591

Manual of ASCB1 Series of Intelligent Micro-Circuit Breakers

V1.1

Acrel Electric Co., Ltd.

Declare

The company reserves the right to modifications to the product specifications described in this manual without notice. Before ordering, please consult the local agent for the new specifications of this product.

Content

1. General

ASCB1 series intelligent micro circuit breakers (hereinafter referred to as intelligent micro circuit breakers) are applied to low-voltage terminal distribution networks in industrial, commercial, civil buildings and infrastructure fields in residential buildings and similar places.The intelligent micro circuit breaker is used with the intelligent gateway to conduct real-time monitoring of the key electrical parameters of the power line, such as voltage, current, power, temperature, leakage, energy consumption, etc., and has remote control, abnormal warning, accident trip warning alarm, electric energy metering statistics, fault positioning and other functions.

This series of products can be selected from unipole, 2 pole, 3 pole, 4 pole.

2. Product Model

- Intelligent Micro-circuit Breaker

A SCB 1 □ - 63 - □ □ - □P

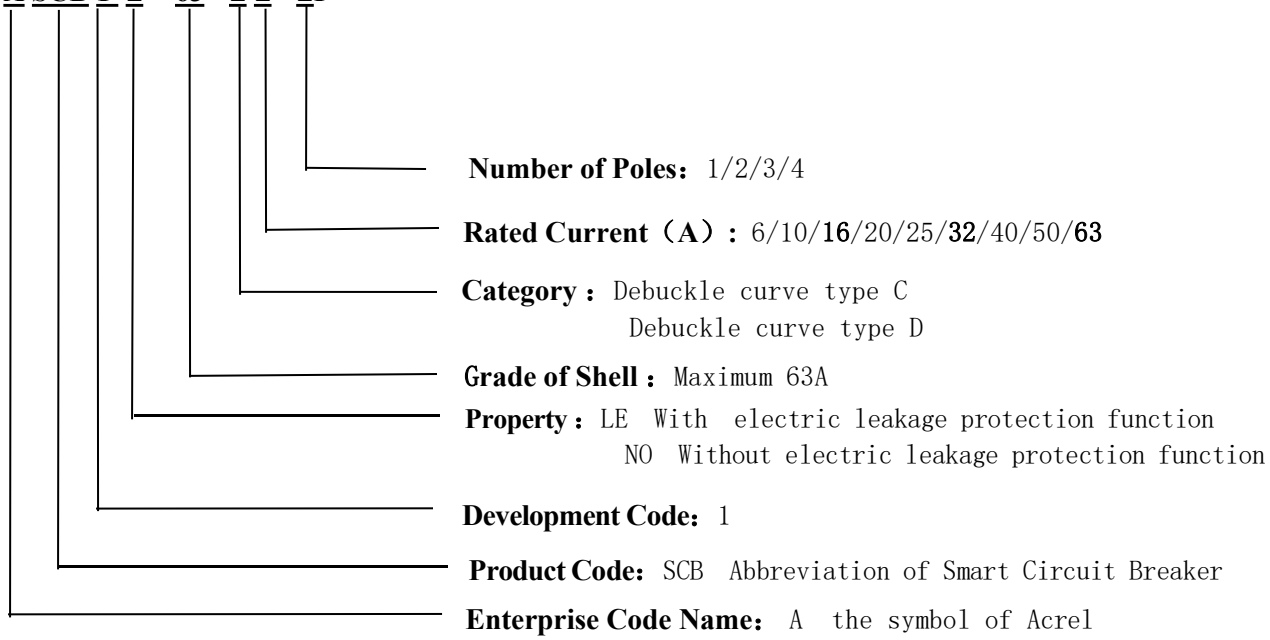


Table 1 Function Description of Intelligent Micro Circuit Breaker

Product Model	Description OF Functional
ASCB1-63	➢ Can monitor voltage, current, power, power and temperature in real time ➢ with overpressure, underpressure, overload, short circuit, overcurrent, and overtemperature and other protection functions ➢ With local manual lever, local electric control, local lock, remote control, timing control and other control function ➢ Guide rail type installation, optional pole number 1P / 2P / 3P / 4P ➢ Standard RS-485 (MODBUS) communication; optional buckle curve type C / D

ASCB1LE-63	➢ Real-time monitoring of voltage, current, power, electric energy, temperature and leakage and other parameters ➢ With overvoltage, undervoltage, overload, short circuit, overcurrent, ultra-moderate leakage and other protection functions ➢ With local manual lever, local electric control, local lock, remote control, timing control and other control functions ➢ Guide rail type installation, optional pole number 2P / 4P; standard RS-485 (MODBUS) communication; optional buckle curve type C / D type.

- Smart Gateway

A SCB 1 - MS - □

Communication Protocol： 4GUE/4G/WF:Wi-Fi/CE:Ethernet/blank:RS-485

Category the Product： Smart gateway

Development Code： 1

Product Code： SCB Abbreviation of Smart Circuit Breaker

Enterprise Code Name： A the symbol of Acrel

Table 2 Intelligent Gateway Function Description Table

ASCB1-MS-4GUE/ ASCB1-MS-4G	➢ Can connect to up to 16 intelligent micro circuit breakers. ➢ Can see the real-time data of voltage, current, power, power, temperature and leakage of each intelligent micro circuit breaker. ➢ Can view the fault, alarm and separation status of each intelligent micro circuit breaker. ➢ Can set and control the parameters for each intelligent micro circuit breaker. ➢ Din rail type installation;LCD display. ➢ Support event logging; support RS485 communication. ➢ Support for 4G network communication.
ASCB1-MS-WF	➢ Can connect to up to 16 intelligent micro circuit breakers. ➢ Can see the real-time data of voltage, current, power, power, temperature and leakage of each intelligent micro circuit breaker. ➢ Can view the fault, alarm and separation status of each intelligent micro circuit breaker. ➢ Can set and control the parameters for each intelligent micro circuit breaker. ➢ Din rail type installation;LCD display. ➢ Support event logging; support RS485 communication. ➢ Support for Wi-Fi communication.

ASCB1-MS-CE	➢ Can connect to up to 16 intelligent micro circuit breakers. ➢ Can see the real-time data of voltage, current, power, power, temperature and leakage of each intelligent micro circuit breaker. ➢ Can view the fault, alarm and separation status of each intelligent micro circuit breaker. ➢ Can set and control the parameters for each intelligent micro circuit breaker. ➢ Din rail type installation,LCD display. ➢ Support event logging; support RS485 communication. ➢ Support for Ethernet communication.
ASCB1-MS	➢ Can connect to up to 16 intelligent micro circuit breakers. ➢ Can see the real-time data of voltage, current, power, power, temperature and leakage of each intelligent micro circuit breaker. ➢ Can view the fault, alarm and separation status of each intelligent micro circuit breaker. ➢ Can set and control the parameters for each intelligent micro circuit breaker. ➢ Din rail type installation,LCD display. ➢ Support event logging; support RS485 communication.

3. Technical Parameter

Table 3. Technical parameters table of intelligent micro circuit breaker

Model		ASCB1-63	ASCB1LE-63
Pole		1P/2P/3P/4P	2P/4P
Grade of Shell		63A	
Rated Voltage		230V（1P/2P）、400V(3P/4P)	
Rated Current		6A,10A,**16A**,20A,25A,**32A**,40A,50A,**63A**	
Instantaneous Unbuckle Type		C/D	
Rated Short-circuit Breaking Capacity		6000A	
Protect	Over-current Protection	Default 100% rated current alert, 110% Rated current trip with adjustable threshold	
	Short-circuit Protection	C：5-10 Rated current for 0.04 seconds for circuit break protection D：10-14 Rated current for 0.04 seconds for circuit break protection	
	Overload Protection	Default 100% rated power alert, 110% Rated power trip with adjustable threshold	
	Over-voltage Protection	Default 110% rated voltage alert, 120% rated voltage trip with adjustable threshold	

	Under-voltage Protection	Default 90% rated voltage alert, 80% rated voltage trip with adjustable threshold	
	Over-temperature Protection	Default 80℃ alert, 100℃ trip, the threshold is adjustable	
	Leakage Protection	No	Default 20mA alert, 30mA trip, the threshold is adjustable
Leakage self-Inspection		No	Manual button self-inspection
Mechanical Life		20000次	
Electrical Life		6000次	
Levels of Protection		IP20	
Connection Capacity		1-35mm²	
Elevation Requirements		2000m	
Ambient Temperature		-10℃～55℃, the average temperature at 24h was no higher than 40℃	
Environmental Requirements		No explosion hazard, no conductive dust, no sufficient corrosion of metal and damaged insulation, no significant vibration	
Relative Humidity		At + 40℃, the relative humidity of the air is 50% and can have high relative humidity at lower temperatures	
Storage Temperature		-20℃-70℃	
Class of Pollution		II	
Installation Type		III	
Way to Installation		Standard 35mm guide rail installation	

Table 4 ASCB1 Intelligent Gateway

Product Model	ASCB1-MS-4GUE/ ASCB1-MS-4G	ASCB1-MS-WF	ASCB1-MS-CE	ASCB1-MS
Power Supply	AC 220V			
Consumption	≤30W			
Communication	4G	Wi-Fi	Ethernet	RS-485
Display	LCD dot-matrix			
Incident Record	Up to 20 alarm, fault and action records each			
Protocol	Modbus、MQTT and so on			
Elevation Requirements	2000m			
Ambient Temperature	-10℃-45℃, 24h the average temperature is not higher than 35℃			

Environmental Requirements	No explosion hazard, no conductive dust, no sufficient corrosion of metal and damaged insulation, no significant vibration
Relative Humidity	At + 40℃, the relative humidity of the air is 50% and can have high relative humidity at lower temperatures
Storage Temperature	-20℃-70℃
Levels of Protection	IP20
Way to Installation	Standard 35mm guide rail installation

4. Installation and wiring

4.1. Outline and Installing Dimensions （unit：mm）

- Intelligent micro-circuit breaker

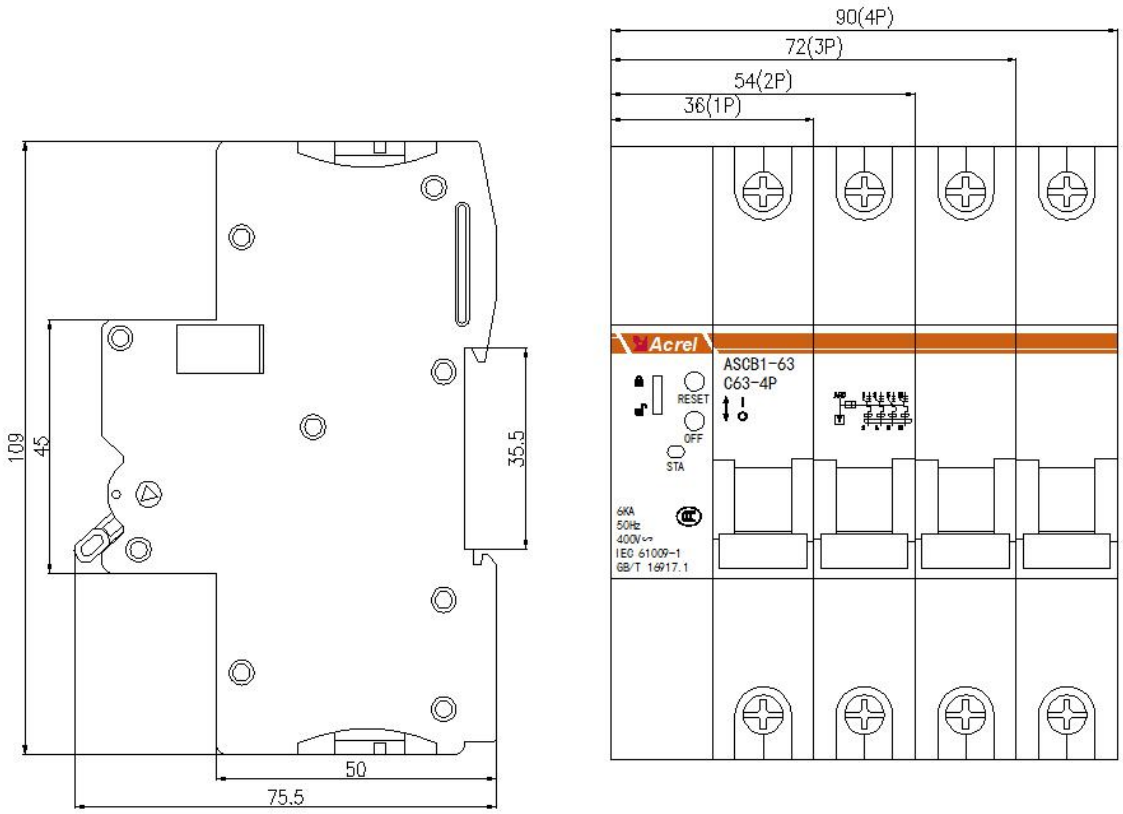


Figure 1 Outline dimensions of the intelligent micro circuit breaker

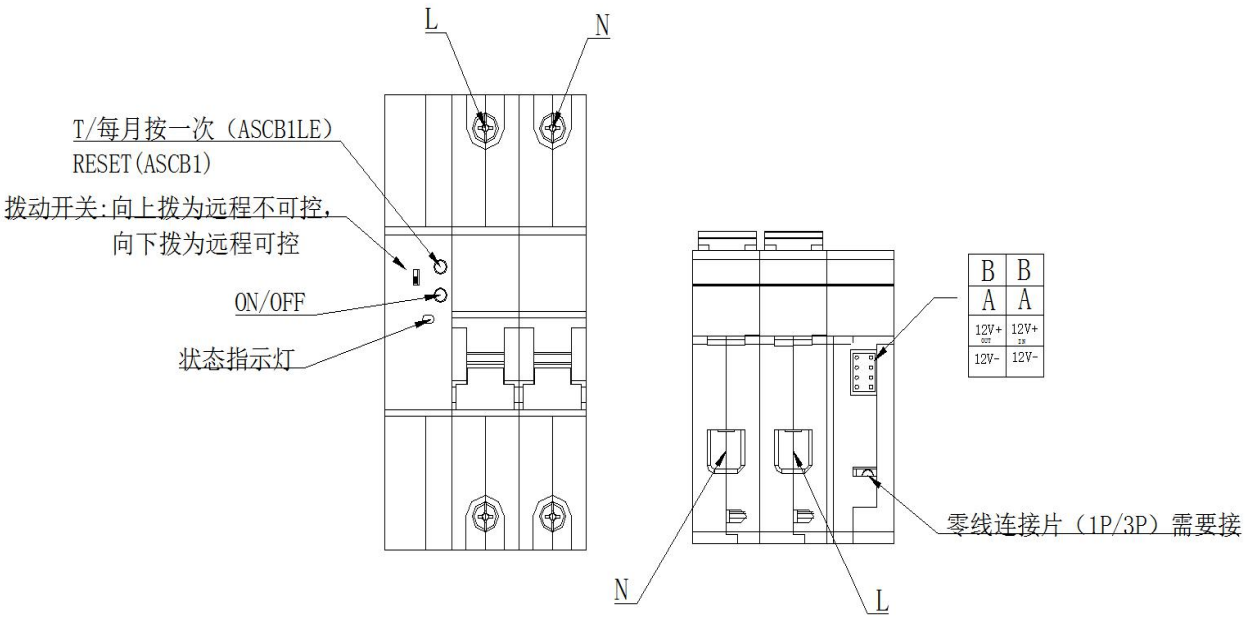


Figure 2 Schematic diagram of intelligent micro circuit breaker terminals

- Smart Gateway

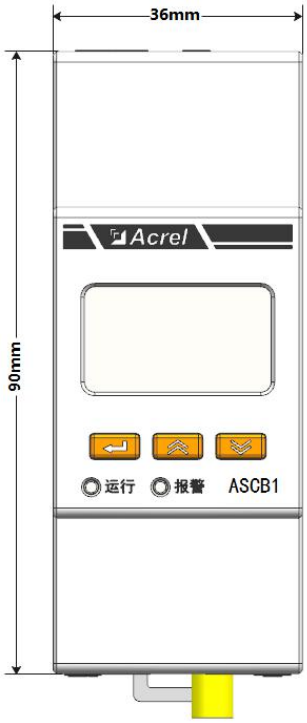


Figure 3 Dimension of intelligent gateway

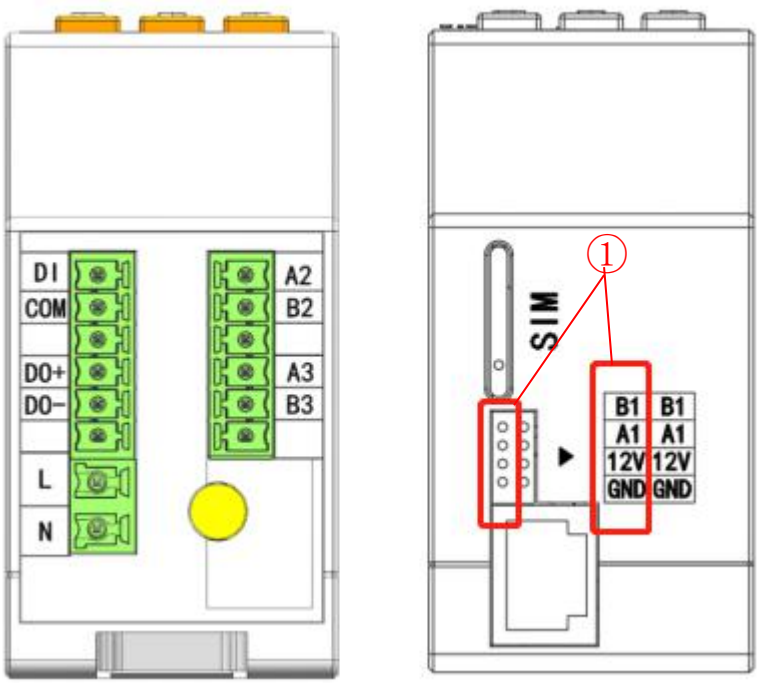


Figure 4 Schematic diagram of the intelligent gateway wiring terminals

Note:In area ① of figure 4,A1 and B1 are used to communicate with the intelligent micro circuit breaker over RS-485, '12V' provides auxiliary power to the intelligent micro circuit breaker.

'L' and 'N' are used to connect the external AC 220V auxiliary power supply.

4.2. Installation

1) This equipment is suitable for the standard 35mm guide rail type installation, when the installation is only need to card the equipment into the track and can be fixed with the buckle.

2) Select and use suitable Internet of Things modules and electric boxes according to the actual distribution management and line laying design requirements The specifications of the box are installed in combination and installed in sequence according to the illustrated modules, and each module is connected with the 8PIN data cable specially made by the manufacturer.

3) The circuit breaker should be installed vertically, and the contact is disconnected when the handle is in "/ OFF". When the handle moves upward, the contact moves in the closed direction;

4) The nominal cross-sectional area of the connecting copper wire matching the circuit breaker rated current is shown in Table 5.

Table 3. Matching table of rated current and wire cross-sectional area

Rated Current (A)	10	16～20	25	32	40～50	63
Cable Section Area (mm^2)	1.5	2.5	4	6	10	16
Torsion (N.m)	3.5	3.5	3.5	3.5	3.5	3.5

5) During installation, please tighten the copper wire with the torque specified in Table

5. After installation, check the copper wire as a shaking wire, and tighten the copper wire again with the specified torque.

Figure 5 is an example of intelligent micro circuit breaker installation wiring, for reference only.

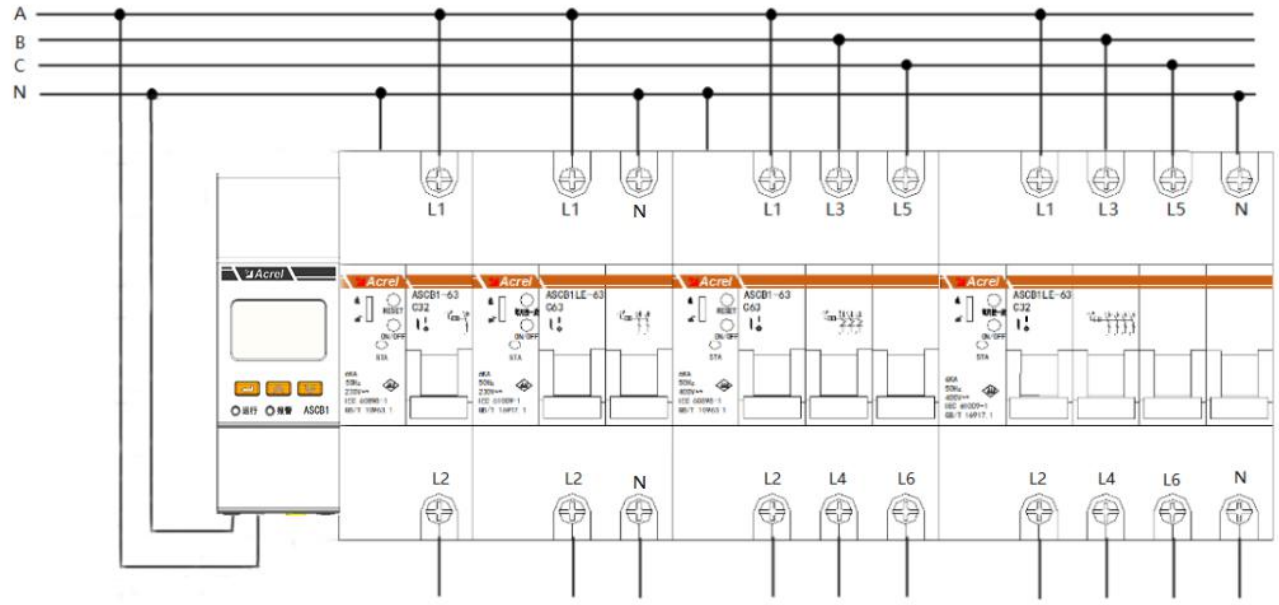


Figure 5 Installation wiring example diagram

4.3. Schematic Diagram of Wiring

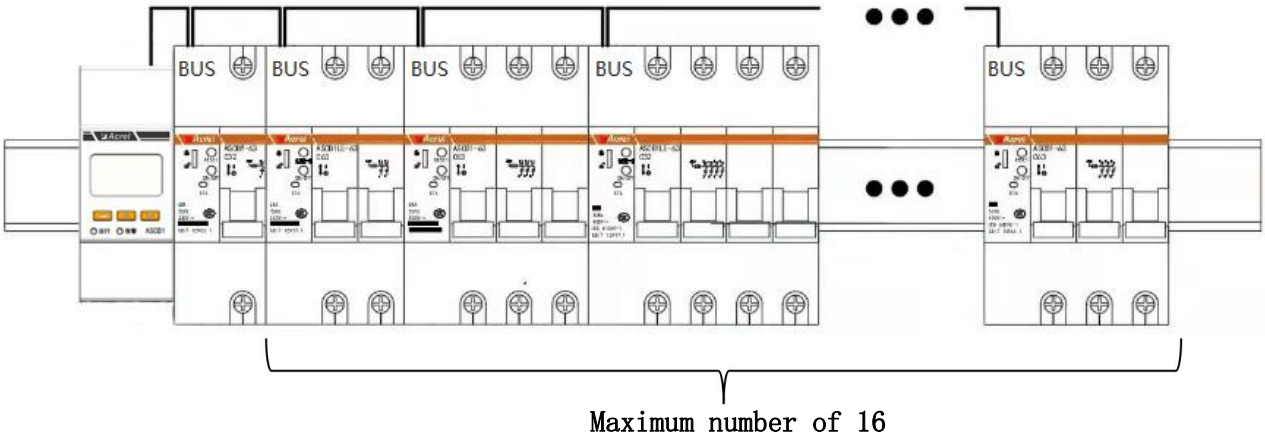


Figure 6 Example of wiring diagram of intelligent micro circuit breaker

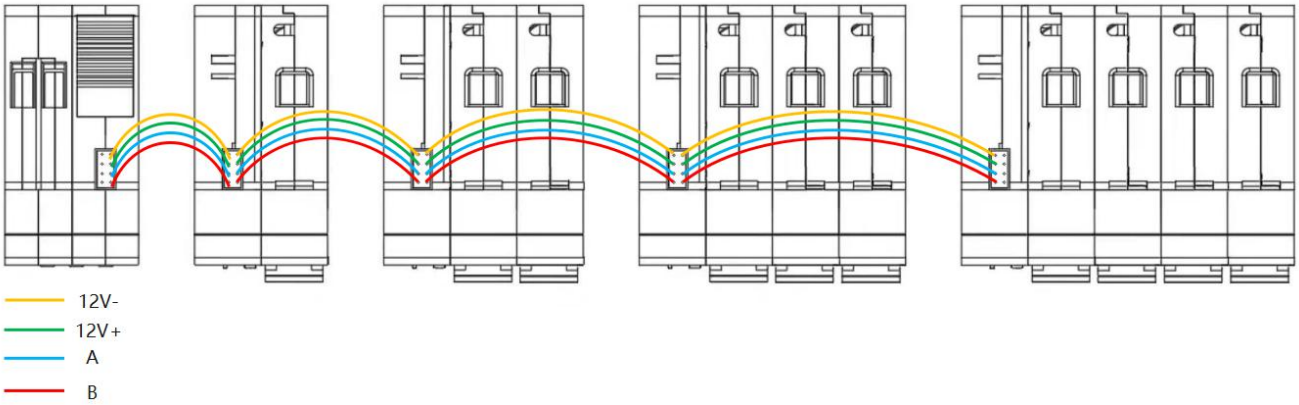


Figure 7 4pin terminal wiring diagram (top view)

Note: Each type of intelligent micro circuit breakers can be installed in any combination, one gateway can connect up to 16 intelligent micro circuit breakers.

5. Operational Guidelines

5.1. Description of Button Panel and Indicator of Intelligent Miniature Circuit Breaker

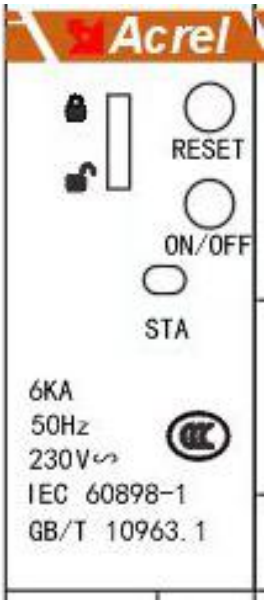


Figure 8 Description of the Button in the Panel of Smart Miniature Circuit Breaker

Button description:

- ON/OFF: Short press: Split and close button. Long press3S: The maintenance status enters and exits
- T/Press once a month or RESET: Short press leakage test jump button. Long press3S: The number of alarm resets and recloses is zeroed
- Lock: Local lock on and off

Indicator Description:

- Green: If it is off for 2s, it flashes for 0.1s, and it is in normal operation state
- Green: If the interval of 0.5s flashes, it indicates that the circuit breaker is in maintenance state (local closing and remote closing cannot be carried out)
- Red: If it is normally on, it means that the circuit breaker is in the closing state
- Red: If it is off for 2s, it flashes for 0.1s, and the circuit breaker fails
- Red: If the interval of 0.5s flashes, the circuit breaker will alarm
- After entering the automatic address assignment, the traffic light flashes for 0.5s, and after the address assignment is completed, it is displayed according to the actual status

5.2. Description of Smart Gateway Button Panel and Indicator Light

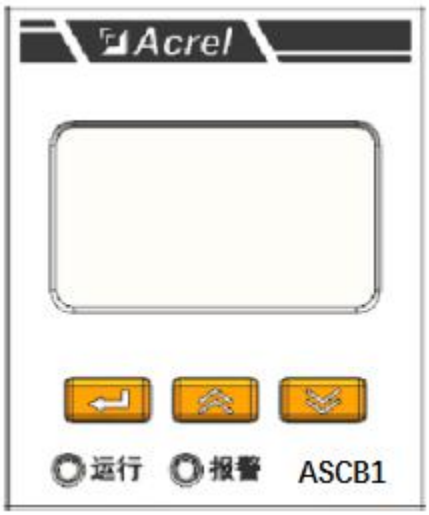


Figure 9 Description of Smart Gateway Button Panel

Button description:

- ↵ : Confirm or return
- ▲: Page up
- ▼: Page down

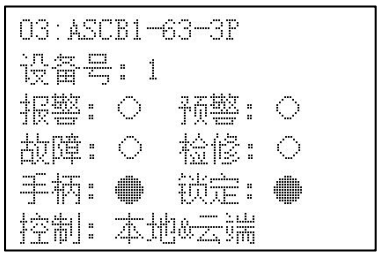
Indicator Description:

- green light: Off for 2s, flashing for 0.1s, running state (normal state)
- red light: If it is off for 2s, it flashes for 0.1s, and there is a circuit breaker fault
- red light: If the interval of 0.5s flashes, there is a circuit breaker alarm;

5.3. Interface Operation

5.3.1. Device Status Display

After the intelligent miniature circuit breaker is powered on, Use the ▲ key and ▼ key to turn the page to query the device status of each device number, and the device status interface is displayed as follows.



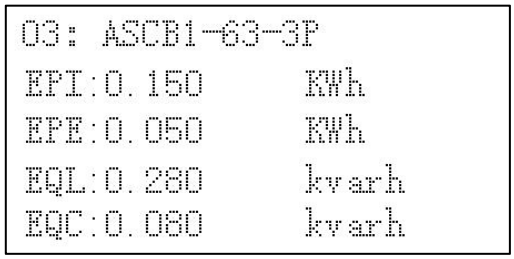
Note: The status definition table is as follows.

Definition Symbol	○	●
alarm	no alarms	alarms
early warning	no early warning	there is an early warning
fault	trouble-free	faulty
overhaul	not overhauled	overhaul

achievement	opened	closed
lock	local unlock, remote controllable	local locked, remote cannot be controlled

5.3.2. Display of Current Equipment Electrical Parameter Data

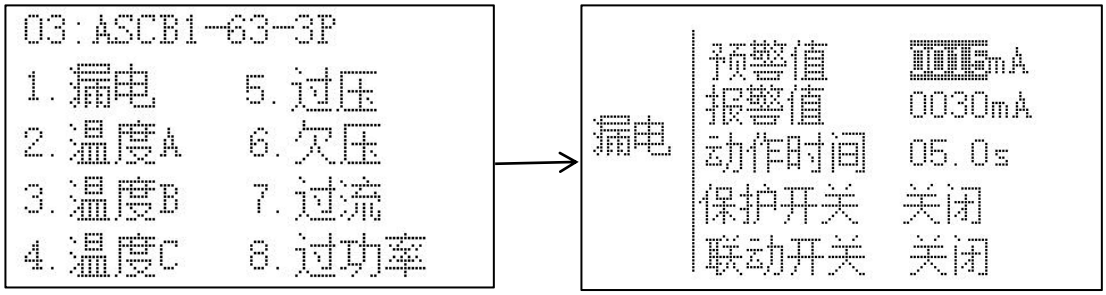
Press the Enter key on the main interface, select "Equipment List", and then select the circuit breaker to view the data. Press the Enter key, and you can use ▲ and ▼ keys to turn pages to query the equipment electrical parameter data display interface. The following figure shows the electrical parameter data display interface.



EPI represents the absorbed active energy value, EPE represents the released active energy value, EQL represents the inductive reactive energy value, and EQC represents the capacitive reactive energy value.

5.3.3. Display and Setting of Device Protection Parameters

Press Enter on the main interface, select "Equipment List", press Enter to select the circuit breaker to set protection parameters, such as "03: ASCB1-63-3P", press Enter twice, select "Parameter Setting", press Enter, enter the password "0001", select "Protection Setting", and press Enter to select all protection parameters for viewing.



Note:

1、Use ▲ and ▼ to modify or set leakage, temperature, overvoltage, undervoltage, overcurrent, and overpower.

2、Temperature: Detect the temperature in a short period of time. If it exceeds the alarm value, it will alarm. The time and threshold can be adjusted according to the actual situation.

3、Creepage: Detect the residual current in a short time, and give an alarm if it exceeds the alarm value. The time and threshold can be adjusted according to the actual situation.

4、Overvoltage, undervoltage: Detect the voltage in a short time, exceed the alarm value for alarm, and the time and threshold can be adjusted with the actual situation.

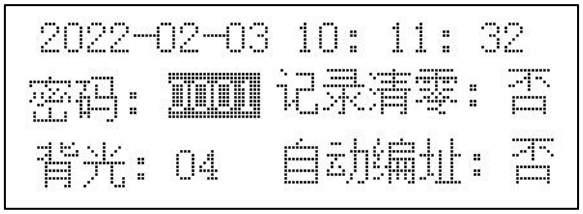
5、Overcurrent: Detect the current in a short time, exceed the alarm value for alarm,

and the time and threshold can be adjusted with the actual situation.

6、Over power：Detect power, alarm when the alarm value is exceeded, and the time and threshold can be adjusted with the actual situation.

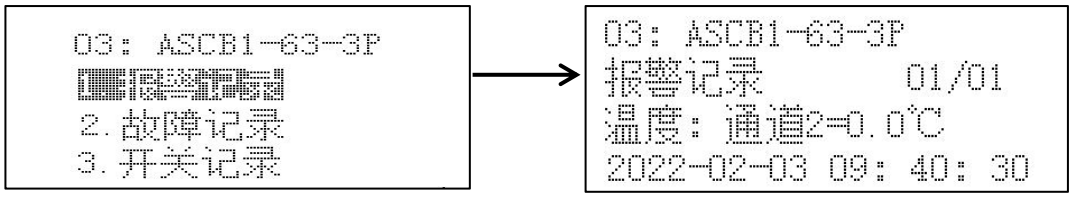
5.3.4. How to set up Automatic Device Addressing

Return to the home page of the intelligent gateway, select "5. Local Settings", enter, enter the password "0001", select "4. Other Settings", select "Automatic Addressing:", press the Enter key, change "No" to "Yes", press and hold the Enter key to return to the previous interface, and then press and hold the Enter key to pop up "Save Data", press ▲ and ▼ keys to select Yes.



5.3.5. A Query for Device Event Logging

Return to the home page of the intelligent gateway, select "Equipment List", select the circuit breaker to view the event record, such as "03: ASCB1-63-3P", press Enter twice, select "Event Record" and press Enter to view the alarm, fault and switch records.



Note：

1）The data "01" in the upper right corner of the alarm record represents the first data, and the subsequent alarm records can be "02, 03... 20" in sequence (20 at most).

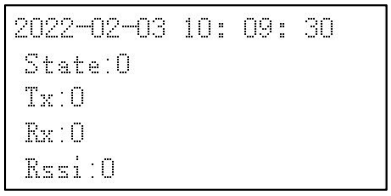
2）The data "01" in the upper right corner of the fault record represents the first data, and the subsequent alarm records can be "02, 03... 20" in sequence (20 at most).

3）The data "01" in the upper right corner of the switch record represents the first data, and the subsequent alarm records can be "02, 03... 20" in sequence (20 at most).

4）Press ▲ left key and ▼ right button to switch the interface for data recording.

5.3.6. Display of Device Network Information

Return to the home page of the intelligent gateway, and select "3. Network information" as shown in the figure.



（1）

There are four values displayed in the information interface (1), and the meanings are as follows:

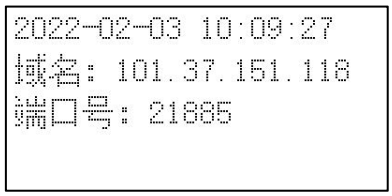
- **Rssi：** The current signal value is displayed after Rssi
- **State：** The state displayed after the state is the state of the current module.

There are ten states from 0 to 9, of which the corresponding numbers of 0 to 9 are as

follows

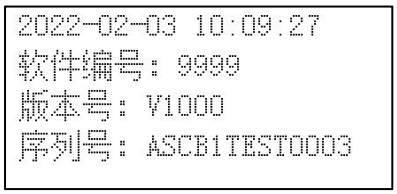
- 0 Initialization
- 1 Obtain IMEI serial number
- 2 Check the SIM card to get the card number
- 3 Set network mode
- 4 Waiting for GPRS to attach
- 5 Check signal value
- 6 Set networking mode
- 7 Connect server
- 8 Server connected
- 9 Close server connection

- TX：The number of data sent is displayed after TX
- Rx：Rx displays the number of received data



（2）

In the information interface (2), the first line displays the domain name (no display if no domain name is set), The second line shows the port number of the connection server.



（3）

The information interface (3) displays the software number, version number and serial number.

6.Protocol

6.1 Introduction to function codes

Read data using 03H function code, Write data using 10H function code。

6.1.1 Function code 03H：Read registers

This function allows the user to obtain the data and system parameters collected and recorded by the device. There is no limit to the number of data a host can request at one time, but it cannot exceed the defined address range.

The following example reads the A, B, and C three-phase voltages from a circuit breaker at address 01(Each address in the data frame represents 1 register, occupying 2 bytes). The address of phase A voltage is 0032H~0033H (voltage value is 219.9V), the address of the B phase voltage is 0 034 H~0 035H (voltage value is 220.0V), The address of the C phase voltage is 0036H~0037H (voltage value is 220.1V).

Host Send	Send Information
Address Code	01H

Return from Host	Returns Information
Address Code	01H

Function Code		03H
Start Address	High Byte	00H
	Low Byte	32H
Number of Registers	High Byte	00H
	Low Byte	06H
CRC Checksum	Low Byte	64H
	High Byte	07H

Function Code		03H
Number of Bytes		0CH
0032H Register Data	High Byte	66H
	Low Byte	E6H
0033H Register Data	High Byte	5BH
	Low Byte	43H
0034H Register Data	High Byte	00H
	Low Byte	00H
0035H Register Data	High Byte	5CH
	Low Byte	43H
0036H Register Data	High Byte	99H
	Low Byte	19H
0037H Register Data	High Byte	5CH
	Low Byte	43H
CRC Checksum	Low Byte	CBH
	High Byte	DDH

6.1.2 Function code10H：Write registers

Function code 10H allows the user to change the contents of multiple registers.

The following example is to set the leakage protection parameters of the circuit breaker with address 01, the protection switch is turned on and the associated switch, the early warning value is set to 2 0mA, the alarm value is set to 3 0mA, and the alarm time is set to 5s. The address of the leakage alarm type is 0 208H, the address of the leakage warning value is 0 209H, the address of the leakage alarm value is 0 20AH, and the address of the leakage alarm time is 0 20BH. (Each address in the data frame represents 1 register, occupying 2 bytes)

Host Send		Send Information
Address Code		01H
Function Code		10H
Start Address	High Byte	02H
	Low Byte	08H
Number of Registers	High Byte	00H
	Low Byte	04H
Number of Byte		08H
0208H Data to be Written	High Byte	00H
	Low Byte	03H
0209H Data to be Written	High Byte	00H
	Low Byte	14H
020AH Data to be Written	High Byte	00H
	Low Byte	1EH
020BH Data to be Written	High Byte	00H
	Low Byte	32H
CRC	Low Byte	B2H

Return from Host		Returns Information
Address Code		01H
Function Code		10H
Start Address	High Byte	02H
	Low Byte	08H
Number of Registers	High Byte	00H
	Low Byte	04H
CRC Checksum	Low Byte	41H
	High Byte	B0H

Checksum	High Byte	37H

6.2 Address Table

Description of the data type:

Byte: Unsigned 8-bit data

Chart: Character type 8-bit data

Word: Unsigned 16-bit data

Ushort: Unsigned 16-bit data

Float: Floating-point 32-bit data。

Number	Address	parameter	Read and write	description	type
1	0x0000	year	R	0-99(Actual +2000)	Byte
		month	R	1-12	Byte
2	0x0001	day	R	1-31	Byte
		time	R	0-23	Byte
3	0x0002	divide	R	00-59	Byte
		second	R	00-59	Byte
4-10	0x0003~0x0009	Serial number (14 bytes)	R	14 characters make up the product number	char
11	0x000A	times of the gate has been reclosed	R		ushort
12	0x00B	Leakage temperature pre-alarm flag bit	R	Bit0：Leakage channel； Bit1-Bit4：Temperature channels 1-4 1：alarm ； 0：normal	ushort
13	0x000C	Power pre-alarm flag bit	R	Bit0：Over power status bits Bit4：Power factor low status bits 1：alarm ； 0：normal	ushort
14	0x000D	Voltage pre-alarm flag bit	R	Bit0：Overvoltage status bits Bit4：Unbalanced state bits Bit5：Harmonic state bits Bit8：Undervoltage status bits 1：alarm ； 0：normal	ushort
15	0x000E	Current pre-alarm flag bit	R	Bit0：Overcurrent status bits Bit4：Unbalanced state bits Bit5：Harmonic state bits 1：alarm ； 0：normal	ushort
16-17	0x000F~0x0010	obligate	R		
18	0x0011	The current signal value	R	Values are 0-99 99 or 0 indicates that there is currently no signal. In other cases, higher values indicate a better signal	ushort
19	0x0012	Current model	R	High byte：1：1P 2:2P 3:3P 4:4P Low byte：0:No leakage 1：With	ushort

				leakage	
20	0x0013	Leakage temperature wiring fault flag bit	R	Bit0：Leakage channel status bits (hardware) Bit1-Bit4：Temperature channel 1-4 status bits Bit5: Circuit breaker failure 1：abnormal ； 0：normal	ushort
21	0x0014	Leakage temperature alarm flag bit	R	Bit0：Leakage channel Bit1-Bit4：Temperature channels 1-4 Bit5: short circuit 1：alarm ； 0：normal	ushort
22	0x0015	Power alarm flag bits	R	Bit0：Over power status bits Bit4：Power factor low status bits 1：alarm ； 0：normal	ushort
23	0x0016	Voltage alarm flag bit	R	Bit0：Overvoltage status bits Bit4：Unbalanced state bits Bit5：Phase sequence abnormality Bit6：Harmonic state bits Bit8：Undervoltage status bits 1：alarm ； 0：normal	ushort
24	0x0017	Current alarm flag bits	R	Bit0：Overcurrent status bits Bit4：Unbalanced state bits Bit5：Phase sequence abnormality Bit6：Harmonic state bits 1：alarm ； 0：normal	ushort
25	0x0018	Current status	R	bit0：1：Closing；0：Open gate Bit1: 1：Local locking；0：Local unlock Bit2: 1：Overhaul open；0：Overhaul pass	ushort
26	0x0019	Split closing control	R/W	1：Close once；0：Open the gate once	ushort
27-28	0x001A~0x001B	Residual current measurement	R	Unit: mA	float
29-30	0x001C~0x001D	Temperature 1 measurement	R	Unit: ℃	float
31-32	0x001E~0x001F	Temperature 2 measurement	R	Unit: ℃	float
33-34	0x0020~0x0021	Temperature 3 measurements	R	Unit: ℃	float
35-36	0x0022~0x0023	Temperature 4 measurements	R	Unit: ℃	float
37-38	0x0024~0x0025	Measured value when residual current alarms	R	Unit: mA	float
39-40	0x0026~0x0027	Temperature 1 when alarmed measured value	R	Unit: ℃	float
41-42	0x0028~0x0029	Temperature 2 measured when alarm	R	Unit: ℃	float
43-44	0x002A~0x002B	Temperature 3 when alarmed measured value	R	Unit: ℃	float
45-46	0x002C~0x002D	Temperature 4 when alarmed measured value	R	Unit: ℃	float
47-48	0x002E~0x002F	frequency	R	Unit: Hz	float
49-50	0x0030~0x0031	Voltage unbalance	R	Unit: %	float
51-52	0x0032~0x0033	Phase A voltage	R	Unit: V	float

53-54	0x0034~0x0035	Phase B voltage	R	Unit: V	float
55-56	0x0036~0x0037	Phase C voltage	R	Unit: V	float
57-58	0x0038~0x0039	Average value of phase voltage	R	Unit: V	float
59-60	0x003A~0x003B	Zero sequence voltage	R	Unit: V	float
51-52	0x003C~0x003D	AB phase line voltage	R	Unit: V	float
53-54	0x003E~0x003F	BC phase line voltage	R	Unit: V	float
55-56	0x0040~0x0041	CA phase line voltage	R	Unit: V	float
57-58	0x0042~0x0043	Average line voltage	R	Unit: V	float
69-70	0x0044~0x0045	Alarm measurement value in case of phase A overvoltage	R	Unit: V	float
71-72	0x0046~0x0047	Alarm measurement value in case of phase B overvoltage	R	Unit: V	float
73-74	0x0048~0x0049	Alarm measurement value in case of phase C overvoltage	R	Unit: V	float
75-76	0x004A~0x004B	Alarm measurement value in case of phase A undervoltage	R	Unit: V	float
77-78	0x004C~0x004D	Alarm measurement value in case of phase B undervoltage	R	Unit: V	float
79-80	0x004E~0x004F	Alarm measurement value in case of phase C undervoltage	R	Unit: V	float
81-82	0x0050~0x0051	Current unbalance	R	Unit: %	float
83-84	0x0052~0x0053	Measured value of phase A current	R	Unit: A	float
85-86	0x0054~0x0055	Measured value of phase B current	R	Unit: A	float
87-88	0x0056~0x0057	Measured value of phase C current	R	Unit: A	float
89-90	0x0058~0x0059	Average current	R	Unit: A	float
91-92	0x005A~0x005B	Zero sequence current	R	Unit: A	float
93-94	0x005C~0x005D	Alarm measurement value in case of phase A overcurrent	R	Unit: A	float
95-96	0x005E~0x005F	Alarm measurement value in case of phase B overcurrent	R	Unit: A	float
97-98	0x0060~0x0061	Alarm measurement value in case of phase C overcurrent	R	Unit: A	float
99-100	0x0062~0x0063	Phase A active power	R	Unit: kW	float
101-102	0x0064~0x0065	Phase B active power	R	Unit: kW	float
103-104	0x0066~0x0067	Phase C active power	R	Unit: kW	float
105-106	0x0068~0x0069	Total active power	R	Unit: kW	float
107-108	0x006A~0x006B	A-phase reactive power	R	Unit: kvar	float
109-110	0x006C~0x006D	B-phase reactive power	R	Unit: kvar	float

111-112	0x006E~0x006F	C-phase reactive power	R	Unit: kvar	float
113-114	0x0070~0x0071	Total reactive power	R	Unit: kvar	float
115-116	0x0072~0x0073	A-phase apparent power	R	Unit: kVA	float
117-118	0x0074~0x0075	B-phase apparent power	R	Unit: kVA	float
119-120	0x0076~0x0077	C-phase apparent power	R	Unit: kVA	float
121-122	0x0078~0x0079	Total apparent power	R	Unit: kVA	float
123-124	0x007A~0x007B	A-phase power factor	R		float
125-126	0x007C~0x007D	B-phase power factor	R		float
127-128	0x007E~0x007F	C-phase power factor	R		float
129-130	0x0080~0x0081	Total power factor	R		float
131-132	0x0082~0x0083	EPI measured value	R	Input active electric energy，Unit: kWh	float
133-134	0x0084~0x0085	EPE measured value	R	Output active electric energy，Unit，Unit: kWh	float
135-136	0x0086~0x0087	EQL measured value	R	Input reactive electric energy，Unit: kvarh	float
137-138	0x0088~0x0089	EQC measured value	R	Output reactive electric energy，Unit: kvarh	float
139-140	0x008A~0x008B	ES measured value	R	Apparent electric energy，Unit: kVAh	float

6.3 Address table of system setting information related parameters

Number	Address	Parameter	Reading and writing	Value range	Type
1	0x1100 high	year	R/W	00-99	Byte
	0x1100 low	month	R/W	1-12	Byte
2	0x1101 high	day	R/W	1-31	Byte
	0x1101 low	time	R/W	0-23	Byte
3	0x1102 high	divide	R/W	00-59	Byte
	0x1102 low	second	R/W	00-59	Byte
4	0x1103 high	Buzzer switch	R/W	0: Turn off the buzzer 1：Alarm only 2：Alarms and faults	Byte
	0x1103 low	Broken wire short-circuits detection switch	R/W	0：Detection is off 1：Detect open	Byte
5	0x1104	Leakage transformer ratio	R/W	The ratio setting is based on the mated leakage current transformer	ushort
6	0x1105	address	R/W	1-247	ushort
7	0x1106	baud rate	R/W	4800,9600,19200,38400	ushort
8	0x1107	Address 2	R/W	1-247	ushort
9	0x1108	Baud rate 2	R/W	4800,9600,19200,38400	ushort
10	0x1109	password	R/W	1-9999	ushort
11	0x110A	Backlight time	R/W	0-99 min 0 means solid	ushort

12	0x110B	LCD contrast	R/W	20-40，Default 30	ushort
13	0x110C	Obligate			
14	0x110D	Obligate			
15	0x110E	Wireless alarm or fault main report	R/W	0:Do not report 1：Report	ushort
16	0x110F	The length of the primary address segment	R/W	0: No data is available as a heartbeat packet Even, the number of bytes sent，0x00 begin	
17	0x1110	Wireless active upload time	R/W	Unit: s，Step size 1s，Default 120 (120 seconds)	ushort
18	0x1111	Server TCP port number	R/W		ushort
18-19	0x1112～0x1113	Server IP address	R/W	4 bytes for IPV4, if all are 0, the domain name mode is enabled	byte
20-52	0x1114～0x1133	domain name	R/W	64 strings	char
53	0x1134	Debug mode	R/W	1：Debug mode (RS485 will fail)，0：normal	ushort
54	0x1135	Server reconnection	R/W	Times, default 3 times, when this setting is continuously exceeded, the server reconnects	ushort
55	0x1136	Online schooling	R/W	Unit: day，default1	ushort
56-65	0x1137～0x1140	WIFI name	R/W	20 strings	byte
66-75	0x1141～0x114A	WIFI password	R/W	20 strings	ushort
76-77	0x114B～0x114C	Gateway IP address	R/W	4 bytes for IPV4	byte
78-79	0x114D～0x114E	Subnet mask	R/W	4 bytes for IPV4	byte
80-81	0x114F～0x1150	Local IP	R/W	4 bytes for IPV4	byte
82-83	0x1151	DHCP	R/W	0：DHCP close 1: DHCP open	ushort
84-86	0x1152～0x1154	MAC address	R/W	6 bytes	byte
87	0x1155	Wireless status	R/W	Low byte：0：CE,1:4G，2：WiFi High byte：0：The module is out of contact 1The module is normal	ushort
88	0x1156	Register the port number	R/W	0～65535	ushort
89-90	0x1157～0x1158	Register	R/W	4 bytes for IPV4	byte

6.4 Electrical alarm parameter setting address table

Number	Address	Parameter	Read and write	Range of values	Type
1	0x0200	Voltage range	R/W	Unit: V，Default 220(V)	Word
2	0x0201	Current range	R/W	Unit: ，Default 100(A)	Word
3	0x0202	Wiring method	R/W	Default 1，Generally do not change	Word
4	0x0203	Voltage ratio	R/W	Default 1，Generally do not change	Word
5	0x0204	Current conversion ratio	R/W	Default 1，Generally do not change	Word
6	0x0205	Leakage current transformation ratio	R/W	Default 1，Generally do not change	Word
7	0x0206	obligate			
8	0x0207	obligate			
9	0x0208	Leakage alarm type	R/W	Bit0 Protection switch:1 open，0 close Bit1 Protect the associated switch：1 open，0 close Bit2 Protection-related maintenance：1 open，0 close	

10	0x0209	Leakage warning value	R/W	Leakage 20-1000, unit is mA， step size 1mA	Word
11	0x020A	Leakage alarm value	R/W	Leakage 20-1000, unit is mA, step size 1mA	Word
12	0x020B	Leakage alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
13	0x020C	Temperature 1 alarm type	R/W	Bit0 Protection switch： 1 on, 0 off Bit1 Protect the associated switch： 1 on, 0 off Bit2 Protection-related maintenance: 1 on, 0 off	Word
14	0x020D	Temperature 1 warning value	R/W	Temperature 45-140, unit is °C, steps 1°C	Word
15	0x020E	Temperature 1 alarm value	R/W	Temperature 45-140, unit is °C, steps 1°C	Word
16	0x020F	Temperature 1 alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
17	0x0210	Temperature 2 alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off; Bit2 protection related maintenance: 1 on, 0 off	Word
18	0x0211	Temperature 2 warning value	R/W	Temperature 45-140, unit is °C, steps 1°C	Word
19	0x0212	Temperature 2 alarm value	R/W	Temperature 45-140, unit is °C. steps 1°C	Word
20	0x0213	Temperature 2 alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
21	0x0214	Temperature 3 alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	Word
22	0x0215	Temperature 3 warning value	R/W	Temperature 45-140, unit is °C, steps 1°C	Word
23	0x0216	Temperature 3 alarm value	R/W	Temperature 45-140, unit is °C, steps 1°C	Word
24	0x0217	Temperature 3 alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
25	0x0218	Temperature 4 alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	Word
26	0x0219	Temperature 4 warning value	R/W	Temperature 45-140, unit is °C, steps 1°C	Word
27	0x021A	Temperature 4 alarm value	R/W	Temperature 45-140, unit is °C, steps 1°C	Word
28	0x021B	Temperature 4 alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
29	0x021C	Overvoltage alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	Word
30	0x021D	Overvoltage warning value	R/W	Range: 1000~1400 (1 decimal place, that is 100%~140%)	Word
31	0x021E	Overvoltage alarm value	R/W	Range: 1000~1400 (1 decimal place, that is 100%~140%)	Word
32	0x021F	Overvoltage alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
33	0x0220	Undervoltage alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off.	Word
34	0x0221	Undervoltage warning value	R/W	Range: 400~1000 (decimal point is 1 decimal place, that is, 40%~100%)	Word

35	0x0222	Undervoltage alarm value	R/W	Range: 400~1000 (decimal point is 1 decimal place, that is, 40%~100%)	Word
36	0x0223	Undervoltage alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
37	0x0224	Overcurrent alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	Word
38	0x0225	Overcurrent warning value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
39	0x0226	Overcurrent alarm value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
40	0x0227	Overcurrent alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
41	0x0228	Overpower alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	Word
42	0x0229	Overpower warning value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
43	0x022A	Overpower alarm value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
44	0x022B	Overpower alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
45	0x022C	Short circuit alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	Word
46	0x022D	Short circuit warning value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
47	0x022E	Short-circuit alarm value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
48	0x022F	Short circuit alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
49	0x0230	Voltage unbalance alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	Word
50	0x0231	Voltage imbalance warning value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
51	0x0232	Voltage imbalance alarm value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
52	0x0233	Voltage unbalance alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
53	0x0234	Current imbalance alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	Word
54	0x0235	Current imbalance warning value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
55	0x0236	Current imbalance alarm value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
56	0x0237	Current imbalance alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
57	0x0238	Voltage inverting alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	Word
58	0x0239	Voltage inverting warning value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
59	0x023A	Voltage inverting alarm value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
60	0x023B	Voltage inverting alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
61	0x023C	Current inverting	R/W	Bit0 protection switch: 1 on, 0 off	Word

		alarm type		Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	
62	0x023D	Current inverting warning value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
63	0x023E	Current inverting alarm value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 100%~120%)	Word
64	0x023F	Current inverting alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word
65	0x0240	Low power factor alarm type	R/W	Bit0 protection switch: 1 on, 0 off Bit1 protection association switch: 1 on, 0 off Bit2 protection related maintenance: 1 on, 0 off	Word
66	0x0241	Low power factor warning value	R/W	Range: 0~1000 (3 decimal places, that is 0.000~1.000)	Word
67	0x0242	Low power factor alarm value	R/W	Range: 1000~1200 (The decimal point is 1 decimal place, that is, 0.000~1.000)	Word
68	0x0243	Low power factor alarm time	R/W	Range: 1~600 (decimal point is 1 decimal place, unit is s)	Word

7.Matters Needing Attention

- Before using the product, please check whether the appearance is in good condition. If there is any damage, find the seller to replace it in time.
- Make correct wiring according to the operating instructions, and carefully check after wiring to ensure correct wiring

Amendment record

Revised edition	Revision time	Revised terms
V1.0	2023.2.8	The new version was released

Headquarters: Acrel Electric MFG. Co., Ltd

Address: 253, Yalu Road, Jiading District, Shanghai

Phone: 0086-21-69158338 0086-21-69156052 0086-21-59156392

0086-21-69156971

Fax: 0086-21-69158303

Uniform Resource Locator: www.acrel.cn

Mailbox: ACREL001@vip.163.com

Zip code: 201801

Production base: Jiangsu Acrel Electric Appliance Manufacturing Co., Ltd

Address: No.5, Dongmeng Road, Dongmeng Industrial Park, Nanzha Street, Jiangyin City, Jiangsu Province

Phone: 0086-510-86179966

Fax: 0086-510-86179975

Uniform Resource Locator:www.jsacrel.cn

Mailbox: sales@email.acrel.cn

Zip code: 214405

2023.2