

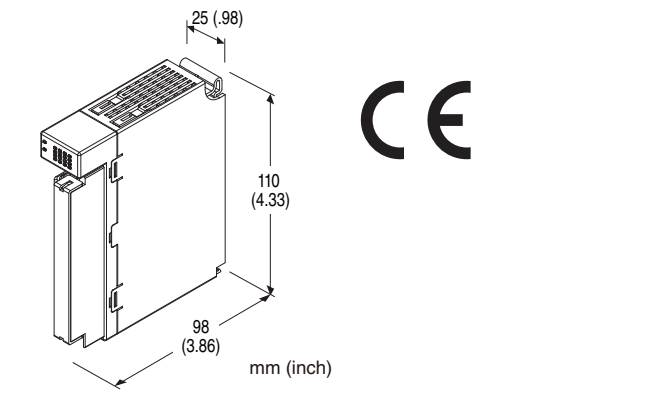
Remote I/O R30 Series

THERMOCOUPLE INPUT MODULE

(4 points, isolated)

Functions & Features

- 4 channels for thermocouple input remote I/O module
- Isolation between input channels
- Input range of each channel is individually adjustable with PC configurator



MODEL: R30TS4S[1]

ORDERING INFORMATION

- Code number: R30TS4S[1]
- Specify a code from below for [1].
(e.g. R30TS4S/Q)
- Specify the specification for option code /Q
(e.g. /C01/SET)

NO. OF CHANNELS

4: 4

COMMUNICATION MODE

S: Single

[1] OPTIONS

blank: none

/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to M-System's web site.)

- /C01: Silicone coating
- /C02: Polyurethane coating
- /C03: Rubber coating

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet
(No. ESU-9002)

CAUTION

■ UNUSED INPUT CHANNELS

Set unused channels to "CH disabled" with PC Configurator software (model: R30CFG). Otherwise, unused channels left open are to be burnout status, setting a data error at the PLC or other host devices.

RELATED PRODUCTS

- PC configurator software (model: R30CFG)
Downloadable at M-System's web site.
For connecting to PC, use commercially available Mini-B type USB cable. (provided by user)

GENERAL SPECIFICATIONS

Connection

Internal bus: Via the Installation Base (model: R30BS)

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

Internal power supply: Via the Installation Base (model: R30BS)

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

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

(Solderless terminals with insulation sleeve do not fit.)

Applicable wire size: 0.25 to 0.75 mm²

Screw terminal: Nickel-plated steel

Isolation: Input 1 to input 2 to input 3 to input 4 to internal bus or internal power

Input type & range: Selectable with PC configurator software (model: R30CFG)

Temperature unit: °C, °F or absolute temperature selectable with PC configuration software (model: R30CFG)

Conversion rate: Selectable with PC configuration software (model: R30CFG)

Burnout: Selectable among upscale, downscale or no burnout with PC configurator software (model: R30CFG)

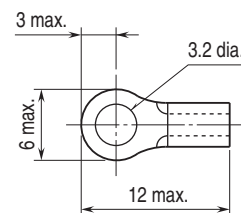
Linearization: Standard

Cold junction compensation: CJC sensor attached to the input terminals

Status indicator LED: RUN, ERR

(refer to the instruction manual)

■ **Recommended solderless terminal size - M3 (unit: mm)**



INPUT SPECIFICATIONS

Module type: Analog input, 4 points

Thermocouple: K, E, J, T, B, R, S, C, N, U, L, P, PR

Input resistance: $\geq 30 \text{ k}\Omega$

Burnout sensing: $\leq 0.1 \mu\text{A}$

Temperature range

T/C	°C	
	USABLE RANGE	CONFORMANCE RANGE
K (CA)	-273.2 – +1470	-150 – +1370
E (CRC)	-273.2 – +1020	-170 – +1000
J (IC)	-273.2 – +1300	-180 – +1200
T (CC)	-273.2 – +500	-170 – +400
B (RH)	20 – 1920	400 – 1760
R	-100 – +1860	200 – 1760
S	-100 – +1860	0 – 1760
C (WRe 5-26)	-50 – +2420	0 – 2315
N	-273.2 – +1400	-130 – +1300
U	-273.2 – +700	-200 – +600
L	-273.2 – +1000	-200 – +900
P (Platinel II)	-50 – +1500	0 – 1395
(PR)	-50 – +1860	0 – 1760
T/C	°F	
	USABLE RANGE	CONFORMANCE RANGE
K (CA)	-460 – +2678	-238 – +2498
E (CRC)	-460 – +1868	-274 – +1832
J (IC)	-460 – +2372	-292 – +2192
T (CC)	-460 – +932	-274 – +752
B (RH)	68 – 3488	752 – 3200
R	-148 – +3380	392 – 3200
S	-148 – +3380	32 – 3200
C (WRe 5-26)	-58 – +4388	32 – 4199
N	-460 – +2552	-202 – +2372
U	-460 – +1292	-328 – +1112
L	-460 – +1832	-328 – +1652
P (Platinel II)	-58 – +2732	32 – 2543
(PR)	-58 – +3380	32 – 3200

Burnout value: Upper 32767, Lower -32768

INSTALLATION

Current consumption: 55 mA

Operating temperature: -10 to +55°C (14 to 131°F)

Storage temperature: -20 to +65°C (-4 to +149°F)

Operating humidity: 10 to 90 %RH (non-condensing)

Atmosphere: No corrosive gas or heavy dust

Mounting: Installation Base (model: R30BS)

Weight: 170 g (0.37 lb)

PERFORMANCE

Conversion accuracy: $\pm 1^\circ\text{C}$ ($\pm 1.8^\circ\text{F}$) except $\pm 2.0^\circ\text{C}$ ($\pm 3.6^\circ\text{F}$) for B, R, S, C, PR

Conversion rate: 250 / 500 msec.

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

Converted data range

°C, K: Engineering unit value x 10 (integer) (Default

setting)

°F: Engineering unit value (integer)

* Scaling of converted data is configurable with the configurator software (model: R30CFG). Refer to the software manual for details.

Data allocation: 4

Cold junction compensation error: $\pm 1.0^\circ\text{C}$ at $25^\circ\text{C} \pm 10^\circ\text{C}$ (R, S, C & PR: $\pm 1.5^\circ\text{C}$, B without CJC)

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

R, S, C & PR; $\pm 0.03 \text{ } \%/^\circ\text{C}$ ($\pm 0.02 \text{ } \%/^\circ\text{F}$)

B: $\pm 0.05 \text{ } \%/^\circ\text{C}$ ($\pm 0.03 \text{ } \%/^\circ\text{F}$)

Input delay time: 50 ms

Burnout response time: ≤ 1 sec.

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

Dielectric strength: 1500 V AC @ 1 minute (input 1 to input 2 to input 3 to input 4 to internal bus or internal power)

1500 V AC @ 1 minute (power input to FE; isolated on the power supply module)

STANDARDS & APPROVALS

EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

EN 50581

CONFIGURATOR SOFTWARE SETTING

With configurator software, settings shown below are available.
Refer to the software manual of R30CFG for detailed operation.

■ CHANNEL INDIVIDUAL SETTING

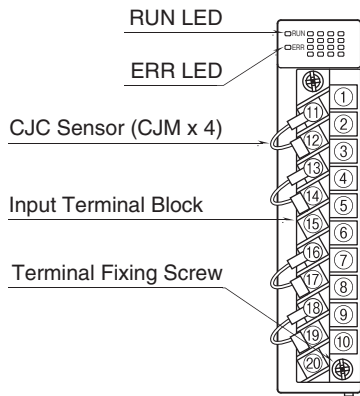
ITEM	USABLE RANGE	DEFAULT SETTING
Unused Setting	CH enabled CH disabled	CH enabled
Input Type	K (CA) E (CRC) J (IC) T (CC) B (RH) R S C (WRe 5-26) N U L P (Platinel II) (PR)	K (CA)
Burnout	Upscale Downscale None	Upscale
CJC	enabled disabled	enabled
Unit	degC degF K	degC
Fine zero adjustment	-320.00 – +320.00 (%)	0.00 (%)
Fine gain adjustment	-3.2000 – +3.2000	1.0000
Zero base	-3 200.0 – +3 200.0 (degC, K) -32 000 – +32 000 (degF)	0.0
Full base	-3 200.0 – +3 200.0 (degC, K) -32 000 – +32 000 (degF)	0.0
Scaled range zero	-32 000 – +32 000	0
Scaled range span	-32 000 – +32 000	10 000

■ CHANNEL BATCH SETTING

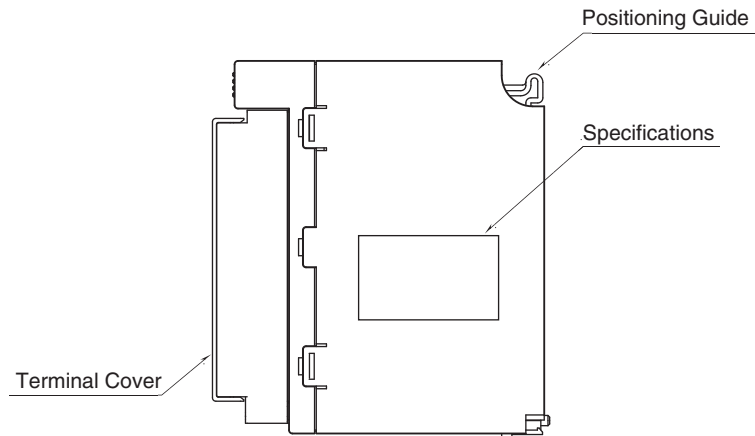
ITEM	USABLE RANGE	DEFAULT SETTING
Conversion Rate	250 ms 500 ms	500 ms
Simulate Input	Normal input Simulated data	Normal input

EXTERNAL VIEW

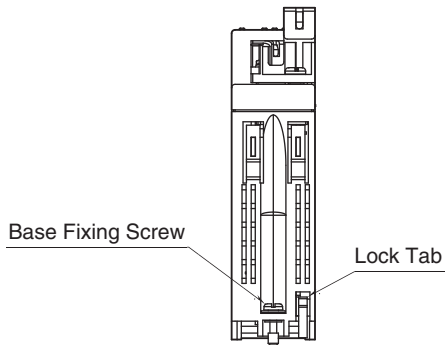
FRONT VIEW



SIDE VIEW



BOTTOM VIEW

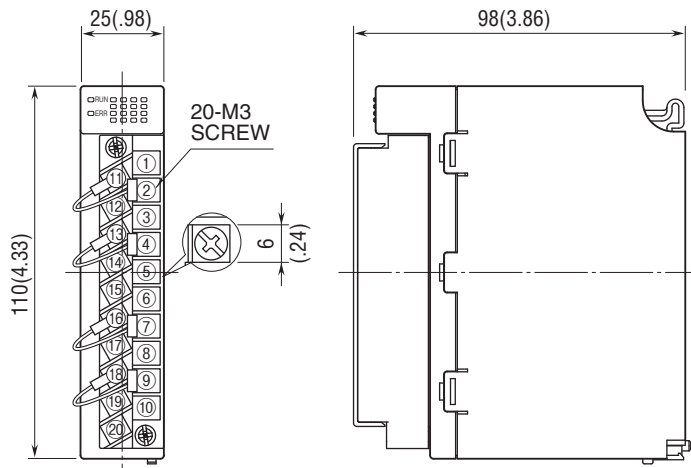


TERMINAL ASSIGNMENTS

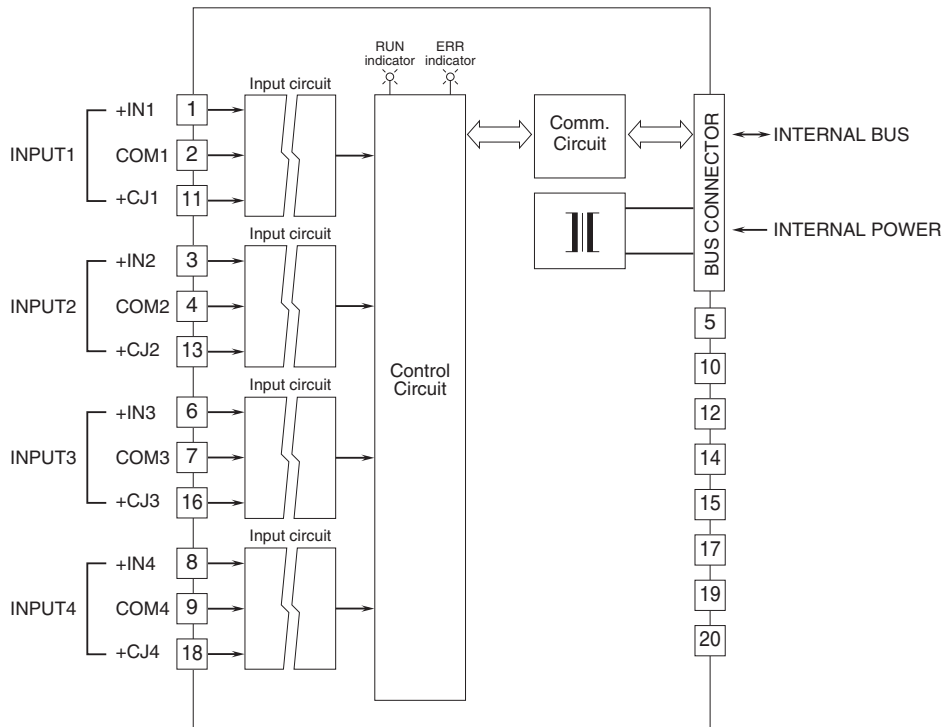
	1
11	+IN1
+CJ1	2
	COM1
12	NC
NC	3
	+IN2
13	+CJ2
	COM2
14	NC
NC	5
15	NC
NC	6
	+IN3
16	+CJ3
	COM3
17	NC
NC	8
	+IN4
18	+CJ4
	COM4
19	NC
NC	10
20	NC
NC	

NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	+IN1	T/C 1	11	+CJ1	CJC 1
2	COM1	Common 1	12	NC	No connection
3	+IN2	T/C 2	13	+CJ2	CJC 2
4	COM2	Common 2	14	NC	No connection
5	NC	No connection	15	NC	No connection
6	+IN3	T/C 3	16	+CJ3	CJC 3
7	COM3	Common 3	17	NC	No connection
8	+IN4	T/C 4	18	+CJ4	CJC 4
9	COM4	Common 4	19	NC	No connection
10	NC	No connection	20	NC	No connection

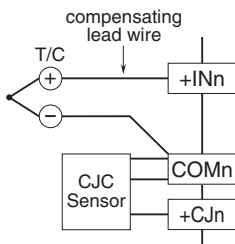
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



■ Input Connection Example





Specifications are subject to change without notice.