## Remote I/O R7 Series

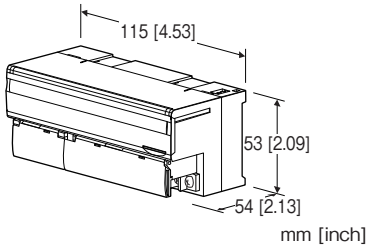
## FLEX NETWORK I/O MODULE

(RTD input, 4 points, isolated)

Functions & Features

• 4 points RTD input module for FLEX NETWORK
• Input sensor type can be selected with the front DIP switches for all channels.
• Easy parameter setting of individual channels with the configurator software

FLEX NETWORK is registered trademark of Digital Electronics Corporation in Japan.




## MODEL: R7FN–RS4-R[1]

## ORDERING INFORMATION

• Code number: R7FN-RS4-R[1]
Specify a code from below for [1].
(e.g. R7FN-RS4-R/Q)
• Specify the specification for option code /Q
(e.g. /C01/SET)

## I/O TYPE

**RS4**: RTD input, 4 points

## POWER INPUT

DC Power
**R**: 24 V DC
(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

## [1] OPTIONS

**blank**: none
**/Q**: Options other than the above (specify the specification)

**SPECIFICATIONS OF OPTION: Q (multiple selections)**

COATING (For the detail, refer to our web site.)
**/C01**: Silicone coating
**/C02**: Polyurethane coating
**/C03**: Rubber coating

EX-FACTORY SETTING
**/SET**: Preset according to the Ordering Information Sheet (No. ESU-7808-RS4)

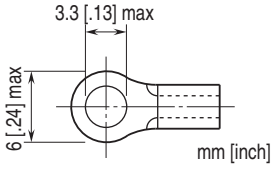
## RELATED PRODUCTS

• PC configurator software (model: R7CON)
The configurator software is downloadable at our web site. A dedicated cable is required to connect the module to the PC. Please refer to the users manual for the PC configurator for applicable cable types.
• Screen editor software (model: GP-Pro EX)
Screen editor software GP-Pro EX (Ver.2.70 or higher) is available.
For versions between 2.60 and 2.70, the driver must be installed. The driver is downloadable at Digital Electronics Corporation's web site. http://www.proface.co.jp/

## GENERAL SPECIFICATIONS

**Connection:** M3 separable screw terminal (torque 0.5 N·m)
**Solderless terminal**: Refer to the drawing at the end of the section.
• **Communication cable**
**Recommended manufacture**: Japan Solderless Terminal MFG.Co.Ltd
**Applicable wire size**: 0.2 to 0.5 $mm^2$ (AWG 26 to 22)
• **Others**
**Recommended manufacture**: Japan solderless terminal MFG.Co.Ltd, Nichifu Co.,ltd
**Applicable wire size**: 0.25 to 1.65 $mm^2$ (AWG 22 to 16)
**Screw terminal**: Nickel-plated steel
**Housing material**: Flame-resistant resin (gray)
**Isolation**: Input 0 to input 1 to input 2 to input 3 to FLEX NETWORK to power to FG
**Zero adjustments**: Configurable via R7CON
**Span adjustments**: Configurable via R7CON
**Conversion rate**: Configurable via R7CON
**Burnout setting**: Selectable between upscale (*) and downscale with the front DIP switch
(*) Factory default setting
**Linearization**: Standard
**RTD Setting**: Selectable with front DIP SW or PC programming.
**Status indicator LED**: PWR, RUN
(Refer to the instruction manual)

■Recommended solderless terminal






MG CO., LTD.
www.mgco.jp

## FLEX NETWORK COMMUNICATION

**Communication configuration**: 1: N
**Connection method**: Multi-drop Connection
**Communication method**: Cyclic Time Division, half-duplex
**Communication I/F**: Differential, pulse transfer isolation
**Error Check**: Format, bit, CRC-12 verification
**Max. Number of Nodes**: 63 (1008 I/O points)
**Required node**: 4
**Network cable**: Pro-face's following cable
FN-CABLE2010-31-MS (10 m)
FN-CABLE2050-31-MS (50 m)
FN-CABLE2200-31-MS (200 m)
**Transmission distance**: 12 Mbps: 100 meters (328 ft)(*)
6 Mbps: 200 meters (656 ft)
(*) Factory default setting
**Station address**: Rotary switch
(Refer to the instruction manual)
**Terminating resistor**: Built-in

## INPUT SPECIFICATIONS

**Input resistance**: ≥ 1 MΩ
**Maximum leadwire resistance**: 100 Ω per wire
**Sensing current**: ≤ 1 mA

| RTD | BURNOUT INDICATION (°C) | | CONFORMANCE |
|---|---|---|---|
| | Downscale | Upscale | RANGE (°C) |
| Pt 100 (JIS '97, IEC) | -240 | +900 | -200 to +850 |
| Pt 100 (JIS '89) | -240 | +900 | -200 to +660 |
| JPt 100 (JIS '89) | -236 | +560 | -200 to +510 |
| Pt 50 Ω (JIS '81) | -236 | +700 | -200 to +649 |
| Ni 100 | -100 | +252 | -80 to +250 |
| Cu 10 @ 25°C | -212 | +312 | -50 to +250 |
| Cu 50 | -100 | +200 | -50 to +150 |

| RTD | BURNOUT INDICATION (°F) | | CONFORMANCE |
|---|---|---|---|
| | Downscale | Upscale | RANGE (°F) |
| Pt 100 (JIS '97, IEC) | -400 | +1652 | -328 to +1562 |
| Pt 100 (JIS '89) | -400 | +1652 | -328 to +1220 |
| JPt 100 (JIS '89) | -393 | +1040 | -328 to +950 |
| Pt 50 Ω (JIS '81) | -393 | +1292 | -328 to +1200 |
| Ni 100 | -148 | +486 | -112 to +482 |
| Cu 10 @ 25°C | -350 | +594 | -58 to +482 |
| Cu 50 | -148 | +392 | -58 to +302 |

## INSTALLATION

**Current consumption**
•**DC**: Approx. 90 mA
**Operating temperature**: -10 to +55°C (14 to 131°F)
**Storage temperature**: -20 to +65°C (-4 to +149°F)
**Operating humidity**: 30 to 90 %RH (non-condensing)
**Atmosphere**: No corrosive gas or heavy dust
**Mounting**: DIN rail (35 mm rail)
**Weight**: 200 g (0.44 lb)

## PERFORMANCE

**Conversion accuracy**: ±1°C (±1°F)
(±3°C [±5.4°F] for Cu 10)
**Conversion rate**: 250 msec. (*) or 500 msec. selectable
(*) Factory default setting
**Converted data range**:
• Engineering unit value (°C, K) × 10 (integer)
• Engineering unit value (°F)
**Temp. coefficient**: ±0.015 %/°C (±0.008 %/°F) of max. span
**Response time**: Conversion rate × 2 + 50 msec. (0 – 90 %)
**Insulation resistance**: ≥ 100 MΩ with 500 V DC
**Dielectric strength**: 1500 V AC @ 1 minute (input 0 to input 1 to inpu 2 to input 3 to FLEX NETWORK to power to FG)

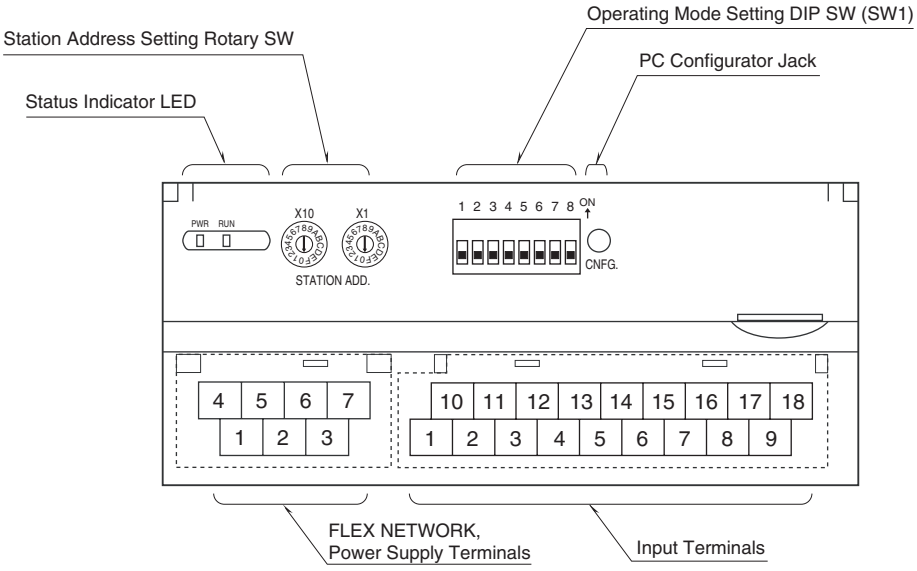
## STANDARDS & APPROVALS

**EU conformity**:
EMC Directive
EMI EN 61000-6-4
EMS EN 61000-6-2
RoHS Directive



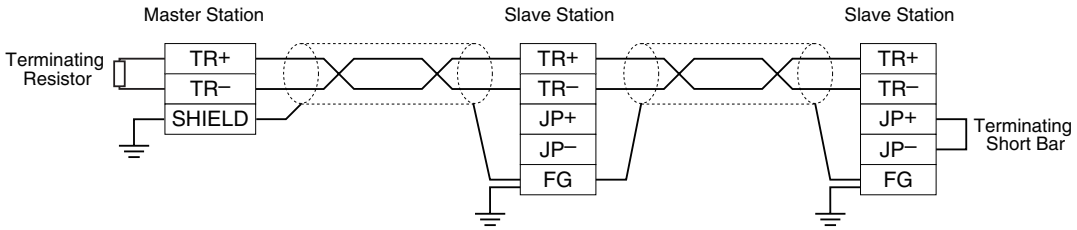
MG CO., LTD.
www.mgco.jp

## EXTERNAL VIEW




## CONNECTION DIAGRAMS

■ **MASTER CONNECTION**




Note: Be sure to use the terminator(s) located at both ends of the modules.

## TERMINAL ASSIGNMENTS

■ INPUT TERMINAL ASSIGNMENT

| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|
| INA0 | INb0 | INA1 | INb1 | NC | INA2 | INb2 | INA3 | INb3 |

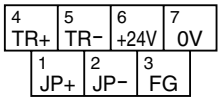
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| NC | INB0 | NC | INB1 | NC | NC | INB2 | NC | INB3 |

| NO. | ID | FUNCTION | NO. | ID | FUNCTION |
|---|---|---|---|---|---|
| 1 | NC | No connection | 10 | INA0 | RTD 0-A |
| 2 | INB0 | RTD 0-B | 11 | INb0 | RTD 0-b |
| 3 | NC | No connection | 12 | INA1 | RTD 1-A |
| 4 | INB1 | RTD 1-B | 13 | INb1 | RTD 1-b |
| 5 | NC | No connection | 14 | NC | No connection |
| 6 | NC | No connection | 15 | INA2 | RTD 2-A |
| 7 | INB2 | RTD 2-B | 16 | INb2 | RTD 2-b |
| 8 | NC | No connection | 17 | INA3 | RTD 3-A |
| 9 | INB3 | RTD 3-B | 18 | INb3 | RTD 3-b |



MG CO., LTD.
www.mgco.jp

### ■ NETWORK, POWER SUPPLY TERMINAL ASSIGNMENT




| NO. | ID | FUNCTION, NOTES |
|---|---|---|
| 1 | JP+ | Terminating resistor |
| 2 | JP– | Terminating resistor |
| 3 | FG | FG |
| 4 | TR+ | Network |
| 5 | TR– | Network |
| 6 | +24V | Power input (24V DC) |
| 7 | 0V | Power input (0V) |

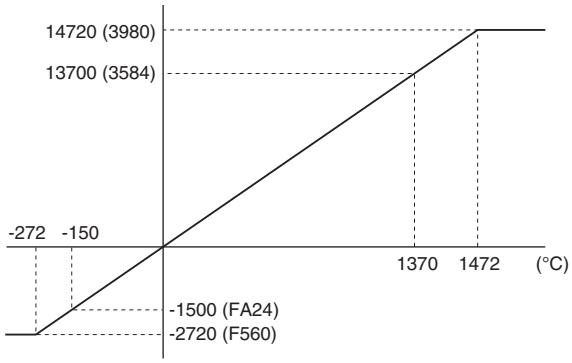
## DATA CONVERSION

### ■ INPUT RANGE AND DATA CONVERSION (FACTORY DEFAULT SETTING)

Engineering unit value °C or K is multiplied by 10 and expressed in 16 bits. °F data is represented in engineering unit value, without multiplication. Negative value is represented in 2's complements.

• Input TYPE K Thermocouple

| Input Value | Converted Data, Decimal | Converted Data, Hex |
|---|---|---|
| ≤ -272°C | -2720 | F560 |
| -150°C | -1500 | FA24 |
| 1370°C | 13700 | 3584 |
| ≥ 1472°C | 14720 | 3980 |



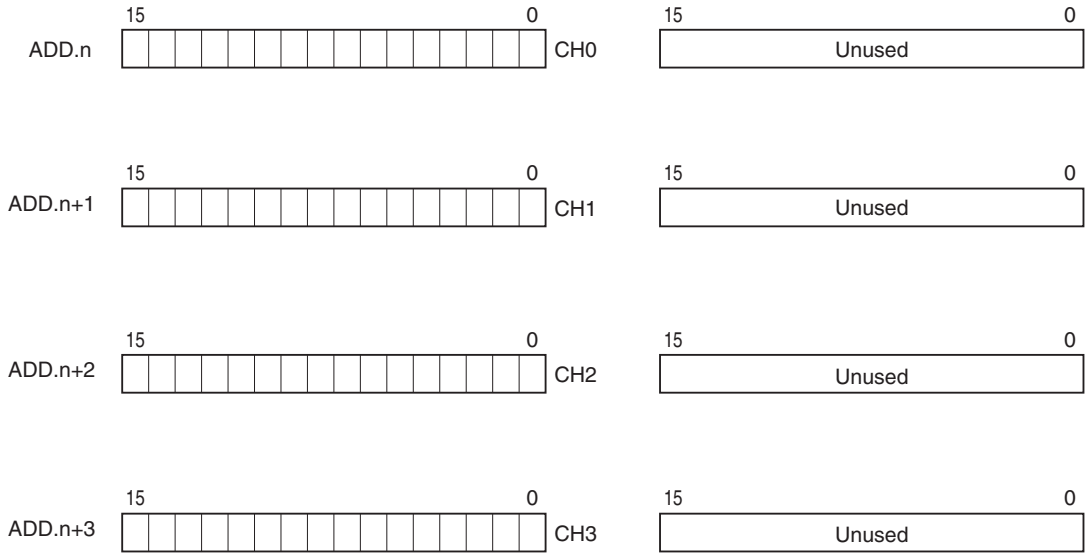



MG CO., LTD.
www.mgco.jp

## I/O DATA DESCRIPTIONS

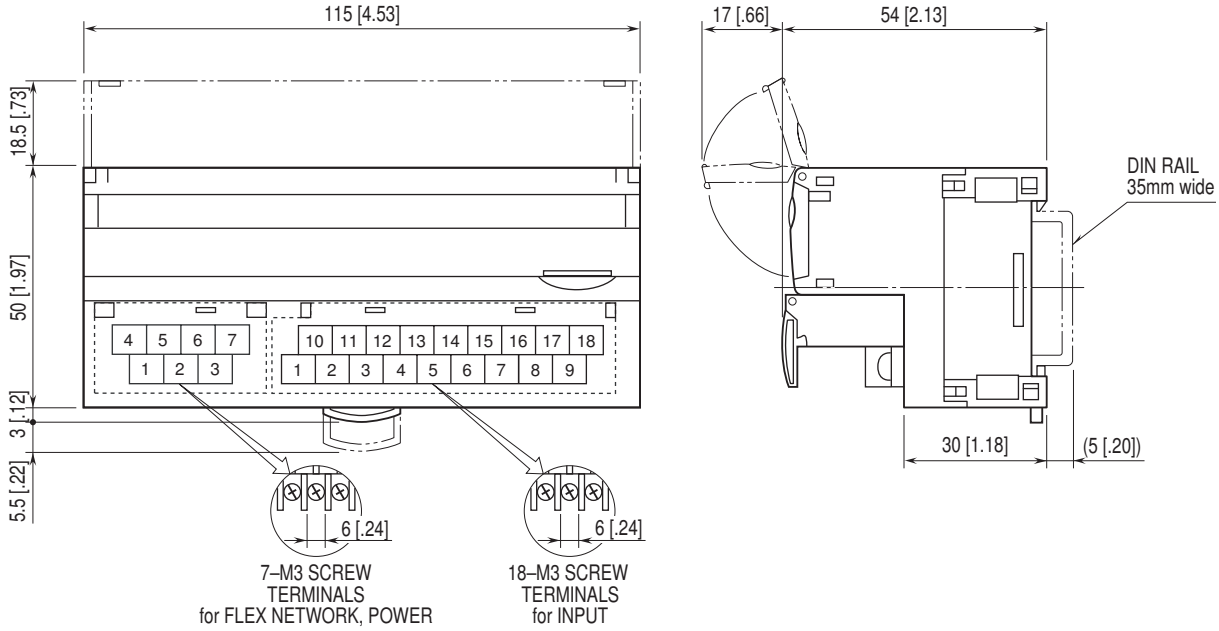
■ **ANALOG INPUT**

**• Di** **• Do**




The data is 16-bit binary.
Negative value is represented in 2's complements.

## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]

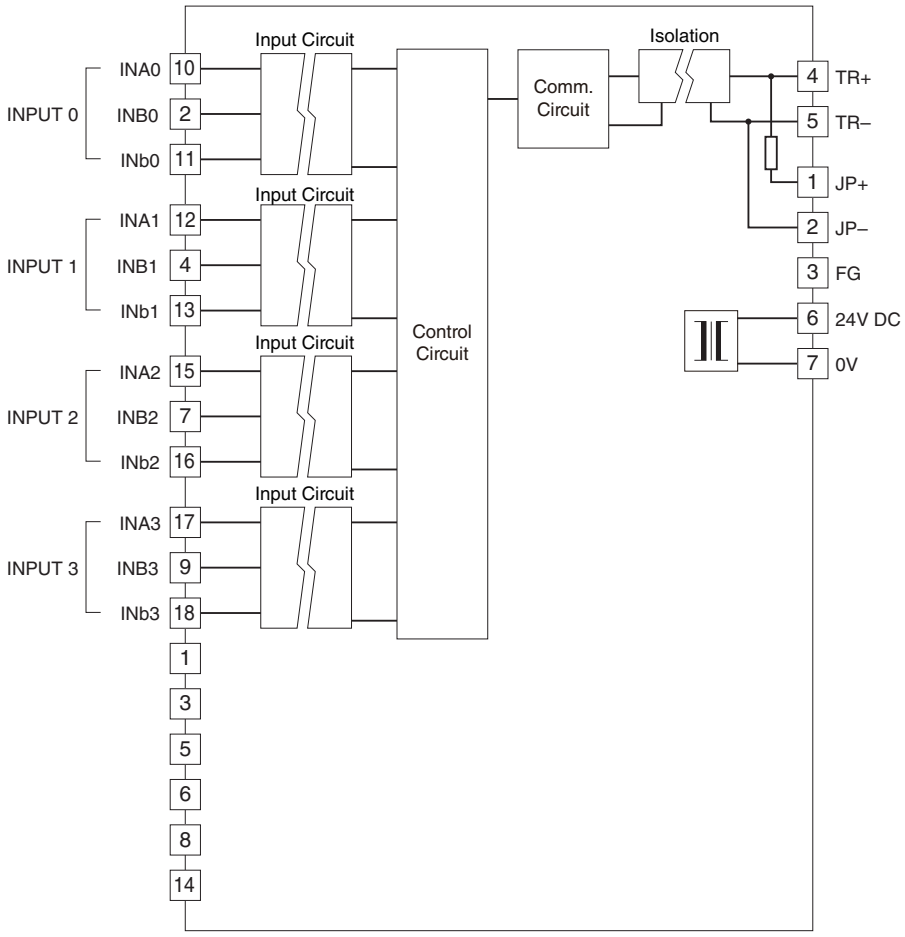




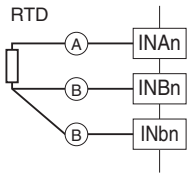

MG CO., LTD.
www.mgco.jp

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

Note: In order to improve EMC performance, bond the FG terminal to ground.
Caution: FG terminal is NOT a protective conductor terminal.




■ **Input Connection Example**




⚠ Specifications are subject to change without notice.



MG CO., LTD.
www.mgco.jp