

Remote I/O R7 Series

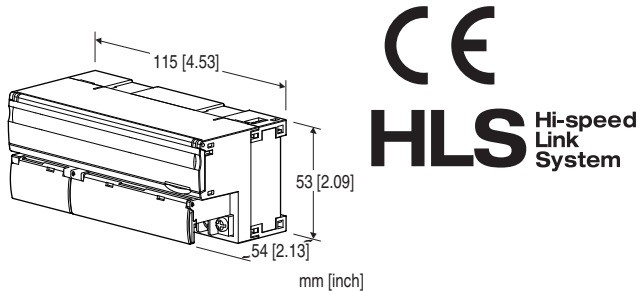
HI-SPEED LINK SYSTEM I/O MODULE

(NPN discrete input & NPN transistor output, 8 points each)

Functions & Features

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

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



MODEL:R7HL-DAC16C-R[1]

ORDERING INFORMATION

- Code number: R7HL-DAC16C-R[1]
Specify a code from below for [1].
(e.g. R7HL-DAC16C-R/H/Q)
- Specify the specification for option code /Q
(e.g. /C01/SET)

I/O TYPE

DAC16C: NPN discrete input &
NPN 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 (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-7812-V)

GENERAL SPECIFICATIONS

Connection: M3 separable screw terminal (torque 0.5 N·m)

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

• Communication cable

Recommended manufacture: J.S.T. Mfg. Co., Ltd.

Applicable wire size: 0.2 to 0.5 mm² (AWG 26 to 22)

• Others

Recommended manufacture: J.S.T. 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: I/O to HLS to power to FG

Output at the loss of communication:

Hold the output (*), Reset the output

Selectable with the front DIP SW

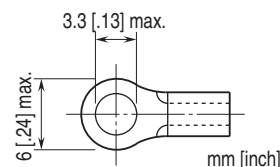
(*) Factory default setting

Status indicator LEDs: PWR, RUN

(Refer to the instruction manual)

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

■Recommended solderless terminal



HLS COMMUNICATION

Communication mode:

Communication mode option code blank: Full-duplex

Communication mode option code /H: half-duplex

Network cable

• Shield cable

Full-duplex communication:

ZHY262PS and ZHT262PS

(Shinko Seisen Industry Co., Ltd.)

Half-duplex communication:

ZHY221PS (Shinko Seisen Industry Co., Ltd.)

• Dual-shield cable:

ZHY262PBA (Shinko Seisen Industry Co., Ltd.)

Transmission distance / Transfer rate:

100 meters (328 ft)/12 Mbps (default),
200 meters (656 ft)/6 Mbps
(Selectable with DIP switch)
Station address: Rotary switch
(Refer to the instruction manual)
Data allocation: 1
Terminating resistor: Built-in (Selected with the DIP SW;
factory setting: disabled)

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

INPUT SPECIFICATIONS

Common: Positive common (NPN) per 8 points
Maximum inputs applicable at once: No limit (at 24 V DC)
Rated input voltage: 24 V DC $\pm 10\%$; ripple 5 %p-p max.
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: Negative common (NPN) per 8 points
Maximum outputs applicable at once: No limit (at 24 V DC)
Rated load voltage: 24 V DC $\pm 10\%$
Rated output current: 0.25 A per point, 2.0 A per common
Residual voltage: ≤ 1.2 V
Leakage current: ≤ 0.1 mA
ON delay: ≤ 0.2 msec.
OFF delay: ≤ 0.5 msec.
(When driving an inductive load, connect a diode in parallel
with the load.)

INSTALLATION

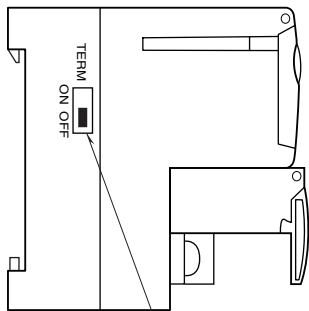
Current consumption
•DC: Approx. 45 mA
Operating temperature: -10 to +55°C (14 to 131°F)
Storage temperature: -20 to +65°C (-4 to +149°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Atmosphere: No corrosive gas or heavy dust
Mounting: DIN rail (35 mm rail)
Weight: 200 g (0.44 lb)

PERFORMANCE

Insulation resistance: ≥ 100 M Ω with 500 V DC
Dielectric strength: 1500 V AC @ 1 minute (I/O to HLS to
power input to FG)

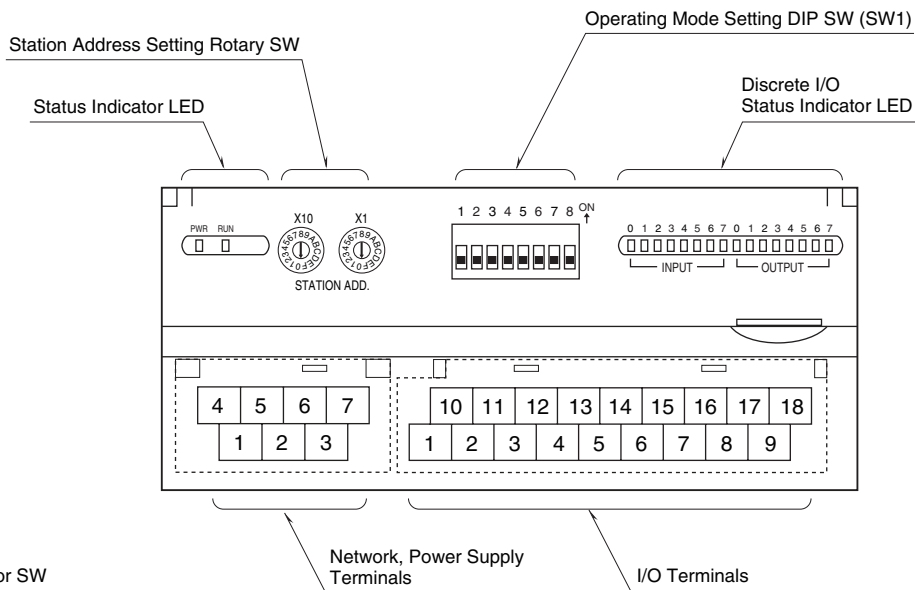
EXTERNAL VIEW

■ SIDE VIEW



Terminating Resistor SW

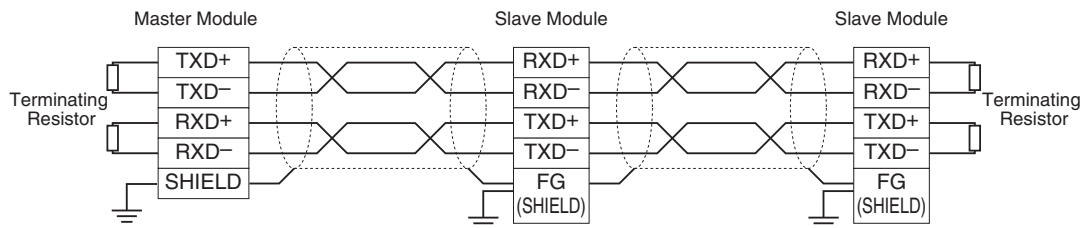
■ FRONT VIEW



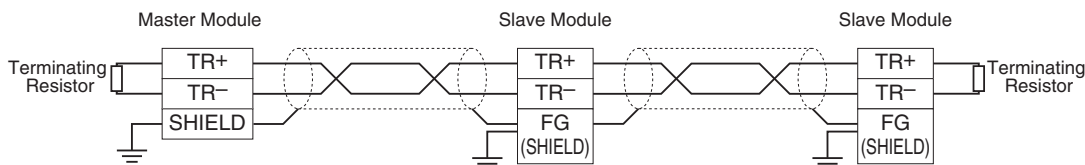
COMMUNICATION CABLE CONNECTIONS

■ 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.

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

10	11	12	13	14	15	16	17	18
+24V	X1	X3	X5	X7	Y1	Y3	Y5	Y7
1	2	3	4	5	6	7	8	9
COM	X0	X2	X4	X6	Y0	Y2	Y4	Y6

NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	COM	Common	10	+24V	24V DC
2	X0	Input 0	11	X1	Input 1
3	X2	Input 2	12	X3	Input 3
4	X4	Input 4	13	X5	Input 5
5	X6	Input 6	14	X7	Input 7
6	Y0	Output 0	15	Y1	Output 1
7	Y2	Output 2	16	Y3	Output 3
8	Y4	Output 4	17	Y5	Output 5
9	Y6	Output 6	18	Y7	Output 7

■ NETWORK, POWER SUPPLY TERMINAL ASSIGNMENT**• Full-duplex communication**

4	5	6	7
RXD+	RXD-	+24V	0V
1	2	3	
TXD+	TXD-	FG	

NO.	ID	FUNCTION, NOTES
1	TXD+	Network (slave, transmission +)
2	TXD-	Network (slave, transmission -)
3	FG	FG
4	RXD+	Network (master, transmission +)
5	RXD-	Network (master, transmission -)
6	+24V	Power input (24V DC)
7	0V	Power input (0V)

• Half-duplex communication

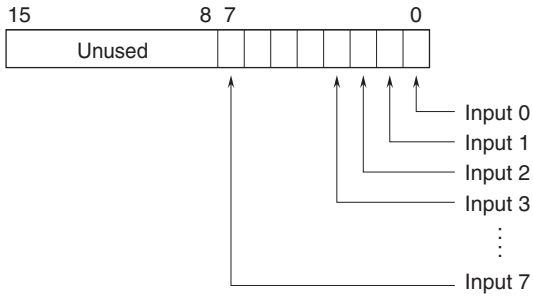
4	5	6	7
TR+	TR-	+24V	0V
1	2	3	
NC	NC	FG	

NO.	ID	FUNCTION, NOTES
1	NC	No connection
2	NC	No connection
3	FG	FG
4	TR+	Network
5	TR-	Network
6	+24V	Power input (24V DC)
7	0V	Power input (0V)

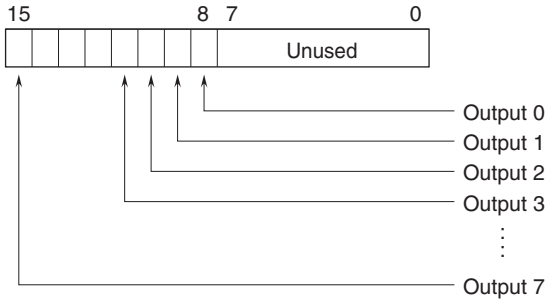
I/O DATA DESCRIPTIONS

■ DISCRETE I/O

• Di area

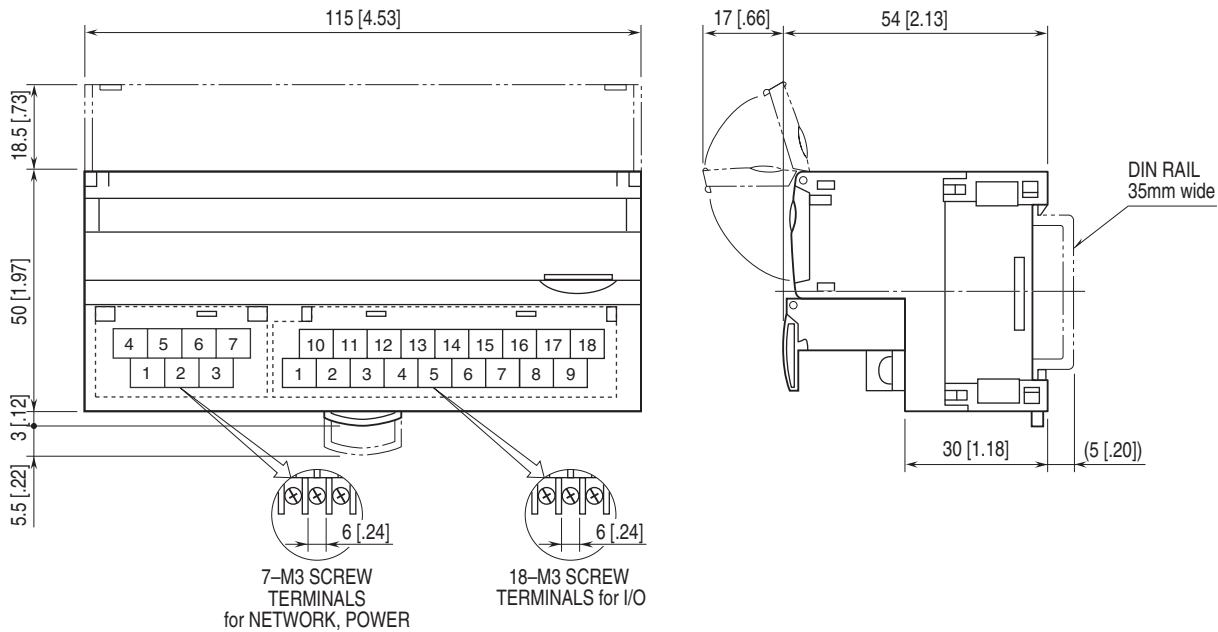


• Do area



0: OFF
1: ON

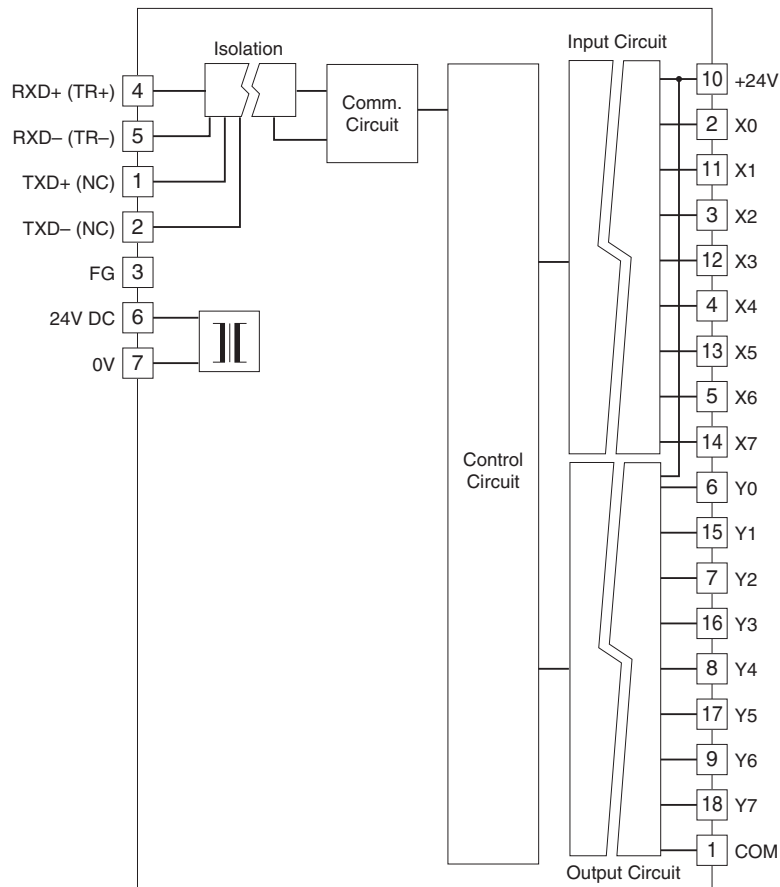
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

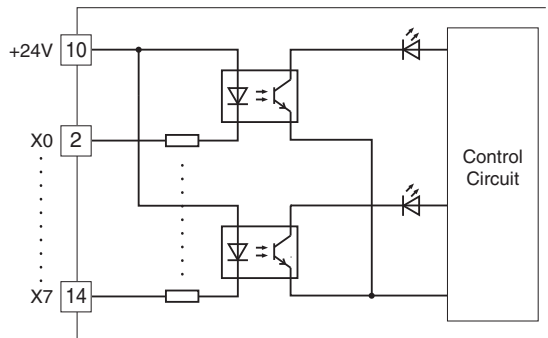
Note: In order to improve EMC performance, bond the FG terminal to ground.

Caution: FG terminal is NOT a protective conductor terminal.

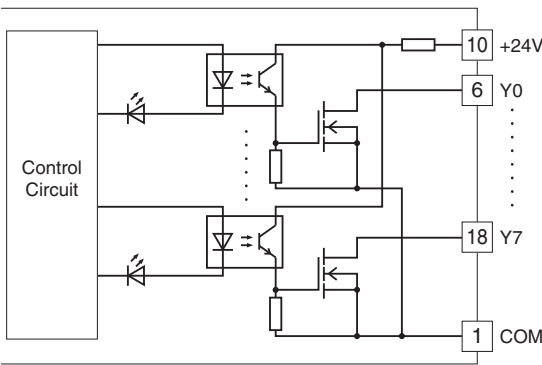


Note: Terminal numbers in parentheses are for half-duplex communication model.

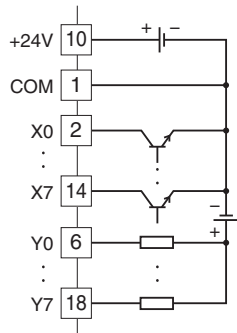
■ Input Circuit



■ Output Circuit



■ I/O Connection Example



Specifications are subject to change without notice.