SUNGROW
Clean power for all

User Manual

Energy Management Controller

EMS300CP

EMS300CP-UEN-Ver22-202509

Contents

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About This Manual

This manual introduces the system in overview, diagram, operation step and examples for you to understand and use this system flexibly and effectively.

The system is referred to as "EMS300CP" hereinafter unless otherwise specified.

Target Group

This manual is intended for:

- Operators
- Managers
- Engineers

How to Use This Manual

This manual is briefly described by using the standard interface as an example. For specific activated functions, refer to the content of the technical agreement or the contract.

Contents may be periodically updated or revised due to the product development. The manual content of subsequent versions of the product may be subject to change. The latest manual can be found at **support.sungrowpower.com** .

Symbols

Important instructions contained in this manual should be followed during installation, operation and maintenance of the product. They will be highlighted by the following symbols.

The symbols listed below may be used in this manual. Please read carefully to make better use of this manual.

⚠ DANGER

Indicates that there is a serious potential danger, which can lead to death or serious injury if not avoided.

⚠ WARNING

Indicates that there is a moderate potential danger, which may lead to death or serious injury if not avoided.

⚠ CAUTION

Indicates that there is a mild potential danger, which may lead to moderate or mild personal injury if not avoided.

NOTICE

Indicates that there is a potential risk, which may cause the equipment to fail to operate normally or cause property damage if not avoided.

Indicates additional information, emphasized contents or tips that may be helpful, e.g. to help you solve problems or save time.

Note

In order to provide customers with the best usage experience, the products and product manuals are always in the process of improvement and upgrade. If the manual received is slightly inconsistent with the product, it may be a result of product version upgrade, and the actual product shall prevail.

The diagrams in this manual are for reference only. The actual product received may differ.

How to Use This Manual

Read this manual carefully before performing operation on the device. Keep the manual in a convenient place for future reference.

The content of the manual will be periodically updated or revised as per the product development. It is probably that there are changes in manuals for the subsequent module edition. If there any mismatch between the product and its manual, the actual product shall govern.

1 System Description

1.1 Introduction

EMS300CP is a Web-based local energy management system (EMS) controller. With a dedicated monitoring software system, it helps to address problems arising from the waste of surplus solar and wind power, unstable loads, and fluctuations in energy prices during peak and off-peak hours. Through optimized energy storage control, distributed power output, and load on/off control, the system enables efficient and cost-effective energy control across diverse application scenarios and operation modes, thus balancing energy supply and demand efficiently.

1.2 Requirements

Item	Requirements
Browser	Chrome 65 or above; 100% zoom
Display	Resolution 1920 x 1080; 100% scale

1.3 Port Introduction

The layout and identifiers of EMS300(Energy Management System) terminals are shown below.

Identifier	Name	Recommended cable	Description
ETH1~ETH2	Ethernet port	-	Can be connected to the background through devices like switch and router.
ETH3~ETH4	Fast dispatch port	-	Reserved function for fast active and reactive power dispatching using the Goose protocol.

Identifier	Name	Recommended cable	Description
ETH5	Ethernet port	-	Reserved for master/standby functions.
DI	Digital Input	0.75mm^{2}outdoor antiultraviolet wire	An interface for receiving binary signals (0 or 1), used to acquire the status of external dry contact switches.
USB	USB port	-	Reserved
Micro SD	SD port	-	Used for software programming (this port is only available to SUNGROW technicians)
Debug	Debug port	-	Used for debugging of EMS300CP
RST	Reset	-	Press and hold (> 30s) to restart EMS300 and restore factory settings Short press (< 3s), function reserved
DO1~DO4	Digital Output	0.75mm^2 outdoor antiultraviolet wire	Passive dry contact (used only for signal output, without providing power). The dry contact switch is controlled by an internal relay, with external specifications of 250VAC/3A and 30VDC/3A.
PT1、PT2 AI1~AI4	Analog input	0.75mm^2 outdoor antiultraviolet wire	• PT100/PT1000 detect range: -30℃~120℃ • Two-wire or three-wire connection method • AI1: 0~10Vdc • AI2-AI4: 4~20mA
A1B1~A7B7	RS485 communication interface	2 x (0.75~1.5)mm^2 outdoor anti-ultraviolet	Support of 7 inputs of RS485 Can be connected to both slave device and background

Identifier	Name	Recommended cable	Description
		twisted pair with a shielding layer	
IRIG-B	Inter-Range Instrumentation Group-Time Code Format B	-	Reserved
CAN	CAN communication port	-	Reserved
DC IN 24V,1.25A	DC24V power supply port	1~1.5mm^{2}Outdoor UV-resistant cable	For currents ≤ 1.25A, the switching power supply used for this port requires reinforced insulation.
AC IN 100–277V,0.48A	AC power supply port	1~1.5mm^2 outdoor antiultraviolet wire	Connecting 100~277Vac (50/60Hz), current≤0.48A
⏚	Grounding hole	1~1.5mm^2 outdoor antiultraviolet wire	Connecting protective grounding cable

AC power supply port

High voltages may be present on the AC power supply port "AC IN 100–277V,0.48A" . Therefore, before cable connection, ensure that the ports are free of voltage and the grounding cable is reliably connected.

Digital input/output ports

Digital input/output ports

RS485 communication ports

For the RS485 communication ports (A1B1~A7B7), the communication distance should be no more than 1,000m.

2 Login Steps

Step 1 Connect the PC to the EMS300CP by using an Ethernet cable.

Step 2 Configure the IP address of the PC to be on the same network segment as the EMS300CP Ethernet ports (ETH1, ETH2, and ETH5). The IP addresses of these Ethernet ports are listed in the table below. For example, the default IP address of ETH1 is 14.14.14.14. Thereby, the IP address of the PC can be set to 14.14.14.X where X cannot be 14, and the subnet mask can be set to 255.255.255.0.

Table 2-1 Controller IP Address

Port	Default IP Address	Virtual IP Address
ETH1	14.14.14.14	15.15.15.15
ETH2	12.12.12.12	16.16.16.16
ETH5	13.13.13.13	17.17.17.17

The above IP addresses are for reference only. The actual ones may be different.

Step 3 Enter the IP address of an Ethernet port in the address bar on the PC to go to the Web interface of the EMS300CP.

Step 4 Click in the upper right corner of the page, and select the desired language.

Step 5 Click **Login**, enter the username and password, then click **Confirm** to log in as an O&M user.

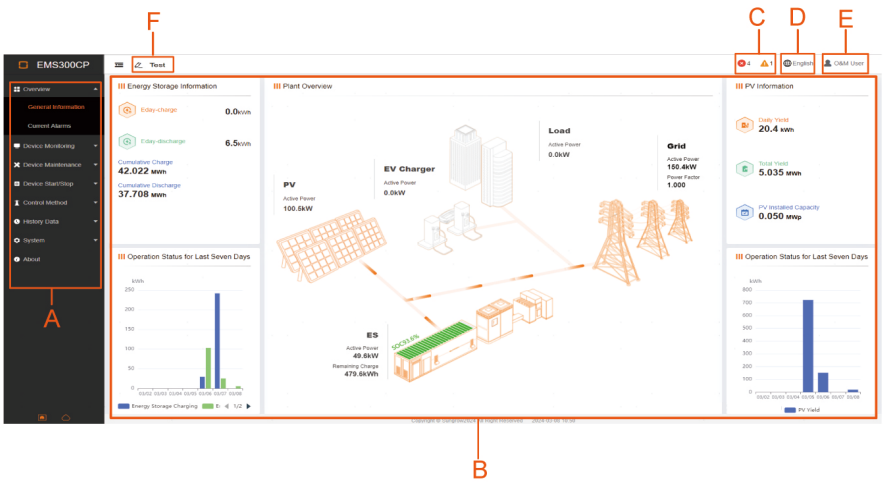
User types include **Ordinary user** and **O&M user**.
The **Ordinary user** can view basic information, real-time faults, and device monitoring information of the system.
The **O&M user** not only has the permissions of the **ordinary user**, but also can set and modify the control strategies and parameters of the system.
This manual provides instructions for the Web system by taking the O&M user as an example.

The default username for the O&M user is “maintain” and the password is “pw1111”.
Please change the password promptly upon first login. To change the password, click **maintain > Change password** and set a new password. The password must be 12 to 32 characters in length and contain at least three of the following four character types: uppercase letters, lowercase letters, numbers, and special characters.
If you forgot your login password, contact Sungrow and provide the S/N and system time of the current device to obtain a dynamic password.

--End

3 Web Main Interface

The following figure shows the Web main interface.



Item	Name	Description
A	Navigation menu	Displays the main functions.
B	Function display area	Displays the function currently queried or parameters currently set.
C	Fault/Alarm	Displays the level and quantity of current system faults and alarms. Click the corresponding value to enter the corresponding interface.
D	Language	Used to switch the language as needed.
E	Username	Displays the current login username.
F	Plant name	Click to edit the name of the plant.

: indicates the connection status of the Ethernet port.

: indicates the cloud access status.

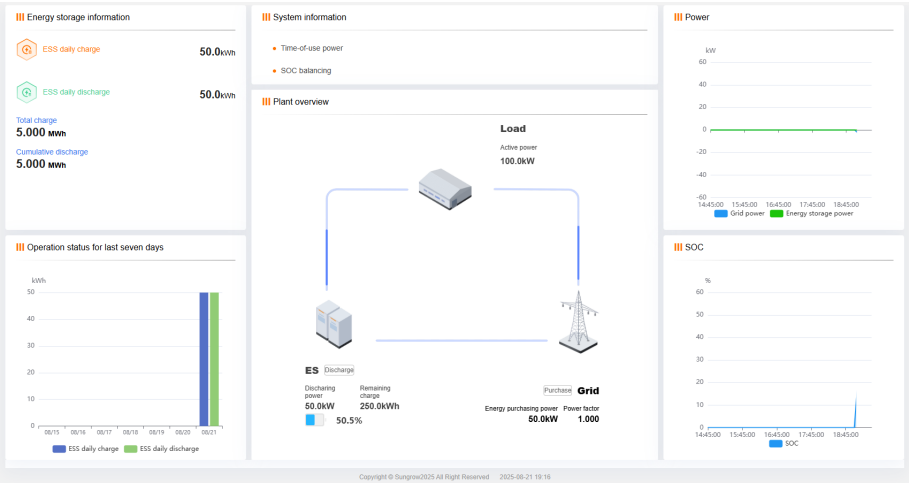
The figure is for reference only. The actual interface may be different and shall prevail.

4 Overview

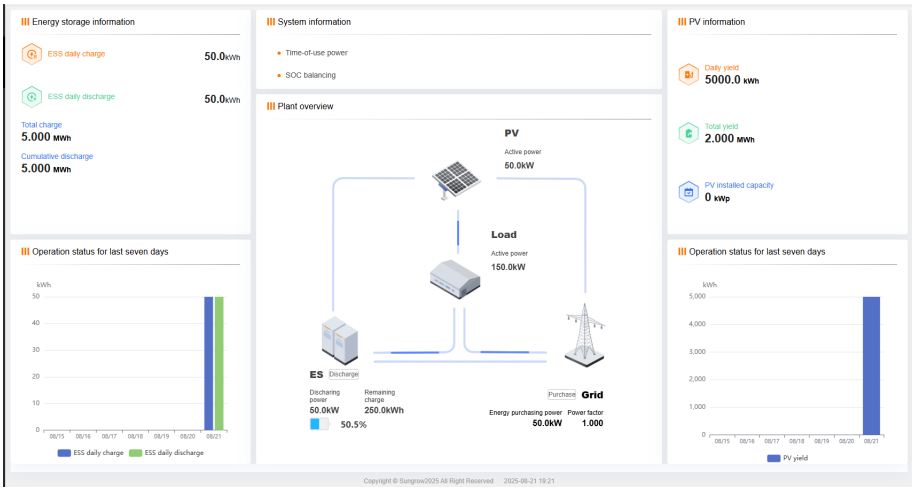
4.1 General Information

Choose **Overview > General Information** to view the real-time operating information of the plant. There are four main scenarios, namely, ESS-only, PV-ESS, PV-ESS-Charging, and PV-ESS-DG.

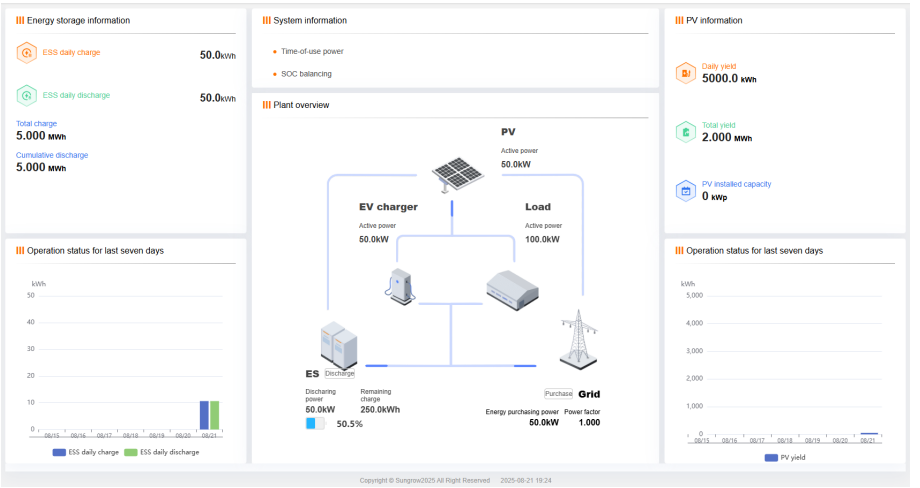
- ESS-only:



- PV-ESS:



- PV-ESS-Charging:



- PV-ESS-DG:

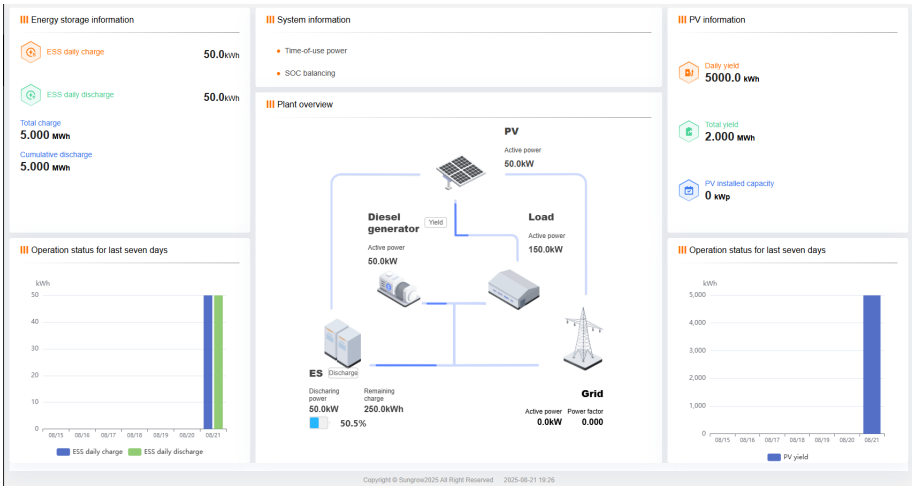


Figure 4-1

The figure is for reference only. The actual user interface may differ.

Charge/Discharge

Daily charged/discharge energy of the energy storage system, and cumulative charged/discharged energy.

Plant Overview

- Load: View real-time active power of the load.
- ES: View the active power and remaining charge.
- Grid: View the active power of the plant.
- PV: View the PV side active power.
- Charger: View the active power.

Operation Status for Last 7 Days

- View the operation data of charging and discharging of energy storage in the last 7 days.
- View the operation data of PV power generation in the last 7 days.

Yield Information

View the daily yield, total yield, and PV installed capacity of the plant.

Power

View grid power and energy storage power.

SOC

View the remaining battery power at each time point.

Energy Storage Information

Daily charged/discharge and cumulative charge/discharge of the ESS.

PV Information

Daily yield, total yield, and PV installed capacity.

4.2 Current Alarms

Click **Overview > Current Alarms**. The fault information of devices can be viewed on this interface, as shown below.

No.	Device Name	Fault Name	Type	Time	Fault ID
1	SC50HV_15	Low System Insulation Resistance	Fault	2022-11-30 15:57:10	32441
2	LC200(192.168.16.141-502-1)	PCS unit fault	Alarm	2022-11-30 15:57:10	32341
3	LC200(192.168.16.111-502-1)	BSC unit alarm	Alarm	2022-11-30 09:35:17	32345

The figure is for reference only. The actual interface may be different and shall prevail.

Click **Fault ID** to view the corresponding solution.

5 Device Monitoring and Maintenance

5.1 Device Monitoring

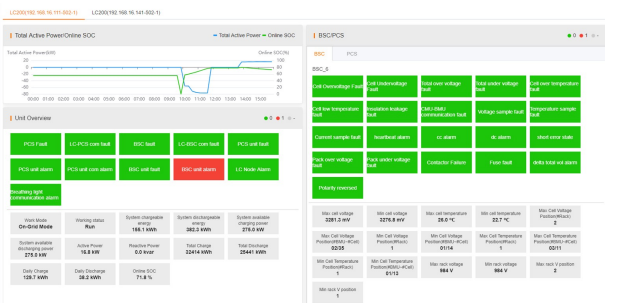
This interface mainly displays detailed working conditions of PV, energy storage and other devices in the plant.

5.1.1 Energy Storage Unit View

This page provides real-time operating information for each energy storage unit.

Procedure

1. Choose **Device Monitoring > Energy Storage Unit View** to view the real-time operating information of a device.



2. Click the tab of a local controller in the upper part of the interface to view the real-time data of the ESS.

   More Operations

   - **One-click recharge**: Click to issue a recharge command to a target energy storage unit.

     - This function also takes effect when **Active recharge** of a target energy storage unit is disabled.
     - The firmware version of EMS300CP must be P024 or later.

   - **Fault reset**: Click to issue a fault recovery command to a target energy storage unit.

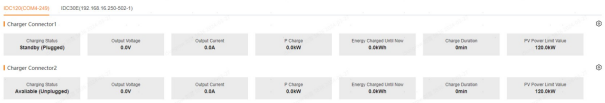
     The local controller and its sub-devices, BSCs and CMUs, require on-site troubleshooting and resolution of the fault cause before the fault recovery takes effect.

5.1.2 Charger Unit View

Users can view the real-time information of each charger here.

Procedure

1. Choose **Device Monitoring > Charger Unit View** to check the real-time information of the chargers.



2. Click a tab of a charger on the screen to view its real-time information.

Users can click and set the below parameters for each charging connector.

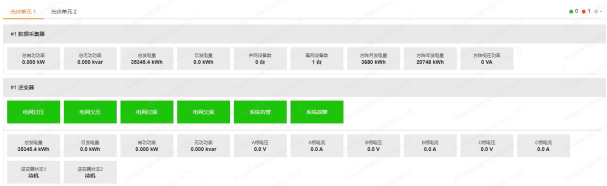
Parameter	Description
Device Start	Turn on to enable the charging connector for use.
Output Power Settings	Set according to the actual situation.

5.1.3 PV Unit View

On this interface users can view the real-time information of the PV unit.

Procedure

1. Click **Device Monitoring > PV Unit View**.



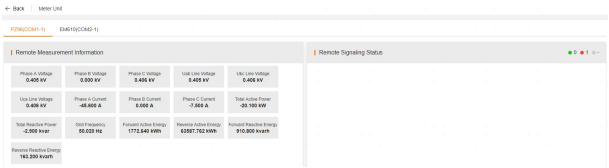
2. Click the tab of a local controller in the upper part of the interface to view the real-time information of the PV unit.

5.1.4 Other Device View

Users can view the remote measurement information and remote signaling status of a meter on this page.

Procedure

1. Click **Device Monitoring > PV Unit View**
2. Click a meter unit to view the remote measurement information and remote signaling status.



5.2 Device List

Click **Device Maintenance > Device List** to enter the corresponding interface.

On this interface users can manage the connected devices.

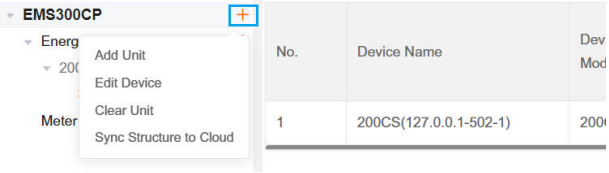
5.2.1 Add Device

5.2.1.1 Add Unit

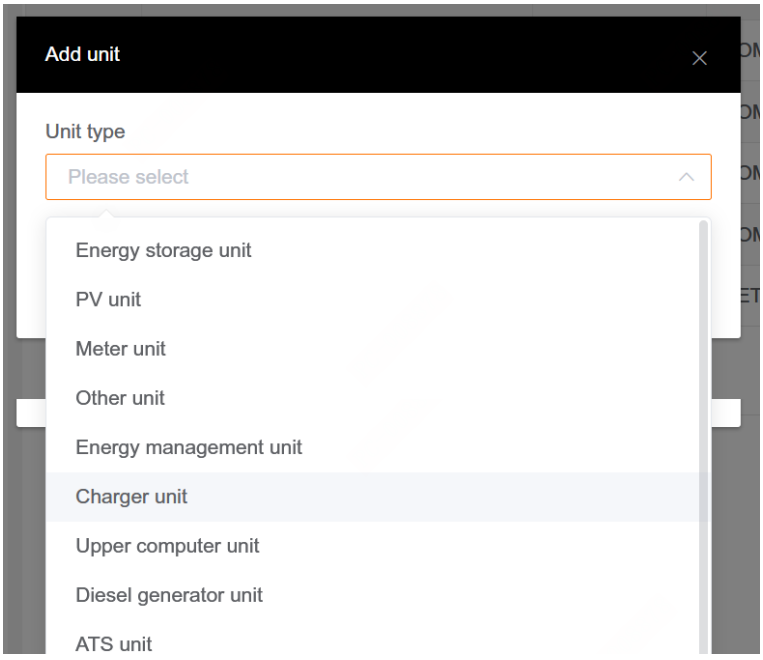
This function is used to create a unit list, into which devices can be added for management. Units are classified into **Energy storage unit**, **PV unit**, **Meter unit**, **Other unit**, **Energy management unit**, **Charger unit**, **Upper computer unit**, **ATS unit**, and **Diesel generator unit**.

Step 1 Choose **Device maintenance > Device list**.

Step 2 Click + on the right side of the plant-level master node EMS300CP.



Step 3 Select **Add unit**. In the pop-up window, select the target unit type from the **Unit type** drop-down list.



Select **Edit device** in the dialog box to modify the name of the plant-level master node.

Step 4 Click **Confirm**.

--End

Click + on the right side of a unit, select **Edit device** to edit the unit name, and select **Delete unit** to delete the unit.

5.2.1.2 Add Data Logger

This function is used to connect data loggers manufactured by Sungrow to the plant.

Prerequisite

A PV unit has been added in the plant system by referring to 5.2.1.1 Add Unit.

Step 1 Click + on the right side of the PV unit and select **Add device**.

Step 2 Select **Data logger** from the **Device type** drop-down list.

Step 3 Select a port. The default port is NET. Configure the following parameters according to actual conditions:

Parameter	Description
Protocol type	The default protocol type is IEC104. It can be switched to MODBUS-TCP.
SSL encryption	This parameter defaults to **Disable** and can be set to **Enable**. When it is enabled, **Certificate file** must be selected. For **Certificate file** management, please refer to 11.3.11 Certificate Management.

<table>
<tr><th colspan="3">Parameter</th><th>Description</th></tr>
<tr><td colspan="3"></td><td>• This parameter is available when Network security mode configuration is enabled and the Protocol type is set to MODBUS-TCP.
• Ensure that the device to be connected is switched to safe mode, and that the actual port settings are consistent with the peer ports in the Networking mode.</td></tr>
<tr><td rowspan="6">Networking mode</td><td rowspan="2">Standalone network</td><td>Peer IP address</td><td rowspan="6">The peer IP address refers to the IP address of the data logger that is connected, and the peer port refers to the port of the data logger. Set this parameter according to actual conditions.</td></tr>
<tr><td>Peer port</td></tr>
<tr><td rowspan="4">Dual network</td><td>Network A peer IP address</td></tr>
<tr><td>Network A peer port</td></tr>
<tr><td>Network B peer IP address</td></tr>
<tr><td>Network B peer port</td></tr>
<tr><td colspan="3">Device model</td><td>Select the actual model of the data logger to be connected.</td></tr>
</table>

Step 4 Click **Save** to save the settings.

--End

5.2.1.3 Add Meter

The system allows you to add multiple meters of different models, including system-defined models and custom models.

5.2.1.3.1 Add Meter of System-Defined Model

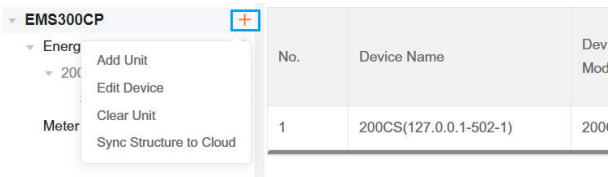
Use this function to connect meters to the plant.

Prerequisite

You have understood the type, access type, and port information of the meter to be connected.

Step 1 Choose **Device maintenance > Device list**.

Step 2 Click + on the right side of the plant-level master node EMS300CP.



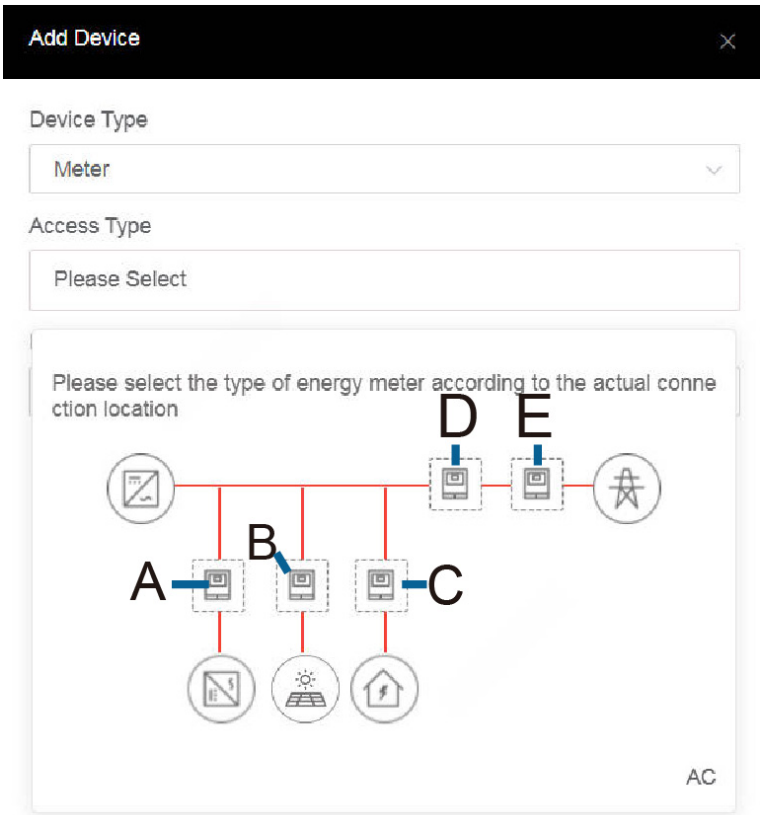
Step 3 Select **Add unit**. In the pop-up window, select Meter unit from the **Unit type** drop-down list.

Step 4 Click **Confirm**.

Step 5 Click + on the right side of the meter unit and select **Add device**.

Step 6 In the **Add device** window, select **Meter** from the **Device type** drop-down list.

Step 7 In **Access type**, select the type of meter according to the actual location of the connection point. Options include **ESS electricity meter**, **PV electricity meter**, **Load electricity meter**, **Overload monitoring meter**, and **Gateway meter**.



Position	Type	Description	Quantity Limit
A	ESS electricity meter	Obtain the energy metering value from the system side.	≤ 25
B	PV electricity meter	Obtain the energy metering value from the inverter side.	≤ 20
C	Load electricity meter	Obtain the energy metering value from the load side.	≤ 40
D	Overload monitoring meter	Obtain the energy metering value at the grid connection point and block overload in real time to protect devices in the grid.	≤ 10
E	Gateway meter	Obtain the energy metering value at the grid connection point.	≤ 4

Step 8 Select the port for the meter from the **Port** drop-down list.

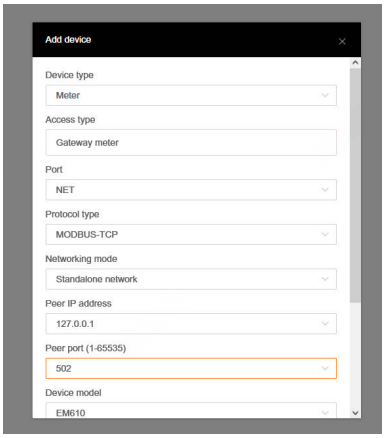
- If the port selected is COM, configure the following parameters:

Parameters	Description
Device model	Select the model of the meter.
Start address	Default value: 1. The value must be an integer in the range of 1–255.
Quantity of device	Enter the actual number of devices. Default value: 1. The value must be an integer in the range of 1–80. The maximum configurable number of devices varies based on the **Access type** you choose.

- If the port selected is NET, configure the following parameters:

Parameters	Description
Protocol type	MODBUS-TCP by default.
SSL encryption	**Disable** by default. You don't need to configure this parameter.
Networking mode	Choose **Standalone network**. Configure the following parameters as needed: - Peer IP address: The IP address of the meter that is connected. - Peer port: The port of the meter that is connected.
Device model	Select the model of the meter.
Start address	Default value: 1. The value must be an integer in the range of 1–255.
Quantity of device	Enter the actual number of devices. Default value: 1. The value must be an integer in the range of 1–80. The maximum configurable number of devices varies based on the **Access type** you choose.

Sample settings for EM610:



Step 9 Click **Save**. If the information of the meter appears in the device list on the right, the meter has been successfully added.

Step 10 (Optional) Click in the **Action** column to edit the meter information. The parameter descriptions are as follows. Click **Save** to save the settings.

Parameters	Description
Port	Indicate the port type of the meter. Non-editable.
Device name	Specify the name for the meter.
Instruction interval (4–5000) ms	Set the interval for collecting commands. 18 ms by default.
Timeout value (100–5000) ms	Set the communication timeout period. 1000 ms by default.
Retry attempts (1–10)	Set the number of retries allowed after a communication timeout. 5 by default.
PT transformation ratiof	Set the PT ratio. 1.000 by default.
CT transformation ratiof	Set the CT ratio. 1.000 by default.
Meter reverse polarity enable	If this function is enabled, the reading value will be reversed when the meter is connected in reverse.
Access type	Set the access type of the meter. Options include: • Load electricity meter • Gateway meter • Overload monitoring meter • ESS electricity meter

Parameters	Description
	• PV electricity meter
Connected to ESS or not	• Yes: Connected to ESS • No: Not connected to ESS. This parameter is available only when the **Access type** is set to **Overload monitoring meter**.
Meter purpose	Set the meter's purpose. Options include: • Same as access type: The default option, indicating that the meter's purpose is consistent with its access type. This option is a single choice and cannot be selected simultaneously with other purposes. • Monitoring only: Indicates that the meter data is used only for viewing. This option is a single choice and cannot be selected simultaneously with other purposes. • Gateway meter: Indicates that the meter is used as a gateway meter. It can be simultaneously selected with **Overload monitoring meter**. • Overload monitoring meter: Indicates that this meter is used as an overload monitoring meter. It can be simultaneously selected with **Gateway meter**. • The meter's purpose can only be switched when the EMS300CP is shut down. • The firmware version of EMS300CP must be P024 or later.

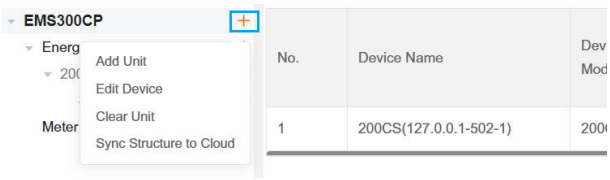
--End

5.2.1.3.2 Add Meter of Custom Model

You can use a custom template to add a meter of a model that is not preconfigured in the system.

Step 1 Choose **Device maintenance > Device list**.

Step 2 Click + on the right side of the plant-level master node EMS300CP.

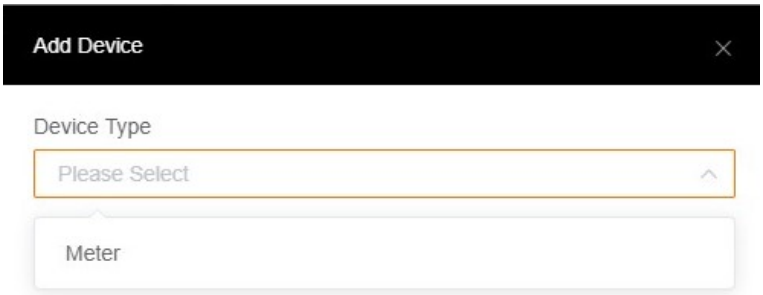


Step 3 Select **Add unit**. In the pop-up window, select Meter unit from the **Unit type** drop-down list.

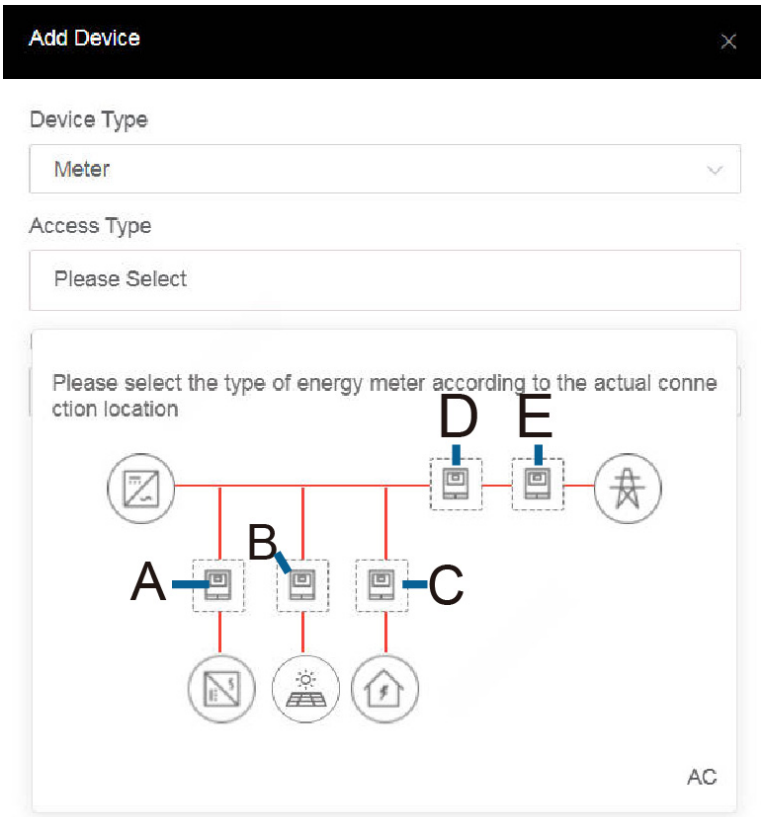
Step 4 Click **Confirm**.

Step 5 Click + on the right side of the meter unit and select **Add device**.

Step 6 In the **Add device** window, select **Meter** from the **Device type** drop-down list.



Step 7 In **Access type**, select the type of meter according to the wiring position.



Position	Type	Description	Quantity Limit
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D	Overload monitoring meter	Obtain the energy metering value at the grid connection point and block overload in real time to protect devices in the grid.	≤ 10
E	Gateway meter	Obtain the energy metering value at the grid connection point.	≤ 4

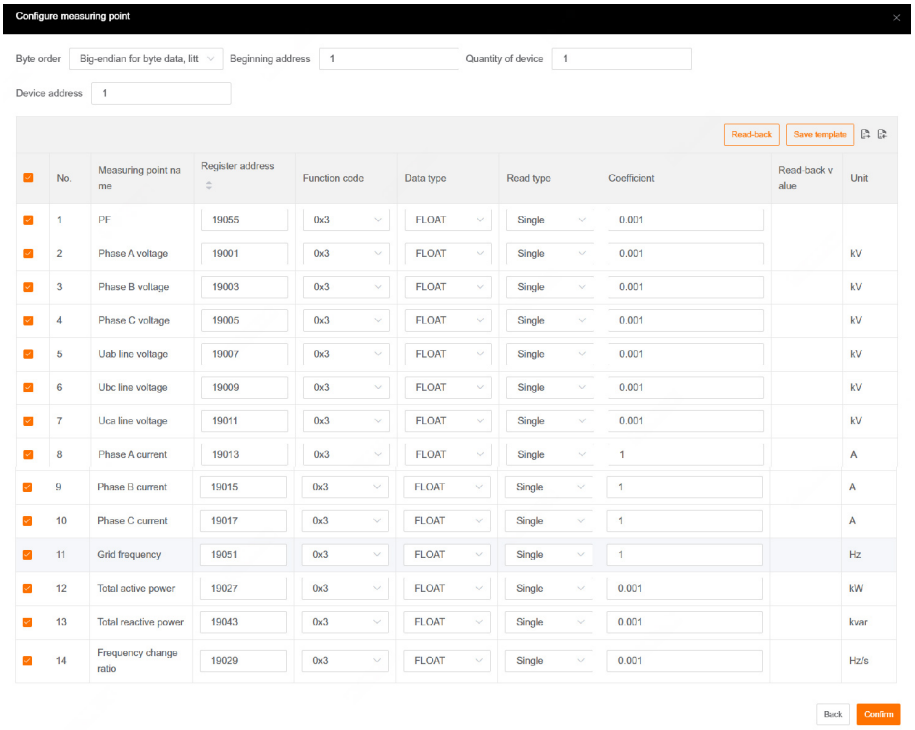
Step 8 Select the port of the meter connected from the **Port** drop-down list.

Options include: COM and NET. If the port selected is NET, configure the following parameters:

Parameters	Description
Protocol type	MODBUS-TCP by default.
SSL encryption	**Disable** by default. You don't need to configure this parameter.
Networking mode	Choose **Standalone network**. Configure the following parameters as needed: • Peer IP address: The IP address of the meter that is connected. • Peer port: The port of the meter that is connected.
Start address	Default value: 1. The value must be an integer in the range of 1–255.
Quantity of device	Enter the actual number of devices. Default value: 1. The value must be an integer in the range of 1–80. The maximum configurable number of devices varies based on the **Access type** you choose.

Step 9 Select **Others** from the **Device model** drop-down list.

Step 10 After selecting **Custom** from the **Configuration method** drop-down list, click **Next**. The **Configure measuring point** window pops up.



a. Set the measuring point information associated with the meter. Click **Read-back** in the upper right corner to retrieve the current collected values of the measuring points.

b. Click **Save template** in the upper right corner to save the current measuring point configuration as a template, then click to export the template to the local device. You can click to import a local template into the system.

Step 11 Click **Save**. If the information of the meter appears in the device list on the right, the meter has been successfully added.

Step 12 For editing meter parameters, please see Edit meter parameters.

--End

5.2.1.4 Add String Inverters

Prerequisites

A Sungrow data logger has been added in the plant system by referring to 5.2.1.2 Add Data Logger.

String inverters can be added only when there is a data logger, and cannot be added directly under a PV unit.

Step 1 Click on the right side of the data logger unit and select **Add device**.

Step 2 In the **Add device** window, select **String inverter** from the **Device type** drop-down list.

Step 3 Select the port for string inverter connection from the **Port** drop-down list. Sungrow string inverters can be connected only through the COM port.

- If the port selected is COM, configure the following parameters:

Parameter	Description
Device model	Select the model of the string inverter to be connected.
Beginning address	Default value: 1. The value must be an integer in the range of 1–255.
Quantity of device	Enter the actual number of devices. Default value: 1. The value must be an integer in the range of 1–80.

- If the port selected is NET, configure the following parameters:

Parameter	Description
Protocol type	MODBUS-TCP by default.
SSL encryption	This parameter defaults to **Disable** and can be set to **Enable**. When it is set to **Enable**, **Certificate file** must be selected. For **Certificate file** management, please refer to 11.3.11 Certificate Management.

<table>
<tr><th colspan="3">Parameter</th><th>Description</th></tr>
<tr><td colspan="3"></td><td> 
This parameter is available when Network security mode configuration is enabled.
Ensure that the device to be connected is switched to safe mode, and that the actual port settings are consistent with those of the peer port in Networking mode.</td></tr>
<tr><td rowspan="6">Networking mode</td><td rowspan="2">Standalone network</td><td>Peer IP address</td><td rowspan="6">The peer IP address refers to the IP address of the string inverter to be connected, and the peer port refers to the port of the string inverter.
Configure this parameter according to actual conditions.</td></tr>
<tr><td>Peer port</td></tr>
<tr><td rowspan="4">Dual network</td><td>Network A peer IP address</td></tr>
<tr><td>Network A peer port</td></tr>
<tr><td>Network B peer IP address</td></tr>
<tr><td>Network B peer port</td></tr>
<tr><td colspan="3">Device model</td><td>Select the model of the string inverter to be connected.</td></tr>
<tr><td colspan="3">Beginning address</td><td>Default value: 1. The value must be an integer in the range of 1–255.</td></tr>
<tr><td colspan="3">Quantity of device</td><td>Enter the actual number of devices. Default value: 1. The</td></tr>
</table>

Parameter	Description
	value must be an integer in the range of 1–80.

Step 4 Click **Save** to save the settings.

--End

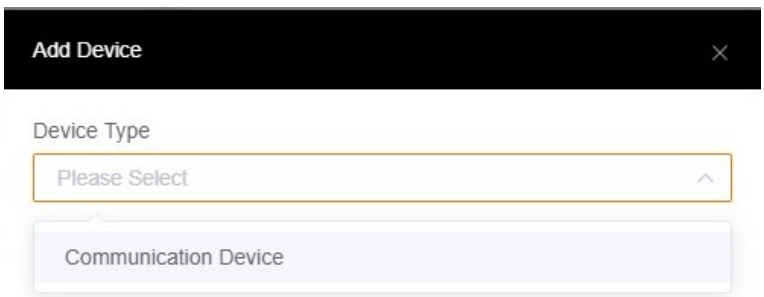
5.2.1.5 Add Communication Device

Prerequisites

An other unit has been added in the plant system by referring to 5.2.1.1 Add Unit.

Step 1 Click + on the right side of the "other unit" and select **Add device**.

Step 2 In the **Add device** window, select **Communication device** from the **Device type** drop-down list.



Step 3 Select the port for device connection from the **Port** drop-down list.

- If the port selected is COM, click on the right of **Configuration file** to upload the configuration file. The O&M personnel will sort the configuration file according to the actual conditions of the plant and fill in the **Device address**.
- If the port selected is NET, configure the following parameters:

Parameter	Description
Protocol type	MODBUS-TCP by default.
SSL encryption	This parameter defaults to **Disable** and can be set to **Enable**. When it is set to **Enable**, **Certificate file** must be selected. For **Certificate file** management, please refer to 11.3.11 Certificate Management.

<table>
<tr><th colspan="3">Parameter</th><th>Description</th></tr>
<tr><td colspan="3"></td><td> 
This parameter is available when Network security mode configuration is enabled.
Ensure that the device to be connected is switched to safe mode, and that the actual port settings are consistent with those of the peer port in Networking mode.</td></tr>
<tr><td rowspan="6">Networking mode</td><td rowspan="2">Standalone network</td><td>Peer IP address</td><td rowspan="6">The peer IP address refers to the IP address of the communication device to be connected, and the peer port refers to the port of the communication device. Configure this parameter according to actual conditions.</td></tr>
<tr><td>Peer port</td></tr>
<tr><td rowspan="4">Dual network</td><td>Network A peer IP address</td></tr>
<tr><td>Network A peer port</td></tr>
<tr><td>Network B peer IP address</td></tr>
<tr><td>Network B peer port</td></tr>
<tr><td colspan="3">Configuration File</td><td>It is the LC package, which contains the point table for the LC. The configuration file is sorted by O&M personnel according to the actual conditions of the plant.</td></tr>
</table>

Parameter	Description
Device address	Enter a value in the range of 1–255 according to actual conditions.

Step 4 Click **Save** to save the settings.

--End

5.2.1.6 Add Energy Storage Device

Prerequisite

An energy storage unit has been added in the plant system by referring to 5.2.1.1 Add Unit.

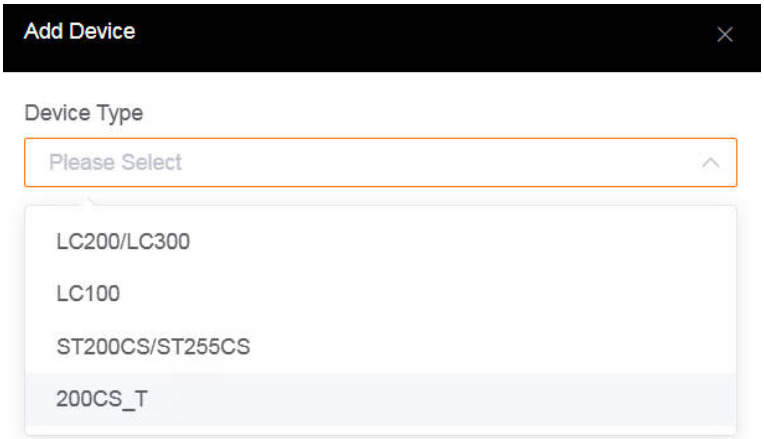
You can add energy storage devices in two ways: manual adding and one-click access. The one-click access function is only applicable to ST255CS, ST200CS, and ST835CS. Before performing one-click access, complete the following operations. In the example below, the ETH2 port of the EMS is connected to the ETH1 port of the LC.

- The ETH1 port of the LC is **enabled** by default in the system. No manual enabling is required. To check the enabling status of the ETH1 port of the LC, log in to the LC Web, choose **Settings > Communication parameters**, and check whether ETH1 in the Auto access configuration section is set to **Enable**.
- On the EMS Web interface, choose **System > Ethernet** and enable the **DHCP Service** for ETH2.
- On the EMS Web, choose **System > Ethernet**, click the **Energy storage device IP** tab, and set the **Beginning address** and **Ending address**. The system will assign IP addresses to the energy storage devices within this subnet. For detailed instructions, see 11.8.2.2 Configure Energy Storage Device IP Settings.

1. Manual Adding

Step 1 Click + on the right side of the energy storage unit.

Step 2 In the **Add device** window, select the type of the device to be connected from the **Device type** drop-down list.



Step 3 Select the port for device connection from the **Port** drop-down list.

If the NET port is selected, configure the following parameters:

Parameter			Description
Protocol type			MODBUS-TCP by default.
SSL encryption			This parameter defaults to **Disable** and can be set to **Enable**. When it is set to **Enable**, **Certificate file** must be selected. For **Certificate file** management, please refer to 11.3.11 Certificate Management. • This parameter is available when **Network security mode configuration** is enabled. • Ensure that the device to be connected is switched to safe mode, and that the actual port settings are consistent with those of the peer port in Networking mode.
Networking mode	Standalone network	Peer IP address	The peer IP address refers to the IP address of the LC to

Parameter			Description
		Peer port	be connected, and the peer port refers to the port of the LC. Configure this parameter according to actual conditions.
	Dual network	Network A peer IP address	
		Network A peer port	
		Network B peer IP address	
		Network B peer port	
Device model			Select the model of the device to be connected.
Device address			The value must be an integer in the range of 1–255.
Sub-device quantity			Enter the actual number of sub-devices. Default value: 0.

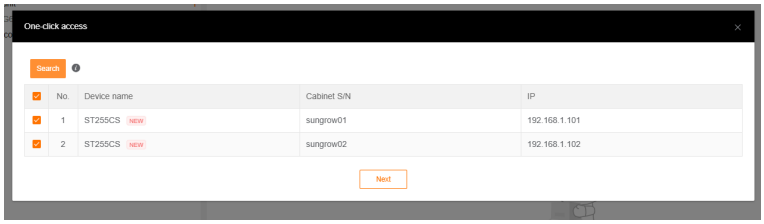
Step 4 Click **Save** to save the settings.

2. One-click Access

Step 5 Click + on the right side of the energy storage unit.

Step 6 Select **One-click access**.

Step 7 Click **Search**. The found devices will be displayed on the page.



Step 8 Select the devices to be added and click **Next**.

Step 9 Click **Complete**. The "Operation successful" message will appear on the page, indicating that the devices have been successfully added.

--End

View Device Information

For detailed instructions, see 5.1.1 Energy Storage Unit View.

5.2.1.7 Add Charger

Prerequisite

A charger unit has been added in the plant system by referring to 5.2.1.1 Add Unit.

Step 1 Click + on the right side of the charger unit and select **Add device**.

Step 2 In the **Add device** window, select **EV charger** from the **Device type** drop-down list.

Step 3 Select the port for charger connection from the **Port** drop-down list.

- Select the COM port if the IDC120, IDC180, or CDC240 charger is used. Then, configure the following parameters:

Parameter	Description
Device model	Select the model of the charger actually used in the plant.
Beginning address	Default value: 1. The value must be an integer in the range of 1–255.
Quantity of device	Enter the actual number of devices. Default value: 1. The value must be an integer in the range of 1–80.

- Select the NET port if the IDC30E or IDC480E charger is used. Then, configure the following parameters:

Parameter	Description
Protocol type	MODBUS-TCP by default.
SSL encryption	This parameter defaults to **Disable** and can be set to **Enable**. When it is set to **Enable**, Certificate file must be selected. For **Certificate file** management, please refer to 11.3.11 Certificate Management.

<table>
<tr><th colspan="3">Parameter</th><th>Description</th></tr>
<tr><td colspan="3"></td><td>- This parameter is available when Network security mode configuration is enabled.
- Ensure that the device to be connected is switched to safe mode, and that the actual port settings are consistent with those of the peer port in Networking mode.</td></tr>
<tr><td rowspan="6">Networking mode</td><td rowspan="2">Standalone network</td><td>Peer IP address</td><td rowspan="6">The peer IP address refers to the IP address of the charger to be connected, and the peer port refers to the port of the charger. Configure this parameter according to actual conditions.</td></tr>
<tr><td>Peer port</td></tr>
<tr><td rowspan="4">Dual network</td><td>Network A peer IP address</td></tr>
<tr><td>Network A peer port</td></tr>
<tr><td>Network B peer IP address</td></tr>
<tr><td>Network B peer port</td></tr>
<tr><td colspan="3">Device model</td><td>Select the model of the charger to be connected.</td></tr>
<tr><td colspan="3">Beginning address</td><td>Default value: 1. The value must be an integer in the range of 1–255.</td></tr>
<tr><td colspan="3">Quantity of device</td><td>Enter the actual number of devices. Default value: 1. The</td></tr>
</table>

Parameter	Description
	value must be an integer in the range of 1–80.

Step 4 Click **Save** to save the settings.

--End

5.2.1.8 Add LOGGER_UPPER Device

In Japan's power systems, the LOGGER_UPPER device is typically used to receive power limit percentage commands issued by the northbound power company (i.e., grid operator). This device can dynamically adjust the output power of the ESSs or related power equipment based on the requirements of the power company.

Prerequisite

An upper computer unit has been added in the plant system referring to the 5.2.1.1 Add Unit.

Step 1 Click + on the right side of the upper computer unit and select **Add device**.

Step 2 In the **Add device** window, select **LOGGER_UPPER** from the **Device type** drop-down list.

Step 3 Select a port. The default fault is NET. Configure the following parameters according to actual conditions:

Parameter	Description
Protocol type	MODBUS-TCP by default.
SSL encryption	This parameter defaults to **Disable** and can be set to **Enable**. When it is set to **Enable**, Certificate file must be selected. For **Certificate file** management, please refer to 11.3.11 Certificate Management.

<table>
<tr><th colspan="3">Parameter</th><th>Description</th></tr>
<tr><td colspan="3"></td><td>• This parameter is available when Network security mode configuration is enabled.
• Ensure that the device to be connected is switched to safe mode, and that the actual port settings are consistent with those of the peer port in Networking mode.</td></tr>
<tr><td rowspan="6">Networking mode</td><td rowspan="2">Standalone network</td><td>Peer IP address</td><td rowspan="6">The peer IP address refers to the IP address of the LOGGER_UPPER device to be connected, and the peer port refers to the port of the LOGGER_UPPER device. Configure this parameter according to actual conditions.</td></tr>
<tr><td>Peer port</td></tr>
<tr><td rowspan="4">Dual network</td><td>Network A peer IP address</td></tr>
<tr><td>Network A peer port</td></tr>
<tr><td>Network B peer IP address</td></tr>
<tr><td>Network B peer port</td></tr>
<tr><td colspan="3">Device model</td><td>Select the model of the device. Default value: LoggerUpper.</td></tr>
<tr><td colspan="3">Beginning address</td><td>Default value: 1. The value must be an integer in the range of 1–255.</td></tr>
<tr><td colspan="3">Quantity of device</td><td>Enter the actual number of devices. Default value: 1. The</td></tr>
</table>

Parameter	Description
	value must be an integer in the range of 1–80.

Step 4 Click **Save** to save the settings.

--End

5.2.1.9 Add ATS

Prerequisite

An ATS unit has been added in the plant system by referring to 5.2.1.1 Add Unit.

Step 1 Click + on the right side of the ATS unit and select **Add device**.

Step 2 In the **Add device** window, select **ATS** from the **Device type** drop-down list.

Step 3 Select the port for device connection from the **Port** drop-down list.

- If the port selected is COM, configure the following parameters:

Parameter	Description
Device model	Select the model of the device to be connected.
Beginning address	Default value: 1. The value must be an integer in the range of 1–255.
Quantity of device	Enter the actual number of devices. Default value: 1. The value must be an integer in the range of 1–80.

- If the port selected is NET, configure the following parameters:

Parameter	Description
Protocol type	MODBUS-TCP by default.
SSL encryption	This parameter defaults to **Disable** and can be set to **Enable**. When it is set to **Enable**, Certificate file must be selected. For **Certificate file** management, please refer to 11.3.11 Certificate Management.

<table>
<tr><th colspan="3">Parameter</th><th>Description</th></tr>
<tr><td colspan="3"></td><td> 
This parameter is available when Network security mode configuration is enabled.
Ensure that the device to be connected is switched to safe mode, and that the actual port settings are consistent with those of the peer port in Networking mode.</td></tr>
<tr><td rowspan="6">Networking mode</td><td rowspan="2">Standalone network</td><td>Peer IP address</td><td rowspan="6">The peer IP address refers to the IP address of the device to be connected, and the peer port refers to the port of the device. Configure this parameter according to actual conditions.</td></tr>
<tr><td>Peer port</td></tr>
<tr><td rowspan="4">Dual network</td><td>Network A peer IP address</td></tr>
<tr><td>Network A peer port</td></tr>
<tr><td>Network B peer IP address</td></tr>
<tr><td>Network B peer port</td></tr>
<tr><td colspan="3">Device model</td><td>Select the model of the device to be connected.</td></tr>
<tr><td colspan="3">Beginning address</td><td>Default value: 1. The value must be an integer in the range of 1–255.</td></tr>
<tr><td colspan="3">Quantity of device</td><td>Enter the actual number of devices. Default value: 1. The</td></tr>
</table>

Parameter	Description
	value must be an integer in the range of 1–80.

Step 4 Click **Save** to save the settings.

--End

5.2.1.10 Add Diesel Generator

Prerequisite

A diesel generator unit has been added in the plant system by referring to 5.2.1.1 Add Unit.

Step 1 Click + on the right side of the diesel generator unit and select **Add device**.

Step 2 In the **Add device** window, select **Diesel generator** from the **Device type** drop-down list.

Step 3 Select the port for device connection from the **Port** drop-down list.

- If the port selected is COM, configure the following parameters:

Parameter	Description
Device model	Select the model of the device to be connected.
Beginning address	Default value: 1. The value must be an integer in the range of 1–255.
Quantity of device	Enter the actual number of devices. Default value: 1. The value must be an integer in the range of 1–80.

- If the port selected is NET, configure the following parameters:

Parameter	Description
Protocol type	MODBUS-TCP by default.
SSL encryption	This parameter defaults to **Disable** and can be set to **Enable**. When it is set to **Enable**, Certificate file must be selected. For **Certificate file** management, please refer to 11.3.11 Certificate Management.

<table>
<tr><th colspan="3">Parameter</th><th>Description</th></tr>
<tr><td colspan="3"></td><td> 

This parameter is available when Network security mode configuration is enabled.
Ensure that the device to be connected is switched to safe mode, and that the actual port settings are consistent with those of the peer port in Networking mode.
</td></tr>
<tr><td rowspan="6">Networking mode</td><td rowspan="2">Standalone network</td><td>Peer IP address</td><td rowspan="6">The peer IP address refers to the IP address of the device to be connected, and the peer port refers to the port of the device. Configure this parameter according to actual conditions.</td></tr>
<tr><td>Peer port</td></tr>
<tr><td rowspan="4">Dual network</td><td>Network A peer IP address</td></tr>
<tr><td>Network A peer port</td></tr>
<tr><td>Network B peer IP address</td></tr>
<tr><td>Network B peer port</td></tr>
<tr><td colspan="3">Device model</td><td>Select the model of the device to be connected.</td></tr>
<tr><td colspan="3">Beginning address</td><td>Default value: 1. The value must be an integer in the range of 1–255.</td></tr>
<tr><td colspan="3">Quantity of device</td><td>Enter the actual number of devices. Default value: 1. The</td></tr>
</table>

Parameter	Description
	value must be an integer in the range of 1–80.

Step 4 Click **Save** to save the settings.

--End

5.2.2 Edit Device

Modify the name and attributes of the device that has been added.

Step 1 Click **Device Maintenance > Device List** to enter the corresponding interface.

Step 2 Expand the device list and click ••• on the right of a device.

Step 3 Click **Edit Device Attributes**. Modify the device attributes in the **Edit Device** dialog box.

Step 4 Click **Save** to save the modification.

--End

5.2.3 Delete Device

After the device is dismantled from the site, delete the device on **Device List** interface to keep the consistency.

Step 1 Click **Device Maintenance > Device List** to enter the corresponding interface.

Step 2 Expand the device list and click ••• on the right of a device.

Step 3 Click **Delete Device**.

Step 4 Click **Confirm** in the pop-up window.

--End

5.2.4 Check Device Communication Status

This section mainly describes how to check whether the communication status of each device is normal.

Step 1 Click **Device Maintenance > Device List** to enter the corresponding interface.

Step 2 Click the unit to be checked. The device list under that unit will be displayed on the right. For example, click **Meter Unit**.

Step 3 Check the communication status of each device.

- Online: Indicate that the device's communication is normal and is displayed as .

- Offline: Indicate that the device's communication is abnormal and is displayed as  .

--End

6 Parameter Maintenance

6.1 Configure Time-of-Use Periods for Meter

For the DTSD1352-CT/F2C meter, you can configure critical peak, peak, shoulder, valley, and deep valley periods to help users optimize electricity consumption behaviors so as to lower costs while maintaining grid load balance.

Prerequisite

- This function is only applicable to the DTSD1352-CT/F2C meter.
- Before configuring critical peak, peak, shoulder, valley, and deep valley periods, make sure that the meter is properly connected and in normal communication status. For details about device communication status check, see 5.2.4 Check Device Communication Status.
- The **Meter Type** of the meter is set to **8-Rate**. For details about how to edit the parameters of the meter, see 5.2.1.3 Add Meter.

6.1.1 Configure Time-of-Use Period Templates for Meter

Step 1 Click **Parameter Maintenance > Meter Parameters** to enter the corresponding interface.

Step 2 Click  in the **Action** column.

Step 3 Configure a time-of-use period template. For initial setup after system installation, a pop-up window as shown below will automatically appear on the page, prompting you to configure a time-of-use period template.

a. Enter a custom **Template Name**.

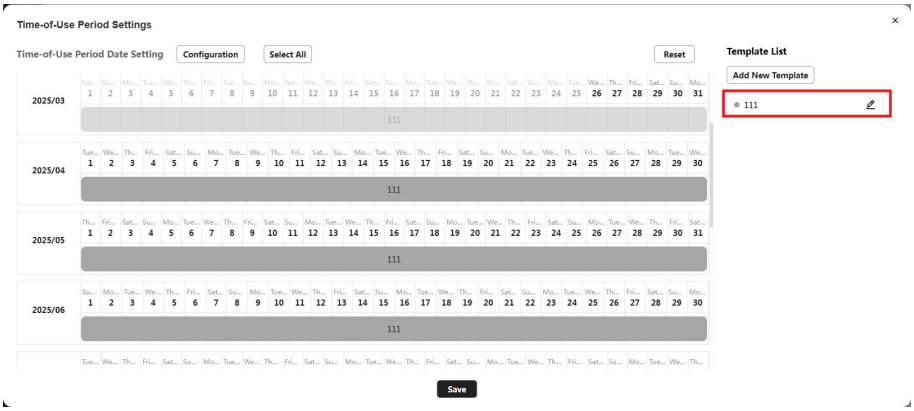
b. Click the Critical Peak, Peak, Shoulder, Valley, and Deep Valley sections respectively to select time blocks. Drag the handles on the two sides of the selected block to adjust its duration.

To delete a selected time period, click the Close icon in the upper right corner of the selected block.

c. Repeat step b until the entire 24-hour period is defined without overlaps.

d. Click **Save** to save the settings.

e. The created template will appear in the Template List on the right panel of the **Time-of-Use Period Settings** page.



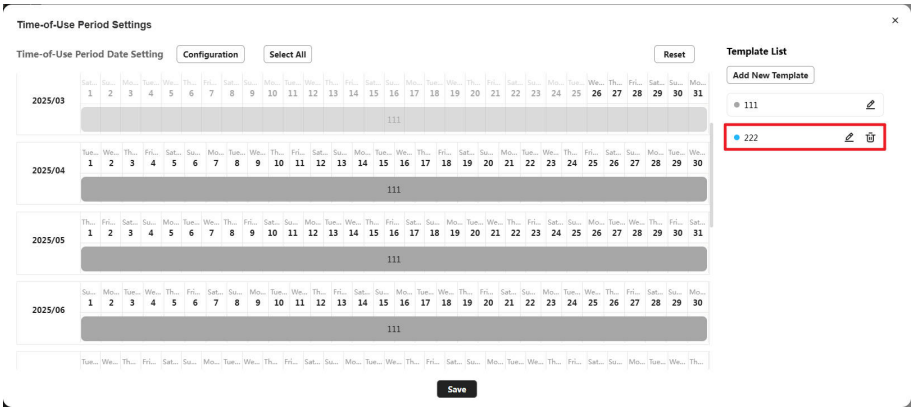
Step 4 (Optional) Add a new time-of-use period template. If the existing time-of-use period templates do not meet requirements, a new template can be added.

a. Click **Add New Template** on the **Time-of-Use Period Settings** page.

Figure 6-1 Add a New Template

b. Configure the template following the steps outlined in 3.

c. The created template will appear in the Template List on the right panel of the **Time-of-Use Period Settings** page.



Up to 8 templates are supported.

Step 5 (Optional) Edit an existing time-of-use period template. Click the Edit icon of the desired template to edit it.

Step 6 (Optional) Delete a time-of-use period template. Click the Delete icon of the desired template to delete it.

--End

6.1.2 Configure Time-of-Use Period Strategies for Meter

Prerequisite

- A time-of-use period template has been configured for the meter by referring to 6.1.1 Configure Time-of-Use Period Templates for Meter.

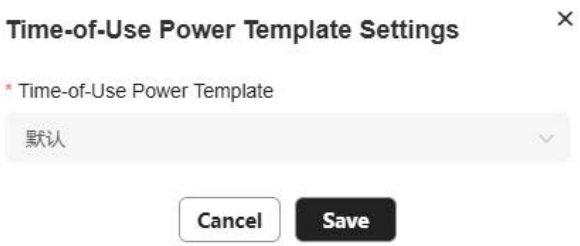
Step 1 Click **Parameter Maintenance > Meter Parameters** to enter the corresponding interface.

Step 2 Click in the **Action** column.

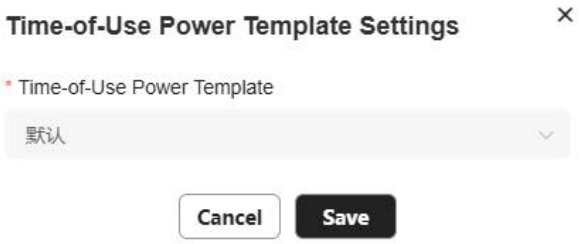
The system applies a default time-of-use period template initially. Modify or replace it as needed.

Step 3 You can configure time-of-use period strategies for the current year. Choose an appropriate time-of-use period template to configure the time-of-use period strategy.

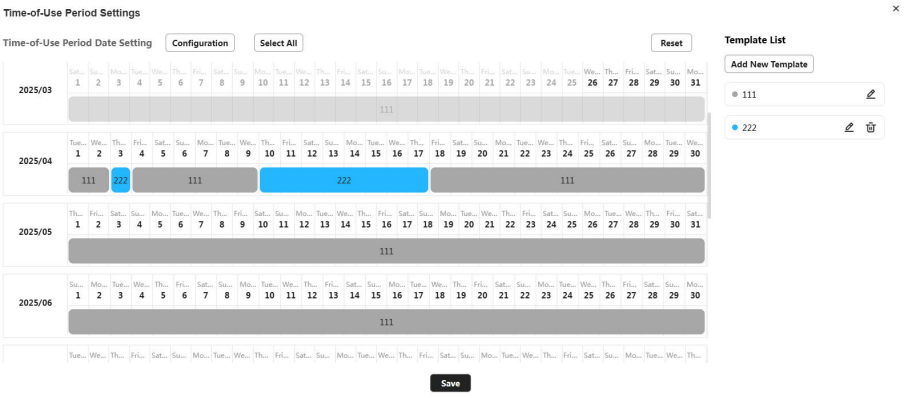
- If the same strategy applies to all days of the current year, select all dates using the **Select All** option, then click **Configuration**. In the pop-up window, select the desired time-of-use period template and click **Save**. The configured strategy will apply to all selected days.



- If different strategies apply to different days, hover over a specific date, select a single day or a date range, then click **Configuration**. In the pop-up window, select the desired time-of-use period template and click **Save**. The configured strategy will apply only to the selected days.

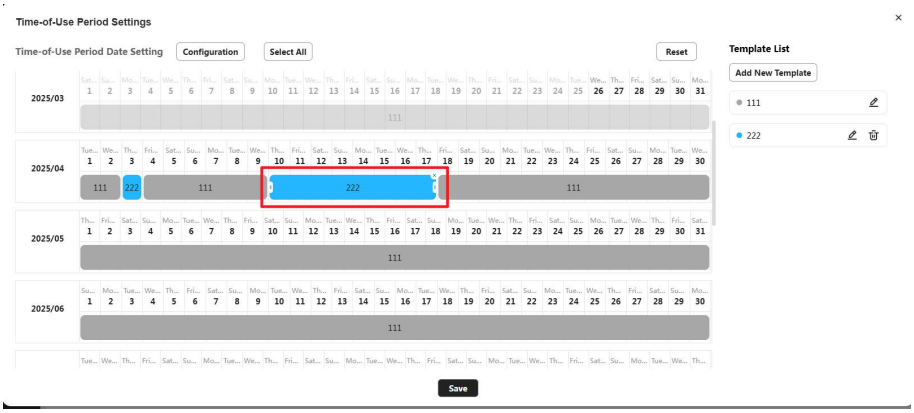


Step 4 Click **Save** to save the configured time-of-use period strategy.



Step 5 (Optional) Delete a time-of-use period strategy.

a. Hover over the configured time block you want to delete, and click the Close icon in the upper right corner of the time block.



b. Click **Save** to save the settings.

--End

6.2 Meter Time Synchronization

The system supports **automatic** and **manual** time synchronization for meters.

1. Automatic Synchronization

Step 1 Click **Parameter Maintenance > Meter Parameters** to enter the corresponding interface.

Step 2 Set the Meter Time Synchronization Interval. Enter an interval. Range: 0.0-10.0. Default value: 4.0.

Step 3 Click  in the Action column. The system will automatically perform periodic time synchronization for the meter based on the set interval.

2. Manual Synchronization

Step 4 Click **Parameter Maintenance > Meter Parameters** to enter the corresponding interface.

Step 5 Click  in the Action column. The system will perform time synchronization for the meter.

--End

6.3 Configure Charger Parameters

Step 1 Choose **Parameter Maintenance > Charger parameters**.

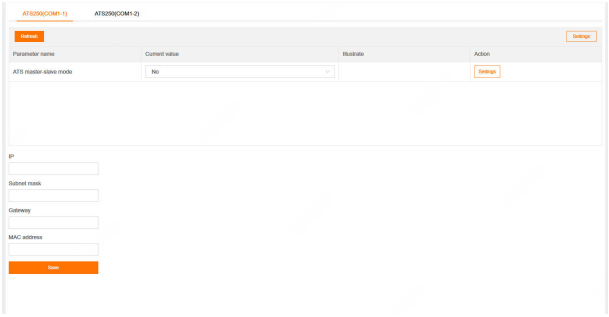
Step 2 Set the **Total charger output power (offline) (W)** and **Communication timeout (s)** according to actual conditions.

Step 3 Click **Save** to save the settings.

--End

6.4 Configure ATS Parameters

Step 1 Choose **Parameter Maintenance > ATS parameters**.



Step 2 Click the tab of the ATS that you want to configure, set **ATS master-slave mode**, **Fault reset**, or **Sync check failed fault reset** as needed, and click **Settings** to apply the settings.

- When **ATS master-slave mode** is set to **Yes**, you can configure the **ATS master/slave settings**.
- When **ATS master-slave mode** is set to **No**, the ATS master-slave mode is disabled.

Step 3 Set the **IP**, **Subnet mask**, **Gateway**, and **MAC address** of the ATS according to actual conditions.

After configuring the ATS communication parameters, the ATS needs to be reconnected to the system.

Step 4 Click **Save** to save the settings.

--End

7 Device Start/Stop

7.1 Grid-connected/Off-grid Startup

Users can configure the startup settings for the devices and start or stop the devices in the plant in one click.

Configure Startup Parameters

Step 1 Choose **Device start/stop > Grid-connected/off-grid startup**.

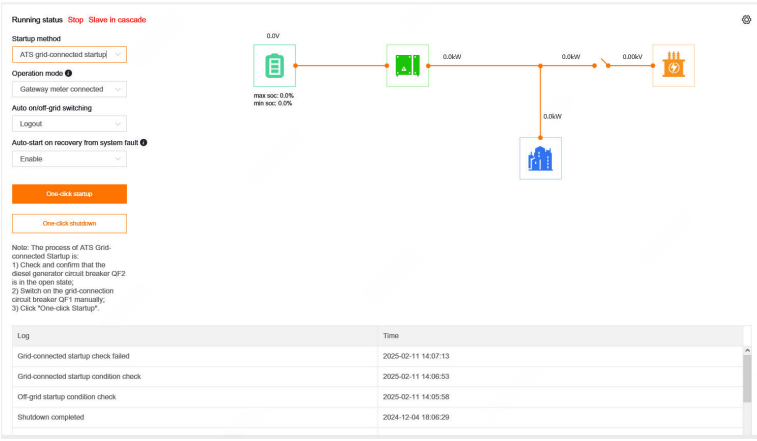


Figure 7-1 Grid-connected/Off-grid Startup

Step 2 Select a startup method for devices in the plant from the **Startup method** drop-down list.

- When no ATS is connected, the **Startup method** can be set to **Off-grid startup** or **Grid-connected startup**.
  - Off-grid startup
    When the device is in the off-grid status, select **Off-grid startup** to start all the devices in the plant. After a successful startup, the **Running status** will show “Off-grid”.
    Configure the black start parameters before proceeding with the startup. To do this, click ⚙ in the upper-right corner to open the black start configuration window. The descriptions of the parameters are shown below.

Parameter	Description
Black start SOC threshold	The default value is 46.
Minimum number of running units	Number of units with the minimum SOC.

Parameter	Description
Load rated power	Set this parameter according to actual conditions.
Startup mode	Select an option according to actual conditions. • VSG mode: Users can select VSG mode if there is one or more LCs. • Off-grid mode: Users can select Off-grid mode if there is one LC only.
System waiting time	Range: 0–100. Default value: 20.
System timeout	Range: 0–200. Default value: 60.

- Grid-connected startup
  When the device is in the grid-connected status, select **Grid-connected startup** to start all the devices in the plant. After a successful startup, the **Running status** will show “Grid-connected”.

  At least one LC is needed to start the system. The system starts the LC first, and then the PV system.

- When ATSs are connected, the following options are available for **Startup method**:
  - ATS grid-connected startup: Ensure that the diesel generator circuit breaker QF2 is in the open state. Switch on the grid connection circuit breaker QF1 manually. Then, apply this startup method.
  - ATS off-grid startup (VSG mode): Ensure that the grid connection circuit breaker QF1 and diesel generator circuit breaker QF2 are in the open state. Then, apply this startup method.
    Configure the black start parameters before proceeding with the startup. For details, refer to parameter configuration.
  - ATS off-grid startup (diesel generator): Ensure that the grid connection circuit breaker QF1 is in the open state. Switch on the diesel generator circuit breaker QF2 manually. Then, apply this startup method.
  - ATS grid-connected startup (bypass switch on): Ensure that the diesel generator circuit breaker QF2 is in the open state. Switch on the grid connection circuit breaker QF1 manually. Then, apply this startup method.
  - ATS startup (bypass switch on, diesel generator): Click **Diesel generator startup**. Switch on the diesel generator circuit breaker QF2 manually. Then, apply this startup method.

Step 3 Select the **Operation mode**.

Three operation modes are available, Gateway meter connected and Gateway meter not connected. When the system is in Stop state, you can select Gateway meter connected or Gateway meter not connected for startup.

Step 4 When the system is in Running state, you can enable or disable **Auto on/off-grid switching**.

Step 5 Enable or disable **Auto-start on recovery from system fault**. This function is enabled by default. When this function is enabled, if a fault occurred in the ESS, the plant will restart automatically after recovering from the ESS fault.

Step 6 Click **One-click startup** to perform startup, and click **Yes** in the pop-up dialog box.

--End

One-click Shutdown

Users can click **One-click shutdown** to stop the devices in the plant. At this time, the running status will be “Stop”.

View Operation Log

The detailed will be shown on the screen when the off-grid/grid-connected start/stop task is executed.

8 Energy Management

Set the **Country/Region** to **China**, **Europe**, **Japan**, **Australia**, or **Others** by referring to 11.3.8 Setup Wizard.

- The default control strategies may vary by region. Please refer to the actual interface.
- For configurations in Japan's HV scenarios, refer to *EMS300CP User Manual (Japan's HV Scenarios)*.

8.1 Grid-connected Active Power

8.1.1 Self-Consumption (Europe/Australia)

This mode makes the PV installation and the battery cover the most of the loads' demand, reducing energy import from the grid. Users can set different battery charging/discharging time windows based on electricity prices at different times to reduce the electricity cost.

Step 1 Choose **Energy Management > Grid-connected Active Power**.

Step 2 Select the **Self-consumption** mode.

Step 3 Enable or disable **Peak shaving mode**. It is disabled by default.

If **Peak shaving mode** is enabled, you must set the **Reserved SOC for peak shaving (%)** within the range of 0–100.

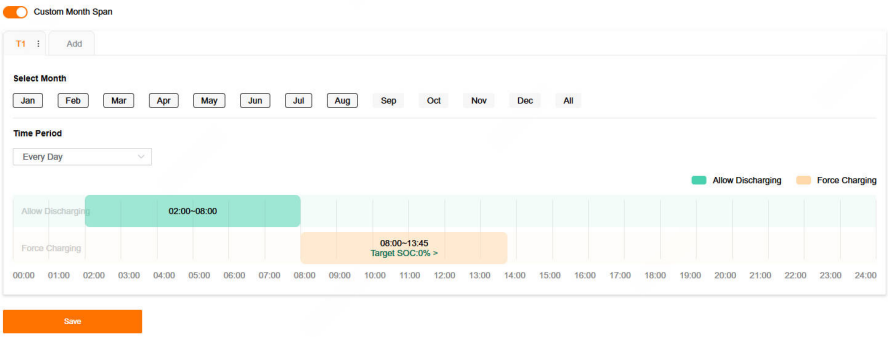
- The **Reserved SOC for peak shaving** must be at least 2% higher than the **Power backup lower SOC threshold**, and must not exceed the **SOC upper limit**. Otherwise, the setting will not take effect.
- The firmware version of EMS300CP must be P024 or later, and the Country/region must be set to Europe.

Step 4 Set a power upper limit for the system to purchase energy from the grid in **Threshold on power purchase (demand control) (kW)**. Default value: 0. When the energy purchase power exceeds this threshold, the excess power will be drawn from the battery, helping reduce the user's electricity cost.

This threshold does not apply during forced charging time periods. In this case, the limit is determined by the **Power limit for energy purchase** set in Grid-connected power control. If **Purchase energy with limited power** is not enabled, there will be no restriction on battery charging.

Step 5 Set a power upper limit for the system to feed energy into the grid in **Threshold on power feed-in (demand control) (kW)**. Default value: 0. After you configure this threshold, the system prioritizes load demand, and the surplus PV power is fed into the grid. Only when the feed-in power exceeds this threshold, the excess power will be absorbed by charging the battery.

Step 6 Enable **Custom time period** to add a battery usage plan. Users can create custom charging/discharging time windows, allowing the system to make the most of the PV output in on-peak hours and charge the battery properly in off-peak hours. In this way, electricity cost is reduced.



a. Select months in the **Select month** section.

You can set different time windows based on seasonal energy demand patterns.

b. In the **Time period** section, select the days on which the battery charging/discharging plan applies.

You can apply the charging/discharging plan to every day, or set different charging/discharging plans respectively for working days & non-working days. The plan applies to every day by default.

- **Every day**: The default option, indicating the set charging/discharging plan applies on all days.
- **Working days & non-working days**: Switch between 

to set different charging/discharging plans respectively for working days and non-working days.

c. Set the battery discharging and forced charging windows within a day.

1. Tap a time period in the **Allow discharging** time bar. Then, drag the left or right edge of the window to adjust the length of time. A new discharging window will be created (with the minimum granularity of 15 minutes). The battery is allowed to discharge to supply the loads in the specified time period.
2. Tap a time period in the **Force charging** time bar. Then, drag the left or right boundary of the window to adjust the length of time. A new charging window will be created (1 hour by default). Click the added time window, and in the pop-up dialog box, enter the target charging SOC in **Target SOC**.
   In the specified time period, the battery is charged at its maximum allowable power until reaching the preset target SOC.

- Battery discharging and forced charging windows can overlap. If a time window allows both battery discharging and forced charging, forced charging will be executed first.
- Outside of the configured time periods, the battery is not allowed to discharge or be charged by drawing power from the grid. In this case, the battery can only be charged by PV power.

Step 7 Click **Save** to save the settings.

--End

8.1.2 Time-of-Use Power Management(China/Japan/Others)

Time-of-use power management allows users to configure charging and discharging power settings based on time-of-use electricity rates. The ESS follows predefined schedules to charge or discharge at specified power levels, optimizing energy costs.

Time-of-use power management consists of two key steps:

- Configure time-of-use power templates: Define the charging and discharging schedule for various periods within a day. The configured templates are stored in the template list for future use.
- Configure time-of-use power strategies: Select a period and apply predefined time-of-use power templates.

8.1.2.1 Configure Time-of-Use Power Templates

Step 1 Choose **Energy Management > Grid-connected Active Power**.

Step 2 Select the **Time-of-Use Power** mode.

Figure 8-1 Time-of-Use Power Management

Step 3 When you enable time-of-use power for the first time, a time-of-use power template must be created to define the charging and discharging schedule for different time periods.

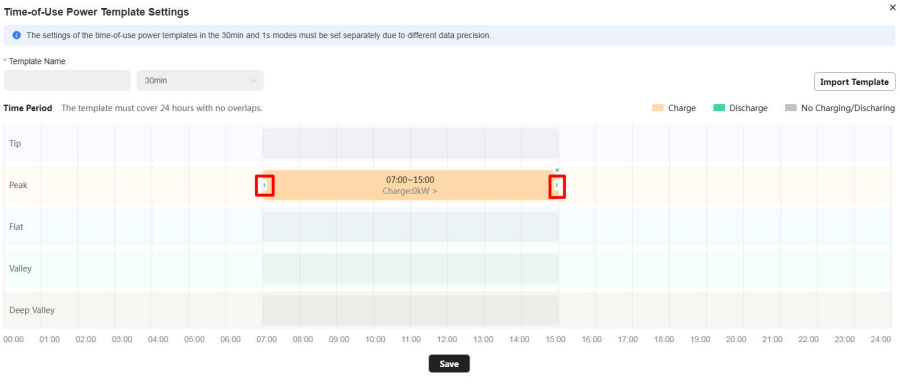
The system supports two time granularities: 30-minute interval, and 1-second interval. The following sections provide detailed setup instructions for each.

The first created time-of-use power template is designated as the default template, which can be modified but not deleted.

- **30-Minute Interval Configuration**:
  - **a.** When time-of-use power is set to **Enable**, the following configuration window will pop up.

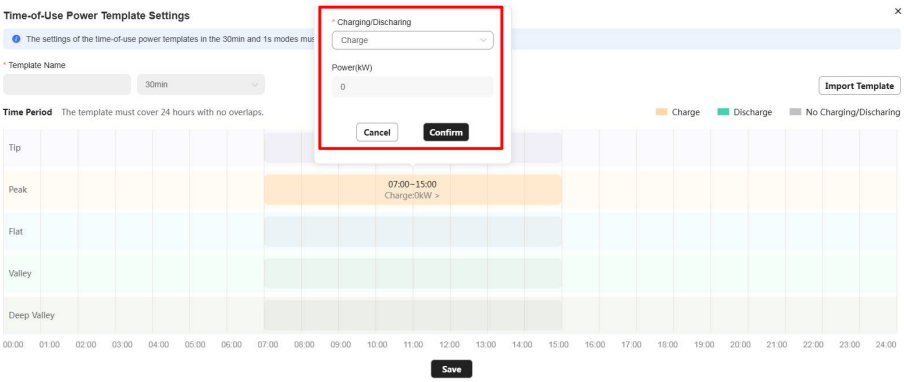
The following steps demonstrate how to manually configure the charging and discharging schedule for a day. Alternatively, an existing template can be imported using the **Import template** button.

  - **b.** Enter a custom **Template name**.
  - **c.** Select **30min** as the time unit.
  - **d.** Click the Critical peak, Peak, Shoulder, Valley, and Deep valley sections respectively to select time blocks. Drag the handles on the two sides of the selected block to adjust its duration.



To delete a selected time period, click the **Close** icon in the upper right corner of the selected block.

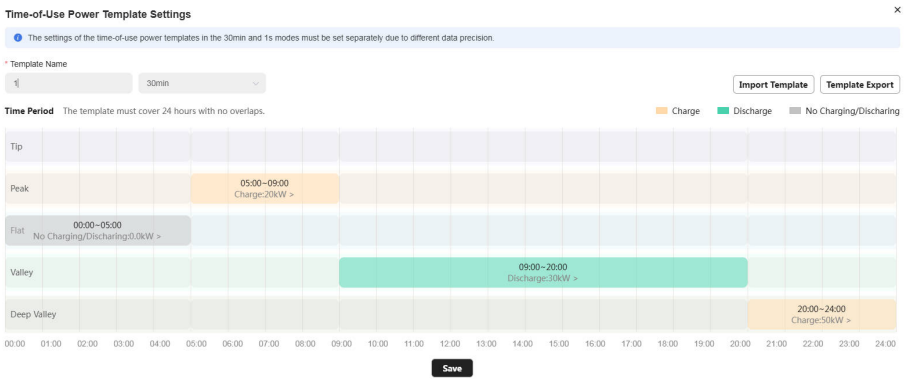
  - **e.** Click a time block to configure charging and discharging parameters. Click **Confirm** to apply the settings.



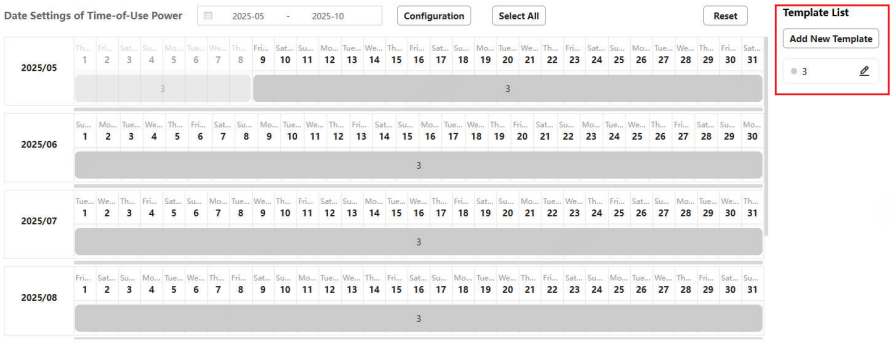
Charging/Discharging: Select **Charge**, **Discharge**, or **No charging/discharging**.
Power: Set the charging and discharging power based on actual needs.

f. Repeat steps d to e until the entire 24-hour period is defined without overlaps.

g. Click **Save** to save the settings.



h. The created template will appear in the Template List on the right panel.



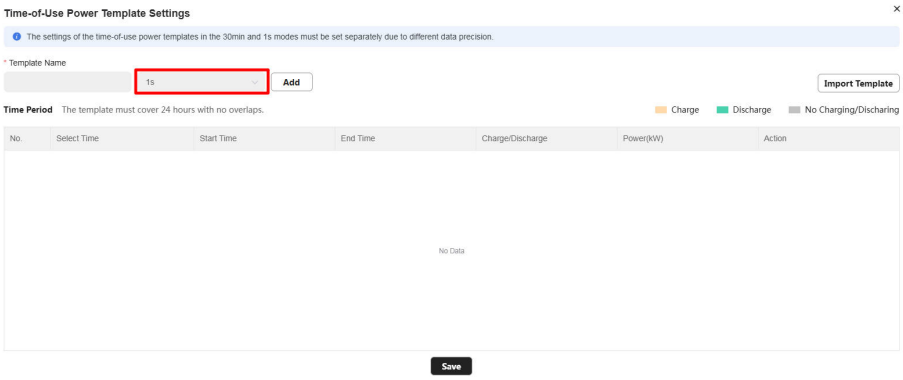
- **1-Second Precision Configuration**:

a. When time-of-use power is set to **Enable**, the following configuration window will pop up.

The following steps demonstrate how to manually configure the charging and discharging schedule for a day. Alternatively, an existing template can be imported using the **Import template** button.

b. Enter a custom **Template name**.

c. Select **1s** as the time unit.

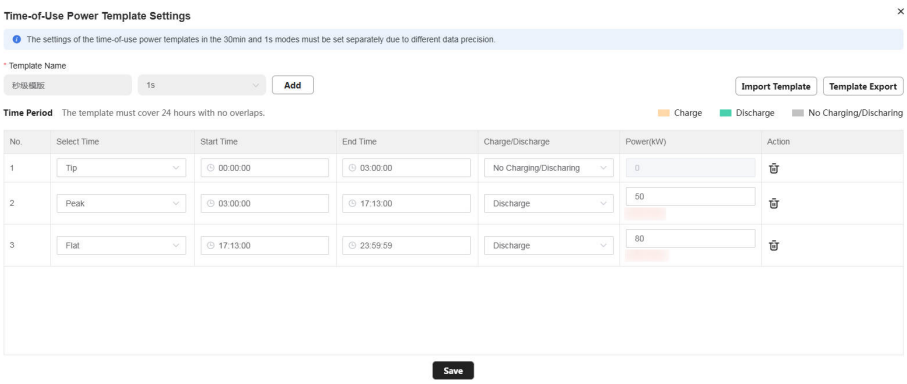


d. Click **Add** and configure the following parameters.

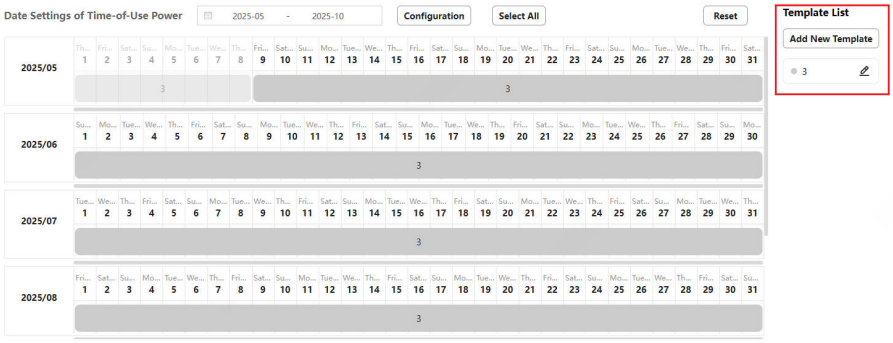
Parameter	Description
Select time	Click to choose from Critical peak, Peak, Shoulder, Valley, and Deep valley.
Start time	Set the start time (in HH:MM:SS format).
End time	Set the end time (in HH:MM:SS format).
Charge/Discharge	Select a status for the period from Charge, Discharge, or No charging/discharging.
Power (KW)	Enter a fixed power value, up to the rated power.

e. Repeat step d until the entire 24-hour period is defined without overlaps.

f. Click **Save** to save the settings.



g. The created template will appear in the Template List on the right panel.



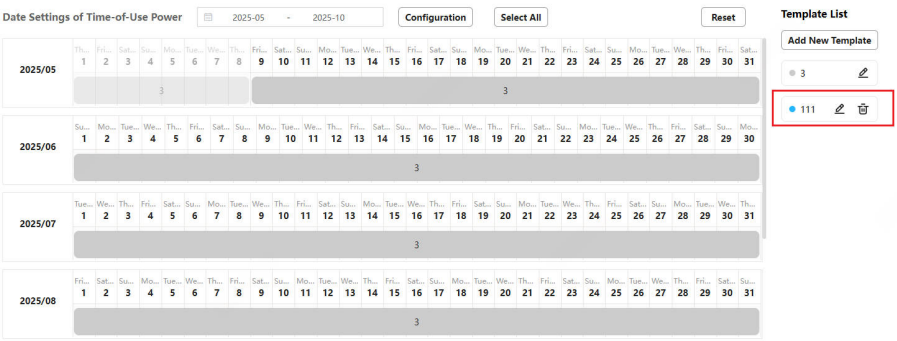
Step 4 (Optional) Add a new time-of-use power template. If the existing time-of-use power templates do not meet requirements, a new template can be added.

a. Click **Add new template**.

Figure 8-2 Add a New Template

b. Configure the template following the steps outlined in 3.

c. The created template will appear in the Template List on the right panel.



Up to 10 templates are supported.

Step 5 (Optional) Edit an existing time-of-use power template. Click the Edit icon of the desired template to edit it.

Step 6 (Optional) Delete a time-of-use power template. Click the Delete icon of the desired template to delete it.

--End

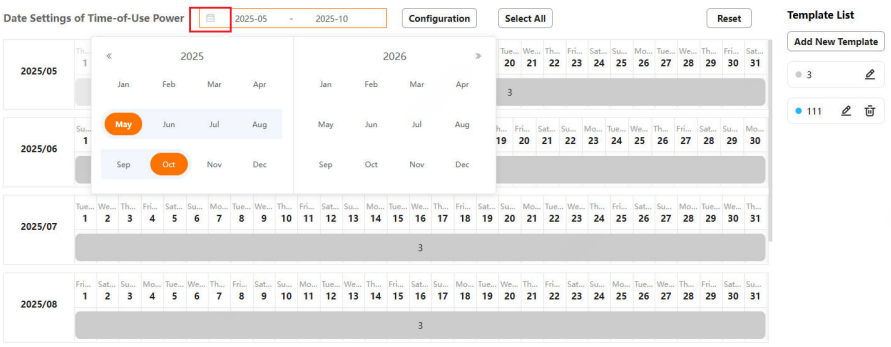
8.1.2.2 Configure Time-of-Use Power Strategies

Step 1 Choose **Energy Management > Grid-connected Active Power**.

Step 2 Select the **Time-of-Use Power** mode.

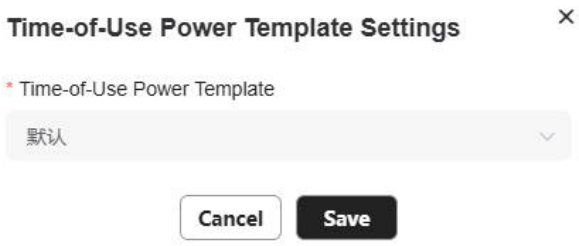
Step 3 Click the calendar icon highlighted in the figure below to select a target period (e.g., a specific month).

The system applies a default time-of-use power template initially. Modify or replace it as needed.

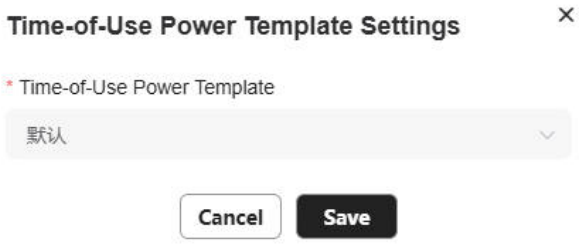


Step 4 Choose an appropriate time-of-use power template to configure the time-of-use power strategy:

- If the same strategy applies to all days in the selected period, select all dates using the **Select all** option, then click **Configuration**. In the pop-up window, select the desired time-of-use power template and click **Save**. The configured strategy will apply to all selected days.



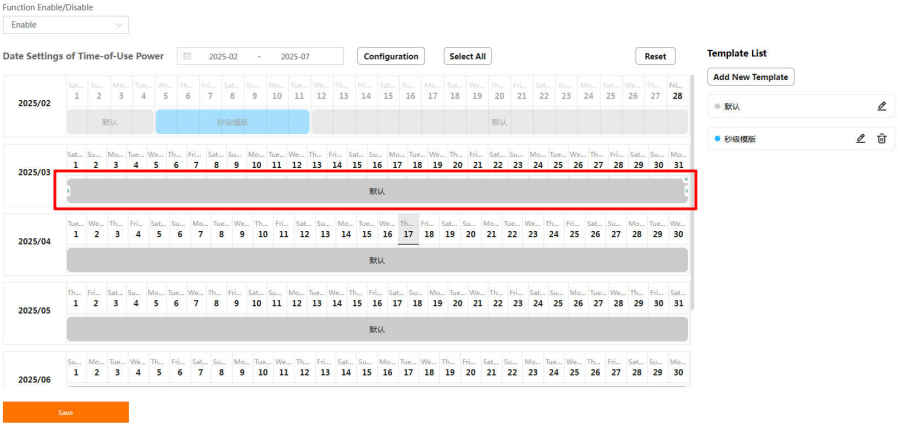
- If different strategies apply to different days (e.g., differentiating weekdays and weekends), hover over a specific date, select a single day or a date range, then click **Configuration**. In the pop-up window, select the desired time-of-use power template and click **Save**. The configured strategy will apply only to the selected days.



Step 5 Click **Save** to save the configured time-of-use power strategy.

Step 6 (Optional) Delete a time-of-use power strategy.

a. Hover over the configured time block you want to delete, and click the Close icon in the upper right corner of the time block.



b. Click **Save** to save the settings.

--End

8.1.3 Remote Time-of-Use Power Management(China/Japan/Others)

Third-party dispatch units can allocate and adjust the output power in different time periods based on grid demand and power generation resources to ensure stable grid operation. On the **Remote TOU power** page, users can view power settings for each time period but cannot modify the parameters.

Step 1 Choose **Energy Management > Grid-connected Active Power**.

Step 2 Select the **Remote TOU power** mode.

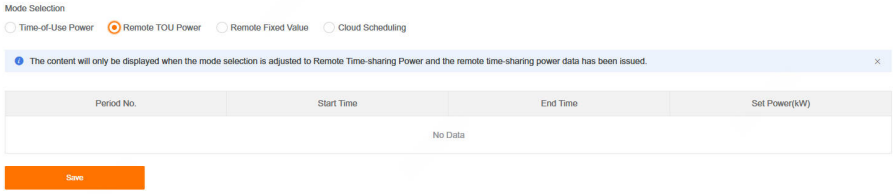


Figure 8-3 Remote Time-of-Use Power Management

Step 3 View power allocation information for each time period sent by the third-party dispatch unit on this page. Take note of the following items:

- Each row on the page shows the charging or discharging status of the ESS during a specific time period.
- Set power: A positive value indicates that the ESS is discharging, while a negative value indicates that the ESS is charging.

--End

8.1.4 Time Plan(Europe/Australia)

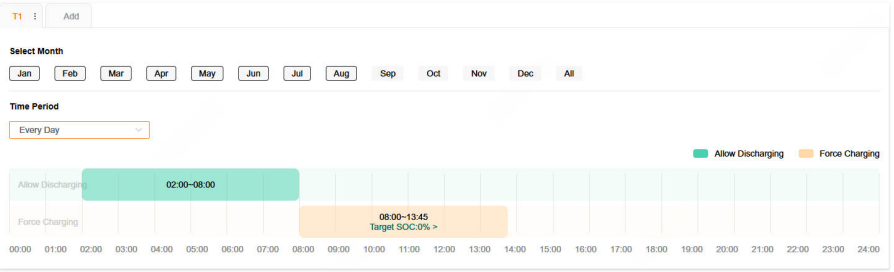
The time plan mode is mainly used for electricity trading scenarios. Users can set the time windows and power for battery charging/discharging, according to the on- and off-peak electricity prices, to maximize the economic benefits.

> This mode only controls the commercial and industrial ESS, or residential ESS, but does not control the PV system.

Step 1 Choose **Energy Management > Grid-connected Active Power**.

Step 2 Select the **Time plan** mode.

Step 3 Configure the time windows for battery charging and discharging.



a. Select months in the **Select month** section.

b. In the **Time period** section, select the days on which the battery charging/discharging plan applies.

You can apply the charging/discharging plan to every day, or set different charging/discharging plans respectively for weekdays and weekends. The plan applies to every day by default.

- **Every day**: The default option, indicating the set charging/discharging plan applies on all days.
- **Weekdays & weekends**: Switch between 

to set different charging/discharging plans respectively for weekdays and weekends.

c. Set the battery discharging and charging windows within a day.

1. Tap a time period in the **Discharge** time bar. Then, drag the left or right edge of the window to adjust the length of time. A new discharging window will be created. The time window is 1 hour by default.
2. Click the time window. In the **Power** field, enter the discharging power for the battery. The battery will discharge at the specified discharging power within the set time period.
3. Tap a time period in the **Charge** time bar. Then, drag the left or right edge of the window to adjust the length of time. A new charging window will be created.
4. Click the time window. In the **Power** field, enter the charging power for the battery. The battery will be charged at the specified charging power within the set time period.

- The discharging and charging windows cannot overlap.
- Outside of the configured time periods, the battery is not allowed to discharge or be charged by drawing power from the grid.

d. To add more month spans, click **Add** to the right of the default month span name and repeat the above steps to configure the charging and discharging periods.

Step 4 Click **Save** to save the settings.

--End

8.1.5 Forced Mode(Europe/Australia)

The forced mode is mainly used in battery O&M to ensure it operates in compliance with the preset charging/discharging mode and power. Restore the system to the previous working mode after maintenance work is completed.

This mode only controls the commercial and industrial ESS, or residential ESS, but does not control the PV system.

Step 1 Choose **Energy Management > Grid-connected Active Power**.

Step 2 Select the **Forced mode**.

Step 3 In the **Charging/discharging command** drop-down list, select the desired action based on the actual situations.

- **Stop**
  Stop battery charging or discharging manually. The battery enters standby mode.
- **Charge**
  Enter a power value in **Charging/discharging power (kW)**. The battery will be charged at the set charging power until it is fully charged.
- **Discharge**
  Enter a power value in **Charging/discharging power (kW)**. The battery will discharge at the set discharging power until it is fully discharged.

Step 4 Click **Save** to save the settings.

--End

8.1.6 VPP(Europe/Australia)

In the VPP mode, the system operates according to the feed-in power and battery charging/discharging commands from the VPP provider. The system supports command transmission and control via IEC104, MODBUS, and API.

- IEC104 or Modbus: Commands are received through the EMS300CP controller to control the ESS. For details, please contact the professional technical personnel of Sungrow to obtain the point table.
- API: API commands are received through the iSolarCloud platform and issued to the EMS300CP controller for execution, so as to control the ESS. You can refer to the API usage guide for relevant regulations.

Energy management and scheduling will be conducted based on the external demands, to satisfy the needs and operation requirements of the grid and achieve efficient utilization and scheduling of external resources.

Step 1 Choose **Energy Management > Grid-connected Active Power**.

Step 2 Select the **VPP** mode.

Step 3 Click **Save** to save the settings.

--End

8.1.7 Remote Fixed Value(China/Japan/Europe/Others)

This function is used to make the plant output active power according to the target value remotely set by the third-party scheduling system.

Step 1 Choose **Energy management > Grid-connected active power**.

Step 2 Select the **Remote fixed value** mode.

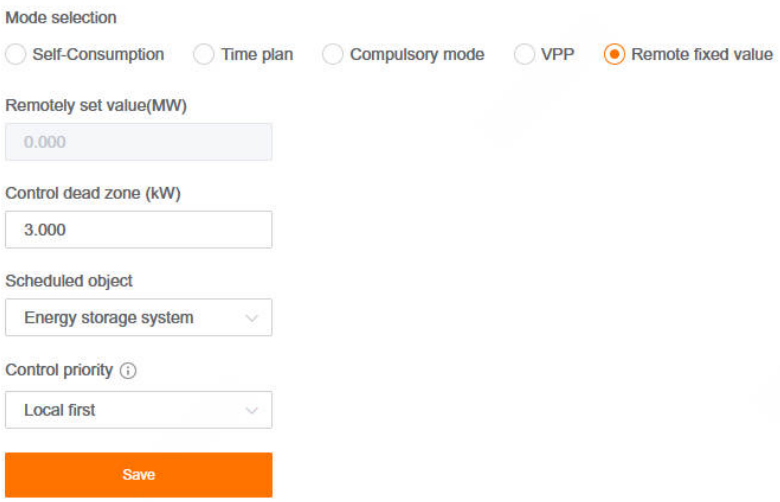


Figure 8-4 Remote Fixed Value

Step 3 Configure the following parameters as needed:

Parameter	Description
Remotely set value (MW)	Shows the remotely set active power when the scheduling mode is set to Third party scheduling.
Control dead zone (kW)	Set this parameter based on the actual power of the plant. It is recommended to set this parameter to 1% of the rated power. It defines the range within which the target active power value can fluctuate. For example, if the target active power of the grid-connected point is 10 kW, and the control dead

Parameter	Description
	zone is set to 5 kW, then the target active power of the grid-connected point can range from 5 kW to 15 kW.
Control priority	• Local first: When the power command from third-party scheduling conflicts with the local control strategy, the local control command will be prioritized. • Schedule first: When the power command from third-party scheduling conflicts with the local control strategy, the third-party scheduling command will be prioritized.
Scheduled object	This parameter can only be configured when the **Control priority** is set to Schedule first. • Grid-connection point: The target power value set in active power control will be used to perform closed-loop control for the power of the grid-connection point. • Energy storage system: The target power value set in active power control will be used to perform closed-loop control for the power of the ESS. This item is valid when active power control is enabled alone. If other control strategies such as overload protection are enabled, the target power value will be used to perform closed-loop control on the power of the grid-connection point.

Step 4 Click **Save** to save the settings.

--End

8.1.8 Cloud Scheduling(China/Japan/Others)

The system receives ESS active power plan curves from the cloud. In this mode, the target value of ESS active power is adjusted based on these plan curves.

Step 1 Choose **Energy Management > Grid-connected Active Power**.

Step 2 Select the **Cloud scheduling** mode.

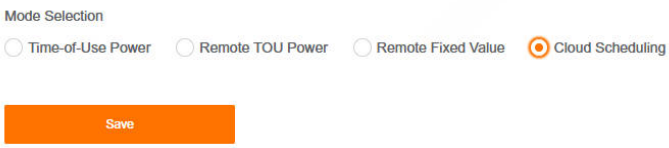


Figure 8-5 Cloud Scheduling

Step 3 Click **Save** to save the settings.

--End

8.2 Grid-connected Reactive Power

8.2.1 Optimized Power Factor ControlIt(China/Japan/Europe/Others)

Optimized power factor control is used to adjust the power factor to reduce the power factor adjustment charges.

This strategy is only used to control the reactive power currently.

Step 1 Choose **Energy Management > Grid-connected Reactive Power**.

Step 2 Click to set **Function enable/disable** 。

- **Enable**: Enable the reactive power control function. Proceed to subsequent configurations.
- **Disable**: Disable the reactive power control function.

Step 3 Select the**Optimized Power Factor Control** mode.

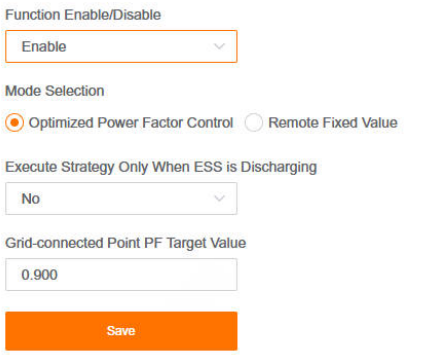


Figure 8-6 Optimized Power Factor Control

Step 4 Set **Execute strategy only when ESS is discharging** based on the actual conditions. Default value: **No**.

- **Yes**: When the grid power factor decreases, the optimized power factor control strategy will only be executed during discharging of the ESS.
- **No**: When the grid power factor decreases, the optimized power factor control strategy will be executed during charging, discharging, and zero power output of the ESS.

Step 5 Set **Grid-connected point PF target value**. Set the value based on the actual conditions.

If the power factor of the grid-connection point is less than the set target value, the target reactive power value of the grid-connection point can be calculated on the basis of the set target value and the active power value of the grid-connection point, and then the reactive power can be regulated by the ESS and PV system.

Step 6 Click **Save** to save the settings.

--End

8.2.2 Remote Fixed Valuet(China/Japan/Europe/Others)

This function is used to make the plant output reactive power according to the target value remotely set in Third party scheduling mode.

Step 1 Choose **Energy Management > Grid-connected Reactive Power**.

Step 2 Click to set **Function enable/disable**.

- **Enable**: Enable the reactive power control function. Proceed to subsequent configurations.
- **Disable**: Disable the reactive power control function.

Step 3 Select the **Remote fixed value** mode.

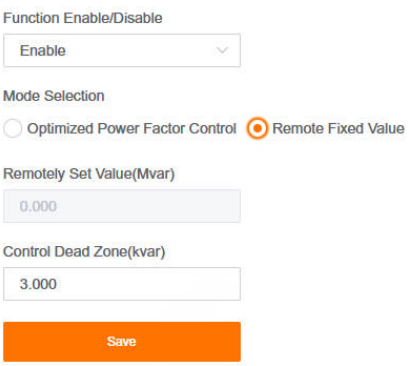


Figure 8-7 Remote Fixed Value

Step 4 Configure the following parameters.

Parameter	Description
Remotely set value (Mvar)	Shows the remotely set reactive power when the scheduling mode is set to Third party scheduling.
Control dead zone (kvar)	Set the value according to actual conditions. It defines the range within which the target reactive power value can fluctuate. For example, if the target reactive power of the grid-connected point is 10 kvar, and the control dead zone is set to 5 kvar, then the target reactive power of the grid-connected point can range from 5 kvar to 15 kvar.

Step 5 Click **Save** to save the configuration.

--End

8.3 Backup Operation (China/Japan/Others)

In the event of off-grid startup, if the PV system supplies power to both the ESS and the loads, you can set different PV active power values for different power supply scenarios.

This function is applicable to off-grid scenarios.

Step 1 Choose **Energy management > Backup operation**.

The figure is for reference only. The actual user interface may differ.

Step 2 Configure the following parameters:

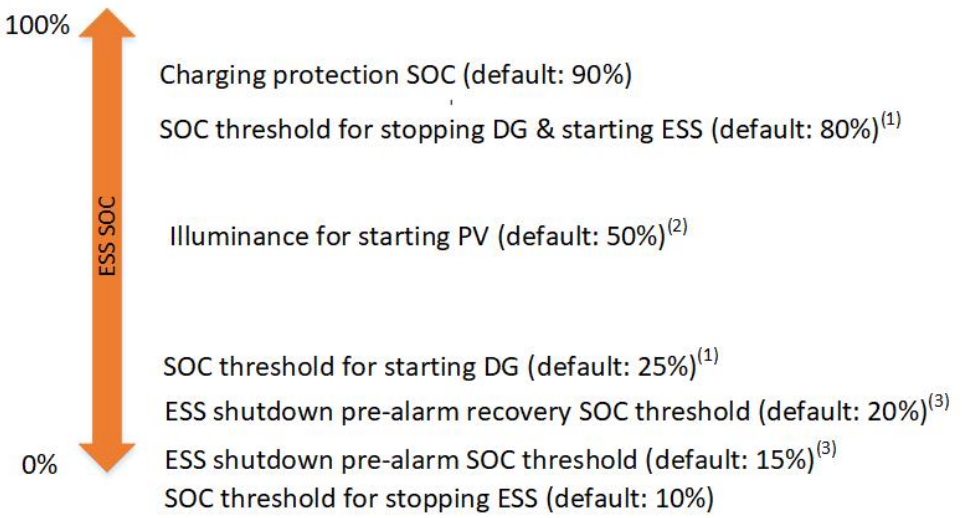
Parameter	Description
Charging protection SOC (%)	Charging stops when the ESS SOC reaches this threshold. Default value: 90. Range: 0–100. One decimal place is supported.
Charging protection SOC deadband setpoint	It limits the range within which the target charging protection SOC value can fluctuate. Default value: 2. Range: 0–100. One decimal place is supported.
SOC threshold for stopping DG & starting ESS (%)(1)	When the ESS SOC reaches this threshold, the diesel generator will shut down. Default value: 80. Range: 0–100. One decimal place is supported.
SOC threshold for starting DG (%)(1)	When the ESS SOC reaches this threshold, the diesel generator will start. Default value: 25. Range: 0–100. One decimal place is supported.

Parameter	Description
ESS shutdown pre-alarm recovery SOC threshold (%) (3)	When the ESS SOC is greater than or equal to this threshold, set the measuring point "ESS shutdown pre-alarm" of the ATS to 0. Default value: 20. Range: 0–100. One decimal place is supported. The firmware version of EMS300CP must be P024 or later.
ESS shutdown pre-alarm SOC threshold (%)(3)	When the ESS SOC is less than or equal to this threshold, set the measuring point "ESS shutdown pre-alarm" of the ATS to 1. Default value: 15. Range: 0–100. One decimal place is supported. The firmware version of EMS300CP must be P024 or later.
SOC threshold for stopping ESS (%)	When the ESS SOC is less than or equal to this threshold, discharging is prohibited. Default value: 10. Range: 0–100. One decimal place is supported.
Irradiance for starting PV (W/m^2)	When the PV irradiance reaches this value, the PV equipment starts. Default value: 50. Range: 0–100. One decimal place is supported.
ESS charging power coefficient	When the system supplies power to both the ESS equipment and the loads, PV active power = ESS charging power coefficient × Current minimum charging power allowed by ESS equipment + Load power. Default value: 0.8. Range: 0–1. Two decimal places are supported.
Load factor K2	When the ESS equipment is fully charged and power is supplied only to the loads, PV active power = K2 × Load power. Default value: 0.98. Range: 0–1. Two decimal places are supported.
Regular load power (kW)(2)	Set this parameter to the total power demand value of all electrical equipment and loads in the

Parameter	Description
	system except chargers. The default value is 10 kW. The maximum value cannot exceed the maximum discharge capacity of the ESS. Default value: 10. The set value must be greater than 0. One decimal place is supported. If the value is set too small, the power supplied to chargers will be too high, resulting in insufficient power supply. If the value is set too large, the power supplied to chargers will be too low, affecting charging time.
SOC threshold to stop supplying power to charger (%)(2)	It is recommended to set this value to Number of available ESSs (N) × Remaining power of a single ESS that can supply a regular load power setpoint × Demand duration. When the SOC of the ESS (Number of available energy storage units × Remaining power of a single energy storage unit) falls below the value of this parameter, the system will stop supplying power to the chargers. Default value: 50. Range: 0–100. Only integers are supported.
ESS VSG frequency adjustment value (Hz)(3)	Default value: 0. Range: -0.3 to 0.3. Two decimal places are supported.
Diesel generator startup timeout(1)(3)	Default value: 5. Range: 0–15. One decimal place is supported.

(1) This parameter is displayed only when diesel generators are connected to the plant.
(2) This parameter is displayed only when chargers are connected to the plant.
(3) This parameter is displayed only when diesel generators are connected to the plant.

The illustration of SOC parameter settings and actual ESS SOC values under the Backup operation control strategy is as follows:



Step 3 (Optional) Configure **VSG parameter management**. After you configure the following parameters, the system can independently maintain stable voltage and frequency in off-grid mode, ensuring reliable power supply to the load.

- **VSG parameter management** is displayed only when ST200CS or ST255CS devices are connected to the plant.
- If you do not want to use this function in the plant, select **Disable**.

- **Enable**: Enable the function. Configure the following parameters. Then, the system will send the configured parameters to the LC.

Parameter	Description
Output voltage setpoint (V)	Default value: 340. Range: 340–440.
Output frequency setpoint (Hz)	Default value: 48. Range: 48–52.
Active power-frequency droop coefficient	Default value: 1. Range: 1.0–4.0.
Reactive power-voltage droop coefficient	Default value: 1. Range: 1.0–2.0.
Sent active power setpoint (kW)	Default value: 0. The maximum value cannot exceed the rated power of the LC.

Parameter	Description
Sent reactive power setpoint (kvar)	Default value: 0. The maximum value cannot exceed the rated power of the LC.

- **Disable**: Disable the function.

Step 4 Click **Save** to save the settings.

--End

8.4 Fast Frequency Responset(China/Japan/Others)

Fast frequency response is used to measure the frequency at the grid-connection point in real time and perform auto control accordingly to keep the frequency within a safe range.

8.4.1 Primary Frequency Regulation

Step 1 Click **Energy Management > Fast-frequency Response**.

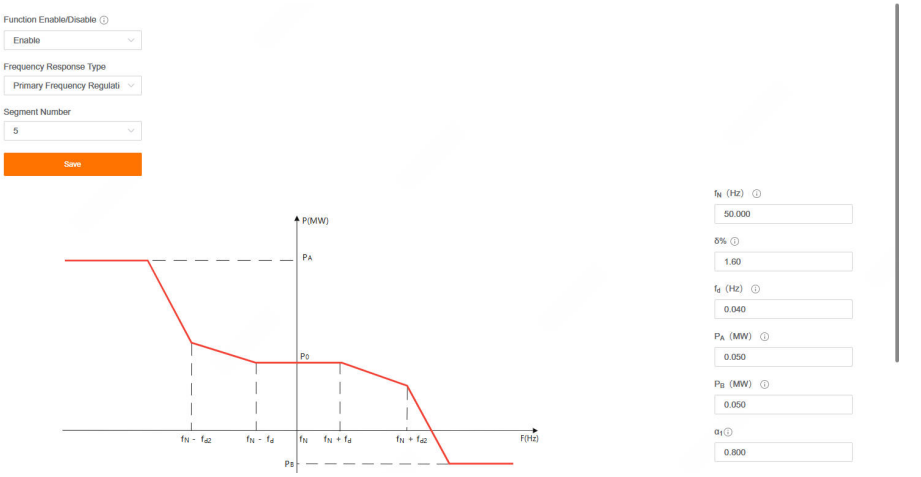
Step 2 Set **Function enable/disable** .

- **Enable**: Enable the function.

> If no meter or fast frequency sampling devices are connected to the plant, the function will not take effect even after being enabled.

- **Disable**: Disable the function.

Step 3 Select **Primary frequency regulation** from the **Frequency response type** drop-down list.



> The figure is for reference only. The actual user interface may differ.

Step 4 Set the **Segment number** to 3 or 5.

Step 5 Configure the frequency regulation parameters on the right. The descriptions of the parameters are shown below.

Parameter	Description
f_N	Rated frequency of grid-connection point
δ%	Frequency regulation coefficient (δ%=-△f(%)/△P(%))
f_d	Frequency regulation dead zone
P_A	Maximum output active power
P_B	Maximum active power absorbed
α_1	Lower limit of active power limit coefficient
α_2	Upper limit of active power limit coefficient
δ_2% *	Frequency regulation II regulation coefficient
f_{d2} *	Frequency regulation II dead zone

*Parameters required to be set when Segment number is set to 5.

The active power limit coefficient is the absolute value of the ratio of the active power output increment limit against the rated power of energy storage.

Step 6 Click **Save** to save the settings.

--End

8.4.2 DC

Step 1 Click **Energy Management > Fast-frequency Response**.

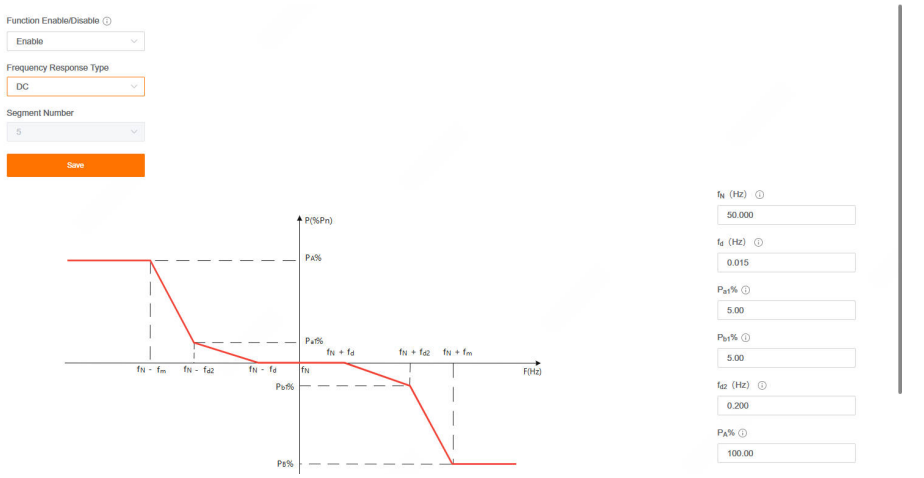
Step 2 Set **Function enable/disable**.

- **Enable**: Enable the function.

  If no meter or fast frequency sampling devices are connected to the plant, the function will not take effect even after being enabled.

- **Disable**: Disable the function.

Step 3 Select **DC** from the **Frequency response type** drop-down list.



The figure is for reference only. The actual user interface may differ.

Step 4 Configure the frequency regulation parameters on the right. The descriptions of the parameters are shown below.

Parameter	Description
f_N	Rated frequency of grid-connection point
f_d	Frequency regulation dead zone
P_{a1}%	Max. percentage of active power output in segment 1
P_{b1}%	Max. percentage of active power absorbed in segment 1
f_{d2}	Frequency regulation II dead zone
P_A%	Max. percentage of active power output
P_B%	Max. percentage of active power absorbed
f_m	Frequency deviation threshold for full-scale response

Step 5 Click **Save** to save the settings.

--End

8.4.3 DM

Step 1 Click **Energy Management > Fast-frequency Response**.

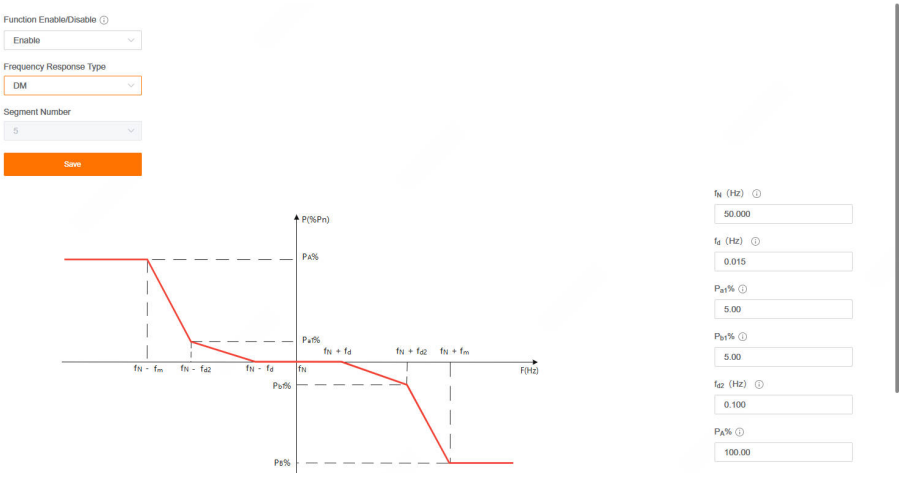
Step 2 Set **Function enable/disable**.

- **Enable**: Enable the function.

If no meter or fast frequency sampling devices are connected to the plant, the function will not take effect even after being enabled.

- **Disable**: Disable the function.

Step 3 Select **DM** from the **Frequency response type** drop-down list.



The figure is for reference only. The actual user interface may differ.

Step 4 Configure the frequency regulation parameters on the right. The descriptions of the parameters are shown below.

Parameter	Description
f_N	Rated frequency of grid-connection point
f_d	Frequency regulation dead zone
P_{a1}%	Max. percentage of active power output in segment 1
P_{b1}%	Max. percentage of active power absorbed in segment 1
f_{d2}	Frequency regulation II dead zone
P_A%	Max. percentage of active power output
P_B%	Max. percentage of active power absorbed
f_m	Frequency deviation threshold for full-scale response

Step 5 Click **Save** to save the settings.

--End

8.4.4 DR

Step 1 Click **Energy Management > Fast-frequency Response**.

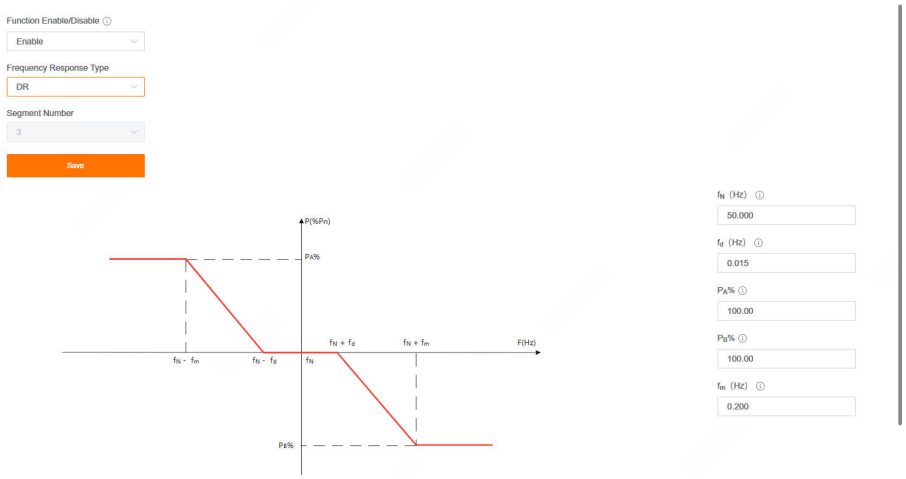
Step 2 Set **Function enable/disable**.

- **Enable**: Enable the function.

  If no meter or fast frequency sampling devices are connected to the plant, the function will not take effect even after being enabled.

- **Disable**: Disable the function.

Step 3 Select **DR** from the **Frequency response type** drop-down list.



The figure is for reference only. The actual user interface may differ.

Step 4 Configure the frequency regulation parameters on the right. The descriptions of the parameters are shown below.

Parameter	Description
f_N	Rated frequency of grid-connection point
f_d	Frequency regulation dead zone
P_A%	Max. percentage of active power output
P_B%	Max. percentage of active power absorbed
f_m	Frequency deviation threshold for full-scale response

Step 5 Click **Save** to save the settings.

--End

8.4.5 Contingency FCAS

Step 1 Click **Energy Management > Fast-frequency Response**.

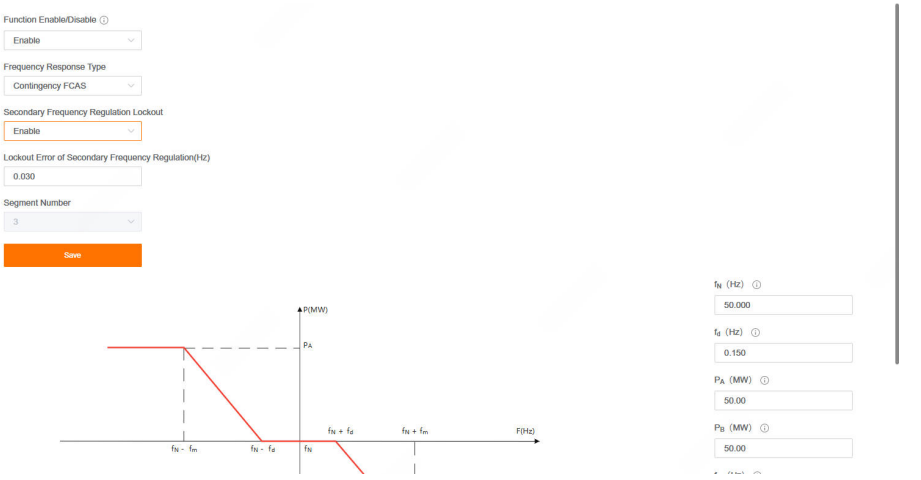
Step 2 Set **Function enable/disable** .

- **Enable**: Enable the function.

  If no meter or fast frequency sampling devices are connected to the plant, the function will not take effect even after being enabled.

- **Disable**: Disable the function.

Step 3 Select **Contingency FCAS** from the **Frequency response type** drop-down list.



The figure is for reference only. The actual user interface may differ.

Step 4 (Optional) Complete the secondary frequency regulation settings.

Parameter	Description
Secondary frequency regulation block	Default value: Disable. • **Enable**: Enable secondary frequency regulation block. • **Disable**: Disable secondary frequency regulation block.
Secondary frequency regulation block error	Set this parameter when **Secondary frequency regulation block** is set to Enable. The default value is recommended. This parameter is used for coordinated control of primary and secondary frequency regulation. When the grid frequency deviation is less than the value of this parameter, secondary frequency regulation (i.e., receiving AGC commands) and primary frequency

Parameter	Description
	regulation will be combined, regardless of whether they are in the same or opposite directions. When the grid frequency deviation exceeds the value of this parameter, the secondary frequency regulation block strategy is executed, and combination will not be performed.

Step 5 Configure the frequency regulation parameters on the right. The descriptions of the parameters are shown below.

Parameter	Description
f_N	Rated frequency of grid-connection point
f_d	Frequency regulation dead zone
P_A	Maximum output active power
P_B	Maximum active power absorbed
f_m	Frequency deviation threshold for full-scale response

Step 6 Click **Save** to save the settings.

--End

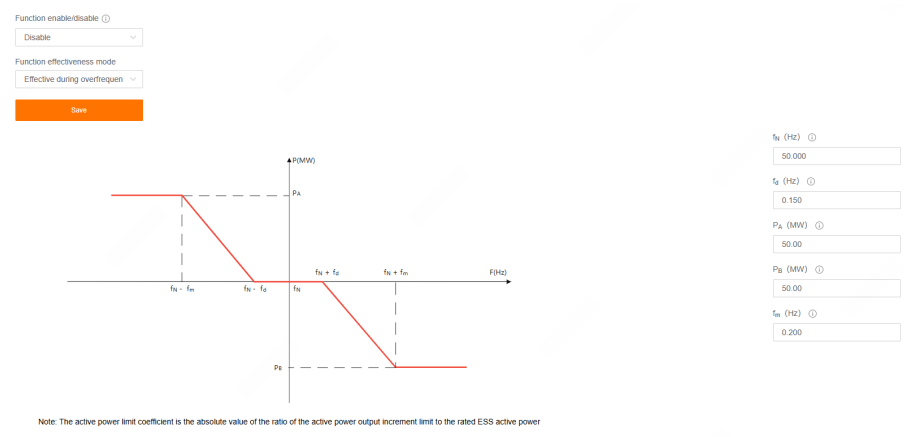
8.5 FCAS(Australia)

FCAS is used to regulate the grid connection frequency of the plant. It responds to grid frequency fluctuations according to set frequency regulation parameters to maintain system stability.

Prerequisite

It is recommended to install a DTSU666-20 gateway meter in the plant.

Step 1 Choose **Energy Management > FCAS**.



Step 2 Set **Function enable/disable**.

- **Enable**: Enable the function.
- **Disable**: Disable the function.

Step 3 Set the **Function effectiveness mode**.

- **Effective during overfrequency**: The function is effective only during overfrequency.
- **Effective during underfrequency**: The function is effective only during underfrequency.
- **Effective during overfrequency and underfrequency**: Default mode. The function is effective during both overfrequency and underfrequency.

The firmware version of EMS300CP must be P024 or later.

Step 4 Configure the frequency regulation parameters on the right. The descriptions of the parameters are shown below:

Parameter	Description	Value
f_N (Hz)	Rated frequency at grid connection point	Default value: 50.000.
f_d (Hz)	Frequency regulation deadband	Default value: 0.150. When the frequency is within the range of f_N (**Rated frequency at the grid connection point**)±0.150, the frequency regulation strategy does not respond.
P_A (MW)	Max. output active power	Range: [0, 9999.99]. Default value: 50.00. Set this parameter according to actual conditions.

Parameter	Description	Value
P_B (MW)	Max. active power absorbed	Range: [0, 9999.99]. Default value: 50.00. Set this parameter according to actual conditions.
F_m (Hz)	Frequency deviation threshold for full-scale response	The critical value that triggers the maximum power output/ absorption response. Default value: 0.500.

Step 5 Click **Save** to save the settings.

--End

9 Power Control

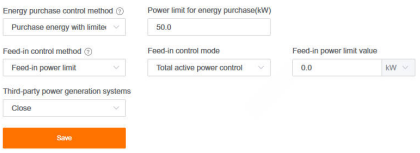
Set the **Country/Region** to **China**, **Europe**, **Japan**, **Australia**, or **Others** by referring to 11.3.8 Setup Wizard.

- The default control strategies may vary by region. Please refer to the actual interface.
- For configurations in Japan's HV scenarios, refer to *EMS300CP User Manual (Japan's HV Scenarios)*.

9.1 Grid-Connected Power Control (Europe/Australia)

To ensure electrical safety and regulatory compliance, users need to set a proper feed-in power limit based on the requirements of the local grid operator, preventing the feed-in power of the system from exceeding the allowable range. In addition, users can set a power limit for energy purchase based on their capacity demands to prevent energy purchased from the grid exceeding the allowable range.

Step 1 Choose **Power Control > Grid-connection Power Regulation**.



Step 2 In the **Energy purchase control method** drop-down list, select **No limit** or **Purchase energy with limited power**.

Step 3 If **Purchase energy with limited power** is selected, enter a proper power limit in Power limit for energy purchase based on the rated current of the main power source equipment that is connected in the system or other maximum power demand requirements.

Step 4 In the **Feed-in control method** drop-down list, select **No limit** or **Feed-in power limitation**.

Step 5 If **Feed-in power limitation** is selected, you need to select a unit for the target feed-in power. Options include **kW** and **%**.

Step 6 When the unit **kW** is selected, set a proper feed-in power value based on local regulatory requirements.

Step 7 When the unit **%** is selected, select a basis for limiting the grid-connected power from the **Feed-in power limit ratio calculation basis** drop-down list.

Feed-in power limit = Feed-in power limit ratio × (Feed-in power limit ratio calculation basis + Rated power of third-party power generation system)

- **Nominal power**: The dispatched value is calculated based on the rated power of the energy storage unit that is connected.
- **Installed PV power**: The dispatched value is calculated based on the installed PV power of the inverter that is connected. Enter the **Total installed power of modules** based on the actual plant conditions.

Step 8 Set the **Feed-in control mode**.

- Total active power control: Default option. The system determines whether to trigger the control strategy based on the total active power value.
- Per-phase active power control: The system determines whether to trigger the control strategy based on the active power value of each phase.

The firmware version of EMS300CP must be P024 or later.

Step 9 In the **Third-party power generation systems** drop-down list, select **Open** or **Close**.

When third-party power generation equipment is present in the plant but not connected to the EMS300CP, this parameter must be set.

Step 10 If **Open** is selected in **Third-party power generation systems**, users can specify the rated power in **Rated power of third-party power generation system (kW)**. Range: 0–99999999. Unit: kW. The default value is 0.

Step 11 Click **Save** to save the settings.

--End

9.2 Demand Control(China/Japan/Others)

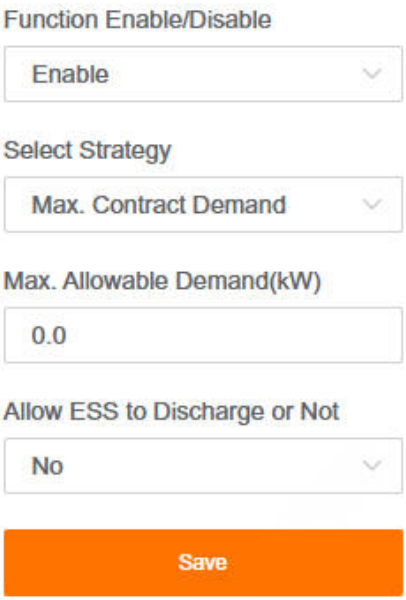
After you set the maximum demand threshold, the system will intelligently regulate the charging and discharging behavior of energy storage devices to ensure that the real-time power at the grid-connection point remains below this threshold. This effectively reduces demand charges.

- Demand: The average power over a specified time interval.
- Maximum demand: The maximum demand recorded within a specified period.

Step 1 Choose **Power Control > Demand Control**.

Step 2 Set **Function enable/disable**.

- **Enable**: Enable the demand control function. Proceed to subsequent configurations.



- **Disable**: Disable the demand control function.

Step 3 Select an option in **Select strategy**. Options include **Max. contract demand** and **Max. actual demand**.

- **Max. contract demand** (static demand)
  In ESS or PV+ESS scenarios, power is consumed in charging the ESS and supplying the load, which may cause the demand value to become excessively high. However, the EMS can reduce the charging power of the ESS based on the set static demand (Max. Contract Demand) value, to ensure that the static demand is not exceeded in planned charging of the ESS (e.g., when the time-of-use power control strategy is enabled). If the power at the point of common coupling (PCC) still exceeds the demand, the ESS can discharge to meet load consumption. In this case, set **Allow ESS to discharge or not** to **Yes**.

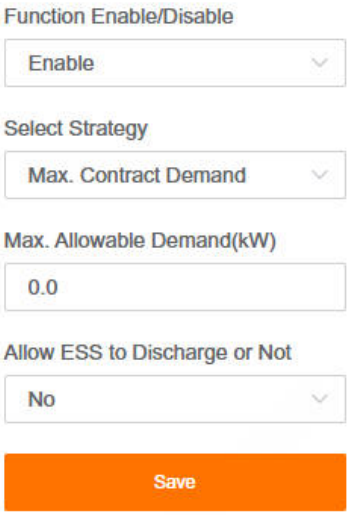


Figure 9-1 Max. Contract Demand

- **Max. actual demand** (dynamic demand)
  In ESS-only or PV+ESS scenarios, the EMS collects the real-time demand value from the PCC meter. (The value is dynamic and refreshed whenever the power drawn from the grid at the PCC exceeds the history maximum value.) The EMS controls the ESS to reduce the charging power, ensuring that the maximum demand is not exceeded in planned charging of the ESS. If the power at the PCC still exceeds the demand, the ESS can discharge to meet load consumption. In this case, set **Allow ESS to discharge or not** to **Yes**.

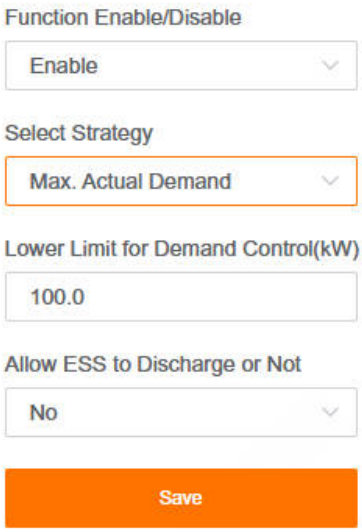


Figure 9-2 Max. Actual Demand

The descriptions of the demand control parameters are as follows.

Table 9-1 Parameter Description

Demand Control Strategy	Description
Max. actual demand	Set the value to the real-time demand of the gateway meter. You must also set the Lower limit for demand control (kW). If the meter's real-time demand value falls below the set Lower limit for demand control, the set Lower limit for demand control will be adopted as the maximum allowable demand. Range: 0.0-99999.0 kW. Default value: 100 kW.
Max. contract demand	Set the value to the maximum contract demand. In this case, you must also set Max. allowable demand (kW) to the maximum contract demand. Range: 0.0-99999.0 kW. Default value: 0.

Step 4 Set **Allow ESS to discharge or not**.

- **Yes**: The ESS is allowed to discharge to supply the load in addition to reducing the charging power in demand control.
- **No**: The ESS is allowed to reduce the charging power but not to discharge in demand control.
- When **Allow ESS to discharge or not** is set to **No**, if the ESS is discharging and the demand control strategy is enabled, the strategy will not be executed.

Step 5 Click **Save** to save the settings.

--End

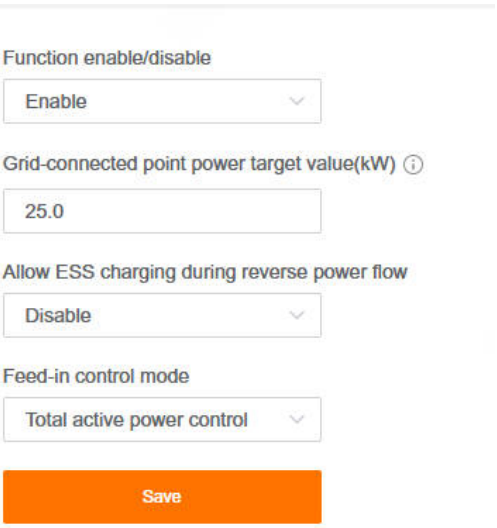
9.3 Zero Export (China/Japan/Others)

The zero export strategy prevents the PV-ESS system from feeding power into the grid. If the discharging power of the PV-ESS system exceeds the load power, the system will automatically reduce the PV output, lower the discharging power, or charge the batteries to prevent power back-feeding.

Step 1 Choose **Power Control > Zero export**.

Step 2 Click to set **Function enable/disable**.

- **Enable**: Enable the zero export function. Configure the following parameters:



Parameter	Description
Target power at grid connection point (kW)	The default value is 0. It is recommended to set this value to -1% to -2% of the rated active power of the ESS. When the actual power at the grid connection point exceeds the set target value, the system will automatically reduce the ESS discharge or PV output.
Allow ESS charging during reverse power flow	- **Enable** If the ESS discharging power is reduced to 0 and power back-feeding persists, the ESS switches to charging mode to reduce export at the grid connection point. - **Disable** If the ESS discharging power is reduced to 0 and PV output is reduced, but power back-feeding persists, the EMS allows power back-feeding to exist and does not take further action.
Feed-in control mode	- Total active power control: Default option. The system determines whether to trigger the control strategy based on the total active power value. - Per-phase active power control: The system determines whether to trigger the control strategy based on the active power value of each phase. The firmware version of EMS300CP must be P024 or later.

- **Disable**: Disable the zero export function.

Step 3 Click **Save** to save the settings.

--End

9.4 DI Power Regulation(Europe/Australia)

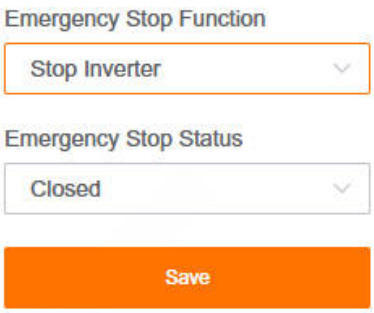
Step 1 Choose **Power Control > DI Power Regulation**.

Step 2 Configure the **Emergency stop function**. This function allows users to stop the inverter immediately in case of an emergency. Options include:

- **Close**

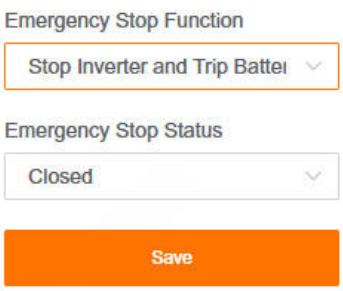
Disable the emergency stop function.

- **Stop inverter**



When emergency stop is triggered, the inverter stops feeding power to the grid and stops receiving power from the grid. The inverter enters the emergency stop state. You must configure the **Emergency stop status**. Select whether DI10 triggers emergency stop via opening or closing, based on actual requirements.

- **Stop inverter and trip battery**



When triggered, the inverter stops exporting power to the grid, and the battery ceases all interactions with the inverter or grid, neither charging nor discharging. The inverter enters the emergency stop state, and the battery enters the trip state.
You must configure the **Emergency stop status**. Select whether DI10 triggers emergency stop via opening or closing, based on actual requirements.

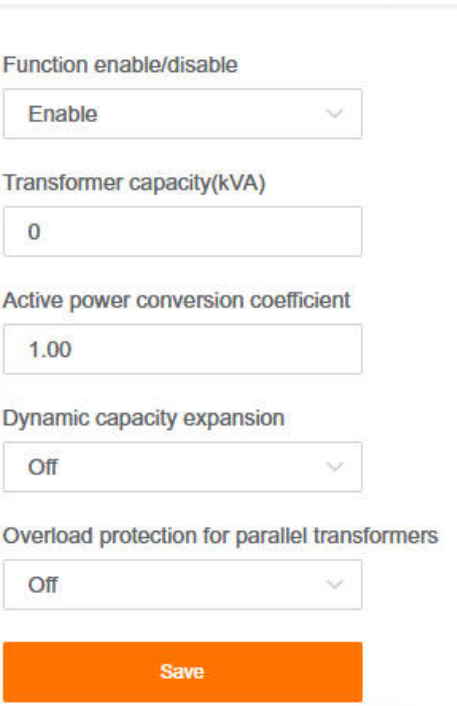
Step 3 Click **Save** to save the settings.

--End

9.5 Overload Protection (China/Japan/Europe/Others)

Overload protection is used to regulate the charging power of the ESS, so as to ensure the power of the transformer at the grid connection point does not exceed the rated capacity, thus preventing overload.

Step 1 Choose **Power Control > Overload Protection**.



Step 2 Click to set **Function enable/disable**.

- **Enable**: Enable the overload protection function. Configure the following parameters.

Parameter	Description
Transformer capacity (kVA)	The capacity of the transformer at the grid connection point. Set this parameter based on the actual situation. This parameter applies to scenarios where only one overload monitoring meter is connected to protect a single transformer. In this case, **Overload protection for parallel transformers** must be disabled.
Active power conversion coefficient	Default: 1. Range: 0–1. Protection trigger threshold = **Transformer capacity** × **Active power conversion coefficient** (Protection is activated when the power on the transformer side is greater than the threshold.)

Parameter	Description
	This parameter applies to scenarios where only one overload monitoring meter is connected to protect a single transformer. In this case, **Overload protection for parallel transformers** must be disabled.
Dynamic capacity expansion	- Enable: In the event of overload, the system first reduces the charging power of the ESS. If the charging power is reduced to 0 and overload still exists, the ESS discharges. - Disable: In the event of overload, the system only reduces the charging power of the ESS (discharging is prohibited).
Overload protection for parallel transformers	When multiple overload monitoring meters are connected and protection for multiple parallel transformers is required, enable **Overload protection for parallel transformers** and configure the following parameters: - Transformer capacity (kVA): Set the transformer capacity value of the transformer connected to the current overload monitoring meter. - Impedance voltage (%): Set the percentage of the impedance voltage for the current transformer. - Active power conversion coefficient: The default value is 1 and the value ranges from 0–1. A value of 0 indicates that the transformer does not participate in overload protection. The firmware version of EMS300CP must be P024 or later.

- **Disable**: Disable the overload protection function.

Step 3 Click **Save** to save the settings.

--End

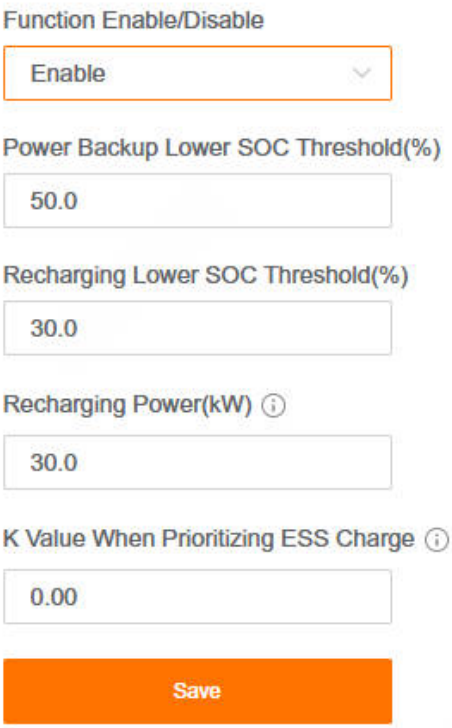
9.6 Power Backup(China/Japan/Europe/Others)

Power backup is used to set protection thresholds for the SOC of the ESS, so that the ESS operates within the set SOC range when connected to the grid, and some energy is reserved to supply the loads in the event of a grid outage.

Step 1 Choose **Power Control > Power Backup** .

Step 2 Click to set **Function enable/disable**.

- **Enable**: Enable the power backup function. Configure the following parameters.



Parameter	Description
Power backup lower SOC threshold (%)	50% by default. Set this parameter according to actual conditions. When the SOC of the ESS falls below this threshold, the ESS is not allowed to discharge.
Recharging lower SOC threshold (%)	When the SOC of the ESS drops to this threshold, the recharging mechanism is triggered to restore the SOC to a safe or usable level.
Recharging power (kW)	Set this parameter according to actual conditions. The energy storage system will be charged at this specified power.
K value when prioritizing ESS charge	Range: [0, 1]. For example, if this parameter is set to 0.1, an amount of power equivalent to 10% of the rated active power of the energy storage device will

Parameter	Description
	be allocated from the available power for charging the energy storage device. This parameter takes effect only when a charger is connected to the plant.

SOC in the table refers to the percentage of the current battery power to the total capacity of the battery, namely, the actual available battery power.

- **Disable**: Disable the standby power function.

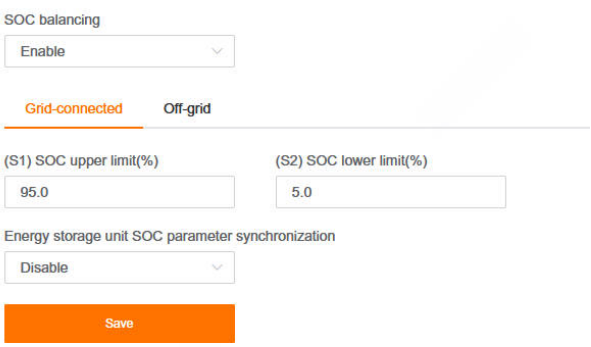
Step 3 Click **Save** to save the settings.

--End

9.7 SOC Protection (China/Japan/Europe/Others)

To ensure the safe and efficient operation of the ESS, you can configure the SOC protection thresholds to keep the system strictly within the specified SOC range during grid-connected operation. By optimizing the control of each PCS, the battery SOC across the entire plant is maintained at a healthy level, preventing overcharging and overdischarging, thereby reducing battery degradation and extending battery life.

Step 1 Choose **Power Control > SOC Protection**.



Step 2 Click in **SOC balancing**.

- **Enable**: Enable the SOC balancing function to ensure that all Packs maintain similar SOC levels, preventing individual batteries from being damaged due to overcharging or overdischarging. This helps extend the service life of the entire Pack.
- **Disable**: Disable the SOC balancing function.

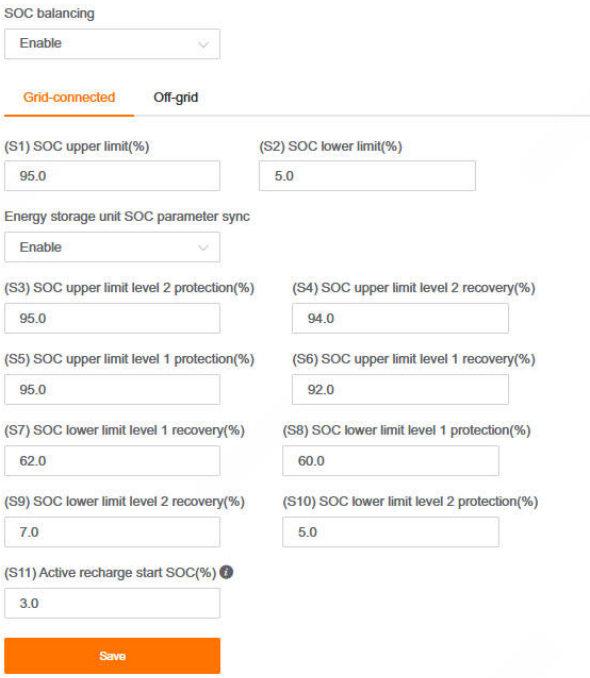
Step 3 Configure the SOC balancing strategy on the **Grid-connected** or **Off-grid** tab.

Step 4 Configure the following parameters as needed:

Parameters	Description
SOC upper limit (%)	When the SOC of the ESS is greater than or equal to the SOC upper limit, the EMS300CP issues a zero power command to the local controller (hereinafter referred to as LC). Default value: 97%.
SOC lower limit (%)	When the SOC of the ESS is less than or equal to the lower limit, the EMS300CP issues a zero power command to the LC. 5% by dafault.

Step 5 Click ⌄ in **Energy storage unit SOC parameter sync**.

- **Enable**: The EMS300CP will transmit the configured SOC thresholds to the LC, which then performs further SOC protection. Configure the following parameters:

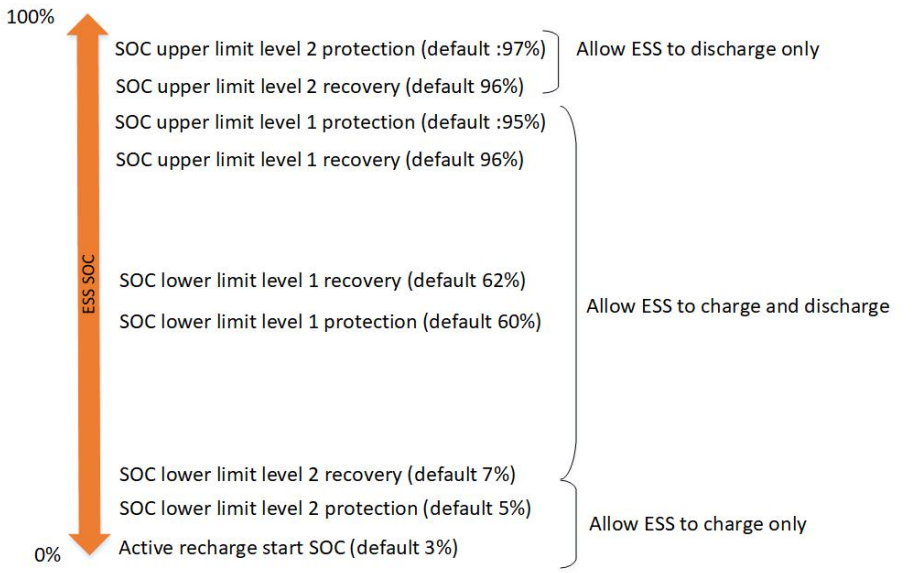


Parameters	Description
SOC upper limit level 2 protection (%)	Default value: 97%. When the SOC of the ESS is greater than or equal to this threshold, the ESS is prohibited from charging.
SOC upper limit level 2 recovery (%)	Default value: 96%. If the SOC of the ESS is less than or equal to this threshold, the ESS resumes charging.

Parameters	Description
SOC upper limit level 1 protection (%)	Default value: 95%. Set this parameter according to actual conditions. When the SOC of the ESS reaches this threshold, the EMS300CP sends an alarm to notify the user that the SOC has reached the SOC upper limit level 1 protection threshold.
SOC upper limit level 1 recovery (%)	Default value: 92%. Set this parameter according to actual conditions.
SOC lower limit level 1 recovery (%)	Default value: 62%. Set this parameter according to actual conditions. If the SOC of the ESS is greater than or equal to this threshold, the ESS resumes discharging.
SOC lower limit level 1 protection (%)	Default value: 60%. Set this parameter according to actual conditions. When the SOC of the ESS reaches this threshold, the EMS300CP sends an alarm to notify the user that the SOC has reached the SOC upper limit level 1 protection threshold.
SOC lower limit level 2 recovery (%)	Default value: 7%. Set this parameter according to actual conditions. If the SOC of the ESS is greater than or equal to this threshold, the EMS300CP goes back to the lower level 1 protection status, and discharging is prohibited.
SOC lower limit level 2 protection (%)	Default value: 5%. Set this parameter according to actual conditions. When the SOC of the ESS is less than or equal to this threshold, the ESS is prohibited from discharging. In this case, the ESS needs to be recharged.
Active recharge start SOC (%)	Default value: 3%. Set this parameter according to actual conditions. When the SOC of the ESS is less than or equal to the active recharge start SOC value, active recharge will be triggered.

Parameters	Description
	- If the active recharge start SOC value is 0 or is greater than or equal to the SOC lower limit level 2 protection threshold, there is a risk of failure in the active recharge function of the energy storage unit. - This parameter is configurable only in grid-connected mode. - The firmware version of EMS300CP must be P024 or later.

The relationship between the configured SOC parameters of the energy storage unit and the actual SOC of the ESS under the SOC protection strategy is shown in the figure below:



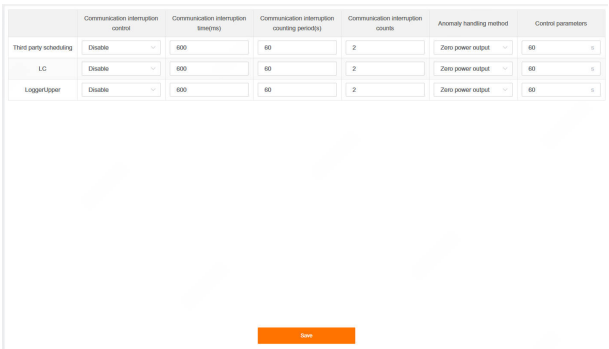
- **Disable**: The EMS300CP will not transmit SOC thresholds to the LC.

Step 6 Click **Save** to save the settings.

--End

9.8 Anomaly Handling

Step 1 Choose **Power control > Anomaly handling**.



Step 2 Configure the following anomaly check settings as needed. If an anomaly occurs, the system will operate according to the configured **anomaly handling** method.

Parameter	Description
Communication interruption control	• Enable: Enable anomaly check for the device. • Disable: Disable anomaly check for the device.
Communication interruption counting period (s) Communication interruption time (ms) Communication interruption counts	Anomaly handling can be triggered in the following two ways: • When a single communication interruption lasts for a period longer than the set **Communication interruption counting period (s)**, the system triggers anomaly handling. • When the duration of a communication interruption exceeds the set **Communication interruption time (ms)**, the system records a communication interruption event. If the number of communication interruptions occurring within the set **Communication interruption counting period (s)** reaches the set **Communication interruption counts**, the system triggers anomaly handling.
Anomaly handling method	The available options for **Anomaly handling method** vary by device type. • For third-party scheduling device: Keep current value, Zero power output, and Full-plant shutdown are supported. • For ESS LC: Zero power output is supported. • For Logger Upper: Keep current value, Zero power output, and Full-plant shutdown are supported.
Control parameter	Default value: 60. Range: [0, 600]. Unit: s. The **Control parameter** settings vary by the **Anomaly handling method**:

Parameter	Description
	• Keep current value: There is no need to set the **Control parameter**. When an anomaly occurs, the system keeps the current value. • Zero power output: - If the **Control parameter** is set to 0, the system immediately sends a zero power output command. - If the **Control parameter** is set to a non-zero value, the system calculates the ramp-down rate based on the current power and sends a command to reduce power to zero within the time specified by the Control parameter. • Full-plant shutdown: There is no need to set the **Control parameter**. When an anomaly occurs, the system executes the full-plant shutdown command.

The Communication interruption counting period (s), Communication interruption time (ms), and Communication interruption counts for third-party scheduling devices can be modified remotely.

Step 3 Click **Save** to save the settings.

--End

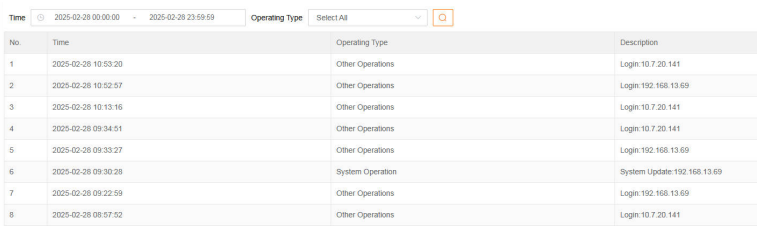
10 History Data

Users can view information such as operation log, history curve, fault records, and dispatch records in this function module.

10.1 Operation Log

It is used to record the Web operations. Users can view specific log content by setting the time range and operation type.

Step 1 Click **History Data > Operation Log**.



Step 2 Set the start and end time in **Time**, and click in **Operation Type** to select the operation type.

Step 3 Click on the right to view the operation log for the selected time period.

--End

10.2 History Curve

On this interface users can view the data records of parameters of every device in the plant by selecting the device and the parameter.

Step 1 Click **History Data > History Curve** to enter the corresponding interface.

Step 2 Click , select the device and parameter to be viewed, and set the start and end time.

Step 3 Click to view the history curve within the specified time period.

Users can select to view data records in a table or a chart. Click the icons in the following table to switch between display methods.

Icon	Description
	Switch to table form.
	Switch to curve form.

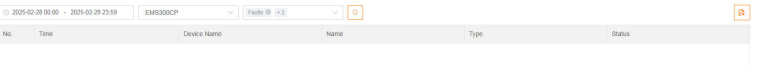
Step 4 Click to export the queried information to local for viewing.

--End

10.3 Fault Record

Search relevant faults by different conditions.

Step 1 Click **History Data > Fault Records**.



Step 2 Set the start and end time, and click to select the device name and fault type.

Step 3 Click to view the fault records in the set time period. The fault records mainly include the following information.

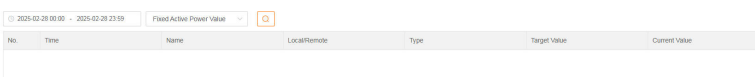
Parameter	Description
Time	Time of fault.
Device Name	The faulty device.
Name	Detailed description of the fault.
Type	There are three types of fault: "Fault", "Warning" and "Event.
Status	-

Step 4 Click to export the queried information to local for viewing.

--End

10.4 Dispatch Record

Step 1 Click **History Data > Dispatch Record**.



Step 2 Set the start and end time, and click to select the parameter to be viewed.

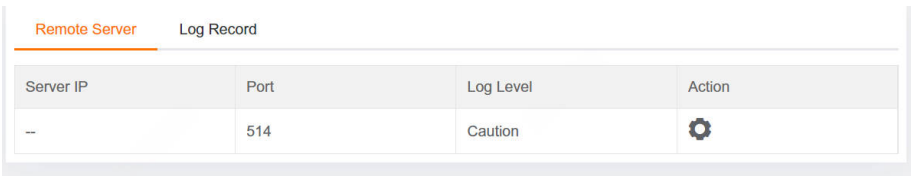
Step 3 Click to view the dispatch records within the specified time period.

--End

10.5 Syslog

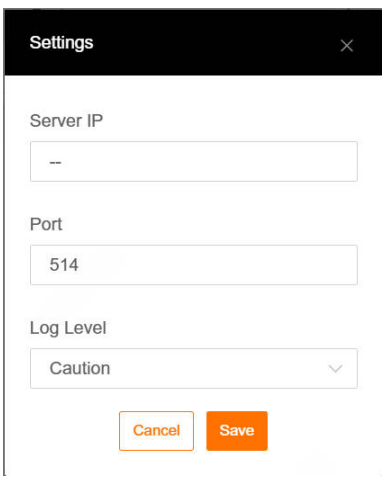
The Syslog feature records the system logs and operation logs of EMS300CP and supports uploading logs of specified levels to a remote server.

Choose **History Data > Syslog**.



Set the Remote Server for Log Upload

1. Click the **Remote Server** tab.
2. Click in the **Action** column to open the **Settings** window.



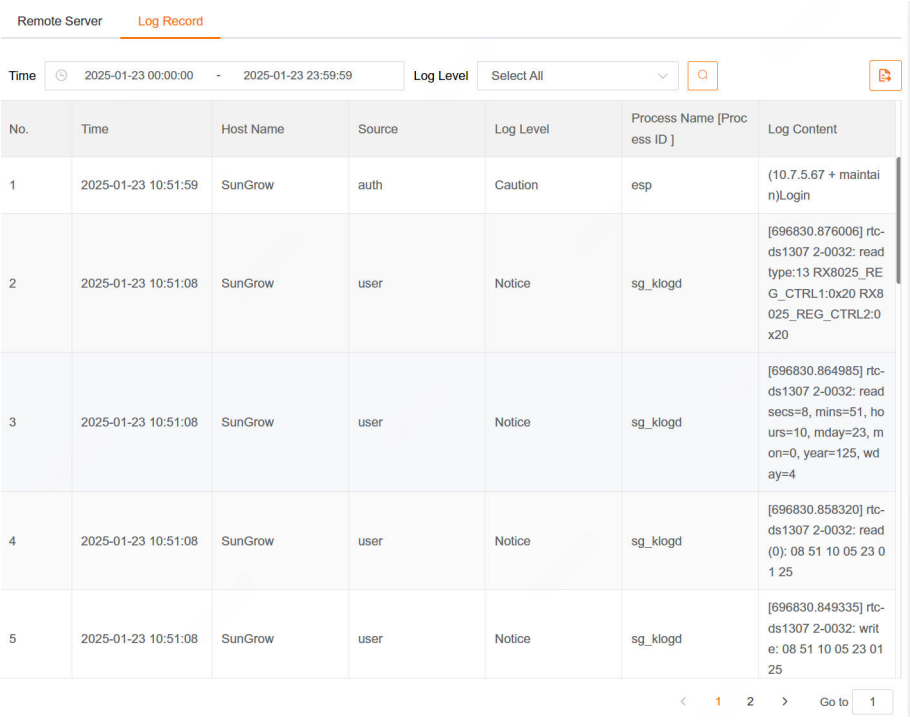
3. Configure the following parameters:
   - Server IP: The IP address of the remote server.
   - Port: The port number of the remote server.

- Log Level: The level of logs to be uploaded.

4. Click **Save** to save the settings.

View Log Record

1. Click the **Log Record** tab.



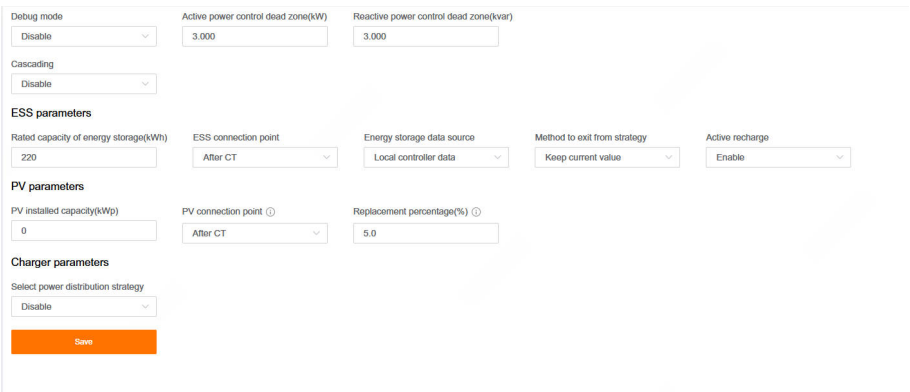
2. Select the start and end time of logs to be viewed in the **Time** selection box.
3. Set the level of logs to be viewed.
4. Click  to view all logs of the specified time period and log level.
5. (Optional) Click  to export logs to your local system.

11 System

11.1 Plant Parameters

Step 1 Choose **System > Plant Parameters**.

Figure 11-1 Plant Parameters



Step 2 Configure the following parameters:

Parameters	Description
Debug mode	• **Enable**: Enable the debug mode. If the debug mode is enabled, the power control command will not be sent to the PCS or PV inverter. • **Disable**: Disable the debug mode.
Reactive power control deadband (kvar)	Set this parameter based on the actual power of the plant. It is recommended to set this parameter to 1% of the rated power. It defines the range within which the target reactive power value can fluctuate. For example, if the target reactive power of the grid connection point is 10 kvar, and the control deadband is set to 5 kvar, then the target reactive power of the grid connection point can range from 5 kvar to 15 kvar.
Cascade	• **Enable**: Enable the function. In this case, select an option in **Master/slave controller setting**. • **Disable**: Disable the function.

Parameters	Description
Master/slave controller setting	Set this parameter if **Cascade** is set to **Enable**. • Master in cascade: This controller is a master controller. • Slave in cascade: This controller is a slave controller.
ESS rated capacity (kWh)	Default value: 220. Set this parameter according to actual conditions.
ESS connection point	**After CT** by default.
Energy storage data source	• Meter data: Select this option when the meter type is **ESS electricity meter**. In this case, the EMS collects ESS charge/discharge data from the ESS electricity meter. • Local controller data: The EMS collects ESS charge/discharge data from the LC.
Method to exit from strategy	• **Retain current value**: After the strategy is exited, the ESS continues to operate at the original power. • **Apply zero power**: After the strategy is exited, a zero power output command is issued.
Active recharge	• **Enable**: Enabled by default. The ESS supports enabling this function manually, but it takes effect only once at a time. • **Disable**: The ESS supports disabling this function manually, but it takes effect only once at a time. The firmware version of EMS300CP must be P024 or later.
PV installed capacity (MWp)(1)	The actual PV installed capacity of the plant.
PV connection point(1)	**After CT** by default. A third-party PV device must be connected after CT.
Shifting percentage (%)(1)	ESS-PV shifting step = PV rated power × shifting percentage
Select power distribution strategy(2)	**Disable** by default. Options include: • Evenly distributed: Allocate charging power evenly according to the quantity of EVs and grid power limits. • First come first served: Based on charger sequence and grid power limits, allocate power according to EV

Parameters	Description
	needs, prioritizing earlier-sequence EVs for quicker charging. • Disable: No power distribution strategy is enabled.

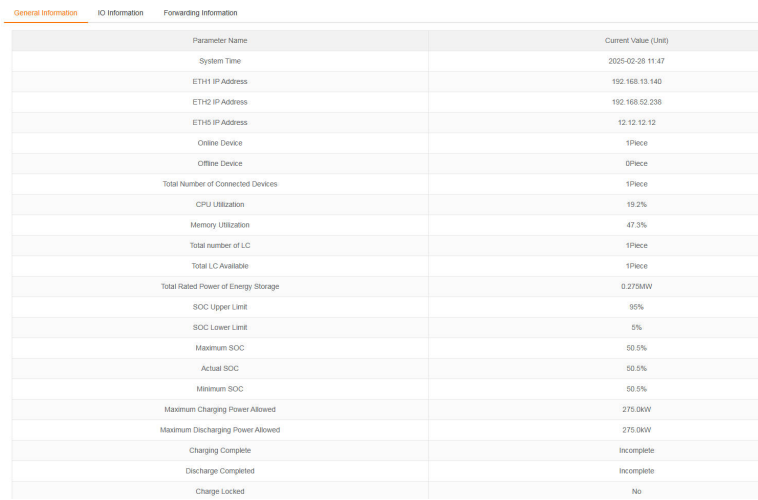
(1) This parameter is displayed only when PV devices are connected to the plant.
(2) This parameter is displayed only when chargers are connected to the plant.

Step 3 Click **Save** to save the settings.

--End

11.2 Run Information

Click **System > Run Information** to enter the corresponding interface.



On this interface users can view **General Information**, **I/O Information**, and **Forwarding Information**.

11.3 System Maintenance

11.3.1 System Update

Only online update is supported.

Prerequisite

You need to install and open the iConfig tool. Please contact Sungrow Customer Service for the iConfig installation package.

Procedure

Step 1 Choose **System > System maintenance**.

Step 2 Click **System update** and select **Online update package** in the **Select update package** page.

Step 3 Select an update package after iConfig is detected.

If no update package is found, go to iConfig and download one.

Step 4 Click **Confirm**.

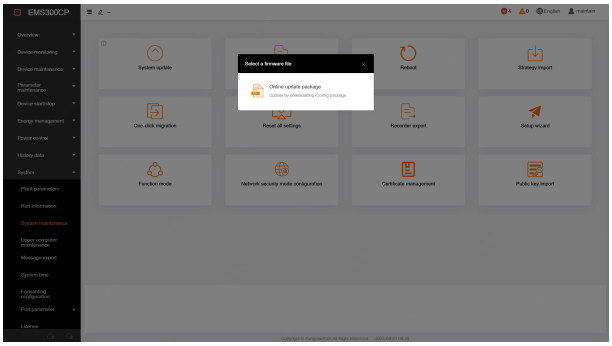


Figure 11-2

--End

After the update is completed, you can refer to 12 Firmware Version to check whether the update was successful.

11.3.2 Log Export

Step 1 Choose **System > System Maintenance**.

Step 2 Click **Log Export_Debugging, operations and other logs**.

Step 3 Select a log type in **Log file type selection** dialog box.

Step 4 Click **Confirm** to export the log.

--End

11.3.3 Reboot

Step 1 Choose **System > System maintenance**.

Step 2 Click **Reboot**.

Step 3 Click **Confirm** in the warning dialog box to restart the system.

--End

11.3.4 Strategy Import

Prerequisite

The **strategy import** function is used to import control strategy programs and configuration files.

Step 1 Choose **System > System maintenance**.

Step 2 Click **Strategy import**, select a strategy file, and click **Open** to import the file.

--End

The strategy file must be in ".zip" format.

11.3.5 One-click Migration

Prerequisite

The **one-click migration** function is used to import the configurations of other devices or export the configurations of the current device.

Step 1 Choose **System > System maintenance**.

Step 2 Click **One-click migration**.

a. Click **Import**, select the file to be imported, enter the **Decompression password**, and click **Confirm** to complete the import.

The decompression password is the same as the compression password set during configuration export.

b. Click **Export**, enter the **Compression password**, and click **Confirm** to complete the export.

Please keep the password for the compressed package safe, as it will be required when importing the configuration in the compressed package to a new device later.

--End

The imported file must be in ".zip" format.

11.3.6 Reset All Settings

Step 1 Choose **System > System maintenance**.

Step 2 Click **Reset all settings**.

Step 3 Click **Confirm** in the warning dialog box.

--End

This function will delete the IEC104/GOOSE forwarding protocol point tables, imported third-party point tables, historical data, parameter storage data, license, fault recording data, historical fault data, previous port packet export data, imported IEC104 collection point tables, third-party FTP record data, as well as device and device-stored configuration files. It will also reset default values for point table configurations and remove non-synchronizable data.

11.3.7 Recording Export

Step 1 Choose **System > System maintenance**.

Step 2 In the **Log file type selection** dialog box, select log types and specify a time period.

Step 3 Click **Confirm**.

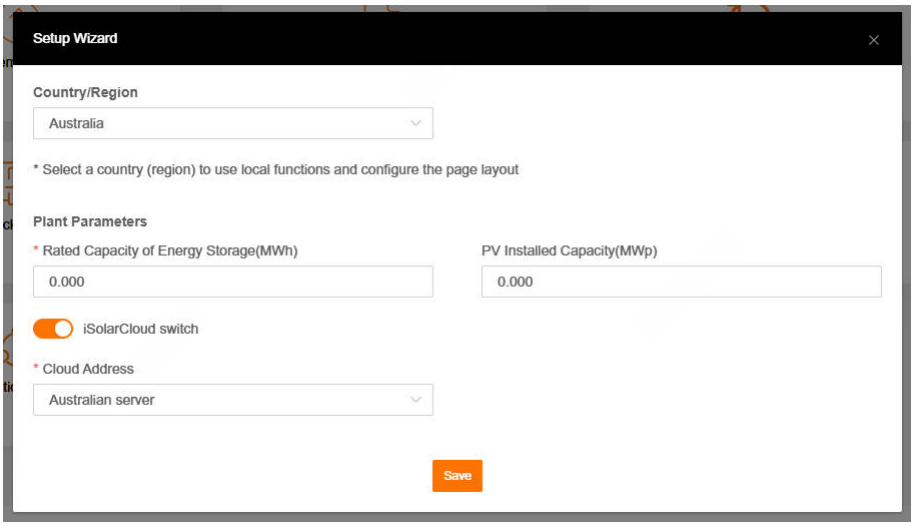
--End

11.3.8 Setup Wizard

After the system is installed and deployed, users can configure server information, plant parameters, and the iSolarCloud address based on the country/region where the plant is located.

Step 1 Choose **System > System maintenance**.

Step 2 Click **Setup wizard**.



Step 3 Select the country/region where the plant is located. Options include: **China**, **Europe**, **Australia**, **Japan**, and **Others**. Then, the system will display region-specific features on the interface accordingly.

If **Japan** is selected in **Country/Region**, you need to select a scenario. Options include: **HV/UHV ESS-only scenario** and **C&I ESS scenario**.

- In HV/UHV ESS-only scenarios, only energy storage devices and grid devices are displayed in the plant overview diagram.
- In C&I ESS scenarios, devices such as loads, energy storage devices, and diesel generators are displayed in the plant overview diagram.

Step 4 Completed the plant settings.

- **Rated capacity of energy storage (MWh)**: Enter the actual rated energy storage capacity of the plant.
- **PV installed capacity (Mwp)**: Enter the actual PV installed capacity of the plant.

Step 5 To upload data to iSolarCloud, turn on the **iSolarCloud switch**. Then select the appropriate iSolarCloud server. Options include: **Chinese server**, **Australian server**, **European server**, and **International server**.

Step 6 Click **Save** to save the settings.

--End

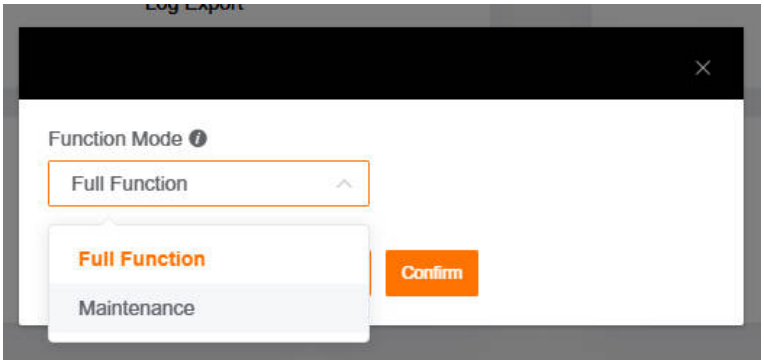
11.3.9 Function Mode

Users can switch the function mode based on actual needs. The system interface will display only the corresponding function menus to ensure a clean and efficient user experience.

Step 1 Choose **System > System maintenance**.

Step 2 Click **Function mode**.

Step 3 Select a mode based on your actual needs.



- **Full function**: In this mode, the system supports device monitoring, control strategy management, and maintenance functions.
- **Maintenance**: In this mode, the system only supports maintenance operations such as device monitoring and updates.

Step 4 Click **Confirm** to save your settings.

--End

11.3.10 Network Security Mode Configuration

After enabling network security mode, certain ports on the Web will be forcibly closed, and a risk warning will show up when accessing the page.

Step 1 Choose **System > System Maintenance**.

Step 2 Click **Network Security Mode Configuration**.

Step 3 Determine whether to enable the network security mode in the pop-up window.

Turning off network security mode will weaken the network security protection for the device.

Step 4 Click **Confirm**. The change will be applied after restart.

After the **Network security mode configuration** is enabled, the default password for maintain is changed to Pw1111111111.

--End

11.3.11 Certificate Management

The EMS300CP supports viewing and importing HTTPS certificates, IEC104 certificates, Modbus TCP certificates, and Modbus TCP collection certificates.

Step 1 Choose **System > System maintenance**.

Step 2 Click **Certificate management**.

Step 3 Click the **HTTPS certificate**, **IEC104 certificate**, **Modbus TCP certificate** or **Modbus TCP certificate for collection** tab.

Step 4 To import a certificate, click **Import certificate**, select the corresponding protocol, and upload the certificate file and the private key file.

Step 5 Click **Confirm**.

--End

11.3.12 Public Key Import

To ensure safe system updates, digital signatures are used to verify the authenticity and integrity of update packages. When performing a controller update in Network Security Mode, please import the public key file for the update package to complete the verification process.

Step 1 Choose **System > System Maintenance**.

Step 2 Click **Public Key Import**.

Step 3 Select the public key file in the pop-up window.

Step 4 Click **Open** to import the file to the system.

--End

11.3.13 ATS250 Update

Step 1 Choose **System > System maintenance**.

Step 2 Click **ATS250 update**. The **Select a firmware file** window opens.

Step 3 Select the **Device type**. Options include All, Master, and Slave.

Step 4 Click **Select a firmware file** and select a local file.

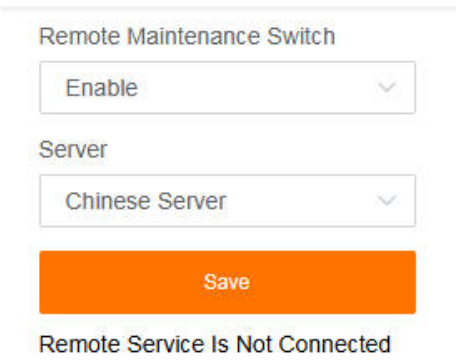
Step 5 Click **Confirm**.

The update will cause ATSs to shut down.

--End

11.4 Remote Maintenance

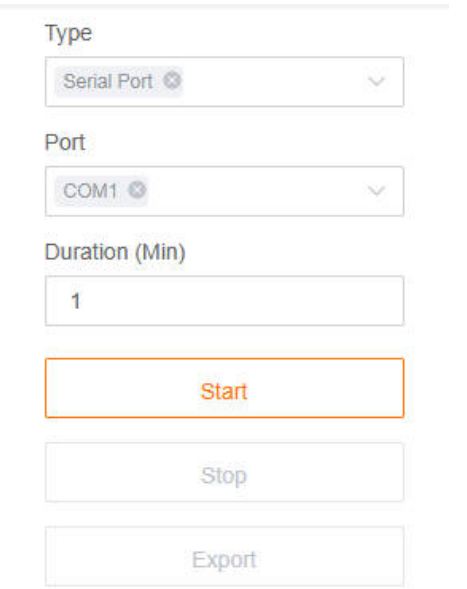
1. Click **System > Remote Maintenance** to enter the corresponding interface.



2. Click in **Remote Maintenance Switch**.
   - Remote maintenance is supported if this switch is set to **Enable**, and it is required to set the address.
     - Select **Chinese Server** for projects in Mainland China.
     - Select **European Server** for projects in Europe.
     - Select **Australian Server** for projects in Australia.
     - Select **International Server** for projects in other regions.
   - Remote maintenance is not supported if this switch is set to **Disable**.
3. Click **Save** to save the configuration.

11.5 Message Export

Step 1 Click **System > Message Export** to enter the corresponding interface.



Step 2 Set **Type**, **Port**, and **Duration**, and click **Start** to start recording messages. The recording is automatically stopped when the set duration ends, or it can be manually interrupted by clicking **Stop**.

Step 3 Click **Export** to export the message.

--End

11.6 System Time

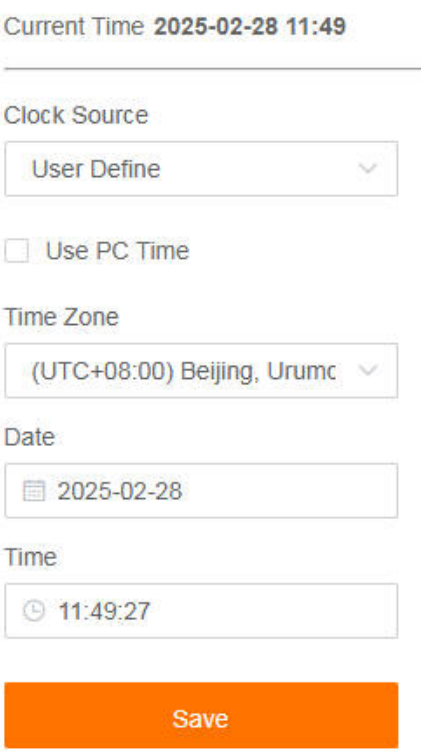
On this interface, users can check whether the current system time is correct and carry out time calibration.

NOTICE

The system time must be set if the controller is used for the first time.

Procedure

1. Choose **System > System Time**.



2. Select a clock source from the **Clock Source** drop-down list. Options include **User Define**, **NTP**, and **iSolarCloud**.

Clock Source	Description
User Define	The current system time and time zone can be set in the following two ways: • Select **Use PC Time** to synchronize the controller time with the PC time. • Select a time zone from the **Time Zone** drop-down list. Specify the **Date** and **Time** to manually set the controller time. It is recommended to select **User Define** during commissioning.
NTP(Network Time Protocol)	Used to synchronize computer system time. • Select a time zone from the **Time Zone** drop-down list. • Set the server site in **Server**. Use the default value. • Set the NTP synchronization interval in **Time Interval**. Unit: minutes.

Clock Source	Description
iSolarCloud	Synchronize the controller time with the iSolarCloud time.

3. Click **Save** to save the settings.

11.7 Forwarding Configuration

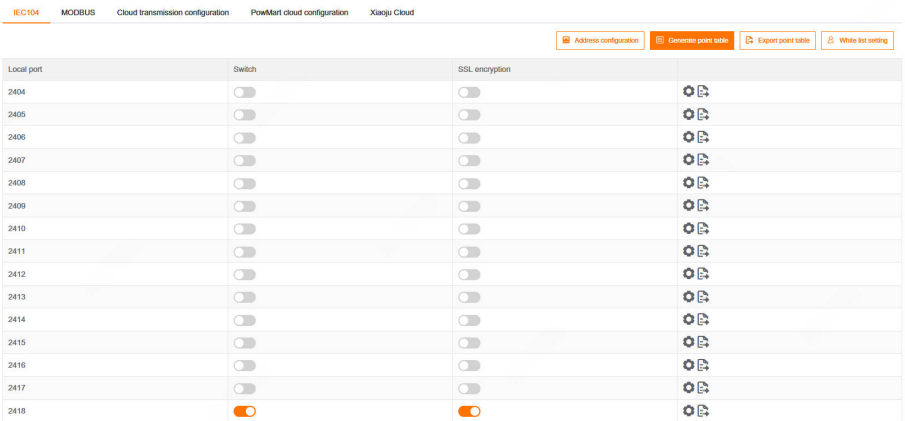
11.7.1 IEC104 Forwarding Service Configuration

The IEC104 is a communication protocol used for remote monitoring and control systems. It can transmit various types of information, including remote signaling, telemetry, remote control, remote regulating, and remote pulse.

Select a local port, enable IEC104 forwarding service for this port, and configure the point table.

Step 1 Choose **System > Forwarding configuration**.

Step 2 Click the **IEC104** tab.



Step 3 Select an appropriate port from the local port list and click to enable IEC104 forwarding service for this port.

Step 4 Click the SSL encryption icon to enable SSL encryption for the local port.

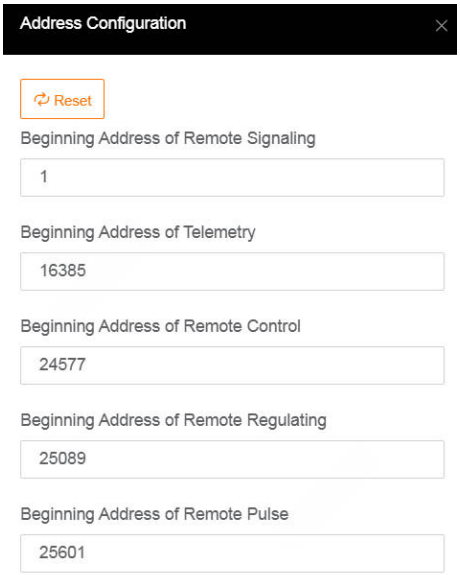
The IEC104 forwarding service operates on ports 2404–2418. The port 2418 is enabled by default with SSL encryption applied, while other ports are disabled by default and do not use SSL encryption. The users can manually enable or disable the Switch icon and SSL encryption icon of the local port.

SSL encryption will be available when **Network security mode** is enabled. It is recommended to enable SSL encryption to improve data transmission security.

Step 5 (Optional) Configure the point table.

If you choose to use the default point table, skip step 4 and go to step 5 directly.

- Click **Address configuration** in the upper right corner of the page. In the pop-up window, enter the beginning addresses of remote signaling, telemetry, remote control, remote regulating, and remote pulse.



  The figure above shows the default addresses configured in the system. You can modify the addresses as needed.
  You can click **Reset** to restore the default address settings.
- Select an enabled local port to configure a custom point table for this port.

  In the third column of the selected port, click to open the **Advanced settings** window. Configure the following parameters.
  - Remote signaling measuring point type: Set the type of measuring point sent from the upper-level device.
  - Remote signaling time mark: Set the remote signaling time tag sent from the upper-level device.
  - Upload with a change: When this parameter is set to enable, if the EMS device detects changes in monitoring data, the changes will be uploaded.
  - Configuration file: Click to import the point table configuration file.

  Click **Save** to complete the point table configuration.

Step 6 Generate the point table. Click **Generate point table** in the upper right corner. Point tables will be generated for all enabled ports based on the configuration in step 3. If step 4 is skipped, the default point table will be applied.

--End

Export Point Table

- Click **Export point table** in the upper right corner to export the point tables of all ports.
- Select a port and click to export its point table to your local system.

White List Setting

Click **White list setting** in the upper right corner of the page to open the setting window.

- If the **Enable white list** checkbox is not selected, the default peer IP address is "0.0.0.0". Any backend device with a valid IP address is allowed to access the controller.
- If the **Enable white list** checkbox is selected, enter the peer IP address. Then, only devices with the specified IP address can access the controller.

11.7.2 Modbus

This function is used to configure Modbus forwarding service of the controller.

Server

In Server mode, the controller functions as the server and transmits data and instructions with the upper computer server through Modbus TCP protocol.

1. Choose **System > Transfer configuration > MODBUS**.
2. Click the **Server** tab.
3. Turn on/off the local port by clicking the icon in the Switch column according to the actual conditions.
4. Click the SSL encryption icon to enable SSL encryption for the local port.
   Ports 502 to 516 are used for the Modbus forwarding service. The port 516 is enabled by default with SSL encryption applied, while other ports are disabled by default and do not use SSL encryption. The users can manually enable or disable the Switch icon and SSL encryption icon of the local port.

   SSL encryption will be available when **Network security mode** is enabled. It is recommended to enable SSL encryption to improve data transmission security.

5. For whitelist setting, please refer to White List Setting.

RTU

In RTU mode, the controller transmits data and instructions with the upper computer server through Modbus RTU protocol.

1. Click **System > Transfer configuration > MODBUS** to enter the corresponding interface.
2. Click the **RTU** tab.
3. Select the serial port name and enter the delay time.
4. Click to save the settings.

11.7.3 Cloud Transmission Configuration

It is used to upload data to the cloud server.

Step 1 Click **System > Forwarding Configuration > Cloud Transmission Configuration** to enter the corresponding interface.

Step 2 Click **Upload Parameters** to select whether to upload the parameters to the cloud or not.

--End

11.7.4 PowMart Cloud Configuration

It is used to upload the local plant data to the PowMart cloud.

Step 1 Choose **System > Forwarding Configuration > PowMart Cloud Configuration**.

Step 2 Turn on the cloud transmission switch.

Step 3 Acquire information such as PowMart cloud address, port number, instance ID, group ID, accessKey, secretKey, and plant identification number from the third-party provider. Then, complete the settings.

> Select **Yes** or **No** to determine if the plant is a test site according to the actual situation in **Test Site or Not**.

Step 4 Click **Save.**

--End

11.7.5 Xiaoju Cloud

This function is used to upload data to the Xiaoju Cloud server.

Step 1 Choose **System > Forwarding Configuration**.

Step 2 Click the **Xiaoju Cloud** tab.

Step 3 Click **Modify**.

Step 4 Turn on **Enable** to enable the Xiaoju Cloud function. Configure the following parameters based on the actual conditions.

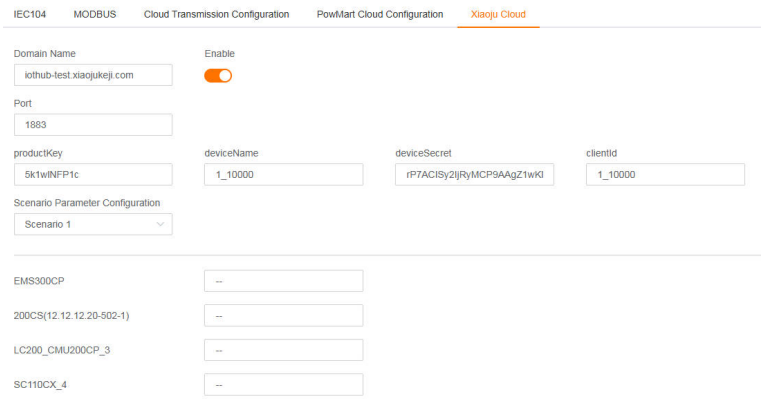


Table 11-1 Parameter Description

Parameter	Description
Domain Name	The domain name of the Xiaoju Cloud server.
Port	The port number used for establishing connections between the system and the Xiaoju Cloud server.
productKey, **deviceName**, **deviceSecret**, and **clientId**	The information can be obtained from Xiaoju Cloud.
Scenario Parameter Configuration	Options include: • **Scenario 1**: One box-type transformer and one energy storage device. • **Scenario 2**: Two box-type transformers and one energy storage device. • **Scenario 3**: One box-type transformer and two energy storage devices.

Step 5 Click **Confirm** to save the settings.

--End

11.8 Port Parameter

Set ports of the controller on the interface. There are 7 RS485 ports (COM1~COM7).

11.8.1 RS485

On this interface user can view or modify parameters of each port of the controller.

Step 1 Click**System > Port Parameter > RS485**to enter the corresponding interface.

Step 2 Click in the **Action** column to modify the port function, baud rate, parity bit, and stop bit. The parameters are explained as follows.

Parameter	Description
Serial port	COM1 ~ COM7, cannot be changed.
Port function	• Acquisition • Forwarding background
Baud rate	The default value is 9600. Please fill in according to the actual situation.
Parity bit	Presence and absence, odd and even.

Parameter	Description
Stop bit	Please select according to the actual situation.

When the controller is connected to a device via a serial port, the **Baud Rate**, **Parity Bit**, and **Stop Bit** of the port must be the same as those of the connected device so that the controller can communicate normally with the device.

--End

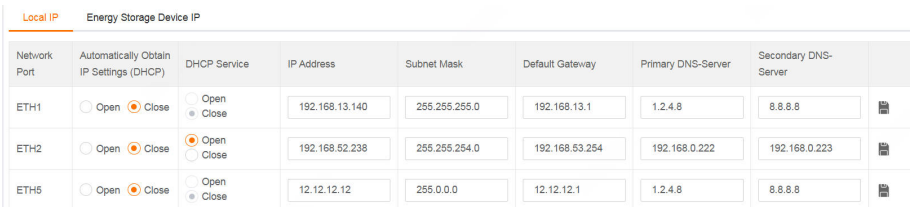
11.8.2 Ethernet

11.8.2.1 Configure Controller IP Settings

This section describes how to configure IP addresses for the network ports of the controller and enable the DHCP service.

The DHCP function is only applicable to ST255CS.

Step 1 Click **System > Port Parameter > Ethernet** to navigate to the corresponding page.



Step 2 Set the IP address for each network port. After completing the settings, click on the right side to save the settings.

- If you enable **Automatically Obtain IP Settings (DHCP)** for a port, the local area network (LAN) will assign an IP address to the port.
- If **Automatically Obtain IP Settings (DHCP)** is disabled, enter the parameters such as IP address, subnet mask, and gateway address.

The default IP address and virtual IP address for each port are as follows:

Table 11-2 Controller IP Address

Port	Default IP Address	Virtual IP Address
ETH1	14.14.14.14	15.15.15.15
ETH2	12.12.12.12	16.16.16.16
ETH5	13.13.13.13	17.17.17.17

The above IP addresses are for reference only. The actual ones may be different.

Step 3 (Optional) Configure the DHCP service.

a. To perform one-click access, the DHCP service must be enabled. Based on the connection status of the LC, select the corresponding network port and enable its DHCP service. For example, if the LC is connected to the ETH2 port of the controller, the DHCP service needs to be enabled for only ETH2.

b. Click on the right side to save the settings.

c. To perform one-click access for energy storage devices, configure energy storage device IP settings by referring to 11.8.2.2 Configure Energy Storage Device IP Settings.

--End

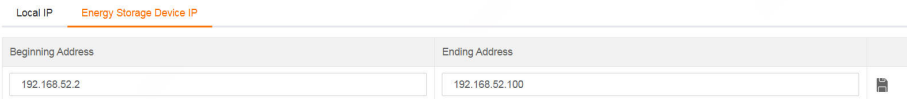
11.8.2.2 Configure Energy Storage Device IP Settings

On the Energy Storage Device IP page, you can set the beginning and ending IP addresses for energy storage device. The system will automatically assign IP addresses within the range to energy storage devices.

This page is displayed only when the DHCP service is enabled for the ETH ports of the controller.

Step 1 Click **System > Port Parameters > Ethernet** to enter the corresponding interface.

Step 2 Click the **Energy Storage Device IP** tab.



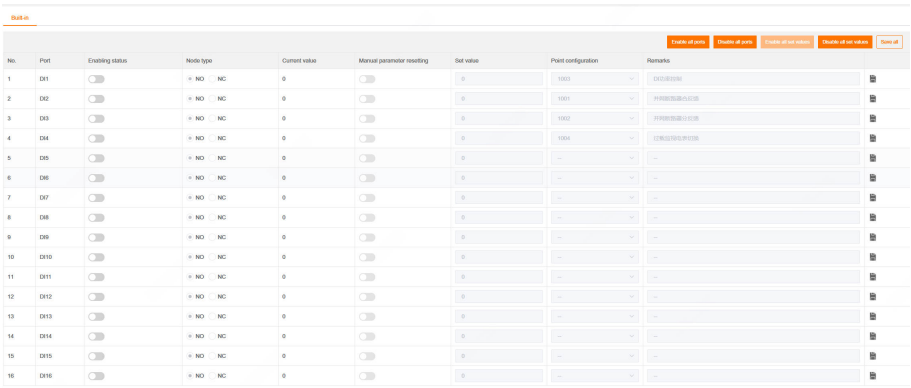
Step 3 Set the **Beginning Address** and **Ending Address**. By default, the DHCP service is enabled for the ETH2 port, and the beginning and ending IP addresses are preconfigured for energy storage devices. You can modify the settings as needed. For example, if the LC's ETH1 port (with an IP address of 192.168.1.100) is connected to the controller, the beginning IP address for energy storage devices can be set to 192.168.1.100. Considering that up to 25 devices can be connected, the ending IP address can be set to 192.168.1.150.

Step 4 Click to save the settings.

--End

11.8.3 DI

Step 1 Choose **System > Port parameter > DI** to enter the **DI** page.



Step 2 Configure the following parameters:

Parameter	Description
Enabling status	Click to switch the status. • : The port is enabled and allows parameter configuration. • : The port is disabled.
Node type	Set this parameter according to actual conditions. Options include **NO** and **NC**.
Current value	Display the current output value of the DI.
Manual parameter setting	• : Enable manual parameter setting. The value received by the connected device is determined by the **Set value**. • : Disable manual parameter setting. The **Set value** and **Point configuration** cannot be modified.
Set value	Set this parameter according to actual conditions. Options include 0 and 1. The default value is 0.
Point configuration	Through **point configuration**, you can adjust or modify the remarks of preset strategies. • 1001: Preset with the remarks “Grid-connected circuit breaker closed feedback”, configured on port DI2 by default. • 1002: Preset with the remarks “Grid-connected circuit breaker open feedback”, configured on port DI3 by default. • 1003: Preset with the remarks “DI power control”, configured on port DI1 by default.

Parameter	Description
	• 1004: Preset with the remarks “Overload monitoring meter switching,” configured on port DI4 by default.
Remarks	Enter remarks of no more than 20 characters.

Step 3 Click on the right to save the settings.

Step 4 (Optional) Click **Enable all ports** in the upper right corner of the page to enable all DI ports.

Step 5 (Optional) Click **Disable all ports** in the upper right corner of the page to disable all DI ports.

Step 6 (Optional) Click **Enable manual setting for all** in the upper right corner of the page to enable manual parameter setting for all enabled DI ports.

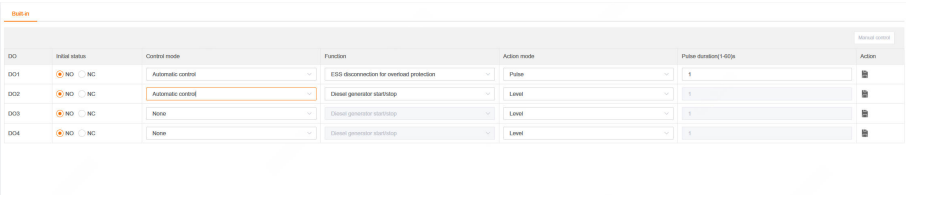
Step 7 (Optional) Click **Disable manual setting for all** in the upper right corner of the page to disable manual parameter setting for all enabled DI ports.

Step 8 (Optional) Click **Save all** in the upper right corner of the page to save all DI settings.

--End

11.8.4 DO

Step 1 Choose **System > Port parameter > DO** to enter the **DO** page.



Step 2 Configure the following parameters:

Parameter	Description
Initial status	Set this parameter according to actual conditions. Options include **NO** and **NC**.
Control mode	• None: No control is applied to this DO port. • Automatic control: Control the DO port via automatic control. • Manual control: After selecting Manual control from the drop-down list, you can click **Manual control** in the upper right corner of the page to control the DO port as needed.

Parameter	Description
Function	Support automatic control for Diesel generator start/stop, Grid-connected circuit breaker, ESS disconnection for overload protection, Charger disconnection for overload protection, and Diesel generator start upon ESS fault.
Action mode	Select the Pulse or Level action mode.
Pulse duration (1–60) s	When the Action mode is set to Pulse, set the pulse duration as needed. The value range is 1–60.

Step 3 Click  on the right to save the settings.

--End

11.9 License

On this interface users can view license information and import license files.

Step 1 Click **System > license** to view the basic information and license status of the product.

Step 2 Click **Select File** to import the license file. Please contact SUNGROW customer service and provide the contract number to apply for the license file.

Click **Clear** to clear the license file.

--End

12 Firmware Version

Here you can check the firmware version of the controller.

Step 1 Click **System > About** to navigate to the corresponding page.

Step 2 Click the field corresponds to **Version** five times to check the firmware version.

The firmware version of the EMS300CP is identified by **Product Release Software Version**, formatted as “EMS300CP-SV100.001.00.P[XXX]". For easier recognition, the firmware version is often shortened and referred to as "P[XXX]."

Name	Value
Product Release Software Version	EMS300CP-SV100.001.00.P017
Product Build Software Version	EMS300CP-SV100.001.00.B005
Strategy Base Version	EMS_BASE_Ver1.00
Platform Release Software Version	SUNSHINE-SV100.001.00.P017
Platform Build Software Version	SUNSHINE-SV100.001.00.B006.08
DRA7DSP1 Software Version	DSP_APP_VER_0.1
System Software Version	A15SYS-SV100.003.00.PA04

--End

13 User Management

An Administrator can create O&M User accounts, reset account passwords, set parameters related to account and login security, and enable R&D debugging mode.

Step 1 The firmware version of EMS300CP should be P020 or later. See 12 Firmware Versionfor how to check the firmware version.

Step 2 An Administrator account is required to proceed with the operations below.

--End

13.1 User Roles and Permissions

The following user roles are available in this system:

- Ordinary User
- O&M User
- Developer
- Administrator

Developer accounts are available for SUNGROW technical support team only.

Permission	Role		
	Ordinary User	O&M User	Administrator
View real-time plant data	✔	✔	✕
Configure controller port settings	✕	✔	✕
Configure forwarding service for the controller	✕	✔	✕
Manage devices	✕	✔	✕
Set device parameters	✕	✔	✕
Export data	✕	✔	✕
Set control strategies	✕	✔	✕
Perform controller system maintenance	✕	✔	✕
View all O&M Users	✕	✕	✔

Permission	Role		
	Ordinary User	O&M User	Administrator
Create or delete an O&M User account	×	×	✔
Reset account password	×	×	✔
Set parameters related to account and login security	×	×	✔
Enable O&M mode	×	×	✔

13.2 Default Accounts and Passwords

Username	Role	Default password
maintain	O&M user	• Network security mode disabled: pw1111 • Network security mode enabled:Pw1111111111
administrator	Administrator	pw1111
develop	Developer	Obtain the S/N through customer authorization and generate a dynamic password.

13.3 Creating O&M User Account

An Administrator can create more O&M user accounts to meet the O&M (operation and maintenance) needs of the team.

The system provides one O&M User account "maintain" by default.

In addition to the "maintain" account, the Administrator can create up to 4 more O&M user accounts.

Username requirements

- The name can contain uppercase letters, lowercase letters, numbers, and underscores;
- The name must start with a letter;
- The name should be 4–16 characters long.

Password requirements

- Passwords should contain at least three of the following four character types: uppercase letters, lowercase letters, numbers, and special characters;
- Password should be 12–32 characters long.

- If Network Security Mode is not enabled, the passwords of all users are permanently valid.
- Under Network Security Mode, the Administrator can set passwords to expire after a number of days between 1 and 90 for different types of users.

Prerequisite

- Log in to the Web as an Administrator. See 13.2 Default Accounts and Passwords for details.

Step 1 Choose **User Management** on the navigation bar.

Step 2 Click **Add** to open the "**Add User**" window.

Step 3 Set the username and password.

Step 4 Select **O&M User** in **Permission**.

Step 5 Click **Confirm**.

--End

13.4 Deleting O&M User

Prerequisite

- Log in to the Web as an Administrator. See 13.2 Default Accounts and Passwords for details.

Step 1 Choose **User Management** on the navigation bar.

Step 2 Click  in the "Action" column.

Step 3 Click **Confirm** in the confirmation dialog to delete this user.

Step 4 You can click **Clear Users** to delete all user accounts.

--End

13.5 Account Password Reset

13.5.1 O&M Account Password Reset

Prerequisite

- Log in to the Web as an Administrator. See 13.2 Default Accounts and Passwords for details.

Step 1 Choose **User Management** on the navigation bar.

Step 2 Click  in the “Action” column to open the **Modify User** window.

Step 3 Reset the username or password.

Step 4 Click **Confirm**.

--End

13.5.2 Administrator Account Password Reset

Step 1 Log in to the EMS300CP Web system.

Step 2 Enter the Administrator account name: administrator.

Step 3 Click **Forgot Password** to open the **Modify Password** window.

Step 4 Enter the secret key.

Get the secret key via email or phone.

If your account has not been linked to an email address or a phone number, contact SUNGROW customer service for secret key.

Step 5 Enter the new password and double-confirm.

Step 6 Click **Confirm**.

--End

13.6 Account and Login Security Settings

To enhance account security, you can set limits for login attempts and session timeouts.

Prerequisite

- Log in to the Web as an Administrator. See 13.2 Default Accounts and Passwords.

Step 1 Choose **Session management** in the navigation bar.

Step 2 Change the account and session security settings.

You can set the following parameters:

- **Number of illegal visits**: Set the maximum number of allowed failed login attempts. If the count of failed login attempts due to incorrect passwords exceeds this number, the account will be locked out (range: 3–6; 6 by default).
- **Session timeout**: Defines the period of inactivity after which the login session will time out. Once timed out, the user will be required to log in again (range: 10–30; 10 by default).
- **User lock time**: Specifies the duration for which the user account remains locked after exceeding the failed login attempts limit. The user must wait until this period expires for the account to be unlocked (range: 10–30; 10 by default).
- **System notification**: Displays a notification message on the account login page.

Step 3 Click **Save**.

--End

13.7 O&M Mode

The Administrator must enable **R&D Debugging** to allow Developer users to log in to the Web for debugging.

- In Network Security Mode, **R&D Debugging** is turned off by default.
- If Network Security Mode is not enabled, **R&D Debugging** is turned on by default.

Prerequisite

- Log in to the Web as an Administrator. See 13.2 Default Accounts and Passwords for details.

Step 1 Choose **R&D Management** on the navigation bar.

Step 2 Turn on the switch.

The switch will automatically turn off after being on for 24 hours.

--End

14 Appendix

14.1 Quality Assurance

When product faults occur during the warranty period, SUNGROW will provide free service or replace the product with a new one.

Evidence

During the warranty period, the customer shall provide the product purchase invoice and date. In addition, the trademark on the product shall be undamaged and legible. Otherwise, SUNGROW has the right to refuse to honor the quality guarantee.

Conditions

- After replacement, unqualified products shall be processed by SUNGROW.
- The customer shall give SUNGROW a reasonable period to repair the faulty device.

Exclusion of Liability

In the following circumstances, SUNGROW has the right to refuse to honor the quality guarantee:

- The free warranty period for the whole machine/components has expired.
- The device is damaged during transport.
- The device is incorrectly installed, refitted, or used.
- The device operates in harsh conditions beyond those described in this manual.
- The fault or damage is caused by installation, repairs, modification, or disassembly performed by a service provider or personnel not from SUNGROW.
- The fault or damage is caused by the use of non-standard or non-SUNGROW components or software.
- The installation and use range are beyond stipulations of relevant international standards.
- The damage is caused by unexpected natural factors.

For faulty products in any of above cases, if the customer requests maintenance, paid maintenance service may be provided based on the judgment of SUNGROW.

Product data such as product dimensions are subject to change without prior notice. The latest documentation from SUNGROW should take precedence in case of any deviation.

14.2 Contact Information

In case of questions about this product, please contact us. We need the following information to provide you the best assistance:

- Model of the device
- Serial number of the device
- Fault code/name
- Brief description of the problem

For detailed contact information, please visit: **https://en.SUNGROWpower.com/contactUS**

SUNGROW

Sungrow Power Supply Co., Ltd.

www.sungrowpower.com

M-D-000453