INSTRUCTION MANUAL

DC CURRENT OUTPUT MODULE, 4 points
(High-speed Link System, isolated, 12 bits data)

MODEL **R7HL-YS4L**

BEFORE USE ....

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact our sales office or representatives.

■ PACKAGE INCLUDES:

DC current output module..(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

POINTS OF CAUTION

■ CONFORMITY WITH EU DIRECTIVE

- Use dual-shield cables (Shinko Seisen Industry Model ZHY262 PBA) for the network. If it is not sufficient, use a ferrite core (Kitagawa Industries Model GRFC-13) for the network cable.
- The equipment must be mounted inside the instrument panel of a metal enclosure.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures* to ensure the CE conformity.
  * For example, installation of noise filters and clamp filters for the power source, input and output connected to the unit, etc.

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  24V DC rating: 24V ±10%, approx. 140mA

■ GENERAL PRECAUTIONS

- Before you remove the unit or mount it, turn off the power supply and output signal for safety.
- Before you remove the terminal block or mount it, make sure to turn off the power supply and output signal for safety.
- DO NOT set the switches on the module while the power is supplied. The switches are used only for maintenance without the power.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -10 to +55°C (14 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.
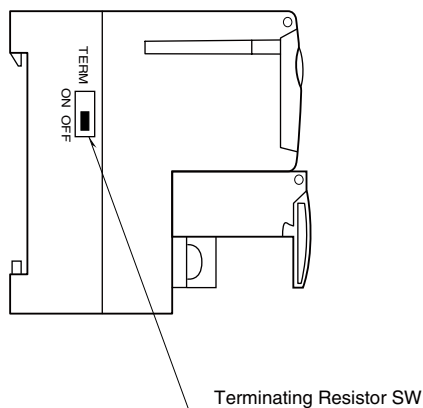
■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.
- Be sure to close the terminal cover for safety.
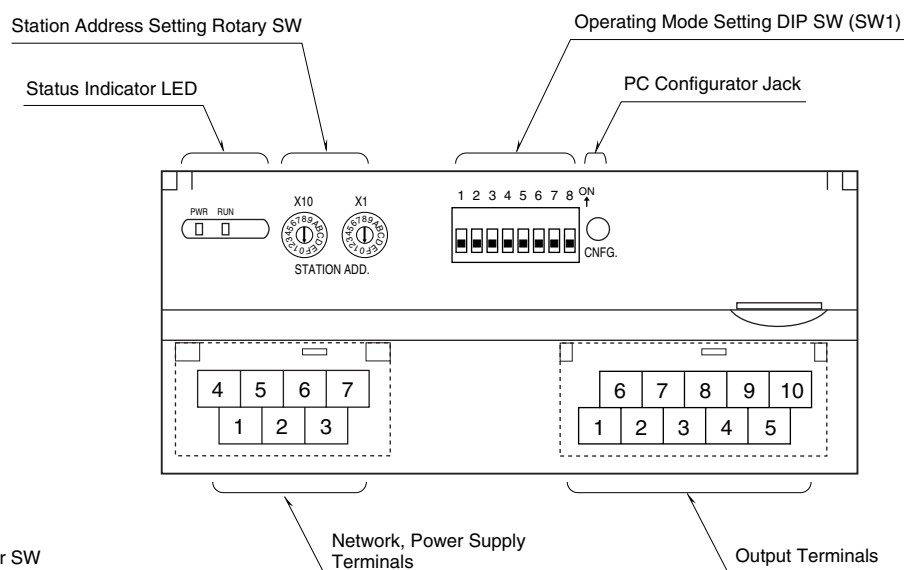
■ AND ....

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION

■ **SIDE VIEW**

■ **FRONT VIEW**

Station Address Setting Rotary SW

Operating Mode Setting DIP SW (SW1)

Status Indicator LED

PC Configurator Jack

Terminating Resistor SW

Network, Power Supply Terminals

Output Terminals

■ **STATUS INDICATOR LED**

ID	COLOR	FUNCTION
PWR	Green	Turns on when the internal 5V is supplied normally.
RUN	Green	Turns on when the refresh data is received normally.

■ **STATION ADDRESS**

The left switch determines the sixteenths place digit, while the right switch does the ones place digit of the address. The data allocation is 1. (Range: 01H to 3FH)

Station Address Setting (x1)

Station Address Setting (x16)
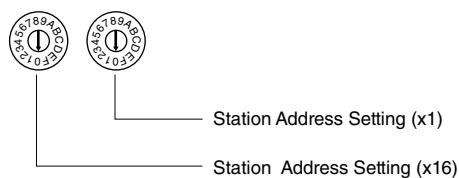
■ **OPERATING MODE**

(*) Factory setting

• **Output at the Loss of Communication: SW1-7**

SW1-7	OUTPUT AT THE LOSS OF COMMUNICATION
OFF	Hold the output (*) (maintains the last data received normally)
ON	Reset the output (to 0%)

• **Transfer Rate: SW1-8**

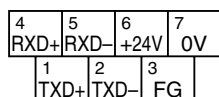| SW1-8	TRANSFER RATE	
	Option code: None	Option code: /3
OFF	12 Mbps (*)	3 Mbps
ON	6 Mbps	Unused

Note: Be sure to set unused SW1-1 through 1-6 to OFF.

■ **TERMINATING RESISTOR**

To use the terminating resistor, turn the switch ON, and OFF to invalidate. (Factory setting OFF)
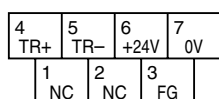
■ **NETWORK, POWER SUPPLY TERMINAL ASSIGNMENT**
• **Full-duplex communication**

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)

■ **OUTPUT TERMINAL ASSIGNMENT**

6 NC	7 I0	8 I1	9 I2	10 I3
1 NC	2 COM0	3 COM1	4 COM2	5 COM3
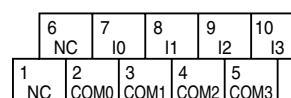
NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	NC	No connection	6	NC	No connection
2	COM0	Common 0	7	I0	Current output 0
3	COM1	Common 1	8	I1	Current output 1
4	COM2	Common 2	9	I2	Current output 2
5	COM3	Common 3	10	I3	Current output 3

PC CONFIGURATOR

The following parameter items can be set with using PC Configurator Software (model: R7CON).
Refer to the users manual for the R7CON for detailed operation of the software program.
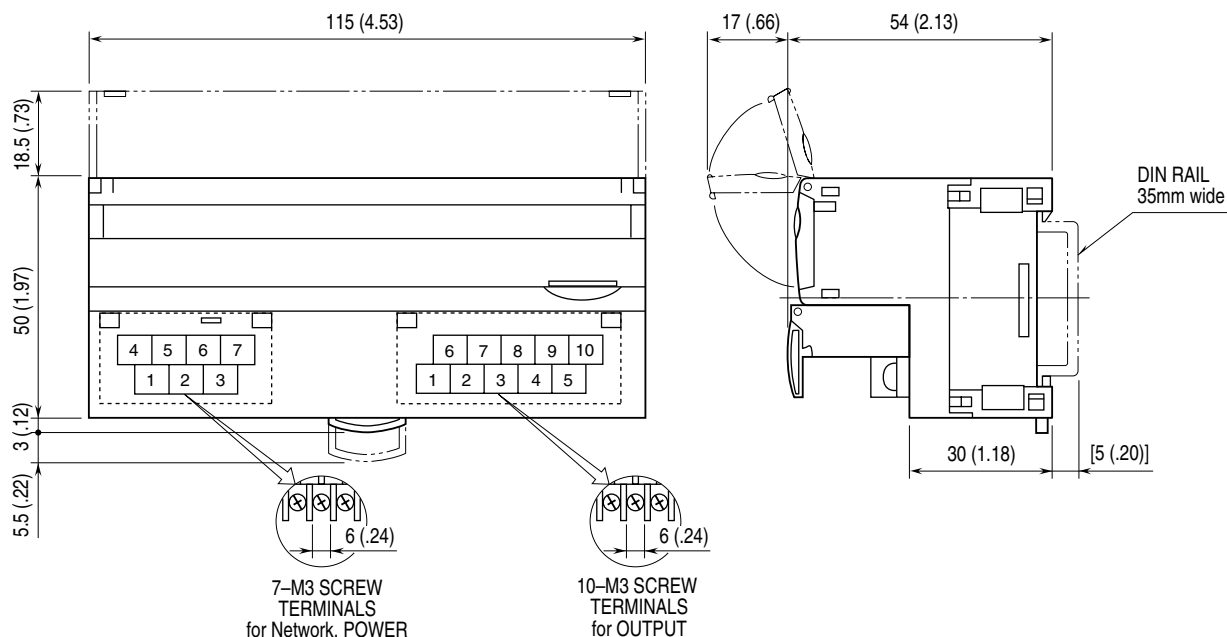
■ **CHANNEL INDIVIDUAL SETTING**

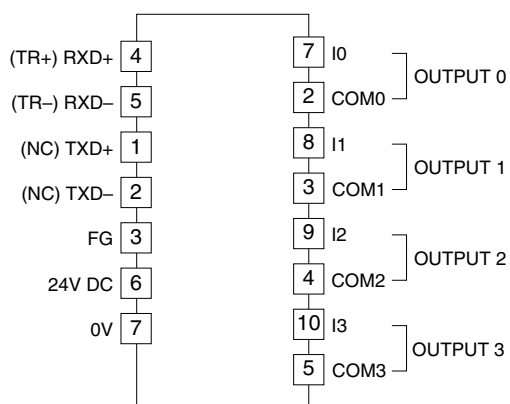| PARAMETER	SETTING RANGE	DEFAULT SETTING
Bias adjustment	-320.00 – +320.00 (%)	0.00 (%)
Gain adjustment	-3.2000 – +3.2000	1.0000

TERMINAL CONNECTIONS

Connect the unit as in the diagram.

■ EXTERNAL DIMENSIONS unit: mm (inch)

7–M3 SCREW TERMINALS
for Network, POWER

10–M3 SCREW TERMINALS
for OUTPUT

DIN RAIL
35mm wide

■ CONNECTION DIAGRAM

Note: In order to improve EMC performance, bond the FG terminal to ground.
Caution: FG terminal is NOT a protective conductor terminal.

(TR+) RXD+	4	7	I0	OUTPUT 0
(TR–) RXD–	5	2	COM0	
(NC) TXD+	1	8	I1	OUTPUT 1
(NC) TXD–	2	3	COM1	
FG	3	9	I2	OUTPUT 2
24V DC	6	4	COM2	
0V	7	10	I3	OUTPUT 3
		5	COM3	

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

WIRING INSTRUCTIONS

■ SCREW TERMINAL

Torque: 0.5 N·m

■ SOLDERLESS TERMINAL

Refer to the drawing below for recommended ring tongue terminal size. Spade tongue type is also applicable.
Recommended solderless terminal:
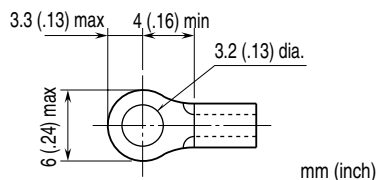• **Communication cables**
   Applicable wire size: 0.2 to 0.5 mm² (AWG 26 to 22)
   Recommended manufacturer: Japan Solderless Terminal MFG. Co., Ltd.

• **Others**
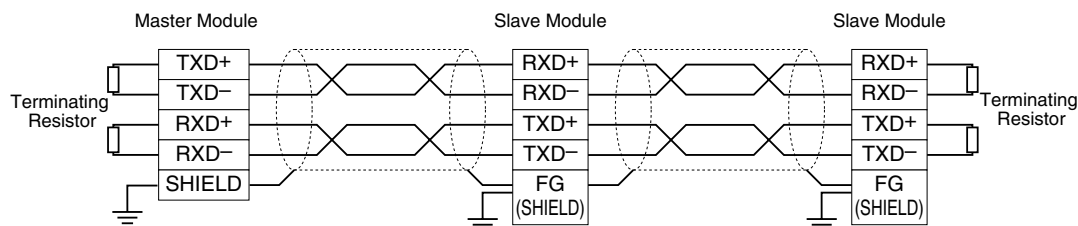   Applicable wire size: 0.25 to 1.65 mm² (AWG 22 to 16)
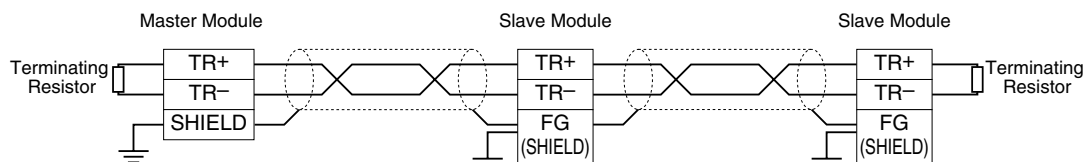   Recommended manufacturer: Japan Solderless Terminal MFG. Co., Ltd. or Nichifu Co., Ltd.

3.3 (.13) max   4 (.16) min
3.2 (.13) dia.
6 (.24) max
mm (inch)

COMMUNICATION CABLE CONNECTIONS

■ **MASTER CONNECTION**

• **Full-duplex communication**

Master Module | Slave Module | Slave Module

Terminating Resistor | TXD+ | RXD+ | RXD+ | Terminating Resistor
| TXD− | RXD− | RXD−
| RXD+ | TXD+ | TXD+
| RXD− | TXD− | TXD−
| SHIELD | FG (SHIELD) | FG (SHIELD)

• **Half-duplex communication**

Master Module | Slave Module | Slave Module

Terminating Resistor | TR+ | TR+ | TR+ | Terminating Resistor
| TR− | TR− | TR−
| SHIELD | FG (SHIELD) | FG (SHIELD)

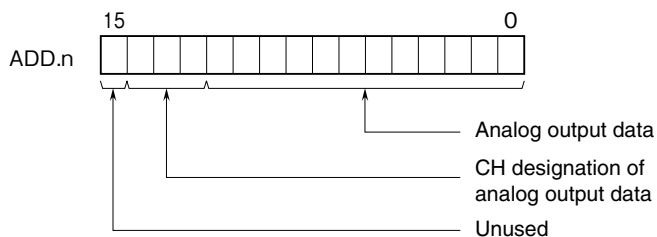Note: Be sure to turn ON the switch of the terminating resistor located at both ends of the modules.

I/O DATA DESCRIPTIONS

■ **ANALOG OUTPUT**

• **Di**

ADD.n   15 0

— Analog output data
— CH designation of analog output data
— Unused

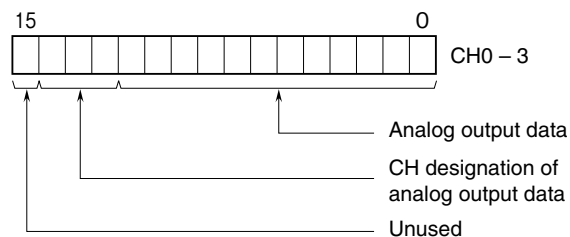• **Do**

15 0   CH0 – 3

— Analog output data
— CH designation of analog output data
— Unused

The data is 12-bit binary.
Divided by 4 times scan, 4 points output data is transferred by using CH designation bit.
For Di, the data written to Do is echoed back.

■ **DATA ACQUISITION PROCEDURE**

1) Write the desired CH designation bit (see table below) to the CH designation bit (bit 12 to 14) for the analog output data of Do, from the host program.

2) After one scan, the channel specified above is updated.

CHANNEL	CH DESIGNATION BIT
0	000
1	001
2	010
3	011