# INSTRUCTION MANUAL
# (DETAILED VERSION)

## ANNUNCIATOR
## FSA-110



# ⊖ DAIICHI ELECTRONICS CO., LTD.

Contents

Thank you for purchasing DAIICHI ELECTRONICS product.
Please read this instruction manual carefully before using.

## Safety precautions

■ **Environment conditions**
Please be sure to use this product in a place that meets the following conditions.
In places that do not meet this condition, it may cause malfunction or failure and product life decline.
● Within the range of ambient temperature -10 to +55 ℃, humidity 5 to 90% RH.
● Place free of dust, corrosive gas, salt and oily smoke. (Corrosive gas : $SO_2$ / $H_2S$, etc.)
● Location that is not affected by vibration and shock.
● Location that is not affected by external noise.
● Altitude 2000m or less.

■ **Outdoor use conditions**
● These products are not a dustproof, waterproof, and splash proof construction. Please avoid the place with much dust. Moreover, please install in the place not exposed to rain or water drop.
● Please do not install in the place where sunlight hits directly. Discoloration and degradation of a name plate, and deformation of the case by the surface temperature rise may occur.

■ **Mounting and wiring**
Please refer to this instruction manual for mounting and the wiring.

| ⚠ CAUTION | ● Please refer to connection diagram for the wiring. <br> ● Please avoid hot line work. <br> ● Please use an electrical wire size suitable with the rated current. <br> ● Please check the tightening of the screw. |
|---|---|

■ **Preparation**
This product must be set before use. Please set correctly after reading this instruction manual.

■ **Maintenance and inspection**
● Inspection in energized state is dangerous.
● No replacement in periodic inspection.
● After wiring change and maintenance, attach the terminal cover.
● Please wipe off lightly with the dry soft cloth. Please do not use the organic solvent, chemicals, cleaners, etc., such as alcohol, for cleaning.

■ **Storage**
Please store in a place that meets the following conditions.
● The ambient temperature within -25 to +70 ℃ (storage temperature).
● Daily average temperature 40 ℃ or less.
● Location corresponding to the usage environment and use conditions.
● Aluminum electrolytic capacitors are used in products. Please energize the power supply within one year after purchase.

■ **Countermeasures against troubles**
If trouble occurs within the warranty period, DAIICHI ELECTRONICS will repair this product.

■ **Disposal**
Please dispose this product as industrial waste (non-combustible).
Mercury parts and a nickel-cadmium battery are not used for this product.

■ **Product replacement cycle**
The recommended replacement period for this product is 10 years.

■ **Warranty period**
The warranty period of the product is one year after the date of delivery.

## Composition of type

| Type | Specification code | | | | |
|---|---|---|---|---|---|
| FSA-110- | ① Auxiliary supply | | ② Communication output | |
| | 1 | 100/110V AC | 0 | None |
| | 2 | 100/110V DC | 1 | CC-Link |

## 1 Product outline

■ Fault / operation input ×8, External operation input ×2, Alarm output ×2 (Warning, Caution) are equipped as standard.
■ The operation mode (Warning, Caution, Operation) can be selected freely for each input.
■ Remote monitoring of failure information is possible by CC-Link communication (option).
■ Sequence operation (alarm display, alarm output, communication data) can be checked without adding input.
■ The guidance display by OLED makes setting easy.

## 2 Name and function of each part

BI1 LED
BI2 LED
BI3 LED
BI4 LED

FSA-110    DAIICHI

Name label
(31mm×11mm Max.)
BI5 LED
BI6 LED
BI7 LED
BI8 LED
OLED

SET  MODE  −  +  LAMP TEST  ALARM STOP  LAMP RESET

Switch ×7
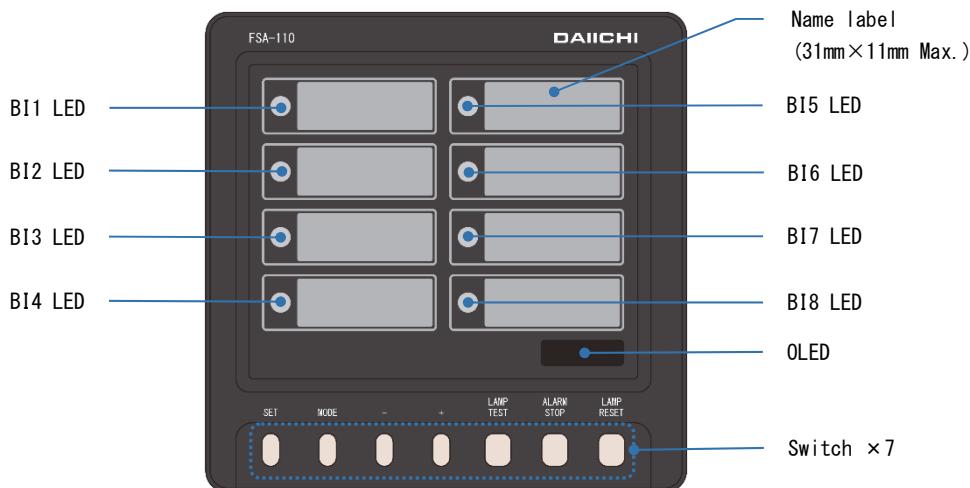
| Name | Function | Description page |
|---|---|---|
| BI 1 to BI8 LED | When fault / operation input (BI1 to BI8) is applied, it flashes or lights in the following color.<br>Warning：Red,　Caution：Amber,　Operation：White / Green / Blue / Red<br>(Inputs can be set individually) | 6 to 9 |
| Name label | Paste the name label of the fault or operation corresponding to each input.<br>(Name label need to be prepared by the user.) | ― |
| OLED | Provides guidance on configuration and testing. | 5, 8 to 11 |
| SET | Used for transition to setting mode, test mode, and confirmation of setting (test) items and settings. | 5, 8 to 10 |
| MODE | Used to shift to test mode, to return to monitoring mode, and to return to the previous screen. | 5, 8 to 10 |
| −／＋ | Used for setting, selecting test items / elements, and changing set values. | 5, 8 to 10 |
| LAMP TEST | Used to check the lighting of the LED. | 6, 7 |
| ALARM STOP | Stop the alarm state. | 6, 7 |
| LAMP RESET | Resets fault indication (LED). | 6, 7 |

## 3 Included items

① Instruction Manual (Installation and Operation) 8 pages (A4 size) ····· 1 pc
② M5 flange nut (for mounting) ········································· 2 pcs

## 4 Dimension diagram



110

16.5  103.5

110

φ99

15

2-M5 screw

(4.3)

M4 screw
M4 screw
M3 screw

90±0.5

φ101±1

90±0.5

Panel cut
(Front view)

2-φ7
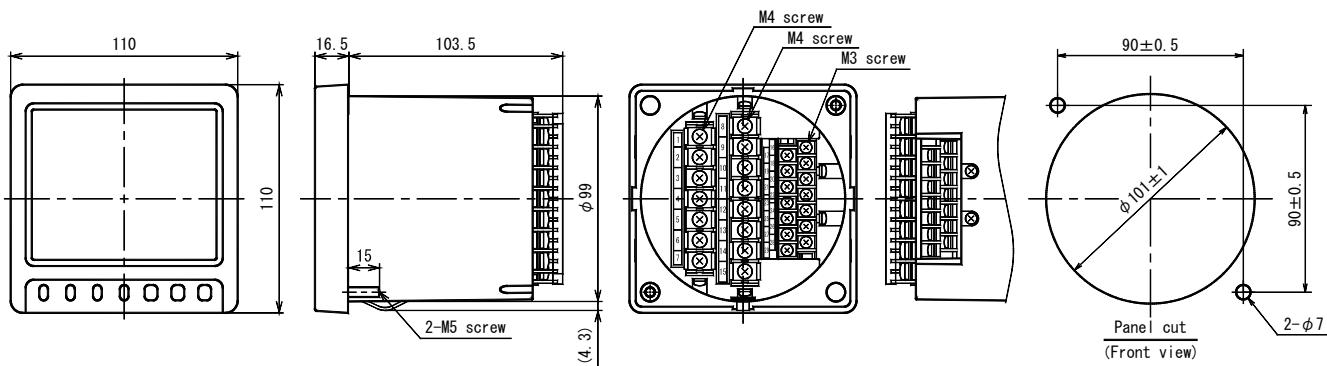
## 5 Installation instructions

(1) Unit is put in a cut hole of a panel from the front.
    Its body is inserted until it exceeds retaining
    stopper of the lower base.

(2) Please fix the unit in place with attached
    M5 flange nut with tightening torque of
    2.0 to 2.5N·m.

(1)                    (2)



Retaining stopper
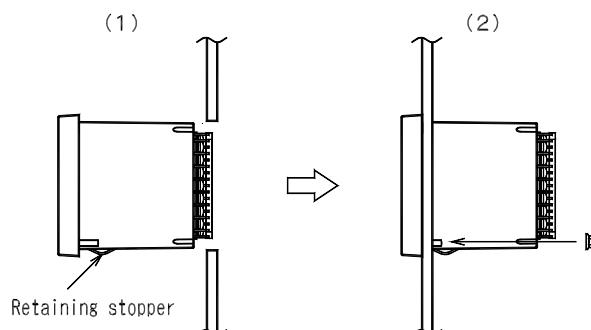
## 6 Connection

Remove the terminal cover and connect correctly according to the connection diagram.
After wiring, attach the terminal cover.



(±)(~)

Input

BI1 (+)
BI2 (+)
BI3 (+)
BI4 (+)
BI5 (+)
BI6 (+)
BI7 (+)
BI8 (+)
ALARM STOP (+)
LAMP RESET (+)
BI COM (−)

Aux. supply
(±)(~)

DA
DB
DG
Ter.(2)
SLD
FG (3)

(1)
Communication output
CC-Link

BL
BZ

Alarm output
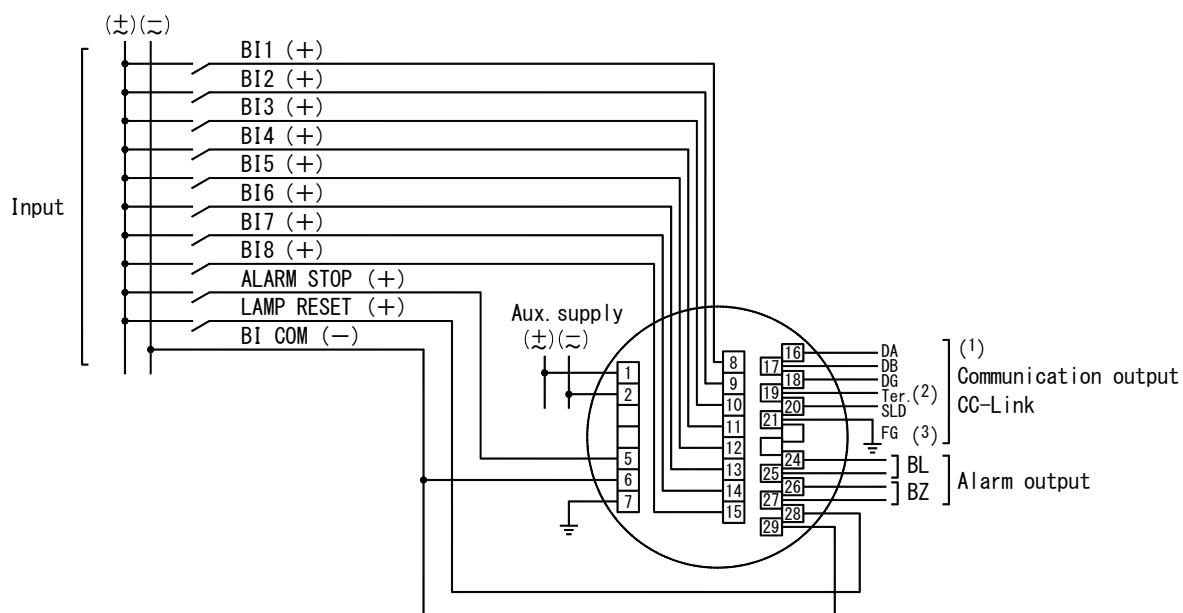
Note(1) Option.
Note(2) By shorting number 17 (DB) and number 19 (Ter.), termination resistor of 110Ω is internally connected.
       Please use it only for the equipment which becomes terminated in connection form.
Note(3) FG is equivalent to functional ground, so dedicated ground or common ground is recommended.
       SLD and FG are connected internally.

# 7 Operation

This product can switch to each mode (monitoring mode, setting mode, test mode) by switch operation.
You can also operate while checking the OLED display.
For the operation method in each mode, please refer to section 8 to 10.
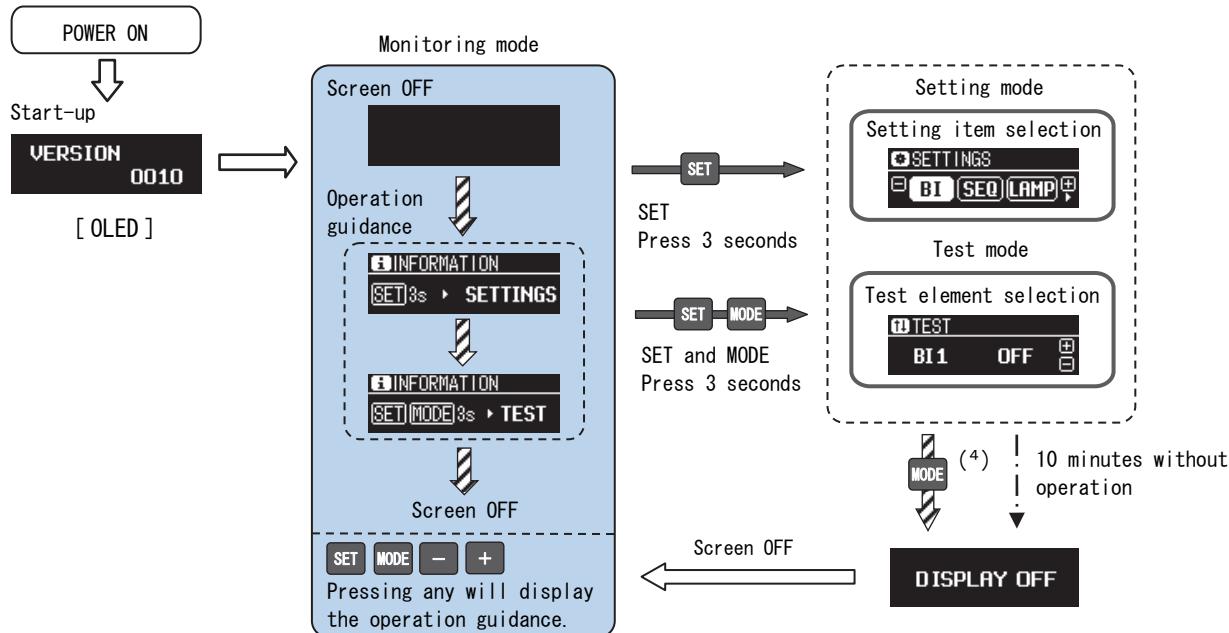


Note(4) From any screen, press MODE for 3 seconds or more to return to monitoring mode.

## 8 Monitoring mode

## 8.1 Display (LED)

Displayed according to the sequence in Section 8.3.  The lighting color of the LED is as follows.

| Display | Operation mode setting | | |
|---|---|---|---|
| | Warning | Caution | Operation (5) |
| LED lighting color | Red ● | Amber ● | White ●<br>Green ●<br>Blue ●<br>Red ● |
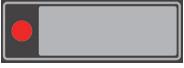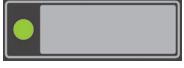
Note(5) The lighting color of the LED can be set individually for each input.

## 8.2 Operation

Operates according to the sequence in Section 8.3.  The operation is as follows.

| Operation (6) | | Operation mode setting | | |
|---|---|---|---|---|
| | | Warning | Caution | Operation |
| LAMP TEST | Switch | The BI1 to BI8 LEDs light up when the switch is pressed, regardless of the input status. | | |
| ALARM STOP | Switch | Stop the alarm state.<br>LED：Flicker stop,　Alarm output：OFF | | Unused |
| | External operation input | | | |
| LAMP RESET | Switch | Resets (turns off) the fault indication (LED) during the manual recovery sequence. | | Unused |
| | External operation input | | | |

Note(6) Operation in setting mode is invalid.

## 8.3 Sequence

### (1) Operation Mode : Warning, Caution

■ Automatic reset [A-14] (7)
Fault input recovers after "ALARM STOP" operation.
The display also returns automatically.
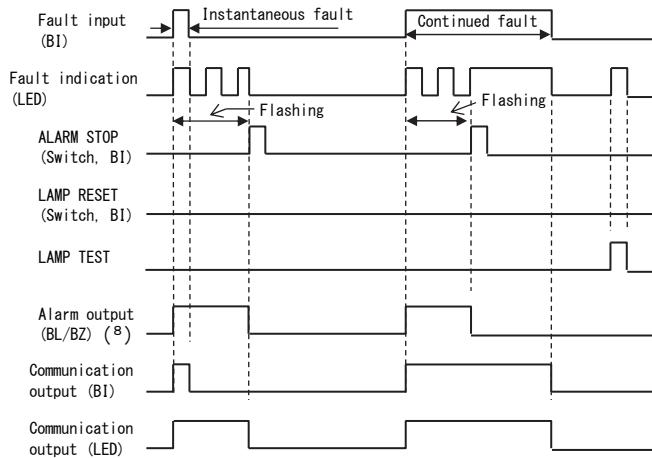
■ Manual reset [M-14] (7)
After recovery from the fault input, the display
recovers by the "LAMP RESET" operation.
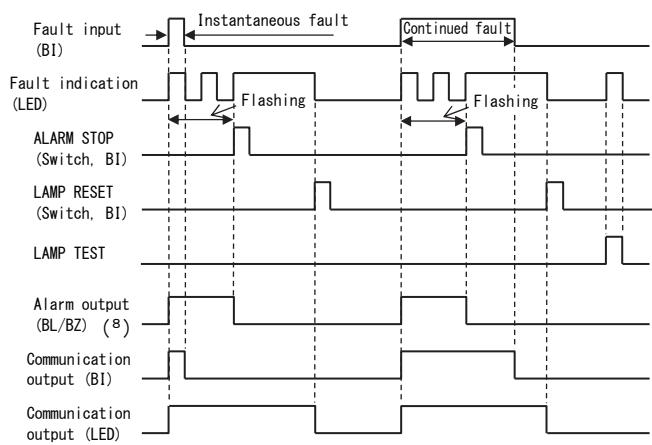


Note(7) Expression by the ISA standard ANSI / ISA-S18.1-1979
Note(8) BL : Warning, BZ : Caution

### (2) Operation mode : Operation
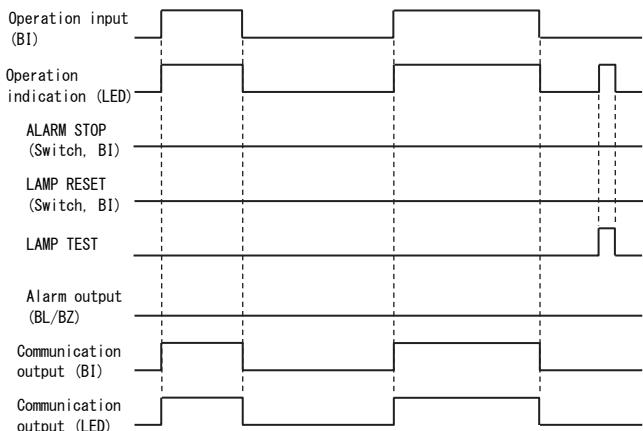
## 9 Setting mode

## 9.1 Setting flow

Monitoring mode
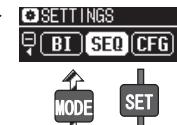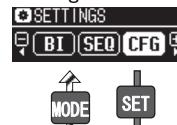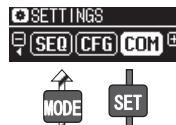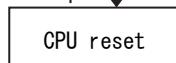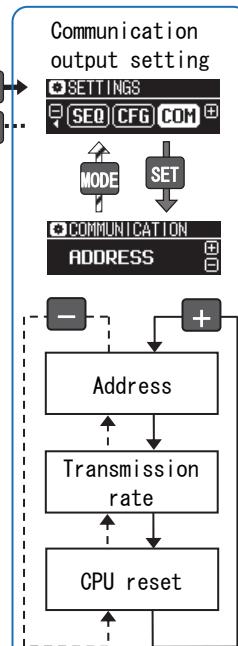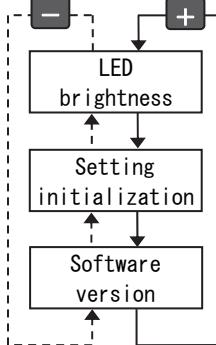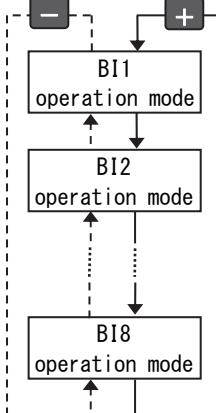
<Note>
When in setting mode, the fault / operation input becomes invalid and all sequence operations are cleared.

## 9.2 Setting method

### (1) Display

Example：BI element selection

■ Setting item

■ Setting element
Select with ＋,－.

Example：BI1 operation mode setting

■ Switch icon
Expresses that it operates by ＋, －.

■ Current setting (ﾚ)

■ Setting value
Select with ＋,－.

### (2) Operation

● Setting item / element selection display
① Select the setting item / element with ＋ －.  Confirm with SET.
② When confirmed, it will shift to the setting display of the selected item / element.

● Setting screen
① Select the setting value with ＋ －.  Confirm with SET.
② Once confirmed, the "mark (ﾚ)" indicating the current set value will be displayed to the left of the changed set value.
③ When there are many setting values (address of communication output), press ＋ － for a longer time to change at high speed.

## 9.3 Setting menu

### (1) BI operation mode setting　BI

Thick frame : Initial setting value

| Item | Setting description | Setting content | | |
|---|---|---|---|---|
| BI operation mode<br><br>[BI1 to BI8] | Set the operation mode of fault / operation input (BI1 to BI8).<br><br>Set the lighting color for the operation indication.<br>Lighting color for warning and caution cannot be set. | 【Element】 ▣BI / BI1 　→SET→　 【Operation mode】 ▣BI1 / ✔MAJOR FAILURE ←MODE←<br><br>The corresponding LED lights up during setting.<br><br><Note> "Operation" (Lighting color : Red) has the same lighting color as "Warning".  Please check the application before setting. | **Setting range (10)** | |
| | | | WARNING (9) | Red |
| | | | CAUTION (9) | Amber |
| | | | OPERATION (WHITE) | White |
| | | | OPERATION (GREEN) | Green |
| | | | OPERATION (BLUE) | Blue |
| | | | OPERATION (RED) | Red |

Note(9)  Initial setting value.  BI1 to BI4 : WARNING, BI5 to BI8 : CAUTION
Note(10)  Unit display is indicated as below.
　　　　WARNING　 : MAJOR FAILURE
　　　　CAUTION　 : MINOR FAILURE
　　　　Operation : STATUS

### (2) Sequence setting　SEQ

Thick frame : Initial setting value

| Item | Setting description | Setting content | | |
|---|---|---|---|---|
| Sequence<br><br>[ SEQUENCE ] | Set the sequence operation of the annunciator. | 【Sequence】 ▣SEQUENCE / ✔AUTO<br>This applies to inputs whose operation mode is set to warning or caution.<br>Also, it does not affect the operation indication. | **Setting range** | |
| | | | Automatic reset | AUTO |
| | | | Manual reset | MANUAL |

### (3) Configuration setting　CFG

Thick frame : Initial setting value

| Item | Setting description | Setting content | | |
|---|---|---|---|---|
| LED brightness<br><br>[ LUMINANCE ] | Set the brightness of the LED. | 【Item】 ▣CONFIG / LUMINANCE 　→SET→　 【Element】 ▣CFG>LUMINANCE / RED 　→SET→　 【Brightness】 ▣CFG>LUMI>RED / ✔3 　←MODE←<br><br>Brightness can be set for each lighting color. | **Setting element** | |
| | | | RED | |
| | | | AMBER | |
| | | | WHITE | |
| | | | GREEN | |
| | | | BLUE | |
| | | | **Setting range** | |
| | | | 5 | Bright |
| | | | 4 | ↑ |
| | | | 3 | |
| | | | 2 | ↓ |
| | | | 1 | Dark |
| Set value initialization<br><br>[ DEFAULT ] | All set values can be initialized. | 【Item】 ▣CONFIG / DEFAULT 　→SET→　 【Initialization】 ▣CFG>DEFAULT / SETTINGS [SET]3s 　→SET→ 3 seconds 　【After initialization】 ▣CFG>DEFAULT / ✔ SETTINGS [SET]3s<br><br>Press SET for 3 seconds to initialize all settings.<br>When initialization is complete, the "ㄴ" mark appears on the left. | | |
| Software version<br><br>[ SOFTWARE ] | Display the software version. | 【Item】 ▣CONFIG / SOFTWARE 　→SET→　 【Version】 ▣CFG>SOFTWARE / VERSION 0010 　Version : 4-digit alphanumeric | | |

(4) Communication output setting  COM (Communication output option only)

Thick frame：Initial setting value

| Item | Setting description | Setting content | | |
|---|---|---|---|---|
| Address<br><br>〔ADDRESS〕 | Set the communication address. | 【Item】<br>● COMMUNICATION<br>ADDRESS ⊞⊟　SET→　【Address】<br>● COM›ADDRESS<br>✓ 1 ⊞⊟　←MODE | | Setting range<br>1<br>...<br>64 |
| Transmission rate<br><br>〔BIT RATE〕 | Set the transmission speed of communication. | 【Item】<br>● COMMUNICATION<br>BIT RATE ⊞⊟　SET→　【Transmission rate】<br>● COM›BIT RATE<br>✓ 156 kbps ⊞⊟　←MODE | | Setting range<br>156kbps<br>625kbps<br>2.5Mbps<br>5Mbps<br>10Mbps |
| CPU reset<br><br>〔CPU RESET〕 | The equipment can be reset while auxiliary power is applied, such as during recovery from the communication stop state. | 【Item】<br>● COMMUNICATION<br>CPU RESET ⊞⊟　SET→　【Reset】<br>● COM›CPU RESET<br>RESET SET5s　←MODE | Press SET for 5 seconds to reset the device.<br>(It will be in monitoring mode after reset) | |

# 10 Test mode

## 10.1 Test flow

Monitoring mode　　SET-MODE→　Test mode
Press 3 seconds　　⊞ TEST
←MODE　　　　　　BI 1　OFF ⊞⊟
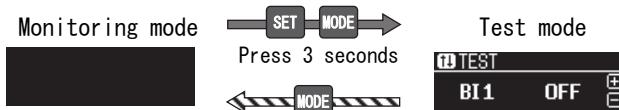
<Note> When in test mode, the fault / operation input becomes invalid and all sequence operations are cleared.

## 10.2 Test method

The sequence operation can be checked without applying input to the fault / operation input (BI1 to BI8).

| Test item | Test content |
|---|---|
| Sequence test | ・Select the fault / operation input (BI1 to BI8) to be tested with ⊞ or ⊟.<br>・Press SET to ON the selected BI, and press SET again to OFF the BI.<br>　⊞ TEST　　　　SET　　⊞ TEST<br>　BI 1　OFF ⊞⊟ ←→ BI 1　ON ⊞⊟<br>・After ON / OFF of operation, it operates according to the sequence set for each input (refer to section 8.3).　LED, switch, external operation input, alarm output, communication output can be checked. |

# 11 Specification

## 11.1 Rating

| Item | | Specification |
|---|---|---|
| Input | | Fault / operation input (BI) : 8 points, ALARM STOP : 1 point, LAMP RESET : 1 point<br>Input pulse width : More than 50ms.　Negative common |
| Input range and input current | | The input rating is the same as the auxiliary power supply.<br>(1) 85 to 127V AC　Approx. 5mA (110V AC)　(Rated voltage　100/110V AC)<br>(2) 80 to 143V DC　Approx. 5mA (110V DC)　(Rated voltage　100/110V DC) |
| Auxiliary supply | Power supply range and consumption VA | (1) 85 to 127V AC　4.5VA　(Rated voltage　100/110V AC)<br>(2) 80 to 143V DC　3W　(Rated voltage　100/110V DC) |
| | Inrush current (Time constant) | Rated voltage 110V AC　Less than 1.1A (Approx. 14ms)<br>Rated voltage 110V DC　Less than 0.8A (Approx. 14ms) |

## 11.2 Detailed specifications

| Item | | Specification |
|---|---|---|
| Display | LED | Warning : Red,　Caution : Amber,　Operation : White, Green, Blue, Red<br>Total 8 points,　Can be set for each input. |
| | OLED | Display guidance on settings and tests. |
| Alarm output | Contact configuration | BL : Warning　BZ : Caution　Normally-open contact (a contact) 2 points |
| | Contact capacity | 125V AC　8A, 125V DC　0.3A (Resistance load)<br>125V AC　5A, 125V DC　0.1A (Inductive load) |
| | Response time | Less than 100ms |
| Communication output (Option) | Protocol | CC-Link Ver.1.10 |
| | Transmission method | Broadcast polling method |
| | Synchronous method | Frame synchronization method |
| | Transmission rate | 156kbps / 625kbps / 2.5Mbps / 5Mbps / 10Mbps |
| | Encoding method | NRZI |
| | Transmission path format | Bus format　(compliance standards, TIA-485-A) |
| | Transmission format | HDLC compliant |
| | Error control method | CRC $(X^{16} + X^{12} + X^5 + 1)$ |
| | Number of occupied stations | Remote device station.　1 station is occupied. |
| | Remote input / output | RX : 32 points　RY : 32 points |
| | Remote register | RWr : 4 points　RWw : 4 points |
| | Maximum transmission distance | 1200m (156kbps) / 900m (625kbps) / 400m (2.5Mbps) / 160m (5Mbps) / 100m (10Mbps) |
| | Number of connections | ① { (1×a) + (2×b) + (3×c) + (4×d) } ≦ 64 stations<br>　a : Number of units occupied by 1 station<br>　b : Number of units occupied by 2 stations<br>　b : Number of units occupied by 3 stations<br>　d : Number of units occupied by 4 stations<br>② { (16×A) + (54×B) + (88×C) } ≦ 2304<br>　A : Number of connected of remote I/O stations ⋯ MAX. 64 units<br>　B : Remote device station ⋯⋯⋯⋯⋯⋯⋯⋯ Max. 42 units<br>　C : Number of connected of local stations and intelligent device<br>　　stations ⋯⋯⋯ MAX.26 units |
| | Address setting | 1 to 64 |
| | Connection cable | Ver.1.10 compatible CC-Link dedicated cable |
| | Terminating resistor | 110Ω　Internal termination resistor is connected when the terminal is short-circuited |

| Item | Specification・Performance | |
|---|---|---|
| Insulation resistance | Between auxiliary supply, input, alarm output and ground (communication output is grounded). | Above 50MΩ at DC500V. |
| | Between auxiliary supply and input and alarm output. | |
| | Between alarm outputs. | |
| Voltage test (Power frequency withstand voltage) | Between auxiliary supply, input, alarm output and ground (communication output is grounded). | 2210V AC (50/60Hz) 5 seconds |
| | Between auxiliary supply and input and alarm output. | |
| | Between alarm outputs | 1390V AC (50/60Hz) 5 seconds |
| Impulse voltage test (Impulse withstand voltage) | Between auxiliary supply, input, alarm output and ground (communication output is grounded). | 5kV 1.2/50μs |
| | Between auxiliary supply and input, alarm output, communication output. | |
| | Between input and auxiliary supply, alarm output, communication output. | |
| | Between alarm output and auxiliary supply, input, communication output | |
| Damped oscillatory wave immunity test IEC 61000-4-12 | Peak voltage : 2.5kV, frequency : 1MHz ±10%,  Add 3 times for 30 seconds. Malfunction and communication stop must not occur. ・Auxiliary supply (Normal / Common) | |
| Square impulse immunity test B-402 Standards | Add noise (1μs, 100 ns width) repeatedly for 5 minutes. Malfunction and communication stop must not occur. ・Auxiliary supply (Normal / Common)    2.0kV or more ・Input (BI) (Common)            1.5kV or more ・Alarm output (Common)          1.5kV or more ・Communication output (Induction)    1.0kV or more | |
| Radio wave immunity test | ・There should be no malfunction or communication stop when the radio waves of the rated output 5W transceiver (150MHz band, 400MHz band) are contacted and intermittently irradiated. ・There should be no malfunction or communication stop when the radio waves of the mobile phone or wireless LAN (2.4GHz, 5GHz) are contacted and intermittently irradiated. | |
| Electrostatic discharge immunity test IEC 61000-4-2 | Conducted under normal usage conditions. No malfunction or communication stop at air discharge 15kV, contact discharge 8kV. Capacitor charge method. | |
| Vibration | IEC 60068-2-6 : 2007 Frequency range : 10 to 55 Hz,  Single amplitude : 0.15 mm,  Sweep cycle : 10 times | |
| Shock | IEC 60068-2-27 : 2008 Peak acceleration : 500 m/s² | |
| Power outage guarantee | Each set value is data-saved by non-volatilized memory. | |
| Overload capacity | 1.5 times 10 seconds, 1.2 times continuation (AC power supply), 1.3 times continuation (DC power supply) of rated voltage. | |
| Construction | 110×110×103.5mm [W×H×D] , Body diameter : 99mmφ , With terminal cover | |
| Material | Case : ABS (V-0) , Terminal block : PBT , Terminal cover: Polycarbonate | |
| color | Black (Munsell N1.5) | |
| Protection rating | IP40 | |
| Terminal screw | M4×15 , M3×14 | |
| Mass | Approx. 500g | |
| Operating temperature and humidity limits | -10 to 55℃ , 5 to 95% RH (Non condensing) | |
| Storage temperature limits | -25 to 70℃ | |

# 12 Trouble shooting

| Trouble | Probable cause | Treatment method |
|---|---|---|
| LED does not light. | No auxiliary power is applied to terminal 1-2. | Please apply auxiliary power supply. |
| | Fault / operation input is not applied. | If no fault / operation input is applied, the LED will not light. By pressing the LAMP TEST switch, lighting can be confirmed. |
| Even if the LAMP RESET switch is pressed (external operation input is applied), the LED does not turn off. | Fault / operation input is applied. | The LED cannot be turned off when a fault / operation input is applied. |
| OLED display does not light. | Auto display off function (Display off without operation for 10 minutes) | Press any switch (SET MODE + −) to display the operation guidance on the OLED display.。 |
| Alarm output (BL) does not output. | The BI operation mode is "CAUTION" or "OPERATION". | Check the setting. |
| Alarm output (BZ) does not output. | The BI operation mode is "WARNING" or "OPERATION". | Check the setting. |
| Data link error. Communication error. | Communication settings (Address, Bit rate) are not correct. | Check the setting. |
| | Communication cable is disconnected or not connected correctly (polarity, etc.) | Check the communication cable. |
| | Ver.1.10 compatible communication cable is not used | |
| | Incorrect communication procedure. | Check the communication specification. |
| | Communication is stopped. | Please perform the CPU reset. |
| | Termination resistor is not connected. | Make sure that a terminating resistor is connected to the terminating device. |