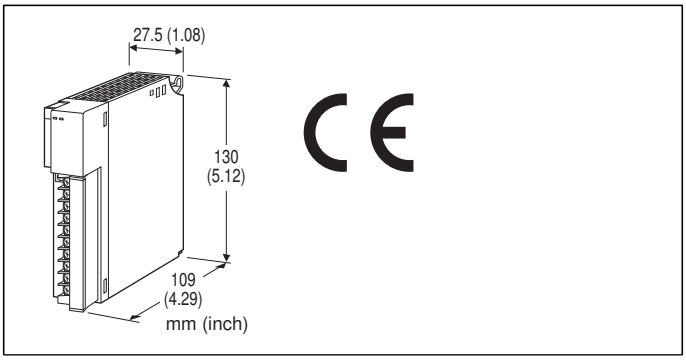
Remote I/O R3 Series

THERMOCOUPLE INPUT ALARM MODULE

(4 points, isolated)



MODEL: R3-AT4[1][2]

ORDERING INFORMATION

• Code number: R3-AT4[1][2]
Specify a code from below for each of [1] and [2].
(e.g. R3-AT4W/CE/Q)
• Specify the specification for option code /Q
(e.g. /C01)

NO. OF CHANNELS

4: 4

[1] COMMUNICATION MODE

S: Single
W: Dual

[2] OPTIONS (multiple selections)

Standards & Approvals
blank: Without CE
/CE: CE marking
Other Options
blank: none
/Q: Option other than the above (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to M-System's web site.)
/C01: Silicone coating
/C02: Polyurethane coating
/C03: Rubber coating

GENERAL SPECIFICATIONS

Connection
Input: M3 separable screw terminal (torque 0.5 N·m)
Internal power: Via the Installation Base (model: R3-BSx)
Screw terminal: Nickel-plated steel
Isolation: Input 1 to input 2 to input 3 to input 4 to internal bus or internal power
Sensor type: Selectable with the side DIP SW
Temperature unit: °C, °F or absolute temperature selectable with the side DIP SW
Conversion rate: Selectable with the side DIP SW
Burnout detection: Upscale or downscale selectable with the side DIP SW
Linearization: Standard
Cold junction compensation: CJC sensor attached to the input terminals
RUN indicator: Bi-color (red/green) LED;
Red when the bus A operates normally;
Green when the bus B operates normally;
Amber when both buses operate normally.
ERR indicator: Bi-color (red/green) LED;
Red with burnout; Green in normal operating conditions.

INPUT SPECIFICATIONS

Input resistance: 30 kΩ min.
Burnout sensing: 0.1 μA

Temperature range

T/C	°C	
	USABLE RANGE	CONFORMANCE RANGE
K (CA)	-272 to +1472	-150 to +1370
E (CRC)	-272 to +1120	-170 to +1000
J (IC)	-260 to +1300	-180 to +1200
T (CC)	-272 to +500	-170 to +400
B (RH)	24 to 1920	400 to 1760
R	-100 to +1860	200 to 1760
S	-100 to +1860	0 to 1760
C (WRe 5-26)	-52 to +2416	0 to 2315
N	-272 to +1400	-130 to +1300
U	-252 to +700	-200 to +600
L	-252 to +1000	-200 to +900
P (Platinel II)	-52 to +1496	0 to 1395
(PR)	-52 to +1860	0 to 1760
T/C	°F	
	USABLE RANGE	CONFORMANCE RANGE
K (CA)	-458 to +2682	-238 to +2498
E (CRC)	-458 to +2048	-274 to +1832
J (IC)	-436 to +2372	-292 to +2192
T (CC)	-458 to +932	-274 to +752
B (RH)	75 to 3488	752 to 3200
R	-148 to +3380	392 to 3200
S	-148 to +3380	32 to 3200
C (WRe 5-26)	-62 to +4381	32 to 4199
N	-458 to +2552	-202 to +2372
U	-422 to +1292	-328 to +1112
L	-422 to +1832	-328 to +1652
P (Platinel II)	-62 to +2725	32 to 2543
(PR)	-62 to +3380	32 to 3200

Max. (upscale) or min. (downscale) value of the usable range when a burnout is detected.

INSTALLATION

Operating temperature: -10 to +55°C (14 to 131°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Atmosphere: No corrosive gas or heavy dust
Mounting: Installation Base (model: R3-BSx)
Weight: 200 g (0.44 lb)

PERFORMANCE

Conversion accuracy: ±1.0°C (±1.8°F) except ±2.0°C (±3.6°F) for B, R, S, C, PR
Conversion rate: 250 msec. or 1 sec. selectable
Data allocation: 1
Current consumption: 70 mA
Cold junction compensation error:
±1.0°C max. (at 25°C ±10°C)
±1.8°F max. (at 77°F ±18°F)
(±1.5°C or ±2.7°F for R, S, PR)
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Burnout response time: ≤ 2 sec.
Insulation resistance: ≥ 100 MΩ 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)
2000 V AC @ 1 minute (power input to FG; 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

ALARM SETTING

The following parameters are programmable using the PC Configurator Software (model: R3CON).

■ALARM TRIP POINT
(-270.0 to +2400.0°C or -454 to +4352°F;
factory set to A1: 400.0°C, A2: 300.0°C, A3: 200.0°C, A4: 100.0°C)
Four alarm setpoints are selectable per each input.

■ALARM TYPE
(High or Low; factory set to A1: High, A2: High, A3: Low, A4: Low)
High or Low alarm is selectable for each alarm trip point.
High alarm: An alarm is set when the input signal goes above the setpoint.
Low alarm: An alarm is set when the input signal goes below the setpoint.

■DEADBAND (HYSTERESIS)
(0.0 to 900.0°C or 0 to 1620°F; factory set to 10.0°C or 100°F)
Deadband (deviation between the points where the alarm is set and reset) is selectable for each alarm trip point.

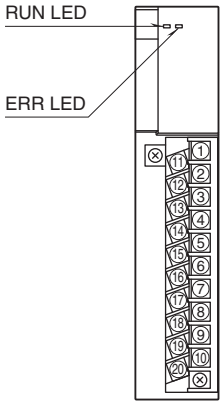
■ALARM ON DELAY TIME
(0.0 to 99.0 seconds; factory set to 1.0)
The alarm output is set when the preset time elapses after the input has entered in the alarm range.
This setting is common to all four points.

■POWER ON DELAY TIME
(0.0 to 99.0 sec.; factory set to 5.0)
The alarm output start functioning in the preset time after the power has been turned on.
This setting is common to all four points.

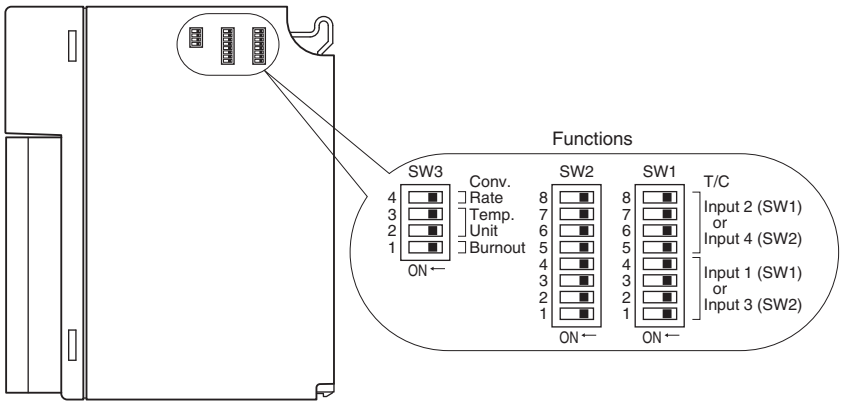
■ALARM HOLD TIME
(0.0 to 99.0 seconds; factory set to 1.0)
The alarm output is held for the preset time even if it is reset in shorter time.
This setting is common to all four points.

EXTERNAL VIEW

■ **FRONT VIEW**

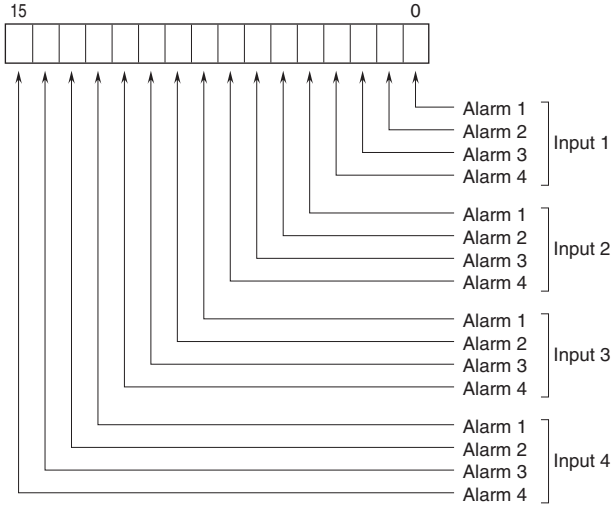


■ **SIDE VIEW**

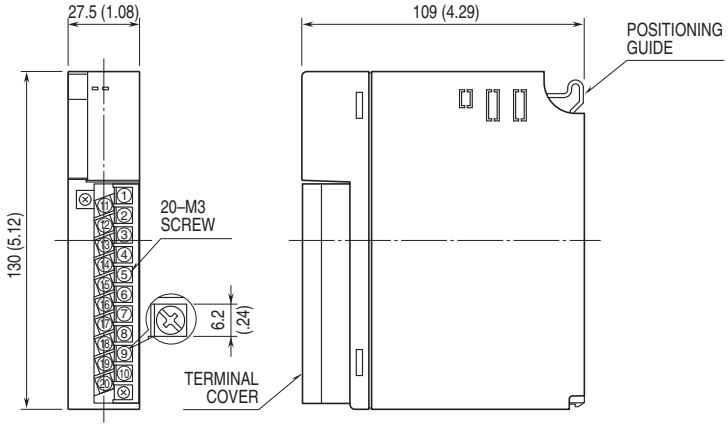


OUTPUT DATA DESCRIPTIONS

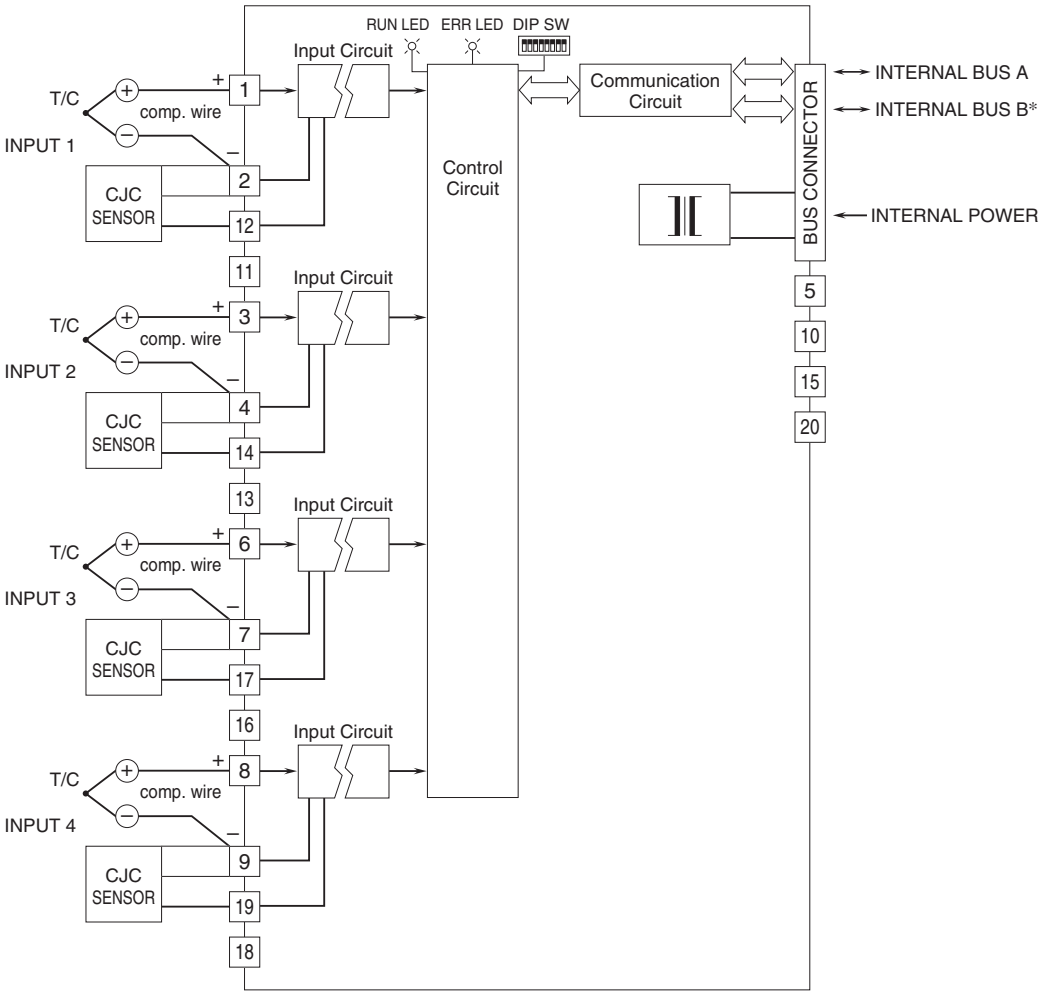
Four alarm setpoints are selectable per each input. One (1) word (16 bit) data is transmitterd to the PLC or the host device via the R3 network module.



EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



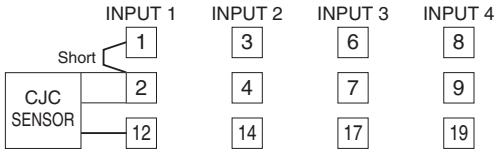
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



*For dual redundant communication.

• Unused Input Channels

Close across the unused input terminals as shown below. (Choose K (CA) thermocouple for unused channels.)



Unused channels left open are equal to the burnout, which turns the red ERR LED on and sets a burnout flag at the PLC or the host device.

Shortcircuiting the terminals means approximate room temperature. An alarm setpoint must be set to a value that does not trip an unwanted alarm.

Unused channels can be specified and set so on the PC Configurator Software (model: R3CON) without needing to short at the field terminals.

⚠ Specifications are subject to change without notice.