Temperature Input Module for Zone 2
Series 9482/33

15235E00

- 8 channels for temperature sensors
- Intrinsically safe inputs Ex ia
- For Pt-, Ni- and Cu-resistance temperature detectors according to DIN, IEC and GOST in 2-, 3- and 4-wire circuits
- For thermocouples according to IEC, DIN and GOST with internal or external reference junction
- For resistance transmitter, mV sensors and joystick application
- Line fault monitoring per channel
- Diagnostics based on NE107
- Module can be replaced in hazardous area under voltage (hot swap)

The temperature input module is used for connecting of up 8 intrinsically safe temperature sensors to the remote I/O system IS1+.
Each channel can be used as input for resistance temperature detectors and resistance transmitters in 2, 3 or 4 wire technology or as earthed/insulated thermocouples and mV sensors.
In the operating mode "4 channel fast", very short signal delays are achieved, which allow special applications, such as joystick applications.
Compensation of the reference junction temperature is performed internally for thermocouples or via an external reference junction.

Compatible spare for IS1 remote I/O modules:
Series 9480/12 and 9481/12

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface	x	x	x	x	x	x
Installation in			x			x

WebCode 9482B

Explosion Protection								
Global (IECEx)								
Gas and dust	IECEx DEK 13.0046X Ex nA ia [ia Ga] IIC T4 Gb [Ex ia Da] IIIC							
Europe (ATEX)								
Gas and dust	DEKRA 13 ATEX 0140 X ⟨Ex⟩ II 3 (1) G Ex nA ia [ia Ga] IIC T4 Gc ⟨Ex⟩ II (1) D [Ex ia Da] IIIC							
Certifications and certificates								
Certificates	IECEx, ATEX, India (PESO), Canada (cFM), Serbia (SRPS), USA (FM), Belarus (operating license)							
Further parameters								
Installation	in Zone 2, Zone 22 and in the safe area							
Further information	see respective certificate and operating instructions							
Safety data								
	For proof of intrinsic safety, the safety data listed below must be used in accordance with the combination of connections and the corresponding sensor. For further information and combination, see operating instructions.							
Combination of connections 1								
Sensors	up to 8 resistance temperature detectors or resistance transmitters							
Note	no thermocouple / mV sensor connected							
Installation type	insulated							
Max. output voltage U_o ext	6.24 V							
Max. current I_o	2-wire	3-wire	4-wire					
	6.5 mA	7.8 mA	9.8 mA					
Max. power P_o	2-wire	3-wire	4-wire					
	10.5 mW	12.5 mW	15.7 mW					
Max. connectable inductance L_o / Capacitance C_o								
IIC	L_o [mH]	100	50	20	2	0.2	0.02	0.002
	C_o [µF]	1.1	1.2	1.4	2.0	3.2	7.0	25
IIB / IIIC	L_o [mH]	100	50	20	2	0.2	0.02	0.002
	C_o [µF]	5.8	6.3	7.1	10	19	51	570
combination of connections 2								
Sensors	up to 8 thermocouples or mV sensors							
Note	can be connected simultaneously to resistance temperature detector and resistance transmitter and/or external reference junction.							
Installation type	earthed							
Reference junction	internal/external							
Thermocouple / mV sensor								
Max. output voltage U_o ext	12.92 V							
Max. current I_o	25.0 mA							
Max. power P_o	81.0 mW							
Max. connectable inductance L_o / Capacitance C_o								
IIC	L_o [mH]	72	50	10	2	1	0.5	0.2
	C_o [µF]	0.17	0.22	0.34	0.46	0.53	0.62	0.78
IIB / IIIC	L_o [mH]	100	20	5	1	0.5	0.2	0.1
	C_o [µF]	1.2	1.6	2.1	3.0	3.5	4.5	5.7
Resistance sensor	see value combination of connections 3							
ext. reference junction	see values combination of connections 4							

Explosion Protection

Safety data

combination of connections 3								
Sensors	up to 8 resistance temperature detectors / resistance transmitters and/or thermocouples / mV sensors							
Note	simultaneously connected in any combination of sensor types possible							
Installation type	Resistance temperature detector and resistance transmitter insulated / thermocouple and mV sensor earthed							
Reference junction	internal/external							
Resistance sensor								
Max. output voltage U_o ext	12.92 V							
Max. current I_o	2-wire	3-wire	4-wire					
	13.1 mA	15.7 mA	19.6 mA					
Max. power P_o	2-wire	3-wire	4-wire					
	42.2 mW	50.6 mW	63.3 mW					
Max. connectable inductance L_o / Capacitance C_o								
IIC	L_o [mH]	100	50	20	5	1	0.5	0.2
	C_o [µF]	0.19	0.25	0.31	0.40	0.54	0.63	0.78
IIB / IIIC	L_o [mH]	100	20	10	2	1	0.5	0.1
	C_o [µF]	1.3	1.7	1.9	2.5	3.0	3.5	5.7
Thermocouple / mV sensor	see values combination of connections 2							
ext. reference junction	see values combination of connections 4							
combination of connections 4								
Sensors	External reference junction							
Note	when connected to thermocouples / mV sensors, also simultaneously connectable to resistance temperature detectors / resistance transmitters							
Installation type	insulated							
Reference junction	external (3-wire)							
external reference junction								
Max. output voltage U_o ext	12.92 V							
Max. current I_o	17.4 mA							
Max. power P_o	56.2 mW							
Max. connectable inductance L_o / Capacitance C_o								
IIC	L_o [mH]	66	50	20	5	1	0.5	0.2
	C_o [µF]	0.17	0.21	0.29	0.39	0.53	0.62	0.78
IIB / IIIC	L_o [mH]	100	20	5	1	0.5	0.2	0.1
	C_o [µF]	1.2	1.6	2.1	2.9	3.5	4.5	5.7
Resistance sensor	see value combination of connections 3							
Thermocouple / mV sensor	see values combination of connections 2							
Note	Siehe Kapitel 6.2 Nachweis der Eigensicherheit							
Max. internal capacity C_i	negligible							
Max. internal inductance L_i	negligible							

Selection Table

Version	Description	Installation	Order number	Weight kg
Temperature Input Module for Zone 2	8 channels with adjustable parameters for resistance temperature detectors, thermocouples	in Zone 2, Zone 22 and in the safe area	**9482/33-08-10**	0.275
Note	Please order 2 terminals separately - see Accessories			

Technical Data

Electrical data

Ex i inputs

Resistance temperature detector / resistance transmitter

Number of channels	8
Operating modes	8 channel precise/ 4 channel fast (joystick)
Connection type	2-, 3- and 4-wire circuits
Resistance range	0 … 10 kΩ
Measuring current	< 200 µA multiplexed
Max. line resistance per cable	100 Ω
Measurement accuracy	0.025 % (8 channel precise) / ± 1 % (4 channel fast joystick)
Note	All values in % of measuring range at 23 °C
Ambient temperature influence	0.025 % / 10 K
Linearity (adjustable parameters)	Temperature linear / resistance linear

connectable resistance temperature detectors / resistance transmitters

Type	Reference	Measuring range (ITS-90)	Medium resolution
Pt100	IEC 60751	-200 ... +850 °C	0.1 K
Pt500	IEC 60751	-200 ... +850 °C	0.1 K
Pt1000	IEC 60751	-200 ... +850 °C	0.1 K
Ni100	DIN 43760	-60 ... +180 °C	0.1 K
Ni500	DIN 43760	-60 ... +180 °C	0.1 K
Ni1000	DIN 43760	-60 ... +180 °C	0.1 K
Pt46[2)]	GOST 6651-94	-200 ... +1100 °C	0.15 K
Pt50[2)]	GOST 6651-94	-200 ... +1100 °C	0.15 K
Pt100[1)]	GOST 6651-94	-200 ... +1100 °C	0.1 K
Cu53[2)]	GOST 6651-94	-50 ... +180 °C	0.1 K
M50[1)]	GOST 6651-94	-200 ... +200 °C	0.15 K
M100[1)]	GOST 6651-94	-200 ... +200 °C	0.1 K
3-wire potentiometer	- -	0 ... 500 Ω	0.02 Ω
3-wire potentiometer	- -	0 ... 2,5 k Ω	0.10 Ω
3-wire potentiometer	- -	0 ... 5 k Ω	0.20 Ω
3-wire potentiometer	- -	0 ... 10 k Ω	0.4 Ω
Joystick (4-wire)	- -	500 ... 10 k Ω	

Reaction time

Type	Type of connection	Operating mode 4 channel fast Error control		Operating mode 8 channel fast Error control	
		Activated	Deactivated	Activated	Deactivated
RTD	2-wire	400 ms	400 ms	750 ms	720 ms
RTD	3-wire	400 ms	400 ms	750 ms	720 ms
RTD	4-wire	400 ms	400 ms	750 ms	720 ms
R	2-wire in R	400 ms	400 ms	750 ms	720 ms
R	3-wire in %	90 ms	70 ms	750 ms	720 ms
R	4-wire in R	400 ms	400 ms	750 ms	720 ms
R	4-wire in %	90 ms	70 ms	750 ms	720 ms

To achieve the times of "error control deactivated", the error control on all channels must be "OFF"! As soon as the error control is "ON" at one channel only, the times for "error control activated" are valid.

Technical Data

Electrical data

Ex i inputs	
Thermocouples / mV sensors	
Number of channels	8
Operating modes	8 channel precise/4 channel fast
Connection type	2-wire circuits
Signal range	-10 … +100 mV
Linearity (adjustable parameters)	Temperature linear / voltage linear
Note	All values in % of the measuring range at 23 °C

connectable thermocouples / mV sensors

Type	Reference	Measuring range (ITS-90)	Medium resolution	Medium measurement deviation with regard to measuring range
B	IEC 60584-1	+400 ... +1800 °C	0.25 K	0.1 %
E	IEC 60584-1	-200 ... +1000 °C	0.1 K	0.013 %
J	IEC 60584-1	-200 ... +1200 °C	0.1 K	0.014 %
K	IEC 60584-1	-200 ... +1370 °C	0.1 K	0.02 %
N	IEC 60584-1	-200 ... +1300 °C	0.1 K	0.02 %
R	IEC 60584-1	-50 ... +1767 °C	0.2 K	0.05 %
S	IEC 60584-1	-50 ... +1767 °C	0.2 K	0.053 %
T	IEC 60584-1	-200 ... +400 °C	0.1 K	0.042 %
L	DIN 43710	-200 ... +900 °C	0.1 K	0.027 %
U	DIN 43710	-200 ... +600 °C	0.1 K	0.038 %
XK	GOST 8.585	-50 ... +800 °C	0.1 K	0.02 %
mV	- -	0 ... +100 mV	3.6 µV	0.01 %

Reaction time

Type	Type of connection	Operating mode 4 channel fast Error control		Operating mode 8 channel fast Error control	
		Activated	Deactivated	Activated	Deactivated
Thermocouple	2-wire	500 ms	450 ms	800 ms	750 ms
0 ... 100 mV	2-wire	500 ms	450 ms	800 ms	750 ms

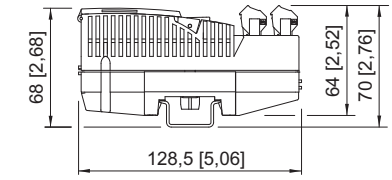
To achieve the times of "error control deactivated", the error control on all channels must be "OFF"! As soon as the error control is "ON" at one channel only, the times for "error control activated" are valid.

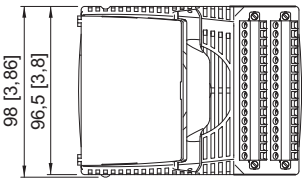
Input resistance	10 MΩ
Ambient temperature influence	0.025 % / 10 K
Reference junction compensation	
Number of channels	1 (clamping unit see operating instructions)
Operating modes	internal (adjustable parameters) / external 3-wire circuit
Connection type	3-wire circuit (external)
Measuring range	-40 … +80 °C
Measurement accuracy	internal: 0.025% / external: depending on sensor type, see "Connectable resistance temperature detectors"
resolution	0.1 K
Temperature deviation for thermocouples with internal compensation	± 2 K
Galvanic separation	
Test voltage	
acc. to standard	EN 60079-11
Between auxiliary power/ system components	≥ 1500 V AC
Between two I/O modules	≥ 500 V AC
Between I/O channels/ system components	≥ 500 V AC
Between I/O channels/ ground (PA)	≥ 500 V AC

Technical Data

Electrical data	
Electromagnetic compatibility	
	Tested to the following standards and regulations: EN 61326-1, IEC 61000-4-1 … 6, NAMUR NE 21
Measurement accuracy	0.1 % (8 channel precise) under strong electromagnetic influence
Electrical connection	
Power supply	BusRail Types 9494
Ex i field signals	Pluggable, blue terminals, 16-pole, 2.5 mm², screw- or spring-type versions with lock
Auxiliary power	
Maximum power consumption	1 W
Maximum power dissipation	1 W
Device-specific data	
Settings	
Module	
Diagnostics message	ON / OFF
Operating mode	8 channel precise / 4 channel fast
Selection reference junction	internal / external 3-wire
Type external reference junction	PT100, PT1000, PT100 GOST
Signal	
Behaviour in case of error	hold last value
Error control	ON / OFF
Sensor type	see table (connectable sensors)
Type of connection	2-, 3-, 4-wire
Ambient conditions	
Ambient temperature	-40 … +75 °C (observe operating instructions)
Storage temperature	-40 … +80 °C
Maximum relative humidity	95 % (without condensation)
Maximum operating altitude	< 2000 m
Semi-sinusoidal shock (IEC EN 60068-2-27)	15 g (3 shocks per axis and direction)
Sinusoidal vibration (IEC EN 60068-2-6)	1 g in the frequency range 10 ... 500 Hz 2 g in the frequency range 45 ... 100 Hz
Mechanical data	
Degree of protection (IEC 60529)	IP20
Module enclosure	polyamide 6GF
Fire resistance (UL 94)	V2
Pollutant class	corresponds to G3
Dimensions	L = 128 mm, B = 96.5 mm, H = 67 mm
Indication	
LED indication	
Module requires maintenance	LED "M/S", blue
Operating state	LED "RUN", green
Group error	LED "ERR", red
Function indication	
Retrievable parameters	Manufacturer, Type, hardware revision, software revision, serial number
Error indication	
Module status and alarms	• Internal bus error primer / redundant • No response from IOM • Configuration does not correspond to the module • Hardware error • Excess temperature • Slot error • Module requires maintenance
Signal errors for each channel	
Signal status bit	"0" = signal disturbed; "1" = signal valid
Wire breakage input	Resistance temperature detector / resistance transmitter: > 100 Ω; thermocouples / mV-sensors: > 1000 Ω
Short circuit input	Resistance temperature detector / resistance transmitter: < 15 Ω
Measuring range	Exceeding / shortfall
Mounting / Installation	
Mounting orientation	horizontal or vertical (observe operating instructions)
Mounting type	on 35 mm DIN rail NS 35/15 (DIN EN 60715)

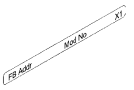
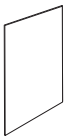
Dimensional drawings (all dimensions in mm [inches]) - subject to modifications





15254E00

Accessories and Spare Parts

Designation	Figure	Description	Art. no.
Pluggable terminal	 02079E00	2.5 mm² with lock, 16-pole, screw connector, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits Labelling: 1 ... 16 Attention: An additional terminal is necessary for I/O module Series 9470 and 9480. Designation: 17 ... 32	**162702**
		2.5 mm² with lock, 16-pole, screw connector, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits Labelling: 17 ... 32	**162718**
	 02077E00	2.5 mm² with lock, 16-pole, spring clamp connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits, incl. test jacks Labelling: 1 ... 16 Attention: An additional terminal is necessary for I/O module Series 9470 and 9480. Designation: 17 ... 32	**162695**
		2.5 mm² with lock, 16-pole, spring clamp connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits, incl. test jacks Labelling: 17 ... 32	**162716**
Reference junction		Serves for measurement of the junction temperature with Pt 100 in 3-wire circuit. ext. reference junction in terminal block	**160673**
Labelling strips	 05869E00	"FB Addr ... Mod No ..." for pluggable terminal, sheet with 26 strips	**162788**
DIN A4 sheet	 09900E00	For label plate on I/O modules; 6 labels on each sheet; print-out using IS Wizard; packaging unit = 20 sheets	**162832**
Partition	 15196E00	For mounting between intrinsically safe and non-intrinsically safe connections of the I/O modules, in order to adhere to the required 50 mm distance	**220101**
Warning sign	 05872E00	"Clean modules only with a damp cloth."	**162796**

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