

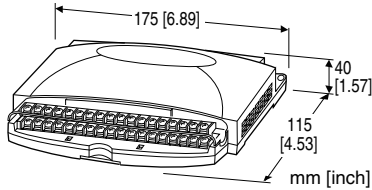
Remote I/O R1M Series

CONTACT I/O MODULE

(4 totalized counter inputs, 8 contact inputs and outputs)

Functions & Features

- Totalized counter inputs
- Counts stored in E²PROM
- Easy system expansion via Modbus RTU



MODEL: R1M-P4T-[1][2]

ORDERING INFORMATION

- Code number: R1M-P4T-[1][2]
- Specify a code from below for each of [1] and [2].
(e.g. R1M-P4T-M2/Q)
- Specify the specification for option code /Q
(e.g. /C01)

FIELD TERMINAL TYPE

T: M3 screw terminals

[1] POWER INPUT

AC Power

M2: 100 - 240 V AC (Operational voltage range 85 - 264 V, 47 - 66 Hz)

DC Power

R: 24 V DC

(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

[2] OPTIONS

blank: none

/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to our web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

RELATED PRODUCTS

- R1X configurator software (model: R1CON)

Downloadable at our web site.

A dedicated cable is required to connect the module to the PC. Please refer to the internet software download site or the users manual for the PC configurator for applicable cable types.

GENERAL SPECIFICATIONS

Connection

Power input, transmission: Euro type connector terminal (Applicable wire size: 0.2 - 2.5 mm² (AWG24 - 12), stripped length 7 mm)

RS-232-C: 9-pin D-sub connector (male)
(Lock screw No. 4-40 UNC)

I/O: M3 screw terminals (torque: 0.6N·m)

Screw terminal: Nickel-plated steel

Housing material: Flame-resistant resin (gray)

Channel selector for the digital display: Rotary DIP switch;

1 thr. 8: ch.1 thr. ch.8 contact input

A thr. D: ch.A thr. ch.D totalized counter input

0, 9, E, F: no display

Isolation: RS-232-C or RS-485 to I/O to power

Node address setting: Rotary switch; 1 - F (15 nodes)

RUN indicator LED: Green light blinks in normal conditions.

Count memory at power loss: Count value is saved in the the non-volatile memory (E²PROM) when the power supply is lost.

Number of rewritable times: 10⁵ times

Data storing characteristics: 10 years at 20°C

■ Indicators

Digital display: 6-digit red LED; 4.6 mm high; Shows either totalized (lower 6 digits only) or momentary value; selectable with internal DIP switch

COMMUNICATION

Baud rate: 38.4 kbps

Communication: Half-duplex, asynchronous, no procedure

Protocol: Modbus RTU

Refer to Modbus Protocol Reference Guide (EM-5650) for supported functions.

■ RS-232-C

Standard: Conforms to RS-232-C, EIA

Transmission distance: 10 meters max.

■ RS-485

Standard: Conforms to TIA/EIA-485-A

Transmission distance: 500 meters max.

Transmission media: Shielded twisted-pair cable (CPEV-S 0.9 dia.)

INPUT SPECIFICATIONS

■ **Totalized Counter Input (high speed):** Dry contact, 4 points

Commons: All negatives

Max. input frequency: 10 kHz

Minimum pulse width: 50 μ sec.

Max. counter value: 999 999 999 (reset to zero at overflow)

Sensing: Approx. 5 V DC (pull-up resistance 22 k Ω); \leq 0.8 V at Lo; \geq 4 V at Hi

Caution: The totalized counter itself can accept frequencies as high as 10 kHz. In order to eliminate unwanted input by chattering, be careful to choose an input device to be free of the problem (e.g. mercury relay).

■ **Contact Input:** Dry contact, 8 points

Commons: All negatives

Sensing: Approx. 5 V DC (pull-up resistance 22 k Ω); \leq 0.8 V at Lo; \geq 4 V at Hi

Sampling rate: 50 msec.

Totalizing counter function

Number of input channels: 8

Max. input frequency: 100 Hz

Minimum pulse width: 5 msec.

Max. counter value: 999 999 999 (reset to zero at overflow)

■ **Counter Reset Input:** Dry contact, 1 point

Commons: All negatives

Sensing: Approx. 5 V DC (pull-up resistance 22 k Ω); \leq 0.8 V at Lo; \geq 4 V at Hi

Sampling rate: 50 msec.

Logic: Enable at pulse edge sinking

OUTPUT SPECIFICATIONS

■ **Contact Output:** Open collector, 8 points

Commons: All negatives

Rating: 24 V DC @ 50 mA (resistive load)

Saturation voltage: 1.6 V DC

For use with inductive loads, external protection of contact and noise quenching is recommended.

Sampling rate: 50 msec.

INSTALLATION

Power consumption

•AC: Approx. 10 VA

•DC: Approx. 7 W

Operating temperature: -5 to +60°C (23 to 140°F)

Operating humidity: 30 to 90 %RH (non-condensing)

Mounting: Surface or DIN rail

Weight: 400 g (0.88 lb)

PERFORMANCE

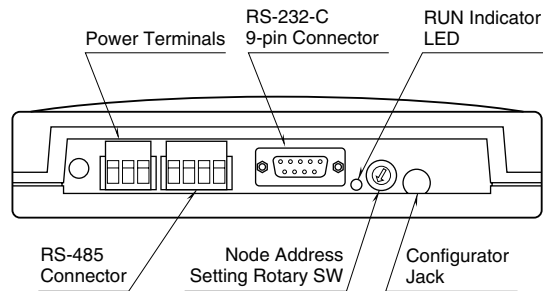
Multi-transmission time: 5 msec.

Insulation resistance: \geq 100 M Ω with 500 V DC

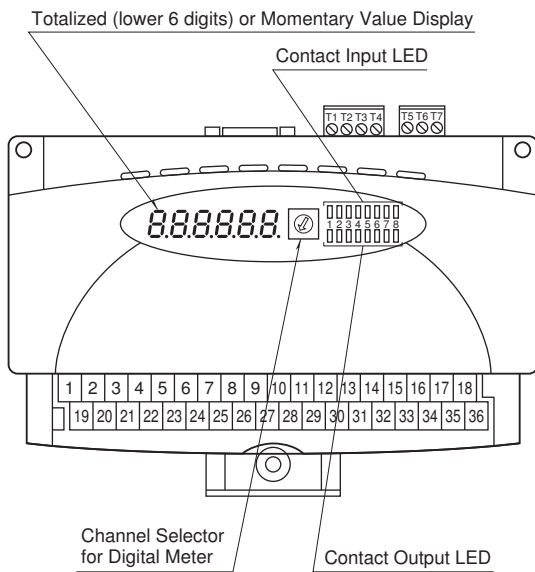
Dielectric strength: 2000 V AC @ 1 minute (RS-232-C or RS-485 to I/O to power to ground)

EXTERNAL VIEW

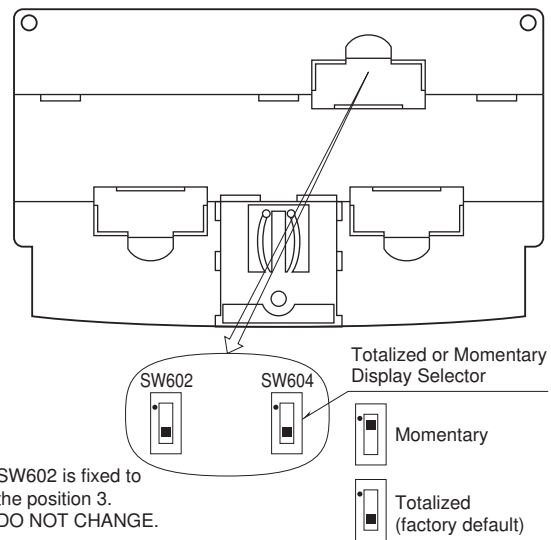
REAR VIEW



TOP VIEW



BOTTOM VIEW

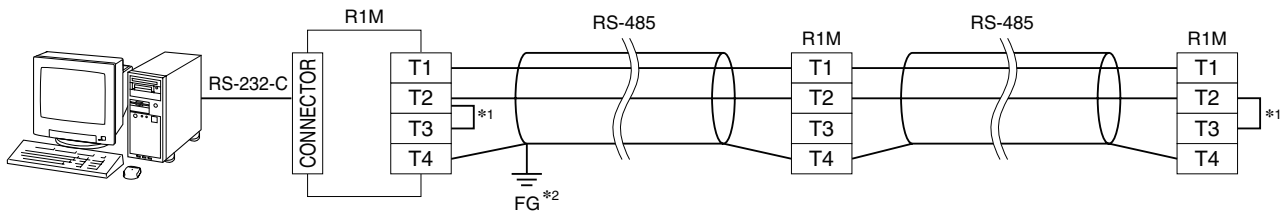


RS-232-C INTERFACE



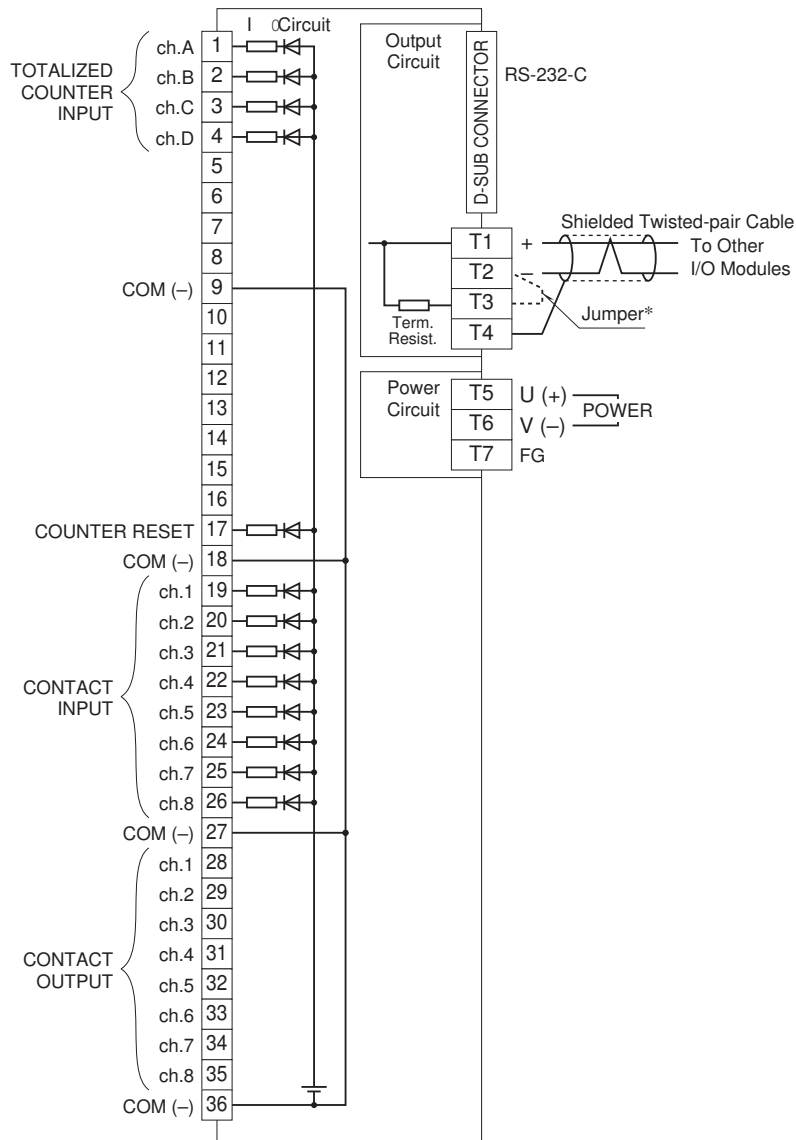
| ABBR. | PIN NO. | EXPLANATION OF FUNCTION |
|---------|---------|--|
| BA (SD) | 2 | Transmitted Data |
| BB (RD) | 3 | Received Data |
| AB (SG) | 5 | Signal Common |
| CB (CS) | 7 | Clear to Send |
| CA (RS) | 8 | Request to Send |
| | 1 | Not Used. |
| | 4 | DO NOT connect. Connecting may cause malfunctions. |
| | 6 | |
| | 9 | |

MODBUS WIRING CONNECTION



- *1. Internal terminating resistor is used when the device is at the end of a transmission line.
- *2. Install shielded cables to all sections and ground them at single point.

CONNECTION DIAGRAM



- * When the device is located at the end of a transmission line via twisted-pair cable, (when there is no cross-wiring), close across the terminal T2 –T3 with the attached jumper pin (or with a leadwire).
When the device is not at the end, remove the jumper pin.

DO NOT CONNECT to the terminals 5 thr. 8 or 10 thr. 16.
Wrong connection may cause failure of the device.

Caution: FG terminal is NOT a protective conductor terminal.

MODBUS COMMUNICATION

■ COMMUNICATION PARAMETERS

| PARAMETER | SPECIFICATION |
|---------------------|------------------------------|
| Data Mode | RTU |
| Baud Rate | 9600 / 19200 / 38400 (*) bps |
| Parity | None / Odd (*) / Even |
| Bit Length | 8 |
| Stop Bit | 1 (*) / 2 |
| Node Address | 1 (*) to 15 |
| Floating Point Data | N/A |
| Interface | RS-232-C/ RS-485 |

(*) Ex-factory setting

■ FUNCTION CODES & SUPPORTED CODES

| CODE | NAME | | |
|------|---------------------------|---|---|
| 01 | Read Coil Status | X | Digital output from the slave |
| 02 | Read Input Status | X | Status of digital inputs to the slave |
| 03 | Read Holding Registers | X | General purpose register within the slave |
| 04 | Read Input Registers | X | Collected data from the field by the slave |
| 05 | Force Single Coil | X | Digital output from the slave |
| 06 | Preset Single Registers | X | General purpose register within the slave |
| 07 | Read Exception Status | | |
| 08 | Diagnostics | | |
| 09 | Program 484 | | |
| 10 | Poll 484 | | |
| 11 | Fetch Comm. Event Counter | | Fetch a status word and an event counter |
| 12 | Fetch Comm. Event Log | | A status word, an event counter, a message count and a field of event bytes |
| 13 | Program Controller | | |
| 14 | Poll Controller | | |
| 15 | Force Multiple Coils | X | Digital output from the slave |
| 16 | Preset Multiple Registers | X | General purpose register within the slave |
| 17 | Report Slave ID | | Slave type / 'RUN' status |
| 18 | Program 884/M84 | | |
| 19 | Reset Comm. Link | | |
| 20 | Read General Reference | | |
| 21 | Write General Reference | | |
| 22 | Mask Write 4X Register | | |
| 23 | Read/Write 4X Register | | |
| 24 | Read FIFO Queue | | |

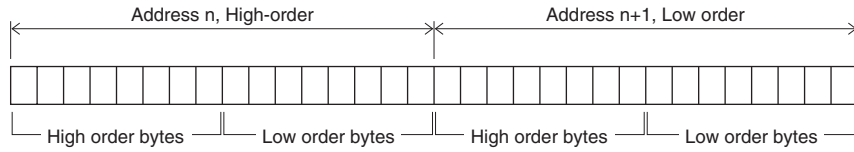
■ DATA ADDRESS

| | ADDRESS | DATA FORMAT | NAME |
|-----------------------|-----------|-------------|---------------------------------|
| Coil (0X) | 1 – 8 | bit | DO |
| | 49 | bit | All counters reset |
| | 50 | bit | Pulse logic to count |
| Input Status (1X) | 1 – 8 | bit | DI |
| Input Register (3X) | 1 – 16 | UL | Totalized count (ch.1 – 8) |
| | 17 – 24 | UL | Totalized count (ch.A – D) |
| | 33 – 40 | UI | Momentary value (ch.1 – 8) |
| | 41 – 44 | UI | Momentary value (ch.A – D) |
| | 513 | I | System status |
| | 514 – 521 | B16 | Model No. ("R1M-x") |
| | 522 – 529 | B16 | Serial No. |
| | 530 – 537 | B16 | Hardware version No. |
| Holding Register (4X) | 538 – 545 | B16 | Firmware version No. |
| | 1 – 16 | UL | Counter preset value (ch.1 – 8) |
| | 17 – 24 | UL | Counter preset value (ch.A – D) |

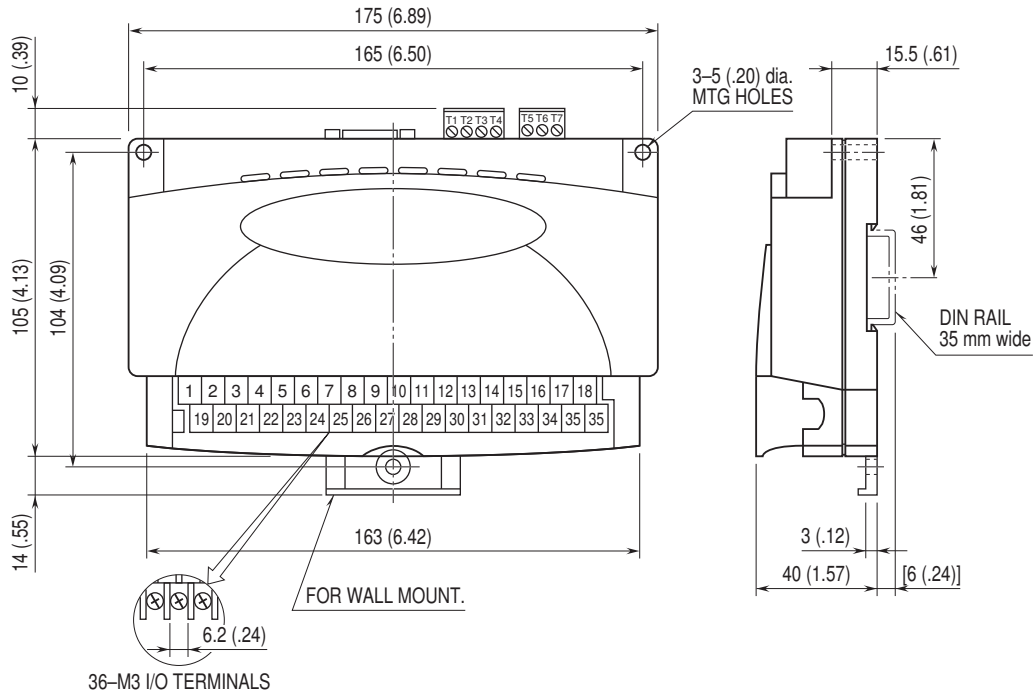
bit = 1 bit, UL = 32-bit integer, I = signed 16-bit integer, UI = 16-bit integer, B16 = 16-byte character

INPUT DATA

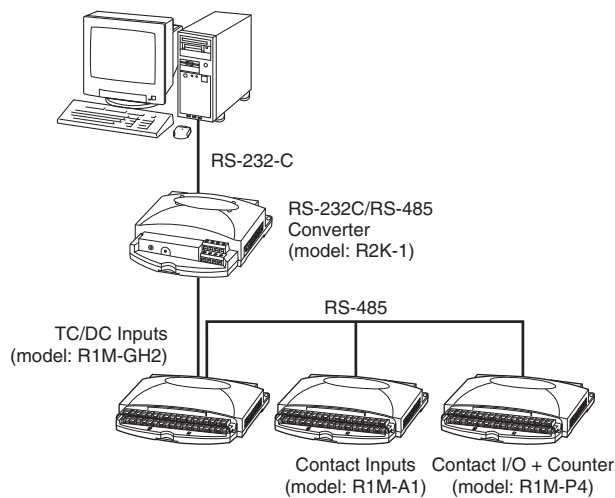
- 32-bit Integer, No sign



EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



SYSTEM CONFIGURATION EXAMPLES



When the cable distance between the PC and the R1Ms is long, insert an RS-232-C/RS-485 Converter for isolation.



Specifications are subject to change without notice.