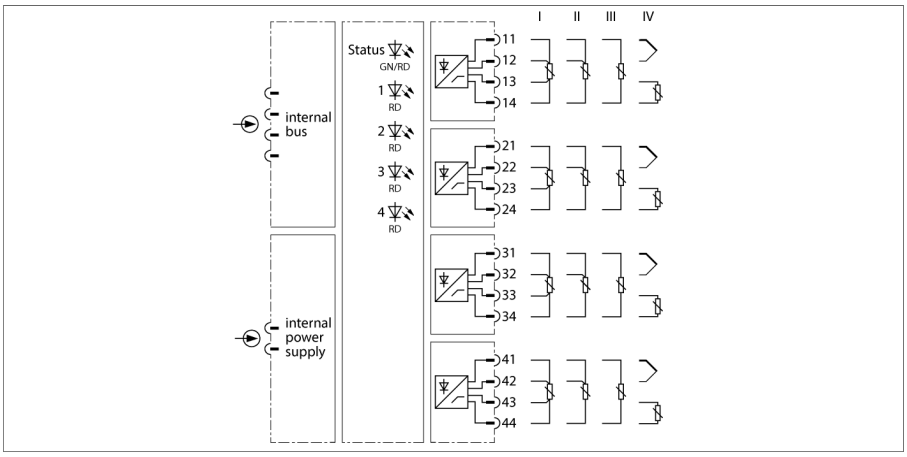
excom I/O System
4-Channel Temperature Input Module
TI401EX





The input module TI401EX is used for the connection of 2, 3 and 4-wire temperature probes of the types Pt100, Pt200, Pt500, Pt1000, Ni100 and Cu100, as well as for the connection of thermocouples of the types B, E, D, J, K, L, N, R, S, T and U. The module can also be used for the measurement of low voltages (-75…+75 mV, -1.2…+1.2 V) and for resistance measurements (0…30 Ω, 0…300 Ω, 0…3 kΩ).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with excom. The ignition protection type of the inputs is Ex ia IIC.

Line compensation of 2-wire temperature resistors is done by means of parametrized resistance values. These values have to be determined first through measurements.

When using thermocouples, external cold junction compensation can be carried out separately for each channel by connecting a PT100 (2-wire) to the unused terminals X3 + X4. Instead, internal compensation is parameterized for all channels via an integrated temperature resistor.

The temperature is indicated in Kelvin. For conversion to °C, please observe an offset of 273.2.

Setting the parameters, such as line monitoring, substitute value strategy and attenuation, can be carried out channel-by-channel and is initiated exclusively by the master.

- Input module for connecting temperature sensors, thermocouples, low voltages and resistor elements
- Complete galvanic isolation

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Type	TI401EX
ID	100028780
Supply voltage	Via module rack, central power supply module
Power consumption	≤ 1 W
Power dissipation	≤ 0.5 W
Galvanic isolation	Complete galvanic isolation acc. to EN 60079-11
Number of channels	4

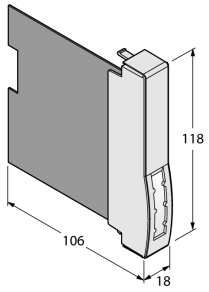
Input circuits	Intrinsically safe acc. to EN 60079-11 Pt100 Pt200 Pt500 Pt1000 Ni100 Cu100 0…30 ohms 0…300 ohms 0…3 kiloohms Thermocouples: B, C, D, E, J, K, L, L (GOST), N, R, S, T, U Low voltages: -75…+75 mV, -1.2…+1.2 V

Reference temperature	25 °C
Resolution	0.1 K (RTD and TC) 5 µV (±75 mV) 100 µV (±1.2 V) 1 mΩ (0…30 Ω) 10 mΩ (0…300 Ω) 100 mΩ (0…3000 Ω)
Measuring accuracy (including linearity, hysteresis and repeatability)	RTD: ≤ 0.1 % of measuring span. Thermocouple type: E, K, J, L, N, T, U ≤ 0.1 % of measuring span Thermocouple type: D, R, S ≤ 0.2 % of measuring span Thermocouple type: B ≤ 0.5 % of measuring span
Linearity deviation	≤ 0.05 % measuring range
Temperature drift	≤ 0.005 % of measuring span/K
Rise time/fall time	≤ 1.3 s (10…90 %)
Max. measurement tolerance under EMC influence	≤ 0.1 % with shielded signal cable

Ex approval acc. to conformity certificate	IECEx PTB 21.0019X
Ex approval acc. to conformity certificate	PTB 21 ATEX 2001X
Device designation	Ⓔx II 2 (1) G Ex ib [ia Ga] IIC T4 Gb
Device marking	Ⓔx II (1) D [Ex ia Da] IIIC

Displays/Operating elements	
Operational readiness	1 × green/red
State/ Fault	4 × red

Dimensions



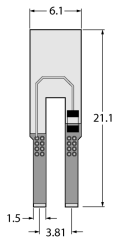
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Housing material	Plastic
Connection mode	module, plugged on rack
Protection class	IP20
Ambient temperature	-40…+70 °C
Relative humidity	≤ 93 % at 40 °C acc. to IEC 60068-2-78
Vibration test	Acc. to IEC 60068-2-6
Shock test	Acc. to IEC 60068-2-27
EMC	Acc. to EN 61326-1 Acc. to Namur NE21
MTTF	62 years acc. to SN 29500 (Ed. 99) 40 °C
Dimensions	18 x 118 x 106 mm

Approvals	ATEX cFMus cFM IECEx CCC KOSHA EAC Ex UKCA CE

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Accessories

Type code	Ident-No.		Dimension drawing
TI-CJC-2 (10PCS)	6884209	Cold junction compensation element (Pt100) for thermocouples measuring with the TI40…	

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