed or configured, then click "Query" to retrieve the current values of the selected parameters. If modification is required, enter the "Modification Item" and click "Modification", then click "View Result" to check whether the modification is successful.



SEC30CCON0047

No.	Parameters	Description
1	Three-phase Unbalanced Output	When the power grid adopts split-phase metering, the three-phase unbalance function needs to be enabled.
2	Backup Power N and PE Relay Switch	To comply with local laws and regulations, ensure that the relay inside the BACK-UP port remains closed and the N and PE wires are connected when the inverter is working off-grid.
3	Depth Of Discharge (On-Grid)	Indicates the depth of discharge of the battery when the inverter is on-grid or off-grid.
4	Depth Of Discharge (Off-grid)	
5	Backup SOC Holding	The battery will be charged to preset SOC protection value by utility grid or PV when the system is running on-grid, so that the battery SOC is sufficient to maintain normal working when the system is off-grid.
6	Immediate Charging	Enable to charge the battery by the grid immediately. Take effect once. Start or stop based on actual needs.
7	SOC for Stopping Charging	Stop charging the battery once the battery SOC reaches SOC For Stopping Charging.
8	Immediate Charging Power	Indicates the percentage of the charging power to the inverter rated power when enabling Immediate Charging. For example, setting the Immediate Charging Power of a 10kW inverter to 60 means the charging power of the inverter is 10kW*60%=6kW.

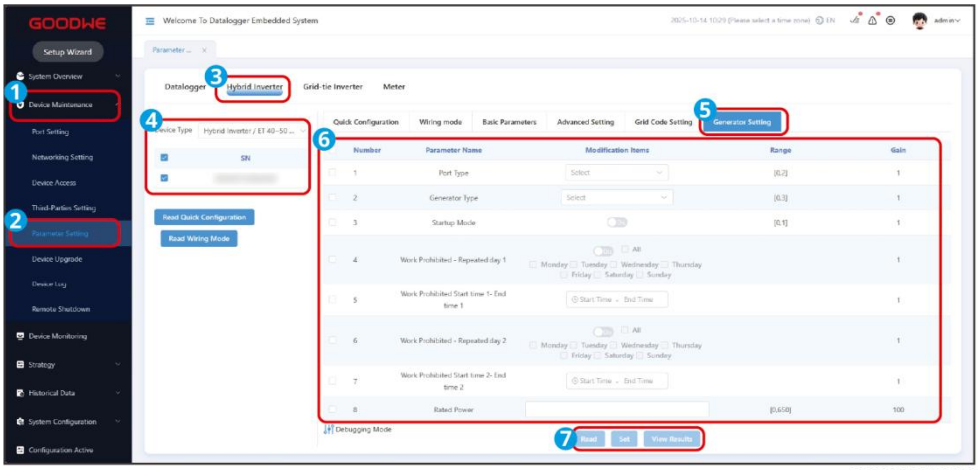
9	PV Connect Mode	• Independent Connection: The PV strings are connected one-to-one with the MPPT ports on the inverter side. • Partial Parallel Connection: When one PV string is connected to multiple MPPT ports on the inverter side, other PV modules are simultaneously connected to other MPPT ports on the inverter side. • Parallel Connection: When external PV strings are connected to the PV input ports on the inverter side, one PV string is connected to multiple PV input ports.
10	PX Curve	After enabling this function, the inverter will adjust the three-phase power according to the grid voltage to ensure maximum power utilization and minimize voltage rise. If the default value does not meet the requirements, the voltage threshold of the PX Curve can be modified according to actual needs.

8.6.2.5. Setting Generator Parameters

Step 1: Go to "Device Maintenance" > "Parameter Setting" > "Hybrid Inverter".

Step 2: Select the device type and click the SN of the inverter to be viewed or configured.

Step 3: Check the parameters to be viewed or configured, then click "Query" to retrieve the current values of the selected parameters. If modification is required, enter the "Modification Item" and click "Modification", then click "View Result" to check whether the modification is successful.



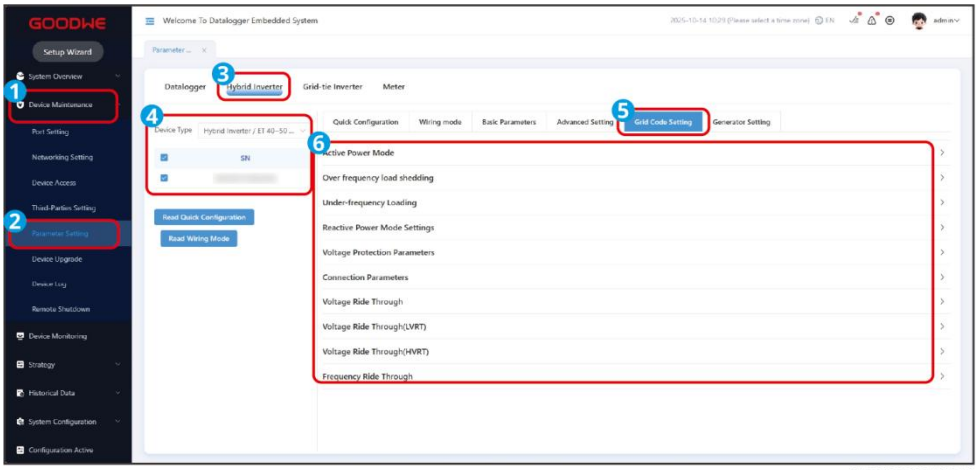
SEC30CCON0048

No.	Parameters	Description
1	Battery Port	• Generator Connection: The inverter is connected to the generator to control its startup and shutdown. • Load Connection: The inverter is connected to general loads to

		control their startup and shutdown.
2	Generator Startup Mode	● Manual Control of Generator (Does Not Support Dry Node Connection): The generator must be manually controlled to start and stop; the inverter cannot control the generator's operation. ● Manual Control of Generator (Does Not Support Dry Node Connection): The generator must be manually controlled to start and stop; the inverter cannot control the generator's operation. ● No generator connected: When no generator is connected to the energy storage system, select No generator connected.
3	Generator Dry Node Switch	Switch control mode: When the switch is turned on, the generator operates; after reaching the set operating time, the generator automatically stops operating.
4	Prohibit Daily Repetition	Set the time period during which the generator is prohibited from operating.
5	Prohibition Start Time - Prohibition End Time	Set the time period during which the generator is prohibited from operating.
6	Rated Power	Set the rated power of the generator.
7	Run Time	The generator's continuous operation time after it starts running. After the set time, the generator will stop. If the operation time includes a prohibited working time, the generator will stop during that period. After the prohibited time ends, the generator will restart and continue timing.
8	Upper Voltage	Set the operation voltage range of the generator.
9	Lower Voltage	
10	Upper Frequency	Set the frequency range for generator operation.
11	Lower Frequency	
12	Preheating Time	Set the generator no-load preheating time.
13	Maximum Charging Power	The charging power when the generator charges the battery.

8.6.2.6. Setting Customized Safety Parameters of Hybrid Inverters

NOTICE
Set the custom safety parameters in compliance with local requirements. Do not change the parameters without the prior consent of the grid company.



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Setting the Active Power Mode

Step 1: Go to “Device Maintenance” > “Parameter Setting” > “Hybrid Inverter” > “Grid Code Setting” > “Active Power Mode”.

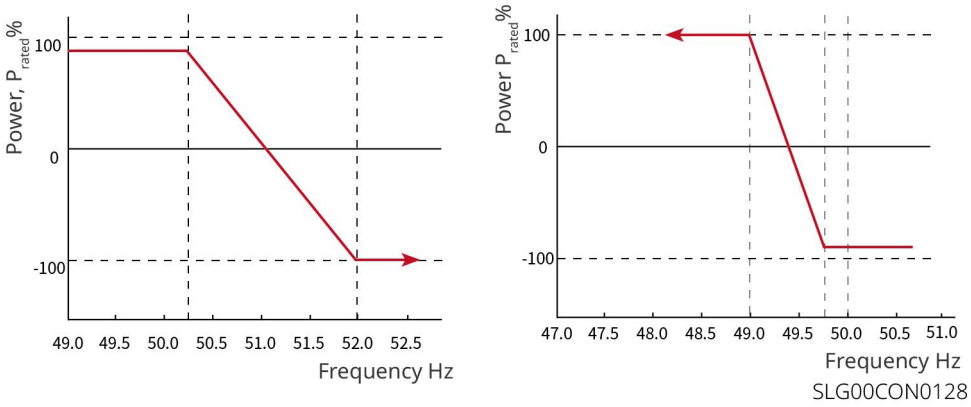
Step 2: Set the parameters based on actual needs.

No.	Parameters	Description
1	Generation Power Limit	Set the output power limit of the inverter.
2	Power Gradient	Set the gradient when the active output power increases or decreases.

Setting the Overfrequency Unloading Parameter

Step 1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage Inverter” > “Safety Parameter Settings” > “ Overfrequency Unloading”.

Step 2: Set the parameters based on actual needs.



No.	Parameters	Description
1	P(F) Curve	Enable P(F) Curve when it is required by local grid standards and requirements.
2	Over-Frequency Load Shedding Mode	Set the overfrequency unloading mode based on actual needs. Slope mode: adjusts power based on the over frequency point and load reduction slope. Stop mode: adjusts the power based on the over-frequency start point and over-frequency end point.
3	Overfrequency Threshold	The inverter output active power will decrease when the utility grid frequency is too high. The inverter output power will decrease when the utility grid frequency is higher than Overfrequency Threshold.
4	Import/Export Electricity Conversion Frequency	When the set frequency value is reached, the system switches from selling electricity to buying electricity.
5	Overfrequency Endpoint	The inverter output active power will decrease when the utility grid frequency is too high. The inverter output power will stop decreasing when the utility grid frequency is higher than Overfrequency Endpoint.
6	Over-Frequency Power Slope Reference Power	Adjust the inverter output power based on Apparent Active Power, Rated Active Power, Momentary Active Power, Or Max. Active Power.
7	Power Response To Overfrequency Gradient	When the grid frequency exceeds the overfrequency point, the inverter output power is reduced according to the slope.
8	Tentional Delay Ta	Indicates the delayed response time when the inverter output

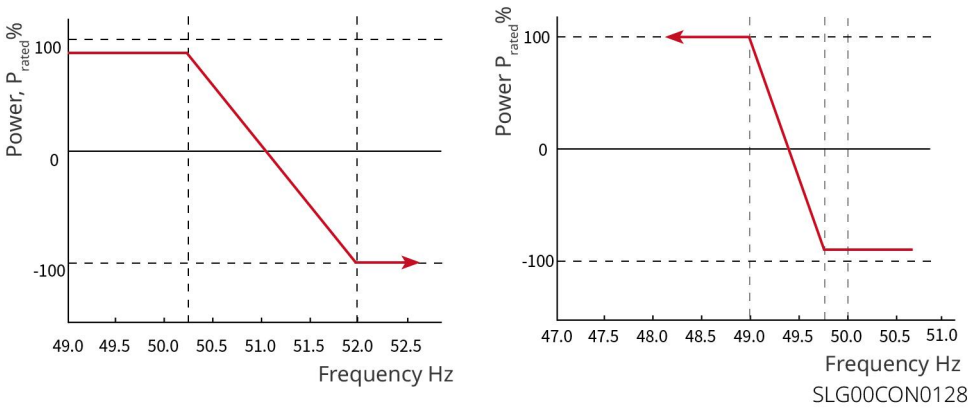
		power is higher than the Overfrequency Threshold.
9	Hysteretic Function	Enable the hysteretic function.
10	Frequency Hysteresis Point	During over-frequency load reduction, if the frequency decreases, the power output is based on the lowest point of the load reduction power until the frequency is less than the hysteresis point and the power is restored.
11	Hysteresis Waiting Time	For over-frequency load reduction and frequency decrease, when the frequency is less than the hysteresis point, the power recovery waiting time, that is, it takes a certain amount of time to recover the power.
12	Hysteresis Power Recovery Slope Reference Power	For over-frequency load reduction and frequency decrease, when the frequency is less than the hysteresis point, the power recovery benchmark, that is, the power recovery is based on the recovery slope * the rate of change of the reference power. Supported Parameters: P_n (Rated Power), P_s (Apparent Power), P_m (Current Power), P_{max} (Maximum Power), Power Difference (△P).
13	Hysteretic Power Recovery Slope	For under-frequency loading and frequency increase, when the frequency exceeds the hysteresis point, the slope at which the power is recovered.

Set the Underfrequency Load Restoration Parameter

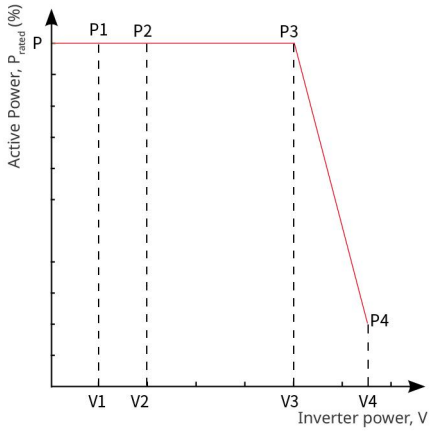
Step 1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage Inverter” > “Safety Parameter Settings” > “Underfrequency Load Restoration”.

Step 2: Set the parameters based on actual needs.

P(F) Curve



P(U) Curve



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No.	Parameters	Description
1	P(F) Curve	Enable P(F) Curve when it is required by local grid standards and requirements.
2	Underfrequency Load Mode	Set the underfrequency unloading mode based on actual needs. Slope mode: adjusts power based on the underfrequency point and load increase slope. Stop mode: adjusts the power based on the underfrequency start point and underfrequency end point.
3	Underfrequency Threshold	The inverter output active power will increase when the utility grid frequency is too low. The inverter output power will increase when the utility grid frequency is lower than Underfrequency Threshold.
4	Import/Export Electricity Conversion Frequency	When the set frequency value is reached, the system switches from selling electricity to buying electricity.
5	Underfrequency Endpoint	The inverter output active power will increase when the utility grid frequency is too low. The inverter output power will stop increasing when the utility grid frequency is lower than Underfrequency Endpoint.
6	Over-Frequency Power Slope Reference Power	Adjust the inverter output power based on Apparent Active Power, Rated Active Power, Momentary Active Power, Or Max. Active Power.
7	Under-Frequency Power Slope	The inverter output active power will increase when the utility grid frequency is too low. The slope of the inverter output power when it rises.

8	Tentional Delay Ta	Indicates the delayed response time when the inverter output power is lower than the Underfrequency Threshold.
9	Hysteretic Function	Enable the hysteretic function.
10	Frequency Hysteresis Point	During underfrequency loading, if the frequency increases, the power is output according to the lowest point of the loaded power until the frequency is higher than the hysteresis point and the power is restored.
11	Hysteresis Waiting Time	For underfrequency loading, the frequency increases, when the frequency is higher than the hysteresis point, the waiting time for power recovery, that is, it takes a certain amount of time to recover the power.
12	Hysteresis Power Recovery Slope Reference Power	For underfrequency loading, the frequency increases, when the frequency is higher than the hysteresis point, the benchmark for power recovery, that is, the power recovery is carried out according to the recovery slope * the rate of change of the benchmark power. Supported Parameters: P_n (Rated Power), P_s (Apparent Power), P_m (Current Power), P_{max} (Maximum Power), Power Difference (△P).
13	Hysteretic Power Recovery Slope	For under-frequency loading, frequency increase, when the frequency is higher than the hysteresis point, the power change slope when power is restored.
14	P(U) Curve	Enable P(U) Curve when it is required by local grid standards and requirements.
15	Vn Voltage	The percentage of actual voltage to the rated voltage at Vn point, n= 1, 2, 3, 4. For example, setting Vn Voltage to 90 means V/Vrated%=90%.
16	Vn Active Power	The percentage of the output active power to the apparent power at Vn point, n=1, 2, 3, 4 For example, setting Vn Voltage to 48.5 means P/Prated%=48.5%.
17	Output Response Mode	Set the active power output response mode. Supports: • PT-1 Behavior, realize active scheduling based on the first-order LPF curve within the response time constant.

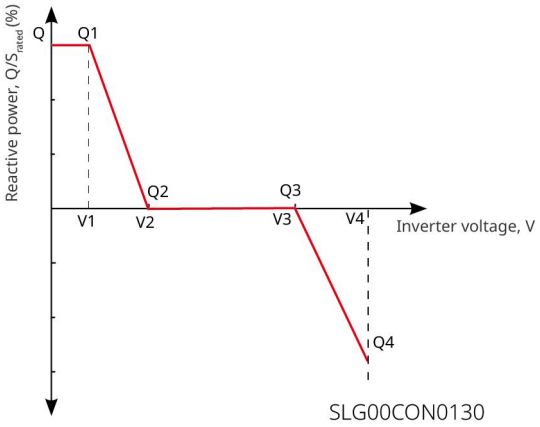
		• Gradient Control, realize active scheduling based on the power change slope.
18	Power Gradient	When the output response mode is set to Gradient Control, active power scheduling is achieved according to the power change gradient.
19	First-order Low-pass Filter Time Parameter	Set the time constant within which the active power changes based on the first order LPF curve when the Output Response Mode is set to be First-order Low-pass Filter Time Parameter.

Setting the Reactive Power Mode

Step 1: Go to “Device Maintenance” > “Parameter Setting” > “Hybrid Inverter” > “Grid Code Setting” > “Reactive Power Mode”.

Step 2: Set the parameters based on actual needs.

Q(U) Curve



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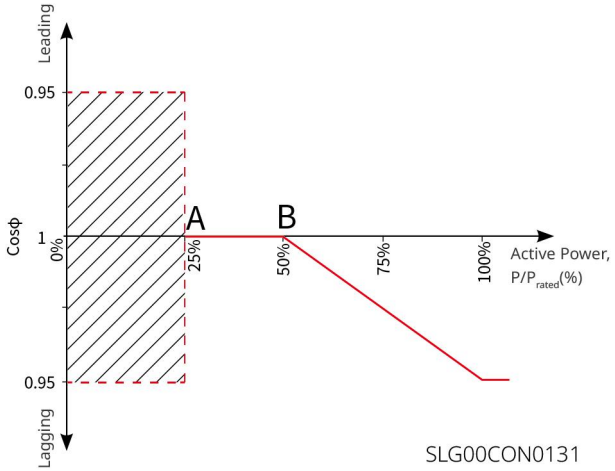
Cos(φ) Curve



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No.	Parameters	Description
1	Fix PF	Enable this function when a fixed power factor PF value is

		required in compliance with the grid standard requirements of certain countries or regions.
2	Under-excited / Over-excited	Set the power factor to positive or negative in accordance with the grid standard requirements of the country or region where the system is located, as well as actual needs.
3	Power Factor	Set the power factor according to actual needs, the range is [0.8,1).
4	Fix Q	According to the grid standard requirements of certain countries or regions, turn on this function when it is necessary to limit the output power.
5	Under-excited / Over-excited	Set the reactive power as inductive or capacitive reactive power based on actual needs and local grid standards and requirements.
6	Reactive Power	The percentage of reactive power to the apparent power.
7	Q(U) Curve	Enable Q(U) Curve when it is required by local grid standards and requirements.
8	Mode Option	Set Q(U) Curve mode. Supported: basic mode, slope mode.
9	Vn Voltage	The percentage of actual voltage to the rated voltage at Vn point, n=1, 2, 3, 4. For example, setting Vn Voltage to 90 means V/Vrated%=90%.
10	Vn Reactive Power	The percentage of the reactive output power to the apparent power at Vn point, n=1, 2, 3, 4. For example, setting Vn Voltage to 48.5 means Q/Srated%=48.5%
11	Voltage Dead Zone Width	When the Q(U) curve mode is set to Slope Mode, configure the voltage dead band. Within the dead band range, there is no requirement for reactive power output.
12	Over-excitation Slope	In Q(U) curve mode set to slope mode, the power change slope is set to a positive or negative value.
13	Under-excitation Slope	
14	Vn Reactive Power	The percentage of the reactive output power to the apparent power at Vn point, n=1, 2, 3, 4. For example, setting Vn Voltage to 48.5 means Q/Srated%=48.5%.
15	Q(U) Curve Time	The power is required to reach 95% in the first order LPF

	Constant	curve within three time constant.
16	Enable Extension Function	Enable the extended functions and configure the corresponding parameters.
17	Lock-In Power	When the inverter output reactive power to the rated power ratio is between the Lock-in power and Lock-out power, the ratio meets Q(U) curve requirements.
18	Lock-out Power	
19	Cosφφ (P) Curve	Enable Cosφ Curve when it is required by local grid standards and requirements.
20	Mode Option	Set cosφ (P) Curve mode. Supported: basic mode, slope mode.
21	Pn Power	The percentage of the inverter output active power to the rated power at point N. N=A, B, C, D, E.
22	Pn Cos φ	Pn Power Factor N=A, B, C, D, E.
23	Over-excitation Slope	In cosφ (P) curve mode set to slope mode, the power change slope is set to a positive or negative value.
24	Under-excitation Slope	
25	Pn Power	The percentage of the inverter output active power to the rated power at point N. N=A, B, C.
26	Pn Cos φ	Pn Power Factor N=A, B, C.
27	Cos φ (P) Curve Time Constant	The power is required to reach 95% in the first order LPF curve within three time constant.
28	Enable Extension Function	Enable the extended functions and configure the corresponding parameters.
29	Lock-in Voltage	When the grid voltage is between Lock-in Voltage and Lock-out Voltage, the voltage meets Cosφ curve requirements.
30	Lock-out Voltage	
31	Enable Q(P) Curve	When Q(P) curves need to be set according to the power grid standards of certain countries or regions, enable this function.
32	Mode Option	Set Q(P) Curve mode. Supported: basic mode, slope mode.
33	Pn Power	The percentage of the output reactive power to the rated power at Pn point, n=1, 2, 3, 4, 5, 6. For example, setting P_n Power to 90 means Q / Prated%=90%.

34	Pn Reactive Power	The percentage of the output active power to the rated power at Pn point, n=1, 2, 3, 4, 5, 6. For example, setting Pn Reactive Power to 90 means P/Prated%=90%.
35	Over-excitation Slope	In Q(P) curve mode set to slope mode, the power change slope is set to a positive or negative value.
36	Under-excitation Slope	
37	Pn Power	The ratio of reactive power to apparent power output by the Vn-point inverter, n=1, 2, 3 For example, setting P_n Power to 90 means Q / Prated%=90%.
38	Pn Reactive Power	The ratio of reactive power to apparent power output by the Vn-point inverter, n= 1, 2, 3. For example, setting Pn Reactive Power to 90 means P/Prated%=90%.
39	Time Constant	The power is required to reach 95% in the first order LPF curve within three time constant.

Setting Protection Parameters

Step 1: Go to "Device Maintenance">"Parameter Settings" > "Energy Storage Inverter">“Safety Parameter Settings” > “Protection Parameters”.

Step 2: Set the parameters based on actual needs.

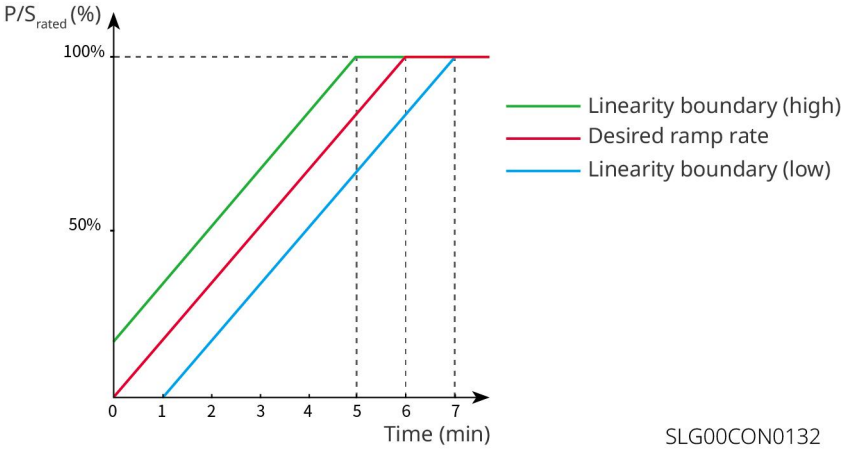
No.	Parameters	Description
1	OV Stage n Trip Value	Set the grid overvoltage protection threshold value, n = 1, 2, 3, 4.
2	OV Stage n Trip Time	Set the grid overvoltage protection tripping time, n = 1, 2, 3, 4.
3	UV Stage n Trip Value	Set the grid undervoltage protection threshold value, n= 1, 2, 3, 4.
4	UV Stage n Trip Time	Set the grid undervoltage protection tripping time, n = 1, 2, 3, 4.
5	10Min Overvoltage Trip Threshold	Set the 10min overvoltage protection threshold value.
6	10Min Overvoltage Trip	Set the 10min overvoltage protection tripping time..

	Time	
7	OF Stage n Trip Value	Set the grid overfrequency protection threshold value, n = 1, 2, 3, 4.
8	OF Stage n Trip Time	Set the grid overfrequency protection tripping time, n = 1, 2, 3, 4.
9	UF Stage n Trip Value	Set the grid underfrequency protection threshold value, n = 1, 2, 3, 4.
10	UF Stage n Trip Time	Set the grid underfrequency protection tripping time, n = 1, 2, 3, 4.

Setting Connection Parameters

Step 1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage Inverter” > “Safety Parameter Settings” > “Connection Parameters”.

Step 2: Set the parameters based on actual needs.



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No.	Parameters	Description
1	Upper Voltage	The inverter cannot connect to the grid if it is powered on for the first connection and the grid voltage is higher than the Upper Voltage.
2	Lower Voltage	The inverter cannot connect to the grid if it is powered on for the first connection and the grid voltage is lower than the Lower Voltage.
3	Upper Frequency	The inverter cannot connect to the grid if it is powered on for the first connection and the grid frequency is higher than the Upper Frequency.
4	Lower Frequency	The inverter cannot connect to the grid if it is powered on for the first connection and the grid frequency is lower than the Lower Frequency.
5	Observation	When the inverter is connected to the grid for the first time, wait for the grid connection time after the grid voltage and frequency meet

	Time	the grid connection requirements. Time
6	Enable Soft Ramp Up Gradient	Enable the start-up slope function.
7	Soft Ramp Up Gradient	Indicates the percentage of incremental output power per minute based on the local requirements when the inverter is powered on for the first time. For example, setting **Soft Ramp Up Gradient** to 10 means the start-up slope is 10%P_{rated}/min.
8	Upper Voltage	The inverter cannot connect to the grid if it is reconnecting due to a fault and the grid voltage is higher than the Upper Voltage.
9	Lower Voltage	The inverter cannot connect to the grid if it is reconnecting due to a fault and the grid voltage is lower than the Lower Voltage.
10	Upper Frequency	The inverter cannot connect to the grid if it is reconnecting due to a fault and the grid frequency is higher than the Upper Frequency.
11	Lower Frequency	The inverter cannot connect to the grid if it is reconnecting due to a fault and the grid frequency is lower than the Lower Frequency.
12	Observation Time	The waiting time for connecting the inverter to the grid when meeting the following requirements. 1. The inverter is reconnecting to the grid due to a fault. 2. The utility grid voltage and frequency meet certain requirements.
13	Reconnection Load Slope Enable	Enable the start-up slope function.
14	Reconnection Gradient	In some countries/regions, set the percentage of incremental output power per minute when the inverter is not powered on for the first connection. For example, setting it to 10 means the reconnection slope is 10% Prated/min.

Fault Ride Through

Step 1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage Inverter” > “Safety Parameter Settings”>“Fault Ride-Through”.

Step 2: Set the parameters based on actual needs.

No.	Parameters	Description
1	Current Distribution	Set the current distribution mode. Supported modes: Reactive Power

	Mode	Priority Mode, Active Power Priority Mode, Constant Current Mode.
2	Active Power Recovery Mode after Ride-Through	Set the active power recover mode after LVRT or HVRT. Supported modes: Disabled, Slope Scheduling, First-Order Low-Pass Filter.
3	Power Change Gradient	Realize active power recovery based on the power change slope.
4	First-order Low-pass Filter Time Parameter	Set the time constant within which the active power changes based on the first order LPF curve.
5	Reactive Power Recovery Mode After Ride-Through	Set the reactive power recovery mode after the completion of Low-Voltage Ride-Through (LVRT) or High-Voltage Ride-Through (HVRT). Supported modes: Disabled, Slope Scheduling, First-Order Low-Pass Filter.
6	Power Change Gradient	Recover reactive power dispatch based on the power change slope.
7	First-order Low-pass Filter Time Parameter	Set the time constant within which the reactive power changes based on the first order LPF curve.

Fault Ride-Through Mode (LVRT)

LVRT (Low-Voltage Ride-Through): Refers to the requirement that the inverter shall not disconnect from the grid immediately but shall maintain grid connection and provide support for a certain period when the grid experiences a short-term low voltage due to an abnormality.

Step 1: Go to "Device Maintenance">"Parameter Settings" > "Energy Storage Inverter">”Safety Parameter Settings”>“Fault Ride-Through (LVRT) Mode”.

Step 2: Set the parameters based on actual needs.

No.	Parameters	Description
1	Enable LVRT	Enable LVRT Function
2	UVn Voltage	The ratio of the ride through voltage to the rated voltage at UVn point during LVRT. n=1,2,3,4,5,6,7.
3	UVn Time	The ride through time at UVn point during LVRT. n=1,2,3,4,5,6,7.
4	Enter LVRT Threshold	When the grid voltage is between the low penetration threshold and the exit low penetration threshold, the inverter does not immediately

5	Exit LVRT Threshold	disconnect from the grid.
6	Slope K1	K-factor for reactive power during LVRT.
7	Enable Zero Current Mode	When enabled, the system outputs zero current during low-voltage ride-through.
8	Entry Threshold	The threshold for entering zero current mode.

Fault Ride-Through Mode (HVRT)

HVRT: With HVRT on, the inverter will stay connected with the utility grid after a short-term utility grid high voltage exception occurs.

Step 1: Go to "Device Maintenance">"Parameter Settings" > "Energy Storage Inverter">”Safety Parameter Settings”>“Fault Ride-Through (HVRT) Mode”.

Step 2: Set the parameters based on actual needs.

No.	Parameters	Description
1	Enable HVRT	Enable HVRT Function
2	OVn Voltage	The ratio of the ride through voltage to the rated voltage at OVn point during HVRT. n=1,2,3,4,5,6,7.
3	OVn Time	The ride through time at OVn point during HVRT. n=1,2,3,4,5,6,7.
4	Enter High Voltage Ride-Through Threshold	When the grid voltage is between the high penetration threshold and the exit high penetration threshold, the inverter does not immediately disconnect from the grid.
5	Exit High Voltage Ride-Through Threshold	
6	Slope K2	K-factor for reactive power during HVRT.
7	Enable Zero Current Mode	The system outputs zero current during high-voltage ride-through.
8	Entry Threshold	The threshold for entering zero current mode.

Frequency Fault Ride-Through

Step1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage Inverter” > “Safety Parameter Settings” > “Frequency Fault Ride-Through”.

Step 2: Set the parameters based on actual needs.

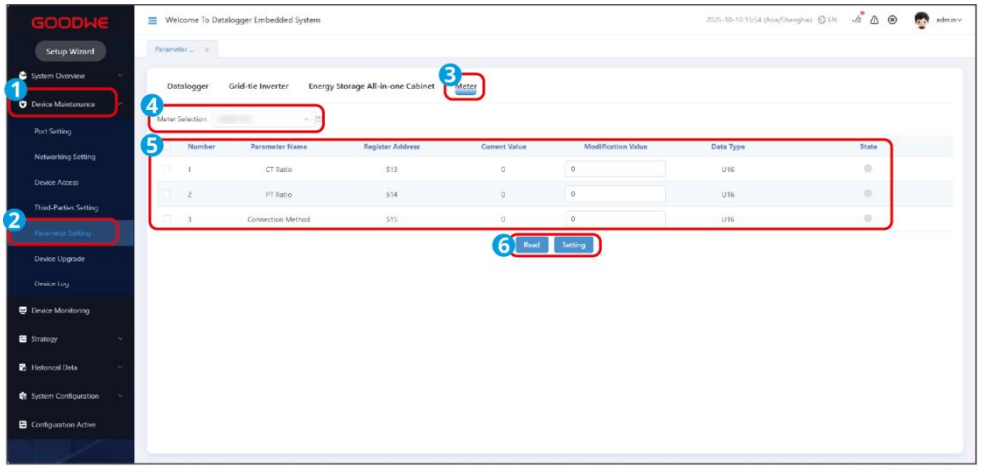
No.	Parameters	Description
1	Frequency Hopping Enabled	Enable frequency hopping function.
2	UFn Frequency	The frequency at the UFn point during frequency ride through. n=1,2,3.
3	UFn Time	The ride through duration at the UFn point during frequency ride through. n=1,2,3.
4	OFn Frequency	The frequency at the OFn point during frequency ride through. n=1,2,3.
5	OFn Time	The ride through duration at the OFn point during frequency ride through. n=1,2,3.

8.6.3. Setting Smart Meter Parameters

Step 1: Go to "Device Maintenance" > "Parameter Settings" > "Meter".

Step 2: Select the device type and check the SN of the device to be viewed or configured.

Step 3: Tick the parameters to be viewed or configured, then click "Read" to view the current values of the selected parameters. To modify, input the “Modification Value” and click “Setting” to apply the changes.



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No.	Parameters	Description
1	CT Ratio	Set the ratio of the primary side current to the secondary side current of the CT.

2	PT Ratio	Set the ratio between the primary voltage and secondary voltage of the PT.
3	Connection Method	Set the connection mode of the smart meter according to the actual situation.

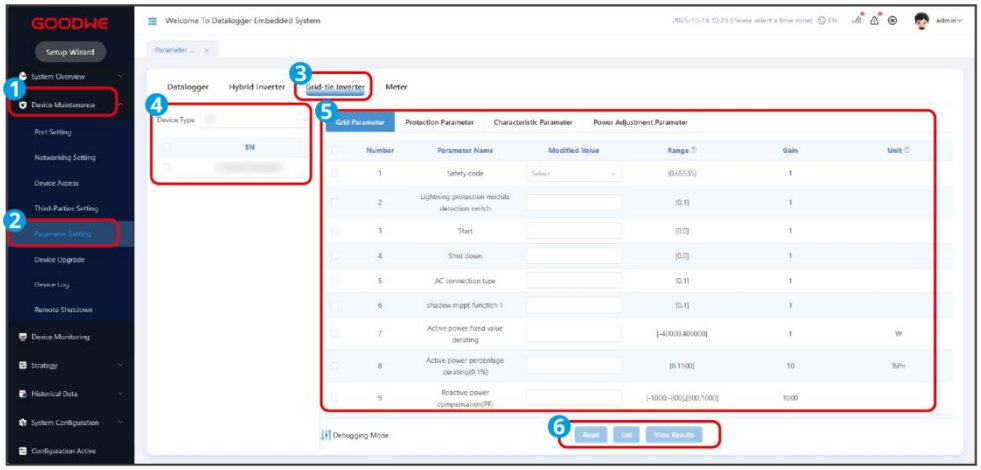
8.6.4. Setting Grid-Tied Inverter Parameters

NOTICE
● The parameters to be configured vary by inverter model. Please refer to the actual interface display. ● Enter 0 or 1 to enable or disable a function. 0 indicates disabling the function, and 1 indicates enabling the function.

Step 1: Go to “Device Maintenance” > “Parameter Settings” > “Grid-Tied Inverter”.

Step 2: Select the device type and click the SN of the inverter to be viewed or configured.

Step 3: Tick the parameters to be viewed or configured, then click "Read" to view the current values of the selected parameters. If modification is required, enter the "Modification Item" and click "Modification", then click "View Result" to check whether the modification is successful.



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Grid Control Parameters

No.	Parameters	Description
1	Safety Code	Set the safety country/region in compliance with the local grid standard and application scenario of the inverter.
2	Lightning Protection Module	Enable or disable SPD detection function.
3	Power On	Issue the start-up command.
4	Shutdown	Issue the shutdown command.

5	AC Connection Mode	● Set whether the inverter output includes an N wire based on the application scenario. ● 0: Three-phase four-wire system (3W/PE); 1: Three-phase five-wire system (3W/N/PE).
6	Shaded MPPT Function Switch	When the inverter is used in scenarios where PV strings are significantly shaded, enable this function. The inverter will perform a global MPPT scan at regular intervals to find the maximum power point.
7	Active Power Fixed-value Derating	Adjust the inverter's active power output by a fixed value.
8	Active Power Percentage Derating	Adjust the inverter's active power output as a percentage of the rated power.
9	Reactive Power Compensation (PF)	Set the power factor of the inverter.
10	Reactive Power Compensation (Q/S)	Set the reactive power output of the inverter.
11	Reactive Power	Reactive Power Compensation Fixed Value
12	Nighttime Reactive Power Compensation	Enable or disable night reactive power function. Enable or disable the night reactive power function. In certain specific application scenarios, power grid companies require inverters to provide reactive power compensation at night to ensure the local grid's power factor meets the required standard.
13	Night Reactive Power Parameters Taking Effect	Enable this function, the inverter outputs reactive power based on Fixed Value of Night Reactive Power Scheduling. Otherwise, the inverter executes the remote scheduling command.
14	Percentage of Night Reactive Power Scheduling	Schedule the reactive power by percentage during night reactive scheduling period.
15	Fixed Value of Night Reactive Power Scheduling	Schedule the reactive power by fixed value during night reactive scheduling period.

Characteristic Parameters

No.	Parameters	Description
1	EU Remote Shutdown Enable	Enable or disable remote shutdown function.
2	Anti-PID Function Switch	Enable or disable anti-PID.
3	PID Recovery Function Switch	Enable or disable PID recovery.
4	Power Limit	Enable or disable power limit function.
5	Single-Inverter Anti-Backflow Export Power Percentage	Set the backflow export power as a percentage of the rated power.
6	Three-Phase Anti-Backflow Mode	Set power limit mode. 0: the total power of the three phases cannot exceed the power limit. 1: power of any phase cannot exceed the power limit.
7	External Meter CT Ratio	Set the CT ratio value of the smart meter.
8	ISO Limit Set	To protect the equipment, the inverter performs an insulation impedance check on the input side during self-check at startup. If the measured value is lower than the set value, the inverter will not connect to the grid.
9	NPE Overvoltage Detection Switch	Enable or disable N-PE overvoltage detection.
10	N-PE Error Threshold	Set the N-PE overvoltage alarm threshold.
11	Active Power Scheduling Response Method	● Set the active power scheduling response method. Supported method: gradient control or PT-1 behavior. ● 0: disable; 1: gradient control; 2: PT-1 behavior tau; 3: PT-1 behavior respond time.
12	Gradient of Active Power	Set the active power change slope.
13	Active Power Scheduling LPF Time	Set the low pass filtering time for active power scheduling.

14	Reactive Scheduling Response Method	• Set the reactive power scheduling response method. Supported method: gradient control or PT-1 behavior. • 0: disable; 1: gradient control; 2: PT-1 behavior tau; 3: PT-1 behavior respond time.
15	Gradient of Reactive Power	Set the reactive power change slope.
16	Reactive Power Scheduling LPF Time	Set the low pass filtering time for reactive power scheduling.

Protection Parameters

No.	Parameters	Description
1	OV Stage n Trip Value	Set the level n overvoltage protection threshold. n= 1, 2.
2	OV Stage n Trip Time	Set the level n overvoltage protection duration. n= 1, 2.
3	UV Stage n Trip Value	Set the level n undervoltage protection threshold. n= 1, 2.
4	UV Stage n Trip Time	Set the level n undervoltage protection duration. n= 1, 2.
5	Phase n Overvoltage Protection	Set the level n overvoltage protection threshold. n= 3, 4.
6	Phase n Overvoltage Protection Time	Set the level n overvoltage protection duration. n= 3, 4.
7	10Min Overvoltage Trip Threshold	Set the 10-min overvoltage protection threshold.
8	10Min Overvoltage Trip Time	Set the 10-min overvoltage protection duration.
9	OF Stage n Trip Value	Set the level n overfrequency protection threshold. n= 1, 2.
10	OF Stage n Trip	Set the level n overfrequency protection duration. n= 1, 2.

	Time	
11	UF Stage n Trip Value	Set the level n underfrequency protection threshold. n= 1, 2.
12	UF Stage n Trip Time	Set the level n underfrequency protection duration. n= 1, 2.
13	Level n Overfrequency Protection Value	Set the level n overfrequency protection threshold. n= 3, 4.
14	Level n Overfrequency Protection Time	Set the level n overfrequency protection duration. n= 3, 4.
15	Level n Underfrequency Protection Value	Set the level n underfrequency protection threshold. n= 3, 4.
16	Level n Underfrequency Protection Time	Set the level n underfrequency protection duration. n= 3, 4.
17	Start-up On-grid Voltage Upper Limit	In certain countries/regions, the inverter cannot connect to the grid if it is powered on for the first connection and the grid voltage is higher than the Start-up On-grid Voltage Upper Limit.
18	Start-up On-grid Voltage Lower Limit	In certain countries/regions, the inverter cannot connect to the grid if it is powered on for the first connection and the grid voltage is lower than the Start-up Grid Connection Voltage Lower Limit.
19	Start-up On-grid Frequency Upper Limit	In certain countries/regions, the inverter cannot connect to the grid if it is powered on for the first connection and the grid frequency is higher than the Start-up On-grid Frequency Upper Limit.
20	Start-up On-grid F Lower Limit	In certain countries/regions, the inverter cannot connect to the grid if it is powered on for the first connection and the grid frequency is higher than the Start-up On-grid Frequency Upper Limit.
21	Start-up Grid Connection Waiting Time	The waiting time for connecting the inverter to the grid when the inverter is powered on for the first connection.
22	Start-up Grid Connection Power Loading	Set the percentage of incremental output power per minute when the inverter is powered on for the first connection.

	Rate	
23	Reconnection Voltage Upper Limit	In certain countries/regions, when the inverter is shut down due to a fault protection, it is not allowed to reconnect to the grid if the grid voltage is higher than the set value of the Reconnection Voltage Upper Limit.
24	Reconnection Voltage Lower Limit	In certain countries/regions, when the inverter is shut down due to a fault protection, it is not allowed to reconnect to the grid if the grid voltage is lower than the set value of the Reconnection Voltage Lower Limit.
25	Reconnection Frequency Upper Limit	In certain countries/regions, when the inverter is shut down due to a fault protection, it is not allowed to reconnect to the grid if the grid frequency is higher than the set value of the Reconnection Frequency Upper Limit.
26	Reconnection Frequency Lower Limit	In certain countries/regions, when the inverter is shut down due to a fault protection, it is not allowed to reconnect to the grid if the grid frequency is lower than the set value of the Reconnection Frequency Lower Limit.
27	Reconnection Waiting Time	Set the waiting time for the inverter to restart after a grid failure is restored.
28	Reconnection Power Loading Rate	In some countries/regions, set the percentage of incremental output power per minute when the inverter is not powered on for the first connection. For example, setting Reconnection Power Loading Slope to 10 means the reconnection slope is 10% Prated/%%。
29	LVRT Enable	Low voltage ride-through (LVRT) refers to the situation, when the grid experiences a short-term low voltage abnormality, the inverter cannot immediately disconnect from the grid and has to work for a period of time. Enable this function, the inverter's LVRT is being activated.
30	LVRT Depth n	The ratio of the ride through voltage to the rated voltage at a feature point during LVRT. n=1,2,3,4,5,6,7.
31	LVRT Duration n	Set the duration of the characteristic points on the LVRT curve. n=1,2,3,4,5,6,7.
32	Judgment Threshold of Entering LVRT	Set the threshold for triggering LVRT. The threshold settings should meet the local grid standard.
33	Judgment Threshold of Exiting LVRT	Set the threshold for exiting LVRT. The threshold settings should meet the local grid standard.
34	LVRT Positive Sequence Reactive Power K	During LVRT, the inverter needs to generate positive sequence reactive power to support the grid. This parameter is used to set the positive-sequence reactive power generated by the inverter.

	Value	
35	LVRT Zero Current Mode Enable	The standards of some countries/regions require that the output current during LVRT should be limited. Enable this function, the output current is less than 10% of the rated current during LVRT.
36	Threshold of Entering Voltage	After enabling LVRT Zero Current Mode Enable, the zero current mode starts if the power grid voltage is less than Threshold of Entering Voltage during LVRT.
37	HVRT Enable	High voltage ride-through (HVRT) refers to the situation, when the grid experiences a short-term high voltage abnormality, the inverter cannot immediately disconnect from the grid and has to work for a period of time. Enable this function, the inverter's HVRT is being activated.
38	HVRT Depth n	Set the voltage percentage of the characteristic points on the low-voltage ride-through (LVRT) curve n=1,2,3,4,5,6,7.
39	HVRT Duration n	Set the duration of the characteristic points on the LVRT curve n=1,2,3,4,5,6,7.
40	Judgment Threshold of Entering HVRT	Set the threshold for triggering LVRT. The threshold settings should meet the local grid standard.
41	Exit HVRT Judgment Threshold	Set the threshold for exiting HVRT. The threshold settings should meet the local grid standard.
42	HVRT Positive Sequence Reactive Power K Value	During HVRT, the inverter needs to generate positive sequence reactive power to support the grid. This parameter is used to set the positive-sequence reactive power generated by the inverter.
43	HVRT Zero Current Mode Enable	The standards of some countries/regions require that the output current during HVRT should be limited. Enable this function, the output current is less than 10% of the rated current during HVRT.
44	Threshold of Entering Voltage	After enabling HVRT Zero Current Mode Enable, the zero current mode starts if the power grid voltage is less than Threshold of Entering Voltage during HVRT.
45	Current Distribution Mode	● Set the sharing mode of reactive current and active current. ● 0:Reactive Power Priority; 1:Active Power Priority; 2:Constant Current Mode;
46	Active Power Recovery Mode After Crossing	● Active current recovery mode during ride-through recovery, supported mode: slope recovery, first-order LPF recovery, and no requirement.

		• 0: disable; 1: slope response; 2: time constant; 3: respond time.
47	Active Power Recovery Rate After Riding Through	The rate at which the active current recovers during the ride through recovery process.
48	Resume 1st-order LPF after Crossing	The active current recovers at the characteristic of first order LPF after the ride through recovery.
49	Reactive Power Recovery Mode After Ride-Through	• Reactive current recovery mode during ride-through recovery, supported mode: slope recovery, first-order LPF recovery, and no requirement. • 0: disable; 1: slope response; 2: time constant; 3: respond time.
50	Reactive Power Recovery Rate After Riding Through	The reactive current recovers at the slope after the ride through recovery.
51	Reactive power recovery at the end of ride through (First-order low-pass filter)	The reactive current recovers at the characteristic of first order LPF after the ride through recovery.
52	Frequency Riding Through Enable	After enabling Frequency Riding Through Enable, the inverter continues to generate power during required time even the grid frequency is abnormal.
53	n-order Under Frequency Riding Through Point_UFn	Set the level n underfrequency protection threshold value.
54	n-order Under Frequency Riding Through Time_UTn	Set the level n underfrequency protection tripping time.
55	n-order Over Frequency Riding Through Point_OFn	Set the level n overfrequency protection threshold value.
56	n-order Over Frequency Riding Through Time_OTn	Set the level n overfrequency protection tripping time.

Power Adjustment Parameters

No.	Parameters	Description
1	Overfrequency Threshold (Slope Mode)	Per standards in certain countries/regions, the inverter's active power output must be derated when the grid frequency exceeds this overfrequency threshold.
2	Overfrequency Power Reduction Slope (Slope Mode)	In Slope Mode, this parameter defines the slope of the inverter's active power derating change when the grid frequency exceeds the overfrequency threshold.
3	P-F Curve (Overfrequency)	Enable or disable overfrequency power derating.
4	Underfrequency Threshold(Slope Mode)	In certain countries/regions, the inverter's active power output must be increased when the grid frequency is lower than this underfrequency threshold.
5	Underfrequency Power Slope Recovery	Set the power recovery slope for exiting overfrequency power derating.
6	Frequency Hysteresis Point	The corresponding frequency point for the underfrequency hysteresis function.
7	Tentional Delay Ta	Hysteresis Delay Time.
8	Overfrequency Endpoint	Set the exit frequency for overfrequency derating.

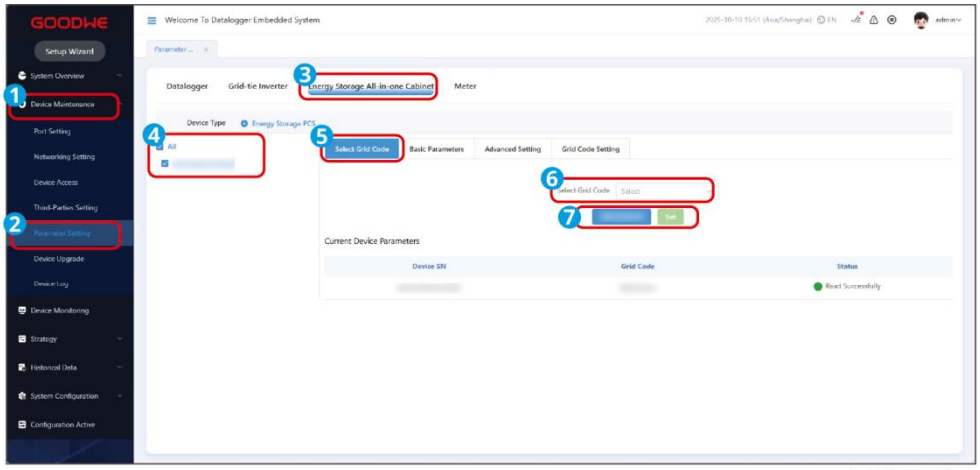
8.6.5. Setting Parameters of Energy Storage All-in-one Cabinet

8.6.5.1. Setting Safety Country for the Energy Storage All-in-one Cabinet

Step 1: Go to "Device Maintenance" > "Parameter Settings" > "Energy Storage All-in-one Cabinet".

Step 2: Select the device type and check the SN of the device to be viewed or configured.

Step 3: Click "Select Safety Code", choose the safety standard country according to actual needs, and click "Set" to complete the configuration.



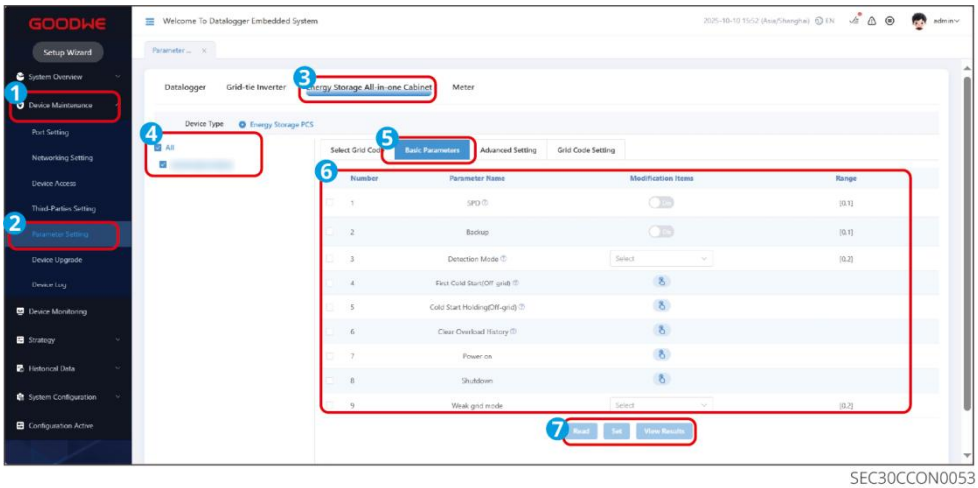
SEC30CCON0052

8.6.5.2. Setting Basic Parameters of the Energy Storage All-in-one Cabinet

Step 1: Go to "Device Maintenance" > "Parameter Settings" > "Energy Storage All-in-one Cabinet".

Step 2: Select the SN of the device to be viewed or configured.

Step 3: Click "Basic Parameters", check the parameters to be viewed or configured, and then click "Query" to view the current values of the selected parameters. If modification is required, enter the "Modification Item" and click "Setting", then click "View Result" to check whether the modification is successful.



SEC30CCON0053

No.	Parameters	Description
1	Lightning Protection Alarm	After enabling SPD, when the SPD module is abnormal, there will be SPD module abnormal alarm prompt.
2	Backup Power Supply Function	After enabling Backup, the battery will power the load connected to the BACKUP port of the inverter to ensure Uninterrupted Power Supply when the power grid fails.

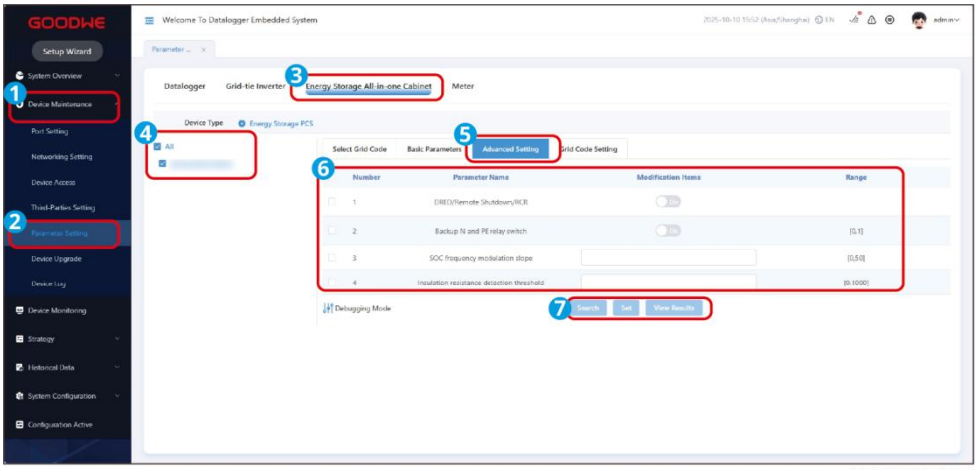
3	Detection Mode	• UPS Mode - Full-Wave Detection: Detect whether the grid voltage is too high or too low. • UPS Mode - Half-Wave Detection: Detect whether the grid voltage is too low. • EPS Mode - Support LVRT: Disable the grid voltage detection function.
4	First Cold Start (Off - grid)	Take effect once. In off-grid mode, enable First Cold Start (Off-grid) to output backup supply with battery or PV.
5	Cold Start Holding (Off-grid)	Take effect multiple times. Once this feature is enabled, you can use batteries or photovoltaics to output backup power in off-grid mode.
6	Clear Overload Fault	Once the power of loads connected to the BACK- UP exceeds the rated load power, the inverter will restart and detect the power again. The inverter will perform restart and detection several times until the overloading problem is solved. Time increases between each reboot. Tap Clear Overload History to reset the restart time interval after the power of the loads connected to BACK-UP meets the requirements. The inverter will restart immediately.
7	Power On	Sends commands to start or shut down the energy storage system.
8	Shutdown	
9	Weak Grid Mode	For weak grid areas, enable this mode to ensure stable operation of the device. • Disabled: Weak grid support function is not activated. • High Impedance Mode: Resolves high impedance issues caused by Weak Grid Mode and supports stable device operation.

8.6.5.3. Setting Advanced Parameters of the Energy Storage All-in-one Cabinet

Step 1: Go to "Device Maintenance" > "Parameter Settings" > "Energy Storage All-in-one Cabinet".

Step 2: Select the SN of the device to be viewed or configured.

Step 3: Click "Advanced Parameters", check the parameters to be viewed or configured, and then click "Query" to view the current values of the selected parameters. If modification is required, enter the "Modification Item" and click "Setting", then click "View Result" to check whether the modification is successful.

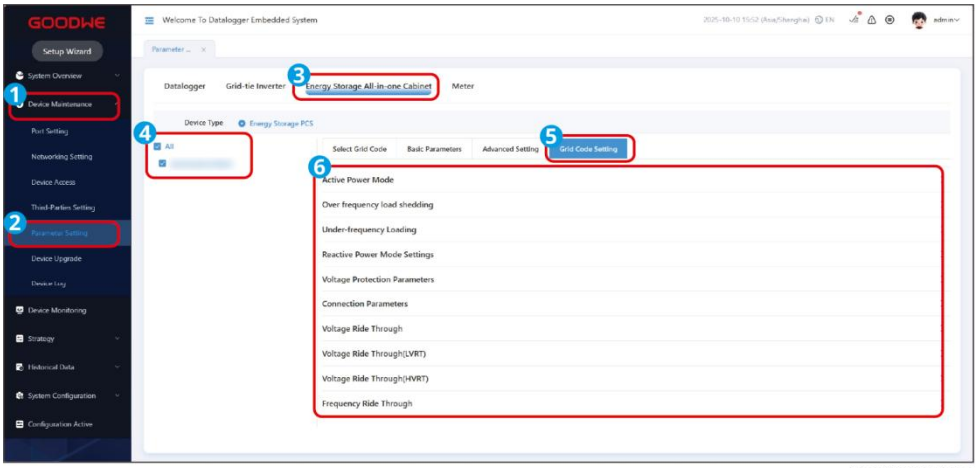


SEC30CCON0054

No.	Parameters	Description
1	DRED/Remote Shutdown/RCR	Enable DRED/Remote Shutdown/RCR before connecting the third party device to comply with local laws and regulations.
2	Setting Power N and PE Relay Switches	To comply with local laws and regulations, ensure that the relay inside the BACK-UP port remains closed and the N and PE wires are connected when the inverter is working off-grid.
3	SOC Frequency Modulation Slope	When the system is off-grid, if the off-grid SOC is too high or too low, it is necessary to adjust the off-grid AC frequency to achieve over-frequency load reduction or under-frequency load increase of the inverter. The SOC frequency modulation slope refers to the AC frequency adjustment value.
4	Insulation Resistance Detection Threshold	Set the threshold for insulation resistance detection. Default value:50K.

8.6.5.4. Setting Custom Safety Parameters for the Energy Storage All-in-one Cabinet

NOTICE
Set the custom safety parameters in compliance with local requirements. Do not change the parameters without the prior consent of the grid company.



SEC30CCON0055

Setting the Active Power Mode

Step 1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage All-in-one Cabinet” > “Safety Parameter Settings” > “Active Power Mode Settings”.

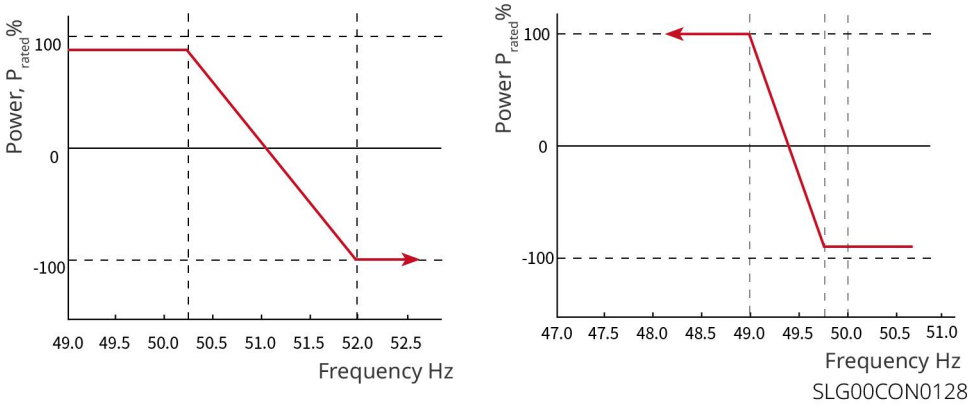
Step 2: Set the parameters based on actual needs.

No.	Parameters	Description
1	Generation Power Limit	Set the output power limit of the inverter.
2	Power Change Gradient	Set the slope of change when the active output power increases or decreases.

Set the Overfrequency Deloading Parameter

Step1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage All-in-one Cabinet” > “Safety Parameter Settings” > “Overfrequency Deloading”.

Step 2: Set the parameters based on actual needs.



SLG00CON0128

No.	Parameters	Description
1	P(F) Curve	Enable P(F) Curve when it is required by local grid standards and requirements.
2	Overfrequency	Set the overfrequency unloading mode based on actual

	Deloading Mode	needs. Slope mode: adjusts power based on the over frequency point and load reduction slope. Stop mode: adjusts the power based on the over-frequency start point and over-frequency end point.
3	Overfrequency Threshold	The inverter output active power will decrease when the utility grid frequency is too high. The inverter output power will decrease when the utility grid frequency is higher than Overfrequency Threshold.
4	Import/Export Electricity Conversion Frequency	When the set frequency value is reached, the system switches from selling electricity to buying electricity.
5	Overfrequency Endpoint	The inverter output active power will decrease when the utility grid frequency is too high. The inverter output power will stop decreasing when the utility grid frequency is higher than Overfrequency Endpoint.
6	Over-Frequency Power Slope Reference Power	Adjust the inverter output power based on Apparent Active Power, Rated Active Power, Momentary Active Power, Or Max. Active Power.
7	Power Response To Overfrequency Gradient	When the grid frequency exceeds the overfrequency point, the inverter output power is reduced according to the slope.
8	Tentional Delay Ta	Indicates the delayed response time when the inverter output power is higher than the Overfrequency Threshold.
9	Hysteretic Function	Enable the hysteretic function.
10	Frequency Hysteresis Point	During over-frequency load reduction, if the frequency decreases, the power output is based on the lowest point of the load reduction power until the frequency is less than the hysteresis point and the power is restored
11	Hysteresis Waiting Time	For over-frequency load reduction and frequency decrease, when the frequency is less than the hysteresis point, the power recovery waiting time, that is, it takes a certain amount of time to recover the power
12	Hysteresis Power Recovery Slope Reference Power	For over-frequency load reduction and frequency decrease, when the frequency is less than the hysteresis point, the power recovery benchmark, that is, the power recovery is

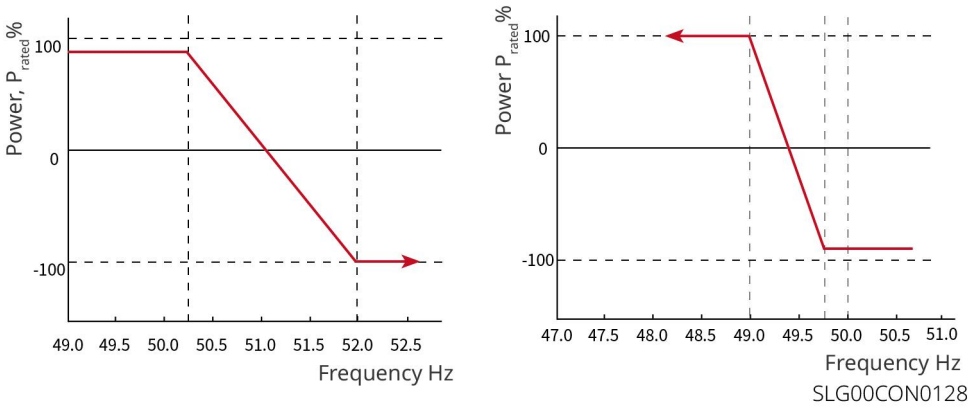
		based on the recovery slope * the rate of change of the reference power. Supported Parameters: P_n (Rated Power), P_s (Apparent Power), P_m (Current Power), P_{max} (Maximum Power), Power Difference (△P).
13	Hysteretic Power Recovery Slope	For over-frequency load reduction and frequency reduction, when the frequency is less than the hysteresis point, the power change slope when the power is restored.

Setting the Overfrequency Unloading Parameter

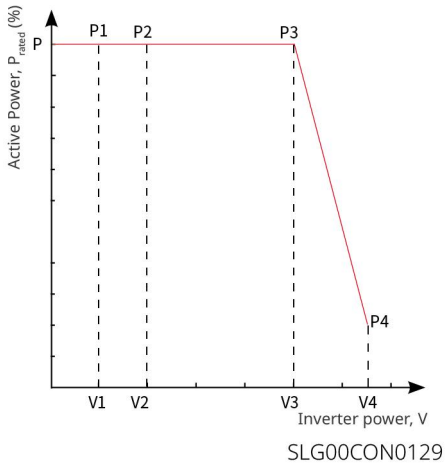
Step1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage All-in-one Cabinet” > “Safety Parameter Settings” > “Overfrequency Deloading”.

Step 2: Set the parameters based on actual needs.

P(F) Curve



P(U) Curve



No.	Parameters	Description
1	P(F) Curve	Enable P(F) Curve when it is required by local grid standards and requirements.

2	Underfrequency Load Mode	Set the underfrequency unloading mode based on actual needs. Slope mode: adjusts power based on the underfrequency point and load increase slope. Stop mode: adjusts the power based on the underfrequency start point and underfrequency end point.
3	Underfrequency Threshold	The inverter output active power will increase when the utility grid frequency is too low. The inverter output power will increase when the utility grid frequency is lower than Underfrequency Threshold.
4	Import/Export Electricity Conversion Frequency	When the set frequency value is reached, the system switches from selling electricity to buying electricity.
5	Underfrequency Endpoint	The inverter output active power will increase when the utility grid frequency is too low. The inverter output power will stop increasing when the utility grid frequency is lower than Underfrequency Endpoint.
6	Over-Frequency Power Slope Reference Power	Adjust the inverter output power based on Apparent Active Power, Rated Active Power, Momentary Active Power, Or Max. Active Power.
7	Under-Frequency Power Slope	The inverter output active power will increase when the utility grid frequency is too low. The slope of the inverter output power when it rises.
8	Tentional Delay Ta	Indicates the delayed response time when the inverter output power is lower than the Underfrequency Threshold.
9	Hysteretic Function	Enable the hysteretic function.
10	Frequency Hysteresis Point	During underfrequency loading, if the frequency increases, the power is output according to the lowest point of the loaded power until the frequency is higher than the hysteresis point and the power is restored.
11	Hysteresis Waiting Time	For underfrequency loading, the frequency increases, when the frequency is higher than the hysteresis point, the waiting time for power recovery, that is, it takes a certain amount of time to recover the power.
12	Hysteresis Power	For underfrequency loading, the frequency increases, when

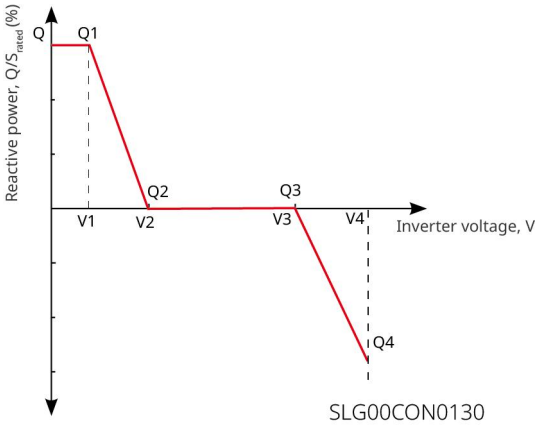
	Recovery Slope Reference Power	the frequency is higher than the hysteresis point, the benchmark for power recovery, that is, the power recovery is carried out according to the recovery slope * the rate of change of the benchmark power. Supported Parameters: P_n (Rated Power), P_s (Apparent Power), P_m (Current Power), P_{max} (Maximum Power), Power Difference (△P).
13	Hysteretic Power Recovery Slope	For under-frequency loading, frequency increase, when the frequency is higher than the hysteresis point, the power change slope when power is restored.
14	P(U) Curve	Enable P(U) Curve when it is required by local grid standards and requirements.
15	Vn Voltage	The percentage of actual voltage to the rated voltage at Vn point, n= 1, 2, 3, 4. For example, setting Vn Voltage to 90 means V/Vrated%=90%
16	Vn Active Power	The percentage of the output active power to the apparent power at Vn point, n=1, 2, 3, 4 For example, setting Vn Voltage to 48.5 means P/Prated%=48.5%
17	Output Response Mode	Set the active power output response mode. Supports: • PT-1 Behavior, realize active scheduling based on the first-order LPF curve within the response time constant. • Gradient Control, realize active scheduling based on the power change slope.
18	Power Change Gradient	The active scheduling will be implemented based on the power gradient when the output response mode is set to slope scheduling.
19	First-order Low-pass Filter Time Parameter	Set the time constant within which the active power changes based on the first order LPF curve when the Output Response Mode is set to be First-order Low-pass Filter Time Parameter.

Setting the Reactive Power Mode

Step 1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage All-in-one Cabinet” > “Safety Parameter Settings” > “Active Power Mode Settings”.

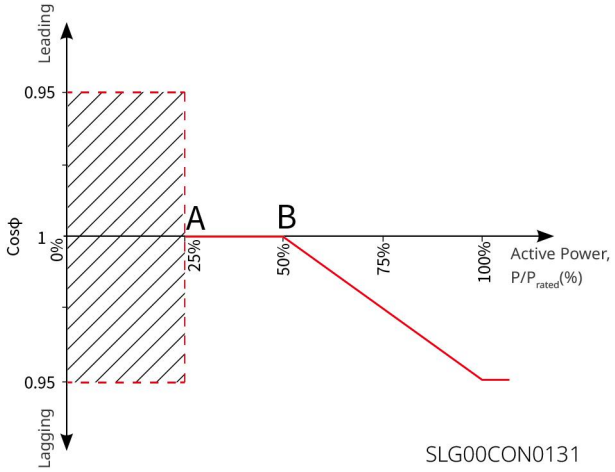
Step 2: Set the parameters based on actual needs.

Q(U) Curve



SLG00CON0130

Cos(φ) Curve



SLG00CON0131

No.	Parameters	Description
1	Fix PF	Enable this function when a fixed power factor PF value is required in compliance with the grid standard requirements of certain countries or regions.
2	Under-excited / Over-excited	Set the power factor to positive or negative in accordance with the grid standard requirements of the country or region where the system is located, as well as actual needs.
3	Power Factor	Set the power factor according to actual needs, the range is [0.8,1).
4	Fix Q	According to the grid standard requirements of certain countries or regions, turn on this function when it is necessary to limit the output power.
5	Under-excited / Over-excited	Set the reactive power as inductive or capacitive reactive power based on actual needs and local grid standards and requirements.

6	Reactive Power	The percentage of reactive power to the apparent power.
7	Q(U) Curve	Enable Q(U) Curve when it is required by local grid standards and requirements.
8	Mode Option	Set Q(U) Curve mode. Supported: basic mode, slope mode.
9	Vn Voltage	The percentage of actual voltage to the rated voltage at Vn point, n=1, 2, 3, 4. For example, setting Vn Voltage to 90 means V/Vrated%=90%
10	Vn Reactive Power	The percentage of the reactive output power to the apparent power at Vn point, n=1, 2, 3, 4. For example, setting Vn Voltage to 48.5 means Q/Srated%=48.5%
11	Voltage Dead Zone Width	When the Q(U) curve mode is set to Slope Mode, configure the voltage dead band. Within the dead band range, there is no requirement for reactive power output.
12	Over-excitation Slope	In Q(U) curve mode set to slope mode, the power change slope is set to a positive or negative value.
13	Under-excitation Slope	
14	Vn Reactive Power	The percentage of the reactive output power to the apparent power at Vn point, n=1, 2, 3, 4. For example, setting Vn Voltage to 48.5 means Q/Srated%=48.5%
15	Q(U) Curve Time Constant	The power is required to reach 95% in the first order LPF curve within three time constant.
16	Enable Extension Function	Enable the extended functions and configure the corresponding parameters.
17	Lock-In Power	When the inverter output reactive power to the rated power ratio is between the Lock-in power and Lock-out power, the ratio meets Q(U) curve requirements.
18	Lock-out Power	
19	Cosφφ (P) Curve	Enable Cosφ Curve when it is required by local grid standards and requirements.
20	Mode Option	Set cosφ (P) Curve mode. Supported: basic mode, slope mode.
21	Pn Power	The percentage of the inverter output active power to the rated power at point N. N=A, B, C, D, E.
22	Pn Cos φ	Pn Power Factor N=A, B, C, D, E.

23	Over-excitation Slope	In cosφ (P) curve mode set to slope mode, the power change slope is set to a positive or negative value.
24	Under-excitation Slope	
25	Pn Power	The percentage of the inverter output active power to the rated power at point N. N=A, B, C.
26	Pn Cos φ	Pn Power Factor N=A, B, C.
27	Cos φ (P) Curve Time Constant	The power is required to reach 95% in the first order LPF curve within three time constant.
28	Enable Extension Function	Enable the extended functions and configure the corresponding parameters.
29	Lock-in Voltage	When the grid voltage is between Lock-in Voltage and Lock-out Voltage, the voltage meets Cosφ curve requirements.
30	Lock-out Voltage	
31	Enable Q(P) Curve	When Q(P) curves need to be set according to the power grid standards of certain countries or regions, enable this function.
32	Mode Option	Set Q(P) Curve mode. Supported: basic mode, slope mode.
33	Pn Power	The percentage of the output reactive power to the rated power at Pn point, n=1, 2, 3, 4, 5, 6. For example, setting P_n Power to 90 means Q / Prated%=90%
34	Pn Reactive Power	The percentage of the output active power to the rated power at Pn point, n=1, 2, 3, 4, 5, 6. For example, setting Pn Reactive Power to 90 means P/ Prated%=90%
35	Over-excitation Slope	In Q(P) curve mode set to slope mode, the power change slope is set to a positive or negative value.
36	Under-excitation Slope	
37	Pn Power	The ratio of reactive power to apparent power output by the Vn-point inverter, n=1, 2, 3 For example, setting P_n Power to 90 means Q / Prated%=90%
38	Pn Reactive Power	The ratio of reactive power to apparent power output by the Vn-point inverter, n= 1, 2, 3. For example, setting Pn Reactive Power to 90 means P/ Prated%=90%
39	Time Constant	The power is required to reach 95% in the first order LPF

		curve within three time constant.

Setting Protection Parameters

Step1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage All-in-one Cabinet” > “Safety Parameter Settings” > “Protection Parameters”.

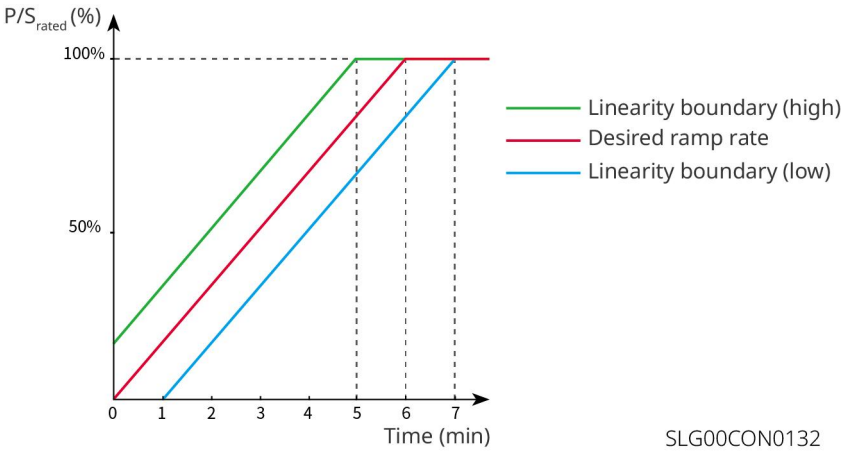
Step 2: Set the parameters based on actual needs.

No.	Parameters	Description
1	OV Stage n Trip Value	Set the grid overvoltage protection threshold value, n = 1, 2, 3, 4.
2	OV Stage n Trip Time	Set the nth-order trip time for grid overvoltage triggering, where n = 1, 2, 3, 4.
3	UV Stage n Trip Value	Set the grid undervoltage protection threshold value, n= 1, 2, 3, 4.
4	UV Stage n Trip Time	Set the grid undervoltage protection tripping time, n = 1, 2, 3, 4.
5	10Min Overvoltage Trip Threshold	Set the 10min overvoltage protection threshold value.
6	10Min Overvoltage Trip Time	Set the 10min overvoltage protection tripping time..
7	OF Stage n Trip Value	Set the grid overfrequency protection threshold value, n = 1, 2, 3, 4.
8	OF Stage n Trip Time	Set the grid overfrequency protection tripping time, n = 1, 2, 3, 4.
9	UF Stage n Trip Value	Set the grid underfrequency protection threshold value, n = 1, 2, 3, 4.
10	UF Stage n Trip Time	Set the grid underfrequency protection tripping time, n = 1, 2, 3, 4.

Setting Grid Connection Parameters

Step 1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage All-in-one Cabinet” > “Safety Parameter Settings” > “Grid Connection Parameters”.

Step 2: Set the parameters based on actual needs.



No.	Parameters	Description
1	Upper Voltage	The inverter cannot connect to the grid if it is powered on for the first connection and the grid voltage is higher than the Upper Voltage.
2	Lower Voltage	The inverter cannot connect to the grid if it is powered on for the first connection and the grid voltage is lower than the Lower Voltage.
3	Upper Frequency	The inverter cannot connect to the grid if it is powered on for the first connection and the grid frequency is higher than the Upper Frequency.
4	Lower Frequency	The inverter cannot connect to the grid if it is powered on for the first connection and the grid frequency is lower than the Lower Frequency.
5	Observation Time	When the inverter is connected to the grid for the first time, wait for the grid connection time after the grid voltage and frequency meet the grid connection requirements. Time
6	Enable Soft Ramp Up Gradient	Enable the start-up slope function.
7	Soft Ramp Up Gradient	Indicates the percentage of incremental output power per minute based on the local requirements when the inverter is powered on for the first time. For example, setting **Soft Ramp Up Gradient** to 10 means the start-up slope is 10%P_{rated}/min.
8	Upper Voltage	The inverter cannot connect to the grid if it is reconnecting due to a fault and the grid voltage is higher than the Upper Voltage.
9	Lower Voltage	The inverter cannot connect to the grid if it is reconnecting due to a fault and the grid voltage is lower than the Lower Voltage.
10	Upper	The inverter cannot connect to the grid if it is reconnecting due to a fault and the grid frequency is higher than the Upper Frequency.

	Frequency	
11	Lower Frequency	The inverter cannot connect to the grid if it is reconnecting due to a fault and the grid frequency is lower than the Lower Frequency.
12	Observation Time	The waiting time for connecting the inverter to the grid when meeting the following requirements. 1. The inverter is reconnecting to the grid due to a fault. 2. The utility grid voltage and frequency meet certain requirements.
13	Reconnection Load Slope Enable	Enable the start-up slope function.
14	Reconnection Gradient	In some countries/regions, set the percentage of incremental output power per minute when the inverter is not powered on for the first connection. For example, setting it to 10 means the reconnection slope is 10% Prated/min.

Fault Ride Through

Step1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage All-in-one Cabinet” > “Safety Parameter Settings” > “Fault Ride Through”.

Step 2: Set the parameters based on actual needs.

No.	Parameters	Description
1	Current Distribution Mode	Set the current distribution mode. Supported modes: Reactive Power Priority Mode, Active Power Priority Mode, Constant Current Mode.
2	Active Power Recovery Mode After Crossing	Set the active power recover mode after LVRT or HVRT. Supported modes: Disabled, Slope Scheduling, First-Order Low-Pass Filter.
3	Power Change Gradient	Implement active power dispatch based on the power change slope.
4	First-order Low-pass Filter Time Parameter	Set the time constant within which the active power changes based on the first order LPF curve.
5	Reactive Power Recovery Mode After Ride-Through	Set the reactive power recovery mode after the completion of Low-Voltage Ride-Through (LVRT) or High-Voltage Ride-Through (HVRT). Supported modes: Disabled, Slope Scheduling, First-Order Low-Pass Filter.
6	Power Change	Recover reactive power dispatch based on the power change slope.

	Gradient	
7	First-order Low-pass Filter Time Parameter	Set the time constant within which the reactive power changes based on the first order LPF curve.

Fault Ride-Through Mode (LVRT)

LVRT (Low-Voltage Ride-Through): Refers to the requirement that the inverter shall not disconnect from the grid immediately but shall maintain grid connection and provide support for a certain period when the grid experiences a short-term low voltage due to an abnormality.

段时间。

Go to "Device Maintenance">"Parameter Settings" > "Energy Storage All-in-one Cabinet">”Safety Parameter Settings”>“Fault Ride-Through (LVRT) Mode”.

Step 2: Set the parameters based on actual needs.

No.	Parameters	Description
1	Enable LVRT	Enable LVRT Function
2	UVn Voltage	The ratio of the ride through voltage to the rated voltage at UVn point during LVRT. n=1,2,3,4,5,6,7.
3	UVn Time	The ride through time at UVn point during LVRT. n=1,2,3,4,5,6,7.
4	Enter LVRT Threshold	When the grid voltage is between the low penetration threshold and the exit low penetration threshold, the inverter does not immediately disconnect from the grid.
5	Exit Low Penetration Threshold	
6	Slope K1	K-factor for reactive power during LVRT.
7	Enable Zero Current Mode	When enabled, the system outputs zero current during low-voltage ride-through.
8	Entry Threshold	The threshold for entering zero current mode.

Fault Ride-Through Mode (HVRT)

HVRT: With HVRT on, the inverter will stay connected with the utility grid after a short-term utility grid high voltage exception occurs.

Go to "Device Maintenance">"Parameter Settings" > "Energy Storage All-in-one Cabinet">”Safety Parameter Settings”>“Fault Ride-Through (HVRT) Mode”.

Step 2: Set the parameters based on actual needs.

No.	Parameters	Description
1	Enable HVRT	Enable HVRT Function
2	OVn Voltage	The ratio of the ride through voltage to the rated voltage at OVn point during HVRT. n=1,2,3,4,5,6,7.
3	OVn Time	The ride through time at OVn point during HVRT. n=1,2,3,4,5,6,7
4	Enter High Voltage Ride-Through Threshold	When the grid voltage is between the high penetration threshold and the exit high penetration threshold, the inverter does not immediately disconnect from the grid.
5	Exit High Voltage Ride-Through Threshold	
6	Slope K2	K-factor for reactive power during HVRT.
7	Enable Zero Current Mode	The system outputs zero current during high-voltage ride-through.
8	Entry Threshold	The threshold for entering zero current mode.

Frequency Fault Ride-Through

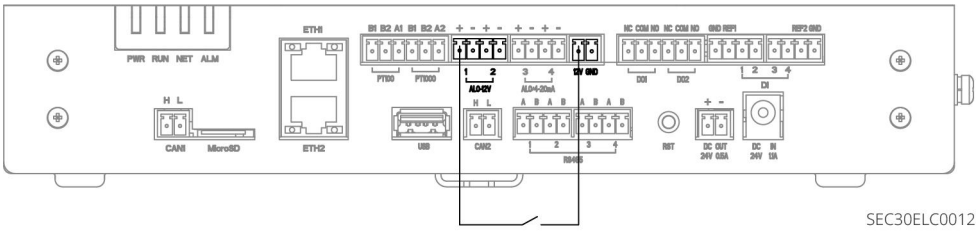
Step1: Go to “Device Maintenance” > “Parameter Settings” > “Energy Storage All-in-one Cabinet” > “Safety Parameter Settings” > “Frequency Fault Ride Through”.

Step 2: Set the parameters based on actual needs.

No.	Parameters	Description
1	Frequency Hopping Enabled	Enable frequency hopping function.
2	UFn Frequency	The frequency at the UFn point during frequency ride through. n=1,2,3.
3	UFn Time	The ride through duration at the UFn point during frequency ride through. n=1,2,3.
4	OFn Frequency	The frequency at the OFn point during frequency ride through. n=1,2,3.
5	OFn Time	The ride through duration at the OFn point during frequency ride through. n=1,2,3.

8.7. Setting Remote Shutdown Parameters

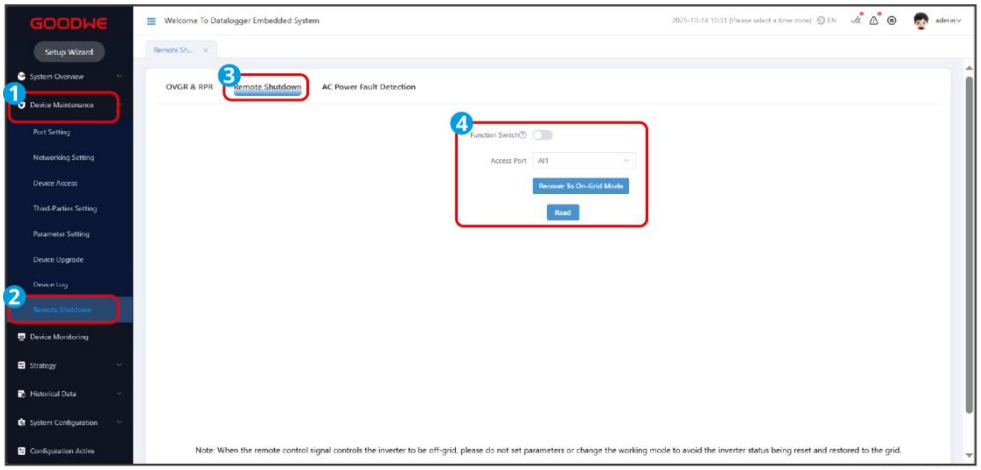
In accordance with the requirements of certain countries or regions, if the one-click shutdown function needs to be implemented, connect the protection device to the AI1+ or AI2+ port and the 12V power output port of the control box.



SEC30ELC0012

Step 1: Go to "Device Maintenance" > "Remote Shutdown" > "Remote Shutdown".

Step 2: Set remote shutdown access port and port status according to actual requirements.



SEC30CCON0056

No.	Parameters	Description
1	Function Switch	Enable or disable Remote Shutdown.
2	Access Port	Set according to the actual port connected to the control box. Supported ports: AI1 or AI2.
3	Resume On-Grid	If you need to resume the On-grid state after the device is OFF, tap "Resume On-Grid Immediately".

8.8. Setting Control Strategy

8.8.1. Setting Operation Mode Parameters

NOTICE
Currently, only the operating modes of hybrid inverters or all-in-one energy storage cabinets are supported for configuration.

8.8.1.1. Setting Working Mode of Hybrid Inverters

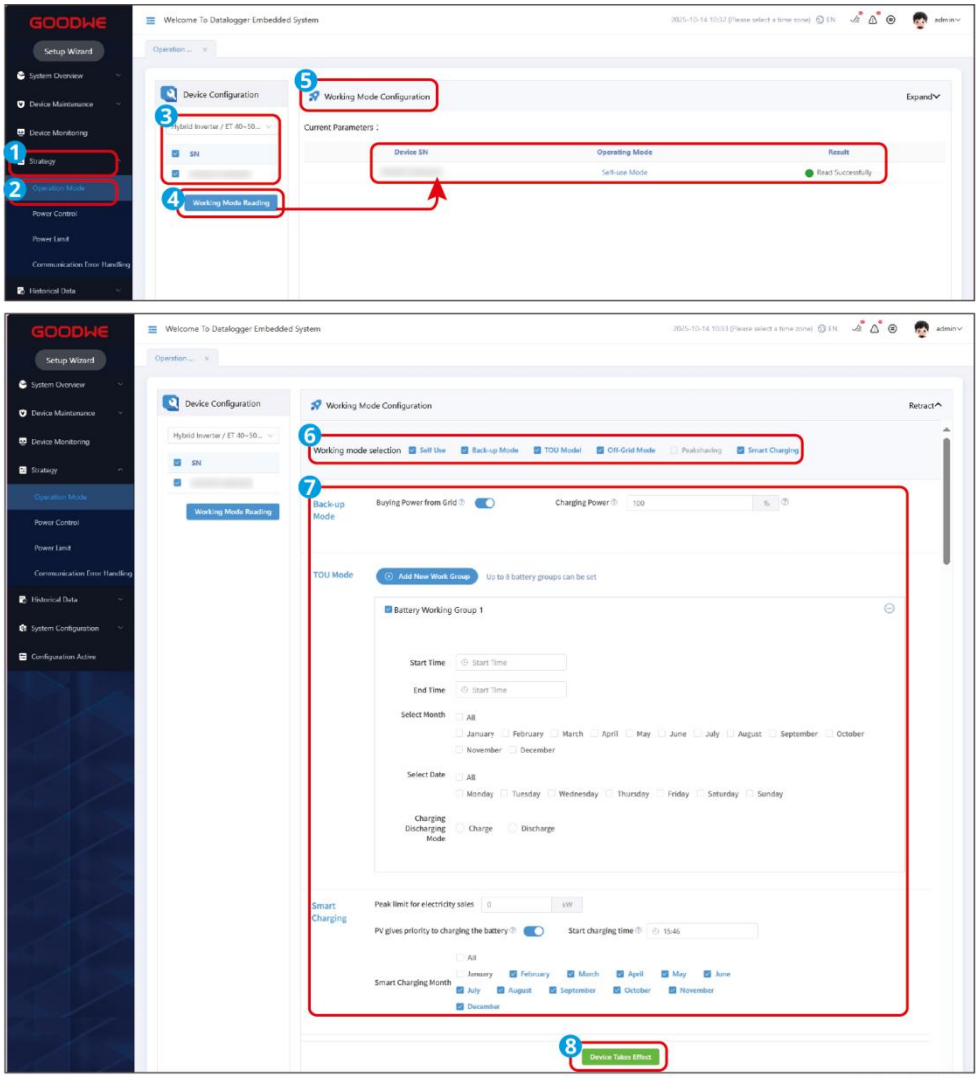
NOTICE
Set Working Mode of the hybrid Inverter.

Step 1: Go to "Strategy" > "Operation Mode“.

Step 2: Tick the inverter SN and click ”Working Mode Read” to view curren working mode.

Step 3: Click ”Working Mode Configuration” to set the working mode according to actual needs.

Step 4: After completing the settings, click "Configuration Activate"



SEC30CCON0057

Parameters	Description
Self-use mode: When setting this working mode, on the basis of self-use mode, back-up mode, economic mode, and smart charging mode can be enabled at the same time. Priority: Back-up mode > TOU mode > Smart charging mode > Self-use mode.	
Back-up mode: The back-up mode is mainly applied to the scenario where the grid is unstable. When the grid is disconnected, the inverter turns to off-grid mode and the battery will supply power to the BACKUP loads; when the grid is restored, the inverter switches to on-grid mode.	
Buying Power from Grid	To allow power purchasing from the utility grid.
Charging Power	The percentage of the purchasing power to the rated power of the inverter.
Smart charging: In some countries/regions, the PV power feed into the utility grid is limited. Select Smart Charging to charge the battery using the surplus power to minimize PV power waste.	
Peak Power Sales Limit	Set the Peak Power Sales Limit in compliance with local laws and

	regulations. The peak power limit must be lower than the local specified output power limit.
PV Prioritizes Charing Battery	Within the charging time range, photovoltaic power generation is prioritized for charging the battery.
Smart Charging Month	Set the smart charging months. More than one month can be set.
TOU Mode: It is recommended to use TOU mode in scenarios when the peak-valley electricity price varies a lot. Select TOU mode only when it meets the local laws and regulations. Select TOU mode only when it meets the local laws and regulations. Set the battery to charge mode during Vally period to charge battery with grid power. And set the battery to discharge mode during Peak period to power the load with the battery.	
Start Time	Within the Start Time and End Time, the battery is charged or discharged according to the set Battery Mode as well as the Rated Power.
End Time	
Select Months	Set the months for the economic mode as needed; multiple months can be selected.
Select Date	Set the dates for the economic mode as needed; multiple dates can be selected.
Charge/Discharge Mode	• Charge or discharge according to actual needs. • The percentage of the charging power to the inverter rated power and charge cut-off SOC in charge mode. • The percentage of discharging power to the rated power of the inverter in discharge mode.
Peak shaving mode: Peak shaving mode is mainly applicable to peak power limited scenarios. When the total power consumption of the load exceeds the power consumption quota in a short period of time, battery discharge can be used to reduce the power exceeding the quota.	
Time Period for Purchasing Electricity and Charging	The utility grid will charge the battery between Start Time and End Time if the load power consumption do not exceed the power quota. Otherwise, only PV power can be used to charge the battery.
Time Period for Purchasing Electricity and Charging	
Peak Power Purchase Limit	Set the maximum power limit allowed to purchase from the grid. When the loads consume power exceed the sum of the power generated in the PV system and Peak Power Purchase Limit, the excess power will be made up by the battery.

Reserved SOC For Peakshaving	In Peak Shaving mode, the battery SOC should be lower than Reserved SOC For Peakshaving. Once the battery SOC is higher than Reserved SOC For Peakshaving, the peak shaving mode fails.
Off-grid mode: Suitable for areas without a power grid. Store PV-generated power in the battery to supply loads when PV generation is insufficient or unavailable at night.	

8.8.1.2. Setting EMS Working Mode of the Energy Storage All-in-one Cabinet

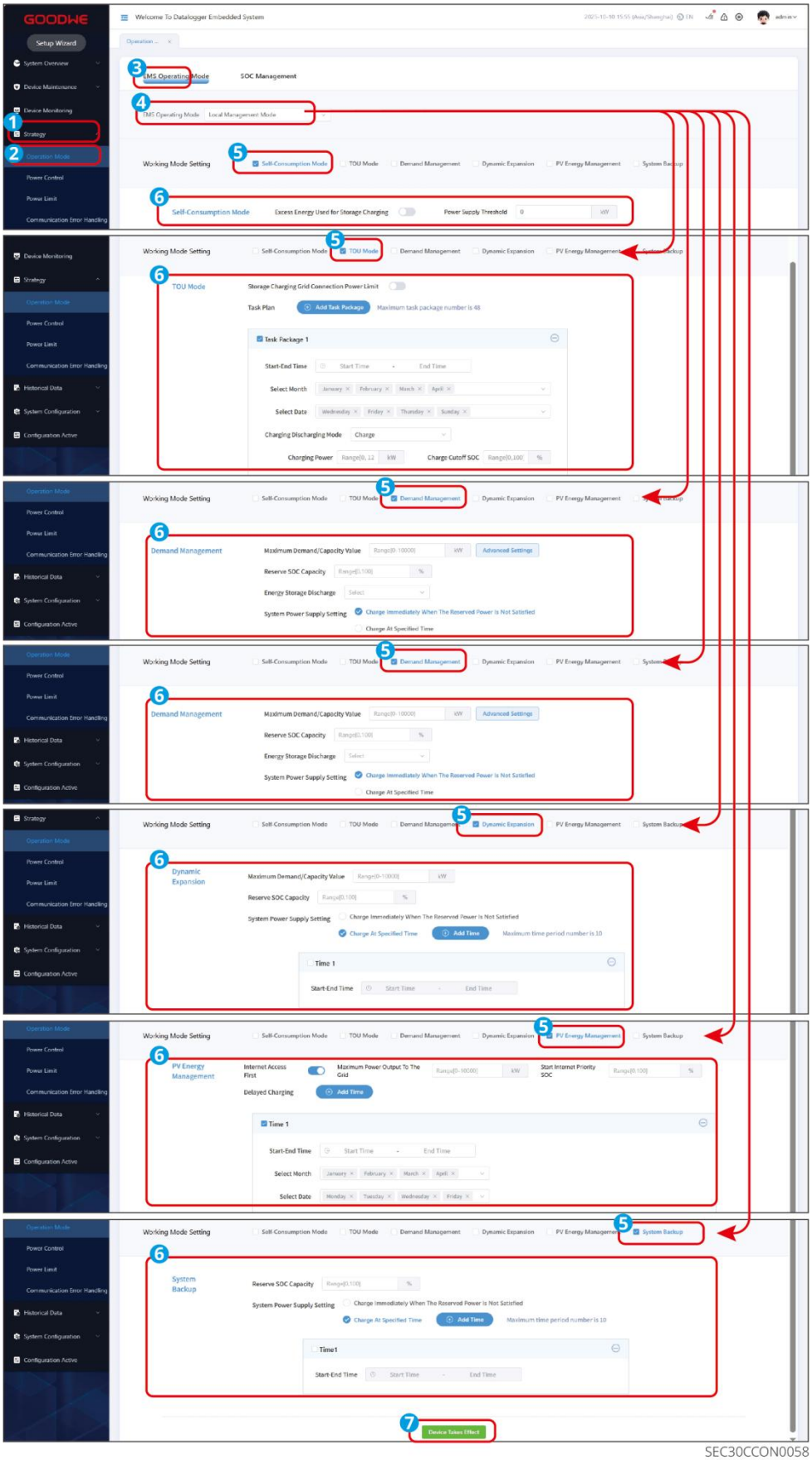
NOTICE
● Set EMS Working Mode of SEC3000C. After configuration, the energy storage cabinet is dispatched in accordance with the SEC3000C, requiring no separate setting of the working mode. ● Priority: System Backup > Power limit > Power Adjustment > Demand Management > PV Energy Management > TOU Mode/Self-Consumption Mode

Step 1: Go to "Device Maintenance" > "Strategy" > "Operating Mode".

Step 2: Set the EMS working mode to "Local Management Mode". In this mode, the control strategy for the energy storage system's operation is not subject to third-party dispatch control.

Step 3: Configure the specific operating mode based on actual requirements.

Step 4: After completing the settings, click "Configuration Activate"



SEC30CCON0058

Parameters	Description

Self-Consumption Mode: applicable to regions with high electricity prices and low or no feed-in tariff subsidies. The power generated by the PV system supply the loads in priority; the excess power will charge the batteries, and then the remaining power will be sold to the utility grid. When photovoltaic power generation fails to meet the load demand, the energy storage system discharges to supply power to the load.	
Surplus electricity is used for charging the energy storage system.	After enabling, the surplus electricity from photovoltaic power generation (after meeting the load demand) will be used to charge the energy storage system. Disabled by default.
Power Supplement Threshold	• When the combined power supply from photovoltaic generation and the energy storage system is insufficient for the load, electricity needs to be purchased from the grid. Set the upper limit for electricity purchased from the grid based on actual requirements. If the purchased electricity exceeds the power supplement threshold, the system will continue to purchase electricity but trigger an alarm. • Default value: Unlimited.
TOU Mode: It is recommended to use TOU mode in scenarios when the peak-valley electricity price varies a lot. Select TOU mode only when it meets the local laws and regulations. Example: During off-peak price periods, set the energy storage system to charging mode to purchase electricity from the grid for charging; during peak price periods, set it to discharging mode to supply power to the load via the battery.	
On-Grid Export Power Limit for Energy Storage	• Set the export power limit for electricity purchased from the grid to charge all electrical devices (e.g., load, battery). Configure reasonably based on photovoltaic power generation capacity and load consumption. • Default value: Unlimited.
End Time	Within the Start Time and End Time, the battery is charged or discharged according to the set Battery Mode as well as the Rated Power.
Select Months	Set the months for the economic mode as needed; multiple months can be selected.
Select Date	Set the dates for the economic mode as needed; multiple dates can be selected.
Charge/Discharge Mode	Charge or discharge according to actual needs.
Charging/Discharging Power	Power during charging or discharging.
Charging/Discharging	Charging/discharging stops when the battery SOC reaches the set value.

Cut-off SOC	
• Demand Management/Dynamic Expansion: mainly applicable to scenarios where the peak power for electricity purchase is limited. When the total power consumption of the load exceeds the power consumption quota in a short period of time, battery discharge can be used to reduce the power exceeding the quota. • Support setting cross-transformer sub-demand via Demand Management > Advanced Settings to protect the transformer.	
Maximum Demand/Capacity Value	Set the maximum power limit allowed to purchase from the grid.
Reserved SOC Capacity	When the system's consumption exceeds the maximum demand/capacity value, the energy storage system starts discharging to supply the load. Set the reserved SOC capacity value to ensure the energy storage system has sufficient power to meet demand requirements.
System Power Supply Setting	When the energy storage system's SOC is lower than the reserved SOC capacity, it needs to be charged to above the set value. Supports: • Immediate charging when SOC is below the reserved capacity • Scheduled charging
PV Energy Management: In compliance with local laws and regulations, when photovoltaic power generation is sufficient, the surplus electricity can be set to feed into the grid.	
Grid Feed-Priority Mode	• After enabling, when the photovoltaic power generation exceeds the load demand, the surplus electricity is preferentially fed into the grid. After the output power reaches the maximum grid feed power, the excess electricity charges the energy storage system. • Applicable to scenarios where the FIT (Feed-in Tariff) is higher than the electricity consumption tariff, and the grid cannot charge the energy storage system.
Maximum Grid Feed Power	When the grid feed-priority mode is enabled, it is necessary to set the maximum power limit for electricity fed into the grid.
SOC Priority for Activating Grid Feed	When the battery SOC is lower than this threshold, the battery is charged preferentially.
Smart Charging	• After enabling grid feed-priority: If the current time is within the delayed charging period, the surplus PV energy is preferentially fed into the grid; after reaching the maximum grid feed power, the

	remaining energy charges the energy storage system. ● If the current time is not within the delayed charging period, the surplus PV energy can only be fed into the grid, and the energy storage system will not be charged. If the maximum grid feed power is exceeded, the photovoltaic power generation will be curbed.
System Backup: When the grid is operating normally, the energy storage system reserves electricity to discharge and supply power to the load in the event of a grid outage.	
Reserved SOC Capacity	The energy storage system's SOC must be higher than the reserved SOC capacity. Discharging shall stop when the SOC reaches the set value. If the energy storage system's SOC is lower than the reserved SOC capacity, it shall be charged via the grid or photovoltaic power generation.
System Power Supply Setting	When the energy storage system's SOC is lower than the reserved SOC capacity, it needs to be charged to above the set value. Supports: ● Immediate charging when SOC is below the reserved capacity ● Scheduled charging

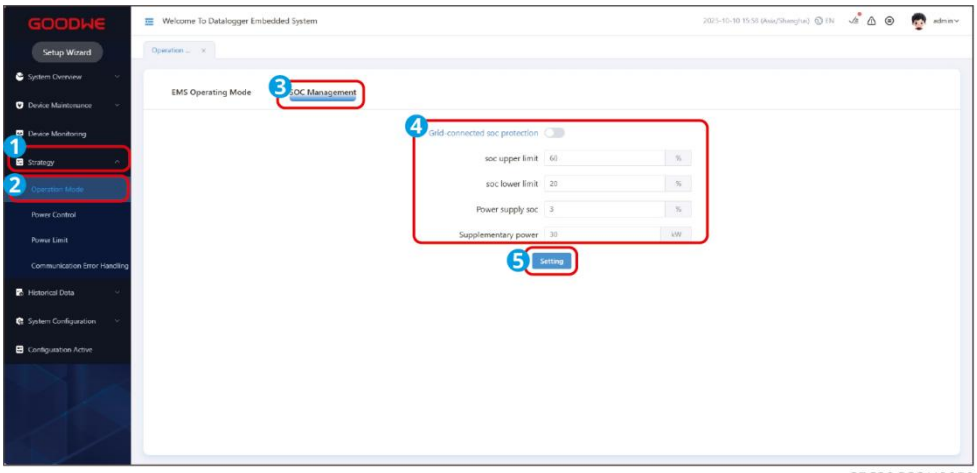
8.8.1.3. Managing SOC Protection of the Energy Storage All-in-one Cabinet

NOTICE
The SOC management function is enabled by default.

Step 1: Go to "Device Maintenance" > "Strategy" > "Operation Mode" > "SOC Management".

Step 2: Enable the "Grid-connected SOC Protection" function according to actual needs and set the SOC value.

Step 3: After completing the settings, click “Setting”.



SEC30CCON0059

No.	Parameters	Description
1	SOC Upper Limit	The battery stop charging once the battery SOC reaches the set value. Default value: 95%.
2	SOC Lower Limit	The battery stop charging once the battery SOC reaches the set value. Default value: 5%.
3	Power Supply SOC	Set the SOC according to actual needs. The system will start charging after naturally discharging to the set value to ensure no complete power depletion. Default value: 3%.
4	Supplement Power	When the battery SOC drops to the Power Supply SOC, it will charge the battery at the supplement power. Default value: 30kW.

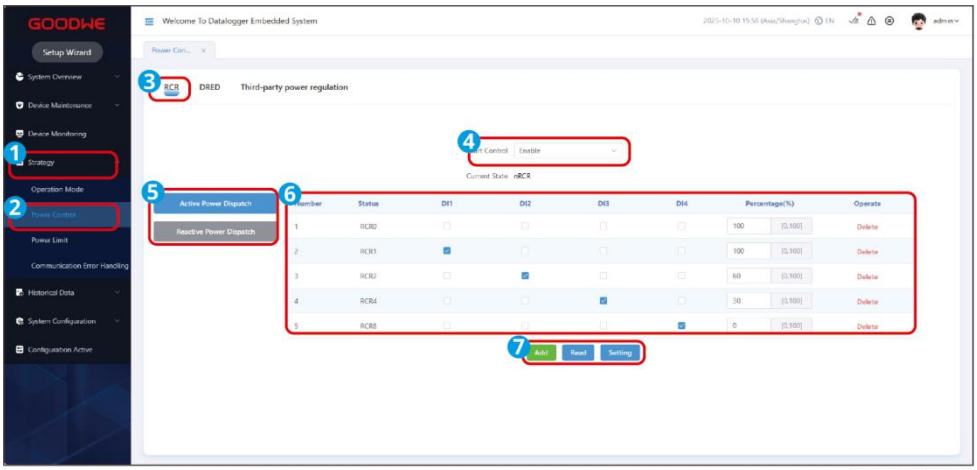
8.8.2. Setting Power Adjustment Parameters

8.8.2.1. Setting RCR Parameters

- The standards of German and other regions require that the inverter must provide signal controlling port for RCR (Ripple Control Receiver), which can be used for grid scheduling.
- To implement the RCR function, connect the RCR device to the DI1/DI2/DI3/DI4/REF1 ports of the built-in data collector in the control box to achieve active power derating, or connect it to the DI1/DI2/DI3/DI4/REF2 ports to achieve reactive power dispatching.

Step 1: Go to "Strategy" > "Power Control" > "RCR".

Step 2: Set the RCR parameters according to actual needs.



SEC30CCON0060

No.	Parameters	Description
1	Start Control	Enable or disable RCR.
2	Current Status	● Indicates current RCR running status. For instance, RCR1 (100) represents the operating state as RCR1, and the power feeding to the grid is 100% of the rated power. ● nRCR indicates that the operating status is inactive.

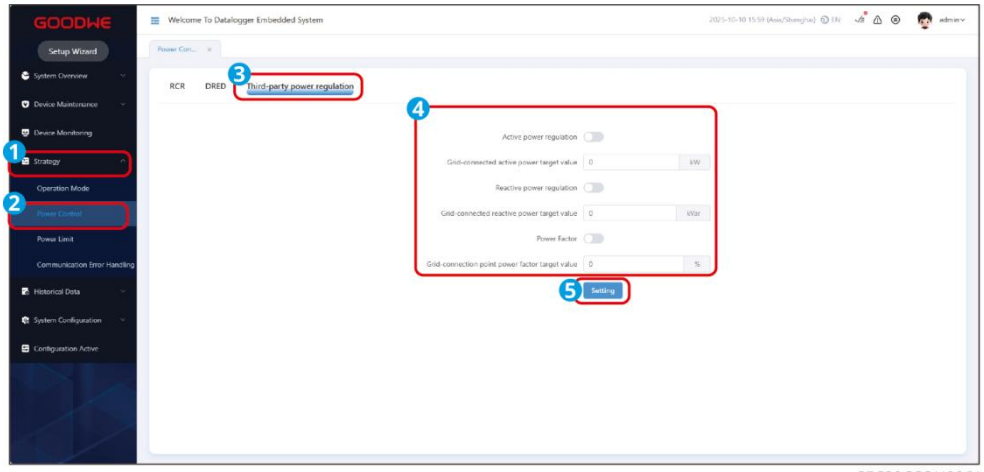
3	Active Dispatch Mode	• Select one or more DI ports based on the requirements of the grid company and the type of RCR fixture, and set the corresponding percentage. The percentage refers to the ratio of the system's output power to its rated power (expressed as a percentage). • Support for configuring 16 percentage levels. Set according to the actual needs of the grid company. • Do not repeat the state combinations of DI1-DI4. Otherwise the function will not execute properly. • If the actual wiring of the connected DI port does not match the web configuration, the operating state will not be effective.
4	Reactive Scheduling	• Select one or more DI ports based on the requirements of the grid company and the type of RCR fixture, and set the corresponding PF value. • Support for configuring 16 power factor levels. Set according to the actual needs of the grid company. • The PF value range is required to be: [-100, -80] or [80, 100]. [-100, -80] corresponds to a lagging power factor between [-0.99, -0.8], and [80, 100] corresponds to a leading power factor between [0.8, 1]. • Do not repeat the state combinations of DI1-DI4. Otherwise the function will not execute properly. • If the actual wiring of the connected DI port does not match the web configuration, the operating state will not be effective.

8.8.2.2. Setting Third-Parties Power Control Parameters

Set the active or reactive power output parameters of the grid connection point according to the third-party dispatching requirements.

Step 1: Go to "Strategy" > "Power Control" > "Third-Party Power Regulation".

Step 2: Set parameters according to actual needs.



SEC30CCON0061

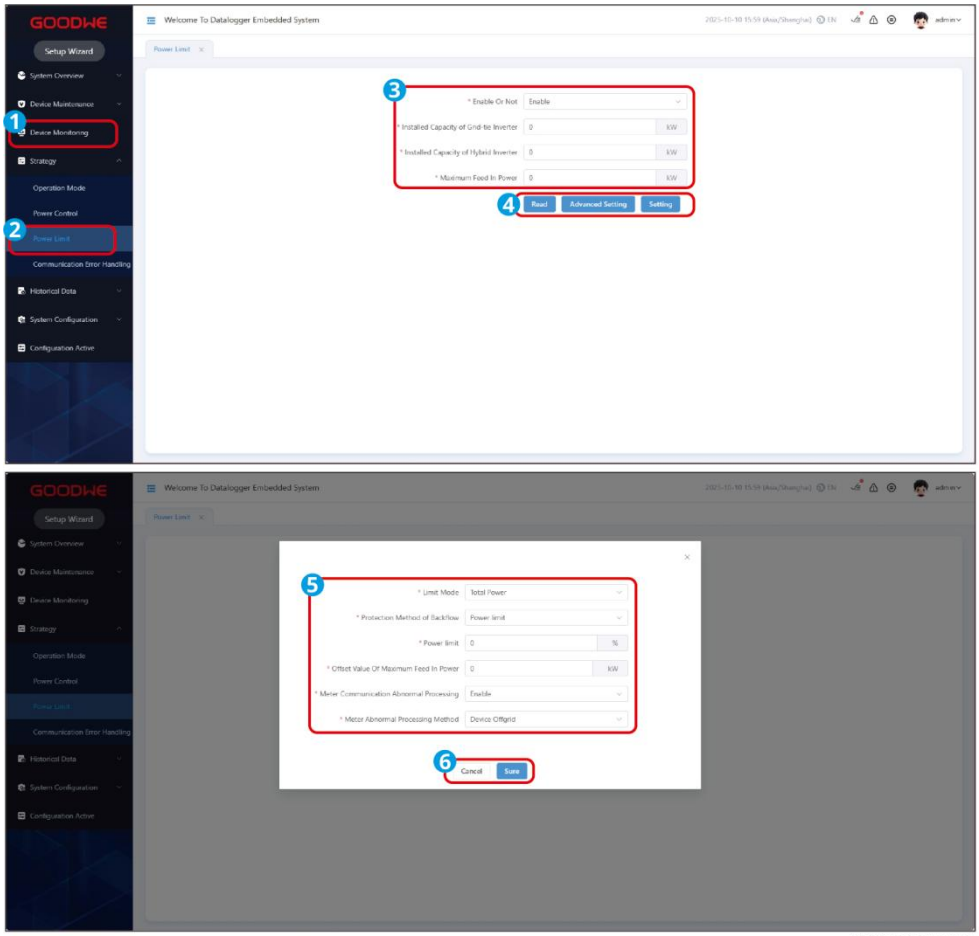
No.	Parameters	Description
1	Active Power Regulation	Set the active power output to a fixed target value according to the third-party dispatching requirements.
2	Grid-connected Active Power Target Value	Active Power Target Value of the Grid Connection Point
3	Reactive Power Regulation	Set the active power output to a fixed target value according to the third-party dispatching requirements
4	Grid-connected Reactive Power Target Value	Reactive Power
5	Power Factor	Set the power factor of the entire photovoltaic (PV) system.
6	Grid-connected Point Power Factor Target Value	Grid-connected Point Power Factor Target Value

8.8.3. Setting the Export Power Limit Parameter

When all loads in a photovoltaic system are unable to consume the electricity generated by the system, the remaining electricity is fed into the utility grid. By configuring on-grid power limit parameters, the power fed into the grid can be controlled.

Step 1: Go to "Strategy" > "Power Limit“.

Step 2: Set power limit parameters according to actual needs.



SEC30CCON0062

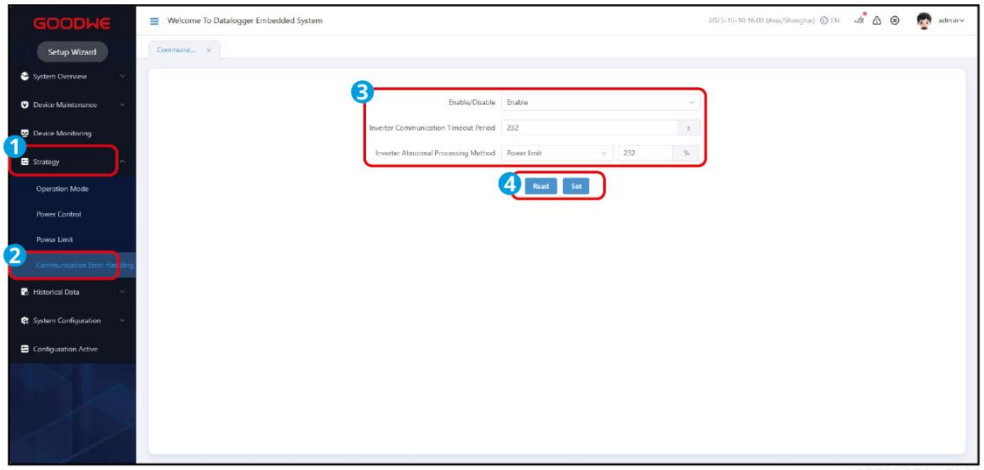
No.	Parameters	Description
1	PV Inverter Installed Capacity	Set the total capacity of all grid-tied inverters in the system.
2	Energy Storage Inverter Installed Capacity	Set the total rated capacity of energy storage inverters in the system.
3	Maximum Grid-Feeding Power	Set the value based on the actual maximum power feed into the utility grid in accordance with the requirements of certain countries or regions.
4	Start Control	Enable or disable the on-grid power limit function.
5	Limitation Method	Select the method for controlling the device's output power based on actual conditions. ● Total Power: Control the total power at the on-grid point to not exceed the output power limit. ● Single-Phase Power: Control the power of each phase at the grid-connection point to not exceed the output power limit.
6	Power Limit	When the system has a backflow phenomenon that exceeds the

	Protection Handling Method	maximum protection time (5 seconds by default), the following protection measures can be taken: ● Power Limitation: The device continues to operate at a percentage of its rated power. ● Device Grid Disconnection.
7	Backflow Protection Handling Power Limit	The device continues to operate at a percentage of its rated power.
8	Maximum Grid-Feeding Power	● Set the adjustable range of the maximum power that the device can actually purchase from the power grid. ● Maximum Power Fed to Grid = Maximum Grid-Feeding Power + Maximum Grid-Feeding Power Offset.
9	Smart Meter Communication Abnormality Handling	Enable this function, and protection measures will be taken when there is a communication abnormality between the smart meter and the device.
10	Smart Meter Exception Handling Method	When smart meter communication exception occurs in the system, the following protection measures can be adopted: ● Power Limitation: The device continues to operate at a percentage of its rated power. ● Device Grid Disconnection.
11	Smart Meter Handling Power Percentage	The device continues to operate at a percentage of its rated power.

8.8.4. Setting Communication Error Handling Parameters

Step 1: Go to "Strategy" > "Communication Error Handling".

Step 2: Set the paramters according to actual needs.



SEC30CCON0063

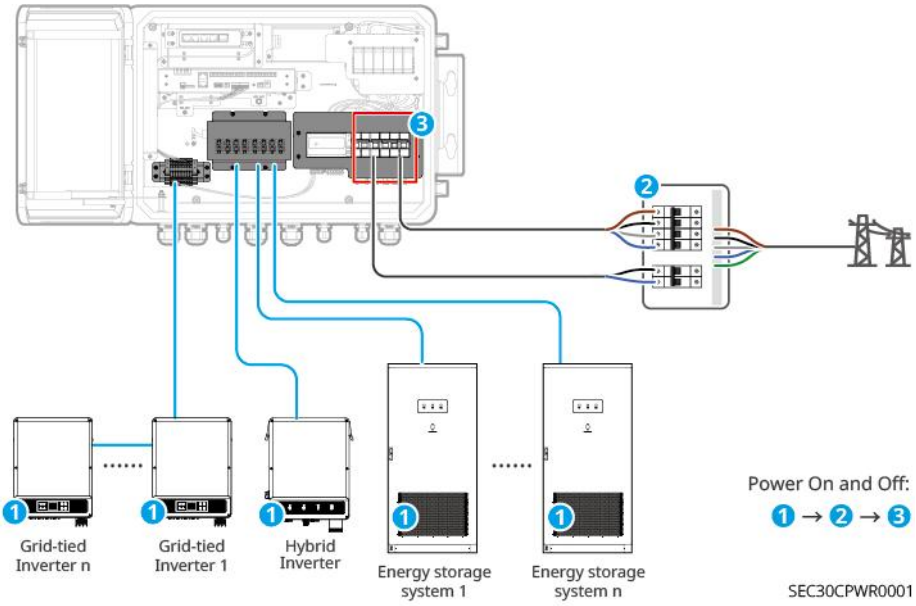
No.	Parameters	Description
1	Enable/Disable	Enable this function, and protection measures will be taken when there is a communication exception between the smart meter and the device.
2	Inverter Communication Timeout Period	When the communication abnormality between the inverter and the control box exceeds the set time, corresponding protection measures will be taken.
3	Inverter Abnormal Processing Method	When a communication abnormality occurs between the inverter and the control box, the following protection measures can be adopted: ● Power Limitation: The device continues to operate at a percentage of its rated power. ● Device Grid Disconnection.

9. System Maintenance

9.1. Power Off the System

DANGER

- Power off the system before operations and maintenance. Otherwise, damages to the equipment or electric shocks may occur.
- After the equipment is powered off, the internal components require some time to discharge. Please wait until the equipment is fully discharged in accordance with the time specified on the label.



9.2. Equipments Removing

DANGER

- Make sure the equipment is powered off.
- Wear proper personal protective equipment before any operations.

Step 1: Disconnect all electrical connections of the device, including the power cable and communication cable.

Step 2: Remove the equipment.

Step 3: Store the inverter properly. If the inverter needs to be used later, ensure that the storage conditions meet the requirements.

9.3. Dispose of the Equipment

If the equipment cannot work any more, dispose of it according to the local disposal requirements for electrical equipment waste. Do not dispose of it as household waste.

9.4. Routine Maintenance

WARNING

- If any issue that may affect the battery or energy storage inverter system is identified, please contact after-sales personnel; do not disassemble the equipment without authorization.
- Contact after-sales service for help if the copper conductor is exposed. Do not touch or disassemble privately because high voltage danger exists.
- In case of other emergencies, contact the after-sales service as soon as possible. Operate following the instructions or wait for the after-sales service personnel.

Maintaining Item	Maintaining Method	Maintaining Routine	Maintaining Purpose
System Cleaning	1. Check whether the heat sinks and air inlets/outlets are free of foreign objects and dust. 2. Check if the installation space meets requirements and if there is any debris around the device.	Once 6 months	Prevent heat dissipation failures.
System installation	1. Check whether the equipment are installed securely and whether the screws are installed tightly. 2. Check whether the equipment is damaged or deformed.	Once 6 months - 12 months	Ensure that the equipment is installed securely.
Electrical Connection	Check whether the cables are securely connected. Check whether the cables are broken, or whether there is any exposed copper core.	Once 6 months - 12 months	Ensure the reliability of electrical connection.

Sealing	Check whether all the terminals and ports are properly sealed. Reseal the cable hole if it is not sealed or too big.	Once a year	Confirm that the machine seal and waterproof performance are intact.

9.5. System Maintenance (WEB)

9.5.1. Upgrade the Device

NOTICE
During the upgrade process, ensure the device remains powered on. A power outage may cause the upgrade to fail.

Upgrading via USB flash drive (only for EzLogger)

NOTICE
Before the upgrade, confirm that only the required upgrade package is stored in the USB drive. If multiple upgrade packages are present, the system will default to reading the first one, which may result in a failed upgrade.

Step 1: Contact after-sales service to obtain the device upgrade package, and prepare a USB flash drive formatted in FAT32 with a capacity not exceeding 32GB.

Step 2: Create a new folder in the root directory of the USB flash drive, name it "collector", and store the device upgrade package in the "collector" folder.

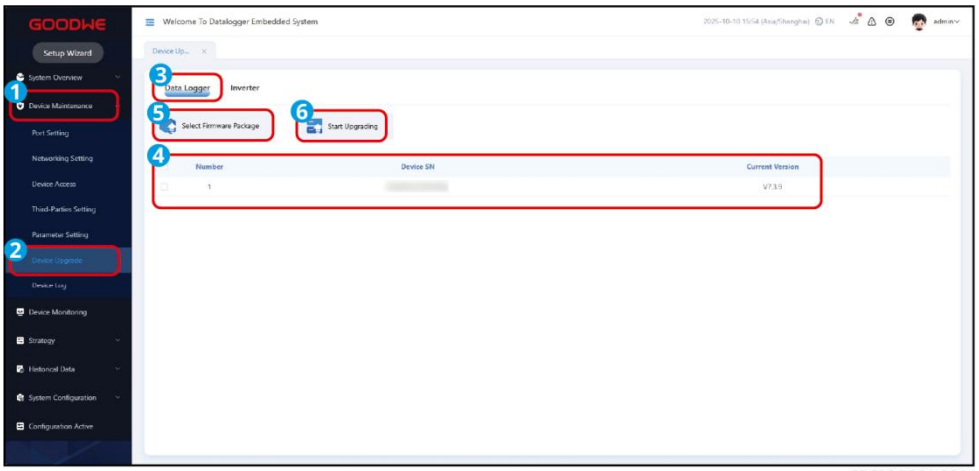
Step 3: Insert the USB drive into the USB interface of the data collector. Once the data collector detects the device upgrade package and starts the upgrade, the fault indicator light will flash rapidly. If the upgrade indicator light does not start flashing rapidly, the upgrade has not begun. Please check the status of the upgrade package and the USB flash drive.

Step 4: After the upgrade is completed, the data collector will restart automatically. Please remove the USB flash drive; otherwise, it may cause repeated upgrades.

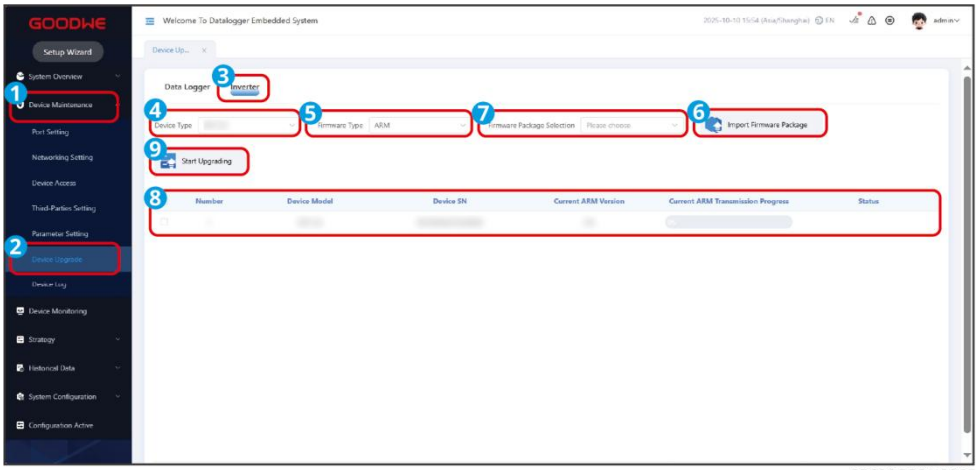
Upgrading via Web

Step 1: Contact after-sales support to obtain the device upgrade package.

Step 2: Save the device upgrade package to the local computer, and upgrade the device in accordance with the following operation instructions.

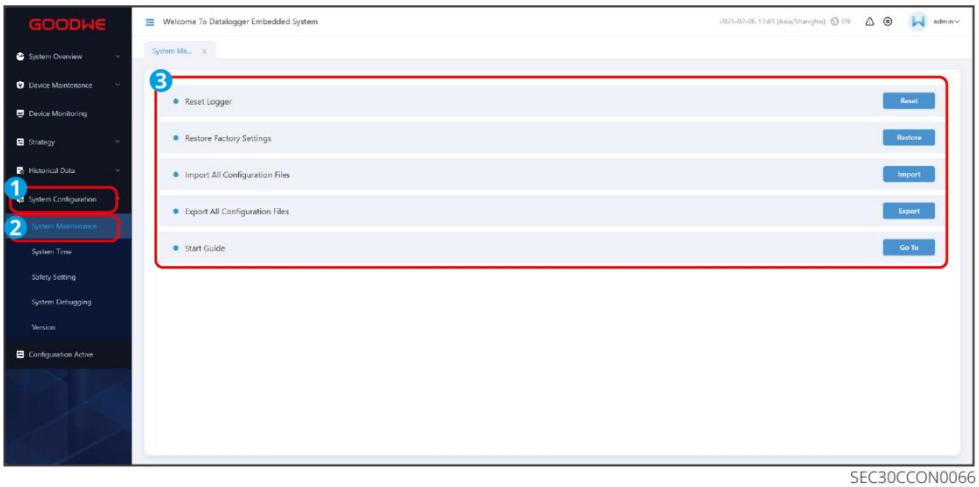


SEC30CCON0064



SEC30CCON0065

9.5.2. Maintain the System



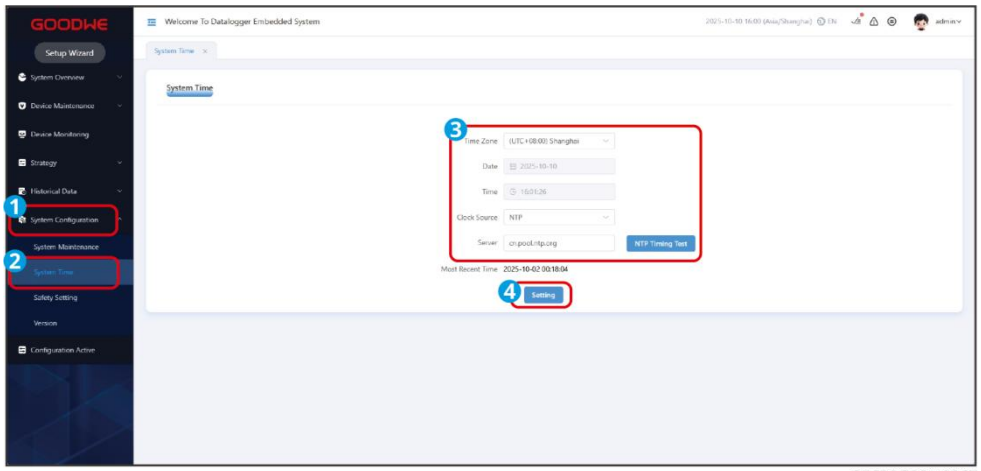
SEC30CCON0066

No.	Parameters	Description
1	Restart Data Collector	Execute a system reset; the data collector built into the control box will automatically shut down and restart.
2	Restore Factory Settings	● Restore Factory Settings: Clear device access information, forwarding configurations, login passwords, and other related data. ● Restore Communication Configuration (Optional): Reset network adapter settings. ● Restore Data Collector Data (Optional): Clear logs, historical alarms, historical data, and other relevant information.
3	Import Full Configuration File	Before replacing the control box or the built-in data collector, export the configuration file of the data collector to a local device.
4	Export Full Configuration File	After replacing the control box or the built-in data collector, import the locally exported configuration file into the new control box or built-in data collector. The data collector will restart automatically after a successful import, and the configuration file will take effect. Verify that the device parameters have been

		configured correctly.

9.5.3. Setting the System Time

NOTICE
Modifying the date and time will affect the integrity of the system's power generation and performance data records. Do not change the time zone or system time arbitrarily.



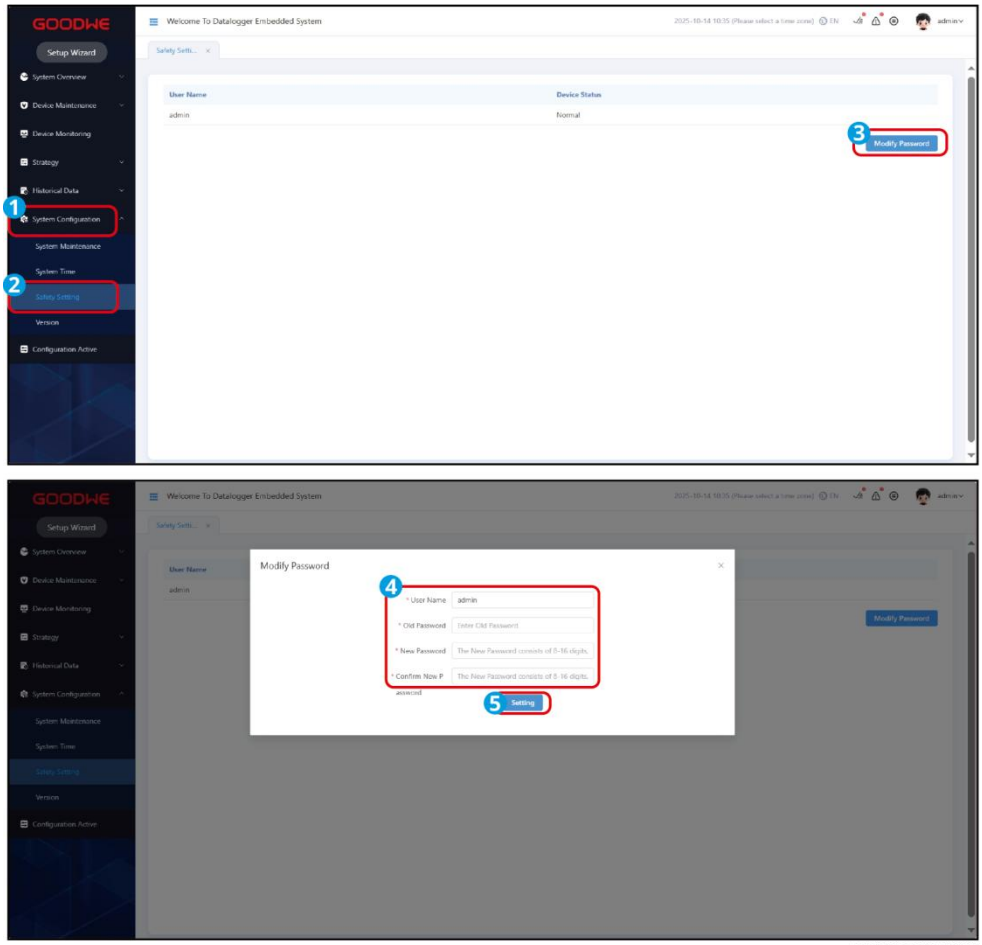
SEC30CCON0067

No.	Parameters	Description
1	Time Zone	Manual modification is only allowed when the clock source is set to Manual Time Synchronization.
2	Date	
3	Time	
4	Clock Source	● Set the clock source. Supported options: NTP, Modbus-TCP, Manual Time Synchronization, GoodWe Cloud Platform Time Synchronization. ● When the SEC3000C+GW125/261-ESA-LCN-G10 is applied in China, set the clock source to NTP.

9.5.4. Change the Login Password

Step 1: Go to "System Configuration" >"Safety Setting".

Step 2: Click "Modify Password", enter the old and new passwords as applicable, and click "Setting".



SEC30CCON0068

9.6. Troubleshooting

Perform troubleshooting according to the following methods. Contact the after-sales service if these methods do not work.

Collect the information below before contacting the after-sales service, so that the problems can be solved quickly.

1. Product information like serial number, software version, installation date, fault time, fault frequency, etc.
2. Installation environment, including weather conditions, whether the PV modules are sheltered or shadowed, etc. It is recommended to provide some photos and videos to assist in analyzing the problem.
3. Grid situation

No.	Troubleshooting	Solutions
1	Data logger indicator not lit after being powered on.	1. Verify if the built-in single-phase circuit breaker of the SEC3000C has voltage (range: 100Vac-240Vac). 2. Whether Single-phase Circuit Breaker is switched on.
2	Meter indicator not lit	1. For three-phase four-wire systems: Verify if the

	after being powered on.	built-in three-phase circuit breaker of the SEC3000C has voltage (line voltage range: 156Vac-480Vac). 2. For three-phase three-wire systems: Inspect the built-in three-phase circuit breaker of the SEC3000C and confirm if L2 and N wires are short-circuited (line voltage range: 156Vac-480Vac). 3. Make sure the three-phase circuit breaker is switched on.
3	Unable to load the WEB page.	1. Check whether web page is visited 1 minute later after the equipment is powered on. 2. Check whether the equipment is correctly connected with and PC via network cables. 3. Check whether the IP address setting is modified to 172.18.0.XXX or automatic access. 4. Clear the cache of the browser page.
4	Device offline displayed on WEB	1. 1.Check if the hybrid inverter is connected to in-built switch's network port via WiFi/ LAN Kit-20. 2. Check whether the inverter is correctly connected to the RS485 communication terminal of the SEC3000C.
5	Smart meter displays abnormal data.	1. Check whether the CT ratio setting in the web interface matches the actual CT ratio in use. 2. Check whether the CT wiring is correct. 3. Three-phase four wire system: ensure that the wiring sequence (N/L1/L2/L3) of the SEC3000C's in-built three-phase circuit breaker is correct. 4. Three-phase three wire system: check the in-built three-phase circuit breaker to make sure whether L2 and the neutral (N) cable are short circuited, and whether the wiring sequence (/L1/L2/L3) is correct.

10. Technical Parameters

Technical Parameters	SEC3000C
Communication	
Max. Inverters Supported	RS485: 60，LAN*[1]: 10
RS-485 Interface	4
Ethernet	2* RJ45, 10/ 100Mbps
4G	Optional
Digital/Analog Input/Output	DI×4, DO×2, AI×4
Configuration	
Data Logger	EzLogger3000C* 1
Switch	15 Ports
Smart meter	GM330* 1
Meter Voltage Measurement Range (Vac)	3L/N/PE: 172~817(line voltage) 3L/PE 100~472(line voltage)
Meter Frequency Measurement Range(Hz)	50/60
Meter Current Measurement Range	nA:5A(200≤n≤5000)
Power Supply	100~240V, 50/60Hz
Power (W)	≤25
Mechanical	
Dimension (W×H×D mm)	575*400*242
Weight (kg)	≤14
Installation Method	Wall Mounting, Bracket Mounting, Pole Mounting
Environment	
Operating Temperature Range (℃)	-30~+60
Storage Temperature Range (℃)	-40~+70

Relative Humidity	0~95%(non-condensing)
Max. Operating Altitude (m)	3000
Ingress Protection Rating	IP65
Anti-corrossion Class	C5M
Certification Compliance	
Certificate	CE-RED (EN18031), RCM

*1.SEC3000C support ET series and ESA 261kWh all in one system.

*2.More certificates available upon request.

11. Appendix

11.1. Abbreviations

Abbreviation	English Description
U_{batt}	Battery Voltage Range
$U_{batt,r}$	Nominal Battery Voltage
$I_{batt,max\ (C/D)}$	Max. Continuous Charging Current Max. Continuous Discharging Current
$E_{C,R}$	Rated Energy
U_{DCmax}	Voltage
U_{MPP}	MPPT Operating Voltage Range
$I_{DC,max}$	Max. Input Current per MPPT
$I_{SC\ PV}$	Max. Short Circuit Current per MPPT
$P_{AC,r}$	Nominal Output Power
$S_{r\ (to\ grid)}$	Nominal Appart Power Output to Utility Grid
$S_{max\ (to\ grid)}$	Max. Appart Power Output to Utility Grid
$S_{r\ (from\ grid)}$	Nominal Appart Power from Utility Grid
$S_{max\ (from\ grid)}$	Max. Appart Power from Utility Grid
$U_{AC,r}$	Nominal Output Voltage
$f_{AC,r}$	Nominal AC Grid Frequcy
$I_{AC,max(to\ grid)}$	Max. AC Currt Output to Utility Grid
$I_{AC,max(from\ grid)}$	Max. AC Currt From Utility Grid
P.F.	Power Factor
S_r	Back-up Nominal apparent power
S_{max}	Max. Output Apparent Power (VA) Max. Output Appart Power without Grid
$I_{AC,max}$	Max. Output Current
$U_{AC,r}$	Nominal Output Voltage
$f_{AC,r}$	Nominal Output Frequency
$T_{operating}$	Operating Temperature Range
$I_{DC,max}$	Max. Input Current
U_{DC}	Input Voltage
$U_{DC,r}$	DC Power Supply
U_{AC}	Power Supply/AC Power Supply
$U_{AC,r}$	Power Supply/Input Voltage Range

$T_{operating}$	Operating Temperature Range
P_{max}	Max Output Power
P_{RF}	TX Power
P_D	Power Consumption
$P_{AC,r}$	Power Consumption
$F_{(Hz)}$	Frequency
$I_{SC\ PV}$	Max. Input Short Circuit Currt
U_{dcmin}-U_{dcmax}	Range of input Operating Voltage
$U_{AC,rang(L-N)}$	Power Supply Input Voltage
$U_{sys,max}$	Max System Voltage
$H_{altitude,max}$	Max. Operating Altitude
PF	Power Factor
THDi	Total Harmonic Distortion of Currt
THDv	Total Harmonic Distortion of Voltage
C&I	Commercial & Industrial
SEMS	Smart Energy Managemt System
MPPT	Maximum Power Point Tracking
PID	Pottial-Induced Degradation
Voc	Open-Circuit Voltage
Anti PID	Anti-PID
PID Recovery	PID Recovery
PLC	Power-line Communication
Modbus TCP/IP	Modbus Transmission Control / Internet Protocol
Modbus RTU	Modbus Remote Terminal Unit
SCR	Short-Circuit Ratio
UPS	Uninterruptible Power Supply
ECO mode	Economical Mode
TOU	Time of Use
ESS	Energy Storage System
PCS	Power Conversion System
SPD	Surge Protection Device
DRED	Demand Response Enabling Device
RCR	Ripple Control Receiver
AFCI	AFCI
GFCI	Ground Fault Circuit Interrupter
RCMU	Residual Current Monitoring Unit

FRT	Fault Ride Through
HVRT	High Voltage Ride Through
LVRT	Low Voltage Ride Through
EMS	Energy Management System
BMS	Battery Management System
BMU	Battery Measure Unit
BCU	Battery Control Unit
SOC	State of Charge
SOH	State of Health
SOE	State Of Energy
SOP	State Of Power
SOF	State Of Function
SOS	State Of Safety
DOD	Depth of Discharge

11.2. Terminology Explanation

Explanation of Overvoltage Categories

Overvoltage Category I: connects to equipment connected to a circuit where measures have been taken to reduce transient overvoltage to a low level;

Category II: applies to fixed downstream equipment. Such equipments include appliances, portable tools, and other household and similar loads. If there are special requirements for the reliability and applicability of such equipment, Voltage Category III shall be adopted.

Category III: For equipment in fixed electrical distribution installations, the reliability and applicability of the equipment must comply with special requirements. Such equipments include switchgear in fixed power distribution devices and industrial equipment permanently connected to fixed power distribution devices;

Overvoltage Category IV: applied to the upstream equipment in the power supply of the distribution device, including measuring instruments and upstream over-current protection devices.

Humid Scenarios Category Definition

Environmental Parameters	Level		
	3K3	4K2	4K4H
Humidity range	0~+40℃	-33~+40℃	-33~+40℃
Temperature range	5%~85%	15%~100%	4%~100%

Overvoltage Category Definition:

Outdoor Inverter: The ambient air temperature range is -25 to +60℃, and it is suitable for environments with pollution degree 3;

Indoor Type II Inverter: The ambient air temperature range is -25 to +40℃, and it is suitable for environments with pollution degree 3;

Indoor Type I Inverter: The ambient air temperature range is 0 to +40℃, and it is suitable for environments with pollution degree 2.

Pollution Class Category Definition

Pollution Degree 1: No pollution or only dry non-conductive pollution;

Pollution Degree 2: In general, there is only non-conductive pollution, but the transient conductive pollution caused by occasional condensation must be taken into account;

Pollution Degree 3: There is conductive pollution, or the non-conductive pollution becomes conductive pollution due to condensation;

Pollution Degree 4: Persistent conductive pollution, such as pollution caused by conductive dust or rain and snow.

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