

041



# ASJ Series Residual Current Operated Relay

Installation and Operation  
Instruction V1.9

Acrel Co., LTD

## **Declaration**

Please read this manual carefully before using these products, in which the involved pictures, logos, symbols, etc. are all reserved by the Acrel Co., Ltd. Personnel not inside the company shall not publicly reprint all or part of the contents without written authorization.

Before using the product, please read the tips and precautions in this operation manual, and Acrel does not take responsibility for personal injuries or economic losses caused by ignoring tips of this manual;

The contents of the manual will be continuously updated and revised, thus the products functions in this manual may inevitably have a slight discrepancy with the real objects during the continuous upgrading process. Users should give first place to the purchased real products, and can search [www.acrel.cn](http://www.acrel.cn) to downloads or through sales channels to obtain the latest version of the manual.

# Contents

1 Introduction.....	1
2 Types of Products.....	1
3 Technical parameters.....	2
4 Installation and connection .....	2
4.1 Shape and Installation Dimensions.....	2
4.2 Installation Instructions.....	3
4.2.1 Installation Steps.....	3
4.2.2 Installation of accessories .....	4
4.3 Terminals and wiring .....	4
4.4 Matters needing attention.....	4
5 Operating Guide.....	5
5.1 Description of AC type Panel .....	5
5.2 Description of A-type panel.....	5
5.3 Description of LCD type panel.....	5
5.4 Description of Selection.....	6
5.5 Instructions for the selection of transformer .....	7
6 Typical applications .....	8
7 Programming menu.....	8
7.1 Programming Example .....	9
7.2 Programming Example .....	12
8 Communication Guide .....	13
8.1 Overview of Communication Protocol.....	13
8.2 Introduction to function code.....	14
8.3 Communication Address Table .....	15
9 Ordering example.....	16





## ASJ series residual current operated relay


### 1 Introduction

ASJ series residual current operated relay can be combined with low voltage circuit breaker or low voltage contactor to form a residual current protection device, which is mainly used for the TT and TN system distribution lines with AC 50Hz and rated voltage of 400V and below. It is used to protect the electrical circuit form ground faults, prevent equipment damage caused by earth fault current and electrical fire accidents, and can also be used to provide indirect contact protection against personal electric shock hazard.

Products meet the requirements of GB/T 22387-2016 *residual current operated relay*.

### 2 Types of Products

Type	Function	Installation	Appearance
ASJ10-LD1C	AC-type residual current measurement; Alarm prompt of current crossing line; Rated residual operating current can be measured; Limit non-driving time can be set; Two sets of relay output; With local and remote “test” and “reset” functions.	Guide (DIN 35mm)	
ASJ10-LD1A	A-type residual current measurement; Current percentage light column display; Rated residual operating current can be measured; Limit non-driving time can be set; Two sets of relay output (settable) <sup>note 1</sup> ; With local and remote “test” and “reset” functions.		
ASJ10L-LD1A <sup>note 2</sup>	A-type residual current measurement; Rated residual operating current can be measured; Limit non-driving time can be set; Two sets of relay output (settable); Transformer breakage alarm can be set; Pre-alarm value can be set; Return value can be set. With on-site display, remote "test", "reset" LCD display, 25 event records.		
ASJ20-LD1C	AC-type residual current measurement; Alarm prompt of current crossing line; Rated residual operating current can be measured; Limit non-driving time can be set; Two sets of relay output; With local and remote “test” and “reset” functions.	Panel (48*48)	

ASJ20-LD1A	A-type residual current measurement; Current percentage light column display; Rated residual operating current can be measured; Limit non-driving time can be set; Two sets of relay output (settable) <sup>note 1</sup> ; With local and remote “test” and “reset” functions.	
------------	---	---

Note 1: The function of setting for relay means that you can set the initialization and the output state of relay by yourself through the code dialing on the panel; the specific setting guide can be found from the chapter 5.2.

Note 2: Optional function, RS485 interface, Modbus-RTU Communication, type is ASJ10L-LD1A/C

### 3 Technical parameters

Technical Parameter		Indicator	
		AC type	A type
Power supply	Voltage range	AC110V、AC220V (±10%)	AC/DC85~265V
	Power dissipation	≤5W	
Input	Rated residual operating current $I_{\Delta n}$	0.03、0.1、0.3、0.5(A)	0.03、0.05、0.1、0.3、0.5、1、3、5、10、30(A) <sup>note 3</sup>
	Limit non-driving time $\Delta t$	0.1、0.5(s)	0、0.06、0.1、0.2、0.3、0.5、0.8、1、4、10(s) <sup>note 4</sup>
	Rated residual non-operating current $I_{\Delta no}$	50% $I_{\Delta n}$	50% $I_{\Delta n}$
	Performance characteristics	Sinusoidal AC	Sinusoidal AC and pulsating DC
	Frequency	50Hz±5Hz	50Hz±5Hz
	Operating range	-20% ~ -10% $I_{\Delta n}$	-20% ~ -10% $I_{\Delta n}$
Output	Output mode	One is normally open and another is for transformation	One is normally closed or open, and another is for transformation
	Contact capacity	5A 250VAC 5A 30VDC	AL1:8A 250VAC; 5A 30VDC AL2:6A 250VAC; 5A 30VDC
	Reset mode	Local reset or remote reset	Local reset, remote reset or automatic reset
Installation and use environment	Temperature	Run temperature: -20°C ~ +55°C, Storage temperature: -30°C ~ +70°C	
	Humidity	≤95%RH, no condensation, and no corrosive gas places	
	Elevation	≤2000m	
	Class of pollution	Grade three	
	Installation category	Type III	

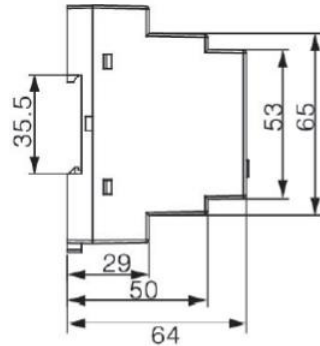
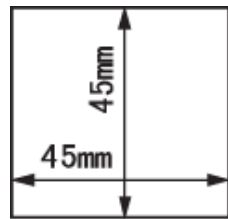
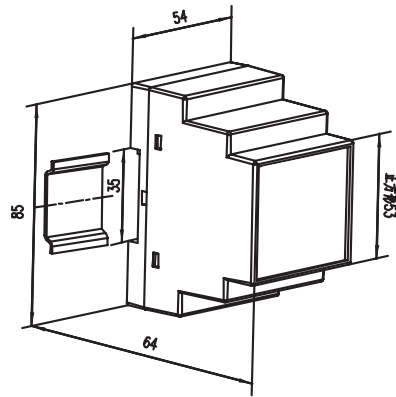
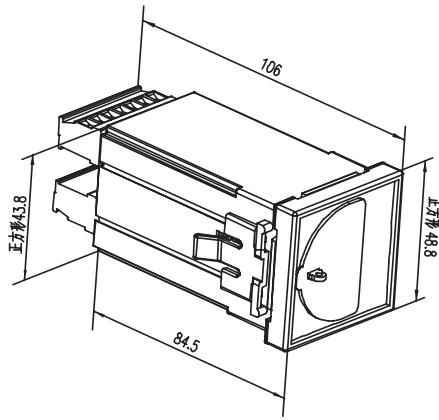
Note 3: ASJ10L-LD1A rated residual operating current  $I_{\Delta n}$  is 10mA~30A continuously adjustable;

Note 4: ASJ10L-LD1A limit non-driving time  $\Delta t$  is 0~10S continuously adjustable.

### 4 Installation and connection

#### 4.1 Shape and Installation Dimensions

Shape and Installation Dimensions is seen picture blow.



Pic 1 ASJ20 Shape and hole size

Pic 2 ASJ10 Shape and Installation size

The specific size of the meter is shown in the table below.

type	Panel size (mm)	Shell size (mm)	Hole size (mm)
ASJ10	/	85*54*64 (length*width*height)	/
ASJ20	48*48 (Width*Height)	43.8*43.8*100 (width*height*depth)	45*45 (Width*Height)

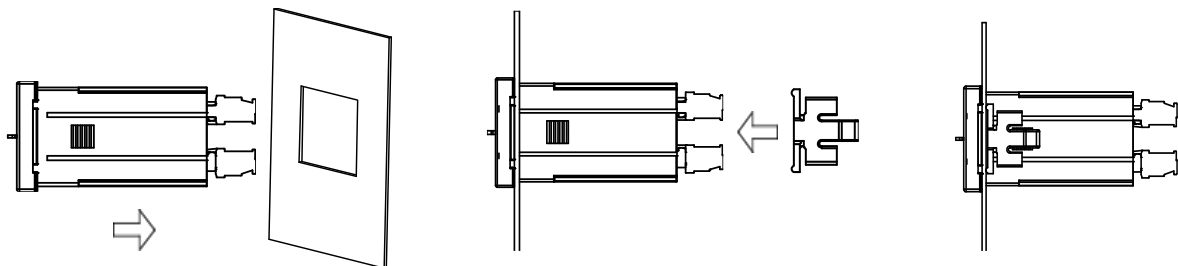
## 4.2 Installation Instructions

### 4.2.1 Installation Steps

ASJ20 series instrument installation method is panel installation, both sides of the buckle extrusion fixed, the specific operation is as follows:

- 1) On the switchboard, choose the appropriate place to cut the 45mm\*45mm mounting hole;
- 2) Take out the remaining current relay and remove the fixed buckle;
- 3) Install the instrument into the distribution board, and then install it with a buckle.

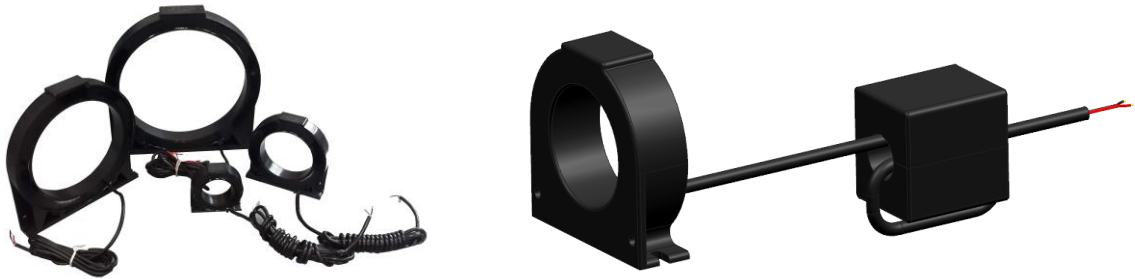
The specific operation is shown in the figure below.



ASJ10 series meters are mounted by the standard DIN-35mm guide rail.

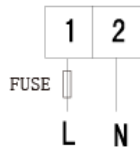
#### 4.2.2 Installation of accessories

Accessories include residual current transformers and magnetic rings. The remaining current transformer passes through all the phase lines and neutral lines, and is installed in the cabinet with a firm fixation. The secondary side wiring is connected to terminals 40 and 41 of the instrument through a magnetic ring. The installation method of the magnetic ring is shown in the figure below. It is installed near the end of the instrument wiring and the wiring bypasses the magnetic ring for two laps.

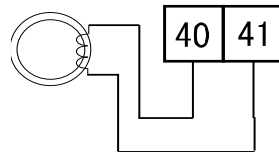


#### 4.3 Terminals and wiring

##### 4.3.1 Auxiliary power supply and signal input terminal

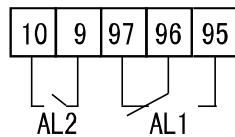


Auxiliary power supply



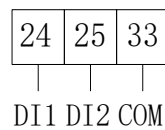
Signal input

##### 4.3.2 Switching quantity input/output terminal



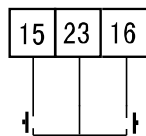
Relay output terminal  
(no auxiliary power supply)

AL1: Alarm relay  
AL2: warning relay

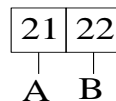


Switching input terminal  
(Only ASJ10L-LD1A)

##### 4.3.3 Additional functional terminals



Remote test remote reset



RS485 interface  
(Only ASJ10L-LD1A)

#### 4.4 Matters needing attention

A) The grounding wire (PE) shall not penetrate the remaining current transformer.

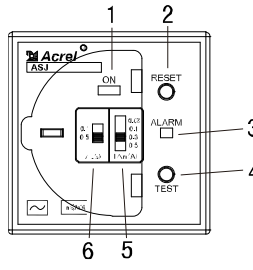
B) For single-phase power grid, only phase lines and neutral lines need to penetrate the residual current transformer.

C) ASJ10L-LD1A/C provides RS485 communication interface and adopts Modbus-RTU protocol. No more than 128 instruments can be connected on one line at a time.

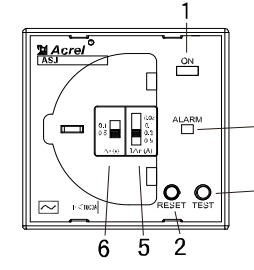
## 5 Operating Guide

### 5.1 Description of AC type Panel

No.	Name	Function
1	Power light	Lights continuously when the working power supply is normal
2	Reset button	To reset the system
3	Alarm light	Lights when the rated residual operating current $I_{\Delta n}$ is exceeded
4	Test button	To test whether the indicator light is normal, and the relay can operate.
5	residual current set switch	Providing four settings of residual operating current
6	Limit non-driving time set switch	Providing two settings of limit non-driving time



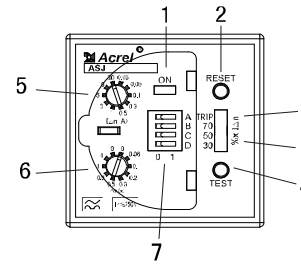
ASJ20-LD1C



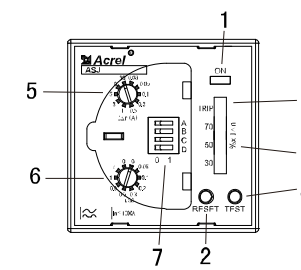
ASJ10-LD1C

### 5.2 Description of A-type panel

No.	Name	Function																																																												
1	Power light	Lights continuously when the working power supply is normal																																																												
2	Rest button	To reset the system																																																												
3	Alarm light	Lights when the rated residual operating current $I_{\Delta n}$ is exceeded																																																												
4	Test button	To test whether the indicator light is normal, and the relay can operate normally.																																																												
5	residual current set switch	Providing four settings of residual operating current																																																												
6	limit non-driving time set switch	Providing two settings of limit non-driving time																																																												
7	Dial switch	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th colspan="2">dial</th> <th colspan="2">Relay AL2</th> <th colspan="3">Relay AL1</th> <th rowspan="2">State</th> </tr> <tr> <th>A</th> <th>B</th> <th>10</th> <th>9</th> <th>97</th> <th>96</th> <th>95</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td rowspan="3">State</td> </tr> <tr> <td>0</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>0</td> <td>warning</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>alarm</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="2">C</td> <td colspan="6">0: manual reset, 1: automatic reset</td> </tr> <tr> <td colspan="2">D</td> <td colspan="6">reserve</td> </tr> </tbody> </table>	dial		Relay AL2		Relay AL1			State	A	B	10	9	97	96	95	0	0						State	0	1						1	0	warning					1	1	alarm					C		0: manual reset, 1: automatic reset						D		reserve					
		dial		Relay AL2		Relay AL1			State																																																					
		A	B	10	9	97	96	95																																																						
		0	0						State																																																					
		0	1																																																											
		1	0	warning																																																										
1	1	alarm																																																												
C		0: manual reset, 1: automatic reset																																																												
D		reserve																																																												
8	Indicator light with streamer	Three green LEDs are combined to show the current percentage, which will flash when the current reaches more than 50%, indicating early warning.																																																												



ASJ20-LD1A

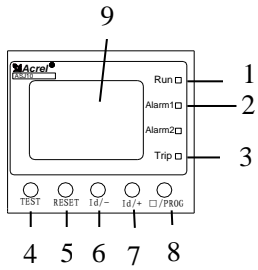


ASJ10-LD1A

### 5.3 Description of LCD type panel

No.	Name	Function
1	Run light	Work often light, communication light flashing
2	Alarm light	Red indicator light, it lights when the leakage current reaches the alarm value



3	Disconnected alarm light	Red indicator light, it lights when the external transformer is disconnected	 <p style="text-align: center;">ASJ10L-LD1A</p>
4	Test key	In normal operation, press key for 2s, then the current channel relay will operate, backlight will turn red, and alarms will be output. used to check the relay and alarm trip	
5	Reset key	In operation mode, used to relieve relay operation; In programming mode, used to return to previous menu or mode.	
6	Td/- key	In SOE page of operation mode, it is used to view the fault records; In programming mode, it is used to enter next menu or subtract 1 from the value;	
7	Td/+ key	In SOE page of operation mode, it is used to view the fault records; In programming mode, it is used to back last menu or add 1 from the value. Long press the Td/- key and Td/+ key at the same time, system will start a self-check and reset.	
8	PROG key	In operation mode, short press the key to enter SOE interface; In programming mode, it is used to select, return, confirm and save menu item.	
9	LCD	The LCD can display the real-time residual current value, rated residual current setting value, limit non-driving time setting value and communication status. The LCD backlight is green in normal operation. When alarming, the residual current reaches the alarming value, and the backlight is red. When the residual current reaches the warning value, and the backlight is yellow.	

Note:

When the rated residual current is set to be 30mA, the action delay time is invalid, and operate immediately by default.

When there is an alarm indication of transformer disconnection, the “TEST” button is locked and invalid.

#### 5.4 Description of Selection

1) The device is mainly used in system protection, as the protection of direct electric shock, indirect electric shock, electrical fire and hierarchical protection. For directing shock protection only as supplementary protection, the rated residual operating current at this time does not exceed 30mA.

2) Protective devices must be installed in the following equipment and places: mobile electrical equipment and hand-held power tools, electrical equipment used in production, electrical and mechanical equipment in construction sites, electrical equipment installed outdoors, etc. (See GB13955 for details).

3) The rated remaining operating current shall fully consider the normal leakage current value

of the system. Generally not less than 2~4 times of the maximum measured residual current: 4 times of the branch line; Branch line 2.5 times; Main line 2 times. According to the empirical formula:

Single-phase circuit:  $I_{\Delta n} \geq I_n/2000$  (lighting)

Three-phase loop:  $I_{\Delta n} \geq I_n/1000$  (power or power lighting hybrid)  $I_{\Delta n}$  is the maximum current.

4) In order to ensure the selectivity of hierarchical protection action, the current and time coordination between the upper and lower levels shall conform to the following provisions:

$I_{\Delta n1}$  (upper)  $\geq I_{\Delta n2}$  (lower)

$tF$  (upper ASJ return time)  $> tFA$  (low ASJ break time), the time difference is not less than 0.2s.

General branch line and end: 30~100mA,  $\leq 0.1s$ ; Branch line: 300~500mA, 0.2~0.8S;

Main line: 500~1000mA,  $\leq 2s$ .

### 5) System Selection Instructions

Type of system	Wiring of system	description
TT system		ASJ is recommended. The earth fault current is very small and difficult to be estimated, operating current can not be reached, and the hazardous voltage will appear on the shell.
TN-S system		ASJ can be used. cut off the fault more quickly and sensitively, improve the safety and reliability. PE line is not allowed to pass through the transformer.
TN-C system		ASJ can not be used, if PEN line is not iterative earthing, the ASJ refuse to operate; if PEN line is iterative earthing, ASJ will be misoperated.
TN-C-S system		If it is the TN-C system in front of the point F, ASJ is not allowed; if it is the TN-S system at the back of point F, ASJ can be used, but PE line cannot pass through the transformer.
IT system		ASJ can be applied. The insulation monitoring device is applied firstly and the residual current device is applied to prevent the reduction of insulation in the system and make it the secondary backup protection,

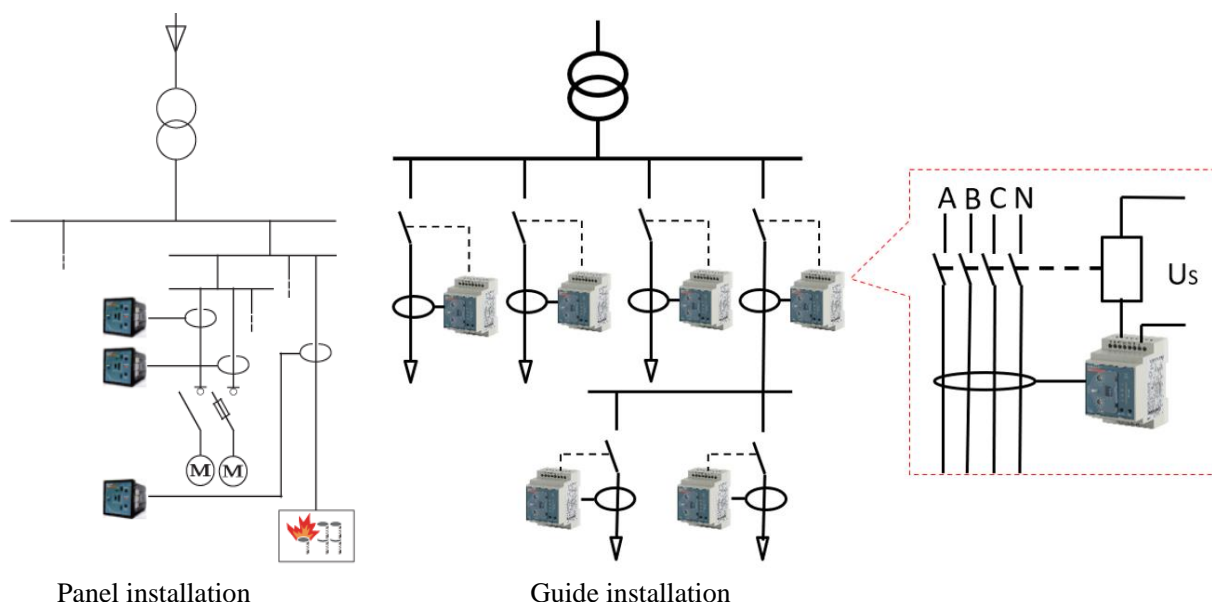
### 5.5 Instructions for the selection of transformer

type	hole	Main loop rated current	ratio
AKH-0.66L45	45mm	80A	1A:1mA

AKH-0.66L80	80mm	250A	1A:1mA
AKH-0.66L100	100mm	400A	1A:1mA
AKH-0.66L150	150mm	630A	1A:1mA
AKH-0.66L200	200mm	1000A	1A:1mA
AKH-0.66L-260*100II	265*104mm	1000A	1A:1mA

Note: Attention should be paid to the type of residual current transformer, the installation aperture and the rated current of the main circuit to prevent the situation that the outlet cable or copper bar cannot all pass through the transformer. If the above type cannot be satisfied, please contact us.

## 6 Typical applications



## 7 Programming menu

This section and next section only applies to ASJ10L-LD1A

First Menu	Second Menu	Third menu	Descriptions
Addr	1~247	none	Address setting
bAUd	1200, 2400, 4800, 9600, 19200, 38400	none	Communication Baud rate setting
AL	Select a modified bit	modified bit	Rated residual operating current setting
AL.Pr	Select a modified bit	modified bit	Prewarning operating current setting
rSt.P	Select a modified bit	modified bit	Percentage of alarm, prewarning operating current return value
Td	Select a modified bit	modified bit	Limit non-driving time setting
Mod	000,001,010,011,100,101, 110, 111	none	For details see attached table: Mod Menu Description
Brk	on/oFF	none	Disconnection alarm setting
LCd	0~9999	none	Backlight setting, 0: backlight is always bright; 1~9999, backlight goes out after

			1~9999 seconds. Unit: 1 second
PASS	1~9999	none	Password setting
TimE	Year, month, day, hour, minute	Modify time	Time setting
Clr	yes/no	none	Yes: clear the event log

Mod menu instructions:

Bit2	0	Manual reset
	1	Automatic reset
Bit1	0	Relay AL1 terminals 97,96 are normally closed by default, 96,95 are normally open by default
	1	Relay AL1 terminals 97,96 are normally open by default, 96,95 are normally closed by default
Bit0	0	Relay AL2 terminals 10 and 9 are normally open by default
	1	Relay AL2 terminals 10 and 9 are normally closed by default

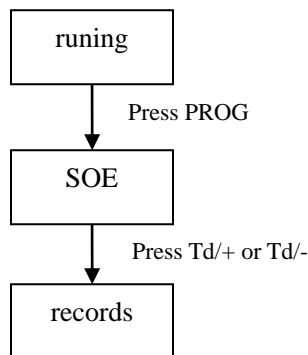
After entering the first level menu, short press PROG key to enter the second level menu, Td/+ key and Td/- key are used to switch channels between the second level menu, then press PROG key, use Td/+ key and Td/- key to modify the specific value. When you're done, press PROG or RESET to return. After the modification is completed, press RESET key to exit. Before exiting, you should choose whether to save or not. Press the RESET key again to avoid saving and press PRGO key to save (when setting the real-time time, it will be saved after modified).

The default return value of alarm and prewarning operating current is 85%. When the leakage current is less than 85% of the rated residual operating current, the alarm relay AL1 is reset, and when the leakage current is less than 85% of the rated prewarning residual operating current, the prewarning relay AL2 reset (the instrument should be set to automatic reset mode).

### 7.1 Programming Example

The following is a few programming diagrams, users can refer to these examples to program menu items of the same level.

#### 1) View SOE records in running mode



Each SOE consists of two pages, and the SOE format is as follows:

n.01            Al  
**200mA**

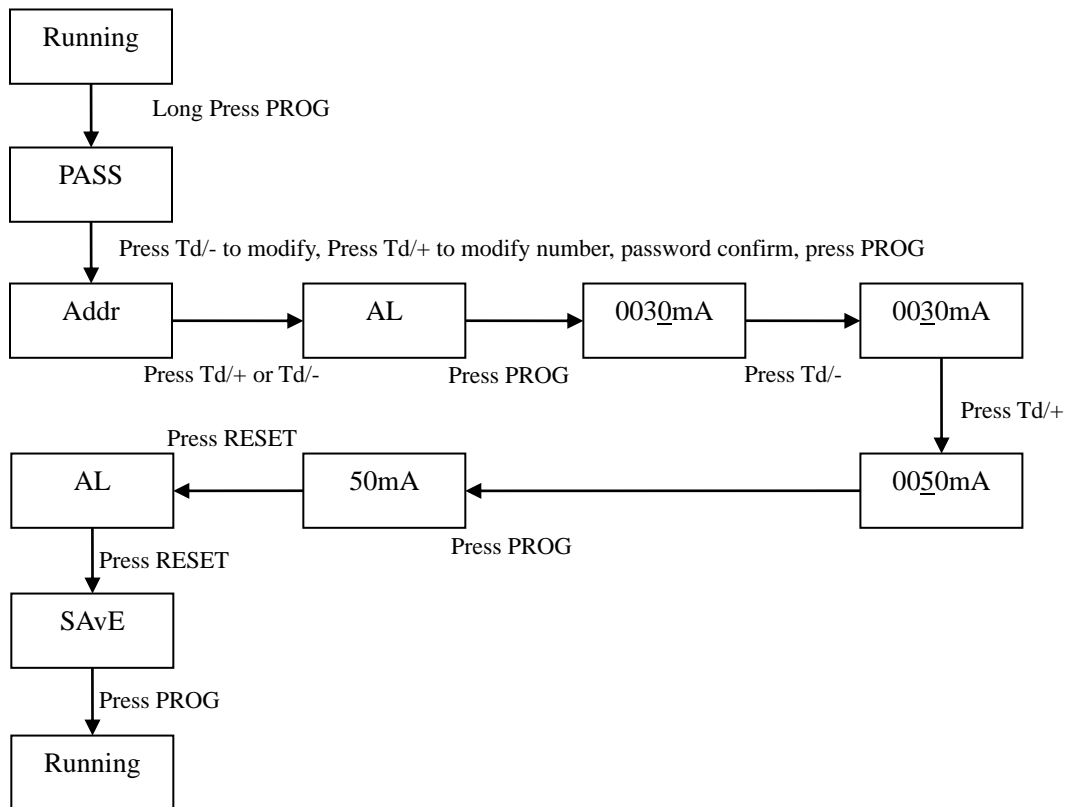
n.01            11.03  
**12:08**

n.01 is the latest event record, and so on.

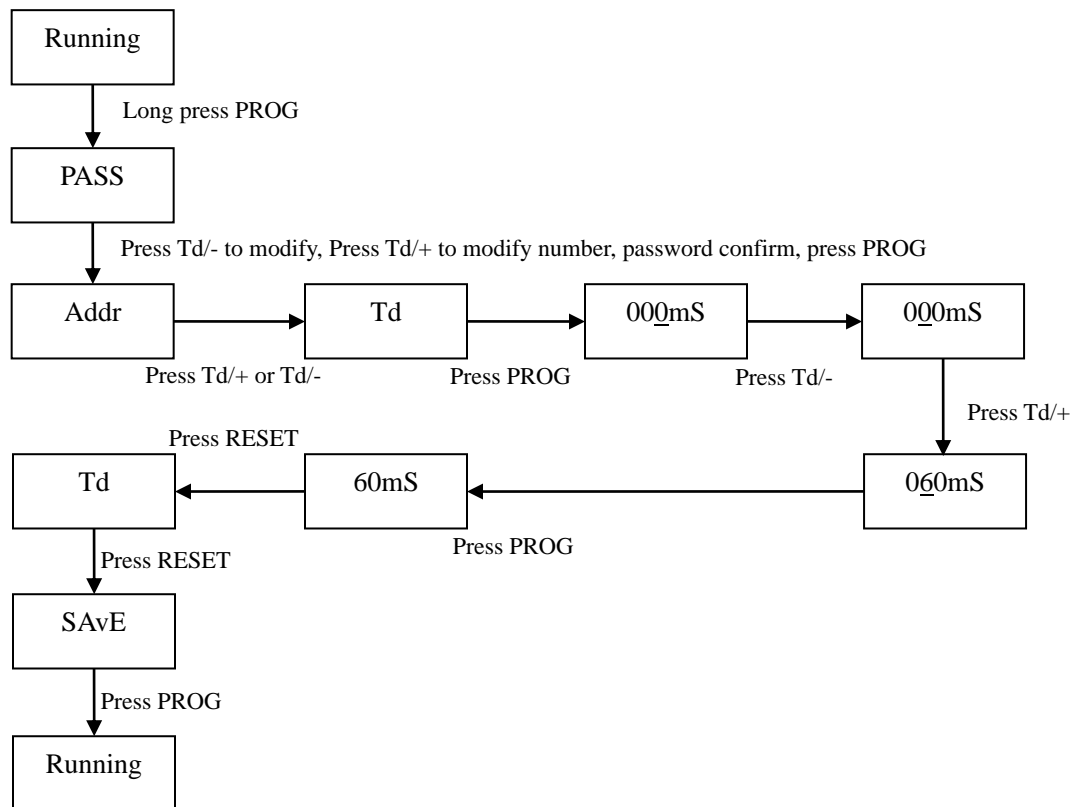
Al indicates that the record is generated by the residual current alarm action, and the AL.pr indicates that it is generated by the warning action.

The example shows that the first event record is generated by the residual current alarm action, the alarm value is 200 mA, the occurrence time is 11.03.12:08.

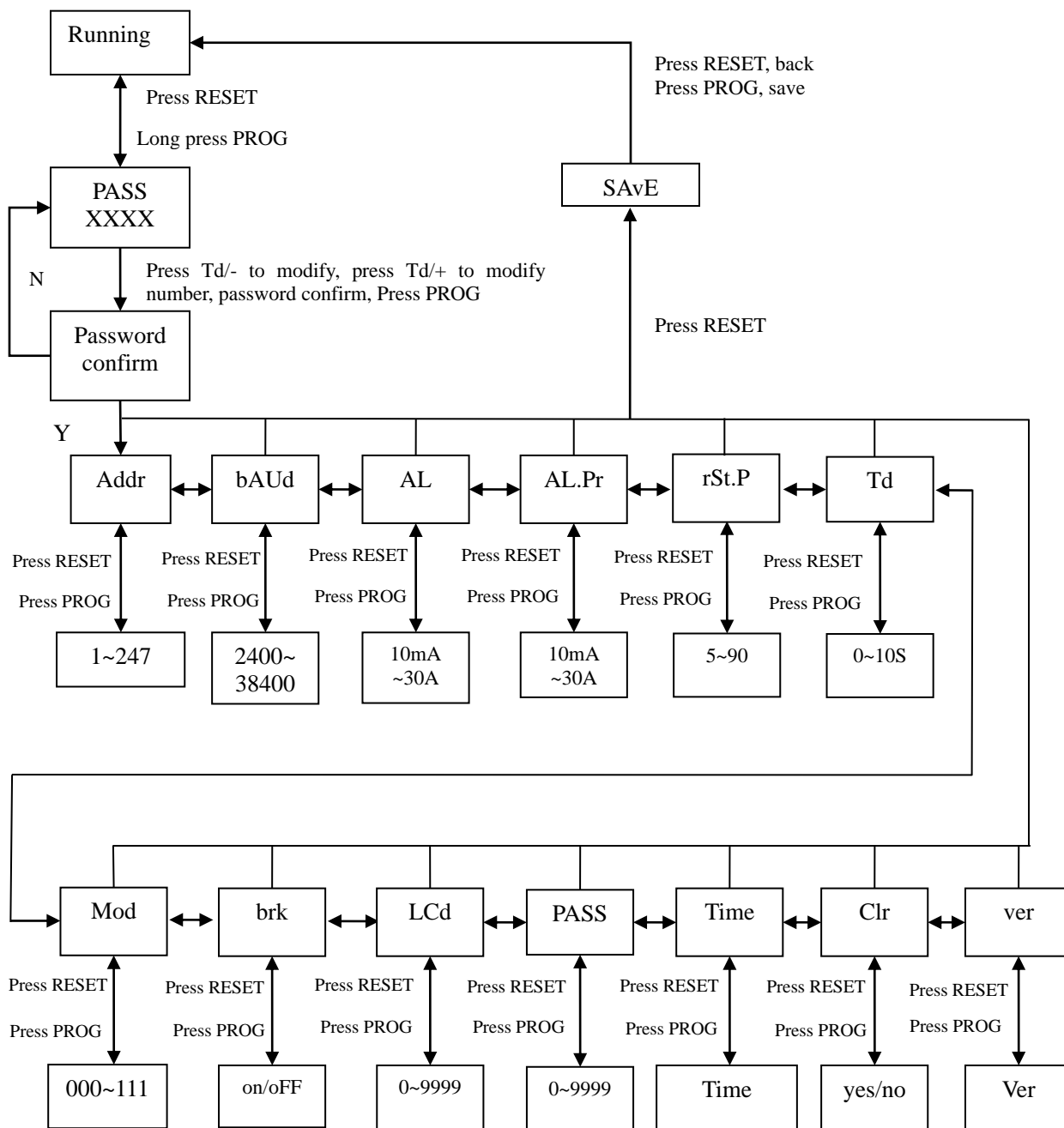
2) Set the residual current operating value to 50mA, \_ represents the modified bit.



60ms Set the limit non-driving time to 60ms.



## 7.2 Programming Example



## 8 Communication Guide

### 8.1 Overview of Communication Protocol

ASJ10L-LD1A/C residual current operated relay uses Modbus-RTU communication protocol. The protocol defines check codes, data sequences, etc. in detail, which are necessary for specific data exchange. The Modbus-RTU protocol uses a master-slave acknowledgment connection (half duplex) on a communication line, which means that signals are transmitted in opposite directions on a single communication line. First, the host computer's signal is addressed to the only terminal device (slave), then the response signal from the terminal device is transmitted to the host in the opposite direction.

The Modbus-RTU protocol only allows communication between the host (PC, PLC, etc.) and terminal devices, and does not allow data exchange between independent terminal devices, so that each terminal device does not occupy the communication line when they are initialized, but only responds to query signals reaching the local computer.

#### 8.1.1 Transmission Mode

The information is transmitted asynchronously and in bytes. The communication information transmitted between the master and the slave is in 11-bit word format, which consists of 1 start bit, 8 data bits (the lowest valid bit is sent first), no check bit, and 1 stop bit.

#### 8.1.2 Information Frame Format

Address	Function	data	CRC
1 byte	1 byte	n byte	2 bytes

Address code: the address code is composed of one byte (8-bit binary) at the beginning of the frame and the decimal is 0-255. Only 1-247 is used in the residual current relay, and other addresses are reserved. These bits indicate the address of the user-specified terminal device that will receive the host data from it. The address of each terminal device must be unique. Only the terminal to which it is addressed will respond to the query containing the address. When the terminal sends back a response, the slave address data in the response tells the host which terminal is communicating with it.

Function code: the function code tells the terminal to which it is addressed which function to perform. The following table lists the function codes used in this series of instruments as well as their significance and function.

function	definition	Function
03H/04H	Read data register	Get the current binary value of one or more registers
10H	Modify multi register	Set binary values into a series of multiple registers

Data area: the data area contains the data required by the terminal to perform specific functions or the data collected when the terminal responds to the query. The contents of the data may be values, reference addresses, or set values. For example, the function code tells the terminal to read a register, and the data area needs to indicate which register to start from and how many data to read. The embedded address and data vary according to the types and the different contents between the slaves.



CRC check code: the error check (CRC) field takes up two bytes and contains a 16 bit binary value. The CRC value is calculated by the transmitting device, and then attached to the data frame. The receiving device recalculates the CRC value when receiving byte data, and then compares it with the value in the received CRC field. If the two values are not equal, an error occurs.

The process of generating a CRC is as follows:

- 1) Reset a 16-bit register as 0xFFFF (all 1), which is called CRC register.
- 2) The 8-bit of the first byte in the data frame is XOR with the low byte in CRC register, and the result is saved back to CRC register.
- 3) Move the CRC register to the right by one bit, fill the highest bit with 0, and the lowest bit is out and detected.
- 4) If the lowest bit is 0, repeat the third step (the next shift); if the lowest bit is 1, XOR the CRC register with a preset fixed value (0xa001).
- 5) Repeat the third and fourth steps until eight shifts, this completes a complete octet.
- 6) Repeat steps 2 through 5 to process the next octet until all bytes are processed.
- 7) The final CRC register value is the value of the CRC.

In addition, there is a method to calculate CRC by using the preset table. Its main feature is that the calculation speed is fast, but the table needs a large storage space. This method will not be described here, please refer to the related materials.

## 8.2 Introduction to function code

### 8.2.1 Function code 03H or 04H: register read

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

The following example reads a value from machine 01 at the address 0008H.

Master Send		Data	Slave Return		Data
Address		01H	Address		01H
Function		03H	Function		03H
Start Address	High byte	00H	Bytes		02H
	Low byte	08H	Data of	High byte	00H
number of Registers	High byte	00H	Registers	Low byte	50H
	Low byte	01H	CRC codes	Low byte	21H
CRC codes	Low byte	74H		High byte	75H
	High byte	0CH			

### 7.2.2 Function code 10H: write register

Function code 10H allows the user to change the contents of multiple registers. The time and date in the meter can be written with this function number. The master can write up to 16 (32 bytes) of data at a time.

The following example is a device with a preset address of 01 date and time of 12:00 on Friday, December 01, 2009. From Monday to Sunday, 1 to 7 are used instead.

Master Send		Data	Slave Return		Data
Address		01H	Address		01H
Function		10H	Function		10H
Start Address	High byte	00H	Start Address	High byte	00H
	Low byte	04H		Low byte	04H
number of Registers	High byte	00H	number of Registers	High byte	00H
	Low byte	03H		Low byte	03H
Bytes		06H	CRC codes		Low byte 31H
0004H data for sending	High byte	09H	High byte		C9H
	Low byte	0CH			
0005H data for sending	High byte	01H			
	Low byte	05H			
0006H data for sending	High byte	0CH			
	Low byte	00H			
CR codes	Low byte	53H			
	High byte	3FH			

### 8.3 Communication Address Table

No.	Address	Parameter	Read/Write	Range of value	Value type
1	0000H	Residual current value	R	0~30000mA	word
2	0001H~0007H	retain			
3	0008H	Rated residual operating current setting	R/W	10~30000mA	word
4	0009H	Prewarning operating current value	R/W	10~30000mA	word
5	000AH~000FH	retain			
6	0010H	Limit non-driving time value	R/W	0~10000ms	word
7	0011H~0017H	retain			
8	0018H	Address	R/W	1~247	word
9	0019H	Baud rate	R/W	0,1,2,3,4,5 38.4k, 19.2k, 9600, 4800, 2400, 1200	word
10	001AH	Disconnection alarm setting	R/W	bit2, bit1, bit0 000: close 001: open	word
11	001BH	Alarm status	R	bit2, bit1, bit0 000: normal 001: warning 010: alarm 100: break line	word
12	001CH	Mode setting	R/W	See chapter 8.4	word
13	001DH	Protection password	R/W	0000~9999 (default:0001)	word
14	001EH	Di status	R	bit1, bit0; 01: ch1 10: ch2	word
15	001FH	Backlight delay	R/W	0~9999; 0: lighting, default 60s	word
16	0020H~0023H	retain			
17	0024H	year (H)	R/W	00~99: 2000~2099	word
18		month (L)	R/W	1~12	
19	0025H	day (H)	R/W	1~31	word

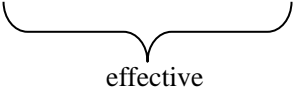
20		hour (L)	R/W	0~23		
21	0026H	minute (H)	R/W	0~59	word	
22		second (L)	R/W	0~59		
23	0021H~002CH	Reserved				
24	002DH	No.1 SOE	Record type	R	0: alarm, 1: warning	word
25	002EH		Actual value of alarm	R	0~30000mA	word
26	002FH		Alarm setting value	R	10~30000mA	word
27	0030H		Year (H)	R	Alarm time - year	word
28			Month (L)	R	Alarm time - month	
29	0031H		Day (H)	R	Alarm time - day	word
30			Hour (L)	R	Alarm time - hour	
31	0032H		Minute (H)	R	Alarm time - minute	word
32		Second (L)	R	Alarm time - second		
33	0033H~00C2H	Others 24 SOEs	R	The format same as No.1 SOE		

Note: H represents the upper 8 bits. L represents the lower 8 bits.

#### 8.4 001CH data parsing

The parameter of address 001CH represents the current setting value, as shown in the table below.

High 8 bit	Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8
Low 8 bit	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0



Bit0	0	Relay AL2 terminals 10 and 9 are normally open by default
	1	Relay AL2 terminals 10 and 9 are normally closed by default
Bit1	0	The terminals 97 and 96 of relay are normally closed by default and 96 and 95 are normally open by default
	1	The terminals 97 and 96 of relay are normally open by default and 96 and 95 are normally closed by default
Bit2	0	Manual reset
	1	Automatic reset

#### 9 Ordering example

example:

Auxiliary power supply AC 220V/50Hz

Rated current In: 80A

model selection

residual current operated relay: ASJ10-LD1C; residual current transformer: AKH-0.66L-L45

