Intrinsic Safety Barrier

Temperature Barrier (Thermocouple)

Safety Automation Group

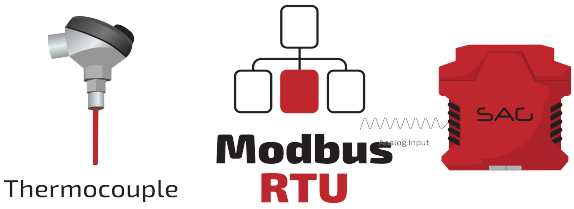
MD-TT1

Temperature Intrinsic Safety Barrier (Thermocouple)

Safety Automation Group

- Support 1 Channels
- 24 VDC Supply
- Analog Signal Type
- Modbus RTU, RS-485 Interface
- Connection with Screw Terminals
- Configurable with Modbus Protocol
- Measuring Temperature from Thermocouples

Product Features



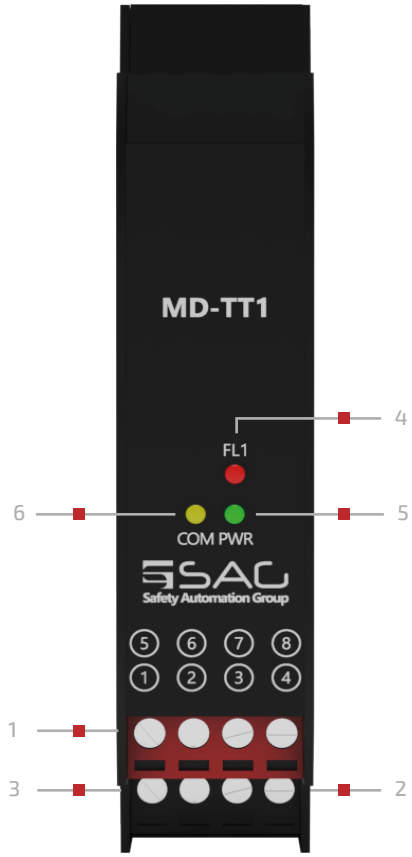
MD-TT is an isolated barrier that prevents the risk of excess temperature, arcs, and sparks igniting the explosive atmosphere present in a hazardous area. It features up to three channels, and every single of them supports analog signals and can be configured with the MODBUS protocol.

The MD-TT can measure temperature from a thermocouple. It supports a wide range of sensors including B, E, J, K, N, R, S, and T sensor types with an internal cold junction. The temperature value transmits to a safe area through the MODBUS protocol for processing and monitoring purposes, which is done via an integrated CPU platform.

Moreover, the MD-TT consumes current and power up to 208 mA and 5W respectively. Its power dissipation is acceptably less than 1W. And the environmental conditions are -20 to +60 °C as an operation, and -25 to +65 °C as storage temperature.

Front View

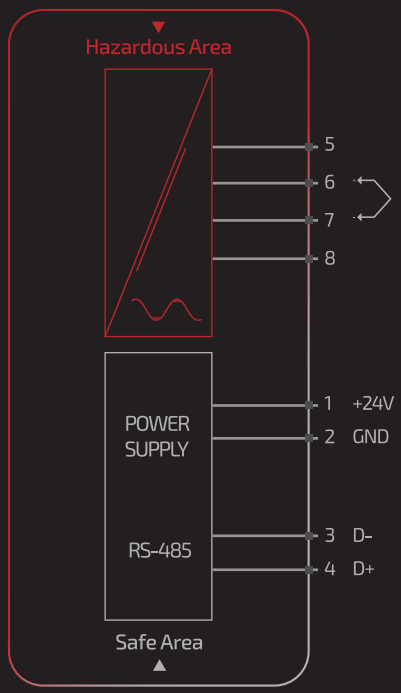
1. Analog Input : Channel 1
2. RS-485 Terminal
3. Power Supply Terminal
4. Fault LED Channel 1
5. Power LED
6. Communication LED



Connection View

MD-T1

THERMOCOUPLE TEMPERATURE
INTRINSIC SAFETY BARRIER



MD-TT1 PIN Configuration

1.	+24VDC	5.	Channel 2
2.	GND	6.	Analog Input
3.	RS-485 (D-)	7.	Thermocouple
4.	RS-485 (D+)	8.	

Temperature Barrier(Thermocouple)

TECHNICAL DATA

MD-TT1

GENERAL SPECIFICATION

Signal Type	Analog Input
Number of Channels	1 Channel

SUPPLY

Rated Voltage	24 VDC Nom (20-30 VDC) Reverse Polarity Protected
Connection	Terminal 1 PIN 1(+24 VDC), Terminal 1 PIN 2 (GND)
Power Dissipation	< 1 W
Current Consumption	Approx. 208mA
Max. Power Consumption	5 W

INPUT

Input	Thermocouple
Connection	Terminals 2
Rated Values	-
Integration Time	400 ms
Input Range	±500 mV (TC/mV)

THERMOCOUPLE

Thermocouple	B, E, J, K, L, N, R, S, T – Type (IEC 584-1: 1995)
Cold Junction Compensation	Internal
Measurement Loop Monitoring	-

DEVIATION

Thermocouple	Deviation of CJC: ±0.8 K

DATA CONNECTION

Modbus RTU	RS-485 connection up to 115.2 kbps for Monitor/ Configuration
Connection	Terminal1 PIN 3 (D-), Terminal1 PIN 4 (D+)

MOUNTING

Mounting	On 35 mm DIN Mounting Rail Acc. to EN 60715:2001

ISOLATION

Input / Power Supply	1500 VDC Example. safe electrical isolation by reinforced insulation according to IEC/EN 61010^-1 Rated insulation voltage 300 Veff test voltage 3 kV, 50 Hz, 1 min.

Temperature Barrier(Thermocouple)

TECHNICAL DATA

MD-TT1

ENVIRONMENTAL CONDITIONS

Operation Temperature	Temperature Limits –20 to +60 °C
Storage Temperature	Temperature Limits –25 to +65 °C

APPROVALS

IEC60079-0, IEC60079-11, IEC60079-15

FM & FM-C No.3024643,3029921C,conforms to Class 3600,3610,3611,3810

LOCATION

Safe Area/Non Hazardous Locations or Zone 2, Group IIC T4, Class I, Division 2, Groups A, B, C, D

Temperature Code T4 and Class I, Zone 2, Group IIC, IIB, IIA T4 installation.

SAFETY DESCRIPTION

ATEX	II 1 G Ex ic [ia Ga] IIC T4 Gc, II 3 G Ex ic [ic] IIC T4 Gc, II 1 D Ex ic [ia IIIC Da] IIC Gc II 3 D Ex ic [ic IIIC Dc] IIC Gc
IECEx	Ex ic [ia Ga] IIC T4 Gc, Ex ic [ic] IIC T4 Gc, Ex ic [ia IIIC Da] IIC Gc, Ex ic [ic IIIC Dc] IIC Gc
North American Zones	Class 1, Zone 2 AEx ic [ia Ga] IIC T4 Gc, Class I, Zone 2 AEx [ic] IIC T4 Gc Zone 20 Ex ic [ia IIIC Da] IIC Gc, Zone 2 Ex ic [ic IIIC Dc] IIC Gc
North American Div	Class I, Division 2, Groups A, B, C, D T4, Class II, Division 2, Groups F, G

ASSOCIATED ELECTRICAL APPARATUS

Vo/Voc	17.0 V, Io/Isc = 85 mA, Po/Po = 1.45 W
IECEx	24V, Ci = 6 nF, Li = 0 nH. Um = 30 V, -20 °C ≤ Ta ≤ 60°C.

ORDERING INFORMATION

MD-TT N

MD:

Modbus Compatible

TT:

Temperature Intrinsic Safety Barrier (Thermocouple)

N:

Number of Channels

1 : One Channel 2 : Two Channel 3 : Three Channel

ORDERING INFORMATION

MD-TT1	Temperature Intrinsic Safety Barrier (Thermocouple), 1 channel
MD-TT2	Temperature Intrinsic Safety Barrier (Thermocouple), 2 channel
MD-TT3	Temperature Intrinsic Safety Barrier (Thermocouple), 3 channel

SAG
Safety Automation Group

www.sagco.ca

HB Safety Automation Group
#250 - 997 Seymour St.
Vancouver, BC, Canada
V6B 3M1