

# AMC16Z series DC precision distribution monitoring system

Installation and Operation Instruction V1.2

Acrel Co.,LTD

## Declaration

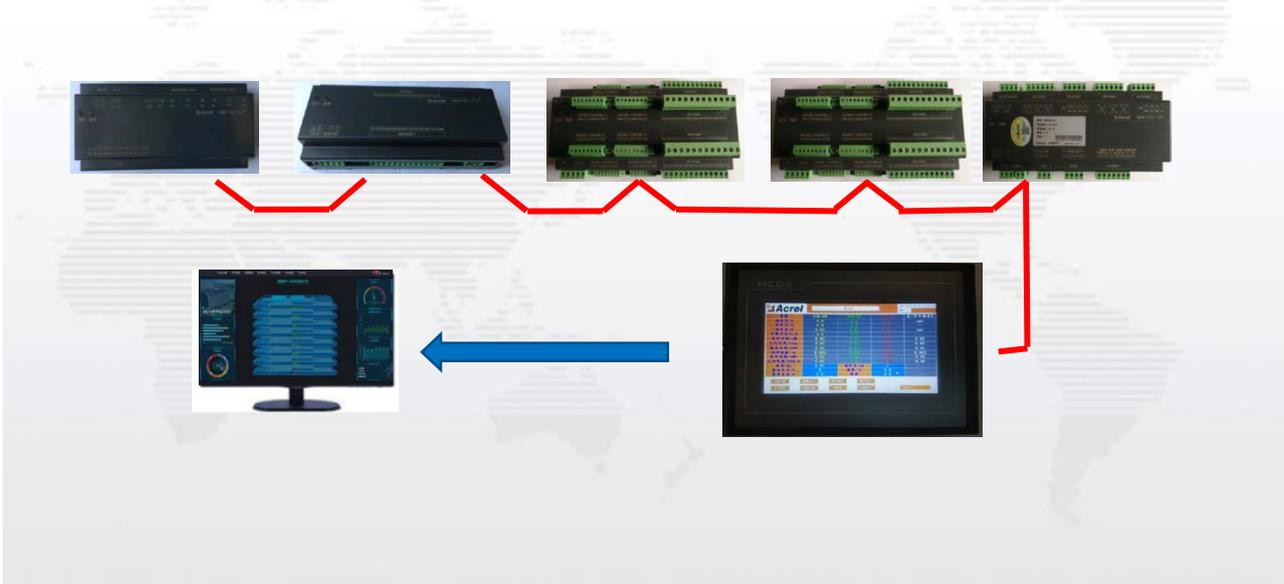
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With the rapid development of data centers, the energy consumption problem of data centers has become more and more prominent. The energy management and power supply and distribution design of data centers have become hot issues. Efficient and reliable data center power distribution system solutions are the key to improving data center power distribution. Power efficiency, an effective way to reduce equipment energy consumption. To achieve energy saving in the data center, it is first necessary to monitor each electrical load, and there are many load loops in the data center. Traditional measuring instruments cannot meet the requirements of cost, volume, installation, construction, etc. The multi-circuit monitoring device required for centralized monitoring of the center.

Acrel's AMC16Z series DC precision power distribution monitoring device is a measurement device specially designed for data center server power management. The device is compact in design, and can monitor all electrical parameters, input and output switches, and lightning arrester status of A+B two incoming lines and 96 outgoing lines in real time. The alarm thresholds of all measurement channels can be set independently. The limited event immediately triggers the sound and light alarm of the system, which realizes a high degree of integration of the monitoring loop in the volume of the traditional instrument.

## 2 Product model

Model	Function description
AMC16Z-ZD(-P24)	Monitor the full power parameters of the A+B dual DC incoming circuit, monitor the status of 6 switches, 2 alarm outputs, 1 temperature and humidity detection, 1 RS485 communication, ±12V output (Only power supply to incoming module matching Hall sensor), DC24V independent auxiliary power supply.
AMC16Z-FD	Monitor the full power parameters of 24 branches of A+B dual-channel DC outlet, and 1 channel of RS485 communication.
AMC16Z-FDK24	Monitor the full power parameters and switch status of the 24 branches of the A+B dual DC outgoing line, and 1 channel of RS485 communication.
AMC16Z-FDK48	Monitor the full power parameters and switch status of the 48 shunts of the A+B dual DC outgoing lines, and 1 channel of RS485 communication.
AMC16Z-KA	Wet contact, monitoring the switching status of 48 branches of A+B, and 1 channel of RS485 communication.
AMC16Z-KD	Dry contact, monitoring the switch status of 48 branches of A+B, and 1 channel of RS485 communication.

### 3 Technical parameter

#### DC incoming line

Meter model		AMC16Z-ZD(-P24)
Measurement parameters		Voltage, current, power, electrical energy, ambient temperature and humidity
Bus voltage	Rated	48VDC,240VDC,336VDC
	Measuring range	±20%
	Overload	Instantaneous voltage 2x/sec
Current incoming loop	Rated	5V (Hall sensor, powered by AMC16Z-ZD ±12V).
	Overload	Lasts 1.2x, instantaneous 10x/sec
Temperature and humidity	Temperature range	-40°C~+99°C
	Humidity range	20%~90%
Measurement accuracy	Incoming wire	Voltage/current 0.5 level, power/energy level 1
	Temperature	±1°C
	Humidity	±5%
Auxiliary power supply		AMC16Z-ZD: Signal power draw (≤15W). AMC16Z-ZD-P24: DC24V independent auxiliary power supply
Environment	Temperature	Working: -15°C~55°C Storage: -25°C~ 70°C
	Humidity	Relative humidity ≤ 93%.
	Elevation	≤2500m
Switching output		2CH 3A 250VAC / 3A 30VDC
Switching input		6-way stem node
Communication		RS485/Modbus-RTU
Installation method		DIN35mm rail or baseplate mounting
Protection level		IP20
Pollution level		2
Security	Insulation	The insulation resistance between all terminals and the conductive parts of the housing is not less than 100MΩ
	Withstand pressure	A voltage and current signal B voltage and current signal switching output between the other ports to meet AC2kV 1min, between the switch input and other ports should be satisfied AC0.5kV 1min, leakage current should be less than 2mA, no breakdown or flashover phenomenon.
Electromagnetic compatibility	Antistatic interference	Level 4
	Electrically resistant fast transient bursts	Level 3
	Anti-surge interference	Level 4
	Resistant to RF electromagnetic field radiation	Level 3

DC outgoing line

Meter model		AMC16Z-FD
Measurement parameters		Voltage, current, power, energy
Bus voltage	Rated	48VDC,240VDC,336VDC
	Measuring range	±20%
	Overload	Instantaneous voltage 2x/sec
Current outgoing loop	Rated	5V (Hall sensor, external supply required ±12V).
	Range	
	Overload	Lasts 1.2x, instantaneous 10x/sec
Measurement accuracy	Outlet	Voltage/current 0.5 level, power/energy level 1
Auxiliary power supply		Powered by AMC16Z-ZD, DC 12-24V when used alone
Environment	Temperature	Working: -15°C~55°C Storage: -25°C~ 70°C
	Humidity	Relative humidity ≤ 93%.
	Elevation	≤2500m
Communication		RS485/Modbus-RTU
Installation method		DIN35mm rail or baseplate mounting
Protection level		IP20
Pollution level		2
Security	Insulation	The insulation resistance between all terminals and the conductive parts of the housing is not less than 100MΩ
	Withstand pressure	A voltage and current signal B voltage and current signal between the other ports meet AC2kV 1min, leakage current should be less than 2mA, no breakdown or flashover phenomenon.
Electromagnetic compatibility	Antistatic interference	Level 4
	Resistant to RF electromagnetic field radiation	Level 3

**Note: The secondary side input voltage of the DC input and outlet modules is 5V, and the default value of the primary side current is 50A. If the Hall sensor is different, the customer can set the ratio through the touch screen according to the actual use.**

Meter model		AMC16Z-FDK24	AMC16Z-FDK48
Measurement parameters		Voltage, current, power, energy, switching status	
Bus voltage	Rated	48VDC,240VDC,336VDC	
	Measuring range	±20%	
	Overload	Instantaneous voltage 2x/sec	
Current outgoing loop	Rated	5V (Hall sensor, external supply required ±12V).	
	Range		
	Overload	Lasts 1.2x, instantaneous 10x/sec	

Measurement accuracy	Outlet	Voltage/current 0.5 level, power/energy level 1
Auxiliary power supply		Powered by AMC16Z-ZD, DC 12-24V when used alone
Environment	Temperature	Working: -15°C~55°C Storage: -25°C~ 70°C
	Humidity	Relative humidity ≤ 93%.
	Elevation	≤2500m
Communication		RS485/Modbus-RTU
Installation method		DIN35mm rail or baseplate mounting
Protection level		IP20
Pollution level		2
Security	Insulation	The insulation resistance between all terminals and the conductive parts of the housing is not less than 100MΩ
	Withstand pressure	A voltage and current signal B voltage and current signal between the other ports meet AC2kV 1min, leakage current should be less than 2mA, no breakdown or flashover phenomenon.
Electromagnetic both Capacitiveness	Antistatic interference	Level 4
	Resistant to RF electromagnetic field radiation	Level 3

**Note: The AMC16Z-FDK module has a secondary side input voltage of 5V and a primary-side current default of 50A. If the Hall sensor is different, the customer can set the ratio through the touch screen according to the actual use.**

#### Active switching module

Meter model	AMC16Z-KA	
Enter the frequency	45-60Hz	
Auxiliary power supply	Powered by AMC16Z-ZD, DC 12-24V when used alone	
Power frequency withstand voltage	Power/input signal AC 2kV/1min 50Hz between ports	
Environment	Temperature	Working: -15°C~55°C Storage: -25°C~ 70°C
	Humidity	Relative humidity ≤ 93%.
	Elevation	≤2500m
Switching input	48 wet nodes (48VDC, 240VDC, 336VDC).	
Communication	RS485/Modbus-RTU	
Installation method	DIN35mm rail or baseplate mounting	
Protection level	IP20	
Pollution level	2	
Security	Insulation	The insulation resistance between all terminals and the conductive parts of the housing is not less than 100MΩ
	Withstand pressure	A switch input signal B switch input signal other ports meet AC2kV 1min between two, leakage current should be less than 2mA, no breakdown or flashover phenomenon.
	Antistatic interference	Level 4

Electromagnetic compatibility	Resistant to RF electromagnetic field radiation	Level 3
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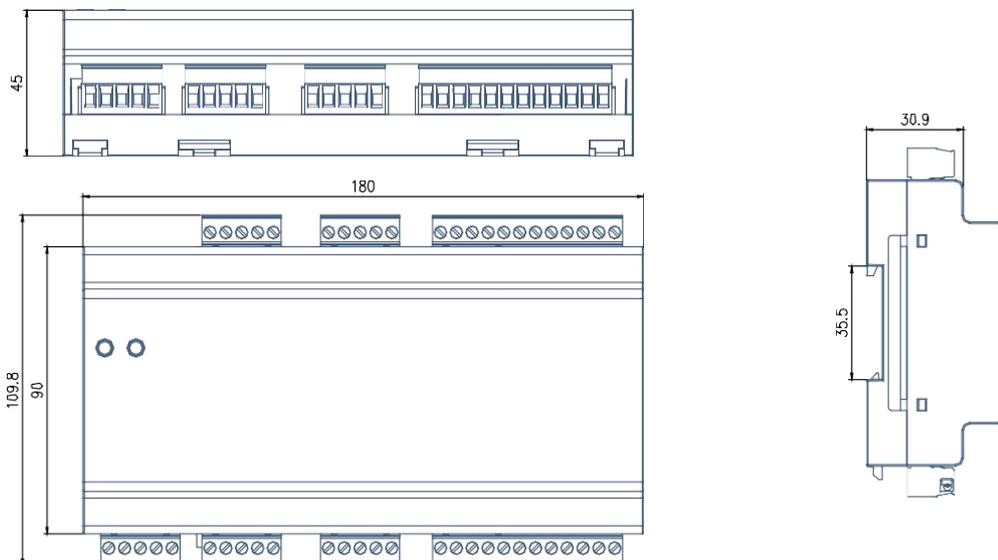
#### Passive switching module

Meter model		AMC16Z-KD
Enter the frequency		45~60HZ
Auxiliary power supply		Powered by AMC16Z-ZD, DC 12-24V when used alone
Insulation resistance		100MΩ
Environment	Temperature	Working: -15°C~55°C Storage: -25°C~ 70°C
	Humidity	Relative humidity ≤ 93%.
	Elevation	≤2500m
Switching input		48-way trunk node
Communication		RS485/Modbus-RTU
Installation method		DIN35mm rail or wall mount
Protection level		IP20
Pollution level		2
Security	Insulation	The insulation resistance between all terminals and the conductive parts of the housing is not less than 100MΩ
	Withstand pressure	A switch input signal B switch input signal other ports meet AC2kV 1min between two, leakage current should be less than 2mA, no breakdown or flashover phenomenon.
Electromagnetic both Capacitiveness	Antistatic interference	Level 4
	Resistant to RF electromagnetic field radiation	Level 3

#### 4 Dimensions

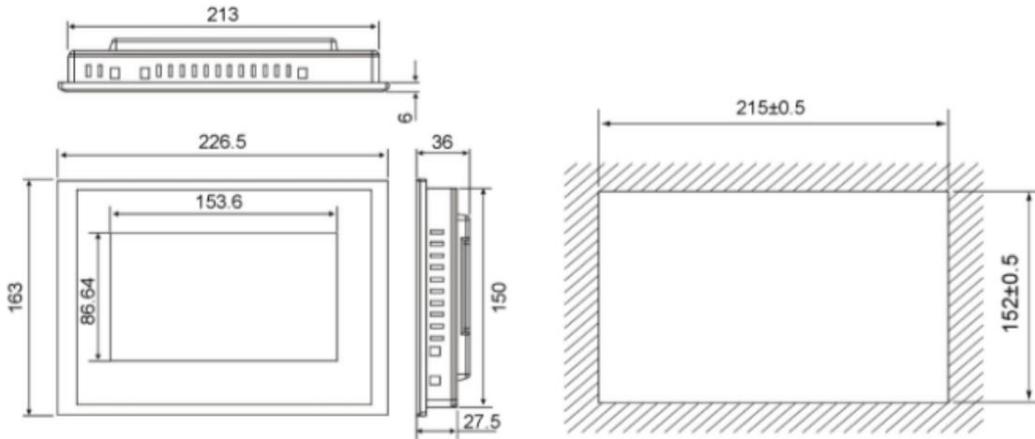
AMC16ZSeries DC Precision power distribution monitoring device

Unit: mm





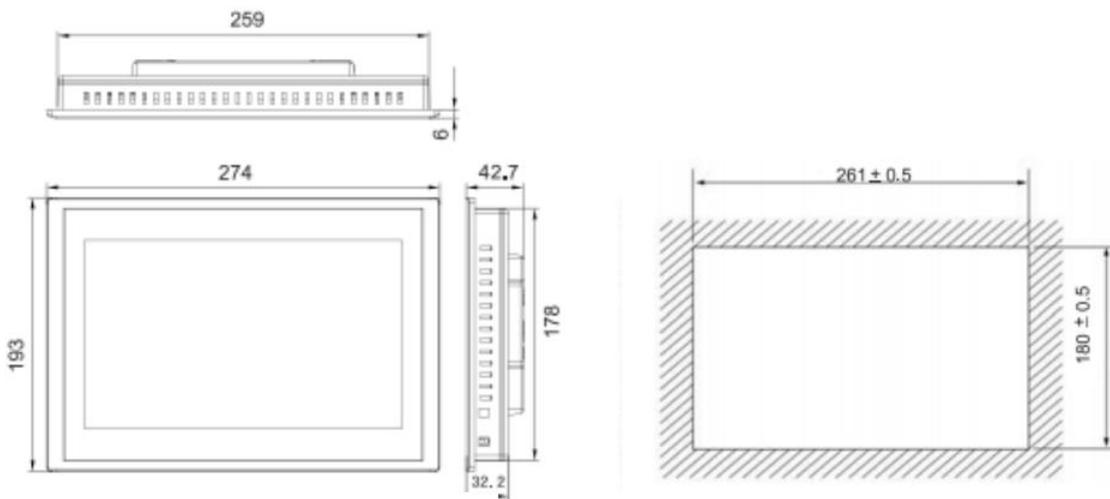
**7 inch touch screen shape and installation**



Dimensions

Hole Size

**10 inch touch screen shape and installation**



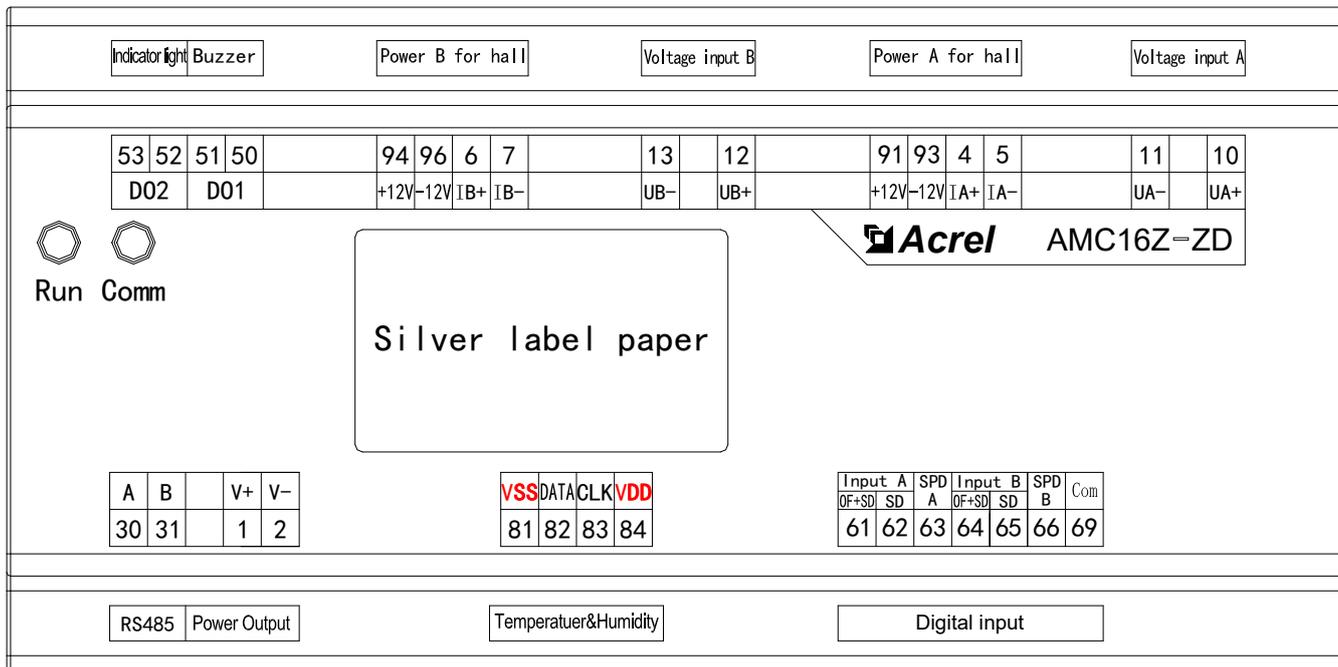
Dimensions

Hole Size

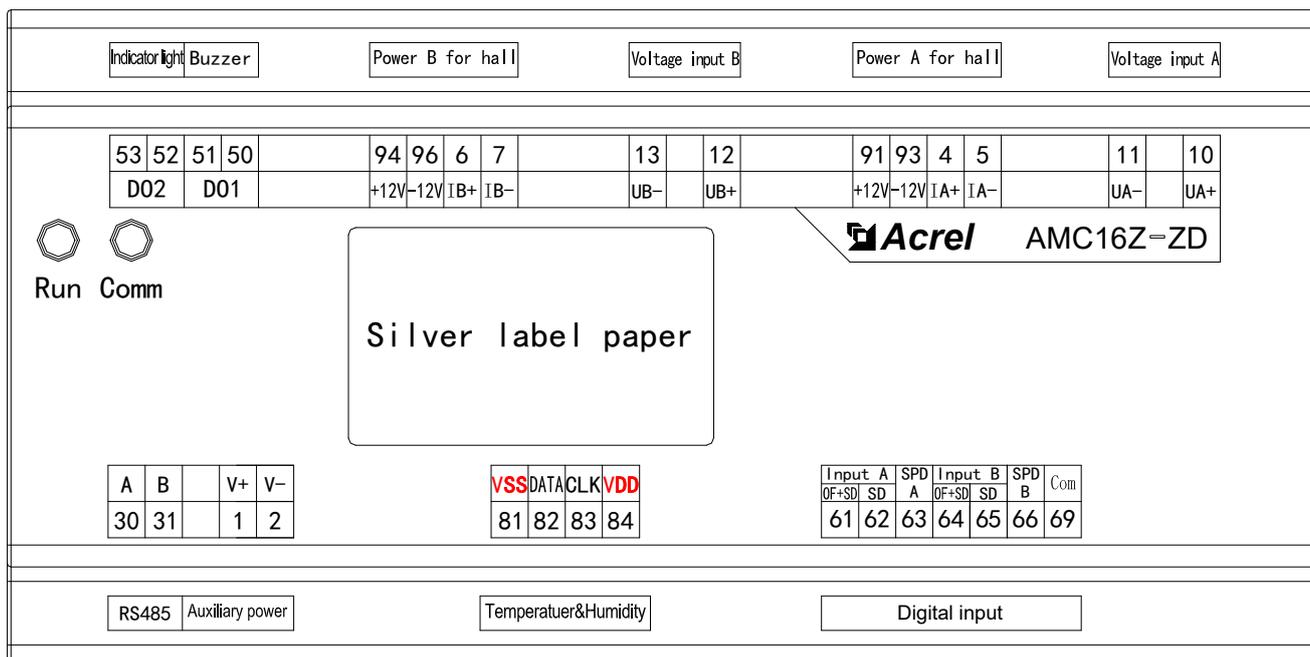
## 5 Wiring

### 5.1 AMC16Z-ZD、AMC16Z-ZD-P24

#### (1) AMC16Z-ZD



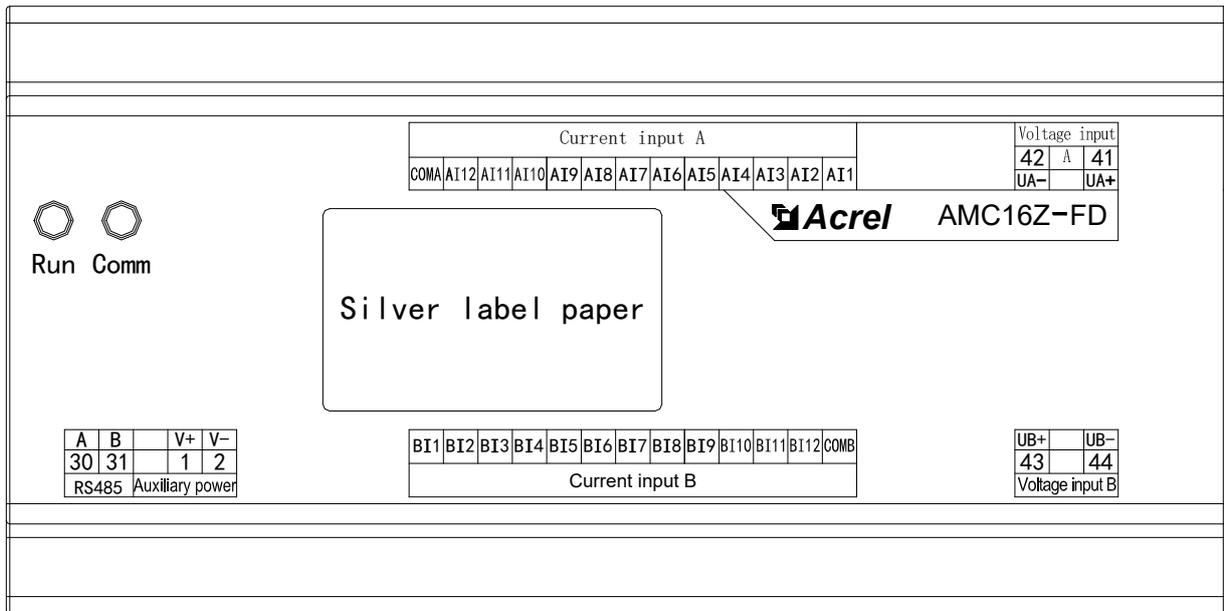
#### (2) AMC16Z-ZD-P24



Terminal number	Definition	Illustrate	Explain
1	V+	Power output at ZD; ZD-P24 auxiliary power supply	Power is supplied to AMC16Z-FD, AMC16Z-KA, AMC16Z-KD, AMC16Z-FD K24, AMC16Z-FDK48 and touch screen, this power supply is forbidden to connect other external devices (such as indicator lights, buzzers); ZD-P24 DC24V power supply
2	V-		
4	IA+	A current input	A incoming DC current (Hall sensor input)
5	IA-		
6	IB+	B current input	B channel incoming DC current

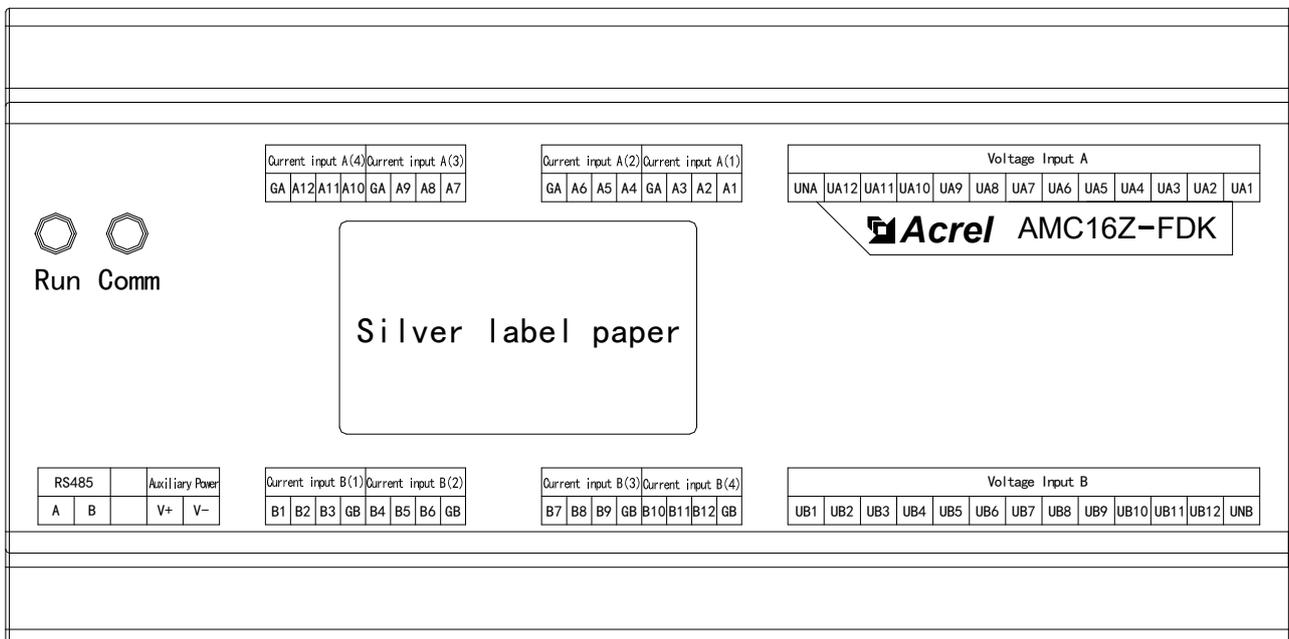
7	IB-		(Hall sensor input)	
10	UA+	A voltage input	A input line DC voltage input	
11	UA-			
12	UB+	B voltage input	B input DC voltage input	
13	UB-			
30	A	RS485 communication	Connect to a touch screen or RS485 hub	
31	B			
50	DO1	Switching output	buzzer	
51				
52	DO2		Light	
53				
61	Enter line A	Switching input	OF+SD	
62			SD	
63	Lightning protection A		Determine the status of the A-way lightning protector	
64	Cable B		OF+SD	
65			SD	
66	Lightning protection B		Determine the status of the B-way lightning protector	
69	Public end			
81	VSS		Temperature and humidity	Connect the WH-3 humidity and temperature sensor
82	DATA			
83	CLK			
84	VDD			
91	+12V	A channel Hall power supply	Power supply to A line entry current matching Hall	
93	-12V			
94	+12V	B channel Hall power supply	Power supply to the B line entry current matching Hall	
96	-12V			

## 5.2 AMC16Z-FD



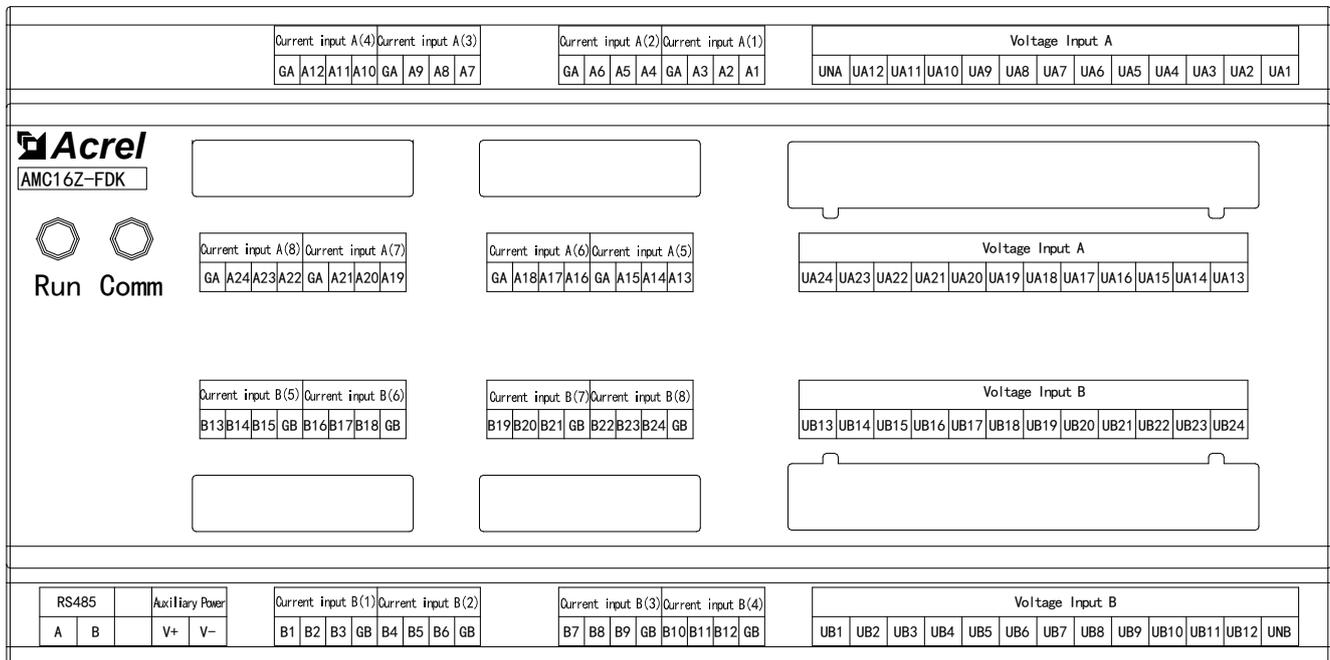
Terminal number	Definition	Illustrate	Explain
1	V+	Auxiliary power supply	Powered by AMC16Z-ZD Or powered by a DC12-24V power supply
2	V-		
30	A	RS485 communication	Connect to a touch screen or RS485 hub
31	B		
41	UA+	A voltage input	A outgoing DC voltage input
42	UA-		
43	UB+	B voltage input	B outgoing DC voltage input
44	UB-		
AI1-AI12		A current input	A outgoing DC current input (12-way Hall sensor).
COMA			
BI1-BI12		B current input	B outgoing DC current input (12-way Hall sensor).
COMB			

### 5.3 AMC16Z-FDK24



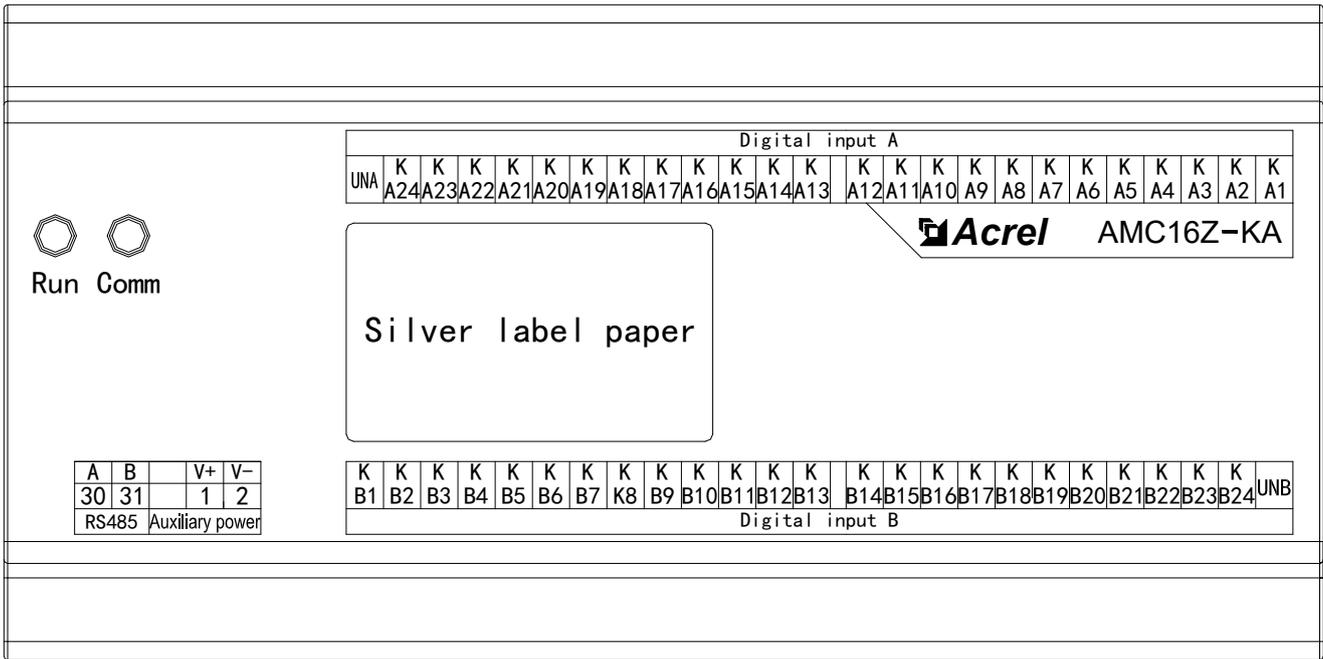
Terminal definition	Illustrate	Explain
V+	Auxiliary power supply	Powered by AMC16Z-ZD Or powered by a DC12-24V power supply
V-		
A	RS485 communication	Connect to a touch screen or RS485 hub
B		
UA1-UA12	A voltage input	A switch input
UNA		
UB1-UB12	B voltage input	B switch input
UNB		
A1-A12	A current input	A outgoing DC current input (12-way Hall sensor).
GA		
B1-B12	B current input	B outgoing DC current input (12-way Hall sensor).
GB		

#### 5.4 AMC16Z-FDK48



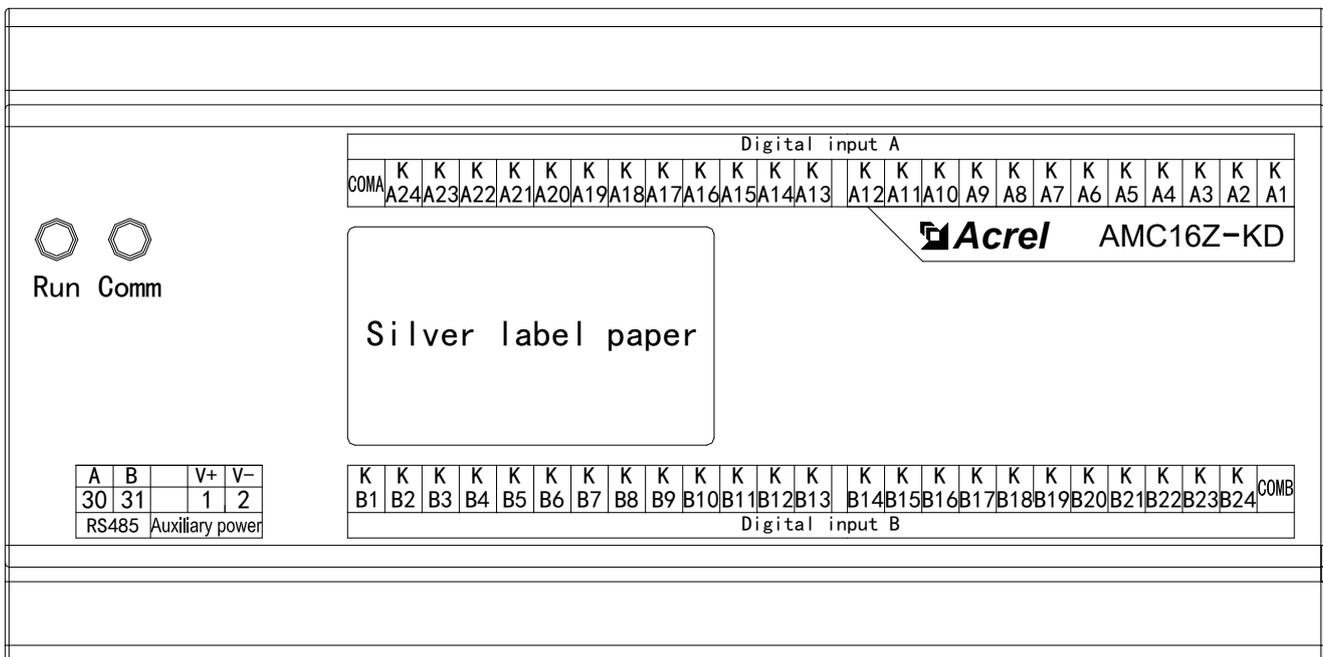
Terminal definition	Illustrate	Explain
V+	Auxiliary power supply	Powered by AMC16Z-ZD Or powered by a DC12-24V power supply
V-		
A	RS485 communication	Connect to a touch screen or RS485 hub
B		
UA1-UA24	A voltage input	A switch input
UNA		
UB1-UB24	B voltage input	B switch input
UNB		
A1-A24	A current input	A outgoing DC current input (24-way Hall sensor).
GA		
B1-B24	B current input	B outgoing DC current input (24-way Hall sensor).
GB		

5.5 AMC16Z-KA



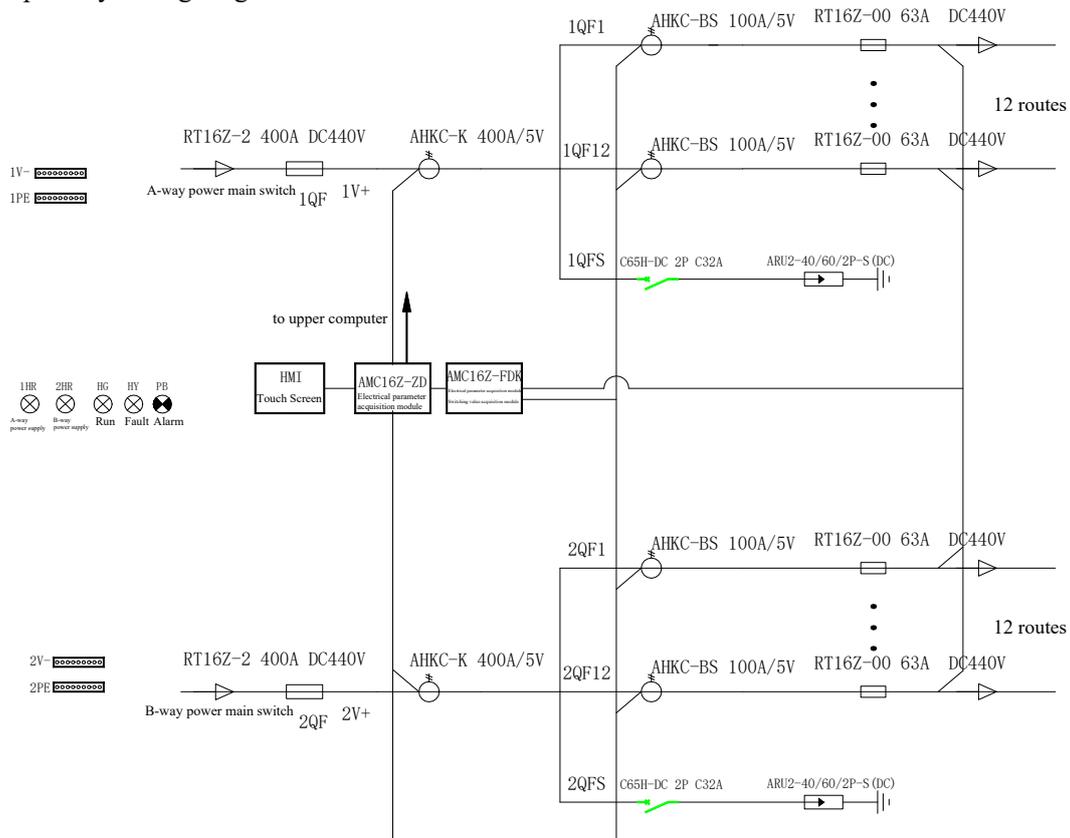
Terminal number	definition	Illustrate	Explain
1	V+	Auxiliary power supply	Powered by AMC16Z-ZD Or powered by a DC12-24V power supply
2	V-		
30	A	RS485 communication	Connect to a touch screen or RS485 hub
31	B		
KA1-KA24	UNA	A switch input	A active switching inputs (24 channels).
KB1-KB24	UNB		
		B switch input	B active switching inputs (24 channels).

5.6 AMC16Z-KD

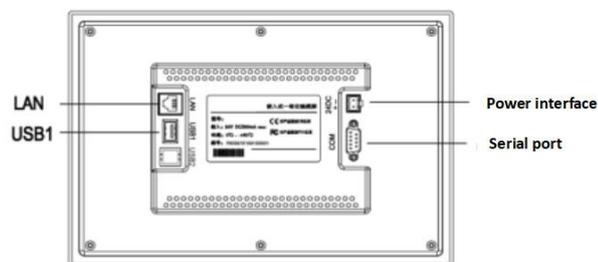


Terminal number	definition	Illustrate	Explain
1	V+	Auxiliary power supply	Powered by AMC16Z-ZD Or powered by a DC12-24V power supply
2	V-		
30	A	RS485 communication	Connect to a touch screen or RS485 hub
31	B		
KA1-KA24		A switch input	A passive switching inputs (24).
COMA			
KB1-KB24		B switch input	B passive switching inputs (24 channels).
COMB			

### 5.7 Typical primary wiring diagram



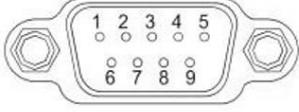
### 6 Touch screen



Serial port(DB9)	2×RS485
USB1	Main port, compatible with USB2.0 standard
LAN (RJ45)	Ethernet interface
Power interface	24V DC ±20%

## Serial port (DB9) pin definition

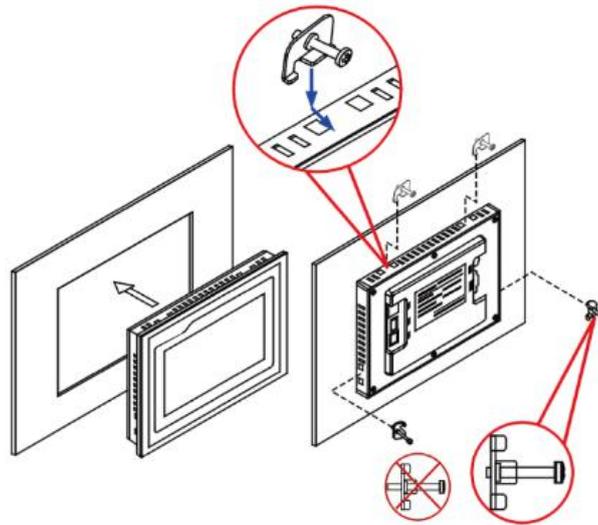
Serial port pin definition



Serial port pin definition

Interface	PIN	Pin definition
COM1	2	RS232 RXD
	3	RS232 TXD
	5	GND
COM2	7	RS485 +
	8	RS485 -
COM3	4	RS485 +
	9	RS485 -

## 6.1 Installation



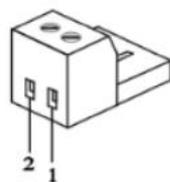
## 6.2 Wiring

### Power wiring

- Step 1: Strip the 24V power cord and insert it into the power plug terminal;  
 Step 2: Use a flat-blade screwdriver to lock the power plug screw;  
 Step 3: Insert the power plug into the product's power socket.

**Tip: Use a power cord with a diameter of 1.25mm (AWG18)**

The schematic diagram and pin definition of the power plug are as follows:



PIN	Definition
1	+
2	-

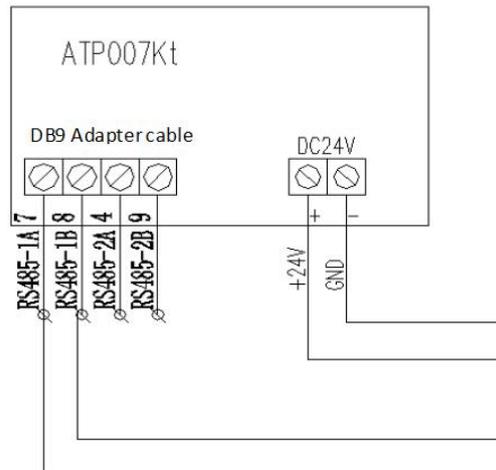
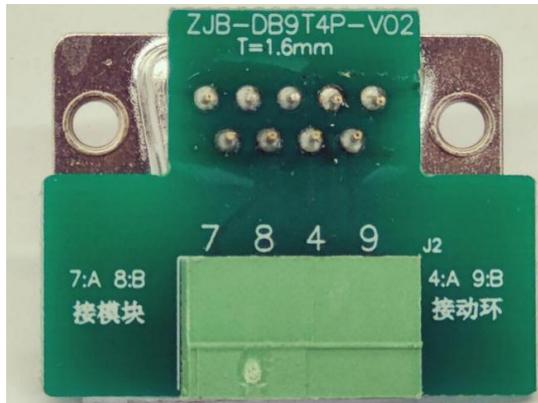


**24VDC only!**

Independent power supply is recommended, the output power of the power supply is 15W.

### Communication wiring

The factory configuration has a green adapter board, where (7-8) is downlink (7 docking 485A; 8 docking 485B), and the module's 485 is connected, green and white (4-9) uplink (4 docking 485A; 9 docking 485B), for rotating rings.



### 6.3 Precautions

- 1、 The output power of the switching power supply supplying power to the touch screen should be redundant, and it is recommended that the power output DC24 be more than 15W;
- 2、 The adapter of the communication wiring is clearly divided into upstream and downstream;
- 3、 When the user updates the touch screen program by himself, he should strictly follow the operation steps and do not mess with the dots;
- 4、 After the program download is completed, remove the USB flash drive containing the update package in time;
- 5、 The U disk disk format used by the update program must be FAT32 grid.

## 7 Touch screen program operation

### 7.1 Detailed description of parameters, functions and operations

#### 7.1.1 Main Parameters

A		B	
U/V	0.0	U/V	0.0
Current/A	0.0	Current/A	0.0
Load Percentage/%	0	Load Percentage/%	0
P/kW	0.00	P/kW	0.00
E/kWh	0.00	E/kWh	0.00
Temperature/°C	0.0		
Humidity	0.0		

Outlet A    Alarm    Switching A    Switching B  
 Outlet B    MAX demand    Month Ep    Settings    Login    User: Administrator

As shown in the figure (2 channels in the figure), the first interface after the touch screen is turned on is the main parameter interface, if there is 1 way out, the incoming line is greater than 1 channel, you can click the button in the lower right corner to switch to view the parameters of other incoming lines. If there are 2 channels out, the incoming line is greater than 2 channels, you can click the button in the lower right corner to switch to view the parameters of other incoming lines.

### 7.1.2 Branch parameters

Click the button with the word "Branch Parameter" on the main parameter interface to enter. If there are 2 outlets, it corresponds to "branch parameter A" and "branch parameter B".

L	Load	I/A	P/kW	EP/kWh	U/V	Load	Limits	Insulation kΩ	Insulation kΩ
01	L01	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
02	L02	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
03	L03	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
04	L04	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
05	L05	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
06	L06	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
07	L07	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
08	L08	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
09	L09	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
10	L10	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
11	L11	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
12	L12	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
13	L13	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
14	L14	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
15	L15	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
16	L16	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
17	L17	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0
18	L18	0.00	0.00	0.00	0.0	0.0%	60A	500.0	500.0

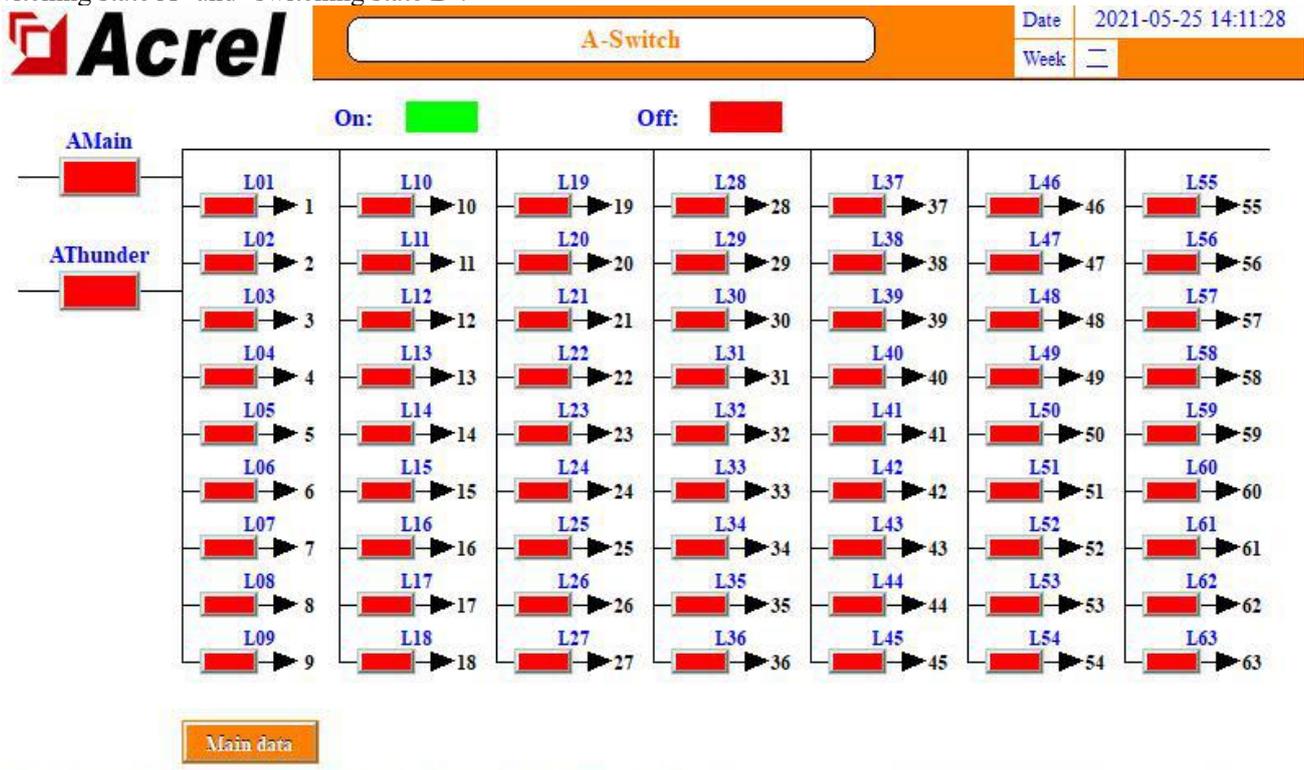
The meanings of the headings are, from left to right:

Branch serial number, loop name/load name, current, power, energy, voltage, load rate, and an overload current alarm limit value. Positive ground insulation and negative ground insulation are displayed after the insulation function is turned on, and will not be displayed if the insulation function is stopped.

Among them, a overload current alarm limit value, users can modify according to their own needs, the modification method is shown in the "parameter setting" section below.

### 7.1.3 Switch status

The switch status interface is the intuitive switch display system diagram of the main branch, and click the button with the word "switch state" in the main parameter interface to enter. If there are two outlets, they correspond to "switching state A" and "switching state B".



### 7.1.3.1 Main switch status

The leftmost column is the main switch state, the main switch state is collected by the main module (AMC16Z-ZD), with the words "main road" and "backup road" are OF+SD points, auxiliary contacts of the main circuit. The word "lightning protection" is the switch status of the lightning protector. SD/switch opening status is not displayed.

Different user field wiring will cause the required fault state corresponding to the module acquisition status is different, the main switch status displayed on this interface is unified as "fault displayed in red, normal display in green". If the user does not meet the test, it is necessary to check whether the switch alarm settings are set correctly according to the needs in combination with the alarm information.

### 7.1.3.2 Branch switch status

The right side of the main switch state is the branch switch state, which is actively collected by AMC16Z-FDK, green represents closed and red represents separation.

### 7.1.4 User Login

If you need to set alarm parameters, you can log in to the person in charge or Admin;

If you want to view the content management interface to view order information such as software number, you need to log in to Admin. The following figure shows how to log on

The figure displays two screenshots of the Acrel user login interface. Both screenshots show a table of electrical parameters on the left and a login form on the right. The top screenshot shows the login process for the '负责人' (Responsible Person) user with password '123'. The bottom screenshot shows the login process for the 'Admin' user with password '10000'. Red arrows and numbers 1, 3, and 5 highlight specific UI elements: 1 points to the 'Login' button in the top navigation bar, 3 points to the selected user in the dropdown menu, and 5 points to the 'Login' button in the login form.

Parameter	Phase A/AB
PhaseU/V	0.0
LineU/V	0.0
Phase I/A	
Load Percentage/%	
ActiveP/kW	
ReactiveP/kVar	
Apparent P/kVA	
Power Factor/φ	
ActiveE/kWh	
ReactiveE/kVarh	
Fre/Hz	
Zero to Ground U/V	
Zero Sequence I/A	
Fundamental P/kW	0.00
Harmonic P/kW	0.00
Fundamental Ep/kWh	0.00

7.1.5 Maximum Demand

The maximum demand is the maximum value of the historical average of the incoming current and power.

**Acrel** A-MAX demand Date: 2021-05-25 14:14:30 Week: --

	I/A	Year	Month	Day	Hour	Minute	Second
A-A	0.00	0	0	0	0	0	0
A-B	0.00	0	0	0	0	0	0
A-C	0.00	0	0	0	0	0	0

	P/KWh	Year	Month	Day	Hour	Minute	Second
A-A	0.00	0	0	0	0	0	0
A-B	0.00	0	0	0	0	0	0
A-C	0.00	0	0	0	0	0	0

**Demand Time Set**

Value Cur

Minute 15 15

Main data

Demand Clear

Save

You can set the "Demand Time Settings" to adjust the frequency of the average value statistics. Click the bottom left to view other lines.

7.1.6 Monthly Energy

Click "Monthly Power" on the main parameter interface to enter. You can view the monthly energy of the main and branch roads. Drag the progress bar or tap Previous or Next to take a closer look. The electrical energy shown is the previous month's electricity, such as 2015-05 represents the electricity before May 1, 2015, that is, the electricity in April.

To query the power for a period of time, you can click the "Power Query" button on this interface, enter the start and end months according to the format sample, and enter "-" in the symbol.

**Acrel** B-Energy Query Date: 2021-05-25 14:49:03 Week: --

Character: [Lowercase]

0

1 2 3 4 5 6 7 8 9 0 <-

q w e r t y u i o p

a s d f g h j k l

Caps z x c v b n m Del

Symbol Abc Blank space Exit Ok

"End Time" means the first day of month. Example of Time:2015-06

StartTime 0 End Time 0 Search Month Ep Main Data

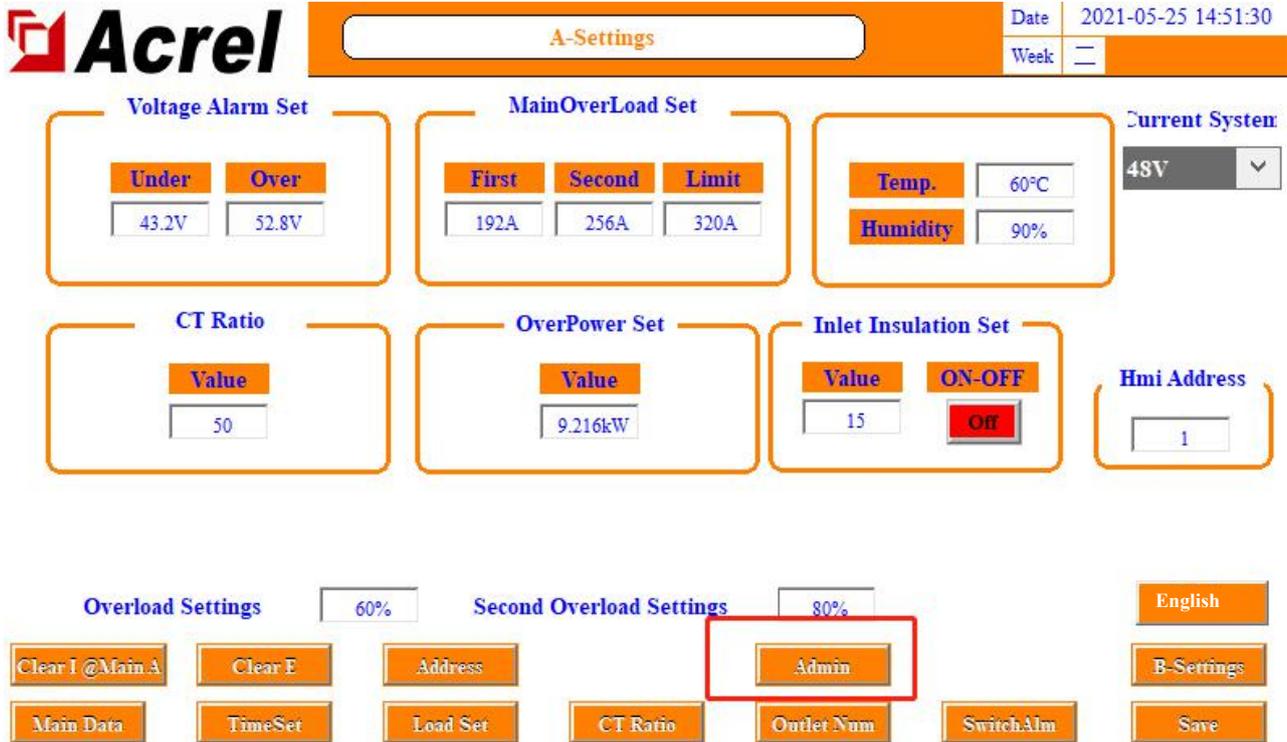
It should be noted that the termination time refers to the first day of the input month, such as entering 2015-05, which represents May 1, 2015, that is, the statistics are April and before of electrical energy.

7.1.7 Parameter Settings

Click "Parameter Settings" from the main parameter interface to enter. (Login required, refer to the permissions described in the "User Login" paragraph above.) )

7.1.7.1 Main road parameter setting

If there are multiple incoming lines, you can click the button in the lower right corner to toggle and set the parameters of other incoming lines, and the parameters common to multiple incoming lines are only set openly on the first interface.



You can selectively use the alarm function according to your own needs, if you trigger an unwanted alarm, you can modify the alarm value to make the alarm disappear, the specific modification method can refer to the following instructions.

**After the parameter setting is completed, you must click "Save Settings" to use it normally and save it when it is powered off.**

7.1.7.1.1 Voltage alarm setting:

This section sets the voltage alarm value for each phase of the main inlet. The system has default values, which can be modified according to their own needs.

Undervoltage is when the input voltage of the line is lower than the parameter set by the undervoltage, the undervoltage alarm of the voltage is triggered.

Overvoltage is, when the line input voltage is higher than the set parameter, the voltage overvoltage alarm is triggered.

7.1.7.1.2 Incoming line overload alarm setting:

This part can set the load alarm value of the main line inlet, which is divided into one and two sections.

The rated value has been preset according to the drawings when leaving the factory, and the first alarm value and the second alarm value have been preset by the rating algorithm, one alarm value = rated value \* 60%, and the second stage alarm value = rated value \* 80%. If the drawing is not clear or the actual application changes, you can modify it yourself.

When the current is greater than the set value, it will trigger a one-stage/two-stage overload alarm, it should be noted that when the second-stage overload is triggered, the one-stage alarm will not be triggered.

7.1.7.1.3 Current ratio setting:

This section sets the current variable ratio CT value. Set the parameters of this part according to the numerical size of the instrument transformer. Set the standard value to 1 for a 50A/5V Hall sensor, and 8 for a 400A/5V Hall sensor. (The outlet side should be 5V).

It has been preset according to the drawing when it leaves the factory, and the actual changes should be made, so it can be modified according to the above rules.

7.1.7.1.4 Power overload setting:

This section sets the power alarm value. The system will arrive at a default value based on the preset load and voltage, which can be modified according to its own needs.

When the power is greater than the set parameter, the frequency overrun alarm will be triggered.

7.1.7.1.5 Temperature:

This part sets that when the cabinet temperature is greater than the set parameters, the temperature overrun alarm will be triggered.

7.1.7.1.6 Humidity:

This part sets that when the humidity is greater than the set parameter, the humidity overrun alarm will be triggered.

7.1.7.1.7 Insulation:

This part sets the start and stop of the insulation function, and sets the start and stop according to the needs of the site. When the insulation function is activated, the insulation content is displayed, which is described in the "Insulation section" below.

Outlet overload alarm setting:

This section is set to the load alarm percentage on the outlet side, graded into one and two segments, similar to 1.8.1.2. The default values are 60% and 80%, and the overload alarm value is calculated with the outlet load rating, that is, the overload of the outlet section = the rated load of the outlet load \* 60%, and the overload of the second section of the outlet = the rating of the outlet load \* 80%, can be modified according to your own needs.

7.1.7.1.8 System Selection:

Due to the variety of voltage system types for DC, the voltage level can be selected under "Current System". It mainly involves the alarm limit value of the incoming line voltage and power. There are 4 options, 336V, 240V, 48V, -48V.

Note that the system type can be modified after 2 minutes of power-on to synchronize and automatically modify the alarm values of voltage and power.

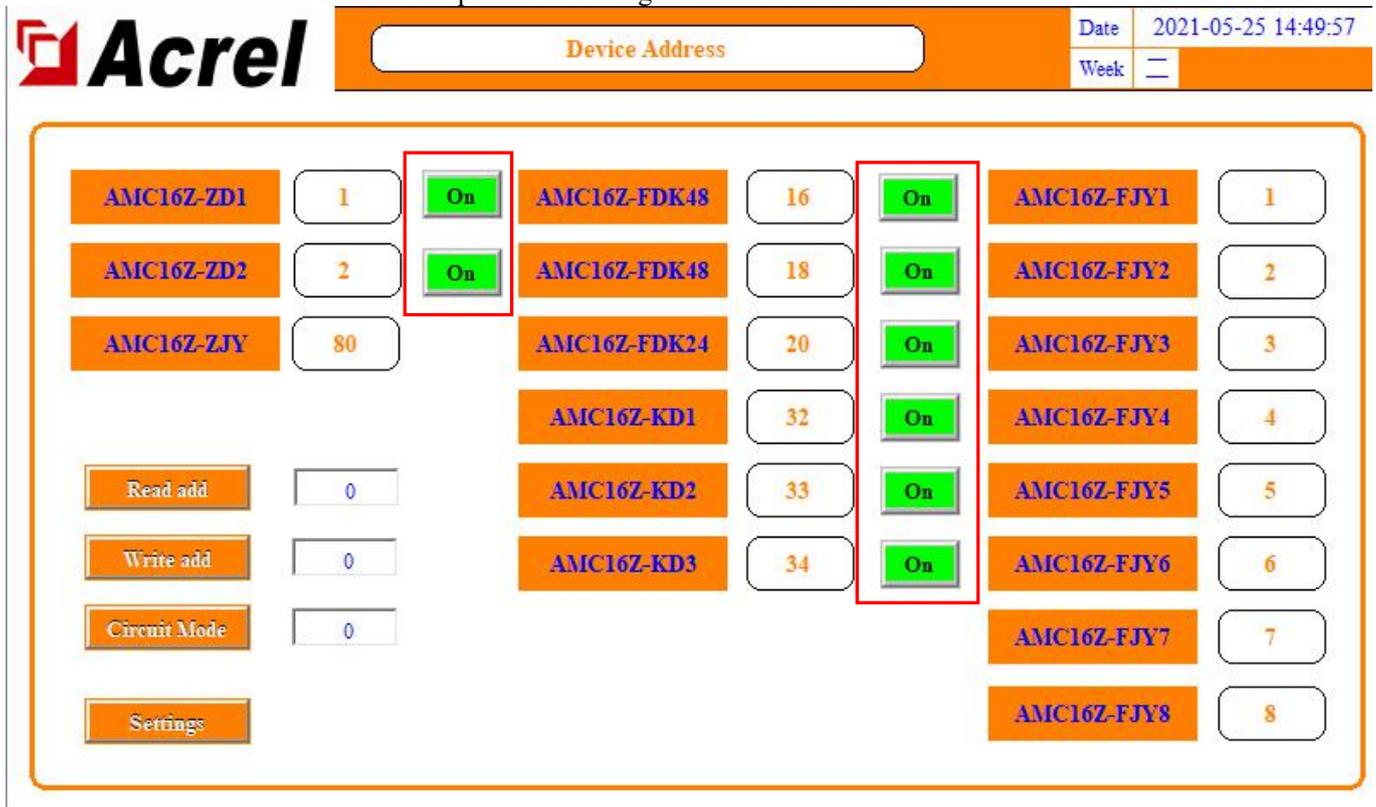
Forwarding data address:

This section involves data forwarding, and you can modify the forwarding data address by yourself, as detailed below.

7.1.7.2 Meter address

In the factory has been the default instrument internal address, if there is a problem of communication, eliminate the cause of wiring, through this function to view the instrument address and modify the instrument address.

Click "Instrument Address" on the parameter setting interface to enter.



As shown in the figure, all modules are shown in the figure, and the labels of modules that are not used at the factory will not be displayed. This section is the correct address for the meter, and if the meter address is not the indicated address, or if the meter address is duplicated, it will cause an error.

View the actual meter address: first disconnect the communication of all modules, connect only the target instrument that needs to view the address, click "Read Address", and the address of the meter is displayed on the right.

(If the address of the meter cannot be read under the premise of ensuring that all module communication is disconnected and there is no problem with wiring, the cause needs to be further troubleshooted.) )

Modify the actual instrument address: disconnect the communication of all modules, connect only the target instrument that needs to view the address, enter the communication address of the instrument on the right, and click "Write Address" to complete.



If there is a module in the actual application that does not need to be used but cannot block the communication alarm, you can click the green switch button on this interface to stop the module. If you want to put it into use at a later stage, you can click again to enable the module.

7.1.7.3 Number of outgoing lines

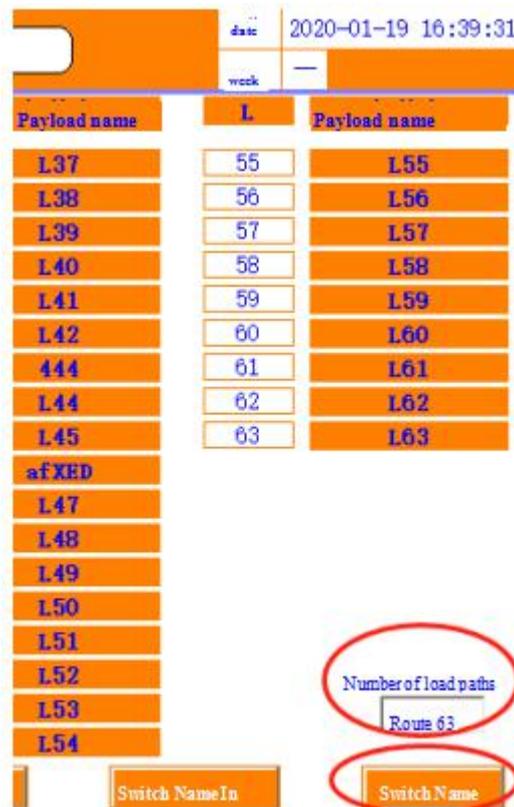
Click "Number of Outbound Lines" on the parameter setting interface to enter. (If there are multiple outlet sides, you need to go to the corresponding line entry parameter setting interface and click "Number of Outgoing Lines" to enter.) )

This part of the function is to adjust the number of lines, the number of switches, the switch name, and the load name.

7.1.7.3.1 Adjust the number of outgoing lines and switch channels.

In the lower right corner of this interface, there is "Load Number of Channels", enter the number in the input box below, and the corresponding number of channels will be displayed in the "Branch Parameters" interface. After the modification, you need to go back to the "Parameter Settings" interface and click "Save Settings" to save the power down.

Click "Switch Name" in the lower right corner to modify the number of switching channels, and the corresponding number of switching channels will be displayed on the "Switch Status" interface after the same modification. After the modification, you need to go back to the "Parameter Settings" interface and click "Save Settings" to save the power down.



7.1.7.3.2 Modify the switch name and load name.

There are two ways to modify: you can directly click the label to modify, or you can use the USB disk to modify in batches.

Bulk Modification:

First insert the USB flash drive behind the touch screen and click "Switch Name Export".



### A-Load Number And Load Name

Date 2021-05-25 14:17:23

Week

L	Load	L	Load	L	Load	L	Load
01	L01	19	L19	37	L37	55	L55
02	L02	20	L20	38	L38	56	L56
03	L03	21	L21	39	L39	57	L57
04	L04	22	L22	40	L40	58	L58
05	L05	23	L23	41	L41	59	L59
06	L06	24	L24	42	L42	60	L60
07	L07	25	L25	43	L43	61	L61
08	L08	26	L26	44	L44	62	L62
09	L09	27	L27	45	L45	63	L63
10	L10	28	L28	46	L46		
11	L11	29	L29	47	L47		
12	L12	30	L30	48	L48		
13	L13	31	L31	49	L49		
14	L14	32	L32	50	L50		
15	L15	33	L33	51	L51		
16	L16	34	L34	52	L52		
17	L17	35	L35	53	L53		
18	L18	36	L36	54	L54		

**LoadNum**

63

Settings

LoadName ToSwitchName

SwitchNameOut

SwitchNameIn

SwitchName

Open the USB flash drive information on the computer and find the USB harddisk folder in the root directory. Find the content you want to change and open the name for the modification sequence number.

Then insert the USB flash drive into the back of the touch screen and click "Switch Name Import". At this point, the names of each channel displayed on the "Branch Parameters" and "Switch Status" interfaces are already the modified names.

#### 7.1.7.4 Energy clearance

Click "Energy Clearance" in the "Parameter Settings" interface, the measured energy of all modules connected to the communication line will be cleared, pay attention to disconnect the modules that do not need to be cleared from the communication line.

#### 7.1.7.5 The main current is cleared

Since the Hall transformer has zero drift, this key is used for zero calibration of the main current. When there is no load, click "Main Current Clear", wait for a period of time before the current returns to zero. If there are multiple lines, you need to enter the corresponding line setting interface in the lower right corner of the "Parameter Settings" interface and click this button of the corresponding circuit.

#### 7.1.7.6 Set time

Click "Set Time" in the "Parameter Settings" screen to modify the current time.

#### 7.1.7.7 Load rating

Click "Load Rating" in the "Parameter Settings" interface to modify the load rating of each way out of the line, which has been preset according to the drawing when leaving the factory, and can be modified by itself if there is a change in the actual application. After the modification is completed, you need to return to the "Parameter Settings" interface and click "Save Settings".

This data is calculated with the percentage of the alarm value of the two-stage load of the outlet section of the "Parameter Settings" interface. An alarm value is displayed in the "Branch Parameters" interface.

#### 7.1.7.8 CT rating

Click "CT Rating" in the "Parameter Settings" interface to modify the CT ratio of each outlet line, and if there are 2 discharge lines, it needs to be set according to the configured Hall sensor primary value (note that the secondary input signal should be 5V). If the Hall sensor is configured with 100A/5V, it should be set to 100. If configured with a 100A/4V Hall sensor, it should be set to 125.

It has been preset according to the drawing when it leaves the factory, and the actual changes should be made, so it can be modified according to the above rules.

L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12
15	15	15	15	15	15	15	15	15	15	15	15
L13	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	L24
15	15	15	15	15	15	15	15	15	15	15	15
L25	L26	L27	L28	L29	L30	L31	L32	L33	L34	L35	L36
15	15	15	15	15	15	15	15	15	15	15	15
L37	L38	L39	L40	L41	L42	L43	L44	L45	L46	L47	L48
15	15	15	15	15	15	15	15	15	15	15	15
L49	L50	L51	L52	L53	L54	L55	L56	L57	L58	L59	L60
15	15	15	15	15	15	15	15	15	15	15	15

Write all

0

Settings

- to GND Set

At the "CT Rating" interface, the branch current is cleared to zero. Click to reset the current of each branch with one button.

7.1.7.9 English version

Click "English" in the "Parameter Settings" interface to switch the interface to the English version, and then click "Chinese" to switch back to the Chinese version.

7.1.7.10 Switch alarm settings

For the alarm of the switch, you can click "Switch Alarm Settings" in the "Parameter Settings" interface to the switch alarm setting interface.

7.1.7.10.1 Branch switch alarm setting (active).

L01	L02	L03	L04	L05	L06	L07	L08
on							
L09	L10	L11	L12	L13	L14	L15	L16
on							
L17	L18	L19	L20	L21	L22	L23	L24
on							
L25	L26	L27	L28	L29	L30	L31	L32
on							

Restart after SwitchAlarmSet

Main data

Restart Hmi

SaveSwitchSet

All On

All Off

Next

This part refers to the AMC16Z-FDK collected active detection switch state, for the trip alarm, that is, need to detect the switch normal and then disconnect to trigger the alarm, if there is a switch is not enabled but there is an alarm, you can click the switch alarm setting of the road, so that "on" becomes "off", and then if you need to enable it you can click to open again.

After the setting is complete, click "Save switch settings".

7.1.7.10.2 Branch SD alarm setting (passive).

Click the next page in the "Switch Alarm Settings" interface to the last page to set the "normally open" and "normally closed" of "Outlet SD".

This part refers to the passive detection switch status collected by the AMC16Z-KD, which is a trip alarm. The SD of the branch is controlled by this key at the touch of a button.

Normally closed: the loop changes from a path to an open circuit and alarms.

Normally open: the loop changes from open to path, then alarm.

Users choose normally open or normally closed according to the actual application, and the default is normally closed when leaving the factory. If the user does not need to use SD alarm, the default is normally closed without alarm.

If there are any changes, click "SD Dedicated Save Settings" on the right after the settings are completed, or click "Save Settings" on the "Parameter Settings" screen.

7.1.7.10.3 Main switch alarm setting (passive).

Click the next page in the "Switch Alarm Settings" interface to the last page to set the switching point of ZD acquisition.

Labels with the words "Main Road" and "Alternate Road" are generally used as auxiliary contacts, and the rest are shown in the label. "Main Road", "Standby Road", "Main Road Lightning Protection" and "Standby Road Lightning Protection" involve the display of the "Switch Status" interface.

A series of buttons under "Use" control whether the switch is in use and displayed, if it is "off", the alarm will not be triggered and the "Switch Status" interface will block the display of the switch status. (All incoming wires used by users are turned on by default at the factory)



The button at the top of the interface controls whether the switch enables alarms. If you need to display only the switch status without enabling the switch alarm, you can [click here](#) to turn off the alarm function.



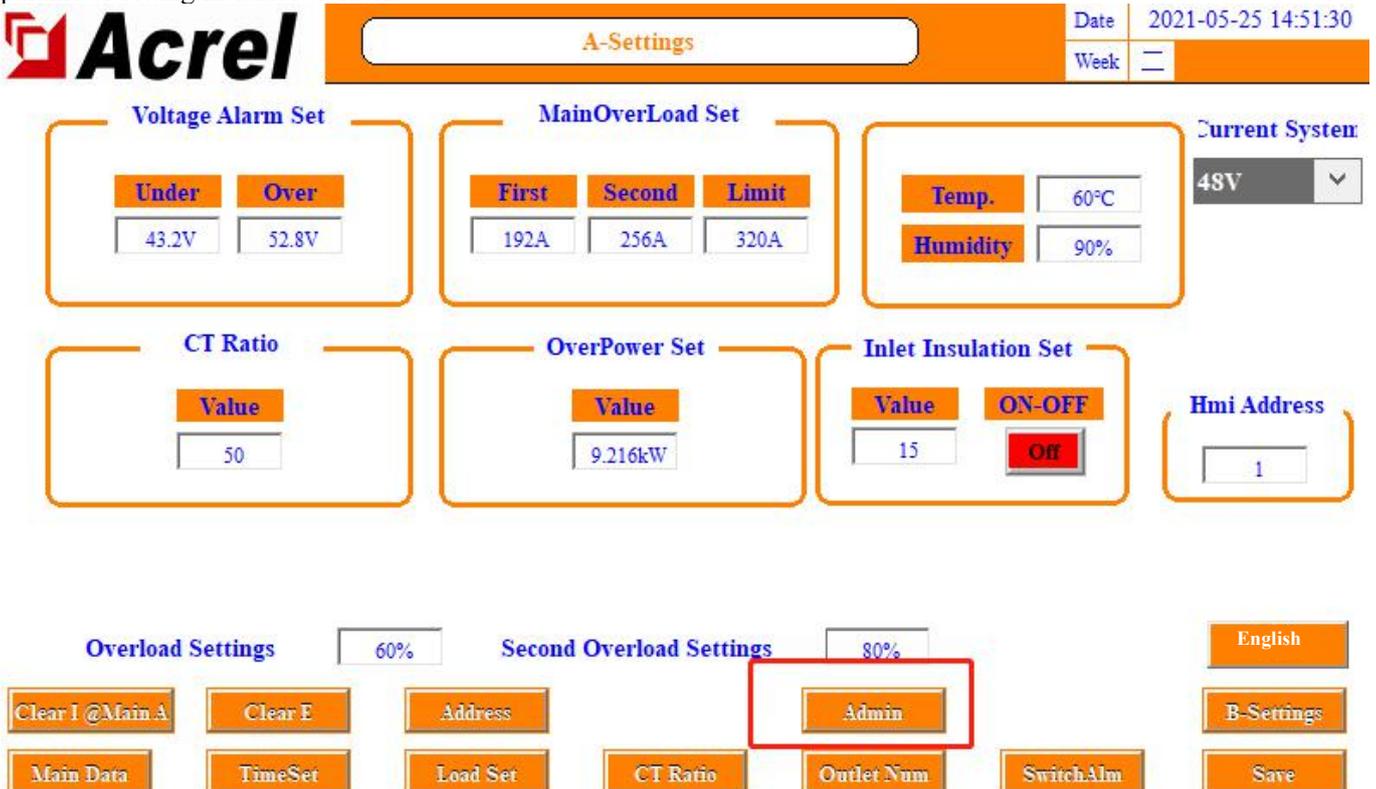
A column of buttons under "Alarm Status" controls the alarm logic to be normally open or normally closed, "main circuit" and "standby circuit" are generally used as auxiliary contacts, "normally closed" is an alarm when the loop changes from a broken circuit to a path, and "normally open" is an alarm when the loop changes from a path to a broken circuit. The logic of SD "tripping" and "lightning protection" is opposite to the logic of the main switch, "normally open" is an alarm when the loop changes from a broken circuit to a path, and "normally closed" means that the loop changes from a path to an open circuit and an alarm.

The factory setting defaults to all switching points: the loop changes from a path to an open circuit and an alarm. The user can change the logic used according to the actual situation. After the changes are complete, click "Save Switch Settings" to save.

#### 7.1.7.11 Internal Management

In the internal management interface, you can query the module information, order information, software number, user information, etc. used by the current system. At the same time, it involves forwarding content, please refer to the forwarding section below.

Follow the steps in 1.4 to log in to Admin. Click "Parameter Settings" and click "Internal Management" on the parameter setting interface to enter.



- Project Name
- User:
- Cabinet Model
- Software Version
- Order Number
- Cabinet Number
- Device name&number
- Inlet&Outlet Num
- Device add

V1.00

1

Two three phase main incoming lines +120 outgoing lines in total

IP Address

0 . 0 . 0 . 0

0

Save

Port:502



Main data

If there is a problem during use, you will need to provide information on this page when contacting.

7.1.8 Alarm Information

7.1.8.1 Current alarm information

Click "Alarm Information" on the "Main Channel Parameters" screen to view the current alarm. Click "Alarm Silencer" to confirm that the current alarm stops the buzzer and the alarm message does not disappear. If a new alarm is generated at this time, even if the new alarm disappears, the buzzer will not stop as long as there is an alarm entry in the current alarm message.

When an alarm is generated and then all repairs disappear, the system will automatically silence the sound.

Date	Time	Alarm type	Alarm value	Alarm description	Response time
2021/05/25	14:19:46	Negative jump alarm	0	Spare-B Thunder Alarm	2021/05/25 14:20:59
2021/05/25	14:19:46	Negative jump alarm	0	Spare-B Tripped	2021/05/25 14:20:59
2021/05/25	14:19:43	Negative jump alarm	0	Spare-B Switch Alarm	2021/05/25 14:20:59
2021/05/25	14:19:42	Negative jump alarm	0	Spare-A Thunder Alarm	2021/05/25 14:20:59
2021/05/25	14:19:42	Negative jump alarm	0	Spare-A Tripped	2021/05/25 14:20:59
2021/05/25	14:19:41	Negative jump alarm	0	Spare-A Switch Alarm	2021/05/25 14:20:59
2021/05/25	14:09:52	Switch variable alarm	1006	KD1#AMC16Z Communication Alarm	2021/05/25 14:20:59
2021/05/25	14:09:51	Switch variable alarm	1006	FAK48-2#AMC16Z Communication Alar	2021/05/25 14:20:59
2021/05/25	14:09:50	Switch variable alarm	1006	FAK48-1#AMC16Z Communication Alar	2021/05/25 14:20:59
2021/05/25	14:09:50	Switch variable alarm	1006	FAK24#AMC16Z Communication Alarm	2021/05/25 14:20:59
2021/05/25	14:09:48	Switch variable alarm	1006	ZA2#AMC16Z Communication Alarm	2021/05/25 14:20:59
2021/05/25	14:09:45	Switch variable alarm	1006	KD3#AMC16Z Communication Alarm	2021/05/25 14:20:59
2021/05/25	14:09:45	Switch variable alarm	1006	KD2#AMC16Z Communication Alarm	2021/05/25 14:20:59
2021/05/25	14:09:45	Switch variable alarm	1006	ZA1#AMC16Z Communication Alarm	2021/05/25 14:20:59

Confirm
Last
Next

Main data

History

7.1.8.2 Historical alarm information

Click "Historical Alarm" on the "Current Alarm" screen to view the historical alarm. Click "Clear Alarm" to clear all historical alarm entries. "Clear Alarm" has permission restrictions, and you need to log in to the person in charge or Admin to clear historical alarms.

Date	Time	Alarm type	Alarm value	Alarm description	End time
2021/05/25	14:19:46	Negative jump alarm	0	Spare-B Thunder Alarm	
2021/05/25	14:19:46	Negative jump alarm	0	Spare-B Tripped	
2021/05/25	14:19:43	Negative jump alarm	0	Spare-B Thunder Alarm	2021/05/25 14:19:44
2021/05/25	14:19:43	Negative jump alarm	0	Spare-B Switch Alarm	
2021/05/25	14:19:42	Negative jump alarm	0	Spare-A Thunder Alarm	
2021/05/25	14:19:42	Negative jump alarm	0	Spare-A Tripped	
2021/05/25	14:19:41	Negative jump alarm	0	Spare-A Switch Alarm	
2021/05/25	14:19:26	Negative jump alarm	0	A-Main Switch Alarm	2021/05/25 14:19:27
2021/05/25	14:09:52	Switch variable alarm	1006	KD1#AMC16Z Communication Alarm	
2021/05/25	14:09:51	Switch variable alarm	1006	FAK48-2#AMC16Z Communication Alar	
2021/05/25	14:09:50	Switch variable alarm	1006	FAK48-1#AMC16Z Communication Alar	
2021/05/25	14:09:50	Switch variable alarm	1006	FAK24#AMC16Z Communication Alarm	
2021/05/25	14:09:48	Switch variable alarm	1006	ZA2#AMC16Z Communication Alarm	
2021/05/25	14:09:45	Switch variable alarm	1006	KD3#AMC16Z Communication Alarm	
2021/05/25	14:09:45	Switch variable alarm	1006	KD2#AMC16Z Communication Alarm	

7.1.9 Insulation function

**Note: All the following parameters are set according to the drawings at the factory, and the function of self-modification is open.**

In the Insulation Start and Stop section of the "Parameter Settings" interface, click Turn on the insulation function.

7.1.9.1 Main circuit insulation information

After starting the insulation function, there will be more "insulation information" buttons on the "Main Parameters" interface, click to view the insulation parameters of the main inlet.

1-Insulation		2-Insulation	
Bus+to Ground U/V	0.0	Bus+to Ground U/V	0.0
Bus-to Ground U/V	0.0	Bus-to Ground U/V	0.0
Bus U/V	0.0	Bus U/V	0.0
Bus+to Ground R/V	500	Bus+to Ground R/V	500
Bus-to Ground R/V	500	Bus-to Ground R/V	500

7.1.9.2 Branch insulation information

After activating the insulation function, the insulation parameters collected by the AMC16Z-FJY module will be displayed on the "Branch Parameters" interface.

7.1.9.3 Insulation-related alarm settings

If there is any modification, you must click "Save Settings" after the modification to save the alarm and power down normally.

The screenshot shows a control panel with several settings:

- CT Ratio:** Value set to 50.
- OverPower Set:** Value set to 9.216kW.
- Inlet Insulation Set:** Value set to 15, ON-OFF switch set to On.
- Hmi Address:** Value set to 1.
- NUM of Insulation:** Value set to 0.
- Insulation Switching:** Switch set to Off.
- Overload Settings:** Set to 60%.
- Second Overload Settings:** Set to 80%.
- Language:** English.
- Buttons:** Clear I @Main A, Clear E, Address, Insulation Set, Admin, B-Settings, Main Data, TimeSet, Load Set, CT Ratio, Outlet Num, SwitchAlm, Save.

7.1.9.3.1 Incoming insulation resistance rating

The "Parameter Settings" interface sets the alarm limit values of the positive and negative resistance to ground of the main line in this section. When the positive resistance of the bus bar to ground and the negative resistance value of the bus bar to ground are less than the set value, the alarm is triggered.

7.1.9.3.2 Number of insulation submodules

In this section, set the number of access to the insulation submodule AMC16Z-FJY. If the settings here do not match the actual situation, it will cause FJY communication alarm or communication problems.

7.1.9.3.3 Switching

This section can turn on and off switching.

7.1.9.3.4 Outlet insulation resistance rating

Click "Insulation Alarm" on the "Parameter Settings" interface to enter the insulation resistance alarm setting on the outlet side. If there are 2 outlet sides, switch to the corresponding interface in the lower right corner of the "Parameter Settings" interface and click "Insulation Alarm" to enter.

The screenshot shows the 'A-Insulation + to GND Settings' interface with the following details:

- Header:** Acrel logo, title 'A-Insulation + to GND Settings', Date: 2021-05-25 14:52:47, Week: --.
- Grid:** A 6x10 grid of outlets labeled L01 to L60. Each cell contains the value '15'.
- Buttons:** 'Write all' button and a numeric input field containing '0'.
- Footer:** 'Settings' button on the left and '- to GND Set' button on the right.

In this section, set the alarm limit values of the positive and negative resistance of the branch to ground. When the positive insulation resistance and negative insulation resistance of a branch are less than the set value, the alarm of the road is triggered.

7.2 Data Forwarding

7.2.1 RS485 communication

Through the RS485 communication interface of the touch screen to connect the data to the background monitoring

system, then to set the correct communication address, the default communication address is 1, the baud rate is 9600 (can not be changed), the communication address is set in the parameter setting interface, in the "forwarding data address" input box, modify to the corresponding address, Then click Save Settings, otherwise it will revert to the default address 1 after power loss. Note that the communication data format is 9600.n 8.1。

**A-Settings** | Date: 2021-05-25 14:16:21 | Week: —

	Loss	Under	Over
Main A	10V	187V	242V
Main B	10V	187V	242V
Main C	10V	187V	242V

	First	Second	Limit
Main A	192A	256A	320A
Main B	192A	256A	320A
Main C	192A	256A	320A

0-GND U	20V
IA-IO	300A
Temp.	60°C
Humidity	90RH
LeakageI	300mA

	Value
CT A	50
CT B	50
CT C	50

	Value
Main A	42.24kW
Main B	42.24kW
Main C	42.24kW

	Value
U	33%
I	330%

Under	Over
47Hz	53Hz

Hmi Address: 1

Overload Settings: 60%

Second Overload Settings: 80%

Buttons: Device add, Load Num, Clear E, Chinese, B-Settings, Main data, TimeSet, Load Set, CT Ratio, PhaseSet, SwitchAlm, Save

### 7.2.2 Ethernet communication (optional).

Through the Ethernet port communication interface of the touch screen to access the data to the background monitoring system, to correctly set the network address and port number, note that the touch screen network address setting can be set in the internal management interface of the touch screen software. The port number for network communication is 502 and cannot be changed.

**Admin** | Date: 2021-05-25 14:20:39 | Week: —

Project Name		<b>IP Address</b> <input type="text" value="0.0.0.0"/> <input type="text" value="0"/> Save Port:502  Main data
User:		
Cabinet Model		
Software Version	V1.00	
Order Number		
Cabinet Number	1	
Device name&number		
Inlet&Outlet Num	Two three phase main incoming lines +120 outgoing lines in total	
Device add		
Modification		

The background software acquisition touch screen interval is recommended to be greater than 500ms.

Revision record

Date	Old version	New version	Revision
2022.2.24		V1.0	1.First writing
2023.5.10	V1.0	V1.1	1.Add P24 model related content 2.Increase the overall size of the touch screen
2023.8.25	V1.1	V1.2	1.modify the FDK laser printing diagram and change the switch input to voltage input

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