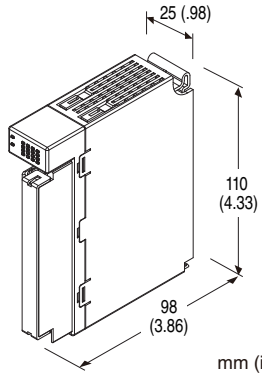
Remote I/O R30 Series

UNIVERSAL INPUT MODULE

(2 points, isolated)

Functions & Features

- 2 points universal input I/O module
- Isolation between the channels
- Input range of each channel is individually adjustable with PC configurator



MODEL: R30US2S[1]

ORDERING INFORMATION

- Code number: R30US2S[1]

Specify a code from below for [1].
(e.g. R30US2S/Q)

- Specify the specification for option code /Q

(e.g. /C01/SET)

NO. OF CHANNELS

2: 2

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-9017)

CAUTION

■ UNUSED INPUT CHANNELS

Set unused channels to "CH disabled" with PC Configurator software (model: R30CFG). Otherwise, unused channels left open are to be lower than -15 % or burnout status, setting a data error at the PLC or other host devices.

RELATED PRODUCTS

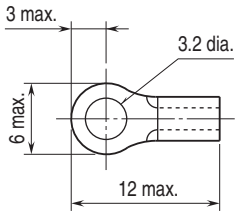
- PC configurator software (model: R30CFG)

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 mm^2
Screw terminal: Nickel-plated steel
Isolation: Input 1 to input 2 to internal bus or internal power
Input type & range: Selectable with PC configurator software (model: R30CFG)
Burnout (T/C, RTD, potentiometer, resistor input): Selectable among upscale, downscale or no burnout with PC configurator software (model: R30CFG)
Linearization (T/C, RTD input): Standard tables stored in memory
Cold junction compensation (T/C): CJC sensor (included) to be 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, 2 points

■ **Universal Input**

Refer to the users manual of R30CFG for setting input type and range

•**DC current input**

Input resistance: Input resistor (49.9 Ω) incorporated
Input range: -20 – +20 mA

•**DC narrow span voltage input range** (-1000 – +1000 mV)

Input resistance: ≥ 100 kΩ

•**DC wide span voltage input range** (-10 – +10 V)

Input resistance: ≥ 1 MΩ

•**Thermocouple input**

Input resistance: ≥ 100 kΩ
Input range: See Table 1
Conformance range: See Table 1

•**RTD input** (2- or 3-wire)

Input sensing: ≤ 0.33 mA
Input range: See Table 1
Maximum leadwire resistance: 20 Ω per wire

•**Potentiometer input**

Input sensing: ≤ 0.33 mA
Input range: 0 – 4000 Ω
Maximum leadwire resistance: 20 Ω per wire

•**Resistor input**

Input sensing: ≤ 0.33 mA
Input range: 0 – 4000 Ω
Maximum leadwire resistance: 20 Ω per wire

INSTALLATION

Current consumption: 45 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: See Table 1.
Conversion rate: ≤ 100 msec.
Converted data range

DC current/voltage, potentiometer or resistor: 0 to 10000 with respect to input range (Default setting)

Thermocouple or RTD:

°C, K: Engineering unit value × 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: 2
Cold junction compensation error (T/C):
±2.0°C at 0 – 50°C (±3.6°F at 32 – 122°F)
(Cold junction compensation is not available for B thermocouple.)
Temp. coefficient: ±0.03 %/°C (±0.02 %/°F)
Input delay time: ≤ 150 ms
Burnout response time (T/C, RTD, potentiometer or resistor input): ≤ 1 s
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 1500 V AC @ 1 minute (Input 1 to Input 2 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

INPUT TYPE, RANGE & CONVERSION ACCURACY

Table 1

INPUT TYPE	INPUT RANGE	CONVERSION ACCURACY
DC Current	-20 – +20 mA DC	±20 µA
DC Voltage	-1000 – +1000 mV DC	When maximum range*2 is 60 mV or less: ±80 µV When maximum range*2 is 120 mV or less: ±150 µV When maximum range*2 exceeds 120 mV: ±1 mV
	-10 – +10 V DC	±10 mV
Potentiometer*3	0 – 4000 Ω	Larger value of either ±0.1 Ω or ±0.1 %
Resistor*3	0 – 4000 Ω	Larger value of either ±0.1 Ω or ±0.1 %

Thermocouple*3	°C			°F		
	Usable range	Conv. accuracy *1	Conformance range	Usable range	Conv. accuracy *1	Conformance range
(PR)	-50 – +1860	±2.0	0 – 1760	-58 – +3380	±3.6	32 – 3200
K (CA)	-273.2 – +1470	±1.0	-150 – +1370	-460 – +2678	±1.8	-238 – +2498
E (CRC)	-273.2 – +1020	±1.0	-170 – +1000	-460 – +1868	±1.8	-274 – +1832
J (IC)	-273.2 – +1300	±1.0	-180 – +1200	-460 – +2372	±1.8	-292 – +2192
T (CC)	-273.2 – +500	±1.0	-170 – +400	-460 – +932	±1.8	-274 – +752
B (RH)	20 – 1920	±2.0	400 – 1760	68 – 3488	±3.6	752 – 3200
R	-100 – +1860	±2.0	200 – 1760	-148 – +3380	±3.6	392 – 3200
S	-100 – +1860	±2.0	0 – 1760	-148 – +3380	±3.6	32 – 3200
C (WRe 5-26)	-50 – +2420	±2.0	0 – 2315	-58 – +4388	±3.6	32 – 4199
N	-273.2 – +1400	±1.0	-130 – +1300	-460 – +2552	±1.8	-202 – +2372
U	-273.2 – +700	±1.0	-200 – +600	-460 – +1292	±1.8	-328 – +1112
L	-273.2 – +1000	±1.0	-200 – +900	-460 – +1832	±1.8	-328 – +1652
P (Platinel II)	-50 – +1500	±1.0	0 – 1395	-58 – +2732	±1.8	32 – 2543
RTD*3	°C			°F		
	Usable range	Conv. accuracy	Conformance range	Usable range	Conv. accuracy	Conformance range
Pt 100 (JIS'97, IEC)	-240 – +950	±1.0	-200 – +850	-400 – +1742	±1.8	-328 – +1562
Pt 500	-240 – +950	±0.5	-200 – +850	-400 – +1742	±0.9	-328 – +1562
Pt 1000	-240 – +950	±0.5	-200 – +850	-400 – +1742	±0.9	-328 – +1562
Pt 50 Ω (JIS'81)	-235 – +750	±2.0	-200 – +649	-391 – +1382	±3.6	-328 – +1200
JPt 100 (JIS'89)	-235 – +610	±1.0	-200 – +510	-391 – +1130	±1.8	-328 – +950
Ni 508.4 Ω	-100 – +330	±0.5	-50 – +200	-148 – +626	±0.9	-58 – +392
Cu 10 @ 25°C	-210 – +350	±3.0	-50 – +250	-346 – +662	±5.4	-58 – +482

*1 Thermocouple: Cold junction compensation error is not included in above figures. Take it into account when cold junction compensation is enabled.

*2 Maximum range: Absolute value of 0% or 100% of the input range, whichever is greater.

*3 Burnout indication (potentiometer, resistor, thermocouple or RTD): upscale burnout (32767), downscale burnout (-32768)

CONFIGURATOR SOFTWARE SETTING

With configurator software, settings shown below are available.

Refer to the software manual of R30CFG for detailed operation.

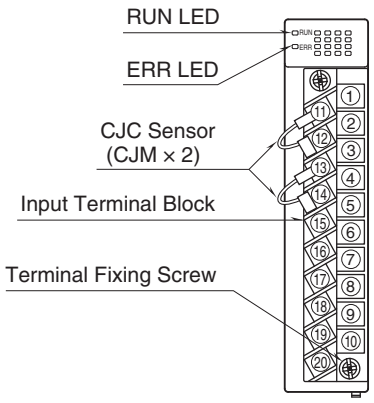
■ **CHANNEL INDIVIDUAL SETTING**

FEATURES	PROGRAMMABLE RANGE	DEFAULT SETTING
Unused Setting	CH enabled CH disabled	CH enabled
Input Type	-10 – +10 V DC -1000 – +1000 mV DC -20 – +20 mA DC POT 0 – 4000 Ohm POT 0 – 2500 Ohm POT 0 – 1200 Ohm POT 0 – 600 Ohm POT 0 – 300 Ohm POT 0 – 150 Ohm OHM 0 – 4000 Ohm RTD Pt 100 RTD Pt 500 RTD Pt 1000 RTD Pt 50 Ω RTD JPt 100 RTD Ni 508.4 Ω RTD Cu 10 TC (PR) TC K TC E TC J TC T TC B TC R TC S TC C TC N TC U TC L TC P	-10 – +10 V DC
Wiring	2-wire 3-wire	–
Burnout	Upscale Downscale None	–
CJC	enabled disabled	–
Unit	degC degF K	–
Fine zero adjustment	-320.00 – +320.00 (%)	0.00 (%)
Fine gain adjustment	-3.2000 – +3.2000	1.0000
Zero base	depends on input types*1	-10.000 V DC
Full base	depends on input types*1	10.000 V DC
Scaled range Zero	-32 000 – +32 000	0
Scaled range Span	-32 000 – +32 000	10 000
First Order Lag filter	0.0, 0.5 – 60.0 sec.	0.0 sec.

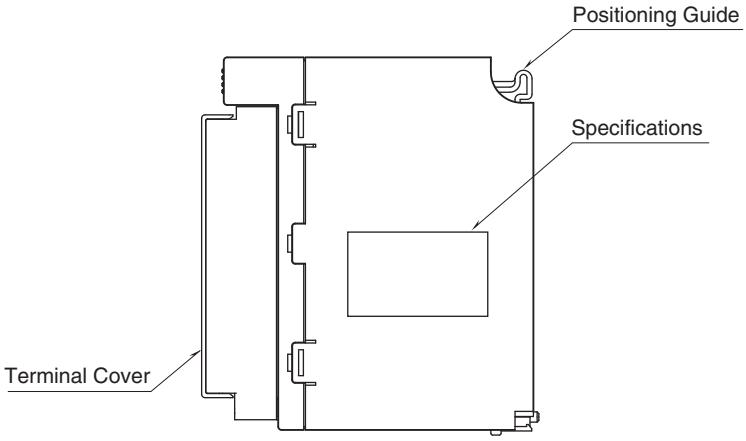
* For details, refer to the users manual of R30CFG .

EXTERNAL VIEW

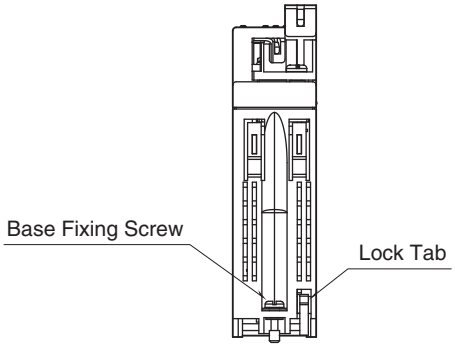
■ **FRONT VIEW**



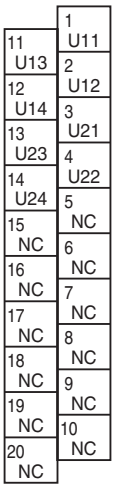
■ **SIDE VIEW**



■ **BOTTOM VIEW**

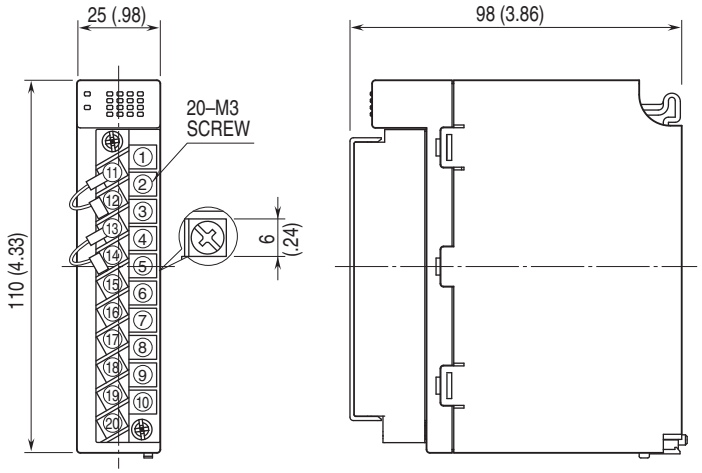


TERMINAL ASSIGNMENTS

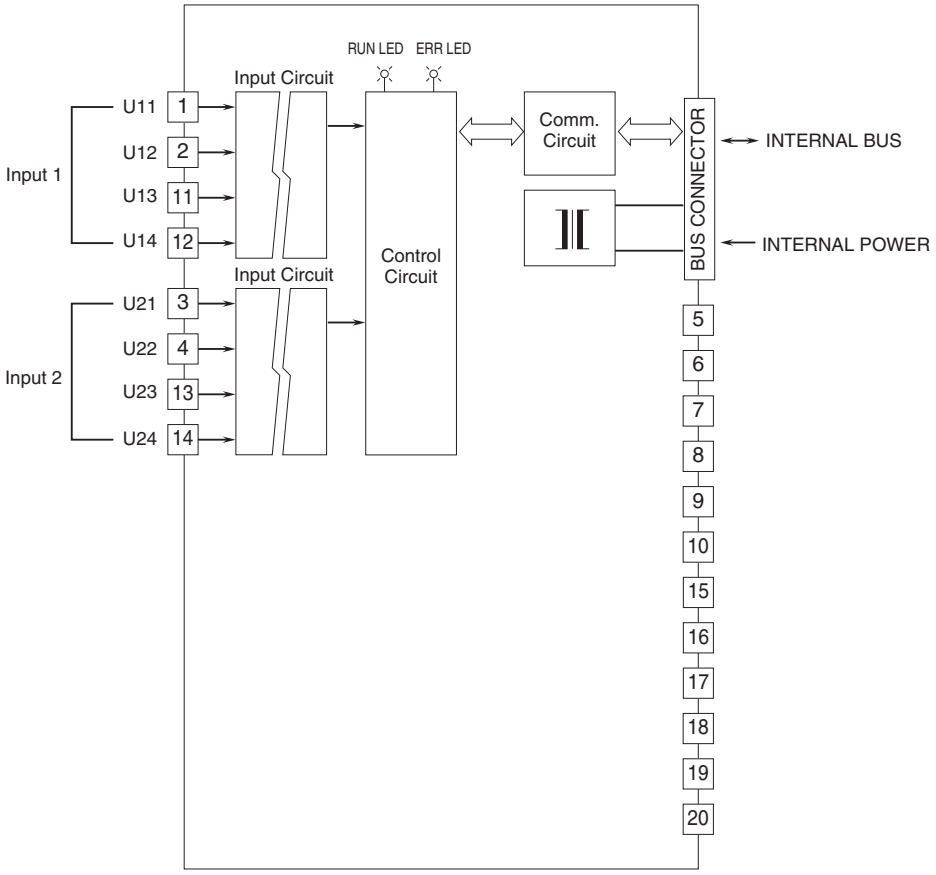


No.	ID	FUNCTION					
		Wide Span Voltage Range / Current	Narrow Span Voltage Range	T/C	RTD / Resistor (3-wire)	RTD / Resistor (2-wire)	Potentiometer
1	U11	Wide Span volt. range / Current 1	–	–	–	–	–
2	U12	–	Narrow Span volt. range 1	T/C 1	RTD 1 – b	–	Input S1
3	U21	Wide Span volt. range / Current 2	–	–	–	–	–
4	U22	–	Narrow Span volt. range 2	T/C 2	RTD 2 – b	–	Input S2
5	NC	No connection					
6	NC	No connection					
7	NC	No connection					
8	NC	No connection					
9	NC	No connection					
10	NC	No connection					
11	U13	–	–	CJM1	RTD 1 – B	RTD 1 – B	Input L1
12	U14	Common 1	Common 1	Common 1	RTD 1 – A	RTD 1 – A	Input H1
13	U23	–	–	CJM2	RTD 2 – B	RTD 2 – B	Input L2
14	U24	Common 2	Common 2	Common 2	RTD 2 – A	RTD 2 – A	Input H2
15	NC	No connection					
16	NC	No connection					
17	NC	No connection					
18	NC	No connection					
19	NC	No connection					
20	NC	No connection					

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)

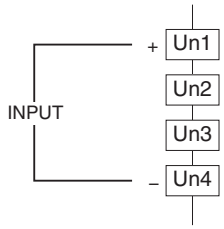


SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

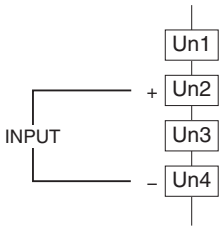


■ **UNIVERSAL INPUT CONNECTION**

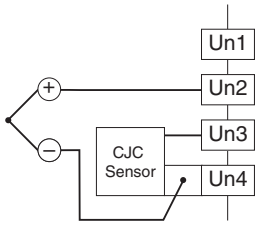
• **DC Voltage** (-10 – +10 V)
• **DC Current** (-20 – +20 mA)



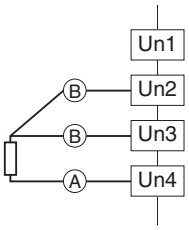
• **DC Voltage** (-1000 – +1000 mV)



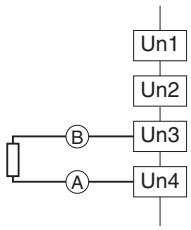
• **Thermocouple**



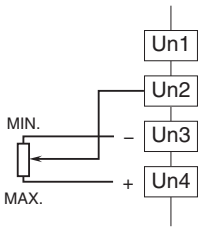
• **RTD or Resistor (3-wire)**



• **RTD or Resistor (2-wire)**



• **Potentiometer**



⚠ Specifications are subject to change without notice.