INSTRUCTION MANUAL

THERMOCOUPLE INPUT MODULE, 4 points
(High-speed Link System)

MODEL **R7HL-TS4**

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:

Thermocouple input module (body + 4 CJC sensors)........(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. 90mA

■ GENERAL PRECAUTIONS

- Before you remove the unit or mount it, turn off the power supply and input 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.
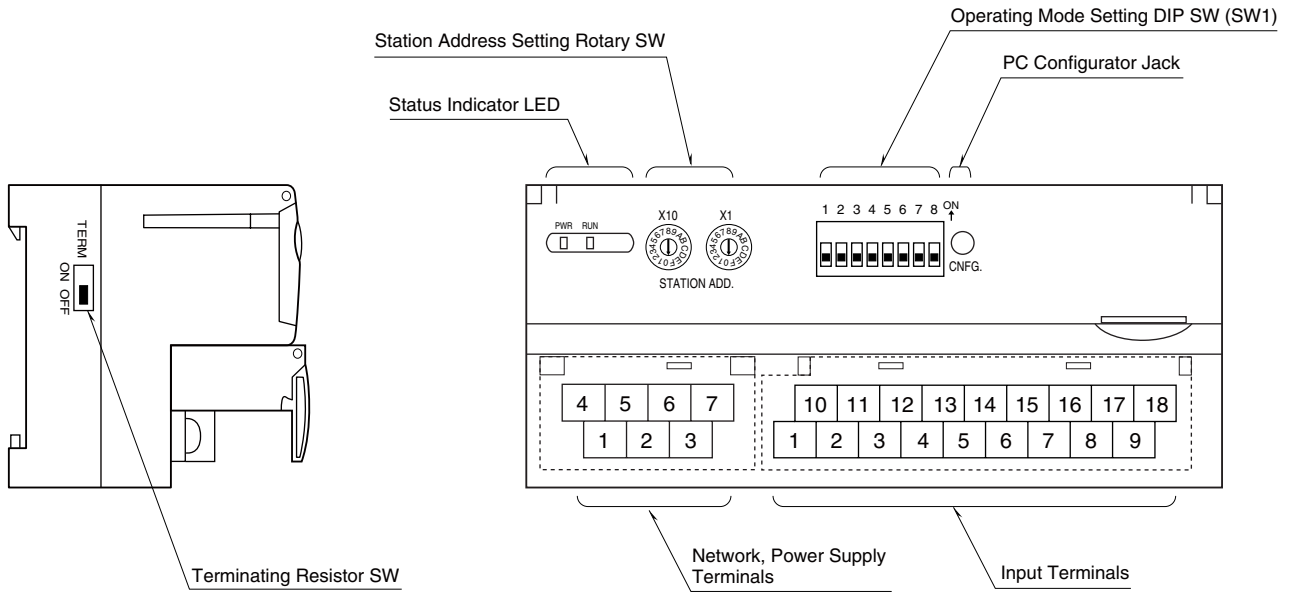
■ AND ....

- 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

Operating Mode Setting DIP SW (SW1)

PC Configurator Jack

Station Address Setting Rotary SW

Status Indicator LED

Terminating Resistor SW

Network, Power Supply Terminals

Input 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 4.

• **Full-duplex communication**

Setting "n" with the rotary switches, the addresses are n, n+2, n+4 and n+6. (Range: 01H to 39H)

• **Half-duplex communication**

Four (4) addresses are assigned from the one set with the rotary switch. (Range: 01H to 3CH)

Station Address Setting (x1)

Station Address Setting (x16)
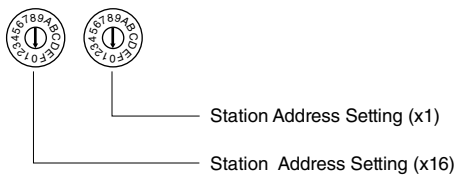
■ OPERATING MODE

(*) Factory setting

• Burnout (SW1-2)

SW1-2	BURNOUT
OFF	Upscale (*)
ON	Downscale

• Thermocouple Type (SW1-3, 1-4, 1-5, 1-6)

SW1-3	SW1-4	SW1-5	SW1-6	THERMOCOUPLE TYPE
OFF	OFF	OFF	OFF	K (CA) (*)
ON	OFF	OFF	OFF	E (CRC)
OFF	ON	OFF	OFF	J (IC)
ON	ON	OFF	OFF	T (CC)
OFF	OFF	ON	OFF	B (RH)
ON	OFF	ON	OFF	R
OFF	ON	ON	OFF	S
ON	ON	ON	OFF	C (WRe 5-26)
OFF	OFF	OFF	ON	N
ON	OFF	OFF	ON	U
OFF	ON	OFF	ON	L
ON	ON	OFF	ON	P (Platinel II)
OFF	OFF	ON	ON	(PR)
ON	ON	ON	ON	PC Configurator setting

• Transfer Rate (SW1-8)

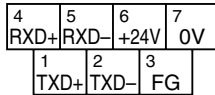| SW1-8	TRANSFER RATE
OFF	12 Mbps (*)
ON	6 Mbps

Note : Be sure to set unused SW1-1 and 1-7 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	
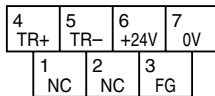
NO.	ID	FUNCTION, NOTES
1	NC	No connection
2	NC	No connection
3	FG	FG
4	TR+	Network
5	TR–	Network
6	+24V	Power input (24V DC)
7	0V	Power input (0V)

■ INPUT TERMINAL ASSIGNMENT

10 +IN0	11 –IN0	12 +IN1	13 –IN1	14 NC	15 +IN2	16 –IN2	17 +IN3	18 –IN3
1 +CJ0	2 –CJ0	3 +CJ1	4 –CJ1	5 NC	6 +CJ2	7 –CJ2	8 +CJ3	9 –CJ3
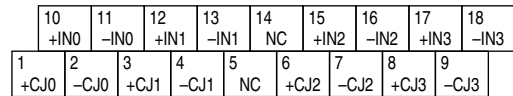
NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	+CJ0	CJC 0	10	+IN0	T/C + 0
2	–CJ0	CJC 0	11	–IN0	T/C – 0
3	+CJ1	CJC 1	12	+IN1	T/C + 1
4	–CJ1	CJC 1	13	–IN1	T/C – 1
5	NC	No connection	14	NC	No connection
6	+CJ2	CJC 2	15	+IN2	T/C + 2
7	–CJ2	CJC 2	16	–IN2	T/C – 2
8	+CJ3	CJC 3	17	+IN3	T/C + 3
9	–CJ3	CJC 3	18	–IN3	T/C – 3

PC CONFIGURATOR

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

■ CHANNEL INDIVIDUAL SETTING

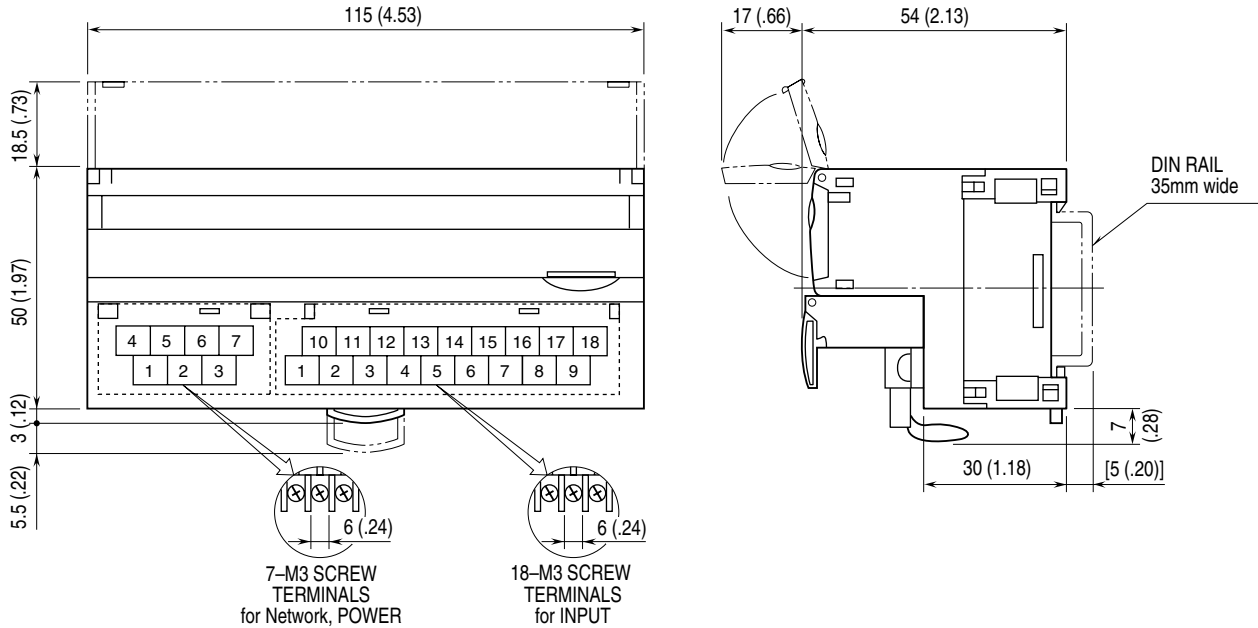| PARAMETER	AVAILABLE RANGE	DEFAULT SETTING
TC Type	K (CA) E (CRC) J (IC) T (CC) B (RH) R S C (WRe 5-26) N U L P (Platinel II) (PR)	K (CA)
Temp Unit	C, F, K	C
Zero scale	-32000 to +32000	0
Full scale	-32000 to +32000	10000
Bias	-320.00 to +320.00	0.00
Gain	-3.2000 to +3.2000	1.0000
Zero temp	Depends on sensor type	0.00 (degC)
Full temp	Depends on sensor type	0.00 (degC)

■ CHANNEL BATCH SETTING

PARAMETER	AVAILABLE RANGE	DEFAULT SETTING
Conversion rate	0: 250 msec. 1: 500 msec.	0: 250 msec.

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TERMINAL CONNECTIONS

Connect the unit as in the diagram.

■ EXTERNAL DIMENSIONS unit: mm (inch)

115 (4.53)

18.5 (.73)

50 (1.97)

3 (.12)

5.5 (.22)

| 4 | 5 | 6 | 7 |
| 1 | 2 | 3 |

| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

6 (.24)

6 (.24)

7–M3 SCREW
TERMINALS
for Network, POWER

18–M3 SCREW
TERMINALS
for INPUT

17 (.66)   54 (2.13)

DIN RAIL
35mm wide

7 (.28)

30 (1.18)   [5 (.20)]

■ CONNECTION DIAGRAM

INPUT 0
+IN0   10
−IN0   11
+CJ0   1
−CJ0   2

INPUT 1
+IN1   12
−IN1   13
+CJ1   3
−CJ1   4

INPUT 2
+IN2   15
−IN2   16
+CJ2   6
−CJ2   7

INPUT 3
+IN3   17
−IN3   18
+CJ3   8
−CJ3   9

4   RXD+ (TR+)
5   RXD− (TR−)
1   TXD+ (NC)
2   TXD− (NC)
3   FG
6   24V DC
7   0V
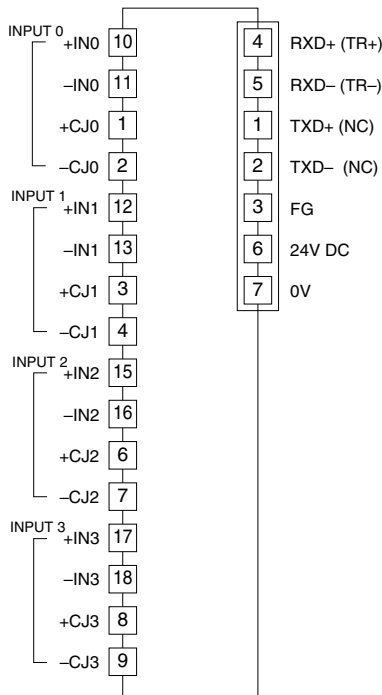
Note 1: Terminal numbers in parentheses are for half-duplex
        communication model.
Note 2: In order to improve EMC performance, bond the FG
        terminal to ground.
Caution: FG terminal is NOT a protective conductor terminal.

■ Input Connection Examples

T/C
+
−

+INn
−INn

CJC
SENSOR

+CJn
−CJn
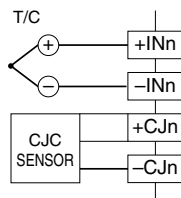
WIRING INSTRUCTIONS

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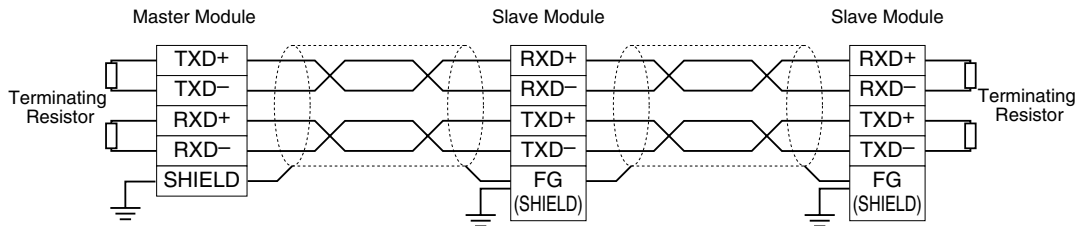
Applicable wire size: 0.25 to 1.65 mm^2 (AWG 22 to 16)

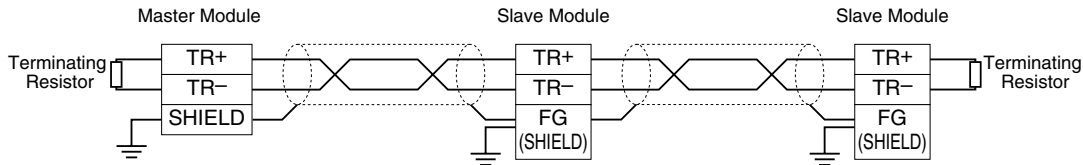Recommended manufacturer: Japan Solderless Terminal MFG. Co., Ltd. or Nichifu Co., Ltd.

3.3 (.13) max   4 (.16) min

3.2 (.13) dia.

6 (.24) max

mm (inch)

M-SYSTEM CO., LTD.
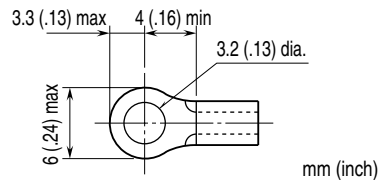
COMMUNICATION CABLE CONNECTIONS

■ **MASTER CONNECTION**
• **Full-duplex communication**
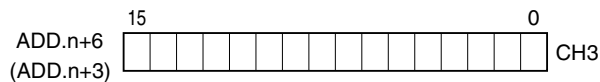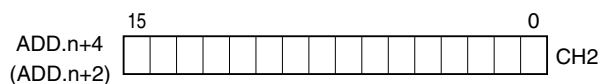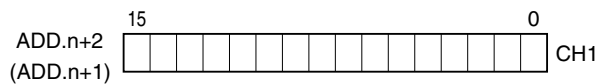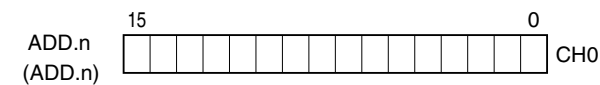

• **Half-duplex communication**

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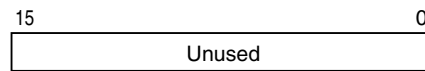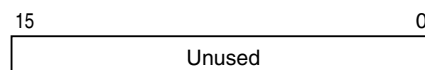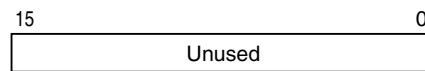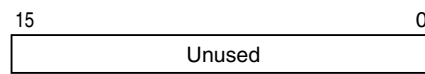
I/O DATA DESCRIPTIONS

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

■ **ANALOG INPUT**

• **Di**   • **Do**

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