INSTRUCTION MANUAL

DC CURRENT OUTPUT MODULE, 2 points
(High-speed Link System)

MODEL **R7HL-YS2**

BEFORE USE ....

Thank you for choosing M-System. 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 M-System's 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.

■ 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.
• 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.
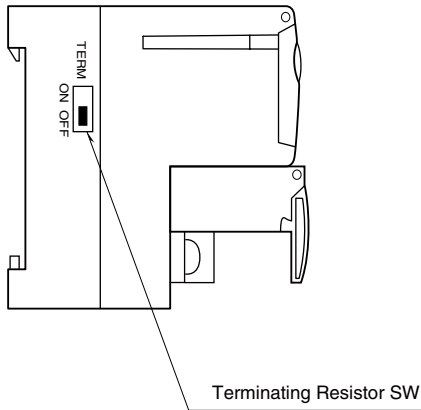
■ WIRING

• 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.
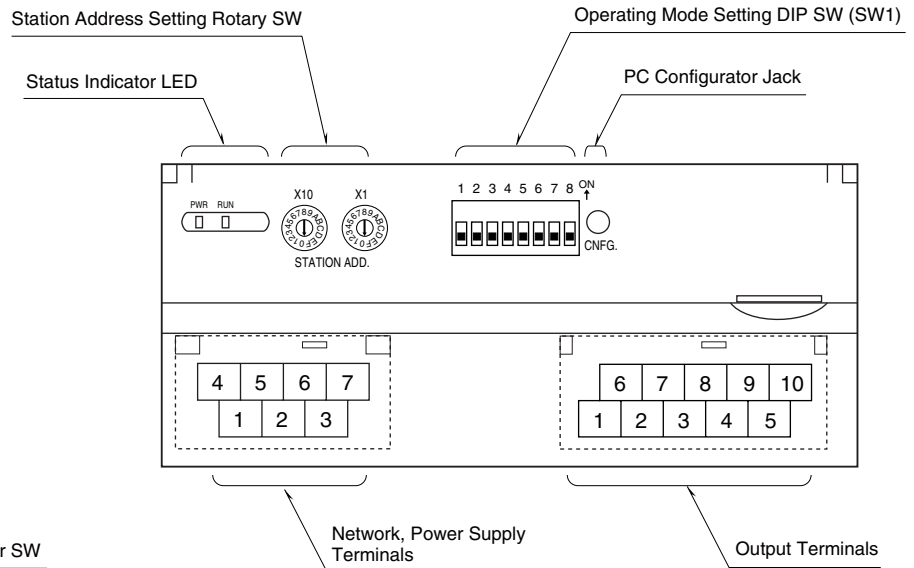
■ AND ....

• 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.

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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 2.

• **Full-duplex communication**

Setting "n" with the rotary switches, the addresses are n and n+2. (Range: 01H to 3DH)

• **Half-duplex communication**

Two (2) addresses are assigned from the one set with the rotary switch. (Range: 01H to 3EH)

Station Address Setting (x1)

Station Address Setting (x16)
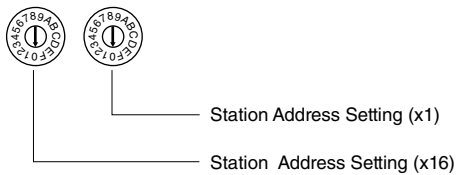
■ OPERATING MODE

(*) 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 -15%)

• **Transfer rate (SW1-8)**

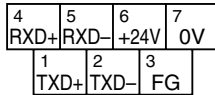| SW1-8	TRANSFER RATE
OFF	12 Mbps (*)
ON	6 Mbps

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)

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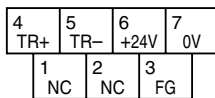
NO.	ID	FUNCTION, NOTES
1	NC	No connection
2	NC	No connection
3	FG	FG
4	TR+	Network
5	TR–	Network
6	+24V	Power input (24V DC)
7	0V	Power input (0V)

■ OUTPUT TERMINAL ASSIGNMENT

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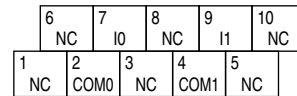
NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	NC	No connection	6	NC	No connection
2	COM0	Common 0	7	I0	Current 0
3	NC	No connection	8	NC	No connection
4	COM1	Common 1	9	I1	Current 1
5	NC	No connection	10	NC	No connection

PC CONFIGURATOR

With configurator software, settings shown below are available.
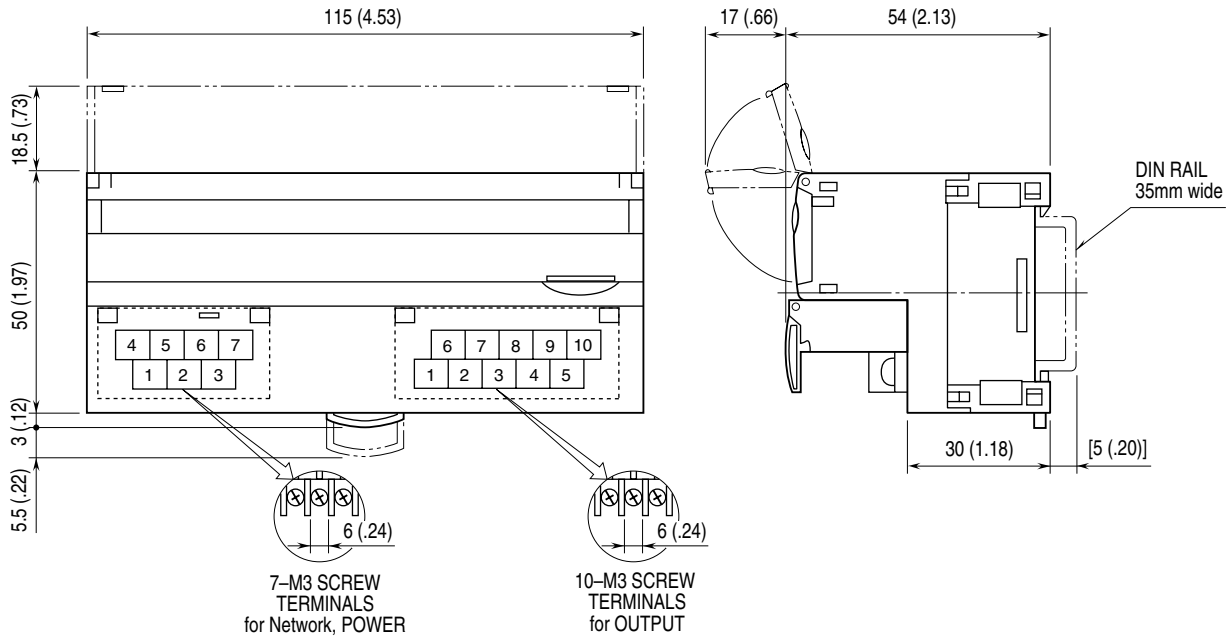Refer to the software manual of R7CON for detailed operation.

■ CHANNEL INDIVIDUAL SETTING

PARAMETER	AVAILABLE RANGE	DEFAULT SETTING
Zero scale	-32000 to +32000	0
Full scale	-32000 to +32000	10000
Bias	-320.00 to +320.00	0.00
Gain	-3.2000 to +3.2000	1.0000

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TERMINAL CONNECTIONS

Connect the unit as in the diagram.

■ **EXTERMNAL DIMENSIONS unit: mm (inch)**

7–M3 SCREW TERMINALS
for Network, POWER

10–M3 SCREW TERMINALS
for OUTPUT

DIN RAIL
35mm wide

■ **CONNECTION DIAGRAM**

RXD+ (TR+)	4	
RXD– (TR–)	5	
TXD+ (NC)	1	
TXD– (NC)	2	
FG	3	
24V DC	6	
0V	7	

7 I0   OUTPUT 0
2 COM0
9 I1   OUTPUT 1
4 COM1
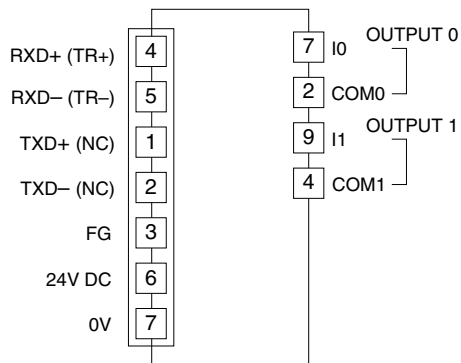
Note 1: Terminal numbers in parentheses are for half-duplex communication model.
Note 2: In order to improve EMC performance, bond the FG terminal to ground.
Caution: FG terminal is NOT a protective conductor terminal.

# 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.
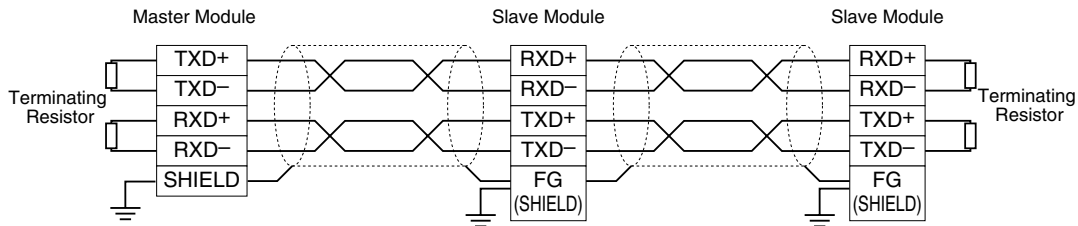
Recommended solderless terminal:

• **Communication cables**

Applicable wire size: 0.2 to 0.5 mm^2 (AWG 26 to 22)

Recommended manufacturer: Japan Solderless Terminal MFG. Co., Ltd.

• **Others**

Applicable wire size: 0.25 to 1.65 mm^2 (AWG 22 to 16)

Recommended manufacturer: Japan Solderless Terminal MFG. Co., Ltd. or Nichifu Co., Ltd.
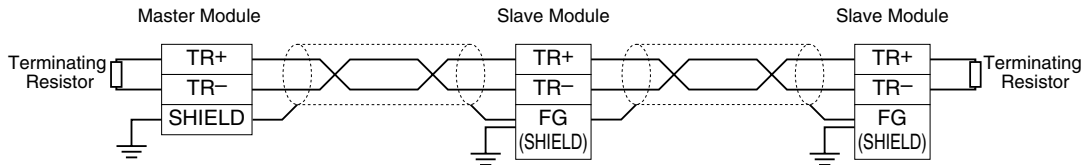

3.3 (.13) max   4 (.16) min
3.2 (.13) dia.
6 (.24) max
mm (inch)
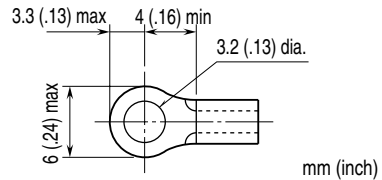
COMMUNICATION CABLE CONNECTIONS

■ **MASTER CONNECTION**

• **Full-duplex communication**

Master Module   Slave Module   Slave Module

Terminating Resistor	TXD+
	TXD−
	RXD+
	RXD−
	SHIELD

	RXD+
	RXD−
	TXD+
	TXD−
	FG (SHIELD)

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

• **Half-duplex communication**

Master Module   Slave Module   Slave Module

Terminating Resistor	TR+
	TR−
	SHIELD

	TR+
	TR−
	FG (SHIELD)

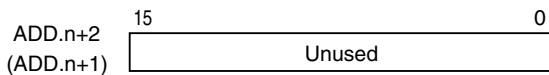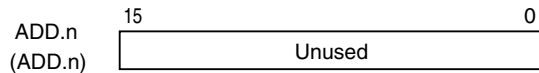| | TR+ | Terminating Resistor |
| | TR− | |
| | FG (SHIELD) | |

Note: Be sure to turn ON the switch of the terminating resistor located at both ends of the modules.
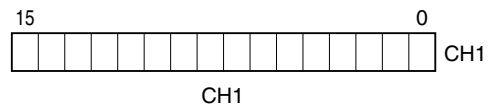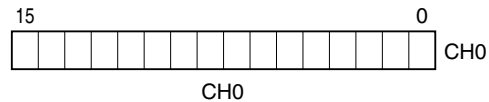
I/O DATA DESCRIPTIONS

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

■ **ANALOG OUTPUT**

• **Di**

ADD.n
(ADD.n)

| 15 | | 0 |
| | Unused | |

ADD.n+2
(ADD.n+1)

| 15 | | 0 |
| | Unused | |

• **Do**

| 15 | 0 | CH0 |

CH0

| 15 | 0 | CH1 |

CH1

The data is 16-bit binary.
Negative value is represented in 2's complements.
Address in parentheses are for half-duplex mode.

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