

Remote I/O R7 Series

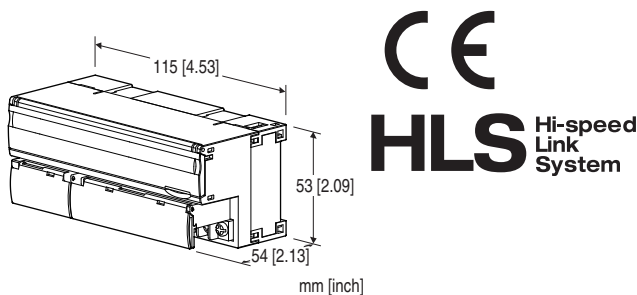
HI-SPEED LINK SYSTEM I/O MODULE

(DC voltage/current input, 4 points, isolated)

Functions & Features

- 4 points DC voltage/current input module for HLS
- Input range can be selected with the front DIP switches for all channels
- Individual channels, zero adjustment, span adjustment, and scaling can be set with the configurator software (model: R7CON)

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



MODEL: R7HL-SV4-R[1]

ORDERING INFORMATION

- Code number: R7HL-SV4-R[1]
Specify a code from below for [1].
(e.g. R7HL-SV4-R/H/Q)
- Specify the specification for option code /Q
(e.g. /C01/SET)

I/O TYPE

SV4: DC voltage/current input (10 V/20 mA), 4 points

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-A)

RELATED PRODUCTS

- PC Configurator cable (model: MCN-CON or COP-US)
- PC configurator software (model: R7CON)
Downloadable at our web site.

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: Input 0 to input 1 to input 2 to input 3 to power to HLS to FG

Zero adjustments: Configurable via R7CON

Span adjustments: Configurable via R7CON

Input range: Selectable with the DIP SW on the front of the unit or configurable via R7CON

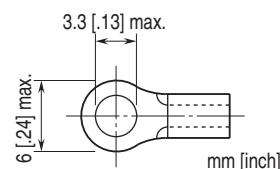
Conversion rate: Configurable via R7CON

Status indicator LEDs: PWR, RUN

(Refer to the instruction manual)

Configurator connection: 2.5 dia. miniature jack

■ 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: 4

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

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

Dielectric strength: 1500 V AC @ 1 minute (input 0 to input
1 to input 2 to input 3 to power input to HLS to FG)

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

■ DC Current

Input resistance: 70Ω

Input range: -20 to +20 mA DC, 0 to 20 mA DC,
4 to 20 mA DC

■ Narrow span voltage

Input resistance: $\geq 100 \text{ k}\Omega$

Input range: -1 to +1 V DC, 0 to 1 V DC, -0.5 to +0.5 V DC

■ Wide span voltage

Input resistance: $\geq 1 \text{ M}\Omega$

Input range: -10 to +10 V DC (*), -5 to +5 V DC,
0 to 10 V DC, 0 to 5 V DC, 1 to 5 V DC

(*) Factory default setting

INSTALLATION

Current consumption

- DC: Approx. 90 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

Conversion rate / conversion accuracy:

10 msec./ $\pm 0.8 \%$, 20 msec./ $\pm 0.4 \%$, 40 msec./ $\pm 0.2 \%$, 80
msec./ $\pm 0.1 \%$ (*)

(*) Factory setting

Data range: 0 - 10000 of the input range

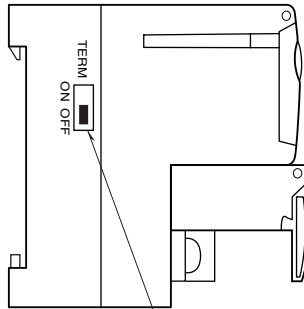
(Scaling of converted data is configurable with the
configurator software (model: R7CON))

Temp. coefficient: $\pm 0.015 \%/^{\circ}\text{C}$ ($\pm 0.008 \%/^{\circ}\text{F}$)

Response time: Conversion rate $\times 2 + 50$ msec. (0 - 90 %)

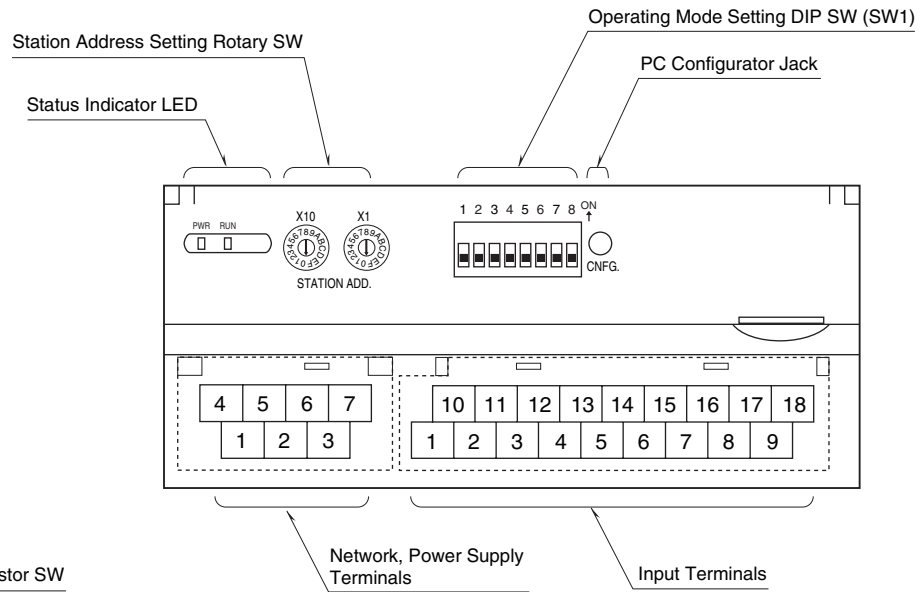
EXTERNAL VIEW

■ SIDE VIEW



Terminating Resistor SW

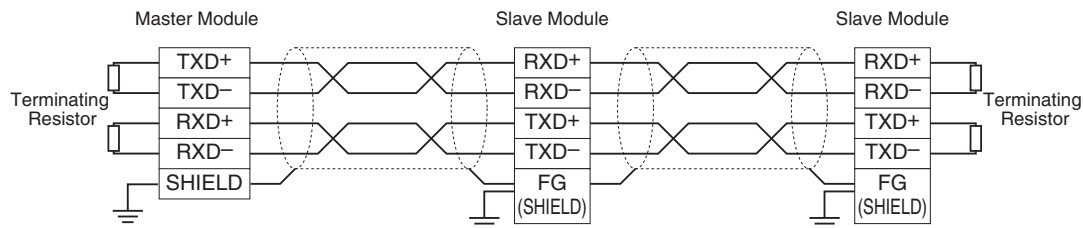
■ FRONT VIEW



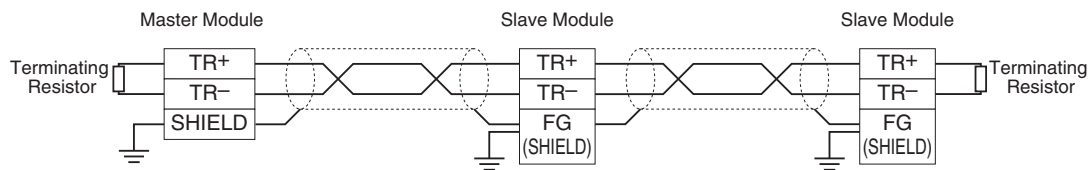
COMMUNICATION CABLE CONNECTIONS

■ 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**■ INPUT TERMINAL ASSIGNMENT**

10 VL0	11 I0	12 VL1	13 I1	14 NC	15 VL2	16 I2	17 VL3	18 I3
1 VH0	2 COM0	3 VH1	4 COM1	5 NC	6 VH2	7 COM2	8 VH3	9 COM3

NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	VH0	Wide span volt. 0	10	VL0	Narrow span volt. 0
2	COM0	Common 0	11	I0	Current range 0
3	VH1	Wide span volt. 1	12	VL1	Narrow span volt. 1
4	COM1	Common 1	13	I1	Current range 1
5	NC	No connection	14	NC	No connection
6	VH2	Wide span volt. 2	15	VL2	Narrow span volt. 2
7	COM2	Common 2	16	I2	Current range 2
8	VH3	Wide span volt. 3	17	VL3	Narrow span volt. 3
9	COM3	Common 3	18	I3	Current range 3

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

4 RXD+	5 RXD-	6 +24V	7 0V
1 TXD+	2 TXD-	3 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 TR+	5 TR-	6 +24V	7 0V
1 NC	2 NC	3 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)

DATA CONVERSION

■ INPUT RANGE AND DATA CONVERSION (FACTORY DEFAULT SETTING)

Analog input data is converted into digital representations of 0 – 100% proportional to each scaled range.

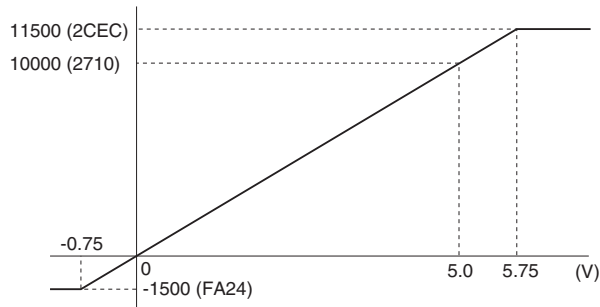
The converted % values are multiplied by 100 and expressed in 16 bits.

Overrange input is possible from -15 to +115% of the nominal range.

When the signal exceeds the limit, the data is fixed at -15% or +115%.

• Input Range 0 – 5V DC

Input Value	Input %	Converted Data, Decimal	Converted Data, Hex
$\leq -0.75V$	-15%	-1500	FA24
0V	0%	0	0
5V	100%	10000	2710
$\geq 5.75V$	115%	11500	2CEC

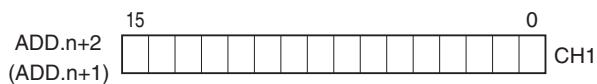
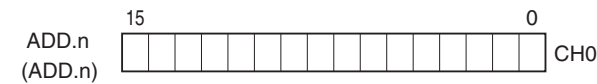


I/O DATA DESCRIPTIONS

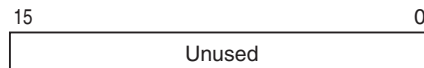
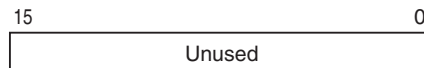
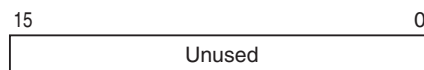
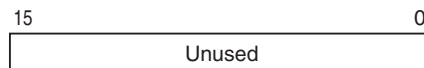
Scaling of analog input is configurable with the configurator software (model: R7CON). Refer to the software manual for details.

■ ANALOG INPUT

• Di area



• Do area

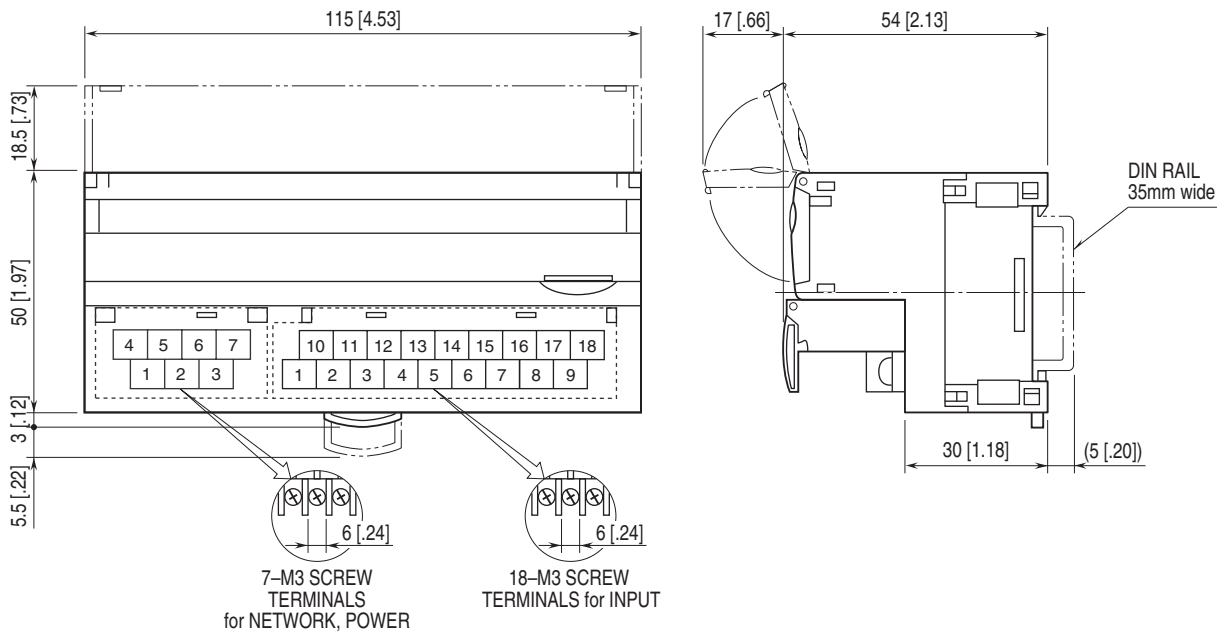


The data is 16-bit binary.

Negative value is represented in 2's complements.

Address in parentheses are for half-duplex mode.

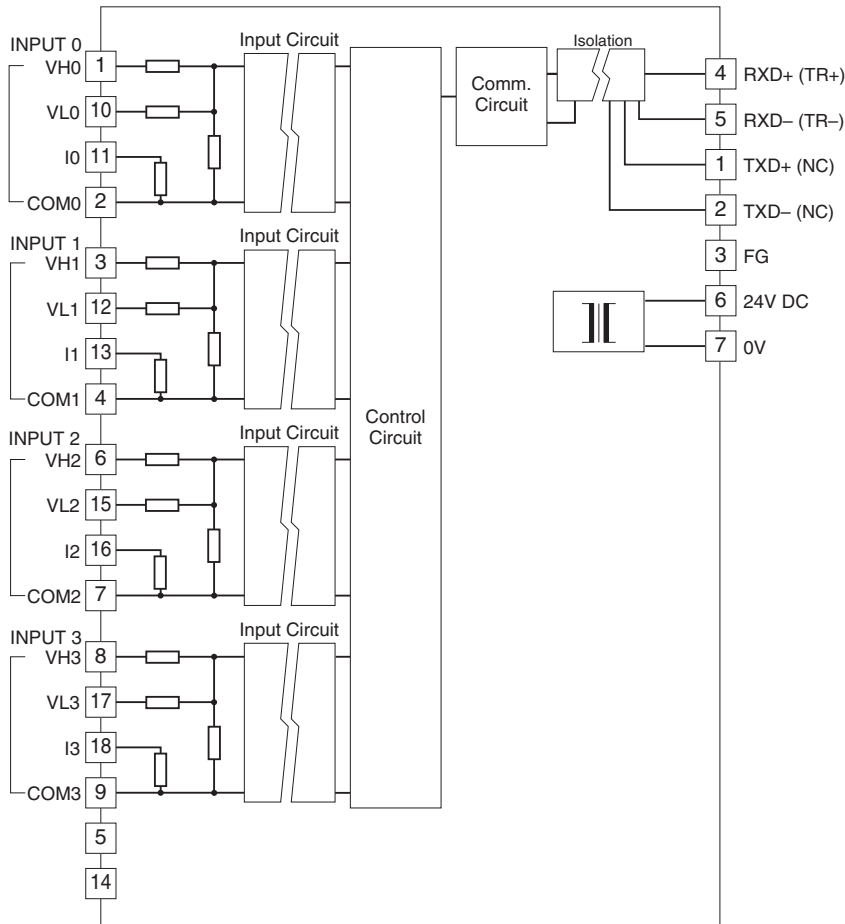
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

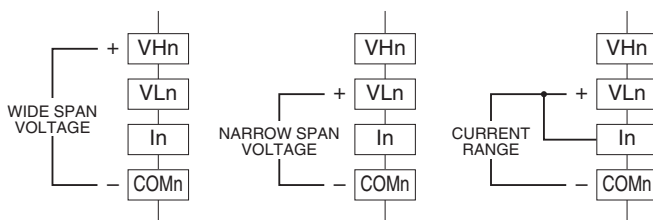
Note: In order to improve EMC performance, bond the FG terminal to ground.

Caution: FG terminal is NOT a protective conductor terminal.



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

Input Connection Examples



Be sure to close across V_{Ln} and I_n terminals for a current input.



Specifications are subject to change without notice.