

Temperature Input Module mV Ex i / I.S. Inputs, 16 Channels Series 9481

- 8 channels for thermocouples (DIN, IEC, GOST) and mV sensors
- Suitable for grounded thermocouples
- Intrinsically safe inputs Ex ia IIC
- Galvanic isolation between inputs and between inputs and system
- Open-circuit monitoring for each field circuit
- Module can be replaced in operation (hot swap)

| | | | | | | |
|-----------------|---|---|---|----------|-----------------|-----------------|
| Zone | 0 | 1 | 2 | 20 | 21 | 22 |
| Class | I | | | II / III | | |
| Zone | 0 | 1 | 2 | 20 | 21 | 22 |
| Ex interface | X | X | X | X | X | X |
| Installation in | | X | X | | X ^{*)} | X ^{*)} |

| | | | | |
|-----------------|---|---|-----------------|-----------------|
| Class | I | | II / III | |
| Division | 1 | 2 | 1 | 2 |
| Ex interface | X | X | X | X |
| Installation in | X | X | X ^{*)} | X ^{*)} |

^{*)} suitable enclosure necessary

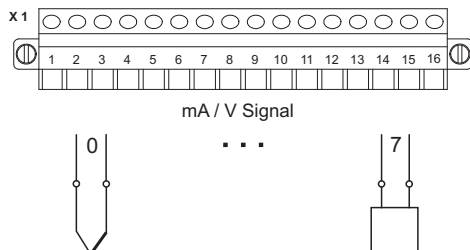


The Temperature Input Module mV is used for the connection of up to 8 thermocouples or mV-signals. Each input is individually monitored for open circuits.

The inputs are galvanically isolated with regard to their function so that interfering ground loops are prevented with grounded thermocouples.

The cold junction temperature is compensated internally on the connection terminals.

The interface of the Temperature Input Module with the internal data bus of the BusRail is designed with redundancy.



06312E00

| Selection Table | | | |
|-----------------------------|--|---------------|--------------------|
| Version | Description | Order number | Weight kg / lbs |
| Temperature Input Module mV | 8 channels for thermocouples (DIN, IEC, GOST) and mV sensors | 9481/12-08-11 | 0.321 / 0.708 |

| Technical Data | | | |
|---|--|--------------|--|
| Certificates | | | |
| IECEX | PTB 06.0001X | | |
| Europe (ATEX) | PTB 00 ATEX 2124 | | |
| USA (NEC) | 3007532 (FM) | | |
| Russia (GOST-R) | 04.B00806 (CTB) | | |
| Other countries | Canada (CSA), Brazil (INMETRO), Belarus (Promatomnadzor) | | |
| Marking | | | |
| IECEX | Ex ib [ia] IIC/IIB T4 | | |
| Europe (ATEX) | II 2 (1) G EEx ib [ia] IIC / IIB T4 II (1) D [Ex iaD] | | |
| USA (NEC) | IS/I/1/ABCD/T4 Ta = 65 °C, IS/I/1/IIC/T4 Ta = 65 °C, AIS/I,II,III/1/ABCDEFG, [AEx ia] IIC, NI/I/2/ABCD/T4 Ta = 65 °C, NI/I/2/IIC/T4 Ta = 65 °C, AIS/I,II,III/1/ABCDEFG, [AEx ia] IIC | | |
| Russia (GOST-R) | 1Exib[ia]IIC/IIBT4 | | |
| Other certificates | | | |
| Marine (DNV) (ABS) (GL) | | | |
| Safety data | | | |
| Maximum values | max. voltage U_i / V_{max} | 6.5 V | |
| | max. voltage U_o / V_{oc} | 1 V | |
| | max. current I_o / I_{sc} | 8.5 mA | |
| | max. power P_o | 2.2 mW | |
| Cable parameters (ATEX) | max. capacitance C_o / C_a for IIC (Σ of input circuits) | 11.1 μ F | |
| | max. capacitance C_o / C_a for IIB (Σ of input circuits) | 174 μ F | |
| | max. inductance L_o / L_a for IIC (Σ of input circuits) | 11.8 mH | |
| | max. inductance L_o / L_a for IIB (Σ of input circuits) | 47.2 mH | |
| The effective internal capacitances and inductances are negligible. | | | |
| Further information | see respective certificate | | |

| Technical Data | |
|-----------------------------------|---|
| Ex i / I.S. inputs | |
| Number of channels | 8 |
| Signal | - 10 mV ... + 100 mV |
| Linearity (adjustable parameters) | linear to temperature / linear to voltage |

Technical Data

| Ex i / I.S. inputs | Type | Reference | Measuring range (ITS-90) | Medium resolution | Medium measurement deviation with regard to measuring range |
|---|---|-------------|---|-------------------|---|
| Connectable thermocouples (adjustable parameters for every 2 channels) | B | IEC 60584-1 | + 400 ... + 1800 °C / + 752 ... + 3272 °F | 0.25 K | 0.1 % |
| | E | IEC 60584-1 | - 200 ... + 1000 °C / - 328 ... + 1832 °F | 0.1 K | 0.013 % |
| | J | IEC 60584-1 | - 200 ... + 1200 °C / - 328 ... + 2192 °F | 0.1 K | 0.014 % |
| | K | IEC 60584-1 | - 200 ... + 1370 °C / - 328 ... + 2498 °F | 0.1 K | 0.02 % |
| | N | IEC 60584-1 | - 200 ... + 1300 °C / - 328 ... + 2372 | 0.1 K | 0.02 % |
| | R | IEC 60584-1 | - 50 ... + 1767 °C / - 58 ... + 3213 °F | 0.2 K | 0.05 % |
| | S | IEC 60584-1 | - 50 ... + 1767 °C / - 58 ... + 3213 °F | 0.2 K | 0.053% |
| | T | IEC 60584-1 | - 200 ... + 400 °C / - 328 ... + 752 °F | 0.1 K | 0.042 % |
| | L | DIN 43710 | - 200 ... + 900 °C / - 328 ... + 1652 °F | 0.1 K | 0.027 % |
| | U | DIN 43710 | - 200 ... + 600 °C / - 328 ... + 1112 °F | 0.1 K | 0.038 % |
| | XK | GOST 8.585 | - 50 ... + 800 °C / - 328 ... + 1472 °F | 0.1 K | 0.02 % |
| | mV | -- | 0 ... + 100 mV | 3.6 µV | 0.01 % |
| Input resistance | 10 MΩ | | | | |
| Maximum delay from the input to the internal bus, 0 ... 90 % of the signal span | 800 ms | | | | |
| Filter time constant (adjustable parameters) | 50 Hz, 60Hz | | | | |
| Response threshold for open-circuit monitoring | > 1 kΩ | | | | |
| Galvanic isolation | | | | | |
| Isolation between the channels | Function up to 100 Vss (for explosion protection, the max. permissible potential difference between the earthing points, e.g. of earthed thermocouples, is 6.5 V) | | | | |
| between power supply and system components | 1500 V AC | | | | |
| between two input / output modules | 500 V AC | | | | |
| between inputs and system components | 500 V AC | | | | |
| Measuring accuracy | | | | | |
| Note | All values in % of the signal span, at 23 °C / 73.4 °F | | | | |
| Measurement deviation | see table | | | | |
| Ambient temperature effect | 0.05 % / 10 K | | | | |
| MTBF acc. to MIL | 24.1 years (at 40 °C / 104 °F) | | | | |
| Cold junction compensation | | | | | |
| Operating mode | Internal | | | | |
| Measuring range | - 40 ... + 80 °C / - 40 ... + 158 °F | | | | |
| Resolution | 0.1 K | | | | |
| Settings | | | | | |
| Open-circuit monitoring | ON, OFF (for each channel) | | | | |
| Value to fieldbus during open circuit | Alarm code, hold last value | | | | |

Technical Data

Diagnostics

| | |
|---------------------------|--|
| Retrievable parameters | Manufacturer, type, version, serial number |
| Module faults | <ul style="list-style-type: none"> • Internal primary bus faults • Internal redundant bus faults • No response • Module does not correspond to configuration • Hardware fault |
| Signal faults per channel | |
| Open circuit | > 1 kΩ |
| Measuring range | Over range / under range |

Power supply

| | |
|---------------------------|-------|
| Maximum power consumption | 1.6 W |
| Maximum power dissipation | 1.6 W |

Mechanical data

| | |
|----------------------------------|---------------|
| Module enclosure | Polyamide 6GF |
| Fire protection class (UL 94) | V2 |
| Degree of protection (IEC 60529) | |
| Modules | IP30 |
| Connections | IP20 |

Electrical connection

| | |
|---------------------------|--|
| Ex i / I.S. field signals | Plug-in terminals 16-pole with catch, 2.5 mm ² / up to 14 AWG, screw or spring type |
|---------------------------|--|

Operator interface

| | |
|-----------|-----------------|
| Operation | LED green "RUN" |
| Fault | LED red "ERR" |


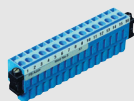
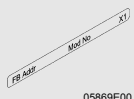



Installation conditions

| | |
|-----------------------|----------------------------|
| Mounting type | on 35 mm DIN rail NS 35/15 |
| Installation position | horizontal and vertical |

Ambient conditions

| | |
|--|---|
| Ambient temperature | - 20 ... + 65 °C / - 4 ... + 149 °F |
| Storage temperature | - 40 ... + 70 °C / - 40 ... + 158 °F |
| Maximum relative humidity | 95 % (no condensation) |
| Vibration, sinusoidal (IEC EN 60068-2-6) | 1 g in frequency range between 10 ... 500 Hz 2 g in frequency range 45 ... 100 Hz |
| Shock, semi-sinusoidal (IEC EN 60068-2-27) | 15 g (3 shocks per axis and direction) |
| Electromagnetic compatibility | Tested according to the following standards and regulations: EN 61326-1 (1998) IEC 1000-4-1...6, NAMUR NE 21 |

Accessories and Spare Parts

| Designation | Illustration | Description | Order number |
|------------------|---|--|--------------|
| Plug-in terminal |  | 2.5 mm ² / 14 AWG with catch, 16-pole, screw connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits Designation: 1 ... 16 Attention: An additional terminal is necessary for I/O module Series 9470 and 9480. Designation: 17 ... 32 | 162702 |
| |  | 2.5 mm ² / 14 AWG with catch, 16-pole, spring connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits including test jacks Designation: 1 ... 16 Attention: An additional terminal is necessary for I/O module Series 9470 and 9480. Designation: 17 ... 32 | 162695 |
| Labelling strips |  | „FB No ... Mod No ...“ for plug-in terminals, sheet with 26 labels | 162788 |
| DIN A4 sheet |  | For I/O module labels; 6 labels each sheet; print out with IS Wizard software; packaging unit = 20 sheets | 162832 |
| Warning sign |  | „Only clean modules with damp cloths“ | 162796 |
| Partition |  | For assembly between intrinsically safe and non-intrinsically safe connectors of the I/O modules, in order to adhere to the required 50 mm / 2 in distance | 162740 |



Dimensional Drawings (All Dimensions in mm / inches) - Subject to Alterations



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