

# Intrinsic Safety Barrier

HART and Modbus Smart Transmitter



# MAD-STC2

Smart Transmitter Intrinsic Safety Barrier  
(HART and Modbus)



- Support 2 Channels
- 24 VDC Supply
- Analog Signal Type
- Modbus RTU, RS-485 Interface
- Connection with Screw Terminals
- 2 Wire Smart Transmitters
- Configurable with Modbus Protocol

## Product Features

HART

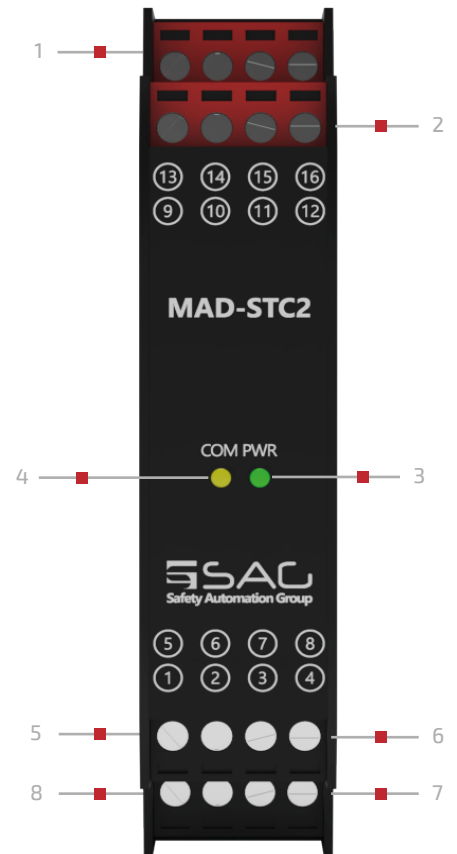
4-20 mA

Modbus RTU



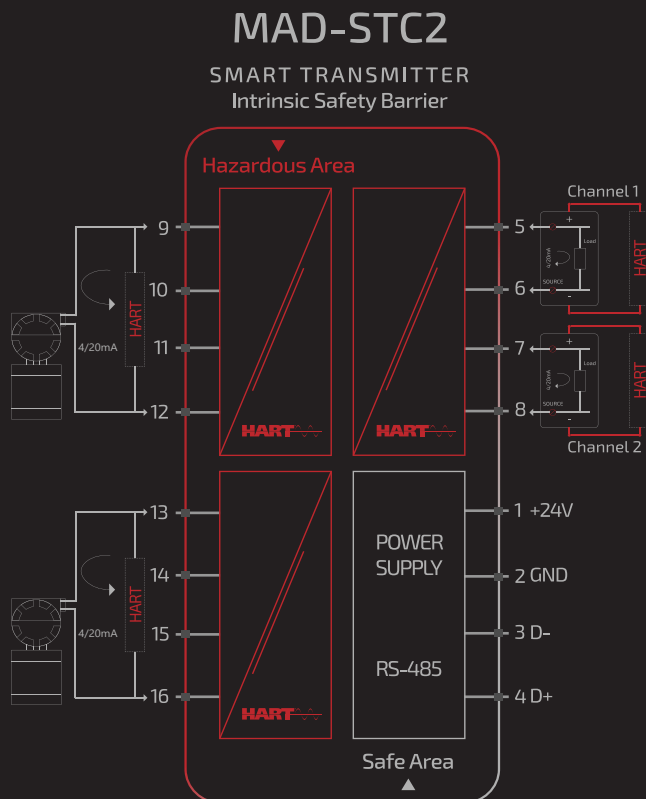
**MAD-STC** is an intrinsically safe barrier, designed for reading 2-wire smart transmitters in hazardous areas. It contains 1 or 2 channel(s). One of the main features of the **MAD-STC** is that it can be used as a HART to MODBUS converter. The **MAD-STC** provides a HART compatible source loop of power to the hazardous area, and it then repeats the measured current in a safe area. In fact, the analog input signals transferred to the safe area are as an isolated current value, in the range of 4 ~ 20 mA. It then carries the hart signal for the smart transmitter bi-directionally. In addition to HART transmitting technology, the MODBUS RTU is also another option to transfer and configure data, with a bit rate of up to 115.2 kbps via the RS-485 serial port. This makes it ideal for convenient, remote monitoring in a safe area. In this case, the user can choose data transfers via the Modbus, or reproduce loop power in the safe area.

# Front View



1. Analog Input : Channel 2
2. Analog Input : Channel 1
3. Power LED
4. Communication LED
5. HART Interface Channel 1
6. HART Interface Channel 2
7. RS-485 Interface
8. Power Supply Terminal

## Connection View



MAD-STC2 PIN Configuration	
1. +24VDC	5. HART Interface Channel 1
2. GND	6. HART Interface Channel 2
3. RS-485 (D-)	7. HART Interface Channel 2
4. RS-485 (D+)	8.
	9. Channel 1
	10. Analog Input
	11. HART/4-20 mA
	12.
	13. Channel 2
	14. Analog Input
	15. HART/4-20 mA
	16.

### TECHNICAL DATA

#### GENERAL SPECIFICATION

Signal Type	Analog Input
Number of Channels	2 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	4...20 mA
Connection	Terminals 3,4
Connection Side	Field Side
Available Voltage	> 16 V at 20 mA

#### OUTPUT

Output	4...20 mA
Connection	Terminals 2
Connection Side	Control Side
Load	0...550 $\Omega$ at 20 mA
Ripple	max. 50 $\mu$ A rms

#### GALVANIC ISOLATION

Input / Power Supply	1500 VDC Example. safe electrical isolation by reinforced insulation according to IEC/EN 61010 <sup>-1</sup> Rated insulation voltage 300 Veff test voltage 3 kV, 50 Hz, 1 min.
Output/ Power Supply	Functional Insulation, Rated Insulation Voltage 50 V AC
Output/ Output	Functional Insulation, Rated Insulation Voltage 50 V AC

#### TRANSFER CHARACTERISTICS

Deviation	At -20 to +60 °C, 4...20 mA : $\leq 10 \mu$ A incl.
Influence of Ambient Temperature	0.25 $\mu$ A/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+)

# Smart Transmitter Barrier

MAD-STC2

## TECHNICAL DATA

### MOUNTING

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

### 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 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

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

$V_0/V_{oc}$  17.0 V,  $I_0/I_{sc} = 85$  mA,  $P_0/P_o = 1.45$  W

IECEX 24V,  $C_i = 6$  nF,  $L_i = 0$  nH.  $U_m = 30$  V,  $-20$  °C  $\leq T_a \leq 60$  °C.

## ORDERING INFORMATION

### MAD-STC N

MAD:

Modbus and HART Compatible

STC:

2 Wire Smart Transmitters

N:

Number of Channels

1 : One Channel

2 : Two Channel

### ORDERING INFORMATION

MAD-STC1 HART and Modbus Smart Transmitter, 1 Channel

MAD-STC2 HART and Modbus Smart Transmitter, 2 Channel



[www.sagco.ca](http://www.sagco.ca)

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