

RM4-TCR Temperature/mV DIN Rail Mounted Process Unit

Input from: mV, 100 Ω or 1000 Ω RTD or thermocouple type B, E, J, K, N, R, S or T.
Functions as: Display/Alarm/Controller/
Transmitter/PLC & Computer Interface

Description

Model RM4-TCR is a DIN rail mounted process unit which can function as an indicator/alarm/controller/transmitter/computer interface. Input types available are 100 Ω or 1000 Ω RTDs (Pt100 or Pt1000) or thermocouple types B, E, J, K, N, R, S or T. Two millivolt input ranges of 0-20mV and 0-50mV are also provided with five point linearisation available on these mV ranges. All function settings, including selection of input type and calibration scaling is carried out via the instruments pushbuttons.

Two alarm relays are provided as standard. The relays can be set for independent operation or to have a "trailing" operation in which one relay automatically follows the operation of another by a programmed offset. Combinations of optional outputs including extra relays, analog output (configurable as retransmission or PI control) or serial communications (ASCII or Modbus protocol) can also be provided.

The RM4 has a programmable display brightness function, this allows the unit to be operated with low display brightness to reduce the instrument power consumption and to improve readability in darker areas.

Temperature units can be selected as $^{\circ}\text{C}$ or $^{\circ}\text{F}$ with a user selectable resolution of up to 0.01 degrees (RTD) or 0.1 degrees (thermocouple). If required the display can be programmed to show the units of temperature as $^{\circ}\text{C}$, $^{\circ}\text{F}$, C or F e.g. **325 $^{\circ}\text{C}$** . For mV inputs the display can be scaled to read in engineering units.

The programmable digital filter improves stability by smoothing out short term interference. An external input is configurable to perform one of various functions e.g. Two level brightness switching, peak hold, display hold, max/min memory, scale switching (allows switching between two sets of display scale values, resolution and display units e.g. $^{\circ}\text{C}$ to $^{\circ}\text{F}$), setpoint only access or security lockout.

Electrical isolation between power supply, temperature sensor input and retransmission eliminates grounding and common mode voltage problems. This isolation feature makes the RM4 ideal for interfacing to PLCs, computers and other data acquisition equipment.



Features

- Pushbutton calibration and setup
- Thermocouple, RTD (2 or 3 wire) or mV input
- Up to 5 point linearisation on mV inputs
- 5 digit LED display and relay/alarm status indication
- Programmable **P** button may be used to display max/min temperature
- Isolation between input signal, output and supply
- 240V, 110V, 48V, 42V, 32V, 24V AC, 12 to 48V DC or 50 to 110V DC operation (factory configured)
- Can be set to display temperature units as $^{\circ}\text{C}$, $^{\circ}\text{F}$, C or F e.g. **23.5 $^{\circ}\text{C}$** , **350 $^{\circ}\text{F}$** etc.
- Digital filter, improves stability
- Two alarm/control relay outputs (5A) standard
- Programmable display brightness reduces power consumption and controls glare in low brightness areas
- Auto dim feature conserves power
- Rugged aluminium DIN rail mount housing
- Remote input to perform a selected special function e.g. peak hold, display hold, max/min, display scale switching or security lock out
- 2 year guarantee

Options

- Isolated analog output, single or two independent outputs 4-20mA, 0-1V or 0-10V configurable as retransmission or PI control
- 16 bit analog retransmission + 3rd setpoint relay
- Additional relays in combination with analog or transmitter supply outputs
- Isolated & regulated 12VDC @ 50mA or 24VDC @ 25mA (link selectable)
- Isolated RS232, RS422 or RS485 serial comms. with choice of standard ASCII or modbus RTU protocol
- Combined analog 4-20mA and RS485 serial outputs

SPECIFICATIONS

Specifications are subject to change without notice

TECHNICAL SPECIFICATIONS

Input types: User selectable via pushbutton:
100Ω(Pt100) RTD or
1000Ω(Pt1000) RTD or
thermocouple types:
B, E, J, K, N, R, S or T or mV

Ranges: 100Ω (-180 to 650°C), 1000Ω (-180 to 550°C), type B (400 to 1866°C), type E (-100 to 1000°C), type J (-100 to 870°C), type K (-100 to 1372°C), type N (-100 to 1300°C), type R (-35 to 1768°C), type S (-35 to 1768°C), type T (-100 to 400°C), mV (0-20mV & 0-50mV ranges)

Display values: Temperature °F or °C or scaled in engineering units for mV input.

ADC resolution: 1 in 20,000

Display resolution: mV & RTD up to 2 decimal places, thermocouple up to 1 decimal place

Accuracy: 0.1% when calibrated

Sample rate: 7.5 per sec.

Conversion: Dual Slope ADC

Microprocessor: MC68HC11 HCMOS

Ambient temp: -10 to 60°C

Humidity: 5 to 95% non condensing

Display: LED 5 digit 7.6mm + alarm annunciator LEDs

Power supply: 240V, 110V, 48V, 42V, 32V, 24VAC
12 to 48V DC or 50 to 110V DC operation (factory configured)

Power consumption: AC supply 6VA max, DC supply 6W max. (depends on load & options)

Output (standard): 2 x relays, form A rated 5A resistive 240VAC

Relay action: Programmable N.O. or N.C.

OUTPUT OPTIONS (see order code for valid combinations)

Third relay: Rated 0.5A resistive at 30VAC or DC, form A. If no other options are fitted the third relay can be factory configured as form C

Fourth relay: Rated 0.5A resistive at 30VAC or DC, form A

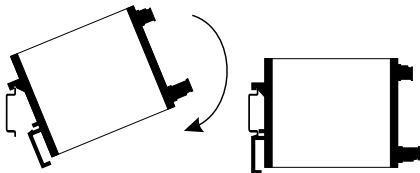
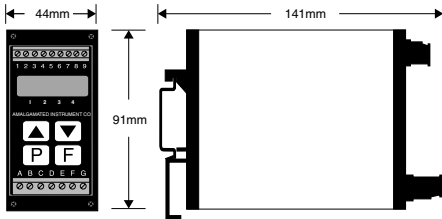
Transmitter supply: Isolated & regulated 12VDC @ 50mA or 24VDC @ 25mA (link selectable)

Switched voltage: Non isolated 24VDC output to be used for open collector or solid state relay driver

Analog retransmission: Isolated single or dual 4-20mA. 0-1V or 0-10V link selectable. 12 bit or 16 bit resolution available on single analog retransmission

Serial communications: Isolated RS232, RS485 or RS422 (factory configured)

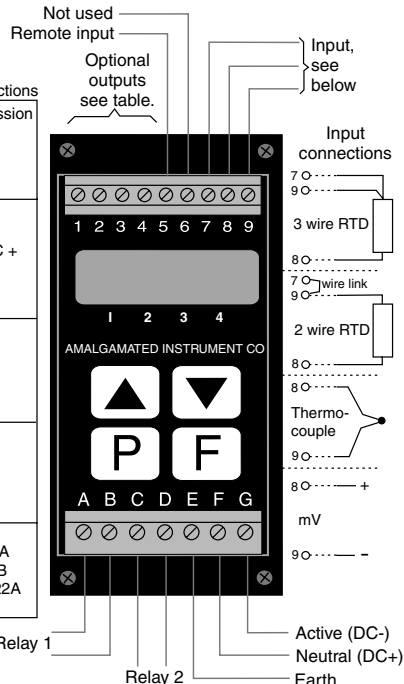
DIMENSIONS AND INSTALLATION DETAILS



ELECTRICAL CONNECTIONS

Common optional output connections

- Third relay + analog retransmission**
 - 1 Relay 3
 - 2 Relay 3
 - 3 Analog retransmission +
 - 4 Analog retransmission -
- Transmitter supply + analog retransmission**
 - 1 Transmitter supply 12/24VDC +
 - 2 Transmitter supply GND
 - 3 Analog retransmission +
 - 4 Analog retransmission -
- Third relay only (Form C)**
 - 1 Not used
 - 2 Relay 3 N/C
 - 3 Relay 3 N/O
 - 4 Relay 3 COM
- Third and fourth relays**
 - 1 Relay 4
 - 2 Relay 4
 - 3 Relay 3
 - 4 Relay 3
- Serial communications**
 - 1 RS232 Rx or RS485/RS422 A
 - 2 RS232 Tx or RS485/RS422 B
 - 3 RS232/RS485 GND or RS422A
 - 4 RS422 B



PHYSICAL CHARACTERISTICS

Case size: 44mm x 91mm x 141mm

Connections: Plug in screw terminals. Max 2.5mm² wire (relays and supply), 1.5mm² wire for input and options

Weight: 500 gms basic model, 550 gms with option card

ORDER CODE

RM4-TCR- - 5 -

POWER SUPPLY

RM4-TCR- - 5

240 VAC	2 4 0
110 VAC	1 1 0
48 VAC	4 8
42 VAC	4 2
32 VAC	3 2
24 VAC	2 4
12 to 48 VDC	D C
50 to 110 VDC	D C H

DISPLAY TYPE (ALL MODELS ARE TYPE 5E)

RM4-TCR- - 5 -

5 DIGIT LED + KEYPAD + STATUS LEDs 5 E

OUTPUT OPTIONS

THIRD RELAY	<input type="checkbox"/> R
THIRD AND FOURTH RELAY	<input type="checkbox"/> R <input type="checkbox"/> R
THIRD RELAY PLUS TRANSMITTER SUPPLY	<input type="checkbox"/> R <input type="checkbox"/> E
TRANSMITTER SUPPLY	<input type="checkbox"/> E
THIRD AND FOURTH SETPOINTS 24VDC	<input type="checkbox"/> S <input type="checkbox"/> S
ANALOG RETRANSMISSION (12 BIT)	<input type="checkbox"/> A
DUAL ANALOG RETRANSMISSION (12 BIT)	<input type="checkbox"/> A <input type="checkbox"/> A
ANALOG PLUS TRANSMITTER SUPPLY	<input type="checkbox"/> A <input type="checkbox"/> E
ANALOG (12 BIT) PLUS 3RD RELAY	<input type="checkbox"/> A <input type="checkbox"/> R
ANALOG (16 BIT) PLUS 3RD RELAY	<input type="checkbox"/> A <input type="checkbox"/> H <input type="checkbox"/> R
RS232 COMMUNICATIONS - ISOLATED	<input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 2
RS422 COMMUNICATIONS - ISOLATED	<input type="checkbox"/> 4 <input type="checkbox"/> 2 <input type="checkbox"/> 2
RS485 COMMUNICATIONS - ISOLATED	<input type="checkbox"/> 4 <input type="checkbox"/> 8 <input type="checkbox"/> 5
ANALOG RETRANSMISSION (12 BIT) PLUS RS485 COMMUNICATIONS	<input type="checkbox"/> A <input type="checkbox"/> 4 <input type="checkbox"/> 8 <input type="checkbox"/> 5