

Remote I/O R7K4D Series

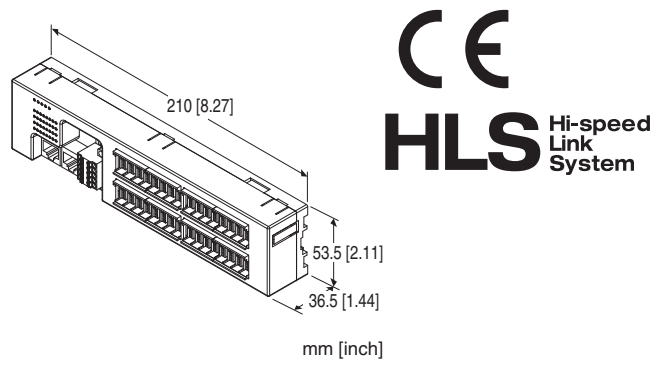
HI-SPEED LINK SYSTEM I/O MODULE

(PNP discrete input & NPN transistor output, 16 points each, e-CON connector, HLS use)

Functions & Features

- 16 points PNP discrete input & 16 points NPN transistor output module for HLS

HLS is the abbreviation for “Hi-speed Link System” of Step Technica Co., Ltd.



MODEL: R7K4DH-1-DAC32A-R[1]

ORDERING INFORMATION

- Code number: R7K4DH-1-DAC32A-R[1]
Specify a code from below for [1].
(e.g. R7K4DH-1-DAC32A-R/H/Q)
- Specify the specification for option code /Q
(e.g. /C01)

TERMINAL BLOCK

- 1: Tension clamp terminal block for power supply
 RJ-45 Modular jack for communication
 e-CON connector for I/O

I/O TYPE

DAC32A: PNP discrete input & NPN transistor output, 16 points each

POWER INPUT

DC Power

R: 24 V DC

(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

[1] OPTIONS (multiple selections)

Communication Mode

blank: Full-duplex

/H: Half-duplex

Other Options

blank: none

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

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

GENERAL SPECIFICATIONS

Connection

HLS: RJ-45 Modular Jack

Power & Sensor excitation: Separable screwless spring terminal

I/O: e-CON connector

Housing material: Flame-resistant resin (gray)

Isolation: Input or output or sensor excitation to HLS or power to FE

Output at the loss of communication:

Output hold (*), Output clear

Selectable with the front DIP SW

(* factory default setting)

Status indicator LED: Power (green) turns on while the power is supplied.

Discrete I/O status indicator LED: Red LED turns on with I/O ON

HLS COMMUNICATION

Communication mode: Full-duplex or half-duplex

Network cable

Shielded cable:

Full-duplex communication:

ZHY262PS and ZHT262PS (Shinko Seisen Industry Co., Ltd.)

Half-duplex communication:

ZHY221PS (Shinko Seisen Industry Co., Ltd.)

Dual shielded cable:

ZHY262PBA (Shinko Seisen Industry Co., Ltd.)

Transmission distance:

12 Mbps: 100 meters (328 ft)

6 Mbps: 200 meters (656 ft)

3 Mbps: 300 meters (984 ft)

(Configurable with DIP SW; factory setting: 12 Mbps)

Terminating resistor: Built-in (Selected with the DIP SW; factory setting: disabled)

Status indicator: Run LED on in normal communication

Station address: Set with rotary switch

(Refer to the instruction manual for details.)

STANDARDS & APPROVALS

EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

INPUT SPECIFICATIONS

Common: Negative common (PNP) per 16 points

Maximum inputs applicable at once: No limit (at 24V DC)

Sensor excitation: 24 V DC $\pm 10\%$; ripple 5 %p-p max.,
 ≤ 2 A (including discrete input load charge); rated current 8 A

ON voltage / current: ≥ 15 V DC (X0 through XF to GND) / ≥ 3.5 mA

OFF voltage / current: ≤ 5 V DC (X0 through XF to GND) / ≤ 1 mA

Input current: ≤ 5.5 mA per point at 24 V DC

Input resistance: Approx. 4.4 k Ω

ON delay: ≤ 0.5 msec.

OFF delay: ≤ 0.5 msec.

OUTPUT SPECIFICATIONS

Common: Negative common (NPN) per 16 points

Maximum outputs applicable at once: No limit (at 24 V DC)

Sensor Excitation: 24 V DC $\pm 10\%$, ripple 5 %p-p max.,
 ≤ 2 A (including discrete output load charge); rated current 8 A

Rated output current: 0.1 A per point, 1.6 A per common

Residual voltage: ≤ 1.2 V

Leakage current: ≤ 0.1 mA

ON delay: ≤ 0.2 msec.

OFF delay: ≤ 0.5 msec.

Overload current protection function: Limits the current value when overcurrent is detected

Overheat protection function: Turns OFF the outputs when overheat is detected

(When driving an inductive load, connect a diode in parallel with the load.)

INSTALLATION

Current consumption

•DC: Approx. 95 mA (rated current 8 A)

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: Approx. 185 g (0.41 lb)

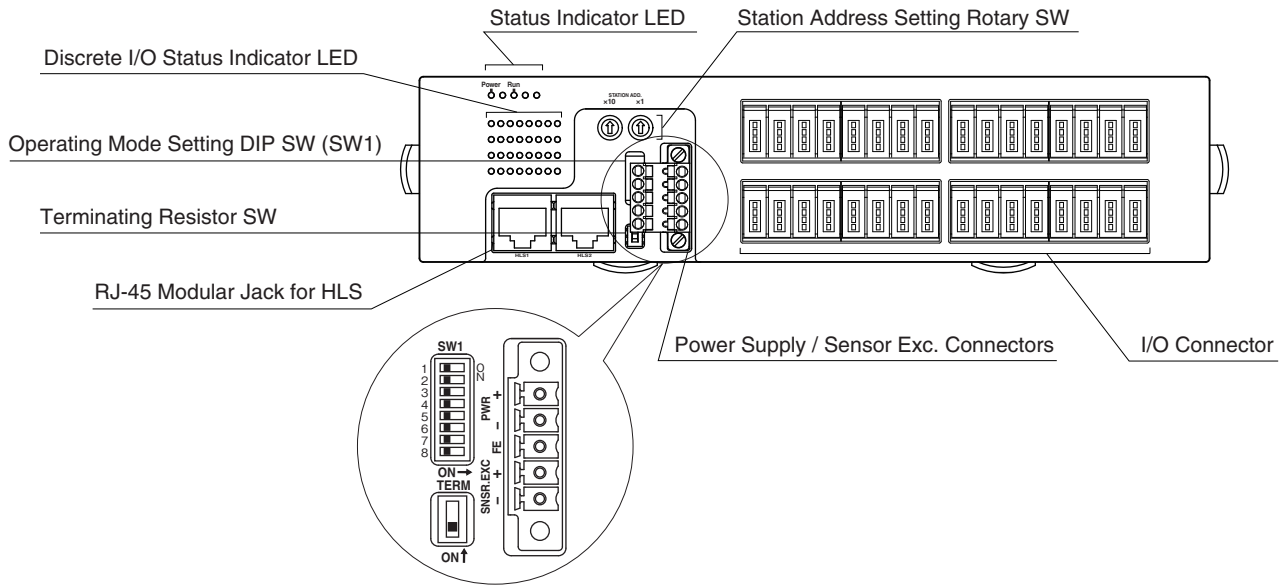
PERFORMANCE

Insulation resistance: ≥ 100 M Ω with 500 V DC

Dielectric strength: 1500 V AC @ 1 minute (input or output or sensor excitation to HLS to power to FE)

MODEL: R7K4DH-1-DAC32A

EXTERNAL VIEW



TERMINAL ASSIGNMENTS

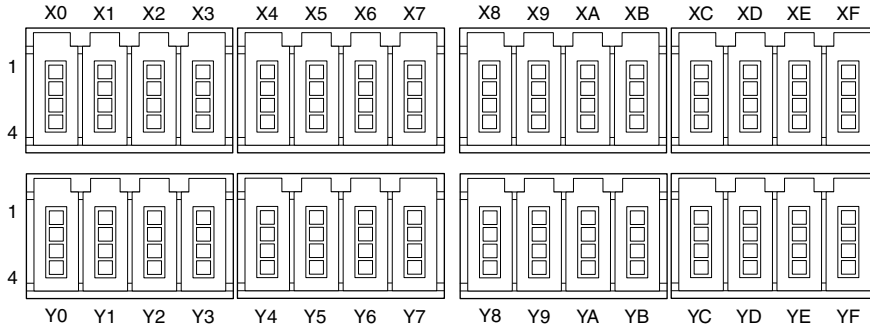
I/O TERMINAL ASSIGNMENT

- e-CON connector

Recommended cable connector: 37104-()-000FL (3M Company)

(The cable connector is not included in the package.)

Specify wire size instead of (); refer to the specifications of the product.)



| PIN No. | ID | FUNCTION | PIN No. | ID | FUNCTION |
|---------|----|-------------|---------|----|-------------|
| X0 | 1 | +24V 24V DC | X8 | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | X0 Input 0 | | 4 | X8 Input 8 |
| X1 | 1 | +24V 24V DC | X9 | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | X1 Input 1 | | 4 | X9 Input 9 |
| X2 | 1 | +24V 24V DC | XA | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | X2 Input 2 | | 4 | XA Input 10 |
| X3 | 1 | +24V 24V DC | XB | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | X3 Input 3 | | 4 | XB Input 11 |
| X4 | 1 | +24V 24V DC | XC | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | X4 Input 4 | | 4 | XC Input 12 |
| X5 | 1 | +24V 24V DC | XD | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | X5 Input 5 | | 4 | XD Input 13 |
| X6 | 1 | +24V 24V DC | XE | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | X6 Input 6 | | 4 | XE Input 14 |
| X7 | 1 | +24V 24V DC | XF | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | X7 Input 7 | | 4 | XF Input 15 |

| PIN No. | ID | FUNCTION | PIN No. | ID | FUNCTION |
|---------|----|-------------|---------|----|--------------|
| Y0 | 1 | +24V 24V DC | Y8 | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | Y0 Output 0 | | 4 | Y8 Output 8 |
| Y1 | 1 | +24V 24V DC | Y9 | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | Y1 Output 1 | | 4 | Y9 Output 9 |
| Y2 | 1 | +24V 24V DC | YA | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | Y2 Output 2 | | 4 | YA Output 10 |
| Y3 | 1 | +24V 24V DC | YB | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | Y3 Output 3 | | 4 | YB Output 11 |
| Y4 | 1 | +24V 24V DC | YC | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | Y4 Output 4 | | 4 | YC Output 12 |
| Y5 | 1 | +24V 24V DC | YD | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | Y5 Output 5 | | 4 | YD Output 13 |
| Y6 | 1 | +24V 24V DC | YE | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | Y6 Output 6 | | 4 | YE Output 14 |
| Y7 | 1 | +24V 24V DC | YF | 1 | +24V 24V DC |
| | 2 | NC Unused | | 2 | NC Unused |
| | 3 | GND 0V | | 3 | GND 0V |
| | 4 | Y7 Output 7 | | 4 | YF Output 15 |

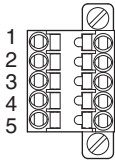
■ POWER SUPPLY, SENSOR EXCITATION

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)



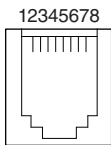
- | | |
|--------------|-------------------|
| 1. PWR+ | Power Supply |
| 2. PWR- | Power Supply |
| 3. FE | Functional earth |
| 4. SNSR.EXC+ | Sensor excitation |
| 5. SNSR.EXC- | Sensor excitation |

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.

■ HLS

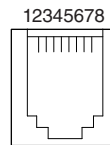
Recommended cable connector: TM21P-88P (Hirose Electric)
(not included in the package)

• Full-duplex communication



- | | |
|---------|----------------------------------|
| 1. NC | Unused |
| 2. NC | Unused |
| 3. TXD+ | Network (slave, transmission +) |
| 4. TXD- | Network (slave, transmission -) |
| 5. RXD+ | Network (master, transmission +) |
| 6. RXD- | Network (master, transmission -) |
| 7. NC | Unused |
| 8. SLD | Shield |

• Half-duplex communication

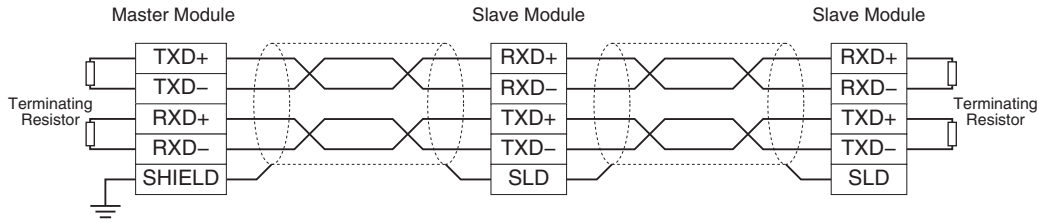


- | | |
|--------|-------------|
| 1. NC | Unused |
| 2. NC | Unused |
| 3. TR+ | Network (+) |
| 4. TR- | Network (-) |
| 5. NC | Unused |
| 6. NC | Unused |
| 7. NC | Unused |
| 8. SLD | Shield |

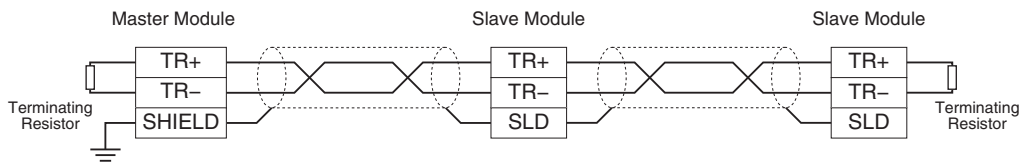
MODEL: R7K4DH-1-DAC32A

■ MASTER CONNECTION

• Full-duplex communication



• Half-duplex communication

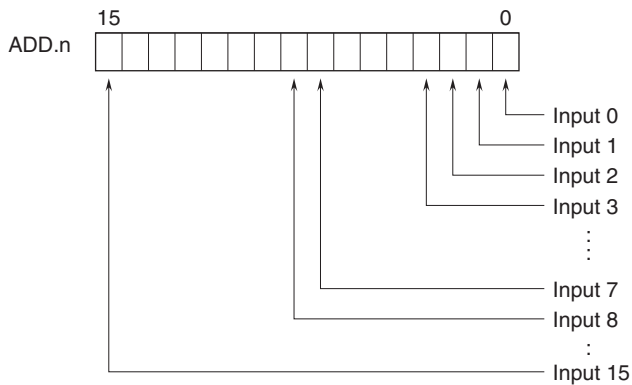


Note: Be sure to turn ON the switch of the terminating resistor located at both ends of the modules.

I/O DATA DESCRIPTIONS

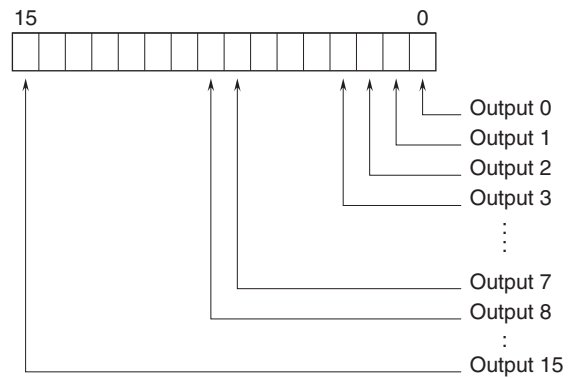
■ DISCRETE I/O MODULE

• Di

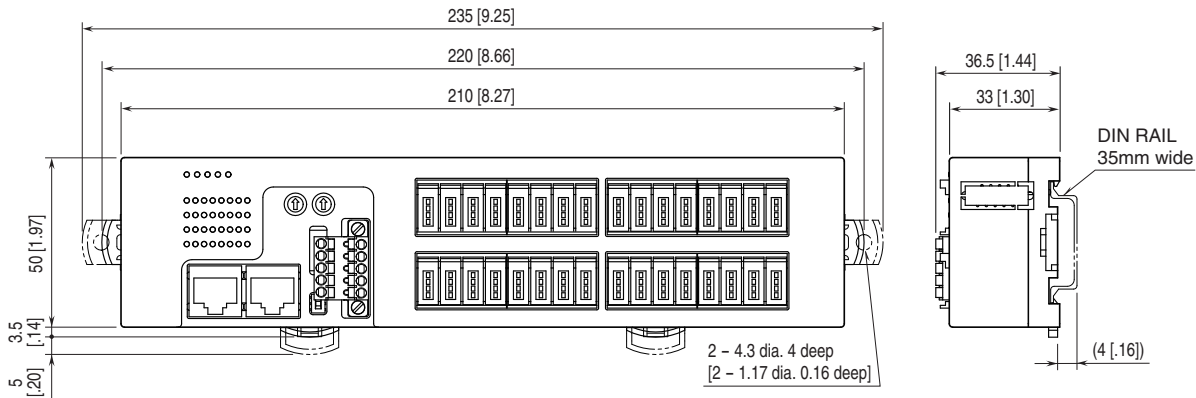


0: OFF
1: ON

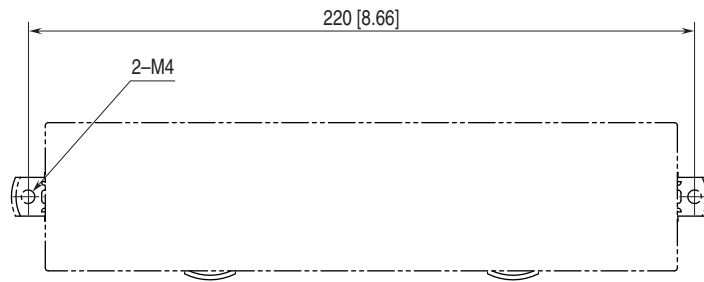
• Do



EXTERNAL DIMENSIONS unit: mm [inch]



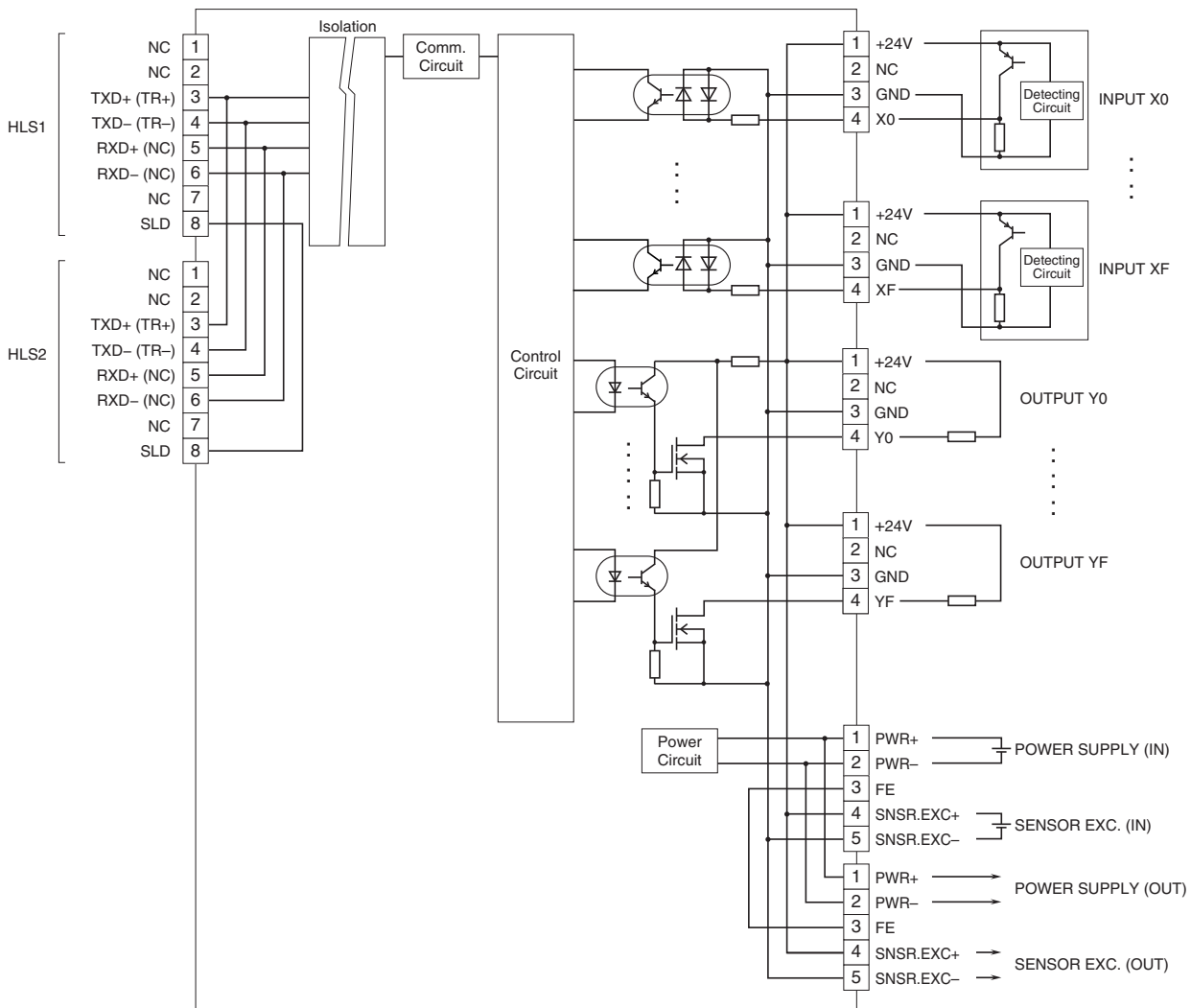
MOUNTING REQUIREMENTS unit: mm [inch]



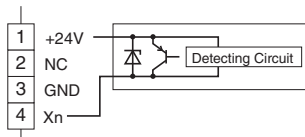
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

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

Caution: FE terminal is NOT a protective conductor terminal.



■ 2-Wire Sensor





Specifications are subject to change without notice.