

# ELR-4MA

## AC Earth Leakage Relay

### User Manual



**Version: 1.10**

**Revision: 2024.11**

## Read me

**When you use ELR-4MAAC earth leakage relay, be sure to read this user manual carefully, and be able to fully understand the implications, the correct guidance of operations in accordance with user manual, which will help you make better use of ELR-4MAAC earth leakage relay, and help to solve the various problems at the scene.**

1. Before the meter turning on the power supply, be sure that the power supply within the provisions of the instrument;
2. When installation, the current input terminal must non-open, voltage input terminals must Non-short circuit;
3. Communication terminal (RS232/RS485) is strictly prohibited to impose on high pressure;
4. Be sure the instrument wiring consistent with the internal system settings;
5. When communicating with the PC, instrument communication parameters must be consistent with the PC.



- **Please read this user manual carefully**
- **Please save this document**

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## 1. - SUMMARIZE

The ELR-4MA Earth Leakage Relay is an advanced protection device designed to enhance the safety and reliability of electrical systems. With a residual current transformer (RCT), it continuously monitors the residual current in the busbars or branches of the system. When the residual current exceeds the preset threshold, the relay promptly outputs an alarm signal, ensuring early detection of potential faults.

Equipped with alarm function, the ELR-4MA ensures that alarm signals remain clearly indicated until received the reset signal, facilitating easy fault diagnosis and troubleshooting. ELR-4MA is critical for preventing equipment damage, minimizing downtime, and safeguarding personnel against electrical hazards.

### FEATURES

- Isolated auxiliary power supply;
- 2XSPDT relay outputs;
- Remote test/reset connections;
- Standard 35mm din rail mounting;
- RS485 Modbus communication;
- Adjustable trip levels and time delay.

### APPLICATIONS

- Smart grid system;
- Medium and low voltage systems;
- Commercial and residential buildings;
- Utilities and power distribution systems;
- Motor control panels and switchboards;
- Industrial control system (PLC, SCADA, DCS).

## 2. - TECHNICAL PARAMETERS

Parameter	Value
Auxiliary power supply	85-265Vac/dc
Power consumption	≤4VA
Frequency	50/60Hz, Accuracy ±0.01Hz
Leakage current alarm threshold	30mA-5A, can set as need.
Time delay	50ms-10sec, can set as need.
Communication	RS-485 MODBUS-RTU
Display	LCD with backlit
Withstand voltage	2.5KV 1min
Insulation	Input, output, power supply to shell >5MΩ
Storage environment	-40~70°C
Working environment	-25~55°C Altitude ≤2500m, 0~95%RH, non-condensing, non-corrosive gas

### 3. - INSTALLATION AND START-UP



The manual you hold in your hand contains information and warnings that the user should respect in order to guarantee a proper operation of all the instrument functions and keep it in safety conditions. The instrument must not be powered on and used until its definitive assembly is on the cabinet's door.

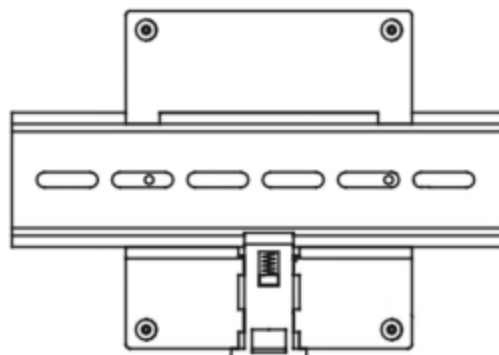
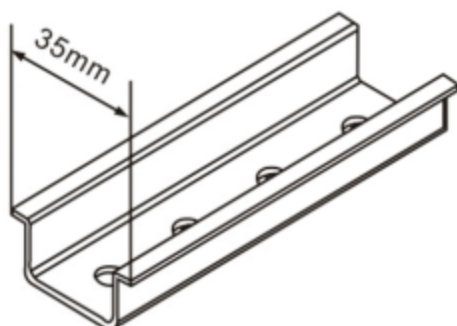
**If the instrument is not used as manufacturer's specifications, the protection of the instrument will be damaged.**

When any protection failure is suspected to exist (for example, it presents external visible damages), the instrument must be immediately powered off. In this case contact a qualified service representative.

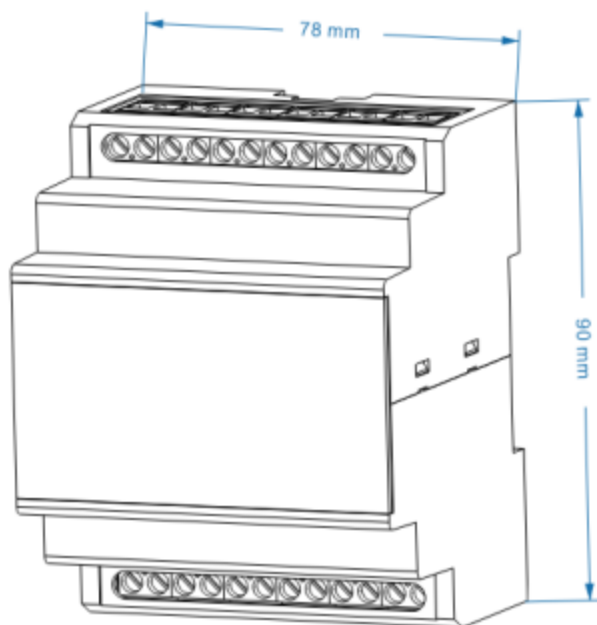
#### 3.1.- Installation

##### Mounting

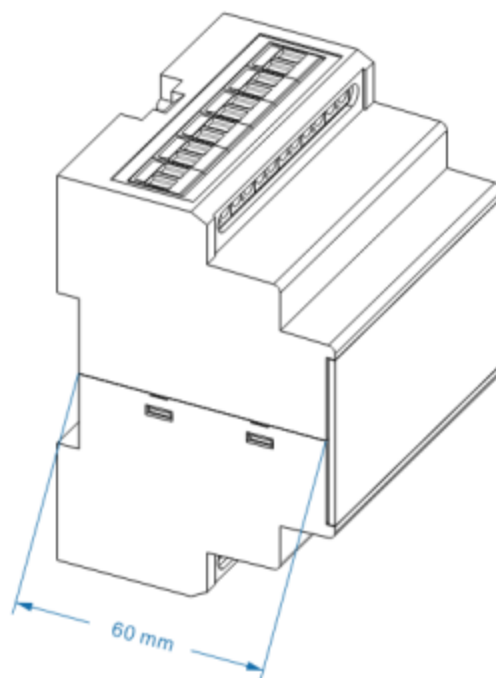
Instrument is to be mounted on 35mm Din-rail. Keep all connections into the cabinet. Please note that with the instrument powered on, the terminals could be dangerous to touch and cover opening actions or elements removal may allow accessing dangerous parts. Therefore, the instrument must not be used until this is completely installed.



**Dimension: 78\*90\*60 mm W\*H\*D**



**Front view**



**Side view**

### 3.2.- Connection Terminal



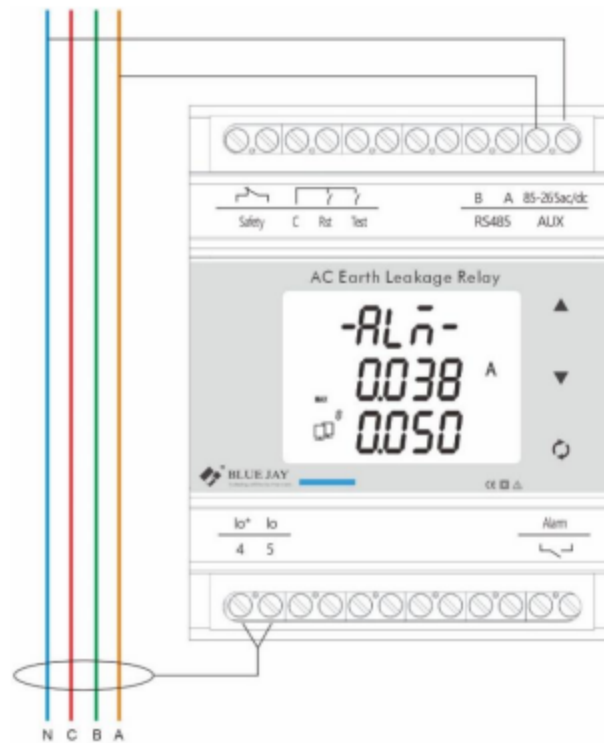
Marked	Notes
<b>Safety</b>	Device disconnection detection
<b>C</b> <b>Rst</b> <b>Test</b>	Common terminal Remote reset, NO contact Remote test, NO contact
<b>RS485</b>	RS485 communication A,B
<b>AUX</b>	Power supply 85-265Vac/dc +/-
<b>lo*</b> <b>lo</b>	Residual current transformer
<b>Alarm</b>	Alarm output relay

#### Notes:

- Short-circuit terminal "C" and "Rst" to activate reset function, then short-circuit terminal "C" and "Test" to activate test function.
- The terminal pin definition may change depends on customer order; please refer to the label on the device.



### 3.3.- Typical Wiring







**Note:**

This connection drawing is for reference only; the actual connecting terminal please refer to the label on the rear part.

## 4.- SCREEN DISPLAY

### 4.1.- Button description

Button	In Monitor Screen	In Config Sub-menu	In Parameter Setup
	Move to previous or next page	Move cursor up and down to select function	Move setting cursor to left
	<b>Press and hold:</b> Call out password screen	Move cursor up and down to select function	Scroll selection number 0 ~ 9
	<b>Press and hold:</b> Display version information	Confirm the values & Entry or jump to down level menu	

**Note:** In **Config. menu**, if change the setting value, press and hold  for exit menu, device will call out confirm screen ask "SAVE".

Then press and hold  for *exit without saving*;

press and hold  for *save and exit*.



## 4.2.- Overall screen


### Page 1: Real time measurement data



**First row:** present leakage current value

**Second row:** max/min leakage current value

In this screen, press  and  can check the max/min leakage current value between the last time reset action and this time reset action.

Press  switch to Page 2: Present parameter threshold



**First row:** leakage current alarm threshold

**Second row:** delay time alarm threshold

### Page 3: Device test status



Screen will show all the displayed contents

**Note:** test function is activated by DI signal, and the "safety" and "alarm" output relay will act according to the device status.

### Page 4: Alarm tripped screen



**First row:** Alarm prompt words

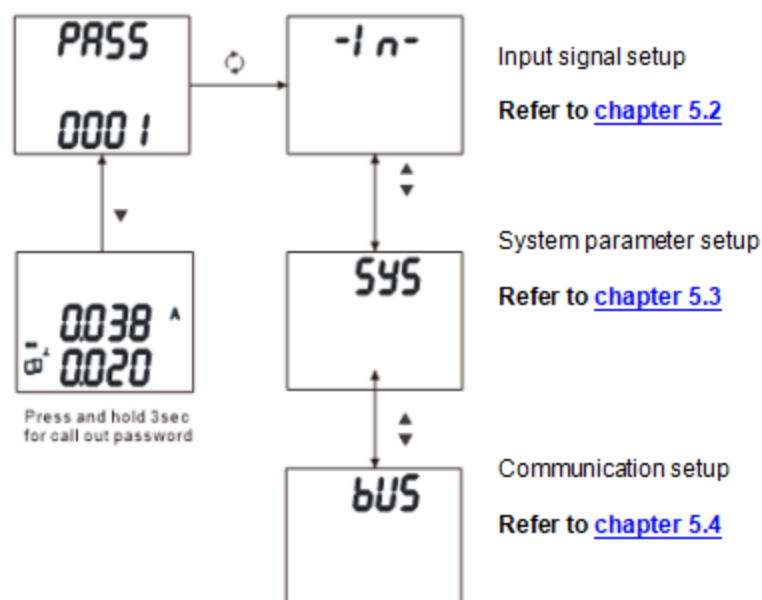
**Second row:** Leakage current value

**Third row:** Maximum leakage current value

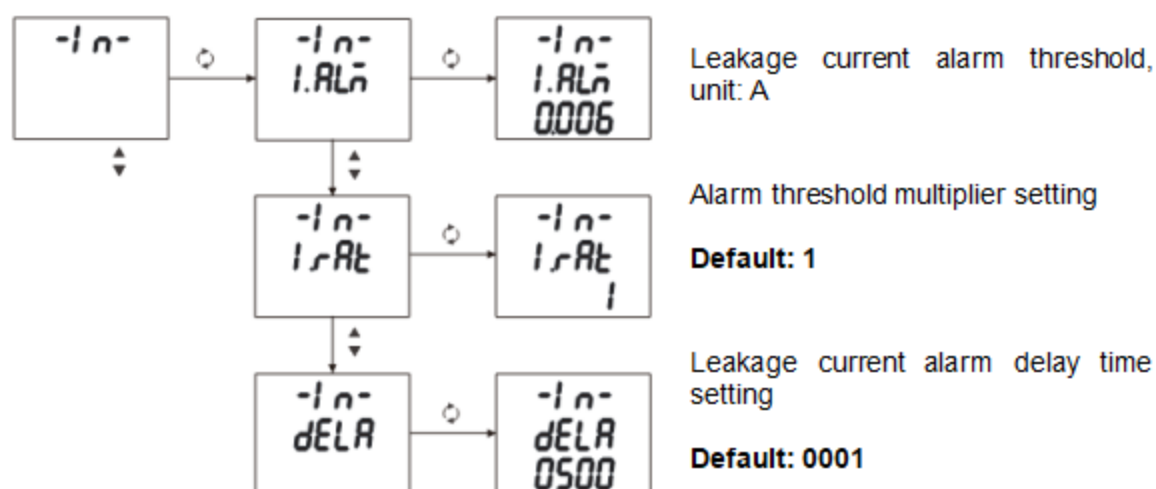
## 5.- SETUP PROCEDURE

### 5.1.- Enter setup menu

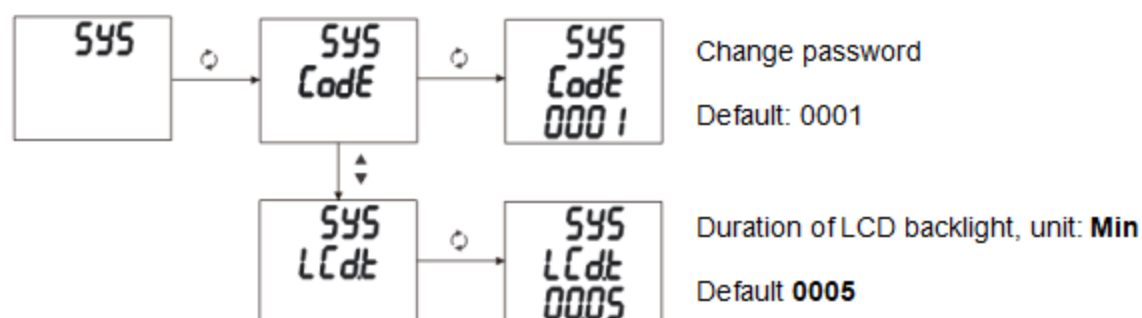
In measuring screen, press and hold the  button, and the prompt of "Password" will appear, and enter the password (default is **0001**), press  button to enter the configuration menu, ELR-4MA provides three configure parameters items: system factory commissioning (SYS), input (-IN-), and communication (Bus). Adopt LCD display layered menu structure management.



## 5.2.- Input signal setup



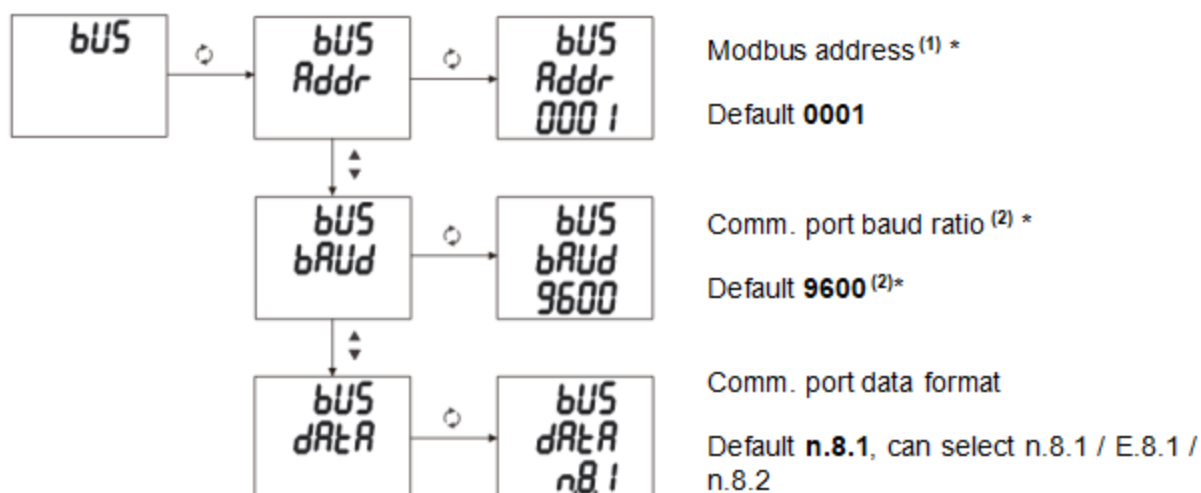
## 5.3.- System setup



### Note:

- If change the password, please keep the password in safety, or only return to Blue Jay for reset new password!

## 5.4.- Communication setup



### Notes:

(1) Modbus address setup range 1-247.

(2) Baud ratio can select 1200 / 2400 / 4800 / 9600 / 19200, and regular meter equipped with communication port max baud ratio is 19200bps. If need higher speed, please contact Blue Jay sales team.

## 6.- SAFETY CONSIDERATIONS



All installation specification described at the previous chapters named:  
**INSTALLATION AND STARTUP, INSTALLATION MODES and SPECIFICATIONS.**

Please note that with the instrument powered on, the terminals could be dangerous to touching and cover opening actions or elements removal may allow accessing dangerous parts. This instrument is factory-shipped at proper operation condition.

- ◆ The device must have a professional installation and maintenance
- ◆ Any operation of the device, you must cut off the input signal and power;

## 7.- MAINTENANCE

The ELR-4MA does not require any special maintenance. No adjustment, maintenance or repairing action should be done when the instrument is open and powered on, should those actions are essential, high-qualified operators must perform them.

Before any adjustment, replacement, maintenance or repairing operation is carried out, the instrument must be disconnected from any power supply source.

When any protection failure is suspected to exist, the instrument must be immediately put out of service. The instrument's design allows a quick replacement in case of any failure.

For any inquiry about the instrument performance or any failure,  
contact to Blue Jay's technical service.

*Blue Jay - After-sales service*

E-mail: [tech@cqbluejay.com](mailto:tech@cqbluejay.com)