Introduction to Equipment of Integrated Cabinet Solution

Contents

1 Overview

This document mainly introduces the product features, appearance and parameters of equipment of integrated cabinet solution, which is convenient for users to understand product information.

1.1 Scope of Product Application

With the growing business, customers are increasingly demanding rapid deployment and flexibility in data centers. This product is an integrated cabinet solution, and the applicable computer room area is about 10m^2 (with separated cooling system). It is mainly used in township outlets of government subordinate industries, banking outlets, precision equipment controllers in industrial application and network access of small and medium-sized enterprises.

1.2 Product Features

Highly integrated:
The whole solution includes cabinet system, power supply, power distribution system, cooling system and monitoring system, providing customers with a comprehensive solution.
Complete power and environment monitoring system:
The intelligent monitoring module is matched with T/H(temp and humidity) sensors, water leakage sensors and smoke sensors, which can monitor the operation environment of equipment in real time. At the same time, it can carry out video monitoring and equipment status monitoring, and transmit data to the Internet for remote monitoring. In case of emergency, it can send a signal to the fire linkage equipment to ensure that the whole system is safe, reliable. The system is highly intelligent and can be flexibly expanded.
Excellent customer interaction:
The system is matched with a 10inches of color touch screen, which can obtain system information and control the operation status of equipment on the screen. At the same time, the system can be monitored in real time through the network.

2 Typical On-site Solution

Single cabinet with air conditioner

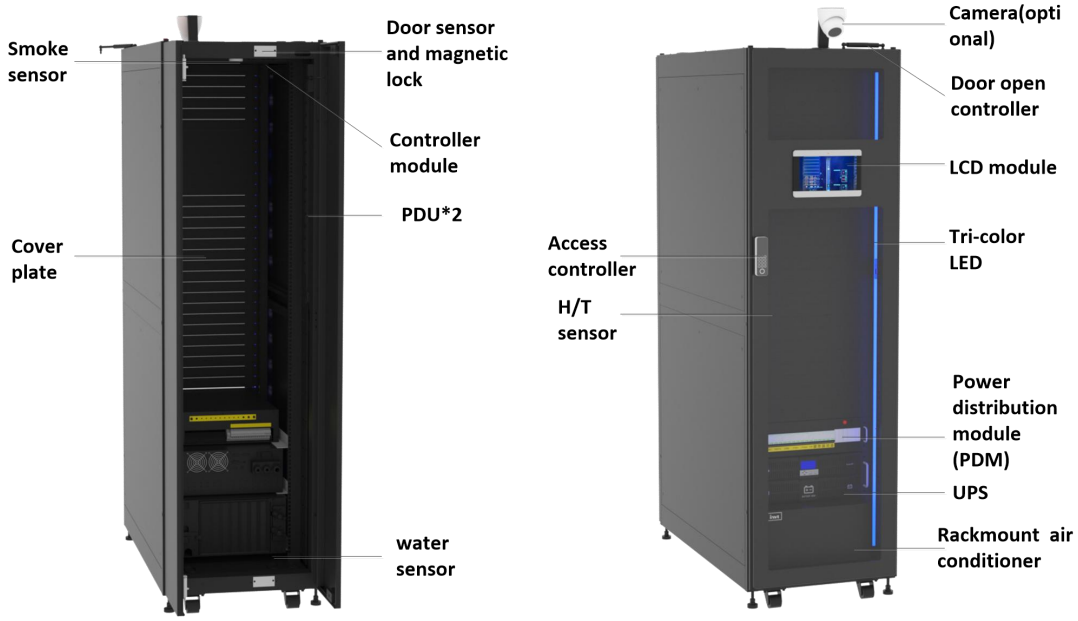


Figure 2- 1: Single Cabinet Built-in Rack Air Conditioner System

Table 2- 1: Typical Configuration of Integrated Cabinet Solution with Air Conditioner

	Configuration
Cabinet size	600mm*1200mm*2000mm (without castor); closed cool and hot channel
Backup time	5-240 minutes
Power distribution	Intelligent power distribution module with lightning protection function, PDU, battery pack (optional) or external battery (optional), ePDU (smart PDU, optional)
UPS	3kVA, 6kVA and 10kVA can be selected according to application requirements
Refrigeration	3.5KW, 7.5KW and 12.5KW rack air conditioners can be selected according to the application requirements
Monitoring	Intelligent power&environment monitoring module (ePAD), single cabinet control module (eCTRL), T/H sensor, magnetic lock, smoke sensor, water immersion sensor, network camera (optional) and access controller, etc.
Other	Acousto-optic alarm, emergency refrigeration system, SMS alarm and infrared sensor

3 System Constitution

3.1 Structure

The cabinet has following characteristics:

- Standard available space is 42U and the available depth of equipment is 730mm
- Standard 19-inch installation interface
- Two PDUs are installed on the rear side inside the cabinet
- The front and rear doors of the cabinet are equipped with auto door open kits
- The static load of cabinet is more than 1500kg
- The protection level is IP5X

3.2 Power Distribution System

The power system includes power distribution module, battery, UPS and PDU.

The power distribution module includes main input breaker, UPS input breaker, UPS output breaker, UPS maintenance breaker, air conditioner breaker and utility input breaker, etc. At the same time, lightning arrester is available at input port.

When the input source is cut off, UPS feeds power to the load through the backup battery pack. UPS can be selected from 3kVA, 6kVA and 10kVA.

There are two PDUs as standard configuration, which are connected to UPS output and utility source respectively, which are backup to each other, and smart PDU is optional.

Power distribution principle of the typical solution:

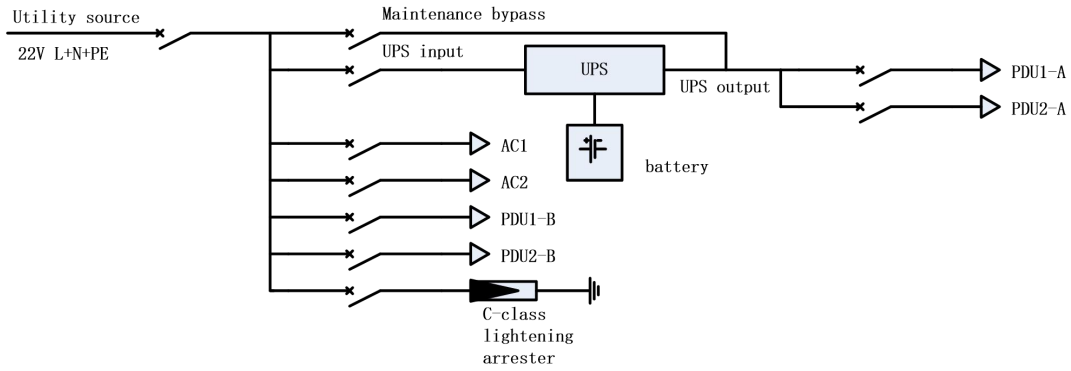


Figure 3- 1: On-site Power Distribution Principle

Table 3- 1: Specifications of Power Distribution System

Item	Configuration I	Configuration II	Configuration III
UPS power	3KVA/2.7KW	6KVA/6KW	10KVA/10KW
Rated voltage	220/230/240VAC	220/230/240VAC	220/230/240VAC
Rated frequency	50 or 60Hz	50 or 60Hz	50 or 60Hz
UPS power distribution air switch	20A	32A	63A

UPS output power distribution air switch	20A	32A	63A
Backup battery	At most 4 (7AH or 9AH 96VDC) battery package or external batteries	At most 4 (7AH or 9AH 192VDC) battery package or external batteries	At most 4 (7AH or 9AH 192VDC) battery package or external batteries
Lightning arrester	Level-C	Level-C	Level-C

3.2.1 UPS Specification

Figure 3-2: Appearance of 3KVA UPS

Table 3-2: Technical Parameters of 3kVA UPS

Item	Parameter
Rated capacity	3KVA/2.7KW
Phases	Single phase
Input power factor	0.99
Input frequency	50/60Hz rated; operation range 40-70Hz
Output voltage	220/230/240Vac,50/60Hz
Efficiency	91%
Dimensions	440mm(W)*480mm(D)*86mm(H) or 440mm(W)*480mm(D)*172mm(H)

Figure 3-3: Appearance of 6kVA/10kVA UPS

Table 3-3: Technical Parameters of 6kVA/10kVA UPS

Item	Parameter	Parameter
Rated capacity	6kVA/6kW	10kVA/10kW

Number of phases	Single phase	Single phase
Input power factor	0.99	0.99
Input frequency	50/60Hz rated; scope of 40-70Hz	50/60Hz rated; scope of 40-70Hz
Input current harmonic	<4%	<4%
Output voltage	220/230/240Vac,50/60Hz	220/230/240Vac,50/60Hz
Efficiency of the whole machine	95%	95%
Dimensions	440mm(W)*550mm(D)*85mm(H)	440mm(W)*550mm(D)*85mm(H)

3.2.2 Power Distribution Module (standard configuration)

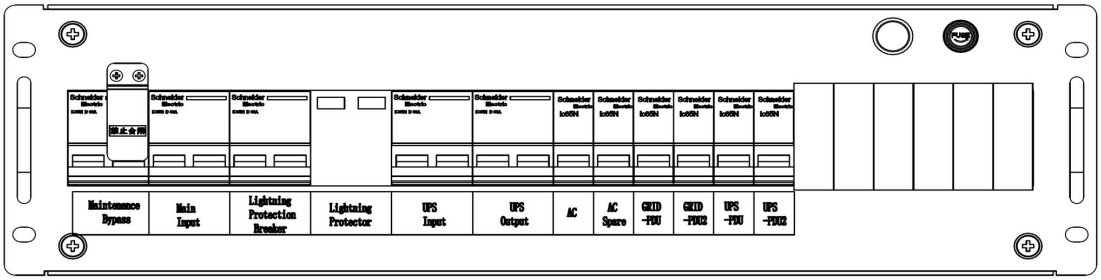


Figure 3-4: Low-voltage Power Distribution Module

Table 3-3: Parameters of Power Distribution Module

Item	Parameter
Input current	63A
Phases	Single phase
UPS input	32A
Configurations	UPS input breaker 32A/2P, UPS maintenance bypass breaker 32A/2P, UPS output breaker 32A/2P, total input breaker 63A/2P, Class-C lightning arrester, PDU breaker 32A/1P, and air conditioner input breaker 16A/1P
Maximum altitude	4500m, derating above 1000m
Operating temperature	0～45℃
Relative humidity	0-95%
Weight	25kg

3.2.3 Battery Package

Item	8-battery pack	16-battery pack
Capacity	7AH/9AH	7AH/9AH
voltage	96VDC	192VDC
Used	3kVA	6kVA/10kVA
Dimensions	438*400*86mm	438*680*86mm
Weight	23kg/25.5kg	45.4kg/51kg

3.3 Cooling System

3.3.1 Cabinet With Air Conditioner

The refrigeration system is integrated inside the cabinet, and the cold and hot air ducts of the cabinet are closed. If the external batteries are located in the same computer room, the temperature range of the computer room is required to be 20-25℃.

Table 3-4: Air Conditioner Parameters (split model)

Item	Parameter
Height	5U
Refrigerating capacity	3.7kW
Sensible cooling capacity	3.7kW
Rated current	13.5A
Circulating flow	700m3/h

3.3.2 Cabinet With integrated Rack Air Conditioner

The integrated rack air conditioner integrates traditional indoor unit and outdoor unit into a 8U cabinet. According to the heat dissipation characteristics of the integrated rack air conditioner, the cabinet needs to leave corresponding ventilation holes on the bottom plate and rear face to dissipate heat during the operation of the air conditioner. In this way, copper pipes and cables connecting the indoor units and outdoor units on site are not needed, and refrigerant is not needed on site. It is fast and convenient to install and use, but it requires good on-site ventilation or heat dissipation conditions, so it cannot be installed in a closed environment without heat dissipation measures.

Table 3-5: Air Conditioner Parameters

Item	Parameter
Height of indoor unit	8U
Refrigerating capacity	3.7kW
Sensible cooling capacity	3.7kW
Rated current	13A
Circulating flow	700m^3/h

3.3.3 Without Air Conditioner Cabinet

The refrigeration system is configured by customers themselves, and civil air conditioners can be configured to provide refrigeration. The room temperature should be 0-27℃. If the batteries are put in the same room, the room temperature should be 20-25℃.

3.4 Intelligent Power Environment Monitoring & Management System

3.4.1 Overview

The intelligent power&environment monitoring system consists of monitoring module, power supply system, sensors, etc.

The monitoring module is integrated into the local LCD display screen system, i.e., intelligent monitoring screen (ePAD), and is equipped with interface-expandable single-cabinet control module (eCTRL) for equipment expand and control. It supports local and remote system management, system status monitoring, system alarm management and system configuration and operation. In addition, the monitoring system can also provide a visual interface, facilitating users to maintain the internal equipment of the system.

3.4.2 Monitoring Module

3.4.2.1 Intelligent Monitoring Screen (ePAD)

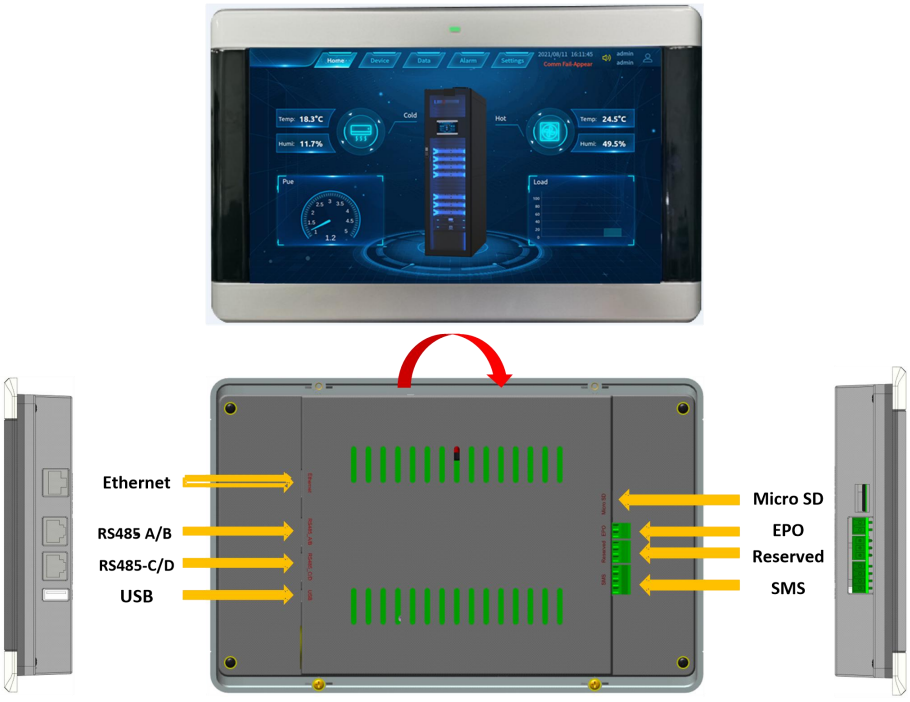


Figure 3-6: Intelligent Monitoring Screen (ePAD)

Table 3-6.1: Specifications of Intelligent Monitoring Screen (ePAD)

<table>
<tr><th>Item</th><th>Parameter</th></tr>
<tr><td>Power input</td><td>● Supports two DC power supplies
● Input voltage: 12VDC (Scope of input voltage: 8-30VDC)
● Input rated current: 500mA</td></tr>
<tr><td>System memory</td><td>512MB</td></tr>
<tr><td>Micro SD card</td><td>The maximum storage space is 32GB, used to store data such as history records</td></tr>
<tr><td>FE expansion</td><td>Support 1 LAN interface, 10/100M communication rate</td></tr>
<tr><td>RS485</td><td>● Support four two-port RJ45 RS485 interfaces with a default communication speed of 9,600bps
● RJ45 interface includes 12VDC power input
Description of RJ45 foot position:
● RS485-A/B interface:
<table>
<tr><td>P1</td><td>P2</td><td>P3</td><td>P4</td><td>P5</td><td>P6</td><td>P7</td><td>P8</td></tr>
<tr><td>A-RS485+</td><td>A-RS485-</td><td>B-RS485+</td><td colspan="2">+12V</td><td>B-RS485+</td><td colspan="2">GND</td></tr>
</table>
● RS485-C/D interface:
<table>
<tr><td>P1</td><td>P2</td><td>P3</td><td>P4</td><td>P5</td><td>P6</td><td>P7</td><td>P8</td></tr>
<tr><td>C-RS485+</td><td>C-RS485-</td><td>D-RS485+</td><td colspan="2">+12V</td><td>D-RS485+</td><td colspan="2">GND</td></tr>
</table></td></tr>
<tr><td>USB</td><td>Support USB2.0 equipment access</td></tr>
<tr><td>SMS</td><td>Support SMS alarm equipment access</td></tr>
<tr><td>Working instruction</td><td>Normal state: indicator light (green) is normally on</td></tr>
</table>

3.4.2.2 Single-cabinet Control Module (eCTRL)

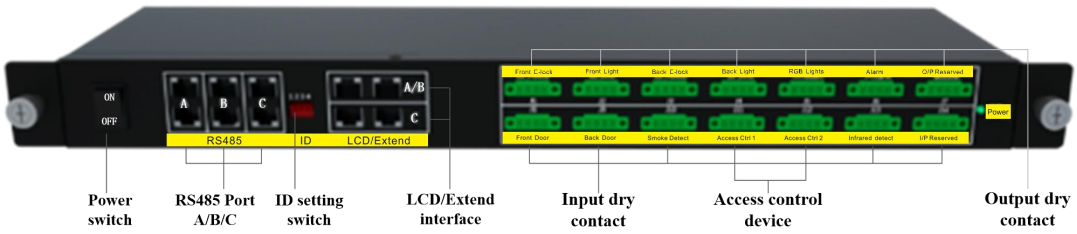


Figure 3-5: Single-cabinet Control Module (eCTRL)

Table 3-6: Specifications of Single-cabinet Control Module (eCTRL)

Item	Parameter
Power input	● Supports two DC power supplies ● Scope of input voltage: 85~264Vac ● Working frequency: 50/60Hz ● Input rated current: 0.56A

<table>
<tr><td>LCD/expansion interface</td><td>

Four RJ45 ports are provided for connection to the RS485 communication port on the intelligent monitoring screen and the next expansion module and power the intelligent monitoring screen through these ports.
RJ45 interface provides 12VDC power

Description of RJ45 foot position:

A/B interface:

<table>
<tr><td>P1</td><td>P2</td><td>P3</td><td>P4</td><td>P5</td><td>P6</td><td>P7</td><td>P8</td></tr>
<tr><td>A-RS485+</td><td>A-RS485-</td><td>B-RS485+</td><td colspan="2">+12V</td><td>B-RS485+</td><td colspan="2">GND</td></tr>
</table>

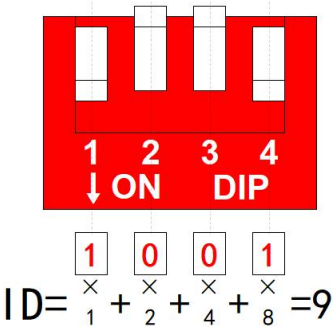
C/D interface:

<table>
<tr><td>P1</td><td>P2</td><td>P3</td><td>P4</td><td>P5</td><td>P6</td><td>P7</td><td>P8</td></tr>
<tr><td>C-RS485+</td><td>C-RS485-</td><td>D-RS485+</td><td colspan="2">+12V</td><td>D-RS485+</td><td colspan="2">GND</td></tr>
</table>
</td></tr>
<tr><td>RS485 communication interface</td><td>

Support three channels of configurable RS485 interfaces. Each channel provides two interfaces for cable connection by means of RJ45 at default communication speed of 9,600bps.
RJ45 interface can provide 12VDC power with rated current of 400mA

Description of RJ45 foot position:

A.B.C interface:

<table>
<tr><td>P1</td><td>P2</td><td>P3</td><td>P4</td><td>P5</td><td>P6</td><td>P7</td><td>P8</td></tr>
<tr><td>RS485+</td><td>RS485-</td><td>/</td><td colspan="2">+12V</td><td>/</td><td colspan="2">GND</td></tr>
</table>
</td></tr>
<tr><td>ID setting switch</td><td>The DIP switch is in 4-bit binary format XXXX, with value ranging 1-15. 1111 is ID15, and 1000 is ID1. For related settings, refer to the following example:
Push the switch up or down, the value in the lower box is 0 or 1, and then multiplied by the related number, and the final result is ID,
as shown below: Only switches for Bits 1 and 4 are pushed down, and the multiplier is respectively 1 and 8, while the rest are 0, added up to 9.
 
</td></tr>
<tr><td>Output dry contact</td><td>Supports nine output dry contact ports, six of which support NC or NO signals, and the other three support NO signals.</td></tr>
<tr><td>Input dry contact</td><td>Supports seven input dry contact ports.</td></tr>
<tr><td>Indicator light</td><td>Normal state: Green light on</td></tr>
</table>

3.4.3 Power Environment Monitoring Components

3.4.3.1 Access Control Device

The access control device manages the permission for personal access and collects statistics on the access records. It supports multiple operation modes such as card swiping, fingerprint and password.

Technical parameters of the access control device

Item	Parameter
Voltage	12VDC
Identification	Fingerprint, ID/IC card and password
Screen	2.0-inch TFT HD color screen
Storage capacity	10 administrators and 3000 users (3000 fingerprints, passwords and card numbers respectively)
Display language	Chinese, English and other languages
Communication	TCP/IP, USB, RS485, Wiegand (one group respectively for input and output)
Operating Environment	Temperature:-10℃ ~ +50℃ Relative humidity: ≦95%(no condensation)
Dimensions	140*44*20mm

Note: Please refer to page 45 for details of the Access Control operation instructions.

3.4.3.2 Smoke sensor

The smoke sensor is used to detect the smoke and gives alarm signals promptly in case of fire.

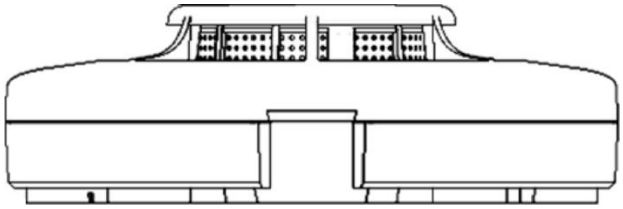
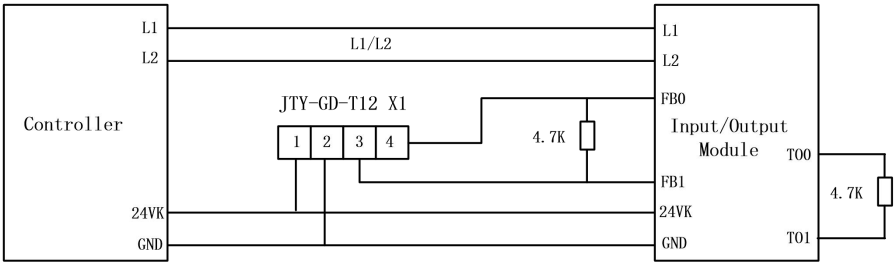


Figure 3- 7 Smoke Sensor

The smoke sensor interface is defined as follows:



Pins 1 and 2 are power supply ports with working voltage of 12V or 24V. Pin 1 is connected to positive terminal and pin 2 is connected to the ground.

Pins 3 and 4 are signal output interfaces, and are normally closed (NC) by default. When an alarm occurs, it turns to be opened, and can also be set to normally open (NO) through jumper.

Table 3-7：Technical parameters:

Item	Parameter
Working voltage	12/24VDC, voltage ranging 8-28VDC
Working current	<2mA@12VDC in monitoring status <30mA@12VDC in case of fire alarm
Contact output	1A/30VDC，0.3A/60VDC
Operation indication	Monitoring status: Indicator (green) blinks once every 60 seconds Alarm status: The indicator (red) is steadily on, and the buzzer makes a rapid "beep" sound every 1.5 seconds Fault status: The buzzer beeps briefly every two seconds
Operating Environment	Temperature:-10℃- +50℃ Relative humidity:≦95%(no condensation)
Dimensions	120*39mm (OD * HEIGHT)

3.4.3.3 Temp/Humidity sensor

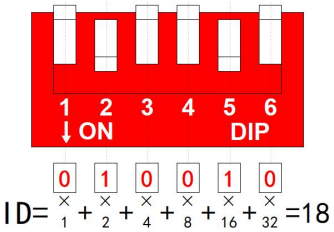
The T/H sensor is used to detect the operating temperature and humidity inside cabinet.

Figure 3-8 T/H Sensor

On the right side of the T/H sensor, the ID setting switch is in DIP pattern, with its value in 6-bit binary XXXXXX format, ranging 1-63. 111111 is ID63, and 100000 is ID1. For related settings, refer to the following example:

Push the switch up or down, the value in the lower box is 0 or 1, and then multiplied by the related number, and the final result is ID,

as shown below: Only switches for Bits 2 and 5 are pushed down, and the multiplier is respectively 2 and 16, while the rest are 0, added up to 18.



Each T/H sensor has an RJ45 RS485 port respectively above and below it. The device can be connected to a controller module in a cabinet either in series or separately. The ports are defined as follows:

P1	P2	P3	P4	P5	P6	P7	P8
RS485+	RS485-	--	+12V		--	GND	

A maximum of 15 T/H sensors can be connected in series through one 485 port on the control module of a cabinet.

The System is equipped with one cold channel T/H sensor in standard configuration. A number of T/H sensors can be provided as required.

Table 3-7：T/H sensor

Item	Parameter
Temperature detection range	0℃-+85℃
Temperature detection accuracy	±0.2℃
Humidity detection range	0~100% RH
Humidity detection accuracy	±2%
Working voltage	12VDC
Dimensions	67.9*46*26mm

3.4.3.4 Water sensor

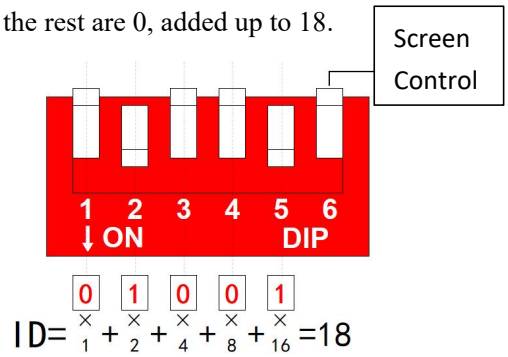
The water sensor is used to check whether there is water on the floor of the equipment room. There are two types of water sensors: the water sensor with or without location detection.

Figure 3- 9 Water Sensor

At the bottom of the water sensor, the ID setting switch in DIP mode is XXXXX in five-bit binary format, ranging 1-31. 11111 is ID31, and 10000 is ID1. For related settings, refer to the following example:

Push the switch up or down, the value in the lower box is 0 or 1, and then multiplied by the related number, and the final result is ID,

as shown below: Only switches for Bits 2 and 5 are pushed down, and the multiplier is respectively 2 and 16, while the rest are 0, added up to 18.



There are two RS485 ports in RJ45 pattern above the water sensor. The device can be connected to the controller module of a single cabinet either in series or separately. The ports are defined as follows:

P1	P2	P3	P4	P5	P6	P7	P8
RS485+	RS485-	--	+12V		--	GND	

The 485 port on the control module in a single cabinet can be connected to a maximum of seven water sensors in series.

Table 3- 8：Water sensor

Item	Parameter
Working voltage	12VDC
Operating Environment	-20℃ ~ +80℃, 0 ~ 95%RH (no condensation)
Precision	Suitable for use with positioning sensor, 1 m
Dimensions	125*64*37mm

3.4.3.5 Webcam

Figure 3- 10 Webcam

The webcam can be directly connected to the network through a network cable. If a video recorder is equipped, the camera must be connected to the network port of the video recorder. If the number of cameras exceeds the number of ports on the VCR, it is necessary to configure another gateway.

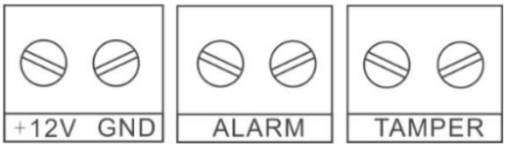
Table 3- 9：Webcam parameters

Item	Parameter
Pixels	2 megapixels in 1/3 inch step-by-step scan
Maximum resolutions	1920*1080
Power supply	DC 12V with PoE
Frame rate	1-30, adjustable
Coding standard	1080P@30fps、720P@30fps、D1@25fps
Protection grade	IP66
Operating Environment	-30℃-+60℃，0-95%RH
Dimensions	D110.7*84.3mm

3.4.3.6 Infrared Detector

Infrared sensor is used to detect human activities in target area. When an intruder passes through the area, alarm signals will be given promptly.

The infrared sensor terminal is defined as follows:



+12V is DC positive pole, and GND indicates the DC negative pole.

ALARM is the output interface for detecting ALARM signals. The default interface is NC. When an ALARM occurs, the interface turns to be disconnected, and can also be set to NO through jumper.

TAMPER is the output interface of anti-removal alarm signal, normally closed, and turns to be disconnected in case of alarm.

Technical parameters:

Item	Parameter
Working voltage	12VDC, voltage ranging 9-16VDC
Working current	≤50mA@12VDC
Contact output	100mA/ 60VDC for detection alarm and 100mA/28VDC for anti-removal alarm
Operation indication	Power-on self-test: The red indicator light turns on for 60 seconds during power-on self-test process. Monitoring status: Indicator light is off Detection alarm status: Red indicator light is on
Operating Environment	Temperature:-10℃ - +50℃ Relative humidity: ≦95%(no condensation)
Dimensions	95*57*38mm

3.4.3.7 Audible and visual alarm

It is used to monitor the host in equipment room and realize linked audible and visual alarm in the room.

The audible and visual alarm interfaces are defined as follows:

The red and black cables at the bottom are for power ports. The operating voltage is 12V. The red cable is connected to positive pole and the black cable is connected to the ground.

Technical parameters:

Item	Parameter
Working voltage	12VDC
Working current	≤45mA
Maximum alarm volume	90dB
Operation mode	Analog rotating LED lighting
Operating Environment	Temperature:-30℃ - +70℃ Relative humidity: ≦95%(no condensation)
Dimensions	95*165mm (OD * HEIGHT)

4 Introduction to User's Interface

4.1 Home page

4.1.1 Login on LCD

The standard system configuration contains a 10.1-inch color touch LCD, which is used to monitor and set each device in the system.

Upon initial login to the system, the user will be granted user permissions by default, so user cannot perform any settings except display language setting and accessing page content and data.

The system functions page is displayed under System Settings, as shown in Figure 4-2. Click on **Login** button under **Login Information** and enter user name and password in the pop-up login dialog box. The default user name and password for administrator account are "admin" and "123456" respectively. The administrator has permission to set device parameters and system parameters.

Change password after login on.

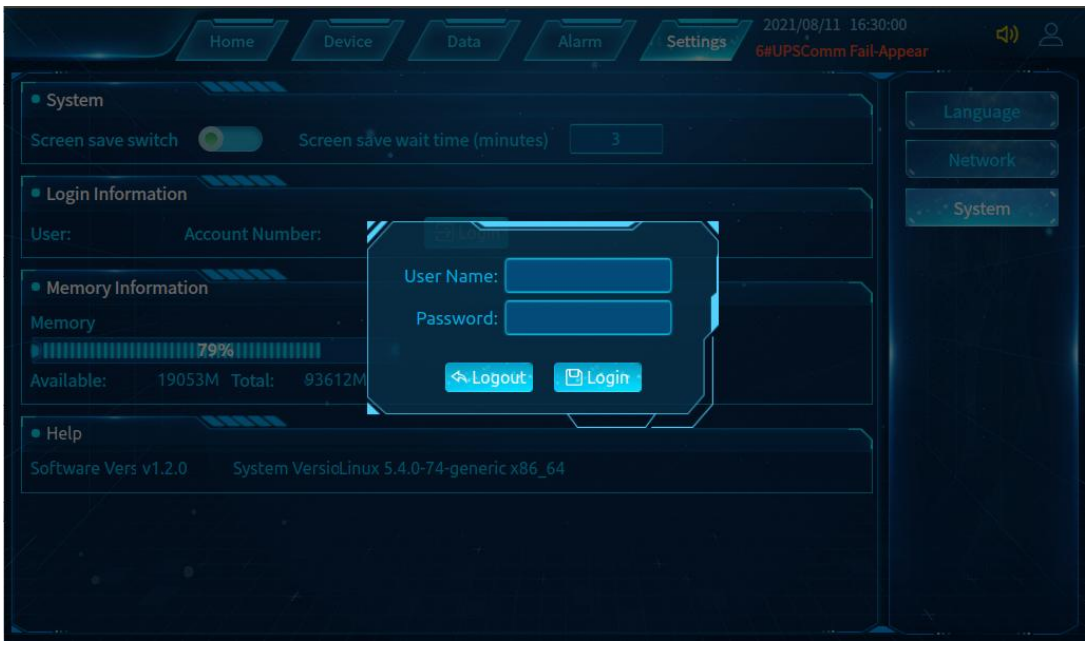


Figure 4- 1 Login Page on LCD

4.1.2 Home page

The home page on LCD contains Mute button and system date/time at the header.

The home page contains system PUE, load, temperature and humidity of cold and hot channels, and cabinet diagram. When an alarm is activated indicating that front or rear door is open, the cabinet diagram will change accordingly.

The top of the home page is the menu bar and click the menu to enter other pages.

Figure 4- 2 Home Page

4.1.3 Door Open Pop-Up

A Door Open pop-up will open when an operater open cabinet door by using card, fingerprint, or password on the access control device.

Notes: Before opening the door by using card, user must activate a new card on the access control machine and the web page (for details, see 4.5.4 Door Management); otherwise, a message "invalid card" will be displayed on the pop-up window.

In case that the communication between intelligent monitoring screen and single-cabinet control module is faulty, all doors will be opened by swiping a card on the access control device.

Figure 4- 3 Door Open Pop-Up on Home page

4.2 Equipment management

4.2.1 Equipment overview

On the menu bar at the bottom of the screen, click **Device Management** to enter device overview page, as shown in Figure 4-4. The status of each device in the system on this page. Icons are displayed in green color indicating normal status, or in red color indicating an alarm, or in gray color indicating disconnection.

Click each equipment button on this page to enter the equipment details page, as shown in Figure 4-5, where you can view the operating parameters and equipment information of the current equipment and make relevant settings.

Figure 4- 4 Equipment Overview

4.2.2 Power distribution system

UPS and electricity meter are shown on the power distribution system page.

UPS device details page

On the UPS page, the operating status and device information, and perform related settings of the current UPS are shown.

Figure 4- 5 UPS Device Details Page

Click **Device Information** to view the current UPS information and operating parameters.

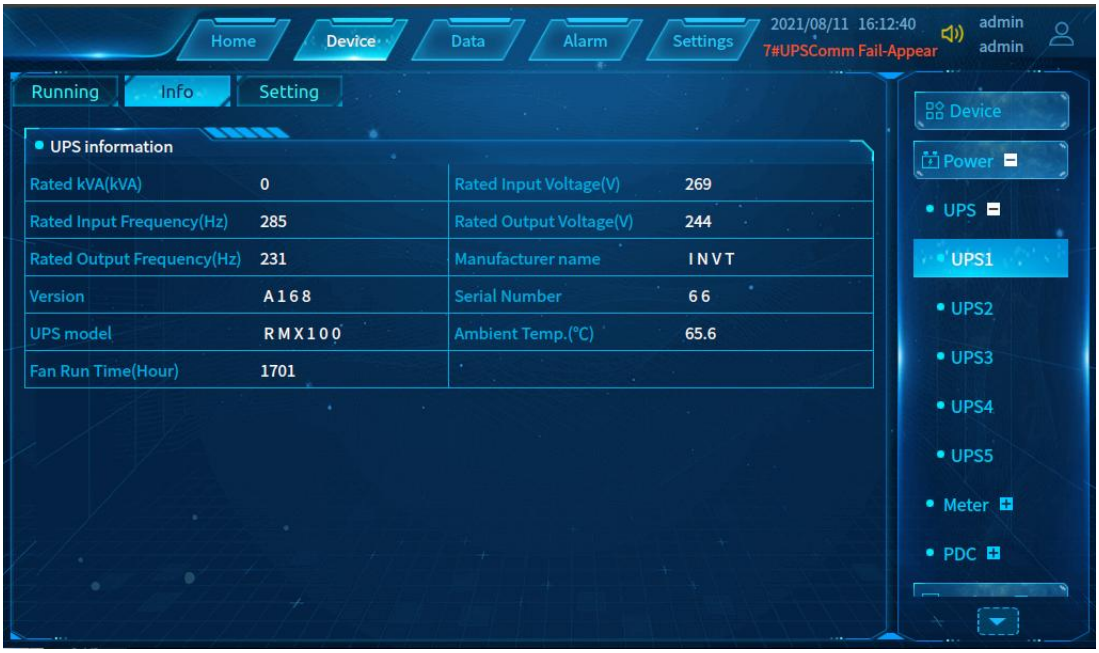


Figure 4- 6 UPS Device Information

Click **Parameter Setting** to remotely control the current UPS.

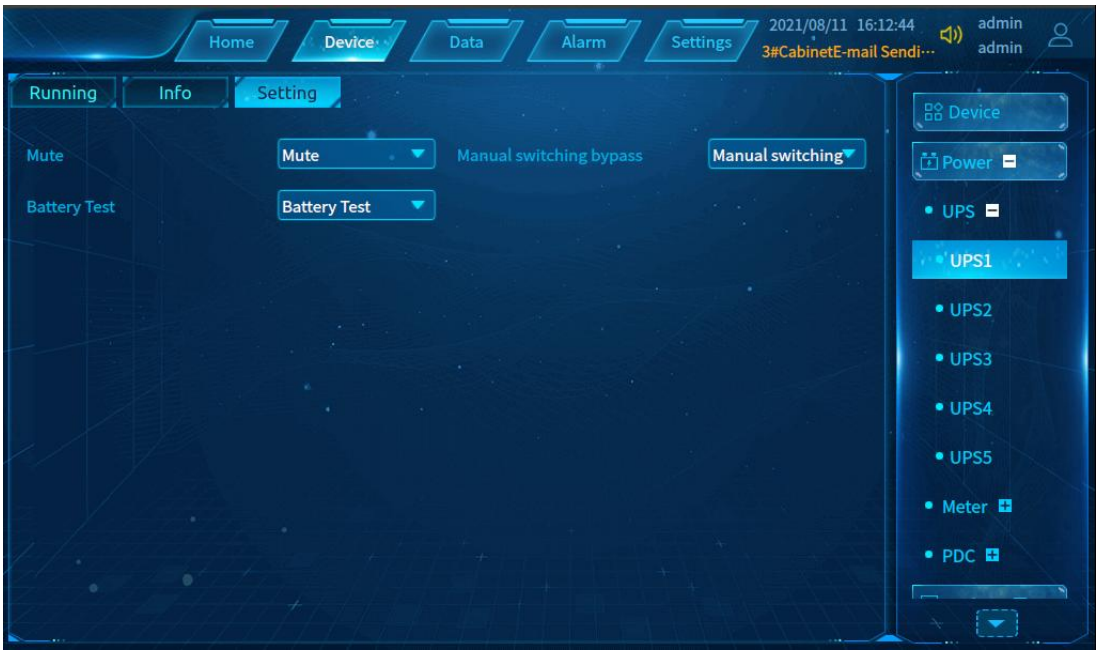


Figure 4- 7 UPS Parameter Setting

Electricity meter device

The values of the current electricity meter are shown on this page.

Figure 4- 8 Electricity Meter Device Information

4.2.3 Environmental system

operation of air conditioner, T/H device and water sensor are shown on this page.

Air conditioning equipment details page

The operating status and device information, and parameter settings of the current air conditioner are included on the page

Figure 4- 9 Air Conditioning Equipment Details Page

Click **Parameter Setting** to remotely turn on and off the current air conditioner and set parameters of the air conditioner.

Figure 4- 10 Air Conditioning Parameter Setting

Temperature and humidity device details page

The operating status of the current temperature and humidity device and set temperature and humidity parameters are shown on the page.

Figure 4- 11 Temperature and Humidity Device Details Page

Click **Parameter Setting** to set the current temperature and humidity limitation.

Figure 4- 12 Setting Temperature and Humidity Parameters

Water sensor device details page

The operating status of the current water sensor and related parameters setting are included on the page.

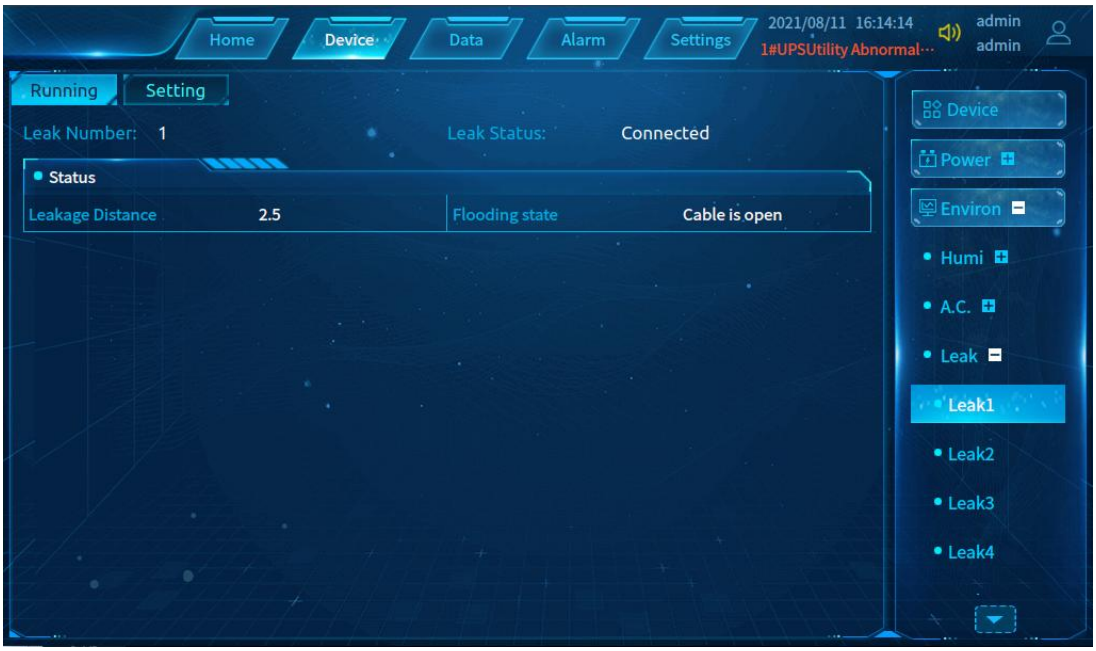


Figure 4- 13 Water Sensor Details Page

Click **Parameter Setting** to set the parameters of the current water sensor.

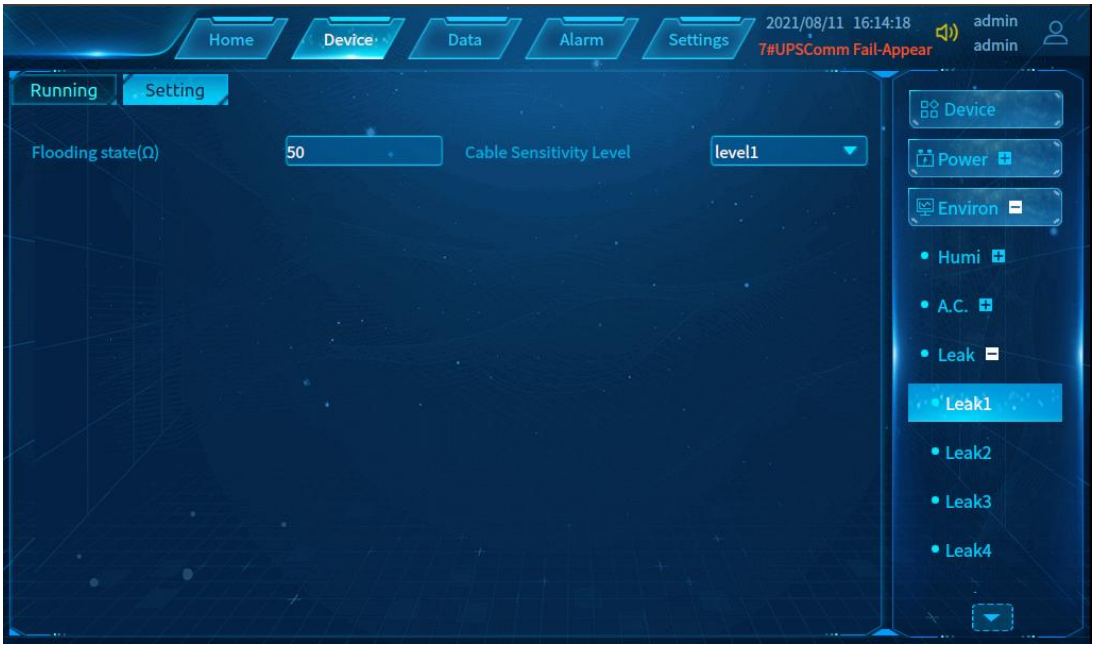


Figure 4- 14 Water Sensor Parameter Settings

4.3 Data management

On this page, you can view the history data records in the system.

All devices are selected by default. You can also search for one or more devices of a single type.

Recent day, week, or month: Click it to search for the data from the current date back to the last day, week, or month, which will be displayed by date in descending order.

You must specify the date and time to search from.

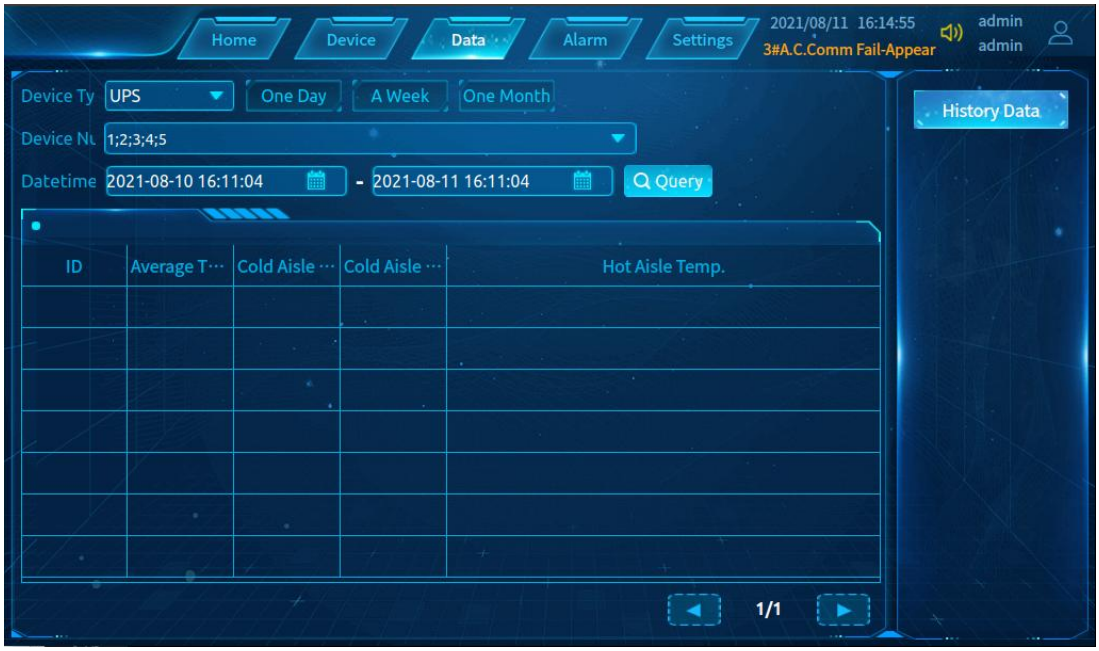


Figure 4- 15 History Data

4.4 Alarm Management

Alarm management includes current alarms and history records.

4.4.1 Current alarm

All current alarms are shown on the page. All alarms are selected by default. You can switch to minor alarms or major alarms.

Figure 4- 16 Current Alarms

4.4.2 History records

On the History Records page, you can view the history alarm records of all devices or selected devices within a specified time range. All devices are selected by default. You can also search for one or more devices of a single type.

Recent day, week, or month: Click it to search for the data from the current date back to the last day, week, or month, which will be displayed by date in descending order.

You must specify the date and time to search from.

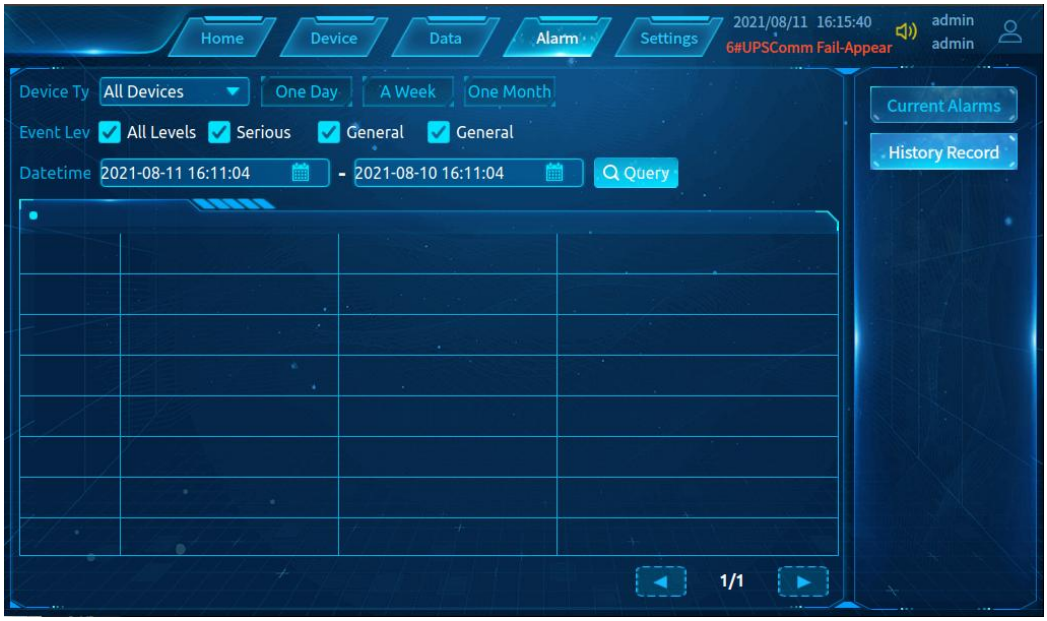


Figure 4- 17 History Records

4.5 System settings

This page contains language settings, network settings, and system function setting. You can set system functions and view system data and information.

4.5.1 Language settings

Language setting contains Chinese and English languages. You can set the interface language to Chinese or English.

Figure 4- 18 Language Settings

4.5.2 Network settings

In network settings, you can set IP address, subnet mask, default gateway, and DNS server for the power environment monitoring module. User can set the IP address and other information based on the environment. If no DNS server is available, you can fill in only one of these options.

Figure 4-19 Network Settings

4.5.3 System functions

The system functions consist of four parts.

1) Screen saver

You can enable/disable the screen saver and set the screen saver waiting time (in minute).

2) Login function

Display information about the current user: 1. User name (account number); 2. Permissions (administrator and user permissions).

You can log in/log out in this function part.

3) System storage overview

The free capacity/total capacity of the system storage is displayed.

4) System information

System model and software version numbers are displayed.

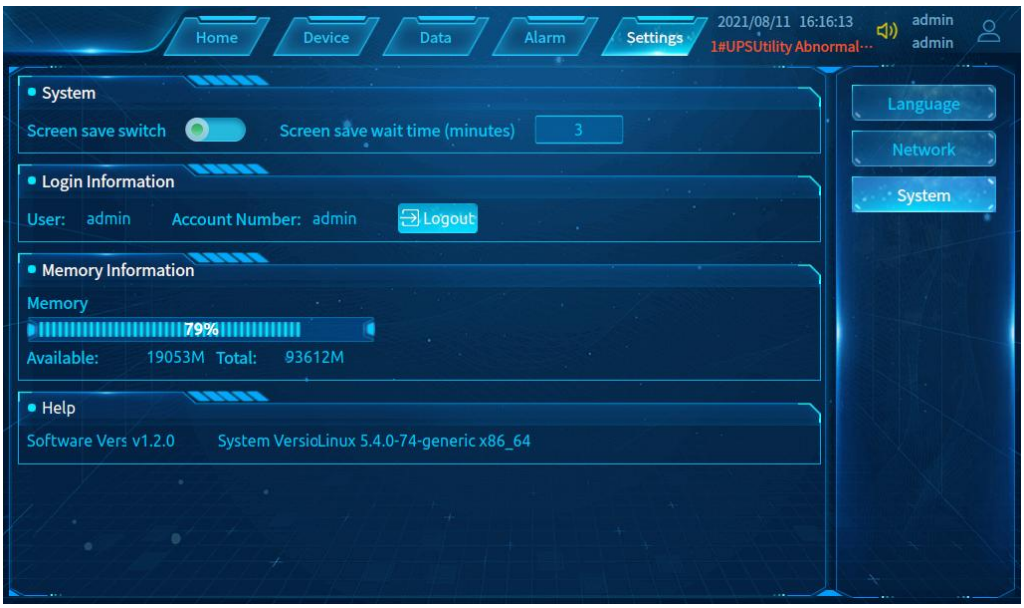


Figure 4- 20 System Functions

4.5.4 Door Management

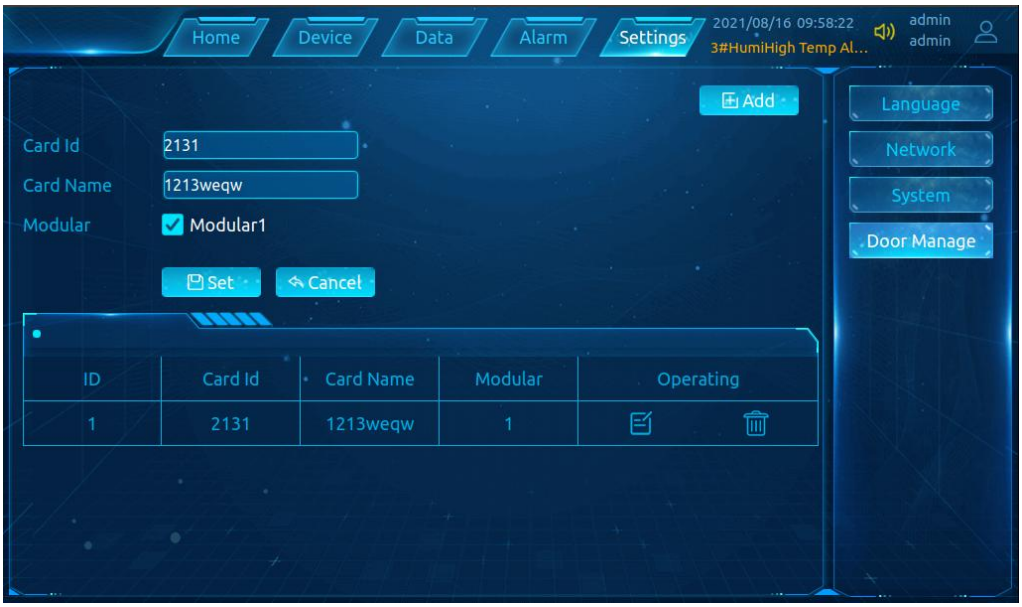


Figure 4- 21 Door Management

4.6 WEB Interface

4.6.1 WEB Login

Enter the corresponding IP address in the browser to enter the login interface. The administrator account is admin and the default login password is 123456. Please change the administrator

password as soon as possible after logging in. IP address can be found on the “Network Settings” page of the intelligent monitoring screen.

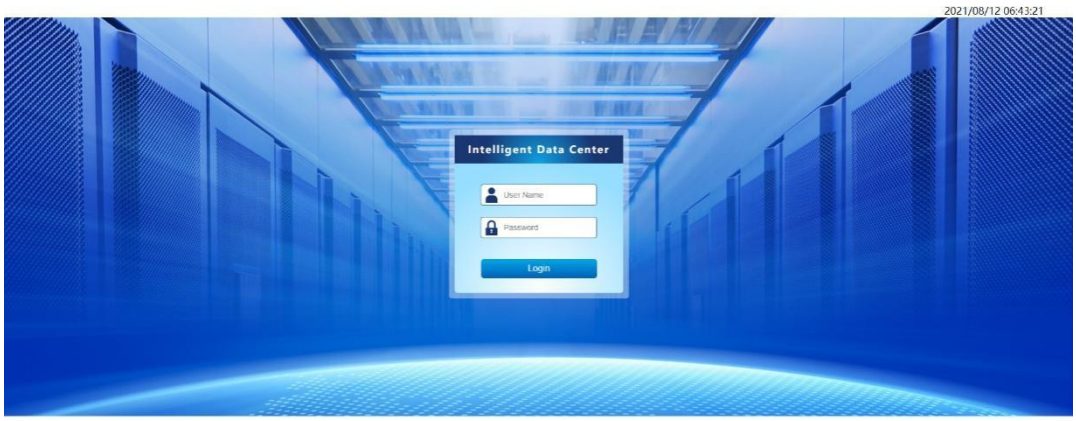


Figure 4-22: WEB Login Interface

After logging in, enter the “User Management” page under “System Settings” to add, delete or modify users. There are two kinds of user rights that can be added: ① user and ② administrator. Except for the interface display language setting, the user cannot make other settings, but can only view the page contents and various data.

The administrator can set equipment parameters and system settings.

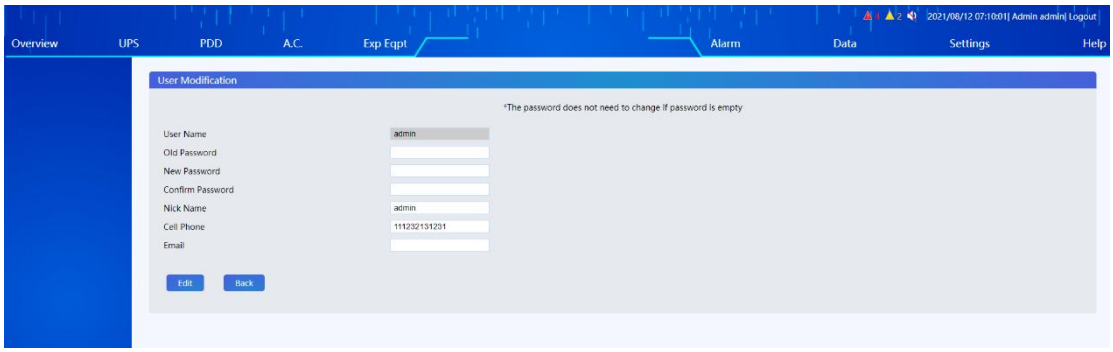


Figure 4-23: User Management Page

4.6.2 System Overview

Enter the system overview page after logging in, as shown in Figure 4-24. The system overview page can display the PUE, power consumption, average temperature and humidity of cold, hot and out-of-cabinet channels, current alarms, equipment statistics and other data of the system in real time, and the data in the chart box can be switched by custom.

Click on the account name in the upper right corner to enter the password modification page, as shown in Figure 4-25.

Click the camera icon in the icon bar above the single cabinet model diagram to enter the camera management interface, as shown in Figure 4-26. If it is needed to add a new camera device, it is possible to click the camera to enter the addition page.

Click the access control icon to enter the access control management interface, as shown in Figure 4-27. It is possible to add, delete and modify the access control card information to open the door remotely.

Click the smoke, infrared and door icons to enter the interface of dry contact equipment, as shown in Figure 4-28, and check the operating status of the equipment.

In case of alarm, the icon will flash dynamically.

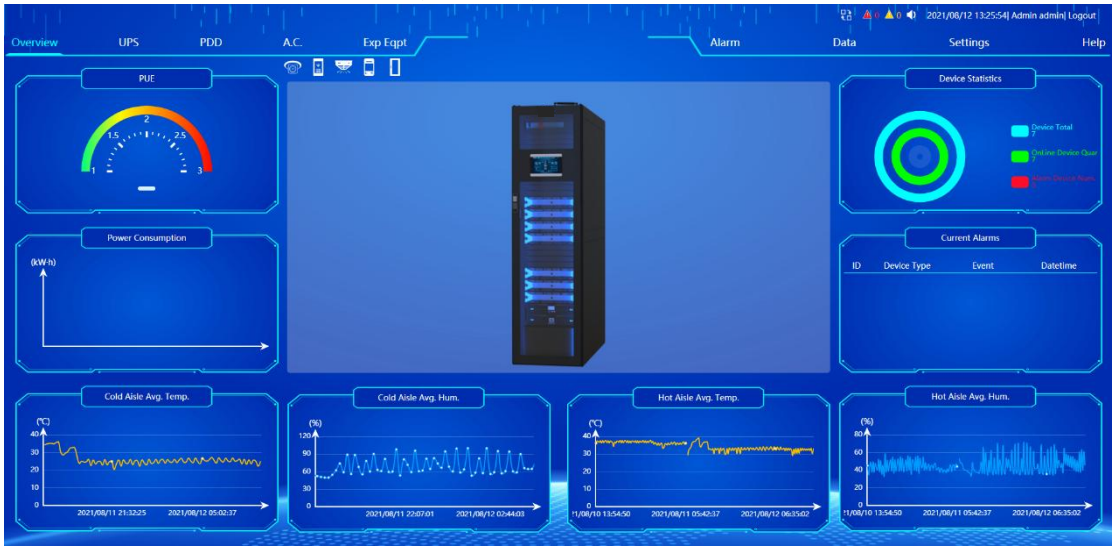


Figure 4-24: Home Page

Figure 4-25: Account and Password Modification

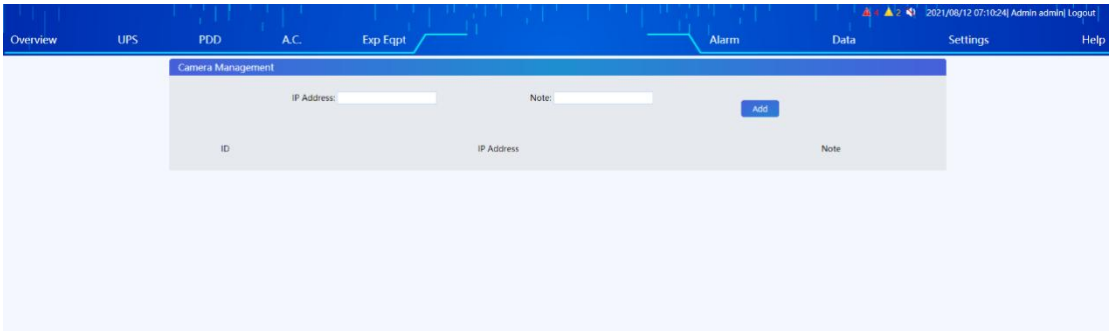


Figure 4-26: Camera Management Page

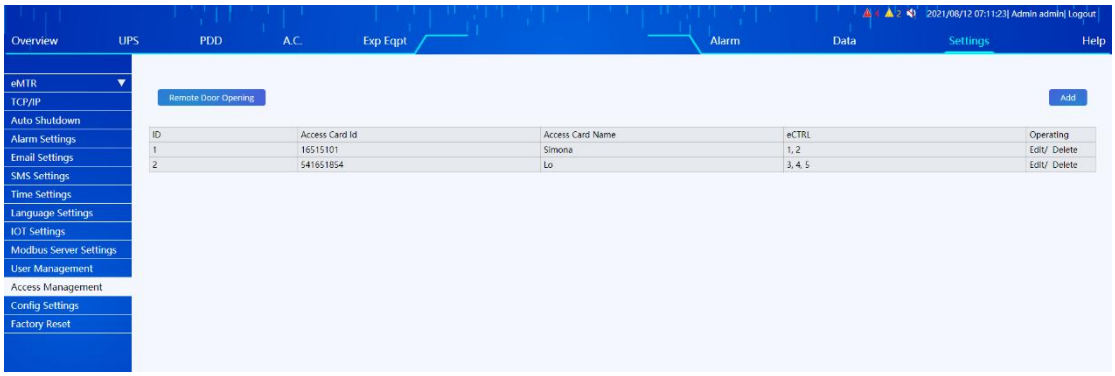


Figure 4-27: Access Control Management Page

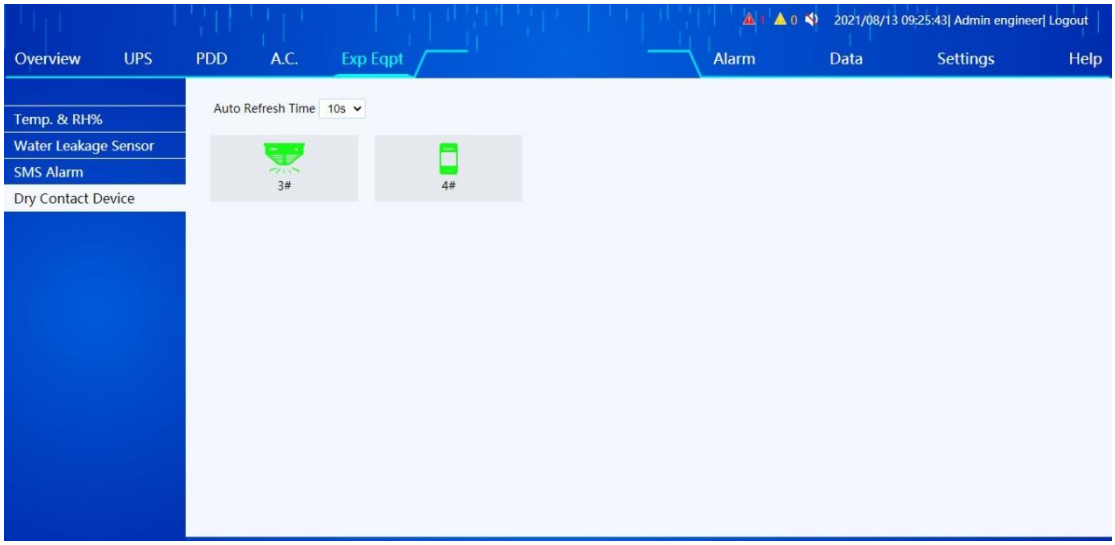


Figure 4-28: Dry Contact Equipment Page

4.6.3 UPS

The UPS current status page displays the main operation data, operation status and various alarms of the currently selected UPS.

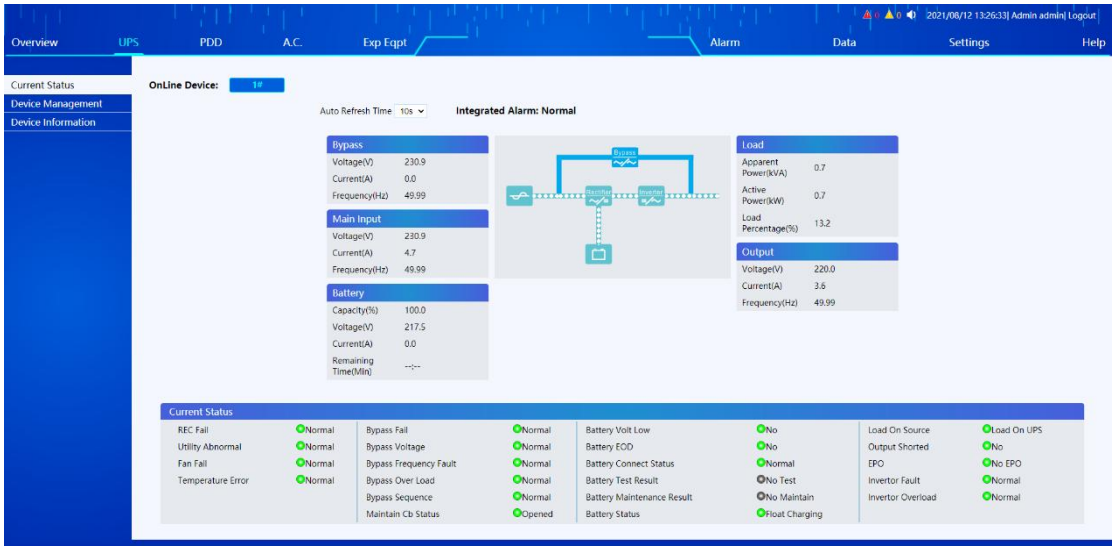


Figure 4- 29: Current Status of UPS

On the equipment management page, the current UPS equipment can be remotely controlled.

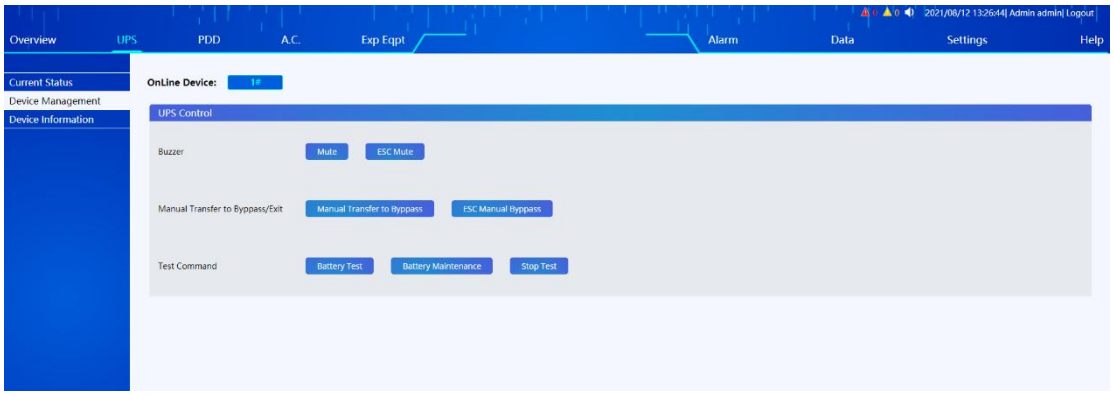


Figure 4- 30: UPS Equipment Management

On the equipment information page, the software version, serial port number, MODBUS address and other information of the current UPS equipment, as well as various rated setting parameters can be seen. At the same time, aliases and remarks can be modified. It is acceptable to fill in the remarks with equipment information that is convenient for managers to remember. After setting, the remarks will be displayed when the mouse moves to the equipment serial number position, which is convenient for customers to manage the equipment.

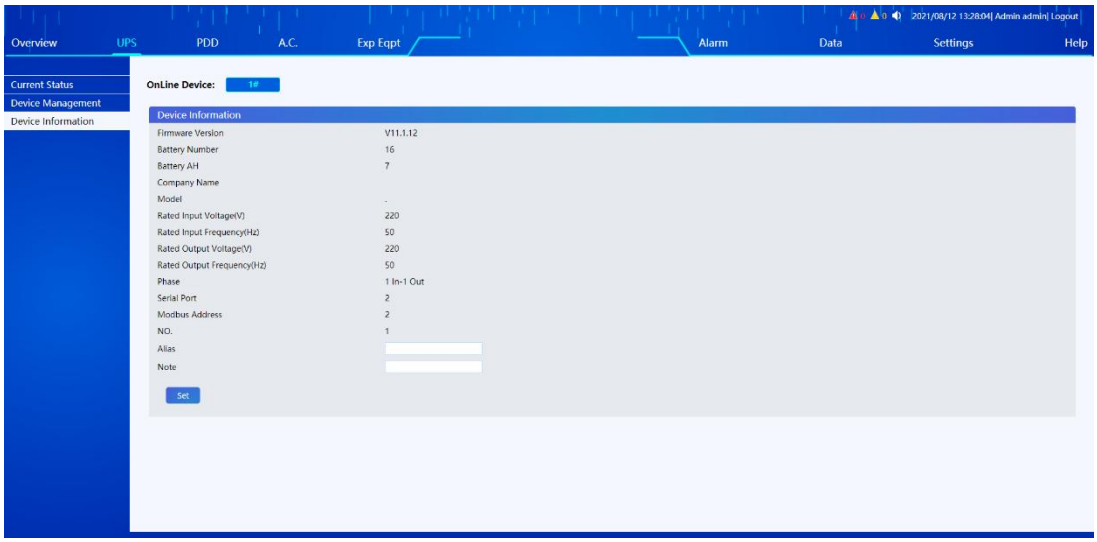


Figure 4- 31: UPS Equipment Information

4.6.4 Power distribution data

On the current status page of ePDU, the working status and operation data of the current

online equipment can be seen.

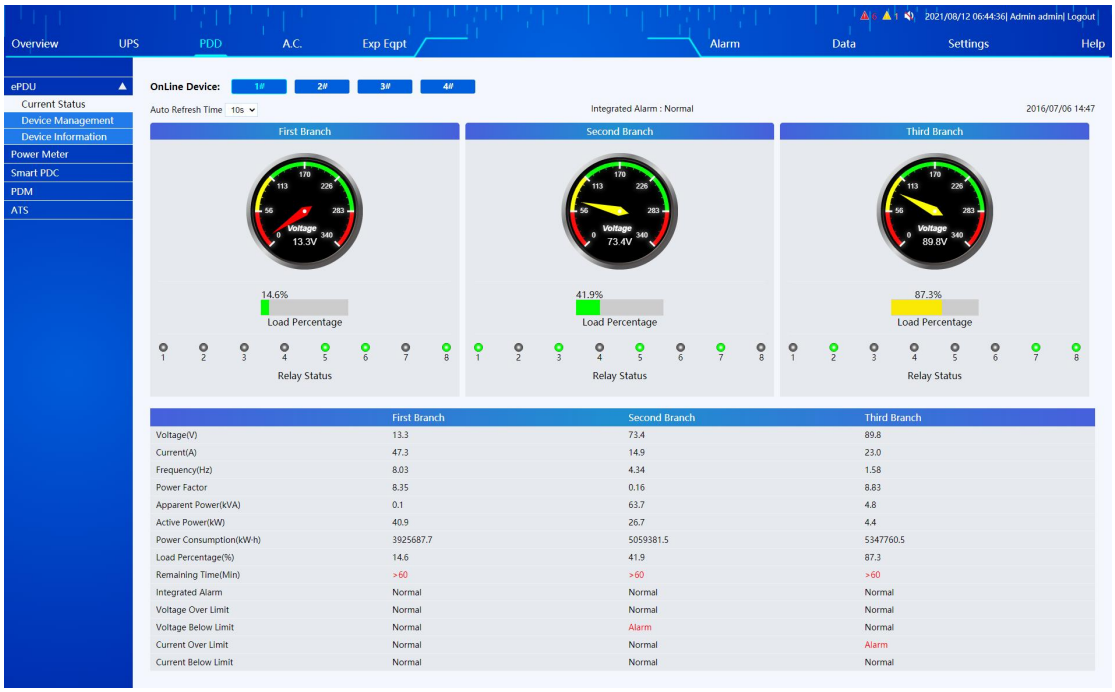


Figure 4- 32: ePDU Status and Operation Data

On the equipment management page, each branch switch of the current ePDU can be controlled; at the same time, the alarm limits of the voltage and current of the equipment PDU can be set.

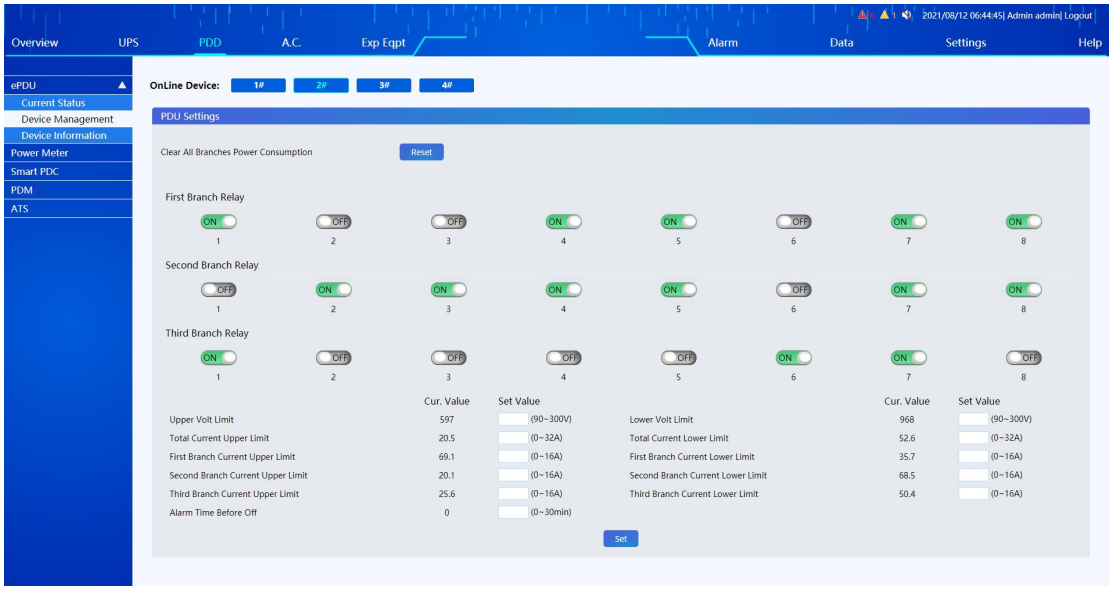


Figure 4- 33: ePDU Equipment Management

On the equipment information page, the serial port number, MODBUS address and rated parameters of the current ePDU equipment can be seen; at the same time, aliases and remarks can be set to facilitate the customer's equipment management

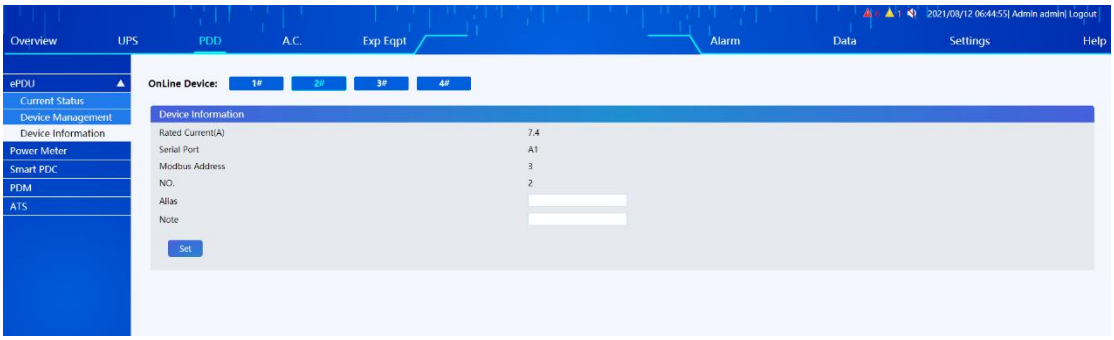


Figure 4- 34: ePDU Equipment Information

4.6.5 Air conditioner

On the current status page of air conditioner, the working status of air conditioner, humidity equipment and other information can be viewed.

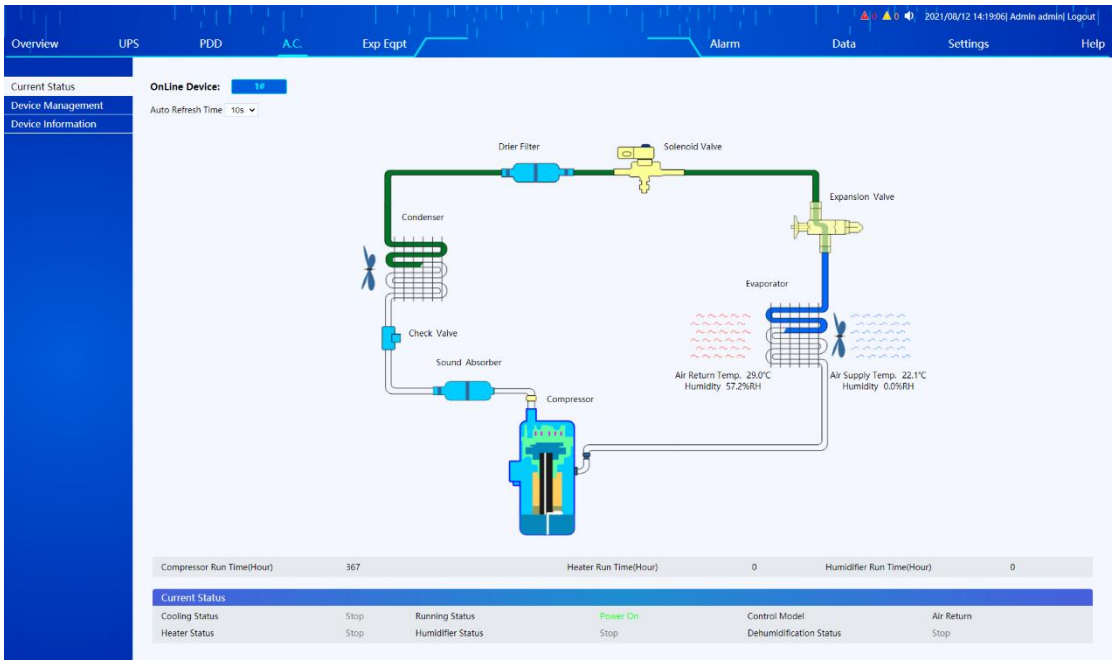


Figure 4-35: Monitoring of Air Conditioner Status

On the equipment management page, customers can control the on/off of face-to-face air conditioner equipment and set various air conditioner parameters at the same time.

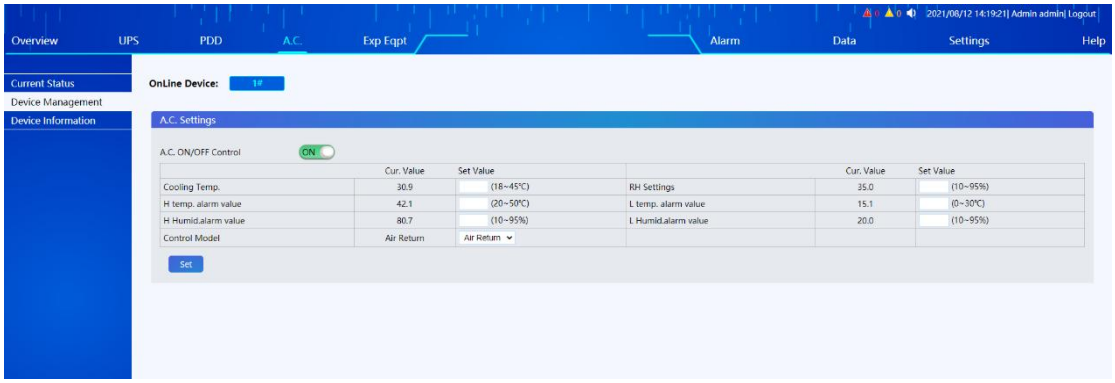


Figure 4-36: Management of Air Conditioner Equipment

On the equipment information page, the serial port number, MODBUS address and other information of the current air conditioner equipment can be seen; at the same time, aliases and remarks can be set to facilitate the customer's equipment management.

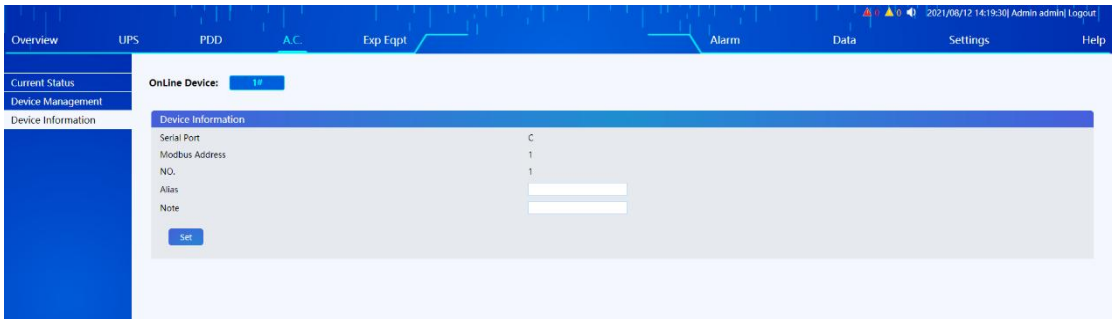


Figure 4- 37：Air conditioning equipment information

4.6.6 Extended device

Expansion equipment mainly includes T/H sensor, water sensor and SMS alarm.
T/H sensor displays the monitoring data of each T/H sensor in the current system.

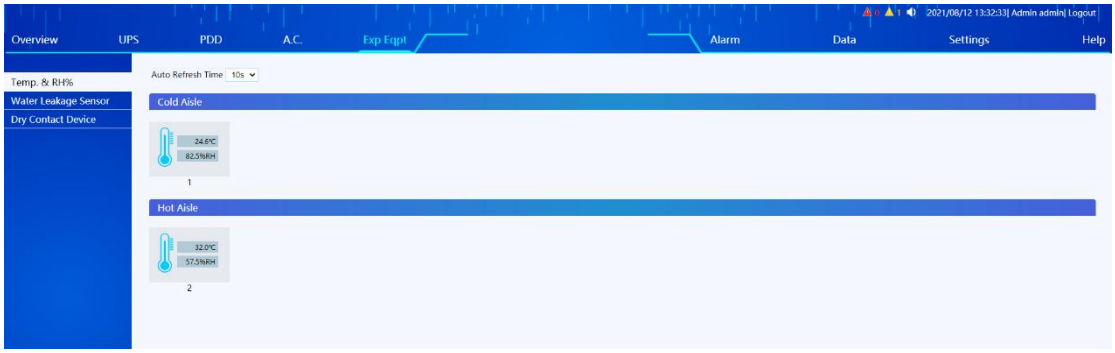


Figure 4- 38：T/H sensor

The water sensor can monitor the status of the water sensor, and once water leakage occurs, the water alarm will display an alarm.

Figure 4- 39： Water Sensor

If the SMS alarm is configured, the customer can set the receiving mobile phone number. When the alarm occurs, the corresponding personnel can be notified by SMS.

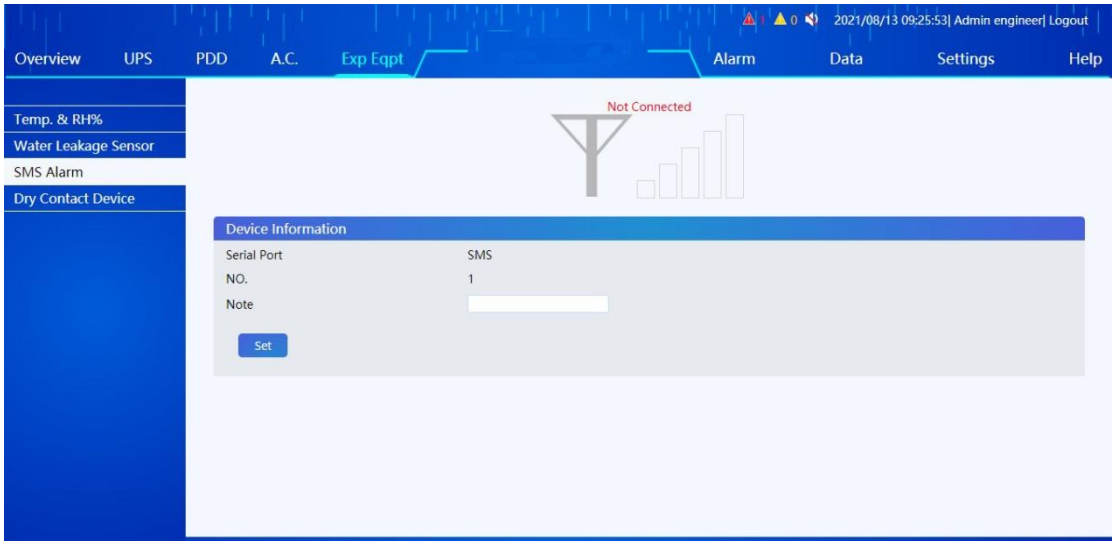


Figure 4- 40：SMS alarm

4.6.7 Alarm management

Alarm management is divided into current alarms and history records.

The current alarm page allows you to view all alarm events occurring in the system at present.

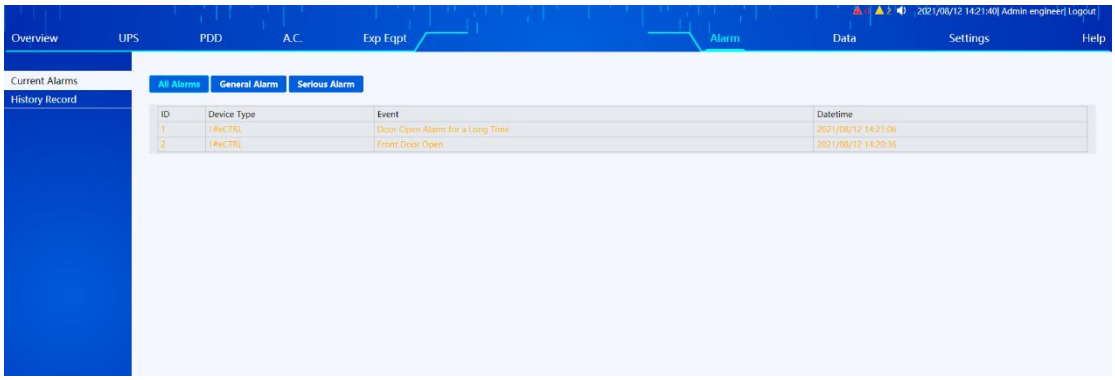


Figure 4- 41: Current alarm

On the history alarm page, the history alarm records of all devices or selected devices within the selected time range can be viewed.

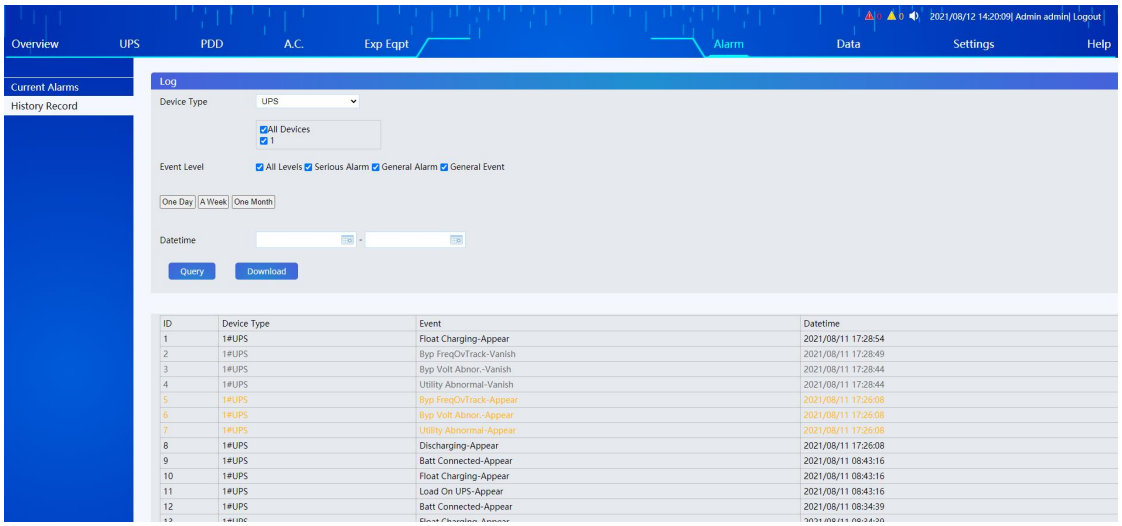


Figure 4-42: History Alarm Record

4.6.8 Data management

Data management is divided into history data, history reports and operation logs.

History data can be used to view the main operating parameters of all equipment or selected equipment within the selected time range.

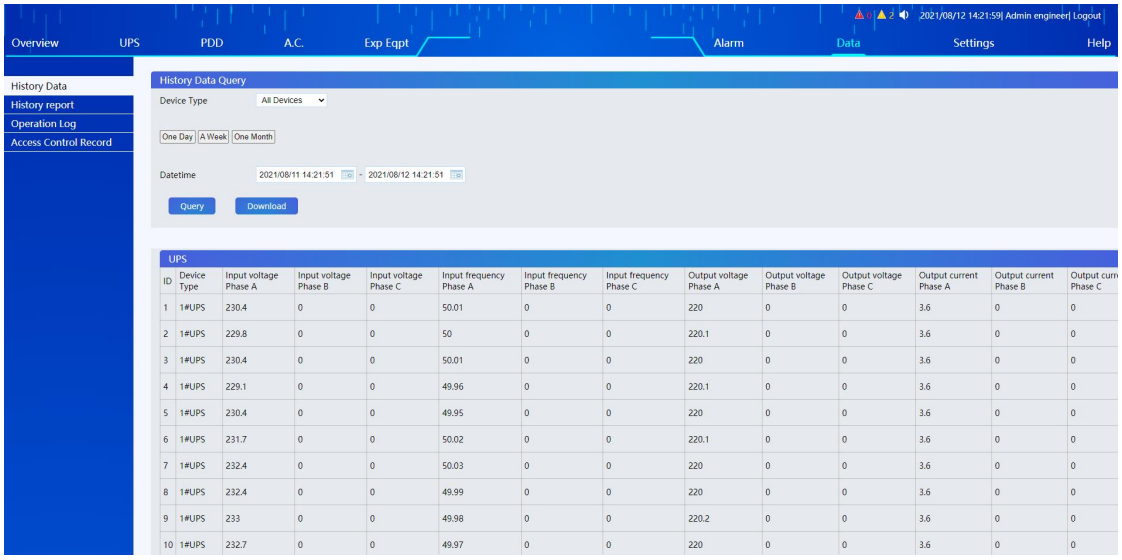


Figure 4- 43: History data

The history report can be used to view the history running trend of selected parameters of selected equipment, which is helpful for customers to analyze and prevent equipment failure.

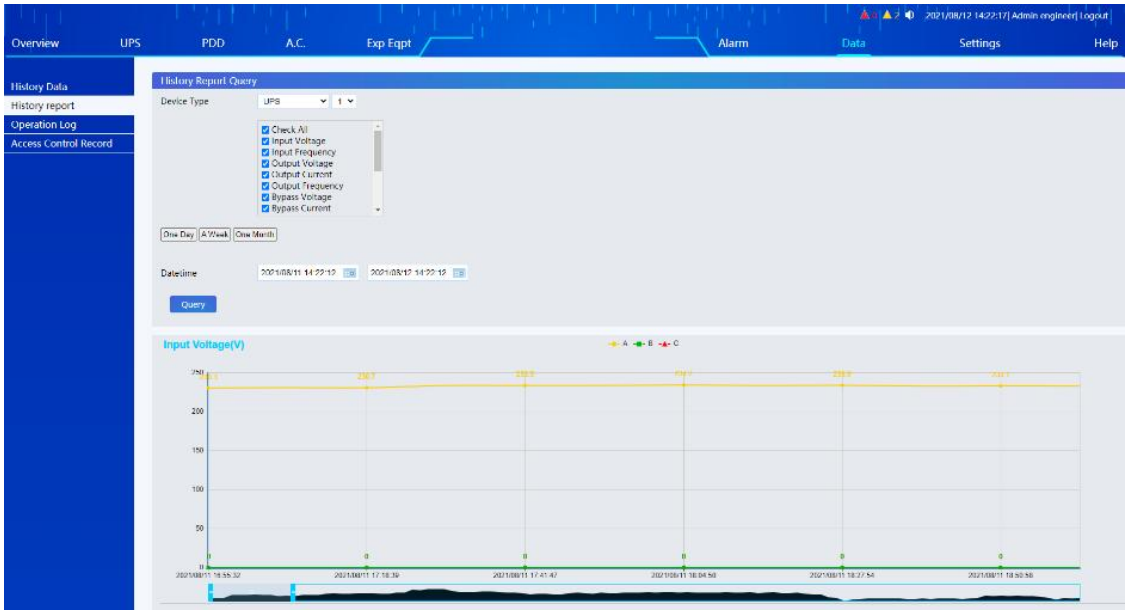


Figure 4- 44： History report form

Operation log can be used to view the history of the whole system.

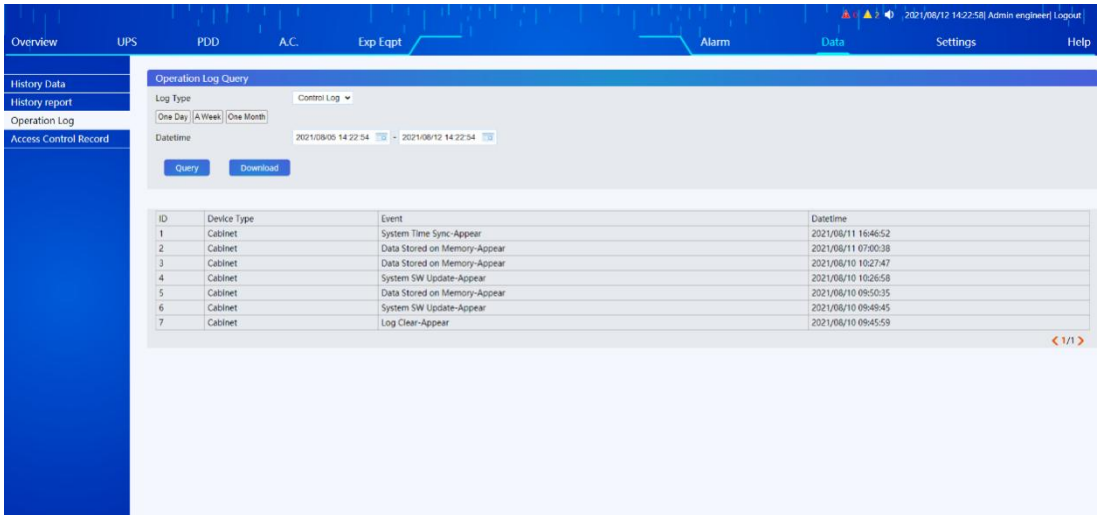


Figure 4- 45: Operation logs

4.6.9 System settings

System settings are divided into monitoring module settings (monitoring system settings, serial port communication settings, equipment management settings, self-defined PUE settings and dry contact function settings), network connection settings, scheduled shutdown, alarm settings, mailbox settings, SMS settings, time calibration, language settings, Internet of Things settings, MODBUS server settings, user management, access control management, batch configuration and restoration of factory settings, etc.

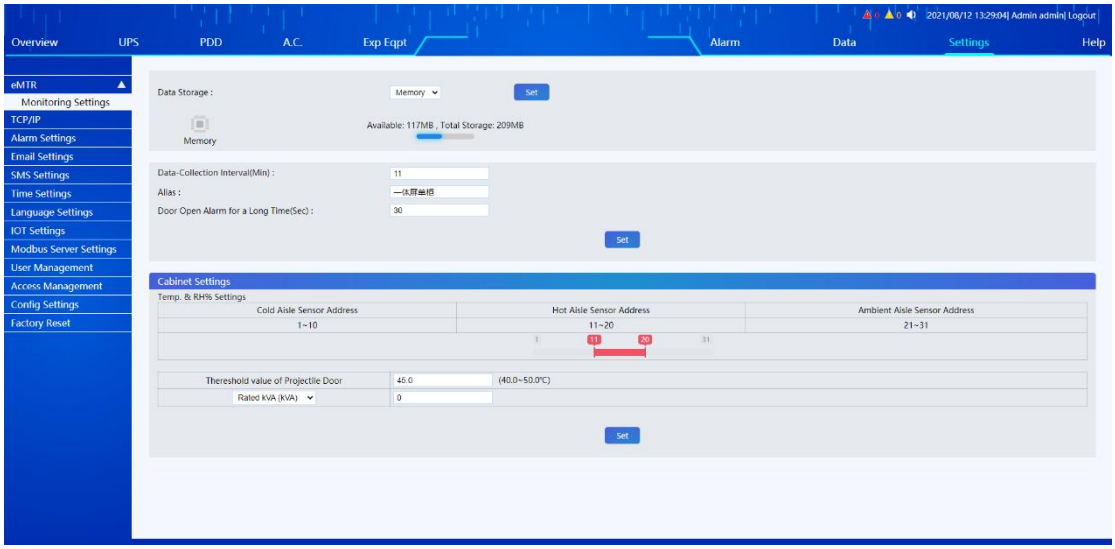


Figure 4- 46：System settings

4.6.10 Help information

Help information is divided into help information and system upgrade page.

The help information page can be used to view the system model, software version and serial number.

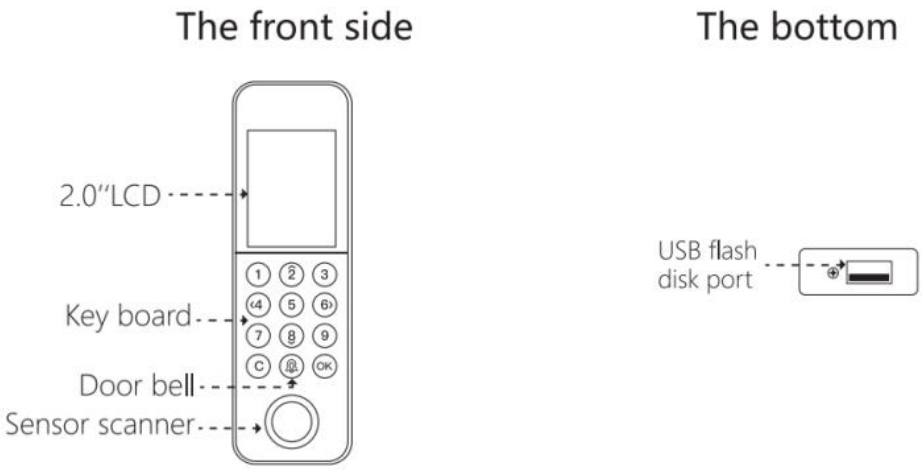
Figure 4- 47：Help information

Software upgrade page can be used to upgrade the system, and the main program of the monitoring module of the system can be upgraded by uploading a new upgrade package directly through the webpage.

Figure 4- 48：System upgrade

5 Operation Instructions for Access Control

5.1 Appearance



5.2 Additional Remarks

An administrator account (account: 888888; password: 888888) will be set in the access control machine before delivery. Customers have all permissions (including modifying user name and password/fingerprint, adding or deleting users, etc.).

5.3 Operations Guide

Announcements:

1. The access control system can be used only after the user is registered and authorized.
2. Special keys:

2: ↑

4: ←

6: →

8: ↓

C: Return

OK: Confirm/Menu

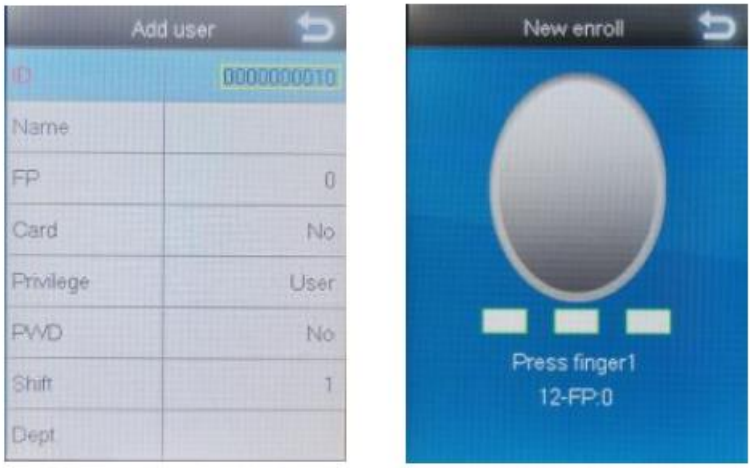
5.3.1 Add User

5.3.1.1 Add user

Step 1 Press [OK] → [Menu] → [User Mgt] → [Add User].

Step 2 Set the ID、Name、FP、Card、Privilege、PWD、Shift、Dept. (Select at least one registration from FP, Card, and PWD)

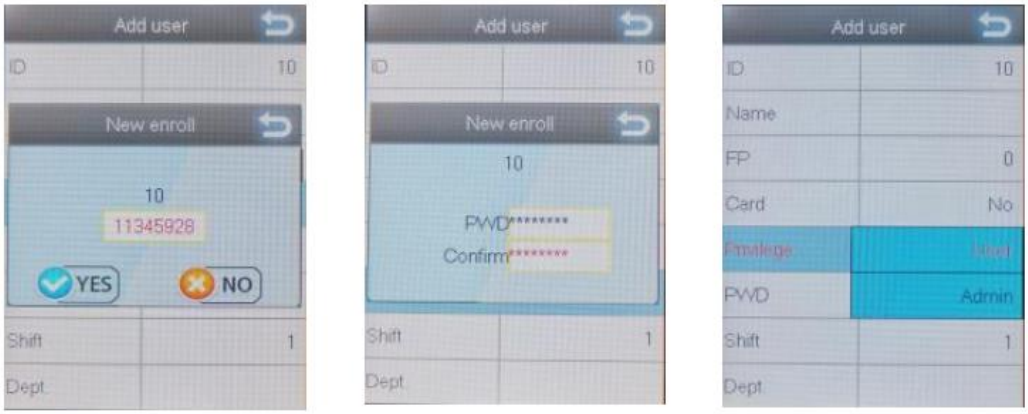
1) ID: You can only use digits as ID (Consists of a maximum of eight digits), and you can only have one ID per person.
2) FP: Select [FP] → Press [OK] → Press the same finger on the sensor scanner three times → Press [OK], One ID can refer up to three different FP.



3) Card: Select [Card] → Press [OK] → Press the card on the sensor scanner → Press [OK] when the card digits appears.
4) PWD: Select [PWD] → Press [OK] → Fill in the password (consists of a maximum of 8

digits) → Press [OK] → Fill in the same password again → Press [OK].

5) Privilege: There are two options: [User] and [Admin]. If you choose [Admin], only when your Admin identity is verified can you enter the menu.



Step 3 After registration, Press [C] → Press [OK].

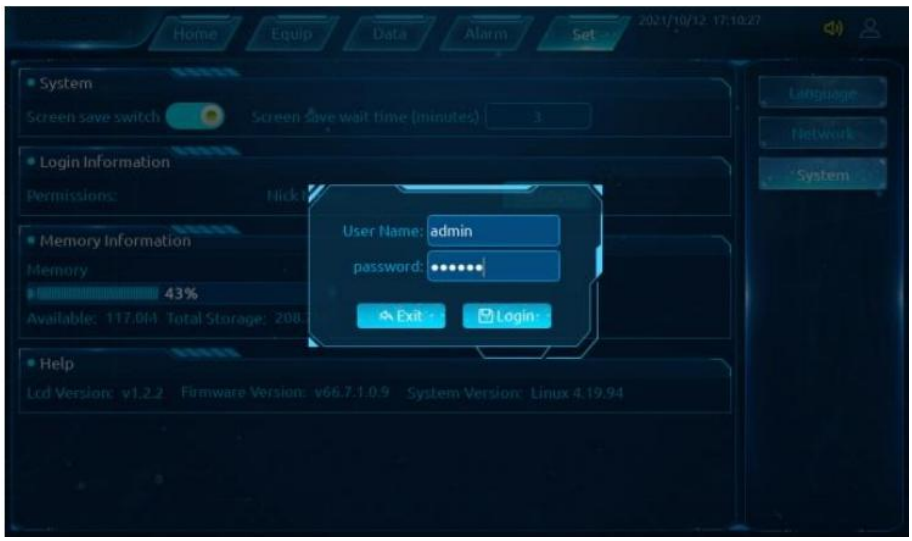
5.3.1.2 User Authorization

Announcements:

Unauthorized users can use the access control system only after they are authorized. Screen authorization has the same effect as web authorization. You only need to select one of the authorization modes.

1） Touch Screen Authorization

Step 1 Click [Set] → [System] → [Login], enter the administrator account (Account: admin; Password: 123456)

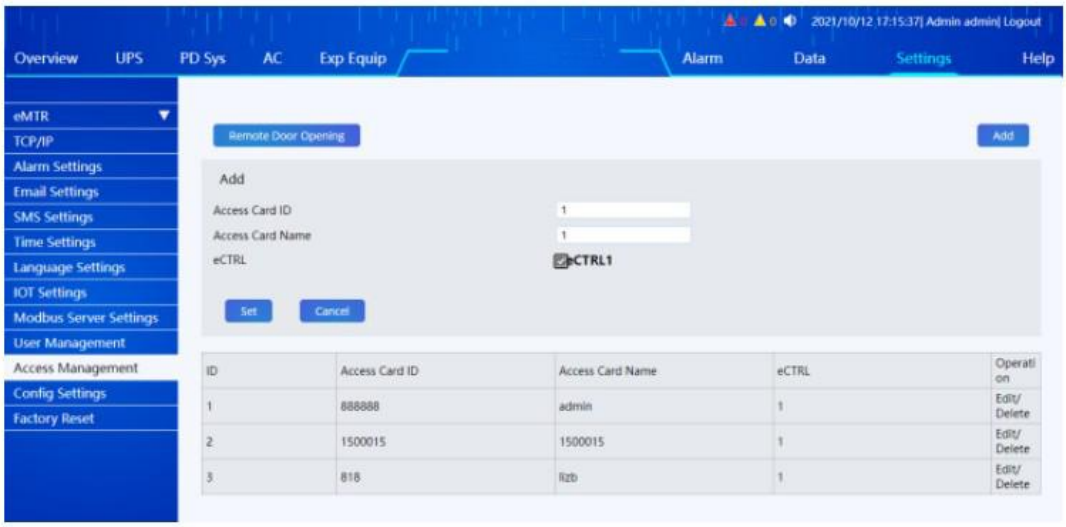


Step 2 After login, Click [Set] → [Access] → [Add].The screen will automatically update the logged in user's access card digits when you Log in to a registered account in the entrance guard machine , then fill out an entrance card name and check [eCTRL1], in the end, click [Set].

2） Web Authorization

Step 1 Connect to the same LAN as the device, and enter the DEVICE IP address (It's can be saw in [System Settings] → [Network]) by browser, Then login by Administrator account (Name: admin, Password:123456).

Step 2 Click [Settings] → [Access Management] → [Add]. The web page will automatically update the logged in user's access card digits when you Log in to a registered account in the entrance guard machine , then fill out an entrance card name and click [eCTRL1],in the end, click [Set].

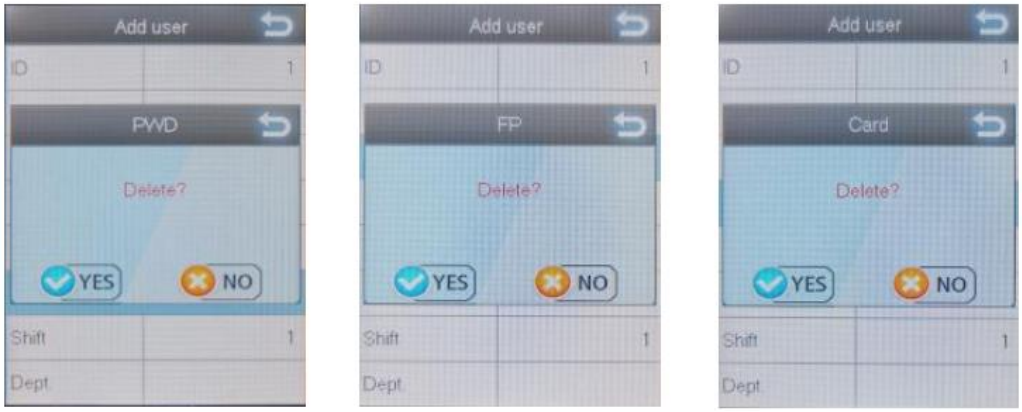


5.3.2 Update Registration Info

Step 1 Press [OK] → [Menu] → [User Mgt] → [Add View].

Step 2 Select a destination user, press [OK]→[Edit]→Edit user information.

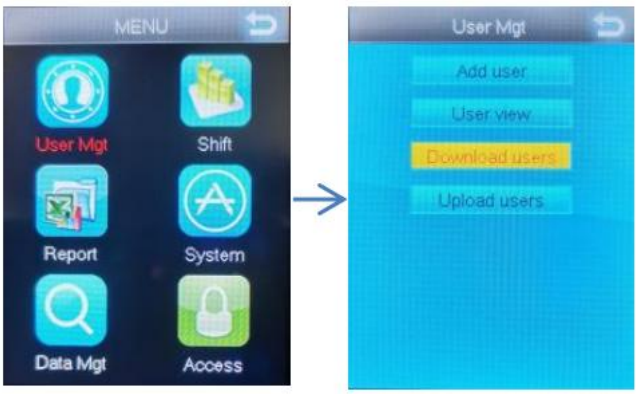
Step 3 Select the item to be modified and press [OK] to modify it. Press [OK] to delete the registered FP(You can delete it only after you register 3 fingerprints)、Card and PWD.



Step 4 When the Settings are complete, press [C] and then press [OK] to save.

5.3.3 Add or Modify User Info in Batches

Step 1 Insert the USB flash drive, press [OK] to enter the main menu, choose [User Management] → [Export Employee Information] , press [OK] to export user information EXCLE



Step 2 Fill in the personnel information as prompted by the information in the form, save the modified file to the U disk after editing.

STAFF										
Note:[1]ID:only fill in the digits(maximum of 8)required;[2]Name:Contains a maximum of eight characters(It can be Chinese, letters, digits);[3]Dept:Contains a maximum of five characters(It can be Chinese, letters, digits);[4]Shift:0~8;[5] Privilege:0 or not filled:user,1:admin;[6]FP:no need to fill in;[7]PWD:up to 8 digits;[8]Card:up to 10 digits;[9]Time Zone:0~8;[10]Start,End:user valid date,the format is yyyy-mm-dd.										
ID	Name	Dept	Shift	Privilege	FP	PWD	Card	Time Zone	Start	End
1	××	Office	1	0	1					
2	××	Office	1	0	0					

Step 3 Insert the USB flash drive, press [OK] key to enter the main menu, choose [User Management] → [Import Employee Information], press [OK] to import user information.

6 Guide on Quick Installation

6.1 Installation of Cabinet Components

After the product arrives, refer to this guide on quick installation for installation:

1) Disassemble the carton, cushioning material and plastic bag outside the cabinet;

2) Loosen the screws connecting the cabinet and the pallet, and remove the cabinet from the pallet;

3) Move the cabinet to the preset position and adjust the anchor fastening nuts until the cabinet is horizontal.

Figure 6-1 Schematic Diagram of Removing Package

6.2 Installation of Air Conditioner Components (*Applicable for Split Air Conditioner*)

The customer installs the outdoor unit and pipelines of the air conditioner on site with the regular installation method. The installation method is as follows:

1) Take out the outdoor unit of the air conditioner from the cabinet, as shown in Figure 6-2;

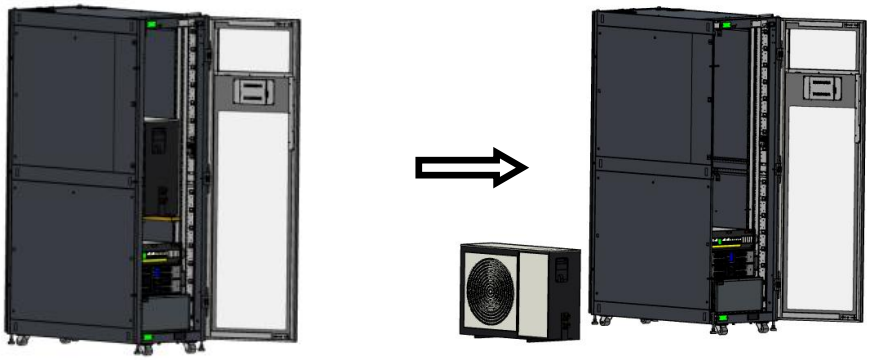
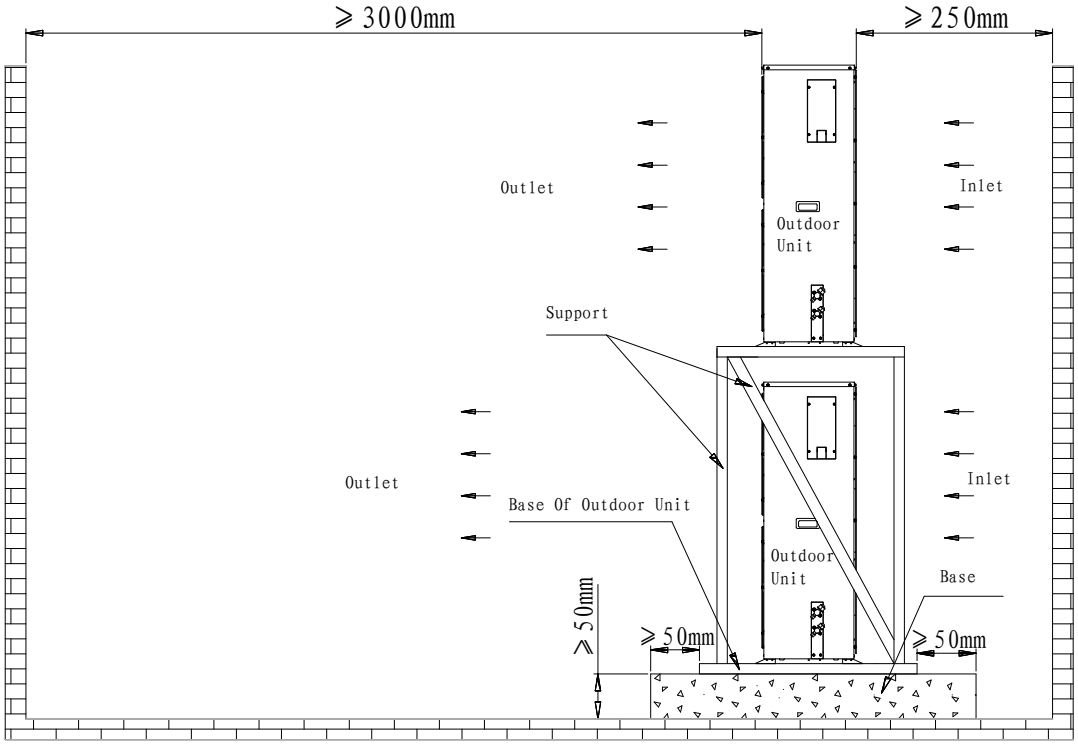
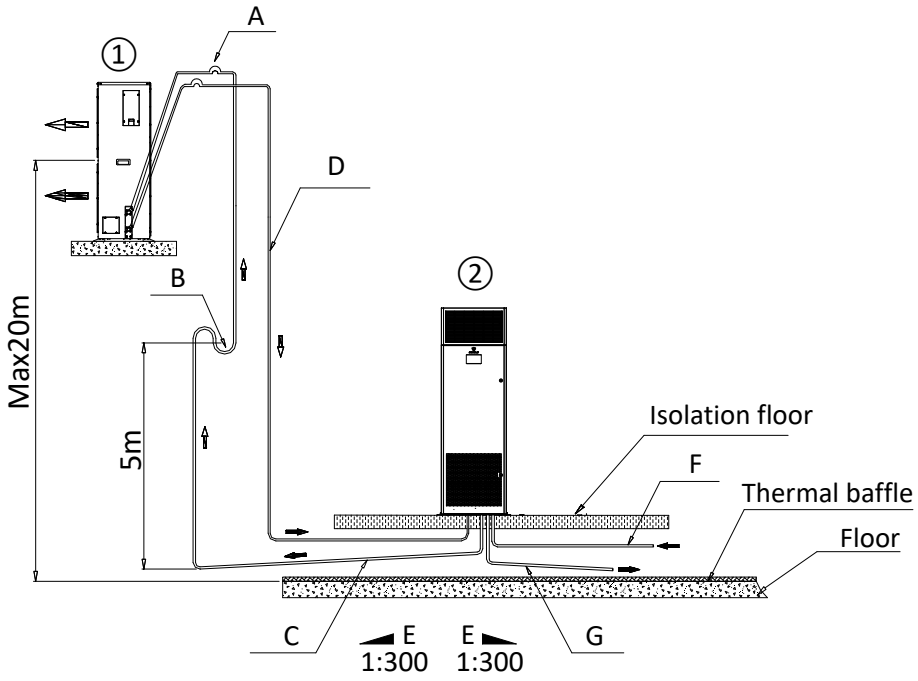


Figure 6-2 Take Out the Outdoor Unit of the Air Conditioner

2) Determine the installation position of the outdoor unit on site, and place the outdoor unit on the pedestal (or tripod). Refer to Figure 6-3 for the distance between the air inlet and outlet side of the outdoor unit and the wall and other obstructions.





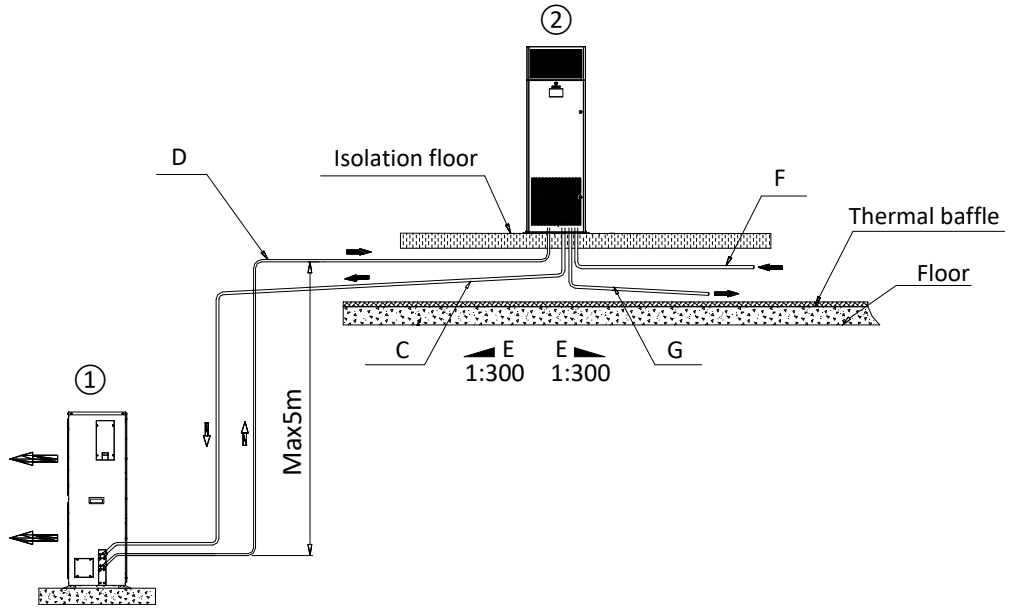


Figure 6-3 Requirements on the Installation of the Outdoor Unit of the Air Conditioner

3) Fix the outdoor unit on the pedestal with expansion bolts;

4) Connecting copper pipes (connecting copper pipes of the user's indoor and outdoor units shall be delivered together with the cabinet) need to be installed on site. The pipeline must be selected and laid according to industry standards, and the system should be vacuumized and filled with refrigerant (only when the pipeline is too long to add refrigerant);

5) The longest pipeline shall not exceed 30m.

6.3 Cable Connection

The internal cable connection of integrated cabinet has been basically preassembled and customers only need to connect utility supply to the input port of the power distribution module; in addition, cables connecting the indoor unit and outdoor unit of the air conditioners (**applicable for the split air conditioner,** attached with the machine) can be used when the machine is opened.

Note: The cable of the integrated rack air conditioning without the outdoor unit is pre-installed in the factory, so there is no need to connect on site.

6.3.1 Connection of the Total Input Cable of the System

Connect the input cable according to Figure 6-4

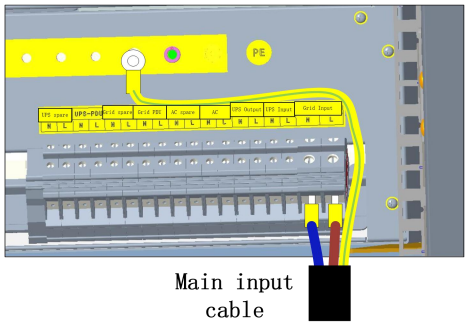


Figure 6-4 Connection of Input Cable

6.3.2 Connection of Cables of the Indoor Unit and the Outdoor Unit (*Applicable for the Split Air Conditioner*)

Connect the cables of the indoor unit and outdoor unit of the air conditioner as Figure 6-5 and Figure 6-6 below respectively.

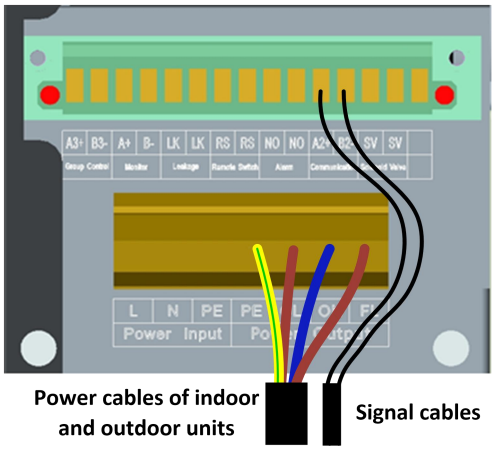


Figure 6-5 Connection of the Cables of the Indoor Unit

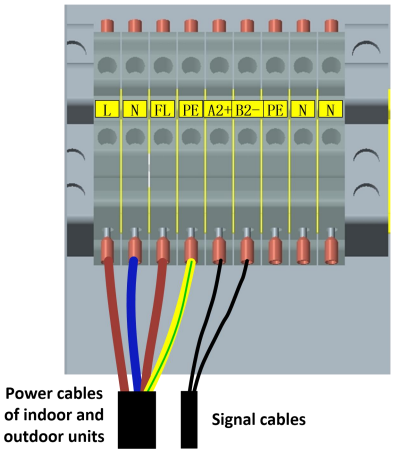


Figure 6-6 Connection of the Cables of the Outdoor Unit

7 System Commissioning

Start preparing for power-on commissioning after complete the wiring of all equipment and the ID setting of all extended equipment.

Step 1: Close the lightning protection switch and electric supply input switch;

Step 2: Close the UPS input and output switches, and the UPS will automatically start up and switch to the inverter state in about 2 minutes;

Step 3: Close the air conditioner switch;

Step 4: Close the electric supply PDU and UPS PDU switches;

Step 5: If other switches are not used, they need not be closed. If they are used, they can be put into use according to the situation.

7.1 Intelligent Monitoring Screen ePAD

Step 1: Power on the single cabinet control module and intelligent monitoring screen, press the switch in Figure 7-1, and the LCD will automatically turn on;

Figure 7-1 Power Switch of the Single Cabinet Control Module

Step 2: After the system is turned on, the screen will display the LCD login page, enter the ID and password;

Step 3: Enter the administrator login password in “System Settings” -> “System Functions” -> “Login Information” on the LCD to enter the LCD display interface, and set the IP address of the intelligent monitoring screen on “System Management” - “Network Settings”;

Step 4: Enter the IP address set in Step 2 in the browser, log in to the WEB as an administrator, and enter “System Settings” - “Time Calibration” to obtain the local time and calibrate it;

Step 5: Enter the relevant power environment equipment page and check the equipment operation;

Step 6: Set remark information for all equipment in the equipment information according to the principle of convenient management.

7.2 Temperature and Humidity Sensor

After installing the Temperature and Humidity sensor and the single cabinet control module and the intelligent monitoring screen are powered on, the Temperature and Humidity sensor will be started at the same time to observe whether there is abnormal communication.

Enter the LCD display screen, “Equipment Management” - “Environmental System” - “Temperature and Humidity” equipment to set the alarm range of temperature and humidity sensing. (Note: This operation requires logging with the administrator account.)

Check the temperature information of the corresponding Temperature and Humidity sensor on the

LCD display screen and compare it with the actual room temperature.

Blow hot air on the Temperature and Humidity sensor with hot air drum or other equipment	The system will give an over-temperature alarm, and the front and rear doors will bounce off after exceeding the set threshold

7.3 Water sensor

After installing the water sensor and the power environment monitoring module is powered on, the water sensor will be started at the same time to observe whether there is abnormal communication.

Inspect the water sensor function.

Immerse the detection line of the water sensor in water	The system will alarm in case of “occurrence of water leakage”.

7.4 Intelligent PDU (Optional)

After PDU wiring is completed, the whole system power distribution is powered on. After UPS has output, close the PDU switch on the power distribution module. At this time, the PDU will have AC input.

Enter the LCD display screen, “Equipment Management” - “Power Distribution System” - “PDU Parameter Setting”, turn on all switches of PDU, observe the power indicator light of PDU output socket, and all indicator lights will turn on green light.

After commissioning, change all switches back to the default settings.

7.5 Smoke sensor

The smoke sensor of the single cabinet system of the integrated data center is installed in the middle of the back and upper side of the cabinet. When the system is powered on, the smoke sensor will start to work, and the smoke sensor will send an alarm signal to the monitoring module and the system will give an alarm. To reset the smoke alarm, it is necessary to power off the smoke, and power off and power on again by plugging and unplugging the dry contact terminal of the smoke or pressing the switch of the single cabinet control module.

The module has smoke entering the smoke detector	The system will alarm

8 Trouble Shooting

In case of equipment alarm, please check and troubleshoot according to the following table. Click the screen-alarm management page to view the fault information. According to the fault

information, the fault can be quickly discharged. The list of faults is shown as follows:

Table 8-1: List of Faults

Name of the fault		Reasons	Fault treatment
The system	Cold channel temperature is too high	1. Air conditioner refrigeration failure 2. The load exceeds the rated capacity 3. Air leakage in cabinet	1. Reduce the load or increase the auxiliary cabinet 2. Check air leakage points and fill the air leakage points
	Cold channel temperature is too low	1. The load is too small 2. Air conditioner refrigeration is too large 3. The server fan does not work 4. The server is too scattered	1. Increase the load or increase the refrigeration point of the air conditioner 2. Increase the refrigeration point 3. Replace the server fan 4. Arrange servers from bottom to top with the interval not exceeding 2U
	Hot channel temperature is too high	1. Air conditioner refrigeration failure 2. The load exceeds the rated capacity 3. Air leakage in cabinet	1. Reduce the refrigeration point of the air conditioner 2. Reduce the load or increase the auxiliary cabinet 3. Check air leakage points and fill the air leakage points
	Hot channel temperature is too low	1. The load is too small 2. Air conditioner refrigeration is too large 3. The server fan does not work 4. The server is too scattered	1. Increase the load or increase the cooling point of the air conditioner 2. Increase the cooling point 3. Replace the server fan 4. Arrange servers from bottom to top with the interval not exceeding 2U
	Mail sending failure	1. Whether the network is normal and connected with the mailbox server 2. Whether the sender's email address is associated with the account number 3. Whether the account password is wrong 4. Whether the mailbox is recognized as a junk mailbox by the mailbox server	1. Use the computer to access the same network environment as the intelligent monitoring screen, and ping the address of the mailbox server to see if the communication is normal; ask IT information personnel if firewall has relevant interception 2. Go to the email settings to see if the sender's email address matches the account's email address 3. Log in to the mailbox server to see if the set account password is successfully logged in, and then enter the account password again to set it. 4. Whether communication with the person in charge of the mailbox server is restricted or change a new account
	Removal of SD card	1. SD card of intelligent monitoring screen is pulled out 2. SD card is not inserted, but SD card storage mode is selected	1. Check whether the SD card of the smart monitoring screen is pulled out and plug in back 2. Change the SD card storage mode back to memory storage
	Space left in SD card is insufficient	The remaining capacity of SD card will soon be insufficient to prompt replacement	Replace with a new SD card; or after backing up the data, enter "Restore Factory Settings" for data clearing and record clearing

	Space left in memory is insufficient	The remaining capacity of memory will soon be insufficient to prompt replacement	After backing up the data, enter “Restore Factory Settings” for data clearing and record clearing; or insert SD card to select SD card storage method
	Data storage failure	Whether there is a power failure or repeated power-on and power-off before this alarm, resulting in database damage	If there is an SD card and the data can be emptied, pull out the SD card and format the SD card; if not, please contact the engineer
	The door opener makes the door open	The average temperature of the system exceeds the threshold of the door opener	Investigate the cause of high temperature in cold and hot channels and lower the temperature
Common equipment	Communication failure	1. Confirm whether to change the equipment address and replace the equipment port 2. Whether the 485 communication line is loose or interfered	1. Enter the page of the corresponding error reporting equipment to view the corresponding serial port number and address, and plug the equipment back into the corresponding serial port and address to set it as the address displayed on the page 2. Re-tighten the 485 communication line; check whether there are short lines in other redundant lines at the 485 communication line
Single cabinet control module	Smoke alarm	1. The smoke sensor is not successfully plugged into the single cabinet control module 2. Smoke damage 3. On-site cabinet fire	1. Check the wiring of smoke sensor control module 2. Replace the new smoke sensor 3. Put out the fire and dial 119
	Infrared intrusion alarm	1. The infrared sensor is not successfully plugged into the single cabinet control module 2. The infrared sensor is damaged 3. Watch the monitor to see if there are illegal people breaking in	1. Check the connection between infrared sensor and control module 2. Replace with a new infrared sensor
	Infrared removal alarm	1. The infrared is not successfully plugged into the single cabinet control module 2. Whether the infrared sensor is removed 3. The infrared sensor is damaged	1. Check the connection between infrared sensor and control module 2. Replace with a new infrared sensor
	Water leakage (dry contact)	1. There is water leakage in the cabinet 2. The water controller or water leakage sensing rope is damaged	1. Eliminate water leakage 2. Replace the water controller or water leakage sensing rope
UPS	No battery	The battery is not connected	1. Check whether the battery is connected correctly 2. Check whether the battery air switch or the insurance is disconnected

			3. Check whether the battery is damaged
	Manual bypass is closed	Bypass switch is closed	The manual bypass air switch is closed, and the UPS will not switch to inverter power supply at this time, so the bypass switch needs to be restored manually
	Bypass is abnormal	1. The bypass power supply is abnormal 2. The bypass air switch is not closed	1. Whether the bypass input power supply is normal 2. Whether the bypass input air switch is closed, please restore the bypass input as soon as possible; otherwise, the bypass will not provide a backup circuit for UPS, and power may be lost when the inverter is abnormal.
	Bypass fault	Short circuit or open circuit fault of bypass SCR	Short circuit or open circuit fault of bypass SCR. Please contact the manufacturer
	Bypass overload	The load is too large	Please check the load and reduce the load of UPS output until the alarm disappears, otherwise there may be bypass overload timeout load power failure.
	Output short circuit	1. Load short circuit 2. Short circuit of UPS output port	1. Whether the load is normal 2. Whether there is abnormal short circuit in the UPS output port, please disconnect the abnormal load or restore the fault point of short circuit and restart it, or manually clear the fault and restart it.
	Rectification fault	Bus voltage is too high, too low, short circuit or rectification IGBT open circuit	Please clear the fault manually. If the fault cannot be recovered, please contact the manufacturer
	Fan fault	The fan is blocked The fan stops running or the speed is abnormal	1. Check whether the fan is blocked abnormally 2. Check whether the fan stops running or the speed is abnormal
	Manual bypass switching	Manually switch to bypass power supply	Manually switch to bypass operation. If the bypass exceeds the tracking voltage, it is possible to power down the load by manually switching the bypass.
	Battery voltage is low	Battery voltage is below threshold	When the battery voltage is low, it will alarm and the battery backup time may be less than one minute. Please restore the electric power supply as soon as possible, otherwise the system may lose power
	Battery connection is reversed	1. The battery wires are connected reversely 2. Internal battery connection error	1. Whether the battery wires are connected normally 2. Whether the battery connection inside the battery pack is normal
	Inverter protection	Abnormal inverter voltage or bus overvoltage	Please clear the fault manually. If the fault cannot be recovered, please contact the manufacturer
	Bypass overload timeout	Bypass overload timeout	When the bypass works, the output overloads and times out, and the UPS output will lose power at this time
	Inverter fault	Abnormal inverter voltage or open circuit of inverter IGBT	Please clear the fault manually. If the fault cannot be recovered, please contact the manufacturer

Air conditioner	Unit does not start	Unit power is not connected	Check the input power supply
	Fan does not operate	No fan control signal output	Check whether the fan control signal output is normal
	Compressor not operate	1. There is no need to start the compressor 2. Compressor driver failure 3. The compressor is damaged	1. Check the compressor demand status 2. Replace the compressor driver 3. Replace the compressor
	The noise of compressor is too large	1. Liquid return 2. Poor lubrication 3. The transportation fixing parts of compressor are not removed	1. Check whether the return air temperature is too low 2. Check the air delivery and return system 3. Add lubricating oil 4. Remove the transportation fixing parts
	High voltage alarm	1. The condenser is dirty and blocked 2. The condensing fan does not operate 3. Excessive refrigerant charge	1. Clean the condenser 2. Check the static resistance and grounding resistance of the condensing fan. If the coil is burned, replace the fan 3. Eliminate excessive refrigerant and control the high pressure at 2.1-3.7MPa
	Low voltage alarm	1. Insufficient refrigerant charge 2. Refrigerant leakage 3. The return air temperature is too low 4. The air volume is too small 5. Expansion valve coil failure	1. Increase the refrigerant charge 2. Weld leakage points 3. Improve the set point of air return temperature 4. Improve the speed of the blower to ensure smooth ventilation 5. Replace the expansion valve coil
	Exhaust temperature is too high	1. The refrigeration system is blocked 2. The system is mixed with air 3. Too little refrigerant charge 4. Outdoor fan failure 5. Poor heat dissipation caused by dirty plugging of condenser	1. Clean the refrigeration system 2. Evacuate the system again and fill it with refrigerant 3. Increase the refrigerant charge 4. Check the outdoor fan operation 5. Clean the condenser
	High temperature alarm	1. Temperature sensor failure 2. Compressor does not work 3. The setting of high temperature alarm value is unreasonable 4. The load design of the unit is too small	1. Check and calibrate the temperature sensor 2. Check the working state of compressor 3. Reset the high temperature alarm value 4. Check the sealing condition of the cabinet and add refrigeration equipment if necessary
	Low temperature alarm	1. Temperature sensor failure 2. The setting of low temperature alarm value is unreasonable 3. Electric heating does not work	1. Check and calibrate the temperature sensor 2. Reset the low temperature alarm value 3. Check the working state of electric heating
	High humidity alarm	1. Humidity sensor failure 2. Dehumidification function is not enabled 3. The setting of high humidity alarm	1. Check and correct the humidity sensor 2. Check and enable dehumidification function 3. Reset the high humidity alarm value

		value is unreasonable	
	Low humidity alarm	1. Humidity sensor failure 2. The setting of low humidity alarm value is unreasonable 3. Humidifier does not work	1. Check and correct the humidity sensor 2. Reset the low humidity alarm value 3. Check the working state of the humidifier
	Electric heating function failure	1. The relay does not actuate 2. Electric heating overload 3. Electric heating failure	1. Check the voltage between digital output port of electric heating and zero line terminal, and 220VAC is normal. If it is normal, the relay fails and the relay should be replaced; otherwise, the controller relay fails and the controller should be replaced. 2. Check whether the blower works normally to ensure smooth airflow 3. Replace the electric heating
	Humidification function failure	1. Water inlet magnetic valve failure 2. Timeout of cumulative operation of humidifier 3. Water supply failure 4. The water inlet valve is not powered	1. Replace the water inlet magnetic valve 2. Replace the humidifier 3. Check the water supply source and pipeline and handle it 4. Check the voltage between digital output port of humidifier inlet valve and zero line terminal, and 220VAC is normal
Temperature and humidity	High temperature alarm	1. Air conditioner refrigeration failure 2. The load exceeds the rated capacity 3. Air leakage in cabinet	1. Reduce the air conditioner refrigeration point 2. Reduce the load or increase the auxiliary cabinet 3. Check the air leakage points and fill the air leakage points
	Low temperature alarm	1. The load is too small 2. Air conditioner refrigeration is too large 3. The server fan does not work 4. The server is too scattered	1. Increase the load or increase the refrigeration point of the air conditioner 2. Increase the refrigeration point 3. Replace the server fan 4. Arrange servers from bottom to top with the interval not exceeding 2U
	High humidity alarm	1. Air conditioner humidity sensor failure 2. Air conditioner dehumidification function is not enabled 3. The setting of high humidity alarm value of air conditioner is unreasonable	1. Check and calibrate the humidity sensor 2. Check and enable dehumidification function 3. Reset the high humidity alarm value
	Low humidity alarm	1. Air conditioner humidity sensor failure 2. The setting of low humidity alarm value of air conditioner is unreasonable	1. Check and calibrate the humidity sensor 2. Reset the low humidity alarm value 3. Check the working state of the humidifier

		3. The air conditioner humidifier does not work	
Water sensor	Water leakage	1. There is water leakage in the cabinet 2. The water sensor is damaged	1. Eliminate water leakage fault 2. Replace the water sensor
	Cable abnormality	The water leakage sensing rope is damaged	Replace the water leakage sensing rope

Appendix A System Specifications

System	**IT rated power**	3KW
	Power grid system	220Vac,50Hz or 60Hz
	Ambient temperature	0-45℃
	Ambient humidity	10-95%
	Altitude	1000m; it shall be reduced according to the standard for over 1000m
Cabinet	**Dimensions (W*D*H)mm**	600*1200*2000
	Equipment space	Maximum 32U
	Display	10.1-inch color touch screen
	Lighting mode	Front and rear LED tube
Power distribution system	**Lightning protection grade**	Class-C
	UPS power	3kVA, 6kVA and 10kVA, etc.
	PDU	depending
	Battery	Built-in battery pack or external battery cabinet
Monitoring system	**Monitoring module**	Intelligent monitoring screen ePAD + single cabinet control module eCTRL
	Monitoring devices	Smoke, T/H sensor, water sensor, access control and video, etc.
Heat dissipation system	**Air conditioner**	Air-cooled rack air conditioner
	Rated refrigerating capacity (KW)	3.7
	Standard air volume (m3/h)	700
Machine	**Package size (W*D*H)mm**	720*1338*2230
	Weight (kg)	188 (excluding indoor unit and outdoor unit of the air conditioner, UPS and battery pack)

Note: This specification is a typical configuration, and the actual configuration specification is configured according to the actual customer demand.