浙江赛唯数字能源技术有限公司
ZHEJIANG SAV DIGITAL POWER TECHNOLOGIES CO.LTD

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EMS CLOUD PLATFORM
- USER MANUAL V1.0.0

浙江赛唯数字能源技术有限公司

ZHEJIANG SAV DIGITAL POWER TECHNOLOGIES CO.LTD.

Contents

I. Revision History

This document records functional changes of the SAV E-Box Commercial & Industrial Energy Storage Cloud Platform.

< 2023/10/17> / <V1.0.0>

< 2023/12/29> / <V1.0.1>

Revision History

No.	Version	Revision Date	Type	Revision Content
1	V1.0.0	2023-10-17	A	Initial version
2	V1.0.1	2023-12-29	M	Revised version

Type: A - Added, M - Modified, D - Deleted

II. Platform Overview

SAV E-Box Commercial & Industrial Energy Storage Cloud Platform

- Data visualization at station and device levels
- Centralized management of operational metrics across multiple stations
- Unified control for energy storage, PV, and charging devices
- Configurable control strategies based on different time periods, battery status, and load types
- Supports multiple operator access with complete data segregation
- Flexible generation of daily, monthly, and annual operation and profit reports
- Value extraction, AI prediction, and decision-making analysis based on big data

III. Product Functions

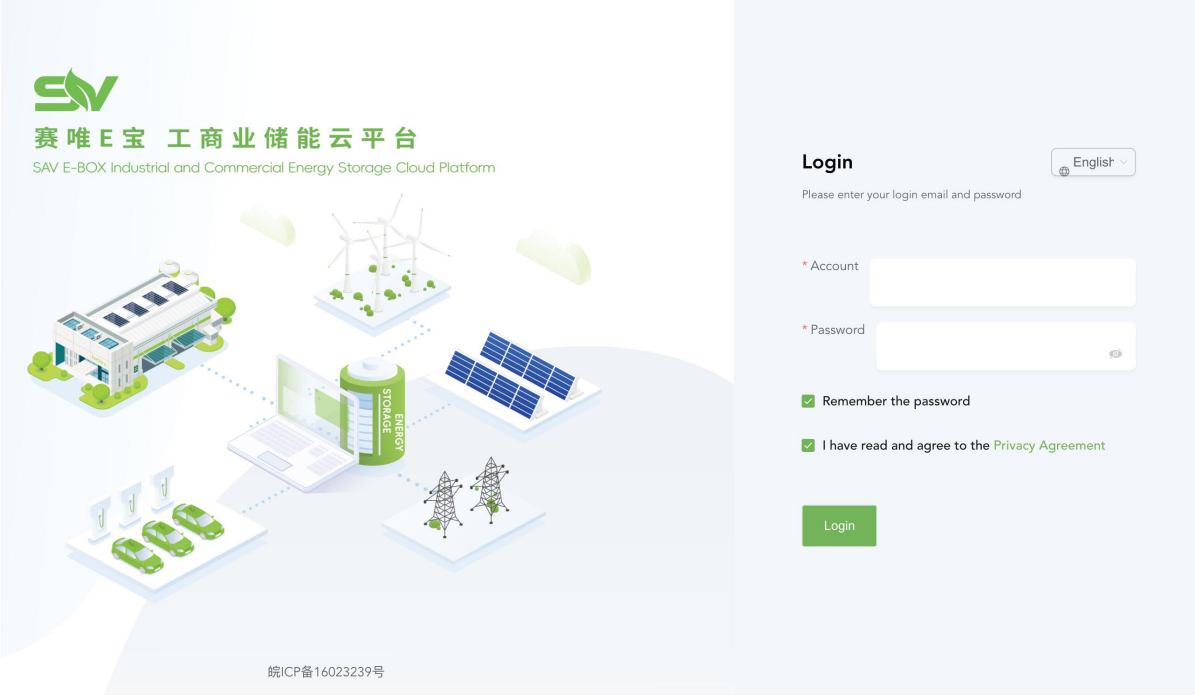
> The *SAV E-Box Commercial & Industrial Energy Storage Cloud Platform* provides various account types with different functionality scopes. This section mainly introduces features available to cloud platform administrators. For more details on account permissions, refer to *System Settings - Account Management*.

Category	Function	Description
Home	Data Dashboard	Unified display of real-time data resource status for all stations
	Multi-Station Overview	Overview of data statistics, platform trends, alarms, and station lists
Single-Station Data	Station Overview	Display single-station data overview, platform trends, station information, efficiency, discharge rate, and system list
	Station System	Real-time station data overview, energy flow chart, power trend, alarm status, equipment operation trend, revenue
	Device Monitoring	Display real-time data of linked devices, with device types and quantities based on project configuration
	Fault Alarms	Monitor equipment status, displaying related fault information in case of malfunctions
	Electricity Price Management	Configure and manage station electricity pricing strategies
Statistics Reports	Energy Report	System operation data for energy usage
	Profit Report	System operation data for revenue
Operation & Maintenance Management	Work Order Management	Targeted management and tracking of work orders based on customer needs
System Management	Station Management	Tools for managing and maintaining stations within the energy storage system
	Public Templates	Company-wide templates accessible to all accounts on the cloud platform
	Account Management	Creating, managing, and maintaining user accounts on the platform
	System Management	Adding, assigning, and managing the EMS system

3.1 Login

1 Open the platform URL in a browser: https://sav.iesscloud.com/#/login. Chrome is recommended. Enter the username and password to log in.

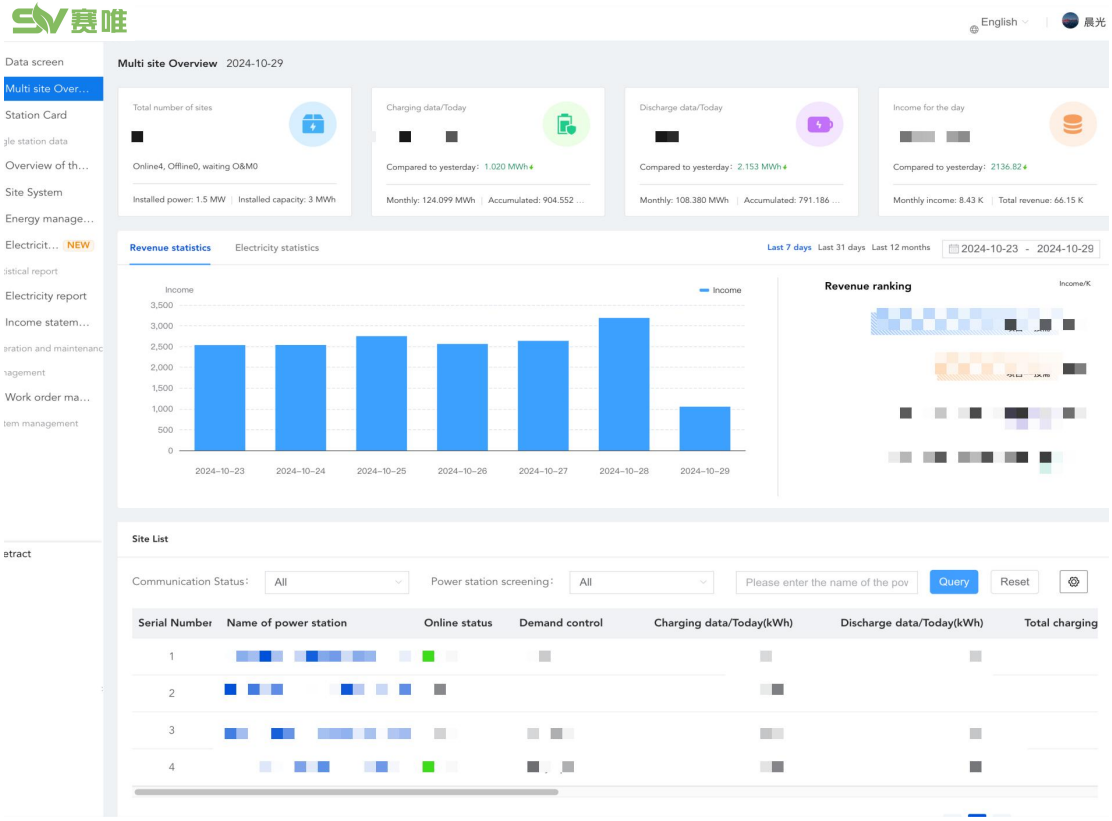
- To create a new account, the platform administrator should navigate to System Management -> Account Settings.



3.2 Multi-Station Overview

3.2.1 Overview

Upon logging into the EMS Cloud Platform, the Multi-Station Overview page appears as the default home page, as shown in the image below:



Multi-Station Overview displays data statistics, platform trends, alarms, and station lists in a card layout.

- Every login or refresh fetches the latest data for real-time display.
- The platform default is to display data from stations managed by the current account.
- Status graphs use a color code: green for normal, red for abnormal, and gray for other states, enabling quick status identification.
- New stations can be added from this page.
- The station list supports filtering, exporting, and custom display fields, with station names clickable to navigate to single-station data.

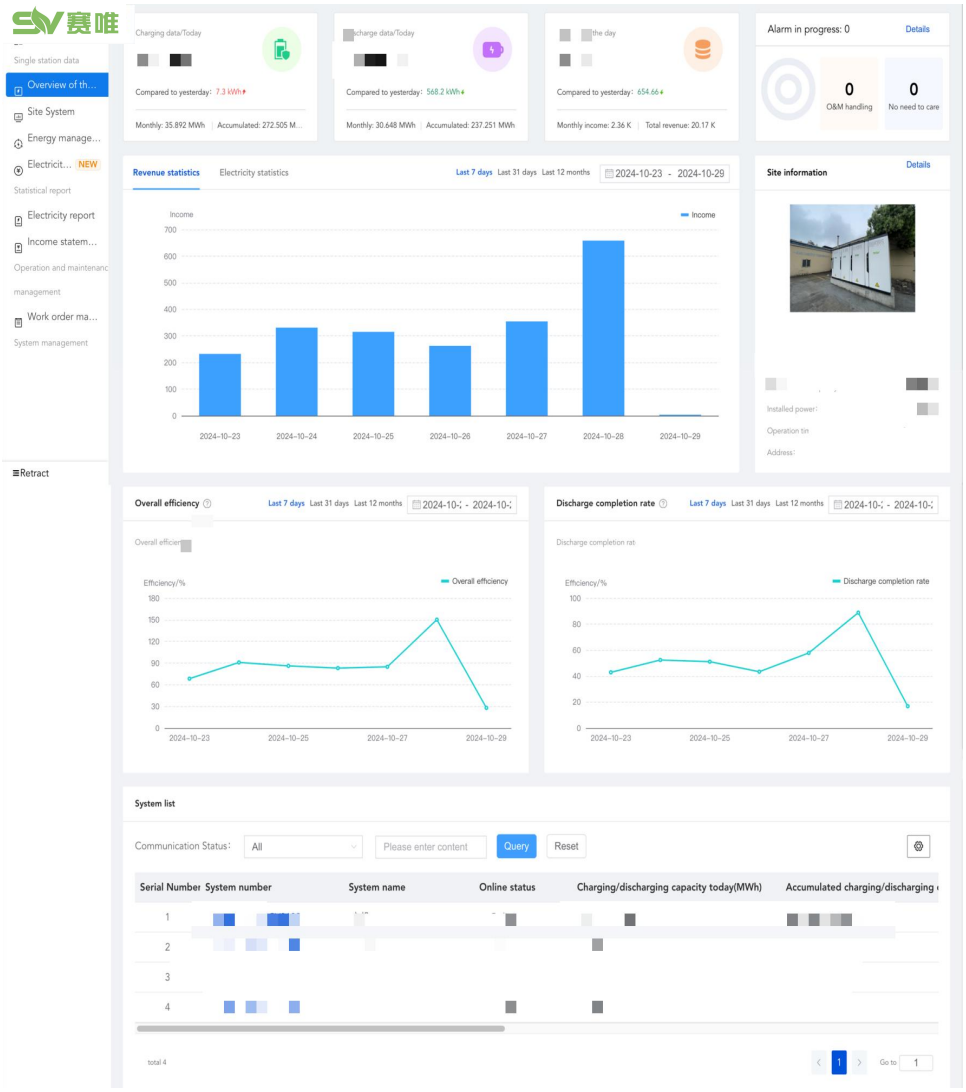
3.3 Single-Station Data

Overview: Single-Station Data provides insights per station, showing overview data, system data, device monitoring, fault alarms, and pricing information.

- The platform default is to display data from stations managed by the current account, with the option to switch between stations.

3.3.1 Station Overview

- Station Overview displays data overview, platform trends, station information, efficiency (charge/discharge ratio), discharge achievement rate (discharge/capacity), and system list for a single station in a card layout.
- New stations can be added from this page.
- System lists can be filtered, exported, and have customized display fields, with system names clickable to navigate to the corresponding station system page.

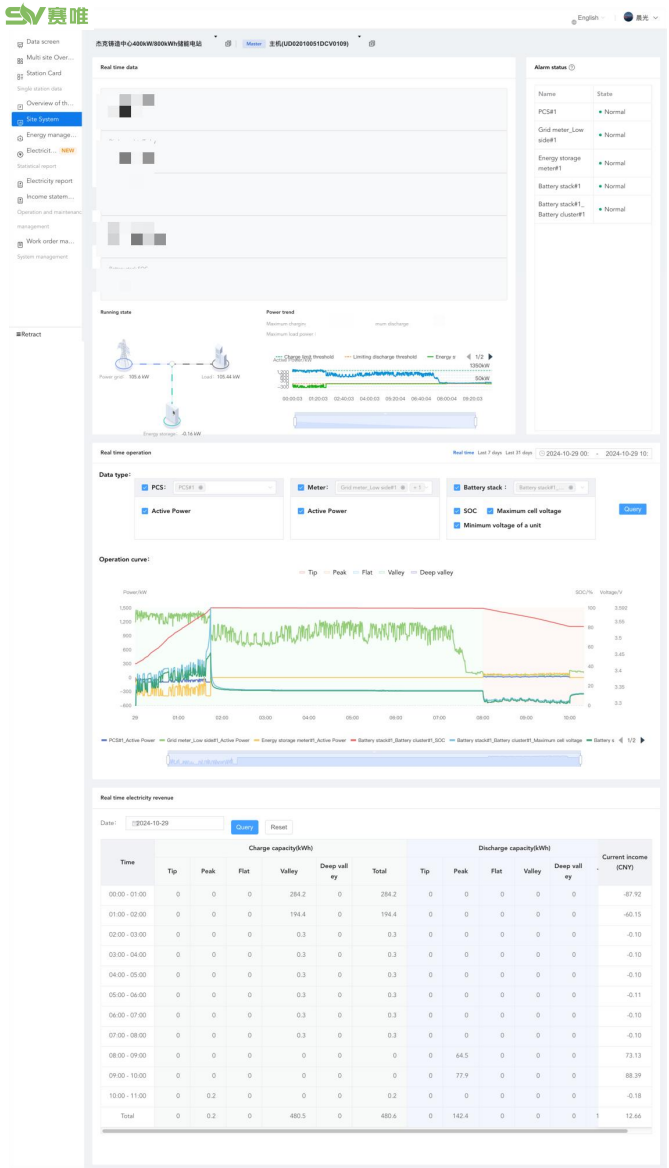


3.2 Station System

3.2.1 Overview

The Station System page displays a real-time data overview, including an energy flow diagram, power data trends, alarm status, equipment operational trends, and real-time power revenue, all in a card layout.

- Users can perform "Energy Management" operations for individual systems directly from this page.
- Real-time power revenue is updated hourly.

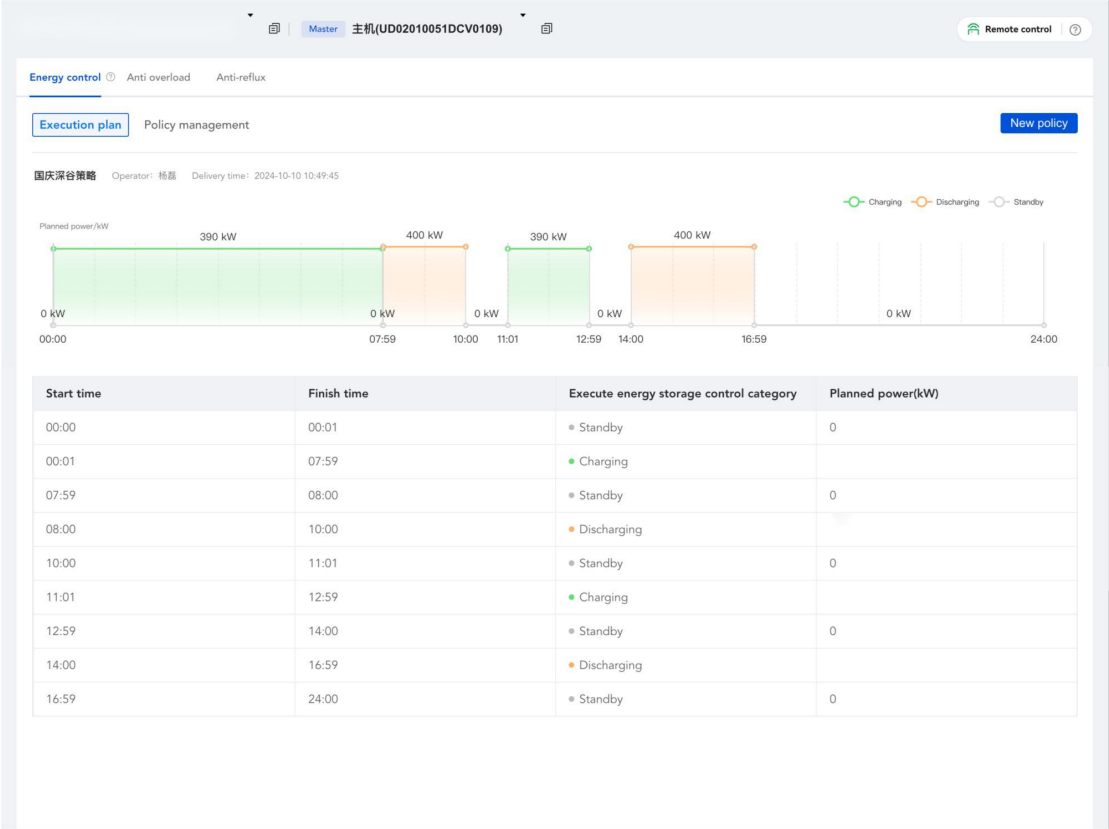


3.2.2 Energy Management

Energy Management enables energy scheduling functions, allowing for strategic energy distribution and utilization based on energy demand changes. This helps avoid prolonged overload or excessive discharge of energy storage devices.

Energy Control:

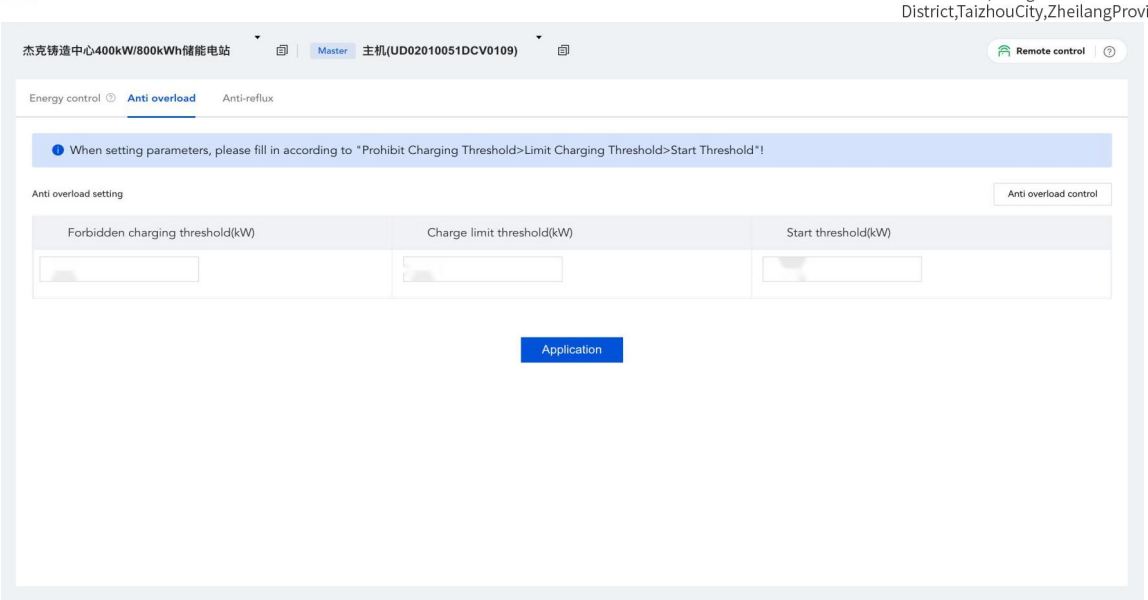
- By setting parameters like start time, end time, storage control type, and planned power parameters, users can enable charge/discharge control capabilities by sending these to the EMS.



Start time	Finish time	Execute energy storage control category	Planned power(kW)
00:00	00:01	Standby	0
00:01	07:59	Charging	
07:59	08:00	Standby	0
08:00	10:00	Discharging	
10:00	11:01	Standby	0
11:01	12:59	Charging	
12:59	14:00	Standby	0
14:00	16:59	Discharging	
16:59	24:00	Standby	0

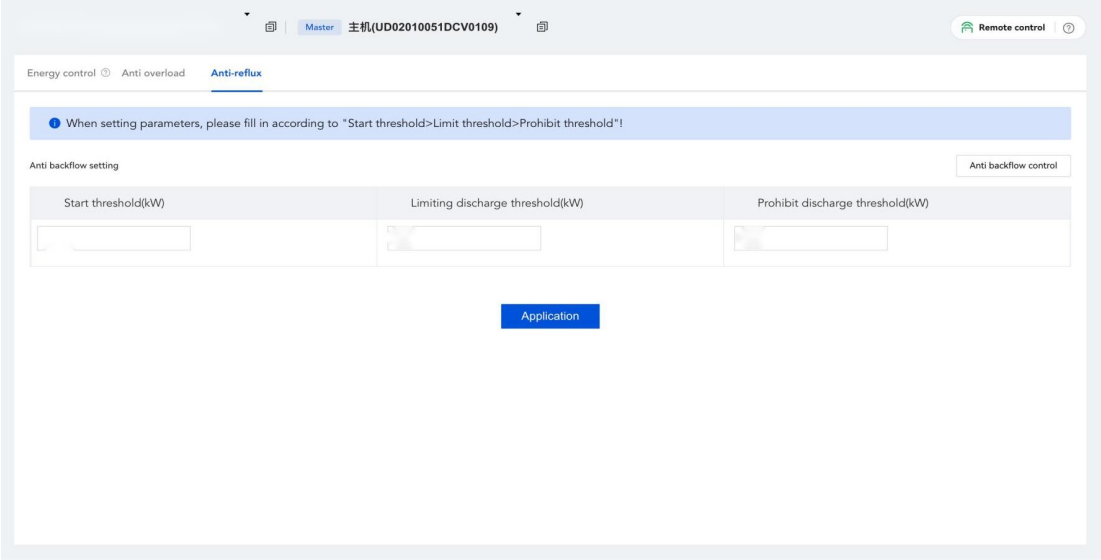
Overload Prevention:

- During charging, the system monitors grid connection point power in real-time and adjusts storage charging power based on set parameters to prevent overloads.
- This is achieved by setting charge limit, start, and prohibit charging thresholds, which are then sent to the EMS.



Anti-Backflow:

- During discharging, the system monitors the grid connection point power in real-time and adjusts storage discharge power based on set parameters to prevent power from flowing back to the grid.
- This is implemented by setting discharge limit, start, and prohibit discharge thresholds and sending these to the EMS.



Manual Control:

- Manual Control allows users to switch between manual and automatic modes for testing EMS equipment.
- **Manual Mode:** Users control charging/discharging, power, and standby operations independently, unaffected by energy control strategies.
- **Automatic Mode:** The system operates automatically based on energy control strategies.

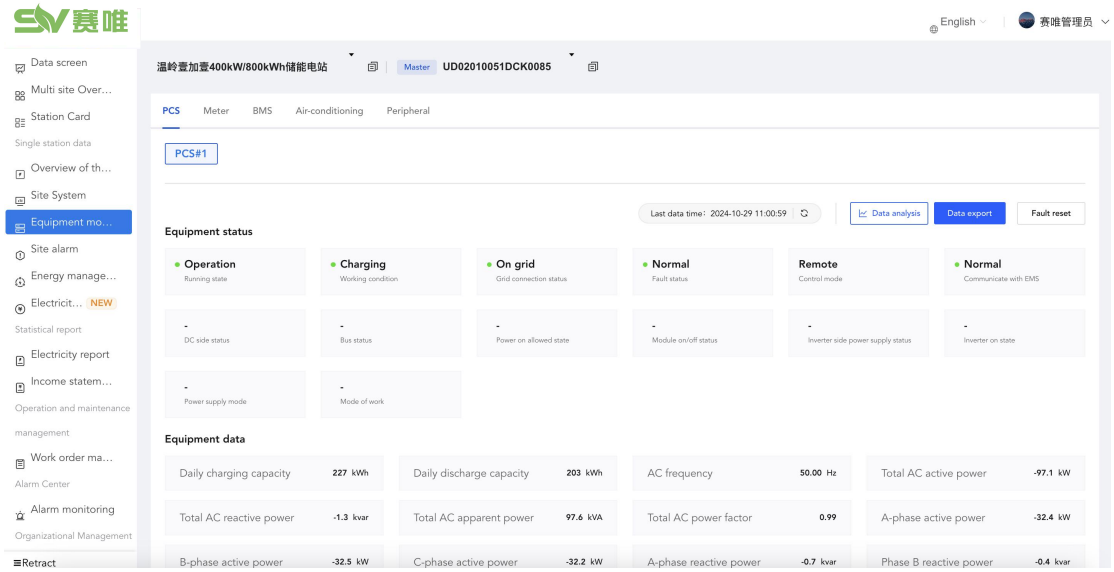
Secondary Protection:

Secondary Protection provides additional parameters to further safeguard and control the battery, ensuring the safe, reliable, and efficient operation of the entire battery storage unit.

3.3 Equipment Monitoring

Displays real-time data for the devices associated with the system and configure specific device types and quantities according to actual projects.

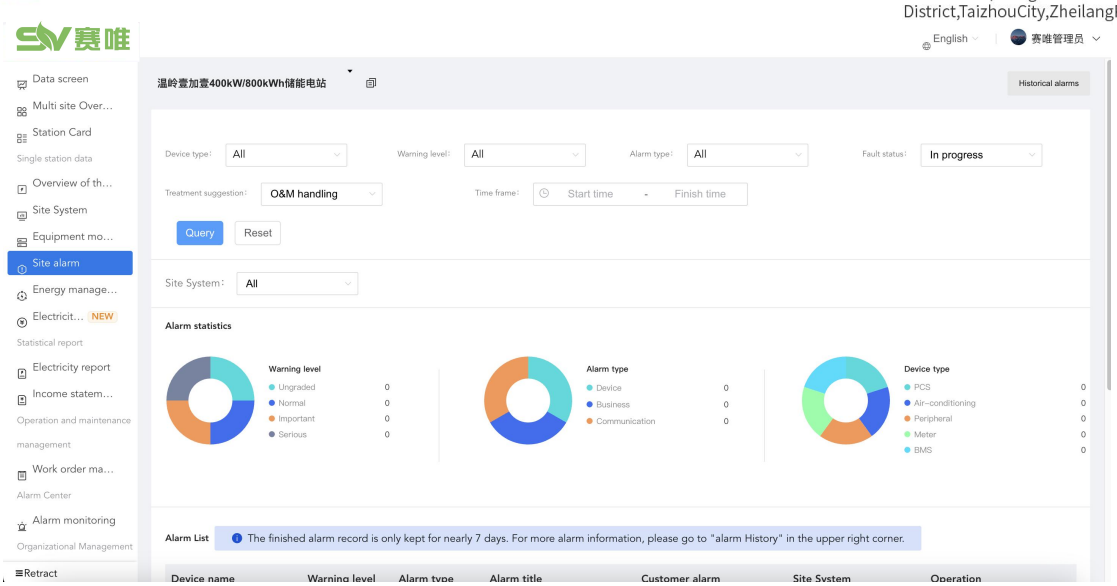
- It supports switching between different types of devices and multiple devices.
- Device Data: Displays device status, real-time device data, and device fault codes, with control capabilities supported based on device types.



3.4 Fault Alert

The Fault Alert feature provides real-time monitoring of device status and operation. When a device encounters an anomaly or fault, relevant information is displayed immediately.

- The page includes a circular chart that displays "Today's Alerts," "Alert Levels," and "Device Types."
- A fault statistics list allows filtered queries based on various conditions.

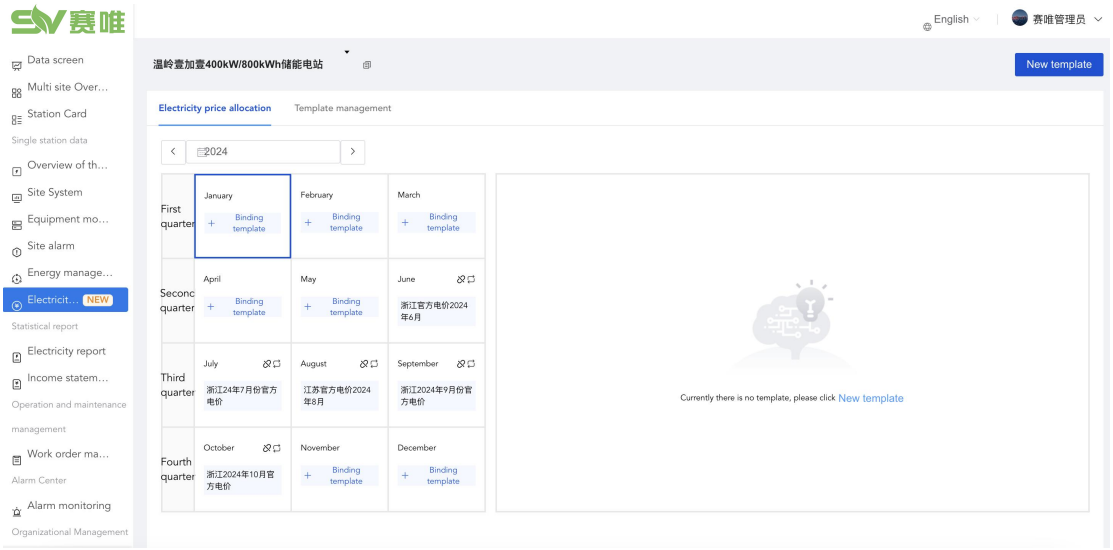


3.5 Electricity Price Management

The Electricity Price Management function primarily involves configuring and managing the electricity price strategies for power stations.

3.5.1 Electricity Price Configuration

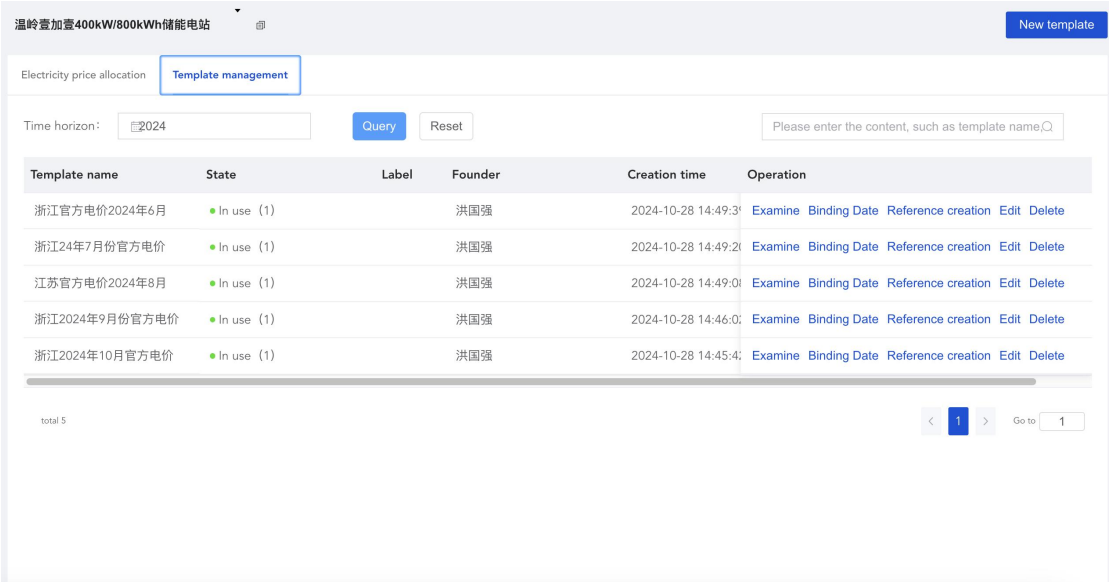
- • It supports configuring electricity prices at the power station level and on a monthly basis.



• Click on the selection box under the month and choose an electricity price template. After making your selection, click "Bind" to complete the binding of the electricity

price template. (Electricity price templates are created in Template Management.)

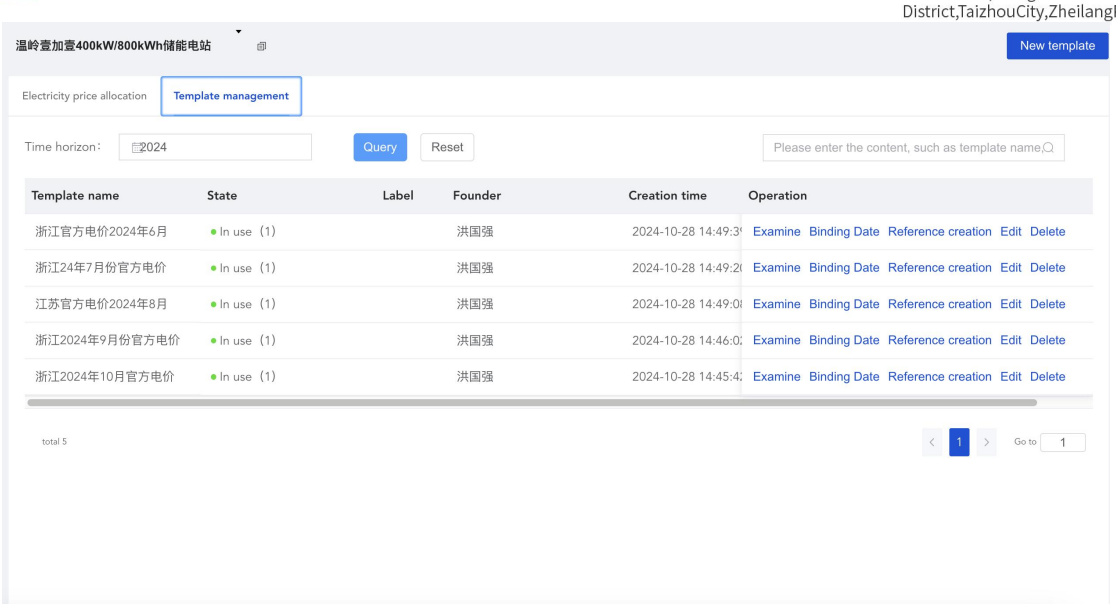
- It supports viewing the details of the already bound electricity price templates.



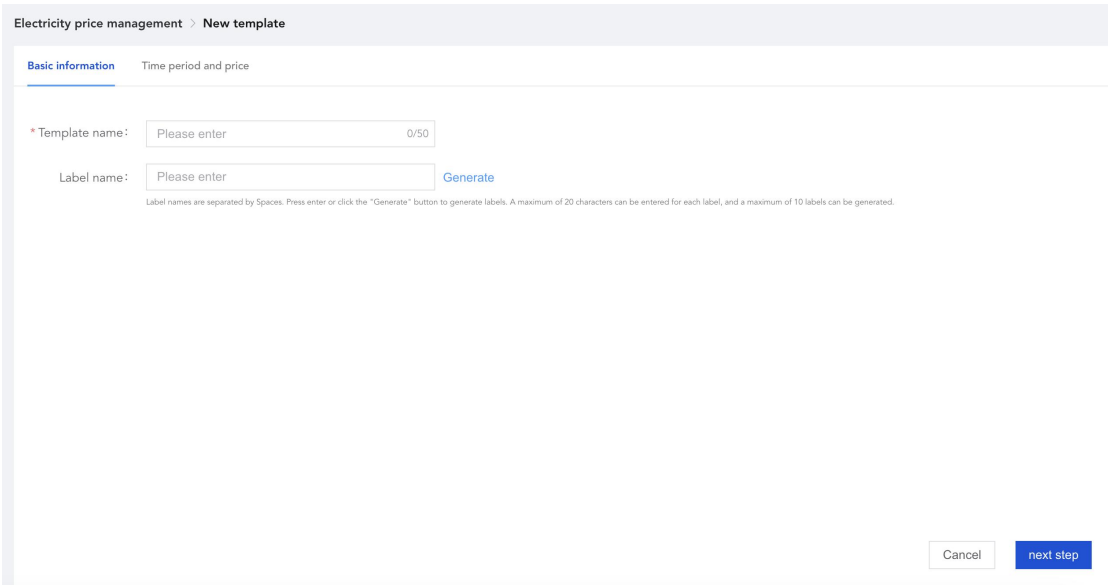
If a user modifies the electricity price template that is already in use, the platform data will not change immediately.
The recalculation will take place around 1:00 AM the day after the modification.

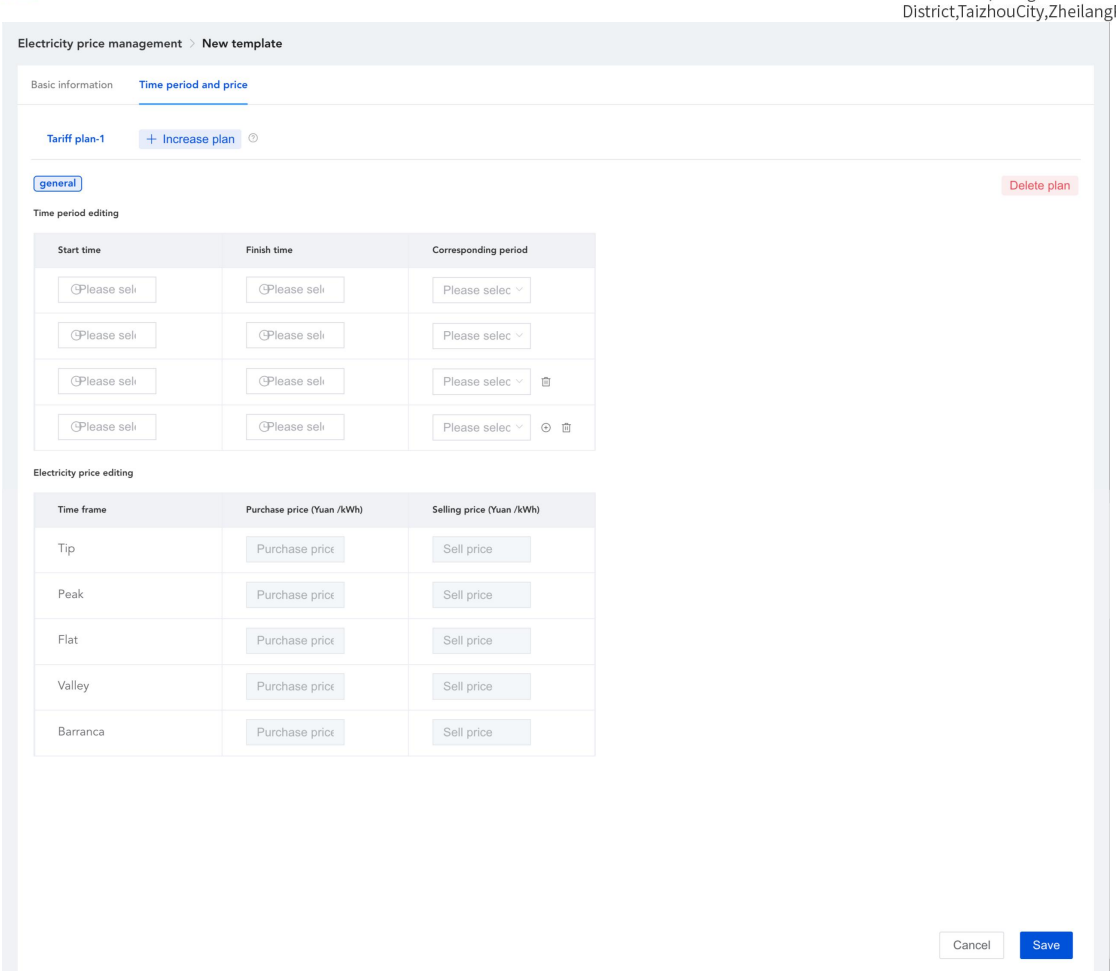
3.5.2 Template Management

The Template Management page allows for the management of electricity price templates under the current power station. It supports the creation of new electricity price templates, referencing existing templates, displaying templates list, and performing corresponding operations.



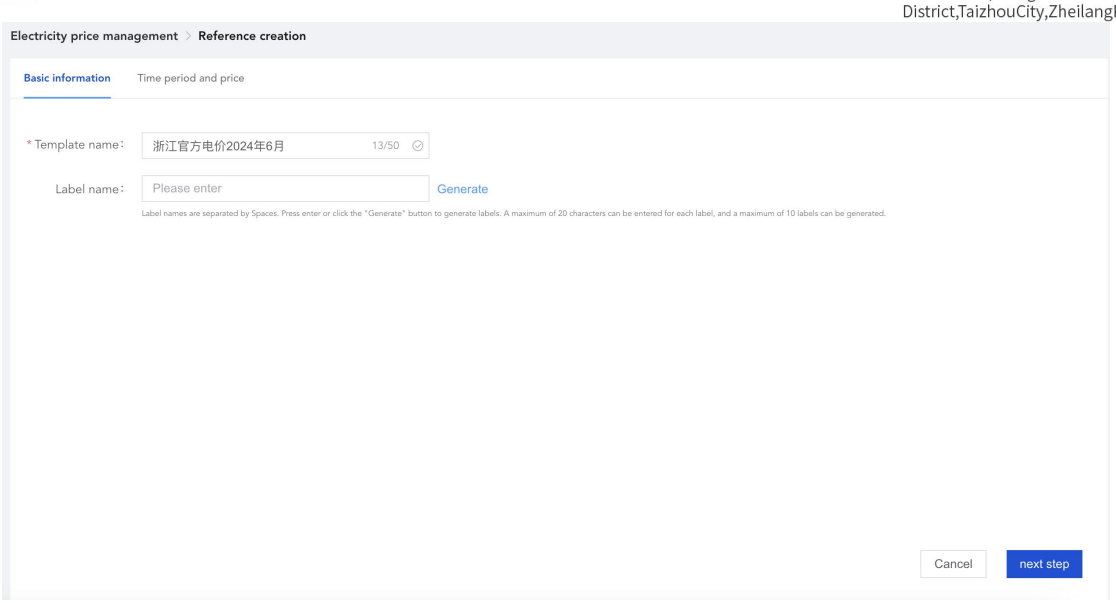
- Create a Template: To create a new electricity price template under the current power station. Click the "Create Template" on the page to access the creation page.
- After filling in the basic information, time periods, and electricity prices in sequence, click "Confirm and Add" to create the template.





Time Periods and Electricity Prices: The set start and end times must total 24 hours.

- Reference-Based Template Creation: When creating a new template, you can quickly do so by basing it on an existing (old) template.
- Operation Steps:Click the "Reference Creation" on the page and turn to the public template library page. Select the corresponding template and click the "Confirm Reference" to add the selected template to the template management list under your power station.

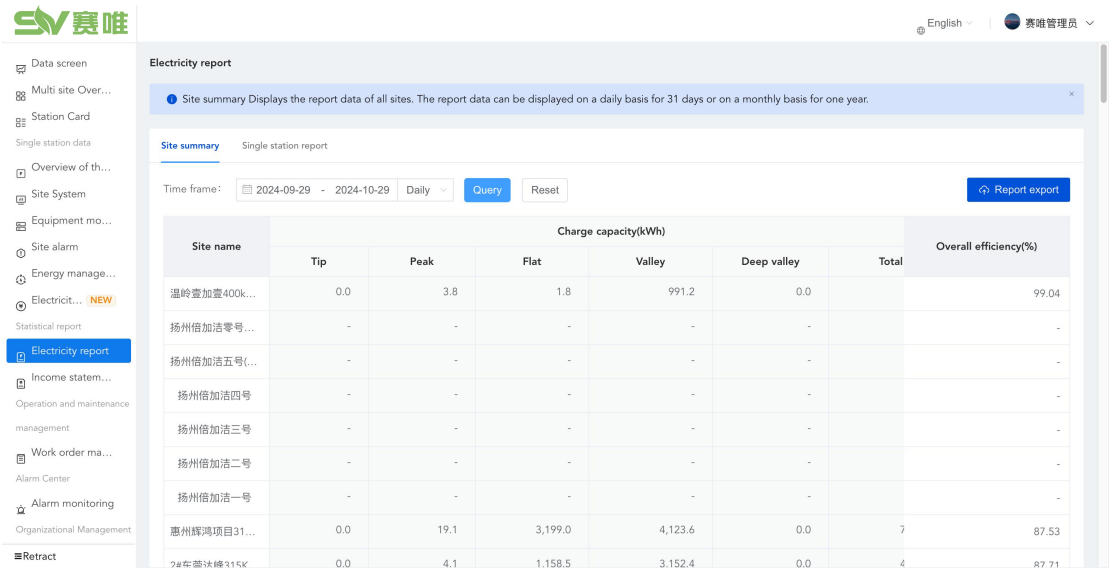

Electricity price management
Reference creation
Basic information
Time period and price
* Template name:
浙江官方电价2024年6月
13/50
Label name:
Please enter
Generate
Label names are separated by Spaces. Press enter or click the "Generate" button to generate labels. A maximum of 20 characters can be entered for each label, and a maximum of 10 labels can be generated.
Cancel
next step

4. Statistical Reporting

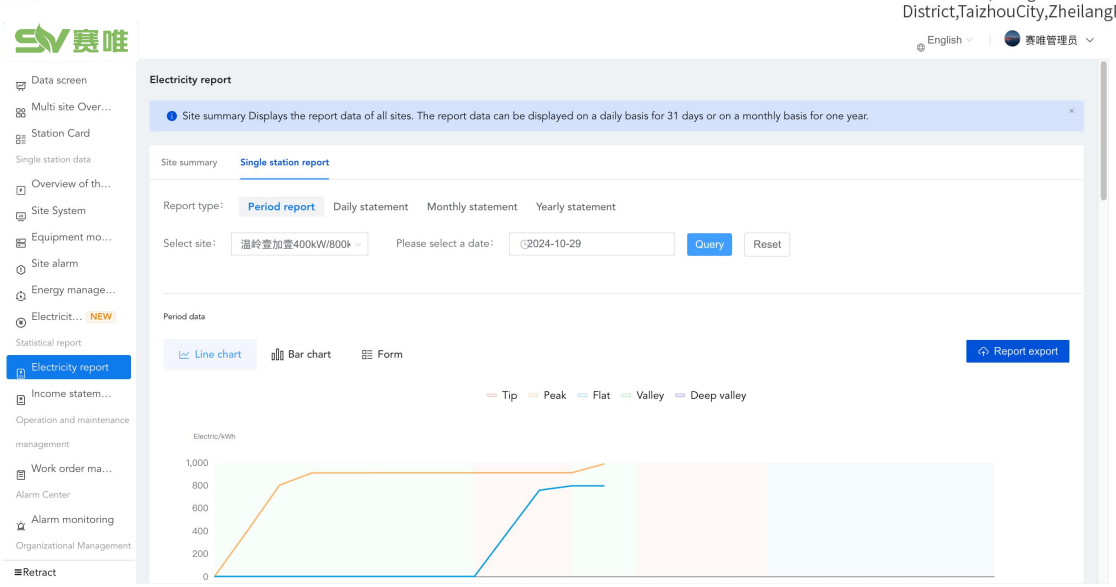
The Statistical Reporting function serves as a display of operational data for the cloud platform system. It provides a centralized reflection of key information such as electricity consumption and revenue, offering comprehensive data support for energy storage management and operations. Users can gain a more intuitive understanding of the system's operational status, formulate reasonable charging and discharging strategies, and improve the efficiency and economy of the energy storage system.

4.1 Electricity Report

- By default, it displays the "Station Summary," which includes charging volume, discharging volume, and overall efficiency data for all power stations managed under the current account.
- It supports filtering by time range (daily, monthly, yearly) with a report export function.

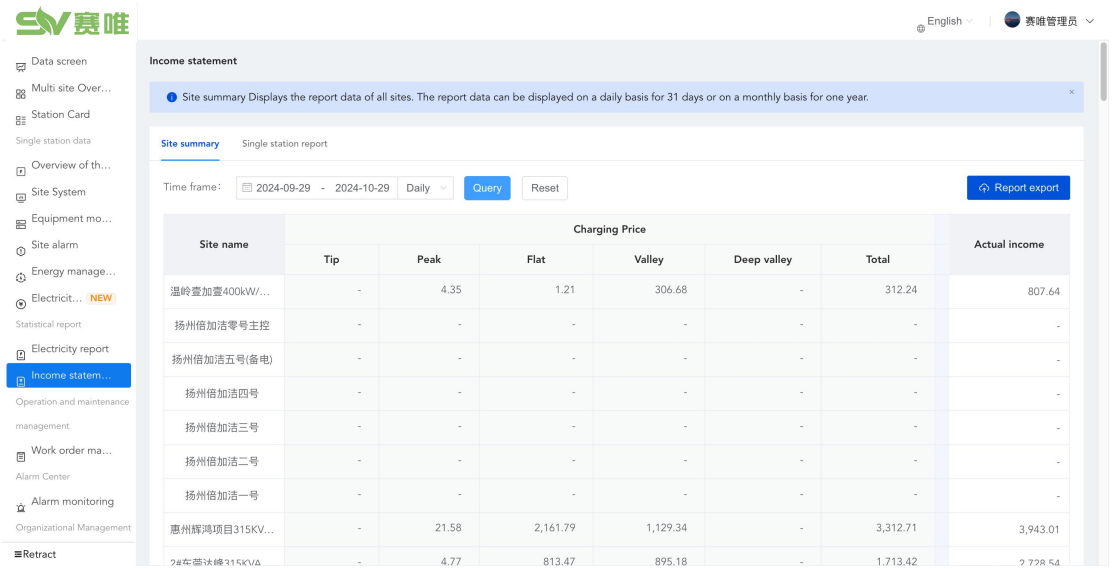


- Single-Station Report: it allows for viewing the charging volume, discharging volume, and overall efficiency data for a single power station managed under the current account.
- It supports switching between different report types (daily, monthly, yearly reports), selecting specific stations, filtering queries by time range, and exporting reports.

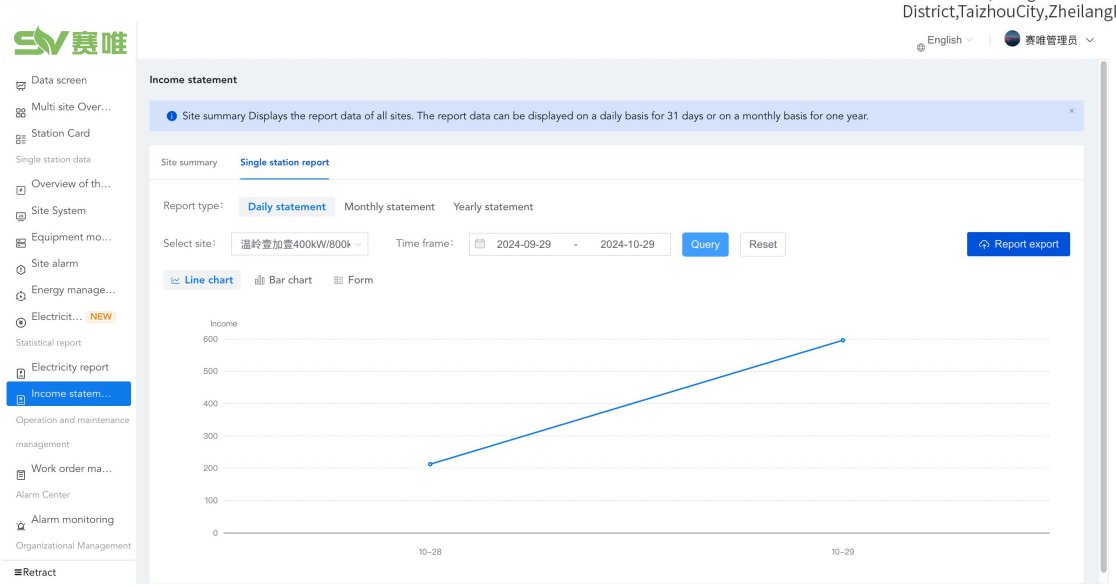


4.2 Revenue Report

- By default, it displays the "Station Summary," which includes charging prices, discharging prices, and time-based revenue amounts for all power stations managed under the current account.
- It supports filtering by time range (daily, monthly, yearly) with a report export function.



- Single-Station Revenue Report: it allows for viewing the charging prices, discharging prices, and time-based revenue amounts for a single power station managed under the current account.
- Supports switching between different report types (daily, monthly, yearly reports), selecting specific stations, filtering queries by time range, and exporting reports.


English
赛唯管理员
Data screen
Multi site Over...
Station Card
Single station data
Overview of th...
Site System
Equipment mo...
Site alarm
Energy manage...
Electricit... NEW
Statistical report
Electricity report
Income statem...
Operation and maintenance management
Work order ma...
Alarm Center
Alarm monitoring
Organizational Management
Retract
Income statement
Site summary Displays the report data of all sites. The report data can be displayed on a daily basis for 31 days or on a monthly basis for one year.
Site summary
Single station report
Report type:
Daily statement
Monthly statement
Yearly statement
Select site:
温岭壹加壹400kW/800k
Time frame:
2024-09-29
2024-10-29
Query
Reset
Report export
Line chart
Bar chart
Form
Income
600
500
400
300
200
100
0
10-28
10-29

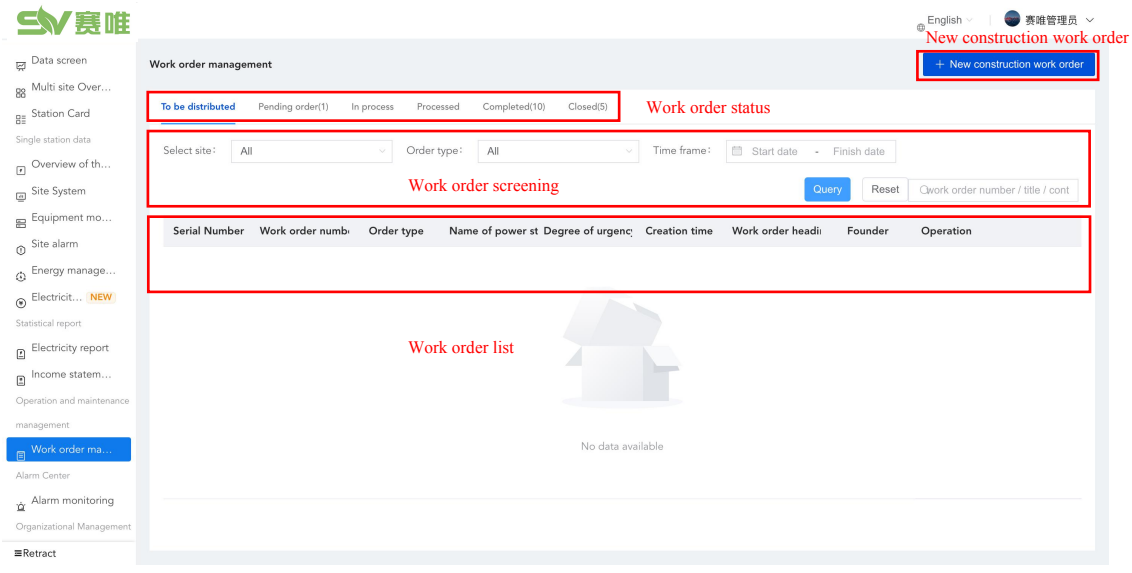
5. Operation and Maintenance Management

5.1 Work Order Management

Work order management is a function that allows for targeted management, maintenance, and tracking of a series of issues and requests related to power station work orders based on the needs of different customers.

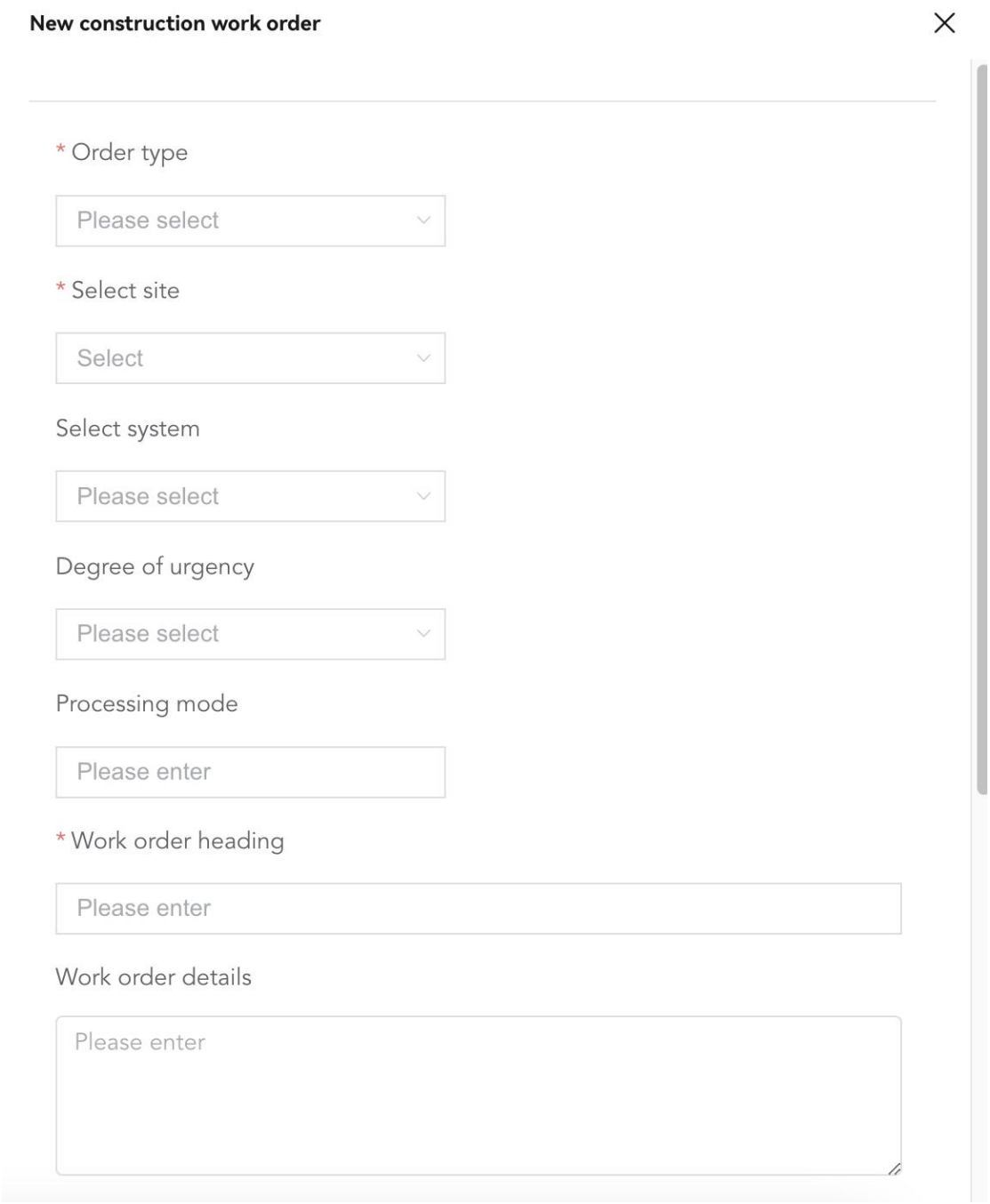
- Work Order Management Overview

Sub-functions	Function Description
Create Work Order	Users with new work order creation permissions can create work orders. Upon completion, the work order will enter the “Pending Assignment.”
Work Order Status	Display corresponding work order data based on different work order statuses.
Work Order List	Display fields and operations for work orders in different statuses in a list format.
Work Order Filter	Use filter conditions to query the work order list and display the corresponding results.
Work Order Operation	Perform corresponding operations on each work order.

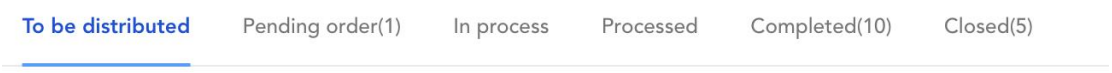


Function Description

- Create New work orders: work orders are created by administrators. Then, they are displayed on the "Pending Assignment" page, where administrators will allocate them.

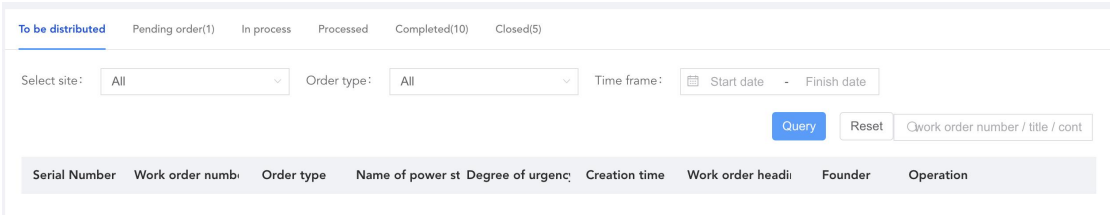


- Work Order Status: Work order management is categorized into the following statuses: "Pending Assignment," "Pending Acceptance," "Processing," "Processed," "Completed," and "Closed."



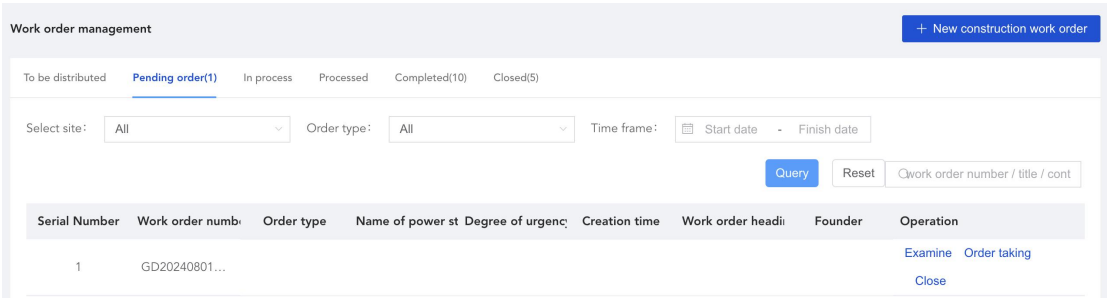
- Pending Assignment： the status means work orders that have been newly created are awaiting assignment to other personnel.
- Pending Acceptance： the status means a work order has already been assigned and is waiting for the handler to accept.
- Processing： the status means the work order is in progress, being handled by the assigned person。
- Processed： the status means operation and maintenance have been completed and is awaiting confirmation by the administrator.
- Completed: the status means a work order has had its processing procedure confirmed.
- Closed： the status means a work order was directly closed by the creator (work orders that are in a status prior to "Processed" are eligible for closure).

- Work Order Filter： the status means the filtering and querying based on work order statuses (fuzzy search supports work order numbers, titles, and contents).



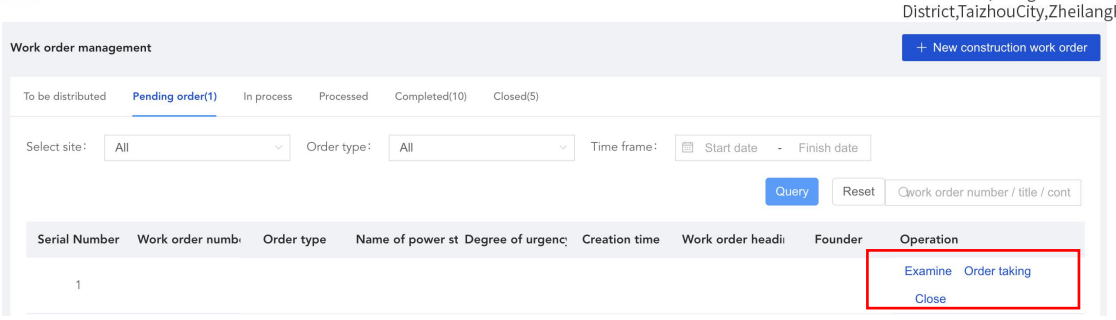
Example: Filter to be assigned

- Work Order List： the status means a list displaying the corresponding fields for each work order status (displayed according to permissions):



Example: Filter to be assigned

- Work Order Operation： the status means the process of handling and resolving work order tasks (operations are defined based on work order status and role permissions).



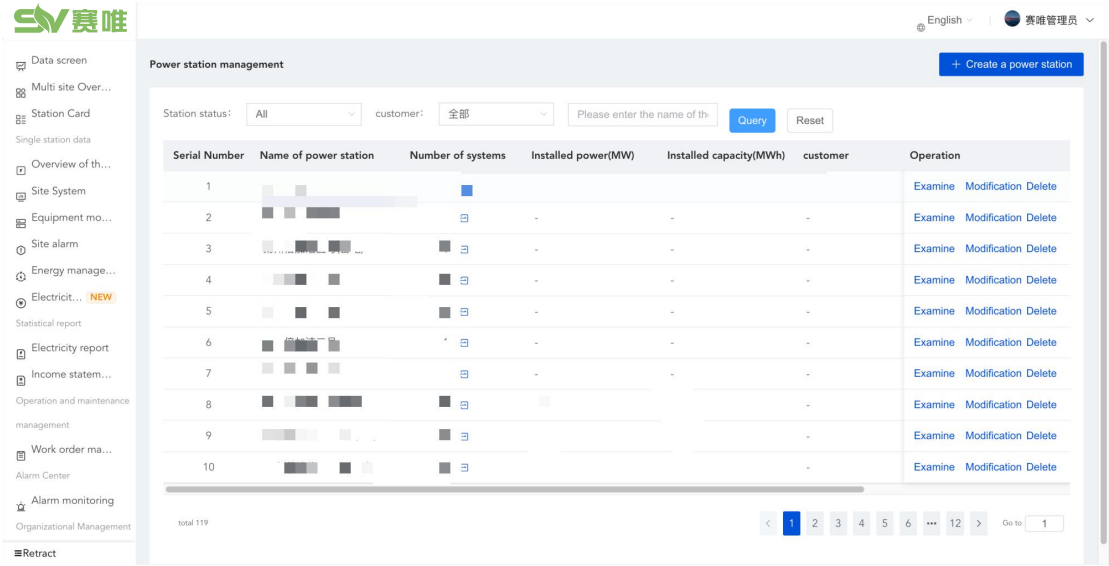
For example： perform a work order task to be assigned

6. System Management

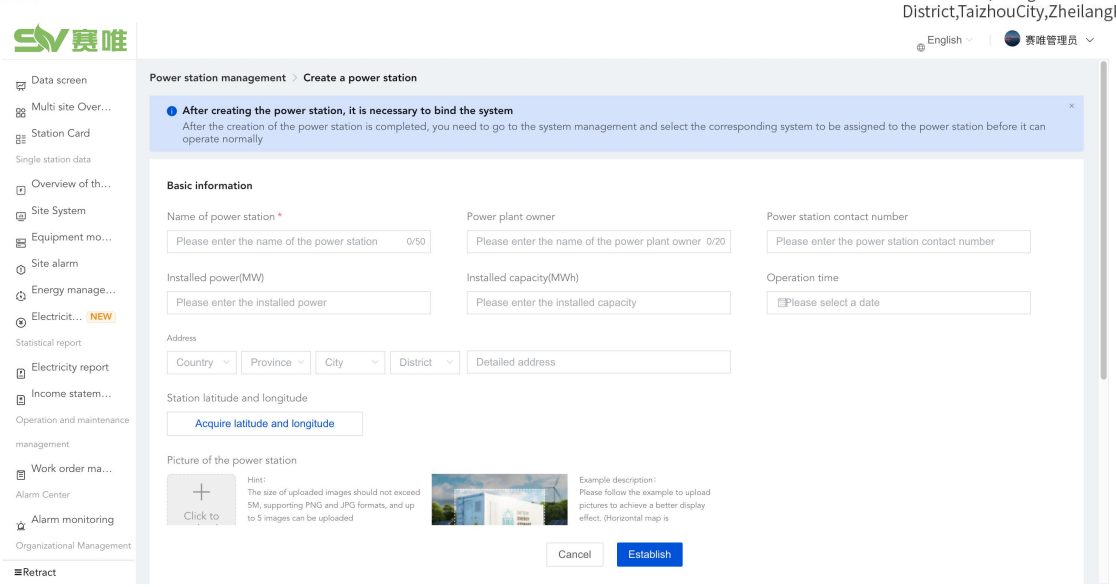
6.1 Power Station Management

The power station management function in the cloud platform is a tool designed for the management and maintenance of power stations within energy storage systems.

- It supports viewing and managing power stations under the current account.

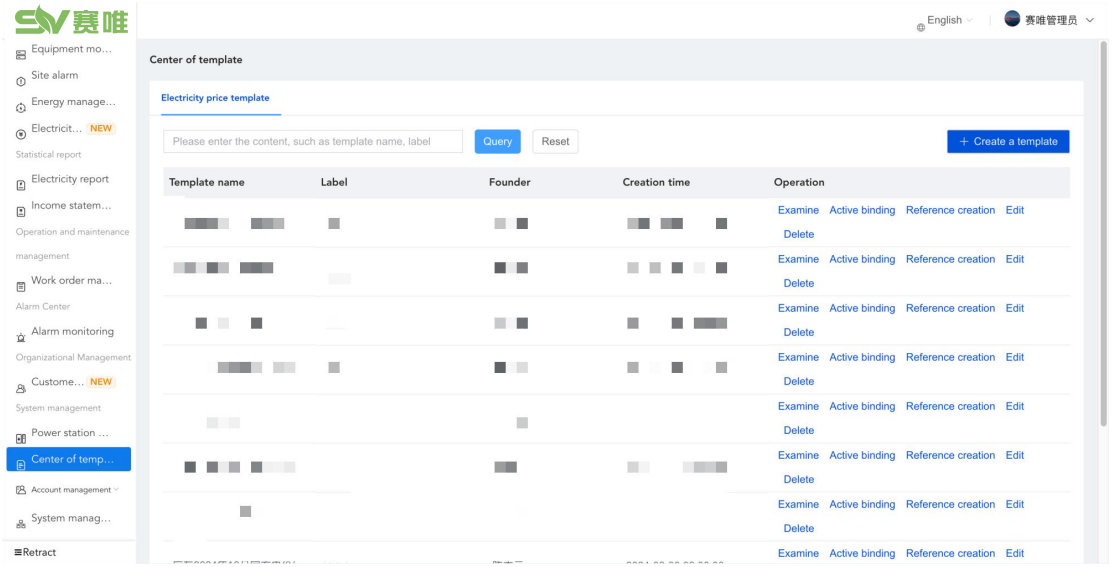


- Click on “Create Power Station” to enter the corresponding page. After filling in the information, click the “Create” button to establish the power station.



6.2 Public Template

- Supports users in creating universal templates at the power station level.



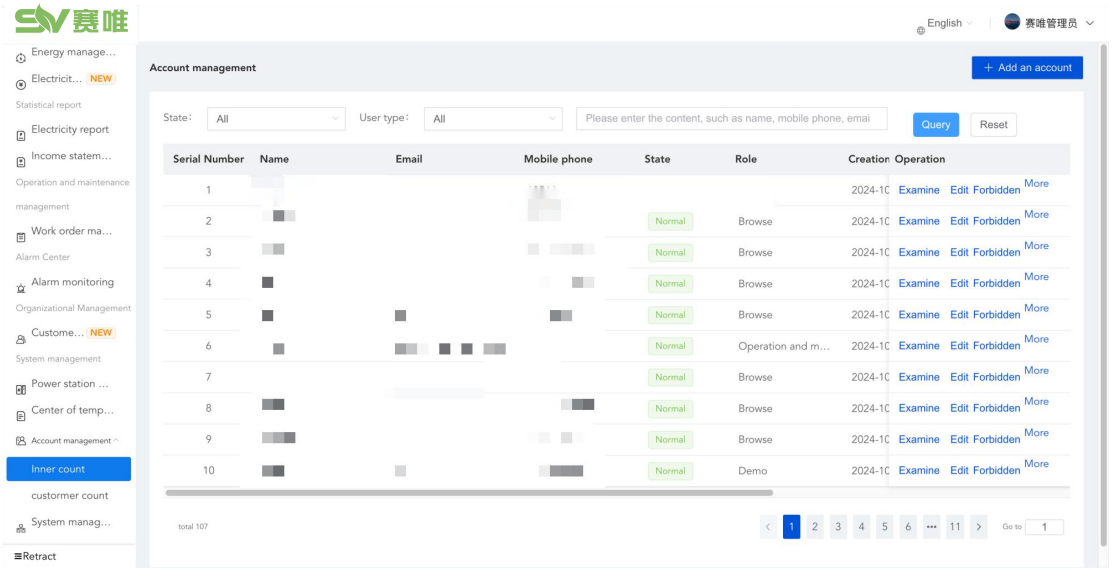
6.3 Account Management

Role	Meaning	Operation permissions	Page permissions
Platform	The highest	Add, delete,	All pages of the platform

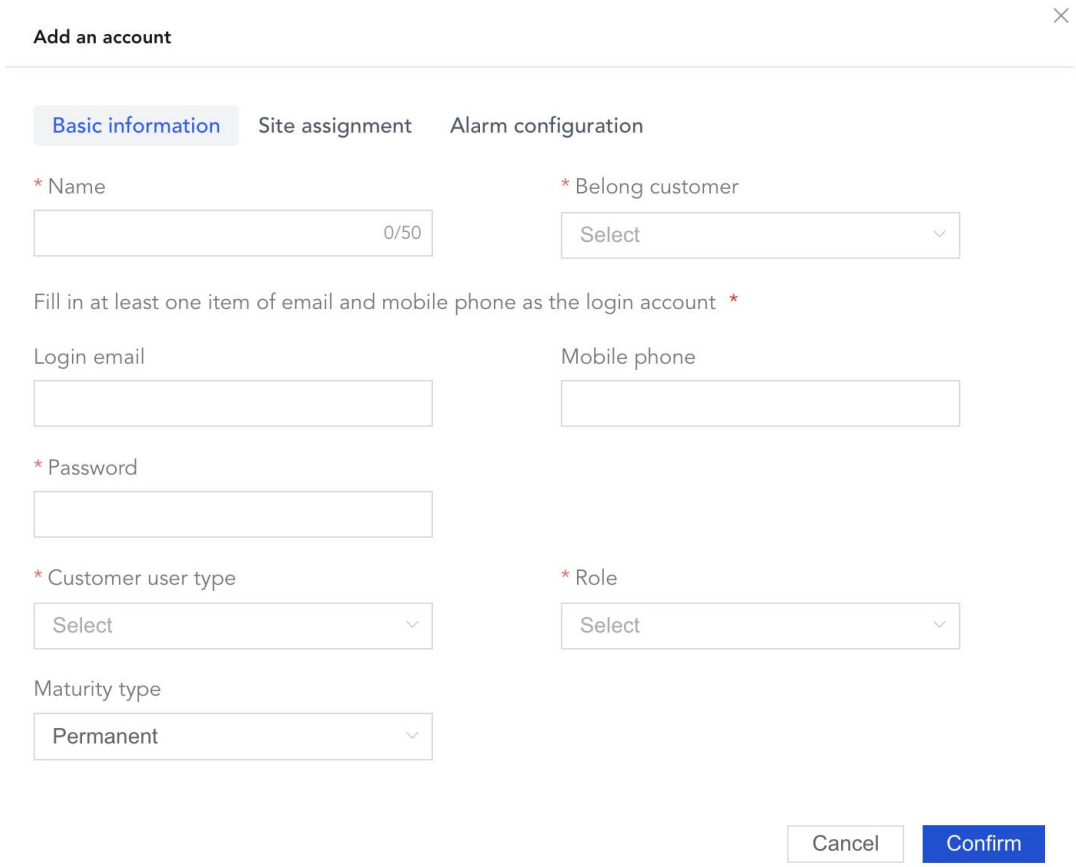
Administrator	administrator of the enterprise account, who has all platform permissions	modify, check	
Operation and Maintenance	Station operation and maintenance personnel, responsible for daily operation and maintenance of the power station	Add, delete, modify, check	All pages except account management and system management
Browse	Used for owners or investors to view daily station data	Check	Data screen, multi-station overview, power station overview, station system, statistical report (power/income)
Experience	User customer experience platform	Check	All pages except account management and system management
Demo	Used by enterprises to explain and demonstrate platform functions	Check	All pages of the platform
EnergyManagement	Used by customers' third-party energy management companies	Add, delete, modify, check	Data screen, multi-station overview, power station overview, station system, electricity price management, statistical report (power/income)

The cloud platform has an account management feature that can be used to create, manage, and maintain user accounts on the platform.

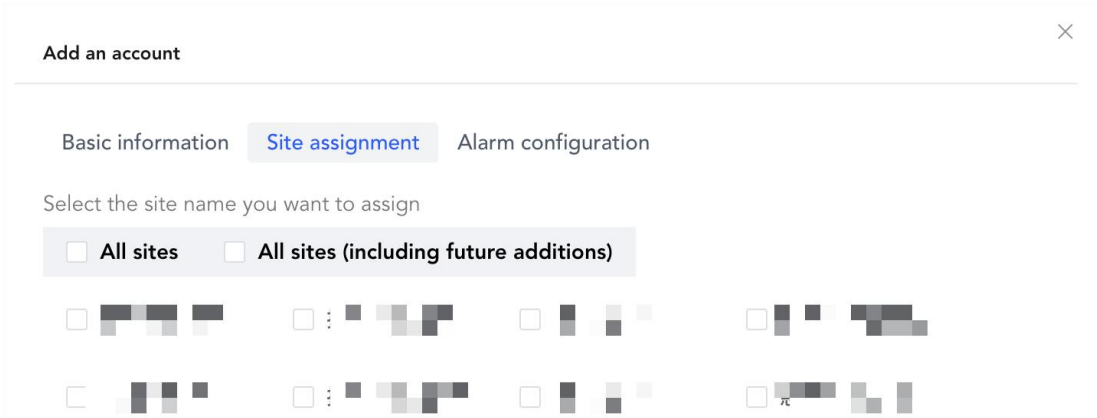
- It supports administrators in creating, viewing, and managing accounts within their company.



- Click on “Add Account” to bring up the corresponding popup window, where you can perform account creation operations. It supports setting up email and mobile accounts, as well as configuring passwords and account roles.

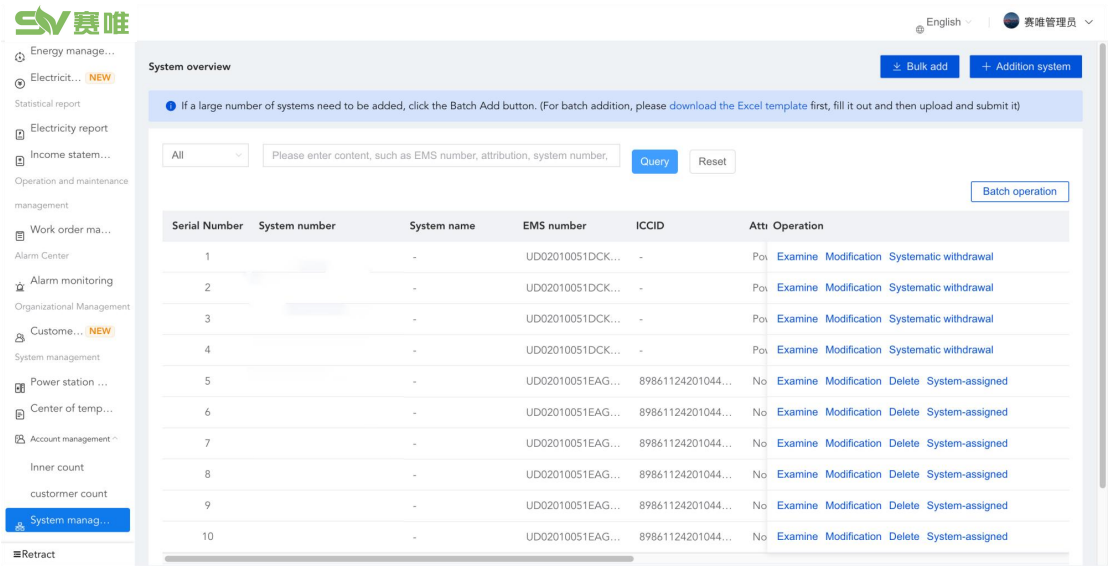


- It supports assigning managed power stations to accounts.

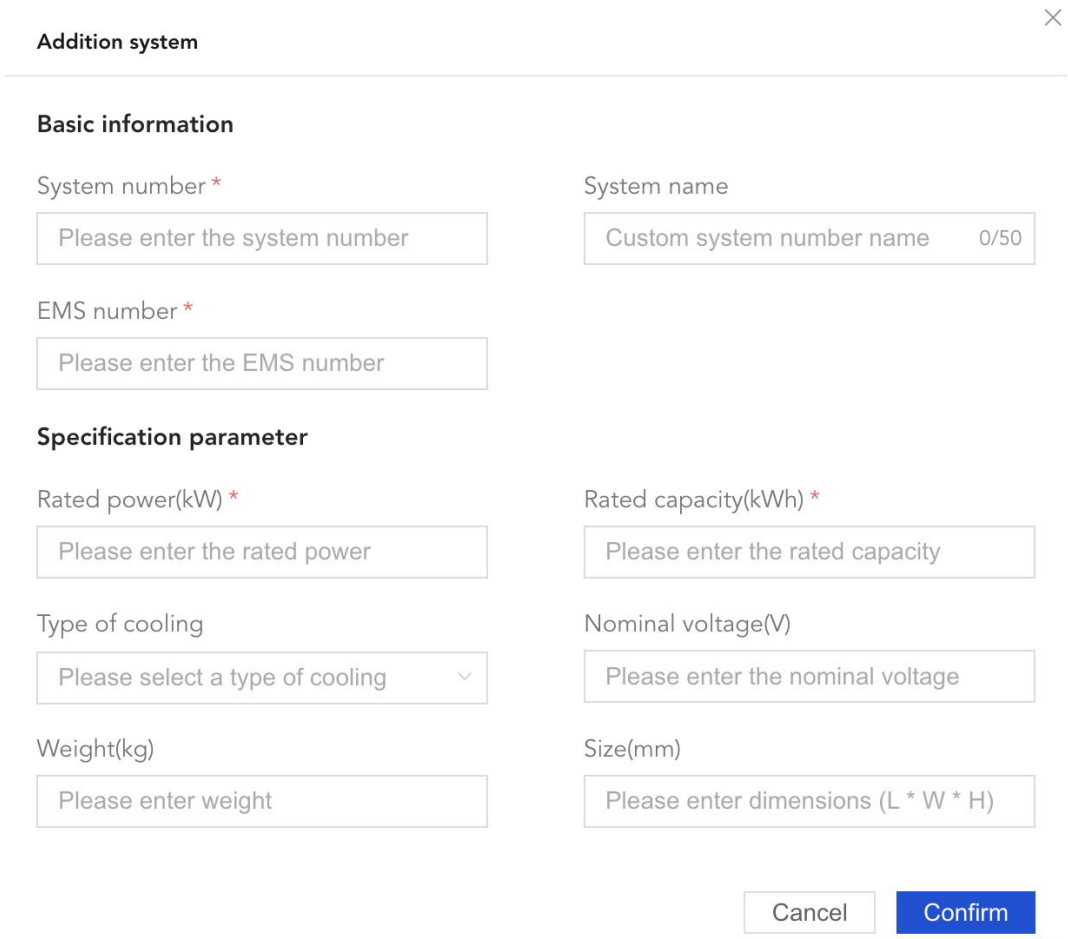


6.4 System Management

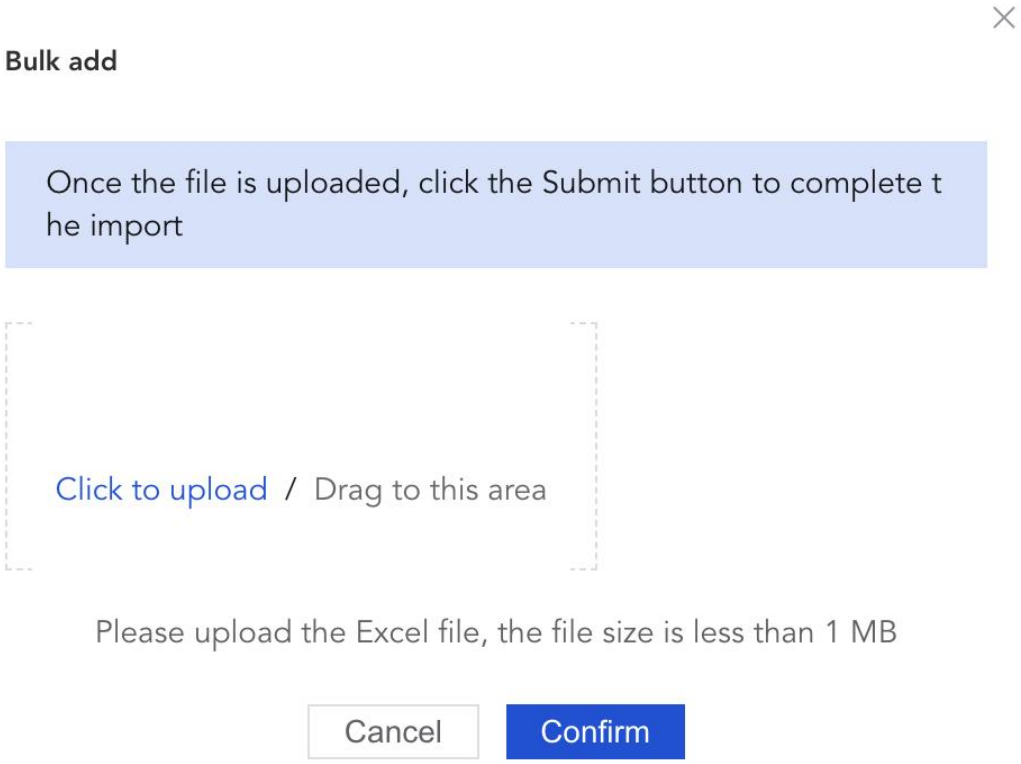
The cloud platform has system management capabilities that can be used to add, assign, and manage the EMS (Energy Management System).



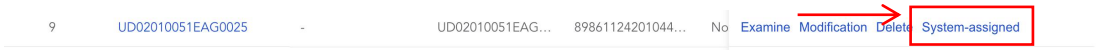
- Click on “Add System” to bring up the corresponding popup window, where you can enter basic information (system number and EMS provided by our company) and specification parameters. After completing the information, click “OK” to add the system.

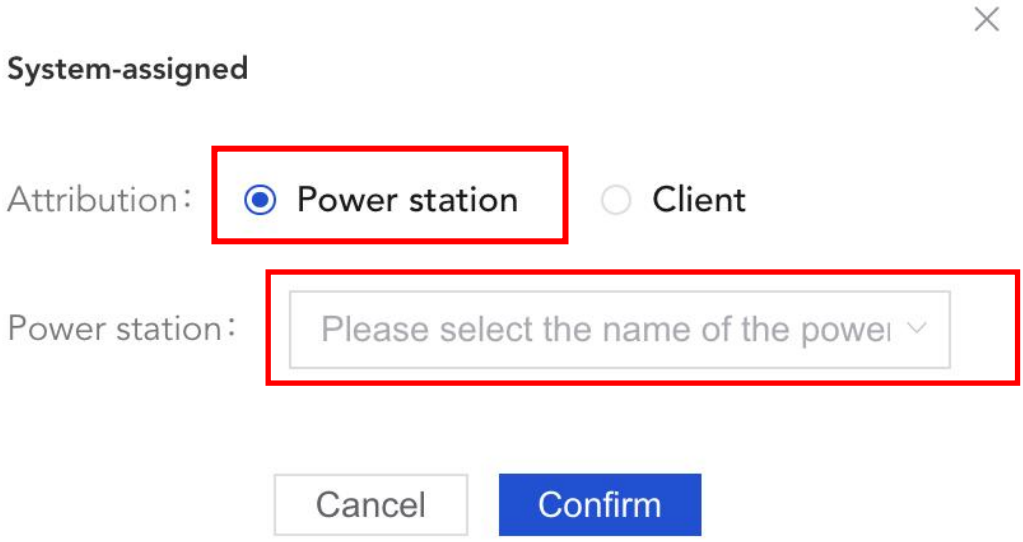


- It supports users to download an Excel template, fill it out, and perform bulk addition operations.



- Click on “System Allocation” in the system list operations to allocate the system to the already created power stations.





7. Data Screen

The EMS cloud platform supports a data center screen monitoring feature. During account login, the screen will continuously display and refresh data in real time.

- Click on the “Cloud Platform - Dashboard Monitoring” entry button to open the dashboard monitoring on a new page, which will provide a unified display of the real-time data resource status for all stations. As shown in the image below:

Others

Frequently Asked Questions (FAQs)

If you encounter any issues while using the product, you can refer to this document.

<To be continued.>

> To be continued.

Other Considerations

- The supplier has the right to modify the specification document without notifying the buyer.
- Any unresolved matters shall be discussed and decided by both the supplier and the buyer.
- The supplier shall not be liable for any losses incurred due to operations not conducted in accordance with the specification document.

ZHEJIANG SV DIGITAL POWER TECHNOLOGIES CO. LTD.