SUNGROW
Clean power for all

User Manual

Energy Management Controller

EMS300CP

EMS300CP-UEN-Ver15-202410

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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

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 and that of the Ethernet ports (ETH1, ETH2, ETH5) of the EMS300CP to the same network segment. The IP address of the Ethernet ports are shown below. The default address of ETH1 is 14.14. 14.14. And 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 255.0.0.0.

table 2-1 Controller IP Address

Port	Default IP address
ETH1	14.14.14.14
ETH2	12.12.12.12
ETH5	13.13.13.13

The above IP addresses are for reference only. The real IP addresses shall prevail.

step 3 Enter the IP of the Ethernet ports in the address bar of the PC to enter the Web interface of the EMS300CP.

step 4 Select the desired language in the upper right corner. Click **Login** and enter the login password pw1111.

User types include **Ordinary User** and **O&M User**.

Ordinary users can view basic information, real-time fault, and device monitoring information of the system.

O&M users not only have the permissions of the ordinary users, but also can set and modify the control strategy and parameter of the system.

In this manual, description is given by using permissions of O&M users as an example.

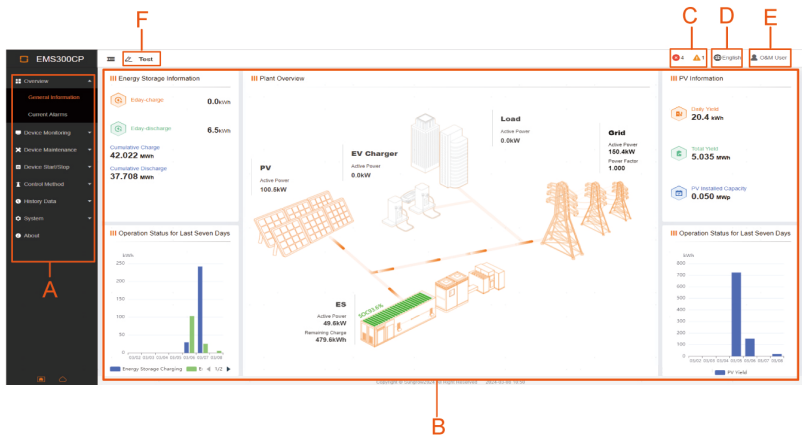
Please change the login password after logging in for the first time. The method of changing the password: Click **O&M User > Modify Password** to set a new password.

If you forgot login password, contact SUNGROW and inform us the S/N and system time of the current device to obtain the dynamic password.

- - End

3 Web Main Interface

The following figure shows the web main interface.



No.	Name	Description
A	Navigation menu	Displays the main functions
B	Function display area	Displays the function currently queried or parameter 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 plant's name

 indicates the connection status of the Ethernet port.

 indicates the cloud access status.

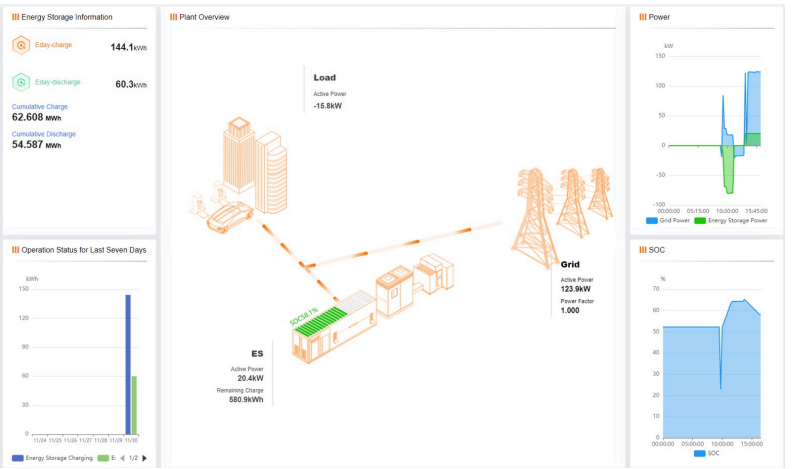
The figure is for reference only. The actual interface may be different and shall prevail.

4 Overview

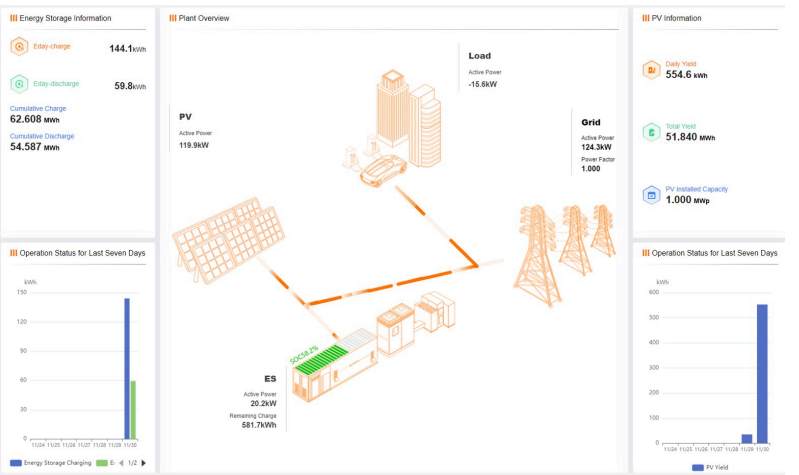
4.1 General Information

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

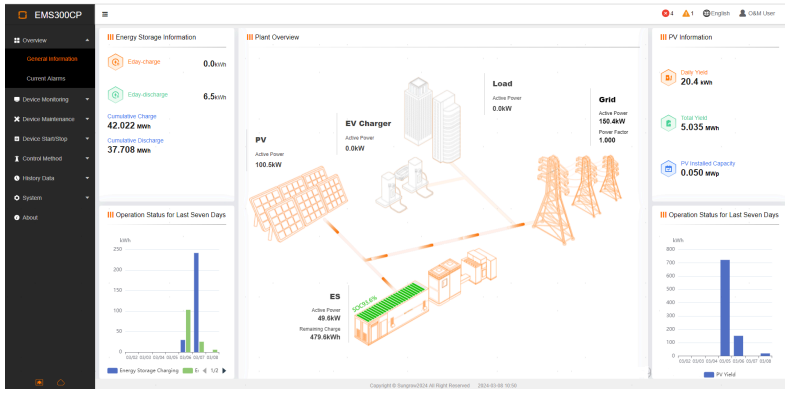
- ESS only



- PV-ESS



- PV-ESS-EV Charging



The figure is for illustration only. The actual interface may be different.

Charge/Discharge

Daily charge/discharge and cumulative charge/discharge of the energy storage system.

Plant Overview

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

Operation Status for Last Seven Days

- Shows the operation data on charging and discharging of the energy storage system in the past seven days.
- Shows the operation data on PV power generation in the past seven days.

Yield Information

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

Power

Shows grid power and energy storage power.

SOC

Shows the remaining battery power at each time point.

Energy Storage Information

Shows the daily charge/discharge and cumulative charge/discharge of the energy storage system.

PV Information

Shows the daily yield, total yield, and installed capacity of the PV installation.

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

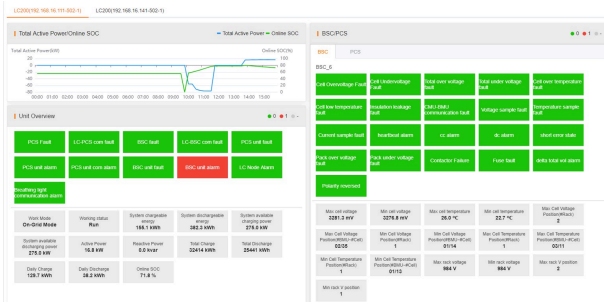
This interface mainly displays detailed working conditions of PV, energy storage and other devices in the plant.

5.1.1 Energy Storage Unit View

On this interface users can view the real-time information of the energy storage unit connected to every local controller.

Procedure

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



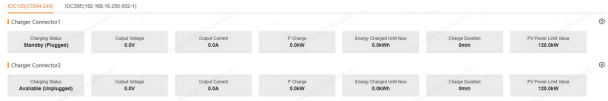
2. Click the tab of a local controller in the upper part of the interface to view the real-time information of the energy storage system.

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.

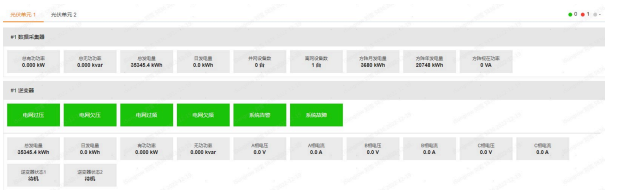
Parameter	Description
Device Start	Turn on to enable the charging connector for use.
Output Power Settings	Set according to the actual situation.

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**.



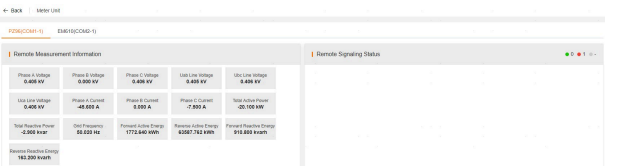
2. Click the tab of a local controller in the upper part of the interface to view the real-time information of the PV unit.

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 > Other Device 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.

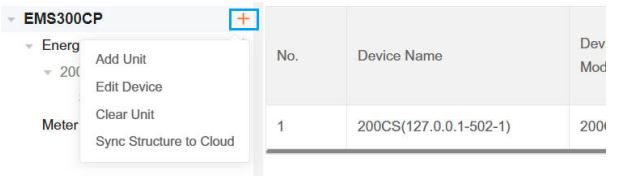
5.2.1 Add Device

5.2.1.1 Add Unit

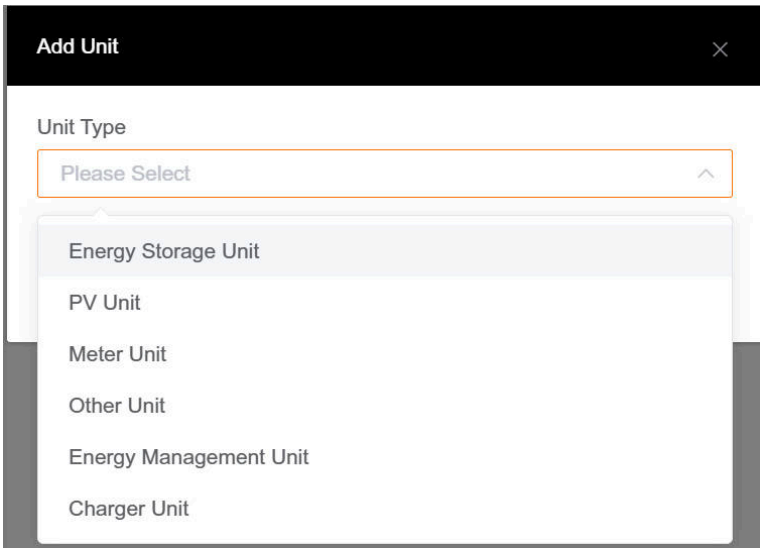
It is used to create a unit list, into which devices can be added for management. Units are classified into **Energy Storage Unit**, **PV Unit**, **Meter Unit**, **Other Unit**and **Charger Unit**.

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

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



step 3 Click **Add Unit** and select the unit type to be added in the dialog box.



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 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

Prerequisites

PV unit has been added in the plant system referring to the 5.2.1.1 Add Unit.
It is to connect the logger to the plant, and the logger refers to the data logger manufactured by SUNGROW.

step 1 Click + on the right side of the PV unit and select **Add Device**.

step 2 In the **Add Device** window, click the drop-down list of **Device Type** and select **Data Logger**.

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

Parameter			Description
Type	IEC104 by default		-
Networking Mode	Standalone network	Peer IP address	The peer IP address refers to the IP address of the logger that is connected, and the peer port refers to the port of the logger. Please select according to the actual conditions.
		Peer port	
	Dual network	Network A peer IP address	
		Network A peer port	
		Network B peer IP address	
		Network B peer port	
Device Model	Logger type		-

step 4 Click **Save** to save the configuration.

- - End

5.2.1.3 Add Meter

Prerequisites

Meter 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 meter unit and select **Add Device**.

step 2 In the **Add Device** window, click the drop-down list of **Device Type** and select **Meter**.

step 3 Click **Access Type**. Select a meter type according to the wiring position. There are two types of meter: electricity meter and gateway meter.

step 4 Click the drop-down list of **Port** and select the port for the meter.

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

Parameter	Description
Device Model	Please select the meter model.
Start/End Address	Set according to actual conditions.
Device Quantity	Set according to actual conditions.

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

Parameter			Description
Type	MODBUS-TCP by default		-
Networking Mode	Standalone network	Peer IP address	The peer IP address refers to the IP address of the meter that is connected, and the peer port refers to the port of the meter. Please select according to the actual situation.
		Peer port	
	Dual network	Network A peer IP address	
		Network A peer port	
		Network B peer IP address	
		Network B peer port	
Device Model	Meter model		Please select the meter model.

Parameter		Description
Start/End Address	-	Set according to actual conditions.
Device Quantity	-	Set according to actual conditions.

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

- - End

5.2.1.4 Add String Inverter

Prerequisites

A SUNGROW logger has been added in the plant system referring to the 5.2.1.2 Adding Data Logger section.

The string inverter can only be added when there is a logger device, and cannot be added directly into the PV unit.

step 1 Click ••• on the right of logger and select **Add Device**.

step 2 In the **Add Device** window, click the drop-down list of **Device Type** and select **String Inverter**.

step 3 Click the drop-down list of **Port** and select the string inverter access port. The string inverter can be accessed only through the COM port.

Select the COM port, and continue to configure the following parameters.

Parameter	Description
Device Model	Please select the model of the connected string inverter.
Beginning Address	Set the address according to actual conditions.

Parameter	Description
Device Quantity	Set the quantity according to actual conditions.

step 4 Click **Save** to save the configuration.

- - End

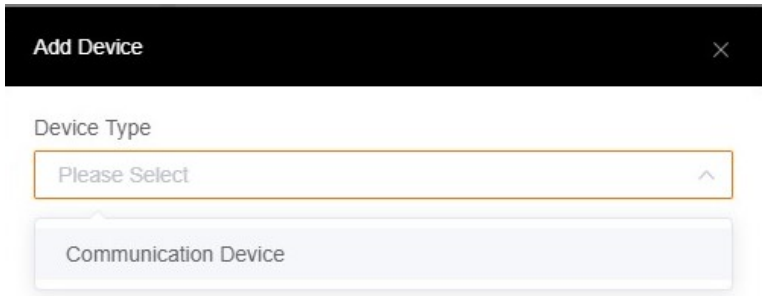
5.2.1.5 Add Communication Device

Prerequisites

Other 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 other unit and select **Add Device**.

step 2 In the **Add Device** window, click the drop-down list of **Device Type** and select **Communication Device**.



step 3 Click the drop-down list of **Port** and select the port for the communication device.

- If the port selected is COM, click on the right of **Configuration File** to upload the configuration file. The operation and maintenance personnel will sort the configuration file according to the actual conditions of the plant and fill in **Device Address**.
- If the port selected is NET, configure the following parameters.

Parameter			Description
Type	MODBUS-TCP by default		-
Networking Mode	Standalone network	Peer IP address	The peer IP address refers to the IP address of the communication device that is connected, and the peer port refers to the port of the communication device. Please select according to the actual situation.
		Peer port	
	Dual network	Network A peer IP address	
		Network A peer port	

Parameter			Description
		Network B peer IP address	
		Network B peer port	
Configuration File	-		It is the LC package, which contains the point table for the LC device. The configuration file is sorted by operation and maintenance personnel according to the actual conditions of the plant.
Device address	-		Set according to actual conditions.

step 4 Click **Save** to save the configuration.

- - End

5.2.1.6 Add LC

Requirements

You have added an energy storage unit to the plant by referring to 5.2.1.1 Add Unit.

step 1 Click + on the right side of the energy storage unit and choose **Add Device**.

step 2 In the **Add Device** window, click to expand the drop-down list of **Device Type** and select LC100 or LC200.

step 3 Select the access port for LC100/LC200 from the drop-down list of **Port**.

Select the NET port, and set the below parameters.

Parameter			Description
Protocol Type	MODBUS-TCP by default		-
Networking Mode	Standalone network	Peer IP address	The peer IP address refers to the IP address of the LC that is connected, and the peer port refers to the port of the LC. Please set according to actual conditions.
		Peer port	
	Dual network	Network A peer IP address	
		Network A peer port	
		Network B peer IP address	
		Network B peer port	
Device Address	-		Set according to actual conditions.
Sub-device Quantity	-		Set the number of devices that are connected to the LC based on the actual conditions.

step 4 Click **Save** to save the configuration.

- - End

5.2.1.7 Add Charger

Requirements

You have added a charger unit to the plant by referring to 5.2.1.1 Add Unit.

step 1 Click + on the right side of the charger unit and choose **Add Device**.

step 2 In the **Add Device** window, click to expand the drop-down list of **Device Type**, and select “EV Charger”.

step 3 Select the access port from the drop-down list of **Port**.

- Select the COM port if the IDC120, IDC180, or CDC240 charger is used. Then, set the parameters below.

Parameter	Description
Device Model	Select the model of the charger actually used in the plant.
Beginning Address	Set according to actual conditions.

Parameter	Description
Quantity of Device	Set according to actual conditions.

- Select the NET port if the IDC30E charger is used. Then, set the parameters below.

Parameter			Description
Protocol Type	MODBUS-TCP by default		-
Networking Mode	Standalone network	Peer IP address	The peer IP address refers to the IP address of the charger that is connected, and the peer port refers to the port of the charger. Please set according to actual conditions.
		Peer port	
	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 charger actually used in the plant.
Beginning Address	-		Set according to actual conditions.
Quantity of Device	-		Set according to actual conditions.

step 4 Click **Save** to save the configuration.

- - 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

6 Device Start/Stop

6.1 Grid-connected/Off-grid Startup

Users can configure the start-up settings and start or stop the devices in the plant in one click.

The page for grid-connected/off-grid startup is shown below.

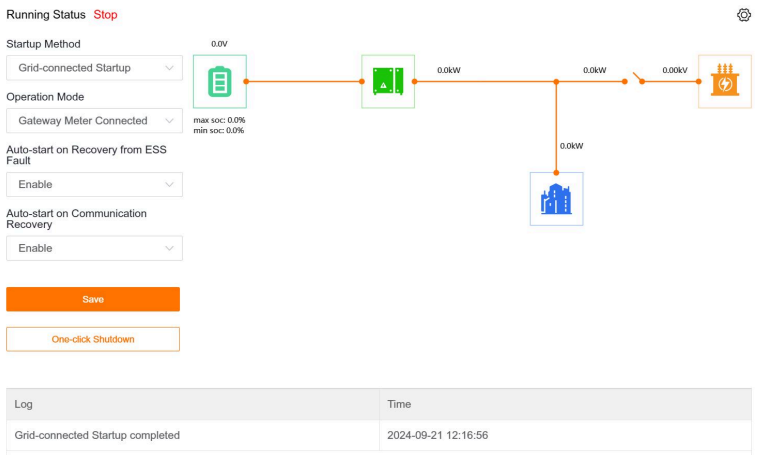


figure 6-1 Grid-connected/Off-grid Startup

step 1 Choose **Device Start/Stop > Grid-connected/Off-grid Startup**.

step 2 Specify the method used to start the devices in the plant in **Startup Method**.

◦ Off-grid Startup

When the device is in the off-grid state, users can select **Off-grid Startup** to start up all the devices in the plant. Once the startup is successful, the **Running Status** will be “Off-grid”.

Configure the black start parameters before startup. Click in the upper-right corner to set the parameters, as listed below.

Parameter	Description
Black Start SOC Threshold	The default value is 46.
Minimum Number of Running Units	Number of units with the minimum SOC.
Load Rated Power	Set this parameter based on the actual situation.

Parameter	Description
Startup Mode	Select an option based on the actual situation. • 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; 20 by default.
System Timeout	Range: 0–200; 60 by default.

◦ Grid-connected Startup

When the device is in the grid-connected state, users can click **Grid-connected Startup** to start all the devices in the plant. Once the startup is successful, the **Running Status** will be “Grid-connected”.

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

step 3 Select the **Operation Mode**.
Three operation modes are available, Gateway Meter Connected, Gateway Meter Not Connected, and Auto On/Off-Grid Switching. When the system is in Stop state, users can select Gateway Meter Connected or Gateway Meter Not Connected for startup based on actual needs. After the system starts operating properly, the operation mode will automatically change to “Auto On/Off-Grid Switching”. In this mode, the system will switch between grid-connected startup and off-grid startup according to the voltage changes at the grid-connection point.

step 4 Enable or disable **Auto-start on Recovery from ESS Fault**. When this function is enabled, in case a fault occurred in the ESS, the plant can restart automatically after recovered from the ESS fault. It is enabled by default.

step 5 Enable or disable **Auto-start on Communication Recovery**. When this function is enabled, in case the ESS's communication was interrupted, the plant can restart automatically after the communication is restored. It is enabled by default.

step 6 Click **Save**, then click “Yes” in the confirmation dialog to start the system up.

- - End

One-click Shutdown

Users can click **One-click Shutdown** to stop the devices in the plant. The running status will then display “Stop”.

View Operation Log

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

7 Control Method

7.1 Operation Parameters

step 1 Choose **Control Method > Operation Parameters**.

step 2 Click in **Scheduling mode** to select a mode. The default mode is "Local".

- **Cloud Scheduling**: The system receives ESS active power plan curves from the cloud. In this mode, the target value of ESS active power will adjust according to these plan curves. Parameters to be set are listed below.

Parameter	Description
Cascading	- **Enable**: Turn on this function. In this case, select an option in **Host/Client Controller Setting**. - **Disable**: Turn off this function.
Host/Client Controller Setting	Set this parameter if **Cascading** is set to **Enable**. - **Host in Cascade**: This controller is a host controller. - **Client in Cascade**: This controller is a client controller.
Rated Capacity of Energy Storage (MWh)	The default value is 0.100.
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.

- **Local:** The system does not respond to the plan curves sent by the cloud. Instead, it controls the charging and discharging of the ESS according to the strategies such as reverse power protection, time-of-use tariff, and demand control. Parameters to be set are listed below.

Parameter	Description
Cascading	- **Enable**: Turn on this function. In this case, select an option in **Host/Client Controller Setting**. - **Disable**: Turn off this function.

Parameter	Description
Host/Client Controller Setting	Set this parameter if **Cascading** is set to **Enable**. - **Host in Cascade**: This controller is a host controller. - **Client in Cascade**: This controller is a client controller.
Rated Capacity of Energy Storage (MWh)	The default value is 0.100.
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.

- **Third Party Scheduling Mode:** The system receives command values or plan curves from a third-party scheduling unit. In this mode, the system does not need to run any of its own control strategies and operates according to the third-party commands. Parameters to be set are listed below.

Parameter	Description
Debug Mode	- **Enable:** Turn on debug mode. In this case, the power control command will not be sent to the PCS or PV inverter. - **Disable:** Turn off the debug mode.
Cascading	- **Enable**: Turn on this function. In this case, select an option in **Host/Client Controller Setting**. - **Disable**: Turn off this function.
Host/Client Controller Setting	Set this parameter if **Cascading** is set to **Enable**. - **Host in Cascade**: This controller is a host controller. - **Client in Cascade**: This controller is a client controller.

Parameter	Description
Scheduled Object	- **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.
Dispatch Interruption Control Mode	Apply one of the following strategies upon dispatch interruptions. - **Keep Current Value**: Maintain the current set value. - **Zero Power Output**: Issue a zero power output command. - **Full-plant Shutdown**: Stop the entire plant. The system determines that there is a dispatch interruption if - a single communication interruption lasts for a period longer than the predefined **Communication Interruption Counting Period (s)**, or - the number of communication interruptions occurred during the **Communication Interruption Counting Period (s)** exceeds the predefined **Communication Interruption Counts**.
Communication Interruption Time (ms)	If the duration of communication interruption exceeds this threshold, the system records a communication interruption event.
Communication Interruption Counting Period (s)	Defines the time period during which the occurrences of communication interruptions will be counted.
Communication Interruption Counts	If the number of communication interruptions occurred during the preset **Communication Interruption Counting Period (s)** exceeds this value, the system determines there is a dispatch interruption.
Rated Capacity of Energy Storage (MWh)	The default value is 0.100.

Parameter	Description
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.

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

- - End

The three scheduling modes support different control strategies, as detailed in the table below. In this table:

- **Yes**: In this scheduling mode, EMS300CP supports parameter control for this strategy.
- **-**: In this scheduling mode, parameters set for this strategy in EMS300CP will not take effect.

All control strategy settings, including the scheduling mode, can be configured via iSolarCloud.

	Cloud Scheduling	Local	Third Party Scheduling Mode
Overload Protection	Yes	Yes	Yes
Demand Control	Yes	Yes	Yes
PV&ES Replacement	Yes	Yes	Yes
Reverse Power Protection	Yes	Yes	Yes
Time-of-Use Power	-	Yes	-
Optimized Power Factor Control	Yes	Yes	-
Active Power Control	-	-	Yes
Reactive Power Control	-	-	Yes
Power Backup	Yes	Yes	Yes
SOC Balancing	Yes	Yes	Yes
PID Control	Yes	Yes	Yes

7.2 Off-grid PV-ESS-Load

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

step 1 Choose **Control Method > Off-grid PV-ESS-Load**.

step 2 Click to set **Function Enable/Disable**.

- If it is set to **Enable**, the Off-grid PV-ESS-Load function is enabled. Please set the below parameters.

Parameter	Description
PV Active Power Ratio k1	When the system supplies power to both the ESS equipment and the loads, PV active power = k1 * current minimum charging power allowed by ESS equipment + load power.
PV Active Power Ratio k2	When the ESS equipment is fully charged and power is supplied only to the loads, PV active power = k2 * load power.

- If it is set to **Disable**, the Off-grid PV-ESS-Load function is disabled.

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

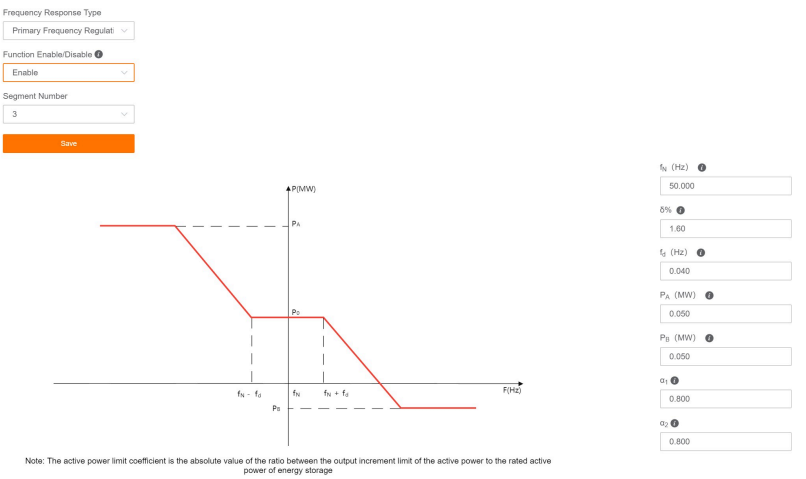
- - End

7.3 Fast-Frequency Response

This function can realize real-time grid-connected point frequency detection and automatic control to keep the frequency within the safe range.
Click **Control Method > Fast-Frequency Response** to enter the corresponding interface.

7.3.1 Primary Frequency Regulation

step 1 Click to set the status of **Function Enable/Disable** and "**Segment Number**, Click **Save**.



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

step 2 Set the right frequency regulation parameters, which are described as shown below.

Parameters	Descriptions
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 PB 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

* indicates the parameter to be set when the segment number = 5.

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

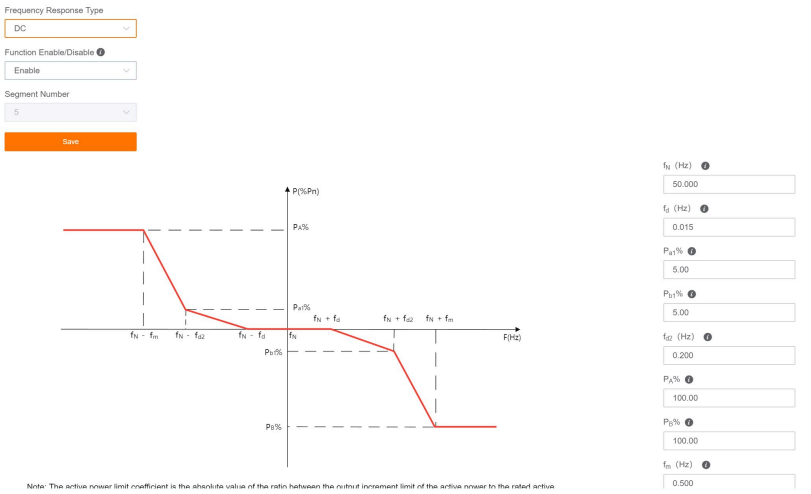
step 3 Click **Save**.

- - End

7.3.2 DC

step 1 Click and select **DC**.

step 2 Set **Function Enable/Disable**.



The figure is for reference only. The interface you actually see may deviate.

step 3 Set the frequency regulation parameters on the right. The description of parameters is 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

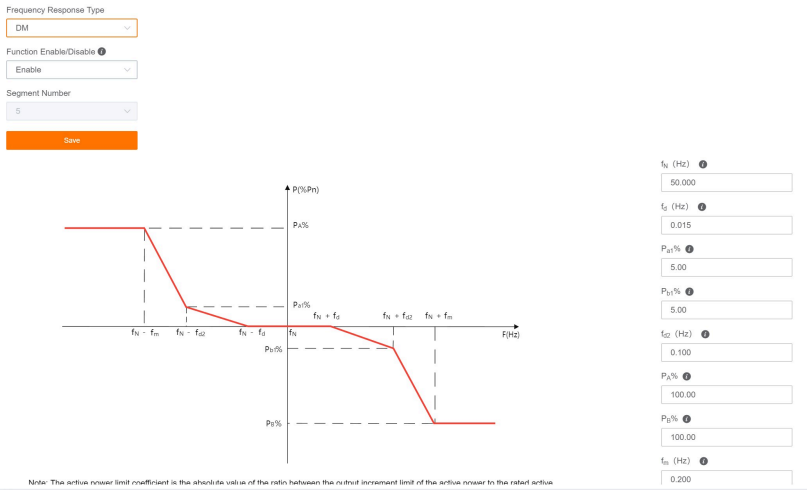
step 4 Click **Save** to save the settings.

- - End

7.3.3 DM

step 1 Click and select **DM**.

step 2 Set **Function Enable/Disable**.



The figure is for reference only. The interface you actually see may deviate.

step 3 Set the frequency regulation parameters on the right. The description of parameters is 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

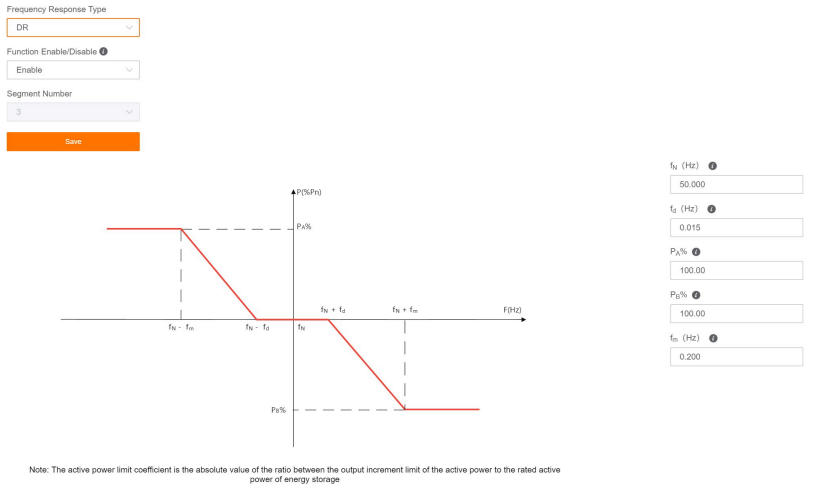
step 4 Click **Save** to save the settings.

- - End

7.3.4 DR

step 1 Click and select **DR**.

step 2 Set **Function Enable/Disable**.



The figure is for reference only. The interface you actually see may deviate.

step 3 Set the frequency regulation parameters on the right. The description of parameters is 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

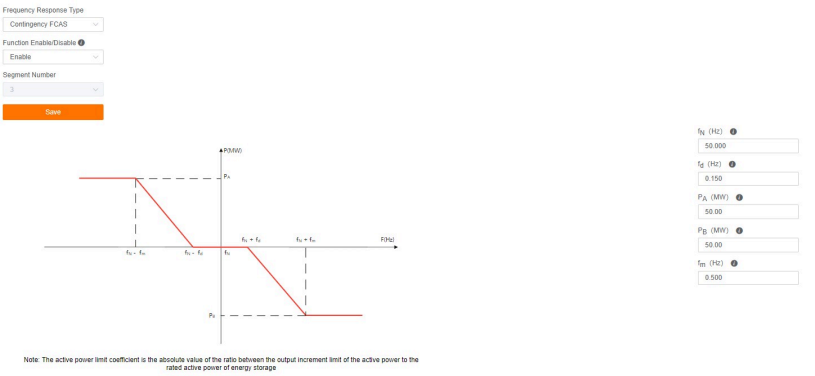
step 4 Click **Save** to save the settings.

- - End

7.3.5 Contingency FCAS

step 1 Click and select **Contingency FCAS**.

step 2 Set **Function Enable/Disable** .



The figure is for reference only. The interface you actually see may deviate.

step 3 Set the frequency regulation parameters on the right. The description of parameters is 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 4 Click **Save** to save the settings.

- - End

7.4 Overload Protection

It 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 of the transformer, thus preventing overload.

step 1 Choose **Control Method > Overload Protection**.

step 2 Click to set **Function Enable/Disable**.

- If it is set to **Enable**, the overload protection function is turned on. Then, set the parameters as follows.

Parameter	Description
Transformer Capacity (kVA)	The capacity of the transformer at the grid-connection point. Set this parameter based on the actual situation.
Active Power Conversion Coefficient	Range: 0 to 1.
Dynamic Capacity Expansion	- Open: Allow the ESS to discharge. - Off: Do not allow the ESS to discharge.

- If it is set to **Disable**, the overload protection function is turned off.

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

- - End

7.5 Demand Control

Users can define the maximum demand that is allowed here. Then, the system will collect and control the real-time power at the grid-connection point, ensuring it does not exceed the predefined maximum demand.

step 1 Click **Control Method > Demand Control**.

step 2 Select **Enable** or **Disable** in **Function Enable/Disable**.

- It is set to **Enable**, the demand control function is enabled. Select a demand control strategy in **Select Strategy** and complete the demand threshold settings.

Demand Control Strategy	Description
Max. Actual Demand	Set the gateway meter's real-time demand as the maximum allowable demand. If this strategy is selected, you need to set the **Lower Limit for Demand Control (kW)**. If the meter's real-time demand value falls below the Lower Limit for Demand Control defined here, this Lower Limit will be adopted as the maximum allowable demand. Range: 0–9999.9 kW; 100 kW by default.
Max. Contract Demand	Set the maximum contract demand as the maximum allowable demand. Please specify a value in **Max. Allowable Demand (kW)**.

- It is set to **Disable**, the demand control function is disabled.

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

- - End

7.6 PV&ES Replacement

In scenarios where the load increases without reverse power at the grid-connection point, the ESS first increases discharging power, and then, gradually, shifts the load demand to the PV installation.

Priority of control strategies: Reverse power protection enjoys higher priority than PV&ES Replacement.

step 1 Click **Control Method > PV&ES Replacement**.

step 2 Click to set **Function Enable/Disable**.

- If it is set to **Enable**, the PV&ES replacement function is enabled, and the following parameters should be set at this time.

Parameter	Description
Replacement Percentage	PV power ramping step size in PV&ES replacement = PV Rated Power * Replacement Percentage

Parameter	Description
Replacement Dead Zone Percentage	Power dead zone where PV power replacement stops = PV Rated Power * Replacement Dead Zone Percentage
Strategy Trigger Dead Zone	When the difference between the power at the grid-connection point and the target grid-connection point power set for reverse power protection is equal to or less than this value, PV&ES replacement is activated.

- If it is set to **Disable**, the PV&ES replacement function is turned off.

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

- - End

7.7 Reverse Power Protection

Reverse power protection 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 **Control Method > Reverse Power Protection**.

step 2 Click to set **Function Enable/Disable**.

- If it is set to **Enable**, the reverse power protection function is enabled. Please set the below parameters.

Parameter	Description
Grid-connected Point Power Target Value(kW)	This value is ≤0 by default. It is recommended to set this value to -1% to -2% of the rated active power of the ESS. When the actual power of the grid-connected point exceeds the preset target value, the system will automatically reduce the PV output or charge the batteries.
Reverse Power Protection Operation Mode	The following two operation modes are available. - **Self-Consumption:** No restrictions on charging-discharging switchover for the ESS. - **Surplus electricity:** When the ESS active power is equal to or greater than 0, reverse power protection is activated.

- If it is set to **Disable**, reverse power protection is disabled.

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

- - End

7.8 Time-of-Use Power

Time-of-use power refers to a mode in which the system operates automatically following specified power in specified time period.

step 1 Click **Control Method > Time-of-Use Power** to enter the corresponding interface.

step 2 Click to set Function Enable/Disable.

- If it is set to **Enable**, the time-of-use power function is enabled.
- If it is set to **Disable**, the time-of-use power function is disabled.

step 3 Click **Add**.

i. Set the C-rate of the system and the time periods for charging and discharging. Set the parameters listed in the table below.

Parameter	Description
Time Type	Click to select the time type.
Start Time	-
End time	-
Charging/Discharging Power (KW)	It can be the same as the rated power. • Negative: Charging • Positive: Discharge

The start time and the end time cannot overlap.

ii. Click **Confirm** in the **Action** column to save the settings.

- Click **Delete** in the **Action** column to delete the sequence.
- Select the sequences that have been set and click **Batch Delete** to delete them in batches.

step 4 Click **Save** to save the configuration.

- - End

7.9 Force Regulation Control

It is used to adjust the power factor to reduce the power factor clause.

The control method is only used to control the reactive power currently.

step 1 Click **Control Method > Force Regulation Control**.

step 2 Click to set **Function Enable/Disable** .

- If it is set to **Enable**, the force regulation control function is enabled, and **Grid-connected Point PF Target Value** should be set at this time. Enter the specific value in the input box.

  If the power factor of the grid-connected point is less than the target value, the target value of the reactive power of the grid-connected point can be calculated on the basis of the target value and the active power value of the grid-connected point, and then the reactive power can be regulated by energy storage and PV devices.
- If it is set to **Disable**, the force regulation control function is disabled.

step 3 Click **Save** to save the configuration.

- - End

7.10 Active Power Control

It is used to make the plant output active power according to the target value remotely set in Third Party Scheduling mode.

step 1 Click **Control Method > Active Power Control** to enter the corresponding interface.

step 2 Click in **Function Enable/Disable**.

- If it is set to **Enable**, the active power control function is enabled, and the following parameters should be set at this time.

Parameter	Description
Remotely Set Value(MW)	Shows the remotely set active power when the scheduling mode is “Third Party Scheduling”.
Control Dead Zone	Set the value according to actual conditions. It limits 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 zone is 5 KW, then the target active power of the grid-connected point can range from 5 KW to 15 KW.

- If it is set to **Disable**, the active power control function is disabled.

step 3 Click **Save** to save the configuration.

- - End

7.11 Reactive Power Control

It is used to make the plant output reactive power according to the target value remotely set in Third Party Scheduling mode.

step 1 Click **Control Method > Reactive Power Control** to enter the corresponding interface.

step 2 Click in **Function Enable/Disable**.

- If it is set to **Enable**, the reactive power control function is enabled, and the following parameters should be set at this time.

Parameter	Description
Remotely Set Value(Mvar)	Shows the remotely set reactive power when the scheduling mode is “Third Party Scheduling”.

Parameter	Description
Control Dead Zone(kvar)	Set the value according to actual conditions. It limits 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 KW, and the control dead zone is 5 KW, then the target reactive power of the grid-connected point can range from 5 KW to 15 KW.

- If it is set to **Disable**, the reactive power control function is disabled.

step 3 Click **Save** to save the configuration.

- - End

7.12 Standby Power Function

It is used to set primary and secondary protection for the SOC of the energy storage system, so that the energy storage system operates within the set SOC range when connected to the grid, and some electricity is reserved to supply power to loads when the system is disconnected from the grid.

step 1 Click **Control Method > Standby Power Function** to enter the corresponding interface.

step 2 Click ⌄ in **Function Enable/Disable**.

- If it is set to **Enable**, the standby power function is enabled, and the following parameters should be set at this time. Enter the specific value in the input box.

Parameter	Status	Description
SOC Upper Limit Level 1 Protection	During grid-connected operation	The default value is 95%. Please fill in according to the actual situation. If the SOC is greater than or equal to the value of SOC upper limit level 1 protection, the system is prohibited from charging.
SOC Upper Limit Level 1 Recovery		The default value is 92%. Please fill in according to the actual situation. If the SOC is less than or equal to the value of SOC upper limit level 1 recovery, the system can be charged.

Parameter	Status	Description
SOC Lower Limit Level 1 Recovery	Standby power	The default value is 62%. Please fill in according to the actual situation. If the SOC is less than or equal to the value of SOC lower limit level 1 recovery, the system can be discharged.
SOC Lower Limit Level 1 Protection		The default value is 60%. Please fill in according to the actual situation. If the SOC is less than or equal to the value of SOC lower limit level 1 protection, the system is prohibited from discharging.
SOC Lower Limit Level 2 Recovery		The default value is 7%. Please fill in according to the actual situation. If the SOC is greater than or equal to the value of SOC lower limit level 2 recovery, the system goes back to the lower level 1 protection status, and discharge is prohibited.
SOC Lower Limit Level 2 Protection		The default value is 5%. Please fill in according to the actual situation. If the SOC is less than or equal to the value of SOC lower limit level 2 protection, the system is prohibited from discharging and carries out charging with the set **Electricity Supplement Power**.
Electricity Supplement Power (kW)		Set according to actual conditions. Lower limit level 2 triggers protection charging power.

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.

- If it is set to **Disable**, the standby power function is disabled.

step 3 Click **Save** to save the configuration.

- - End

7.13 SOC Balancing

Optimize the operation of every PCS and control the SOC of batteries in the whole plant to be relatively balanced, so as to avoid damages to batteries caused by excessive charge and discharge and extend battery life.

7.13.1 Grid-connected Scenario

step 1 Click**Control Method > SOC Balancing > Grid-connected**

step 2 Click in **SOC Balancing**.

- If it is set to **Enable**, the SOC balancing function is enabled, and the following parameters should be set at this time. Enter the specific value in the input box.

Parameter	Description
SOC Upper Limit(%)	If the SOC reaches or exceeds the SOC Upper Limit, the system stops charging the battery. The default value is 95%.
SOC Upper Limit Recovery(%)	When the SOC decreases after reaching the upper limit: if SOC does not drop below this threshold, the battery stops charging but is allowed to discharge; if SOC drops below this threshold, the battery is allowed to charge. The default value is 94%.
SOC Lower Limit Recovery(%)	When the SOC increases after reaching the lower limit: if SOC does not exceed this threshold, the battery stops discharging but is allowed to charge; if SOC exceeds this threshold, the battery is allowed to discharge. The default value is 6%.
SOC Lower Limit(%)	If the SOC reaches or drops below the SOC Lower Limit, the battery stops discharging. The default value is 5%.

- If it is set to **Disable**, the SOC balancing function is disabled.

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

- - End

7.13.2 Off-grid Scenario

step 1 Click **Control Method > SOC Balancing > Off-grid**.

step 2 Click **Off-grid SOC Balancing** in

- If it is set to **Enable**, the off-grid SOC balancing function is enabled, and the following parameters should be set at this time. Enter the specific value in the input box.

Parameter	Description
Charge Step Factor K3	The default value is 0.9. Please set this value according to actual conditions.
Discharge Step Factor K4	The default value is 0.9. Please set this value according to actual conditions.
Adjustment Period	The time interval between the end of the previous round and the start of the next round of off-grid balancing.
Threshold of Available Discharge Power	Adjust for possible load power fluctuations.

- If it is set to **Disable**, the off-grid SOC balancing function is disabled.

step 3 Tap **Save** to save the configuration.

- - End

7.14 PID Controls

7.14.1 Energy Storage Active Power Parameters

step 1 Click **Control Method > PID Control > Energy Storage Active Power Parameters** to enter the corresponding interface.

step 2 Click in **Preset Parameters** to set the status of the **Preset Parameters**.

The preset parameters are divided into: quick, slow and custom, and the default values are as follows.

Parameter	Quick	Slow	Custom
Scale Factor	0.01	0.10	Set by users
Integral Coefficient	0.98	0.01	
Differential Coefficient	0.00	0.00	0.00

step 3 Click **Save** to save the configuration.

- - End

7.14.2 PV Active Power Parameters

step 1 Click **Control Method > PID Control > PV Active Power Parameters** to enter the corresponding interface.

step 2 Click ⌄ in **Preset Parameters** to set the status of the **Preset Parameters**.

The preset parameters are divided into: quick, slow and custom, and the default values are as follows.

Parameter	Quick	Slow	Custom
Scale Factor	0.01	0.10	Set by users
Integral Coefficient	0.98	0.01	
Differential Coefficient	0.00	0.00	0.00

step 3 Click **Save** to save the configuration.

- - End

7.14.3 Energy Storage Reactive Power Parameters

step 1 Click **Control Method > PID Control > Energy Storage Reactive Power Parameters** to enter the corresponding interface.

step 2 Click ⌄ in **Preset Parameters** to set the status of the **Preset Parameters**.

The preset parameters are divided into: quick, slow and custom, and the default values are as follows.

Parameter	Quick	Slow	Custom
Scale Factor	0.01	0.10	Set by users
Integral Coefficient	0.98	0.01	
Differential Coefficient	0.00	0.00	0.00

step 3 Click **Save** to save the configuration.

- - End

7.14.4 PV Reactive Power Parameters

step 1 Click **Control Method > PID Control > PV Reactive Power Parameters** to enter the corresponding interface.

step 2 Click in **Preset Parameters** to set the status of the **Preset Parameters**.

The preset parameters are divided into: quick, slow and custom, and the default values are as follows.

Parameter	Quick	Slow	Custom
Scale Factor	0.01	0.10	Set by users
Integral Coefficient	0.98	0.01	
Differential Coefficient	0.00	0.00	0.00

step 3 Click **Save** to save the configuration.

- - End

8 History Data

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

8.1 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

8.2 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

8.3 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

8.4 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

9 System

9.1 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**.

9.2 System Maintenance

On this interface users can maintain the system, including system update, log export, rebooting, strategy import, one-click migration and resetting all settings.

System upgrade

1. Click **System > System Maintenance > System Update**.
2. Select **Local Update Package** or **Online Update Package** in **Select a Firmware File** dialog box.

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

3. Click **Update** on the Version Information interface.

Log export

1. Click **System > System Maintenance > Log Export_Debugging, operations and other logs** to export debugging and operation logs.
2. Select a log type in **Log File Type Selection** dialog box.
3. Click **Confirm** to export the log.

Rebooting

1. Click **System > System Maintenance > Rebooting**.
2. Click **Confirm** in **Warning** dialog box to restart the system.

Strategy Import

1. Click **System > System Maintenance > Strategy Import**.
2. Select a strategy file and import it.

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

One-click Migration

1. Click **System > System Maintenance > One-click Migration**.
2. The **One-click Migration** dialog box pops up.
   - Click **Import** and select the file to import it.
   - Click **Export** to export the data package to local.

Reset All Settings

1. Click **System > System Maintenance > Reset All Settings**.
2. Click **Confirm** in **Reset All Settings** dialog box.

> If “Reset IP address” is ticked in **Reset All Settings** dialog box, all IP addresses are restored to the factory settings.

9.3 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.

9.4 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

9.5 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. Click **System > System Time** to enter the corresponding interface.
2. Click the drop-down list of **Clock Source** and select **User Define** or **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. • Click the drop-down list of **Time Zone** to select the time zone. Select a time and manually set the controller time in the **Date** and **Time** field. It is recommended to select **User Define** during commissioning.
iSolarCloud	Synchronize the controller time with the iSolarCloud time.

3. Click **Save** and the setting is finished.

9.6 Forwarding Configuration

9.6.1 IEC104

It is used to configure IEC104 forwarding service of the controller.

Click **System > Forwarding Configuration > IEC104** to enter the corresponding interface.

The local port number is 2404 when configuring IEC104 service forwarding.

Generate Point Table

Turn on the switch of the local port 2404.

Click **Generate Point Table**. The default IEC104 point table will be automatically imported into the configuration file.

Export Point Table

Click **Export Point Table** to download the point table to local.

White List Setting

Click **White List Setting**.

- If **Enable White List** is not ticked, the default peer IP address is 0.0.0.0, and any back-end device with a valid IP address is allowed to access the controller.
- If **Enable White List** is ticked, enter the peer IP address, and only devices with the specified IP address can access the controller.

Advanced Settings

Click in the operation bar, and **Advanced Settings** interface pops up. Set Remote Signaling Measuring Point Type, Remote Signaling Time Mark, and Upload with a Change.

Click in the configuration file bar to import the .xml file.

Click **Save** to finish importing the IEC104 forwarding point table.

Export IEC104 Forwarding Point Table

Click to export the forwarding point table to local.

9.6.2 MODBUS

It is used to configure MODBUS forwarding service of the controller.

Server

In Sever mode, the controller functions as the sever and transmits data and instructions with the host computer server through Modbus TCP protocol.

1. Click **System > Forwarding Configuration > MODBUS** to enter the corresponding interface.
2. Click **Server** tab.
3. Turn on/off the local port by clicking the button in the switch column according to the actual conditions.

For whitelist settings, please refer to White List Setting.

RTU

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

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

9.6.3 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

9.6.4 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

9.7 Port Parameter

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

9.7.1 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.
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

9.7.2 Ethernet

On this interface users can perform Ethernet connection for the controller.

step 1 Click **System >** →**Port Parameter >** →**Ethernet** to enter the corresponding interface.

step 2 Set the Ethernet information as below.

◦ If Automatically Obtain IP Settings (DHCP) is Open, the IP address corresponding to the port is invalid and users can log in the device through the virtual IP address. The IP address of each port is as follows.

table 9-1 Controller IP Address

Port	Default IP address
ETH1	14.14.14.14
ETH2	12.12.12.12
ETH5	13.13.13.13

The above IP addresses are for reference only. The real IP addresses shall prevail.

◦ If Automatically Obtain IP Settings (DHCP) is Close , fill in the IP address, the subnet mask, and the gateway address.

step 3 Click on the right to save the settings.

- - End

9.7.3 WLAN

step 1 Click **System**→**Port Parameter**→**WLAN** to enter the corresponding interface.

step 2 Click in **AP hotspot enable switch**.

- If it is set to **Enable**, the hotspot is enabled. And the following parameters should be set.

Parameter	Description
SSID	The name of the wireless local area network (WLAN), which should be filled in according to the actual situation.

Parameter	Description
Security	Please select the wireless network encryption type based on the actual situation. - If there is no encryption, select "None". - If WPA2 is selected, the wireless network can only be connected if the correct password is entered.

- If it is set to **Disable**, the hospot is turned off.

WLAN connection shall be established again if the WLAN password is modified.

step 3 Click **Save** to save the configuration.

- - End

9.7.4 DI

step 1 Click **System >** →**Port Parameter >** →**DI** to enter the corresponding interface.

step 2 Set the DI status to **NO** or **NC** according to actual conditions.

step 3 Click  on the right to save the settings.

- - End

9.7.5 DO

step 1 Click **System >** →**Port Parameter >** →**DO** to enter the corresponding interface.

step 2 Set the DO status to **NO** or **NC** according to actual conditions.

step 3 Click  on the right to save the settings.

- - End

9.8 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

10 About

Click **About** to enter the corresponding interface. In this interface, users can view the controller firmware information.

The user manual can be downloaded by scanning the QR code of the interface using your mobile phone.

11 Appendix

11.1 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.

11.2 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**

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