

# 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 M221<br>Modicon M241<br>Modicon M251<br>Modicon M262                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Analogue input number     | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Analogue input type       | Current 4...20 mA<br>Current 0...20 mA<br>Voltage 0...10 V<br>Voltage - 10...10 V<br>Thermocouple - 200...1000 °C with thermocouple J<br>Thermocouple - 200...1300 °C with thermocouple K<br>Thermocouple 0...1760 °C with thermocouple R<br>Thermocouple 0...1760 °C with thermocouple S<br>Thermocouple 0...1820 °C with thermocouple B<br>Thermocouple - 200...400 °C with thermocouple T<br>Thermocouple - 200...1300 °C with thermocouple N<br>Thermocouple - 200...800 °C with thermocouple E<br>Thermocouple 0...2315 °C with thermocouple C<br>Ni 100/Ni 1000 temperature probe - 60...180 °C<br>Pt 100 temperature probe - 200...850 °C<br>Pt 1000 temperature probe - 200...600 °C |
| Analogue output number    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Analogue output type      | Current: 4...20 mA<br>Current: 0...20 mA<br>Voltage: 0...10 V<br>Voltage: - 10...10 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Complementary

|                                 |                                                                                                                                                                                                                                                                                      |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Analogue input resolution       | 16 bits<br>15 bits + sign                                                                                                                                                                                                                                                            |
| Permissible continuous overload | 13 V, analogue input type: voltage<br>40 mA, analogue input type: current                                                                                                                                                                                                            |
| Input impedance                 | <= 50 Ohm current<br>>= 1 MOhm voltage<br>>= 1 MOhm thermocouple<br>>= 1 MOhm temperature probe                                                                                                                                                                                      |
| Analogue output resolution      | 12 bits                                                                                                                                                                                                                                                                              |
| LSB value                       | 0.15 mV 0...10 Vvoltage<br>0.30 mV - 10...10 Vvoltage<br>0.30 µA 0...20 mAcurrent<br>0.244 µA 4...20 mAcurrent<br>0.1 °Ctemperature probe<br>0.1 °Cthermocouple<br>2.44 mV 0...10 V voltage<br>4.88 mV - 10...10 V voltage<br>4.88 µA 0...20 mA current<br>3.91 µA 4...20 mA current |
| Load type                       | Resistive                                                                                                                                                                                                                                                                            |
| Load impedance ohmic            | 1 kOhm voltage<br>300 Ohm current                                                                                                                                                                                                                                                    |
| Stabilisation time              | 1 ms                                                                                                                                                                                                                                                                                 |

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric Industries SAS nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein.

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Conversion time           | 100 ms + 100 ms per channel + 1 controller cycle time for analogue input thermocouple<br>100 ms + 100 ms per channel + 1 controller cycle time for analogue input temperature probe<br>10 ms + 10 ms per channel + 1 controller cycle time for analogue input voltage/current                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sampling duration         | 10 Ms, analogue input type: voltage/current<br>100 Ms, analogue input type: voltage/current<br>100 Ms, analogue input type: thermocouple<br>100 ms, analogue input type: temperature probe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Absolute accuracy error   | +/- 6 °C at 25 °C for thermocouple R, S 0...200 °C<br>+/- 0.4 % of full scale at 25 °C for thermocouple K - 200...0 °C<br>+/- 0.4 % of full scale at 25 °C for thermocouple J - 200...0 °C<br>+/- 0.4 % of full scale at 25 °C for thermocouple E - 200...0 °C<br>+/- 0.4 % of full scale at 25 °C for thermocouple T - 200...0 °C<br>+/- 0.4 % of full scale at 25 °C for thermocouple N - 200...0 °C<br>+/- 0.1 % of full scale at 25 °C for analogue input voltage/current<br>+/- 0.1 % of full scale at 25 °C for thermocouple C 0...2315 °C<br>+/- 0.1 % of full scale at 25 °C for Pt 100/Pt 1000, Ni 100/ Ni 1000 temperature probe<br>+/- 0.1 % of full scale at 25 °C for thermocouple R, S 200...1760 °C<br>+/- 0.1 % of full scale at 25 °C for thermocouple B 300...1820 °C<br>+/- 0.1 % of full scale at 25 °C for thermocouple K 0...1300 °C<br>+/- 0.1 % of full scale at 25 °C for thermocouple J 0...1000 °C<br>+/- 0.1 % of full scale at 25 °C for thermocouple E 0...800 °C<br>+/- 0.1 % of full scale at 25 °C for thermocouple T 0...400 °C<br>+/- 0.1 % of full scale at 25 °C for thermocouple N 0...1300 °C<br>+/- 0.1 % of full scale at 25 °C for analogue output voltage/current |
| Temperature drift         | +/- 0.006 %FS/°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Repeat accuracy           | +/-0.5 %FS for input<br>+/- 0.4 %FS for output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Non-linearity             | +/- 0.01 %FS, analogue output type: analog output<br>+/- 0.1 %FS, analogue input type: analog input                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 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             | Twisted shielded pairs cable <30 m for input/output circuit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Current consumption       | 55 mA at 24 V DC via external supply no load<br>55 mA at 5 V DC via bus connector no load<br>60 mA at 5 V DC via bus connector full load<br>80 mA at 24 V DC via external supply full load                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 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                | Between input and supply at 1500 V AC<br>Between input and internal logic at 500 V AC<br>Between output and supply at 1500 V AC<br>Between output and internal logic at 500 V AC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Marking                   | CE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Surge withstand           | 1 KV power supply common mode conforming to EN/IEC 61000-4-5<br>0.5 KV power supply differential mode conforming to EN/IEC 61000-4-5<br>1 KV I/O common mode conforming to EN/IEC 61000-4-5<br>0.5 kV I/O differential mode conforming to EN/IEC 61000-4-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Mounting support          | Top hat type TH35-15 rail conforming to IEC 60715<br>Top hat type TH35-7.5 rail conforming to IEC 60715<br>Plate or panel with fixing kit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Height                    | 90 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Depth                     | 70 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Width                     | 23.6 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Net weight                | 0.115 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## Environment

|                                       |                                                                                                                                                                                                                        |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards                             | EN/IEC 61010-2-201<br>EN/IEC 61131-2                                                                                                                                                                                   |
| Resistance to electrostatic discharge | 8 kV in air conforming to EN/IEC 61000-4-2<br>4 kV on contact conforming to EN/IEC 61000-4-2                                                                                                                           |
| Resistance to electromagnetic fields  | 10 V/M 80 MHz...1 GHz conforming to EN/IEC 61000-4-3<br>3 V/M 1.4 GHz...2 GHz conforming to EN/IEC 61000-4-3<br>1 V/m 2 GHz...3 GHz conforming to EN/IEC 61000-4-3                                                     |
| Resistance to magnetic fields         | 30 A/m 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  | 10 V 0.15...80 MHz conforming to EN/IEC 61000-4-6<br>3 V 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: 40 dBµV/m QP class A ( 10 m) at 30...230 MHz conforming to EN/IEC 55011<br>Radiated emissions - test level: 47 dBµV/m QP class A ( 10 m) at 230...1000 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 on DIN rail<br>3 gn at 8.4...150 Hz on DIN rail                                                                                                                                                   |
| Shock resistance                      | 15 gn for 11 ms                                                                                                                                                                                                        |

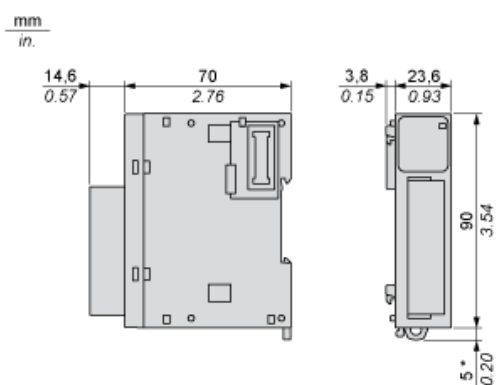
## Packing Units

|                  |            |
|------------------|------------|
| Package 1 Weight | 210.000 g  |
| Package 1 Height | 75.000 mm  |
| Package 1 width  | 105.000 mm |
| Package 1 Length | 125.000 mm |

## Offer Sustainability

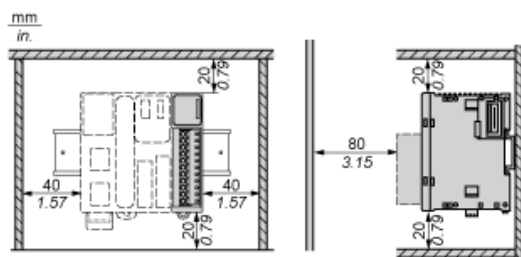
|                            |                                                                                                                             |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Sustainable offer status   | Green Premium product                                                                                                       |
| REACH Regulation           | <a href="#">REACH Declaration</a>                                                                                           |
| EU RoHS Directive          | Pro-active compliance (Product out of EU RoHS legal scope) <a href="#">EU RoHS Declaration</a>                              |
| Toxic heavy metal free     | Yes                                                                                                                         |
| Mercury free               | Yes                                                                                                                         |
| RoHS exemption information | <a href="#">Yes</a>                                                                                                         |
| China RoHS Regulation      | <a href="#">China RoHS Declaration</a>                                                                                      |
| Environmental Disclosure   | <a href="#">Product Environmental Profile</a>                                                                               |
| Circularity Profile        | <a href="#">End Of Life Information</a>                                                                                     |
| WEEE                       | The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins |
| PVC free                   | Yes                                                                                                                         |

## Dimensions

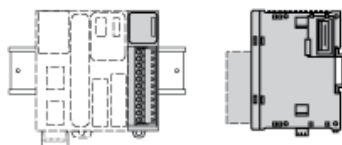


(\*) 8.5 mm/0.33 in when the clamp is pulled out.

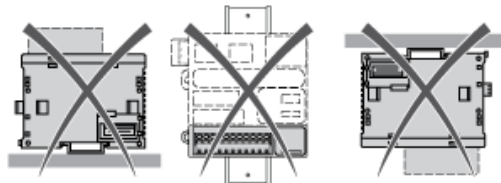
## Spacing Requirements



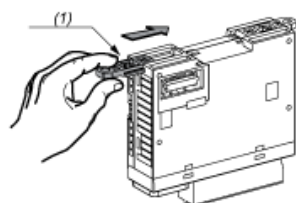
## Mounting on a Rail



## Incorrect Mounting

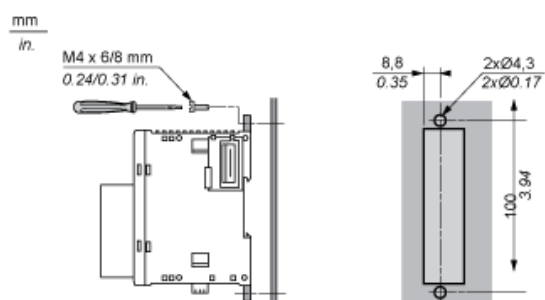


## Mounting on a Panel Surface



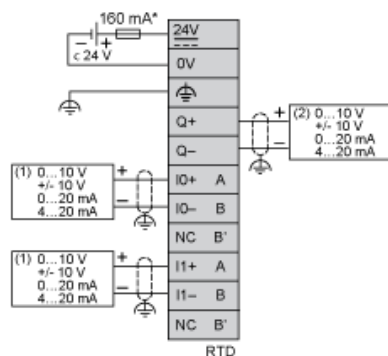
- (1) Install a mounting strip

## Mounting Hole Layout



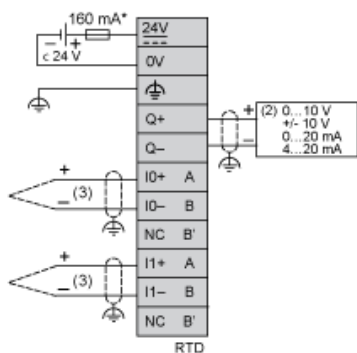
## Analogue Mixed I/O Module

### Wiring Diagram (Current/Voltage type)



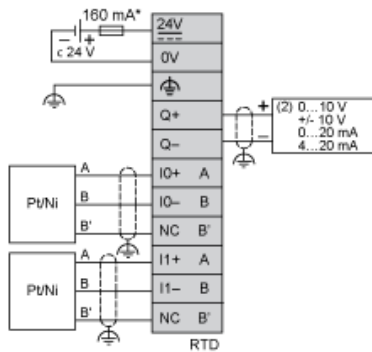
- (\*) Type T fuse
- (1) Current/Voltage analog output device
- (2) Current/Voltage analog input device

### 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