

Preface

Thank you for choosing the Company's products.

EAST Group specializes in the research, development, and manufacture of modular data centers, precision power distribution systems, precision air conditioning systems, intelligent row cabinets, intelligent monitoring systems, and related products. EAST's Integrated Sodium-Ion Battery UPS consolidates data center infrastructure equipment—including the integrated power supply and distribution system, UPS system, sodium-ion battery DC modules, cabinets, cabling, and monitoring management system - within one or more enclosed cabinets, thereby meeting a wide range of performance requirements.

This User Manual contains instructions and information relating to the Integrated Sodium-Ion Battery UPS EA900YN Series, including product introduction, application, and operation. Please read this manual carefully before installing the product. Do not operate the equipment until all safety instructions and operating instructions have been fully read and understood. This User Manual contains important information. Please strictly observe all warnings and operating instructions contained in this manual and indicated on the equipment, and retain this manual properly for future reference.

The Integrated Sodium-Ion Battery UPS Series products must be properly grounded prior to use.

Battery replacement must be performed only by qualified maintenance personnel. In accordance with applicable laws and regulations, batteries are classified as toxic waste. Therefore, in compliance with environmental protection requirements, discarded batteries must be recycled accordingly.

The sale of this product is limited to partners possessing basic knowledge of the Integrated Sodium-Ion Battery UPS Series products. To prevent accidents, it is necessary to have an adequate understanding of other installation requirements and precautionary measures.

No part of this manual may be modified without the Company's authorization. Violators shall be held liable accordingly. The Company reserves the right of final interpretation.

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Chapter 1 Safety Precautions

1.1 General Safety Precautions

This section describes certain safety precautions that shall be observed during the installation, maintenance, and related operations of the Company's equipment.

During all operations involving the Company's products and equipment, the relevant precautions and special safety instructions provided by the Company for the corresponding equipment must be strictly observed. The safety warnings listed in this manual represent only those known to the Company. The Company shall not be held liable for any consequences arising from violations of general safety operating requirements or violations of safety standards related to the design, manufacture, and use of the equipment.

1.2 Disclaimer

The Company shall not be held liable under any of the following circumstances:

- Operation in harsh environments beyond those specified in this manual.
- Any installation or operating environment exceeding the requirements specified in the relevant international standards.
- Unauthorized modification of the product or alteration of software code.
- Failure to operate in accordance with the operating instructions and safety warnings provided in the product and documentation.
- Equipment damage caused by abnormal natural environmental conditions.
- Damage caused by using the battery modules provided by the Company with integrated UPS series products not manufactured by the Company.
- Damage caused by the use of batteries not provided by the Company.

1.3 Utility Power Requirements

Single-phase three-wire system (L, N, PE)

Three-phase five-wire system (L1, L2, L3, N, PE)

Local Regulations and Standards

Local regulations and standards shall be observed during equipment operation. The safety precautions provided in this manual are intended only as supplements to local safety regulations.

Basic Installation Requirements

This product must be commissioned and maintained by engineers certified by the manufacturer or its authorized agents. Otherwise, personal safety may be endangered and equipment failure may occur. Any resulting product damage shall not be covered by the warranty. Personnel responsible for the installation and maintenance of the Company's equipment must undergo rigorous training, fully understand all safety precautions, and master the correct operating procedures before installing, operating, or maintaining the equipment.

- Only qualified and trained personnel are permitted to install, operate, and maintain the equipment.
- Only qualified professionals are permitted to remove safety facilities and service the equipment.
- Replacement and modification of equipment or components (including software) must be performed by personnel certified or authorized by the Company.
- Operators shall promptly report any faults or errors that may lead to safety hazards to the responsible personnel.
- This product shall be installed and used in accordance with the specifications provided in this manual (refer to the "Installation" and "Technical Specifications" chapters). Otherwise, product failure may occur, and any resulting product malfunction or component damage shall not be covered under the product warranty.

Grounding Requirements

The following requirements apply only to equipment requiring grounding (excluding the energy storage unit).

- During equipment installation, grounding must be completed first; during equipment removal, the grounding cable shall be disconnected last.
- Damage to the grounding conductor is strictly prohibited.
- Operation of the equipment without a grounding conductor installed is strictly prohibited.
- The equipment shall be permanently connected to protective earth. Before operating the equipment, check the electrical connections to ensure that the equipment is reliably grounded.

Personal Safety

- Do not operate the equipment or cables during thunderstorms.

- To avoid the risk of electric shock, do not connect Safety Extra-Low Voltage (SELV) circuit terminals to Telecommunications Network Voltage (TNV) circuit terminals.
- Before operating the equipment, wear anti-static work clothing, anti-static gloves, and an anti-static wrist strap, and remove conductive objects such as jewelry and watches to avoid electric shock or burns.
- In the event of a fire, evacuate the building or equipment area immediately and activate the fire alarm or call the fire emergency number. Under no circumstances shall anyone re-enter the burning building.
- For cabinets equipped with anti-static jacks, an anti-static wrist strap must be worn, and the other end shall be connected to the anti-static jack.
- Do not close the switch before the equipment installation has been completed.
- Do not power on the Integrated Sodium-Ion Battery UPS product before the authorized engineer arrives.

Equipment Safety

- Before operation, securely fasten the equipment to the floor or other stable structures, such as walls or mounting racks.
- During system operation, do not block the ventilation openings.
- Before power-on, ensure that all screws inside the equipment are securely fastened to prevent loosening during operation.
- After equipment installation, promptly remove all packaging materials from the equipment area.
- Replace unclear hazard labels in a timely manner.
- The product is suitable for capacitive-resistive, resistive, and slightly inductive loads. It is not suitable for purely capacitive loads, purely inductive loads, half-wave rectified loads, or energy feedback loads.
- Under no circumstances shall the equipment structure, installation sequence, or other configurations be altered without the manufacturer's authorization.
- Under no circumstances shall water be used to clean the electrical components inside or outside the cabinet.

1.4 Electrical Safety

High Voltage

High-voltage power supplies provide operating power for the equipment. Direct contact with high-voltage power sources, or indirect contact through damp objects, may result in fatal hazards. Improper or non-compliant high-voltage operations may cause accidents such as fire or electric shock.

- Personnel performing high-voltage operations or installing AC-powered equipment must possess qualifications for high-voltage and AC electrical operations.
- Cable selection, installation, and routing must comply with local regulations and standards.
- Operation of AC-powered equipment must comply with local regulations and standards.
- Before wiring the product, reconfirm that the switches for the input power supply and utility power distribution are in the OFF position.
- Dedicated tools must be used for high-voltage and AC electrical operations. Ordinary tools shall not be used.
- During operation in humid environments, prevent the equipment from becoming damp. If water or moisture is found inside the cabinet, immediately disconnect the power supply.

High Leakage Current

The equipment must be grounded before being connected to the power supply; otherwise, personal safety and equipment safety may be endangered.

- If a “High Leakage Current” label is affixed near the equipment panel, the protective grounding terminal of the equipment enclosure must be grounded before connecting the AC input power supply, so as to prevent electric shock caused by equipment leakage current.
- The UPS in the Integrated Sodium-Ion Battery product is classified as high leakage current equipment. Configuration with circuit breakers incorporating leakage protection functions is not recommended.

Power Cables

Installation or removal of power cables under live conditions is strictly prohibited. At the moment when the cable conductor contacts a conductive surface, electric arcs or sparks may occur, which may result in fire or eye injuries.

- When the product needs to be moved or rewired, utility power, batteries, and other input sources must be disconnected, and corresponding operations may only be performed after the equipment has been completely powered down (more than 5 minutes). Otherwise, the equipment ports and internal components may still remain energized.
- Before installing or removing power cables, the power switch must be turned off.
- Before connecting power cables, confirm that the cable labels are correct.

Fuses

To ensure safe equipment operation, when a fuse in the equipment is blown, it must be replaced with a fuse of the same model and specifications.

Electrostatic Discharge

Static electricity generated by the human body may damage electrostatic-sensitive components on circuit boards, such as Large-Scale Integrated (LSI) circuits.

- Static electromagnetic fields may be generated by body movement, friction between clothing, friction between shoes and the floor, or handling ordinary plastic objects, and such static charges do not easily dissipate before discharge.
- Before touching the equipment or handling circuit boards or Application-Specific Integrated Circuit (ASIC) chips, anti-static gloves or an anti-static wrist strap must be worn to prevent electrostatic damage to sensitive components. The other end of the anti-static wrist strap must be properly grounded.

1.5 Equipment Operating Environment

Any operation of electronic equipment in flammable air environments constitutes an extreme hazard. The equipment must be used and stored in accordance with the environmental requirements specified in this User Manual.

Allow prolonged use in the following environments:

- High-temperature, low-temperature, or humid environments exceeding the technical specifications (temperature: 0°C–40°C; relative humidity: 0% RH–95% RH).
- Locations exposed to direct sunlight or located near heat sources.
- Locations subject to vibration or impact.
- Locations containing dust, corrosive substances, or salt.

- Marine environments, outdoor land environments near pollution sources, or environments with only simple sheltering conditions. Pollution source areas refer to locations within the following radii:
 - ✧ Within 3.7 km of saltwater environments (such as oceans or saltwater lakes).
 - ✧ Within 3 km of heavy pollution sources, such as metallurgical plants, coal mines, and thermal power plants.
 - ✧ Within 2 km of moderate pollution sources, such as chemical plants, rubber plants, and electroplating facilities.
 - ✧ Within 1 km of light pollution sources, such as food processing plants, leather processing facilities, and heating boilers.

1.6 Battery Safety Operations

Technical Specifications

Table 1-2 Technical Specifications of Sodium-Ion BatteryDC/DC Module

Battery Type	Rated Capacity	Operating Voltage
Sodium-Ion BatteryDC/DC Module	50AH/2280WH	240VDC

Product Features of the Sodium-Ion BatteryDC/DC Module

- The cathode material used in the individual battery cells is sodium iron phosphate (NaFePO₄), featuring high safety, high energy density, and excellent cycle performance.
- The battery pack is equipped with a high-performance Battery Management System (BMS). The BMS provides protection functions including over-discharge, overcharge, overcurrent, high-temperature, and low-temperature protection, thereby ensuring the safety of the battery pack.
- Automatic charge and discharge management is provided. The monitoring unit automatically measures the battery charge and discharge current and performs float charging and equalization charging management of the battery.
- An alarm is generated when the battery voltage falls below the alarm threshold. Automatic shutdown is activated when the voltage becomes excessively low, thereby protecting the battery.
- The battery pack features excellent electromagnetic compatibility.

- Power control technology is organically integrated with computer technology to enable real-time monitoring and control of various parameters and operating statuses.

Battery Precautions

- Do not place the battery pack in water or allow it to become wet.
- Do not charge the battery pack near fire sources or under extremely high-temperature conditions. Do not use or store the battery pack near heat sources (such as fire or heaters). If the battery leaks or emits an odor, immediately remove it from the vicinity of open flames. Before initial use, fully charge the battery before use.
- Do not reverse the positive and negative terminals.
- Do not dispose of the battery pack in fire or heat the battery pack.
- Do not short-circuit the positive and negative terminals of the battery pack with wires or other metal objects.
- Do not pierce the battery pack enclosure with nails or other sharp objects. Do not strike or step on the battery pack.
- Do not disassemble the battery pack or battery cells in any manner.
- Do not place the battery pack in a microwave oven or pressure vessel.
- Do not use the battery pack if it emits an odor, generates heat, becomes deformed, changes color, or exhibits any other abnormal condition. If the battery pack is in use or charging, immediately remove it from the electrical device or charger and discontinue use.
- Do not use the battery pack in extremely hot environments, such as under direct sunlight or inside a vehicle during hot weather. Otherwise, the battery pack may overheat, thereby affecting performance and shortening the service life of the battery pack.
- If electrolyte from a leaking battery enters the eyes, do not rub them. Immediately flush with water and seek medical assistance at once. Failure to handle the situation promptly may result in eye injury.
- Ambient temperature affects discharge capacity. When the ambient temperature exceeds the standard environmental condition ($25\pm 5^{\circ}\text{C}$), the discharge capacity will decrease accordingly.

Special Battery Precautions

- During battery charging, if any odor or abnormal sound occurs, stop charging immediately.
- During battery discharge, if any odor or abnormal sound occurs, stop discharging immediately.
- If any of the above conditions occur, contact the manufacturer immediately. Do not disassemble the battery pack without authorization.

1.7 Hoisting Heavy Objects

Operations at elevated heights shall comply with the following requirements:

Personnel performing hoisting operations must receive relevant training and may only assume their duties after qualification.

- Before carrying out hoisting operations, ensure that the hoisting tools are securely fastened to fixed objects or walls capable of bearing the load.
- During hoisting operations, ensure that the angle between any two lifting cables does not exceed 90°.

1.8 Mechanical Safety

Sharp Edges

When manually handling equipment, protective gloves shall be worn to prevent injuries caused by the sharp edges of the equipment.

When moving or lifting the equipment, hold the equipment handles or support the bottom edge of the equipment.

Fans

Before the fan is powered off and comes to a complete stop, do not insert fingers or circuit boards into the operating fan, so as to prevent personal injury or equipment damage.

1.9 Cable Laying

At excessively low temperatures, severe impact or vibration may cause brittle cracking of the cable plastic sheath. To ensure construction safety, the following requirements shall be observed:

- All cables shall be laid and installed at temperatures above 0°C.
- If the storage temperature of the cables is below 0°C, the cables must be transferred to a room-temperature environment and stored for more than 24 hours prior to installation.

- During cable handling, especially during construction in low-temperature environments, cables shall be handled with care. Improper operations, such as directly pushing cables off vehicles, are strictly prohibited.
- Use of cables in high-temperature environments may cause aging or damage to the insulation layer. Sufficient clearance shall be maintained between cables and DC busbars, shunts, and fuses. User-supplied cables shall possess flame-retardant capability. No cables shall pass behind the cabinet air outlet, and no foreign objects shall obstruct or block the air outlet.

Before connecting cables, confirm that the cables and cable labels conform to the actual installation conditions.

Chapter 2 Product Introduction and Installation

2.1 Models

a. As shown in the table below.

Model	Specification	Rated Capacity	Input/Output Phases	
			Input Phases	Output Phases
EA906YN	Standard, EA906YN,220V/220V,DC240V,EAST	6kVA	Single-phase	Single-phase
EA9010YN	Standard, EA9010YN,220V/220V,DC240V,EAST	10kVA	Single-phase	Single-phase
EA9910YN	Standard, EA9910YN,380V/380V,±DC240V,EAST	10kVA	Three-phase	Three-phase
EA9920YN	Standard, EA9920YN,380V/380V,±DC240V,EAST	20kVA	Three-phase	Three-phase
EA9930YN	Standard, EA9930YN,380V/380V,±DC240V,EAST	30kVA	Three-phase	Three-phase
EA9940YN	Standard, EA9940YN,380V/380V,±DC240V,EAST	40kVA	Three-phase	Three-phase

2.2 Product Introduction

2.2.1 Product Appearance

The Integrated Sodium-Ion Battery UPS EA900YN Series adopts an integrated design. The appearance is shown in Figure 2-1.



Figure 2-1 Appearance of the Integrated Sodium-Ion Battery UPS EA900YN

2.2.2 Internal Layout of the Product

The internal layout of the control cabinet of the Integrated Sodium-Ion Battery UPS EA900YN product is shown in Figure 2-2.

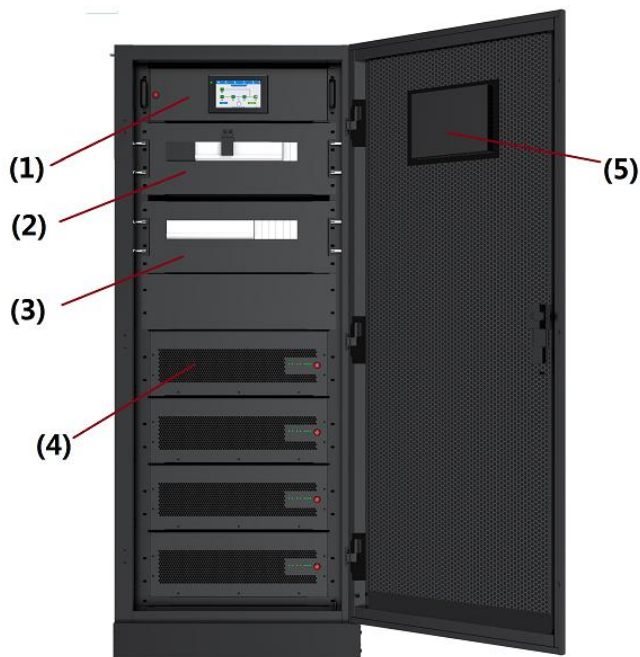


Figure 2-2 Internal Layout of the Integrated Sodium-Ion Battery UPS EA900YN Control Cabinet

No.	Component Name	Description
1	UPS	EA900YN Series UPS may be selected according to requirements
2	Input Power Distribution Module	UPS input power distribution module
3	Output Power Distribution Module (Optional)	UPS output power distribution module
4	Sodium-Ion Battery Module	Outputs DC240V; the quantity of battery modules may be selected according to requirements
5	Power Monitoring Screen	Provides communication, operation, display, alarm, and other functional applications

2.2.2.1 EA900YN UPS

The EA900YN UPS Series adopts a high-performance, intelligent, online, sine-wave uninterruptible power supply system, providing reliable and high-quality AC power for users' precision instruments and equipment. Its schematic block diagram is shown in Figure 2-3.

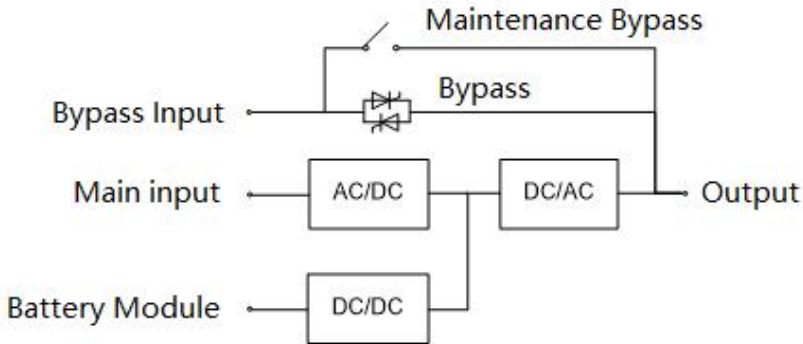


Figure 2-3 Schematic Block Diagram

The UPS supports the following operating modes:

Utility Mode

Utility Mode is the normal operating mode of the UPS. The main operating process is as follows: the utility input voltage is rectified by the rectifier circuit and then boosted by the boost circuit. One portion is supplied to the battery module through the DC/DC charger for battery charging, while the other portion is inverted by the inverter into AC output voltage to provide the load with continuous, uninterrupted, and high-quality AC power. The operating principle of Utility Mode is shown in Figure 2-4.

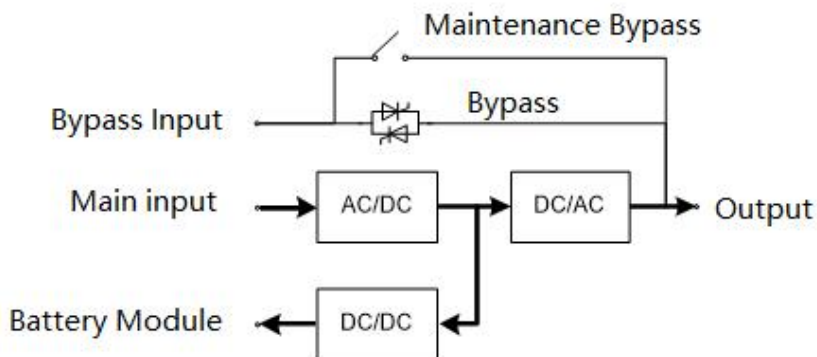


Figure 2-4 Schematic Diagram of Utility Mode

Bypass Mode

In the event of inverter failure, inverter overload, manual transfer to bypass status, or other faults or operations, the UPS output is transferred from the inverter side to the bypass side, and the bypass power supply directly supplies power to the load. Under Bypass Mode, the quality of power supplied to the load is not protected by the UPS, and abnormal bypass input conditions may result in power interruption. The operating principle of Bypass Mode is shown in [Figure 2-5](#).

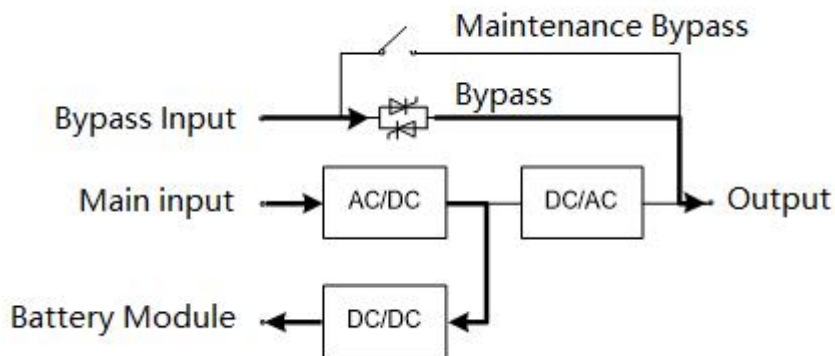


Figure 2-5 Schematic Diagram of Bypass Mode

Battery Mode

When the utility input voltage becomes abnormal, the UPS automatically transfers to Battery Mode. In this mode, the power unit obtains energy from the battery, boosts the voltage through the boost circuit, and then supplies AC output voltage to the load through the inverter, thereby providing the load with continuous, uninterrupted, and high-quality AC power. The operating principle of Battery Mode is shown in Figure 2-6.

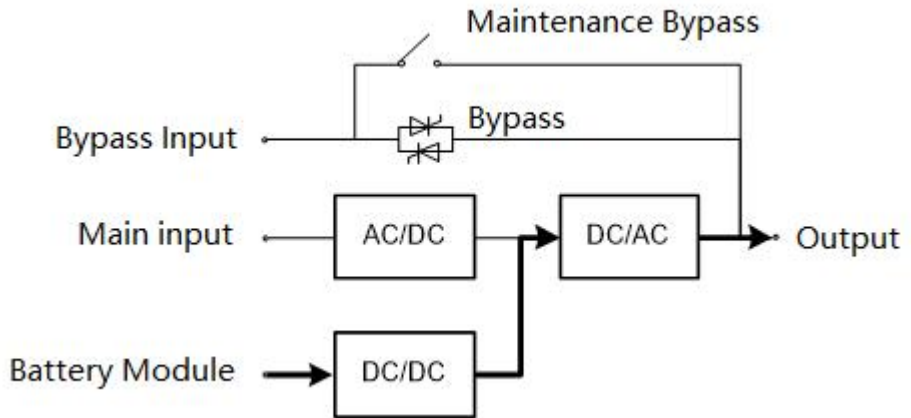


Figure 2-6 Schematic Diagram of Battery Mode

ECO Mode

ECO Mode is the economical operating mode of the UPS and can be configured through the LCD interface. Under ECO Mode, when the bypass input voltage is within the ECO voltage range, power is supplied through the bypass, while the inverter remains in standby status. When the bypass input voltage exceeds the ECO voltage range, the load power supply is transferred from bypass supply to inverter supply. Regardless of whether the load is powered by bypass supply or inverter supply, the rectifier remains enabled and charges the battery through the charger. ECO Mode provides higher system efficiency. The operating principle of ECO Mode is shown in Figure 2-7.

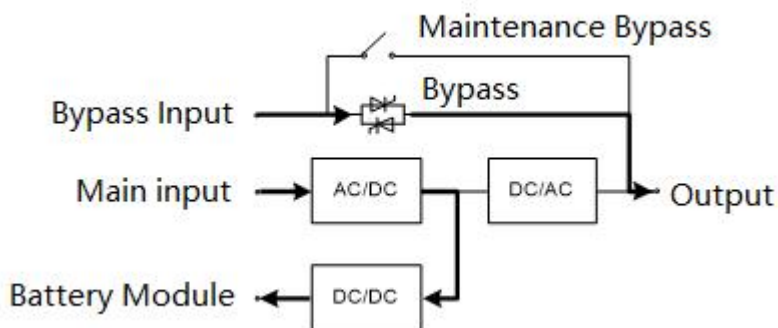


Figure 2-7 Schematic Block Diagram of ECO Mode

Maintenance Bypass Mode

When maintenance or servicing of the UPS is required, the UPS shall operate in Bypass Mode, and the maintenance bypass switch shall be closed so that the UPS operates in Maintenance Bypass Mode. In this mode, power is supplied through the maintenance bypass circuit without passing through the main power unit, allowing maintenance of replaceable units inside the equipment. The operating principle of Maintenance Bypass Mode is shown in Figure 2-8.

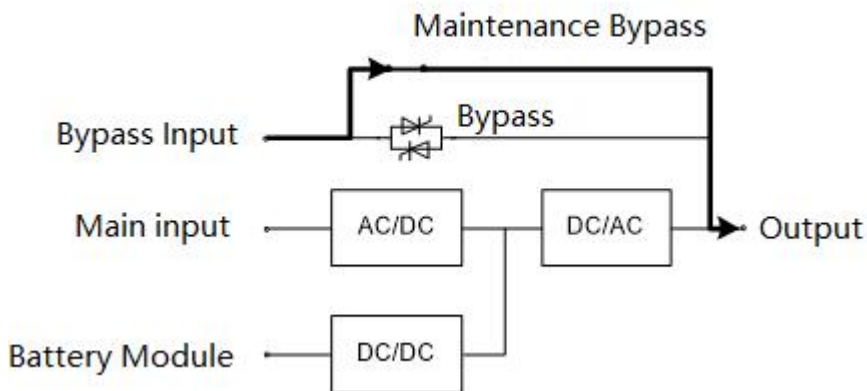


Figure 2-8 Schematic Block Diagram of Maintenance Bypass Mode

2.2.2.2 Input Power Distribution Module

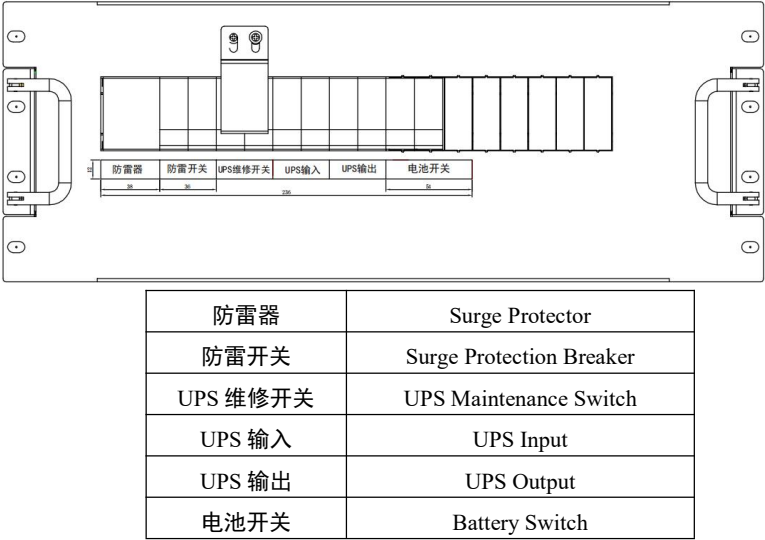


Figure 2-9 Appearance of the Input Module

No.	Component Name	Description
1	Surge Protector & Surge Protection Breaker	When switched on, prevents high voltage generated by lightning from entering electrical equipment, protects electrical equipment, and ensures system stability.
2	UPS Maintenance Switch	When switched on, the UPS enters Maintenance Bypass Mode and is powered through the maintenance bypass circuit without passing through the main power unit, allowing maintenance of replaceable units inside the equipment.
3	UPS Input	Controls the connection and disconnection of the UPS input
4	UPS Output	Controls the connection and disconnection of the UPS output

No.	Component Name	Description
5	Battery Switch	Controls the connection between the output side of the battery module and the UPS

The input power distribution module is used to control the connection and disconnection of various UPS ports and provides surge protection functionality. Its purpose is to improve the reliability and stability of the entire power distribution system and ensure the continuity and quality of the power supply.

2.2.2.3 Output Power Distribution Module (Optional)

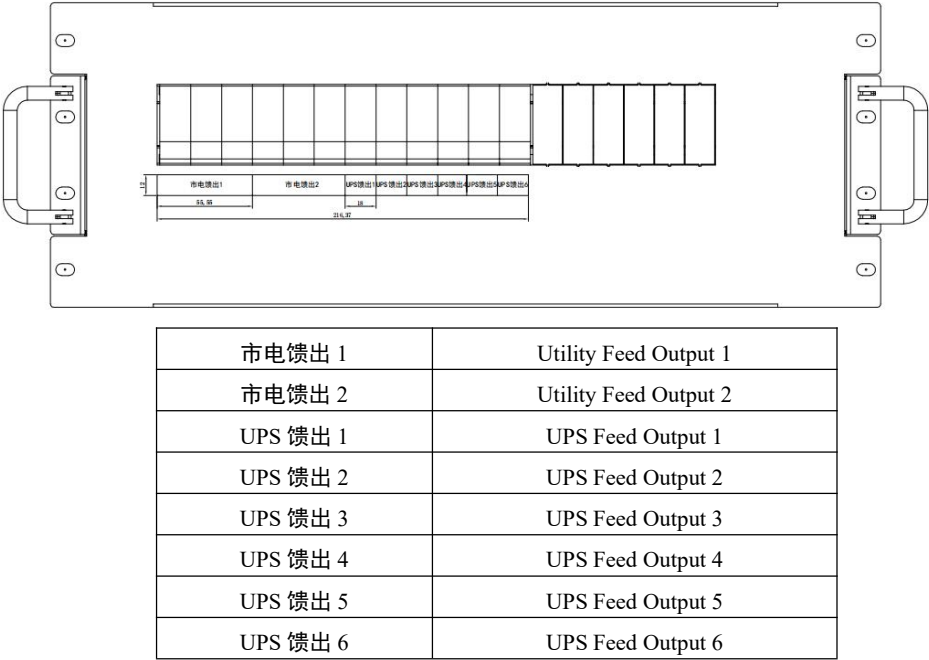


Figure 2-10 Appearance of the Output Module

No.	Component Name	Description
1	Utility Feed Output 1, 2	Controls direct utility power output
2	UPS Feed Output 1~6	Controls UPS output

The output power distribution module is used to control the output distribution of the system to meet the power supply requirements of different equipment or different areas, and may be flexibly adjusted and expanded according to changes in actual power demand.

2.2.2.4 Sodium-Ion BatteryDC/DC Module

1. Appearance of the Sodium-Ion BatteryDC/DC Module

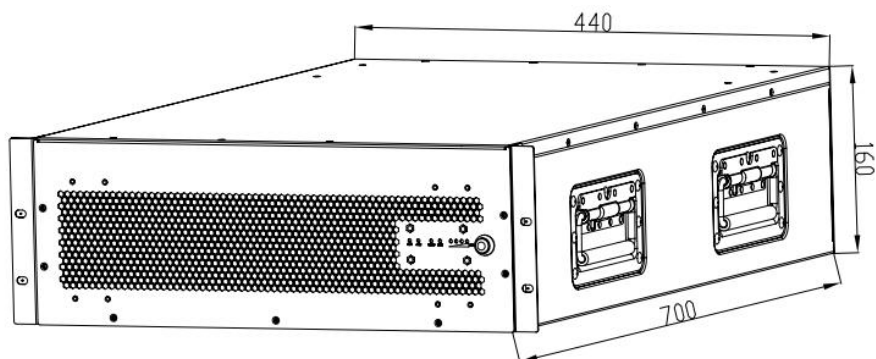


Figure 2-11 Appearance of the Sodium-Ion BatteryDC/DC Module

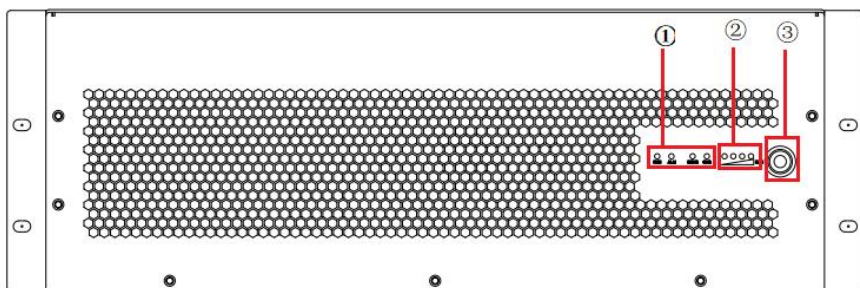


Figure 2-12 Front Panel of the Sodium-Ion BatteryDC/DC Module

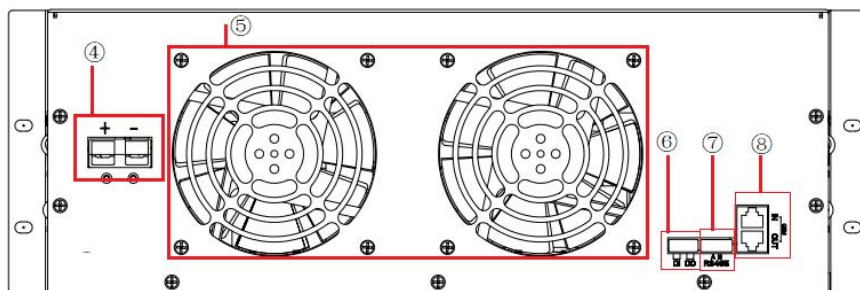


Figure 2-13 Rear Panel of the Sodium-Ion BatteryDC/DC Module

No.	Silk Screen	Name	Description
①	RUN	Running Indicator	Flashing: Standby; Steady ON: Running
	ALM	Alarm Indicator	Alarm indication
	CHG	Charging Indicator	Charging indication
	DCHG	Discharging Indicator	Discharging indication
②	SOC	Capacity Status Indicator	Capacity status indication
③	MANUAL ON/OFF	Manual Power ON/OFF Button	Manual power ON/OFF
④	-	Negative Terminal	Positive and negative wiring terminals. Anderson connector; recommended cable size: 5.26mm ² (10AWG).
	+	Positive Terminal	
⑤	FAN	Fan	
⑥	DI	Dry Contact Input	Associated actions after input detection; configurable
	DO	Dry Contact Output	Alarm output dry contact; configurable
⑦	RS485	Communication Interface	Information reporting and communication with the monitoring panel
⑧	COM IN	Communication Interface	Communication cascading and information reporting
	COM OUT		
	COM OUT		

2. Indicator LEDs and Buttons of the Sodium-Ion BatteryDC/DC Module

2.1. Button Function Description

Status	Operation	Description
Standby	Short Press	Operation under battery sleep status (auxiliary power supply not activated; all LED indicators OFF)

Status	Operation	Description
Power-On	Automatic Startup	If the unit was not shut down during the previous power-down, the unit will automatically power on 60s after entering Standby Mode upon this power-up (after initialization is completed)
	Press and Hold for 15s	Operation under Standby Mode; The unit can only be powered on by pressing and holding the button for 15s after 60s from the initial power-up (after initialization is completed); The interval between the power-on operation and the previous shutdown shall not be less than 300s.
Sleep	Press and Hold for 5s	Operation under Power-On Mode or Standby Mode; When the RUN/ALM/DCHG/CHG indicators flash simultaneously, release the button to directly shut down the auxiliary power supply (all indicators OFF).
Shutdown	Press and Hold for 15s	Operation under Power-On Mode; When the RUN/ALM/DCHG/CHG indicators remain steadily ON simultaneously, release the button to shut down the output and switch to Standby Status.

2.2. LED Function Description

1) Operating and Alarm Indicator LED Status Description

Status	Normal / Alarm / Protection	RUN	ALM	Capacity Indicator LED				Description
								
Shutdown	Sleep	OFF	OFF	OFF	OFF	OFF	OFF	All indicators OFF
Standby	Initialization	Flashing	OFF	Flashing	OFF	OFF	OFF	Initialization self-check (60s)
	Normal	Flashing	OFF	Displayed according to capacity				Standby

				level	status
	Alarm	Flashing	Flashing		Alarm present
	Fault	Flashing	Flashing		Fault present
Charging	Normal	Steady ON	OFF	Displayed according to capacity level	Normal operation
	Alarm	Steady ON	Flashing		Alarm present
	Fault	Steady ON	Flashing		Fault present
Discharging	Normal	Steady ON	OFF	Displayed according to capacity level	Normal operation
	Alarm	Steady ON	Flashing		Alarm present
	Fault	Steady ON	Flashing		Fault present

Note: “Flashing” indicates flashing once per second, ON for 1.5s and OFF for 1.5s.

2) Charging and Discharging Mode Indicator LED Description

Status	Operating Mode	CHG 	DCHG 
Charging	Constant Current Charging	Steady ON	OFF
	Constant Voltage Charging	Steady ON	OFF
	Float Charging	Steady ON	OFF
Discharging	Discharging	OFF	Steady ON

3) Capacity Indicator LED Status Description

Status		Charging				Discharging			
Capacity Indicator LED		L4 	L3 	L2 	L1 	L4 	L3 	L2 	L1 
Capacity (%)	0~25%	OFF	OFF	OFF	Flashing	OFF	OFF	OFF	Flashing
	25%~50%	OFF	OFF	Flashing	Steady ON	OFF	OFF	Flashing	Steady ON
	50%~75%	OFF	Flashing	Steady ON	Steady ON	OFF	Flashing	Steady ON	Steady ON
	75%~100%	Flashing	Steady ON	Steady ON	Steady ON	Flashing	Steady ON	Steady ON	Steady ON
	100%	Steady ON	Steady ON	Steady ON	Steady ON	Steady ON	Steady ON	Steady ON	Steady ON
Running Indicator		Steady ON				Steady ON			

Chapter 3 User Interface

3.1 LCD Interface

3.1.1 LCD Appearance

The monitoring display of the Integrated Sodium-Ion Battery UPS is located on the front side of the prototype unit. Through operation of the monitoring display, functions including equipment operation control, operating status monitoring, parameter configuration, and alarm inquiry can be realized. Under normal operating conditions, the green RUN indicator flashes. In the event of a fault, the red fault indicator remains steadily ON. When alarm information is present, the orange alarm indicator remains steadily ON. As shown in Figure 3-1, the operation control display panel consists of two sections: indicator LEDs and a touchscreen.



Figure 3-1 Monitoring Display

3.1.2 LED Indicators

The LED indicators display the current operating status of the UPS. Descriptions of the indicator statuses are shown in Table 3-1.

Table 3-1 Description of Indicator Statuses

Indicator	Status	Description
Green	Flashing	System operating normally
Red	Steady ON	System fault (UPS, DC module, communication)

Indicator	Status	Description
Yellow	Steady ON	System alarm (UPS, DC module, communication)

3.1.3 Audible Alarm (Buzzer)

When any alarm or fault occurs during system operation, the buzzer emits short beeps until the fault is cleared. The buzzer alarm or mute function may be configured in the system settings.

3.1.4 LCD Menu

The menu structure of the monitoring display interface is shown in Figure 3-2.

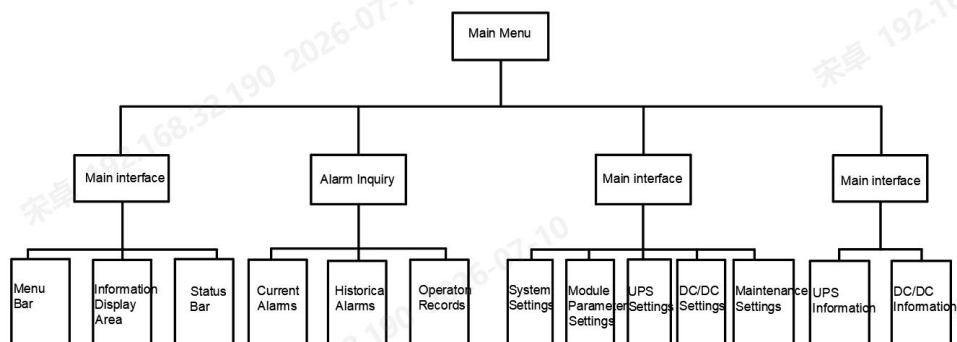


Figure 3-2 Menu Structure

3.2 User Interface

3.2.1 Main Interface

The monitoring display menu consists of three sections: the menu bar, the UPS power flow diagram, and the status bar. Taking the default Main Menu – Overview as an example, as shown in Figure 3-3, the functional descriptions of each area in the Overview interface are shown in Table 3-2.

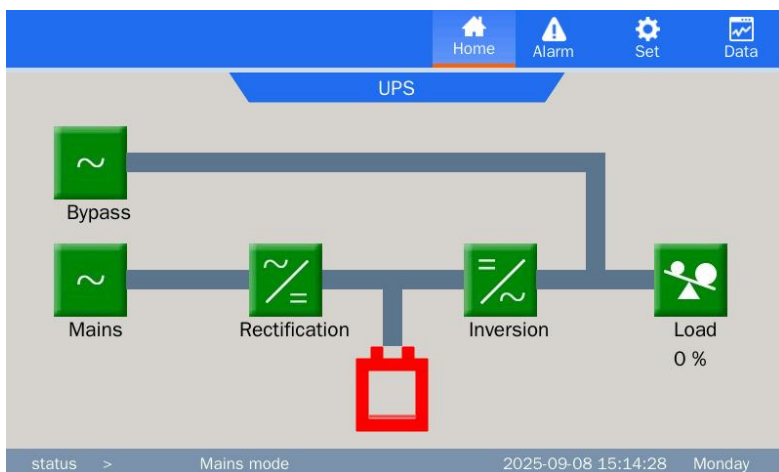


Figure 3-3 Main Menu – Overview

Table 3-2 Functional Description of the Main Menu Interface

No.	Area	Functional Description
1	Menu Bar	First-level menu displaying menu information such as Main Interface, Alarm Inquiry, Parameter Settings, and Information Inquiry.
2	System Power Flow Diagram	Displays the energy flow status of the current cabinet. Click the corresponding operating interface to view status information.
3	Status Bar	Displays the current monitoring operating status and time information.

Table 3-3 Description of Menu Bar Icons

Icon	Name	Functional Description
	Alarm Inquiry	Click the button to enter the alarm interface, where current alarms, historical alarms, and operation records can be viewed. When a fault occurs, a red number will be displayed on the icon. For details, refer to Figures 3-4, 3-5, and 3-6.

Icon	Name	Functional Description
	Parameter Settings	Enter the password to access the parameter settings interface, where the system parameters of the current cabinet can be viewed and modified as required. For details, refer to Figure 3-7.
	Information Inquiry	Click the button or the icon button in the information display area to enter the information inquiry interface, where the current operating information of the cabinet can be viewed. For details, refer to Figure 3-34.

Table 3-4 Password Permission Description

Password Permission	Default	Functional Description
User Password	123456	Unlocks the permissions for power ON/OFF control, common settings, and communication settings. It may be modified under “Parameter Settings – System Settings – Password Settings”.
Engineer Password	Not Open to Public	Unlocks permissions for all controls and settings. For use only by qualified and authorized professional engineers.

3.2.2 Alarm Inquiry

In the Alarm Inquiry interface, current alarms, historical alarms, and monitoring interface operation records of all devices are displayed.

Each alarm message includes the serial number, alarm code, alarm name, occurrence/end time. After the alarm is cleared or the fault is manually cleared, the alarm will be moved to Historical Alarms, and the end time will be updated in real time. Interface descriptions are shown in Tables 3-5 and 3-6.

Table 3-5 Description of the Current Alarms Interface

Display Item	Functional Description
Serial Number	Serial number of the alarm item.
Alarm Name	Information of the current alarm name.
Start Time	Time when the alarm started.

Display Item	Functional Description
Fault Value	Fault value, generally not displayed.

Table 3-6 Description of the Historical Alarms Interface

Display Item	Functional Description
Serial Number	Serial number of the alarm item, arranged in reverse order, with the most recent alarm displayed first.
Alarm Name	Information of the current alarm name.
Start Time	Time when the alarm started.
End Time	Time when the alarm ended after the fault was cleared.
Fault Value	Fault value, generally not displayed.

			Home Alarm Set Data	
			2	
			Alarm	
			Set	
			Data	
			Current alarm	
			Historical alarm	
No.	Alarm name	Start Time		
1	1#DCDC module communication failure	2025-09-08 15:00:25		
2	UPS communication failure	2025-09-08 15:00:25		
			Home	Previous
			Next	Last
			Delete record	
status >			Communication failure	
			2025-09-08 15:01:32	
			Monday	

Figure 3-4 Current Alarms Interface

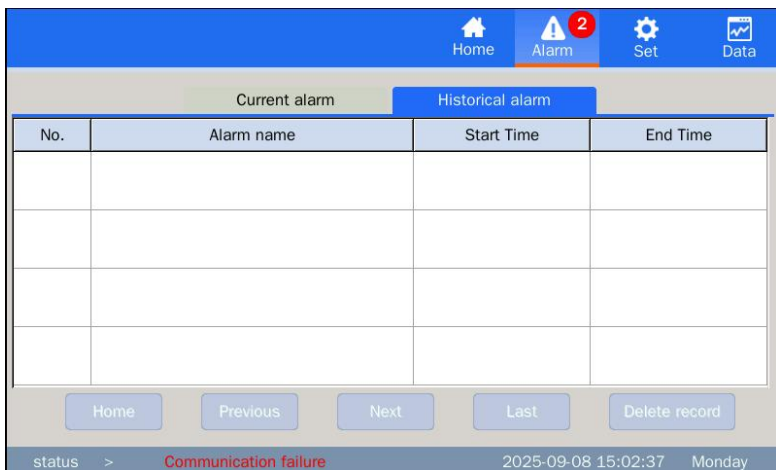


Figure 3-5 Historical Alarms Interface

The operation record information includes the serial number, event description, event type, operation initiator and object, operation result, and operation time, as shown in Table 3-7.

Table 3-7 Description of the Operation Records Interface

Display Item	Functional Description
Serial Number	Serial number of the record item, arranged in reverse order, with the most recent record displayed first.
Event Description	Description of the operation event content.
Event Type	Type of the operation event.
Initiator	Operation initiator.
Object	Object of the operation.
Result	Result of the operation event.
Audit Time	Time of the operation event.
Source	Source of the operation event information, generally not displayed.

3.2.3 Parameter Settings

The Parameter Settings interface is divided into two sections: the User Settings interface and the Engineer Settings interface.

As shown in Figure 3-7, click the Parameter Settings button and enter the password “123456” to access the User Settings interface, which is primarily used for Monitoring System Settings, Module Parameter Settings, UPS Parameter Settings (Control), DC/DC Parameter Settings (Control), and Maintenance Settings.

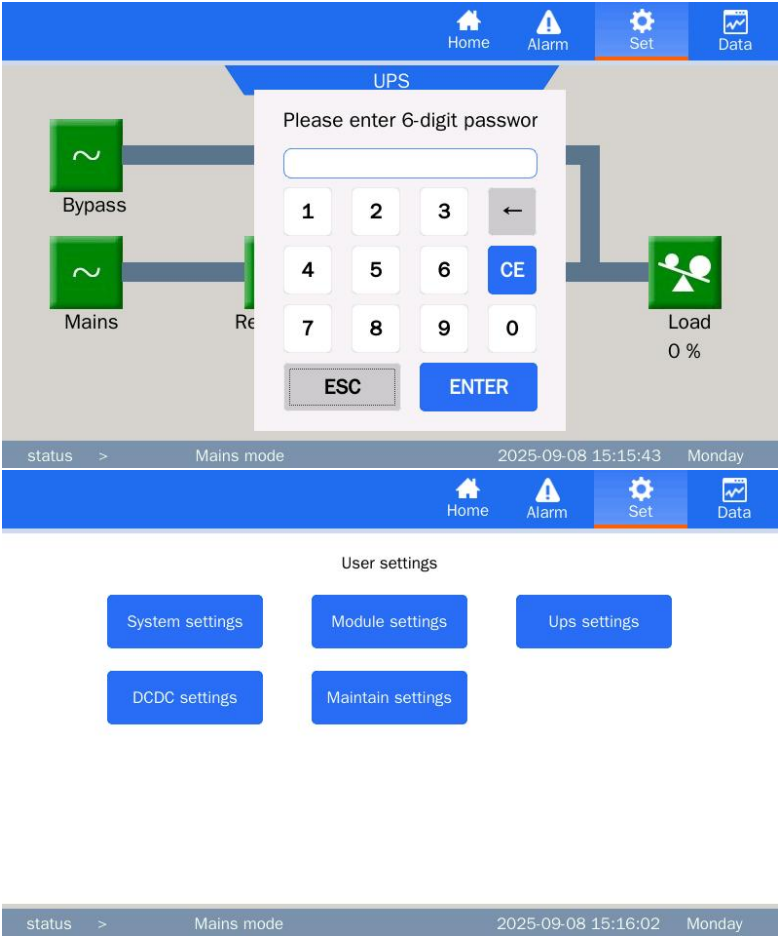


Figure 3-7 User Settings Interface

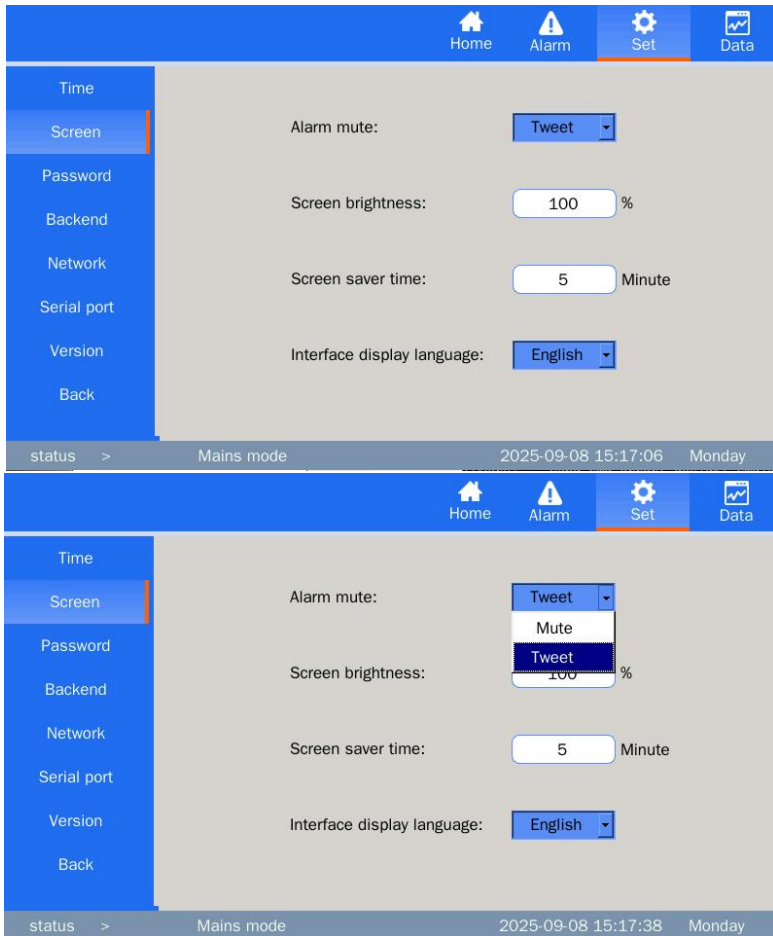
3.2.3.1 System Settings

a. Time Settings: Supports both automatic time synchronization and manual time synchronization. Automatic time synchronization supports configuration of the synchronization interval in minutes, while manual time synchronization supports manual setting of the year, month, day, hour, minute, and second.



Figure 3-8 Time Settings Interface

b. Screen Settings: Supports configuration of screen alarm mute, adjustment of screen brightness, and screen saver timeout settings.



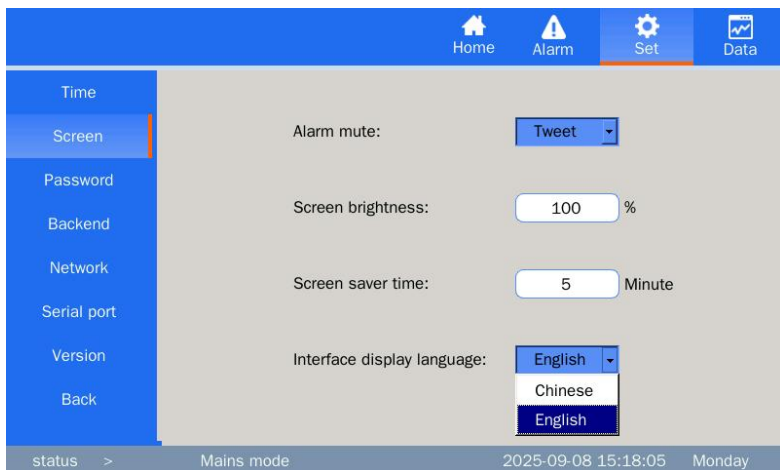


Figure 3-9 Screen Settings Interface

c. Password Settings: Supports modification of the password for accessing the Parameter Settings interface.



Figure 3-10 Password Settings Interface

d. Backend Settings: Supports configuration of the communication address of the monitoring backend.

Figure 3-11 Backend Settings Interface

e. Network Settings: Supports configuration of network type, IP address, network port, and other related parameters.

Figure 3-12 Network Settings Interface

f. Serial Port Settings: Supports configuration of serial port baud rate, parity bit, and stop bit.



Figure 3-13 Serial Port Settings Interface

g. Version Information: Displays the version information of the prototype unit, company information, and contact information.

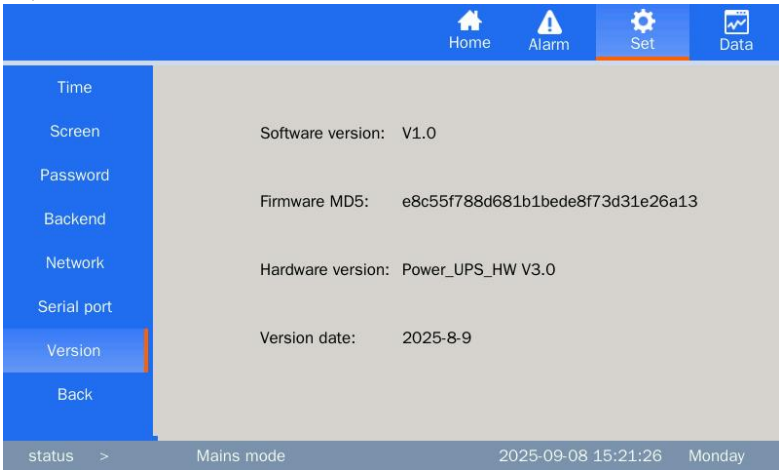


Figure 3-14 Version Information Interface

3.2.3.2 Module Parameter Settings

(1) UPS Module Settings

Supports modification and configuration of the UPS model, quantity, starting address, communication port, and whether a DC/DC module is present. For details, refer to Figure 3-15 below.

The screenshot displays the 'UPS setting' interface. The top navigation bar includes 'Home', 'Alarm', 'Set' (highlighted), and 'Data'. The left sidebar lists 'UPS setting', 'DCDC setting', and 'Back'. The main configuration area contains the following settings:

UPS model:	EA900
UPS Quantity:	1
UPS address:	1
Port:	COM2
DCDC module:	Yes

The bottom status bar indicates the system is in 'Mains mode' with a timestamp of '2025-09-08 15:21:51' on 'Monday'.

Figure 3-15 UPS Module Settings Interface

(2) DC/DC Module Settings

a.Supports modification and configuration of the quantity of DC/DC modules and the communication acquisition method. When the DC/DC modules are configured as positive and negative groups, the communication mode can only be set to dual-port mode. The starting addresses of both ports are “1”, and the number of modules collected by each port may be modified according to actual requirements. For details, refer to Figure 3-16 below.

Setting	Value
DCDC module quantity:	2
Communication way:	Dual port
DCDC address 1:	1
DCDC port 1:	COM3
Number of port 1:	1
DCDC address 2:	1
DCDC port 2:	COM4
Number of port 2:	1

status > Mains mode 2025-09-08 15:23:29 Monday

Figure 3-16 DC/DC Module Settings Interface (Positive and Negative Busbars, Dual-Port)

b. When the DC/DC modules are configured as a single-group parallel system, either single-port mode or dual-port mode may be selected. When single-port mode is selected, only the COM3 port may be selected, while COM4 is locked and does not support modification. When dual-port mode is selected, the starting addresses of the communication ports shall be modified according to the actual addresses of the parallel-connected DC modules and the communication cable connection method. For details, refer to Figure 3-17 below.

Setting	Value
DCDC module quantity:	1
Communication way:	Single port
DCDC address 1:	1
DCDC port 1:	COM3
Number of port 1:	1
DCDC address 2:	1
DCDC port 2:	COM4
Number of port 2:	0

status > Mains mode 2025-09-08 15:22:17 Monday

Figure 3-17 DC/DC Module Settings Interface (Parallel System, Single-Port)

3.2.3.3 UPS Settings

(1) UPS Control: Supports controlling UPS system power ON/OFF, manual transfer to bypass/manual transfer to inverter, battery self-test control, buzzer ON/mute, fault clearing, historical record clearing, and restoration to factory settings through the monitoring system, as shown in Table 3-8 and Figure 3-18 below.

Table 3-8 Description of the UPS Control Interface

Display Item	Functional Description
Power ON	When the mains input is within the normal range, the UPS powers on and outputs in Utility Supply Mode.
Shutdown to Bypass	When the bypass is within the normal range, the UPS switches to Bypass Supply Mode output.
Shutdown and Output OFF	The UPS shuts down and disconnects output.
Manual Transfer to Bypass	When the bypass is within the normal range, the UPS switches to Bypass Supply Mode output, while the main path rectifier continues operating and outputs to the battery side.
Manual Transfer to Inverter	The inverter is enabled, and the UPS switches from Bypass Mode to Main Path Mode.
Battery Discharge for 20 Seconds	When the bypass is within the normal range and the battery capacity is greater than 25%, the system may switch to 20-second battery discharge mode to test whether the battery is operating properly.
Discharge Until Battery Low Voltage	When the mains input is within the normal range and the battery capacity is greater than 25%, the system switches to battery discharge status until the battery voltage becomes low.
Terminate Battery Self-Test	Actively exits battery test status, including battery maintenance test and capacity test.
Buzzer ON/Mute	Enables buzzer alarm or mutes the buzzer.
Clear Fault	After fault rectification, use this button to clear the fault and restore the UPS to normal operating status.
Clear Historical Records	Clears historical records.

Display Item	Functional Description
Restore Factory Settings	Restores factory settings; however, this function is prohibited under three-phase input/single-phase output and single-phase input/single-phase output power distribution configurations.

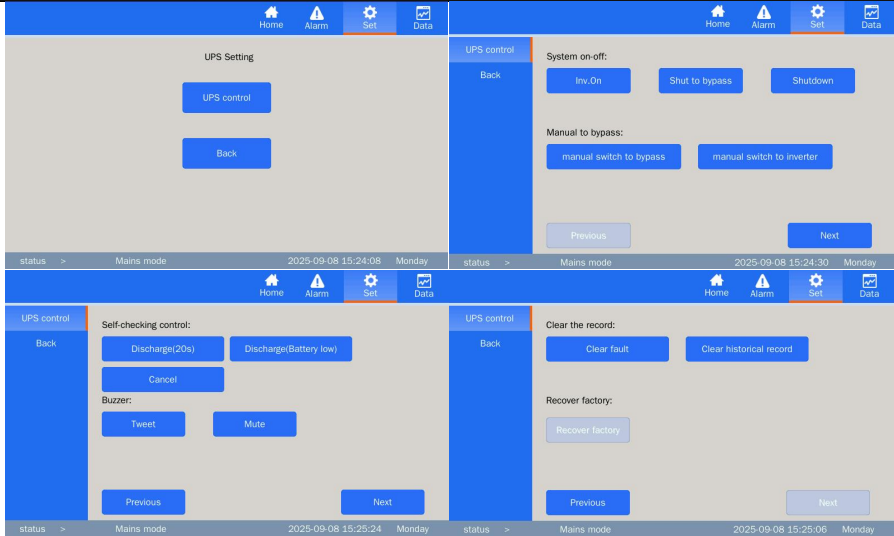


Figure 3-18 UPS Control Interface

3.2.3.4 DC/DC Settings

The DC/DC Settings interface supports functions including DC/DC control and soft-start control.

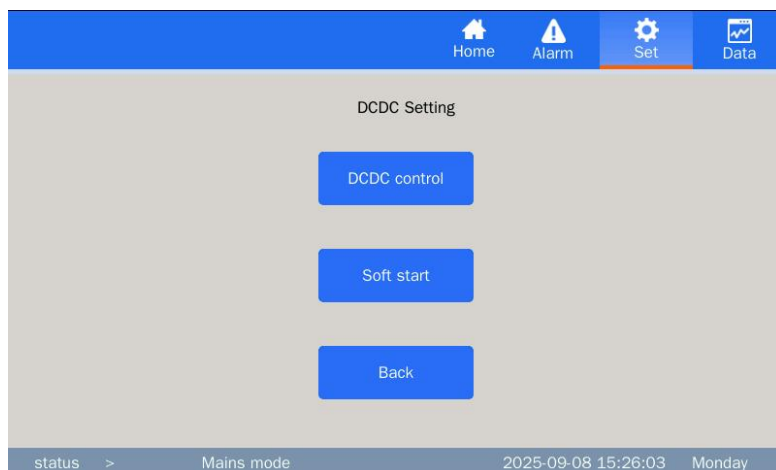


Figure 3-19 DC/DC Settings Interface

(1) DC/DC Control:

Supports controlling DC/DC module power ON/OFF and fault clearing through the monitoring system, as shown in Figure 3-20 below. Detailed descriptions are provided in Table 3-9.

Table 3-9 Description of the DC/DC Control Interface

Display Item	Functional Description
Power ON	Powers on the DC module and enables output.
Power OFF	Powers off the DC module and disconnects output; only the auxiliary power supply remains operating.
Clear Fault	After fault rectification, use this button to clear the fault and restore the DC module to normal operating status.

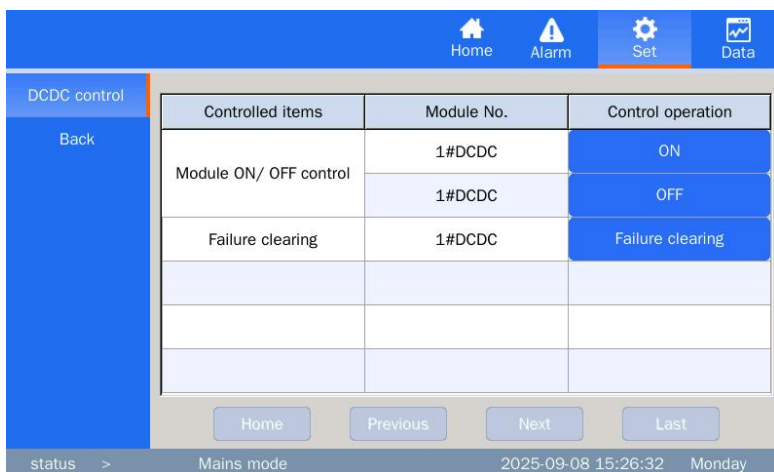


Figure 3-20 DC/DC Control Interface

(2) Soft-Start Control (Battery Startup):

1. UPS Model: EA900 Series: To perform startup under Battery Mode, soft-start is required. Follow the steps below:

Step 1: Press button ③ on the DC/DC module to power it on. The corresponding ① and ② LEDs on the DC/DC module illuminate, and the monitoring screen powers on and displays normally, indicating that the DC/DC module has powered on successfully. If the DC/DC module is already powered on, this step may be omitted. For details, refer to Figure 3-21 below.

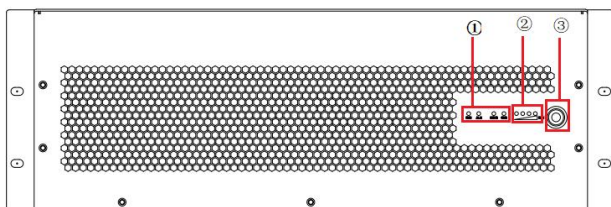


Figure 3-21 Front Panel of the DC/DC Module

Step 2: Briefly press () to illuminate the screen. Communication between the UPS and the monitoring screen is normal.

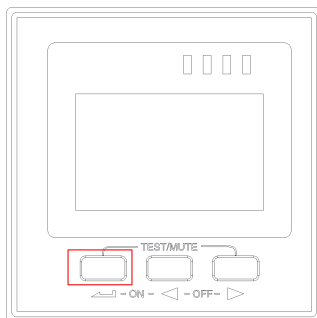


Figure 3-22 EA900 Series UPS Control Panel

Step 3: Click Monitoring Parameter Settings → DC/DC Settings → Soft-Start Control to enter Soft-Start Status.

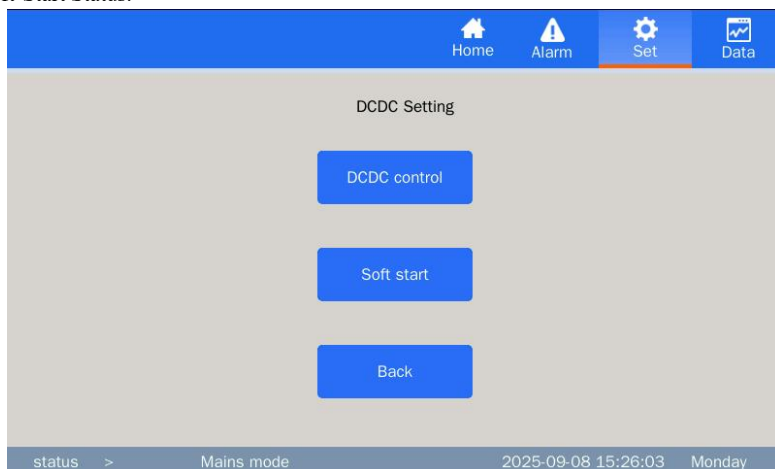


Figure 3-23 Soft-Start Control

Step 4: After clicking Soft-Start Control, the equipment enters the startup process. Upon completion of the soft-start procedure, the equipment powers on automatically.

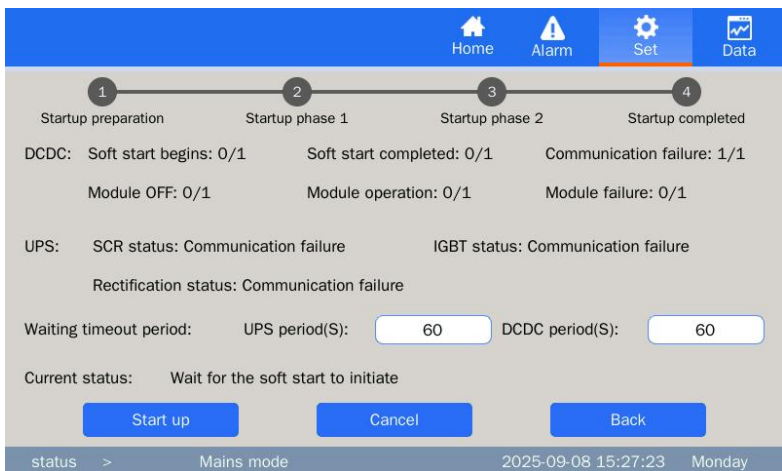


Figure 3-24 Soft-Start Control Interface

3.2.3.5 Maintenance Settings

Includes functions such as screen calibration, monitoring restart, log export, and restoration to factory settings, as shown in Figure 3-28 below. Detailed descriptions are provided in Table 3-10.

Table 3-10 Description of the Maintenance Settings Interface

Display Item	Functional Description
Screen Calibration	Click the Screen Calibration button. According to the prompts on the monitoring screen, the screen restarts and begins calibration to ensure efficient and accurate touchscreen operation.
Restore Factory Settings	Restores factory settings, and all screen-related settings are restored to their factory default values.
Restart Monitoring	Restarts the monitoring system.
Export Logs	Connect a USB interface and click the Export Logs button. The system begins exporting logs. When the progress bar below reaches 100%, the message “Log Export Successful” is displayed. Relevant alarm information, historical alarms, operation records, and parameter information of the DC/DC modules and UPS modules are exported to an Excel spreadsheet.

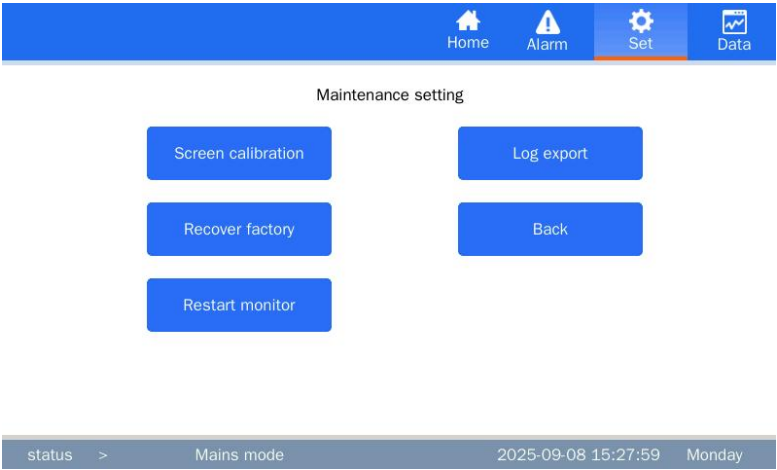


Figure 3-28 Maintenance Settings Interface

3.2.4 Information Inquiry

The Information Inquiry interface mainly includes UPS Information and DC/DC Information, enabling real-time monitoring of the current operating status, voltage, current, remaining capacity, and other parameter information of the equipment. For details, refer to Figure 3-29 below.

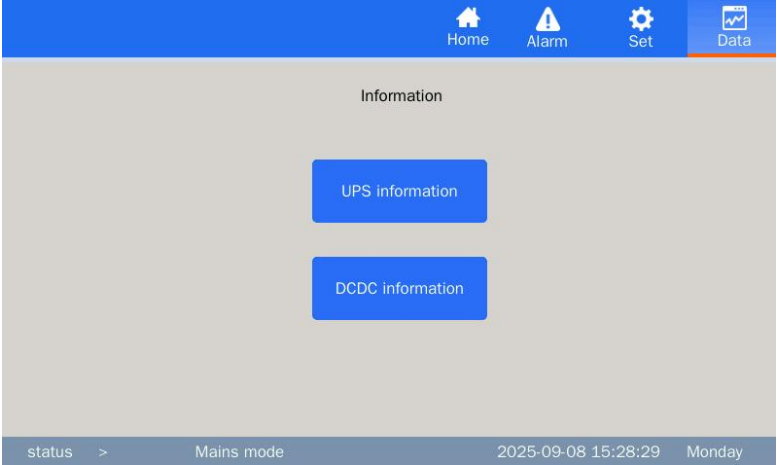


Figure 3-29 Information Inquiry Interface

3.2.4.1 UPS Information

Click the UPS Information button to query related parameter information such as the voltage, current, and power of the UPS main path, bypass, output, and battery under the current operating status. (Clicking the power flow diagram button on the Main Menu interface allows direct access to the corresponding Information Inquiry interface.)

Table 3-11 Description of the Main Path Interface

Display Item	Description
--------------	-------------

Display Item	Description
Main Path Voltage (V)	Main path input phase voltage.
Main Path Current (A)	Main path input phase current.
Main Path Frequency (Hz)	Main path input frequency.
Main Path PF	Main path input power factor.

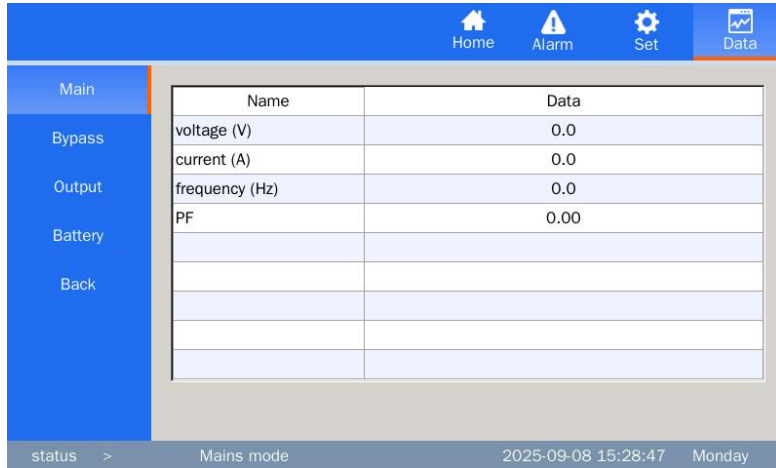


Figure 3-30 Main Path Information Interface

Table 3-12 Description of the Bypass Interface

Display Item	Description
Bypass Voltage (V)	Bypass input phase voltage.
Bypass Current (A)	Bypass input phase current.
Bypass Frequency (Hz)	Bypass input frequency.
Bypass PF	Bypass input power factor.

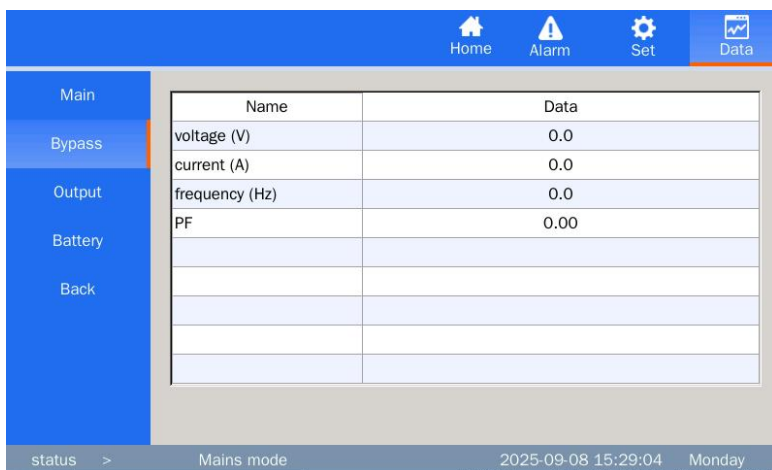


Figure 3-31 Bypass Information Interface

Table 3-13 Description of the Output Interface

Display Item	Description
Output Voltage (V)	AC output phase voltage.
Output Current (A)	AC output phase current.
Output Frequency (Hz)	AC output frequency.
Output PF	Output power factor of each phase of the unit.
Output Apparent Power (kVA)	Output apparent power of each phase of the unit.
Output Active Power (kW)	Output active power of each phase of the unit.
Output Load Percentage (%)	Load ratio of each phase of the unit, namely the ratio of actual power to rated power.

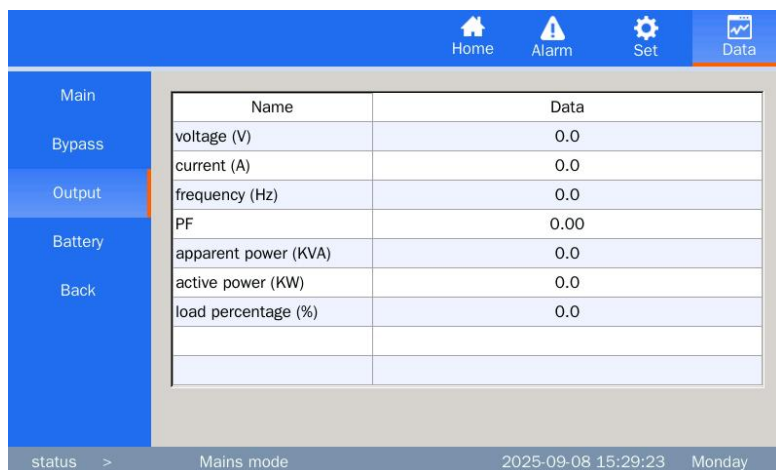


Figure 3-32 Output Information Interface
Table 3-14 Description of the Battery Interface

Display Item	Description
Battery Voltage (V)	DC module output voltage.
Battery Current (A)	DC module output current.
Battery Remaining Capacity (%)	Current remaining battery capacity percentage.
Battery Remaining Time (Min)	Estimated battery discharge duration under the current load condition.
Battery Temperature (°C)	Current operating temperature of the battery (optional battery temperature sensor required; “NA” is displayed when not connected).

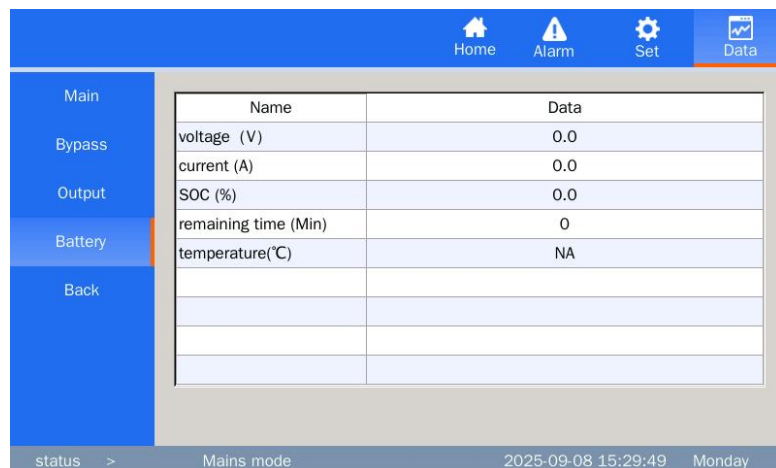


Figure 3-33 Battery Information Interface

3.2.4.2 DC/DC Information

a. Click the DC/DC Information button to query information such as the current DC module status, DC-side output voltage, current, battery DOD status, and EOD status under the current operating condition. For details, refer to Table 3-15 and Figure 3-34 below.

Table 3-15 Description of the DC Information Interface

Display Item	Description
DC-Side Output Voltage (V)	DC module output voltage.
DC-Side Output Current (A)	DC module output current.
Module Status	Displays the current power ON/OFF status of the DC module when communication is normal.
Charge/Discharge Status	Displays the current DC module status as Charging, Discharging, or Neither Charging nor Discharging when communication is normal.
Battery DOD	Displays status “None” when the module has not reached the DOD voltage. Displays status “DOD” when the module voltage reaches the configured DOD voltage.
Battery EOD	Displays status “None” when the module has not reached the EOD voltage. Displays status “EOD” when the module voltage reaches the configured EOD voltage.
Equipment Model	DC module model.
Default Version Number	DC module version number.

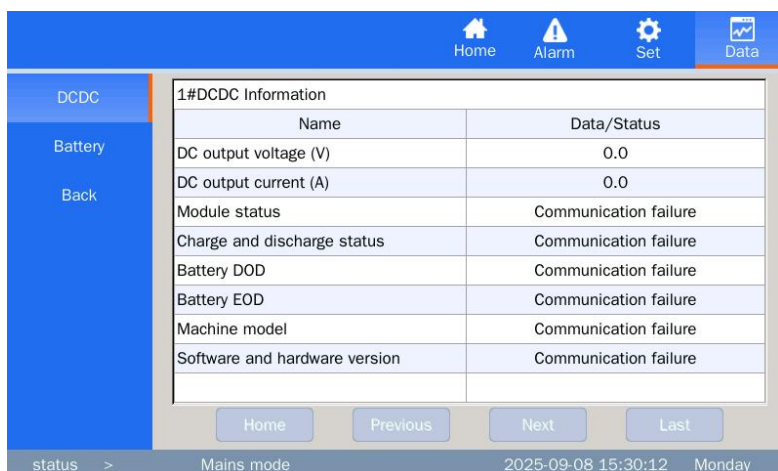


Figure 3-34 DC/DC Information Interface

b. Click the Battery Information button to query information such as the total voltage of the internal battery of the DC module, individual cell voltages, SOC, SOH, and temperature under the current operating condition. For details, refer to Table 3-16 and Figure 3-35 below.

Table 3-16 Description of the Battery Information Interface

Display Item	Description
Total Battery Voltage (V)	Total voltage of the DC module battery pack.
Battery Current (A)	Battery-side output current of the DC module.
SOC (%)	Percentage of remaining battery capacity of the DC module.
SOH (%)	Battery monitoring status of the DC module.
Highest Temperature (°C)	Highest temperature among all individual battery cells in the DC module battery pack.
Lowest Temperature (°C)	Lowest temperature among all individual battery cells in the DC module battery pack.
Highest Cell Voltage (V)	Highest voltage among all individual battery cells in the DC module battery pack.
Lowest Cell Voltage (V)	Lowest voltage among all individual battery cells in the DC module battery pack.

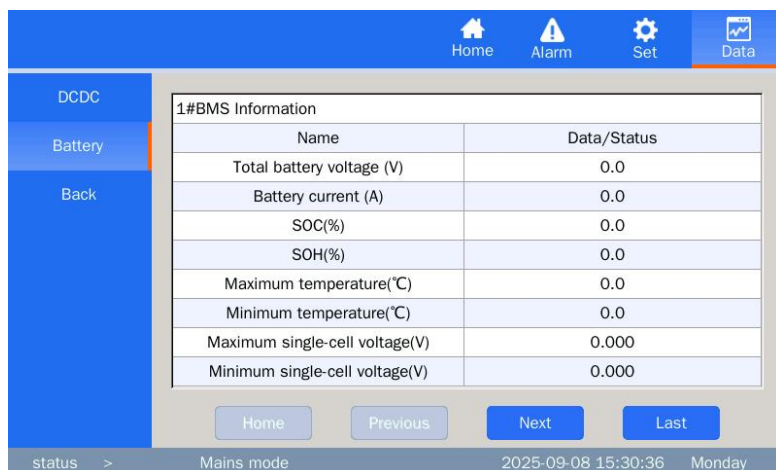


Figure 3-35 Battery Information Interface

Table 3-17 Description of the Battery Status Interface

Display Item	Description
Charge/Discharge Status	Three battery pack statuses of the DC module: Charging, Discharging, and Idle.
Charging Allowed	Indicates whether charging of the DC module battery pack is permitted.
Discharging Allowed	Indicates whether discharging of the DC module battery pack is permitted.
Cell Cycle Count	Charge/discharge cycle count of the DC module battery pack.
Battery Cell Information	Voltage and temperature information of each individual battery cell in the DC module battery pack.



Figure 3-36 Battery Status Interface

Chapter 4 Maintenance

4.1 Integrated Sodium-Ion Battery UPS Maintenance

- Personnel performing the following operations must receive professional training. Before operating or maintaining the Integrated Sodium-Ion Battery UPS, personnel shall wear anti-static work clothing, anti-static gloves, and an anti-static wrist strap, and remove conductive objects such as jewelry and watches to avoid electric shock or burns.
- All internal maintenance and servicing operations must be performed using insulated tools and shall be carried out only by personnel who have received relevant training. Components located behind protective covers that require tools for removal are not user-serviceable components. For maintenance requirements, please contact the Company's Customer Service Center.
- Only qualified maintenance engineers are authorized to maintain the power modules and bypass modules.
- Maintenance of the equipment shall be performed in accordance with the following requirements; otherwise, normal operation may be affected and the service life may be reduced.

4.1.1 Monthly Maintenance

Inspection Item	Standard Requirements	Corrective Actions for Abnormalities
Operating Environment	➤ Ambient temperature: -20°C to 45°C ➤ Humidity: 0% RH to 95% RH (non-condensing) ➤ Input voltage: 1) Single-phase 220V AC 2) Three-phase 380V AC ➤ Frequency: 40Hz to 70Hz	If the temperature or humidity is abnormal, inspect the air-conditioning system. If the input voltage is abnormal, verify utility grid conditions and input wiring. If the output voltage is abnormal, verify the operating status and check for alarms.

Inspection Item	Standard Requirements	Corrective Actions for Abnormalities
Noise	70 dB at 25°C ambient temperature, standard atmospheric pressure, and 100% load	Verify whether the fans are operating properly and check for alarms.
Dynamic Environment Monitoring System	All graphical display units on the monitoring panel shall operate normally, all power operating parameters shall remain within the normal range, and no fault or alarm information shall appear in the displayed records.	If alarms are present, inspect equipment status and parameters according to the alarm information.
Abnormal Noise	No abnormal noise	Inspect the source of abnormal noise, with particular attention to the UPS and DC modules. If the cause cannot be identified, promptly contact the Customer Service Center.
Cleanliness	Gently wipe the cabinet surface with white paper; no obvious blackening shall be present.	Remove dust.
Cables	Cable connections shall be intact, with no aging or damage.	If damage is found, analyze the cause of damage and pay attention to rodent protection.
Power Variation	-	Periodically inspect and record power variation curves.
Component Functional Status	-	Periodically inspect whether all optional accessories are functioning properly. If abnormalities are found, promptly contact the Customer Service Center for replacement.

Inspection Item	Standard Requirements	Corrective Actions for Abnormalities
Complete the Integrated Sodium-Ion Battery UPS Maintenance Report	-	Classify and handle abnormal conditions and alarms.
Export Alarm Information	-	Analyze and generate alarm analysis reports.

4.1.2 Quarterly Maintenance

In addition to repeating all monthly inspections, the inspections shown in Table 4-1 below shall also be performed.

Table 4-1 Quarterly Maintenance

Inspection Item	Standard Requirements	Corrective Actions for Abnormalities
Cleanliness	Gently wipe the cabinet surface with white paper; no obvious blackening shall be present.	Remove dust, especially accumulated dust on fans and air inlet/outlet vents.
External Cables and Terminals	No signs of aging, damage, arcing, or looseness.	Replace cables. Reinforce all output terminals.
Internal Cables and Wiring Harnesses	Cable insulation jackets shall be free from damage, cracking, or abrasion.	Reinforce all power cable connection terminals and inter-board wiring harnesses.
Input/Output Transformers (if applicable)	No overheating discoloration, delamination, peeling, or other abnormalities; connection terminals shall be secure and free from rust or corrosion.	Tighten terminals. Replace the transformer if overheating discoloration, delamination, peeling, rust, or corrosion occurs.

Inspection Item	Standard Requirements	Corrective Actions for Abnormalities
Parameter Inspection	Input, output, battery, and load voltages and currents measured using a multimeter and clamp meter shall be consistent with system requirements and LCD display values.	Reconfigure settings.

4.1.3 Semi-Annual Maintenance

Repeat all quarterly maintenance and inspection procedures.

Remove dust from the top, interior, front, and other areas.

Inspect whether the connection nuts between components are loose. Any loose nuts found shall be retightened promptly.

4.1.4 Annual Maintenance

Repeat all semi-annual maintenance and inspection procedures.

To prevent system failures caused by wear-related failure of certain components and functional modules, replacement within the expected service life is recommended. The life expectancy parameters and recommended replacement intervals for key components are shown in Table 4-2.

Table 4-2 Life Expectancy Parameters and Recommended Replacement Intervals for Key Components

Key Component	Expected Service Life	Recommended Replacement Interval
UPS	≥ 7 years (62,000 hours)	5 to 6 years
Monitoring System	≥ 7 years (62,000 hours)	5 to 6 years
Sodium-Ion Battery DC/DC Module	10 years	8 to 9 years

Chapter 5 Troubleshooting

For common faults, please refer to the handling methods provided in Table 5-1 below. If problems that are difficult to identify or resolve are encountered during troubleshooting, or if any other issues arise, please contact the Company's Customer Service Center.

Table 5-1 Common Fault Handling

Case	Fault Phenomenon	Cause Analysis	Corrective Action
Monitoring screen black screen, frozen, or no display	After the display enters screen saver mode, tapping the screen cannot wake it up, and touch operation is unresponsive.	Check whether the display screen is powered on.	Check the tightness of the monitoring screen power plug. Power off and restart the system. If restarting is ineffective or the above operations cannot resolve the issue, please contact the Customer Service Center.
UPS equipment offline or communication fault	UPS communication connection is interrupted, and the monitoring system displays a communication fault.	Communication equipment connection terminals are loose.	Confirm that the terminals are securely connected.
		Incorrect operation of the equipment address.	Check whether the module settings, UPS type, and communication port are correct. If the above operations cannot resolve the issue, please contact the Customer Service Center.
DC/DC module equipment offline or	DC/DC module communication connection is interrupted, and the	Communication equipment connection terminals are loose.	Confirm that the terminals are securely connected.

Case	Fault Phenomenon	Cause Analysis	Corrective Action
communication fault	monitoring system displays a communication fault.	Incorrect operation of the equipment address.	Check whether the module settings, DC/DC module quantity, communication acquisition method, communication port address, and related parameters are correct. If the above operations cannot resolve the issue, please contact the Customer Service Center.
UPS overload or short-circuit alarm triggered	Alarm indicator illuminates and the buzzer sounds.	Output overload or output short circuit.	Remove non-critical loads. Check for short-circuit points.
Abnormal noise or odor from the UPS	Abnormal noise is heard inside the UPS, and an unusual odor can be detected.	Internal UPS fault.	Immediately shut down the UPS, disconnect the input power supply, and contact the local Customer Service Center for technical support.
Battery pack fault	After battery startup is completed, the battery automatically shuts down shortly afterward.	Battery pack voltage is too low or the battery pack is damaged.	Promptly charge the DC module or replace it with a new module. If the above operations cannot resolve the issue, please contact the Customer Service Center.

Chapter 6 Technical Specifications

Appendix 1: EA900YN Series Characteristics

Model	EA906/9010YN		EA9910/9920YN		EA9930/9940YN	
Rated Capacity	6KVA	10KVA	10KVA	20KVA	30KVA	40KVA
Input Characteristics						
Input Phase Configuration	Single-phase three-wire system (1Φ+N+PE)		Three-phase five-wire system (3Φ+N+PE)			
Rated Input Voltage	208/220/240Vac		380/400/415Vac			
Rated Input Frequency	50/60 Hz		50/60 Hz			
Input Voltage Range	110~176Vac(50%~100% load linear derating) 176~288Vac(no derating)		228~304Vac(50%~100% load linear derating)304~478Vac(no derating)			
Input Frequency Range	40 Hz-70 Hz					
Input Power Factor	≥0.99					
Input Current THDi	< 5% (linear load)		< 3% (linear load)			
Battery Module Voltage	240 VDC					
Output Characteristics						
Output Phase Configuration	Single-phase three-wire system (1Φ+N+PE)		Three-phase five-wire system (3Φ+N+PE)			
Rated Output Voltage	208/220/230/240Vac		380/400/415Vac			
Rated Output Frequency	50/60 Hz		50/60 Hz			
Output Power Factor	≥0.99					

Output Voltage Accuracy	±1% (linear load)			
Output Frequency Accuracy	50/60Hz±0.1%			
Output THDu	THD <1% (linear load), THD < 4% (non-linear load)		THD <1% (linear load),THD < 3% (non-linear load)	
Overload Capacity	105%~110%, 10 minutes; 110%~125%, 1 minute; 125%~150%, 30 seconds		<110%, 60 minutes; 110%~125%, 10 minutes; 125%~150%, 1 minute; >150%, 200 ms	
System Characteristics				
System Characteristics	Online Mode: 94%; ECO MODE: 98%		Online Mode: 95%; ECO MODE: 98%	
Transfer Time	0 ms			
Display	LCD			
Communication Interfaces	Standard: RS232, RS485, Cold Start			
Protection Functions	Battery low-capacity protection, output overload protection, output short-circuit protection, overtemperature protection, etc.			
Operating Environment				
Operating Temperature	0~40℃			
Storage Temperature	-25℃~55℃(excluding battery)			
Relative Humidity	0%~95% (non-condensing)			
Noise (measured at 1 m from equipment)	≤55dB	≤58dB	≤60dB	≤65dB
Altitude	Altitude ≤1000 m; above 1000 m, derating by 1% for every additional 100 m increase in altitude			
Other Characteristics				
Dimensions (W × D × H)	600*850*1600(mm)			600*850*2000 (mm)

Maximum Battery Pack Module Quantity	6	8
UPS Input Distribution Module	Input switch, output switch, maintenance switch, battery switch, surge protection unit (4U height)	

Appendix 2: Technical Specifications of Sodium-Ion Battery DC/DC Module (EUN24050R15S1P)

Product Model		EUN24050R15S1P
Basic Parameters	Cathode Material	Sodium Iron Phosphate (NaFePO ₄)
	Design Life	10 years
	Rated Capacity	50AH/2280WH
	Cooling Method	Air cooling
Electrical Characteristics	Output Voltage	240VDC
	Maximum Output Power	7500W@240V
	Maximum Charging Current	8A@270V
	Startup Time	50-60S
	Maximum Parallel Quantity	CAN:16 units
	Cycle Life	3000 cycles (1C, 80% DOD, 25°C)
Mechanical Characteristics	Dimensions (W × D × H)	440 mm × 700 mm × 160 mm (3U) (excluding mounting ears)
	Weight	≤46.5 KG
	Installation Type	Standard 19-inch rack
	Communication Interfaces	CAN/RS485; 1 DO; 1 DI
Environment	Operating Temperature	0°C~40°C without derating; 40°C~50°C with linear power derating to 50%
	Storage Temperature	0°C~55°C
	Transportation Temperature	-40°C~+60°C
	Relative Humidity	0%~95% (non-condensing)
	Altitude	Altitude ≤1000 m; above 1000 m, derating by 1% for every additional 100 m increase, up to a maximum altitude of 5000 m

Appendix 3: UPS & DC Battery Module Backup Time Table

Table 4 Battery Module Backup Time(UPS Power Rating: 6 kW (1:1)) (Unit: minutes)

Battery Module Quantity	Actual Load (kW)									
	6kW	5.4kW	4.8kW	4.2kW	3.6kW	3.0kW	2.4kW	1.8kW	1.2kW	0.6kW
1	18	20	23	26	30	36	46	61	91	182
2	36	41	46	52	61	73	91	122	182	365
3	55	61	68	78	91	109	137	182	274	547
4	73	81	91	104	122	146	182	243	365	730
5	91	101	114	130	152	182	228	304	456	912

Table 5 Battery Module Backup Time(UPS Power Rating: 10 kW (1:1)) (Unit: minutes)

Battery Module Quantity	Actual Load (kW)									
	10 kW	9 kW	8 kW	7 kW	6 kW	5 kW	4 kW	3 kW	2 kW	1 kW
1	/	/	/	/	18	22	27	36	55	109
2	22	24	27	31	36	44	55	73	109	219
3	33	36	41	47	55	66	82	109	164	328
4	44	49	55	63	73	88	109	146	219	438
5	55	61	68	78	91	109	137	182	274	547

Table 6 Battery Module Backup Time(UPS Power Rating: 10 kW (3:3)) (Unit: minutes)

Battery Module Quantity	Actual Load (kW)									
	10 kW	9 kW	8 kW	7 kW	6 kW	5 kW	4 kW	3 kW	2 kW	1 kW
2	22	24	27	31	36	44	55	73	109	219
4	44	49	55	63	73	88	109	146	219	438

Table 7 Battery Module Backup Time(UPS Power Rating: 20 kW (3:3)) (Unit: minutes)

Battery Module	Actual Load (kW)									
	20 kW	18 kW	16 kW	14 kW	12 kW	10 kW	8 kW	6 kW	4 kW	2 kW

Quantity										
2	/	/	/	/	18	22	27	36	55	109
4	22	24	27	31	36	44	55	73	109	219
6	33	36	41	47	55	66	82	109	164	328
8	44	49	55	63	73	88	109	146	219	438

Table 8 Battery Module Backup Time(UPS Power Rating: 30 kW (3:3)) (Unit: minutes)

Battery Module Quantity	Actual Load (kW)									
	30 kW	27 kW	24 kW	21 kW	18 kW	15 kW	12 kW	9 kW	6 kW	3 kW
2	/	/	/	/	/	/	18	24	36	73
4	/	/	18	21	24	29	36	49	73	146
6	22	24	27	31	36	44	55	73	109	219
8	29	32	36	42	49	58	73	97	146	292

Table 9 Battery Module Backup Time(UPS Power Rating: 40 kW (3:3)) (Unit: minutes)

Battery Module Quantity	Actual Load (kW)									
	40 kW	36 kW	32 kW	28 kW	24 kW	20 kW	16 kW	12 kW	8 kW	4 kW
2	/	/	/	/	/	/	/	18	27	55
4	/	/	/	/	18	22	27	36	55	109
6	16	18	21	23	27	33	41	55	82	164
8	22	24	27	31	36	44	55	73	109	219

Notes:

- When only one battery module is configured, the UPS can support a maximum load of 6.75 kVA and may not be capable of operating under full-load conditions.
- “/” indicates that the load ratio exceeds the battery discharge capability; therefore, such a configuration is not supported.
- Actual backup time may vary depending on factors such as battery configuration, service life, ambient temperature, and storage conditions.

- The above backup time data is based on factory conditions. As battery capacity gradually decreases during service life, the corresponding backup time will also decrease. The backup time values are provided for reference only.