

Remote I/O R7F4D Series

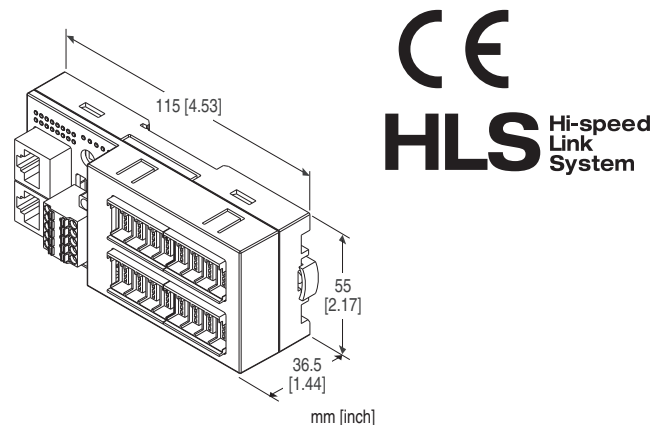
HI-SPEED LINK SYSTEM I/O MODULE

(NPN discrete input & PNP transistor output, 8 points each, e-CON connector)

Functions & Features

- 8 points NPN discrete input & 8 points PNP transistor output module for HLS

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



MODEL: R7F4DH-1-DAC16B-R[1]

ORDERING INFORMATION

- Code number: R7F4DH-1-DAC16B-R[1]
Specify a code from below for [1].
(e.g. R7F4DH-1-DAC16B-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

DAC16B: NPN discrete input &
PNP transistor output, 8 points each

POWER INPUT

DC Power

R: 24 V DC

(Operational voltage range 24 V $\pm$ 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 our 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:

Hold the output (*), Reset the output

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)

Data allocation: 1

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

Status indicator LED: Run LED on in normal communication

Station address: Set with rotary switch
(Refer to the instruction manual for details)

INPUT SPECIFICATIONS

Common: Positive common (NPN) per 8 points
Numbers of input: 8 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 X7 to +24V) /
 ≥ 3.5 mA
OFF voltage / current: ≤ 5 V DC (X0 through X7 to +24V) / $\leq$
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: Positive common (PNP) per 8 points
Number of output: 8 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, 0.8 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. 35 mA (rated current 8 A)
(contact I/O load charge is not included)
Operating temperature: -10 to +55°C (14 to 131°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: 100 g (0.22 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)

STANDARDS & APPROVALS

Refer to the manuals to comply with the standards.

EU conformity:

EMC Directive

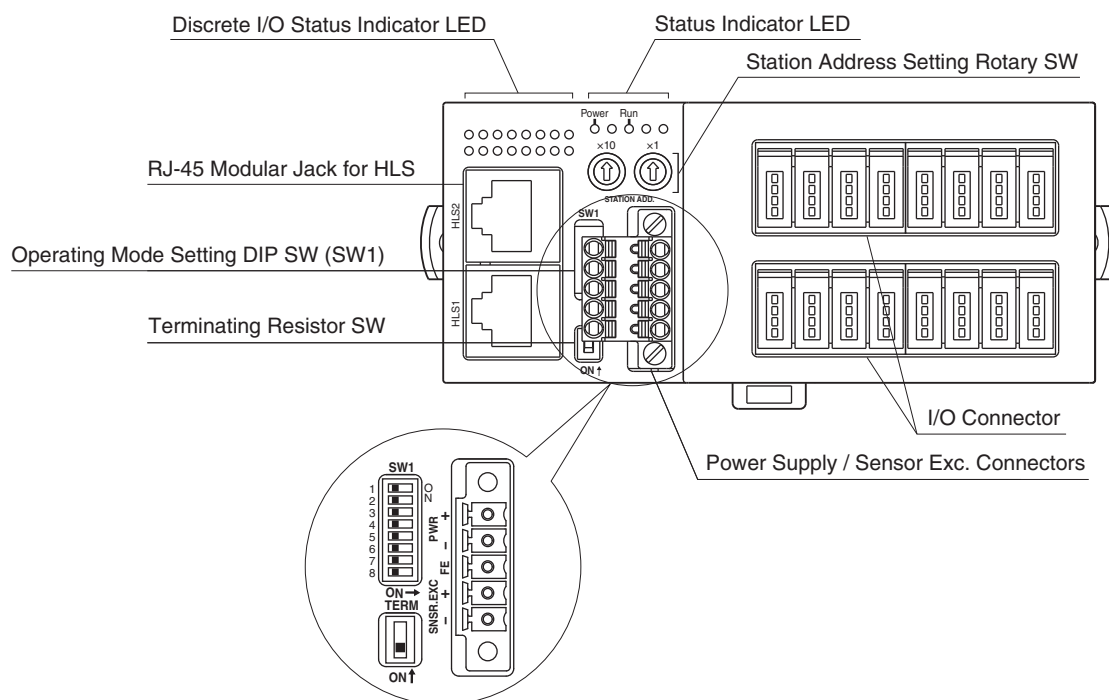
EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

MODEL: R7F4DH-1-DAC16B

EXTERNAL VIEW



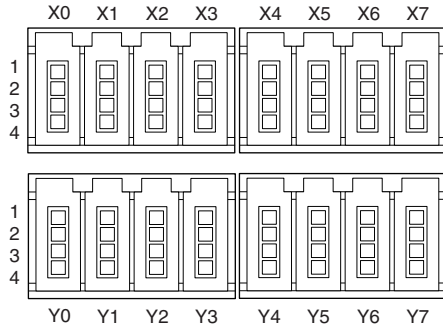
TERMINAL ASSIGNMENTS**■I/O TERMINAL ASSIGNMENT**

- 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)



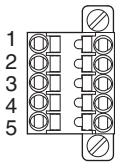
PIN No.	ID	FUNCTION	PIN No.	ID	FUNCTION
X0	1	+24V	Y0	1	+24V
	2	NC		2	NC
	3	GND		3	GND
	4	X0		4	Y0
X1	1	+24V	Y1	1	+24V
	2	NC		2	NC
	3	GND		3	GND
	4	X1		4	Y1
X2	1	+24V	Y2	1	+24V
	2	NC		2	NC
	3	GND		3	GND
	4	X2		4	Y2
X3	1	+24V	Y3	1	+24V
	2	NC		2	NC
	3	GND		3	GND
	4	X3		4	Y3
X4	1	+24V	Y4	1	+24V
	2	NC		2	NC
	3	GND		3	GND
	4	X4		4	Y4
X5	1	+24V	Y5	1	+24V
	2	NC		2	NC
	3	GND		3	GND
	4	X5		4	Y5
X6	1	+24V	Y6	1	+24V
	2	NC		2	NC
	3	GND		3	GND
	4	X6		4	Y6
X7	1	+24V	Y7	1	+24V
	2	NC		2	NC
	3	GND		3	GND
	4	X7		4	Y7

■ 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)



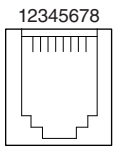
- | | |
|--------------|-------------------|
| 1. PWR+ | Power Supply |
| 2. PWR– | Power Supply |
| 3. FE | Functional earth |
| 4. SNSR.EXC+ | Sensor excitation |
| 5. SNSR.EXC– | Sensor excitation |

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

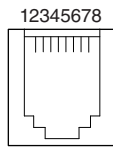
Recommended cable connector: TM21P–88P (Hirose Electric)
(not included in the package)

• 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 |

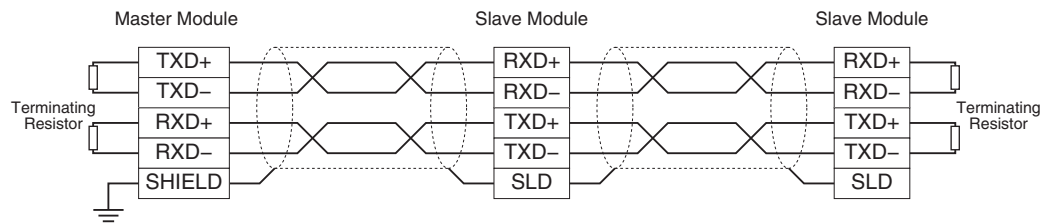
• Half-duplex communication



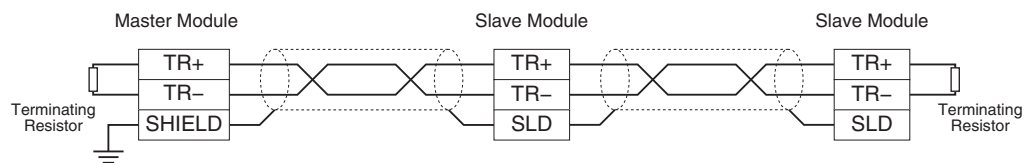
- | | |
|--------|-------------|
| 1. NC | Unused |
| 2. NC | Unused |
| 3. TR+ | Network (+) |
| 4. TR– | Network (–) |
| 5. NC | Unused |
| 6. NC | Unused |
| 7. NC | Unused |
| 8. SLD | Shield |

■ MASTER CONNECTION

• Full-duplex communication



• Half-duplex communication

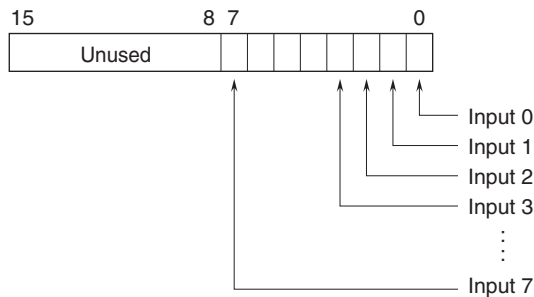


Note: Be sure to turn ON the switch of the terminating resistor located at both ends of the modules.

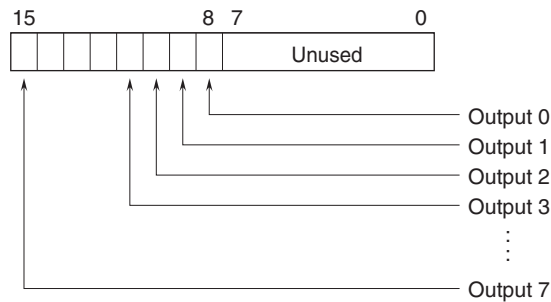
I/O DATA DESCRIPTIONS

■ DISCRETE I/O

• Di



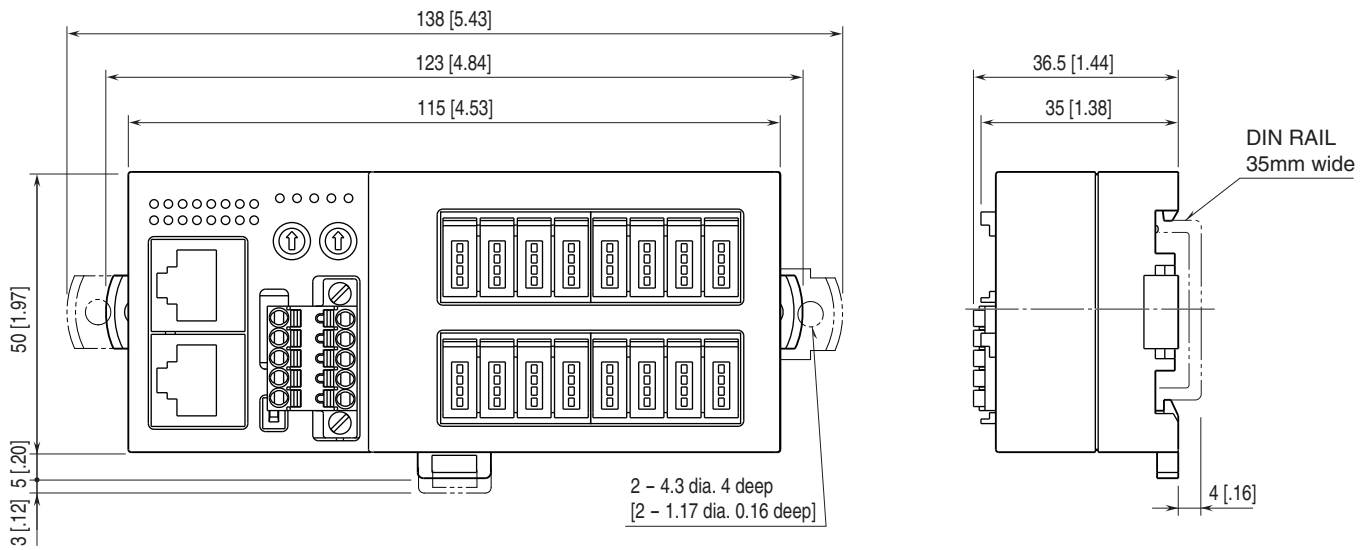
• Do



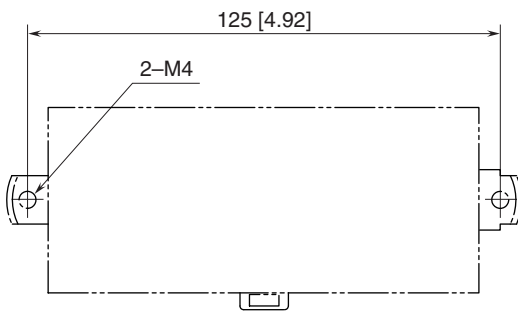
0: OFF
1: ON

MODEL: R7F4DH-1-DAC16B

EXTERNAL DIMENSIONS unit: mm [inch]



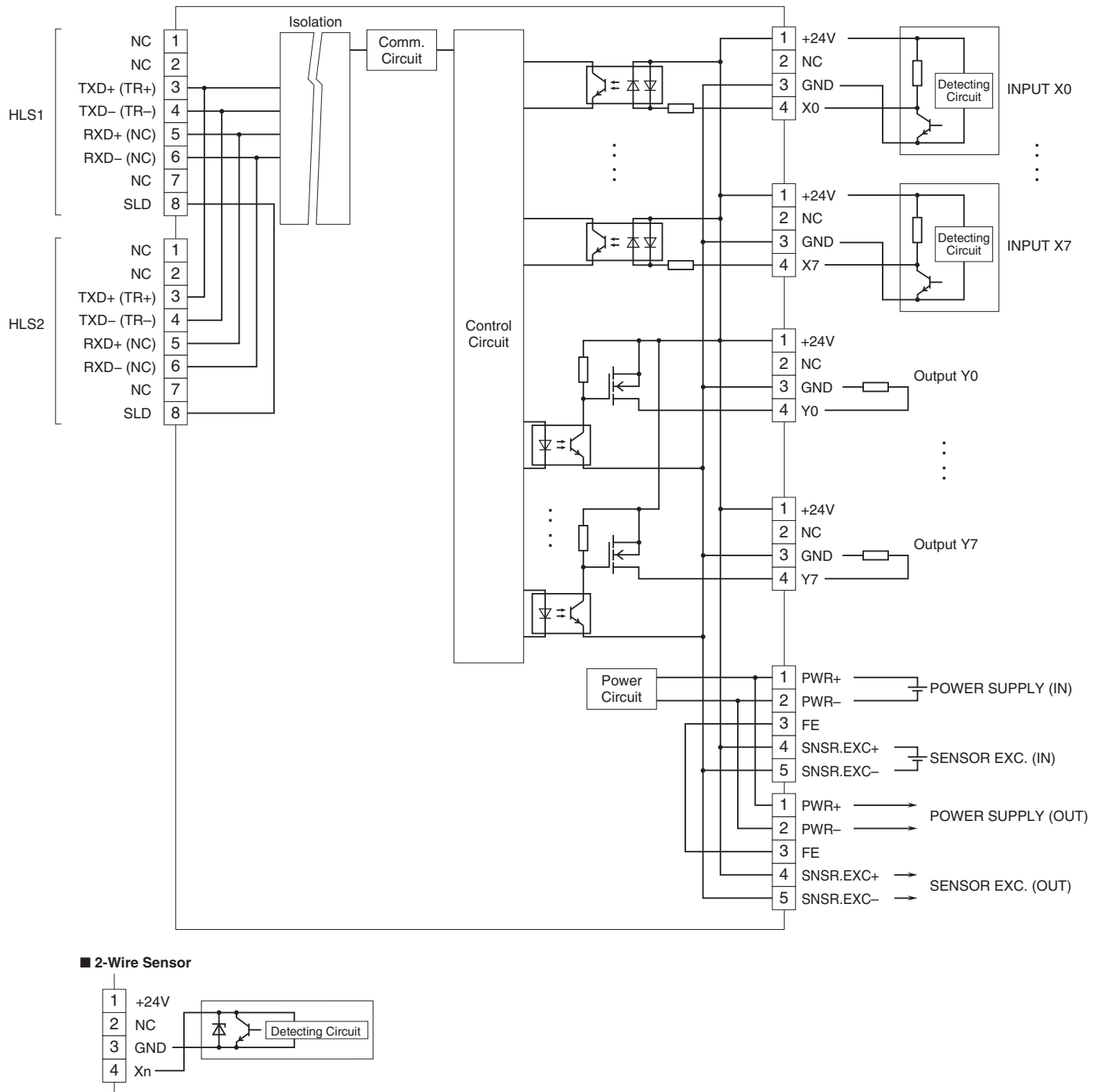
MOUNTING REQUIREMENTS unit: mm [inch]



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.



Specifications are subject to change without notice.