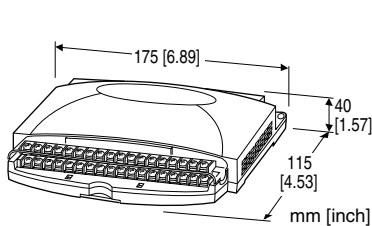## PC Recorders R1M Series

PC RECORDER

(thermocouple or DC input, 16 points)

Functions & Features
• Industrial recorder on PC
• 16-point thermocouple or DC inputs
• Easy system expansion via Modbus RTU
• Recorded data exportable to spreadsheet applications

175 [6.89]
40 [1.57]
115 [4.53]
mm [inch]

CE

MODEL: R1M-GH2T-[1][2]

ORDERING INFORMATION
• Code number: R1M-GH2T-[1][2]
Specify a code from below for each of [1] and [2].
  (e.g. R1M-GH2T-M2/MSR/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 (multiple selections)
PC Recorder Software Package (must be specified)
/MSR: With
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

RELATED PRODUCTS
• Resistor module (model: REM3-250)

PACKAGE INCLUDES...
• PC Recorder Software CD
• 9-pin D-sub connector, straight type (1 m or 3.3 ft)

GENERAL SPECIFICATIONS
Connection
  Power input, transmission: Euro type connector terminal (Applicable wire size: 0.2 – 2.5 mm^2 (AWG24 – 12), stripped length 7 mm)
  RS-232-C: 9-pin D-sub connector (male) (Lock screw No. 4-40 UNC)
  Input: M3 screw terminals (torque: 0.6N·m)
Screw terminal: Nickel-plated steel
Housing material: Flame-resistant resin (gray)
Isolation: Input to RS-232-C or RS-485 to power
Node address setting: Rotary switch; 1 – F (15 nodes)
RUN indicator LED: Green light blinks in normal conditions.

COMMUNICATION
Baud rate: 38.4 kbps
Communication: Half-duplex, asynchronous, no procedure
Protocol: Modbus RTU
■ **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

Input: Thermocouple or DC input, 16 points
(Common negative for DC input)
Measuring Range:
  ±20 V, ±5 V, ±1 V, ±0.8 V, ±0.2 V, ±50 mV, ±10 mV
Input resistance: 300 kΩ
Thermocouple types: PR, K, E, J, T, B, R, S, C, N, U, L, P
Sampling rate: 100 millisec./16 points
50 millisec./8 points
• **Trigger input**: Dry contact; ON detected at ≤1.5 V
Sensing: Approx. 5 V DC @ 1 mA

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 (% of measuring range)

Accuracy
DC input: ±0.3 %
Thermocouple input: See the table on the end of this section.
Cold junction compensation error: ±3°C or ±5.4°F max.
(at 20°C ±10°C or 68°F ±18°F)
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
±0.05 %/°C (±0.03 %/°F) for 10 mV range and T/C B (RH)
Response time: Approx. 0.1 sec. (0 – 90 %)
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 2000 V AC @ 1 minute (input to RS-232-C or RS-485 to power to FG)

Thermocouple Accuracy

T/C	USABLE RANGE (°C)	ACCURACY (%)	CONFORMANCE RANGE (°C)
(PR)	0 to 1770	±0.5	400 to 1770
K (CA)	-270 to +1370	±0.3	0 to 1370
E (CRC)	-270 to +1000	±0.7	0 to 1000
J (IC)	-210 to +1200	±0.7	0 to 1200
T (CC)	-270 to +400	±1.0	0 to 400
B (RH)	100 to 1820	±0.7	700 to 1820
R	-50 to +1760	±0.7	400 to 1760
S	-50 to +1760	±0.7	400 to 1760
C (WRe 5-26)	0 to 2320	±0.7	0 to 2320
N	-270 to +1300	±0.5	0 to 1300
U	-200 to +600	±0.5	0 to 600
L	-200 to +900	±0.3	0 to 900
P (Platinel II)	0 to 1395	±0.5	0 to 1395

T/C	USABLE RANGE (°F)	ACCURACY (%)	CONFORMANCE RANGE (°F)
(PR)	32 to 3218	±0.5	752 to 3218
K (CA)	-454 to +2498	±0.3	32 to 2498
E (CRC)	-454 to +1832	±0.7	32 to 1832
J (IC)	-346 to +2192	±0.7	32 to 2192
T (CC)	-454 to +752	±1.0	32 to 752
B (RH)	212 to 3308	±0.7	1292 to 3308
R	-58 to +3200	±0.7	752 to 3200
S	-58 to +3200	±0.7	752 to 3200
C (WRe 5-26)	32 to 4208	±0.7	32 to 4208
N	-454 to +2372	±0.5	32 to 2372
U	-328 to +1112	±0.5	32 to 1112
L	-328 to +1652	±0.3	32 to 1652
P (Platinel II)	32 to 1395	±0.5	32 to 1395

Note: CJC error is not included.

STANDARDS & APPROVALS

EU conformity:
EMC Directive
  EMI EN 61000-6-4
  EMS EN 61000-6-2
Low Voltage Directive
  EN 61010-1
  Installation Category II
  Pollution Degree 2
  Input or RS-232-C/RS-485 to power: Reinforced insulation (300 V)
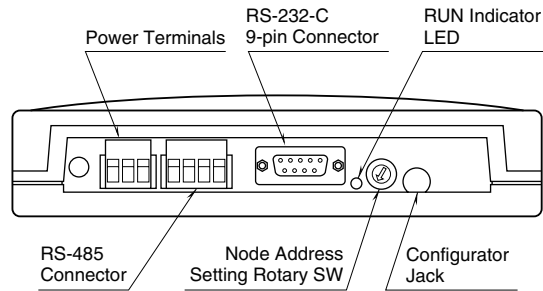 Input to RS-232-C/RS-485: Basic insulation (300 V)
RoHS Directive

PC RECORDER SOFTWARE

PC Recorder Software Package (model: MSRPAC-2010) is included with purchases of this model.

Refer to the MSRPAC-2010 data sheet for the contents of the package and the requirements for the PC to be prepared by the user.
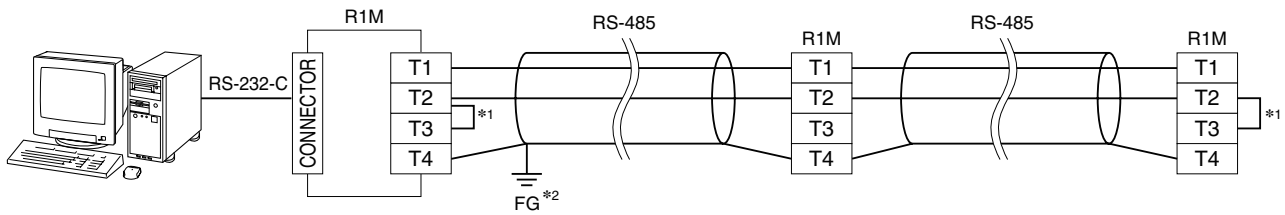
EXTERNAL VIEW

■ **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
	6	cause malfunctions.
	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

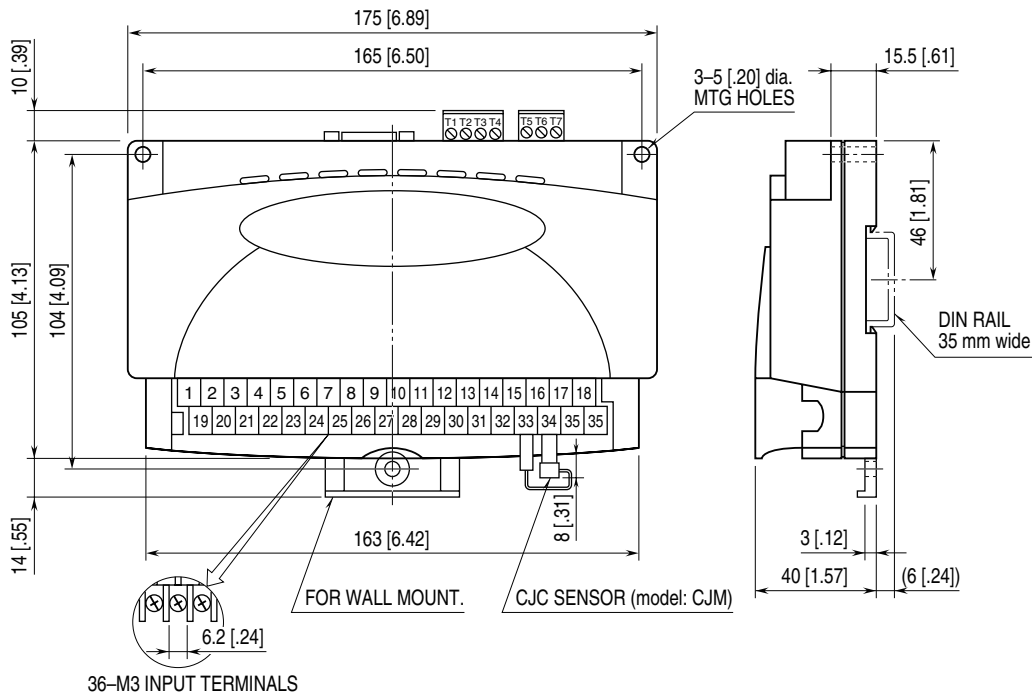Note: In order to improve EMC performance, bond the FG terminal to ground.

Caution: FG terminal is NOT a protective conductor terminal.
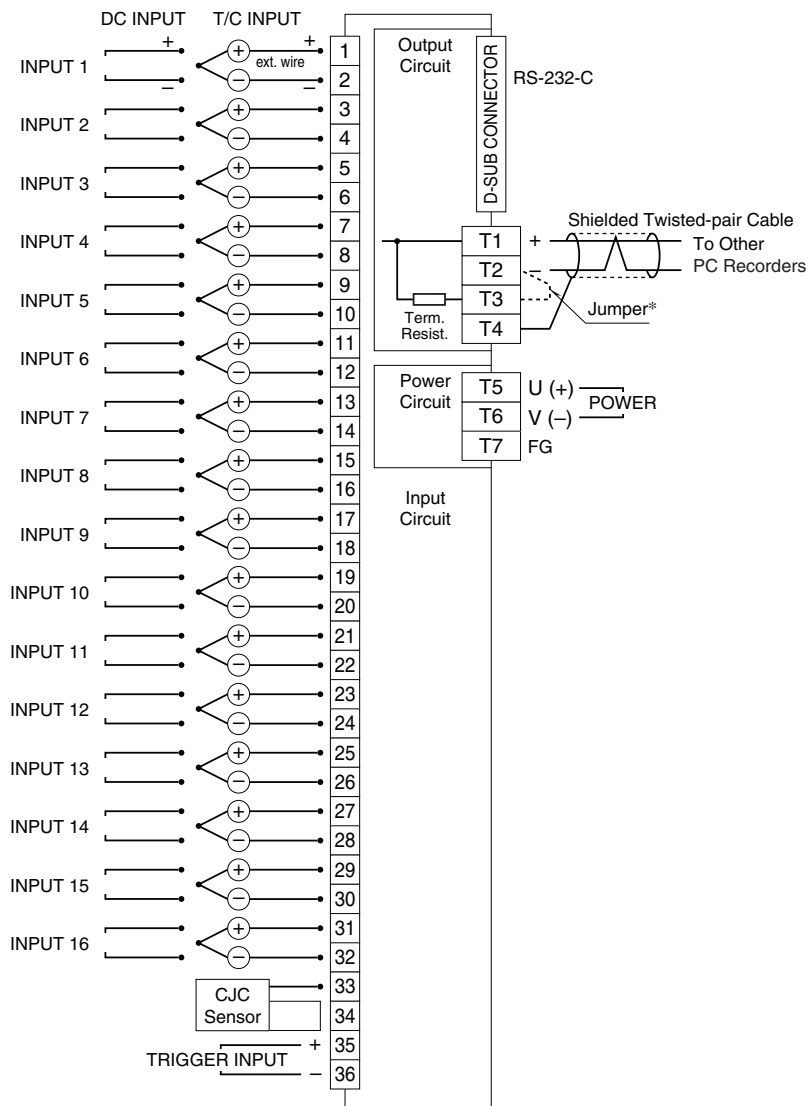
* When the device is located at the end of a transmission line via twisted-pair cable,
(when there is no cross-wiring), close across the terminal T2 – T3 with the attached
jumper pin (or with a leadwire).
When the device is not at the end, remove the jumper pin.
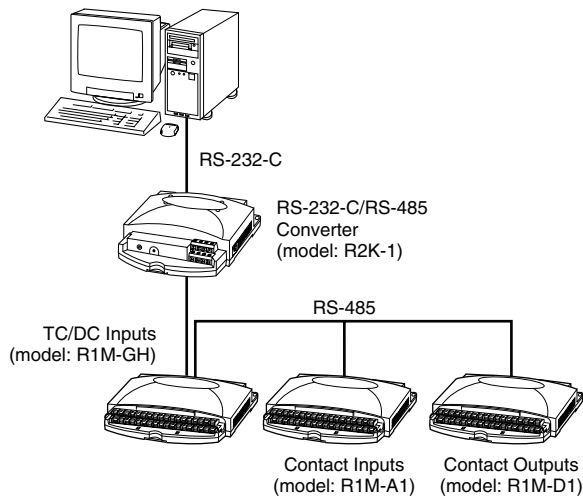
Note 1: This device is not designed to cancel noise included in the input signals.
Be careful to eliminate such noise by using shielded cables.
Note 2: Be sure to maintain the same potential at all the common negative
terminals for DC input.

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS   unit: mm [inch]

175 [6.89]
165 [6.50]
10 [.39]
15.5 [.61]
3–5 [.20] dia. MTG HOLES
T1 T2 T3 T4   T5 T6 T7
46 [1.81]
DIN RAIL 35 mm wide
105 [4.13]
104 [4.09]

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 35

14 [.55]
163 [6.42]
8 [.31]

3 [.12]
40 [1.57]   (6 [.24])

FOR WALL MOUNT.   CJC SENSOR (model: CJM)

6.2 [.24]
36–M3 INPUT TERMINALS

SYSTEM CONFIGURATION EXAMPLES

■ **For MSR128**

RS-232-C

RS-232-C/RS-485 Converter (model: R2K-1)

RS-485

TC/DC Inputs (model: R1M-GH)

Contact Inputs (model: R1M-A1)

Contact Outputs (model: R1M-D1)

When the cable distance between the PC and the R1Ms is long, insert an RS-232-C/RS-485 Converter for isolation.
Only one (1) node is connectable for the MSR16H software.

⚠ Specifications are subject to change without notice.