

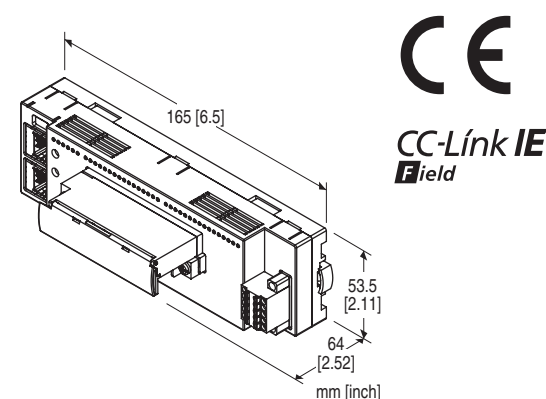
Remote I/O R7I4D Series

CC-Link I/O MODULE

(CC-Link IE Field network, strain gauge input, 2 points, isolated, screw terminal block)

Functions & Features

- 2 points strain gauge input module for CC-Link IE Field



MODEL: R7I4DCIE-LC2-9-R[1]

ORDERING INFORMATION

- Code number: R7I4DCIE-LC2-9-R[1]
Specify a code from below for [1].
(e.g. R7I4DCIE-LC2-9-R/R20/F2K/Q)
- Specify the specification for option code /Q
(e.g. /C01/SET)

I/O TYPE

LC2: Strain gauge input, 2 points

TERMINAL BLOCK

- 9: Tension clamp terminal block for power supply
RJ-45 Modular jack for communication
Screw terminal block for I/O

POWER INPUT

DC Power

R: 24 V DC

(Operational voltage range 24 V $\pm$ 10 %, ripple 10 %p-p max.)

[1] OPTIONS (multiple selections)

Input Range

(be sure to specify)

/R20: -2 - +2 mV/V

/R10: -1 - +1 mV/V

/R05: -0.5 - +0.5 mV/V

CR Filter

(be sure to specify)

/F2K: 2 kHz/2 Hz

/F1: 1 Hz/2 Hz

Other Options

blank: none

/Q: Option other than the above (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to our web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet
(No. ESU-7766-A)

RELATED PRODUCTS

- PC configurator software (model: R7CFG)
- CSP+ file

The configurator software and CSP+ file are downloadable at our web site.

CSP+ file is also downloadable at CC-Link Partner Association's web site.

For connecting to PC, use commercially available Mini-B type USB cable. (provided by user)

GENERAL SPECIFICATIONS

Connection

CC-Link IE Field: RJ-45 modular jack

Power: Tension clamp terminal block

I/O: M3 separable screw terminal (torque 0.5 N·m)

Solderless terminal: Refer to the drawing at the end of the section.

Recommended manufacturer: Japan Solderless Terminal MFG.Co.Ltd, Nichifu Co.,Ltd

Applicable wire size: 0.25 to 1.65 mm² (AWG 22 to 16)

Screw terminal: Nickel-plated steel

Housing material: Flame-resistant resin (gray)

Isolation: Input 0 or monitor output 0 to input 1 or monitor output 1 to CC-Link IE Field or FE to power

Zero adjustments: Configurable via R7CFG

Span adjustments: Configurable via R7CFG

Number of times of averaging: Configurable via R7CFG

Load coefficient: Configurable via R7CFG

Excitation Voltage: Configurable via R7CFG

Lowpass filter: Configurable via R7CFG

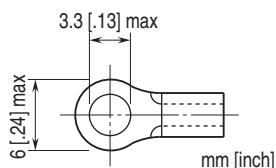
Monitor output: Configurable via R7CFG

Status indicator LEDs: PWR, RUN, RD, SD, D LINK, ERR
(Refer to the instruction manual for details)

Input status indicator LEDs: A.ZERO, ZERO, SPAN, MODE, RESET, UNDER, 0-100, OVER

(Refer to the instruction manual for details)

■Recommended solderless terminal



CC-Link IE Field COMMUNICATION

Protocol: IEEE 802.3

Transmission type: 1000BASE-T

Communication speed: 1 Gbps

Network cable: Cable conformed to CC-Link IE Field

Double shielded twist pair cable (CAT5e)

RJ-45 connector

Network topology: Line, star and ring

Max. number of stations: 120 (Total slave stations)

(Number of max. connectable slaves may vary depending on the master module. Refer to the instruction manual of the master module)

Max. station-to-station distance: 100 m

Station type: Remote device station

Link device: RX/RX 16 points, RWw/RWr 16 points

NetWork No.: 1 to 239 (factory default: 1)

Synchronous communication: Available

INPUT SPECIFICATIONS

■Strain Gauge Input:

• Strain Gauge

Input range:

Option code /R20

-2 – +2 mV/V (at 5 V excitation)

-4 – +4 mV/V (at 2.5 V excitation)

Option code /R10

-1 – +1 mV/V (at 5 V excitation)

-2 – +2 mV/V (at 2.5 V excitation)

Option code /R05

-0.5 – +0.5 mV/V (at 5 V excitation)

-1 – +1 mV/V (at 2.5 V excitation)

Max. Input range:

Option code /R20

-3 – +3 mV/V (at 5 V excitation)

-6 – +6 mV/V (at 2.5 V excitation)

Option code /R10

-1.5 – +1.5 mV/V (at 5 V excitation)

-3 – +3 mV/V (at 2.5 V excitation)

Option code /R05

-0.75 – +0.75 mV/V (at 5 V excitation)

-1.5 – +1.5 mV/V (at 2.5 V excitation)

Zero adjustment:

Option code /R20

-1 – +1 mV/V (at 5 V excitation)

-2 – +2 mV/V (at 2.5 V excitation)

Option code /R10

-0.5 – +0.5 mV/V (at 5 V excitation)

-1 – +1 mV/V (at 2.5 V excitation)

Option code /R05

-0.25 – +0.25 mV/V (at 5 V excitation)

-0.5 – +0.5 mV/V (at 2.5 V excitation)

Lowpass filter:

Approx. 2 kHz or approx. 2 Hz (option code /F2K)

Approx. 1 Hz or approx. 2 Hz (option code /F1)

Conversion rate: min. 2000 samples/sec.

• **Excitation:** 5 V $\pm$ 10% or 2.5 V $\pm$ 10%

(Input range doubled in the case of 2.5 V excitation)

Maximum current: max. 60 mA (Up to 4 strain gauges of 350 Ω can be connected in parallel-adding connection at 5 V excitation)

max. 100 mA (at 2.5 V excitation)

OUTPUT SPECIFICATIONS

Output range: 0 – 10 V DC (for input 0 – 100 %)

Load resistance: $\geq$ 100 k Ω

Operational range: -115 – +115 %

INSTALLATION

Current consumption

• DC at 24 V DC: $\leq$ 170 mA

Operating temperature: -10 to +55°C (14 to 131°F)

Storage temperature: -20 to +65°C (-4 to +149°F)

Operating humidity: 30 to 90 %RH (non-condensing)

Atmosphere: No corrosive gas or heavy dust

Mounting: Surface or DIN rail (35 mm rail)

Weight: 220 g (0.49 lb)

PERFORMANCE

Accuracy:

Option code except /R05

$\pm$ 0.04 % (Averaging 128 samples or more)

$\pm$ 0.05 % (Averaging 64 samples)

$\pm$ 0.10 % (Averaging 8, 16, 32 samples)

$\pm$ 0.15 % (Averaging 4 samples)

$\pm$ 0.20 % (Averaging 2 samples)

Option code /R05

$\pm$ 0.05 % (Averaging 512 samples or more)

$\pm$ 0.10 % (Averaging 64, 128, 256 samples)

$\pm$ 0.20 % (Averaging 16, 32 samples)

$\pm$ 0.30 % (Averaging 2, 4, 8 samples)

Monitor output accuracy: $\pm$ 0.1 %

Converted data range:

Input 0 / input 1: 0 – 10000 of the range from zero to span

Total input data: Sum of input 0 and input 1

Temperature coefficient:

Strain gauge input: $\pm 0.015\text{ }^{\circ}\text{C}$ ($\pm 0.008\text{ }^{\circ}\text{F}$)

Monitor output: $\pm 0.015\text{ }^{\circ}\text{C}$ ($\pm 0.008\text{ }^{\circ}\text{F}$)

Input delay time:

Lowpass filter 2 kHz max. 20 msec. (0 - 90 %)

Lowpass filter 2 Hz max. 200 msec. (0 - 90 %)

Lowpass filter 1 Hz max. 400 msec. (0 - 90 %)

Output delay time: ≤ 250 msec. (0 - 90 %)

Resolution: 1/10000

Insulation resistance: $\geq 100\text{ M}\Omega$ with 500 V DC

Isolation: 1500 V AC @ 1 minute

(input 0 or monitor output 0 to input 1 or monitor output 1 to CC-Link IE Field or FE to power)

STANDARDS & APPROVALS

EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

PC CONFIGURATOR

The following parameters can be set with using PC

Configurator Software (model: R7CFG)

Refer to the users manual for the R7CFG for detailed operation of the software program.

■ CHANNEL INDIVIDUAL SETTING

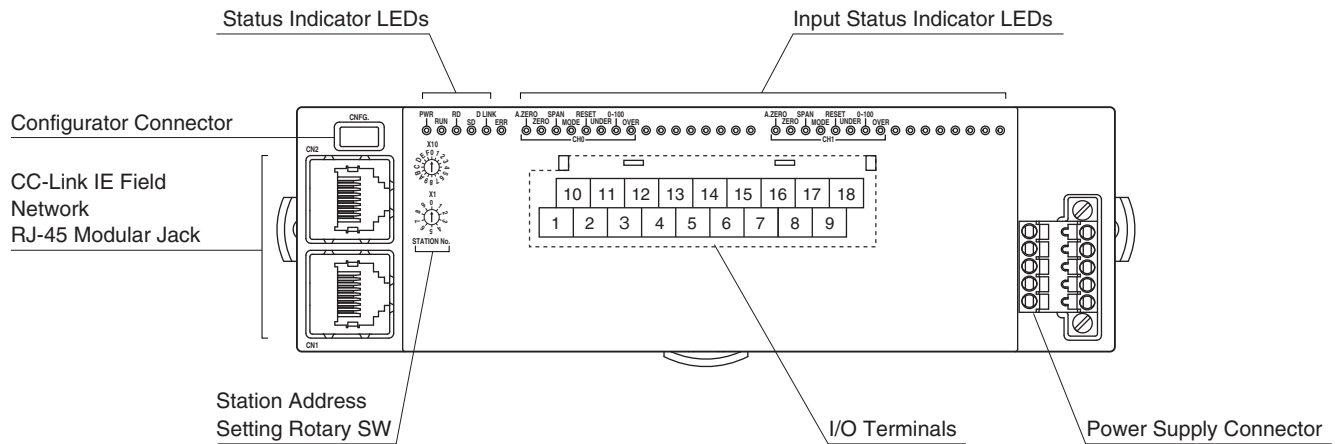
PARAMETER	SETTING RANGE	DEFAULT SETTING
Zero adjustment	-50 to +50%	-
Span adjustment	10% to full scale	full scale
Auto zero	-	-
Reset offset	-	-
Auto scale	0 to 32,000	-
Bias	-320.00 to +320.00 (%)	0.00 (%)
Gain	-3.2000 to +3.2000	1.0000
Zero scale	-32,000 to +32,000	0
Full scale	-32,000 to +32,000	10,000
Load ratio	10.00 to 100.00 (%)	100.00 (%)
Moving average	2, 4, 8, 16, 32, 64, 128, 256, 512, 1024	64
Monitor output	-115.00 to +115.00 (%)	-
Output gain adjustment	-3.2000 to +3.2000	1.0000

■ CHANNEL BATCH SETTING

PARAMETER	SETTING RANGE	DEFAULT SETTING
Excitation	5V, 2.5V	5V
Lowpass filter	2Hz, 2kHz (1Hz)*	2kHz (1Hz)*

*. Values in () are for the option code: /F1.

EXTERNAL VIEW



TERMINAL ASSIGNMENTS

I/O TERMINAL ASSIGNMENT

10	11	12	13	14	15	16	17	18
NC	+EXC0	+IN0	NC	V0	+EXC1	+IN1	NC	V1
1	2	3	4	5	6	7	8	9
NC	-EXC0	-IN0	SLD0	C0	-EXC1	-IN1	SLD1	C1

NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	NC	No connection	10	NC	No connection
2	-EXC0	Excitation 0-	11	+EXC0	Excitation 0+
3	-IN0	Input 0-	12	-IN0	Input 0+
4	SLD0	Shield 0	13	NC	No connection
5	C0	Monitor output 0-	14	V0	Monitor output 0+
6	-EXC1	Excitation 1-	15	+EXC1	Excitation 1+
7	-IN1	Input 1-	16	+IN1	Input 1+
8	SLD1	Shield 1	17	NC	No connection
9	C1	Monitor output 1-	18	V1	Monitor output 1+

POWER SUPPLY

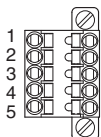
Cable connector: TFMC1,5 / 5-STF-3,5

(Phoenix Contact) (included in the package)

Applicable wire size: 0.2 – 1.5 mm²; stripped length 10 mm

Recommended solderless terminal

- AI0,25–10YE 0.25 mm² (Phoenix Contact)
- AI0,34–10TQ 0.34 mm² (Phoenix Contact)
- AI0,5–10WH 0.5 mm² (Phoenix Contact)
- AI0,75–10GY 0.75 mm² (Phoenix Contact)
- A1–10 1.0 mm² (Phoenix Contact)
- A1,5–10 1.5 mm² (Phoenix Contact)



- | | |
|---------|------------------|
| 1. PWR+ | Power Supply |
| 2. PWR- | Power Supply |
| 3. FE | Functional earth |
| 4. NC | Unused |
| 5. NC | Unused |

Note: The numbers marked on the connector have no relationship to the pin number of the unit.
Wire according to the instruction manual of the unit.

DATA CONVERSION**■ I/O RANGE AND DATA CONVERSION (FACTORY DEFAULT SETTING)**

Analog input data is converted into digital representations of -100 – +100% proportional to each scaled range.

The converted % values are multiplied by 100 and expressed in 16 bits.

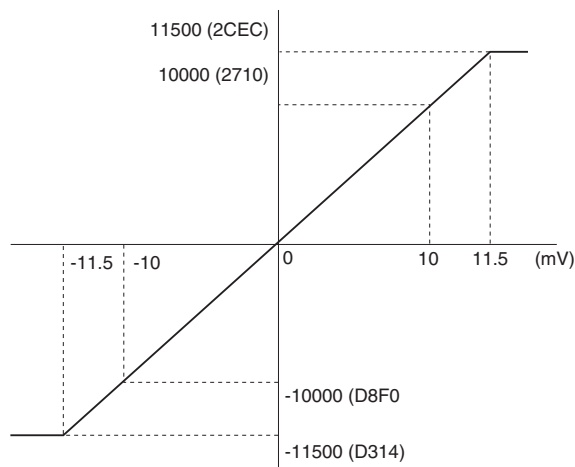
Overrange input is possible from -115 to +115% of the nominal range.

When the signal exceeds the limit, the data is fixed at -115% or +115%.

Minus value is converted into negative values, represented in 2's complements.

• Input Range 0 – 10 mV DC (± 2 mV/V, 5 V DC excitation)

Input Value	Input %	Converted Data, Decimal	Converted Data, Hex
≤ -11.5 mV	-115 %	-11500	D314
-10 mV	-100 %	-10000	D8F0
0 mV	0 %	0	0
10 mV	100 %	10000	2710
≥ 11.5 mV	115 %	11500	2CEC



RESPONSE TIME

- Input module

Response time is time from when a step (0 to 100%) input signal is applied to the input module (slave) until when output from its communication CPU reaches 90% of the final value.

LS: Link scan time (CC-Link IE Field communication cycle)

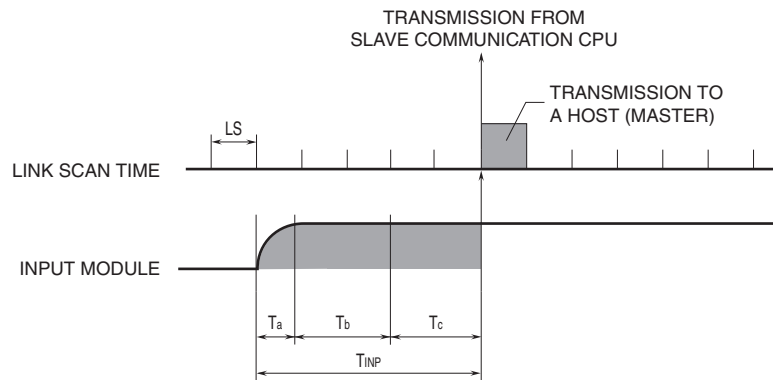
Link scan time depends on the system configuration and settings.

T_{INP} : Input module response time $\leq$ Input Delay time (T_a) + Conversion rate^{*1} (T_b) + input internal processing delay time (T_c) (two link scan time)

*1. Conversion rate x Averaging

E.g.: Averaging (2), input delay time of 20 msec, link scan time of 1 msec.

Input module response time (T_{INP}): Input Delay time (20 msec.) + Conversion rate (0.5 msec.) x Averaging (2) + internal processing delay time (1 msec. x 2) = 23 [msec.]



I/O DATA DESCRIPTIONS

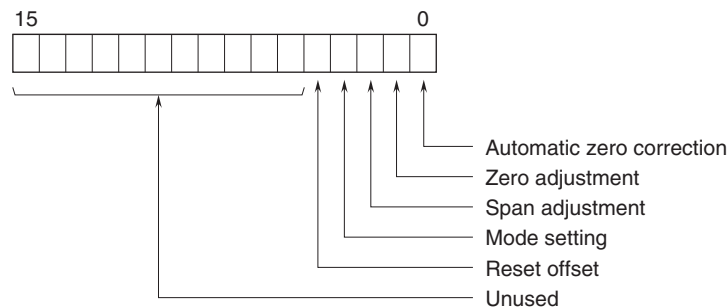
Scaling of analog input module is configurable with the configurator software (model: R7CFG). Refer to the software manual for details.

■ ANALOG I/O UNIT



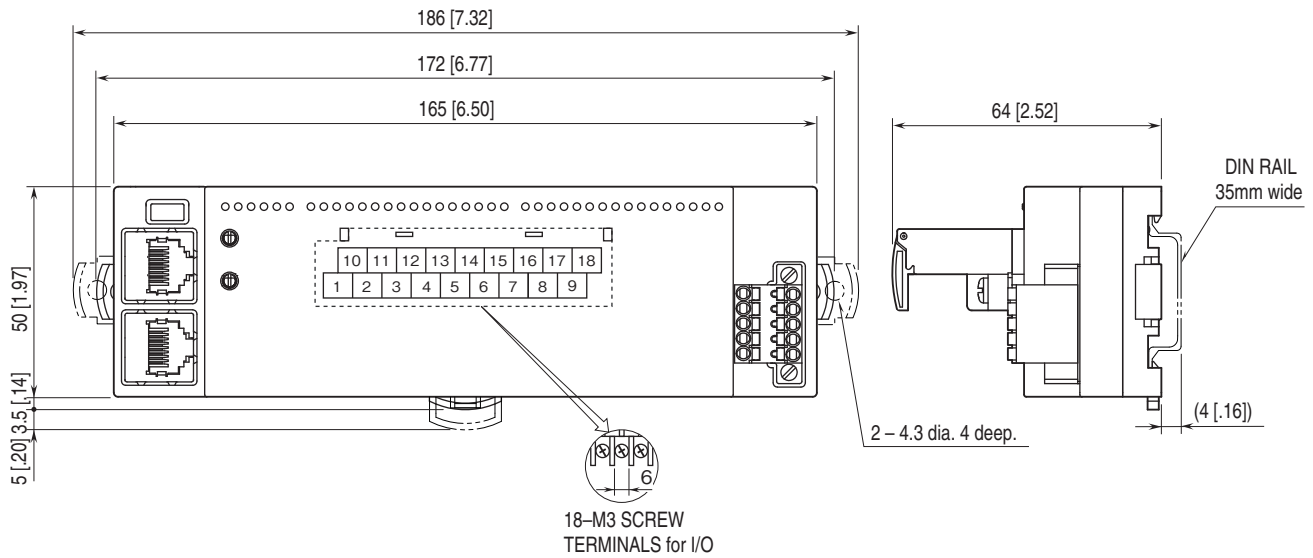
Data is represented in 16-bit binary.
Negative value is represented in 2's complements

■ LC2 SETTING COMMAND DETAILS

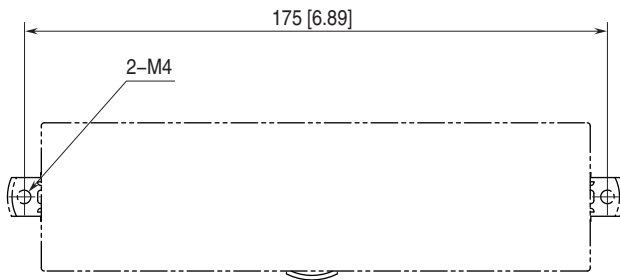


MODEL: R7I4DCIE-LC2-9

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



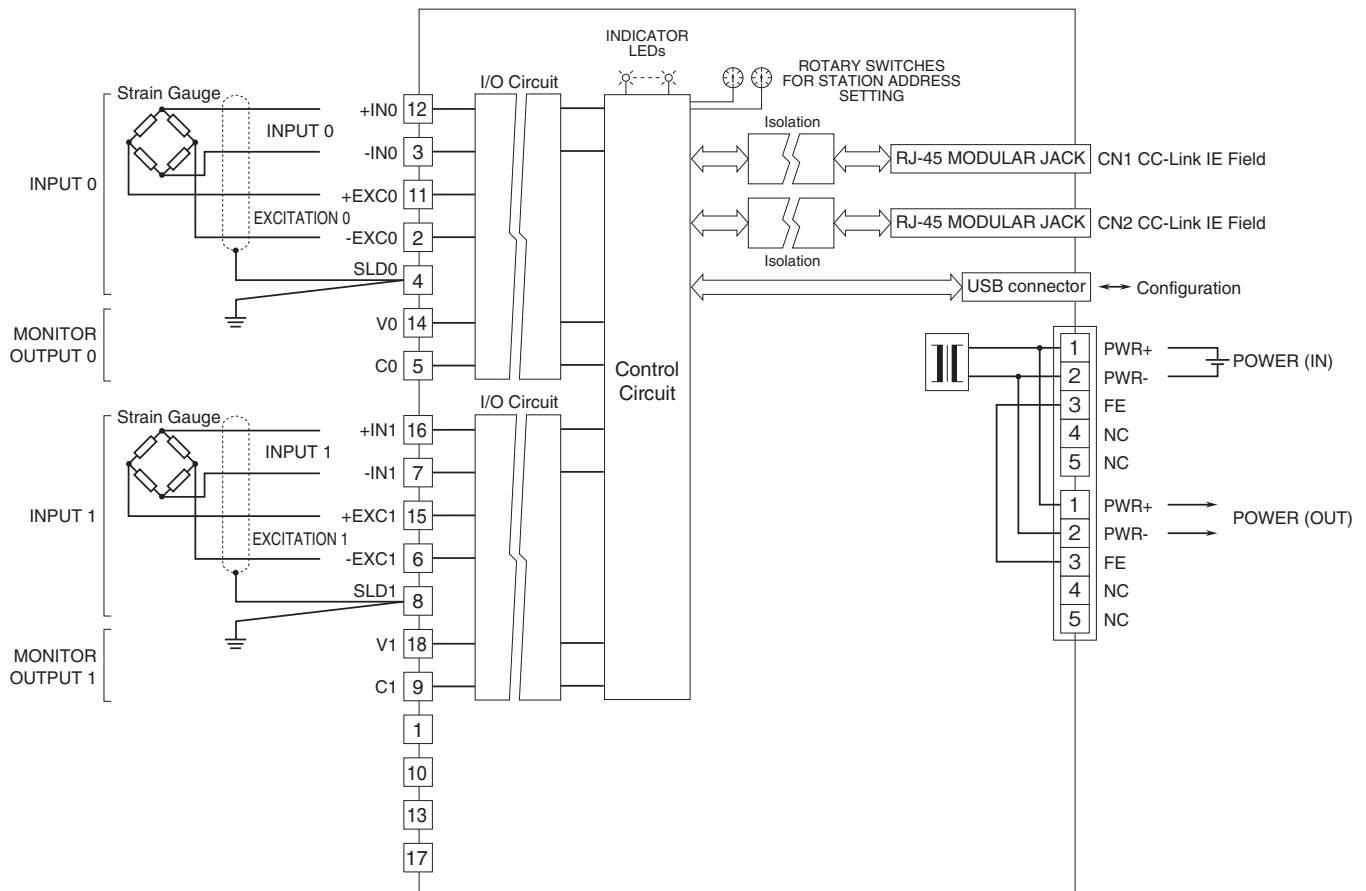
MOUNTING REQUIREMENTS unit: mm [inch]



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

Note: In order to improve EMC performance, bond the FE terminal to ground.

Caution: FE terminal is NOT a protective conductor terminal.



Regarding CN1 and CN2 of RJ-45 connector for CC-Link IE Field network, there is no restriction for connection order.



Specifications are subject to change without notice.