Hertzkron

Active Harmonic Filter

User Manual

Content

Preface

Dear Valued Customer,

Thank you for choosing the Active Harmonic Filter.

For safe and convenient use, and for proper maintenance, please read this user manual carefully before using the device and keep it handy for future reference.

Please adhere to the operating procedures and precautions that outlined in this manual.

Please neither attempt to disassemble or repair it by yourself, nor hand it over to unauthorized service departments If the device encounters any issues. On the contrary please contact our technical service team and provide your name, address, phone number, device model, purchase date, and a description of the fault. We are dedicated to serving you.

Due to product upgrades and technological advancements, the Active Harmonic Filter may differ from the user manual. We apologize for any errors, omissions, or inconsistencies that arise.

Chapter I Safety Precautions

1.1 About This Manual

1) This manual covers the installation and operation of the Active Harmonic Filter. Please read this manual before installation.
2) Only qualified personnel are permitted to operate the equipment, including installation, operation, maintenance, inspection, and removal. It is strictly prohibited for anyone other than our company's technical personnel and qualified users to operate this equipment.
3) Any modification, disassembly, disabling of components, or replacement of parts, may affect the safety performance of the equipment. Not using original parts may affect the working and safety performance of the equipment and will be considered as an automatic waiver of the quality guarantee.
4) Ensure that the equipment is properly grounded before power on. Poor grounding can cause abnormal operation and electric shock hazards.
5) Please wait for at least 10 minutes before disassembling the enclosure. Use a special instrument to test the DC bus voltage and ensure that the residual voltage in the DC capacitors is completely discharged before disassembling components, otherwise, there is a risk of electric shock.
6) Poor ventilation can cause overheating problem and damage the equipment. Do not cover the ventilation openings and ensure the equipment is kept away from any heat sources.
7) When transportation and storage, ensure that the equipment is not exposed to rain or water, not subjected to high temperatures, not corroded by salt fog, and not stored in a dusty environment.

1.2 Safety Labels

To ensure the personal and property safety of users while using this product, as well as to facilitate better product usage, this manual provides relevant information and highlights it with appropriate symbols.

The following are the symbols that may be used in this manual. Please read them carefully.

ATTENTION

Failure to follow the requirements of this manual may result in damage or malfunction of the equipment!

WARNING

Failure to follow the requirements of this manual may result in equipment damage and minor injury to personnel!

DANGER

Failure to follow the requirements of this manual may result in serious accidents, severe injury, or death!

Whenever these symbols are used in this manual, they indicate important safety information. Failure to follow these precautions may result in economic losses, damage to this product, associated components, or enclosures, and may even lead to minor or serious injury or death. Additionally, our company assumes no responsibility for any injuries or equipment damage caused by your company or your company's clients not adhering to the contents of this manual.

1.3 Safety Precautions

Before Installation	
 Danger	1) Do not install if you find water inside the box, missing components, or noticeable damage upon unpacking . 2) Do not install if the packing list does not match the actual items or the ordered equipment.
 Attention	1) This equipment is intended for commercial and industrial use only and should not be used as a power source for any life-support devices. 2) When handling the module, ensure that you firmly hold the enclosure. Dropping it during handling may pose a risk of injury and may also damage the equipment. 3) Handle the module gently to avoid damaging it. 4) Do not use modules that are damaged or have missing parts, as this poses a risk of injury. 5) The device has undergone a high-voltage test before leaving the factory. Do not perform any high-voltage testing on any parts of the device without confirmation from company technical personnel. High voltage testing may damage the equipment's insulation and internal components.

During Installation	
 Danger	1) Installation, maintenance, inspection, or component replacement should not be performed by individuals who are not qualified electrical professionals. Failure to do so may pose a risk of electric shock! 2) For modification projects, when installing primary cables or current sampling secondary lines, ensure that the system is de-energized and that the surrounding area is safe for work. Failure to ensure these conditions may result in electric shock hazards and could lead to serious injury or death!
 Attention	1) When connecting the input cables, ensure that the equipment is properly grounded. The grounding must comply with local electrical regulations. 2) Handle the module with care during installation and avoid dropping or bumping it. Damage resulting from improper handling is not covered under the company's responsibility or warranty. 3) When placing two or more modules in the same cabinet, ensure they are positioned correctly to guarantee effective heat dissipation. It is recommended to add cooling systems such as fans. 4) The installation location of the module should ensure adequate ventilation. Do not obstruct the module's built-in cooling fan's air intake and exhaust vents. 5) The installation location of the module should allow for safe maintenance and adjustment by after-sales personnel. 6) For wall-mounted modules, install them in areas with minimal foot traffic and ensure that safety hazard labels are clearly visible. 7) Avoid installing the module in environments with conductive dust, volatile gases, corrosive substances, or excessive salt.
During Running	
 Danger	1) Do not open the cover after powering on. Failure to adhere to this precaution may result in electric shock and potential injury or death. 2) Do not install or wire the equipment while it is running. 3) Do not touch any primary or secondary terminals of the module. Doing so may pose an electric shock hazard and could result in injury or death. 4) This equipment must be commissioned by the manufacturer or its authorized agents. Any other operation should only be carried out under the guidance of our company's after-sales engineers. Unauthorized operation is prohibited and may cause equipment damage or even result in injury or death.
 Attention	1) Do not change the factory settings of the device while it is operating, as this may cause damage to the equipment. 2) Avoid letting any objects fall into the equipment during operation. This may cause damage to the equipment. 3) After powering on the equipment, avoid starting and stopping of the device frequently or toggling of the upstream switches frequently. 4) Please promptly power off the device and contact our technical personnel if the equipment emits abnormal noises or displays fault information during commissioning.
Maintenance	

 Danger	1) Do not perform maintenance or servicing on the equipment unless you have received professional training. Failure to do so may result in personal injury or equipment damage. 2) Do not perform maintenance or servicing on the equipment while it is live. There is a risk of electric shock. 3) Ensure that the equipment′ s input power is disconnected for at least 10 minutes before performing maintenance or repairs. Failure to do so may result in harm from residual charges in the capacitors. 4) Before performing maintenance or servicing, ensure that the equipment is safely disconnected from all power sources. 5) After replacing any parts of the equipment, parameters must be set and checked. 6) Do not power on or operate equipment that has reported a fault or is damaged, as this may exacerbate the damage.

Chapter II AHF Overview

2.1 Product Principle

The working principle of the professional model of Active Power Filter is to detect the load current in real time, separate the harmonic currents one by one based on a specified harmonic current detection algorithm, and generate a control signal according to the set filtering percentage to drive the IGBT to output a compensation current with the same amplitude but opposite phase as the load harmonic current, so as to achieve the purpose of harmonic cancellation.

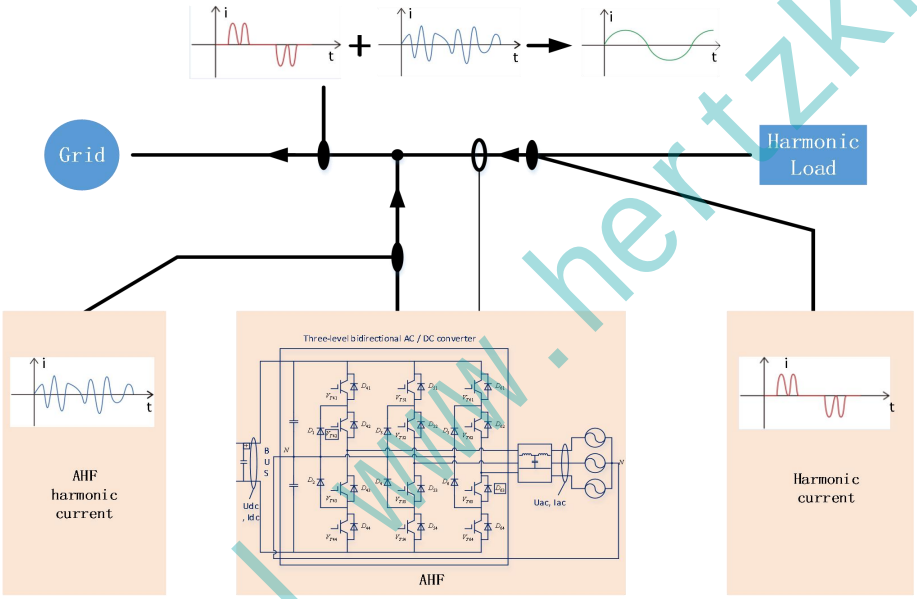


Figure 2.1: Principle Diagram of AHF

Figure 2.2: Physical Diagram of AHF Module

2.2 AHF Model Definition

The model number definition of the AHF is shown in Figure 2.3. The module specifications and dimensions are listed in Table 2.1, while the cabinet specifications and dimensions are shown in Table 2.2. The 3D diagrams of the AHF modules are illustrated in Figures 2.4 and 2.5. Detailed dimensions of modules for different capacity levels can be found in the respective module assembly drawings.

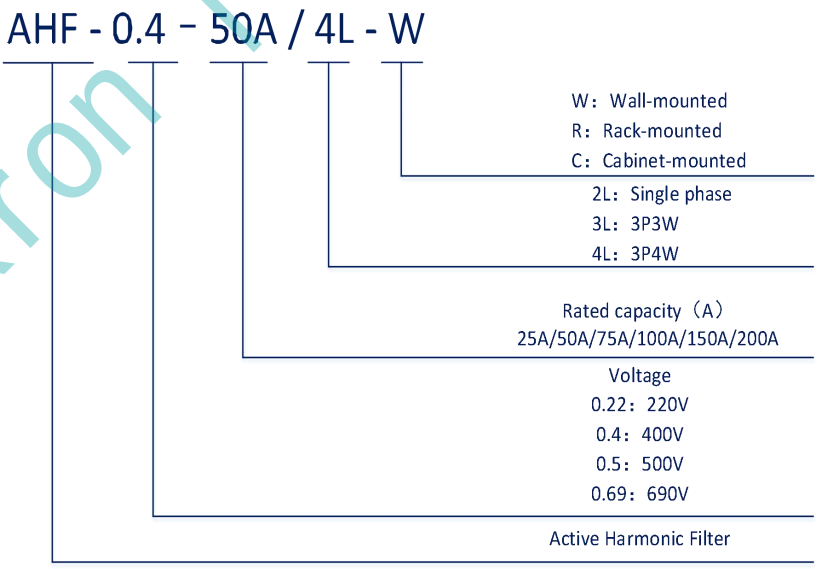


Figure 2.3: Model Specification Diagram

Table 2.1: Module Specifications and Dimensions

Module Model				
Models	**Compensation Capacity (A)**	**System Voltage (V)**	**Dimensions W * D * H (mm)**	**Net Weight (kg)**
AHF-0.4-25A/4L-W	25	400	550*460*92.2	17.4
AHF-0.4-50A/4L-W	50	400	550*460*92.2	17.9
AHF-0.4-75A/4L-W	75	400	587*500*193.2	30.1
AHF-0.4-100A/4L-W	100	400	624*500*243.2	39.6
AHF-0.4-150A/4L-W	150	400	624*500*243.2	41.6
AHF-0.4-200A/4L-W	200	400	785*511*252.0	48.9
AHF-0.5-100A/4L-W	100	500	839*500*328.5	70.1
AHF-0.69-100A/4L-W	100	690	839*500*328.5	70.1
AHF-0.8-100A/3L-W	100	800	839*500*328.5	70.1

Chapter III AHF Technical Specifications

The technical specifications for each series of modules are shown in Table 3.1.

Table 3.1: Technical Specifications for Each Series of Modules

	220V Series	380V Series	500V Series	690V Series	800V Series
Altitude	< 2000m (derated per GB/T 3859.2 above 2000m)				
Ambient Temperature	-10~+50 ℃ (derated above 40 ℃)				
Relative Humidity	≤ 90%, no condensation on surface at monthly min. temperature of 25°C				
Pollution Level	Below Level III				
Operating Voltage	AC220V (±20%)	AC380V (±20%)	AC500V (±20%)	AC690V (-20%~+15%)	AC800V (-20% ~ 850V)
Operating Frequency	50Hz/60Hz (45Hz~63Hz)				
Rated Compensation Capacity	25A	7A,15A,25A, 50A, 75A, 100A, 150A, 200A	100A		100A
Power Grid Structure	L/N	3P3W, 3P4W			3P3W
Numbers in Parallel	Unlimited				
System Efficiency	≥97%				
Switching Frequency	16kHz		12.8kHz		
Function Selection	Harmonic	● Harmonic ● Harmonic + Unbalance			Harmonic
Current Harmonic Compensation Range	2~50 times, with adjustable compensation rate per time				
Harmonic	≥95%				
Unbalance Compensation Capacity	≤5%				None
Full Response Time	<40ms				
Cooling Method	Forced Air Cooling				
Noise	≤60dB	≤65dB			
Communication	2 RS485 communication interfaces (supports WiFi)				
Protection	Overload,Software/Hardware Overcurrent,Over/Undervoltage,Unbalance, Power Supply Fault, Overtemperature, Frequency Anomaly, Short Circuit Protection				
Overload Capacity	1.2 times rated overload for 60 seconds				
Installation	Rack-Mounted, Wall-Mounted				
Entry Line Method	Rear Inlet (Rack-Mounted), Top Inlet (Wall-Mounted)				
Protection Level	IP20（IP54 is customizable）				

Chapter IV Transportation and Storage

4.1 Transportation

The product can be transported by automobile, train, airplane, and ship. It must be handled carefully during transportation. Exposure to rain, intense sunlight, severe vibration, collision, and inversion is strictly prohibited. The transportation temperature should be within the range of -40°C to +70°C.

Symbols	Description
	The module must be kept with the front side facing up. It is prohibited to lay the module horizontally, tilt, or invert.
	Handle with care to avoid damage to the module caused by excessive collision or friction during transportation.
	Take precautions against moisture to avoid the module being exposed to rain or becoming damp.

4.2 Storage

The product must not be exposed to direct sunlight or rain. It should be stored in a well-ventilated area where the surrounding temperature is between -40°C and +70°C, with a maximum relative humidity of 95% (equivalent to an air temperature of 20±5°C) and free from corrosive gases.

4.3 Unboxing and Inspection

Upon unboxing, please carefully check:

 Attention	1) Verify that the capacity and model on the cabinet nameplate, module labels that align with your order.
	2) Check the contents of the box, including: equipment, user manual, product certificate, factory inspection report, six M4X10 cross-recessed flat head screws, two mounting ears, two handles (304 stainless steel, Φ10*96mm, M5 screw holes), one each of 6P/8P/12P terminal blocks, and some accessories pre-installed on the equipment.
	3) If your order includes a centralized monitoring touchscreen, it is typically packaged separately. The package includes a 7-inch touchscreen, touchscreen installation accessories, communication cables for the touchscreen connection module, equipment engineering drawings, and insulation covers for module terminal blocks.
	4) Check for any damage during transportation. If you find any omissions or damage, please contact us promptly for resolution.

4.4 Contents of the Product Packaging

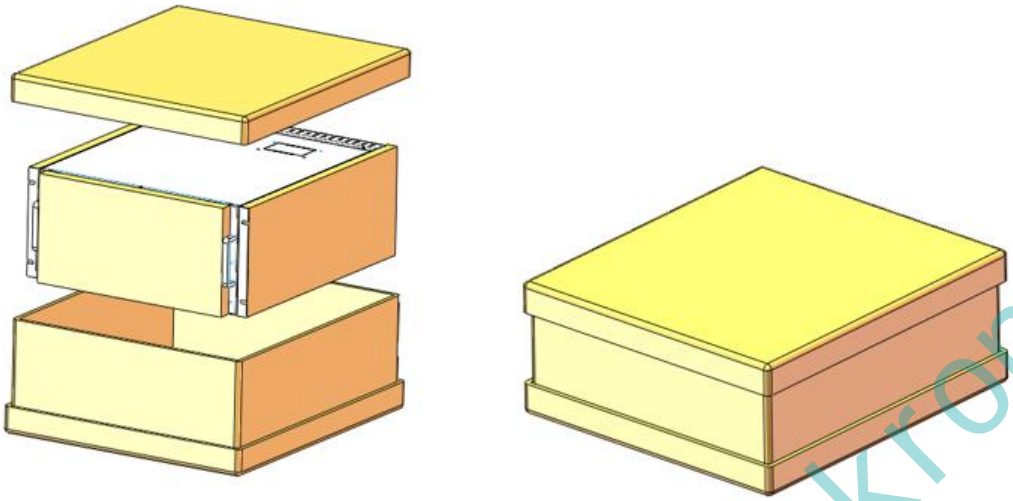


Figure 4.1: Module Packaging Illustration

4.5 Accessory Packaging Contents

1) The package contains the AHF device, a touchscreen, a user manual, a product conformity certificate, and a factory inspection report.

2) Main Unit Accessories: M4x10 Nickel-plated Iron Countersunk Head Screws (Cross-recess) x 6; Mounting Lugs x 2; Handles (304 Stainless Steel, Φ10 x 96 mm, with M5 screw holes) x 2; Terminal Blocks (6-pin, 8-pin, and 12-pin—one of each); and a Primary Wiring Protective Cover (optional—pre-installed on the device body).

3) Main Unit and Accessories (Note: Some accessories are pre-installed on the main unit body at the factory).

Chapter V Installation and System Wiring Diagram

5.1 Power Distribution Interface and Secondary Terminal Interface

The end-user only needs to select appropriate cables based on the power requirements for connecting to the fixed terminals of the equipment. The connections for each terminal are shown in Figure 5.1 and Table 5.1.

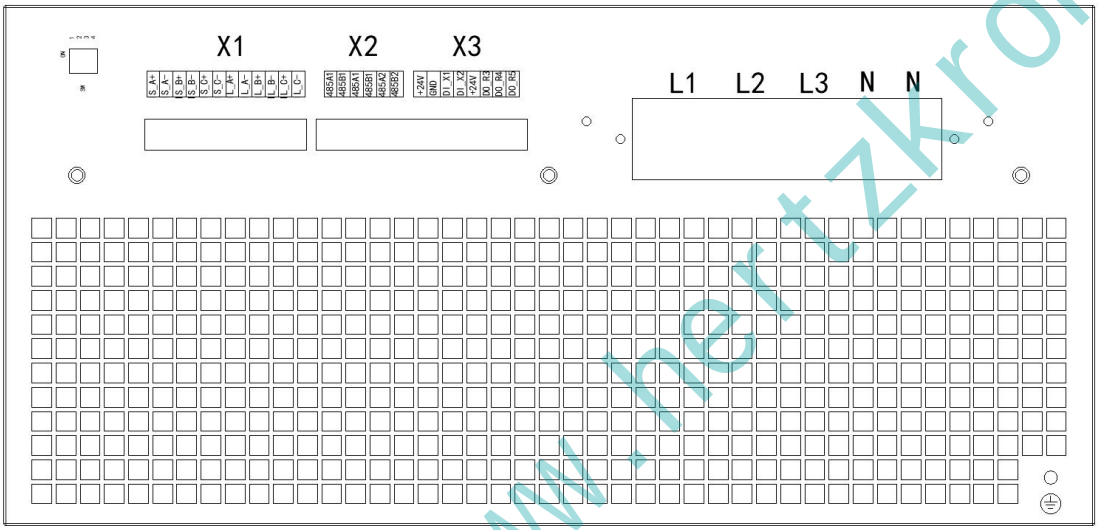


Figure 5.1: External Wiring Terminals

Table 5.1: Terminal Diagram and Description for Modules

Port name	Port labeling	Function/Description
Incoming Line for Primary Circuit Equipment	L1	Phase A Incoming Cable
	L2	Phase B Incoming Cable
	L3	Phase C Incoming Cable
	N	Phase N Incoming Cable (Both N-phase lines must be connected)
	N	Phase N Incoming Cable (Both N-phase lines must be connected)
X1 Terminal: Current Sampling (CT:5A)	IS_A+	Ia (Connects to S1 terminal of the A-phase CT on the grid side or load side)
	IS_A-	Ia (Connects to S2 terminal of the A-phase CT on the grid side or load side)
	IS_B+	Ib (Connects to S1 terminal of the B-phase CT on the grid side or load side)
	IS_B-	Ib (Connects to S2 terminal of the B-phase CT on the grid side or load side)
	IS_C+	Ic (Connects to S1 terminal of the C-phase CT on the grid side or load side)

	IS_C-	Ic (Connects to S2 terminal of the C-phase CT on the grid side or load side)
	IL_A+	Ia (Connect to the S1 terminal of the A-phase CT in this cabinet, if applicable based on the actual situation)
	IL_A-	Ia (Connect to the S2 terminal of the A-phase CT in this cabinet, if applicable based on the actual situation)
	IL_B+	Ib (Connect to the S1 terminal of the B-phase CT in this cabinet, if applicable based on the actual situation)
	IL_B-	Ib (Connect to the S2 terminal of the B-phase CT in this cabinet, if applicable based on the actual situation)
	IL_C+	Ic (Connect to the S1 terminal of the C-phase CT in this cabinet, if applicable based on the actual situation)
	IL_C-	Ic (Connect to the S2 terminal of the C-phase CT in this cabinet, if applicable based on the actual situation)
X2 Terminal: Communication Interface	485A1	Connect to the Human-Machine Interface for Communication or connect with upstream Module in chain mode
	485B1	Connect to the Human-Machine Interface for Communication or connect with upstream Module in chain mode
	485A1	Communicate with the downstream Module in chain mode
	485B1	Communicate with the downstream Module in chain mode
	485A2	Debug interface
	485B2	Debug interface
X3 Terminal: Control and Signal	+24V	Power Output Positive Terminal +24V (for powering the Human-Machine Interface)
	GND	Power Output Negative Terminal 0V (for powering the Human-Machine Interface and indicator lights)
	DI_X1	Start Signal (External dry contact button, powered through the common terminal with +24V)
	DI_X2	Emergency Stop Signal (External dry contact button, powered through the common terminal with +24V)
	+24V	DI Common Terminal (Common terminal for start and emergency stop signal power)
	DO_R3	Fault Indicator: Outputs +24V voltage (creates a voltage with GND to illuminate the indicator light)
	DO_R4	Ready Indicator: Outputs +24V voltage (creates a voltage with GND to illuminate the light)
	DO_R5	Running Indicator: Outputs +24V voltage (creates a voltage with GND to illuminate the light)
Grounding	PE	System Grounding Terminal: Since the system enclosure is metallic, to prevent potential safety hazards, ensure that this terminal is connected to earth ground before powering on the system.
Binary DIP Switch	SW	Set the Module Communication Address ("1" represents "off" and "0" represents "on"). The bit weights from left to right are 1, 2, 4, and 8. The module address is the sum of the values of the switches. A single touchscreen can connect to up to 8 modules, with addresses ranging from 1 to 8.

 Attention	Note: 1) Since the DI and DO of the module are active nodes, multiple modules' DI and DO cannot be connected in parallel. For projects with multiple modules, you can use multi-node buttons in the design (where pressing a button closes multiple normally open nodes, and releasing the button resets them). The DO circuits for multiple modules should be independently designed, with each module requiring its own independent indicator light (DO) circuit. 2) The maximum allowable secondary current for CTs is 5A.

5.2 Accessory Description

Table 5.2: Accessory description

Accessory Name	Installation Location	Function Description	Selection Recommendations
Molded Case Circuit Breaker (MCCB) (Mandatory)	1) Power input terminal of the module. 2) For rack-mounted modules, the circuit breaker is installed inside the cabinet. 3) For wall-mounted modules, the circuit breaker is installed inside the distribution box that comes with the wall-mounted module.	1) Control the module's power on/off. 2) Provides overload, short circuit, and undervoltage protection, safeguarding both the wiring and the module from damage.	1) Typically, one molded case circuit breaker is configured per module, but multiple modules can also be protected by a single larger molded case circuit breaker. 2) The rated current of the molded case circuit breaker should be selected at 1.25 to 1.5 times the rated current of the module. Choose between 3-pole or 4-pole types.
Surge Protection Device (SPD) (Optional)	1) Power input terminal of the module, connected to the upper terminal of the molded circuit breaker. 2) Installed inside the cabinet or within the distribution box.	Provides safety protection for the cabinet and modules. When surge voltages occur in the electrical circuit, the surge protection device can conduct and divert the surge in a very short time, thereby preventing over-voltage from damaging other equipment in the electrical circuit.	1) Poles: 3P+N 2) Maximum discharge current: 40kA and above
Miniature Circuit Breaker (MCB) (Optional)	Surge protection device or fan input terminal.Installed inside the cabinet or within the distribution box.	The purpose of installing an isolating switch before the surge protection device or fan is primarily to prevent fire hazards, such as burning, in the event of a sustained short circuit fault within the surge protection device's internal components.	1) Rated current: 20A and above 2)Poles: 4P
Central Monitoring Screen (Mandatory)	It can be mounted on the cabinet door for cabinet-mounted installations.It	Centralized monitoring facilitates viewing and setting parameters.	Factory-supplied accessories

	can be mounted on the distribution box door for wall-mounted installations.		
Emergency Stop Button (Optional)	Installed on the cabinet door or the distribution box door.	The emergency stop switch can be pressed immediately to stop the module from operating, effectively protecting it if an abnormal situation occurs inside the cabinet or module (such as smoke, unusual noises, or sparks).	Release type button
Fan (Mandatory)	Installed on the rear cabinet door of the cabinet	It is recommended to install 2 fans when the number of modules is ≤2. It is recommended to install 4 fans when the number of modules is >2.	1) AC 220V 50Hz 2) 87W and above 3) Airflow: 850 CFM 4) Rotation direction: Counterclockwise
Status Indicator (Optional)	Installed on the cabinet door. Connected to the circuit at the alarm output point.	Displays the statuses of the module, including running, stopping, normal, and fault conditions.	1) Any color 2) Head diameter: 22mm
Relay (Optional)	Installed inside the cabinet.	Controls the indicator light and fan	Do not connect DI/DO circuits for multiple modules in parallel.
Current Transformer (CT) (Mandatory)	Installed on the main busbar of the distribution system.	Measures the load current of the distribution system.	1) The secondary current must be 5A, with a range of 100/5 to 10000/5 available for selection. 2) Accuracy of 0.5 or better. 3) Rated burden of 2.5 VA or higher.

5.3 Primary Cable Sizing Recommendation

The selection of AHF incoming cables for different capacities and current ratings should comply with electrical regulations and consider environmental conditions. The following table can be used as a reference:

Table 5.3: Recommended Cable Cross-Sectional Area

Primary Power Cable			
Current Capacity (A)	Three-Phase Main Circuit Input (mm^2)	N Cable (mm^2)	PE Cable (mm^2)
50A	16	16	16
75A	25	25	16

100A	35	35 × 2	25
150A	50	50 × 2	35
300A	95	95 × 2	70
450A	150 or 2 x 70	150 or 2 x 70	120
600A	185 or 2 x 95	185 or 2 x 95	150
750A	240 or 2 x 120	240 or 2 x 120	185
900A	300 or 2 x 150	300 or 2 x 150	240
 Attention	1) The AHF is rated based on current; the specifications in the above table are for reference only and should be aligned with national standards. 2) In some projects where the 3rd harmonic is present, harmonic currents can accumulate on the neutral line, reaching up to three times the current of the phase line. Therefore, the neutral line specification must be one size larger than the phase line. For the 100A and 150A modules, there are two terminals for the neutral line, both of which must be connected. 3) Cables are typically selected as BVR multi-stranded copper core PVC-insulated flexible wires. 4) If aluminum cables are used, they should correspond to the appropriate copper wire specifications in terms of current-carrying capacity.		

5.4 Primary Busbar Selection Recommendation

Table 5.4: Copper Plate Selection Recommendation

Current Capacity (A)	Busbar Specifications (mm*mm)
<150	15*3
150~300	30*4
300~600	50*5
600~900	60*8

5.5 CT and Secondary Current Cable Selection Recommendation

The current transformer is primarily used in AHF to measure load current and calculate data such as harmonic current, reactive current, negative sequence current, and zero-sequence current. The following table can be used as a reference:

Table 5.5: CT Cable Selection Recommendation

Parameter	Specification Requirements	Remarks
Primary Rated Current	—	1.5 times the actual maximum operating current in the system ≤ Primary Rated Current of the Transformer

Secondary Rated Current	5A	——
Rated Voltage	≥0.66kV	——
Rated Capacity	≥2VA	——
Accuracy Class	Class 0.5 or Class 0.2	——
Size	——	Specific dimensions should be selected based on the on-site installation environment.
Wire Diameter	Three sets (six wires) of cables on the secondary side of the transformer (rated current 5A). Wire diameter: 2.5 mm^2.	

5.6 Other Cable Selection Recommendation

Table 5.6: Other Cable Selection Recommendation Table

Name	Specification
Surge Protector Primary Wiring	6mm^2 BVR Multi-strand Copper Core Flexible Wire
Fan Circuit Wiring	1.5mm^2 BVR Multi-strand Copper Core Flexible Wire.
Emergency Stop Switch Circuit Wiring	
Indicator Light Circuit Wiring	
Grounding Cable	Yellow-green BVR multi-strand copper-core flexible wire: Protective grounding PE Wire Selection Recommendation: If the cross-sectional area of the AC phase conductor is less than 16mm^2, select a grounding wire with the same cross-sectional area as the phase conductor. If the cross-sectional area of the phase conductor is between 16mm^2 and 35mm^2 (inclusive), choose a 16mm^2 grounding wire. If the cross-sectional area of the phase conductor exceeds 35mm^2, select a grounding wire with a cross-sectional area equal to half of the phase conductor.
Touchscreen Communication Cable	Power Cable: 1.0mm^2 BVR multi-strand copper-core flexible wire (pre-installed by the factory). Communication Cable: Standard plug-in cable provided by our company with the equipment.
Module Interconnection Communication Cable	For communication cables, it is recommended to use RVVP 2*0.75mm^2 shielded wire.

5.7 Installation and Wiring

5.7.1 Installation Environment

Table 5.7: Installation Environment

Installation Environment Requirements	
 Attention	1)Ambient Temperature: The surrounding environment temperature significantly affects the lifespan of the AHF. The operating temperature of the AHF must not exceed the allowed range (-10°C to 50°C). If the temperature falls below -10°C, appropriate heating equipment should be added; if the temperature exceeds 45°C, cooling and ventilation equipment such as air conditioning should be installed. 2)The AHF should be mounted on a flame-retardant surface, with sufficient space around it for heat dissipation, as it generates a significant amount of heat during operation. 3)Install in a location with minimal vibration. Vibration should not exceed 0.6G. Pay special attention to avoid locations near stamping or punching equipment. 4)Avoid installing in areas with direct sunlight, high humidity, or water droplets. 5)Avoid installation in areas with corrosive, flammable, or explosive gases. 6)Avoid installation in locations with oil contamination or dust. 7)The installation environment must not be subjected to strong magnetic fields, nuclear radiation, or high-power RF interference. 8)When installing rack-mounted modules in a cabinet, ensure the cabinet meets relevant standards and regulations. 9)Wall-mounted modules should be installed in areas with minimal foot traffic and must have prominent safety labels. 10)The wall-mounted installation location must be on a dry wall. 11) The module is cooled by an internal fan with intelligent air cooling. Ventilation openings must remain unobstructed during operation. To prevent dust from clogging the intake, regularly clean the intake openings; it is recommended to clean them every three months.

5.7.2 Installation Space

Table 5.8: Installation Space Requirements

Installation Space Requirements	
 Attention	1)Do not obstruct the module's air vents. 2)For floor-standing installations, leave at least 600mm of clearance for airflow at the front and rear of the cabinet, and ensure there is sufficient space for maintenance behind the cabinet. Additionally, ensure that the rear door of the cabinet can open and close properly. 3)For wall-mounted installations, leave at least 150mm of clearance above and below the module for proper airflow. 4)The wall-mounted installation should be positioned at least 1.5 meters above the ground and have a clearly visible electrical hazard warning label.

Rack-Mounted Installation Space Requirements:

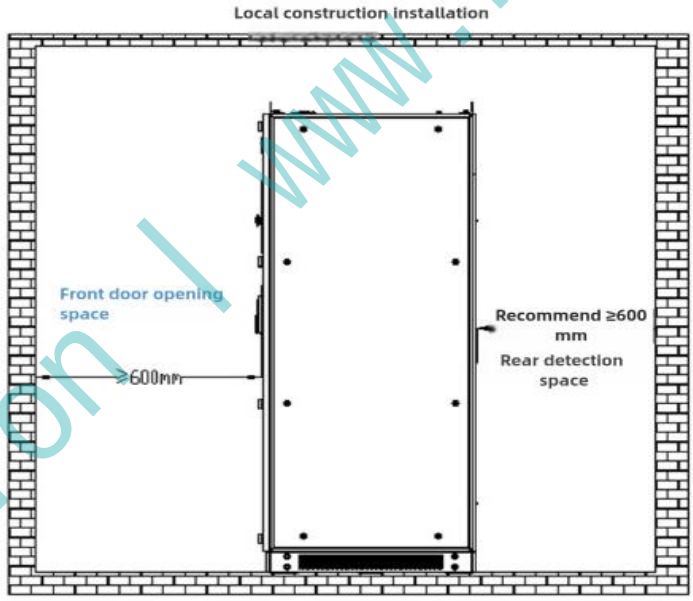


Figure 5.2: Floor-Standing Installation Space Requirements Diagram

Wall-Mounted Installation Space Requirements:

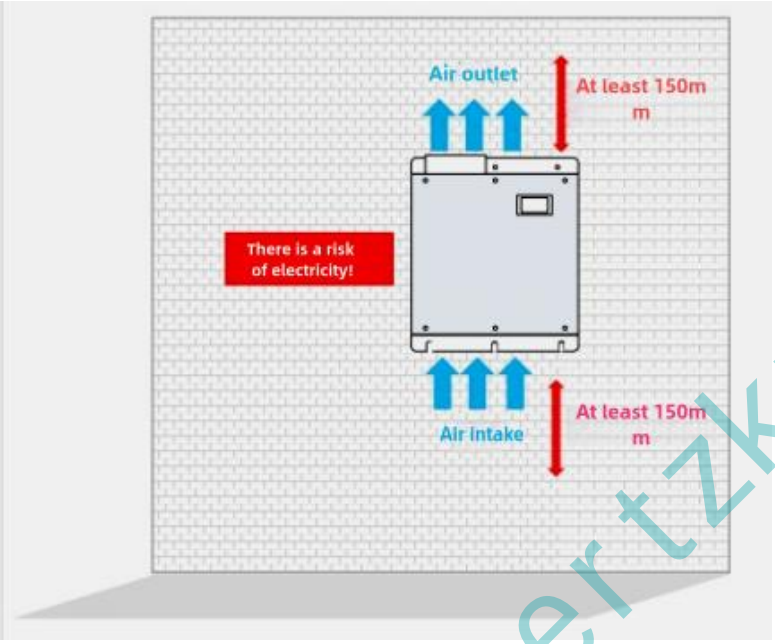


Figure 5.3: Wall-Mounted Installation Space Requirements Diagram

5.8 Installation Guidance

5.8.1 Cabinet Installation

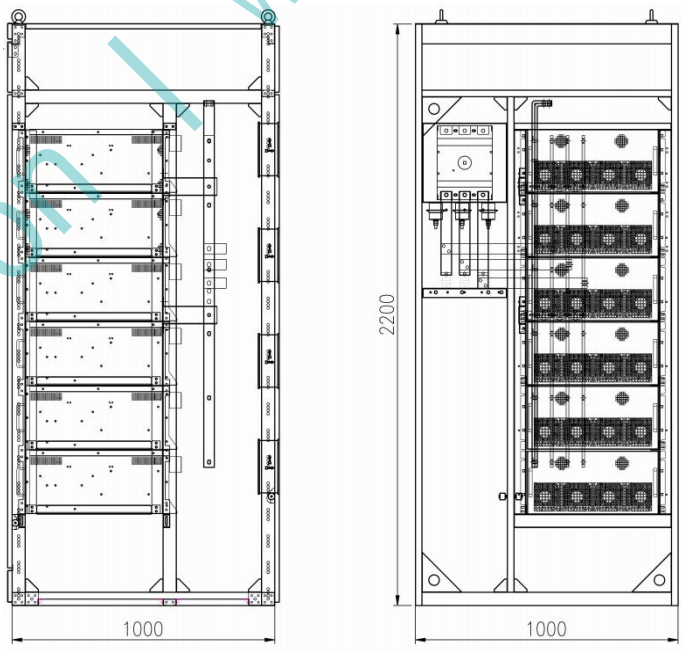


Figure 5.4: 900A Cabinet Installation Diagram

5.8.2 Module Installation:

The AHF module is available in both wall-mounted and rack-mounted versions. The main dimensions of both the wall-mounted and rack-mounted models are identical, excluding protruding parts such as structural components and handles used for mounting.

Wall-Mounted Installation:

The wall-mounted module can be installed on the wall for independent operation. The mounting hole positions are shown in Figures 5.5

Installation Method:
Use six mounting holes in the bracket and secure the module to the wall or cabinet using M8*15 cross-recessed combination screws.

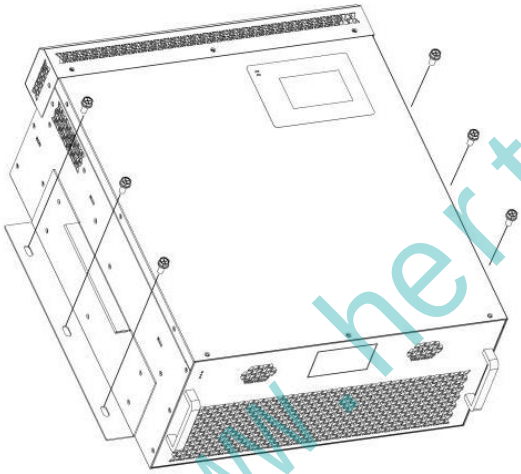


Figure 5.5: Wall-Mounted AHF Installation Diagram for Single SVG Module

Rack-Mount Installation:

When mounting the module in the rack, the location of the installation holes is as shown in Figure 5.6.
Installation Method:
Secure the module to the rack using the 4 mounting holes on the bracket with M6*15 cross-slot combination screws.

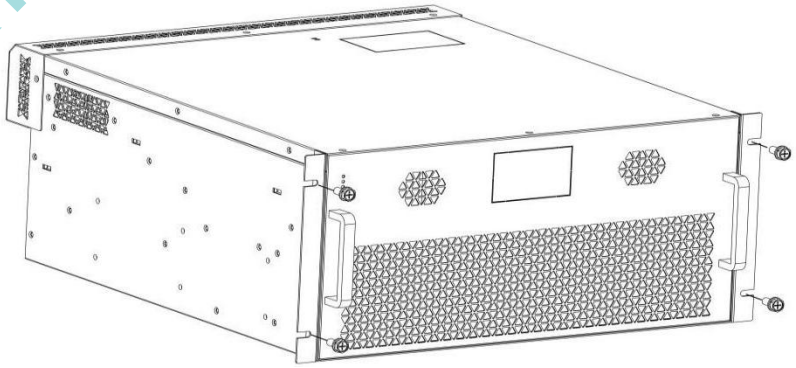


Figure 5.6: Rack-Mounted AHF Installation Hole Diagram

5.9 Cable Wiring

5.9.1 CT Installation Direction Instructions

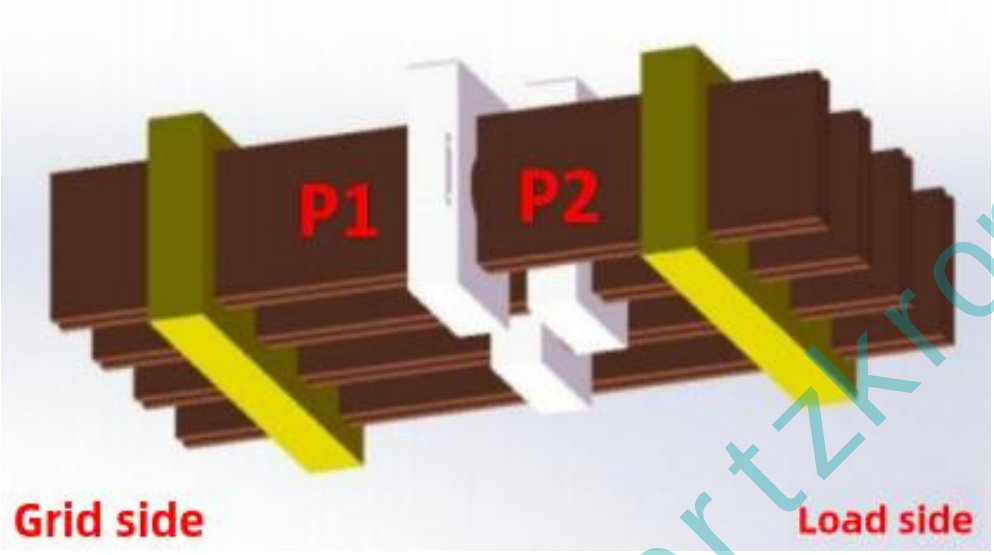


Figure 5.7: CT Installation Diagram

Attention	S1 should be the positive (+) and S2 should be the negative (-) if the current direction of the CT is from P1 to P2.

5.9.2 Single Module Single Cabinet Operating System Wiring Diagram

When operating with a single module in a single cabinet, the field-sampling CT (CT1 in Figure 5.8) should be installed on the load side as shown in Figure 5.8. The field-sampling CT can also be installed on the power side.

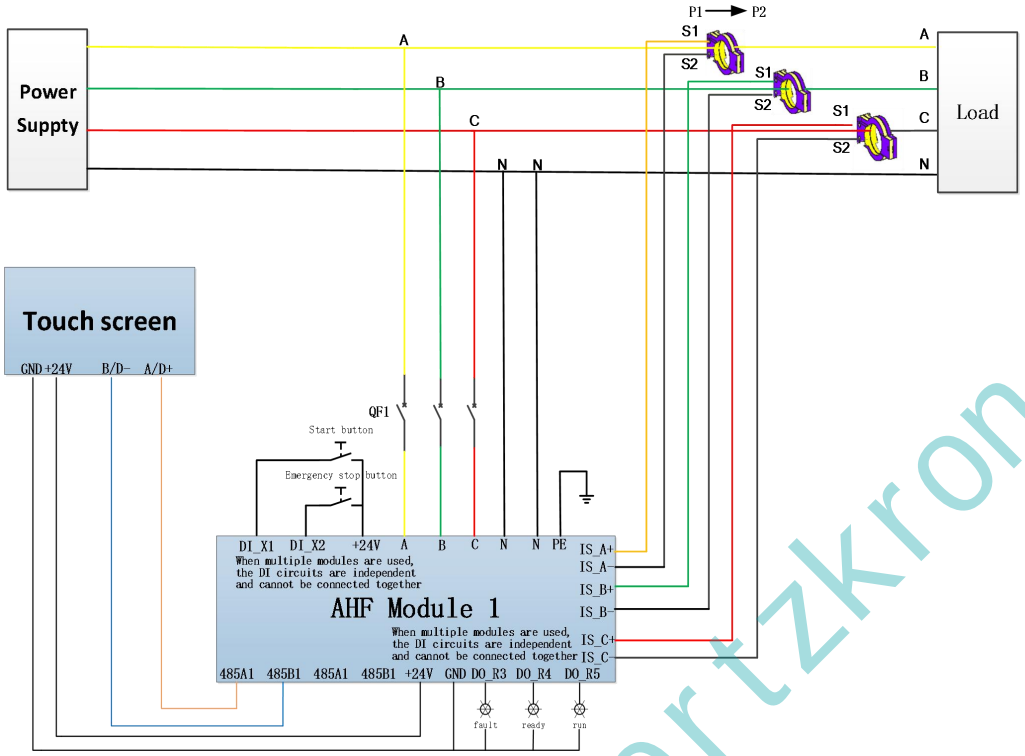


Figure 5.8: System Wiring Diagram for Single Module Operation in a Single Cabinet

5.9.3 Multi Module Single Cabinet Operating System Wiring Diagram

When multiple AHF modules are connected in parallel to increase compensation current, all the devices share a single set of current transformers. The current signals collected by the external current transformers are sent to all the parallel AHF devices. Additionally, an extra set of sampling current transformers (CT2) is installed inside the cabinet to measure the total cabinet current. The on-site CT is installed on the power side, as shown in Figure 5.9.

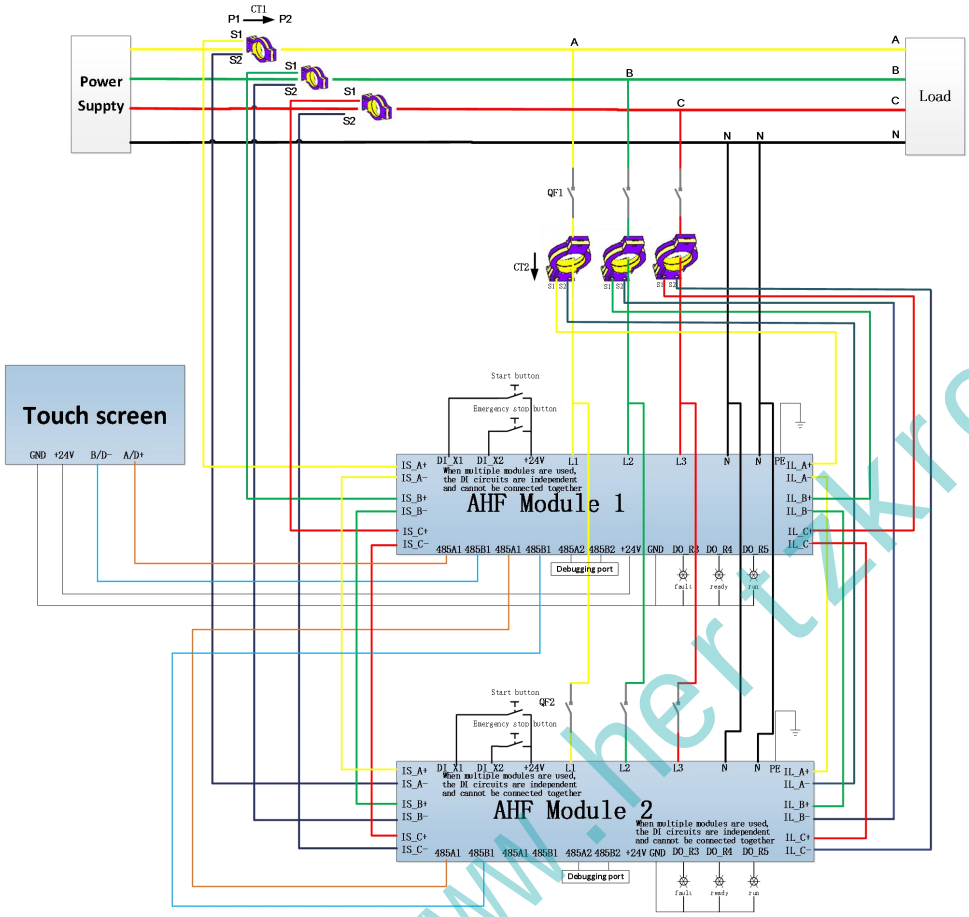


Figure 5.9: Multi Module Single Cabinet Operating System Wiring Diagram

Chapter VI HMI Description (4.3-inch Touchscreen)

6.1 Default Startup Interface

The main interface of the touchscreen is shown in Figure 6.1. The main interface displays various system details, including grid and load information. Users can directly perform start, stop, and reset operations on the device via the touchscreen's main interface. The left side of the main interface features dedicated functional areas for Data, Settings,and Records.

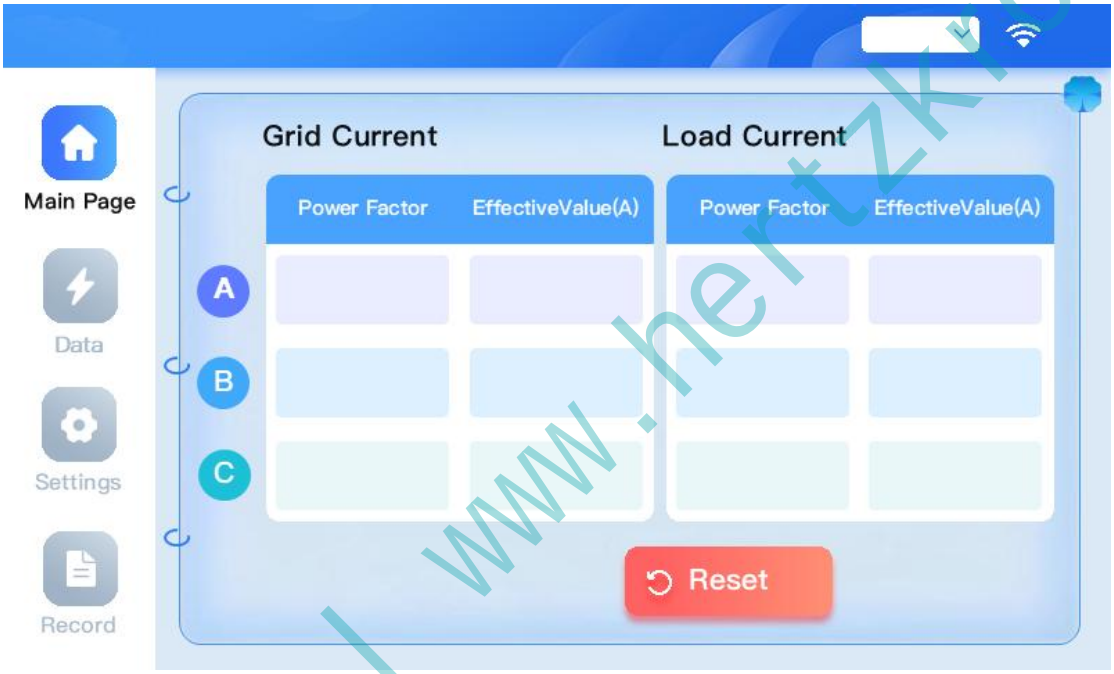


Figure 6.1: HMI Main Page

6.2 User Login

The login page is shown in Figure 6.2. It will pop up when you click the Settings button or update system parameters. Default password is 123.

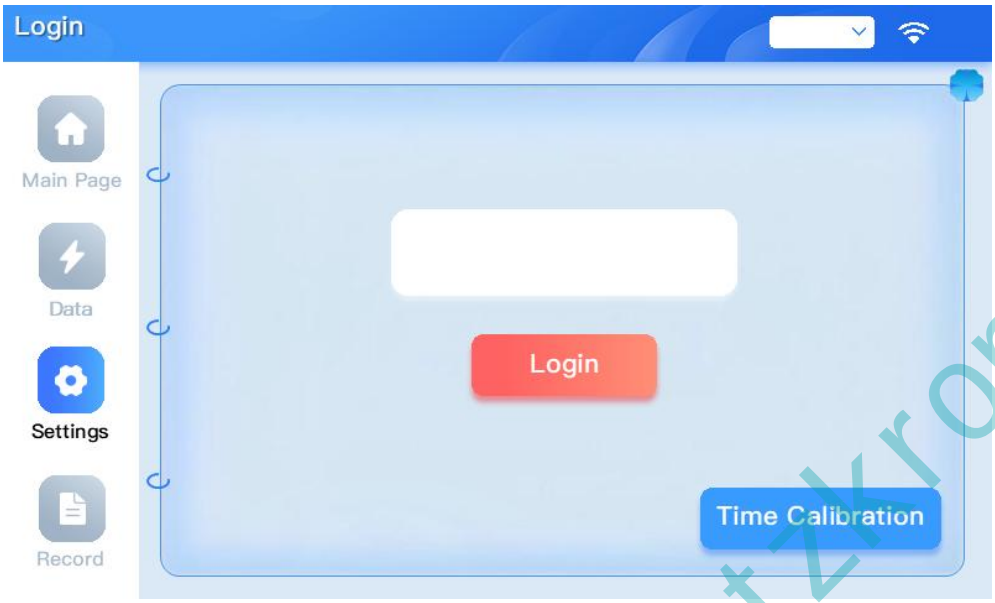


Figure 6.2: Root user login Page

6.3 Operational Permissions

Users can perform operations such as querying and configuring parameters, querying runtime data, accessing historical records, starting, stopping, and resetting.

6.4 Parameters Settings

Select the 'Settings' button on the main touchscreen interface to enter the parameter settings screen, as shown in Figure 6.3. All parameters are categorized into different sections, including 'System Parameters,' 'Sampling Parameters,' 'High Voltage Parameters,' 'Harmonic Controller,' 'Single Parameters,' and 'Time Calibration.' To set a specific parameter, click on the corresponding tab to access the parameter settings page.

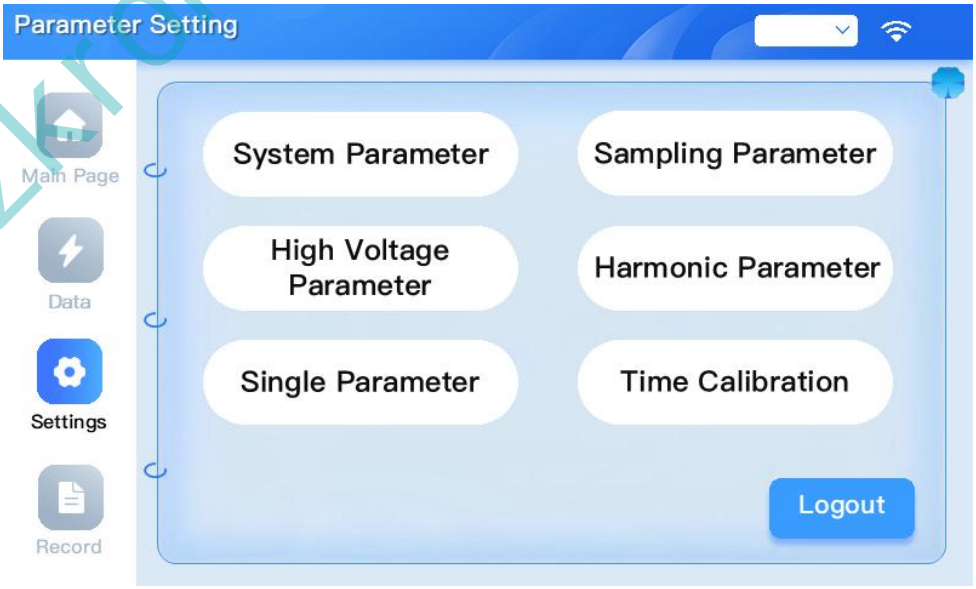


Figure 6.3: Parameter Settings Interface

6.5 Parameter Settings - System Parameters

The system parameter settings interface is shown in Figure 6.4. This section provides a detailed explanation of the parameters in this interface.

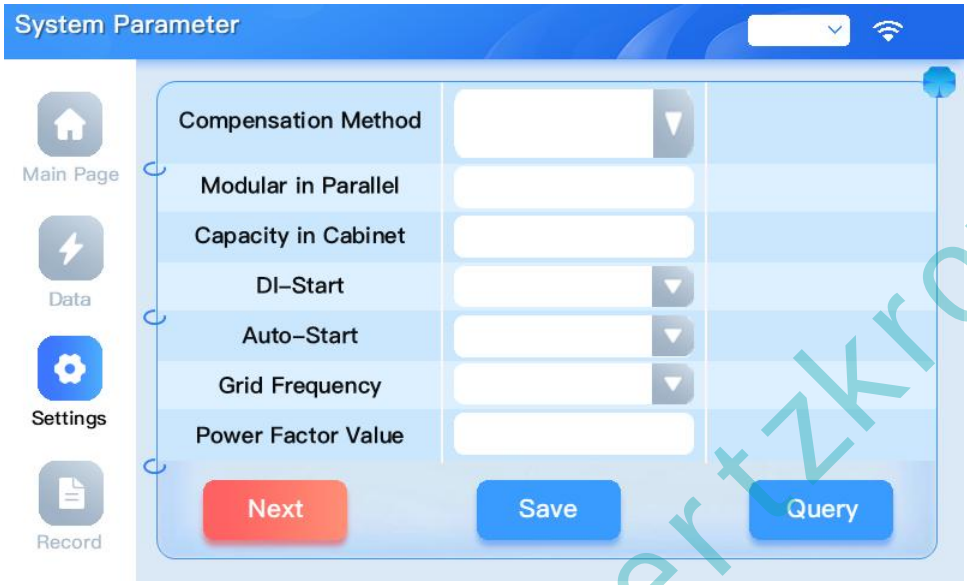


Figure 6.4: System Parameter Settings

1) Number of Parallel Modules: The total number of AHF modules connected in parallel. If three modules are connected in parallel, set this value to 3.
2) Cabinet Capacity: The sum of the capacities of all modules connected in parallel within this cabinet (setting unit: Amperes). For example, if the cabinet contains three modules with individual capacities of 100A, 75A, and 150A, set this value to 225. (Refer to Table 6.1 for the corresponding values for rated capacities.)
3) Compensation Mode Selection: Harmonics, Harmonics + Unbalance, or Self-Aging.
Note: Different priority levels may be selected. Customers are advised to exercise caution when using the Self-Aging mode.
4) DI Start/Stop Enable: If the customer requires the module to be started via an external switch, select Enable; otherwise, select Disable.
5) Auto-Start Enable: If set to Disable, the module will only start after a user manually presses the Start button following power-up. If set to Enable, the module will automatically start once the specified conditions are met after power-up.
6) Power Factor Setpoint: The actual target power factor value for the site; this value can be set within the range of 0 to 1.
7) Once all parameters have been configured, click Confirm Settings to finalize the setup. You may then use the Query Parameters function to verify whether the settings were successfully applied.

6.6 Sampling Parameter

The sampling parameters setting interface is shown in Figure 6.5, and the parameters on this interface are explained in detail.

Figure 6.5: Sampling Parameters Setting Interface

1) Input Current Sampling Position: If the on-site CT is connected on the input side, select Grid Side; if the on-site CT is connected on the load side, select Load Side.

2) Input Current Sampling Direction: If the direction of the on-site CT is from the load side to the grid side, select Into the Grid; otherwise, select Out of the Grid.

3) Input Current CT Variable Ratio: If the on-site CT ratio is 2000:5, set it to 400. Device Current Sampling Enable: This sampling is only used for entire cabinet current sampling. If the cabinet contains more than one module, it is recommended to connect the module to the cabinet's sampling CT. If connected, select Enable; otherwise, select Disable.

4) Equipment Current Sampling position: This sampling is only used for entire cabinet current sampling, choose Cabinet.

5) Equipment Current Sampling Direction: If the entire cabinet's sampling CT direction is from the module side to the busbar side, select Into the Grid; otherwise, select Out of the Grid.

6) Equipment Current CT Ratio: If the entire cabinet's sampling CT ratio is 2000:5, set it to 400.

6.7 Set Harmonic Filtering Parameters

The harmonic filtering interface is shown in Figure 6.6. If site requirements dictate that the module perform harmonic compensation, you may access this interface to select the specific harmonic orders to be compensated, as well as their respective compensation rates. To compensate for a particular harmonic, simply select the desired compensation rate corresponding to that specific order. For instance, if the site requires compensation for the 3rd harmonic, enter "1.00" in the field corresponding to the 3rd harmonic within the interface shown below. Finally, click "Save"; you may then use the "Query" function to verify that the settings have been successfully applied. This device allows you to filter up to 8 selected harmonics.

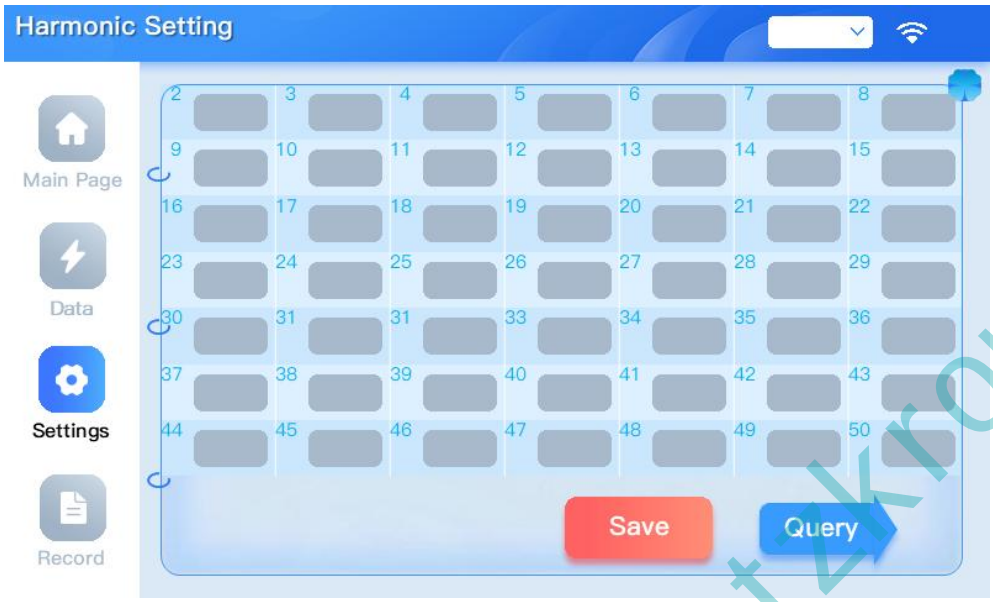


Figure 6.6: Harmonic Filter Parameter Settings Interface

6.8 Parameter Settings – High Voltage Parameters

The high-voltage parameter configuration interface is shown in Figure 6.7, which also provides a detailed explanation of the interface parameters (this function is available only during reactive power compensation).

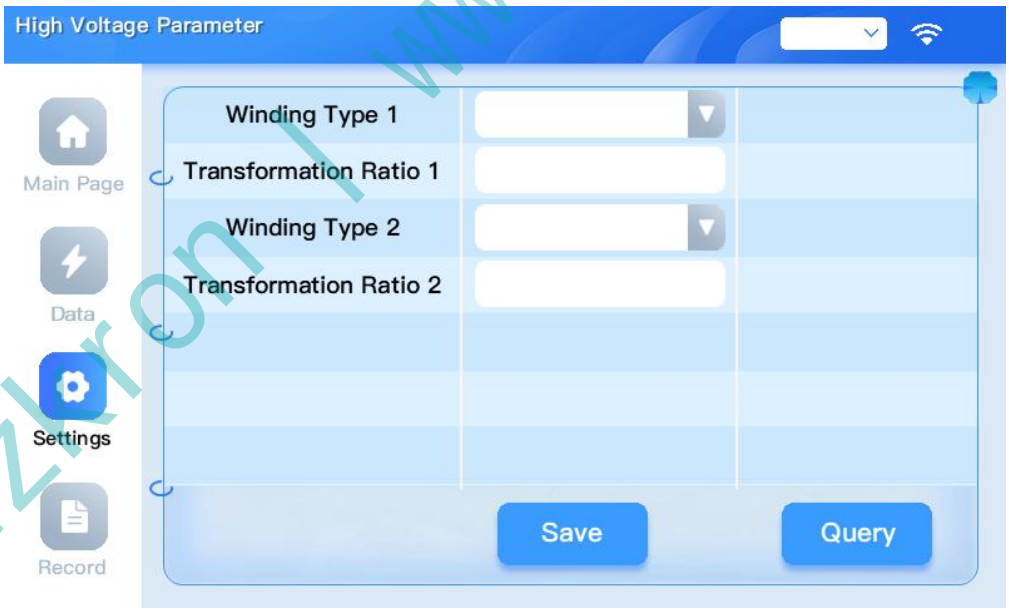


Figure 6.7: High Voltage Parameter Settings Interface

1) Winding Category: You can choose from Normal, YY0, DY11, or YD1.

2) Transformation Ratio: If the on-site transformation ratio is 10kV:0.4kV, set the value to 25.

6.9 Operating Instructions

The equipment's operating modes can be classified into automatic operation and DI operation, and can be configured according to actual requirements.

6.10 Automatic

Auto-start Enable: Select Disabled, and you must manually click the Start button to initiate the AHF device. If set to Enabled, the AHF will automatically start once the device's auto-start conditions are met following power-up.

6.11 Manual Control(DI)

DI Start/Stop Enable: If the customer requires the AHF unit to be started via an external switch, please select Enable for this setting; otherwise, select Disable.

Note: Any parameter modifications must be determined by qualified technical personnel; please proceed with caution.

6.12 Debugging Parameters

The debugging parameters pertain to the manufacturer's debugging interface and are not accessible to the public.

6.13 Startup and DIP Switch Settings

When two or more modules are connected in parallel, the DIP switches must be configured. The module with Address 1 corresponds to Module 1 on the touchscreen; the module with Address 2 corresponds to Module 2 on the touchscreen; and so on.

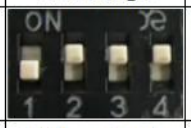
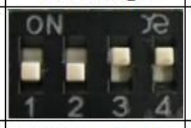
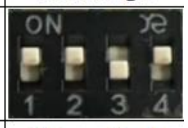
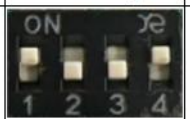
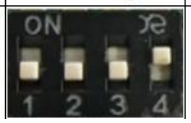
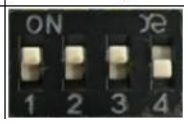
machine number	DIP switch settings	machine number	DIP switch settings	machine number	DIP switch settings	machine number	DIP switch settings
1		2		3		4	
machine number	DIP switch settings	machine number	DIP switch settings	machine number	DIP switch settings	machine number	DIP switch settings
5		6		7		8	

Figure 6.8 : DIP Switch Configuration Diagram

After powering on the equipment, enable the specific modules required to establish a communication link with the touchscreen via the "Module Switching Configuration" interface. Once the communication link has been successfully established, proceed to configure the operating parameters. Provided that the parameters are set correctly and no faults are detected, the "Start Enable" indicator on the touchscreen will illuminate; the "Start" button will become active, while the "Stop" button will remain inactive. On the Module Monitoring interface, select the specific module you wish to start, then click the "Start" button to initiate the equipment startup

sequence; the DC bus voltage will subsequently rise. When multiple modules are operating in parallel, the startup procedure for the remaining modules is similar.

The procedure for shutting down the system via the touchscreen—specifically when two or more modules are operating in parallel—is as follows: When the "Start" button appears inactive and the "Stop" button appears active, simply click the "Stop" button to shut down the equipment.

 Notice	Parameter modifications must be determined by professional technical personnel, please proceed with caution.

Chapter VII HMI Description (7-inch Touchscreen)

7.1 Touchscreen Installation

7.1.1 Touchscreen Mounting Dimensions

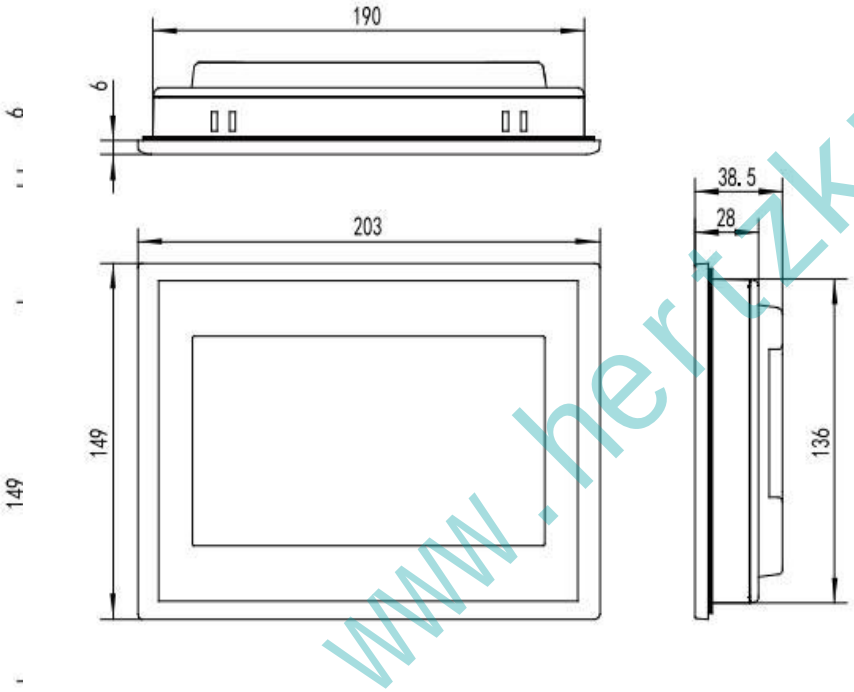


Figure 7.1: Overall Dimensions

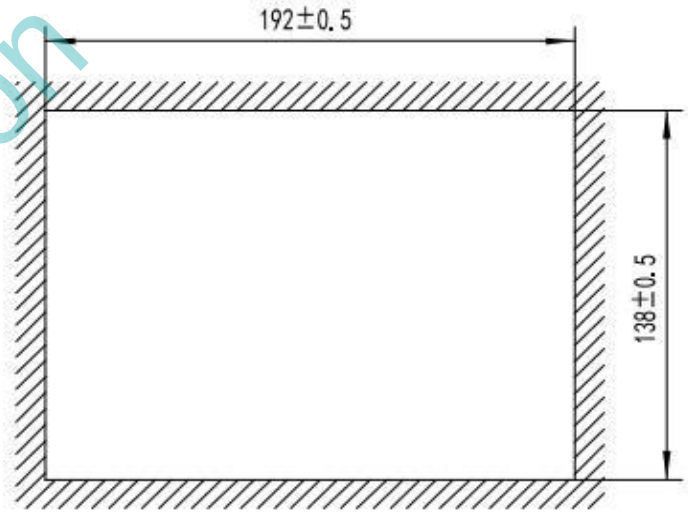


Figure 7.2: Cutout Dimensions

7.1.2 Touchscreen Installation Method

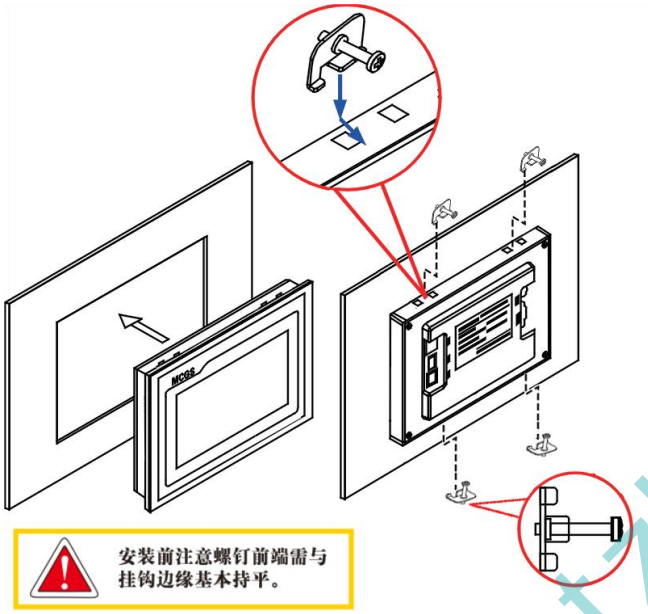


Figure 7.3: Touchscreen Installation Method

7.1.3 Touchscreen Interface Pin Definitions

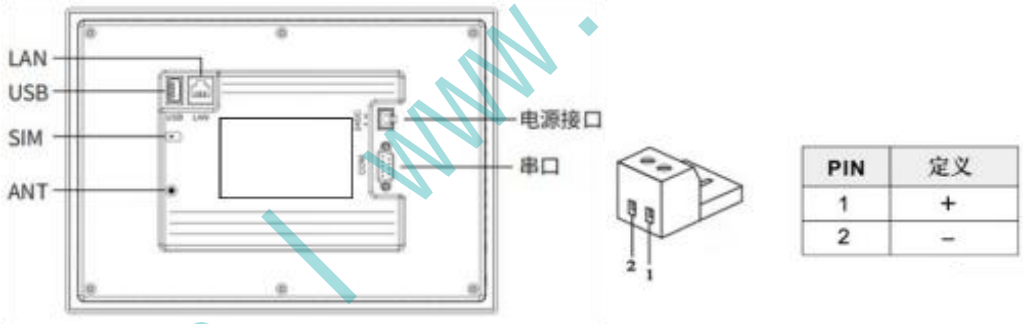


Figure 7.4: Touchscreen Interface Pin Definitions

Table 7.1: Touchscreen Serial Port DB9 Pin Definitions

Touchscreen Serial Port DB9 Pinout			
	COM1 Connects to Modules 1～4	PIN7	RS485+
		PIN8	RS485-
	COM2 Connects to Modules5～8	PIN4	RS485+
		PIN9	RS485-

Table 7.2: Communication Harness and Module Wiring Reference Table

Communication Wire Harness	SVG Module Terminals	directions
COM1:485A	485A1(Module 1)	Modules 1 through 4 are connected to Link 1.
COM1:485B	485B1(Module 1)	
COM2:485A	485A1(Module 5)	Modules 5 through 8 are connected to Link 2.
COM2:485B	485B1(Module 5)	

7.2 Default Startup Screen

Upon powering up the touchscreen, the default display is the "Home" screen. From this interface, users can monitor real-time system operating data, such as grid voltage, grid current, device current, active power, reactive power, and apparent power. Specifically, "device current" refers to the total compensation current of the AHF cabinet, while the remaining data points represent grid-side parameters.

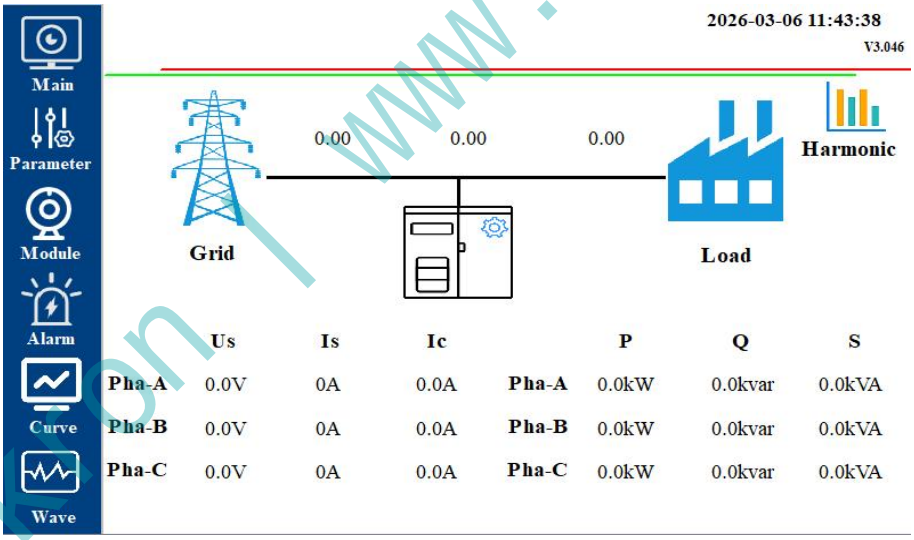


Figure 7.5: Default Startup Interface

The homepage not only displays real-time runtime data but also allows you to navigate to specific sub-interfaces by clicking icon buttons, as shown in the figure below:

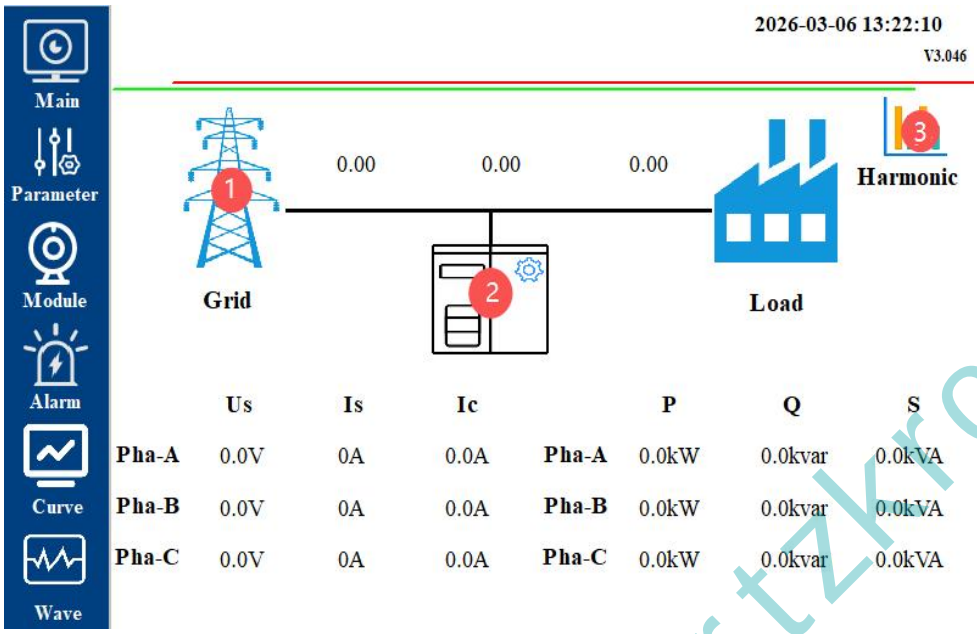


Figure 7.6: Startup Default Interface Navigation Button (Home Button)

①Clicking the "  " icon button on the homepage allows you to navigate to the detailed system operational data monitoring interface; clicking the "Home" button in the top-left corner allows you to return to the previous screen.

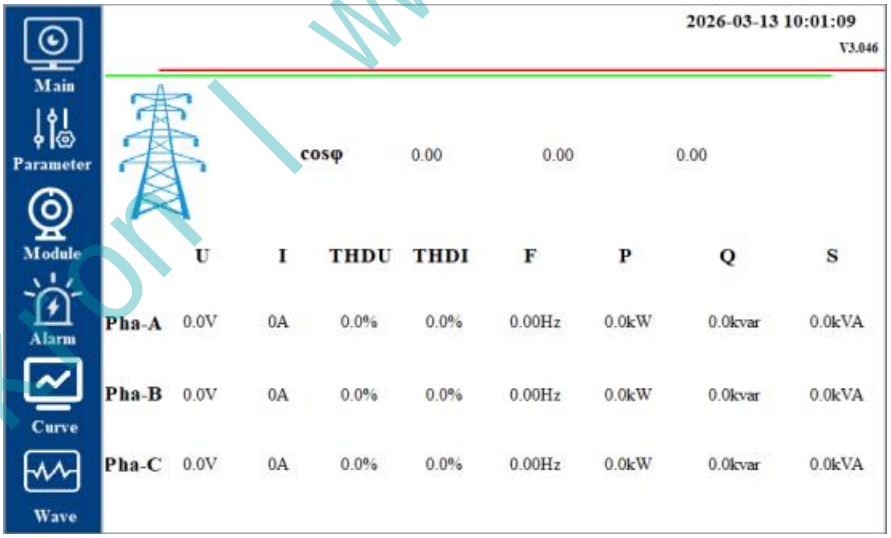


Figure 7.7: System Operation Data Monitoring Interface

② By tapping the "  " icon button on the Home screen, you can navigate to the "Module Switching Settings and Confirmation" interface. You can return to the previous screen by tapping the "Home" button in the top-left corner or the "Back" button in the bottom-right corner.

Through this interface, users can control the communication connection status between each module and the touchscreen. The touchscreen features a "memory" function; therefore, if the device experiences an abnormal power outage and is subsequently powered back on, manual re-engagement is not required.

1）ID：Module serial numbers are fixed, starting from 1; each touchscreen supports the connection of up to 8 modules.

2）Module Exit: The touchscreen terminates communication with this module.

3）Module Entry Point: The communication between the touchscreen input and this module.

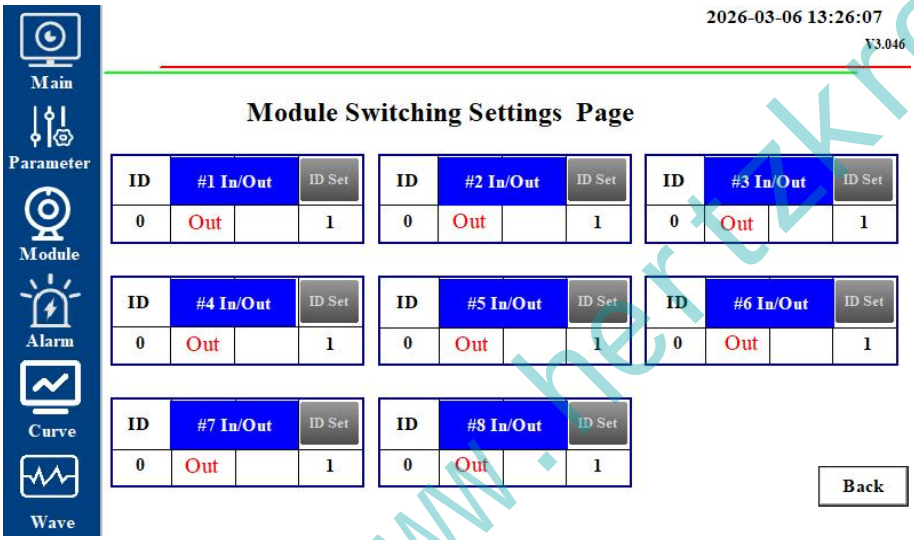


Figure 7.8: Module Switching Settings and Confirmation Interface

③ By clicking the "  " icon button located in the top-right corner of the homepage, you can navigate to the "Harmonic Bar Chart" interface. Users can select the specific harmonics they wish to view by utilizing the Module ID and the selection box on the right. Clicking the "Home" button in the top-left corner allows you to return to the previous screen.

1) This interface displays the harmonic content of the grid voltage, grid current, load current, and device current (module current). The buttons located at the top allow for switching between the harmonic display interfaces for Phases A, B, and C.

2) Display options are available for user selection in the upper-right corner of the interface. When "Device Current" is selected as the displayed content, the Module ID becomes active, allowing users to view the "Device Current" for different modules by specifying the ID number; for all other selected options, the Module ID is not applicable.

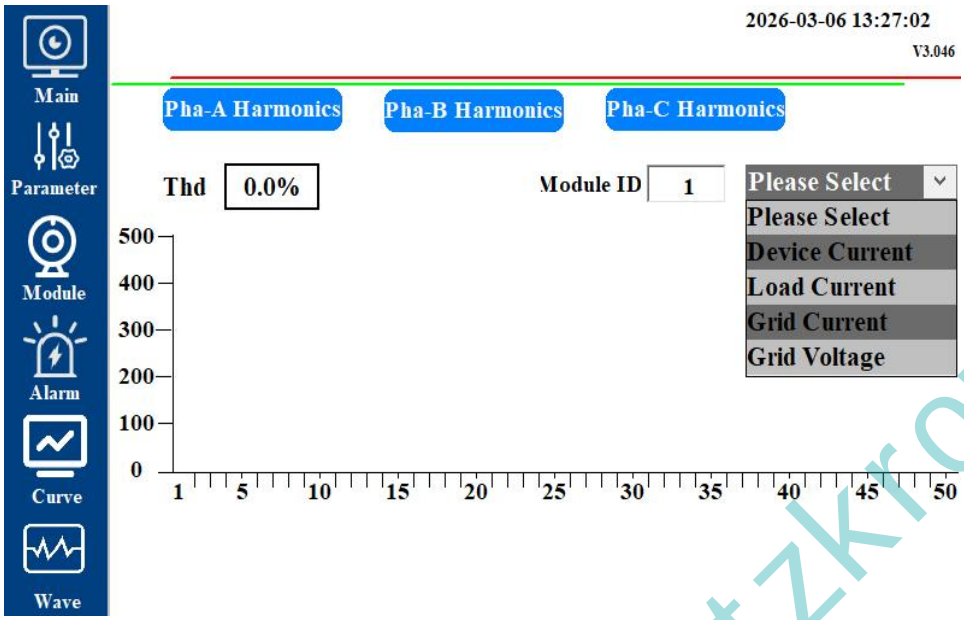


Figure 7.9: Harmonic Bar Chart

7.3 Module Monitoring Interface

The module monitoring interface displays various information regarding the module, including parameters such as the current, voltage, IGBT temperature, and frequency of the individual module. Located in the bottom-right corner of the touchscreen is a status indicator displaying the communication link between the module and the touchscreen; a green indicator signifies that the module is online, while a red indicator signifies that it is offline (this status display is active only when the "Module Switching" function is engaged; it is inactive when the module is switched out).

Users can view operational data for different modules by utilizing the Module 1 through Module 8 toggle buttons located at the top of the interface. Additionally, users may employ the Reset button to reset a module (in the event of an equipment fault, an engineer must first inspect and troubleshoot the issue; once external troubleshooting has been completed, the module can be reset by pressing the Reset button).

Note: When a module fault occurs, the interface displays only the Reset button; when the module is running, it displays only the Stop button; and when the module is in standby mode, it displays only the Start and Reset buttons (however, if an external phase sequence anomaly is detected, the Start button will not be displayed, and an alarm will be triggered).

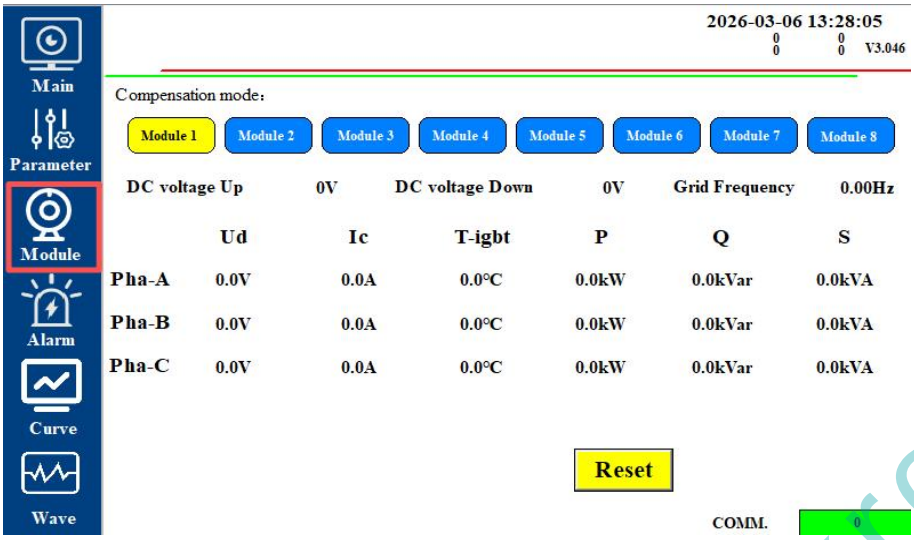


Figure 7.10: Module Monitoring Interface

7.4 Alarm Inquiry

The Alarm Query interface comprises Real-time Alarms and Historical Alarms. The Real-time Alarms section displays the device's most recent alarm records, while the Historical Alarms interface allows users to query alarm information by specifying a specific time period.

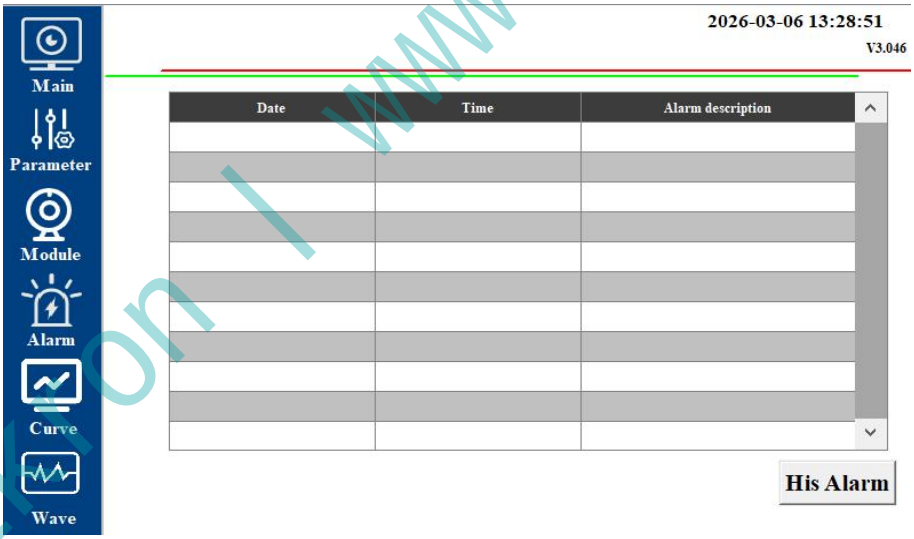


Figure 7.11: Real-time Alarm Information Query

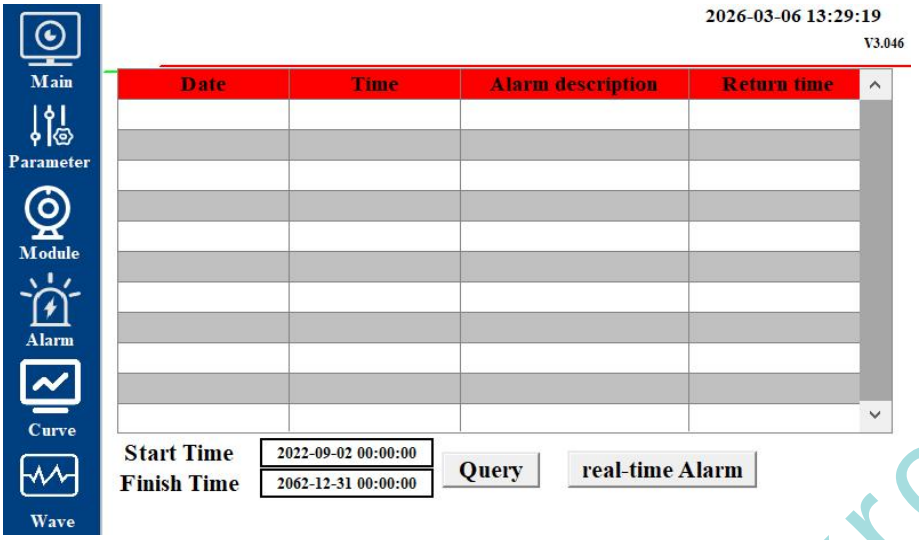


Figure 7.12: Historical Alarm Information Query

7.5 Historical Trends

The Data Curves interface allows you to query historical data, including historical records for grid voltage, grid current, and IGBT temperature.

The curve display interface presents data spanning the 24-hour period immediately preceding the moment the interface is accessed. To determine the absolute time for a specific point, tap on the curve displayed on the screen; an information window will then appear as shown below:

Figure 7.13: Curve Data Information Display

Pressing the double-arrow movement button below shifts the timeline by 12 hours, while the single-arrow button shifts it by 6 hours.

The query time range can be configured using Button . By selecting the Specified Time option, you can retrieve data curves for a designated time interval; the other options need not be utilized.

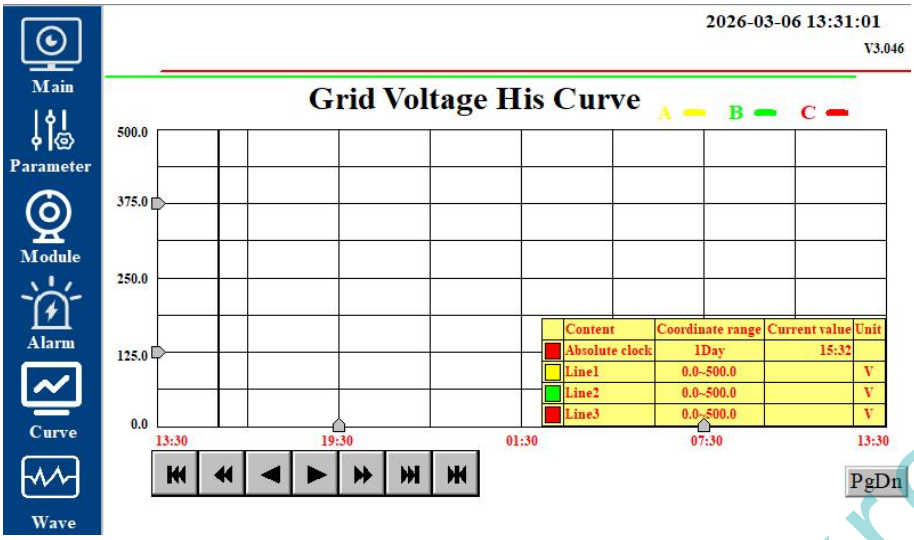


Figure 7.14: Grid Voltage History Curve Interface

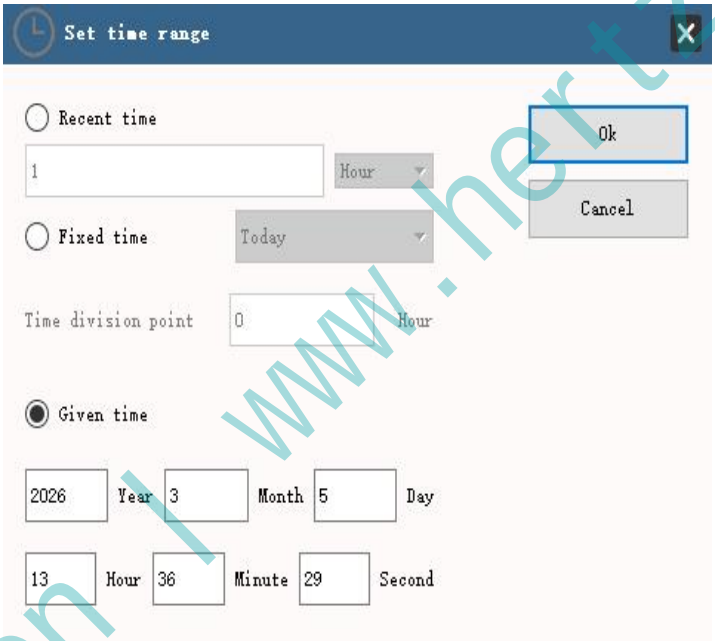


Figure 7.15: Historical Curve Query

7.6 Waveform Display

The waveforms include the grid voltage curve and the device current curve; the horizontal axis, ranging from 0 ～ 30, represents 30 waveform recording data points.

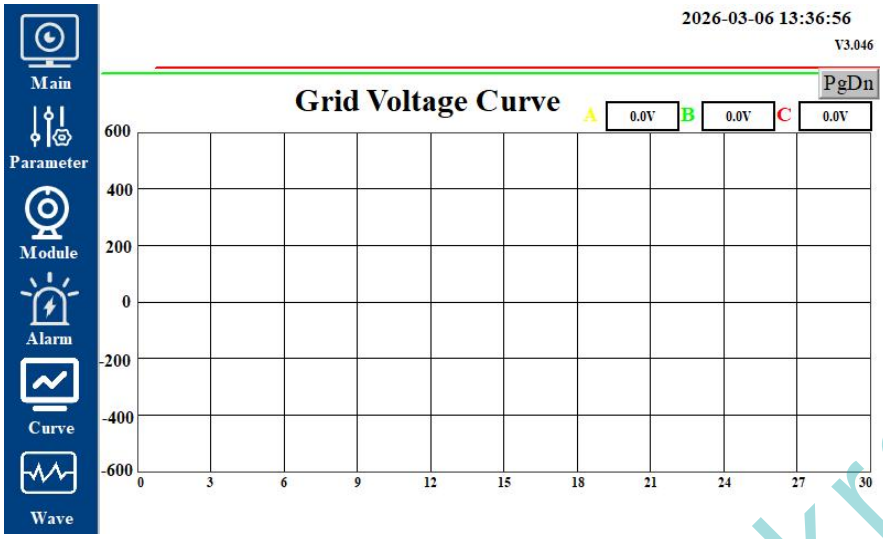


Figure 7.16: Waveform Curve

7.7 Operational Permissions

The permission login interface is shown in the figure below; this interface appears when you click the Parameter Settings button or select a parameter number. Select User2, enter the password 123, and click the Login button.

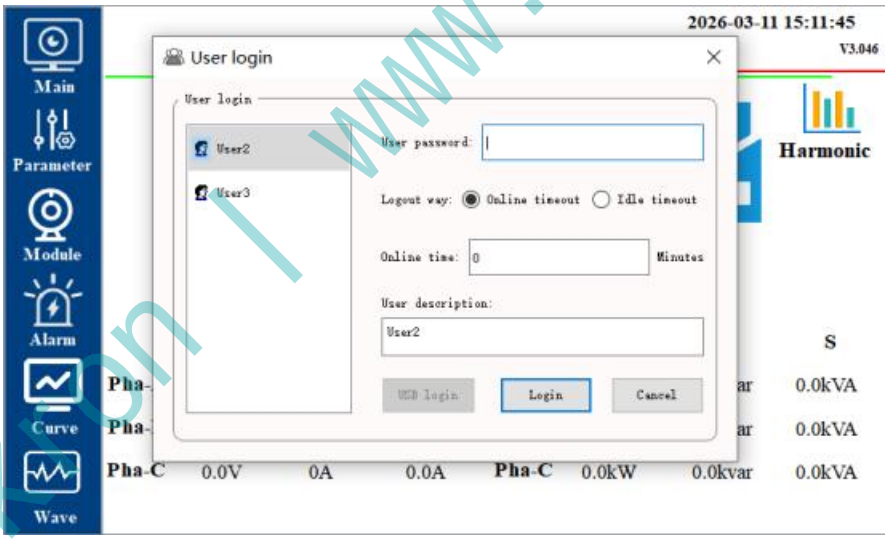


Figure 7.17: Permissions Login Interface

1) Operational Permissions

Under this permission level, users can perform parameter queries, runtime data queries, and historical record queries, as well as operations such as startup, shutdown, and reset.

Set Permissions

Under this permission level, users can not only perform all operations authorized by their operational privileges but also configure relevant runtime parameters.

7.8 Parameter Settings

Select the Parameter Settings button on the touchscreen's main interface to access the Parameter Settings screen. All parameters are categorized into distinct groups—including System Parameters, Sampling Parameters, Harmonic Parameters, and Debugging Parameters—which can be configured to suit actual operating conditions. To configure a specific parameter, simply tap the corresponding entry to enter its dedicated settings interface.

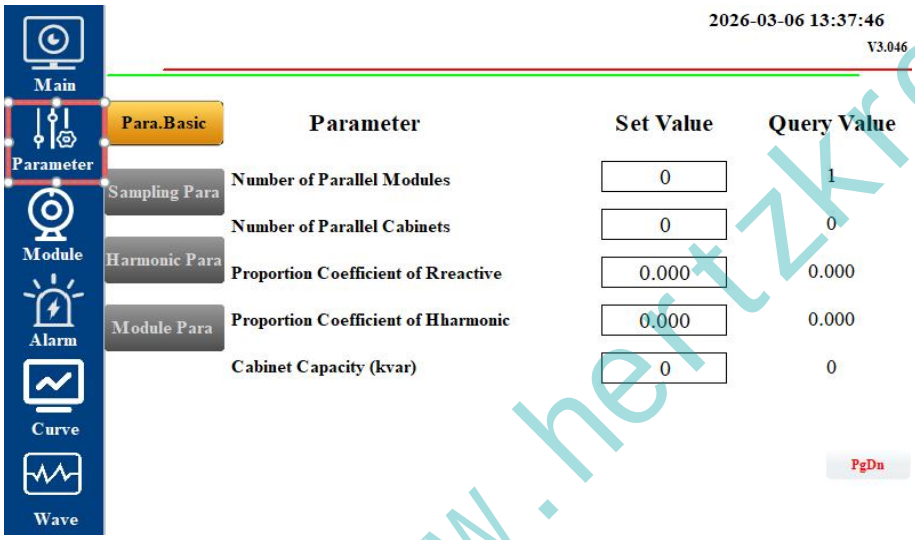


Figure 7.18: Parameter Settings Interface

7.9 System Parameters

Detailed Explanation of the System Parameter Settings Interface:

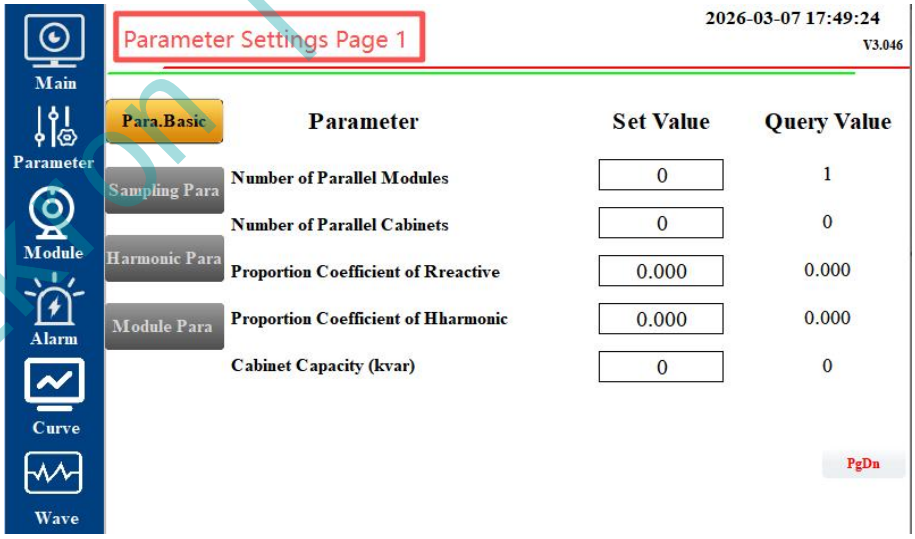


Figure 7.19: System Parameter Settings Interface (Page 1)

1) Number of Parallel Modules: The total count of AHF modules contained within the cabinet. For instance, if the cabinet houses six modules, set this value to 6.

2) Number of Parallel Cabinets: The total count of cabinets operating in parallel. For example, if three cabinets are connected in parallel, set this value to 3.

3) Reactive Capacity Ratio of This Cabinet: The ratio of this specific cabinet's reactive capacity to the aggregate reactive capacity of all cabinets in the system. For instance, if three cabinets have capacities of 100A, 200A, and 300A respectively, the parameter for the first cabinet would be 100/600; thus, set the value to 0.167.

4) Harmonic Capacity Ratio of This Cabinet: The ratio of this specific cabinet's harmonic capacity to the aggregate harmonic capacity of all cabinets in the system. The configuration method is identical to that used for the Reactive Capacity Ratio of This Cabinet.

5) Cabinet Capacity (A): The total current capacity of the modules within the cabinet (in Amperes). For example, if the cabinet contains six 150A modules (where 100kvar ≈ 150A), set this value to 600.

6) Once the parameter settings on this interface are complete, you must click on the specific function fields located beneath the parameters—namely: Number of Parallel Modules, Number of Parallel Cabinets, Reactive Capacity Ratio of This Cabinet, Harmonic Capacity Ratio of This Cabinet, and Cabinet Capacity (kvar). Clicking on these fields will trigger a confirmation dialog box to appear. If the settings are correct, click OK to confirm; otherwise, click Cancel to reset the parameters. You may verify whether the settings have been successfully applied by checking the Query Value display.

Table 7.3: Capacity Correspondence Values

Serial Number	AHF Rated Capacity（A）	SVG Rated Capacity(kvar)
1	15A	10k
2	25A	15k
3	50A	30k
4	75A	50k
5	100A	75k
6	150A	100k
7	200A	150k

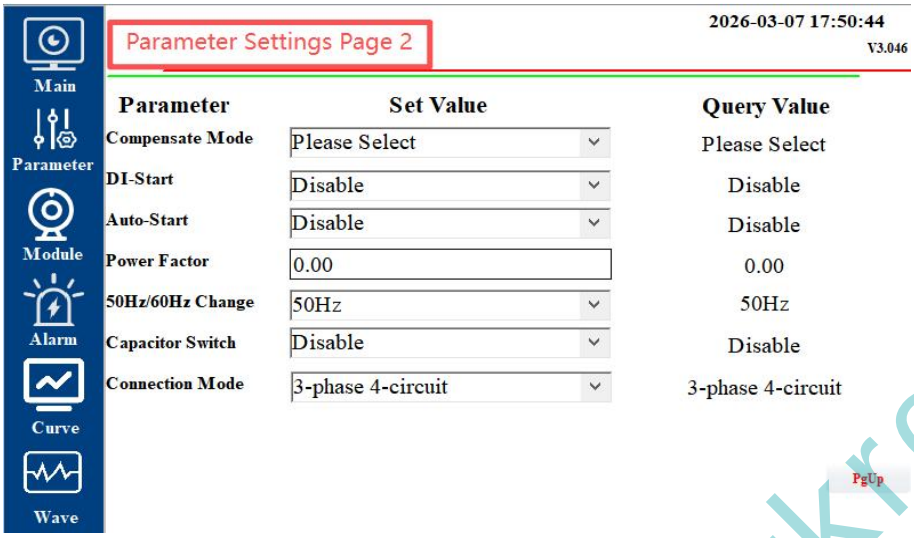


Figure 7.20: System Parameter Settings Interface (Page 2)

1) Compensation Mode Selection: Reactive Power, Reactive Power + Three-Phase Unbalance, or Self-Aging.

Note: Different priorities may be selected; the Self-Aging mode should be used with caution by the customer.

2) DI Start/Stop Enable: If the customer requires the module to be started via an external switch, select Enable; otherwise, select Disable.

3) Auto-Start Enable: If set to Disable, the module must be manually started by pressing the "Start" button after power-up; if set to Enable, the module will automatically start after power-up once the specified conditions are met.

4) Power Factor Setpoint: The actual target power factor value for the site; can be set to a value between 0 and 1.

5) 50Hz/60Hz Switching: Select 50Hz or 60Hz based on the power grid frequency.

6) Capacitor Switching Enable: No configuration is required; the default setting is Disable.

7) Wiring Configuration: Select Three-Phase Three-Wire or Three-Phase Four-Wire based on the wiring system requirements of the equipment.

8) Voltage Selection: Select 380V or 220V.

9) Once parameter configuration is complete on this interface, click on the specific function fields located beneath the parameters—namely: "Compensation Mode Selection, DI Start/Stop Enable, Auto-Start Enable, Power Factor Setpoint, 50Hz/60Hz, Capacitor Switching Enable, Wiring Configuration, and Voltage Selection. A confirmation dialog box will appear; if the settings are correct, click OK; otherwise, click Cancel to reconfigure. You may verify whether the settings were successfully applied by checking the Query Value field.

7.10 Sampling Parameters

Detailed Explanation of the Sampling Parameter Settings Interface:

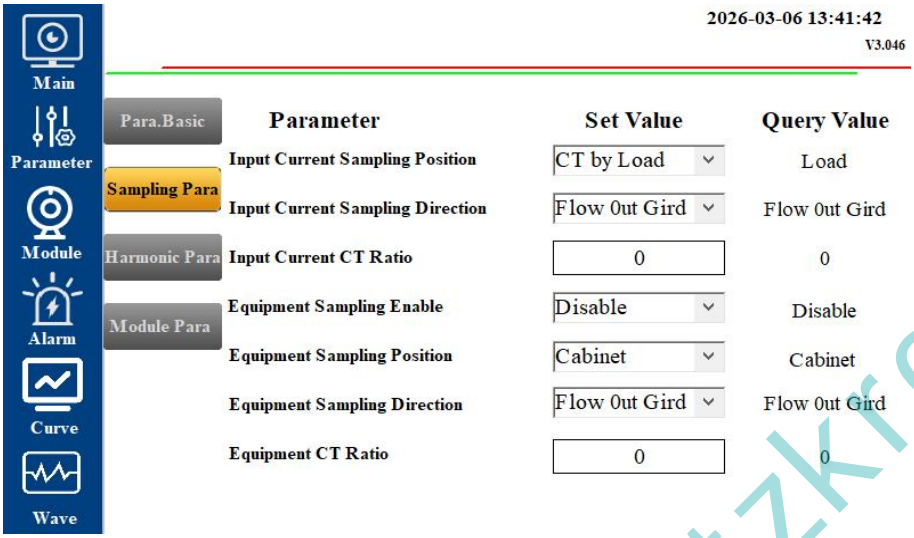


Figure 7.21: Sampling Parameter Settings Interface

1) Input Current Sampling Position Selection: If the field CT is connected on the incoming line side, select Grid Side; if the field CT is connected on the load side, select Load Side.

2) Input Current Sampling Direction Selection: If the direction of the field CT points from the load side toward the grid side, select Flowing into Grid; otherwise, select Flowing out of Grid.

3) Input Current CT Ratio: If the field CT ratio is 2000:5, set the value to 400.

4) Device Current Sampling Enable: This sampling function is used exclusively for whole-cabinet current sampling. If the cabinet contains more than one module, it is recommended that the modules be connected to the cabinet's dedicated sampling CT; if connected, select Enable; otherwise, select Disable.

5) Device Current Sampling Position Selection: This sampling function is used exclusively for whole-cabinet current sampling; select Cabinet.

6) Device Current Sampling Direction Selection: If the direction of the whole-cabinet sampling CT points from the module side toward the busbar side, select Flowing into Grid; otherwise, select Flowing out of Grid.

7) Device Current CT Ratio: If the whole-cabinet sampling CT ratio is 2000:5, set the value to 400.

8) Once the parameter settings on this interface are complete, you must click on the specific function fields located beneath the parameters—namely: Input Current Sampling Position Selection, Input Current Sampling Direction Selection, Input Current CT Ratio, Device Current Sampling Enable, Device Current Sampling Position Selection, Device Current Sampling Direction Selection, and Device Current CT Ratio.A confirmation dialog box will appear; if the settings are correct, click OK; otherwise, click Cancel to reconfigure. You can verify whether the settings were successfully applied by checking the Query Value.

7.11 Harmonic Parameters

The interface for the harmonic controller settings is shown in the figure below. If site requirements mandate that the module perform harmonic compensation, you may access this interface to select the specific harmonic orders to be compensated, as well as their respective compensation rates. To compensate for a particular harmonic, simply select the desired compensation rate corresponding to that specific harmonic order. For instance, if the site requires compensation for the 3rd harmonic, enter "1.00" in the field corresponding to the 3rd harmonic within the interface shown below. Finally, click "Modify"; you may then click "Query" to verify whether the settings have been successfully applied.

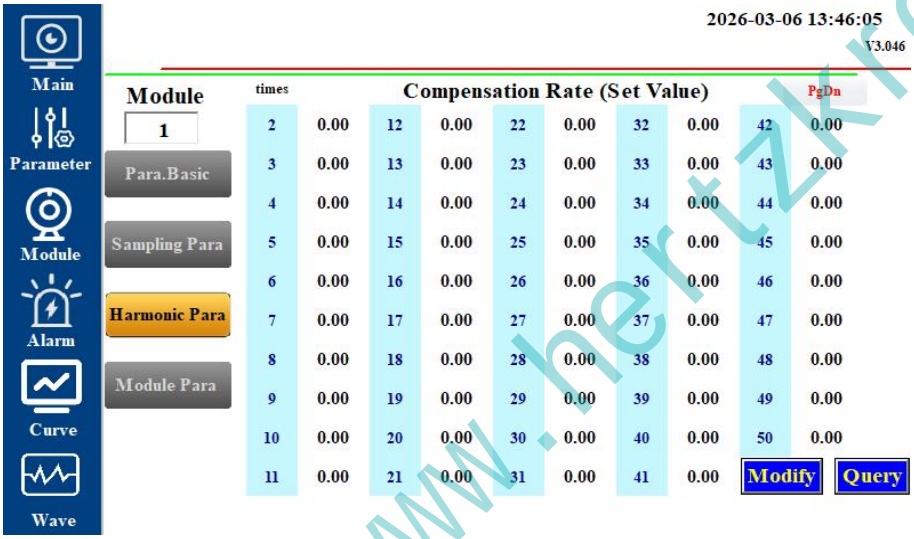


Figure 7.22: Harmonic Compensation Order Selection Settings Interface

7.12 Debugging Parameters

The debugging parameters pertain to the manufacturer's debugging interface and are not accessible to the public.

7.13 Module Startup and DIP Switch Settings

When two or more modules are connected in parallel, the DIP switches must be configured. The communication lines for the four modules with addresses 1 through 4 should be connected to the HMI's COM1 port (terminals 7A/8B), while the communication lines for the four modules with addresses 5 through 8 should be connected to the HMI's COM2 port (terminals 4A/9B). The module with address 1 corresponds to Module 1 on the HMI, the module with address 2 corresponds to Module 2, and so on.

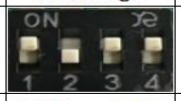
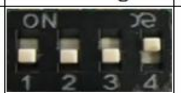
machine number	DIP switch settings	machine number	DIP switch settings	machine number	DIP switch settings	machine number	DIP switch settings
1		2		3		4	
machine number	DIP switch settings	machine number	DIP switch settings	machine number	DIP switch settings	machine number	DIP switch settings
5		6		7		8	

Figure 7.23: DIP Switch Schematic

After powering on the equipment, enable the specific modules required to establish a communication link with the touchscreen via the **Module Switching Configuration** interface. Once the communication link has been successfully established, proceed to configure the operating parameters. Provided that the parameters are set correctly and no faults are detected, the Start Enable indicator on the touchscreen will illuminate; the Start button will become active, while the Stop button will remain inactive. On the Module Monitoring interface, select the specific module you wish to start, then click the Start button to initiate the equipment startup sequence; the DC bus voltage will subsequently rise. When multiple modules are operating in parallel, the startup procedure for the remaining modules is similar.

The procedure for shutting down the system via the touchscreen—specifically when two or more modules are operating in parallel—is as follows: When the Start button appears inactive and the Stop button appears active, simply click the Stop button to shut down the equipment.

7.14 Touchscreen WiFi Network Settings

1) Immediately after powering on the screen, continuously press any location on the screen until the System Configuration Interface appears (as shown in Fig. 7.24); this indicates that you have successfully entered the System Configuration Interface.

Figure 7.24: System Configuration Interface

2) If you have already entered the main interface, please locate and click "Parameters" in the title bar on the right side. After entering the password (Password: 123), locate and click "Debug Parameters" within the interface's title bar. In the displayed Debug Parameters interface, find the "Restart" button (as shown in Figure 7.25); please click "Restart" and repeat the previous operation of continuously pressing and holding the screen.

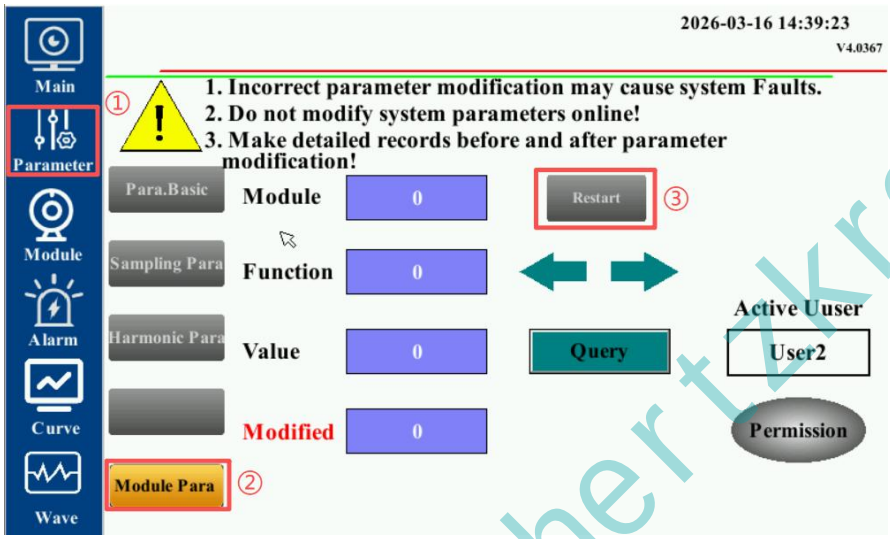


Figure 7.25: Touchscreen Restart Interface

3) Once you have successfully accessed the system configuration interface, please click "System Parameter Configuration." Upon clicking, the "TPC System Settings" interface will appear (as shown in Figure 7.26).

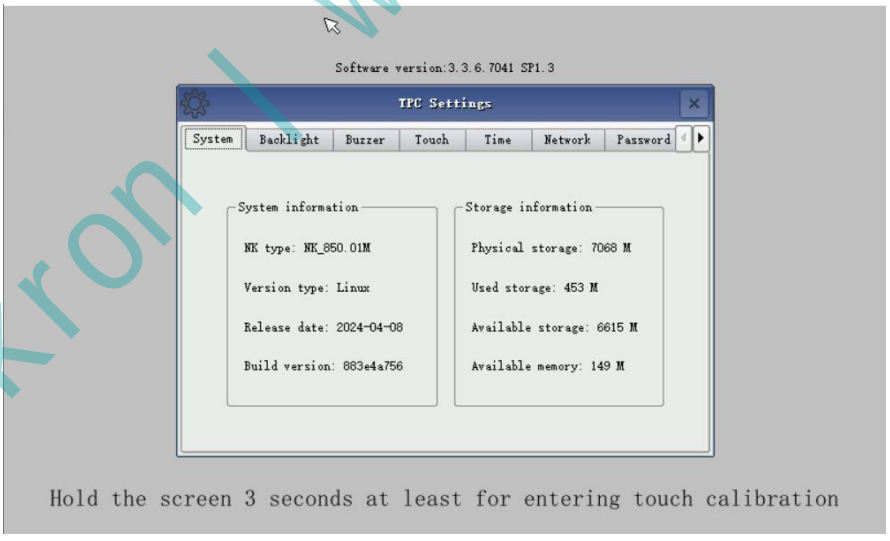


Figure 7.26: TPC System Settings Interface

4) Click the "Network" option in the title bar of the "TPC System Settings" interface to display the Network Settings screen. On this screen, click the drop-down menu next to "Network Adapter," and then select "WiFi" from the options that appear. If the selection field updates to display "WiFi," the selection was successful; then, click the "Configure" button located below (as shown in Figure 7.27).

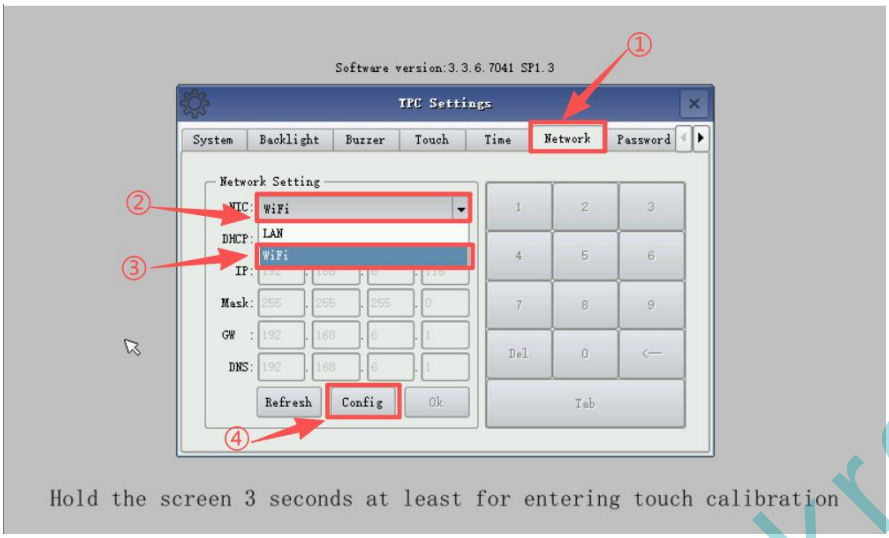


Figure 7.27: WiFi Configuration Interface 1

5) Clicking "Configuration" will take you to the Wi-Fi configuration interface. First, select "Enable"; then, click "SSID" to choose the Wi-Fi network you wish to connect to. Next, enter the password, and finally, click "Connect." After waiting a few seconds, the status indicator will display "Connected," signifying that the network configuration was successful (as shown in Figure 7.28). Click the "Close" button in the top-right corner to exit back to the System Configuration interface (as shown in Figure 7.29), then click "Runtime Environment" to enter the main interface.

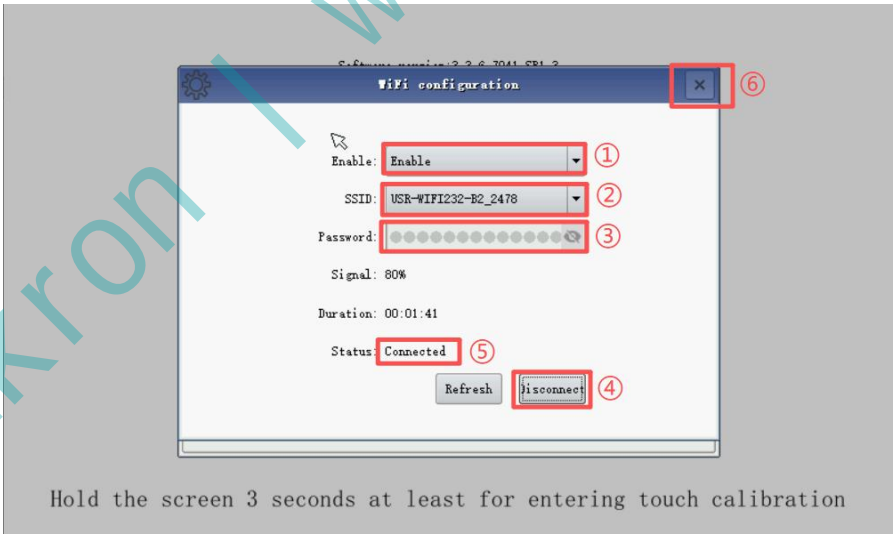


Figure 7.28: WiFi Configuration Interface 2

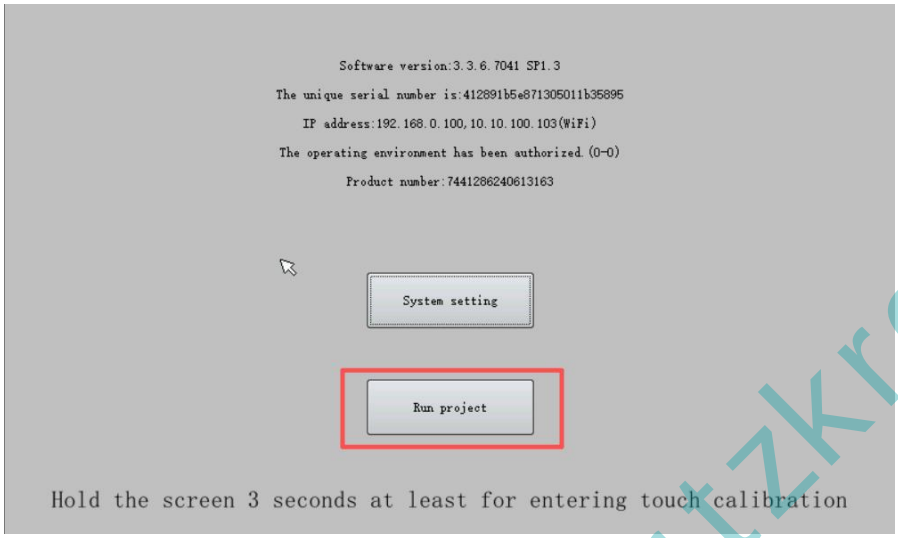


Figure 7.29: Entering the Main Interface

 Attention	Parameter modifications must be determined by professional technical personnel; please proceed with caution.

Chapter VIII AHF Common Troubleshooting

Refer to Table 8.1 for common faults and solutions. Some common faults and alarm messages can be troubleshooted by the user. If the issue cannot be resolved, please contact the product engineer directly.

Faults caused by user errors, such as reversed CT connections, incorrect power line phase sequence, or parameter setting errors, can often be identified during startup and debugging by monitoring the data. If compensation performance is poor but no alarm information is displayed, please contact the product engineer.

Table 8.1: Common Faults and Solutions

Fault and Alarm	Possible Reason	Solution
Communication Fault	Communication failure between the monitoring system and the AHF module.	Check if the communication cables are securely connected.
Over temperature Fault	High ambient temperature; blocked air ducts; fan failure	Check each possible reason one by one
Phase Lock Failure After Startup	Incorrect phase sequence of power lines	Verify the sequence of power lines A, B, and C
AC Software Over voltage Fault	At least one phase of the three-phase voltage is over voltage	Ensure that the three-phase voltage is within the operating range of the device
AC Software Under voltage Fault	At least one phase of the three-phase voltage is over voltage	Ensure that the three-phase voltage is within the operating range of the device
Input Frequency Abnormal	Input frequency exceeding limits caused the AHF to shut down.	Check if the input voltage frequency is within the device's rated range
DC Bus Over Voltage Fault	AHF module shutdown due to excessive DC bus voltage.	Contact the engineer
Over Current Fault	The AHF module shut down because the device's output current exceeded the protection threshold.	1) Check if the network voltage distortion rate is too high; 2) Check for significant voltage surges or drops in the network;

		3) If the network voltage is normal, contact the engineer.

Chapter IX Contact Us

Our company has a comprehensive after-sales service system and network, dedicated to providing timely and high-quality follow-up service to both new and existing customers. If you have any questions or needs, please do not hesitate to contact us. Our technical engineers will be available to assist you 24/7.