FTA-T-14 Fail-safe 0(4)-20 mA analog input FTA (16 channels)

Description

The field termination assembly module FTA-T-14 is the interface between field components (sensors, etc.) and the fail-safe high-density analog input module 10105/2/1 in the FSC system. It can be used for interfacing signals from Class I, Division 2 Hazardous Locations.

The FTA-T-14 module has sixteen analog input channels which may be used for both safety-related and non-safety-related applications. These sixteen channels (separated into two groups of eight channels with common 0 V) are connected to the FTA-T-14 module via a system interconnection cable (SIC), which is plugged into the SIC connector on the FTA module.

The FTA module has a universal snap-in facility for standard DIN EN rails, and screw terminals for connection of power supply, ground and field wiring.

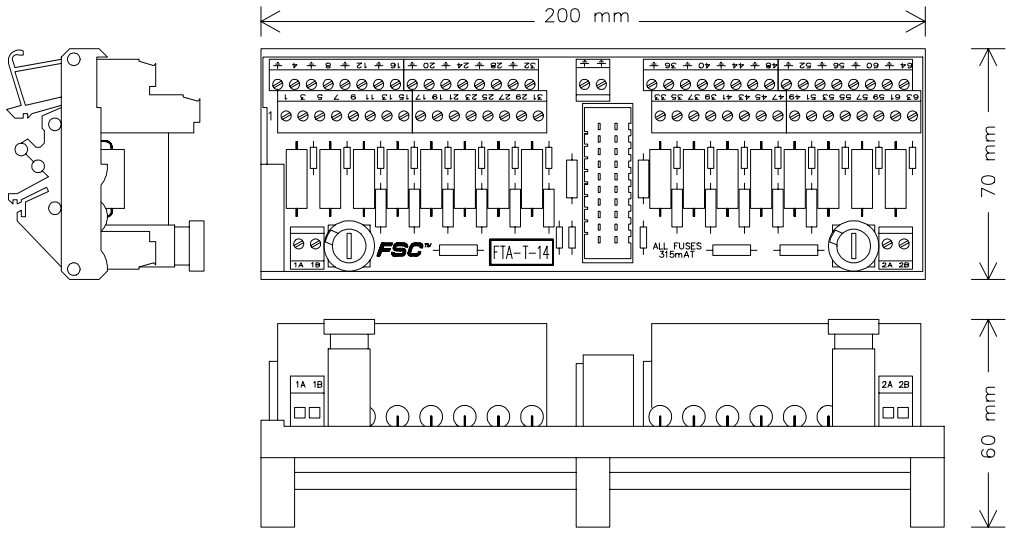

Figure 1 Mechanical layout

Main functions

The FTA-T-14 module has three main functions:

- linear direct conversion of 0(4)-20 mA DC field signals to the signal levels of the fail-safe high-density analog input module 10105/2/1,
- power supply distribution to each transmitter with voltage-current limitation in compliance with Hazardous Area Class I Division 2, and
- enable monitoring of the external power connected to the FTA-T-14 module.

Linear direct conversion

The input circuit of each channel consists of a high-precision resistor which converts the input current (0 to 20 mA) to the input voltage for the high-density analog input module 10105/2/1. The power to the analog transmitter is supplied via a series resistor. Each analog signal has its own terminal for the field cable shield.

Figure 2 below shows the schematic diagram for connecting a transmitter (active and passive).

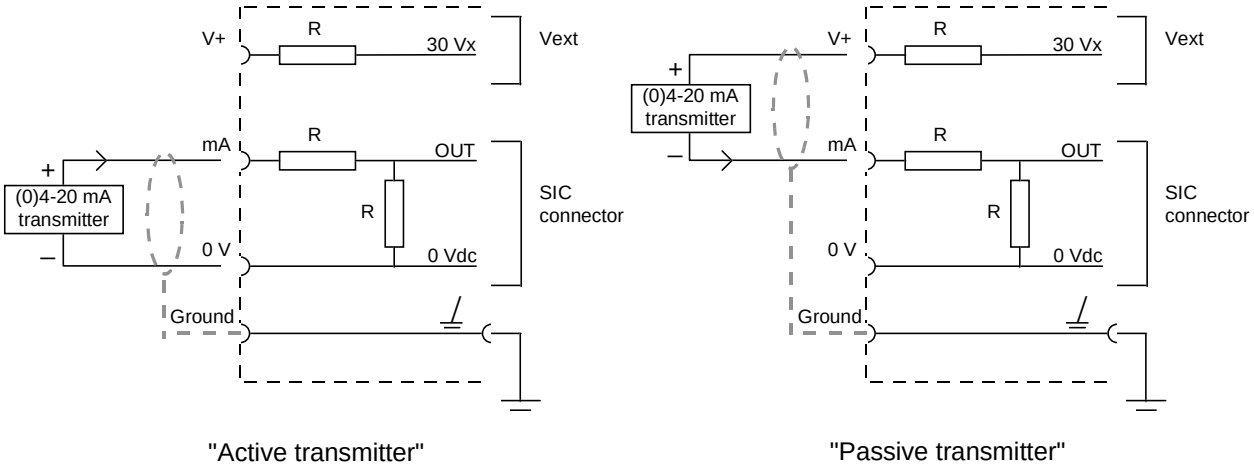

Figure 2 Schematic diagram for connecting a transmitter

Class I Division 2

The FTA-T-14 module may be used in areas with Class I, Division 2 applications. The external output voltage (V+) is current-limited by means of a series resistor.

Transmitter voltage

Figure 3 below shows the available transmitter voltage for passive transmitters.

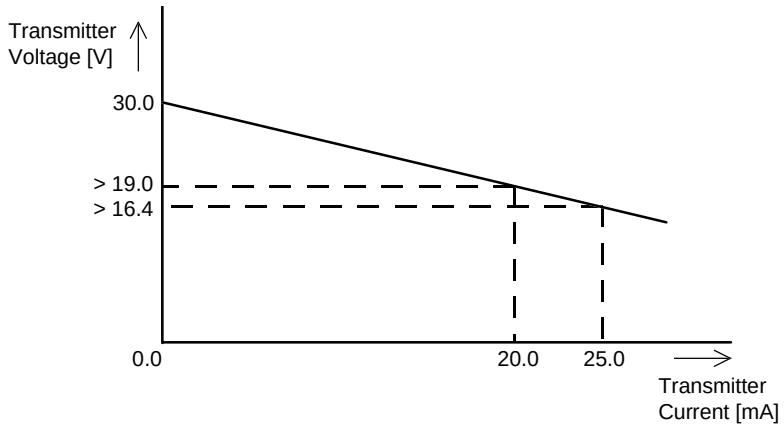

Figure 3 Transmitter voltage for passive transmitters

External power

If all inputs are active, no external power is required.

For loops which contain passive transmitters, analog process data is only available if the supply voltage to the electronics is guaranteed. The high-density analog input concept (using FTA-T-14/15 modules) offers full monitoring of power that is provided externally. If DC/DC converter modules FTA-T-15 are used, even redundant power supplies are covered.

External power can be connected to the FTA-T-14 module via one or both of the two screw terminal pairs marked '1A', '1B', '2A' and '2B'. The screw terminal pairs are interconnected on the FTA module. The sixteen channels on the FTA module are divided into two groups of eight channels, with each group being protected by a 315 mA fuse. Single-channel errors (shorts from V+ to 0 V) cannot blow the group fuse.

Note:
The 0 V connection of the external power is directly connected to the common 0 V of all sixteen analog inputs.

The FSC software can monitor the external power voltage via the fail-safe high-density analog input module 10105/2/1.

Figure 4 below shows the schematic diagram for power distribution with monitoring.

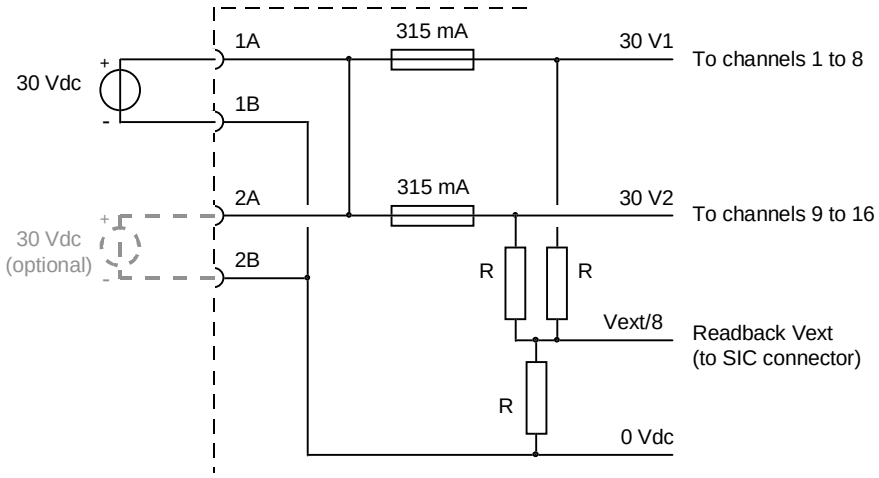

Figure 4 Schematic diagram for power distribution with monitoring

Applications

For details on applications and connection options for the FTA-T-14 module refer to the 'SIC to FTA applications' data sheet.

Connections

External power and ground

The external supply voltage (Vext) and ground are connected to the following screw terminals (marked '1A', '1B', '2A', '2B' and '⏚' on the FTA):

Screw terminal	Function
1A	30 Vdc Vext
1B	0 Vdc Vext
2A	30 Vdc Vext
2B	0 Vdc Vext
⏚	Ground connection
⏚	Ground connection

Connections diagram

The FTA-T-14 module has sixteen groups (= sixteen channels) of four screw terminals to provide optimum connection of field wiring, with a ground terminal per channel for screening of analog input cables. The screw terminals are numbered 1 to 64. The connections diagram of the FTA-T-14 module is as follows:

Connections diagram

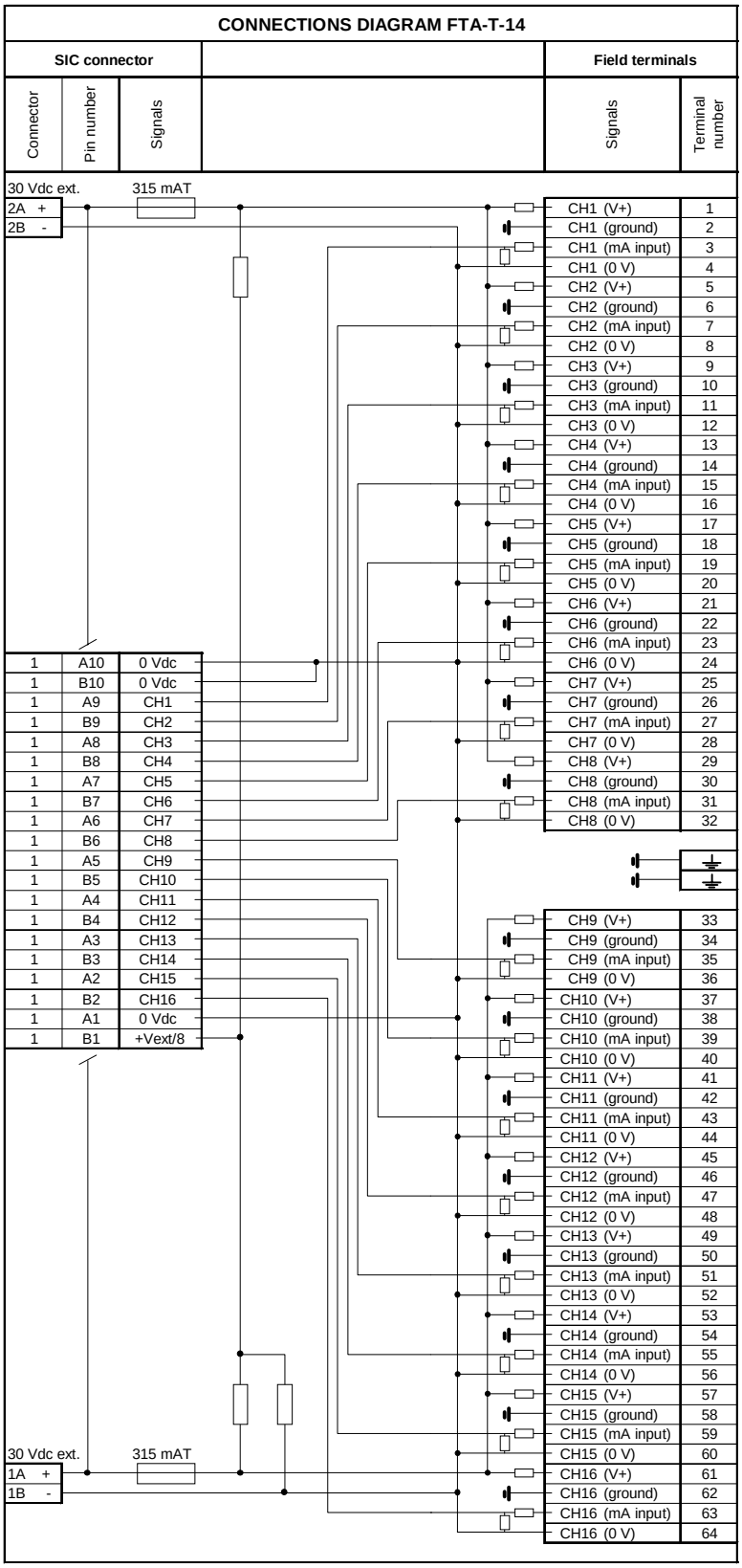

Figure 5 Connections diagram

Technical data

The FTA-T-14 module has the following specifications:

General	Type number:	FTA-T-14
	Approvals:	CE; UL, FM, TÜV approvals pending
Input	Number of input channels:	16 (2 groups of 8 with common 0 V)
	Power requirements:	30 Vdc external 3 mA (without input loop loads)
	Input current:	0 to 25 mA
	Input resistance:	250 Ohm (± 1%)
Output	To passive transmitters (Vext):	
	– output resistance:	270 Ohm (± 5%)
	– igniting current per channel:	< 120 mA at 30 Vdc
	To 10105/2/1 module:	
	– output voltage	0 to 4 Vdc
Fuses	Rating:	315 mAT (slow-acting)
	Dimensions:	5 x 20 mm (0.20 x 0.79 in)
Physical	Module dimensions:	200 x 70 x 60 mm (L x W x H) 7.87 x 2.76 x 2.36 in (L x W x H)
	DIN EN rails:	TS32 / TS35 x 7.5
	Used rail length:	201 mm (7.91 in)
Termination	Screw terminals:	
	– max. wire diameter	2.5 mm² (AWG 14)
	– strip length	7 mm (0.28 in)
	– tightening torque	0.5 Nm (0.37 ft-lb)
Field signal specifications	HYDROGEN (Group A & B):	
	– max. loop inductance	6 mH
	– max. loop capacitance	0.25 µF
	NON-HYDROGEN (Group C & D):	
	– max. loop inductance	20 mH
	– max. loop capacitance	5 µF