User Manual

Product Name: MS-EMS

Applicable Model: MS-G(S)215-2H3

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1 System Introduction

1.1 Introduction

The EMS is an excellent energy management system with the following features:

Free combination: This EMS is unique, as it is featured by free combination. Users can select single cabinets or combine multiple products as needed, easily building power stations adaptable to various scales. This flexibility allows the power station to scale as demand changes, providing unlimited possibilities for future growth.

Autonomous and controllable: The uniqueness of the system lies in its completely autonomous and controllable nature. The deep integration of software and hardware enables users to achieve full control of the system. This autonomy not only improves the operating efficiency of the power station, but also enhances safety and stability and reduces external dependence.

User-friendly: The system interface is simple and intuitive, easy to operate, and users can easily manage energy use without professional knowledge. This makes it easier for users to reduce energy costs, improve energy efficiency, and actively participate in environmental protection activities.

Cloud-edge collaboration: The system adopts a cloud-edge integrated architecture, which cleverly combines cloud and edge computing. This synergy allows users to achieve local power station management and remote centralized control, and provides technical support for future trends such as multi-station energy aggregation and grid dispatching response. In addition, cloud-edge collaboration also improves operation and maintenance efficiency and fault repair speed to ensure system stability.

Intelligent and efficient: The system has built-in intelligent

strategies, including peak load shifting, demand control, load tracking, reverse power protection, etc., which can be customized according to the actual needs of the power station. In addition, it also has the ability to learn. Through the analysis of historical data, it continuously optimizes the execution strategy and makes power station management more intelligent and efficient.

In general, the EMS is an innovative product that leads the future, with many highlights such as free combination, independent controllability, user-friendliness, cloud-edge collaboration and intelligence. It provides greater flexibility and controllability for energy storage power stations, helping them to achieve more efficient energy management and operation.

1.2 About This Manual

This manual mainly describes the software information, guidelines for , operation and so on.

It is highly noted that the complete user manual consists of two files, one document introducing hardware and the another software including user interface. Please follow the steps below to obtain the relevant documents.

1. Scan the following QR code.
2. Click the "**Software**" to access to **software version**.
3. Click the "**Download**" to access to **hardware version**.

1.3 System Operation Environment

1.3.1 Software requirements

System environment: Ubuntu 20.04 64-bit system

1.3.2 Hardware requirements

Memory requirements: 2G and above.
Hard disk requirements: 1T hard disk free space.

1.4 Main functions

The EMS mainly includes the following main functions:

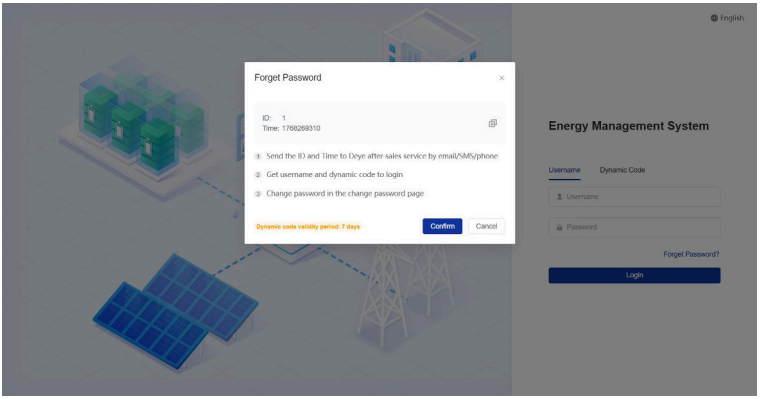
- User-related, support multi-role user login, and control page permissions and content area data permissions;
- Equipment-related, monitoring power station information, energy storage cabinet information, PCS, battery stack, battery cluster, battery pack, dehumidifier and other device data, device information, device events, device upgrades, etc.;
- Currently, the software is required to mainly provide support for peak load shifting, depending on the strategies.

1.5 Login page

One can log in to the site by using username and password. The username and password will be determined before the device is delivered. User registration is not supported for the time being.

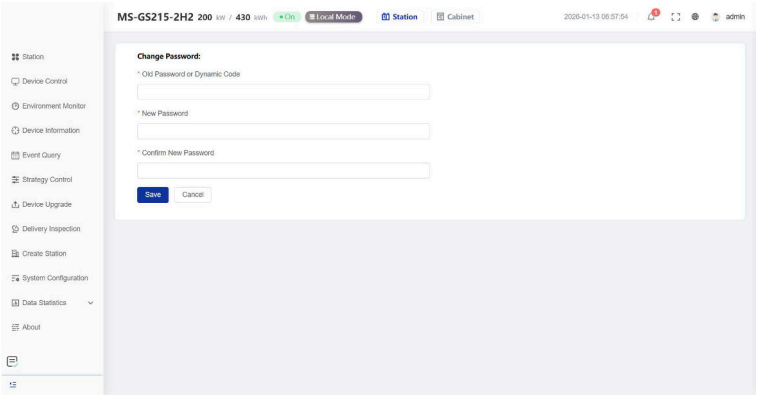
Click English on the upper right corner of the page to switch between multiple languages.

If you forget your password, you can log in with the dynamic code. Click the “Forgot Password” and follow the steps in the pop-up window. After successful login, it is recommended to change the , you can log in password immediately.



After successfully logging in with the dynamic code, it will immediately jump to the password change page. You should change your password

as required.

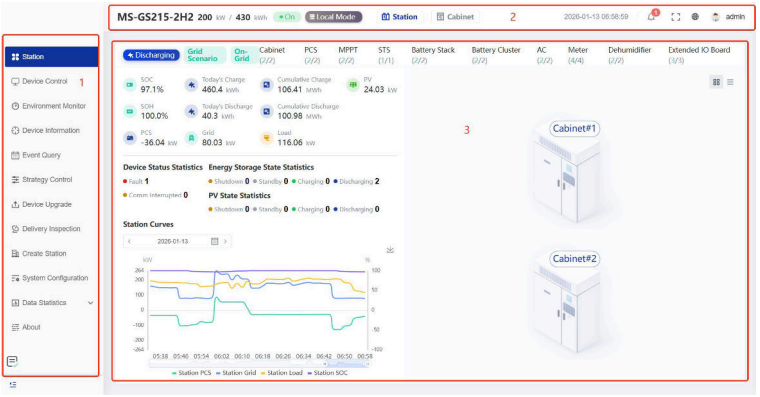

MS-GS215-2H2 200 kW / 430 kWh
On
Local Mode
Station
Cabinet
2026-01-13 06:57:54
admin
Station
Device Control
Environment Monitor
Device Information
Event Query
Strategy Control
Device Upgrade
Delivery Inspection
Create Station
System Configuration
Data Statistics
About
Change Password:
* Old Password or Dynamic Code
* New Password
* Confirm New Password
Save
Cancel

2 Power station Introduction

2.1 Overall framework

The system as a whole mainly includes three parts:

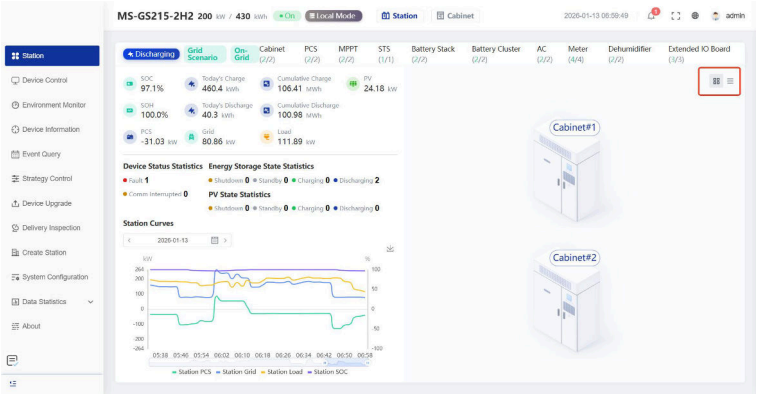
1. Click  on the lower left corner in the left menu bar, to unfold or fold the menu bar;
2. At the top navigation, the name of the current power station, rated power, installed capacity, current system operating status, system response mode, switching between power station and energy storage cabinet pages, current system time, activity event notifications, full-screen display button, multi-language switching button and user module functions are displayed;
3. Content Display Area.



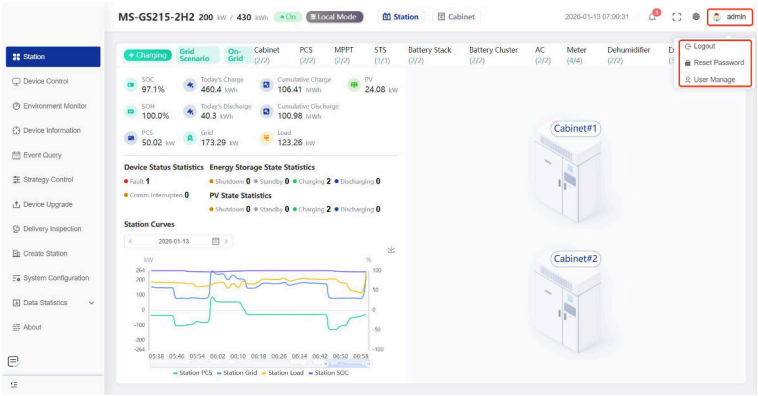
2.2 Overview of power station information

2.2.1 Overview

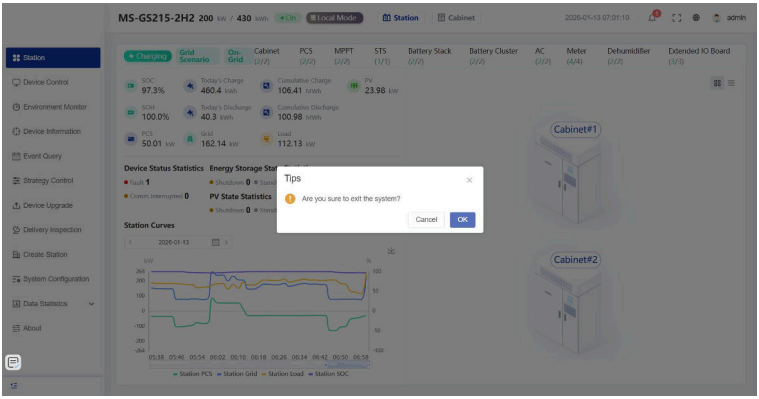
1. If the site is composed of multiple standard energy storage cabinets, the user will enter the EMS homepage by default after successful login. The left side displays the statistical information of the power station, the summary of energy storage cabinets' status and quantity and the curve of the power station, and the right side displays the basic data of each individual cabinet. Click a cabinet to enter the homepage of an individual cabinet. Click on the upper right corner to change the layout of the basic data page of the energy storage cabinet from card pattern to list pattern. The default layout is card pattern.



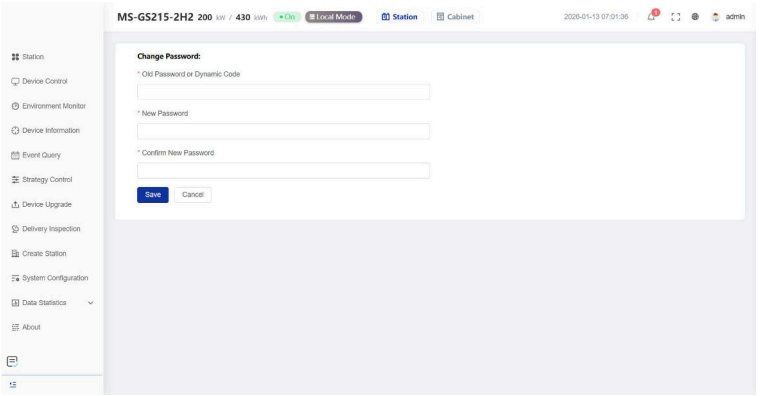
2. Click  on the upper right corner to choose to exit the system, reset passwords or enter the user management option.



1) Exit the system: Click the “OK” to exit the current system platform.



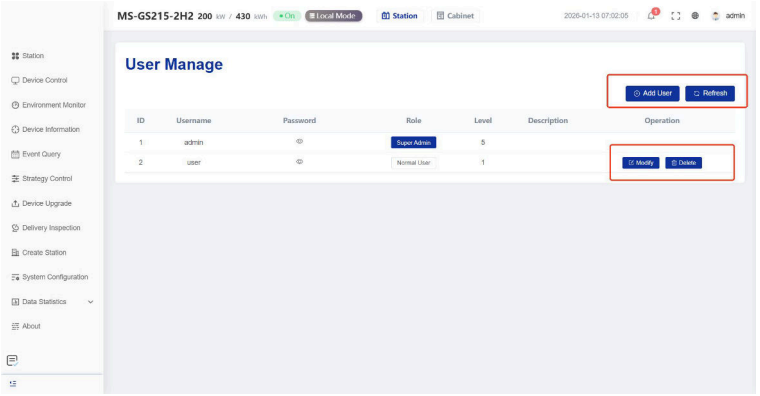
2) Password change: After clicking on the “Reset Password”, the page will jump. User needs to enter the original password or dynamic code first, then enter the new password and confirm it, and finally click the “Save” to complete the password change. If you click the “Cancel”, it will return to the previous page.



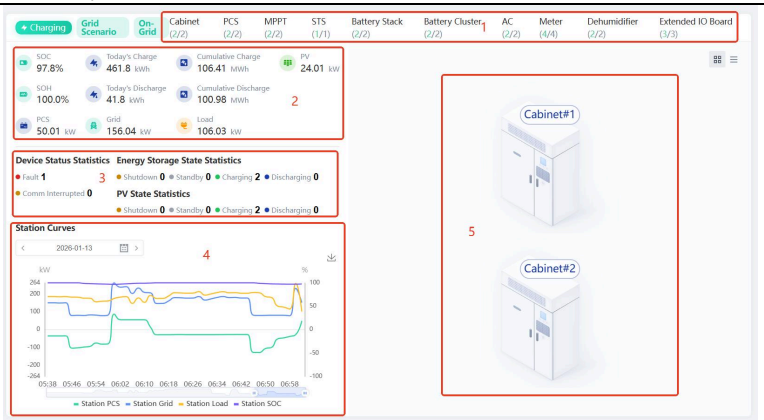
3) User management: It is particularly important to note that only super administrator has access to the user management option.

① To add a new user, you need to fill in the username, password, role, user level and description.

② Click the “Modify” to modify the user name, password, role, user level and description. The password length must not be less than 6 characters.



2.2.2 Details in the Interface



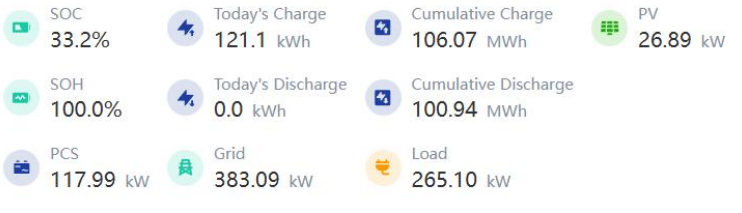
2.2.2.1 Area 1

The communication connection status of all key devices in the centralized monitoring system in this area.

The numbers in brackets indicate "current number of online devices/total number of devices of this type". Users can use this information to clearly grasp the integrity of the system structure and promptly discover abnormal situations such as device offline. For example, "meter (0/2)" means that all 2 meters are offline and need to be troubleshooted.

2.2.2.2 Area 2

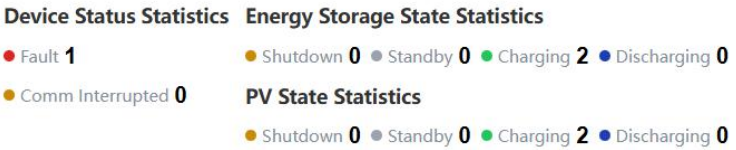
Display the core operating data and status of the power station.



Data item	Notes
SOC	The current remaining power percentage of the battery reflects "how much power is left"
SOH	Battery health state percentage reflects the degree of attenuation of the battery's maximum capacity
Today's charge	The total amount of electricity charged to the battery on that day
Cumulative charge	The total amount of electricity charged into the battery in the system history
Today's discharge	The total amount of electricity discharged from the battery on that day
Cumulative discharge	The total amount of electricity discharged from the battery in the system history
PCS	Real-time power of PCS, negative value indicates charging, positive value indicates discharging
Grid	Real-time power exchanged with the grid. A positive value indicates that power is taken from the grid, and a negative value indicates that power is

	sent to the grid
Load	Total power consumption of loads in the station
PV	Real-time power output of the PV system

2.2.2.3 Area 3

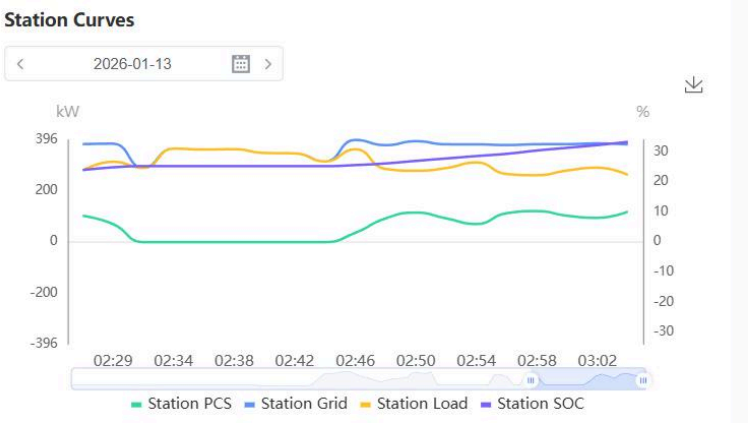


Device status statistics: Display the number of currently faulty device and the number of device with communication interruption.
Energy storage status statistics: Display the number of PCS currently shut down, in standby, charging and discharging.
PV state statistics: Display the number of PV currently shut down, in standby, charging and discharging.

2.2.2.4 Area 4

Station curves: This function displays the operating data of the power station in the form of a curve, supports daily query and time axis scaling, and is convenient for users to analyze historical data and evaluate the

operating status.



Description of curve variables:

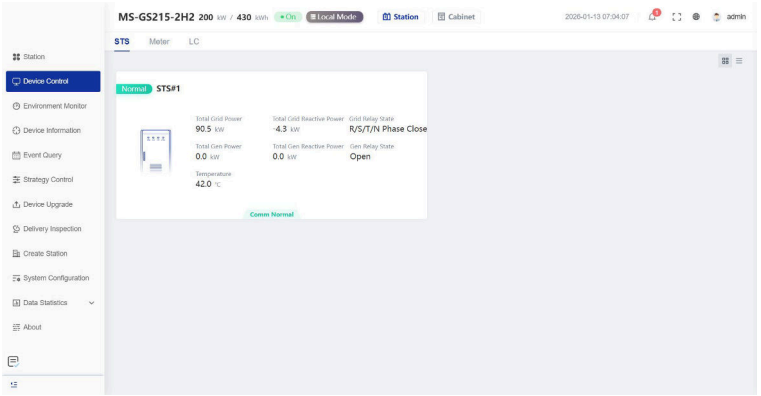
Data item	Notes
Station PCS	Display the real-time power (kW) of PCS. Positive values indicate discharging, negative values indicate charging
Station grid	Display the power exchanged between the station and the public grid (kW). A positive value indicates that power is taken from the grid, and a negative value indicates that power is sent to the grid
Station load	Display the total power consumption of loads in the station (kW)
Station SOC	Display the real-time remaining battery power percentage (%)

2.2.3 Device Control

Select the “Device Control” in the left menu to enter the power station device monitoring page, which mainly involves STS, meter and local controller. The main layout is in card pattern by default, and you can click  on the upper right corner to switch to the list pattern.

2.2.3.1 STS

1. The STS overview interface displays the total grid power, the total grid reactive power , the total generator power , the total generator reactive power, the grid relay state, the generator relay state, and temperature information.



Data item	Notes

Total grid power	The actual power currently input from or delivered to the public power grid. • Positive (+): The system is drawing active energy from the grid. • Negative (-): The system is delivering active energy back to the grid.
Total grid reactive power	Energy currently exchanged with the grid to establish a magnetic field but not to do work
Total gen power	The actual power output of the current backup generator.
Total gen reactive power	The reactive power component of the generator output.
Grid relay state	The main switch connecting the system to the public power grid. • Closed: The system is connected to power grid and can supply power. • Open: The system is isolated from the power grid.
Gen relay state	The main switch connecting the system to the backup generator. • Closed: The system is connected to the generator, which supplies power. • Open: The system is not connected to the generator.
Temperature	Real-time temperature of key components (such as power modules) in the STS cabinet.

2. Click STS to view details. You can click on this interface to view the STS operation status, communication status, STS warning information, temperature information, and details of the grid, generator, and inverter.

1) Basic information of STS

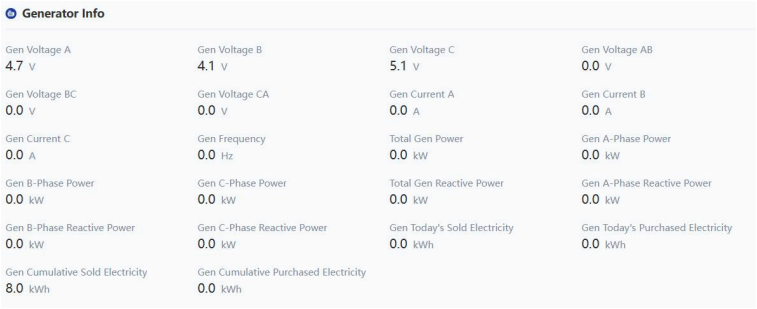
Data item	Notes
Communication address	The unique identifier of the STS in the monitoring network
Communication protocol version	Version number of communication language and rules followed by device for data exchange with monitoring system
Rated power	The maximum active power that this STS is designed to transmit safely and continuously.
Grid relay state	The real-time physical location of the power switch for connecting to the public power grid.
Gen relay state	The real-time physical location of the power switch for connecting to the backup generator.
Parallel relay state	The state of a special switch for controlling short-duration parallel connection between the power grid and the generator

2) Grid info

These parameters reflect the electrical status and energy trading of the connection point between the energy storage system and the public power grid in comprehensive and real time way.

3) Generator info

This interface is used for comprehensive monitoring of the output status and power generation of the backup generator set when it is started and running. It is a key interface for evaluation of the performance of the backup power supply and operation and maintenance management.

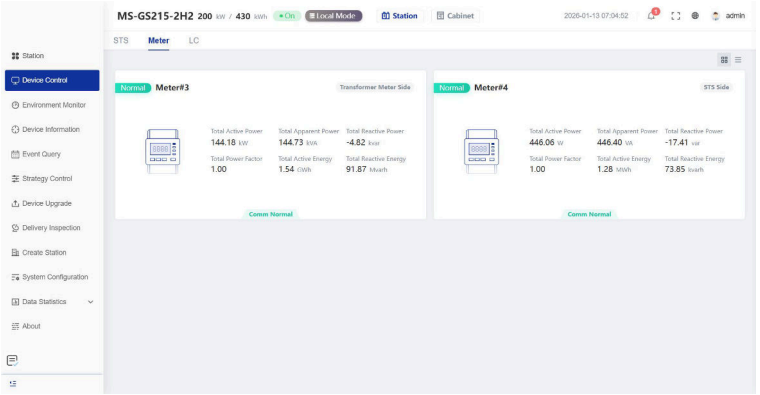


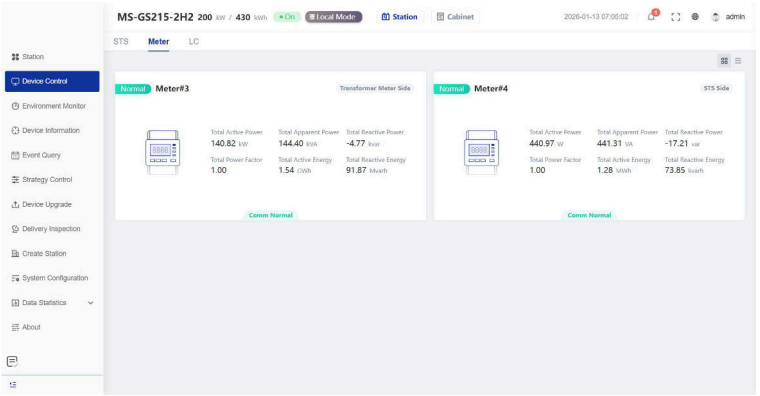
4) Inverter info

This interface is used for monitoring of the voltage status of the inverter, which is the core basis for judging whether the inverter is operating properly and can be safely connected to the power grid or loads.

2.2.3.2 Meter

1. Click the “Meter” to view the real-time operating parameters and energy data of the meters on the transformer side and the STS side.

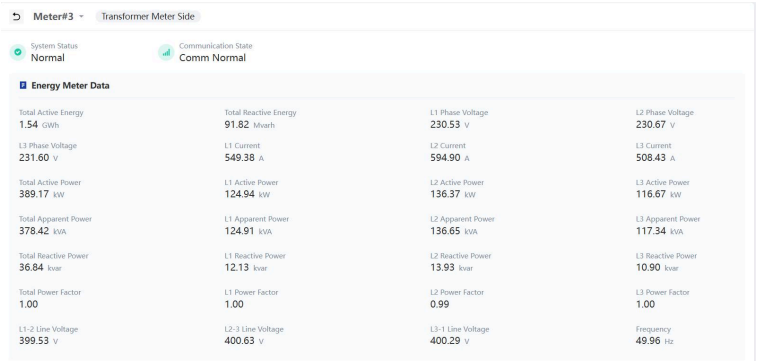




Data item	Notes
Total active power	The actual net power consumed by the current site.
Total apparent power	The total capacity that the current power grid needs to provide.

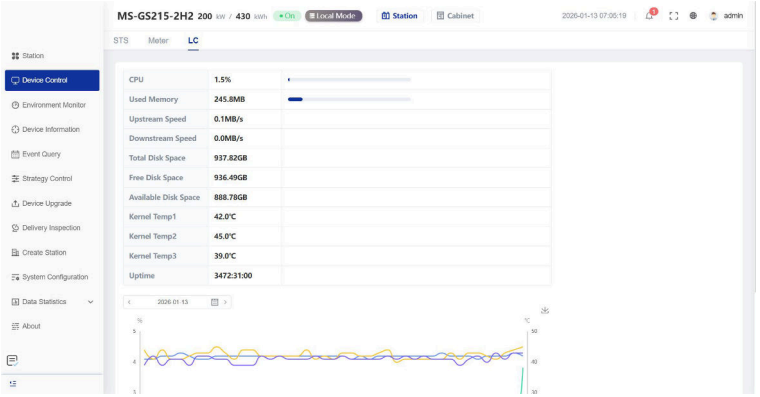
Total reactive power	Reactive power currently exchanged.
Total power factor	The ultimate indicator of power efficiency and quality.
Total active energy	Cumulative total energy consumed.
Total reactive energy	The total reactive energy exchanged cumulatively.

2. Select a meter to view detailed information. This page provides comprehensive and high-precision electrical parameter details of the selected meter, divided into total amount and phase data, which is convenient for users to conduct in-depth power consumption analysis and fault diagnosis.



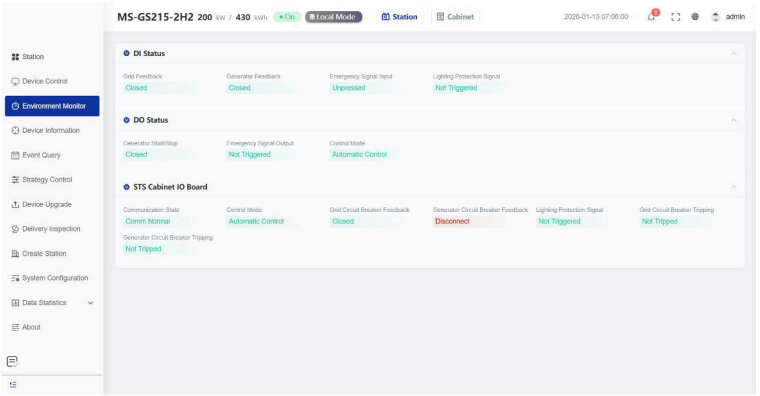
2.2.3.3 Local controller

This interface monitors the hardware operation health of the local controller itself in real time to ensure that it has the ability to stably perform control, calculation and communication tasks.



2.2.4 Environment monitor

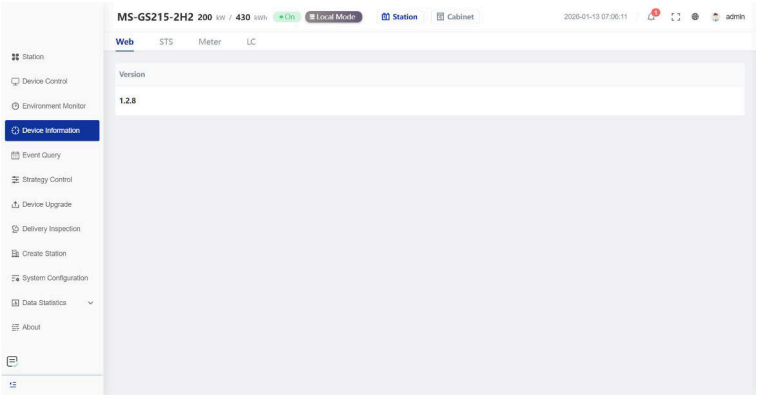
The environment monitor system is a centralized hardware status and safety monitoring platform for the power station. It collects and displays the status information of all key physical switches and safety devices in the cabinet in real time, and is the cornerstone for ensuring the safe and stable operation of the system and realizing intelligent operation and maintenance.



2.2.5 Device Information

Click the “Device Information” and select the power station to view the web page, STS, meter and local controller information.

The Device Information page for power station is used for centralized management and display of the identity files of the core monitoring and communication units of the entire station, providing basic data support for accurate management, efficient operation and maintenance, security auditing and reliable traceability of the system.



2.2.6 Event Query

Click Event Query in the left menu bar to enter the event query page. Event query mainly involves four parts: activity events, historical events, operation logs and export database.

2.2.6.1 Activity event

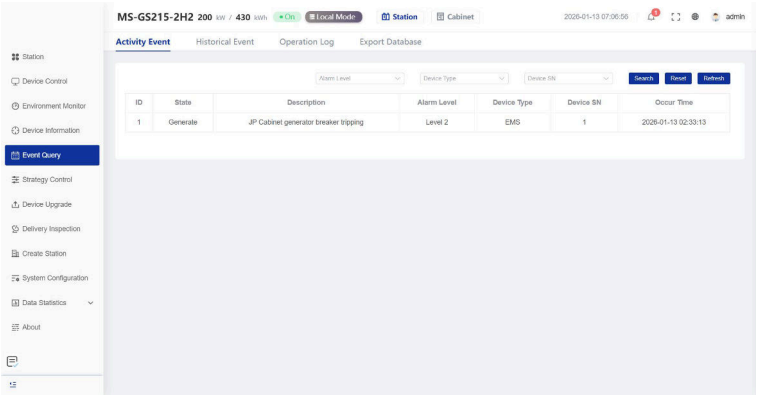
The events with alarms occurring displayed on the activity event page are consistent with the content in the activity event notification in the top navigation. The page mainly includes the following functions:

① Check the alarm state, description, alarm level, device type, device SN, and occur time.

② Search the log according to the alarm level, device type and device SN.

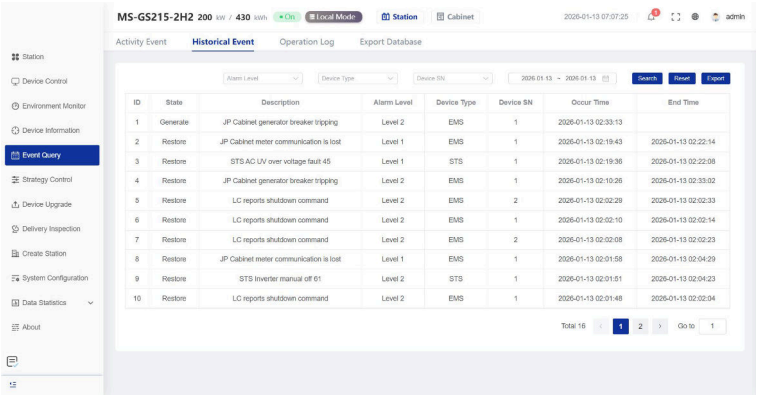
③ Reset the alarm level, device type and device SN in the filter box.

④ Refresh the list content.



2.2.6.2 Historical event

The historical event page displays the events that have triggered alarms in history. The page mainly includes the following functions:
① View the alarm state, description, alarm level, device type, device SN,, occur time and end time of historical alarm events.
② Search logs according to alarm level, device type, device SN, occur time and end time.
③ Reset the alarm level, device type, device SN, occur time and end time in the filter box.
④ Export the historical event list to Excel for subsequent tracking and traceability management.

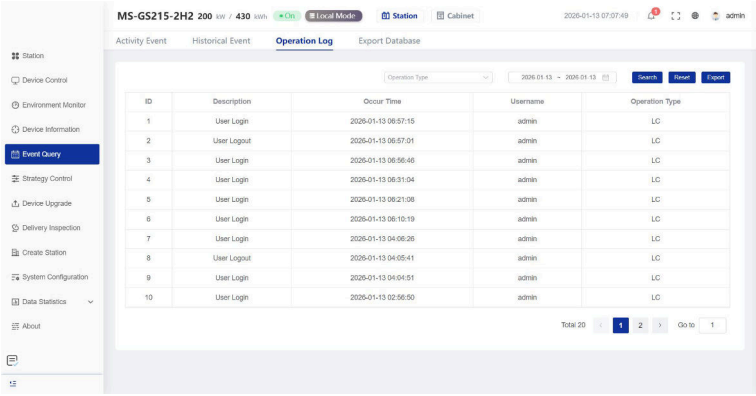


2.2.6.3 Operation log

The operation log list records the operator's specific operations on the device. The page mainly includes the following functions:
① View the description, occur time, username, and operation type of the operation log record.
② Search logs according to device type and occur time.

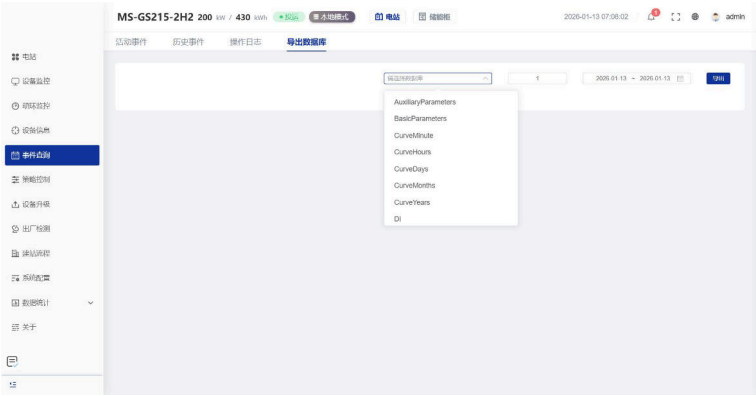
③ Reset the device type and occur time in the filter box.

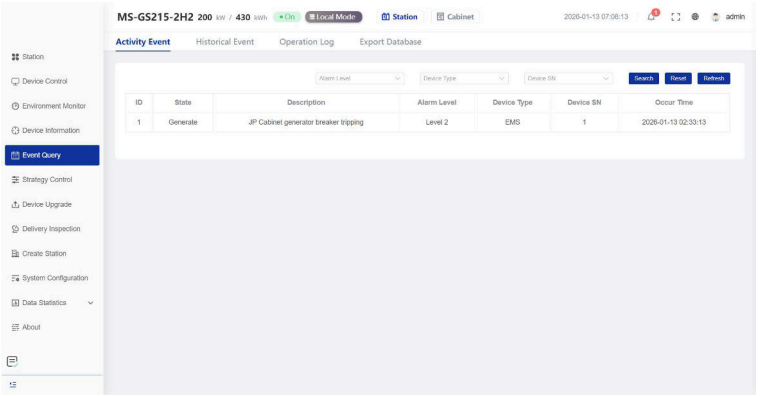
④ Export the operation log list to Excel for subsequent tracking and traceability management.



2.2.7 Export database

Users can select the target database and time range, and export event data with one click for offline analysis or long-term archiving.



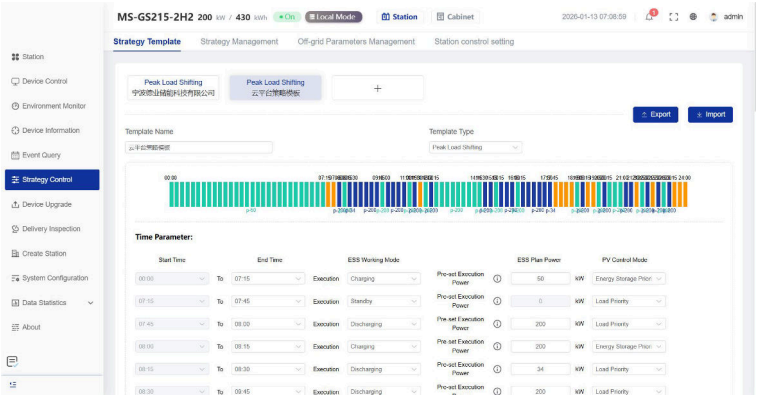


2.2.8 Strategy control

Enter the strategy control page, which mainly includes four parts: strategy template, strategy management, off-grid parameter setting, and power station control setting.

2.2.8.1 Strategy template

1. One can add, delete, view, and edit strategy templates. Strategy templates need to be configured with template name, strategy type, time parameter, strategy parameters, and auxiliary parameters; click the “+” on the right to add multiple templates.



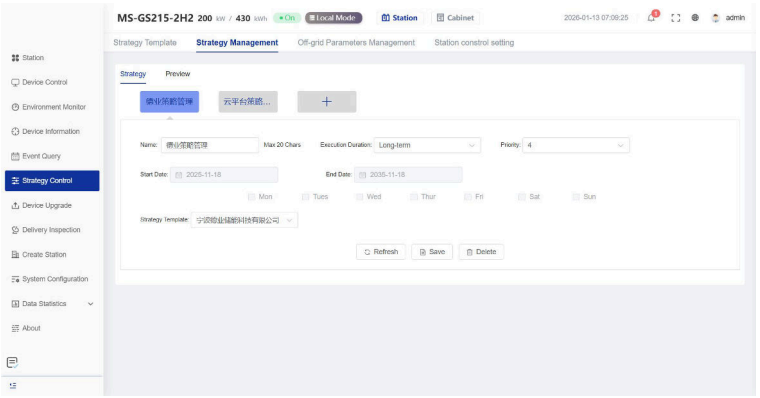
2. The operation instructions for adding a strategy template are as follows:

Name	Function
Strategy name	
Strategy type	Peak load shifting
Start time	The start time of charging or discharging, the first one must be 00:00
End time	The start time of charging or discharging, the last one must be 24:00
ESS working mode	Charging / discharging / standby
ESS plan power	During the period from a specified start time to end time, it operates continuously at the planned power and should always be given positive values
PV control mode	Three options: load priority, energy

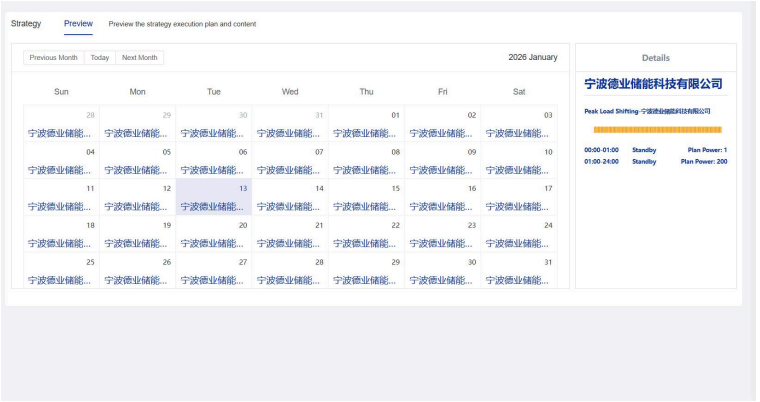
	storage priority and electricity sales priority
-+Right button	Add or delete a time period plan strategy

2.2.8.2 Strategy management

1. Select the strategy management menu, up to 5 strategies. Bind the strategy template with the execution duration and save it as an execution strategy. Set multiple strategies, such as long-term strategy, summer strategy, weekend strategy, National Day strategy, etc. The maximum priority strategy will be executed according to the strategy priority on that day.

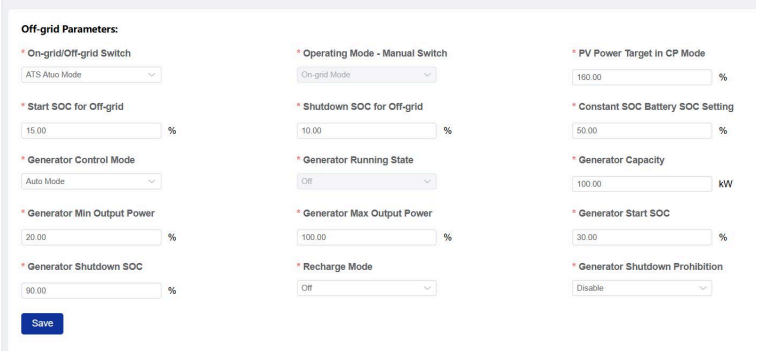


2. After the binding is completed, one can preview the daily strategy by calendar date and view the strategy execution plan and content. If it does not meet the requirements, modify the binding strategy again and preview and confirm after the modification is completed.



2.2.8.3 Off-grid parameters management

This page is used to set the system's strategy when operating in off-grid mode and ensure power supply for critical loads.

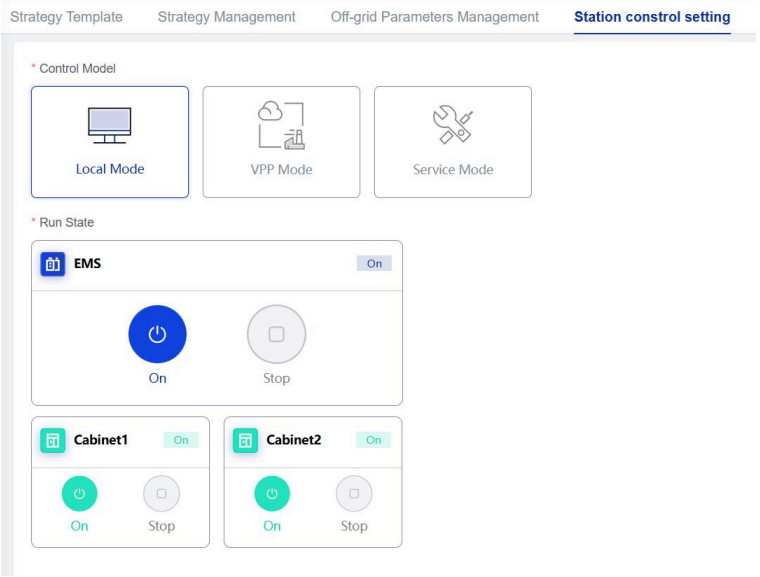


2.2.8.4 Station control setting

Select the station control setting module at the top and enter the password (login password) to enter the power station control setting

page. The page mainly displays the current power station control mode and the run state of EMS.

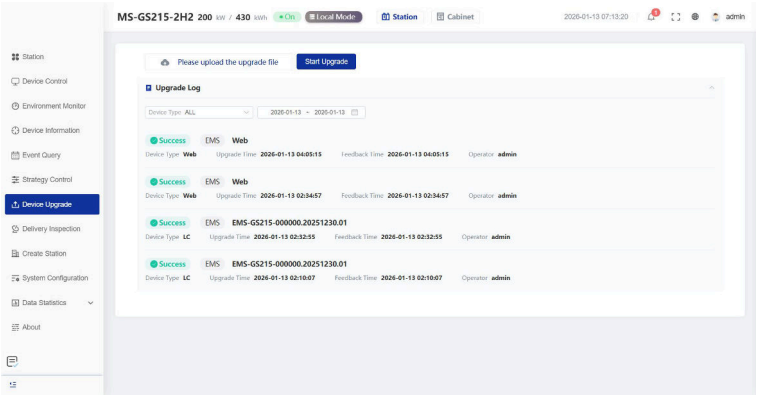
The control mode of the current power station can be switched according to needs, and the operating status of EMS can be changed.



2.2.9 Device Upgrade

Enter the device upgrade page and select the corresponding upgrading file. The upgrading file needs to agree on the file name as required. After uploading the file, click the start upgrade button to upgrade the device. After the upgrade is completed, it will prompt whether the upgrade was successful or failed. At the same time, one can query the upgrade log to view different types of upgrade logs within a certain date range.

You can choose to upgrade all devices or a single device, such as LC, Web and DATABASE.

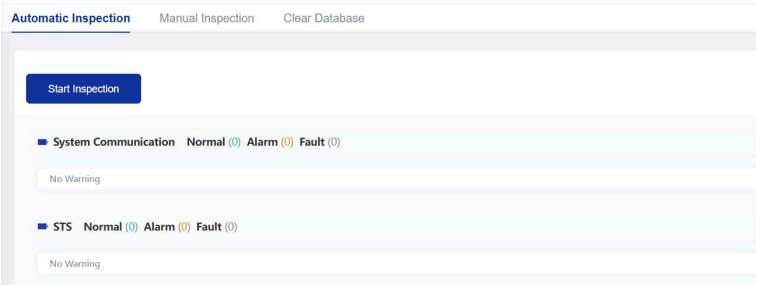


2.2.10 Delivery inspection

Enter the delivery inspection page, which mainly includes three modules: automatic inspection, manual inspection and database clearing.

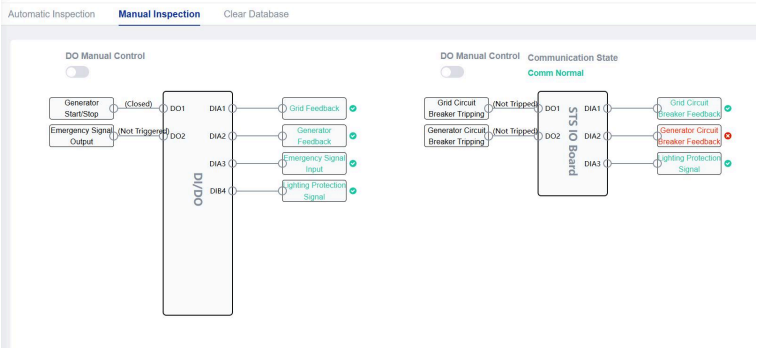
2.2.10.1 Automatic inspection

Click the" Start Inspection" button on the automatic inspection page to automatically inspect the system communication and STS, and display all normal, alarm and fault data of the current power station.



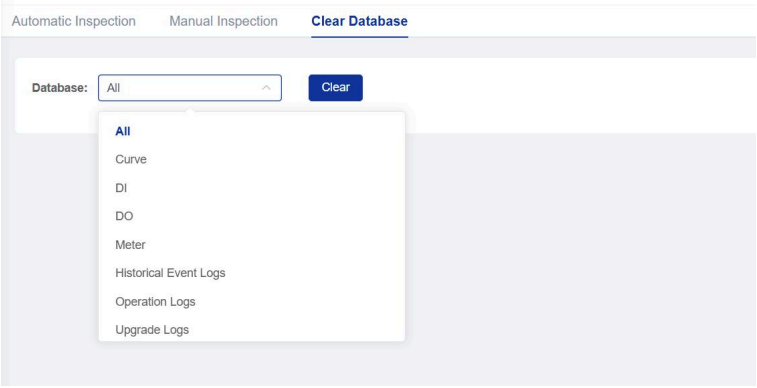
2.2.10.2 Manual inspection

1. The manual inspection page displays the current system DI inspection results and DO status.
2. The control mode of DO is automatic by default. After manual control is turned on, the state of DO can be controlled to detect whether it is normal.



2.2.10.3 Clear database

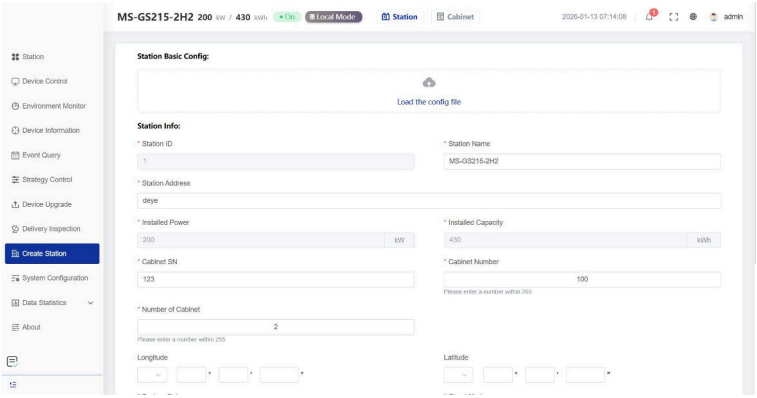
Enter the database clearing page, pull down the dropdown list to select the database to be cleared, and click the “Clear” button to complete the clearing operation.



2.2.11 Create Station

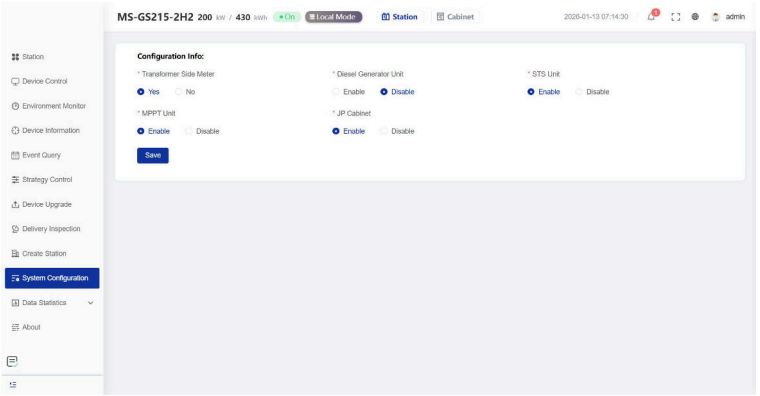
Main functions of creating a station:

1. When the user creates a "power station", enter the name, address, longitude, latitude and other information of the power station. The ID, installed power and capacity of the power station will be determined before the device leaves the factory and cannot be modified.
2. Select the system category and set the current system time.



2.2.12 System Configuration

Enter the system configuration interface to configure the transformer side meter, diesel generator unit, STS unit, MPPT unit, and JP cabinet.



2.2.13 Data Statistics

The data statistics function mainly includes three parts: historical operation curve analysis, historical charge and discharge capacity analysis, and historical fault/event analysis record.

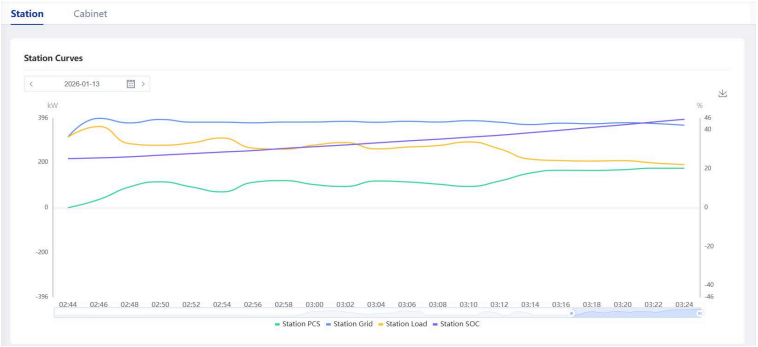
2.2.13.1 Historical operation curve analysis

1. The Power Station's Historical Operation Curve Analysis page mainly displays the historical curves of station PCS, station grid, station load and station SOC.

① Click  to query the historical operation curve of the specified date through the calendar.

② Click  to download the data and information of the current page.

③ Drag the slider to view the data and information for a specific time period.



2. The Energy Storage Cabinet's Historical Operation Curve Analysis page mainly displays the historical curves of the power and SOC of the energy storage cabinet.

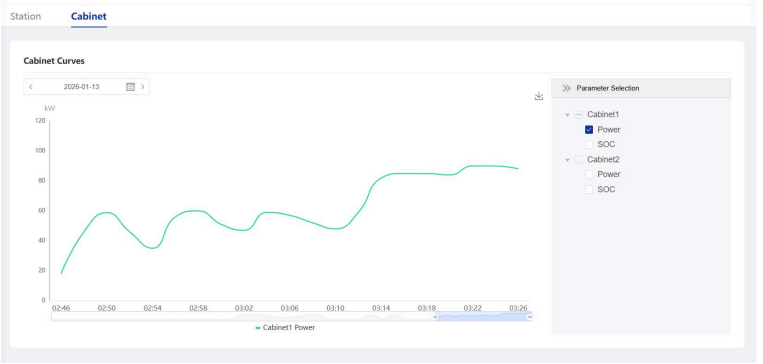
① Click to query the historical operation curve of the specified date through the calendar.

② Click to download the data and information of the current page.

③ Drag the slider to view the data and information for a specific time period.

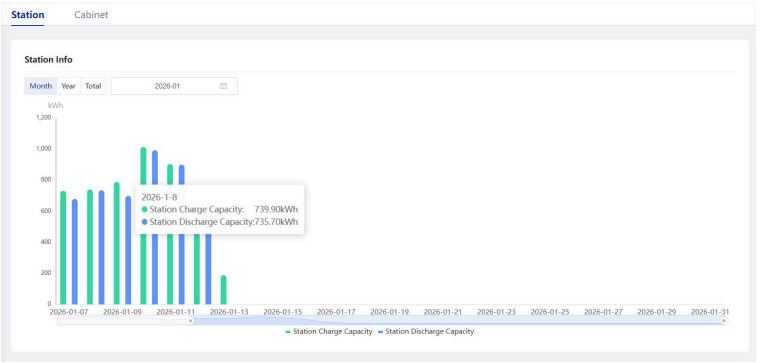
④ Click Parameter Selection to unfold or fold the information on energy storage cabinet.

⑤ Click to select the curve of the specific individual cabinet you want to view.



2.2.13.2 Historical charge and discharge capacity analysis

1. Enter the Station's Historical Charge and Discharge Capacity Analysis page, and you can view the historical charge and discharge data of the current power station by selecting “Overall, Annual and Monthly”. Click  to select a specific year and month.



2. Enter the Energy Storage Cabinet's Historical Charge and Discharge Capacity Analysis page, and you can view the historical charge and

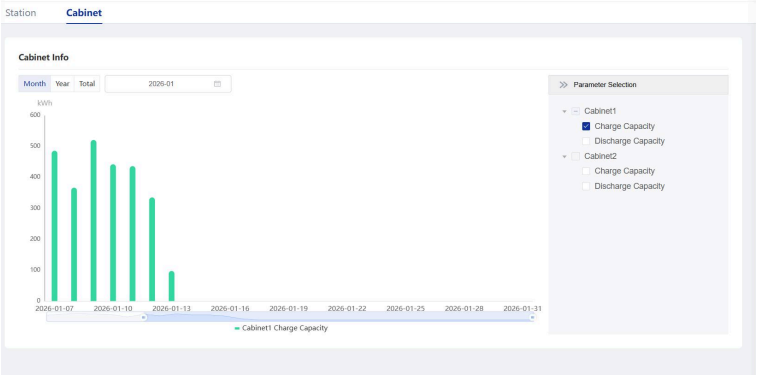
discharge data of the current energy storage cabinet by selecting Overall, Annual and Monthly.

① Click to select a specific year and month.

② Click Parameter Selection to unfold or fold the information on energy storage cabinet.

③ Click and to unfold and fold the specific viewable functional curve of the energy storage cabinet.

④ Click to select the curve of the specific individual cabinet you want to view.

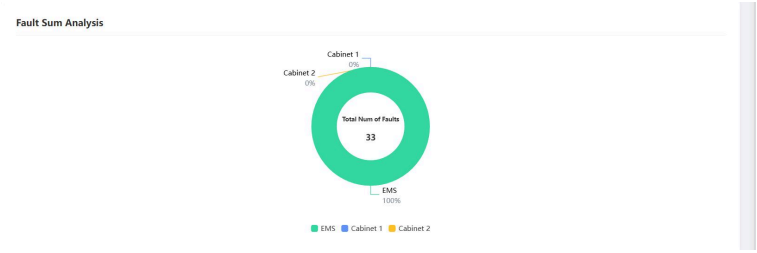


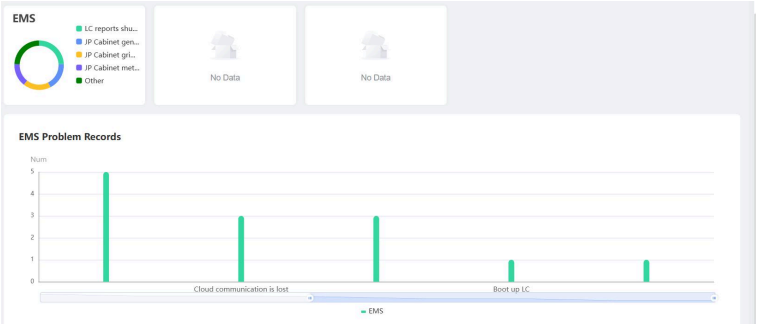
2.2.13.3 Historical fault/event analysis record

1. Enter the historical fault/event analysis record page, which mainly includes three parts:
① The historical fault summary of EMS and each individual cabinet.
② The data of historical faults of EMS with high occurrence frequency and the data of the faults generated by the devices in an individual

cabinet.

③ The histogram of EMS problem records.

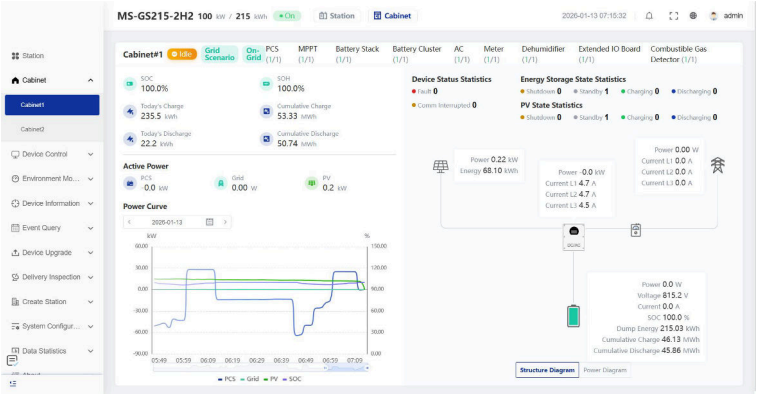




3 Energy Storage Cabinet Introduction

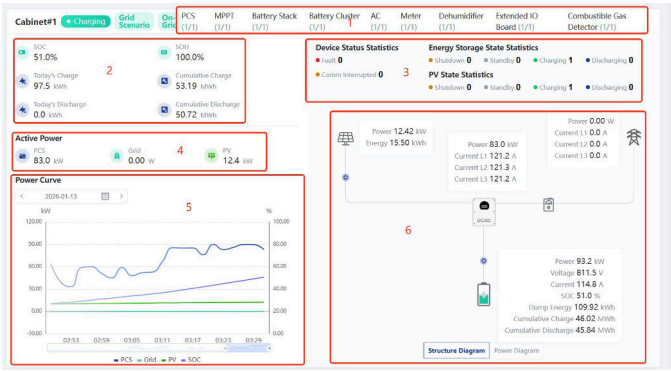
3.1 Homepage of Energy Storage Cabinet

If the power station has only one energy storage cabinet, after logging in, the default page entered is the homepage of an individual cabinet. You can also enter the homepage of an individual cabinet from the EMS homepage above by clicking on an energy storage cabinet.
The left side of the homepage of the individual cabinet mainly displays the device summary and power curve of the current cabinet, and the right side is the structure diagram and power diagram of the individual cabinet. Click each device icon on the structure diagram to jump to the corresponding device monitoring page.



3.2 Overview of energy storage cabinet information

Click Energy Storage Cabinet in the upper navigation bar to display the energy storage cabinet overview interface.



3.2.1 Area 1

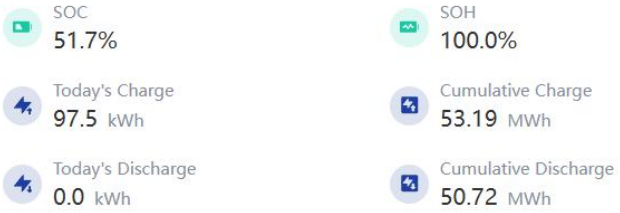
The communication connection status of all key device in the centralized monitoring system in this area.

PCS (1/1)	MPPT (1/1)	Battery Stack (1/1)	Battery Cluster (1/1)	AC (1/1)	Meter (1/1)	Dehumidifier (1/1)	Extended IO Board (1/1)	Combustible Gas Detector (1/1)

The numbers in brackets indicate "current number of online devices/total number of devices of this type". Users can use this information to clearly grasp the integrity of the system structure and promptly discover abnormal situations such as device offline. For example, "meter (0/2)" means that all 2 meters are offline and need to be troubleshooted.

3.2.2 Area 2

Display the core operating data and status of the energy storage cabinet



Data item	Notes
SOC	The current remaining power percentage of the battery reflects "how much power is left"
SOH	Battery health state percentage reflects the degree of attenuation of the battery's maximum capacity
Today's charge	The total amount of electricity charged to the battery on that day
Cumulative charge	The total amount of electricity charged into the battery in the system history
Today's discharge	The total amount of electricity discharged from the battery on that day
Cumulative discharge	The total amount of electricity discharged from the battery in the system history

3.2.3 Area 3

Device status statistics: the number of currently faulty device and the number of device with communication interruption.
Energy storage state statistics: Display the number of PCS currently shut down, in standby, charging and discharging.
PV state statistics: Display the number of PV panels that are currently shut down, in standby, charging and discharging.

3.2.4 Area 4

Real-time monitoring of the active power of PCS, grid and PV.

3.2.5 Area 5

Power chart curve: This chart dynamically displays the historical change trend of key operating parameters within a specified date in the form of a curve.

(1) Description of coordinate system:

Left Y-axis (kW): It corresponds to the values of PCS power, grid power and PV power.

Right Y-axis (%): corresponding to the value of SOC (battery level).

X-axis: represents time, showing the data viewing time range.

(2) Description of curve data:

PCS: Power of energy storage converter.

The curve is above the zero axis (positive value): indicating battery discharge.

The curve is below the zero axis (negative value): indicating battery charge.

Grid: power exchanged with the grid.

Positive value: power is drawn from the grid.

Negative value: supply power to the grid.

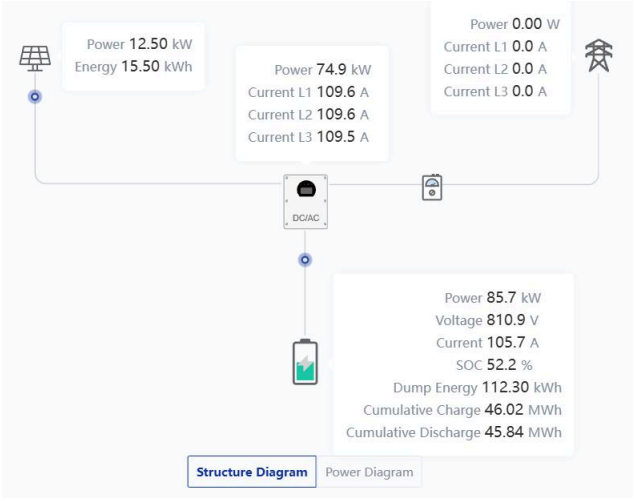
PV: It is the power of PV Output, and is always positive or zero.

SOC: Remaining battery power percentage.

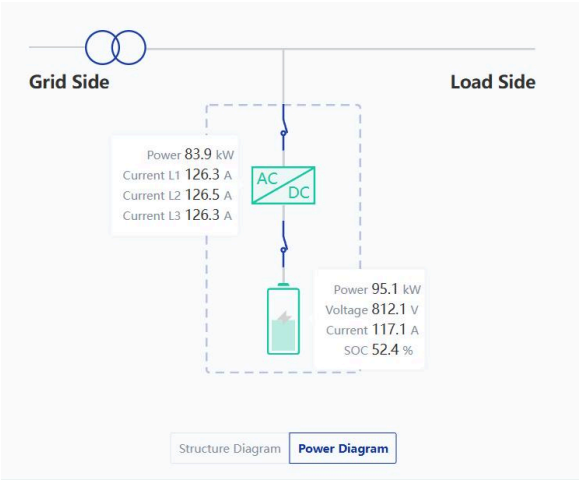
3.2.6 Area 6

This interface displays the system topology and real-time data

Click on the structure diagram to display power grid, PCS, PV and battery information.



Click on the power diagram to show the most basic electrical connection architecture of the system.



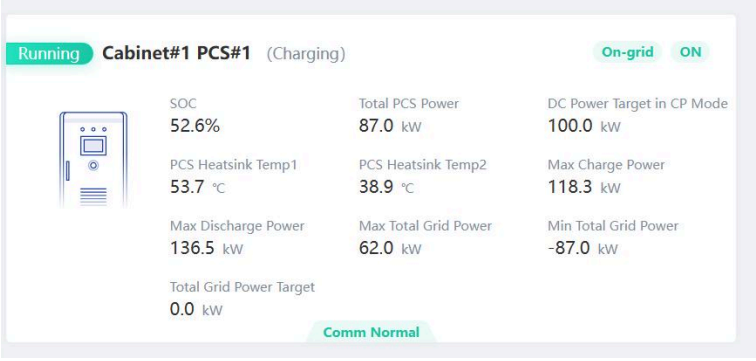
3.3 Device monitoring

Click the left navigation bar-device monitoring, and select the upper navigation bar - energy storage cabinet. Check the device monitoring information of the energy storage cabinet.

3.3.1 PCS

Select the left menu device monitoring and then select the top navigation converter, one can have an overview of the key data of the PCS.

1. The interface displays the words such as "Operating", "Grid-connected", "Started" and "In Normal Communication". This means that the Power Conversion System (PCS) has been powered on and started up, is in a grid-connected state, has stable internal communication, is operating properly, and is ready to receive instructions for charging and discharging at any time.



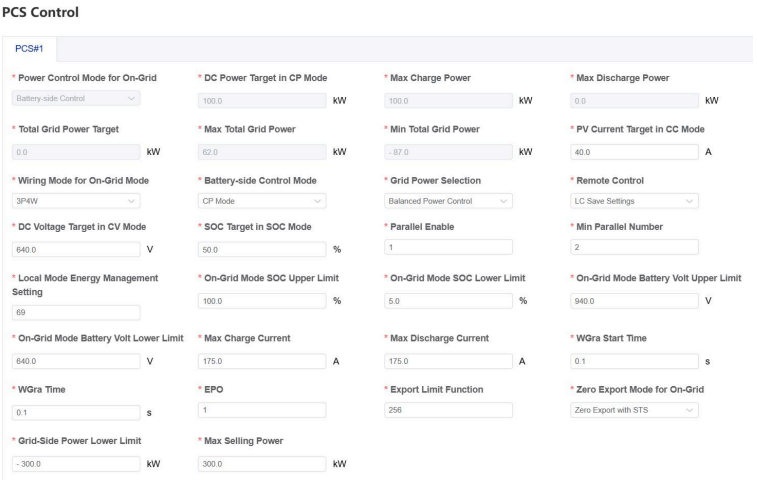
Parameter description

Data item	Notes

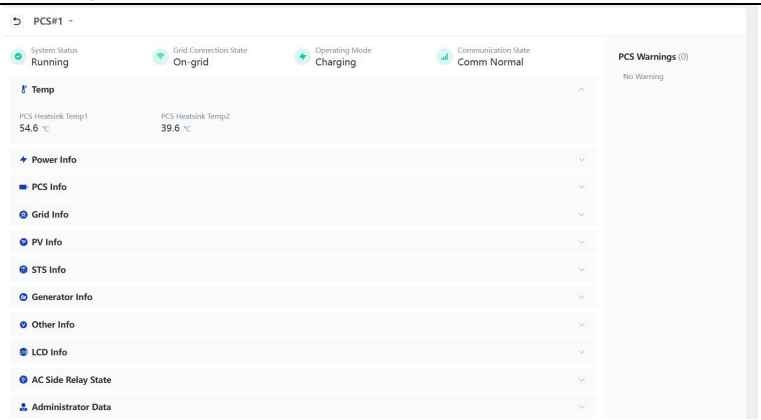
SOC	The current remaining power percentage of the battery reflects "how much power is left". With this variable, user can understand the current energy reserves of the energy storage system.
Total PCS power	The total power currently output by the PCS. Positive values indicate discharging, negative values indicate charging. It enables real-time understanding of whether the system is charging, discharging or idle. It can be compared with the power setpoints to determine whether the device is running according to the instructions.
DC power target in CP mode	The set battery charge and discharge power target value in the constant power mode. The system will maintain the battery running at this power level.
PCS heatsink temp 1/2	Real-time temperature of the radiator temperature sensors 1/2 for the PCS The temperature should be stabilized within a reasonable range
Maximum charge power	Maximum allowable charging power of the current battery
Maximum discharge power	Maximum allowable discharging power of the current battery
Max total grid power	Maximum output power limit set by the system
Min total grid power	Minimum output power limit set by the system

Total grid power target	The set total active power target value on the AC side in the constant power mode

2. Click the interface switching button. The administrator can control the PCS after entering the password, including grid connection, grid disconnection and fault clearing.

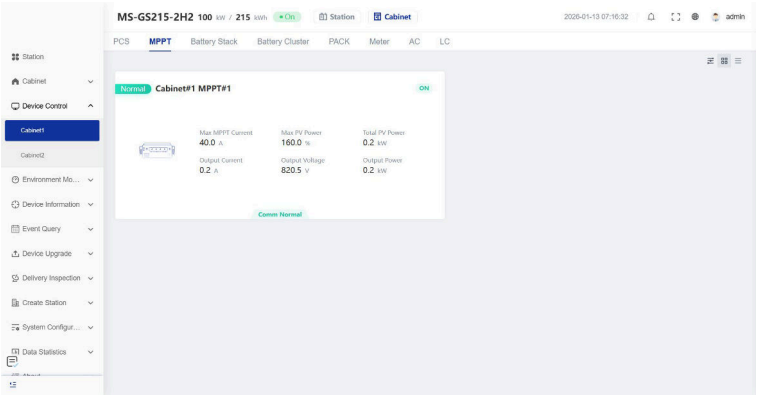


3. Select any PCS to enter the corresponding PCS details page, which mainly displays the various states of the PCS, including system state, grid connection state, operating mode, etc. The warning prompt in the PCS is displayed on the right.



3.3.2 MPPT

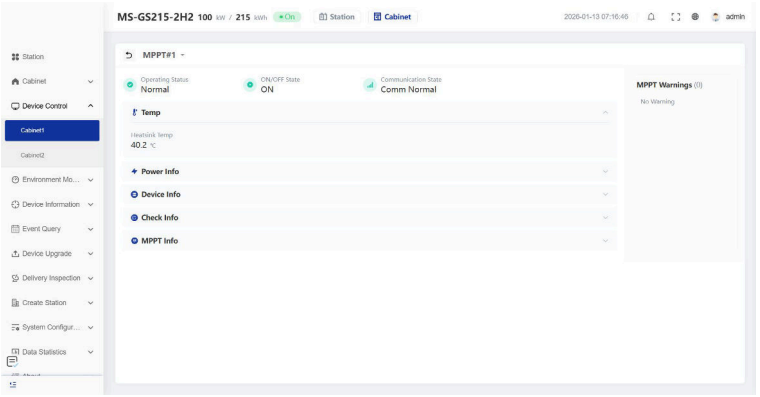
1. Select MPPT in the top navigation bar to get an overview of the key data of the MPPT.



Data item	Notes
Max MPPT current	The maximum possible current that a PV string can provide under the current solar irradiation conditions.

Max PV power	The current photovoltaic power output as a percentage of the theoretical maximum power generation capacity, reflecting the real-time efficiency of the tracking algorithm of the MPPT.
Total PV power	The total active power currently actually output by the PV array.
Output current	The AC current output by the inverter to the load or grid.
Output voltage	AC voltage at inverter output.
Output power	The total active power actually delivered by the inverter to the load or grid.

2.Click an MPPT to view details. The details page shows the operating status, on/off state, communication state, temperature and warning prompts of the MPPT.



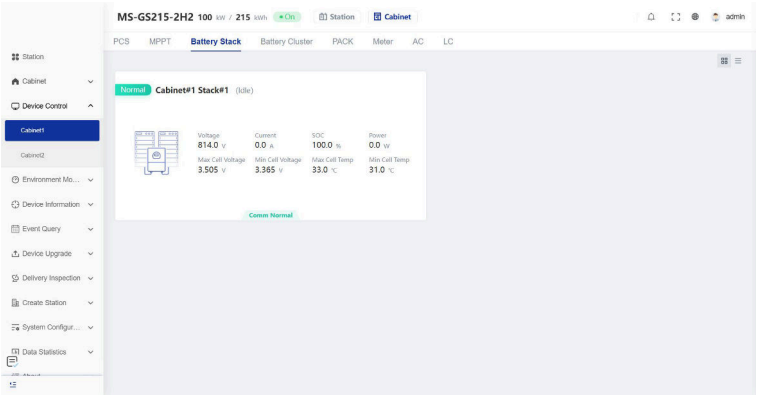
3.Click the Switch View button and enter the password to change the settings of MPPT.

3.3.3 Battery stack

1. Select the left menu device monitoring and then select the top navigation-battery stack. The page mainly includes the following functions:

① Convert the main layout from cards to lists, and the default main layout is cards.

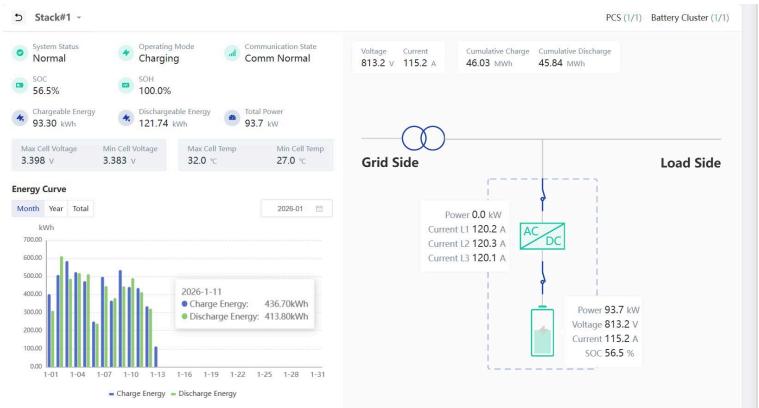
② The page shows the real-time operating parameters of the battery stack.



Data item	Notes
Voltage	Total DC voltage of the battery stack.
Current	The total current flowing into (charging) or out of (discharging) the battery stack.

SOC	Battery state of charge
Power	Total charging/discharging power of battery stack
Max cell voltage	The voltage value of the cell with the maximum voltage among all battery cells
Min cell voltage	The voltage value of the cell with the minimum voltage among all battery cells
Max cell temp	The maximum temperature value among all battery cells or sampling points
Min cell temp	The minimum temperature value among all battery cells or sampling points

2.Select any battery stack to enter the details page, which mainly displays the various states of the battery stack, power curves, power diagrams and other information.

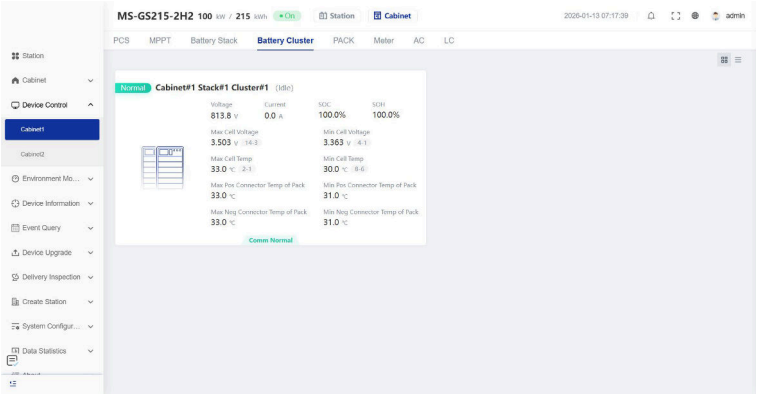


3.3.4 Battery cluster

1. Select Device Monitoring in the left menu and then select Battery Cluster in the top navigation bar.

① Convert the main layout from cards to lists, and the default main layout is cards.

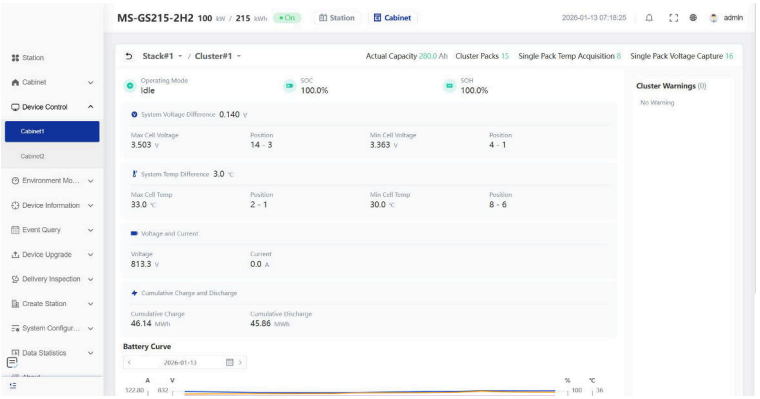
② The page data includes voltage, current, temperature and other data of the battery cluster.



Data item	Notes
Voltage	Total voltage of the battery cluster
Current	Charging and discharging current of this cluster
SOC	Battery state of charge
SOH	Battery state of health
Max cell voltage	Current maximum voltage among all cells
Min cell voltage	Minimum voltage among all cells
Max cell temp	The maximum temperature among all battery cells
Min cell temp	The minimum temperature among all battery cells
Max / Min pos	Measured temperature on the positive high voltage

connector temp of Pack	connector of battery cluster
Max / Min neg connector temp of Pack	Measured temperature on the negative high voltage connector of battery cluster

2.Select a battery cluster to enter the details page, which integrates and displays the core status, detailed operating data, and battery curve of the cluster, and centrally presents all relevant alarm and fault information on the right panel.



3.3.5 Battery pack

1. Select the left menu device monitoring and then select the top navigation battery pack. This interface monitors the core safety parameters inside the battery pack in real time. The page mainly includes the following functions:

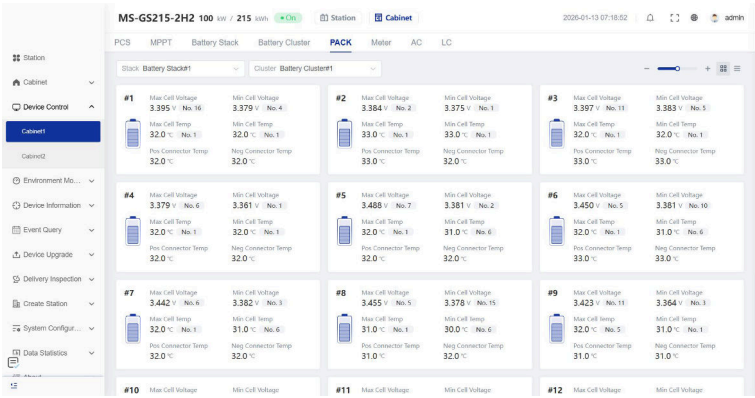
① Select all battery packs under which battery stack and which battery cluster one want to view.

② Scale the main layout, which can be adjusted to 2-column layout, 3-column layout and 4-column layout.

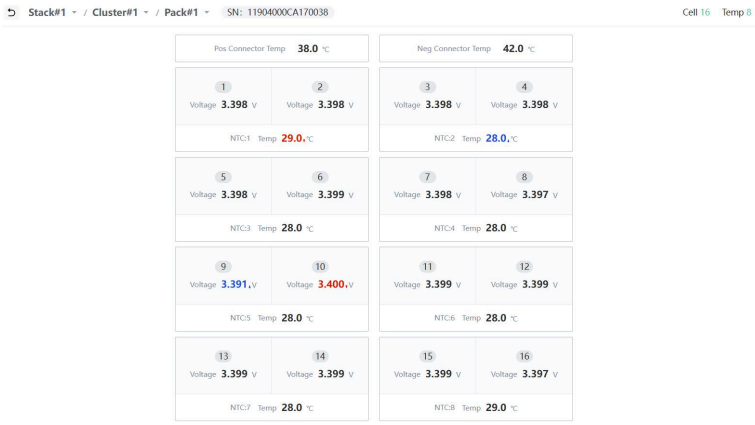
③ Convert the main layout from cards to lists, and the default main

layout is cards.

④ The page data includes information such as the maximum cell voltage and location, the minimum cell voltage and location, the maximum cell temperature and location, and the minimum cell temperature and location. ·



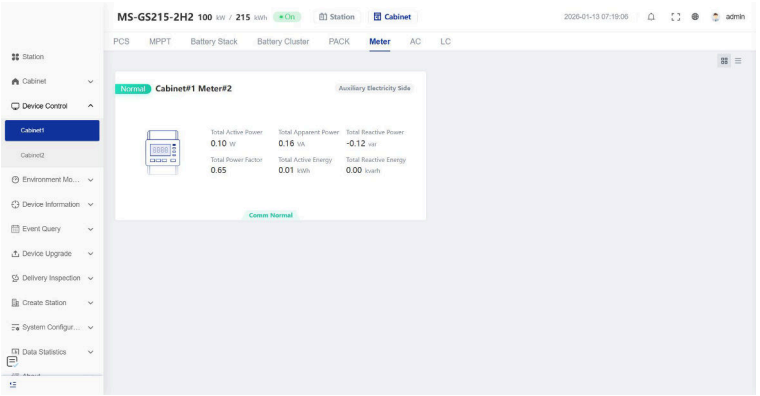
2. Select any battery pack to enter the corresponding battery pack details page, which mainly displays the real-time readings of all distributed temperature sensors inside the battery pack and the real-time voltage value of each battery cell inside the battery pack.



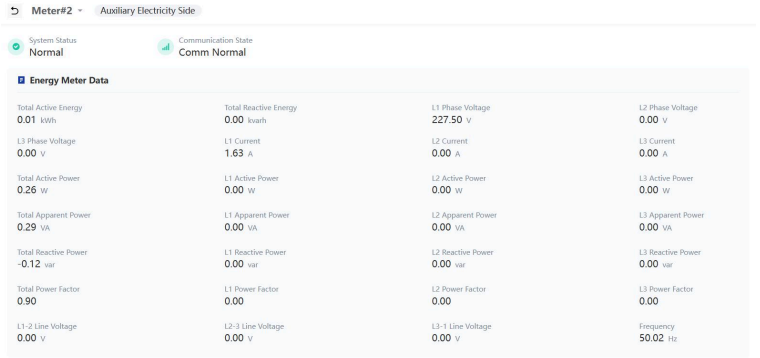
3.3.6 Meter

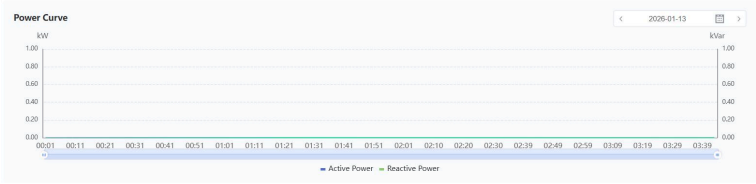
Select Meter in the top navigation bar to get an overview of the key data of the meter.

1. This interface displays the real-time and cumulative energy data of the points measured by the meter, which is used to accurately monitor the energy exchange between the energy storage system and the grid.



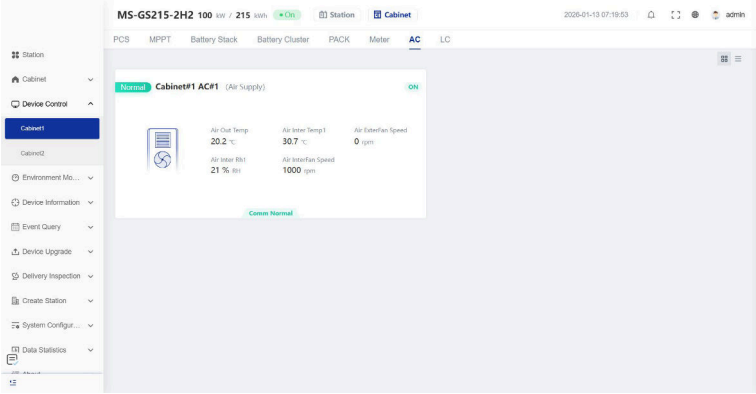
2. Select any meter to enter the corresponding meter details page, which mainly displays the status of the meter, detailed meter data and power curve.





3.3.7 Air conditioner

1. This page is used for monitoring of the operating status and key ambient parameters of the dedicated air conditioner inside the energy storage cabinet to ensure that the battery compartment is at suitable temperature and humidity.



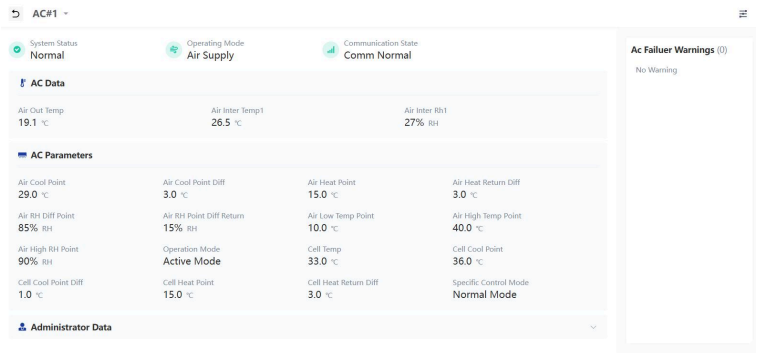
Parameter interpretation

Data item	Notes
Air out temp	Ambient temperature outside the energy storage cabinet
Air inter temp1	Core monitoring parameter: air temperature inside the energy storage cabinet
Air inter Rh1	Relative humidity inside the energy storage cabinet
Air external fan speed	Speed of (condenser) fan of outdoor unit of air conditioner

Air internal fan speed	Speed of fan of indoor unit of air conditioner

2. Click the “AC” to view detailed parameters

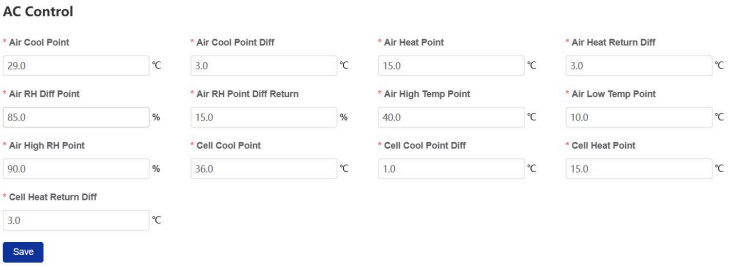
This interface is used for monitoring of the operating status and core parameters of the energy storage air conditioning system in real time, including real-time data on ambient temperature and humidity, temperature/humidity control setpoints, and battery-protection-oriented priority control parameters. Users need to focus on the internal ambient temperature and ensure that all communication is in normal status. The system automatically operates according to the preset cooling point, heating point and battery protection threshold. Under normal circumstances, no manual intervention is required, but the relevant setpoints should be appropriately adjusted according to seasonal changes to optimize operating efficiency and improve battery safety. Any alarm for abnormality shall be handled in time.



3. The AC parameters can be set.

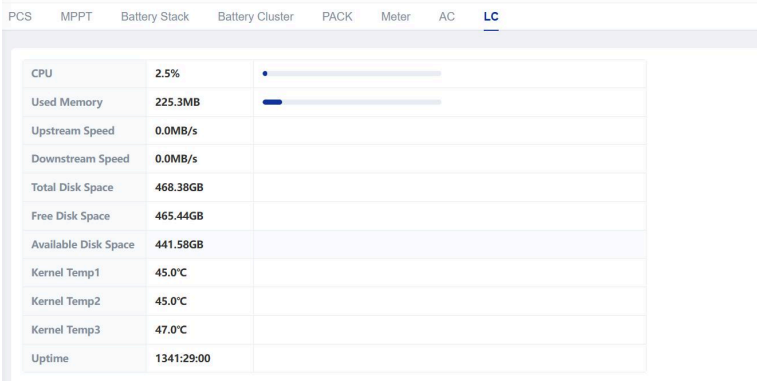
This air conditioning control system adopts an intelligent automatic adjustment mechanism to maintain a suitable operating environment in the energy storage cabinet and give priority to battery safety. Based on multi-level control logic, the system automatically monitors ambient

temperature and humidity and battery temperature, and intelligently selects cooling, heating or dehumidification modes according to preset strategies.



3.3.8 Local controller

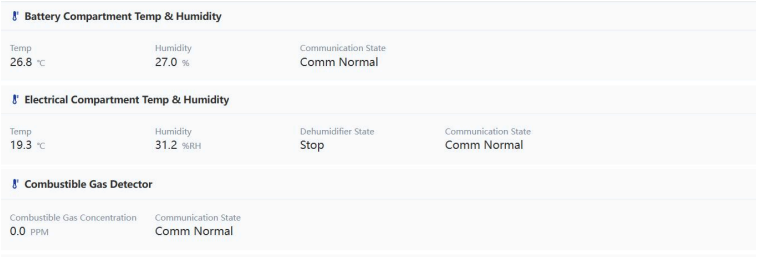
Click on the local controller to view its own hardware resources and operating health, including performance resource status, storage and hardware status, system reliability indicators and other data, and display a curve chart below.



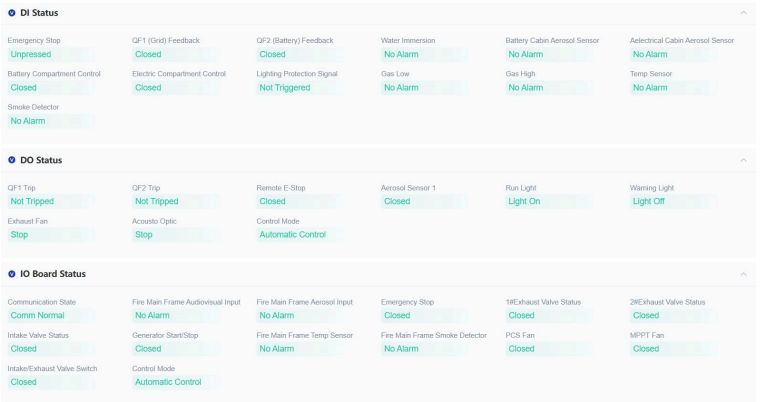
3.4 Environment Monitor

This interface is an integrated monitoring platform for the power environment of energy storage cabinet, and is used for monitoring of the battery system, electrical devices and safety protection status in real time, providing all-round status perception for the safe and stable operation of the cabinet.

1. The system continuously monitors the temperature and humidity of the battery compartment and electrical compartment, as well as the combustible gas concentration. Environmental data is a basic indicator for assessing the operating conditions and safety risks of the devices.



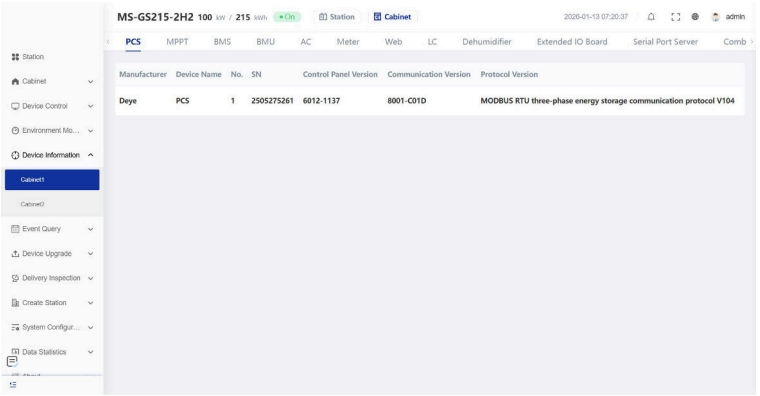
2. Based on the status of DI, DO and IO cards, multiple security systems such as fire alarm, water immersion detection and access control status are integrated. The system automatically monitors the status of each sensor and provides immediate alarm in case of any abnormality. It also controls the mode and communication status to ensure the proper functioning of the control system and smooth communication between the devices.



3.5 Device Information

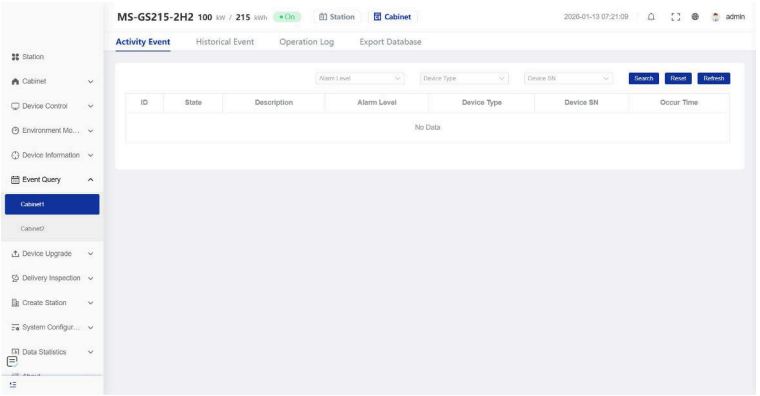
The Device Information interface of this system displays the key identities and version data of all core intelligent components in the energy storage cabinet in centralized way.

Through this interface, operation and maintenance personnel can quickly confirm the identity of the device, verify the compatibility of software and hardware versions, locate IP addresses, provide key information basis for obtaining technical support, and executing software updates and system expansion, to ensure the reliable operation and refined management of the system throughout its full life cycle.

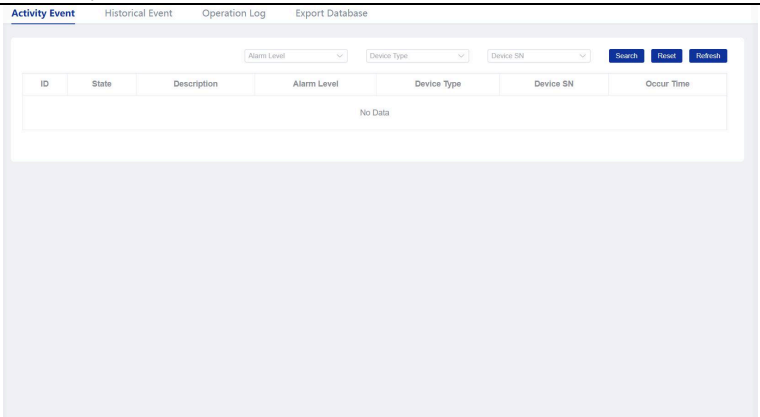


3.6 Event Query

This interface is the core information traceability platform of the energy storage system, and is used to record, query and export all alarm events generated by the system and manual operation records.



(1) Activity event.



The events with alarms occurring displayed on the activity event page are consistent with the content in the activity event notification in the top navigation. The page mainly includes the following functions:

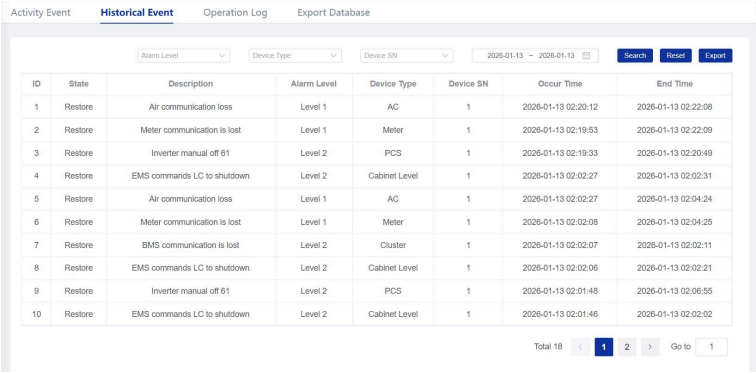
① Check the alarm state, description, alarm level, device type, device SN, and occur time.

② Search the log according to the alarm level, device type and device SN.

③ Reset the alarm level, device type and device SN in the filter box.

④ Refresh the list content.

(2) Historical event



The historical event page displays the events that have triggered alarms

in history. The page mainly includes the following functions:

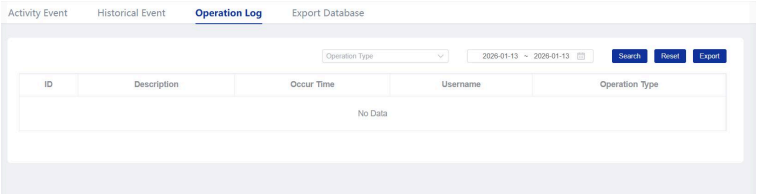
① View the alarm state, description, alarm level, device type, device SN, occur time and end time.

② Search logs according to alarm level, device type, device SN and occur time.

③ Reset the alarm level, device type, device SN and occur time in the filter box.

④ Export the historical event list to Excel for subsequent tracking and traceability management.

(3) Operation log



The operation log list records the operator's specific operations on the device. The page mainly includes the following functions:

① View the description, occur time, username, and operation type of the operation log record.

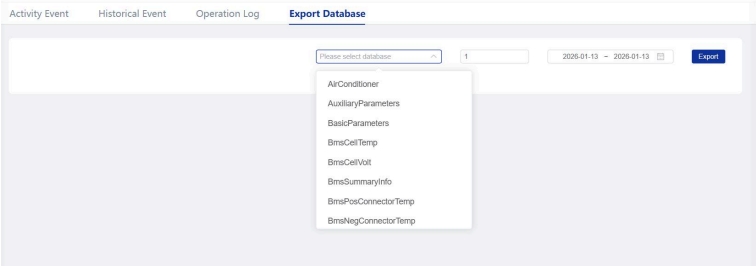
② Search logs according to operation type and occur time.

③ Reset the operation type and occur time in the filter box.

④ Export the operation log list to Excel for subsequent tracking and traceability management.

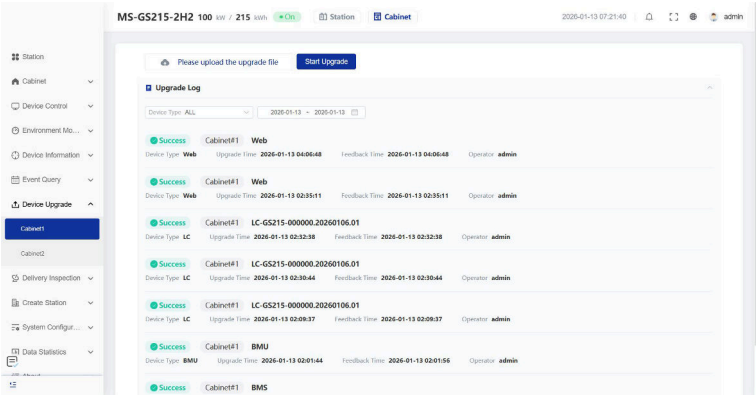
(4) Export database

Users can select the target database and time range, and export event data with one click for offline analysis or long-term archiving.



3.7 Device Upgrade

1. Enter the device upgrade page and select the corresponding upgrade file. The upgrade file needs to agree on the file name as required. After uploading the file, click the “Upgrade” button to upgrade the device.
2. After the upgrade is completed, the system will prompt whether the upgrade was successful or failed. At the same time, one can query the upgrade log to view different types of upgrade logs within a certain date range.

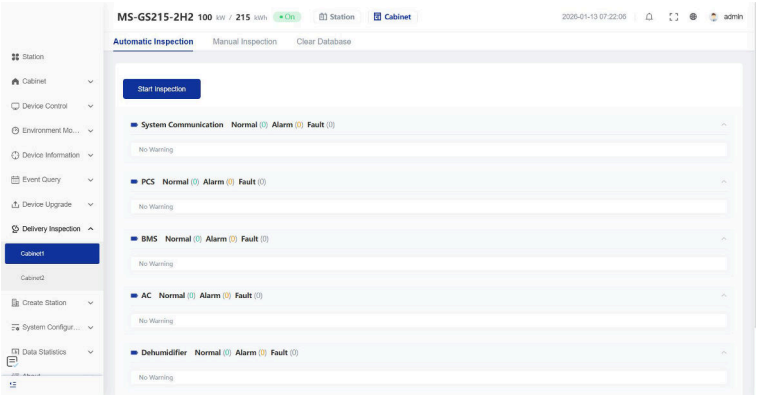


3.8 Delivery Inspection

Enter the delivery inspection page, which mainly includes three parts: automatic inspection, manual inspection and database clearing.

3.8.1 Automatic inspection

The delivery inspection interface displays the quick self-test status of the core submodules (such as system communication, PCS, BMS, air conditioner, and dehumidifier) of the energy storage system, and presents the test results in three forms: "normal", "alarm" and "fault". After the staff starts the test, the interface will automatically summarize the health status of each module. If all modules are displayed as "normal (0)" and there are no warning prompts, it means that the system has passed the self-test and can be put into operation. If there are any alarm or fault entries, you need to further view the detailed log according to the corresponding entries and contact maintenance department.

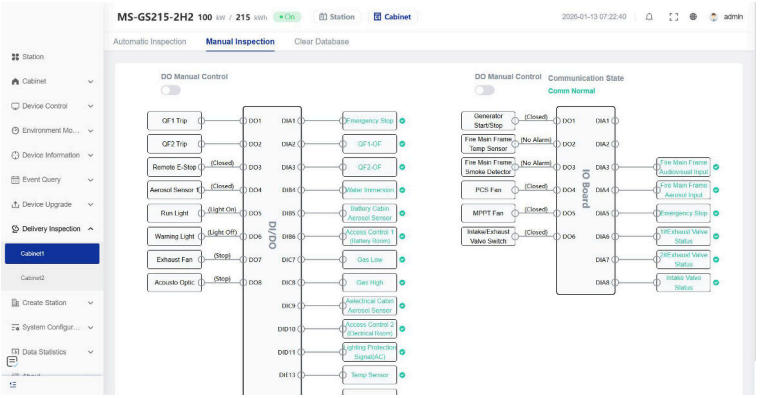


3.8.2 Manual inspection

This interface is the DO manual control and test panel, and is used for remote single-point operation and functional testing of key actuators in

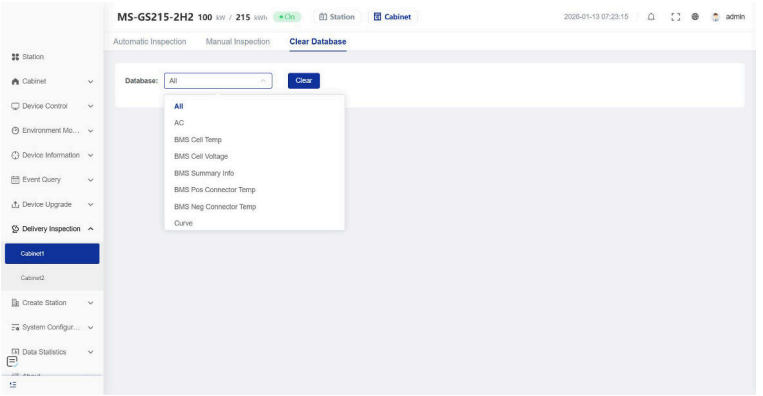
manual mode. Users can remotely control the tripping of circuit breaker, emergency stop, exhaust fan, audible and visual alarm and the operation of other devices by selecting the corresponding channels (such as DO1 and DO2) and changing the switch status. The interface also provides real-time feedback on the input status of each safety sensor (such as access control, water immersion, gas concentration and fire feedback).

1. The manual inspection page displays the current system DI inspection results and DO status.
2. The control mode of DO is automatic by default. After manual control is turned on, the state of DO can be controlled to detect whether it is normal.



3.8.3 Clear database

This interface provides the historical data management function for the system, allowing users to filter specific types of data records and clear them.

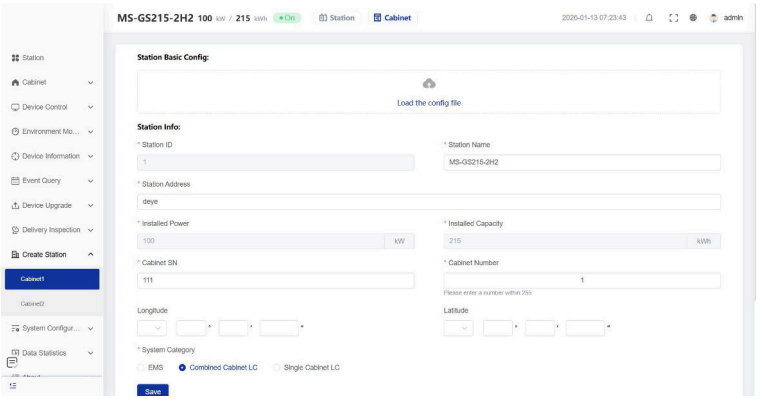


3.9 Create Station

This interface is used to complete the initial setting for creating an "energy storage power station", including basic setting of the power station, selection of system type and time synchronization.

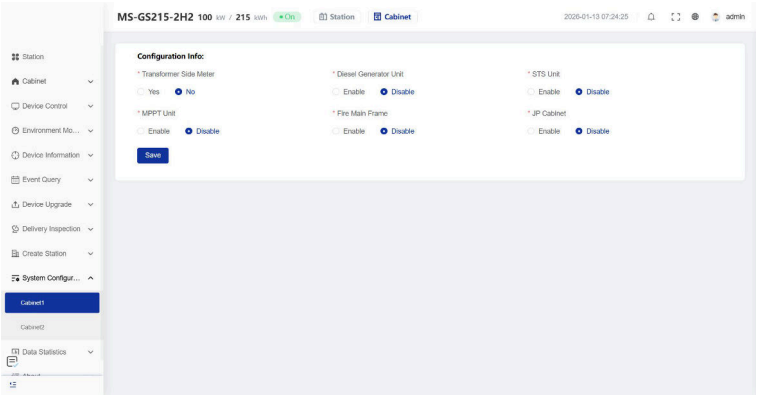
Main functions of creating a station:

1. When the user creates a power station, enters the corresponding power station name, power station address, longitude and latitude information, etc. The power station ID, installed power and capacity have been determined at the factory and cannot be modified.
2. Select the system category and set the current system time



3.10 System Configuration

This interface is used to set the enabling status of optional components and external devices of the energy storage power station. The system will enable or disable the corresponding monitoring and control functions according to user's choice.



3.11 Data Statistics

The data statistics function transforms the original operation data into valuable business insights and operation and maintenance knowledge, enabling users to evaluate the past, optimize the present and predict the future. It is a core tool for realizing the refined and intelligent operation of power stations.
Operation: Click the “Data Statistics” in the left navigation bar to view the historical operation curve analysis, historical charge and discharge capacity analysis, and historical fault/event analysis records of the power station and energy storage cabinet.

3.11.1 Historical operation curve analysis

Enter the Individual Cabinet's Historical Operation Curve Analysis page to view the historical operation curves of energy storage cabinet, PCS, MPPT, battery cluster, battery pack and ambient temperature.
1. Enter the Energy Storage Cabinet's Historical Operation Curve Analysis page, which mainly displays the curves of energy storage cabinet power, PV output power and SOC.

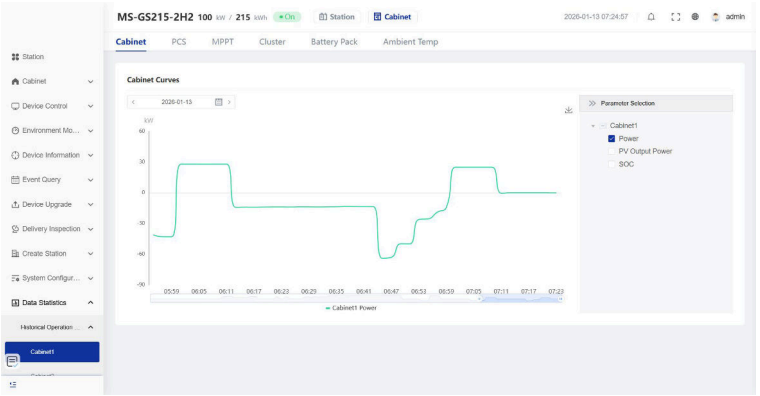
① Click  to view the historical operation curve of the specified date.

② Click  to download the curve on the current page for later traceability and analysis.

③ Click Parameter Selection to unfold or fold the information on energy storage cabinet.

④ Click  to select the functional curve you want to view.

⑤ Drag  to view the curves of different time periods.



2. Enter the PCS's Historical Operation Curve Analysis page, which mainly displays the curves of PCS power, module temperature and maximum allowable charge and discharge power.

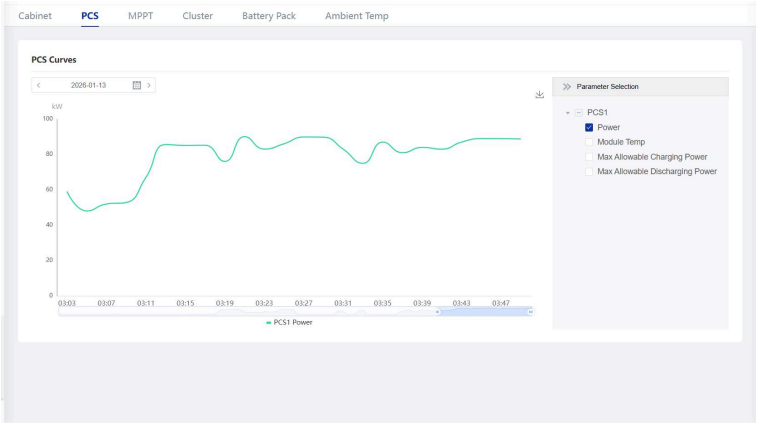
① Click  to view the historical operation curve of the specified date.

② Click  to download the curve on the current page for later traceability and analysis.

③ Click Parameter Selection to unfold or fold the information on PCS.

④ Click  to select the functional curve you want to view.

⑤ Drag  to view the curves of different time periods.



3. Enter the MPPT's Historical Operation Curve Analysis page, which mainly displays the PV module temperature, PV output power and PV total power curves of the MPPT.

① Click  to view the historical operation curve of the specified date.

② Click  to download the curve on the current page for later traceability and analysis.

③ Click Parameter Selection to unfold or fold the information on MPPT.

④ Click  to select the functional curve you want to view.

⑤ Drag  to view the curves of different time periods.

4. Enter the Battery Cluster's Historical Operation Curve Analysis page, which mainly displays curves of battery cluster SOC, maximum and minimum cell temperatures, maximum and minimum voltages, current, total voltage, and maximum allowable charge and discharge power.

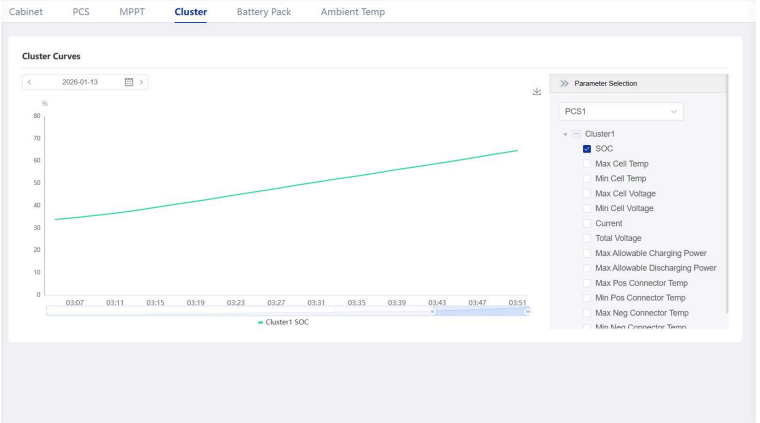
① Click to view the historical operation curve of the specified date.

② Click to download the curve on the current page for later traceability and analysis.

③ Click Parameter Selection to unfold or fold the information on battery cluster.

④ Click to select the functional curve you want to view.

⑤ Drag to view the curves of different time periods.



5. Enter the Battery Pack's Historical Operation Curve Analysis page, which mainly displays the curves of the maximum and minimum single-cell voltages, the maximum and minimum cell temperatures, and the positive and negative connector temperatures of the battery pack.

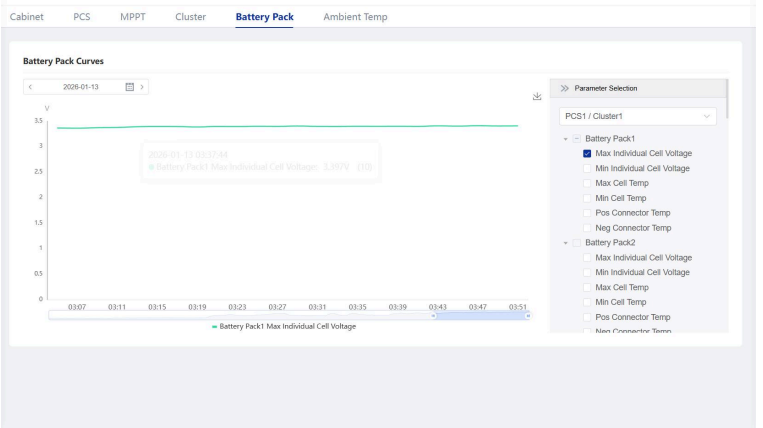
① Click  to view the historical operation curve of the specified date.

② Click  to download the curve on the current page for later traceability and analysis.

③ Click Parameter Selection to unfold or fold the information on battery pack.

④ Click  to select the functional curve you want to view.

⑤ Drag  to view the curves of different time periods.



6. Enter the Ambient Temperature's Historical Operation Curve Analysis page, which mainly displays the curves of internal and external ambient temperatures, battery cell temperature and internal ambient humidity.

① Click  to view the historical operation curve of the specified date.

② Click  to download the curve on the current page for later traceability and analysis.

③ Drag  to view the curves of different time periods.

3.11.2 Historical charge and discharge capacity analysis

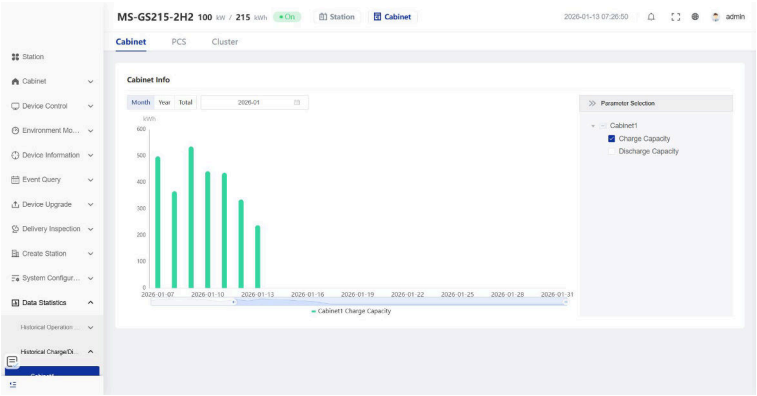
Select Historical Charge and Discharge Analysis to enter the interface to view the historical charge and discharge capacity analysis data of the energy storage cabinets, PCS, and battery clusters.

1. Select Energy Storage Cabinet in the top navigation bar to enter the historical charge and discharge capacity analysis details page of the energy storage cabinet, which displays the energy storage cabinet's historical charge and discharge histogram. You can view the historical charge and discharge data of the current energy storage cabinet by selecting Overall, Annual and Monthly.

① Click  to select a specific year and month.

② Click Parameter Selection to unfold or fold the information on energy storage cabinet.

③ Click  to select the curve of the specific individual cabinet you want to view.



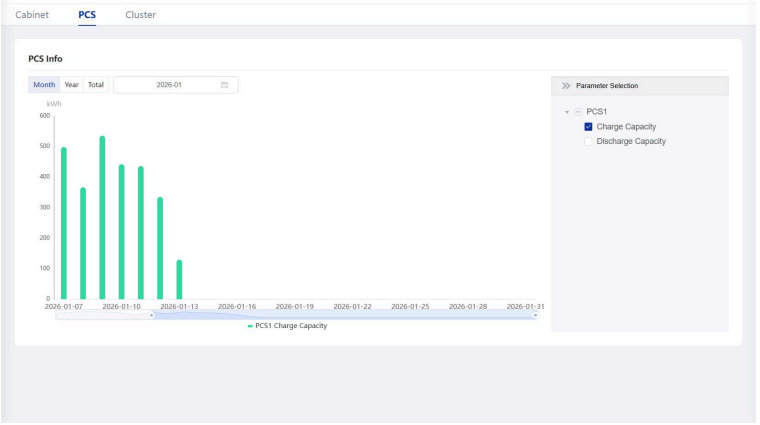
2. Select PCS in the top navigation bar to enter the historical charge and

discharge capacity analysis details page of the PCS, which displays PCS's historical charge and discharge data in the form of histogram.

① Click to select a specific year and month.

② Click Parameter Selection to unfold or fold the information on energy storage cabinet.

③ Click to select the curve of the specific individual cabinet you want to view.

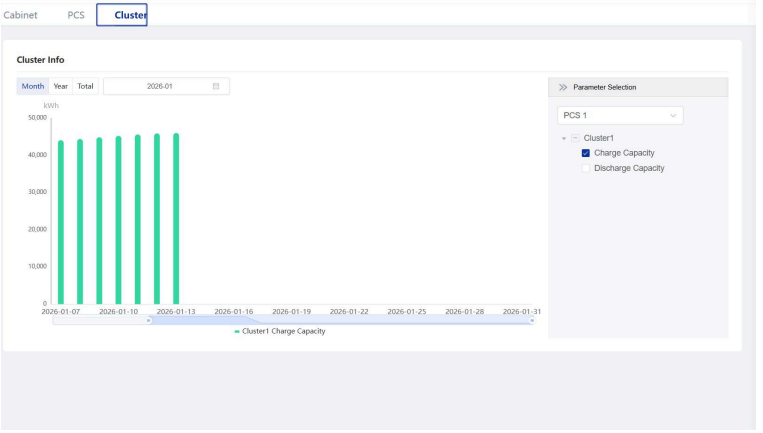


3. Select Battery Cluster in the top navigation bar to enter the historical charge and discharge capacity analysis details page of the battery cluster, which mainly displays data such as the battery cluster's historical charge and discharge and cycles.

① Click to select a specific year and month.

② Click Parameter Selection to unfold or fold the information on energy storage cabinet.

③ Click to select the curve of the specific individual cabinet you want to view.



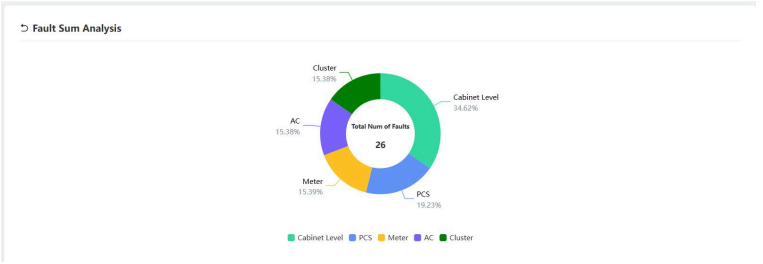
3.11.3 Historical fault/event analysis record

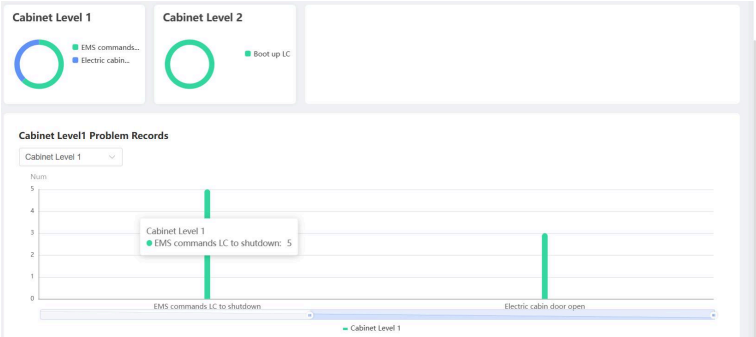
Select Historical Fault/Event Analysis Record to enter the historical fault/event analysis record details page for individual cabinet. The main display contents are as follows:

① The current circular fault summary chart of each device in an individual cabinet.

② Click any device at ① to display a detailed circular fault summary chart of the device selected.

③ Display the fault data of the device selected in step ① in the form of a histogram.




Cabinet Level 1
EMS commands...
Electric cabin...
Cabinet Level 2
Boot up LC
Cabinet Level1 Problem Records
Cabinet Level 1
Num
5
4
3
2
1
0
Cabinet Level 1
EMS commands LC to shutdown: 5
EMS commands LC to shutdown
Electric cabin door open
Cabinet Level 1

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Email: service-ess@deye.com.cn

Website: http://deyeess.com