

# TM3TM3

module TM3 - 2 temperature inputs and 1 analog output



## Main

|                           |  |
|---------------------------|--|
| Range of product          | Modicon TM3  |
| Product or component type | Input/Output analog module   |
| Range compatibility       | Modicon M241<br>Modicon M251<br>Modicon M221   |
| Analogue input number     | 2  |
| Analogue input type       | Thermocouple, analogue input range: 0...1760 °C with thermocouple R<br>Thermocouple, analogue input range: - 200...400 °C with thermocouple T<br>Thermocouple, analogue input range: 0...1820 °C with thermocouple B<br>Pt 1000 temperature probe, analogue input range: - 200...600 °C<br>Thermocouple, analogue input range: - 200...1300 °C with thermocouple K<br>Voltage, analogue input range: - 10...10 V<br>Current, analogue input range: 4...20 mA<br>Ni 100/Ni 1000 temperature probe, analogue input range: - 60...180 °C<br>Thermocouple, analogue input range: - 200...1000 °C with thermocouple J<br>Voltage, analogue input range: 0...10 V<br>Pt 100 temperature probe, analogue input range: - 200...850 °C<br>Current, analogue input range: 0...20 mA<br>Thermocouple, analogue input range: 0...1760 °C with thermocouple S<br>Thermocouple, analogue input range: 0...2315 °C with thermocouple C<br>Thermocouple, analogue input range: - 200...1300 °C with thermocouple N<br>Thermocouple, analogue input range: - 200...800 °C with thermocouple E |
| Analogue output number    | 1  |
| Analogue output type      | - 10...10 V voltage<br>0...20 mA current<br>0...10 V voltage<br>4...20 mA current  |

## Complementary

|                                 |                               |
|---------------------------------|-------------------------------|
| Analogue input resolution       | 15 bits + sign<br>16 bits     |
| Permissible continuous overload | 13 V voltage<br>40 mA current |
| Input impedance                 | >= 1 MOhm temperature probe   |

>= 1 MOhm thermocouple  
 <= 50 Ohm current  
 >= 1 MOhm voltage

|                            |  |
|----------------------------|--|
| Analogue output resolution | 12 bits  |
| LSB value                  | 0.30 mV, analogue input: - 10...10 V voltage<br>2.44 mV, analogue output: 0...10 V voltage<br>0.30 µA, analogue input: 0...20 mA current<br>0.15 mV, analogue input: 0...10 V voltage<br>4.88 mV, analogue output: - 10...10 V voltage<br>0.1 °C temperature probe<br>3.91 µA, analogue output: 4...20 mA current<br>4.88 µA, analogue output: 0...20 mA current<br>0.244 µA, analogue input: 4...20 mA current<br>0.1 °C thermocouple   |
| Load type                  | Resistive  |
| Load impedance ohmic       | 1 kOhm voltage<br>300 Ohm current  |
| Stabilisation time         | 1 ms   |
| Conversion time            | 100 ms + 100 ms per channel + 1 controller cycle time for analogue input temperature probe<br>100 ms + 100 ms per channel + 1 controller cycle time for analogue input thermocouple<br>10 ms + 10 ms per channel + 1 controller cycle time for analogue input voltage/current  |
| Sampling duration          | 10 ms for analogue input voltage/current<br>100 ms for analogue input thermocouple<br>100 ms for analogue input temperature probe<br>100 ms for analogue input voltage/current   |
| Absolute accuracy error    | +/- 0.4 % of full scale at <= 0 °C for thermocouple E<br>+/- 1 % of full scale<br>+/- 0.1 % of full scale for Pt 100/Pt 1000, Ni 100/ Ni 1000 temperature probe<br>+/- 0.1 % of full scale at 25 °C for analogue output voltage/current<br>+/- 0.4 % of full scale at <= 0 °C for thermocouple J<br>+/- 0.1 % of full scale for thermocouple C<br>+/- 0.4 % of full scale at <= 0 °C for thermocouple T<br>+/- 6 °C at 0...200 °C for thermocouple S<br>+/- 0.4 % of full scale at <= 0 °C for thermocouple N<br>+/- 6 °C at 0...200 °C for thermocouple R<br>+/- 0.4 % of full scale at <= 0 °C for thermocouple K<br>+/- 0.1 % of full scale at 25 °C for analogue input voltage/current |
| Temperature drift          | +/- 0.006 %FS/°C   |
| Repeat accuracy            | +/- 0.4 %FS for output<br>+/-0.5 %FS for input   |
| Non-linearity              | +/- 0.1 %FS analog input<br>+/- 0.01 %FS analog output   |
| Output ripple              | 20 mV  |
| Cross talk                 | <= 1 LSB   |
| [Us] rated supply voltage  | 24 V DC  |
| Supply voltage limits      | 20.4...28.8 V  |
| Type of cable              | <= 30 m twisted shielded pairs cable for input/output circuit  |
| Current consumption        | 60 mA at 5 V DC (full load) via bus connector<br>55 mA at 24 V DC (no load) via external supply<br>80 mA at 24 V DC (full load) via external supply<br>55 mA at 5 V DC (no load) via bus connector   |
| Local signalling           | 1 LED green for PWR  |
| Electrical connection      | 11 x 2.5 mm <sup>2</sup> removable screw terminal block with pitch 5.08 mm adjustment for inputs, outputs and supply   |
| Insulation                 | 500 V AC between output and internal logic<br>1500 V AC between output and supply<br>1500 V AC between input and supply<br>500 V AC between input and internal logic   |
| Marking                    | CE   |
| Surge withstand            | 0.5 kV for I/O with differential mode protection conforming to EN/IEC 61000-4-5<br>1 kV for I/O with common mode protection conforming to EN/IEC 61000-4-5<br>1 kV for power supply with common mode protection conforming to EN/IEC 61000-4-5<br>0.5 kV for power supply with differential mode protection conforming to EN/IEC 61000-4-5   |
| Mounting support           | Top hat type TH35-15 rail conforming to IEC 60715<br>Plate or panel with fixing kit<br>Top hat type TH35-7.5 rail conforming to IEC 60715  |

|                |          |
|----------------|----------|
| Height         | 90 mm    |
| Depth          | 70 mm    |
| Width          | 23.6 mm  |
| Product weight | 0.115 kg |

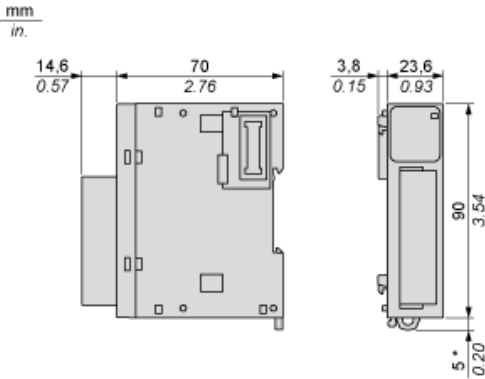
## Environment

|   |   |
|---|---|
| Standards   | EN/IEC 61010-2-201<br>EN/IEC 61131-2  |
| Resistance to electrostatic discharge                                   | 4 kV on contact conforming to EN/IEC 61000-4-2<br>8 kV in air conforming to EN/IEC 61000-4-2  |
| Resistance to electromagnetic fields                                    | 10 V/m at 80 MHz...1 GHz conforming to EN/IEC 61000-4-3<br>1 V/m at 2 GHz...3 GHz conforming to EN/IEC 61000-4-3<br>3 V/m at 1.4 GHz...2 GHz conforming to EN/IEC 61000-4-3   |
| Resistance to magnetic fields   | 30 A/m at 50...60 Hz conforming to EN/IEC 61000-4-8   |
| Resistance to fast transients   | 1 kV I/O conforming to EN/IEC 61000-4-4   |
| Resistance to conducted disturbances, induced by radio frequency fields | 10 V at 0.15...80 MHz conforming to EN/IEC 61000-4-6<br>3 V at spot frequency (2, 3, 4, 6.2, 8.2, 12.6, 16.5, 18.8, 22, 25 MHz) conforming to Marine specification (LR, ABS, DNV, GL)   |
| Electromagnetic emission  | Radiated emissions, test level: 47 dB $\mu$ V/m QP class A (10 m at 230 MHz...1 GHz) conforming to EN/IEC 55011<br>Radiated emissions, test level: 40 dB $\mu$ V/m QP class A (10 m at 30...230 MHz) conforming to EN/IEC 55011 |
| Immunity to microbreaks   | 10 ms   |
| Ambient air temperature for operation                                   | -10...55 °C (horizontal installation)<br>-10...35 °C (vertical installation)  |
| Ambient air temperature for storage                                     | -25...70 °C   |
| Relative humidity   | 10...95 % without condensation in operation<br>10...95 % without condensation in storage  |
| IP degree of protection   | IP20  |
| Pollution degree  | 2   |
| Operating altitude  | 0...2000 m  |
| Storage altitude  | 0...3000 m  |
| Vibration resistance  | 3.5 mm at 5...8.4 Hz with DIN rail mounting support<br>3 gn at 8.4...150 Hz with DIN rail mounting support  |
| Shock resistance  | 15 gn during 11 ms  |

## Offer Sustainability

|                                  |   |
|----------------------------------|---|
| Sustainable offer status         | Green Premium product   |
| RoHS (date code: YYWW)           | Compliant - since 1415 - Schneider Electric declaration of conformity<br><a href="#">Schneider Electric declaration of conformity</a> |
| REACH                            | Reference not containing SVHC above the threshold<br><a href="#">Reference not containing SVHC above the threshold</a>                |
| Product environmental profile    | Available<br><a href="#">Product environmental</a>  |
| Product end of life instructions | Available<br><a href="#">End of life manual</a>   |

Dimensions

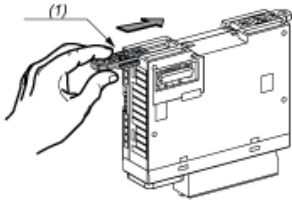


(\*) 8.5 mm/0.33 in when the clamp is pulled out.

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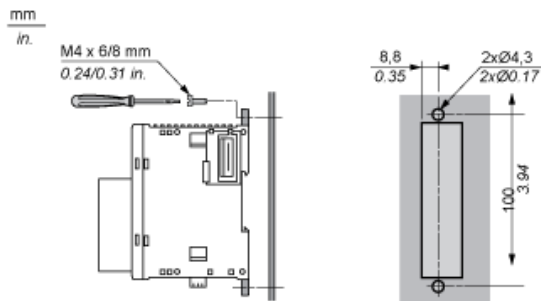
Mounting on a Panel Surface

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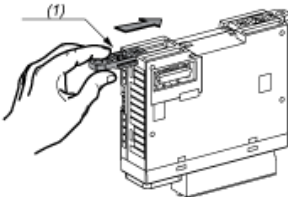


(1) Install a mounting strip

Mounting Hole Layout

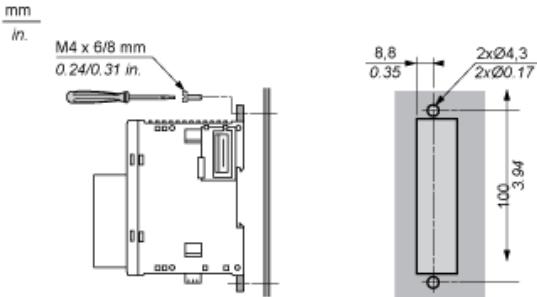


Mounting on a Panel Surface



(1) Install a mounting strip

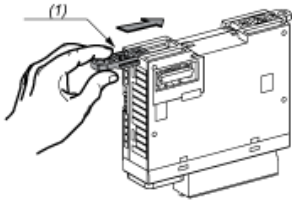
Mounting Hole Layout



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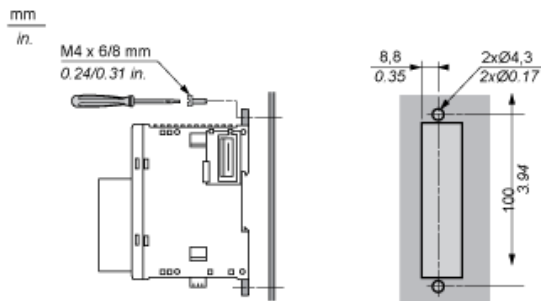
Mounting on a Panel Surface

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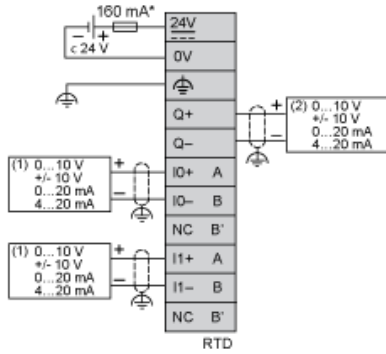
(1) Install a mounting strip

Mounting Hole Layout



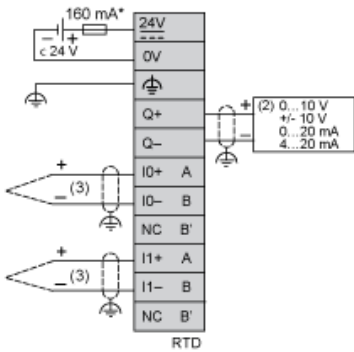
Analogue Mixed I/O Module

Wiring Diagram (Current/Voltage type)



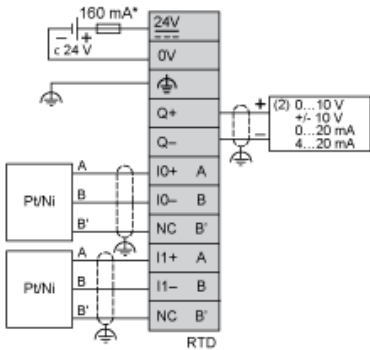
- (\*) Type T fuse
- (1) Current/Voltage analog output device
- (2) Current/Voltage analog input device

Wiring Diagram (Thermocouple input type)



- (\*) Type T fuse
- (2) Current/Voltage analog input device
- (3) Thermocouple

Wiring Diagram (Temperature probe input type)



- (\*) Type T fuse
- (2) Current/Voltage analog input device