| Remote I/O R1M Series |
| :---: |
| CONTACT I/O MODULE |
| (4 totalized counter inputs, 8 contact inputs and outputs) |

## model R1M-P4

## MODEL \& SUFFIX CODE SELECTION

MODEL
Modbus protocol
I/O TYPE
P4 : 4 totalized counter inputs, 8 contact inputs and outputs
FIELD TERMINAL TYPE
T : M3 screw terminals
POWER INPUT
M2: 100-240V AC
R : 24V DC

## ORDERING INFORMATION

Specify code number. (e.g. R1M-P4T-M2)

## RELATED PRODUCTS

- R1X configurator software (model: R1CON) Downl oadable at M-System's web site: http://www.m-system.co.jp
- PC configurator cable (model: MCN-CON)


## GENERAL SPECIFICATIONS

## Connection

Power input, transmission: Terminal block
RS-232C: 9-pin D-sub connector (male)
I/O: M3 screw terminals
Isolation: RS-232C or RS-485 to I/O to power Address setting: Rotary switch; 1 - F (15 nodes)
Count memory at power loss: Count value is saved in the the non-volatile memory ( $E^{2}$ PROM) when the power supply is lost.
Number of rewritable times: $10^{5}$ times
Data storing characteristics: 10 years at $20^{\circ} \mathrm{C}$

■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
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
Contact I/O LEDs: Show each contact I/O status (ch. 1 thr. ch.8)


## Functions \& Features

- 8-point contact I/O plus 3 totalized counter input
- E asy system expansion via Modbus RTU


## COMMUNICATION SPECIFICATIONS

Baud rate: 38.4 kbps
Communication: Half-duplex, asynchronous, no
procedure
Protocol: Modbus RTU
Refer to M odbus Protocol Reference Guide (EM5650) for supported functions.

RS-232C
Standard: Conforms to RS-232C, EIA
Transmission distance: 10 meters max.

## ■RS-485

Standard: Conforms to RS-485, EIA
Transmission distance: 500 meters max.
Transmission media: Shielded twisted-pair cable (CPEV-S 0.9 dia.)

## INPUT \& OUTPUT

■TOTALIZED COUNTER INPUT: (hardware) Dry contact, 4 points
Commons: All negatives
Max. input frequency: 10 kHz
Minimum pulse width: 50 usec .
Max. counter value: 999,999,999 (reset to zero at overflow)
Sensing: Approx. 5V DC (pull-up resistance 22k $\Omega$ ) $\leq 0.5 \mathrm{~V}$ at Lo $\geq 4 \mathrm{~V}$ 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. 5V DC (pull-up resistance 22k $\Omega$ ) $\leq 0.5 \mathrm{~V}$ at Lo $\geq 4 \mathrm{~V}$ at Hi
Sampling rate: 50 millisec.
Totalizing counter function
Number of input channels: 8
Max. input frequency: 100 Hz
Minimum pulse width: 5 millisec.
Max. counter value: 999,999,999 (reset to zero at overflow)

■COUNTER RESET INPUT: Dry contact, 1 point
Commons: All negatives
Sensing: Approx. 5V DC (pull-up resistance $22 \mathrm{k} \Omega$ ) $\leq 0.5 \mathrm{~V}$ at Lo $\geq 4 \mathrm{~V}$ at Hi
Sampling rate: 50 millisec.
Logic: Enable at pulse rising

■CONTACT OUTPUT: Open collector, 8 points
Commons: All negatives
Rating: $\quad 24 \mathrm{~V}$ DC @ 0 mA (resistive load)
Saturation voltage: 1.6V DC
For use with inductive loads, external protection of contact and noise quenching is recommended.
Sampling rate: 50 millisec.

## INSTALLATION

## Power input

AC: Operational voltage range $85-264 \mathrm{~V}$; 47 - 66 Hz, approx. 10VA
DC: Operational voltage range $24 \mathrm{~V} \pm 10 \%$; ripple 10\% p-p max., approx. 7W
Operating temperature: -5 to $+60^{\circ} \mathrm{C}\left(23\right.$ to $\left.+140^{\circ} \mathrm{F}\right)$
Operating humidity: 30 to $90 \%$ RH (non-condensing)
Mounting: Surface or DIN rail
Dimensions: W175×H 115×D40 mm
(6.89" $\times 4.53$ " $\times 1.57$ ")

Weight: $\quad 400 \mathrm{~g}(0.88 \mathrm{lbs})$

## PERFORMANCE

Totalized counter memorized: F or 1 month assured Multi-transmission time: 5 millisec
Insulation resistance: $\geq 100 \mathrm{M} \Omega$ with 500 V DC
Dielectric strength: 2000V AC @1 minute (RS-232C or RS-485 to I/O to power to ground)

## CTOP VIEW

Totalized (lower 6 digits) or Momentary Value Display


## nREAR VIEW



■BOTTOM VIEW


■RS-232C INTERFACE


## 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.

## EXTERNAL DIMENSIONS \& TERMINAL ASSIGNMENTS mm (inch)



## SYSTEM CONFIGURATION EXAMPLE



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

MODBUS COMMUNICATION
■COMMUNICATION PARAMETERS

| PARAMETER | R1M SERIES | R2M SERIES |
| :---: | :---: | :---: |
| Data M ode | RTU | RTU |
| Baud Rate | $9600 / 19200 / 38400(*) \mathrm{bps}$ | $9600 / 19200 / 38400\left(^{*}\right) \mathrm{bps}$ |
| Parity | None / Odd $\left(^{*}\right) /$ Even | None / Odd $\left(^{*}\right) /$ Even |
| Bit Length | 8 | 8 |
| Stop Bit | $\left.1 ~^{*}\right) / 2$ | 1 |
| Node Address | $1\left(^{*}\right)$ to 15 | $1\left(^{*}\right)$ to 15 |
| Floating Point Data | N/A | Normal (*)/Swapped |
| Interface | RS-232C /RS-485 | RS-232C |

(*) Ex-factory setting
■FUNCTION CODES \& SUPPORTED CODES

| CODE | NAME | RxM |  |
| :---: | :--- | :---: | :--- |
| 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 | Collected data from the field by the slave |  |
| 05 | Force Single Coil | X | Digital output from the slave |
| 06 | Preset Single Registers | General purpose register within the slave |  |
| 07 | Read Exception Status |  |  |
| 08 | Diagnostics |  |  |
| 09 | Program 484 |  |  |
| 10 | Poll 484 |  |  |
| 11 | Fetch Comm. Event Counter |  |  |
| 12 | Fetch Comm. Event Log status word, an event counter, a message count and a field |  |  |
| 13 | Program Controller |  |  |
| 14 | Poll Controller |  |  |
| 15 | Force Multiple Coils |  |  |
| 16 | Preset Multiple Registers |  |  |
| 17 | Report Slave ID |  |  |
| 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 ADDRESSES

|  | ADDRESS | TYPE |  | NAME |
| :---: | :---: | :---: | :---: | :---: |
|  |  | P4 | FORMAT | NAME |
| Coil (0X) | 1-8 | Y | bit | DO |
|  | 49 | Y | bit | All counters reset |
|  | 50 | Y | bit | Pulse logic to count |
| Input Status(1X) | 1-8 | Y | bit | DI |
|  | 9-32 | --- | bit | DI |
| Input Register (3X) | 1-16 | Y | UL | Totalized count (software) |
|  | 17-24 | Y | UL | Totalized count (hardware) |
|  | 25-32 | --- | UL | Totalized count |
|  | 33-40 | Y | UI | Momentary value (software) |
|  | 41-44 | Y | UI | Momentary value (hardware) |
|  | 513 | Y | I | System status |
|  | 514-521 | Y | B16 | Model No. ("R1M-x") |
|  | 522-529 | Y | B16 | Serial No. |
|  | 530-537 | Y | B16 | Hardware version No. |
|  | 538-545 | Y | B16 | Firmware version No. |
| Holding Register(4X) | 1-16 | Y | UL | Counter preset value (software) |
|  | 17-24 | Y | UL | Counter preset value (hardware) |
|  | 25-32 | --- | UL | Counter preset value |

$\mathrm{UL}=32$-bit integer, $\mathrm{I}=$ signed 16 -bit integer, $\mathrm{UI}=16$-bit integer, $\mathrm{B} 16=16$-byte character

