

TTM-2S2MM TTM-2S2MC

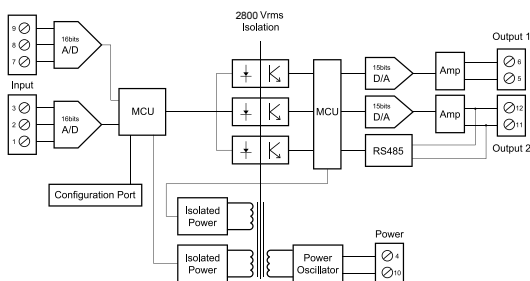
Microprocessor Based Programmable Isolated Dual Independent Channels Universal Signal Transmitter



TTM-2S2MM and **TTM-2S2MC** are the DIN rail mount user programmable Isolated two channel universal signal converters. It accepts various input signals including mV, V, mA, PT100 and 9 different thermocouples. The measuring unit and range are also configurable with a user-friendly TT Configurator software.

General Features

- Unique math function $Output = \sqrt{\frac{A(Input1) + B(Input2)}{C}}$
A,B,C values adjustable via utility software.
Square root function may be switched ON or OFF.
- Unique High/Low comparison output:
The output 1 will scale to Input 1 or input 2 whichever is higher/lower than the other.
- Programmable for various input signals, measuring range.
- Easy configuration without external power connected.
- Dual channel Input:
Resistance thermometer (Pt100)
Thermocouple (J, K, T, E, B, R, S, N, C)
Voltage/Current transmitter (mV/V/mA)
- Dual analog output: 0/4 to 20mA or optional 0~10V.
- RS485 comm. (TTM-2S2MC): Modbus RTU protocol.
- Fault signal on sensor break presettable.



Specifications

- Input signal:** User programmable. refer to table 1.
- **Thermocouple (T/C):** industry standard thermocouple types, J, K, T, E, B, R, S, N, C (ITS-90).
 - **Pt100:** Excitation 180uA. 2 or 3 wire connection (ITS-90 $\alpha=0.00385$).
 - **Voltage:** -60mVdc to 60mVdc or -10Vdc to 10Vdc.
 - **Current:** 0mA to 24mA
- Measuring range:** User programmable. Max. range see table 1.
- Measuring accuracy:** refer to Table 1. the accuracy is tested under the operating condition of $24^{\circ}\text{C} \pm 3^{\circ}\text{C}$.

Input signal	Maximum Range	Accuracy
Thermocouple J	-50 to 1000°C (-58 to 1832°F)	±1°C
Thermocouple K	-50 to 1370°C (-58 to 2498°F)	
Thermocouple T	-270 to 400°C (-454 to 752°F)	
Thermocouple E	-50 to 700°C (-58 to 1292°F)	
Thermocouple B	0 to 1750°C (32 to 3182°F)	±2°C ①
Thermocouple R	-50 to 1750°C (-58 to 3182°F)	±2°C
Thermocouple S		
Thermocouple N	-50 to 1300°C (-58 to 2372°F)	
Thermocouple C	-50 to 1800°C (-58 to 3272°F)	
Pt100*	-200 to 600°C (-328 to 1112°F)	±0.2°C
mV	-60.00 mV to 60.00 mV	±0.01mV
DC volt ②	-10.000 to 10.000 Vdc	±1mV
DC mA ②	0.000 to 24.000 mAdc	±3µA

* Factory setting

Table 1

- ① Accuracy is not guaranteed between 0 and 400°C (0 and 752°F) for type B, R and S.
- ② Range set by an internal DIP switch, see Table 2.

Input sampling rate: 200mS.

Output signal:

TTM-2S2MM: Two analog output, 0/4~20mA or optional 0~10Vdc
TTM-2S2MC: One analog output, DC 0/4~20mA or optional 0~10Vdc and one RS485

Output resolution: 0.6uA.

Output response time: <200mS.

Power supply: 18 to 36 V, internal protection against polarity inversion.

Power Consumption: 2W max.

Communication : Modbus RS485 RTU protocol, 4800~38400 bps

Galvanic isolation: 2 KV 1min. between input and output

Operating temperature: 0 to 55°C

Humidity: 0 to 90% RH

Electromagnetic compatibility (EMC): En 50081-2, En 50082-2

Housing material: ABS plastic. UL 94V0

Weight: 85g



CASE DIMENSIONS

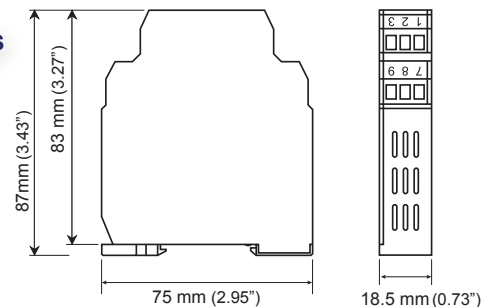
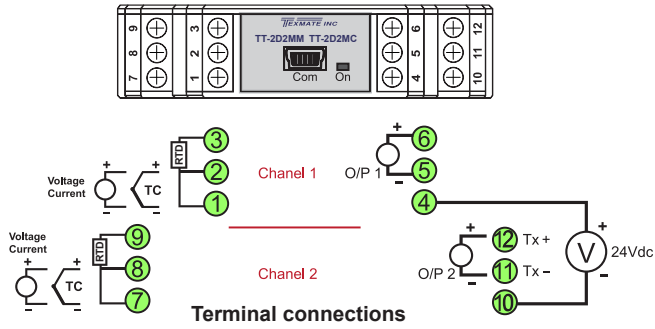


Figure 1

Terminal Connection



Wiring Specification :

Screw tightening torque : 4.3 lb-in,
Wire range : 12~30 AWG.
Wire strip length : 6~7mm

Wiring Precaution :

1. Always keep signal wires away from power or contactor wires.
2. Transmitter's power supply should not be shared with contactors, electrical motor and other inductive devices.

The various input signals are divided into three groups.

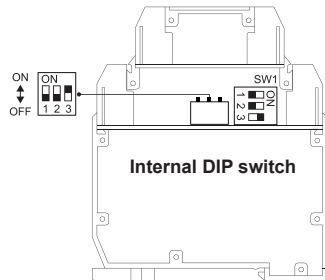
1. **TC/RTD/mV** : Thermocouple type (J, K, T, E, B, R, S, N, C), Pt100 and voltage input in the range of -60mVdc~60mVdc.
2. **Current** : 0~24 mA.
3. **Voltage** : -10~10Vdc.

For the three different groups of input signal type, The SW1 and SW2 should be set according to the Table 2 for each channel separately. Open the cover o change the DIP switch setting.

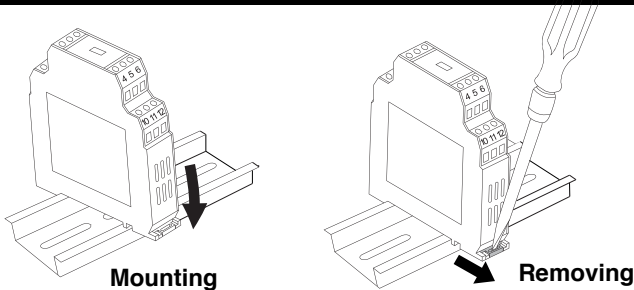
	1	2	3
TC/RTD/mV*	OFF	OFF	ON
0~24mA	ON	OFF	ON
-10V~10V	OFF	ON	OFF

*Factory setting

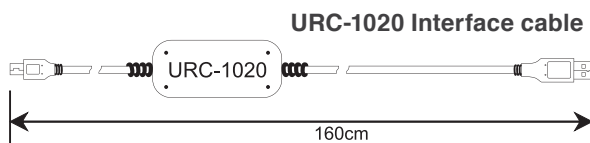
Table 2.
Internal DIP switch setting



Installation



Accessory



Communication

Optional RS-485 interface is available for TTM-2S2MC model. Custom input and output signal adjustment can be recalibrated with **TT Configurator** software.



Configuration

The transmitter is user configurable with the user-friendly **TT Configurator** software and URC-1020 interface cable. The latest version can be download free from www.texmate.com.

The URC-1020 Interface cable consist of interface converter and USB plug. Sold separately. During configuration the transmitter can work alone with or without connecting to a power source.

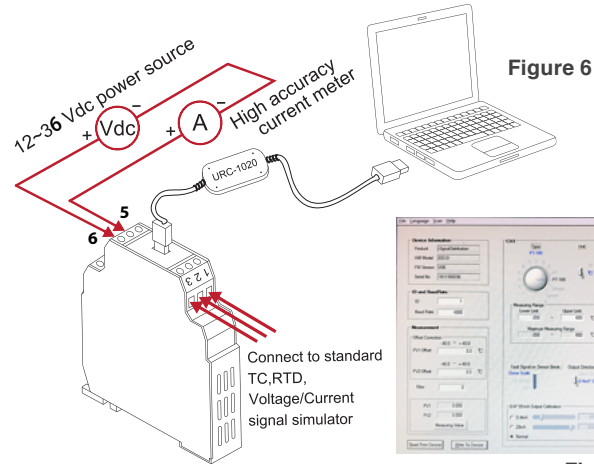


Figure 5

The Configurable parameters are :

1. **Input signal type**: Various input signal type can be selected among the available options.
2. **Unit**: Select the unit ($^{\circ}\text{C}$ or $^{\circ}\text{F}$) of temperature. For linear input (voltage or current), it doesn't effect the measurement.
3. **Measuring range**: Defines the lowest and highest value of measuring range. Within the range, the transmitter will convert input signals into an scalable analogue output signal.
4. **Output direction**: Defines the scalable analogue output signal to be 4 to 20mA or 20 to 4mA.
5. **Fault signal on sensor break**: Defines the output signal to be
 - (1) Downscale ($<4\text{mA}$).
 - (2) Upscale ($>20\text{mA}$).
 - (3) Cut-off. Limit the output signal within the output range when the input is out of measuring range.
6. **Offset Correction**: Allows to eliminate the offset error of measuring value.
7. **ID & Baud Rate**: Set device ID and communication baud rate.
8. **Output Function**: Select output 1 to be
 - (1) scale to channel 1 measuring value (PV1).
 - (2) Math function, which make it possible to be used as signal addition/subtraction/division/square-root converter.
 - (3) High/Low comparison of PV1, PV2 the output 1 will scale to input 1 or input 2 whichever is higher/lower than the other.
9. **0/4~20mA Output Signal Calibration**: Zero and Span adjustment of output signal. A power source should be connected as Figure 6.
10. **Measuring value**: Read the measuring value of channel 1 (Input 1), channel 2 (input2) continually.
11. **Device information**: Indicate the device model, firmware version, series number and communication status. Figure 5.