



## SmartCabinet2-E

User Manual



# SmartCabinet2-E Series Computer Room Solution Product

## User Manual

Version V1.30

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BOM

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# Safety precautions

1. Keep this manual throughout the life of the product.
2. Users should read this manual carefully before performing any operation on the product.
3. "Notices" and "Warnings" in this manual do not represent all safety precautions to be observed, but they are only supplements to various operational safety precautions.
4. This product is professional equipment, used in industrial, commercial or other professional occasions, not to the general public.
5. This product is only used for the purpose of its design. The manufacturer will not bear any responsibility for incorrect use.
6. The key provided by the product must be kept by the person responsible for maintenance.

## Electrical safety

### Dangerous voltage

 Danger	Some components of the system carry dangerous voltage in operation. Direct contact or indirect contact through moist objects with these components will result in fatal injury.
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Safety rules in the industry must be observed for installation of the AC power supply. The installation personnel must be licensed to operate high voltage and AC power.

Never wear a watch, bracelet, bangle, ring, or other conductive objects during operation.

When water or moisture is found on the cabinet, turn off the power immediately. In a moist environment, precautions must be taken to keep moisture out of the power supply.

In the installation process, a prohibition signboard must be put on the operating switch and button.

 Danger	High voltage construction operation may cause fire or electric shock. Areas for connection and wiring of AC cables must be in compliance with the local rules and regulations. Only those who are licensed to operate high voltage and AC power can perform high voltage operations.
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### High leakage current

 Warning	High contact current must be grounded before power connection.
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### Tools

 Warning	In high voltage and AC operation, special tools must be used. No common or self-carried tools should be used.
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In thunderstorms, a strong electromagnetic field will be generated in the air. Therefore, equipment should be well earthed in time to avoid damage by lightning strikes.

## ESD

 Notices	Static electricity generated by the human body will damage the static sensitive elements, such as large-scale integrated circuits (ICs), on the circuit board. Before touching the equipment or holding a plugboard, the circuit board, or an IC chip, an ESD wrist strap must be worn to prevent body static electricity from damaging the static sensitive elements. The other end of the ESD wrist strap must be well earthed.
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## Reversed connection

 Warning	It is forbidden to connect the live wire (L) and neutral wire (N) of AC input in reverse. Otherwise, the system equipment will be damaged.
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Never wear a watch, bracelet, bangle, ring, or other conductive objects during operation.

Insulated tools must be used during operation.

During live operation, the hand, wrist, arm must be kept in the tense state, to prevent such an accident that the tool or the human body moves with a large amplitude in the case of tool slipping.

## Others

### Sharp object

 Warning	When moving the equipment by hand, wear protective gloves to avoid injury by sharp objects.
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### Power cable

 Notices	Prior to cable connection, verify the compliance of the cable and cable label with the actual installation.
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### Binding of signal cables

 Notices	The signal cables should be bound separately from heavy current or high voltage wires, with a binding interval of at least 150 mm.
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# Chapter 1 Product Overview

The SmartCabinet 2-E series of computer room solution products (referred to as SmartCabinet 2-E products for short) are the data cabinet solution products produced by Vertiv Tech Co., which are applied to micro data centers, office areas and other indoor environments. The SmartCabinet 2-E products are used for installation and placement of 19-inch cabinet-type hardware equipment in line with industry standards (EIA-310-E), including servers, voice, data, Internet network equipment and including power supply and distribution system, air conditioning system, rack support system, monitoring management system and fire subrack system (optional). It realizes the safe and efficient operation of the miniature data center and maintains the normal and stable operation of the important equipment such as the server inside the cabinet. It achieves standardized design and standardized on-site assembly without the needs to elevate the floor and install outdoor unit, and the integrated delivery greatly shortens the delivery cycle.

The monitoring management system is based on the powerful data center monitoring and management platform of Vertiv. It is compatible with the whole series of Vertiv products, and it is "Plug and Play". It also provides additional value which is difficult to achieve in separate purchasing such as energy consumption analysis. The new self-learning ECO mode is adopted. Under the suitable equipment environment, the ECO fan is used to replace the air conditioner to refrigerate the load. It has low noise and low power consumption, which greatly helps customers to quickly build a green and healthy data center.

This chapter mainly introduces the model description, application scenario, product characteristics, appearance and specifications, using environment, system architecture and performance indicators of SmartCabinet 2-E products.

## 1.1 Model Description

The model description of SmartCabinet 2-E is shown in Figure 1-1.

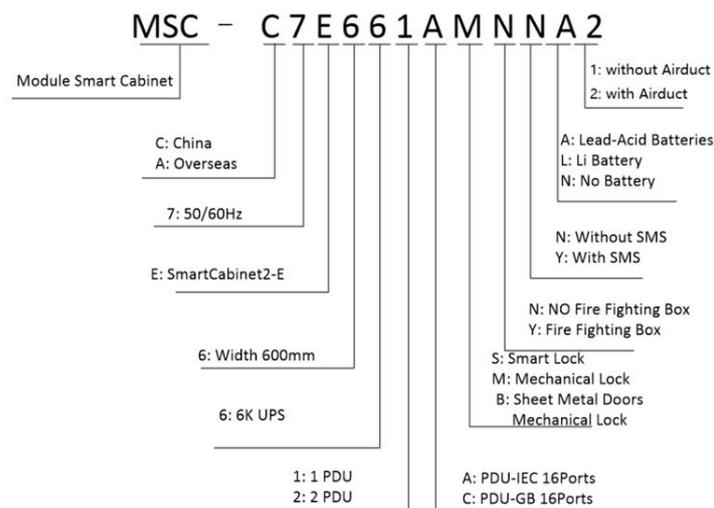


Figure 1-1 Model Description

## 1.2 Application Scenario

The SmartCabinet 2-E products mainly target small data center solutions in air-cooled scenarios. They are mainly used in government, education, health care, transportation, energy, finance, small and medium-sized enterprises and large company branches, and are mainly sold in China and Asia-Pacific region, and are usually applicable to government agencies, bank outlets, offices, small data centers, etc.

## 1.3 Product Characteristics

**Dust and noise control, high efficiency and energy saving:** Fully closed operation and internal circulation system to ensure the cleanliness of cabinets and temperature and humidity, prolong the life of IT equipment. The use of high efficiency special UPS for computer room, combined with precision air conditioner, and sealed cold/hot aisle technology, improves the efficiency of computer room refrigeration. The built-in fan and silent design make it suitable for being used in the office area.

**Intelligent monitoring:** Integrating intelligent control functions such as environmental monitoring, equipment monitoring, alarm linkage, etc., to provide a centralized monitoring platform for computer room management.

**Highly integrated and space-saving:** A standard cabinet provides constant operating conditions for all IT equipment, and only power supply is needed at the user site. The system occupies no more than 1 m<sup>2</sup> and is compact and state-of-art.

**Integrated air conditioner:** The latest customized integrated TMM air conditioner equipment, which integrates indoor and outdoor units, eliminates installation and maintenance troubles.

**Friendly interface, unattended guarding:** Ultra-large 9-inch HMI wide screen display integrates monitoring center and display center in one, providing the equipment operation/alarm/security information at a glance, which is easy to achieve all-weather remote monitoring of cabinet-level data center to meet different application scenarios.

**Fast Delivery:** Once in place, build in one hour, start in one day.

**Access control management:** Smart locks at cabinet level can be selected to ensure the safety of IT equipment in cabinet.

**Video management:** Supporting IPC equipment, realizing video surveillance function of network camera.

**ECO mode:** The ECO mode can be activated intelligently according to the outside environment of the cabinet. The whole load of fan equipment can be used for cooling, energy saving and noise reduction, environmental protection and low carbon.

## 1.4 Product Specification and Appearance



Figure 1-2 SmartCabinet2-E product appearance (Glass door on the left, sheet metal door on the right)

Table 1-1 SmartCabinet2-E product specifications

Parameters	Specifications				
	Local model (mechanical lock)	Local model (smart lock)	Asia Pacific model (mechanical lock)	Asia Pacific model (smart lock)	sheet metal door (mechanical lock)
Dimensions (WxDxH)	600 mm×1200 mm×2150 mm (including ECO module) 770 mm×1330 mm×2500 mm (including Airduct)				
Equipment installation available height	24U(1U=44.45mm)				
IT equipment power	≤3kW				
Voltage	L+N+PE, 220Vac/230Vac/240Vac				

Parameters	Specifications
Sealed mode	Cold and hot aisles are fully sealed
Color	EG7021
Air conditioner cooling capacity	0.9~3.5W
Weight	<420kg
Noise	Overall<75dB, ECO mode only ≤50dB

## 1.5 Using Environment

### 1.5.1 Operating Environment

SmartCabinet 2-E products should be installed away from heat sources and sparks, avoid direct sunlight, and there should be no corrosive gases and organic solvents in the room. The operating conditions are shown in Table 1-2.

Table 1-2 SmartCabinet2-E Operating Environment Requirements

Installation location	The installation site needs to be level; The height of using space should not be less than 2400mm (If the Airduct is include , The height of using space should not be less than 2700mm);
Using scenarios	In the computer room and office area, the front door is more than 1.2m away from the wall or obstacles and the rear door is more than 1.0m away from the wall or obstacles.
Ambient temperature	0°C to 40°C
Ambient humidity	≤80%RH (Notices *)
Altitude	< 2000m, air conditioners need to be derated for higher than 1000m
Rated operating voltage	L+N+PE, 220Vac/230Vac/240Vac; 50/60Hz
Applicable form of power grid	TN-S
Overvoltage level	II
Class of pollution	II
Notices *	When the whole unit runs in high temperature and humidity environment, condensation water may appear outside the front glass door and the display panel, which is a normal phenomenon and does not affect the use.

### 1.5.2 Storage Environment

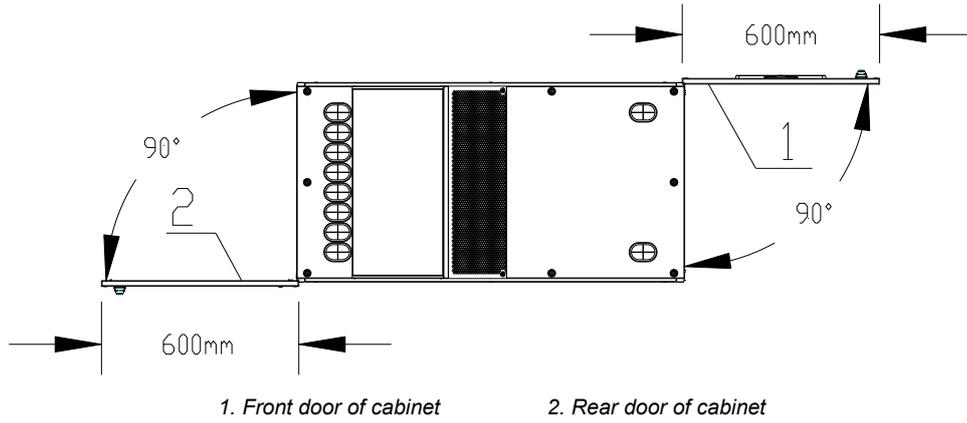
The storage environment of SmartCabinet 2-E products is shown in Table 1-3.

Table 1-3 Storage Environment for SmartCabinet 2-E Products

Item	Requirement
Storage environment	Indoor, clean (no dust, etc.)
Ambient humidity	≤95%, (40°C) RH
Ambient temperature	-25°C to +55°C

### 1.5.3 Space

When installing SmartCabinet 2-E, enough space should be reserved to facilitate the installation and maintenance of cabinets. The required space for opening the front and rear doors of the cabinet is shown in Figure 1-3.



1. Front door of cabinet      2. Rear door of cabinet

Figure 1-3 SmartCabinet2-E Product Maintenance Space

The space using requirements of SmartCabinet 2-E model product are shown in Figure 1-4.

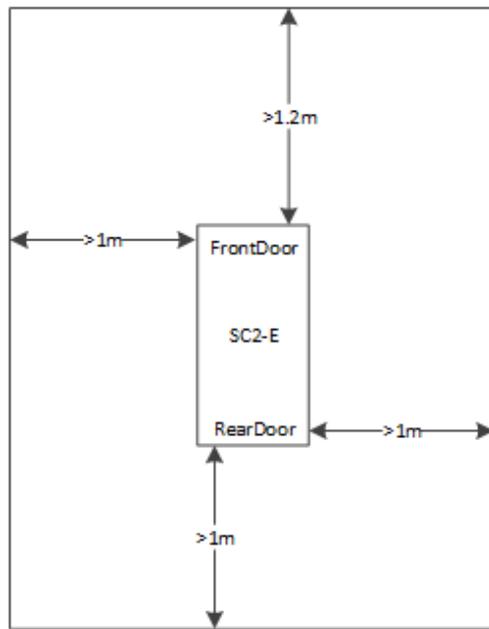


Figure 1-4 SmartCabinet2-E product using space

### 1.5.4 Load Bearing Capacity

The SmartCabinet 2-E product is heavier after the user equipment is installed in it, so the load-bearing capacity of the computer room must be considered before installation. The SmartCabinet 2-E weighs about 350 kg. During installation, it is necessary to evaluate the floor load-bearing according to the total weight of the equipment installed by the users. If you can't determine, please consult the Vertiv office or the service center nearby.

## 1.6 System Architecture

### 1.6.1 Cabinet Structural Components

The cabinet adopts integrated sealed cold and hot aisle cabinet, which is used to install 19-inch hardware equipment in line with industry standard (EIA-310-E), including server, voice, data, Internet network equipment and other equipment. The whole rack system is fully sealed to keep the system clean, dust-free, energy-saving and noise reduction (system noise  $\leq 50$ dB with ECO mode).

### 1.6.2 Power Supply and Distribution System

The SmartCabinet 2-E product integrates ITA2 6kVA UPS, PMU and intelligent switch PDU components, provides AC220V and DC12V/24V output, and provides a safe and reliable power supply system for the whole system and IT load.

The SmartCabinet 2-E product integrates the latest ITA2 6kVA UPS, provides distribution support for IT load, air conditioner equipment, ECO module, monitoring system and illumination system.

PMU, which is used to distribute and control power for PDU, air conditioner and monitoring system, implements the centralized management for the power supply and distribution of the whole system, and has the function of one-way input and multiple-way output control, which is easy to operate and easy to use.

Intelligent switch PDU: It can monitor parameters such as voltage/total current/active power/electricity, support the connection / disconnection of the remote bit-by-bit control socket, and support socket sequential power-on.

## UPS

Liebert® ITA2 6kVA UPS (hereinafter referred to as UPS for short) is an intelligent, on-line, sinusoidal uninterruptible power supply system developed by Vertiv Tech Co., Ltd. It can provide reliable and high-quality AC power supply for precision instruments and equipment. The UPS can be assembled into tower or rack type as required. This equipment is suitable for AC power supply of small computer center, network, communication system, automatic control system and precision instrument equipment.

Table 1-4 SmartCabinet2-E UPS Parameters

Item		ITA2 6kVA UPS
Input	Rated voltage	220Vac/230Vac/240Vac
	Phase Voltage Range	176Vac~288Vac: Full load operation 100Vac~176Vac: Linear Derating Half-load operation at 100Vac
	Rated Frequency	50Hz/60Hz
	Frequency range	40Hz to 70Hz
Output	Rated power	6kW
	Voltage	220Vac/230Vac/240Vac
	Overload capacity	105% to 125%: 5min; 125% to 150%: 1min; 150%: 200ms (ambient temperature: 25 C)
Transfer time	Utility power←→Battery	0ms
	Inverter←→Bypass	Synchronized transfer: <0ms Asynchronous transfer (default): <20ms Or 40 ms, 60 ms, 80 ms, 100 ms, 200 ms optional
Mechanical sizes	Dimensions (width x depth x height)	430mm*400mm*85mm
	Weight	11 kg (gross weight 13 kg)
Environment conditions	Working temperature	From 0°C to 50°C (at 50°C, derated to 0.7)
	Storage temperature	- 40°C to + 70°C without batteries; - 25°C to + 55°C with batteries
	Relative humidity	5%RH to 85%RH, no condensation
	Altitude	Less than 3000m; over 3000m, derate with reference to GB/T3859.2

## Rack-Mounted Distribution Module (PMU)

The SmartCabinet 2-E products use customized PMU equipment to provide distribution management for the whole unit, equipped with level C SPD.

Table 1-5 SmartCabinet2-E PMU parameters

Parameters	Values
Product Model	MSC-TMM-PMU-G3
Rated operating voltage	220V/230V/240V
Rated insulation voltage	450Vac
Rated frequency	50/60Hz
Inlet and Outlet cables	Rear cabling

Power frequency withstand voltage 1 minute	1500V
SPD level	Level C protection

### 1.6.3 Cooling System

The SmartCabinet 2-E products use customized TMM integrated air conditioner, which integrates condensation measurement and evaporation side in the same rack structure, without installing separate outdoor unit, reducing the environmental requirements of equipment and facilitating rapid deployment of cabinets.

Table 1-6 SmartCabinet2-E Cooling System

Parameter Names	Parameter value
Power supply voltage	198Vac~264Vac
Power supply frequency	50/60Hz
Cooling capacity	Cooling capacity adjustable range:900W~3500W.( Cooling capacity is related to the working environment)*
Air volume	The maximum air volume is 700m <sup>3</sup> /h, and the minimum air volume is 350m <sup>3</sup> /h.
Cooling system sealing performance	Under the normal refrigerant (R410A) filling capacity, the leakage rate of the cooling system is ≤ 5.7g / year.
Temperature setting range	Temperature setting and control range: 13 to 28°C, Minimum setting accuracy: ±1°C.
Refrigerant charge	720g
Notices *	If the system load is less than the minimum cooling capacity of the air conditioner, in combination with the ambient temperature and humidity conditions may produce condensation on the inside surface of the cabinet door, this phenomenon will not affect the stable operation of the cabinet equipment, and will naturally disappear with changes in load and environmental conditions.

### 1.6.4 Monitoring management system

The SmartCabinet2-E product uses the HMI display screen as the whole unit monitoring management center. It has an intelligent management system that can provide power and environment monitoring inside the cabinet. It supports the plug-and-play of Vertiv intelligent sensor modules and provides various types of alarm notifications of equipment and environment status and provides the user with integrated web page access function and local display and control functions.

### 1.6.5 Alarm system

It is equipped with monitoring and alarming devices such as temperature and humidity sensor, digital signal input and output module, water sensor, tri-color ambience lamp, smoke detector alarm (optional) and smart door lock. It can detect the temperature and humidity, condensation water, and security inside and outside the cabinet in real time, and automatically make judgment of alarm information and can issue the alarm through HMI screen, WEB background monitoring system, SMS Modem and other means.

### 1.6.6 Lightning protection grounding system

The SmartCabinet2-E products are equipped with Level C SPD. The power distribution of the whole unit meets the requirements of Level C lightning protection test. It has passed the lightning protection test of L-PE and N-PE 15kA, and meets the YD/T944 standard. The SmartCabinet2-E product connects to the TN-S power distribution system. The power neutral point is directly grounded.

The cabinet enclosure and other accessible conductive enclosures are connected to the external grounding system by a special grounding cable. The grounding resistance of the whole unit is <0.1, and the current can withstand ≥25A.

## 1.7 Technical Specifications

Table 1-7 SmartCabinet2-E Technical Specifications

Power supply and distribution system	Input voltage	220Vac/230Vac/240Vac(phase)
	Input voltage range	AC176V~288V

	Input frequency	50Hz/60Hz
	Output voltage	220Vac/230Vac/240Vac (single-phase output)
	Output frequency	50Hz/60Hz , rated frequency $\pm 3$ Hz
	Lightning protection	Configure a Level C SPD
	IT power consumption	$\leq 3$ kW
	UPS Power Distribution	ITA2 6K UPS
	Battery pack	16-cell 12V 9Ah battery
	IT power distribution	dual PDU ( optional )
		PDU with 16 ports
DC output	12Vdc	
	24Vdc	
Cooling system	Air conditioner model	TMM-AR3W1
	Power supply	220V/1P/50&60Hz single-phase input
		Voltage range 198Vac to 264Vac
	Cooling capacity range	Cooling capacity adjustable range:900W~3500W。
	Refrigerant	R410A
	Certification	CE Certification
	Weight	45kg
Emergency fan unit ( ECO module )	1 groups: rear door top (self-starting: high temperature alarm in the cabinet, and ambient temperature lower than cold passage temperature)	

# Chapter 2 Product Installation And Commissioning

## 2.1 Installation Preparation

This chapter mainly introduces the preparation of SmartCabinet2-E products before installation, including installation tools, accessories, shipping accessories, moving and transportation, unpacking, inspection, installation precautions and equipment room requirements.

 **Notices**

1. The components of the SmartCabinet2-E are bulky and heavy, posing a risk of tipping, which can result in personal injury, death, and equipment damage.
2. Read all the instructions below before attempting to move, lift the components, or remove the package.
3. Sharp edges, pointed corners and bare shackles can cause injuries. Only trained personnel with appropriate safety helmets, gloves, shoes and glasses can move, lift components, unpack or prepare for installation.
4. The cabinet kit may be too high to pass through the doorway with the pallet. Measure cabinet assembly and doorway height and identify space before moving cabinet components and air conditioner indoor units to avoid damaging equipment and buildings.

### 2.1.1 Materials

Before installing the SmartCabinet2-E product, in addition to this document, you need to prepare the following materials in advance so that you can refer to it at any time.

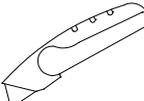
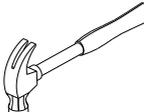
Table 2-1 SmartCabinet2-E system features

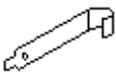
Materials	Purpose	Access method
SmartCabinet2-E whole unit wiring schematic diagram	Confirm the electrical and control loop of the whole unit, and the distribution system organization structure	Refer to Appendix 1 System Power Distribution Diagram
SmartCabinet2-E Product Quick Installation Guide	Guides on-site installation	Shipped with the product

### 2.1.2 Tools and Accessories

To install the cabinet, you need to prepare the following tools.

Table 2-2 SmartCabinet2-E install tools

Name	Purpose	Appearance
Utility knife	Disassemble all kinds of equipment packaging	
Philips screwdriver	Tighten the screws when assembling the parts, recommended size: 1X300	
Flat-blade screwdriver	Dismantle wooden box steel tongue	
Claw hammer	Dismantle wooden box steel tongue	
Levelling meter	Displays the horizontal status of the cabinet system when it is leveled	

Name	Purpose	Appearance
Floating nut buckle	Dismantle or install floating nut	
#19 open end wrench	Remove M12 foot nut	
Adjustable wrench	Remove the foot press M8 bolt	
Step ladder	Assist the removal of packaging, installation of ECO fan module	
Multimeter	Detect power distribution system status and cable wiring	

The accessories are placed in the accessory box inside the cabinet. As shown in Figure 2-1, open the accessory box to obtain the accessories. The list of accessories is as follows:

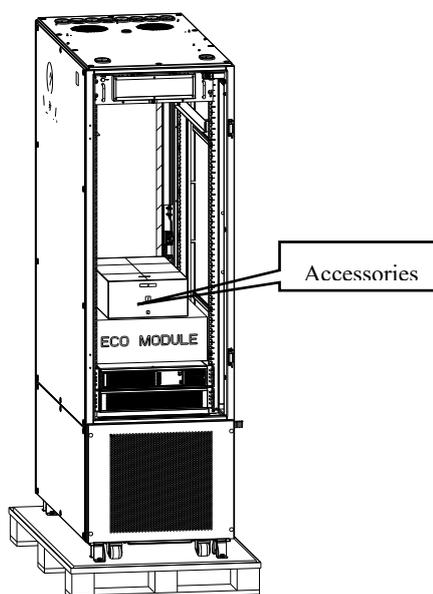
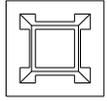
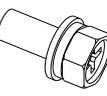
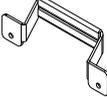


Figure 2-1 The accessories

Table 2-3 The accessories list

Name	Purpose	Appearance	Quantity
Floating nut	Used with M6 screws for the installation of user parts in the cabinet		40
M6x16 panel screws	Used for the installation of user parts in the cabinet		30

Name	Purpose	Appearance	Quantity
295mm black cable-ties	Binding wires		70
100mm black cable-ties	Binding wires		30
Cable tie base	Used for fixing the cable		10
1U dummy panel with brush	Used for blocking the U position with cable passing		1
1U plastic blind plate	Used for blocking U position		12
UPS User Manual		/	1
OT terminal	Clamped onto the user input power cable		4
Floating nut handle	Remove or install the floating nut		1
Combination screw M5*12	Used for the installation of user parts in the cabinet		6
Plastic Parts	plug a hole on cabinet		4
AC handle	Dismantling and installing AC		1

### 2.1.3 Installation Environment

#### Cabinet information

Table 2-4 Cabinet information

Cabinet status	Dimensions (width × depth × height)	Weight
Wooden packaging	770mm×1420mm×2260mm	450kg
Bare cabinet	600mm×1200mm×2000mm	390kg

#### Installation Environment

Table 2-5 Installation Environment

Item	Requirements
Site	Ground flatness tolerance 3mm/2000mm Site height ≥ 2.4m(If the Airduct is including, Site height ≥ 2.7m)

Item	Requirements
Power supply	Minimum cable cross-sectional area $\geq 6\text{mm}^2$ Minimum MCB specification $\geq 63\text{A}$ The length of the cable connected inside the cabinet is about 0.6m
Communication	The length of the cable connected inside the cabinet is about 0.6m
Drainage	Allows 12mm diameter silicone hose to be inserted

#### 2.1.4 Personnel

The construction personnel must have basic safety operation knowledge and must be professionally trained to master the correct operation method. The construction personnel must pass the startup and debugging certification of Vertiv small UPS DPG\air-conditioner and have a certificate.



#### Notices

Vertiv does not assume any responsibility for damage to individuals and equipment caused by the construction personnel who obtained the above certification.

## 2.2 Equipment Installation

### 2.2.1 Moving and Handling

#### Transportation

When transporting cabinet components, air conditioner indoor units and outdoor units, it is recommended to choose rail transportation or shipping. If you choose to transport by a vehicle, you should choose a road with better road conditions to prevent excessive bumps.

#### Moving and Handling

The user needs to transport the cabinet, air conditioner and components to the nearest location to the installation site. Due to the heavy weight, it is recommended to use mechanical handling tools, such as pallet trucks (commonly known as "land cows") or electric forklifts, as shown in Figure 2-2.

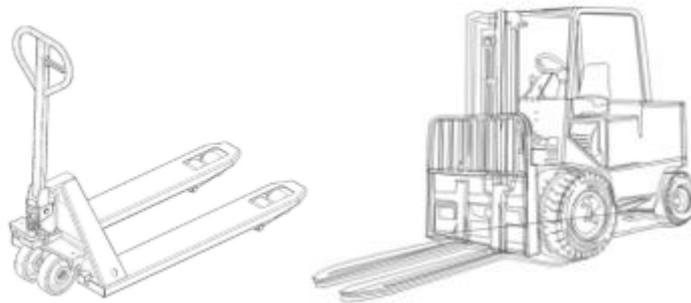


Figure 2-2 Hand Pallet Truck & an Electric Forklift

When unloading and transporting with "land cow" or electric forklifts, it is recommended that the fork is at the center of gravity to prevent tipping, as shown in the Figure 2-3.

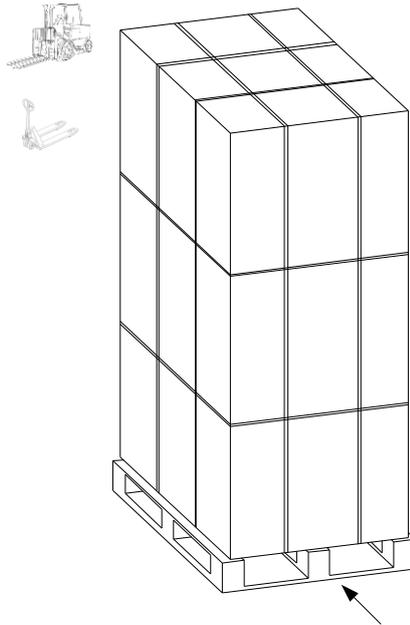


Figure 2-3 Forklift Direction

When transporting each component, the inclination of each equipment should be kept within the range of  $80^{\circ}$  to  $100^{\circ}$ , and should not be excessively tilted, as shown in the Figure 2-4.

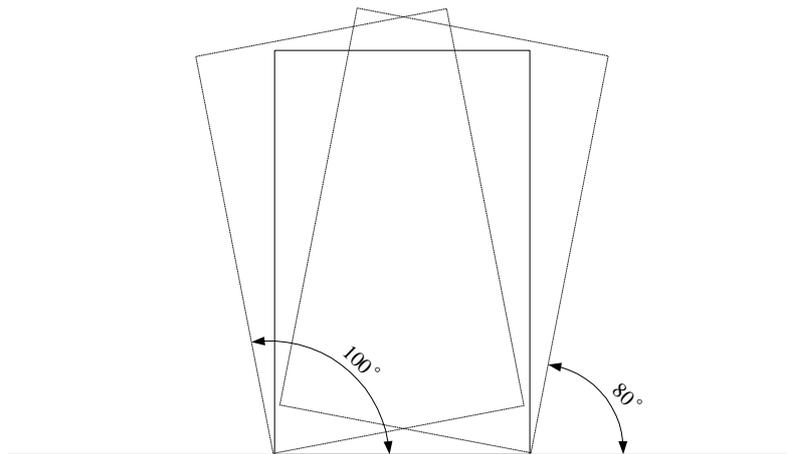


Figure 2-4 Carrying obliquity

#### Notices

1. Always keep the equipment upright and do not leave the equipment outdoors.
2. Use a forklift or pallet truck to ensure that the fork arms (if adjustable) are opened to the widest distance so that they are placed just below the equipment pallet. Also, make sure the length of the fork arm matches the length of the device.
3. When moving the condenser manually, do not touch the copper tube to avoid bending and deformation of the copper tube and system leakage.

### 2.2.2 Installing the Cabinet

#### 1. Unpacking

It is recommended to unpack the cabinet before placing it in the designated site. The steps are as follows:

- 1) Check the anti-tipping label outside the box before opening the box. If the anti-tipping label is activated (the anti-tipping label turns red), please contact the staff of Vertiv in time for proper disposal.
- 2) If you receive the carton packaging, use a utility knife to remove the packaging material, as shown in the Figure 2-5.

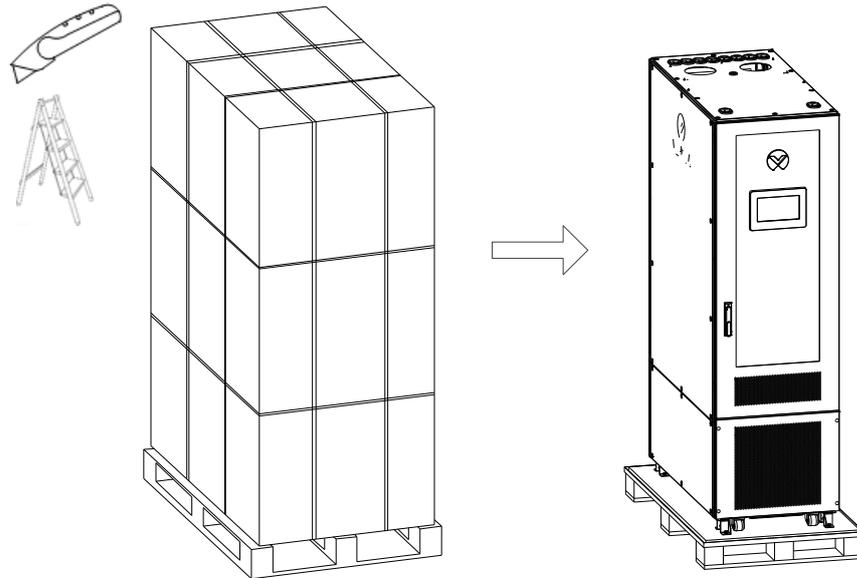


Figure 2-5 Remove paper package

3) If you receive the wooden box packaging, use a flat-blade screwdriver with a claw hammer to open the steel tongue and remove the packaging board, as shown in Figure 2-6.

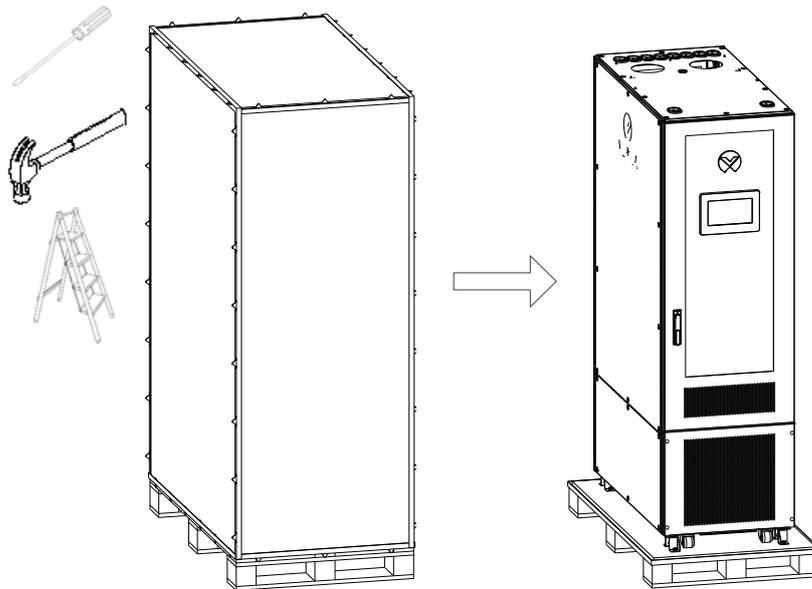


Figure 2-6 Remove wooden package

4) Use a #19 wrench to screw the foot nut, lower the foot, and lift the cabinet. Remove the M8 bolt with the movable wrench and remove the foot-press plate, as shown in Figure 2-7.

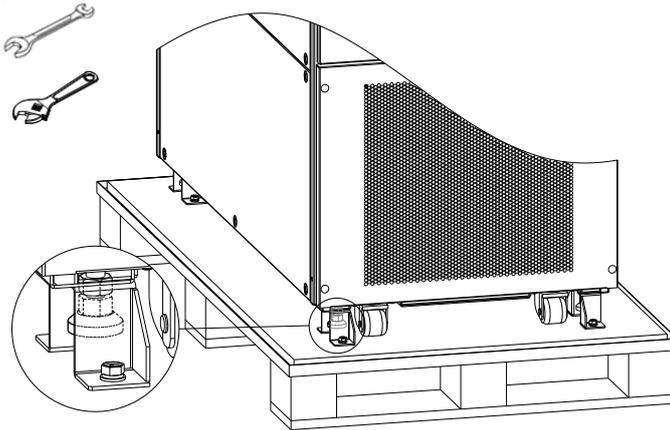


Figure 2-7 Remove foot-press plate

**Notices**

1. The cabinet kit has 4 press plates.
2. There is a risk of scratching the bottom of the cabinet when the floor pressure plate is disassembled.

5) Lift the cabinet horizontally, remove the pallet at the bottom, and gently place the cabinets on the horizontal floor as shown in the figure 2-8.

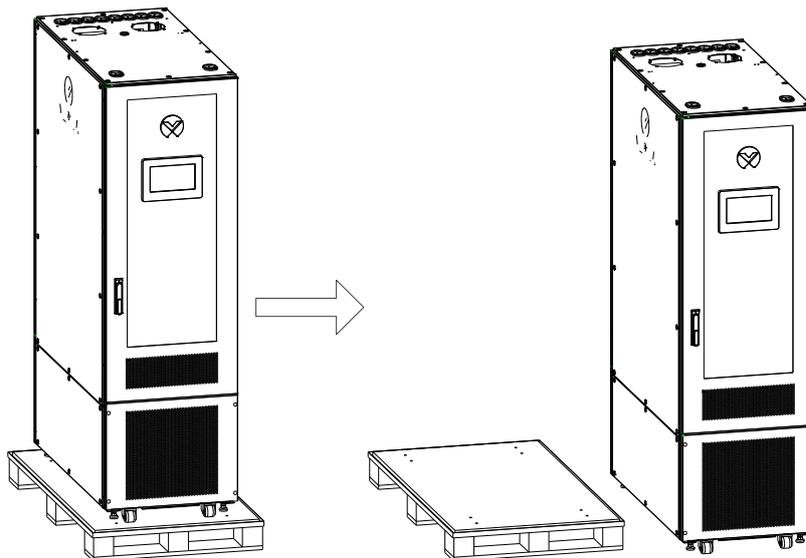


Figure 2-8 Removing the pallet

**Notices**

After the cabinet is placed on the ground, it needs to be leveled, and the inclination angle is less than 5°.

2. Cabinet placement

The cabinet should be placed for future maintenance, as shown in Figure 2-9.

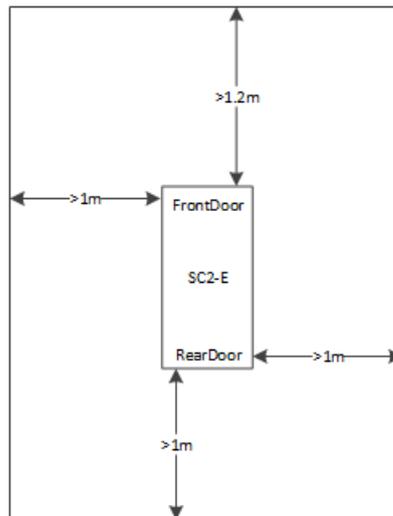


Figure 2-9 SmartCabinet2-E maintenance space

### 2.2.3 ECO fan module

The ECO fan is in the fan box inside the cabinet, as shown below.

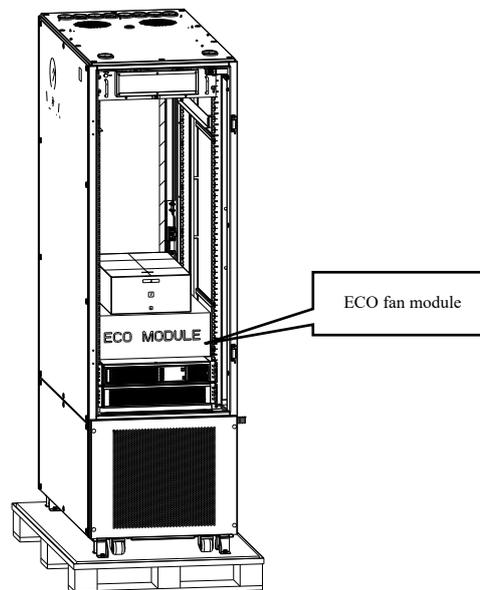


Figure 2-10 ECO fan module

#### Remind

The L-rails for fixed accessory box are the standard components that can be used for customer equipment installation.

- 1) Unpack the ECO fan module, take out the ECO fan module, and place the ECO fan module on the top of the cabinet with a step ladder. The fan cable is threaded into the cabinet from the top guard ring of the cabinet. Use a positioning pin to locate and fix the 2 PCs of M4x8 screws, as shown in Figure 2-11 & Figure 2-12.

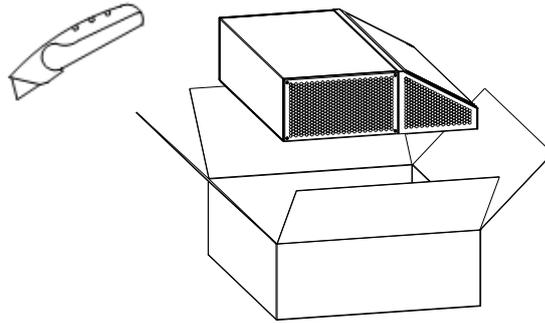


Figure 2-11 Removal the fan package

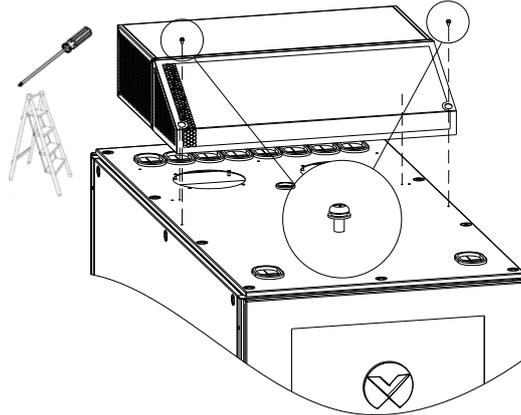


Figure 2-12 Install ECO fan module

2) Install the 5 PCs of M4x10 screws in the cabinet to fix the ECO fan module, as shown in Figure 2-13.

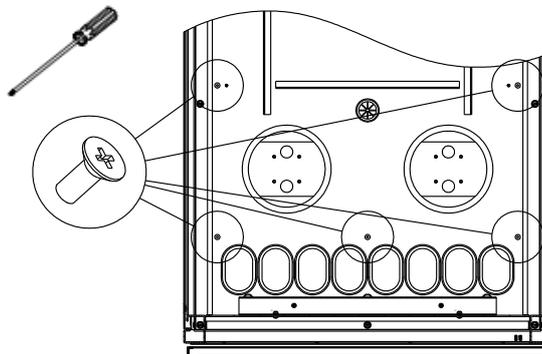


Figure 2-13 Fixing ECO fan module

3) Connect the fan cable to the “+”, “-”, and “SS” Pins in the “FAN” area of the PMU rear terminal block according to Figure 2-14 and bind the cable along the way.

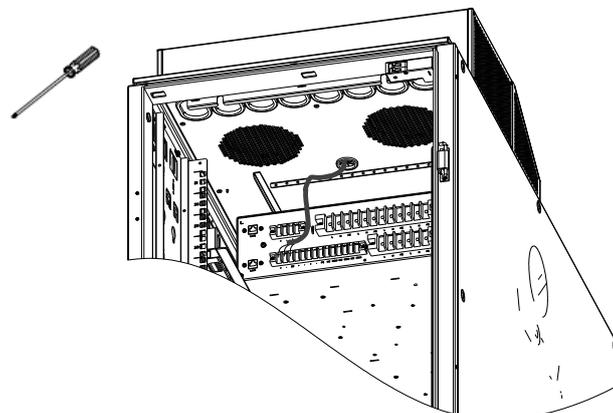


Figure 2-14 ECO module wires connection

---

**Notices**

During the normal operation of the equipment, do not block the outlet of the ECO fan module.

---

### 2.2.4 The wiring of water immersion sensor

Remove the plug button and M5\*12 combination screws (4Pcs) from the rear cover of the air conditioning compartment and remove the rear cover as shown in Figure 2-15.

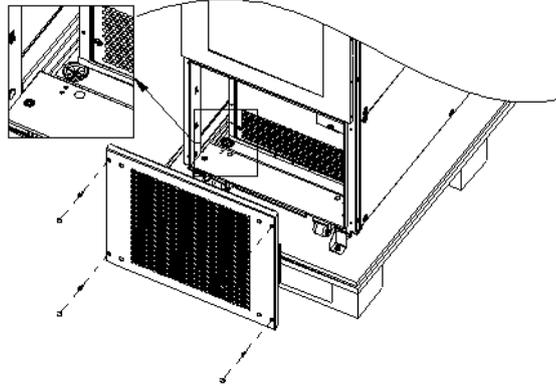


Figure 2-15 Remove the air conditioning compartment rear cover

Remove the water immersion sensor cable, pass it through the lower wire guard ring, and unfold it to the bottom of the cabinet. Once the layout is complete, reinstall the air conditioning compartment rear cover..

### 2.2.5 Battery module (optional)

---

**Notices**

1. There is a danger of high current when operating the battery. Prior to connecting the battery cable, make sure all batteries are disconnected. Before the power supply system is connected to the connection cable of the battery string, the corresponding battery must be disconnected, or the single battery connection bar in the battery string must be disconnected to avoid the power system being charged after installation.
  2. The polarity of the battery connected to both ends of the battery cable and the polarity of the power system terminal must be the same, otherwise the battery and power system will be damaged!
  3. When replacing or installing the battery, first install the bottom part and the top part, and remove the top and bottom to maintain the center of gravity to prevent the battery box from tipping over.
  4. When installing the battery, be sure to tighten each screw on the pole to the specified torque. After 1 to 2 months of delivery, check again that each screw is tightened to the specified torque, otherwise it may cause a fire.
  5. Lead acid batteries can cause chemical hazards.
  6. Make sure that the battery has the same capacity and model. If the battery is replaced by the wrong model, there is a danger of explosion.
  7. When disposing of used batteries, they must be disposed of in accordance with relevant local regulations.
- 

The cabinet comes with a battery module. If you choose an extra battery module, you need to follow the steps below.

- 1) Unpacking the battery module for visual inspection, there should be no obvious damage to the appearance; Check the cable.

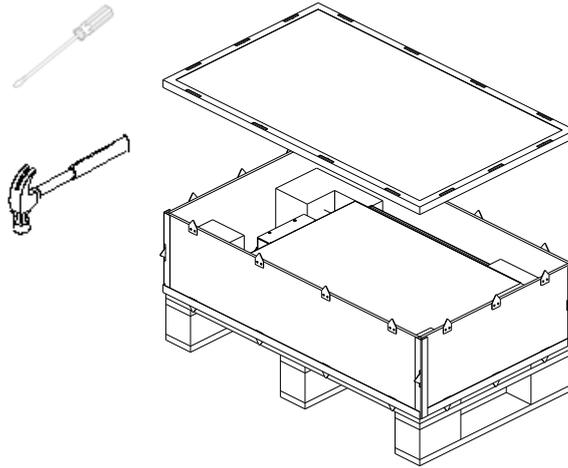


Figure 2-16 Remove the battery package

2) Fix the two mounting ears on both sides of the front panel of the battery pack with M4×10 screws (8pcs), as shown in Figure 2-17.

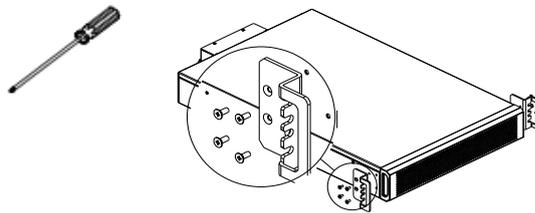


Figure 2-17 Install the mounting ears

3) Remove the two side panels of the cabinet and install floating nuts (8pcs) on the two square holes corresponding to the No.5U position on the column, as shown in Figure 2-18.

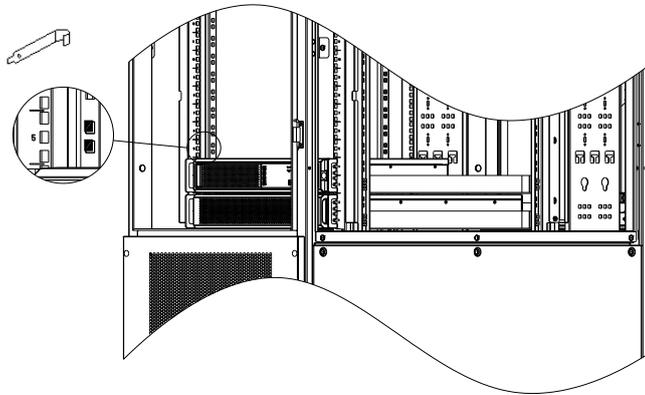


Figure 2-18 Install the floating nuts 1

4) Install the rails, fix with M6×16 screws (8pcs), as shown in Figure 2-19.

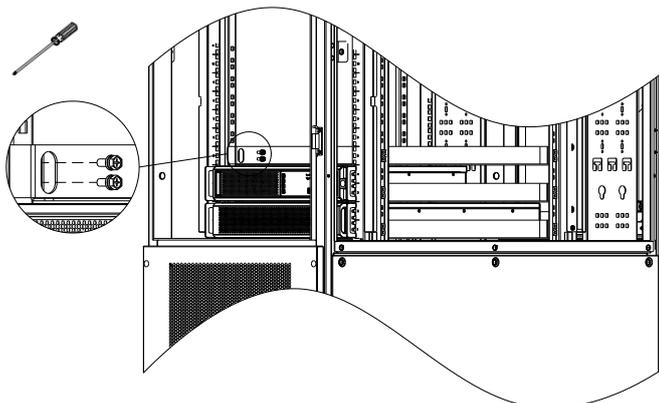


Figure 2-19 Install the rails

5) Install floating nuts (4 pcs) at the 5U and 6U intermediate holes of the left and right columns, as shown in Figure 2-20.

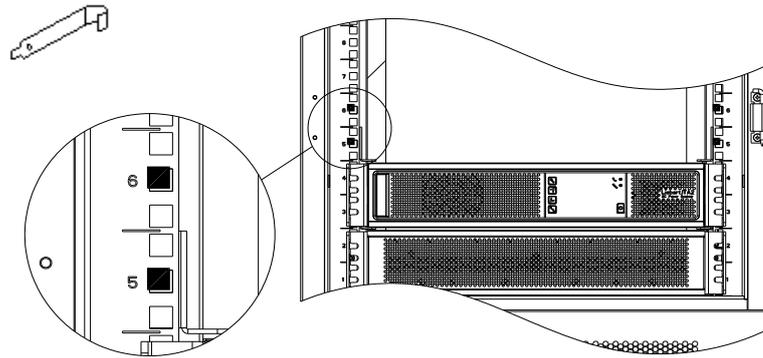


Figure 2-20 Install the floating nuts 2

6) Place the battery pack on the guide rail, install it on the 5th and 6th U positions on the column, and fix it with M6×16 screws (4 pcs), as shown in Figure 2-21.

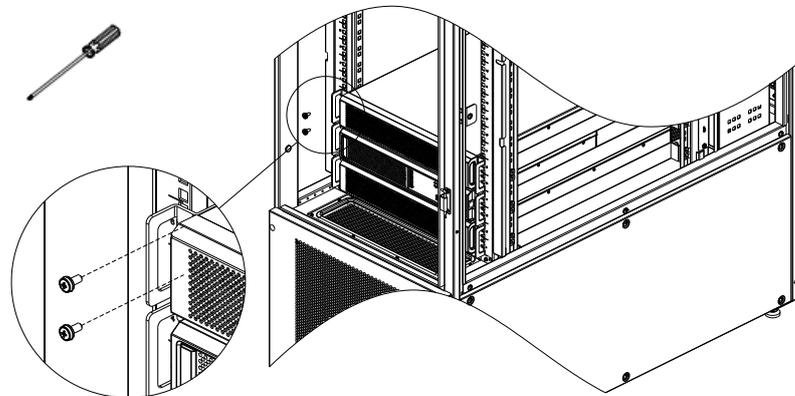


Figure 2-21 Fixing the battery pack

7) Use the battery module's own power cable and communication cable to connect the battery according to Figure 2-22. The solid line in the figure is the power cable, and the dotted line is the communication cable. After connecting, use a flat-blade screwdriver to tighten the power cable loosened screw.

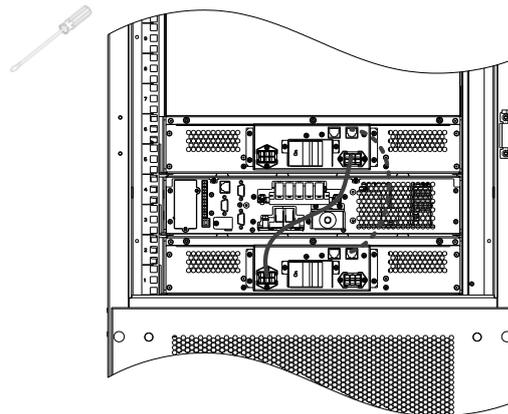


Figure 2-22 Battery wires connection

### 2.2.6 GSM MODEM installation (optional)

1. Take out the GSM MODEM from the cabinet accessory bag.
2. Install the SIM card and GSM MODEM antenna according to Figure 2-23.

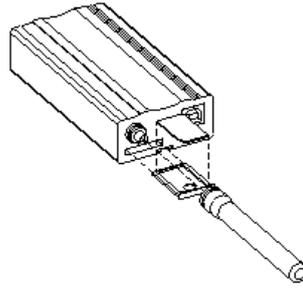


Figure 2-23 Install SIM card and Antenna

3. Install the GSM MODEM at the top of the cabinet with a built-in adapter according to figure 2-24.

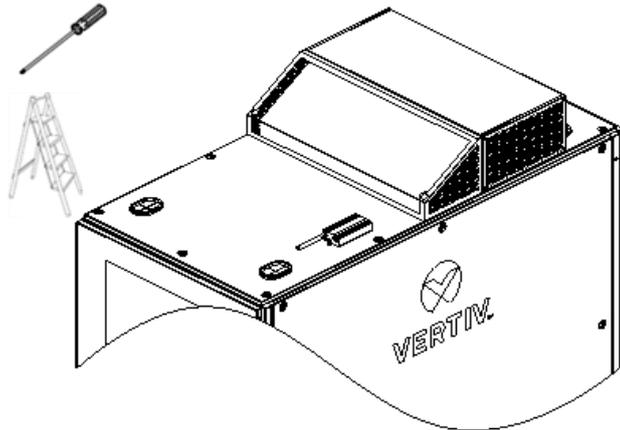


Figure 2-24 Install GSM MODEM at Top of Cabinet

4. Connect the GSM MODEM cable reserved at the protective ring on the right side beside the front door at the top of the cabinet to the GSM MODEM via the built-in cable of the GSM MODEM.

### 2.2.7 Install Airduct (optional)

1)The air duct is installed at the rear door. Figure 2-26 shows the left side installation of the air duct. The air duct supports the right-side installation.

2) Use the M5×12 screws (4pcs) to install the lowermost air duct in the air outlet of the rear door of the cabinet;

3)Splicing the remaining air ducts one section at a time and fixing them to the cabinet using the side panel screws nearby.

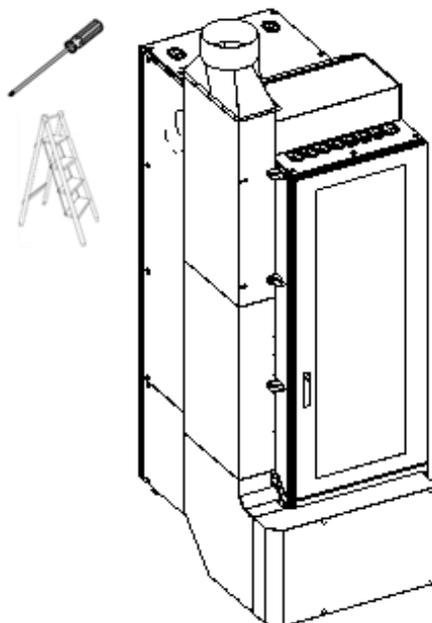


Figure 2-25 Install the air duct

## 2.2.8 User Cable Connection

- 1) Use a utility knife to cut open the two guard rings on the left and right of Figure 2-27;

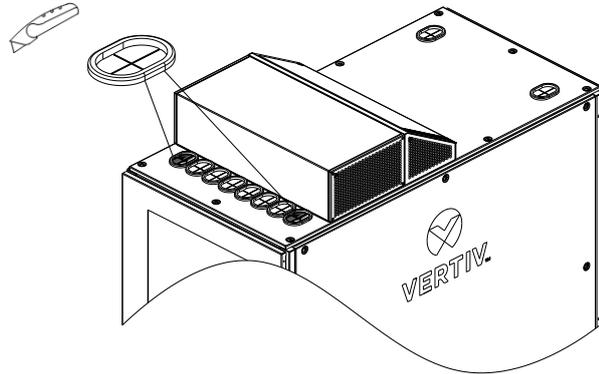


Figure 2-26 Open the guard rings

- 2) The power cable is connected to the cabinet through the right guard ring, and the length of the connected cable is about 0.6m. Connect the cables to the general input “L”, “N” and “PE” of the PMU terminal block shown in the figure below.

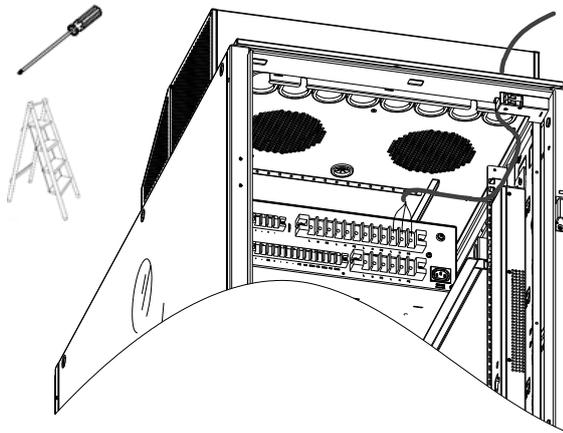


Figure 2-27 Power wires connection

- 3) Connect the communication cable through the left guard ring to the cabinet. The length of the connected cable is about 0.6m. Connect to the “LAN1” port at the end of the PMU.

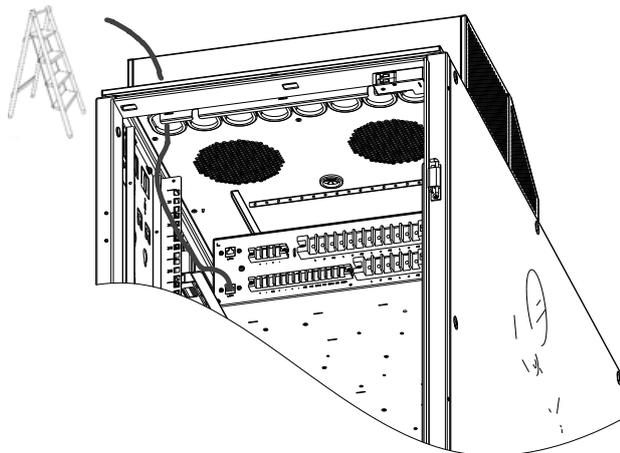


Figure 2-28 Communication wires connection

## 2.2.9 Installation Inspection

Check the installation against the installation checklist, and do not connect to the power and test the unit until the inspection is passed.

Table 2-6 Installation Inspection

Inspection item		Inspection result
Cabinet installation	The cabinet feet support the ground and the cabinet is leveled	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail
	The drain hose is tightly fastened, and the other end of the drain pipe is placed in the floor drain	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail
	The cabinet is neat and tidy without spray defects	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail
	The door can be opened and closed flexibly, and the door lock can be normally used.	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail
	The labels and logos are complete and clear	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail
	The ECO fan module is installed firmly and reliably, and when manually shaking the module, there is no abnormal sound.	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail
	The battery and uninterruptible power supply are installed firmly and reliably, and there is no abnormal noise when manually shaking the cabinets.	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail
	The top guard ring is correctly installed	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail
Cable installation	The user's power cord and communication cable are reliably connected, and the binding is firm and tidy.	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail
	The ECO fan module cable is reliably connected, and the binding is firm and tidy.	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail
	The battery power cable and communication cable are connected reliably.	<input type="checkbox"/> Pass; <input type="checkbox"/> Fail

## 2.3 Software and Hardware Commissioning

### 2.3.1 Commissioning process

The SmartCabinet2-E commissioning process is shown in the Figure 2-30.

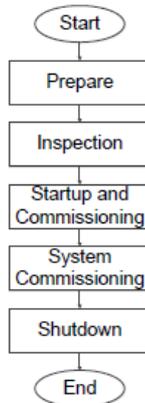


Figure 2-29 Commissioning Flowchart

### 2.3.2 Preparation

The product commissioning is used to support the commissioning scenario in product deployment. Prior to starting the commissioning, the equipment status must meet the following conditions:

The hardware installation and inspection work has been completed, the installation wiring is in place correctly.

### 2.3.3 Inspection

Prior to powering on the SmartCabinet2-E product, check the following list:

Table 2-7 Pre-commissioning checklist

Inspection item	Inspection standard	Remarks
-----------------	---------------------	---------

Power distribution inspection	Check the measurement and confirm that the mains voltage and frequency are correct, and confirm that the mains connection cable is connected correctly and there is no short circuit.	
	Check that the distribution cables of the UPS and PDU are properly connected and that there are no short circuits.	
	Check the battery (if selected) installation and wiring connections are correct, and the battery positive and negative polarities are correct.	
Monitoring system inspection	Check against the wiring diagram, and check and confirm that the line order of all communication cables is correct according to the cable label.	
Thermal management system inspection	Check and confirm that the air conditioner is filled with refrigerant.	the Asia-Pacific model has not been filled with refrigerant upon shipment.
	Check that the ECO fan power supply port is correct.	

### Warning

1. Prior to powering on the SmartCabinet2-E, ensure that the maintenance bypass on the PMU is open and disconnected and protected by the sheet metal protection cover.
2. Make sure the lightning protection module is green before turning on the power.

## 2.3.4 Startup commissioning

The startup flowchart of the SmartCabinet2-E product is shown in the Figure 2-31.

### Notices

Prior to powering on the UPS, please open the UPS output MCB.

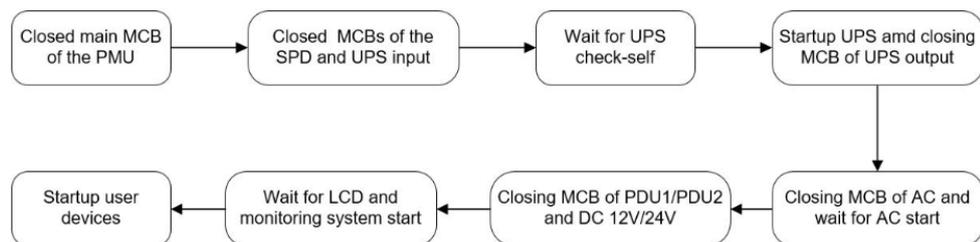


Figure 2-30 Startup flowchart

The startup procedure is as follows:

1. Close the user's external input power switch and close the PMU general input MCB.
2. Close the UPS rear-end input MCB and open the SPD and wait for the UPS to start up.
3. The UPS's LCD screen displays the self-test interface. The fault indicator (red light) and the inverter indicator (green light) are on for about 5 seconds.
4. After the rectifier enters the normal running state for about 30 seconds, the rectifier is started, complete and check the single-unit parameter setting.

1) On the main menu screen, press the arrow keys  or  select the "Setup" menu and press the  key to enter the corresponding page. See the Figure2-32.

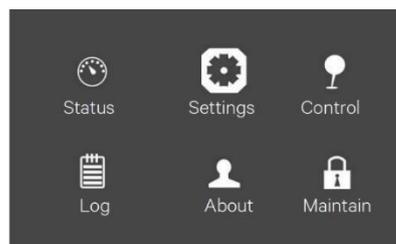


Figure 2-31 Main menu screen

2) Press the arrow keys  or  to select and set the relevant parameters (take “output” as an example), See the Figure 2-33. At the same time, configure the battery type in the **Battery** option according to the selected battery type.

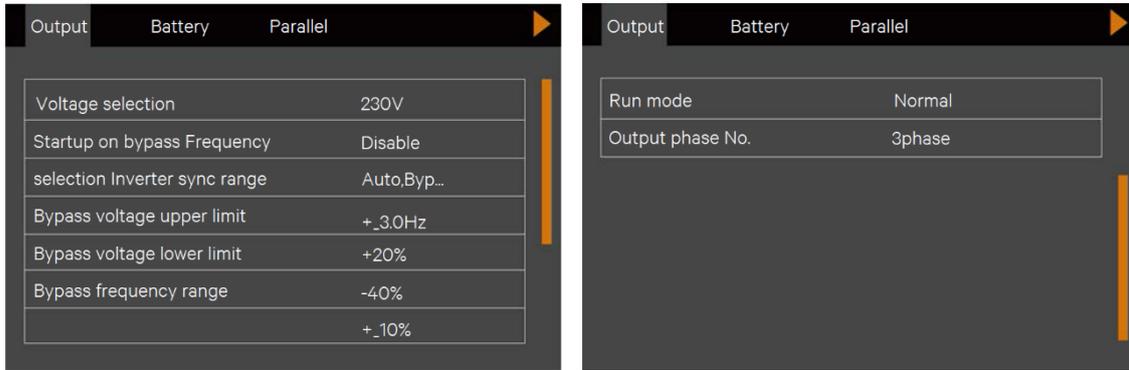


Figure 2-32 Output Interface

5. Press the ON button on the UPS panel for 2 seconds, and the LCD pops up a dialog box as shown in the Figure 2-34. When the user clicks “Yes”, the running indicator (green light) flashes, the inverter starts up, and the running indicator lights up.

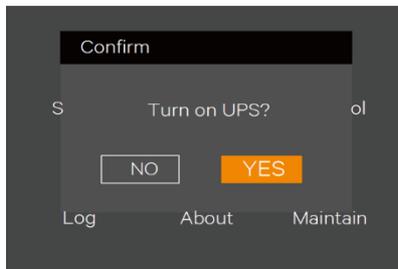


Figure 2-33 UPS turn-on Dialog

6. Measure if the inverter output voltage is normal. If the battery is not connected, the fault indicator flashes; if the battery is connected, the fault indicator is off.
7. Close the UPS output MCB.
8. Close the air conditioner MCB and wait for the air conditioner to start.
9. Close the PDU MCB to confirm that the PDU display panel data is normal. Whether the port indicators are illuminated in sequence.
10. Close the 12V and 24V DC output and wait for the LCD communication to be normal. Log in to the SmartCabinet2-E system and confirm that the parameters are displayed normally.

 **Notices**

1. The PMU contains an SPD module. When the SmartCabinet2-E system is powered on, ensure that the SPD on the PMU works normally, confirm that the front sighting port of SPD is green.
2. Before the SmartCabinet2-E system starts up, make sure that the maintenance bypass switch is disconnected and locked by the sheet metal lock.

 **Warning**

The SmartCabinet2-E system must be started up by trained and authorized professional technicians. It is recommended to be performed by the staff of Vertiv Tech Co., Ltd. Customer Service Center.

2.3.5 System commissioning

1. After startup, the default display interface is displayed via the LCD.
2. Through the LCD local display, click "Settings" -> "Configuration" to display configuration selection interface, select the appropriate configuration options according to the device connection, as shown in the Figure.2-35.

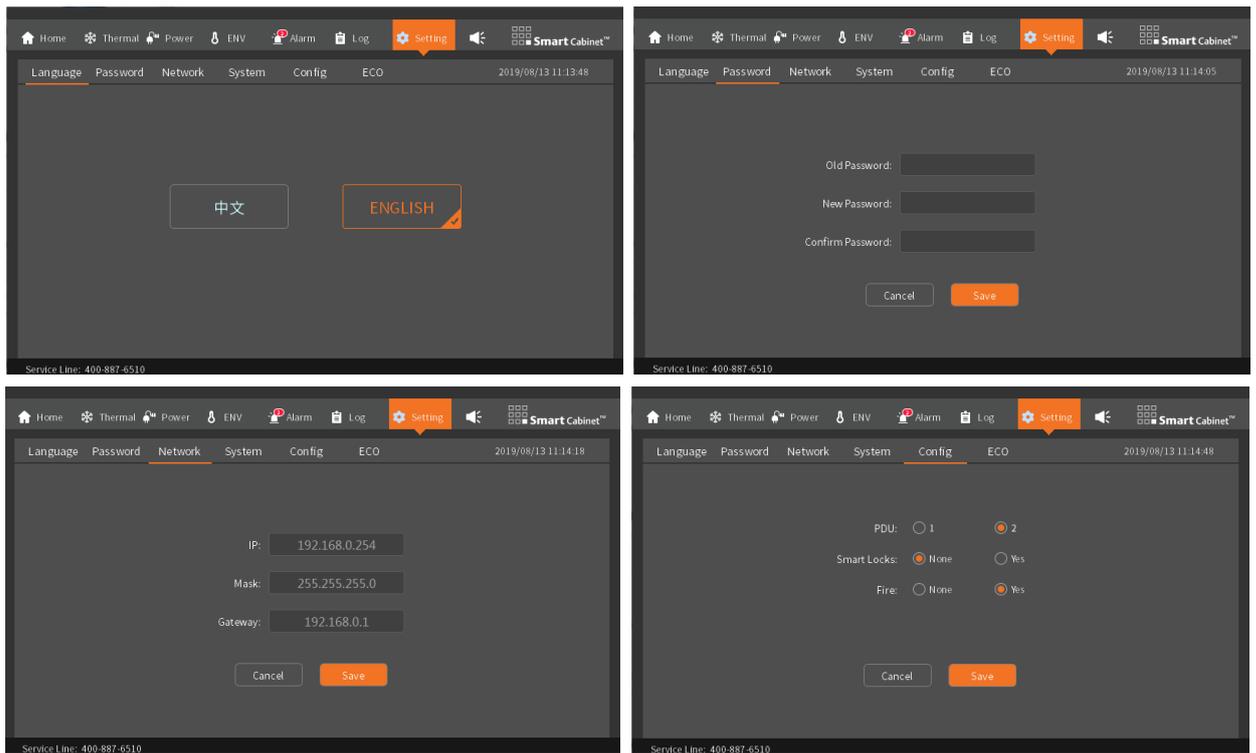


Figure 2-34 Setting screen

3. During the countdown process, the SmartCabinet2-E system will restart the update configuration. After the configuration update is successful, the LCD interface will automatically jump to the system home page.
4. Check whether each device is in normal operation through the LCD local display.
5. Only after all devices are running normally, can the IT devices such as user servers be turned on.

### 2.3.6 Smart door lock commissioning

1. SmartCabinet2-E can be equipped with a smart door lock. The door lock is an all-in-one door lock that supports both the key and the ID card, as shown in the Figure 2-36. The key can be unlocked under any circumstances, so the key needs to be kept in a safe place.



Figure 2-35 SmartCabinet2-E smart door lock appearance

2. After the smart door lock is powered on, the commissioning personnel can use the ID card to debug the door lock to confirm that the door lock can be opened normally.
3. Open the door remotely

When you need to open the door remotely, the commissioner logs in to SmartCabinet2-E through the web page, click "Cabinet Data" -> "Front Door" or "Rear Door" -> "Control", click "Remotely open door" setting signal, as shown in the Figure 2-37 for the remote door opening control. After receiving the door lock signal, the field operator can open the corresponding cabinet door.



Figure 2-36 Remote door opening control

**Notices**

After the remote authorization opens the door lock, the door lock is not opened by the field personnel after waiting for 5s, and the door lock will be automatically locked.

2.3.7 Shutdown

The shutdown flowchart of the SmartCabinet2-E product is shown in the figure 2-38.



Figure 2-37 Power off Flowchart

The shutdown steps are as follows:

1. Ensure that all user IT equipment is completely powered down.
2. Enter the **Thermal** menu of the LCD Monitoring System and turn off the air conditioner.

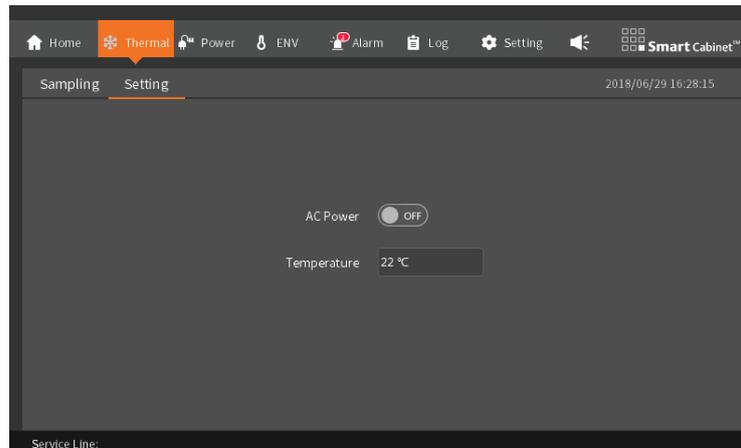


Figure 2-38 Turn Off Air Conditioner

3. After the air conditioner stops supplying cold air, disconnect the air conditioner from the PMU.
4. Press and hold the UPS shutdown button to turn off the UPS.
5. Disconnect the UPS input MCB and output MCB. Disconnect the battery MCB (when the battery is selected).
6. Disconnect the total input MCB on the PMU.
7. Check that all electrical equipment has been completely powered off and close all doors.

## Chapter 3 Operation Settings

The SmartCabinet2-E product uses a customized 9-inch HMI screen as the monitoring center for the entire system. The performance indicators and environmental conditions of the whole machine can be visually viewed and set on the local screen. At the same time, the HMI screen is also used as the intelligent control center of the external access system. Using the local or remote network, the user can track the running status of the device anytime and anywhere. The product provides a rich setting interface on the WEB interface, and the user can control the whole unit as needed, making the operation of the equipment more flexible and reliable.

This chapter describes the operation of the HMI local screen, the WEB intelligent monitoring remote connection and the settings of common functions.

### 3.1 HMI Local Display Interface

#### 3.1.1 Introduction to Local Display

The SmartCabinet2-E system home page is as shown in the Figure.3-1

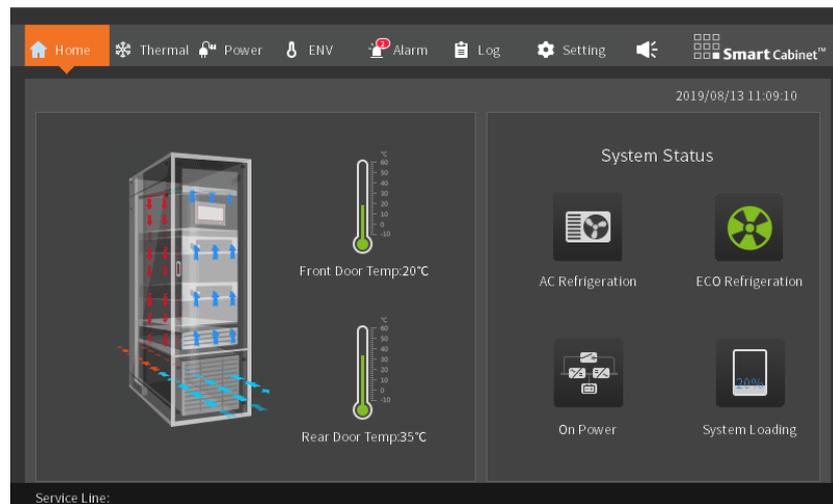


Figure 3-1 Home page (ECO mode)

In the SmartCabinet2-E homepage, menu items include **Home**, **Thermal**, **Power**, **ENV**, **Alarm**, **Log**, and **Settings**. The system menu of the display panel is shown in the Figure 3-2.

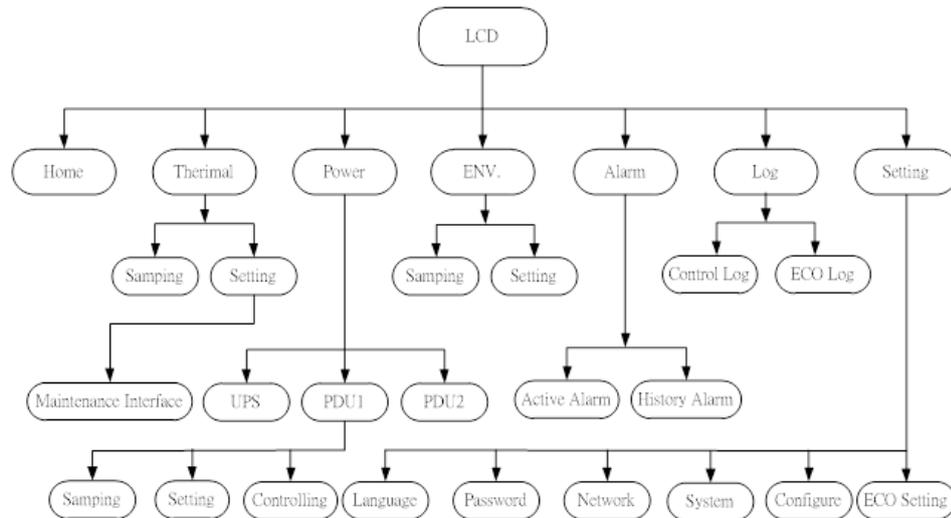


Figure 3-2 System menu

#### 3.1.2 Startup Screen

If SmartCabinet2-E intelligent monitoring unit has switched on, the screen is skipped automatically, and directed to the home page

### 3.1.3 Home

After startup, enter the main screen as shown in the Figure 3-1. On the page, you can view the current cabinet operation status, as well as the temperature value of the hot and cold channel. On the right side of the page, you can display the information of power distribution and refrigeration in common use.

### 3.1.4 Thermal

The air supply temperature is displayed in a graph to display the data of the latest hour, and the curve update time is 6s;

The air conditioner fans, air conditioner and cooling, and ECO fans use animated display switch status, as shown in the Figure 3-3.



Figure 3-3 Thermal management data collection screen

To enter the setting page, you need to enter the password. If the password is correct, you can view and control the operation normally. After switching the page, you can return to the page and you need to re-enter the password. Click “Esc” to view the information on this page, but you cannot control or set it, as shown in the Figure 3-4.

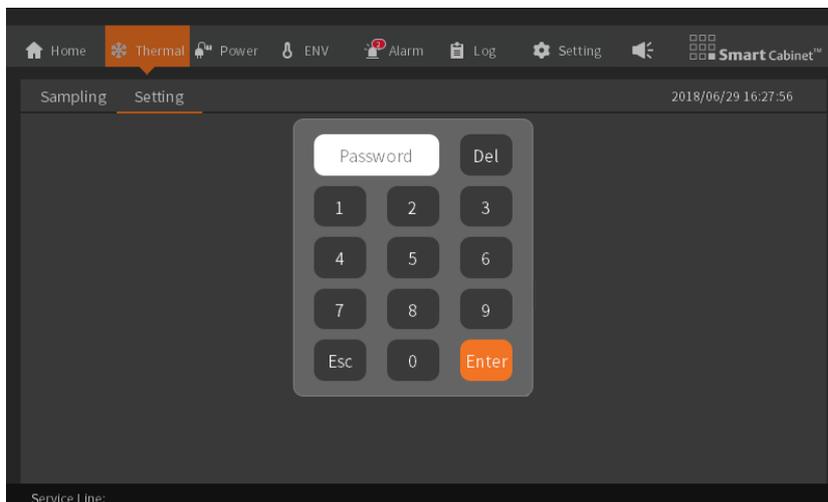


Figure 3-4 Password screen for entering the thermal management settings

As shown in the Figure 3-5, the air conditioning temperature set point can be modified. The factory default setting point is 23°C, and the setting range is 18 to 27 °C.

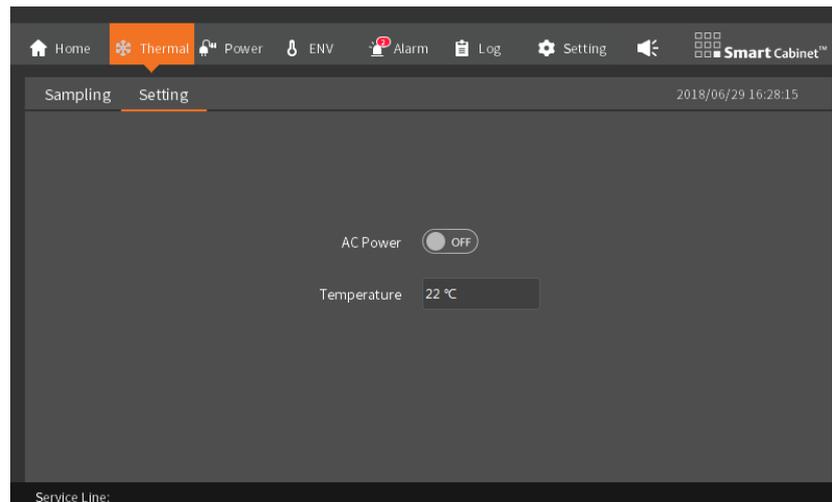


Figure 3-5 Thermal management setting screen

#### Notices

HMI the default password for local settings is "1234".

### 3.1.5 Power

The power distribution page embodies the entire power distribution part of the system. Whether the PDU can be clicked or not is determined by whether the system is equipped with PDUs. As shown in the Figure 3-6, PDU1 can view specific parameters, PDU2 is not configured, and parameters cannot be viewed.

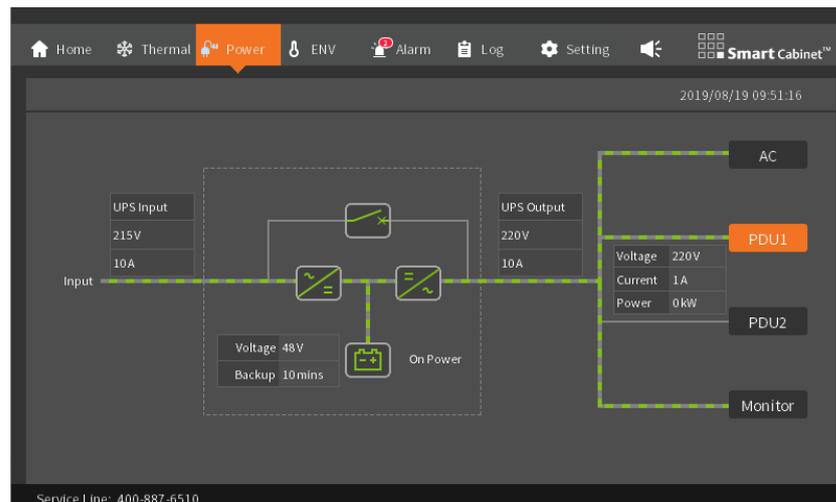


Figure 3-6 PDU1 only

After selecting two PDUs, you can view the parameters, as shown in the Figure 3-7.

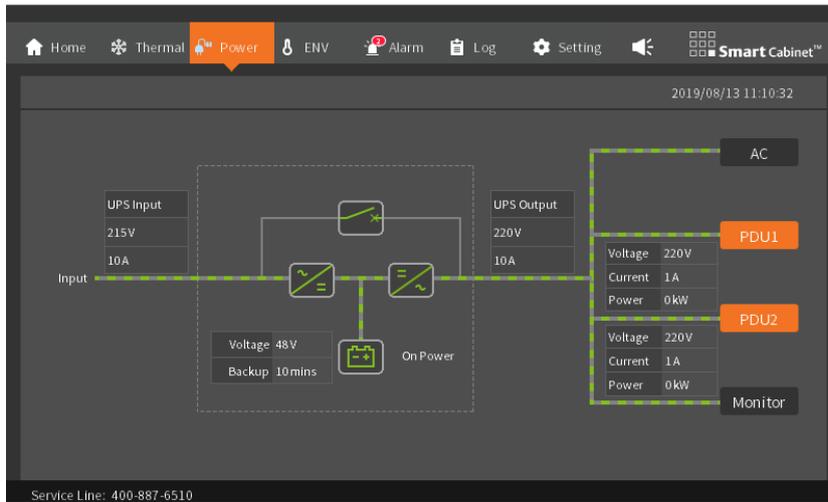


Figure 3-7 Both 2 PDUs

In the power supply and distribution, any port of the PDU can be controlled to be on and off. When performing control operations, password verification is required, as shown in the Figure3-8.

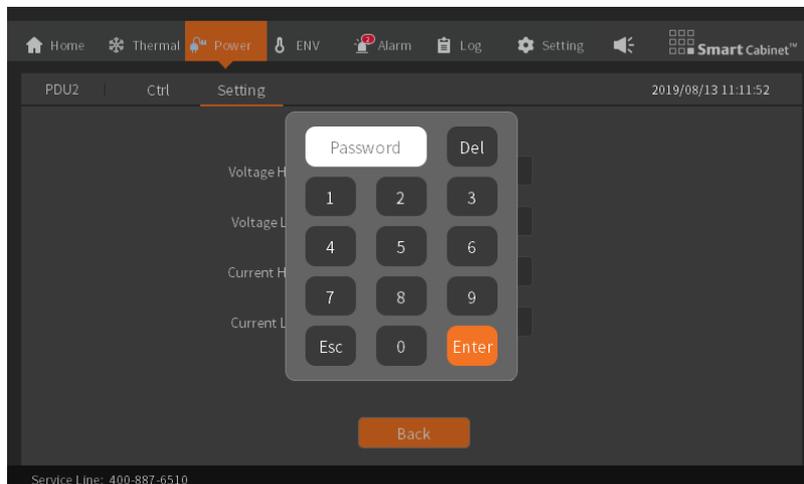


Figure 3-8 PDU Control Password Page

On the control page, you can view the on/off status of each PDU port and the customized interface name. (For the description of PDU custom port, please refer to the 3.2.4 menu items section's attention).

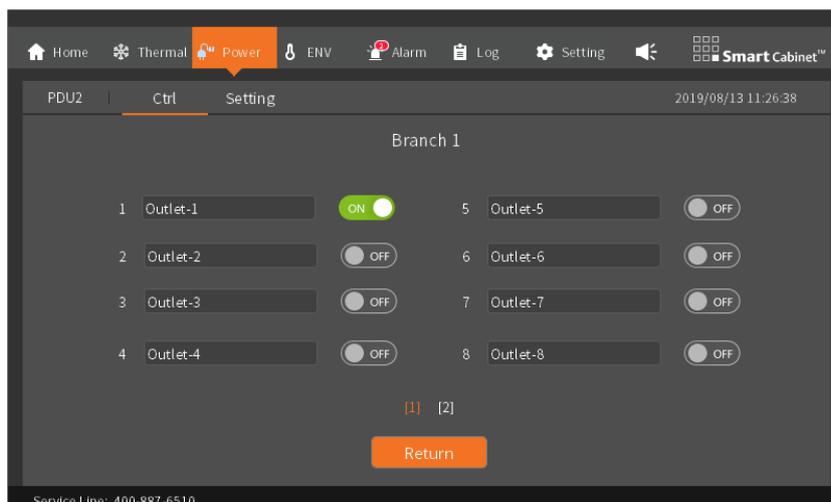


Figure 3-9 Port control

The PDU voltage and current range can be set on the setup page.

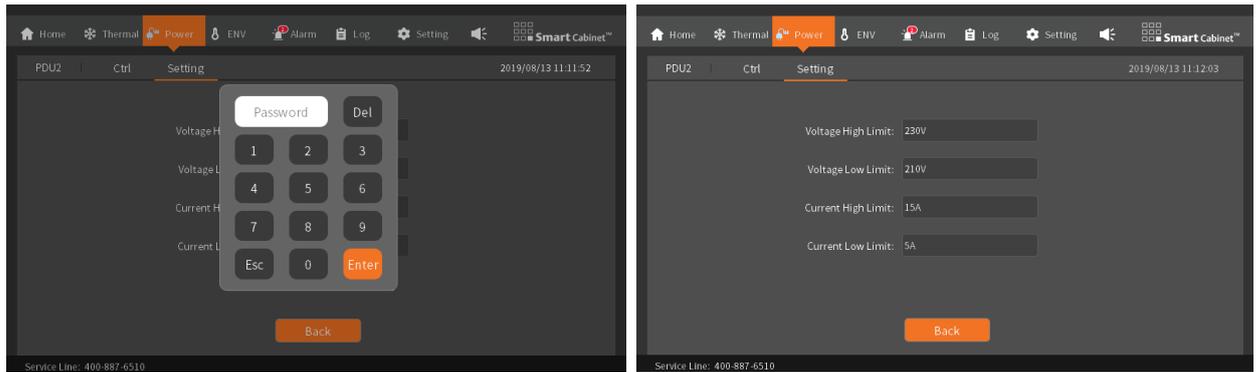
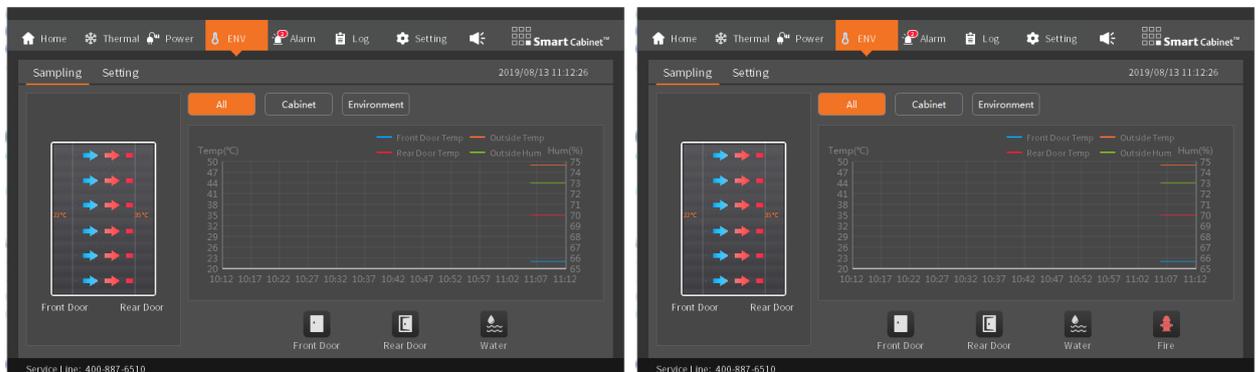


Figure 3-10 PDU source range setting

### 3.1.6 ENV

The environmental values are similar to the thermal management. The front and rear door temperatures are displayed in a graph for nearly one hour of data; the fire subrack icon in the environmental values is hidden automatically according to whether the fire subrack is configured, as shown in the Figure 3-11.



No fire subrack icon

Have fire subrack icon

Figure 3-11 The amount of environmental data collection screen

When setting the environment values, a password is required to enter, as shown in the Figure 3-12.

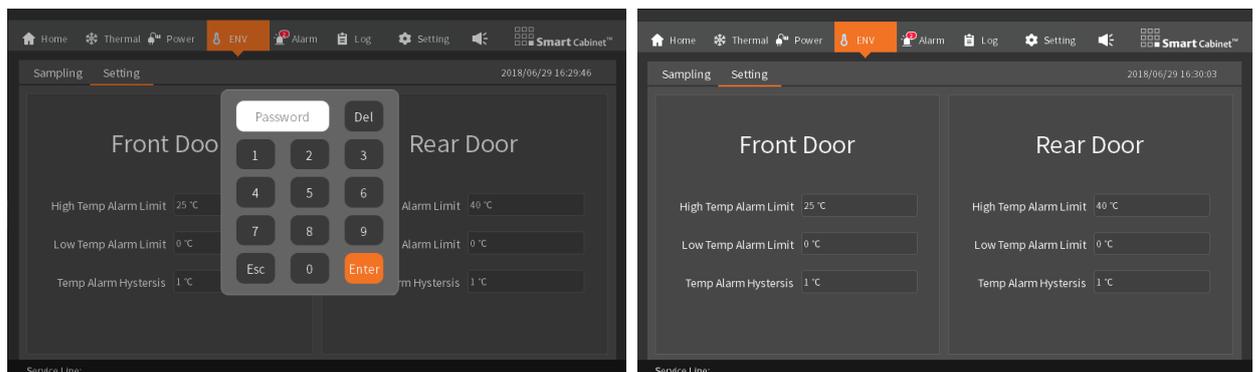


Figure 3-12 Set the amount of environmental data screen (requires a password to enter)

### 3.1.7 Alarm

The alarm screen displays the active and history alarms of the system.

The active alarms list various alarm information currently in the system. Each alarm information includes alarm content, alarm level (minor alarm, major alarm, critical alarm), and alarm time. By viewing the alarm information, the user can accurately understand the current system operation status, and timely process alarm information to ensure stable and safe operation of the system, as shown in the Figure 3-13.

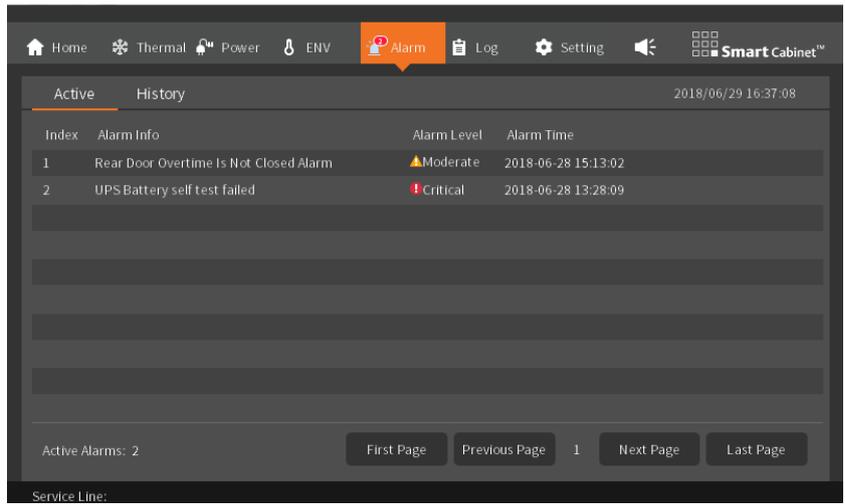


Figure 3-13 The current warning page

The history alarm lists the alarm information of the system in the last week. In order to enable the user to quickly retrieve the history alarm information of the main modules of the system, the history alarm interface sets the alarm filtering options. The items that can be filtered include **AC**, **UPS**, **PDU**, **ENV** and **Others**. Click the corresponding options to filter out the corresponding alarm list, alarm start time, and alarm end time. You can Click the first page, the previous page, the next page, and the last page to view the information in pages, as shown in the Figure 3-14.

The history alarm information of the system allows the user to fully understand the operating status of the system.

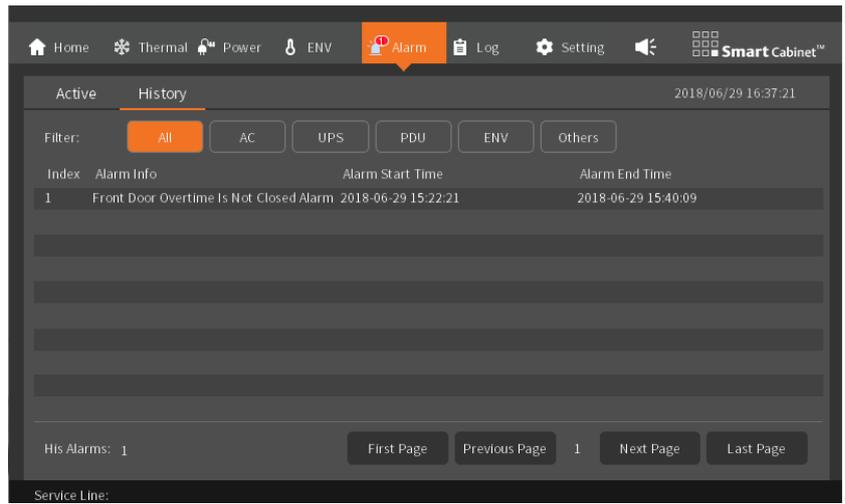


Figure 3-14 The history alarm page

Alarm buzzer: In the upper right corner  of the homepage menu bar, when the alarm is generated, the alarm buzzer will beep. If the next alarm is not generated, the buzzer will beep for 5min, and will automatically turn off after 5min. The buzzer  can be manually clicked  to be turned off.

 **Notices**

The processing of common alarm information can refer to the 4.4 Alarm reference section.

3.1.8 Log

The log page is divided into two parts: **Ctrl Log** and **ECO Log**.

The **Ctrl Log** interface lists the control operations issued by the HMI local display in the last week of the system, such as the air conditioner's power on/off, air supply and return temperature settings, and the temperature hysteresis setting. You can view all control information and control time of the user by viewing the control log, as shown in the Figure 3-15.

For other control commands sent through the WEB page, please visit the WEB page to control the log query related operation records.

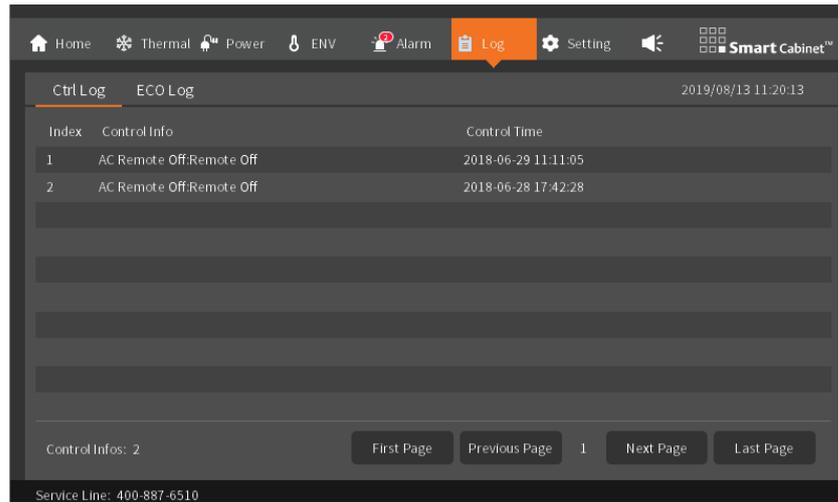


Figure 3-15 Control log interface

The **ECO Log** page mainly shows the operations related to the start and stop of the ECO module, as well as the record of the runtime environment values.

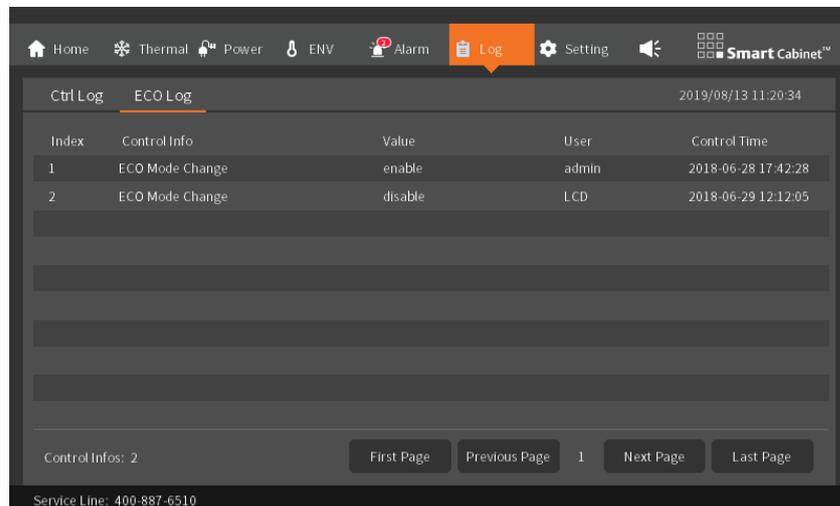


Figure 3-16 ECO log

### 3.1.9 Settings

The settings page includes six options for **Language**, **Password**, **Network**, **System**, **Config** and **ECO**.

#### 1. Language

Used to switch between two built-in LCD local display interface languages, as shown in the Figure 3-17.

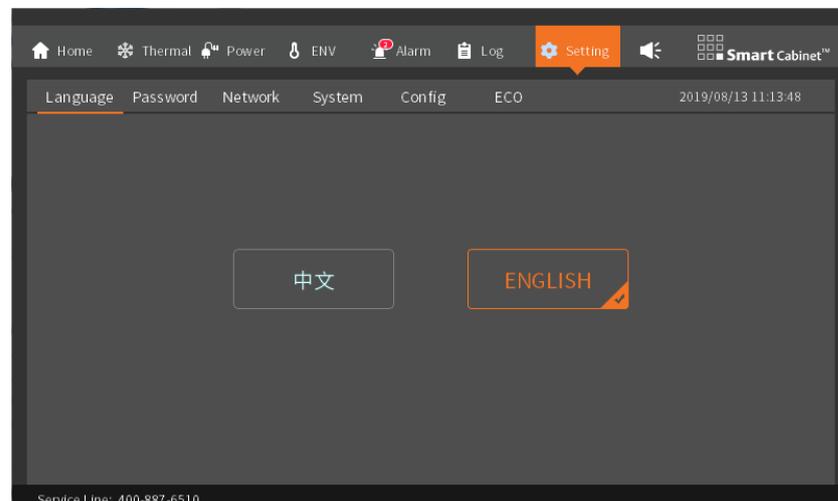


Figure 3-17 Language

### 2. Password

The password (default is "1234") is used to control the setting authority. For example, the air conditioner's power on/off and temperature settings require the correct password entry, as shown in the Figure 3-18.

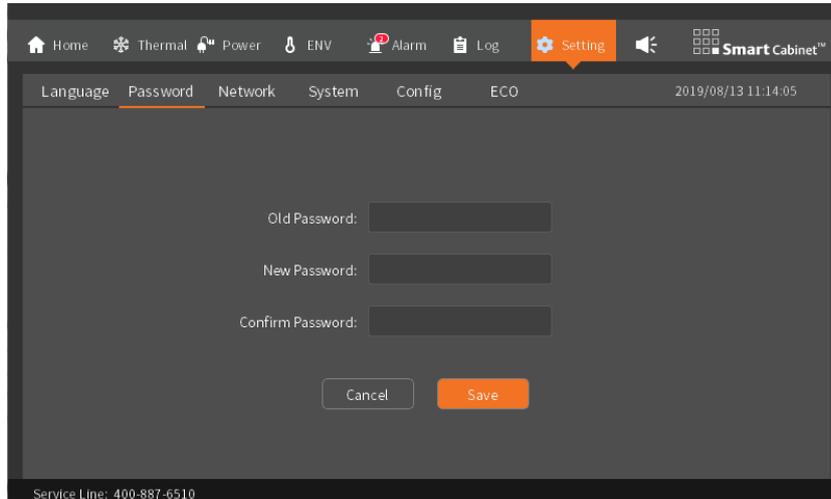


Figure 3-18 Password

### 3. Network

Used to query and modify the IP address of the SmartCabinet2-E intelligent monitoring unit. To modify the system NIC information, click the input box of the corresponding NIC information, enter the IP address information to be set in the string format, click the Save button, and enter the LCD local display password, then the IP address information will be sent to the control system to set New IP. Connect the external PC to the corresponding Ethernet port, access the corresponding network address, log in to the system WEB page, and view the running status of the system in real time on the PC side, such as system alarm information, remote opening of smart door lock, air conditioner on/off and temperature settings, etc., to achieve remote access to the system. The IP address setting screen is as shown in the Figure 3-19.

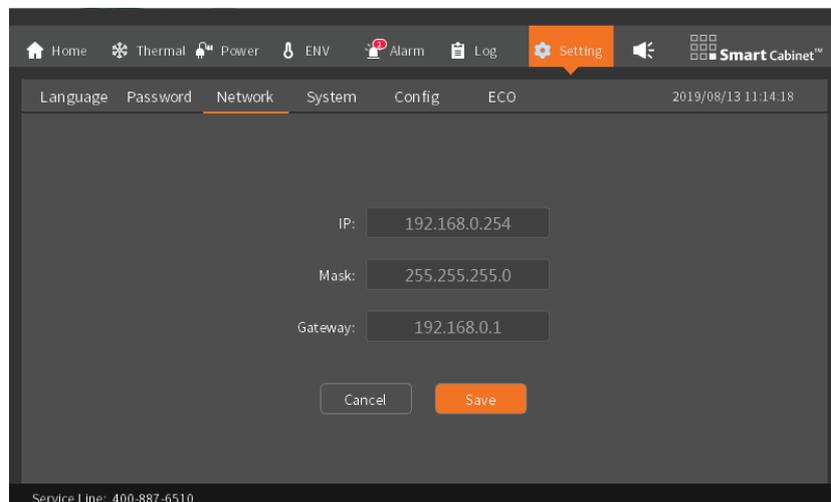


Figure 3-19 Network

### 4. System

Check the software and hardware version number and copyright information of the SmartCabinet2-E intelligent monitoring unit. In the maintenance mode, no alarm sound will be generated, and the alarm icon will change to . To click, you need to cancel the maintenance mode on the system page. The system interface is shown in the Figure 3-20.

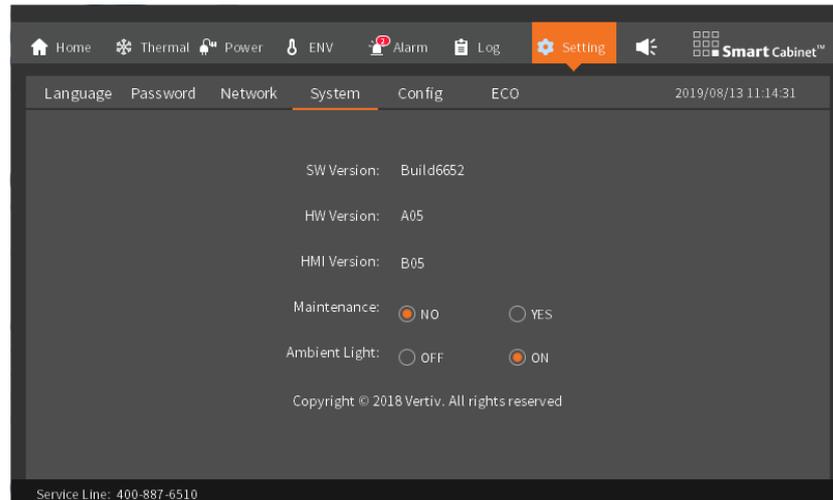


Figure 3-20 System

## 5. Config

The SmartCabinet2-E configuration page configures the number of PDUs, smart door locks, and fire subracks, as shown in the Figure 3-21.

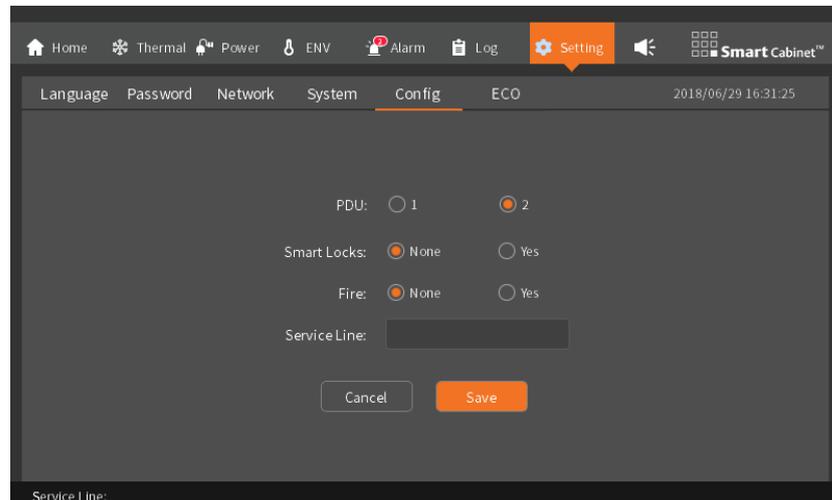


Figure 3-21 Configuration

## 6. ECO

On the ECO page, you can set the ECO mode enable status and ECO entry humidity conditions.

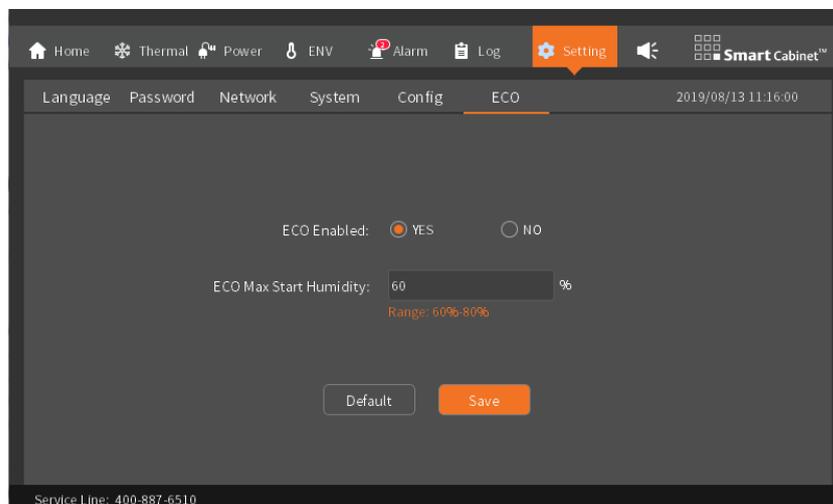


Figure 3-22 ECO settings

## 3.2 Remote WEB Intelligent Monitoring Access Interface

### 3.2.1 Login Preparation

To ensure the normal use of the SmartCabinet2-E intelligent monitoring unit page function, please select and set the browser options as described in this chapter.

#### 1. Check the IP address

Prior to logging in to the SmartCabinet2-E intelligent monitoring unit via the Web, first confirm the IP address and test its connectivity. The test method is as follows:

1) Press the “win” + “R” button at the same time to open the “Run” window and enter “cmd” as shown in the Figure 3-23:

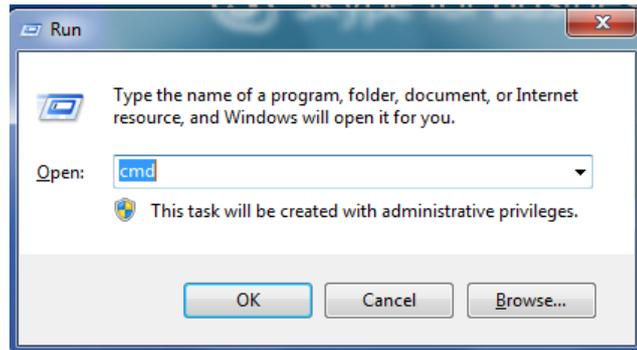


Figure 3-23 Run window

2) Press the Enter key and the page as shown in the Figure 3-24 will pop up. Enter "ping" and IP address on the command line (for example, ping 10.163.236.95) to see if the communication is successful.

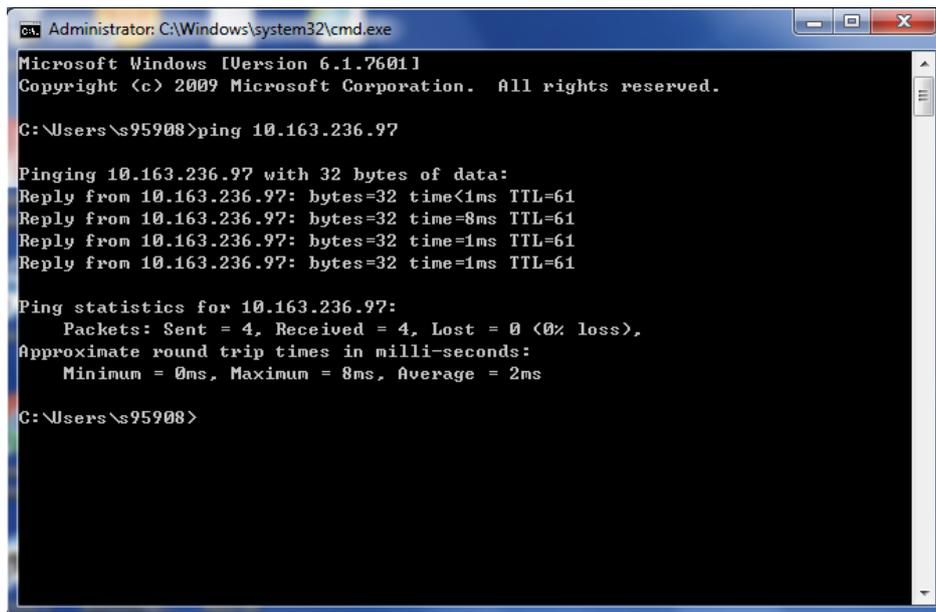


Figure 3-24 Detect network connectivity

#### 2. Check the browser version

Recommended browser versions: **IE11, Firefox, Chrome, Safari.**

#### 3. Check IE browser settings

##### 1. Check IE general settings

Double-click the IE icon to run the software, click on the menu **Tool** → **Internet Options**, click on the **Settings (S)** in the **General** Tab, and change “**Check for newer version of stored pages**” to “**Every time I visit the page**”, as shown in the Figure 3-25:

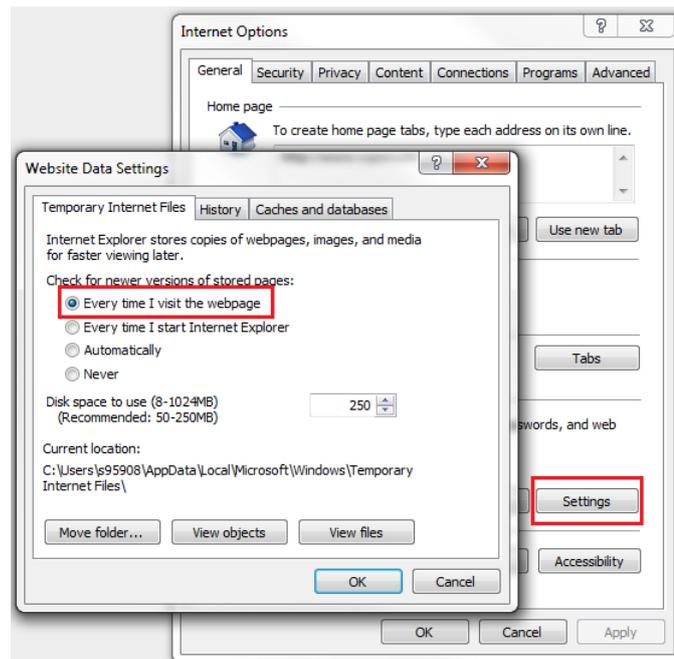


Figure 3-25 Website Data Settings

## 2. Check IE proxy settings

1) Double-click the IE icon to run the software, click on the menu **Tool** → **Internet Options**, then select the **Connections** tab to pop up the page as shown in the Figure 3-26.

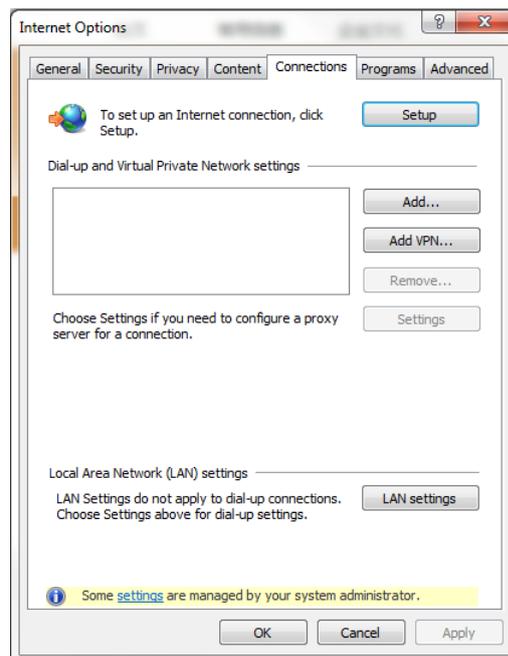


Figure 3-26 Select Connection tab

2) In the page shown, click **LAN Settings (L)** to pop up the page as shown in the Figure3-27.

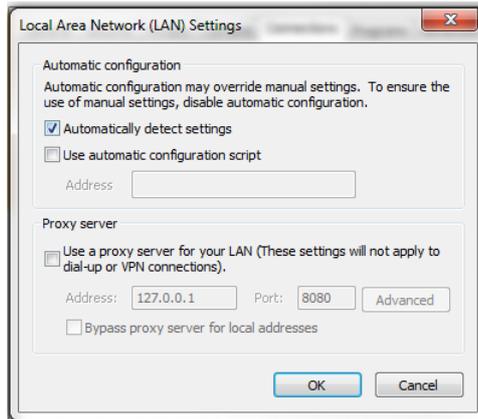


Figure 3-27 Local area network settings

3) Please consult the network administrator of your network to ask if you need to configure proxy and the configuration method. If you do not need an agent, please do not check any options.

### 3. Check IE security settings

1) Double-click the IE icon to run the software, click on the Menu **Tool** → **Internet Options**, then select the **Security** tab and the page shown will pop up.



Figure 3-28 Security Settings1

2) Select **Local Intranet** as shown in the Figure3-28, click **Custom Level ...**, and the dialog box shown in the Figure 3-29 will pop up.

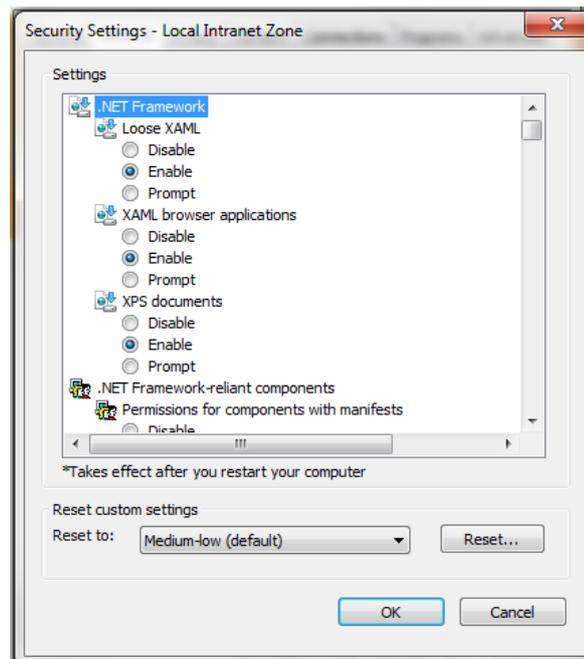


Figure 3-29 Security Settings 2

- 3) Select "**Medium Low (default)**" as shown in the Figure 3-29, and click the **Reset (E)** button to end resetting the custom settings.
- 4) Set to enable **File Download**, as shown in the Figure 3-30.

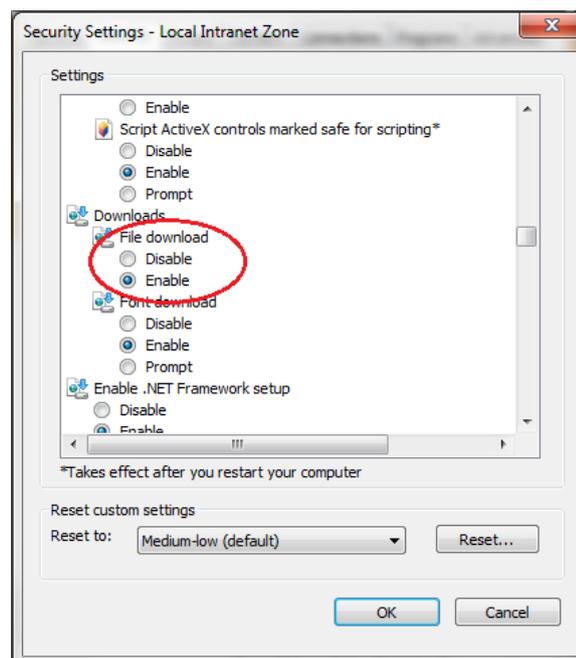


Figure 3-30 Enable file downloads

- 5) Set to enable the **Initialization and scripts ActiveX controls not marked as safe for script**, as shown in the Figure 3-31.

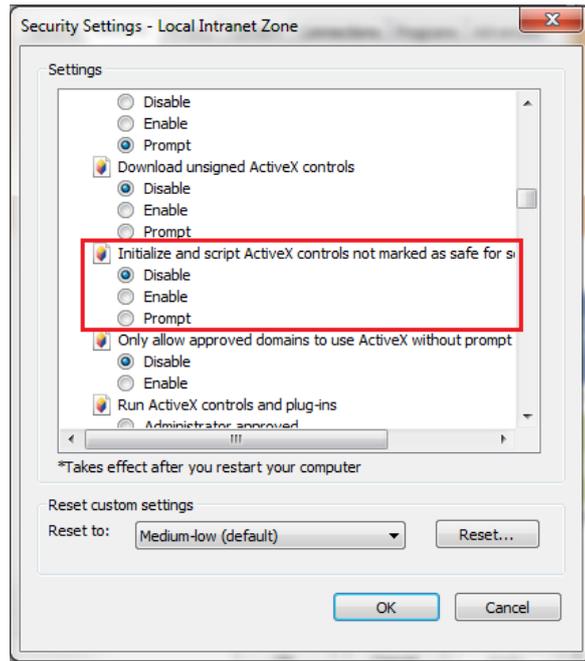


Figure 3-31 Enable ActiveX Controls

6) Add the IP address of the Intelligent Monitoring Unit to the list of trusted sites, as shown in the Figure 3-32.

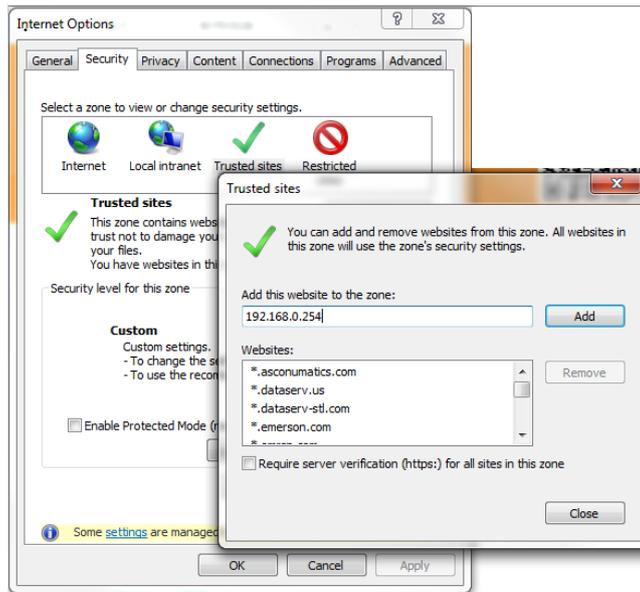
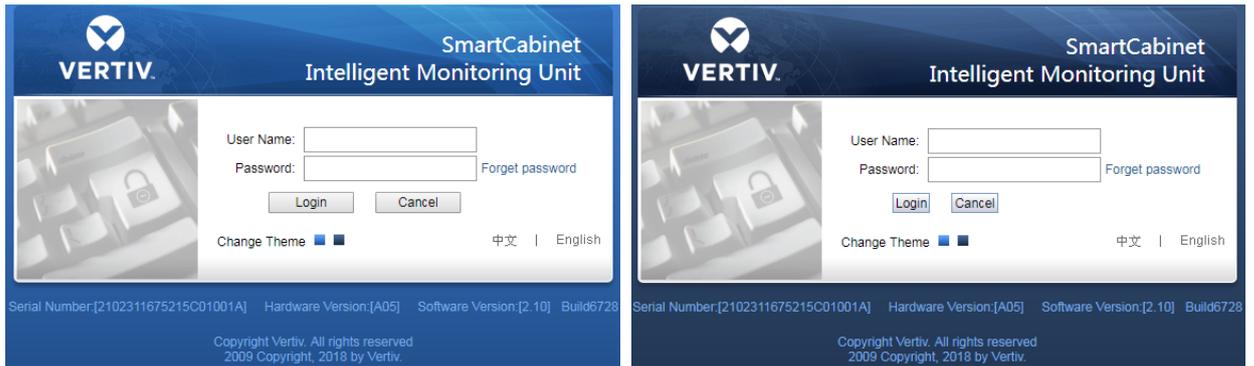


Figure 3-32 Add to trusted sites

### 3.2.2 Logging in the remote monitoring platform

#### 1. Login page

- 1) Start the browser, enter the IP address of the intelligent monitoring unit in the address bar, and the login page appears. As shown in the Figure 3-33, if the login page does not appear, see the 3.2.1 1. Check IE general settings.
- 2) On the login page, click  or  to select the favorite theme style,  represents crystal blue;  represents ocean blue, as shown in the Figure 3-33.



Crystal blue

Ocean blue

Figure 3-33 Intelligent monitoring system login page

3) Enter the username and password (default username: **admin**, default password: **Vertiv**) to log in to the intelligent monitoring unit and pop up the home page as shown in the Figure 3-35. If the user name and password are entered correctly, the home page cannot be accessed. See 3.2.1 3. *Checking IE Browser Settings* to re-set the IE browser.

## 2. Forgot your password

1) If you forget the user password, you can click the **Forgot Password** button on the login page. The screen displays the Retrieve Password page as shown in the Figure 3-34.



Figure 3-34 Retrieve Password page

2) Enter your username, click the **Submit** button, your password will be sent to your previously set mailbox or mobile phone; Click the **Return** to Login button to cancel the operation.

## Notices

You can only receive the passwords sent by the system if you have set the email or SMS parameters correctly in the **SMS Module** and **Email Server Configuration** page. For details, see 3.2.4 c) *Alarm Notification Configuration* in Alarm Management.

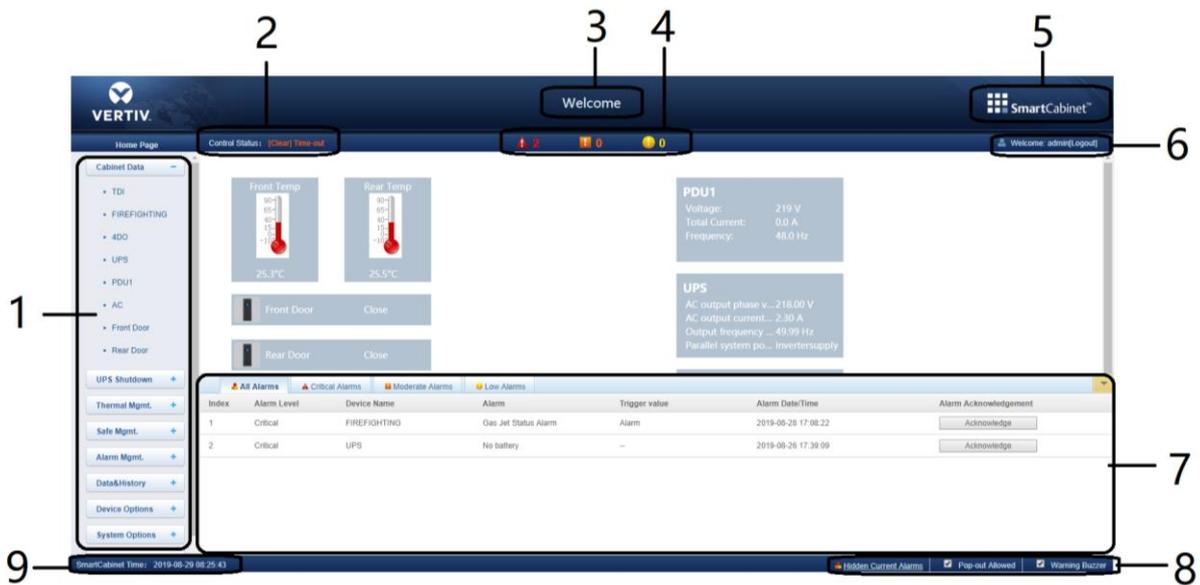
The retrieved password is a new password that is randomly produced by the system. Please modify it after you log in successfully.

### 3.2.3 Monitoring Homepage

After logging in the MSC intelligent monitoring system successfully, the homepage is displayed by default, as shown in the Figure 3-35.

#### 1. Homepage

The home page effect is shown in the Figure 3-35:



- 1. Menu Item
- 2. Controlled state
- 3. Each level the number of real-time alerts
- 4. System Title
- 5. Logo
- 6. Logout [current user]
- 7. Real-time alarm display list
- 8. Alarm alert settings
- 9. Time Calibrating Link

Figure 3-35 Intelligent Monitoring System Homepage

**Notices**

When the system is abnormally running, a corresponding fault alarm will be generated. The emergency ventilation system can prevent the temperature inside the cabinet from rising continuously in a short time. If the high temperature fault alarm does not cease for a long time, the user needs to open the front and rear doors of the cabinet on the site, and contact the service personnel to check the fault.

Click the **Setting** button in the Figure 3-36 to enter the setup status of the home page, as shown in the Figure 3-36.

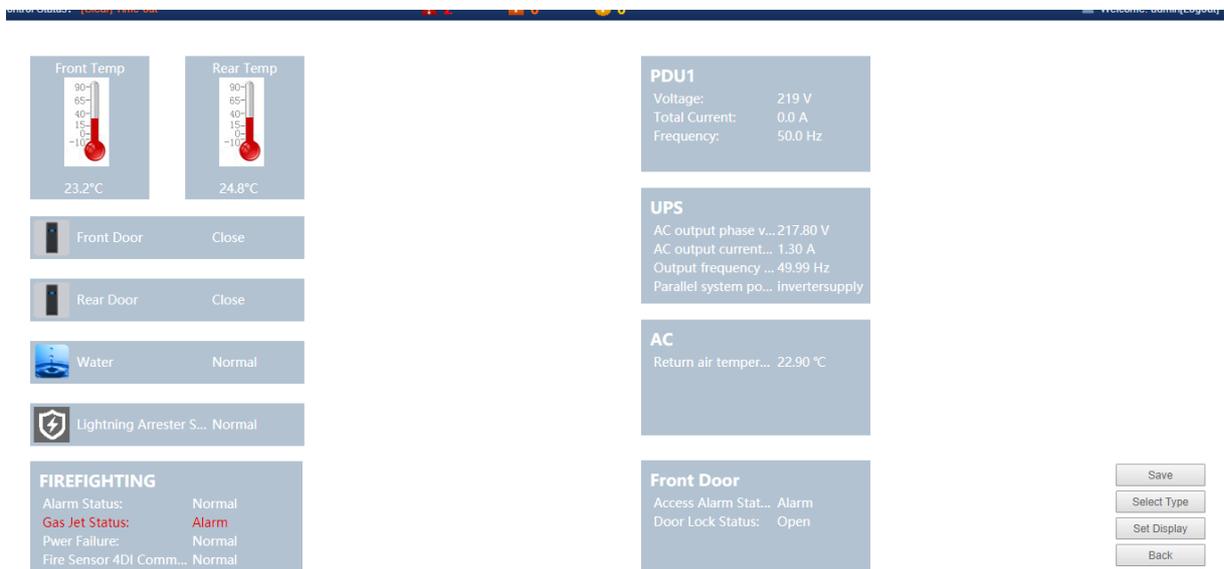


Figure 3-36 Set status

After the home page enters the setup state, the setup method is as follows:

1) Model setting

Click the **Select Type** button to pop up the page as shown in the Figure.3-37.

Click the **Left(<)** and **Right(>)** buttons to select the model image.

After selecting, click the **Select Type** button and then click "OK", the homepage will display the background image.

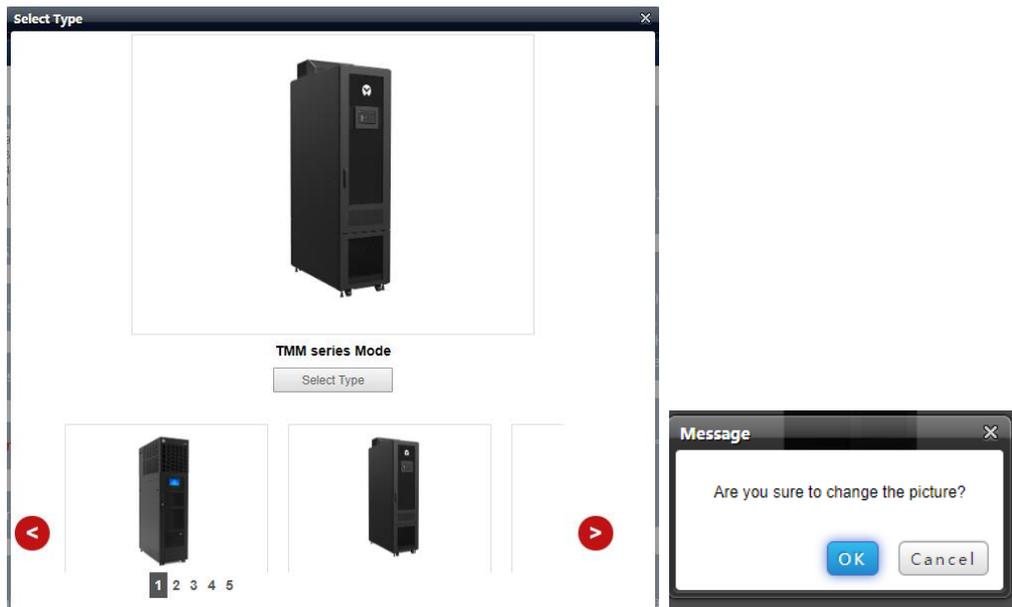


Figure 3-37 Set mode

## 2) Display setting

Click the **Set Display** button to pop up the page as shown in the Figure 3-38.

After selecting the device name, the signal of the device will be displayed in the box below, and the user can select the device signal to be displayed as needed, but no more than four.

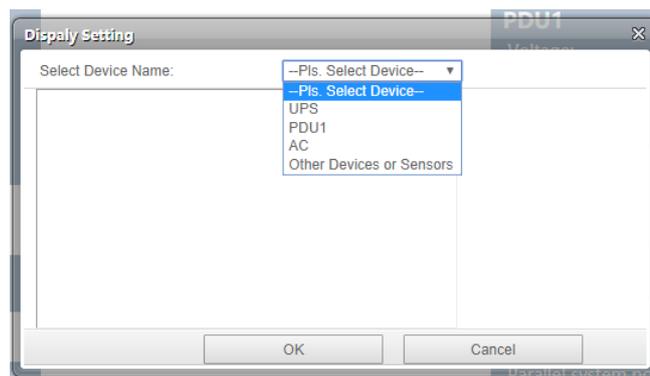


Figure 3-38 Display setting

## 3) Save the configuration

Click the **OK** button to save all the configurations and return to the browse state.

### Time-calibration link

The SmartCabinet system time is displayed at the bottom left of the page. Click the SmartCabinet system time to jump to the time calibration page. For details, see *Time Calibration* in section 3.2.4 8. *System Settings*.

## 2. Release the timeout

When the page has not been operated for more than **15 minutes**, the page will become uncontrollable, as shown in the Figure 3-39.



Figure 3-39 Time-out status

After clicking **[Clear] timeout**, the input box as shown in the Figure 3-40 appears. After the login password verification is passed, the controllable state returns to normal after about 5 seconds.

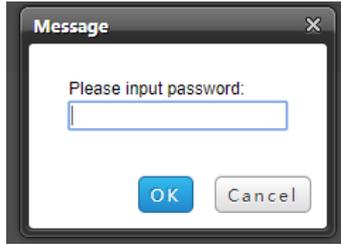


Figure 3-40 Input password

### 3. Logout

Click the **Logout** link in the upper right corner of the homepage, and the prompt box shown in the figure 3-41 will appear. Click **OK** to exit safely.

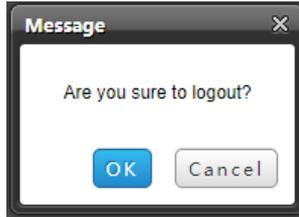


Figure 3-41 Logout

### 4. Current alarm reminder settings

The current alarm display list shrinks to the bottom of the page by default. You can do the following with reference to the Figure 3-35:

- 1) Click to view the active alarm and manually pop up the real-time alarm display list;
- 2) Select the Pop-out allowed check box to make the real-time alarm list pop up automatically when the alarm is generated.
- 3) Select the Warning Buzzer check box to enable the system to play the alarm sound through the browser when there is an alarm.

#### 3.2.4 Menu items

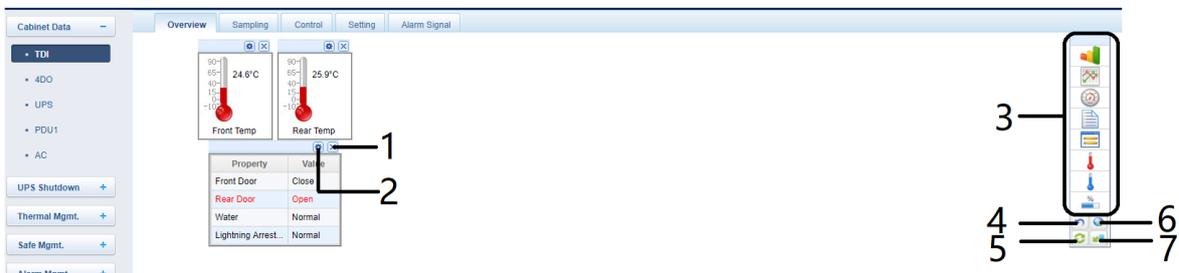
In the intelligent monitoring unit home page, the menu items include **Cabinet Data**, **UPS Shutdown**, **Thermal Mgmt.**, **Safe Mgmt.**, **Alarm Mgmt.**, **Data&History**, **Device Options**, **System Options**, and **Help**.

##### 1. Cabinet Data

Click on the Cabinet Data menu on the left, and the submenu will appear, and will be displayed by device. Clicking on the specific device will display the related information of the device on the right side, including **Overview**, **Sampling**, **Control**, **Setting** and **Alarm Signal**.

##### 1) Overview

Select the **Overview** tab and click the **Edit** button to customize the overview page as shown in the Figure 3-42.



- |                        |  |                               |                        |                        |
|------------------------|--|-------------------------------|------------------------|------------------------|
| 1. Delete control icon | 2. Configuration control icon              | 3. List of available controls | 4. Back to browse icon | 5. Restore system icon |
| 6. Save icon           | 7. Same type of equipment effectively icon |                               |                        |                        |

Figure 3-42 Equipment Overview

In the edit state, click **(5) Restore System** button to restore the default; click **(7) Same type of equipment effectively** button to batch configure other devices of the same type; click **(6) Save** button to save; click **(4) Back to Browse** button to convert page to browsing status.

**Notices**

1. The overview page has different default control display modes according to different device types, and the default is restored to this state.
2. Some types of devices have specific state diagrams that are not removable and not configurable. They can only update state map location information, such as air conditioners, UPS, and so on.

2) Sampling

Click the **Sampling** tab to enter the acquisition signal page to display the acquisition signal of the selected device, as shown in the Figure 3-43.

Index	Signal Name	Value	Sampling Time
1	Front Temp	24.4°C	2019-08-27 16:04:13
2	Rear Temp	25.9°C	2019-08-27 16:04:13
3	Front Door	Close	2019-08-27 16:04:13
4	Rear Door	Open	2019-08-27 16:04:13
5	Water	Normal	2019-08-27 16:04:13
6	Lightning Arrester Status	Normal	2019-08-27 16:04:13
7	Outside Cabinet Temp	24.4°C	2019-08-27 16:04:13
8	Outside Cabinet Hum	69.1%	2019-08-27 16:04:13

Figure 3-43 Acquire the Signal

If a signal is in an alarm state, the line of the signal is displayed in red, as shown in the "Rear door" signal.

3) Control

Click the **Control** tab and go to the Control Signals page to display the control signals for the selected device, as shown in the Figure 3-44.

Index	Signal Name	Value	Refresh Date/Time	Value Setting	Set
1	Remote switch command	Empty	--:--	Empty	Set
2	Remote battery maintenance self test command	Empty	--:--	Empty	Set
3	reset	Empty	--:--	Empty	Set

Figure 3-44 Control signal

Select an item in the drop-down box for the **Set Value** and then click the **Set** button to control the device.

**Notices**

1. The name of each independent port can be customized on the PDU control page.
2. Open the PDU control signal page, as shown in Figure 3-44.
3. Click an Outlet-X status (Outlet-1, Outlet-2, ...) in the signal name column, so that a signal name modification dialog box is displayed, as shown in Figure 3-45.
4. Enter a self-defined port name in the dialog box and click OK to complete the self-defined setting of PDU port name.

Index	Signal Name	Value	Refresh Date/Time
1	Outlet-1 Status	Power Off	--:--
2	Outlet-2 Status	Power Off	--:--
3	Outlet-3 Status	Power Off	--:--
4	Outlet-4 Status	Power Off	--:--
5	Outlet-5 Status	Power Off	--:--
6	Outlet-6 Status	Power Off	--:--
7	Outlet-7 Status	Power Off	--:--
8	Outlet-8 Status	Power Off	--:--
9	Outlet-9 Status	Power On	--:--

**Modify Signal Name**

Please Input New Signal Name:

Outlet-1 Status

OK Cancel Restore System

Figure 3-45 Port Name Modification Dialog Box

### 3) Setting

Click the **Setting** tab to enter the Set Signal page to display the setup signal for the selected device, as shown in Figure 3-46.

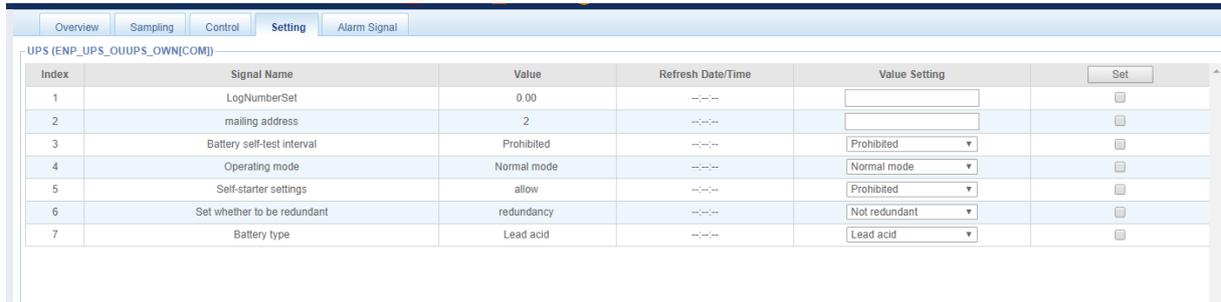


Figure 3-46 Setting signal

Batch settings can be made for signals, and 16 signals can be set in maximum batch size at a time.

### 4) Alarm signal

Click the **Alarm Signal** tab to enter the alarm signal page to display the alarm signal of the selected device, as shown in the figure 3-47.



Figure 3-47 Alarm signal

Batch settings can be made for the level of the alarm signal, and 16 signals can be set in maximum batch size at a time.

## 2. UPS shutdown

In the home page of the MSC intelligent monitoring system, click the **UPS shutdown** menu on the left, and you can see one sub-menu: **Server shutdown**.

Click the **Server Shutdown** sub-menu under the **UPS Shutdown** menu to pop up the Server Shutdown Settings page as shown in the Figure 3-48.



Figure 3-48 Server Shutdown settings page

In the **Server Shutdown** settings page, users can add and remove server shutdown tasks.

The steps to add the server shutdown are as follows:

- 1) Select the UPS device from the UPS drop-down box;
- 2) In the IP address of the associated server, enter the IP address of the server to be shut down;
- 3) Click the Add button to complete the server shutdown task. The basic information will also be displayed in the list above the page.

### 📖 Notices

1. To use this feature, install the software Vertiv network shutdown on the server.
2. Contact the VERTIV technical service center for this software.
3. When running the software on win10 system devices, select "use the software in compatibility mode" from the attributes and select "windows xp (service pack 3)". Run as Administrator.
4. For other usage questions, contact the VERTIV technical personnel.

## 3. Thermal Mgmt.

Click on the **Thermal Mgmt.** menu on the left, and you can see a submenu: **ECO Management**.

Click the **ECO Management** submenu under the **Thermal Mgmt.** menu to pop up the ECO Mode Settings page as shown in the Figure 3-49.



Figure 3-49 ECO management

On this page, you can view the running status of the current ECO module. At the same time, you can set the startup parameters of the ECO mode. For details on the ECO mode, please refer to 3.3 *ECO Settings and Operation Instructions*.

## 4. Safe Mgmt.

Click on the left **Safe Mgmt.** menu, visible submenu: **Fire Suppression System, Video Surveillance , Door Access**.

- 1) Fire Suppression System

Click the **Fire Suppression System** submenu under the **Safe Mgmt.** menu to pop up the **Fire Suppression Alarm Strategy** page as shown in the Figure 3-50.

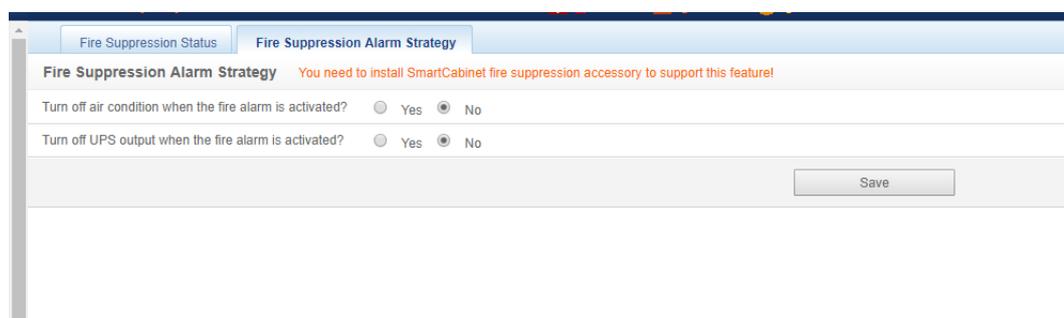


Figure 3-50 Fire Suppression System

When equipped with a fire subrack accessory, you can set the linkage control between fire subrack and air conditioner and UPS on this page.

- 2) Video Surveillance

Click on the **Video Surveillance** submenu under the **Safe Mgmt.** menu and the page shown will be displayed.

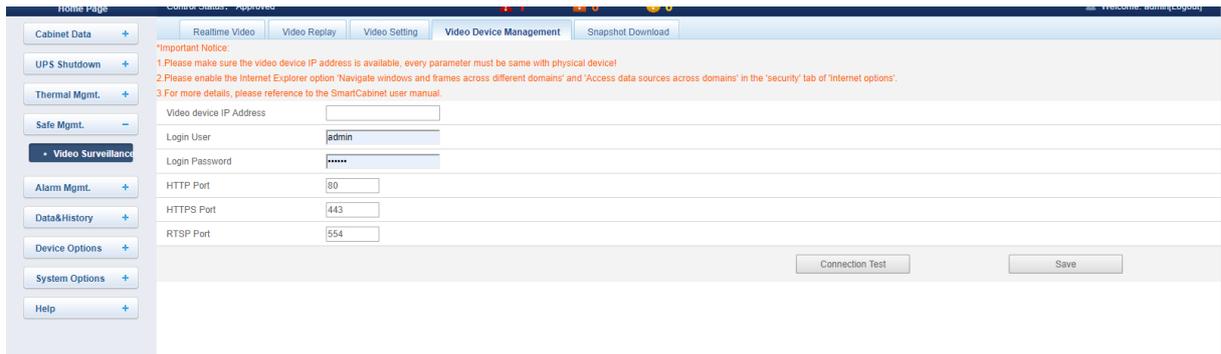


Figure 3-51 Video Surveillance

a) Video device management

Enter the **Video device IP Address**, **Login User** and **Login Password**, **HTTP port**, **HTTPS port**, **RTSP port**, and click the **Connection Test** button to test whether the video device is successfully connected. If the message **“Video device connection test successful!”** is displayed, the connection is successful, otherwise the connection fails. Please check whether the input video device information is correct, and the video device connection is correct. Click the **Save** button to save the entered video device information.

**Notices**

1. Please ensure that the input video device IP address is available, and each parameter must be consistent with the actual device!
2. Please enable "Cross-domain browsing windows and frames" and "Access data sources through domain" on the "Security" tab in Internet Explorer "Internet Options", as shown in Figure 3-52.
3. Support single-channel IPC (IP Camera) camera.
4. In the case of IPC access, up to 1 channel of video is supported.
5. Video management only supports IE browser.

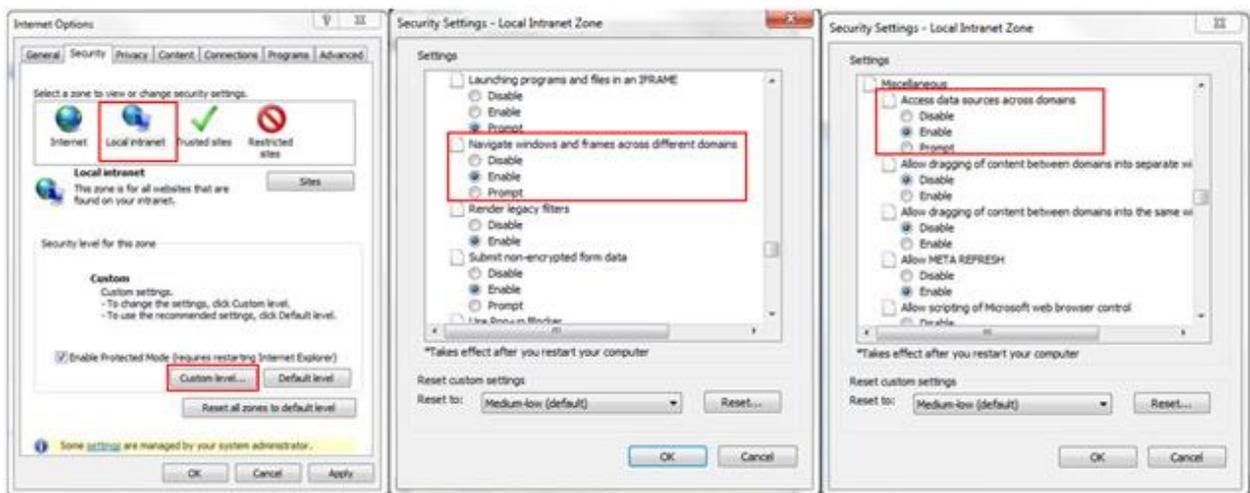


Figure 3-52 Internet Settings

b) Realtime video

Click on the **Live Video** tab under the **Video Surveillance** menu and the page shown will be displayed. The following Table 3-1 gives the icon description.

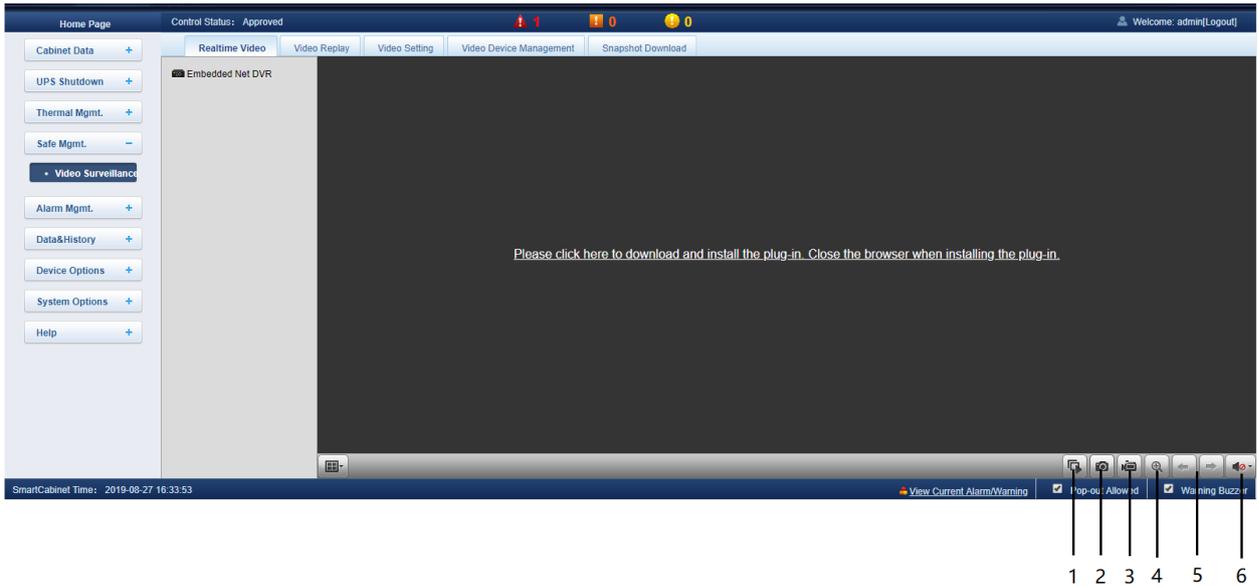


Figure 3-53 Realtime Video page

Table 3-1 Realtime Video page icon description

Icon	Description
1. 	Start/stop real-time browsing of all devices
2. 	Capture
3. 	Video recording
4. 	Zoom in on the video image of the selected area
5. 	When browsing the current page in 1*1 mode, switch to view video monitoring of different devices.
6. 	Set the sound volume

### Notices

1. After the capture and video operations, the file is saved in the **Save Path** of the **Parameter settings\Local configuration\corresponding operation**.

#### c) Video Replay

Click the **Video Replay** tab under the **Video Surveillance** menu, and the page shown in the Figure 3-54 will be displayed. The following Table 3-2 gives the corresponding icon description.

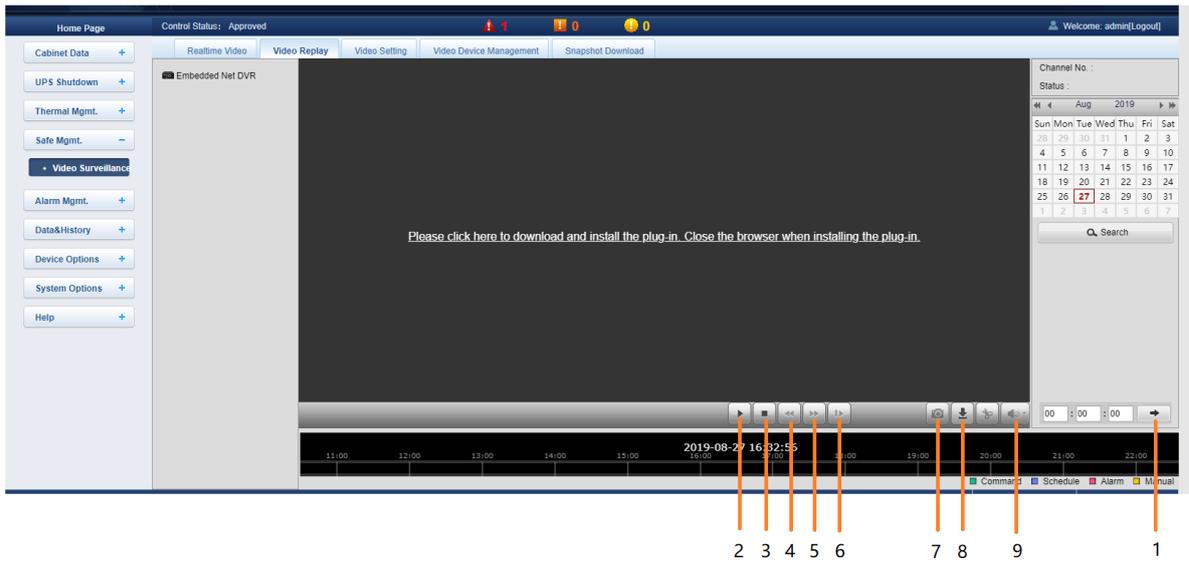


Figure 3-54 Video Playback

Table 3-2 Video Playback page icon description

Icon	Description
1.	Playback time point positioning
2.	Play
3.	Stop
4.	Slow playing
5.	Fast playing
6.	Single frame play
7.	Capture
8.	Download playback video file
9.	Set the sound volume

d) Video settings

Click the **Video Settings** tab under the **Video Surveillance** menu and the page shown will be displayed.

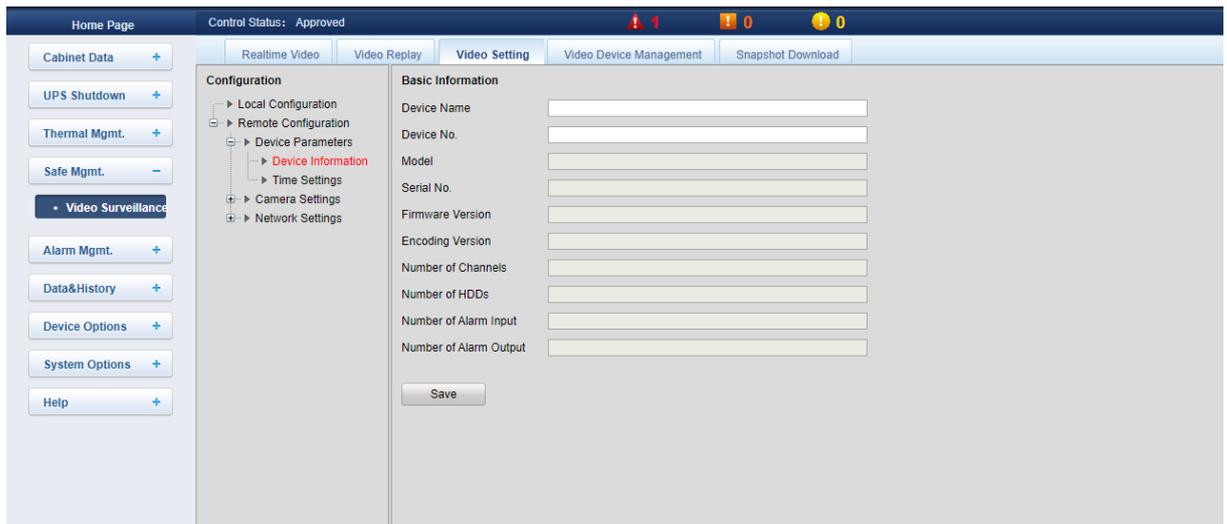


Figure 3-55 Video Setting

The video setting tab provides settings for various parameters of the camera. For details of the parameters, please refer to the Operation Manual provided with the IPC camera.

#### e) Snapshot download

Click the **Alarm Actions** submenu under the **Alarm Mgmt.** menu to add the alarm actions configuration, as shown in the Figure 3-56.

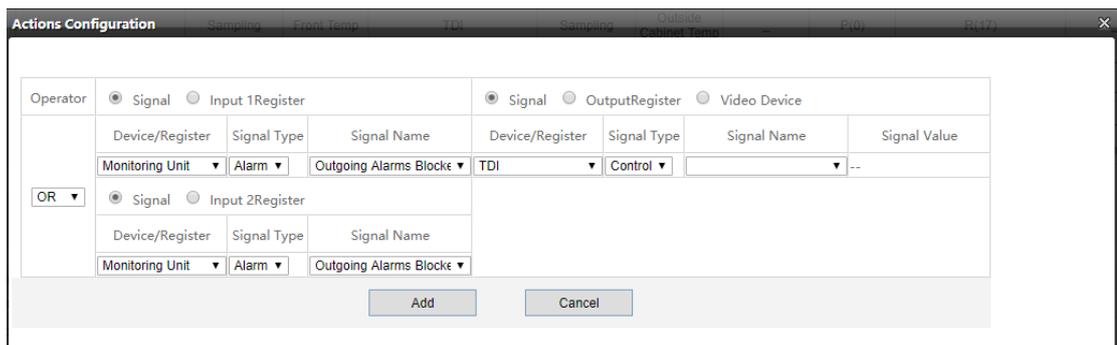


Figure 3-56 Alarm Actions Configuration

After the configured alarm condition is triggered, the video device will capture or record the captured image. The captured image can only be downloaded through the web page by clicking **Snapshot Download** in the **Video Surveillance** menu, and you can also view and delete the image, as the Figure shows. Up to 50 latest photos can be saved. The captured video can be viewed through the **Video Replay** tab under the **Video Surveillance** menu.

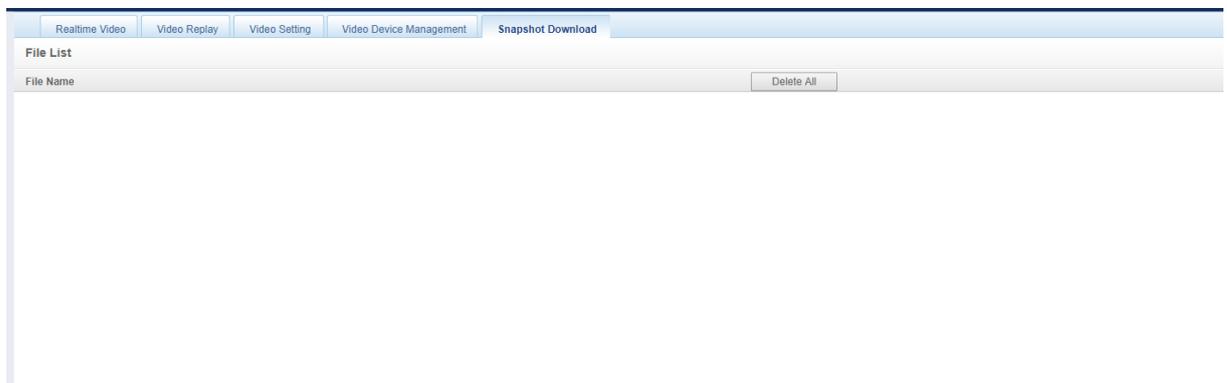


Figure 3-57 Snapshot Download

#### Notices

The video triggered by the linkage is displayed as a yellow manual video recording during replay.

#### 3) Door Access

a) Click the **Door Access** submenu under the **Safe Mgmt.** menu to pop up the **Card Management** page as shown in the Figure 3-58.

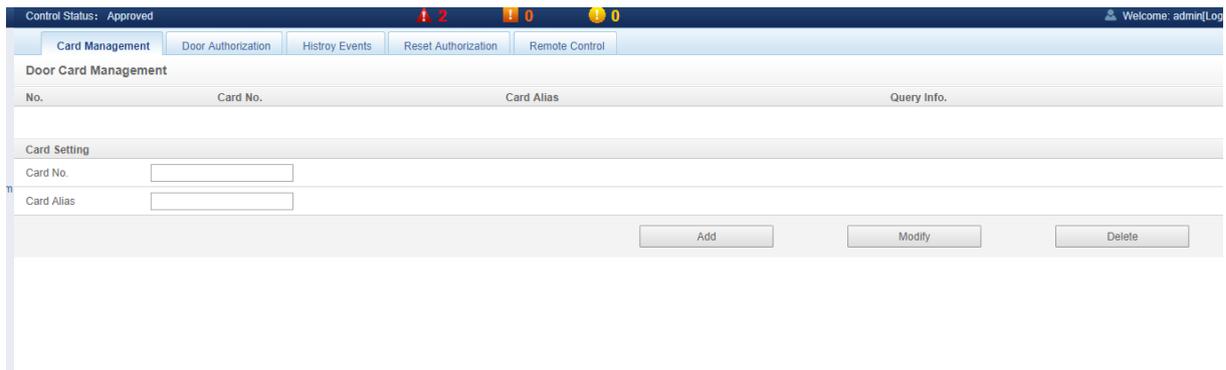


Figure 3-58 Card management

b) Click the **Door Authorization** tab and go to the Door Authorization page to set the authority of the card as shown in the Figure 3-59.

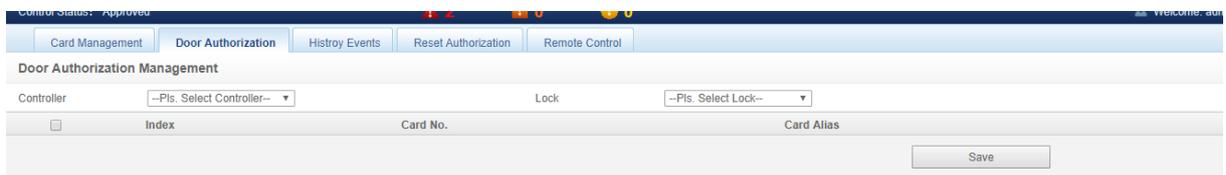


Figure 3-59 Door authorization

c) Click the **History Events** tab to enter the Door Events Query page and list the event log of the access control as shown in the Figure 3-60.

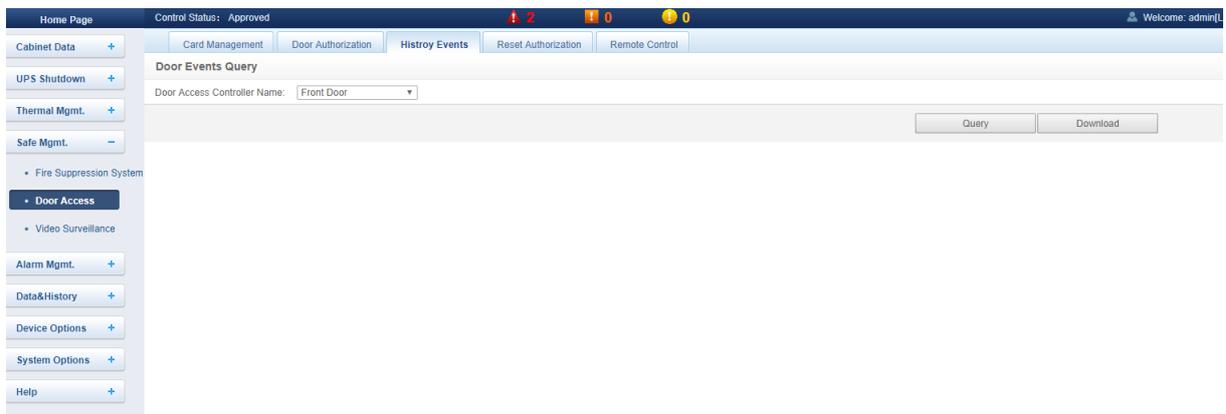


Figure 3-60 History Events

d) Click the **Reset Authorization** tab to enter the Reset Authorization page and select the front and rear door access device controllers as shown in the Figure 3-61.



Figure 3-61 Reset authorization

e) Click the **Remote Control** tab to enter the remote control page and perform front and rear door remote switch control as shown in the Figure 3-62.



Figure 3-62 Remote control

## 5. Alarm Mgmt.

The alarm mgmt. provides a centralized alarm management function, which allows users to customize the alarm notification and alarm linkage rules and complete the historical alarm query function.

In the home page of the intelligent monitoring unit, click the **Alarm Mgmt.** menu on the left, and you can see four sub-menus, including: **Current Alarm, History alarm, Alarm notification, and Alarm Actions.**

### a) Current Alarm

Click the **Active Alarm** submenu under the **Alarm Mgmt.** menu, or follow the 3.2.3 4. *Real-Time Alarm Reminder Settings* section to pop up the current alarm display list, as shown in the Figure 3-63.

Index	Alarm Level	Device Name	Alarm	Trigger value	Alarm Date/Time	Alarm Acknowledgement
1	Critical	UPS	No battery	--	2019-08-26 17:39:09	<input type="button" value="Acknowledge"/>

Figure 3-63 Current alarm

- (1) Click the tab above the alarm list to view the current alarms of the system by alarm level.
- (2) Click the unconfirmed button to confirm the alarm. The confirmed alarm will no longer participate in the alarm linkage, and the alarm notification will be sent only once.
- (3) When the mouse cursor is on the confirmed link, the alarm confirmation message will be displayed in floating, and the mouse cursor will disappear automatically after being removed.

### b) History alarm

Click the **History Alarms** submenu under the **Alarm Mgmt.** menu to view historical alarm records. Select a device name (such as "All Devices") and set the start data/time (for example "2019-08-21 11: 00: 00") and the end data/time (for example "2019-08-21 23: 59: 59"). Then click the **Query** button to list all the alarm records from the start time to the end time. The information includes: **Index, Device name, Signal name, Alarm level, Trigger value/Ref. Video, Start data/time, Confirmed by, Confirmed on date/time and End date/time**, as the Figure 3-64 shows.

Click the **Download** button to download the query results.

Index	Device Name	Signal Name	Alarm Level	Trigger value/Ref. Video	Start Date/Time	Confirmed by	Confirmed on Date/Time	End Date/Time
1	TDI	Rear Door Alarm	Critical	Open	2019-08-27 16:06:52	--	--	2019-08-27 16:06:54
2	TDI	Rear Door Alarm	Critical	Open	2019-08-27 14:07:38	--	--	2019-08-27 16:06:49

Figure 3-64 History alarm query

### c) Alarm notification

#### (1) User alarm notification configuration

Click the **Alarm Notification** submenu under the **Alarm Mgmt.** menu to pop up the page as shown. The user can select which notification mode to receive which alarm notifications for which devices. The user can select the language type of the alarm notification information and customize the alarm content (the device name, alarm description, alarm time, and alarm status are included by default).

Click the **Save** button to complete the alarm configuration. When the alarm is generated, the user will be notified by the configured notification method.

## Notices

The user must first select the **Notification by** to edit the Alarm notification table at the bottom of the page can be edited;

When you select "Select All", all devices are configured with the same alarm level at the same time;

When a low-level alarm is selected, all alarms above this level will be selected.

When a device is selected, the highest level **Critical** is selected by default.

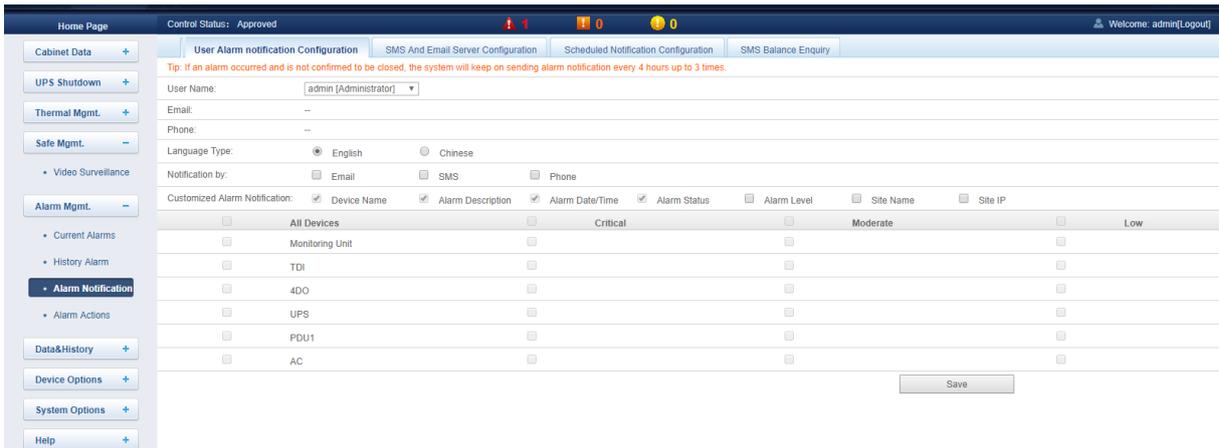


Figure 3-65 User alarm notification configuration

(2)SMS module and mail server configuration

Click the **Alarm Notification** submenu under the **Alarm Mgmt.** menu, then click the **SMS and Email Server Configuration** button to pop up the page as shown in the Figure 3-66.

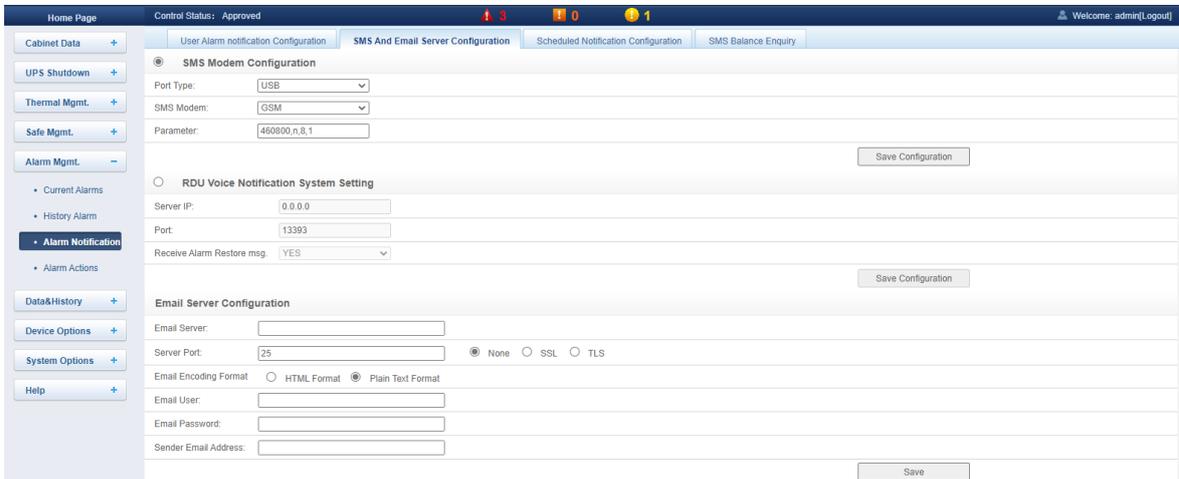


Figure 3-66 SMS and Email server configuration

In the page shown in the Figure 3-66, the user can configure the **SMS modem Configuration** or the **RDU Voice notification system setting** to send an alarm notification through the short message or the telephone or configure the **Email server Configuration** to enable the system to notify the alarm by email. The configuration steps are as follows:

- SMS modem configuration

- 1) Access the SMS MODEM through the USB port as needed, and then select the **Port type**, the page will automatically display the communication parameters;
- 2) Select the type of the **SMS modem** according to the model of the SMS MODEM;
- 3) Set the communication parameters of the SMS MODEM;
- 4) Click the **Save** button to save the current user's SMS module configuration.

- RDU multimedia voice notification system settings

- 1) The user needs to install the RDU multimedia voice notification software package before the RDU configuration;
- 2) Enter the **Server IP** address at the server IP address field;
- 3) Enter the **Port** at the port number field, the default is 13393;
- 4) Click the **Save** button to save the multimedia voice notification system configuration.

- Email server configuration

- 1) Enter the server IP address or domain name at the **Email server**;
- 2) Enter the **Server Port**, **Email user**, **Email password** and **Sender Email address** in the corresponding field;
- 3) Click the **Save** button to save the current user's mail server configuration.

## Notices

1. The port number defaults to 25. When you choose to enable SSL, the port number automatically changes to 465.
2. When using SSL, make sure the mail server supports SSL.

### (3) Scheduled Notification Configuration

Click the **Alarm Notification** submenu under the **Alarm Mgmt.** menu, then click the **Scheduled Notification Configuration** button to pop up the page as shown in the Figure 3-67.

Figure 3-67 Scheduled notification configuration

## Notices

1. The system status timing notification configuration must be used in conjunction with the user alarm notification configuration. Otherwise, the user name, notification method, and sending language cannot be selected.
2. For system status notifications, the phone notification method is not supported.

- 1) Complete and save the settings of the sending user, the notification mode, and the sending language on the **(1)User alarm notification configuration** page;
- 2) Set the **Sending time setting** (setting range: 8: 00 to 20: 00), **Notification Scheduled Cycle** (default: hour), **Interval of Notification** (default: 1) and **Sending time setting** in the **Scheduled Notification Configuration** page (default: Starting time).
- 3) Click the **Save** button to save the system status notification configuration.

### (4)SMS balance Enquiry

Click the **Alarm Notification Configuration** submenu under the **Alarm Mgmt.** menu, then click the **SMS Balance Enquiry** button to pop up the page as shown in the Figure 3-68.

Figure 3-68 SMS balance enquiry

- 1) According to the actual carrier, fill in the **Services number** and **Services code**, select the **Query Scheduled Cycle**, click **Save and Query**; the following dialog box appears, as shown in Figure 3-69.

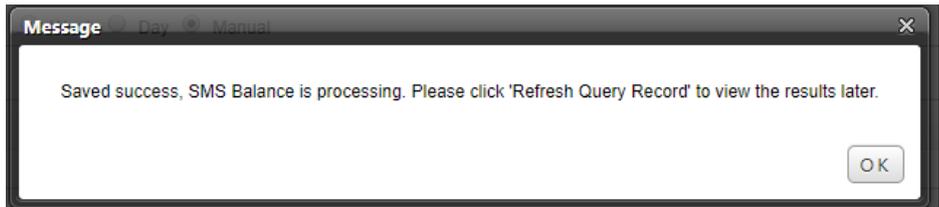


Figure 3-69 Saved successfully

2) Click on **Refresh Query Record** later to view the results.

● Alarm Actions

Click the **Alarm Actions** submenu under the **Alarm Mgmt.** menu to get the alarm linkage function. The page shown in the Figure 3-70 pops up.

Operator	Input 1			Input 2			Parameter 1	Parameter 2	Output				
	Device/Register	Signal Type	Signal Name	Device/Register	Signal Type	Signal Name			Device/Register	Signal Type	Signal Name	Signal Value	
GT	Monitoring Unit	Setting	Blue Light Enable	-	-	-	P(0)	P(0)	R(0)	-	-	-	Delete
OR	TDI	Alarm	Lightning Arrester Alarm	AC	Alarm	Return air high temp alarm	-	-	R(1)	-	-	-	Delete
OR	UPS	Alarm	Inverter overload	Monitoring Unit	Alarm	System OverLoading	-	-	R(2)	-	-	-	Delete
OR	TDI	Alarm	High Front Temp Alarm	TDI	Alarm	High Rear Temp Alarm	-	-	R(3)	-	-	-	Delete
OR	R(1)	-	-	R(2)	-	-	-	-	R(5)	-	-	-	Delete
OR	R(3)	-	-	R(3)	-	-	-	-	R(6)	-	-	-	Delete
OR	R(5)	-	-	R(6)	-	-	-	-	R(7)	-	-	-	Delete
NOT	R(7)	-	-	-	-	-	-	-	R(8)	-	-	-	Delete
OR	R(7)	-	-	R(7)	-	-	-	-	4DO	Control	-	-	Delete
AND	R(0)	-	-	R(8)	-	-	-	-	4DO	Control	-	-	Delete
GT	Monitoring Unit	Sampling	System Cooling Mode	-	-	-	P(0)	P(0)	R(11)	-	-	-	Delete
NOT	R(11)	-	-	-	-	-	-	-	R(12)	-	-	-	Delete
DS	TDI	Alarm	Front Door Alarm	-	-	-	P(180)	-	R(13)	-	-	-	Delete
AND	R(12)	-	-	R(13)	-	-	-	-	R(14)	-	-	-	Delete
OR	R(11)	-	-	R(14)	-	-	-	-	R(31)	-	-	-	Delete
NOT	R(11)	-	-	-	-	-	-	-	R(32)	-	-	-	Delete

Figure 3-70 Alarm linkage configuration 1

● Linkage function

The list of **key to Operator/Symbol** in the figure shows all the commands and their functions. Click the **Add** button to add a new alarm linkage expression, otherwise click the **Cancel** button as shown in the Figure 3-71.

Figure 3-71 Alarm linkage configuration 2

First, select an operator, for example, "OR", and the expression is "Signal 1 [Input 1 Register] or Signal 2 [Input 2 Register] = Signal 3 [Output Register]".

Second, when the input or output parameter in the expression is selected as the signal, first select the device name in the **Device/Register** drop-down list, then select the signal type in the **Signal Type** drop-down list, and finally select the **Signal name** in the Signal Name drop-down list. Signals 1, 2, 3 may be any signal available in an intelligent monitoring system.

Finally, when the parameter in the expression is selected as a **Register**, you need to select the name of the corresponding register, such as R(0), R(1), etc., as shown in the Figure 3-72.

If you click the **Add** button, as shown in the Figure 3-73, the alarm linkage expression has been added, click the **Save and Apply** button to make it effective. Click the **Delete** button to delete the alarm linkage expression and click the **Save and Apply** button to make it effective.

Figure 3-72 Alarm linkage configuration 3

Operator	Input 1			Input 2			Parameter 1	Parameter 2	Output				
	Device/Register	Signal Type	Signal Name	Device/Register	Signal Type	Signal Name			Device/Register	Signal Type	Signal Name	Signal Value	
GT	Monitoring Unit	Setting	Blue Light Enable	--	--	--	P(0)	P(0)	R(0)	--	--	--	Delete

Figure 3-73 Alarm linkage configuration 4

## 6. Data&History

Data management provides users with various types of historical data and log query services.

In the intelligent monitoring system homepage, click on the **Data & History** menu on the left, and you can see four submenus, including: **Device Information**, **History data**, **History Log**, and **Clear History**.

### a) Device data

Click the **Device Information** submenu under the **Data & History** menu to pop up the page as shown in the figure, which contains four sub-pages: **Device Information List**, **Export SNMP MIB**, **Asset Inventory** and **Asset Batch Configuration**.

#### 1) Device information list

The main information of all devices is listed on the page as shown in the Figure 3-74. Click the **Download** button to download the query results.

Index	Device Type	Device Name	Location
1	ENP_RDU[DUMMY]	Monitoring Unit	Cabinet
2	ENP_ENV_TD[COM]	TDI	Cabinet
3	ENP_ENV_FIREFIGHTING[COM]	FIREFIGHTING	Cabinet
4	ENP_ENV_4DO[SENSOR]	4DO	Cabinet
5	ENP_UPS_OUUPS_OWN[COM]	UPS	Cabinet
6	ENP_MPDU_MPS[COM]	PDU1	Cabinet
7	ENP_AC_OU_OWN[COM]	AC	Cabinet
8	ENP_ACC_CHD2100J5[COM]	Front Door	Cabinet
9	ENP_ACC_CHD2100J5[COM]	Rear Door	Cabinet
10	ENP_RDU[DUMMY]	ECO	Cabinet

Figure 3-74 Device Information

#### 2) Export SNMP MIB

As shown in the Figure 3-75, you can choose to export all device MIB information or export MIB information by device type.

After selecting it, click the **Download** to complete the MIB information export.

Figure 3-75 SNMP MIB information derived

#### 3) Asset inventory

As shown in the Figure 3-76, the information of the asset can be queried according to the name, code, ID range, and warranty expiry date.

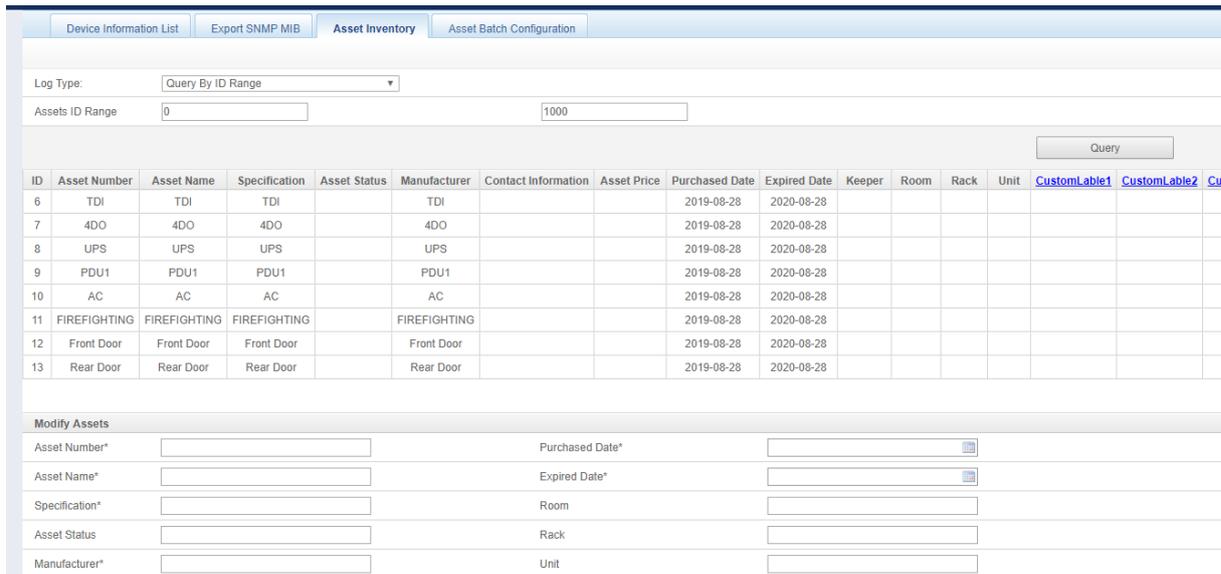


Figure 3-76 Asset Inventory

4) Asset batch configuration

As shown in the Figure 3-77, the asset configuration can be uploaded and downloaded.



Figure 3-77 Asset batch configuration

b) History Data

Click the **History data** submenu under the **Data & History** menu to pop up the page shown in Figure 3-78. There are three submenus: **History report**, **Historical Curve** and **Curve settings**.

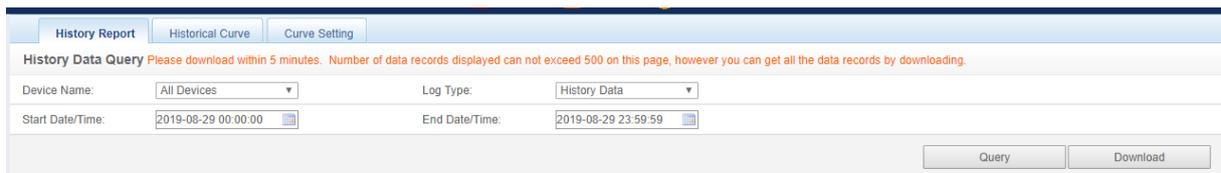


Figure 3-78 History report

1) History report

As shown in the Figure 3-78, select a device name (for example, "All Devices"), select the log type (for example, "Historical Data") and set the start Data/time and the end Data/time (for example, from 2019-08-21 11: 00: 00 to 2019-08-21 23: 59: 59), and then click on the **Query** button to list all historical data from the start time to the end time. Click the **Download** button to download all the query results.

2) Historical curve and curve settings

Prior to selecting the **Curve report** name, first set the **Curve Setting** as shown in the Figure 3-79. For example, first select a device type (for example, "ENP\_AC\_OU\_OW[COM]"), then select the **Supply air temperature** (other options are also available), determine the **Draw Reference line**, and finally enter the name "AC supply air temperature" in the report name.". Then return to the curve report, set the start time and the end time. If the historical data is queried, the historical curve will be generated according to the signal.

Figure 3-79 Curve Setting

## c) History Log

Click the **History Log** submenu under the **Data & History** menu to pop up the page as shown in the Figure 3-80.

Figure 3-80 History Log

In the page shown in the Figure 3-80, select the **log type** (for example, "Control Log") and set the start time and the end time (for example, from 2019-08-21 11: 00: 00 to 2019-08-21 23: 55: 59), then click on the **Query** button to list all control logs from the start time to the end time. Click the **Download** button to download all the query results.

## Notices

When the query type is "System Log" or "Drive Log", after clicking the Query button, the query result will not be displayed on the page, but will be downloaded directly as a compressed package.

## d) Clear history

Click the **Clear History** submenu under the **Data & History** menu to pop up the page as shown in the Figure 3-81. The **History alarm**, **History data**, **Statistics data**, **Control log**, and **System log** can be cleared.

Figure 3-81 Clear history

## 7. Device Options

In the homepage of the intelligent monitoring system, click the **Device Options** menu on the left, and you can see three submenus, including: **Device management**, **Signal setting**, and **Batch configuration**.

## a) Device management

## 1) Add/modify/delete device

Click the **Device Management** submenu under the **Device Options** menu to pop up the page as shown in the Figure 3-82.

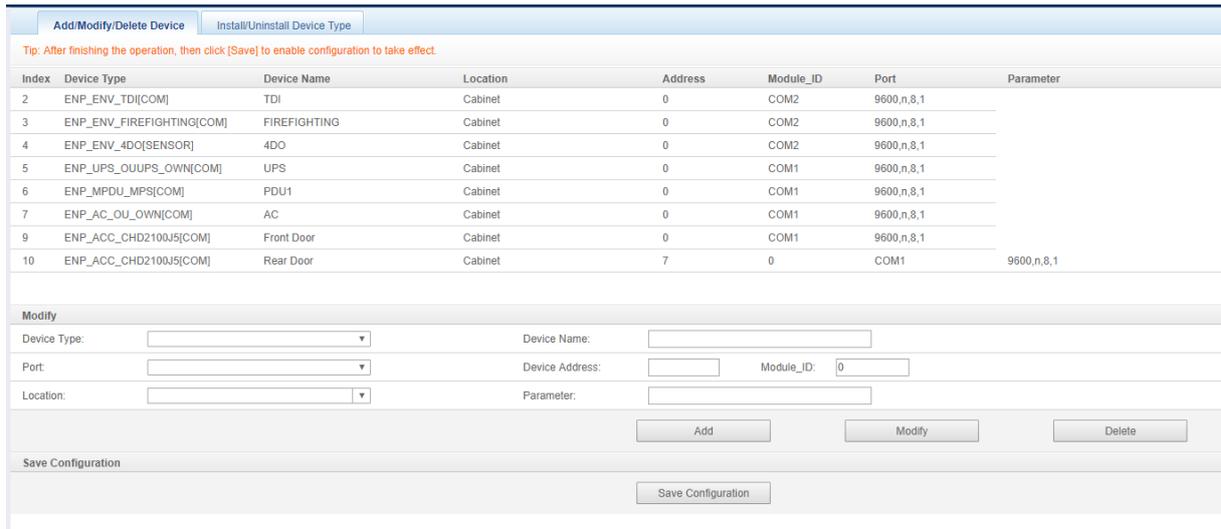


Figure 3-82 Add / Modify / Delete Device

In the page shown in the Figure 3-82, the user can add/modify/delete device information, and the method is as follows:

- Add device

Select the **Device type**;

Enter the device name in the text box of the **Device name**, or use the default device name;

After selecting the device type, the default port number of this device type will be automatically listed in the drop-down box of the **Port**; if the device type is not selected, the port number cannot be selected;

Enter the device address in the text box of the **Device address**. The device address must be an Arabic number from 1 to XX, and the device address under the same port number is not allowed to be duplicated. Some device types do not require a device address to be entered. At this point, the text box for the **Device address** will be grayed out and cannot be edited. When a device has multiple modules, you need to add the module address, the module address must be an Arabic number from 1 to XX, and the **module\_ID** under one device is not allowed to repeat;

Select or enter the **Location**;

Enter the **Parameter** in the text box of the communication parameter. When the device type is determined, the text box of the **Parameter** will display the prompt of the communication parameter, including the device type communication parameter format and the default communication parameter;

Click the **Add** button, the dialog box is displayed, and a device information is added to the device list. Clicking the **Save Configuration** button will prompt the system to restart after the saving is successful. Click **OK** to pop up the User Security Verification dialog box. If you click the **Cancel** button, the newly added device is invalid;

Enter the login password of the current user, click the **OK** button, and the verification will pass to the system restart interface. After the system restarts, the newly added device will take effect.

After the system is restarted, the newly added device will be displayed in the list on the device management page.

**Notices**

The SmartCabinet2-E intelligent system recommends one-click configuration through the HMI local display. The devices added directly through the intelligent monitoring unit web page cannot synchronize data to the HMI local display.

- Delete device:

Select the device you want to delete from the device list.

Click the **Delete** button to delete the device;

Click the **Save Configuration** button to make the device deletion take effect. The specific operation is the same as adding a new device.

**Notices**

If you change the information about this device before clicking the Delete Device button, the device cannot be deleted.

- Modify the device:

Select the device to be modified in the device list;

Modify device information;

Click the **Modify** button to modify device information.

Click the **Save Configuration** button to make the device adding take effect, the same as adding a new device.

After you perform the adding, modifying or deleting operations in the **Add/Modify/Delete Device** page, the configuration command takes effect without clicking the **Save Configuration** button. When you leave the page, a message will pop up as shown in the Figure 3-83, prompting the user to save the configuration.

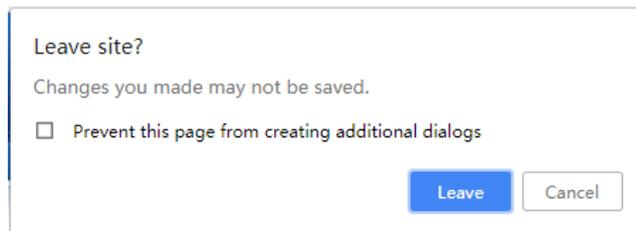


Figure 3-83 Tip

## 2) Install/uninstall device type

Click the **Device Management** submenu under the **Configuration Management** menu, then click the **Install/Uninstall Device Type** tab to pop up the page as shown in the Figure 3-84.

Uninstall Device Type			
Index	Device Type Installed	Version	Uninstall Device Type
1	ENP_MPDU_MPS(COM)	2	Using
2	ENP_MPDU_MPSC(COM)	1.81	Uninstall
3	ENP_AC_SMC(COM)	1.8	Uninstall
4	ENP_UPS_ITA1_3K(COM)	2	Uninstall
5	ENP_UPS_ITAC5_10K(COM)	1.8	Uninstall
6	ENP_UPS_ITA2(COM)	2	Uninstall
7	ENP_ENV_4DI(SENSOR)	2	Uninstall
8	ENP_ENV_4DO(SENSOR)	1.8	Using
9	ENP_ENV_TH1(SENSOR)	2	Uninstall
10	ENP_ENV_TH2(SENSOR)	2	Uninstall
11	ENP_ENV_FIREFIGHTING(COM)	1.81	Using
12	ENP_ENV_OU_RS(SNMP)	2	Uninstall
13	ENP_ENV_FIREFIGHTING_API(COM)	1.81	Uninstall

Figure 3-84 Install / uninstall device type

Click the **Choose File** button to upload the driver configuration package (.iru file format) from the local directory, click the **Install** button to install the new device type.

### Notices

The number of device types supported by the system depends on the remaining space of the system and the size of the driver configuration package itself, but no more than 64.

The lower right part of the page displays the device type information of the installed device. Click the **Uninstall** button to pop up the confirmation dialog box. Click the **OK** button to pop up the User Security Verification dialog box, enter the current user's login password, and click the **OK** button to uninstall the corresponding device type.

### Notices

1. During installation, if the device type exists and the device driver version is higher than the driver to be installed, the device type cannot be installed repeatedly;
2. If the installation package does not have version information or the version information does not match the software version, the device type cannot be installed.
3. If a device uses this device type, the Uninstall button will be grayed out and the device type will not be uninstalled during use.

## b) Signal setting

Click the **Signal Setting** submenu under the **Device Options** menu to pop up the page as shown in the Figure 3-85.



Figure 3-85 Modify the device name

In the page as shown in the Figure 3-85, the user can modify the device name. After entering the new device name, click the **Set** button to make the batch settings.

**Modify signal and modify signal status**

Click the **Modify Signal** submenu under the Configuration Management menu to pop up the page as shown in the Figure 3-86.

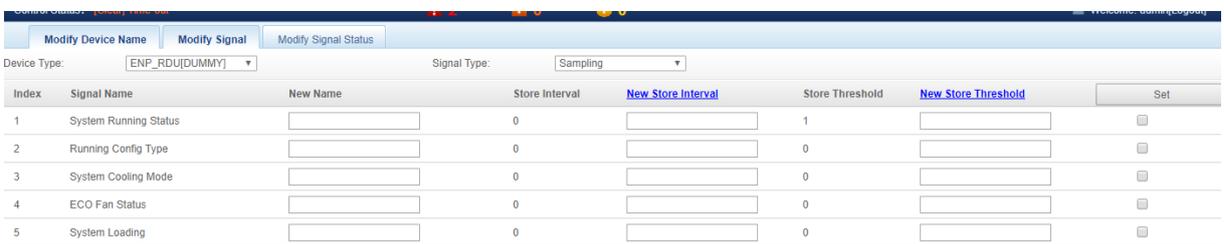


Figure 3-86 Modify signal

Click the **Modify Signal Status** submenu under the Configuration Management menu, select the **Device type**, select the **Signal type**, view the signal status, and the page shown in the Figure 3-87 will pop up.

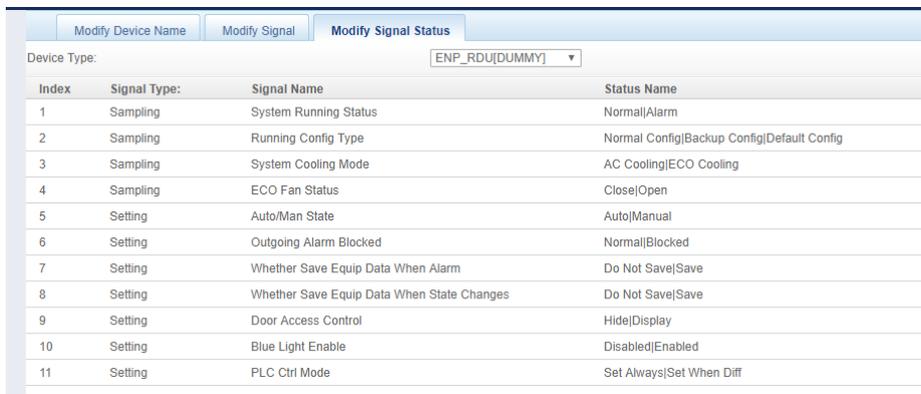


Figure 3-87 Modify the signal status

c) Batch configuration

Click the **Batch Configuration** submenu under the **Device Options** menu to pop up the page as shown in the Figure 3-88.



Figure 3-88 Batch Configuration

Users can perform **Upload** and **Download** operations to complete system batch configuration.

## Notices

1. Only the admin user has authority to perform batch configuration. If batch configuration cannot be performed, click **View Help** to get Help information.
2. The batch configuration files are encrypted after being downloaded to the local.

## 8. System Options

In the intelligent monitoring system home page, click on the system settings menu on the left, and you can see 8 submenus, including: **Monitoring unit, Network settings, User management, Data/Time Setting, Restore System, Site settings, System upgrade** and **System Title**.

### a) Monitoring unit

The monitoring unit sets the signals of the intelligent monitoring system itself, including the **Sampling, Setting** and **Alarm signal**, as shown in the figure 3-89.



Index	Signal Name	Value	Sampling Time
1	System Running Status	Alarm	2019-08-29 11:14:26
2	Running Config Type	Normal Config	2019-08-28 17:08:19
3	System Cooling Mode	AC Cooling	2019-08-28 17:08:23
4	ECO Fan Status	Close	2019-08-28 17:08:23
5	System Loading	0.00kW	2019-08-29 11:14:23

Figure 3-89 Monitoring unit (signal acquisition)

For the operation method of the three sub-pages of the **Sampling, Setting** and **Alarm signal** in the monitoring unit, refer to 3.2.4 1. *Cabinet information*.

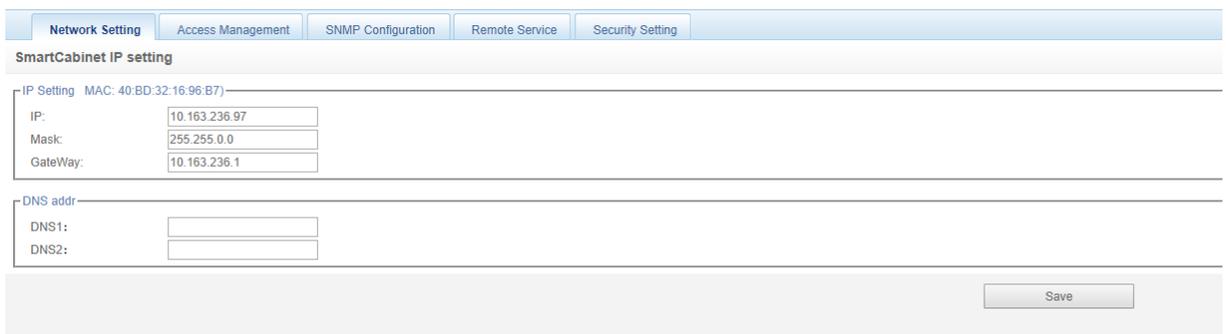
## Notices

1. If the **Active alarm blocking** is set to "**Blocked**" in the setting signal, the active alarm will be blocked. In this case:
2. The alarm signal is displayed in the active alarm, but the alarm notification is not sent. After the alarm ceases, the alarm is not saved to the historical alarm.
3. The **Blocking setting** of the **Active alarm blocking** is automatically released after 24 hours.

### b) Network settings

#### 1) IP settings

Click the **Network Settings** submenu under the **System Options** menu to pop up the page as shown in the Figure 3-90.



SmartCabinet IP setting

IP Setting MAC: 40:BD:32:16:96:B7

IP:

Mask:

GateWay:

DNS addr

DNS1:

DNS2:

Save

Figure 3-90 IP settings

In the page shown in the Figure 3-90, the network parameters that the user can configure are as follows: **IP, Mask, Gateway, DNS addr**. After modifying the network parameters, click the **Save** button to make the parameters take effect.

## Notices

After modifying the IP address, the default is to jump to the new network address and log in to the intelligent monitoring system again.

### 2) Access Management

Click the **Network Settings** submenu under the **System Options** menu, then click the **Access Management** button to pop up the page as shown in the Figure 3-91.

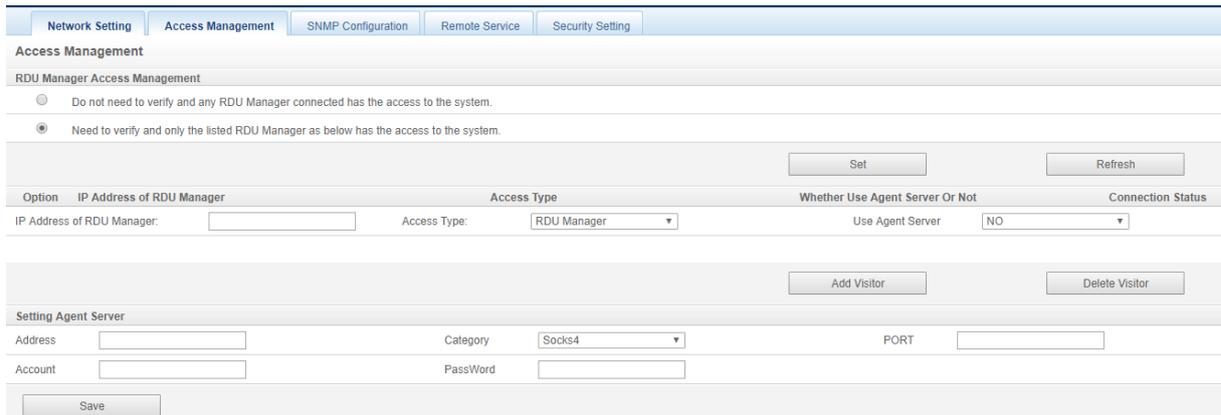


Figure 3-91 Access Management

When adding a visitor, enter the new OptimizeIT Manager IP address in the **IP Address of RDU Manager** text box, click the **Add Visitor** button to complete the configuration.

**Notices**

1. The system can add up to 3 OptimizeIT Manager IP addresses.
2. If you choose to use a proxy when adding a visitor, you also need to configure the proxy server.

3) SNMP Configuration

The SNMP agent can be configured by clicking the **Network Settings** submenu under the **System Options** menu, and then clicking the SNMP Configuration button. The SNMP agent of the Intelligent Monitoring System supports both V2 and V3 versions:

As shown in the figure 3-92, the specific setting method of SNMP V2 is as follows:

- (1)Set the NMS IP (main unit IP address of the SNMP agent data receiving end);
- (2)Set Trap Level: "Enable" or "Disable";
- (3)Other parameters remain at their default values.

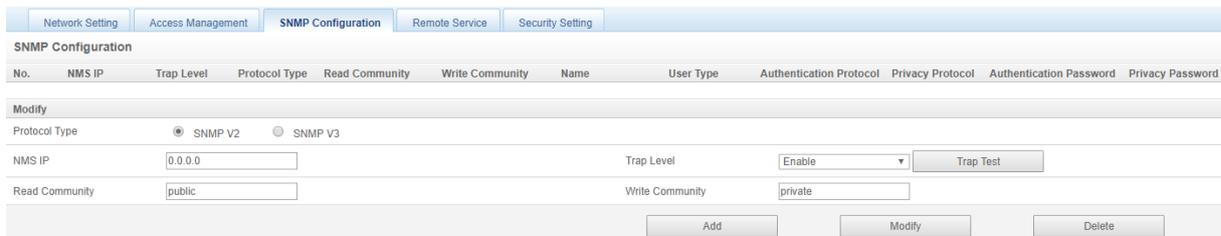


Figure 3-92 SNMP (v2) set

As shown in the figure 3-93, the specific setting method of SNMP V3 is as follows:

- (1)Set the NMS IP (main unit IP address of the SNMP agent data receiving end);
- (2)Select Trap Level: "Enable" or "Disable";
- (3)Set the name;
- (4)Select the user type: "Authentication and Encryption", "Authentication, no encryption", "No authentication, no encryption";
- (5)Select the authentication Protocol: "MD5", "SHA";
- (6)Select the Privacy Protocol: "DES";
- (7)Customize the password for the authentication algorithm and encryption algorithm.

## Notices

1. Based on SNMP V2, SNMP V3 adds user authentication and encryption strategies.
2. If the user type is selected as the "No authentication, no encryption" policy, the **authentication Protocol** and **Privacy Protocol** drop-down box is grayed out and cannot be set.
3. At this stage, the encryption type only supports the DES encryption type.
4. The user needs to customize the authentication and encryption passwords of more than 8 characters, and the password must be the same as the password set by the main unit of the SNMP agent data receiving end. Otherwise, the password cannot be decrypted and received.

After completing the parameter settings, click the **Add** button to add the NMS;

To modify the NMS settings, select the NMS you want to modify, modify the settings, and then click the **Modify** button to save the settings.

To delete the NMS, select the NMS you want to delete and click the **Delete** button to delete the NMS.

Figure 3-93 SNMP (v3) Set

## 4) Remote service

Click the **Network Settings** submenu under the **System Options** menu, then click the **Remote Service** button to pop up the page as shown in the Figure 3-94.

Figure 3-94 Remote service settings

The remote service settings include **Request RDU remote**, **Cancel RDU remote** and **Replace Host**. At the same time, the user can set the communication parameters of the remote service system.

- **Request RDU remote**: used to establish remote hosting relationship
  - (1) Enter a customized customer name in the **End-User** text box;
  - (2) Select the **Contact Person**, when the contact is selected, the corresponding phone and email will be displayed;

## Notices

The remote service customer contact needs to be set in the **System settings** -> **User management** in advance, and a phone or email must be provided, otherwise the hosting request cannot be made. For details on how to set it up, see User Management in this section.

- (3) Select the **Frequency of Reporting**: "Monthly" and "Quarter";

- (4) Select the **Preferred communication method**: “Email”, “GPRS”;
- (5) Click the **OK** button to send a remote hosting request.

- **Cancel remote service**: Used to cancel the established hosting service.

Select **Cancel Remote Service**, click the **OK** button to send a command to cancel the current remote service.

### 5) Security Settings

Click the **Network Settings** submenu under the **System Options** menu, then click the **Security Settings** button to pop up the page as shown in the Figure 3-95.

Figure 3-95 Access control

Select the **Web Server Port** and **Web access security policy**, click the **Save** button to complete the configuration.

### c) User Management

Click the **User Management** submenu under the **System Options** menu to pop up the page as shown in the Figure 3-96.

Figure 3-96 User Management

In the page shown in the Figure 3-96, the user can add users, modify users, and delete users.

- **Add users**

- (1) Enter the username in the text box of the **User name**;
- (2) Select the user's level;
- (3) Configure the user password, the password cannot be empty, and should be at least 6 letters or numbers;
- (4) Re-enter the password in the **Password** text box;
- (5) (Optional) Enter the user's phone number. The phone number can use the following numbers and characters:  
0123456789, +;
- (6) (Optional) Enter the email address;
- (7) Click the **Add** button, the User Security Verification dialog box will pop up, enter the current user's login password, and click the **OK** button to add a new user.

### 📖 Notices

User names can only use English letters, numbers, and - and \_, and the first character must be a letter or number.

- **Delete user**

- (1) Select the user to be deleted in the user list;

- (2) Click the **Delete** button, a confirmation dialog box will pop up, click the **OK** button, the User Security Verification dialog box will pop up, enter the current user's login password, and click the **OK** button to delete the selected user.



### Notices

The admin user cannot be deleted.

- **Modify users**

- (1) Select the user to be modified in the user list;
- (2) Modify user information;
- (3) Click the **Modify** button, the User Security Verification dialog box will pop up, enter the current user's login password, click **OK** button to make the modified user information take effect.

Users logging in to the intelligent monitoring system can be divided into four user groups, each with different security levels and user authorities. For details, see the Table 3-3.

Table 3-3 User security level

Security level	User group	User authorities
Level A	Browser	All users can view device information
Level B	Operator	Operator can send control commands to intelligent devices
Level C	Engineer	The engineer has the following authorities: Send control commands to the intelligent device; Browse, control, modify parameters; Download files; Modify user's own information
Level D	Administrator	The administrator has all the authorities: Send control commands to the intelligent device; browse, control, modify parameters; upload and download files; modify, add, delete user information; air conditioner teamwork control parameter settings; system firmware upgrade

In the page shown in the Figure 3-94, select the current user, you can perform **SMS/phone test** and **Email test**. Prior to using this test function, you need to configure the SMS module and the mail server for the current user. For details, see 3.2.4 c) *Alarm Notification Configuration* in 5. *Alarm Management*.

- **SMS/telephone alarm notification test**

Enter the **Phone number** and click the **SMS/phone Test** button to test if the current user's phone number is connected. If the user receives a test message and a phone call, the test is successful. Otherwise, the test fails. Please check if the current user's phone number is correct and the SMS MODEM connection is correct.

- **Email alarm notification test**

Enter the **Email address** and click the **Email Test** button to test if the current user's email address is correct. If you receive a test email, the test is successful, otherwise the test fails. Please check if the above information is entered correctly.



### Notices

When adding or modifying users, you must enter a phone number or email address, otherwise the settings cannot be completed.

#### d) Date/Time Setting

The clock can be calibrated by clicking the **Date/Time Setting** submenu under the **System Options** menu. As shown in the Figure 3-97, the intelligent monitoring system can automatically obtain time from the time server. Enter the IP addresses of the **Primary** and **secondary servers** in turn, enter the **Interval to Calibrate System Time**, select the **Time zone**, and the **Calibrating protocol**, then click the **Set** button to make the settings take effect.



Figure 3-97 Date/Time Setting

The intelligent monitoring system can also obtain the local time, select **Use current time to calibrate the time** and click the **Get local time** button to get the local time, and then click the **Set** button to make the new time take effect.

**Notices**

Time calibration defaults to **Use current time to calibrate the time**.

e) Restore System

Click the **Restore System** submenu under the **System Options** menu to pop up the page as shown in the Figure 3-98.



Figure 3-98 System Reset

Click the **Reboot SmartCabinet** button to restart the system.

Click the **Restore System** button to restore the Intelligent Monitoring to the default settings.

Click the **Restore LCD Password** button to trigger the LCD local display password recovery.

**Notices**

If the user uses the recovery function, the intelligent monitoring system will restore the original configuration scheme. After the recovery operation, please confirm to wait for 1 minute and then re-enter the intelligent monitoring system through the network to enable the system to complete initialization.

f) Site settings

Click the **Site Settings** submenu under the **System Options** menu to pop up the page as shown in the Figure 3-99.



Figure 3-99 Site setting

As shown in the Figure 3-99, the user can modify the site information of the intelligent monitoring system, including the **Site name**, **Site location**, and **Site description**.

g) System upgrade

Click the **System Upgrade** submenu under the **System Options** menu to pop up the page as shown in the Figure 3-100.



Figure 3-100 System upgrade

In the page shown, click the **Choose File** button to download the Upgrade Package (.rdy file format) from the local directory, and then click the **Install** button to perform the firmware upgrade.

**Notices**

The intelligent monitoring system supports the incremental upgrade function.

h) System Title

Click the **System Title** submenu under the **System Options** menu to pop up the page as shown in the Figure 3-101.



Figure 3-101 System title

In the page as shown in the Figure 3-101, the user can upload the System Logo image to replace the Logo Image at the top right of the page, click the Choose File button, select the Logo Image to be uploaded, and then click the Upload button to upload the file to the intelligent monitoring system. Only images in [.gif] or [.bmp] or [.jpg] format can be uploaded to the intelligent monitoring system, and the image size does not exceed 500K. Click the Restore Default button to restore the default Logo Image.

User can also modify the system title directly above the page. Enter the customized system title in the **System Title** text box and click the **OK** button to make it effective.

**9. Help**

In the homepage of the intelligent monitoring system, click on the **Help** menu on the left, and you will see a submenu, namely: **About SmartCabinet**.

**About SmartCabinet**

The “About SmartCabinet” page displays the intelligent monitoring system **Software version, Serial number, Identify code** and other information, and provides a download link for the user manual, as shown in the Figure 3-102.



Figure 3-102 About SmartCabinet

### 3.3 ECO Settings and Operating Instructions

#### 3.3.1 Setting ECO Mode

The ECO mode is factory-set to the default setting. To enable this function, the customer needs to set it manually. The specific method is as follows:

1. Set the ECO mode in the HMI page;

The submenu of the HMI display home page has the “Settings -> ECO Settings” function. As shown in the Figure 3-103, after the customer manually selects “Enabled” and save the settings, and the ECO function will be enabled. To turn off the ECO function, select the Disable button, and save. The maximum allowable humidity limit is 60% to 80%. Click “Restore Defaults” button will reset the ECO related parameters to the factory values.

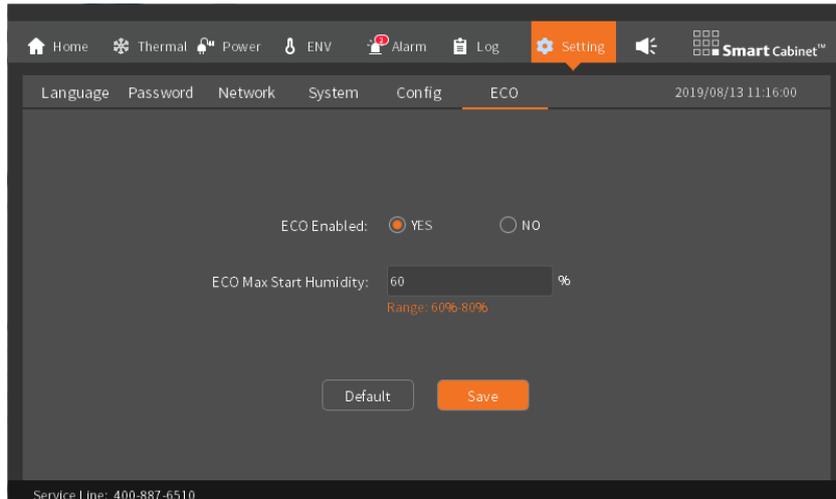


Figure 3-103 ECO setting screen

2. Set the ECO mode in the Web page;

The web page can remotely control the enabling and disabling of the ECO function. The specific setting position is “Thermal Mgmt. -> ECO Management”. On this page, the ECO function can be enabled or disabled by clicking the Enable / Disable button.



Figure 3-104 ECO management

#### 3.3.2 Descriptions of Operating Conditions

1. ECO cooling mode entry conditions

- ECO startup low temperature limit < ambient temperature < cold aisle high temperature alarm value - temperature dead band value (2 °C)
- Ambient humidity < ECO humidity limit

After the ECO function is enabled, when the above conditions are met, the system can enter the ECO cooling mode, turn off the air conditioner, and turn on the ECO fan;

The cold aisle low temperature alarm value defaults to 10 degrees. If the customer modifies the cold aisle alarm value, the ECO startup low temperature limit will also be changed accordingly.

The cold aisle high temperature alarm value defaults to 30 degrees, if the customer modifies the cold aisle alarm value, the ECO startup high temperature limit will also be changed accordingly.

2. ECO cooling mode exit condition

- 
- Cold aisle temperature > cold aisle high temperature alarm value - temperature dead band value (2°C)
  - Hot aisle temperature > hot aisle high temperature alarm value - temperature dead band value (2°C)
  - Ambient temperature > cold aisle high temperature alarm value - temperature dead band value (2°C)
  - Ambient humidity > ECO humidity limit

(The hot aisle high temperature alarm value defaults to 45 degrees, manual change)

When any of the above conditions is met, the ECO mode will be exited, the air conditioner will be turned on, and the fan will be turned off.



#### **Notices**

1. Turn off the air conditioner (turned on by default) and UPS (turned on by default) configuration when the customer selects the fire spray alarm mode: When a fire alarm is given, the ECO mode is immediately exited, the fan is turned off, and the ECO mode is set to prohibited.
  2. When Cold Channel Temperature < Cold Channel Low Temperature Alarm Value, the system does not exit the ECO refrigeration mode and turns off the fan.
-

## Chapter 4 Maintenance

In order to ensure the safe and reliable operation of SmartCabinet2-E products, regular inspection and maintenance are required during the product life cycle. For some components, regular replacement is required according to the using environment and the consumption level of components. At the same time, the SmartCabinet2-E products have monitoring equipment and monitoring cores with comprehensive functions, which can monitor the power and environment system in real time and all aspects and can report the problems to users and related operation and maintenance personnel in a variety of alarm forms to discover and eliminate potential hazards in the device.

This chapter describes the maintenance methods of SmartCabinet2-E products, the processing of device alarm information, the diagnosis and resolution of faults, and the replacement and processing of some components.

### 4.1 Precautions before Maintenance

1. High-voltage and AC operation must be performed using special tools and protective devices.
2. When replacing a device that does not support hot swap (such as air conditioner, UPS, PDU), you must first disconnect the upper MCB of the corresponding device on the PMU to ensure that the device to be replaced is in the power-off state before being replaced.
3. The replacement involves cutting off the general input MCB or turning off the air conditioner and should evaluate the impact on the system. Before the system is powered off, it must be agreed by the customer before proceeding.
4. Do not install or remove the power cord with power. At the moment the power cord is in contact with the conductor, an electric arc or spark can be generated, which can result in fire or eye injury.
5. When removing component cables, mark the corresponding terminal connectors on the cables to avoid subsequent connection errors.

### 4.2 Maintenance Preparation

#### 4.2.1 Technical Materials

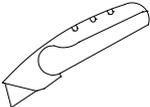
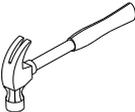
Before performing maintenance on the SmartCabinet2-E product, in addition to this document, you need to prepare the following materials in advance so that you can refer to it at any time.

Table 4-1 Materials before Maintenance

Materials	Usage	Acquisition method
SmartCabinet2-E whole unit wiring schematic diagram	Confirm the electrical and control loop of the whole unit, and the organization structure of the distribution system	Refer to Appendix 1 System Wiring Diagram

#### 4.2.2 Tools

Table 4-2 Necessary tools

Name	Purpose	Appearance
Utility knife	Disassemble all kinds of equipment packaging	
Philips screwdriver	Tighten the screws when assembling the parts, recommended size: 1X300	
Flat-blade screwdriver	Dismantle wooden box steel tongue	
Claw hammer	Dismantle wooden box steel tongue	

Name	Purpose	Appearance
Levelling meter	Displays the horizontal status of the cabinet system when it is leveled	
Floating nut buckle	Dismantle or install floating nut	
#19 open end wrench	Remove M12 foot nut	
Adjustable wrench	Remove the foot press M8 bolt	
Step ladder	Assist the removal of packaging, installation of ECO fan module	
Multimeter	Detect power distribution system status and cable wiring	

### 4.2.3 Personnel

The professional technicians who are certified by Vertiv and have obtained the UPS and air conditioning maintenance qualification certificates.

## 4.3 Equipment Maintenance

### 4.3.1 Maintenance of WEB Monitoring Unit

- Restore default settings

To restore the default settings, please refer to the **Software recovery**. Please refer to Restore Defaults in the section 3.2.4 8. *System Options*.

- Common issue:

**Question 1:** After the alarm is generated, no email or SMS notification is received, or if the alarm is not over, the number of email or SMS notifications is less than 3. How to handle it?

A: Follow the steps below to troubleshoot:

- 1) Please check whether the SMS module and the mail server are configured correctly. See *Alarm Notification Configuration* in 3.2.4 5. *Alarm Management*.
- 2) If you have not received the SMS notification, please confirm whether the telephone card has been in arrears;
- 3) If you have not received the email notification, please click menu **Data & History-> History Log** and **History Data** to check whether the alarm notification sending log has a record of failed mail sending. If yes, it means the network is busy or the mail server communication is busy.

**Question 2:** How to set up multiple SmartCabinet2-E networks for centralized monitoring?

A: The SmartCabinet supports the RDU-M centralized monitoring platform of Vertiv. After the network is connected, the upper RDU-M can monitor the SmartCabinet through simple settings. Multiple SmartCabinet2-E networking modes are shown in the figure 4-1.

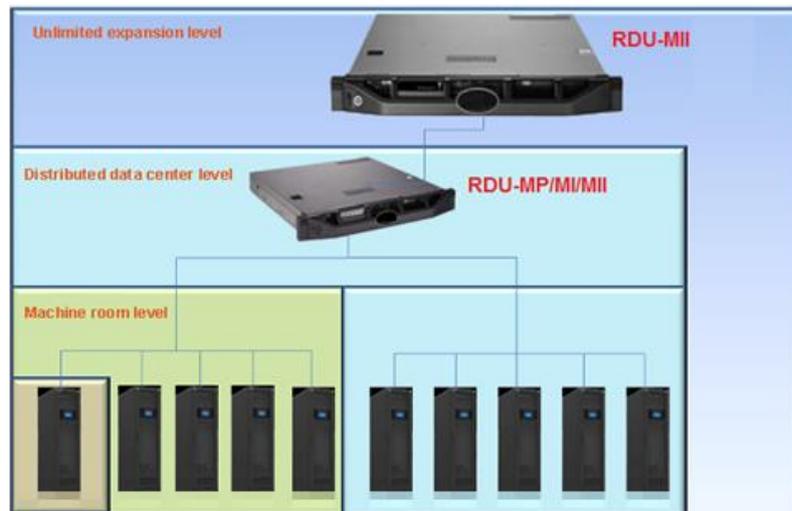


Figure 4-1 Network Topology FIG SmartCabinet2-E

### 4.3.2 Air Conditioner System Maintenance

The air conditioner system maintenance mainly includes two aspects: electrical system inspection and cooling system inspection.

#### Notices

When maintaining the device, the MCB should be disconnected and the power supply should be cut unless the power is required for the commissioning project.

#### 1. Electrical system inspection

The control panel and temperature sensor should be visually inspected **every six months** to determine if the electrical connections are loose or not.

Check the maintenance one by one as follows:

- 1) Perform electrical insulation test of the whole unit, find unqualified contacts and handle them.
- 2) Tighten each electrical contact.
- 3) Clean dust off electrical and control components with a brush or dry compressed air.

#### Notices

All boards are forbidden to be plugged and unplugged with power on. The hot plug can generate a large amount of instantaneous current, which may cause irreparable damage to the circuit. All maintenance for the control board must be performed after the microprocessor controller is powered down.

#### 2. Cooling system inspection

##### 1) Fan

The running characteristics of the fan kit are continuous operation for 24 hours. Any abnormal airflow blocking factor should be eliminated in time to avoid the damage of the cooling system and other system components.

##### 2) Drainage pipe

In order to ensure the normal operation of the drain pipe, the water tray should be tested regularly. Make sure there are no fine debris or leaks in the drainage pipe.

##### 3) Cooling components

The cooling system components should be fully tested every month to discover abnormal operation phenomena in time. The cooling line should be securely fastened and cannot vibrate with the frame of the wall, floor or equipment. Check the cooling line for wear every six months.

##### 4) Condenser

When the condenser air flow is obstructed, use a compressed air or fin cleaning agent (weak alkaline) to clean the condenser and remove dust and debris that obstruct the air flow. When cleaning the fins with compressed air, the direction of purging should be the direction of reverse air flow. Inspect the fins for rewinding or damage and perform

simple repairs if necessary. Check all cooling lines and capillary lines for vibration and reinforce if necessary. Carefully inspect all refrigeration line accessories for oil traces to determine the location of the leak.

### 5) Compressor

The compressor failures generally fall into the following two categories:

- Motor failure (such as coil burnout, insulation damage, short circuit between turns, etc.).
- Mechanical failures (such as compression failure, pressure relief valve failure, thermal disk failure, etc.).

If the operating pressure cannot be established, the compressor has failed. The suction pressure and the exhaust pressure are maintained in equilibrium after starting, and after the cause of the reverse running is excluded, the compressor failure can be determined.

The air conditioner group control system has strong alarm function and protection function to ensure the safe operation of the compressor. During periodic maintenance and inspection, maintenance personnel should record high and low pressure values and confirm the cause of fault alarm protection in a timely manner.

### Notices

1. Avoid direct contact of human skin with residual gases and lubricants in the compressor system. Wear long rubber gloves when handling contaminated parts.
2. The residual refrigerant in the system should be recovered by standard recovery equipment before maintenance. Discharge of refrigerant into the air can cause environmental pollution. Refrigerant emissions must comply with national and local laws and regulations.

## 3. Air conditioner system inspection and maintenance checklist

Table 4-3 AC Maintenance Checklist

SmartCabinet2-E air conditioner			
Date:		Maintained by:	
Equipment model:		Unit No.:	
Classification	Maintenance components	Inspection item	Yes or No?
Monthly maintenance items	Filter	Check the filter for damage and blockage	
		Clean the filter	
	Fan	Whether the fan runs smoothly, with or without abnormal noise	
	Supply air temperature sensor	The supply air temperature sensor is firmly tied and the temperature is detected correctly.	
	Compressor	Listen to running sounds and observe running vibrations	
Semi-annual maintenance items	Filter	Check the filter for damage and blockage	
		Clean the filter	
	Fan	Whether the fan runs smoothly, with or without abnormal noise	
		Check and tighten the circuit connector	
	Supply air temperature sensor	The supply air temperature sensor is firmly tied and the temperature is detected correctly.	
	Cooling System	Suction pressure	
		Air exhaust pressure	
		Suction superheat	
Check the system for leaks			
Condenser cleaning			
	Listen to the running sound and observe the vibration of the unit		

		Check and tighten the circuit connector	
	Circuit board	Check circuit connection connector	
		Check the surface of the board for corrosion	
Remark:			
Signature:			

Please copy this table for recording.

### 4.3.3 UPS power distribution system maintenance

#### 1. Fan maintenance

Under continuous operation, the expected running time of the UPS fan is 20,000 hours to 40000 hours. The higher the ambient temperature is, the shorter the fan life becomes.

During UPS operation, all fans should be checked periodically every six months to confirm that there is wind blowing out from the vents on the rear panel of the UPS.

#### 2. Check UPS status

Clean the UPS regularly, especially the vents, to ensure that airflow is freely circulated inside the enclosure and, if necessary, cleaned with a vacuum cleaner. Confirm that there are no objects obstructing UPS ventilation. It is recommended to check the running status of the UPS every six months.

The inspection contents include:

- 1) Check the UPS for faults. Check if the fault indicator is on, and if there is a fault alarm.
- 2) Check if the UPS is working on the bypass. Under normal circumstances, the UPS should operate in normal mode; if the UPS is operating in bypass mode, the cause should be confirmed, such as: human action, overload, internal fault, etc.
- 3) Check if the battery is in a discharged state. Under normal conditions, the battery should not be discharged. If the UPS is running in battery mode, you need to confirm the cause, such as: power failure, battery test, human action, etc.

## 4.4 Alarm reference

Table 4-4 Normal alarm reference

Alarm contents	Possible cause	Handling method
Environmental values high temperature alarm	High temperature alarm value setting is unreasonable	Check the high temperature alarm value of the temperature sensor of the front door.
	Overloaded	Check if the actual maximum thermal load exceeds the rated value
	The fan is not operating normally	Check if the fan MCB is closed
	Fan failure	Call the Vertiv Technical Service Hotline: 4008876510
	Air conditioner cooling output failure	Call the Vertiv Technical Service Hotline
	Cabinet door is not reliably closed	Check cabinet door and close it
Door status sensor alarm	Cabinet door is not reliably closed	Check cabinet sealed door and close it
	Poor installation of magnetic sensor or sensor damaged	Re-adjust the installation gap or call the Vertiv Technical Service Hotline
Belt type water sensor alarm	Water in the detection zone	Check the computer room for leaks
	Air conditioner condensate leak	Check if the condensate pipe connection is reliable

Alarm contents	Possible cause	Handling method
Air conditioner high pressure alarm	Insufficient air conditioner condensing air volume	Remove impurities from the surface of the coil or near the air inlet; Check the speed regulation performance of the fan speed controller
	Air conditioner condenser fan does not turn	Check if the fan speed controller wiring is loose; Check if the outdoor wiring is loose; Check if the fan speed controller L1 has output; Check if the condensing pressure sensor is normal
Low pressure alarm	Refrigerant leak	Find leaks and replenish refrigerant
	The ambient temperature outside the cabinet is too low	Call the Vertiv Technical Service Hotline
High temperature alarm	High temperature alarm setting is unreasonable	Reset the high temperature alarm value
	Overloaded	Check the actual heating power of the equipment in the cabinet
Low temperature alarm	Low temperature alarm setting is unreasonable	Reset the low temperature alarm value
Temperature sensor communication failure alarm	Temperature sensor communication cable is broken	Check the temperature sensor cable connection, restore cable plug
	Temperature sensor damage	Call the Vertiv Technical Service Hotline
Lightning protection alarm	SPD failure	Call the Vertiv Technical Service Hotline
UPS fan abnormal	UPS internal fan is not working properly	Call the Vertiv Technical Service Hotline
UPS rectifier abnormal	Main circuit input instantaneous high voltage	Check the input utility power, restart the UPS equipment after troubleshooting
	Output load is abnormal	Check load type
	Hardware damage	Call the Vertiv Technical Service Hotline
UPS inverter abnormal	Inverter output short circuit	Check the UPS output cable, restart after troubleshooting
	Hardware damage	Automatically switch to bypass mode, call the Vertiv technical service hotline
UPS ECO bypass abnormal	The ECO mode is enabled, and the bypass voltage and frequency are outside the setting range.	Check bypass input, is the voltage and frequency within the set ECO bypass range?

## 4.5 Troubleshooting

Table 4-5 Troubleshooting

Fault Phenomena	Possible cause	Handling method
Imbalanced temperature	Sealed passage area is obstructed	Check whether the sealed aisle area is blocked by equipment or cables.
	User equipment installation is uneven	Adjust the load of each cabinet to the balance according to the requirements of the user manual.
	Severe fluctuations in the short term	Check if the actual load has a wide range of fluctuations
The fan cannot start	The fan is not operating normally	Check if the fan MCB is open or not
	Fan failure	Call the Vertiv Technical Service Hotline

Monitoring Device is Offline	Communication cable breaks or falls off	Check all communication cables and restore cable connections
	Monitoring device is damaged	Call the VERTIV technical service hotline
Atmosphere Lamp and ECO Module Cannot Start	Monitoring link falls off	After the monitoring link is restored, the maintenance personnel should manually click the "save and take effect" button in the "alarm association" page in the WEB background, and the 4DO module can resume normal operation
The SMS module can't get a text message.	Weak signal from local services or delayed transmission from base stations	Check services signals.
	UIM card has full SMS storage, can't store more SMS	Remove expired messages from UIM cards to ensure adequate storage space

**Notices**

1. Under normal operation of the ECO mode, when the monitoring system goes offline or goes down due to failure, the system will automatically turn off the ECO mode. If the monitoring system fails to return to normal within 10 min, the air conditioner will start automatically to ensure the internal temperature environment of the cabinet.
2. When the monitoring system parameters or settings are changed during use, the monitoring system needs to be restarted. The method is: Switch off the 24 V power supply circuit breaker on the PMU and switch it on after 3 s. The system will start automatically to ensure that the new configuration information can be accurately sent to each monitoring component.

## 4.6 Parts Replacement and Recycle

### 4.6.1 Replace equipment filter

#### 1. Replace filter of ECO fan module

1) Remove the (2 pcs) fixing screws of the decorative guard and upwards remove the decorative guard clamped on the fan module, as shown in Figure 4-2.

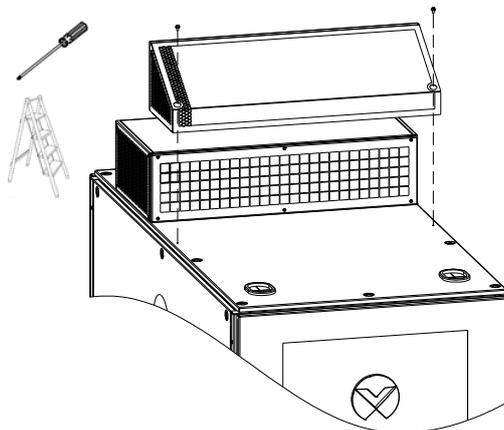


Figure 4-2 Remove Decorative Guard of ECO Fan Module

2) Remove the (14 pcs) fixing screws of the filter hood and remove the old filter, as shown in Figure 4-3.

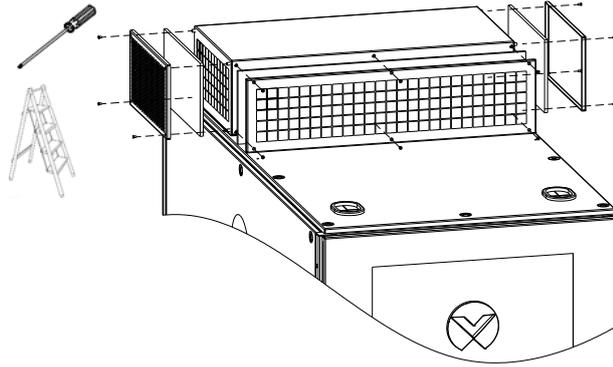


Figure 4-3 Replace Filter of ECO Fan Module

3) Install a new filter hood and decorative guard according to step 2) and step 1).

## 2. Replace front door inlet filter

1) Remove the (11 pcs) screws of the front door wind scooper in Figure 4-4, remove the old filter, and replace it with a new filter.

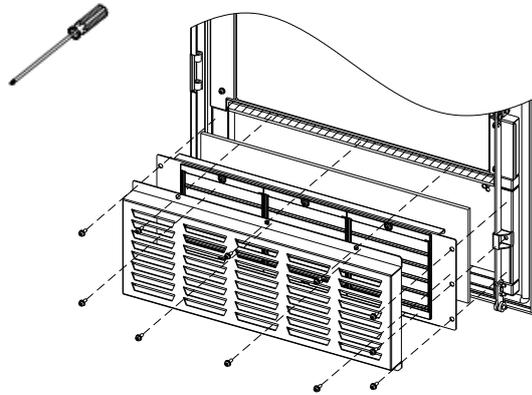


Figure 4-4 Replace Air Inlet Filter

2) Install the louver and wind scooper according to step 1) to complete the replacement.

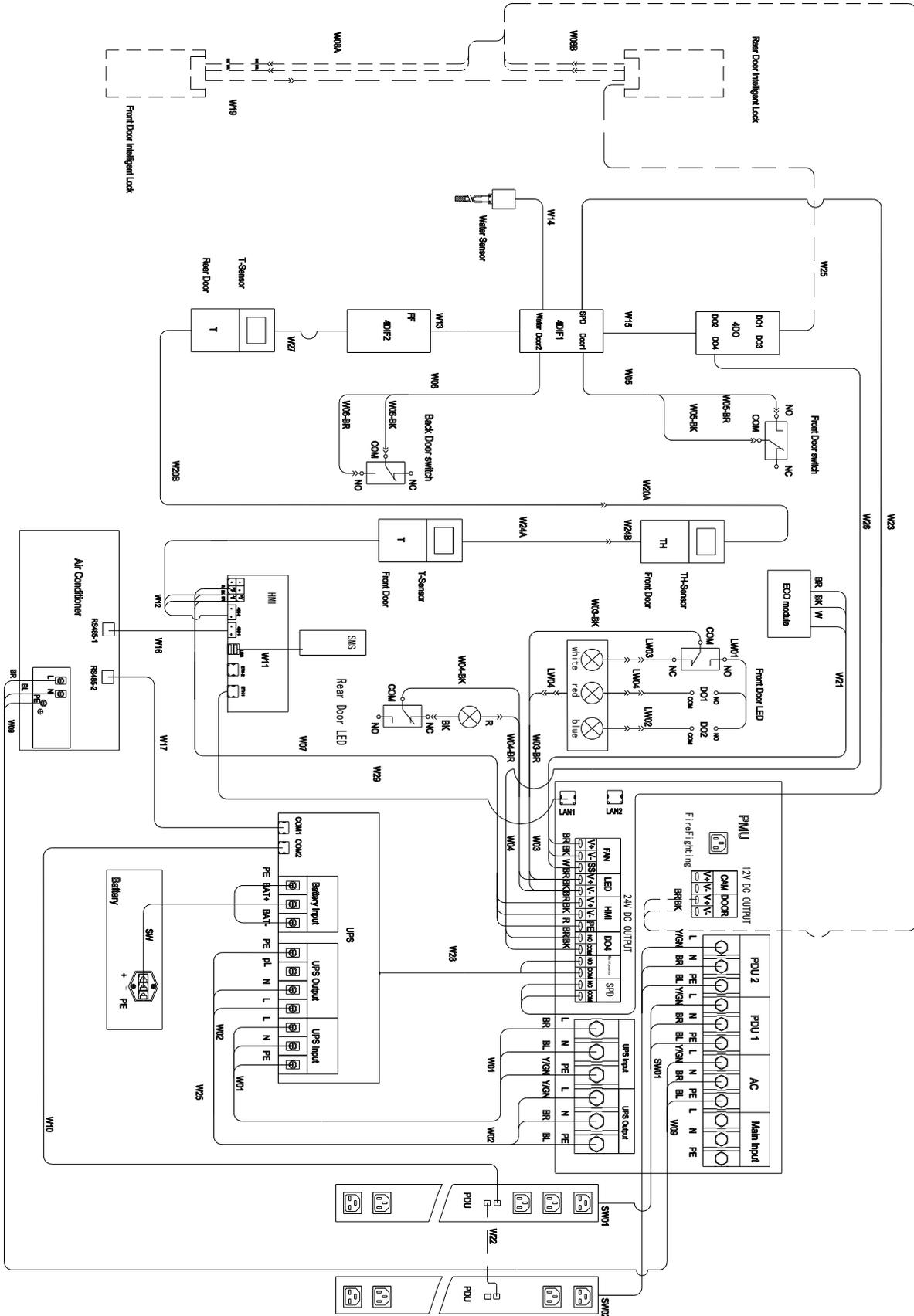
### Notices

It is suggested that a filter should be checked 、cleaned up or replaced once total running time in the ECO mode reaches 1200 h. The running time of ECO mode can be referred in Figure 3-49.

## 4.6.2 Parts replacement and decomposition

The SmartCabinet products contain substances and components (electronic parts) that are harmful to the environment. When the life of a SmartCabinet product expires, it must be decomposed by a professional technician. The SmartCabinet products must be sent to a processing center that professionally collects and processes equipment containing hazardous materials.

# Appendix 1 System Wiring Diagram



# Appendix 2 AC schematic diagram

