Deye

User Manual

Product Name: MS-EMS

Applicable Model: MC-LC430-2H2

MC-LC430-2H3

Contents

1 System Introduction

1.1 Introduction

Deye Energy Management System (EMS) is a highly integrated and intelligent energy management platform. Its design combines flexibility, reliability, ease of use, and foresight. It has the following core features:

1. Modular and flexible configuration

The system supports flexible expansion from a single cabinet to multiple cabinets in parallel connection mode. Users can freely combine cabinets according to actual needs and easily build energy storage power stations of different scales. This architecture allows power stations to expand capacity smoothly with business growth and has good scale adaptability.

2. Software-hardware integration, autonomy, and controllability

Through the deep coupling of software and hardware, the system achieves comprehensive autonomy and controllability from the underlying devices to the upper-level policies. This design not only improves the safety and stability of system operation but also reduces dependence on external technologies.

3. Simple and easy interaction

The system provides an intuitive and friendly operation interface to lower the usage threshold for users. Even non-professionals can get started quickly. This helps users achieve energy cost saving, energy efficiency improvement, and sustainable energy management.

4. Cloud-edge collaboration architecture

The cloud-edge integration design is adopted, which takes into account both local real-time control and cloud centralized management. This architecture supports advanced applications such as multi-station joint control and interactive grid response. It also improves operation and maintenance (O&M) efficiency and system availability.

5. Intelligence-oriented optimization of policies

The system has built-in configurable intelligent operation policies, such as peak load shifting, demand control, and load tracking. It has the ability to learn from historical data and perform optimizations to continuously improve the economy and intelligence level of power station operation. With the core advantages of free combination, autonomy, controllability, user-friendliness, cloud-edge collaboration, intelligence, and high efficiency, Deye EMS provides energy storage power stations with highly flexible and controllable energy management solutions to help users achieve safer, more economical, and more sustainable energy 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 core functions of Deye EMS cover the following three dimensions:
• User permission management: The system supports multi-role user login and implements refined control of role-based page access permissions and data operation permissions.
• Panoramic device monitoring: The system supports data monitoring, information management, event recording, and remote upgrade of key devices in the power station and ESS cabinets.
• Energy strategy control: At present, the system mainly supports the configuration and execution of typical operation policies, such as peak load shifting and charging pile first.

1.5 Login Page

The system uses a preset account mechanism for site login. The username and initial password are set before delivery, and the user

registration function is not available for the time being. If you forget the
password, you can log in with the dynamic verification code sent by the
system. After a successful login, it is recommended to change the initial
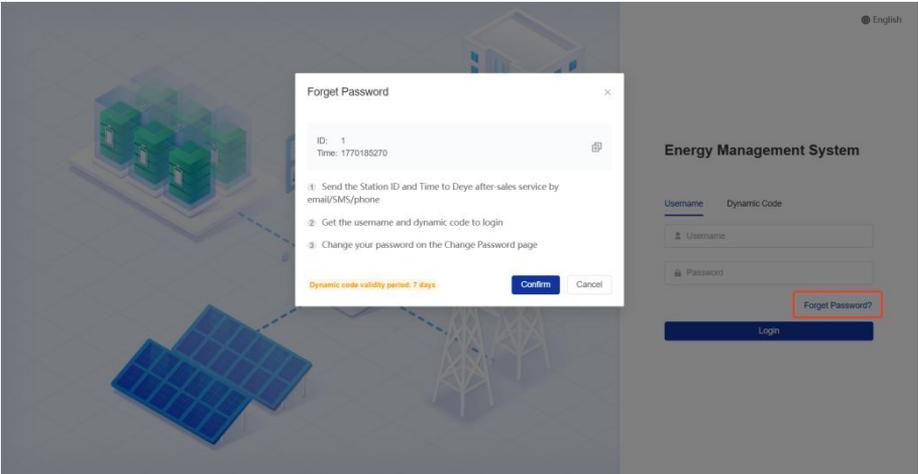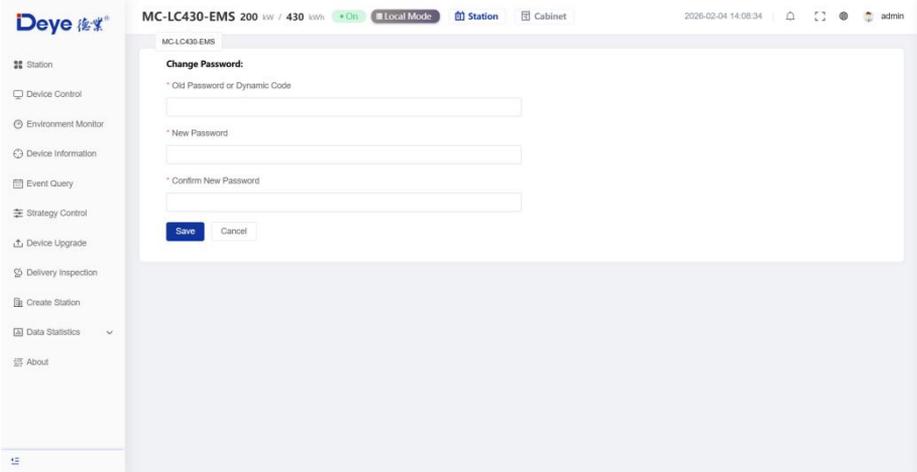password immediately to ensure account security.

If you forget the password, you can log in with the dynamic verification
code.

After logging in with the dynamic verification code, you will be

immediately redirected to the password change page. Please change the

password.

2 Power Station Introduction

2.1 Overall Framework

The system as a whole mainly includes three parts:

1. Left menu: It supports the expansion and collapse operations on the menu bar and is used to access various function modules of the system.

2. Top navigation bar: It displays the name, rated power, and installed capacity of the current power station, as well as the system time. It also provides activity and event notifications, full-screen display, language switching, and user function entries.

3. Main content area.
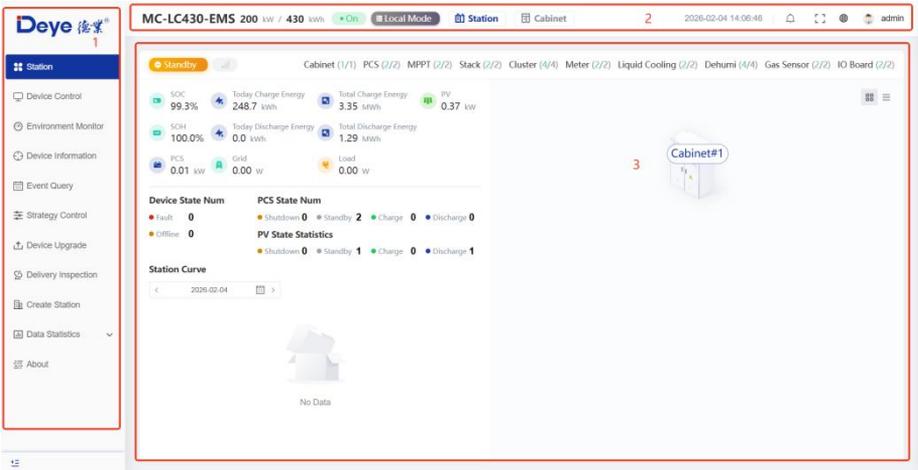
2.2 Overview of Power Station Information

2.2.1 Overview
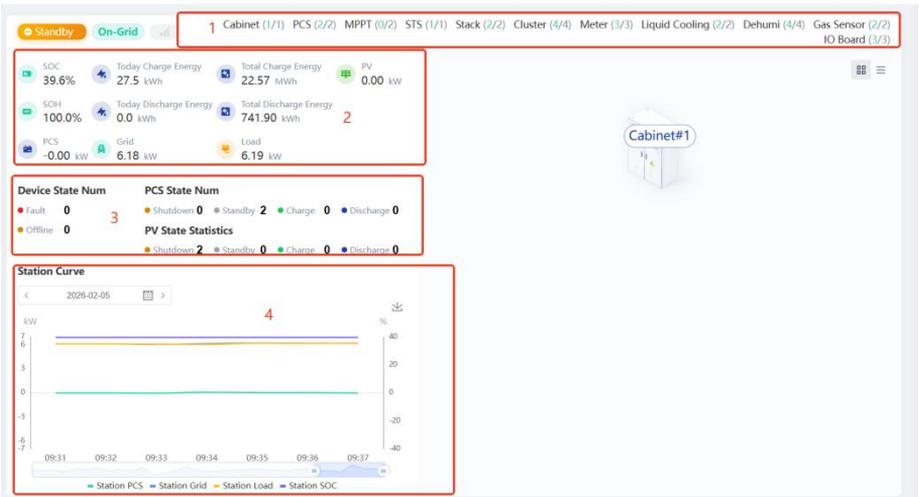
2.2.2 Details in the Interface

2.2.2.1 Area 1

This area displays the communication connection state of all key devices under centralized monitoring in the power station.

Cabinet (1/1) PCS (2/2) MPPT (2/2) Stack (2/2) Cluster (4/4) Meter (2/2) Liquid Cooling (2/2) Dehumi (4/4) Gas Sensor (2/2) IO Board (2/2)

The numbers in brackets indicate the "current number of online devices/total number of devices of the corresponding type". Users can

use this information to clearly know the integrity of the system structure and promptly discover exceptions, such as offline device. For example, "Meter (0/2)" means that all two meters are offline and need to be troubleshooted.

2.2.2.2 Area 2

The data presented in this area is the core indicator system for panoramic monitoring and evaluation of the system operation state.

SOC and SOH directly reflect the real-time power and long-term health state of the energy storage body. They are basic parameters for assessing the system availability and lifespan. The charging and discharging energy statistics quantify the energy throughput performance of the system in the time dimension, providing a basis for operational benefit analysis and strategy optimization. Real-time power data is a visual representation of the dynamic balance of energy flow in the power station.

SOC 99.3%	Today Charge Energy 248.8 kWh	Total Charge Energy 3.35 MWh	PV 0.36 kW
SOH 100.0%	Today Discharge Energy 0.0 kWh	Total Discharge Energy 1.29 MWh	
PCS 0.02 kW	Grid 0.00 W	Load 0.00 W	

Parameter description:

Data Item	Description
SOC	Percentage of the current remaining energy of the battery. It reflects "how much energy is left".
SOH	Battery health state, in percentage. It reflects the attenuation degree of the battery's maximum capacity.

Today Charge Energy	Total amount of energy charged to the battery on the current day.
Total Charge Energy	Total amount of energy charged to the battery in the system history.
Today Discharge Energy	Total amount of energy discharged from the battery on the current day.
Total Discharge Energy	Total amount of energy discharged from the battery in the system history.
PCS	Real-time power of the power conversion system (PCS). A negative value indicates charging, and a positive value indicates discharging.
Grid	Real-time power of exchanging with the grid. A positive value indicates that energy is taken from the grid, and a negative value indicates that energy is sent to the grid.
Load	Total consumption power of loads in the station.
PV	Real-time output power of the photovoltaic (PV) system.

2.2.2.3 Area 3

This area provides a centralized monitoring view of the operational reliability and device coordination state of the energy storage power station. Its core function is to achieve penetrating supervision from system-level energy management to device-level health management.

Device State Num   **PCS State Num**

● Fault   **0**   ● Shutdown **0**   ● Standby **2**   ● Charge **0**   ● Discharge **0**

● Offline   **0**   **PV State Statistics**

                             ● Shutdown **0**   ● Standby **1**   ● Charge **0**   ● Discharge **1**

Device State Statistics: Display the number of currently faulty devices and the number of devices with communication interruption.

PCS State Statistics: Display the number of PCS devices that are currently shut down, in standby, charging, and discharging.

PV State Statistics: Display the number of PV systems that are currently shut down, in standby, charging, and discharging.

2.2.2.4 Area 4

The power station curve function is the core analysis tool for operation analysis and performance evaluation of the energy storage power station. It uses time series curves to display four key variables, namely "Station PCS", "station Grid", "Station Load", and "Station SOC", in a synchronous and visualized manner.

Station Curves

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— Station PCS — Station Grid — Station Load — Station SOC
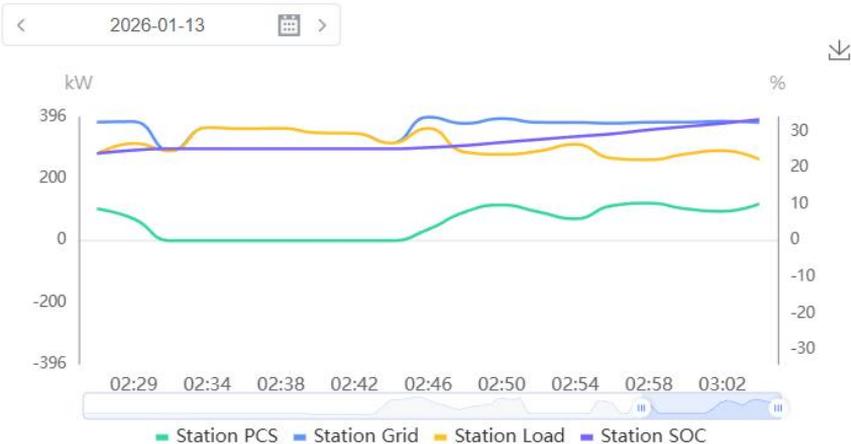
Curve variable description:

Data Item	Description
Station PCS	Display the real-time power (kW) of the PCS. A positive value indicates discharging, and a negative value indicates charging.
Station Grid	Display the power (kW) of exchanging between the station and the public grid. A positive value indicates that energy is taken from the grid, and a negative value indicates that energy is sent to the grid
Station Load	Display the total consumption power (kW) of loads in the station.
Station SOC	Display the real-time remaining battery energy, in percentage (%).

2.2.3 Device Control

Click Device Control in the left navigation bar and select Station from the top navigation bar. Check the monitoring information of power station devices.

2.2.3.1 STS

1. The STS overview interface realizes real-time state monitoring, power quality monitoring, and seamless switching for the control guarantee of the power grid and generator power supply.

Parameter description:

Data Item	Description
Total Grid Power	Actual active power of inputting energy from or sending energy to the public power grid.
Total Grid Reactive Power	Reactive power of exchanging with the grid to establish a magnetic field.
Total Gen Power	Actual active power of the current backup generator output.
Total Gen Reactive Power	Reactive power component of the generator output.
Grid Relay State	Main switch for connecting the system to the public power grid. • Closed: The system is connected to the power grid and can supply power. • Open: The system is isolated from the power grid.
Gen Relay State	Main switch for connecting the system to the backup generator.

	• Closed: The system is connected to the generator and supplies power. • Open: The system is not connected to the generator.
Temperature	Real-time temperature of key components (such as the power module) in the STS cabinet.

2. Click STS to view device details.

The interface of detailed STS parameters realizes full-dimensional management, identity recognition, capability assessment, and accurate state monitoring of the key switching device. It is the decision-making basis for O&M personnel to perform device-level configuration, diagnosis, and security operations.

On this interface, you can click to view the STS operation state, communication state, STS alarm information, temperature information, and detailed data of the grid, generator, and inverter.

1) Basic information of STS

Parameter description:

Data Item	Description
Communication Address	Unique numeric identifier of the STS device in the monitoring network.
Communication Protocol Version	Version number of the communication language and the rule followed by the device for data exchange with the monitoring system.
Rated Power	Maximum power that this STS is designed to transmit energy safely and continuously.

Grid Relay State	Real-time physical location of the power supply switch for connecting to the public power grid.
Generator Relay State	Real-time physical location of the power supply switch for connecting to the backup generator.
Parallel Relay State	State of the dedicated switch for controlling the short-duration parallel connection between the power grid and the generator.

2) Grid info

These parameters reflect the electrical state and energy exchange state of the connection point between EMS and the public power grid in a comprehensive and real-time manner.

Ⓡ Grid Info

Grid Voltage A 226.1 V	Grid Voltage B 228.6 V	Grid Voltage C 228.6 V	Grid Current A 203.5 A
Grid Current B 199.1 A	Grid Current C 171.1 A	STS Grid Frequency 50.0 Hz	Total Grid Power 130.6 kW
Grid A-Phase Power -45.7 kW	Grid B-Phase Power -45.5 kW	Grid C-Phase Power -39.3 kW	Total Grid Reactive Power -3.4 kW
Grid A-Phase Reactive Power 2.0 kW	Grid B-Phase Reactive Power 0.6 kW	Grid C-Phase Reactive Power 0.8 kW	Grid Today's Sold Electricity 0.0 kWh
Grid Today's Purchased Electricity 166.0 kWh	Grid Cumulative Sold Electricity 86.9 MWh	Grid Cumulative Purchased Electricity 156.6 MWh	

3) Generator info

This interface is used for comprehensive monitoring of the output state and energy generation of the backup generator unit when it is started and running. It is a key interface for evaluating the performance of the backup power supply and performing O&M management.

Generator Info

Gen Voltage A	Gen Voltage B	Gen Voltage C	Gen Voltage AB
4.7 V	4.1 V	5.1 V	0.0 V
Gen Voltage BC	Gen Voltage CA	Gen Current A	Gen Current B
0.0 V	0.0 V	0.0 A	0.0 A
Gen Current C	Gen Frequency	Total Gen Power	Gen A-Phase Power
0.0 A	0.0 Hz	0.0 kW	0.0 kW
Gen B-Phase Power	Gen C-Phase Power	Total Gen Reactive Power	Gen A-Phase Reactive Power
0.0 kW	0.0 kW	0.0 kW	0.0 kW
Gen B-Phase Reactive Power	Gen C-Phase Reactive Power	Gen Today's Sold Electricity	Gen Today's Purchased Electricity
0.0 kW	0.0 kW	0.0 kWh	0.0 kWh
Gen Cumulative Sold Electricity	Gen Cumulative Purchased Electricity		
8.0 kWh	0.0 kWh		

4) Inverter info

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

Inverter Info

Inverter Voltage A	Inverter Voltage B	Inverter Voltage C	Inverter Frequency
224.9 V	228.2 V	231.3 V	49.96 Hz
Inverter Voltage AB	Inverter Voltage BC	Inverter Voltage CA	
0.0 V	0.0 V	0.0 V	

2.2.3.2 Meter

1. Click Meter to view the real-time operation parameters and energy data of meters.

Data Item	Description
Total Active Power	Actual net consumption power of the current site.
Total Apparent Power	Total capacity that the current power grid needs to provide.
Total Reactive Power	Reactive power for exchanging.
Total Power Factor	Ultimate indicator of power efficiency and quality.
Total Active Energy	Cumulatively consumed total energy.
Total Reactive Energy	Total cumulative reactive energy for exchanging.

2. Select a meter to view the details. This page provides comprehensive and high-precision electrical parameter details of the selected meter, which are divided into total amount and sub-item data. This facilitates 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 (LC) in real time to ensure that it has the ability to stably execute control, calculation, and communication tasks.

CPU	1.3%	
Used Memory	327.7MB	
Upstream Speed	0.0MB/s	
Downstream Speed	0.2MB/s	
Disk Total Size	468.38GB	
Disk Free Size	468.37GB	
Disk Available Size	444.51GB	
Core Temperature1	37℃	
Core Temperature2	37℃	
Core Temperature3	35℃	
Running Time	75:48:00	

2.2.4 Environment monitor

This interface is used to monitor the power devices and the environmental state of the power station in real time. It displays information such as the emergency stop switch, remote emergency stop, diesel generator start/stop, and control mode.
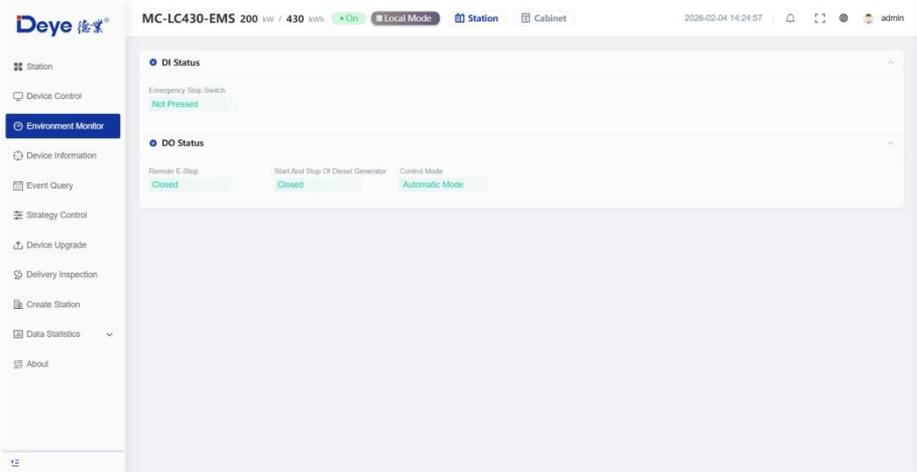
2.2.5 Device Information

The Device Information interface displays the key identities and version data of all core intelligent components of the system in a centralized way. Through this interface, O&M personnel can quickly confirm the device identity, verify the compatibility of software and hardware versions, and determine network addresses, which provides key information for obtaining technical support and executing software updates and system expansion. This ensures the reliable operation and refined management of the system throughout its life cycle.
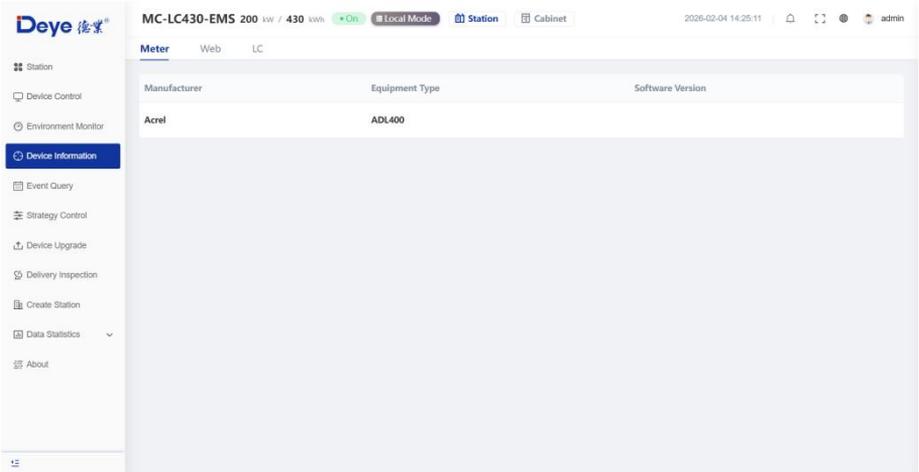
2.2.6 Event Query

Users can enter this function module by clicking the "Event Query" menu in the left navigation bar of the system.

2.2.6.1 Activity event

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

① Check the alarm state, description, alarm level, device type, device number, abnormal value, and creation time of ongoing alarm events.

② Search from logs according to the alarm level, device type, and device number.

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

④ Refresh the list content.
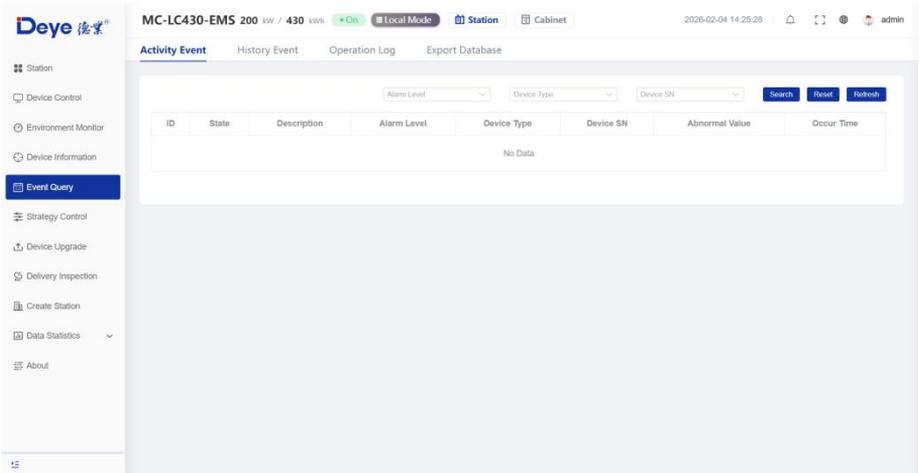
2.2.6.2 History Event

The History Event page displays the events that have triggered alarms in history. The page mainly includes the following functions:

① Check the alarm state, description, alarm level, device type, device number, abnormal value, creation time, and end time of historical alarm events.

② Search from logs according to the alarm level, device type, device number, and creation time.

③ Reset the alarm level, device type, device number, and creation time in the filter box.

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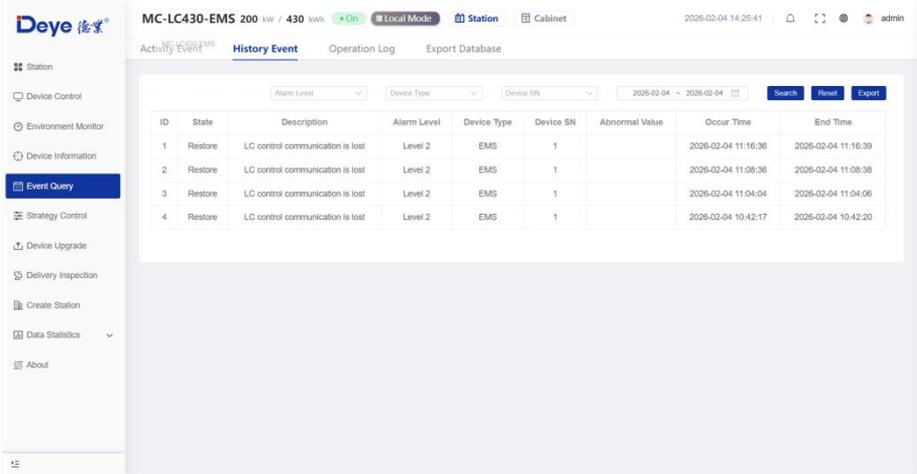
2.2.6.3 Operation Log

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

① Check the description, creation time, username, device number, and operation type of operation log records.

② Search from logs according to the device type and creation time.

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

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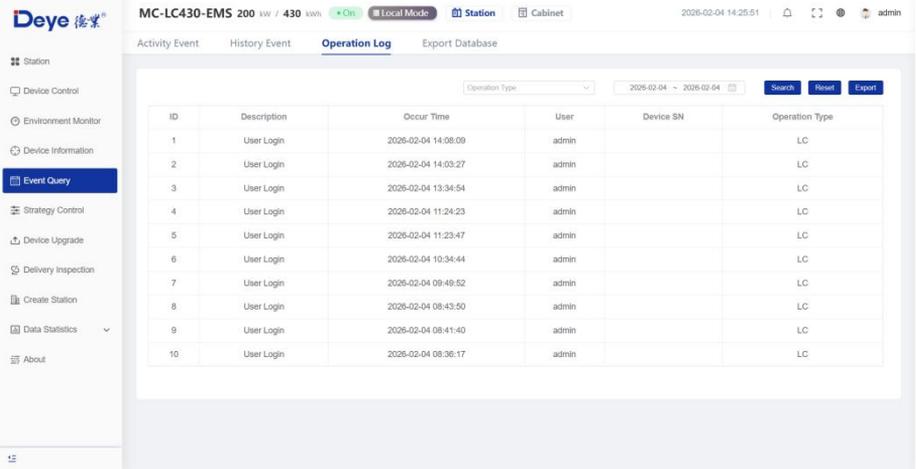
2.2.6.4 Export Database

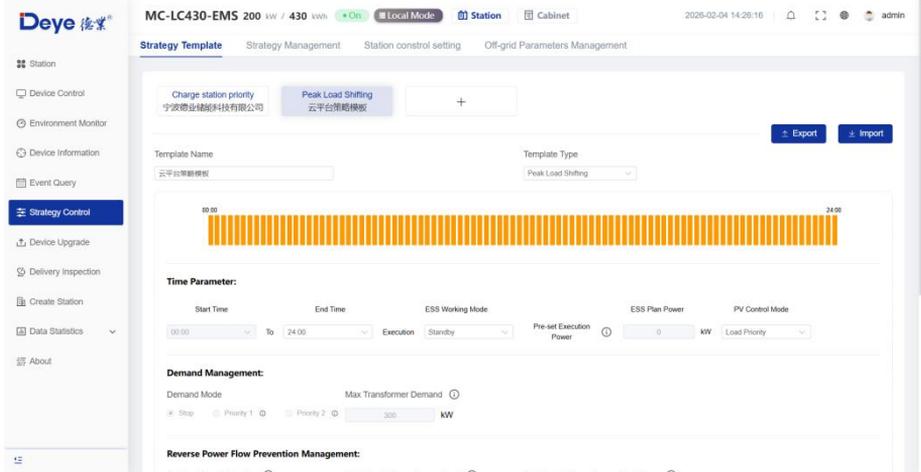Users can select the target database and time range to export event data with one click for offline analysis or long-term archiving.
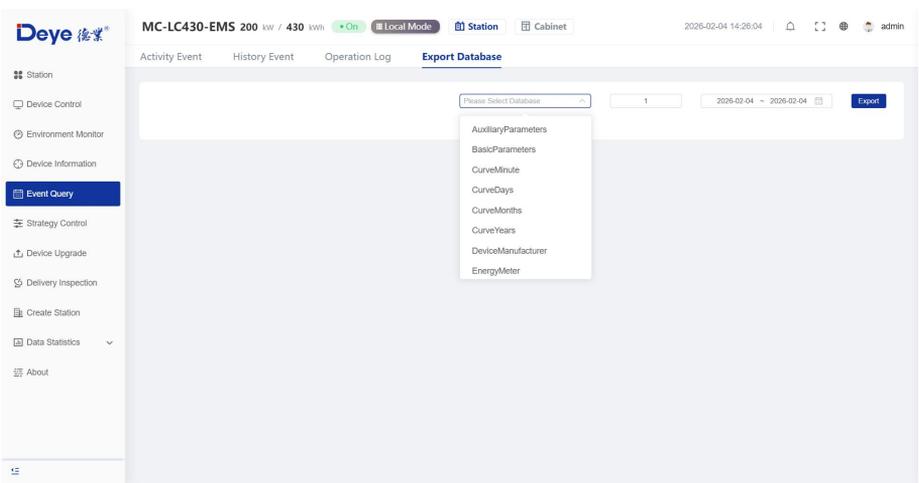
2.2.7 Strategy control

The Strategy Control page mainly includes four parts: strategy template, strategy management, station control settings, and off-grid parameter management.

2.2.7.1 Strategy template

1. Users can add, delete, view, and edit strategy templates. Strategy templates need to be configured with the name, strategy type, time parameters, demand management, anti-backflow protection, and auxiliary parameters. Users can click + on the right to add multiple templates.

S/N	Name	Function
1	Template Name	/
2	Template Type	Peak load shifting or charging pile first.
3	Start Time	Start time of charging or discharging. It must be 00:00 in the first strategy.
4	End Time	End time of charging or discharging. It must be 24:00 in the last strategy.
5	ESS Working Mode	Charging, discharging, standby, or off.
6	ESS Plan Power	During the period from the specified start time to the specified end time, the system operates continuously at the planned power. The value is always a positive one.
7	PV Control Mode	Load first or energy storage first.

2. Demand management, anti-backflow protection, and auxiliary parameters are as follows:

Demand Management:

Demand Mode   Max Transformer Demand ⓘ
◉ Stop   ○ Priority 1 ⓘ   ○ Priority 2 ⓘ   300   kW

Reverse Power Flow Prevention Management:

Anti-backflow Protection ⓘ   Grid Supply Power Lower Limit ⓘ   Grid Supply Power Lower Limit Error ⓘ
Stop   ▾   30   kW   3   kW

Auxiliary Parameter:

SOC Upper Limit ⓘ   SOC Lower Limit ⓘ   Highest Cell Voltage Threshold ⓘ   Lowest Cell Voltage Threshold ⓘ
100   %   0   %   3.650   V   2.500   V

Max Discharging Power ⓘ   Max Charging Power ⓘ   Temp Upper Limit ⓘ   ESS Capacity
200   kW   200   kW   60   ℃   430   kWh

PV Capacity
0   kWh

Data Item	Description
SOC Upper/Lower Limit	Dispatching range of battery capacity. When the strategy is running, SOC remains within this range.
ESS Capacity	Total battery energy actually configured in the system.
PV Capacity	Installed PV capacity configured in the system.
Anti-backflow Protection	Prohibition of feeding energy to the grid. A grid anti-backflow limit is required.
Demand Mode	Demand control function. If it is enabled, the system will dynamically discharge to ensure that the power on the grid side does not exceed the maximum demand of the transformer at all times.
Grid Supply Power Lower Limit	Lower limit of the grid supply power.
Grid Supply Power Lower Limit Error	Grid anti-backflow limit error.
Max Transformer Demand	Maximum consumption power agreed with the grid. The system will control the total

|	load not to exceed this value to avoid fines.
Highest Cell Voltage Threshold	Maximum voltage of battery cells during normal operation.
Lowest Cell Voltage Threshold	Minimum voltage of battery cells during normal operation.
Temp Upper Limit	Maximum temperature of battery cells during normal operation.
Max Discharging Power	Maximum allowed discharging power of the system.
Max Charging Power	Maximum allowed charging power of the system.

2.2.7.2 Strategy management

In the strategy management module, the system supports creating and managing up to 5 strategies. Users can bind strategy templates to specific execution cycles and save them as executable strategy plans, such as long-term strategies, summer strategies, weekend strategies, and holiday strategies.

The system will automatically execute the currently effective strategy with the highest priority every day according to the preset priority rules.
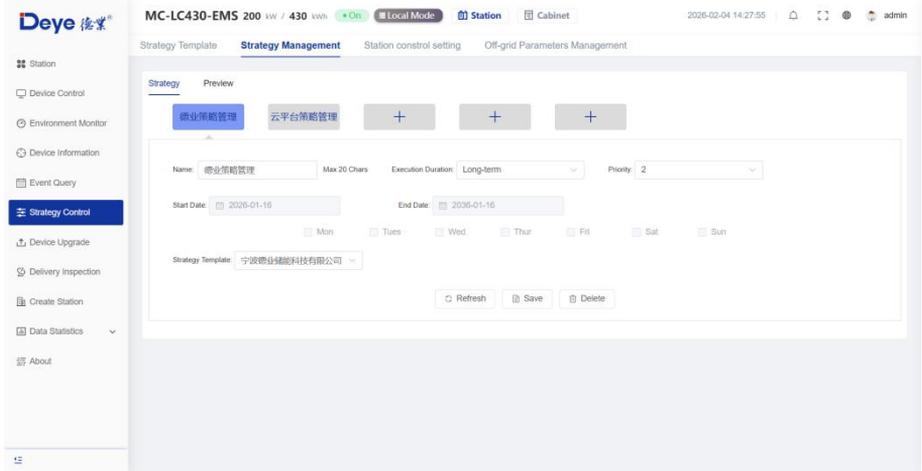
After a strategy is bound, users can preview the daily strategy execution plan and details by date in the calendar view. If the preview result does not meet expectations, users can modify the strategy binding relationship and preview the content again for confirmation after adjustment.
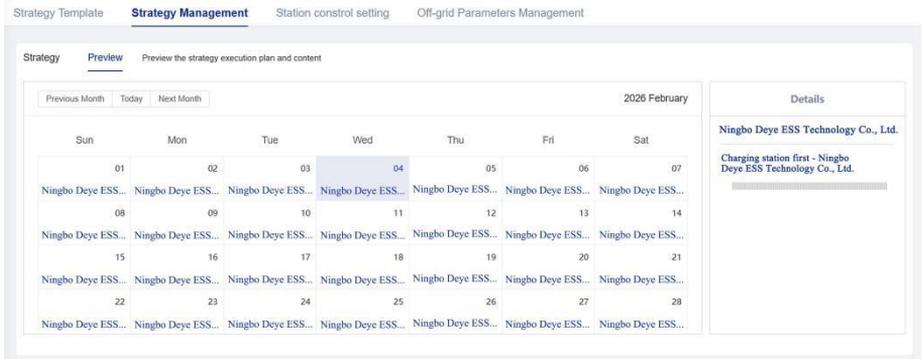
2.2.7.3 Station Control Settings

Users can enter the password to set the power station control mode.

1.   Control mode

Remote mode: The power station is automatically controlled by a remote

system. This mode applies to normal operation.

Local mode: The power station only accepts on-site manual control. This mode applies to commissioning or emergencies.

Maintenance mode: The power station enters a safety lock state. Only authorized personnel are allowed to perform maintenance operations.

2.   Operation state

This controls whether the power station accepts remote dispatching instructions. You can set it to "On" to enable automatic operation.

3.   ESS cabinet state

This controls the power supply and operation state of each ESS cabinet. You can set it to "On" to put the cabinet into operation.
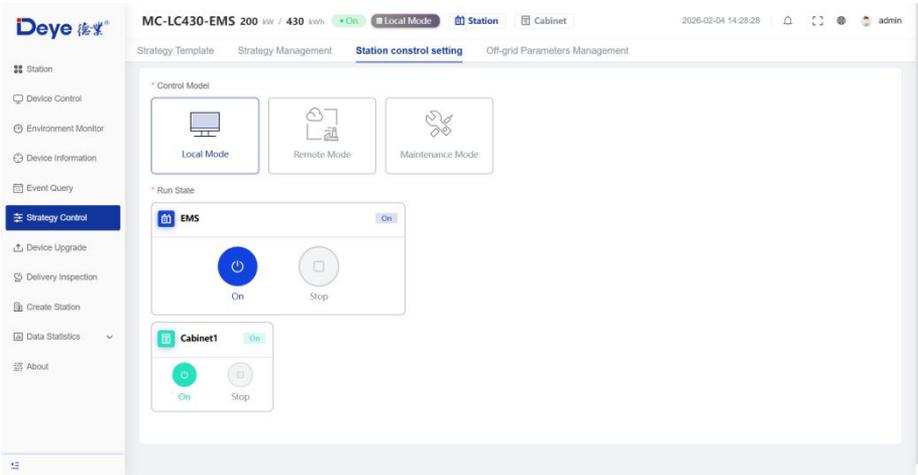
2.2.7.4 Off-grid Parameters Management

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

Strategy Template   Strategy Management   Station control setting   **Off-grid Parameters Management**

Off-grid Parameters:

* On-grid/Off-grid Switch	* Operating Mode - Manual Switch	* PV Power Target in CP Mode
Manual Mode without STS ⌄	On-grid Mode ⌄	110.00 %

* Start SOC for Off-grid	* Shutdown SOC for Off-grid	* Constant SOC Battery SOC Setting
20.00 %	5.00 %	100.00 %

* Generator Control Mode	* Generator Running State	* Generator Capacity
Auto Mode ⌄	Off ⌄	100.00 kW

* Generator Min Output Power	* Generator Max Output Power	* Generator Start SOC
0.00 %	0.00 %	20.00 %

* Generator Shutdown SOC	* Recharge Mode	* Generator Shutdown Prohibition
90.00 %	Off ⌄	Disable ⌄

Save

1.   Settings of the on-grid/off-grid switch mode

①   Automatic mode with STS: The system automatically detects the grid state. When the grid fails or is interrupted, STS will be automatically switched to off-grid operation mode instantly. The battery or generator supplies power to ensure that the power supply to the loads is uninterrupted. After the grid recovers, automatic synchronization and switchback will be performed.

②   Manual mode with STS: STS mode switch requires manual confirmation and operation.

③   Manual mode without STS: STS does not have the automatic switch capability. Switching from on-grid mode to off-grid mode or vice versa requires manual operation on multiple circuit breakers, which is time-consuming and has the risk of a power outage.

2.   Operation mode - manual switch

On-grid mode or off-grid mode.

3.   Settings of parameters, such as battery start SOC for off-grid mode and battery shutdown SOC for off-grid mode

①   Start SOC: In off-grid mode, when the battery level is lower than this value, the system will charge the battery to prevent it from running out of energy if conditions are met.

②   Shutdown SOC: In off-grid mode, when the battery level is lower than this value, the battery will forcibly cut off the output to protect

itself from being damaged due to over-discharge.

4. Settings of the parameter constant battery SOC

    Set a target battery level that you expect to maintain.

5. Settings of the generator control mode: automatic mode or manual
    mode

    ① Automatic mode: The generator is completely automatically started and stopped by the system according to preset parameters without manual intervention.

    ② Manual mode: The start and stop of the generator must be manually instructed.

6. Generator operation state

    The current actual state of the generator (running/shut down) is displayed.

7. Settings of parameters: generator capacity, minimum generator
    output power, and maximum generator output power

    ① Capacity: Rated maximum power of the generator. The system determines its load-bearing capacity based on this parameter.

    ② Minimum output power: Minimum power allowed for stable operation of the generator.

    ③ Maximum output power: Upper limit of the power that the generator is allowed to output during current operation.

8. Settings of parameters: generator start SOC and generator
    shutdown SOC

    ① Start SOC: In off-grid mode, when the battery level is lower than this value, the generator will be automatically started.

    ② Shutdown SOC: After the generator is started, when the battery level rises to this value, the generator will be automatically shut down.

9. Settings of the recharging mode: on or off

    ① On: The generator is allowed to start when the battery level is low for the sole purpose of charging the battery.

    ② Off: After the generator is started, its energy will be supplied to the loads first, and the remaining energy will be supplied to charge the

battery.

10. Settings of the generator shutdown prohibition: disabled or enabled

① Enable: Once the generator is started, the system will prohibit it from automatically shutting down until it is manually set to "Disabled".

② Disable: The system is allowed to automatically shut down the generator according to conditions such as "generator shutdown SOC". It is usually set to "Disable" during normal operation.

2.2.8 Device Upgrade

1. Upload the upgrade file.

Enter the Device Upgrade page, select the upgrade file that meets the naming convention, upload the file, and click the "Start Upgrade" button to start the upgrade process.

2. Obtain the upgrade result feedback and query logs.

After the upgrade is completed, the system will prompt whether this upgrade is successful or has failed. Users can filter and view historical upgrade records by date range and upgrade type in the upgrade log query interface.
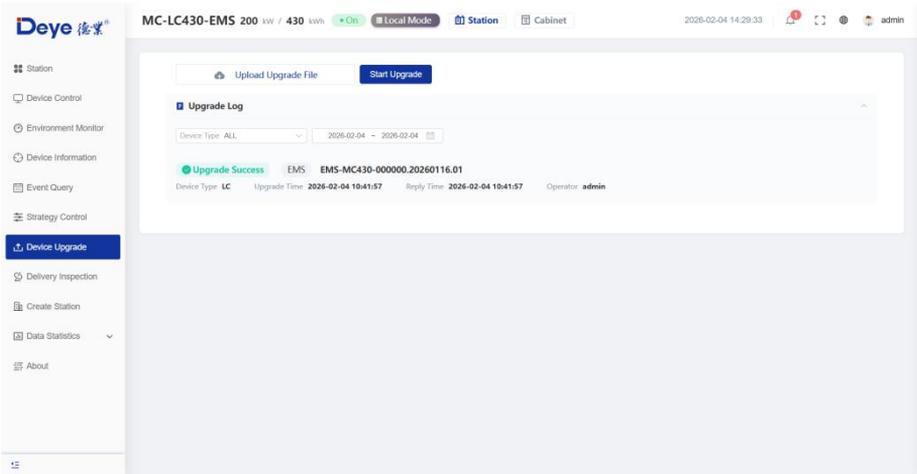
2.2.9 Delivery Inspection

2.2.9.1 Automatic Inspection

The pre-delivery inspection interface displays the fast self-inspection state of the core EMS submodules. Inspection results are presented in three counting forms: "normal", "warning", and "fault". After an inspection starts, the interface will automatically summarize the health state of each module. If all modules are displayed as "normal" and no warning is prompted, it means that the system has passed the self-inspection and can be put into operation. If any warning or fault is found, users need to further view the detailed logs according to the corresponding entries and contact maintenance personnel.
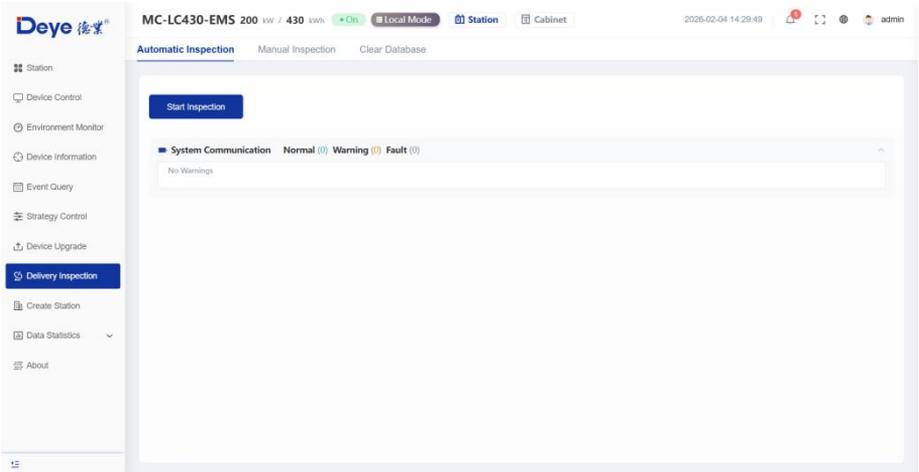
2.2.9.2 Manual Inspection

The Manual Inspection page displays the current system DI inspection

results and DO state.
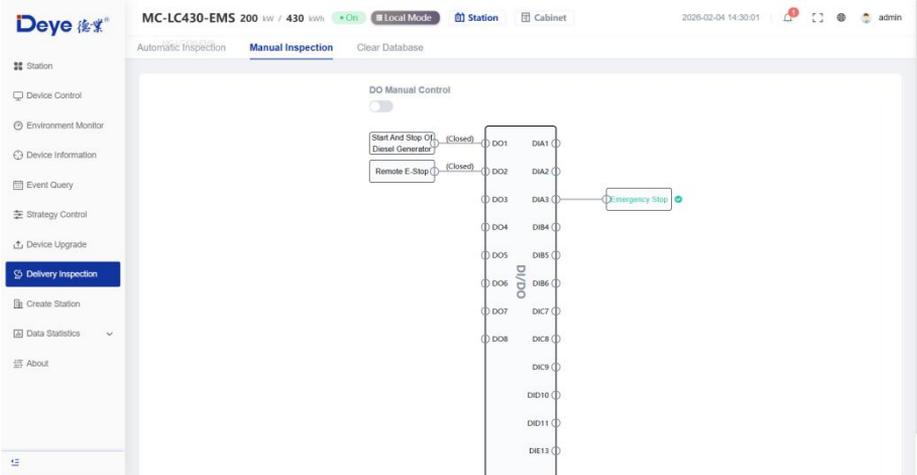
The DO control mode is automatic control by default. After manual control is enabled, the state of DO can be controlled to detect whether DO is normal.

2.2.9.3 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.
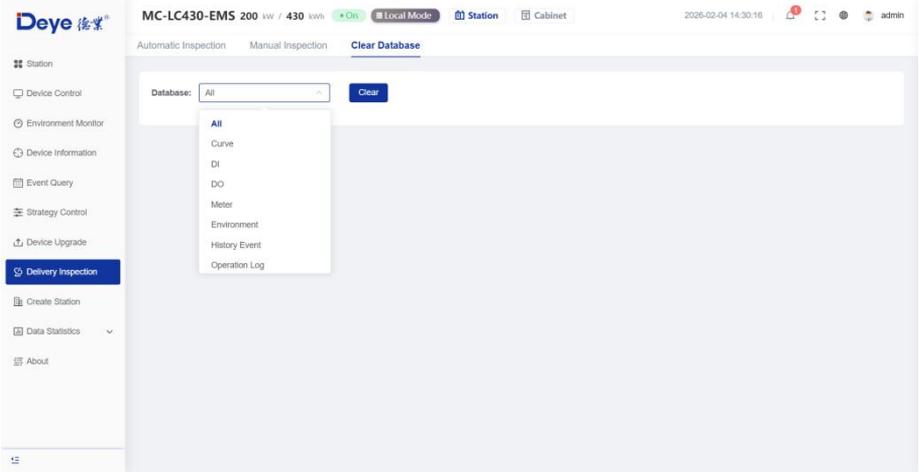
2.2.10 Create Station

This is the power station configuration and management interface of EMS, which is used to complete the entire process from configuring the basic information to setting system parameters for a power station. This "station creation process" usually refers to completing a series of operations, such as power station creation, device configuration, network setting, and function enabling, through the software interface in the early stage of power station deployment. This enables the system to operate normally and connect to the monitoring platform.

Main functions of station creation:

1. When users create a power station, they need to fill in the power station name, address, longitude, latitude, and other information. The power station ID, installed power, installed capacity, and ESS cabinet SN are pre-delivery preset parameters and cannot be modified.

2. Information such as the current network and system time needs to be set.
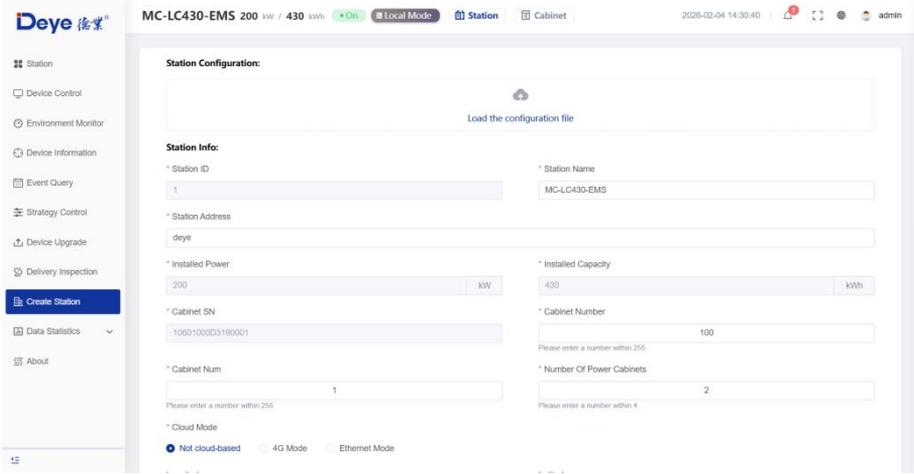
2.2.11 Data Statistics

The data statistics function transforms the original operation data into valuable business insights and O&M knowledge, enabling users to evaluate the past performance, optimize the present performance, and predict the future performance. It is a core tool for realizing the refined and intelligent operation of power stations.

Users can view historical operation data curves for analysis, historical charging and discharging energy for analysis, and historical fault/event analysis records.
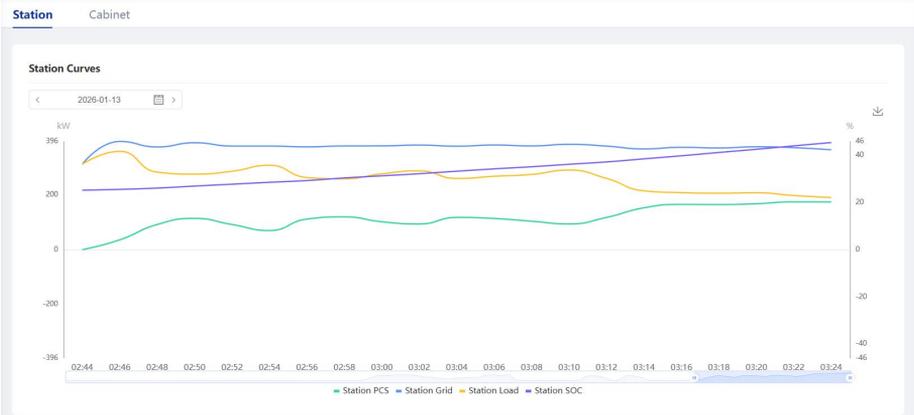
3 Energy Storage Cabinet Introduction

3.1 Overview of energy storage cabinet information

Click Cabinet on the top navigation bar to view the ESS cabinet information.
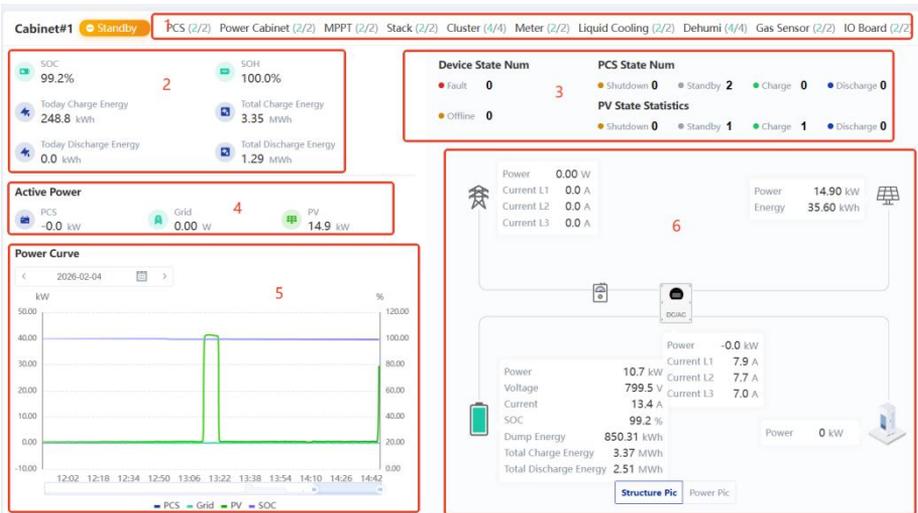
3.1.1 Area 1

PCS (2/2) Power Cabinet (2/2) MPPT (2/2) Stack (2/2) Cluster (4/4) Meter (2/2) Liquid Cooling (2/2) Dehumi (4/4) Gas Sensor (2/2) IO Board (2/2)

This area displays the number of online PCS devices, power cabinets,

MPPT, battery stacks, battery clusters, meters, liquid cooling units, dehumidifiers, gas sensors, and IO boards. It also displays the number of online/total key devices in real time. The format is "device type (number of online devices/total devices)". The information is used to quickly assess system integrity and connection health.

3.1.2 Area 2

This area monitors and quantitatively evaluates the core asset of energy storage batteries throughout their life cycles. It centrally displays the core state and energy data of EMS.

SOC **99.3%**	SOH **100.0%**
Today Charge Energy **248.8** kWh	Total Charge Energy **3.35** MWh
Today Discharge Energy **0.0** kWh	Total Discharge Energy **1.29** MWh

Data Item	Description
SOC	Remaining battery energy. It indicates the current battery charging state and is equivalent to "battery level in percentage".
SOH	Battery health state. It indicates the ratio of the current maximum battery capacity to the capacity of a new battery and reflects the battery life.
Today Charge Energy	Total amount of energy charged to the battery on the current day.
Today Discharge	Total amount of energy discharged from the battery on the current day.

Data Item	Description
Energy	
Total Charge Energy	Total amount of energy charged to the battery in the system history.
Total Discharge Energy	Total amount of energy discharged from the battery in the system history.

3.1.3 Area 3

This area centrally monitors the health state and operation mode of all devices in the system.
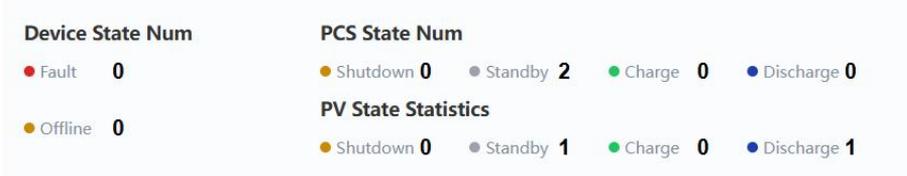
Statistical Category	State	Description
Device State Statistics	Fault	Number of devices encountering an exception. It should be 0 under normal conditions. Any value greater than 0 requires immediate attention.
	Offline	Number of devices that cannot establish a data connection with the system. It should be 0 under

Statistical Category	State	Description
		normal conditions. A value greater than 0 indicates that a line or device disconnection issue exists.
PCS State Statistics	Shutdown/standby/charge/discharge	Distribution of all PCS operation modes. For example, "Standby 2" means that two PCS devices are in standby mode.
PV State Statistics	Shutdown/standby/charge/discharge	Distribution of all MPPT operation modes. For example, "Shutdown 2" means that two PV systems are not operating.

3.1.4 Area 4

This interface displays the active power data of three key nodes in EMS in real time: PCS, grid, and PV. By monitoring these values and changes, users can know the system operation mode, energy flow direction, and system state in real time.

Active Power

PCS	Grid	PV
-0.0 kW	0.00 w	14.8 kW

3.1.5 Area 5

Power Curve: This chart dynamically displays the historical change trends of key operation parameters within a specified date in the form of curves.

Power Curve

① Coordinate Axis Description:

- Left Y-axis (kW): It corresponds to the values of PCS power, grid power, and PV power.
- Right Y-axis (%): It corresponds to the value of SOC.
- X-axis: It represents time and displays the time range for viewing data.

② Curve Data Description:

- PCS: PCS power.

  Curve above the zero axis (positive value): indicating battery discharging.

  Curve below the zero axis (negative value): indicating battery charging.

- Grid: power for exchanging with the grid.

  Positive value: Energy is obtained from the grid.

  Negative value: Energy is sent to the grid.

- PV: PV output power. The value is always positive or zero.

- SOC: remaining battery energy, in percentage.

3.1.6 Area 6

This area displays system topology and real-time data.

Click Structure Pic to display the grid, PCS, PV, and battery information.
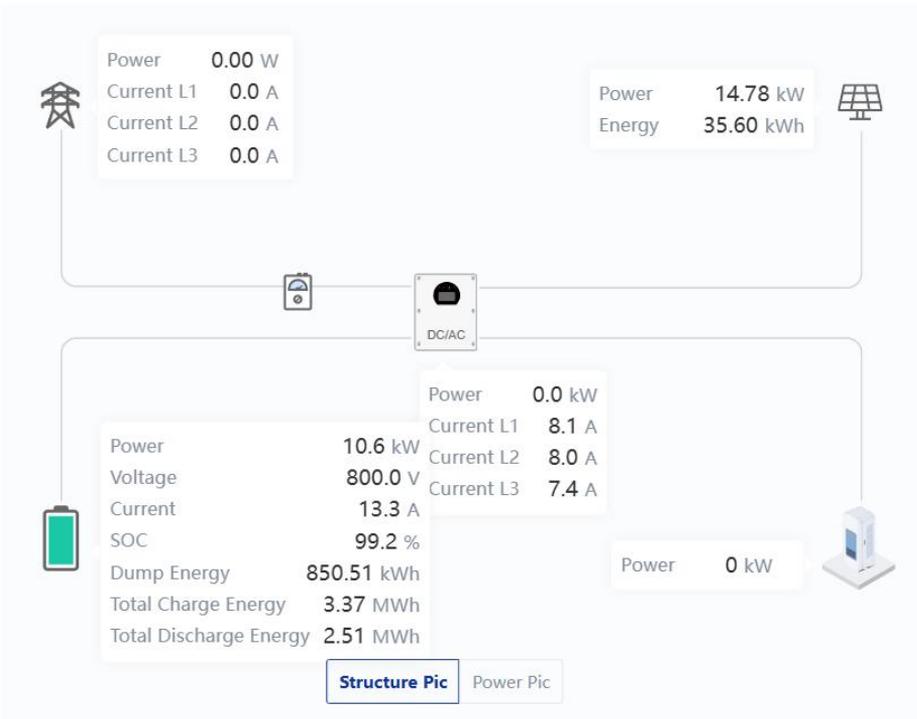
Click Power Pic to display the most basic electrical connection architecture of the system.
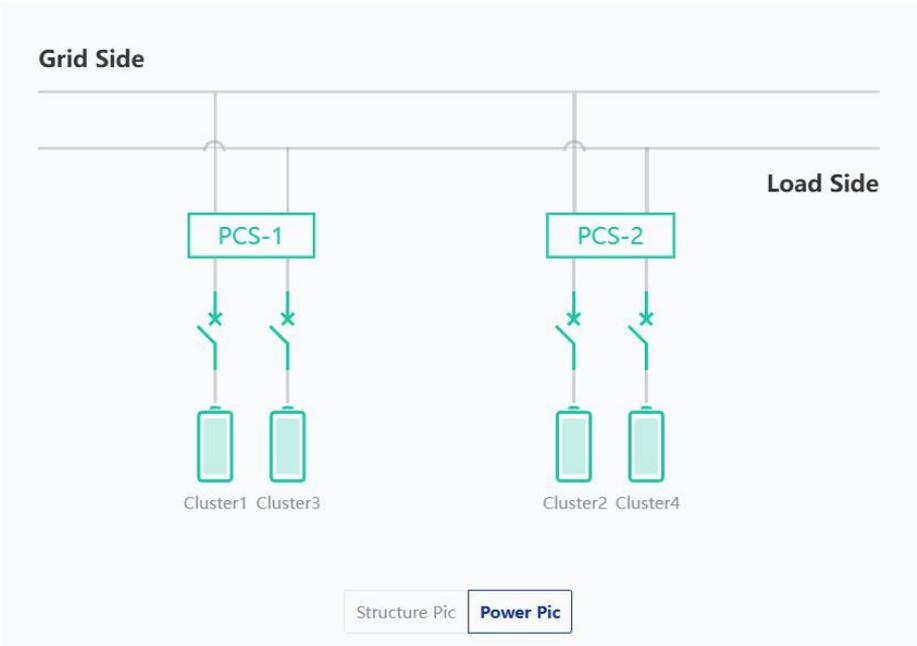
3.2 Device Control

3.2.1 PCS

1.   Select Device Control in the left menu and then select PCS in the top
     navigation bar to check the overview of the key PCS data.

If the interface displays "Running", "On-grid", "ON", and "Communication
Normal", it means that the PCS has been connected to the power supply
and started, is in an on-grid state, has stable internal communication with
the system, is operating properly, and is ready to receive instructions for
charging and discharging at any time.

Parameter description:

Data Item	Description
SOC	Percentage of the current remaining energy of the battery. It reflects "how much energy is left". With this variable, users can know the current energy reserves of EMS.
Total PCS Power	Total output power of PCS. A positive value indicates discharging, and a negative value indicates charging. It enables users to determine whether the system is charging, discharging, or in standby in real time. It can be compared with the set power value to determine whether the device is running according to the instructions.
DC Power Target in CP Mode	Set target value of the battery charging and discharging power in constant power mode. The system will maintain the battery running at this power.
PCS Heatsink Temp 1/2	Real-time temperature of the PCS heatsink temperature sensors 1/2. The temperature should be stabilized within a reasonable range.
Max Charge Power	Maximum allowed charging power of the current battery.
Max Discharge Power	Maximum allowed 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	Set target value of the total active power on the AC side in constant power mode.

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

3. Convert the main layout from card to list. The default main layout is
    card.

4. The PCS details page integrates the key configuration parameters,
    real-time operation data, and device state information of the PCS
    and all related subsystems. The core function of this page is to
    provide O&M personnel and engineers with a comprehensive
    management platform that integrates monitoring, diagnosis,
    debugging, and strategy configuration to achieve in-depth insights
    and refined control of PCS and its system.

Select any PCS to enter the corresponding PCS details page, which mainly
displays the various states of the PCS, including fault state,
on-grid/off-grid state, working state, etc.

View details: Click subtitles to view detailed information, such as energy,

PCS, grid, PV, STS, and generator.

3.2.2 Power Cabinet

1. Select Power Cabinet in the top navigation bar to check the overview of key power cabinet data.

PCU adopts a dual-branch architecture, and each branch is independently connected to a battery stack. The core function of the "branch 1" and "branch 2" variable groups displayed in the power cabinet monitoring interface is to achieve refined monitoring, balanced management, and independent control of each branch.

2. Click the power cabinet to enter the details page and view detailed data.

↩ PCU#1 ▾		
System State ✓ Normal	**COM Status** COM is Normal	
Branch 1		
SOC 99.3 %	Residual Electricity 424.8 kWh	Max Allow Power 459.8 kW
Is Temporary Reduct Power No	Input Voltage 801.6 V	Demand Power 0.0 kW
Input Power 0.0 kW	Voltage 803.0 V	Current 0.0 A
Branch 2		
SOC 99.0 %	Residual Electricity 425.8 kWh	Max Allow Power 448.0 kW
Is Temporary Reduct Power No	Input Voltage 799.9 V	Demand Power 0.0 kW
Input Power 0.0 kW	Voltage 801.0 V	Current 0.0 A

3.2.3 MPPT

The core function of these variables displayed in the MPPT interface is to monitor the real-time performance, diagnose the operation state, and evaluate the power output capacity of the tracking controller for the maximum PV power points. They are key monitoring points to ensure that the energy on the PV side is captured to the maximum extent and safely and efficiently input into ESS cabinets or loads.

1. Select MPPT in the top navigation bar to check the overview of key MPPT data.
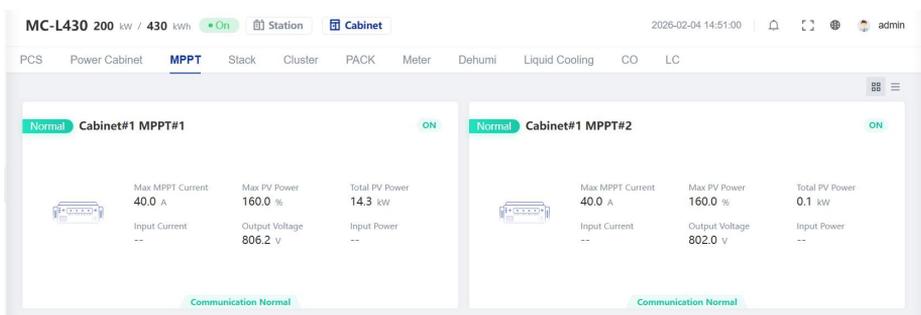
2. Click an MPPT to view details. The details page displays the operation state, on/off state, communication state, temperature, and MPPT warnings.

Click subtitles to view detailed energy information, device information, inspection information, and MPPT information.
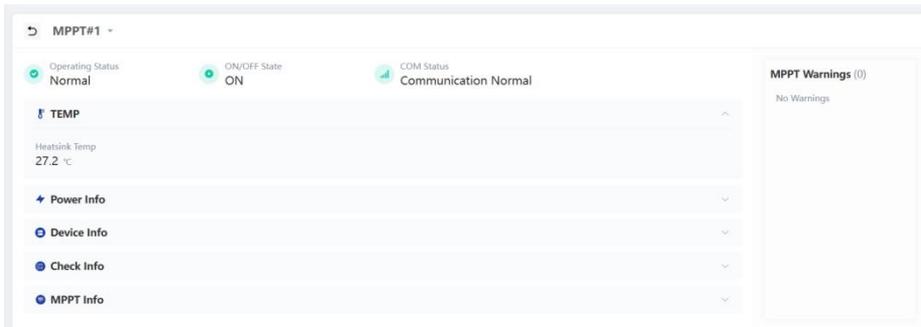
3. Switch to the list view and view MPPT data in a list form.

3.2.4 Stack

This interface realizes multi-dimensional safety monitoring, performance evaluation, and refined management of the core energy carrier battery stack of EMS. It is a basic data layer to ensure battery safety, extend life, and optimize operation.

1. Select Device Control in the left menu bar and then select Stack in the top navigation bar. The page mainly includes the following functions:

① Convert the main layout from card to list. The default main layout is card.

② Display the real-time operation parameters and balance management settings of the battery stack.
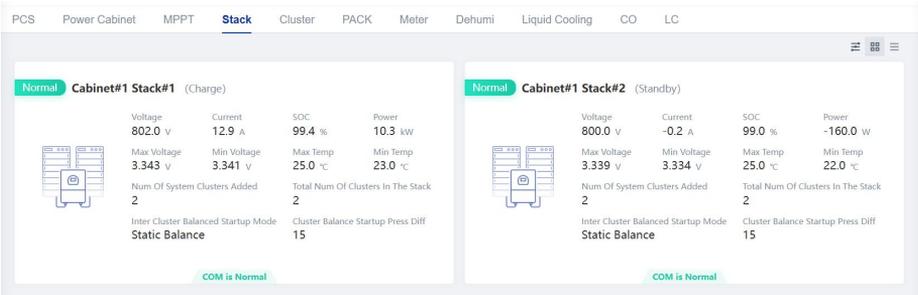
Data Item	Description
Voltage	Total DC voltage of the battery stack.
Current	Total current flowing into (charging) or out of (discharging) the battery stack.
SOC	Battery state of charge.
Power	Instantaneous charging and discharging power of the battery stack.
Max Voltage	Voltage value of the cell with the highest voltage among all battery cells.
Min Voltage	Voltage value of the cell with the lowest voltage among all battery cells.
Max Temp	Highest temperature value among all battery

	cells or sampling points.
Min Temp	Lowest temperature value among all battery cells or sampling points.
Num Of System Clusters Added	Number of battery clusters currently connected to the on-grid/load system for operation. "Cluster" refers to an independent battery unit composed of multiple battery modules connected in series and parallel.
Total Num Of Clusters In The Stack	Total number of physical battery clusters contained in this battery stack.
Inter Cluster Balanced Startup Mode	Strategy of energy balance between battery clusters.
Cluster Balance Startup Press Diff	Voltage difference threshold for starting inter-cluster balance.

2. Select any battery stack to enter the details page, which mainly displays the various states of the battery stack, energy curves, power diagram, and other information.
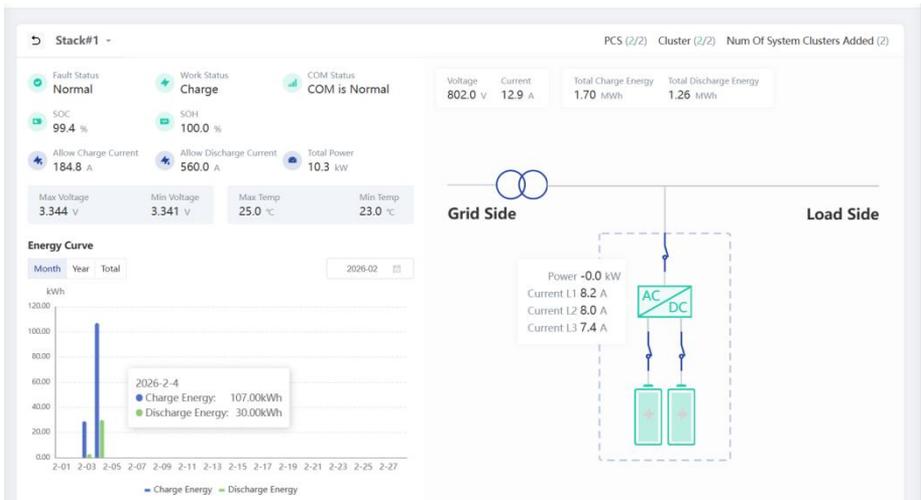
3. Click to switch the view and enter the password to modify the battery stack configuration.

Stack Control   ×

Stack#1	Stack#2

* Inter Cluster Balanced Startup Mode   * Cluster Balance Startup Press Diff

● Static Balance   ○ Charge And Discharge Balance   15.0

Save

4. Switch to the list view and view the battery stack information in a list form.

	PCS	Power Cabinet	MPPT	**Stack**	Cluster	PACK	Meter	Dehumi	Liquid Cooling	CO	LC				

Device Name	Fault Status	Work Status	COM Status	Voltage	Current	SOC	Power	Max Voltage	Min Voltage	Max Temp	Min Temp	Nur
Cabinet#1 Stack#1	Normal	⚡ Charge	COM is Normal	802.1V	12.8A	99.4%	10.3kW	3.345V	3.342V	25.0℃	23.0℃	
Cabinet#1 Stack#2	Normal	⊙ Standby	COM is Normal	800.0V	-0.2A	99.0%	-160.0W	3.339V	3.333V	25.0℃	22.0℃	

3.2.5 Cluster

1. Select Device Control in the left menu bar and then select Cluster in the top navigation bar. The page mainly includes the following functions:

① Convert the main layout from card to list. The default main layout is card.

	PCS	Power Cabinet	MPPT	Stack	**Cluster**	PACK	Meter	Dehumi	Liquid Cooling	CO	LC				

Device Name	Fault Status	Work Status	COM Status	Voltage	Current	SOC	SOH	Max cell volt	Min cell volt	Max cell tem
Cabinet#1 Stack#1 Cluster#1	Normal	⚡ Charging	Communication Normal	802.4 V	6.2 A	99.7%	100.0%	3.346 V	3.343 V	24.0 ℃
Cabinet#1 Stack#2 Cluster#2	Normal	⊙ Standby	Communication Normal	800.0 V	-0.1 A	99.0%	100.0%	3.339 V	3.334 V	24.0 ℃
Cabinet#1 Stack#1 Cluster#3	Normal	⚡ Charging	Communication Normal	802.4 V	6.6 A	99.0%	100.0%	3.345 V	3.343 V	25.0 ℃
Cabinet#1 Stack#2 Cluster#4	Normal	⊙ Standby	Communication Normal	800.0 V	-0.1 A	99.0%	100.0%	3.339 V	3.333 V	25.0 ℃

② Display data of battery clusters, including voltage, current, temperature, and other data.
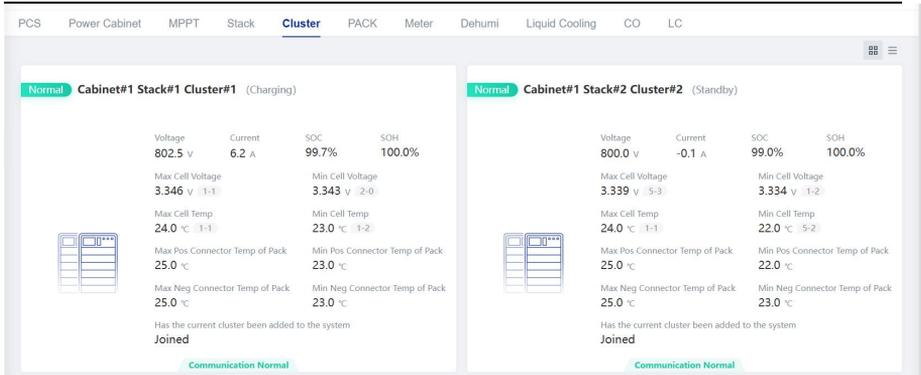
Data Item	Description
Voltage	Total voltage of the battery cluster.
Current	Charging and discharging current of the cluster.
SOC	Battery state of charge.
SOH	Battery state of health.
Max Cell Voltage	Current maximum voltage among all cells.
Min Cell Voltage	Minimum voltage among all cells.
Max Cell Temp	Maximum temperature among all battery cells.
Min Cell Temp	Minimum temperature among all battery cells.
Max/Min Pos Connector Temp of Pack	Measured temperature on the positive high voltage connector of the battery cluster.
Max/Min Neg Connector Temp of Pack	Measured temperature on the negative high voltage connector of the battery cluster.
Has the current cluster been added to the system	It indicates whether the battery cluster has been electrically connected to the system DC bus and is ready.

2. Select any battery cluster to enter the details page, which integrates and displays the core state, detailed operation data, and historical curve of the cluster. The page centrally presents all relevant alarm and fault information on the right panel.
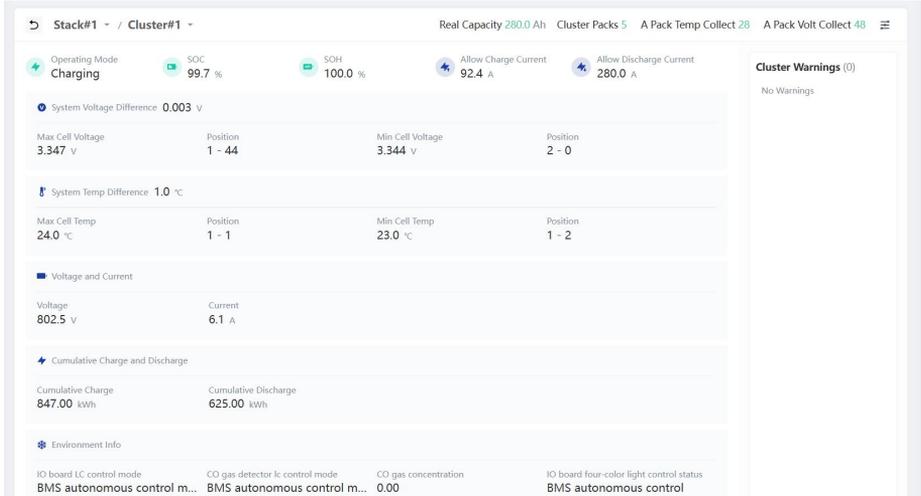
Parameter description:

Data Item	Description
Cluster Packs	Number of standard battery packs in the battery cluster.
Real Capacity	Total capacity currently available in the battery cluster.
A Pack Volt Collect	Number of cell voltage points monitored inside each pack.
A Pack Temp Collect	Number of temperature probes arranged inside each pack.

3.2.6 Pack

The battery pack interface realizes refined monitoring of the internal state of the battery system and early fault location by providing accurate data on voltage, temperature, and physical position at the cell level. This interface upgrades security management from system-level alarms to

unit-level handling that supports accurate locating. It is a key data layer supporting the energy storage power station to achieve intrinsic safety and active O&M.

1. Select Device Control in the left menu bar and then select Pack in the top navigation bar. This interface monitors the core safety parameters inside battery packs in real time. The page mainly includes the following functions:

① Select a battery cluster in a battery stack to view all relevant battery packs.

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

③ Convert the main layout from card to list. The default main layout is card.

④ Display data, including information such as the maximum cell voltage and position, the minimum cell voltage and position, the maximum cell temperature and position, and the minimum cell temperature and position.
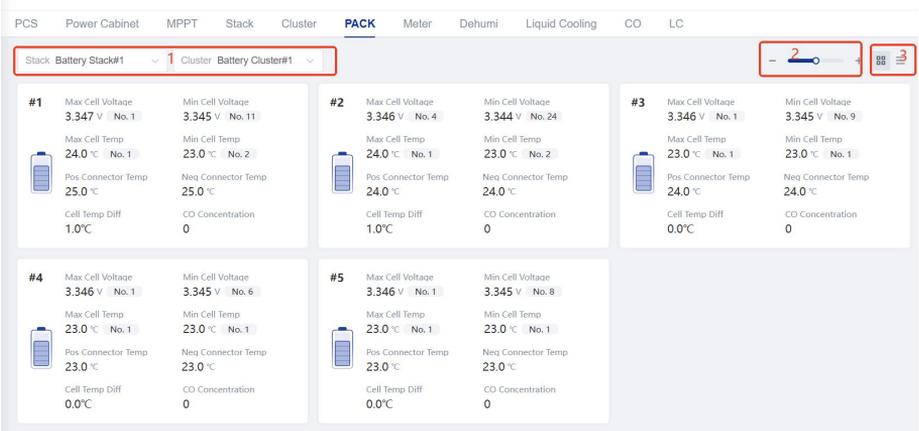
Device Name	Max Volt	Position	Min Volt	Position	Max Temp	Position	Min Temp	Position	Pos Connector Temp	Neg Connector Temp	Cell Temp Diff
Pack#1	3.348V	1	3.346V	9	24.0°C	1	23.0°C	2	25.0°C	25.0°C	1.0°C
Pack#2	3.347V	4	3.345V	23	24.0°C	1	23.0°C	2	24.0°C	24.0°C	1.0°C
Pack#3	3.347V	1	3.346V	3	23.0°C	1	23.0°C	1	24.0°C	24.0°C	0.0°C
Pack#4	3.347V	1	3.346V	5	23.0°C	1	23.0°C	1	23.0°C	23.0°C	0.0°C
Pack#5	3.347V	1	3.346V	8	23.0°C	1	23.0°C	1	23.0°C	23.0°C	0.0°C

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.

3.2.7 Meter

1. Select Device Control in the left menu bar and then select Meter in the top navigation bar. The page mainly includes the following functions:

① Convert the main layout from card to list. The default main layout is card.

Device Name	Meter Name	Fault Status	COM Status	Total Active Power	Total Apt Power	Total Reactive Power	Total Power Factor	Tota
Cabinet#1 Meter#21	Auxiliary Electricity Side	Normal	COM is Normal	248.00 W	565.00 VA	-460.00 var	0.44	1
Cabinet#1 Meter#22	Auxiliary Electricity Side	Normal	COM is Normal	218.00 W	543.00 VA	-442.00 var	0.40	

② Display data, including the total active power, total apparent power, total reactive power, total power factor, total active energy, and total reactive energy of meters in the ESS cabinet.

Normal Cabinet#1 Meter#21   Auxiliary Electricity Side   Normal Cabinet#1 Meter#22   Auxiliary Electricity Side

Total Active Power	Total Apt Power	Total Reactive Power
239.00 W	557.00 VA	-459.00 var
Total Power Factor	Total Active Energy	Total Reactive Energy
0.43	144.38 kWh	89.93 kvarh

COM is Normal

Total Active Power	Total Apt Power	Total Reactive Power
205.00 W	537.00 VA	-442.00 var
Total Power Factor	Total Active Energy	Total Reactive Energy
0.38	94.44 kWh	60.47 kvarh

COM is Normal

2. Select any meter to enter the corresponding meter details page, which mainly displays the meter state, detailed meter data, and power curves.

The detailed meter data provided by this interface is used to realize phase-by-phase power quality diagnosis, load characteristic analysis, and operation issue locating. It provides refined data support for in-depth troubleshooting of system faults and energy efficiency optimization.

↺ Meter#21 ▾ Auxiliary Electricity Side			

Fault Status
✓ Normal

COM Status
COM is Normal

▣ Energy Meter Data

Total Active Energy	Total Reactive Energy	L1 Phase Voltage	L2 Phase Voltage
144.38 kWh	89.93 kvarh	229.80 v	230.60 v
L3 Phase Voltage	L1 Current	L2 Current	L3 Current
230.60 v	1.09 A	0.74 A	0.58 A
Total Active Power	L1 Active Power	L2 Active Power	L3 Active Power
238.00 W	175.00 W	63.00 W	0.00 W
Total Apt Power	L1 Apt Power	L2 Apt Power	L3 Apt Power
557.00 VA	251.00 VA	171.00 VA	135.00 VA
Total Reactive Power	L1 Reactive Power	L2 Reactive Power	L3 Reactive Power
-459.00 var	-171.00 var	-156.00 var	-132.00 var
Total Power Factor	L1 Power Factor	L2 Power Factor	L3 Power Factor
0.43	0.70	0.37	0.00
L1-2 Line Voltage	L2-3 Line Voltage	L3-1 Line Voltage	Frequency
397.70 v	399.00 v	400.00 v	50.03 Hz

Power Curve   < 2026-02-04 📅 >

- Active Power - Reactive Power

3.2.8 Dehumidifier

The core function of the variables displayed on the dehumidifier interface is to monitor the operation state, confirm the control logic, and conduct historical data statistics and device health management for the key environmental control device dehumidifier in the ESS cabinet. This ensures that the battery storage environment is always within a safe and proper humidity and temperature range, thus preventing battery performance degradation or safety accidents caused by condensation, corrosion, or high temperature.

1. Click Dehumi to check the dehumidifier overview. The current humidity and temperature in the cabinet are displayed.

PCS	Power Cabinet	MPPT	Stack	Cluster	PACK	Meter	**Dehumi**	Liquid Cooling	CO	LC

Device Name	Fault Status	Work Status	COM Status	Current Temp	Current Humi
Cabinet#1 Dehumi#1	Normal	● Run	COM is Normal	26.40℃	28%
Cabinet#1 Dehumi#2	Normal	● Run	COM is Normal	24.20℃	31%
Cabinet#1 Dehumi#3	Normal	● Run	COM is Normal	28.50℃	25%
Cabinet#1 Dehumi#4	Normal	● Run	COM is Normal	25.30℃	30%
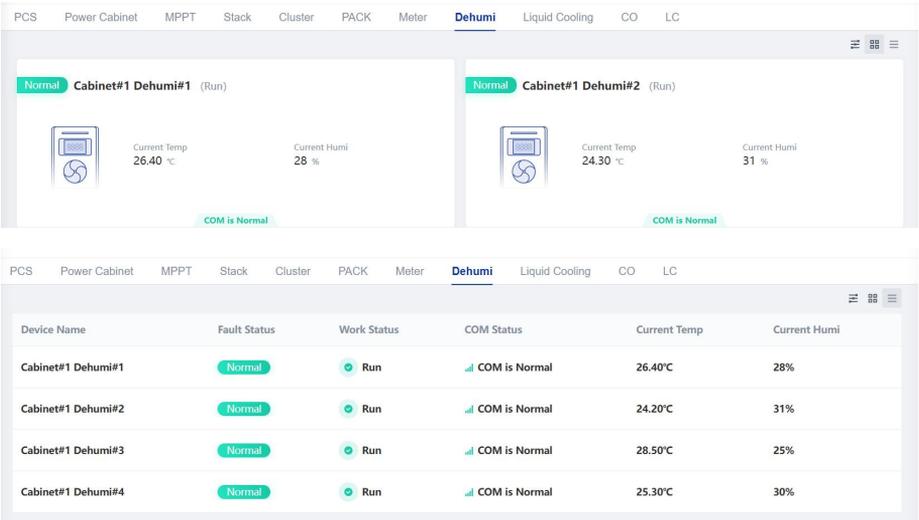
2. Switch the view and enter the password to select dehumidifiers from different manufacturers.

Dehumi Control

| Dehumi#1 | Dehumi#2 | Dehumi#3 | Dehumi#4 |

* **Supplier**

○ BRIM   ○ SANDA   ● FUXIN

Save

3. Click a dehumidifier to view detailed information. The page displays the dehumidifier state, alarm information, dehumidifier data, and parameters.

3.2.9 Liquid Cooling Unit

The liquid cooling unit monitoring interface provides core data support for accurate control, safety warning, and energy efficiency optimization of battery system thermal management by monitoring the temperature and pressure of cooling media and the working state of key actuators. This interface is a key monitoring node to ensure that the batteries work in the optimal temperature range, prevent thermal runaway risks, and improve the overall reliability of the thermal management system.

1. Click Liquid Cooling to check the liquid cooling unit overview, including the liquid supply temperature, liquid return temperature, ambient temperature, water return pressure, and fan gear.

Data Item	Description
Supply Liquid Temp	Temperature of the coolant flowing out from the liquid cooling unit and entering the battery pack cooling pipe.
Return Liquid Temp	Temperature of the coolant flowing out from the battery pack and returning to the liquid cooling unit.
Envir Temp	Air temperature in the battery compartment or device compartment.
Return Water Press	Coolant pressure in the return pipe.
Fan Gear	Speed gear of cooling fans for the external condenser of the liquid cooling unit.

2. Switch the view and enter the password to select liquid cooling units of different manufacturers/models.

3. Click a liquid cooling unit to view the detailed data of the liquid cooling unit. The page centrally displays the on/off state, operation mode, core

parameters, and currently triggered system alarms of the liquid cooling unit, which is used to fully understand the device operation state and conduct fault diagnosis.

3.2.10 CO

1. Click CO to view the carbon monoxide concentration monitored by the CO detector in the ESS cabinet.
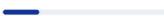

Parameter description:

Data Item	Description
CO Concentration	Real-time monitoring value: concentration of carbon monoxide in the environment currently detected by the detector.
CO Low Alarm Value	Level I alarm threshold. When the CO concentration continues to exceed this value, the system will trigger a level I alarm.
CO High Alarm Value	Level II emergency alarm threshold. When the CO concentration continues to exceed this value, the system will trigger a highest-level alarm.
CO Type	Type of gas monitored by the detector.
CO Range	Maximum measurement range of the detector.

2. Click a CO detector to view details, including the real-time operation state, key parameters, and fault information of the CO detector, which are mainly used to monitor the safety environment conditions in the ESS cabinet.
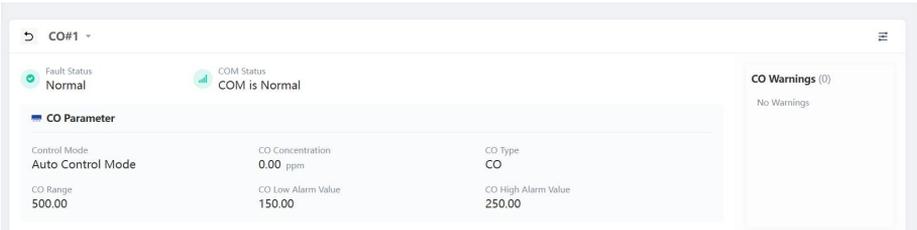

3.2.11 LC

Click LC to view its own hardware resources and operation health, including the performance resource state, storage and hardware state, system reliability indicators, and other data. A curve chart is displayed below.

3.3 Environment Monitor

The ESS cabinet power and environment monitoring interface centrally monitors and confirms the operation safety boundary, key device linkage state, and advanced control mode of the ESS cabinet. This interface displays the cabinet-level emergency response mechanism, internal device coordination logic, and system-level operation architecture. It is the basic control layer to ensure the safety of the cabinet and achieve the expected functions.
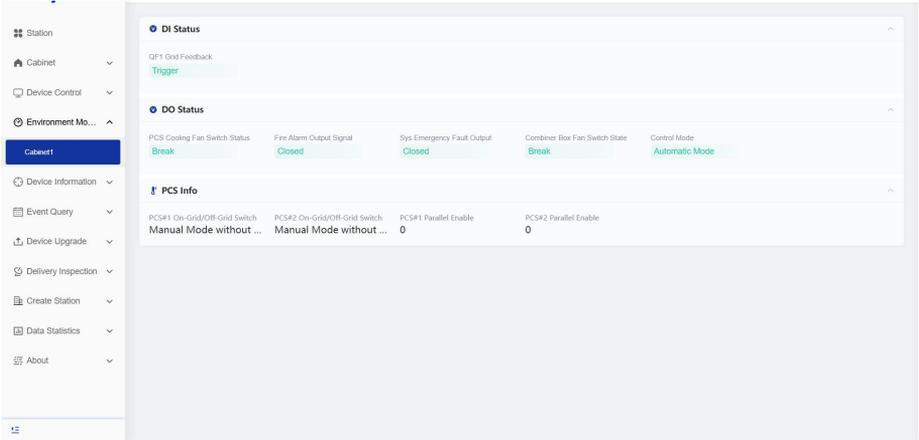
3.4 Device Information

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

Through this interface, O&M personnel can quickly confirm the device identity, verify the compatibility of software and hardware versions, and determine network addresses, which provides key information for obtaining technical support and executing software updates and system expansion. This ensures the reliable operation and refined management of the system throughout its life cycle.

Click Device Information and then select Cabinet to view the device information of the ESS cabinet, including PCS, MPPT, BMS, BMU, meter, web, LC, liquid cooling unit, dehumidifier, gas detector, IO board, and PCU information.

	PCS	MPPT	BMS	BMU	Meter	Web	LC	Liquid Cooling	Dehumi	Gas Sensor	IO Board	PCU

Manufacturer	Device Name	No	SN	IP Address	Hardware Version	Software Version	Protocol Version
Deye	PCS	1	2511191780	172.168.1.201	6012-1137	8001-C01D	263
Deye	PCS	2	2511191733	172.168.1.202	6012-1137	8001-C01D	263

Left navigation:
- Station
- Cabinet
- Device Control
- Environment Mo...
- Device Information
  - Cabinet1
- Event Query
- Device Upgrade
- Delivery Inspection
- Create Station
- Data Statistics
- About

3.5 Event Query

Users can enter this function module by clicking the "Event Query" menu in the left navigation bar of the system.

3.5.1 Activity Event

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

① Check the alarm state, description, alarm level, device type, device number, abnormal value, and creation time of ongoing alarm events.

② Search from logs according to the alarm level, device type, and device number.

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

④ Refresh the list content.
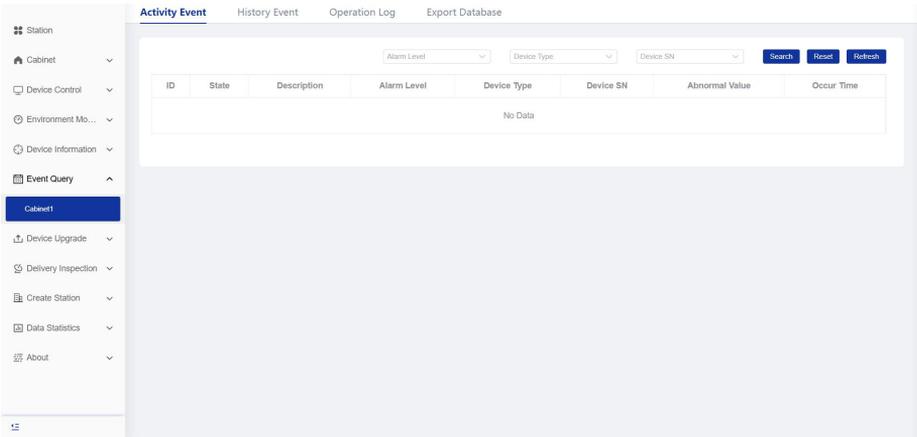
3.5.2 History Event

The History Event page displays the events that have triggered alarms in history. The page mainly includes the following functions:

① Check the alarm status, description, alarm level, device type, device number, abnormal value, creation time, and end time of historical alarm events.

② Search from logs according to the alarm level, device type, device number, and creation time.

③ Reset the alarm level, device type, device number, and creation time in the filter box.

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

| ID	State	Description	Alarm Level	Device Type	Device SN	Abnormal Value	Occur Time	End Time
1	Restore	MPPT power uncontrollable fault 16	Level 1	MPPT	1		2026-02-04 14:28:54	2026-02-04 14:30:54
2	Restore	MPPT power uncontrollable fault 16	Level 1	MPPT	1		2026-02-04 14:11:13	2026-02-04 14:13:13
3	Restore	MPPT power uncontrollable fault 16	Level 1	MPPT	1		2026-02-04 13:56:08	2026-02-04 13:58:09
4	Restore	MPPT power uncontrollable fault 16	Level 1	MPPT	1		2026-02-04 13:39:30	2026-02-04 13:41:30
5	Restore	MPPT power uncontrollable fault 16	Level 1	MPPT	2		2026-02-04 13:30:46	2026-02-04 13:32:47
6	Generate	MPPT power uncontrollable fault 16	Level 1	MPPT	1		2026-02-04 13:26:50	
7	Restore	MPPT power uncontrollable fault 16	Level 1	MPPT	2		2026-02-04 13:07:51	2026-02-04 13:09:51
8	Restore	MPPT power uncontrollable fault 16	Level 1	MPPT	1		2026-02-04 13:05:47	2026-02-04 13:07:47
9	Restore	MPPT power uncontrollable fault 16	Level 1	MPPT	2		2026-02-04 12:59:25	2026-02-04 13:01:25
10	Restore	MPPT power uncontrollable fault 16	Level 1	MPPT	1		2026-02-04 12:44:58	2026-02-04 12:46:58

3.5.3 Operation Log

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

① Check the description, creation time, username, device number, and operation type of operation log records.

② Search from logs according to the device type and creation time.

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

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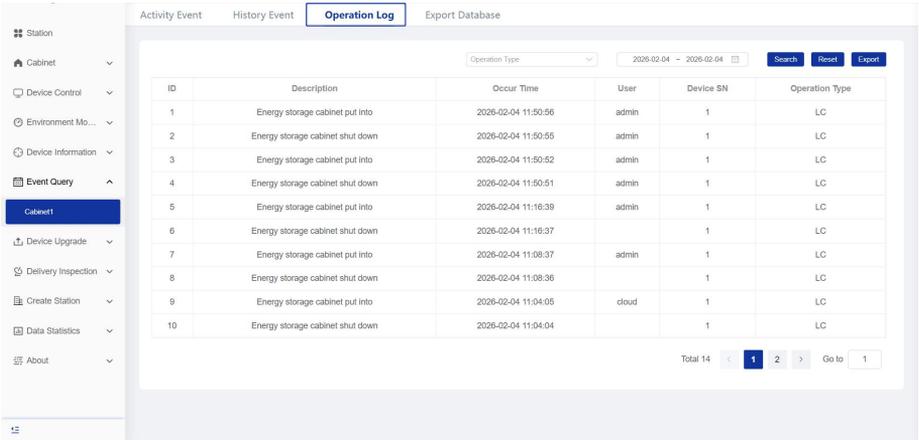
3.5.4 Export Database

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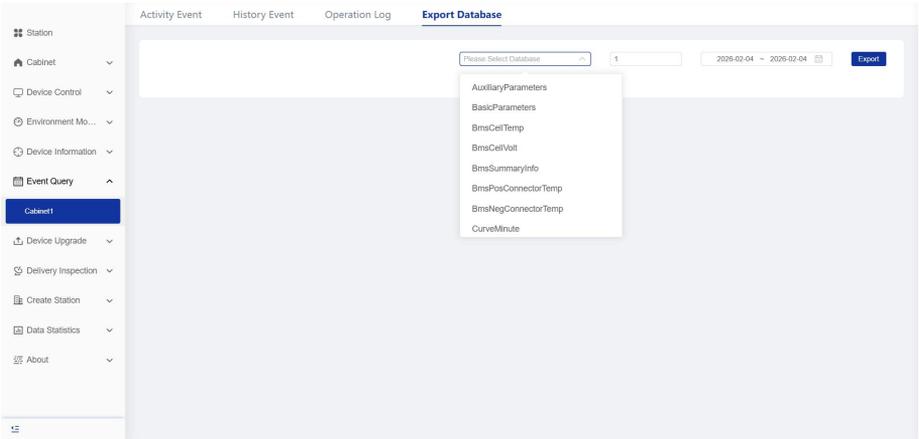

3.6 Device Upgrade

1. Upload the upgrade file.

Enter the Device Upgrade page, select the upgrade file that meets the naming convention, upload the file, and click the "Start Upgrade" button

to start the upgrade process.

2. Obtain the upgrade result feedback and query logs.

After the upgrade is completed, the system will prompt whether this upgrade is successful or has failed. Users can filter and view historical upgrade records by date range and upgrade type in the upgrade log query interface.
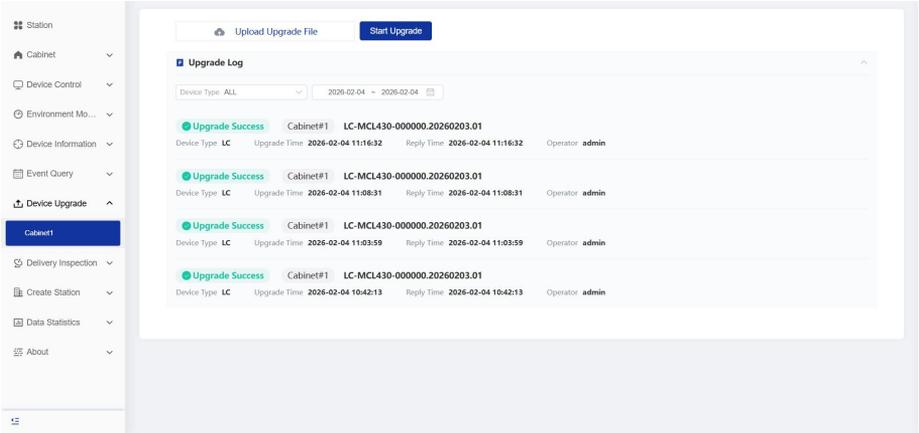
3.7 Delivery Inspection

3.7.1 Automatic inspection

The Delivery Inspection interface is a state summary platform for rapid integrity verification of the core EMS components. The interface presents the self-inspection results of modules such as system communication, PCS, battery management system, liquid cooling unit, and dehumidifier in a centralized manner in three quantitative counting forms: "normal", "warning", and "fault".

After the operator executes the inspection instruction, the system will automatically complete the state scanning and statistics of each module. When all module state counts are "normal (0)" and there are no other exception prompts, it means that the system has passed the

self-inspection and is ready for operation. If any module has any warning or fault, users need to further view the detailed logs according to the corresponding entries and contact the maintenance personnel in time for handling.
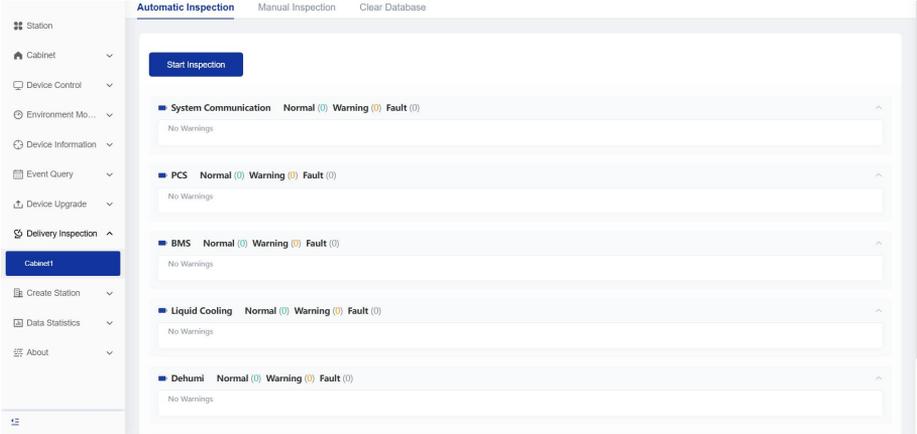

3.7.2 Manual inspection

The Manual Inspection page displays the current system DI inspection results and DO state.

The DO control mode is automatic control by default. After manual control is enabled, the state of DO can be controlled to detect whether DO is normal.
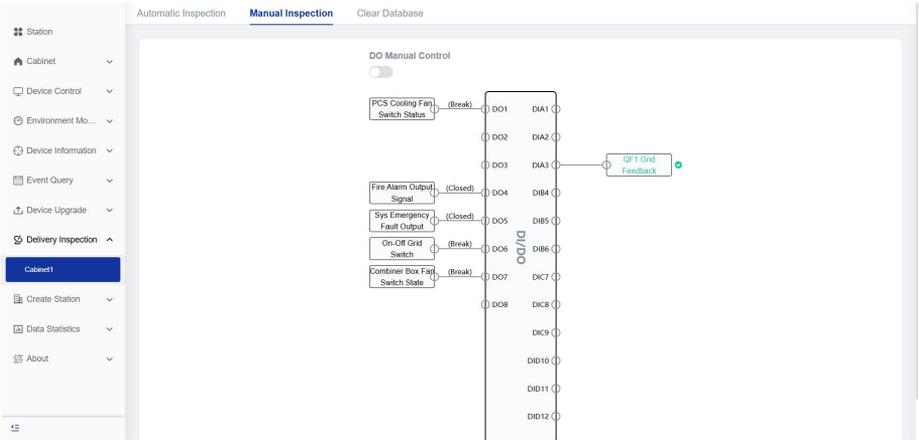
3.7.3 Clear database

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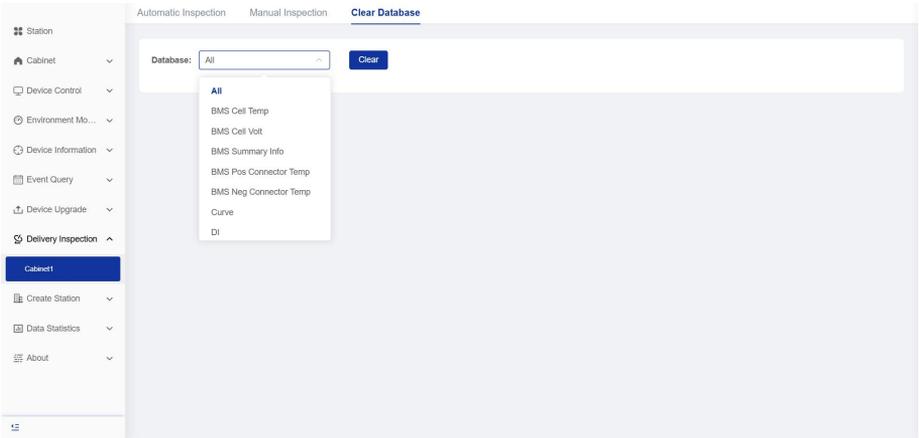
3.8 Create Station

1. Power station information configuration

When users create a power station, they need to fill in the power station

name, address, longitude, latitude, and relevant configuration parameters. The power station ID, installed power, installed capacity, and ESS cabinet S/N have been preset before delivery and cannot be modified.

2. System time settings

After completing the power station information configuration, users can set information such as the system time.


3.9 Data Statistics

The data statistics function transforms the original operation data into valuable business insights and O&M knowledge, enabling users to evaluate the past performance, optimize the present performance, and

predict the future performance. It is a core tool for realizing the refined and intelligent operation of power stations.

Operation: Click Data Statistics in the left navigation bar to view the historical operation data curves for analysis, historical charging and discharging energy for analysis, and historical fault/event analysis records of the power station and ESS cabinet.
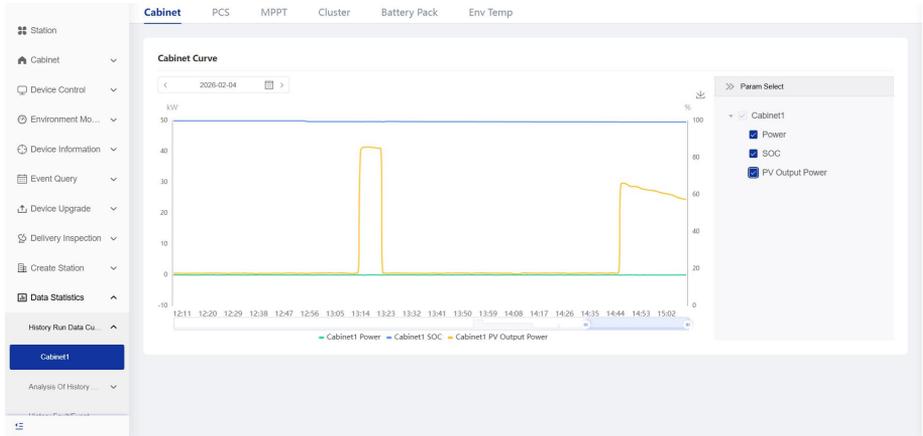
Service Hotline: +86-0574-86320560

Email: service-ess@deye.com.cn

Website: http://deyeess.com