ALM-CH4
Fault Annunciator

User Manual



Version: 1.11

Revision: 2026.10

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Read me

When you use ALM-CH4 Fault annunciator, 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 ALM-CH4 Fault annunciator, 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

ALM-CH4 fault annunciators are designed for cabinet panel mounting, offering a compact structure and efficient wiring. Suitable for power control and monitoring systems, they use a high-reliability MCU to monitor external signals in real time. When a fault occurs, the corresponding panel indicator illuminates, the buzzer sounds, and the alarm relay responds promptly.

The device supports audible alarm mute, alarm reset, and indicator testing via front-panel buttons. It also supports RS485 communication using the Modbus RTU protocol and records up to 300 sequence of events (SOE).

FEATURES

- High brightness LED display;
- 96*96mm panel mounting;
- Flashing alarm lights remain until confirmed;
- Customized or replaceable alarm labels;
- Reliable passive relay contact outputs;
- Records up to 300 SOE events;
- Centralized alarm output for multiple signals;
- Self-fault alarm with normally closed contact;
- Sound alarm interface supports external devices;
- Modular design for easy installation and maintenance.

APPLICATIONS

- Power generation and distribution systems;
- Industrial manufacturing and production facilities;
- Oil, gas, and petrochemical processing plants;
- Data centers and server farm operations;
- Railway, aviation, and maritime transportation systems;
- Heating, ventilation, and air conditioning (HVAC) systems.

2.- TECHNICAL PARAMETERS

Parameter	Value
Operating voltage	85-265VAC/DC (±10~15%), optional 24VDC
Rated power	≤8W
Fault signal inputs	4 channels, Active dry contact with 15Vdc feed, no need extra power supply.
Response time	≤100ms
Flashing frequency	>1Hz
Relay outputs	3 channels Load capacity: 5A@250VAC, 0.5A@110VDC, 0.3A@220VDC
SOE record	Max 300 lists
Panel protection level	Front: IP54; Rear: IP20
Communication	RS485 Modbus RTU
Indication method	LED indicator or text panel
Insulation performance	2.5 kV AC RMS 1 minute, between input / output / case / power supply. 2 kV AC RMS 1 minute, between input / power supply/ communication.
Operating environment	Temp.: -20°C ~+60°C; Humidity: Annual avg. ≤75%, max ≤93%
Wiring terminal	0.2...2.5mm²
Working cycle	100%
Installation method	Panel mount
Dimension	Frame size: 96x96 mm; hole size:91x91mm

3.- FUNCTION DESCRIPTION

3.1.- Alarm indication

When an alarm signal is received at any DI input, the corresponding alarm indicator flashes at a frequency >1Hz until the alarm is pressed reset to acknowledge. After acknowledgment, the indicator remains steadily light if the corresponding DI signal is still active, or turns off if the DI signal has cleared.

The text labels beside the alarm indicators can be customized according to application requirements. They can be pre-printed by the manufacturer, or printing templates and materials can be provided for user customization.

3.2.- Audible alarm and muting

When an alarm signal is received at any DI input, the buzzer sounds and the buzzer relay closes. Pressing the MUTE button can silence the buzzer and the buzzer relay opens without affecting the alarm indicators or the alarm relay status. Muting is also performed when a local or remote reset is triggered.

3.3.- Alarm output

The alarm relay adopts passive normally open contact. When an alarm signal is received at any DI input, alarm relay closes to activate the alarm output. Upon local or remote reset, the system checks the status of each DI input. Alarms are cleared for channels whose input signals are inactive, while alarms remain active for channels whose input signals persist. The alarm relay de-energizes only after all alarms have been cleared.

3.4.- SOE event record

The device is equipped with a high-precision internal RTC real-time clock, which supports storing up to 300 lists of SOE records. The latest event is stored as the 1st entry, followed by subsequent events in chronological order.

Each record includes a complete timestamp (year, month, day, hour, minute, and second), event type, trigger channel/source, and full-channel DI and DO status snapshots. Historical SOE records can be read via Modbus RTU over RS485. To clear all stored records, write 0x0A0A to the modbus register 0x0064, details see chapter 5.3.

3.5.- Device fault alarm

Device faults include power supply failure and main controller IC failure. These faults are indicated by the safety relay, which adopts passive normally closed contact. The contact is open during normal powered operation and closes when a device fault occurs or the power supply fails.

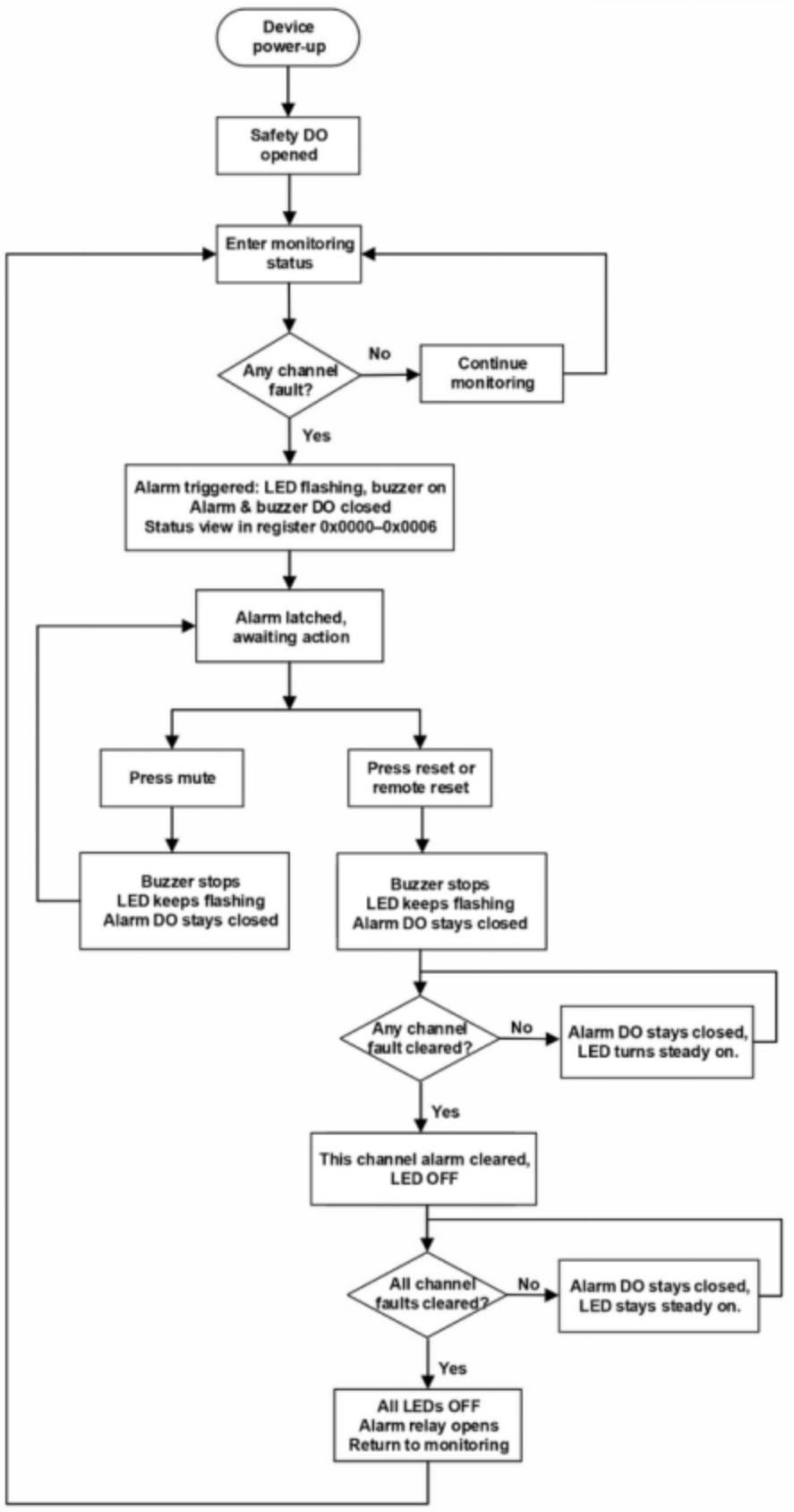
3.6.- Indicator test and reset

Press and hold the test button to verify the operation of all panel LED indicators. All indicators illuminate during the test. When the button is released, the indicators resume their normal status according to the present alarm and operating conditions.

3.7.- Communication parameter reset

Press and hold TEST, RESET, and MUTE simultaneously for over 3 seconds to restore communication defaults value: address 1, 9600 bps, N.8.1 (no parity, 8 data bits, 1 stop bit).

ALM-CH4 operation flowchart :



4.- 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.

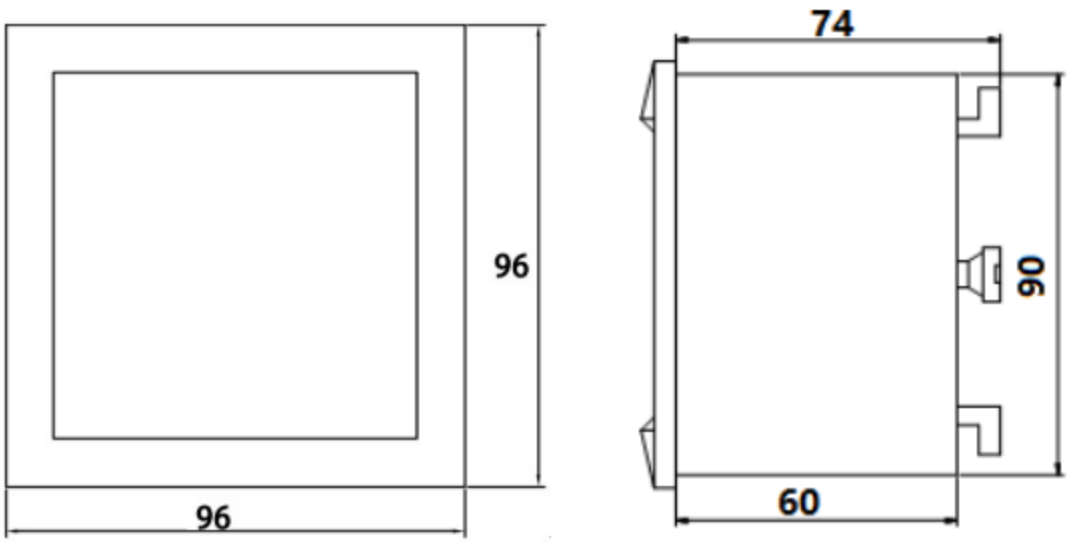
4.1.- Installation

Panel mounting

Instrument is to be mounted on panel (cut-out *91x 91mm*). Keep all connections into the cabinet.

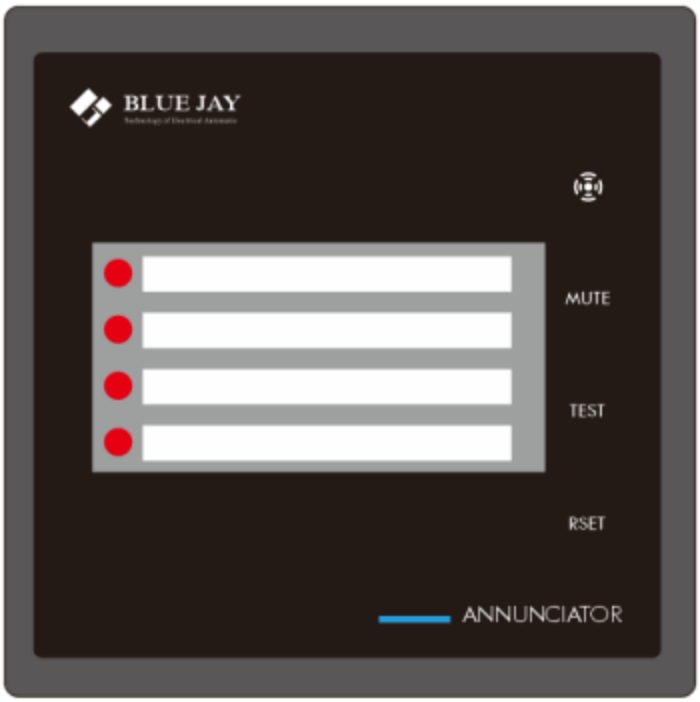
Please note that as the instrument be powered on, the terminals could be dangerous to touch and cover opening actions or elements removal may allow accessing dangerous parts. Therefore, the instrument must not be used until this is completely installed.

Dimension: Unit: mm



Front view **Side view**

4.2.- Front Panel Indicators and Controls

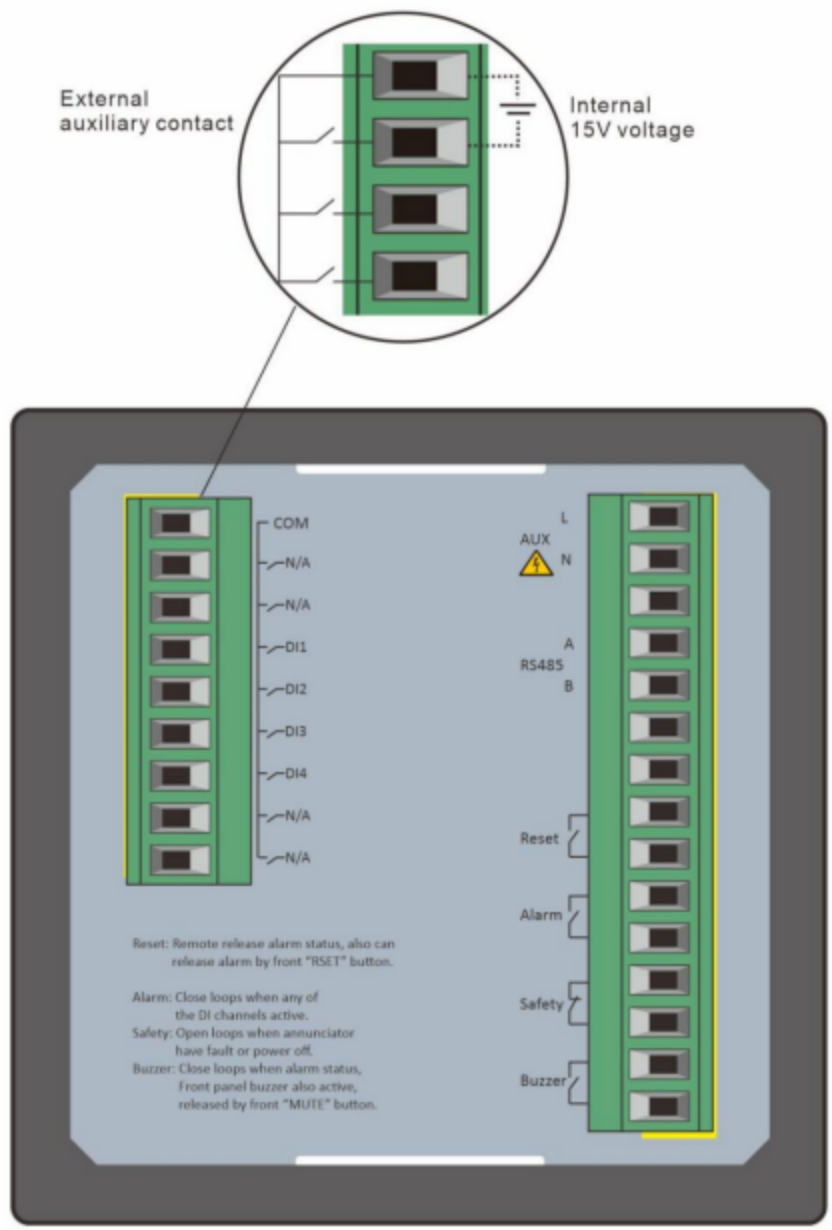


	Fault LEDs, Indicates fault signals of channels 1–4
	Customized fault information label, inserted via the left-side slot
	Buzzer, sounds an alarm when a new fault occurs; can be muted via the “MUTE” button
MUTE	Buzzer muted, resets the buzzer output
TEST	LED Indicator test, press to check all fault LEDs. If an LED fails to light, it indicates an error
RSET	Reset the alarm status

Note:

Simultaneously Press and hold “MUTE, TEST, and RSET” for more than 3 seconds to restore communication settings to the default value.

4.3.- Connection Terminal



Marked	Notes
COM	Input signal common terminal (positive pole)
N/A	Reserved function, not available
DI 1-4	Corresponding to channel 1~4 fault signal inputs, Active dry contact with 15Vdc feed, support external auxiliary contact / DO input, no external power required.
AUX L, N	Power supply 85-265Vac/dc
RS485 A, B	RS485+/-, communication

Reset	Remote release alarm status, also can release alarm by front “RSET” button.
Alarm	Close loops when any of the DI channels active.
Safety	Open loops when annunciator has fault or power off.
Buzzer	Close loops when alarm status, Front panel buzzer also active, released by front “MUTE” button.

Note:

The terminal pin definition may change depends on customer order; please refer to the label on the device.

5.- COMMUNICATION INTERFACE

5.1.- Measurement data, read only, function 0x03 to read

Register	Data	Byte mode		Instruction
0000	DI 1-4	int	1	Channel 1-4 DI status
0002	ALM 1-4	int	1	Channel 1-4 alarm status
0004	RST 1-4	int	1	Channel 1-4 status after reset
0006	DO 1-3	int	1	Channel 1-3 relay output status

Note: In 4-channel version, only bits 2–5 of the above [0000-0004] register is used, other bits are reserved, details see following:

Bit 0: reserved
Bit 1: reserved
Bit 2: channel 1
Bit 3: channel 2
Bit 4: channel 3
Bit 5: channel 4

5.2.- SOE record, read only, function 0x03 to read

Register	Data	Byte mode		Instruction
0x03E8	SOE-1 Timestamp	int	1	Bit15-8 for Year, range: 0-99 Bit7-0 for Month, range: 1-12
0x03E9		int	1	Bit15-8 for Date, range: 1-31 Bit7-0 for Hour, range: 0-23
0x03EA		int	1	Bit15-8 for Minute, range: 0-59 Bit7-0 for Second, range: 0-59
0x03EB	SOE-1 Event Type	int	1	1: DI triggers alarm 2: DI closed 3: Mute operation 4: Reset operation 5: Test operation 6: Power-on/ Restart 7: Comm. parameters reset
0x03EC	SOE-1 Trigger Channel/Source	int	1	1-4: Corresponding 1-4 DI channels; 0: System events (power-on, test comm. reset). For mute/reset/: 100=local panel, 101=remote.
0x03ED	SOE-1 All channel DI status snapshot	int	1	Bits 2–5 correspond to DI 1-4 0: Open; 1: Closed;
0x03EE	SOE-1 All channel DO status snapshot	int	1	Bit 0= Alarm relay; Bit 1 = Safety relay; Bit 2 = Buzzer relay. 0: Open; 1: Closed;

0x03EE-0x03F5	SOE-2	int		The same as SOE-1
0x03F6-0x03FC	SOE-3	int		
0x03FD-0x0303	SOE-4			
…				
0x0C15-0x0C18	SOE-300			

5.3.- Readable and writable register (function 0x03 to read, 0x06 to write)

Register	Data	Byte mode		Instruction
0x0014	Communication address	int	1	Range: 1-247
0x0015	Communication baud rate	int	1	0: 2400, 1: 4800 2: 9600, 3: 19200
0x0016	Communication data format	int	1	0: n.8.1, 1: o.8.1 2: e.8.1, 3: n.8.2
0x001E	RTC. year	int	1	Internal RTC real time clock: Year - Month - Date - Hour - Minutes – Second - Week
0x001F	RTC. month	int	1	
0x0020	RTC. date	int	1	
0x0021	RTC. hour	int	1	
0x0022	RTC. minute	int	1	
0x0023	RTC. second	int	1	
0x0024	RTC. week	int	1	
0x0064	Reset SOE	int	1	Write 0x0A0A for reset SOE record

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 ALM-CH4 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