

## Remote I/O

### IS1+ Remote I/O Temperature input module

For Zone 1 Ex i

9482/32-08-11 Art. No. 217643



- Eight channels for resistance temperature detectors, potentiometers, thermocouples, mV sensors and joysticks
- Ex ia intrinsically safe inputs with line fault monitoring and LED error indication
- Module in Zone 1 can be replaced without having to disconnect the power supply (i.e. hot-swapped)

MY R. STAHL 9482A



The 9482 temperature input module for Zone 1 has eight channels for Ex i operation of resistance temperature detectors with 2-, 3- or 4-conductor connection and thermocouples. Sensors that comply with DIN, IEC and GOST are supported as well as resistance transmitters up to 10 kΩ and also joysticks for rapid 4-channel operation. Earthed thermocouples can be connected. Reference junction compensation can be performed internally or externally.

## Technical Data

### Explosion Protection

Application range (Zones)	1 2
Application range (Zone) note	A suitable enclosure in accordance with the area of application must be used. Refer to the operating instructions.
Ex interface zone	0 1 2 20 21 22
IECEX gas certificate	IECEX DEK 13.0046X
IECEX gas explosion protection	Ex ia [ia Ga] IIC T4 Gb
IECEX dust certificate	IECEX DEK 13.0046X
IECEX dust explosion protection	[Ex ia Da] IIIC
ATEX gas certificate	DEKRA 13 ATEX 0140 X
ATEX gas explosion protection	Ex II 2 (1) G Ex ia [ia Ga] IIC T4 Gb
ATEX dust certificate	DEKRA 13 ATEX 0140 X
ATEX dust explosion protection	Ex II (1) D [Ex ia Da] IIIC
FMus certificate	FM17US0332X
cFM certificate	FM16CA0134X
Marking cFMus	IS, Class I, Div. 1, Groups A,B,C,D; Class I, Zone 1, AEx/Ex ia [ia] IIC AIS Class I,II,III, Div. 1, Groups A,B,C,D,E,F,G; T4 at Ta = 75°C See Doc. 9482 6 031 001 1
Certificates	ATEX (DEK), Brazil (ULB), Canada (FM), China (NEPSI), IECEX (DEK), India (PESO), Korea (KTL), USA (FM)
Ship approval	ABS, BVIS, EU RO MR (DNV), KR, LR

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### Explosion Protection

Declaration of Conformity	ATEX (EUK), China (CCC)
Installation	Zone 1, Zone 2, Cl. I, Div. 1, 2 and in the safe area
Further information	see operating instructions and certificate

### Safety Data

Internal capacitance	Negligible
Internal inductance	Negligible

Notes	For proof of intrinsic safety, the safety data must be used in accordance with the combination of connections and the corresponding sensor. For further information and combination, see operating instructions.
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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		6.42 V							
Max. current $I_o$		2-conductor	3-conductor	4-conductor					
		6.5 mA	7.8 mA	9.8 mA					
Max. power $P_o$		2-conductor	3-conductor	4-conductor					
		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	
	$C_o$ [ $\mu$ F]	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	
	$C_o$ [ $\mu$ F]	5	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 detectors and resistance transmitters an 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	
	$C_o$ [ $\mu$ F]	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	
	$C_o$ [ $\mu$ F]	1.2	1.6	2.1	3.0	3.5	4.5	5.7	
Resistance sensor		See values, combination of connections 3							
External reference junctions		See values, combination of connections 4							
Combination of connections 3									

Sensors	Up to 8 resistance temperature detectors/resistance transmitters and/or thermocouples/mV sensors							
Note	Any combination of sensor types is possible when simultaneously connected							
Installation type	Resistance temperature detector and resistance transmitter insulated/ thermocouple and mV sensor earthed							
Resistance sensor reference junction	Internal/external							
Max. output voltage $U_o$ ext	12.92 V							
Max. current $I_o$	2-conductor	3-conductor	4-conductor					
	13.1 mA	15.7 mA	19.6 mA					
Max. power $P_o$	2-conductor	3-conductor	4-conductor					
	42.2 mW	50.6 mW	63.3 mW					
Max. connectable inductance $L_o$ /capacitance $C_o$	$L_o$ [mH]	100	50	20	5	1	0.5	0.2
		IIC						
	$C_o$ [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
		IIB/IIIC						
	$C_o$ [μF]	1.3	1.7	1.9	2.5	3.0	3.5	5.7
Thermocouple/mV sensor	See values, combination of connections 2							
External reference junctions	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-conductor)							
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 $C_o$	$L_o$ [mH]	66	50	20	5	1	0.5	0.2
		IIC						
	$C_o$ [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
		IIB/IIIC						
	$C_o$ [μF]	1.2	1.6	2.1	2.9	3.5	4.5	5.7
Resistance sensor	See values, combination of connections 3							
Thermocouple/mV sensor	See values, combination of connections 2							

### Electrical Data

Number of channels	8 or 4 Ex i inputs (depends on operating mode)
Operating mode	4-channel fast (joystick) 8 channel accurate
Connection Ex i field signals	Pluggable, blue terminals, 16-pole, 2.5 mm <sup>2</sup> , screw- or spring-type versions with lock
<b>Auxiliary Power</b>	
Power supply connection	BusRail types 9494
Auxiliary power version	Intrinsically safe Ex ia via BusRail

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#### Auxiliary Power

Current consumption	42 mA
Max. power consumption	1 W
Max. power dissipation inputs	1 W

#### Galvanic Isolation

Test voltage for galvanic separation	Acc. to standard EN 60079-11
Auxiliary power/system components	≥ 1500 V AC
I/O module / I/O module	≥ 500 V AC
I/O channels/system components	≥ 500 V AC
I/O channels / ground (PA)	≥ 500 V AC

#### Input

Sensor type 1	Resistance temperature detector Resistance transmitter
Resistance range	0 – 10 kΩ
Measuring current	< 200 μA multiplexed
Accuracy of measurement	± 1% (4-channel fast) 0.025% (8-channel accurate)
Linearity 1 (adjustable parameters)	Resistance-linear Temperature-linear
Sensor type 2	Thermocouples mV transmitter
Connection type 2	2-wire circuits
Signal range of inputs	-10 ... +100 mV
Linearity 2 (adjustable parameters)	Voltage-linear Temperature-linear
Max. line resistance	100 ohm per core
Input resistance	Max. 10 mΩ per channel
Compensation of reference junctions	Internal (adjustable parameters) External 3-wire circuit
Min. input measuring range	-40 °C
Max. input measuring range	+80 °C
Resolution	0.1 K
Notes	For a breakdown of the sensors see table "Ex i inputs"
Accuracy of measurement at reference junctions	Internal: 0.025% External: depends on the sensor type, see connectable resistance temperature detectors
Temperature deviation	±2 K for thermocouples with internal compensation

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Connectable resistance temperature detectors/ resistance transmitters	Type		Reference	Measuring range (ITS-90)	Average measurement discrimination	
		Pt100		IEC 60751	-200 to +850 °C	0.1 K
	Pt500		IEC 60751	-200 to +850 °C	0.1 K	
	Pt1000		IEC 60751	-200 to +850 °C	0.1 K	
	Ni100		DIN 43760	-60 to +180 °C	0.1 K	
	Ni500		DIN 43760	-60 to +180 °C	0.1 K	
	Ni1000		DIN 43760	-60 to +180 °C	0.1 K	
	Pt46		GOST 6651-94	-200 to +1100 °C	0.15 K	
	Pt50		GOST 6651-94	-200 to +1100 °C	0.15 K	
	Pt100		GOST 6651-94	-200 to +1100 °C	0.1 K	
	Cu53		GOST 6651-94	-50 to +180 °C	0.1 K	
	M50		GOST 6651-94	-200 to +200 °C	0.15 K	
	M100		GOST 6651-94	-200 to +200 °C	0.1 K	
	Resistance trans- mitter (3-conductor)		--	0 to 500 Ω	0.02 Ω	
	Resistance trans- mitter (3-conductor)		--	0 to 2.5 kΩ	0.10 Ω	
	Resistance trans- mitter (3-conductor)		--	0 to 5 kΩ	0.20 Ω	
	Resistance trans- mitter (3-conductor)		--	0 to 10 kΩ	0.4 Ω	
	Resistance trans- mitter (3-conductor)		--	-200 to +850 °C 500 to 10 kΩ	0.1 K	
	Resistance trans- mitter (3-conductor)		--			
	Joystick (4-conductor)					
Reaction time	Type	Type of connection	Operating mode		Operating mode	
			4 channel rapid Error monitoring Activated	Deactivated	8 channel precise Error monitoring Activat- ed	Deactivat- ed
	RTD	2-conductor	400 ms	400 ms	750 ms	720 ms
	RTD	3-conductor	400 ms	400 ms	750 ms	
	RTD	4-conductor	400 ms	400 ms	750 ms	
	R	2-conductor	400 ms	400 ms	750 ms	720 ms
	R	in R	90 ms	70 ms	750 ms	
	R	3-conductor	400 ms	400 ms	750 ms	
	R	in %	90 ms	70 ms	750 ms	
		4-conductor in R				
		4-conductor in %				
<p>To achieve the times with "error control deactivated", the error control must be "OFF" for all channels. As soon as the error control is "ON" for just one channel, the times for "error control activated" apply.</p>						

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Connectable thermocouples/mV sensors	Type	Reference	Measuring range (ITS-90)	Average measurement discrimination	Average error of measurement based on measuring range
	B	IEC 60584-1	-400 to +1800 °C	0.25 K	0.1%
E	IEC 60584-1	-200 to +1000 °C	0.1 K	0.013%	
J	IEC 60584-1	-200 to +1200 °C	0.1 K	0.014%	
K	IEC 60584-1	-200 to +1370 °C	0.1 K	0.02%	
N	IEC 60584-1	-200 to +1300 °C	0.1 K	0.02%	
R	IEC 60584-1	-50 to +1767 °C	0.2 K	0.05%	
S	IEC 60584-1	-50 to +1767 °C	0.2 K	0.053%	
T	IEC 60584-1	-200 to +400 °C	0.1 K	0.042%	
L	DIN 43710	-200 to +900 °C	0.1 K	0.027%	
U	DIN 43710	-200 to +600 °C	0.1 K	0.038%	
XK	GOST 8,585	-50 to +800 °C	0.1 K	0.02%	
mV	--	0 to +100 mV	3.6 µV	0.01%	

Reaction time	Type of connection	Operating mode		Operating mode	
		4 channel rapid	Error monitoring	8 channel precise	Error monitoring
		Activated	Deactivated	Activated	Deactivated
Thermocouple 0 to 100 mV	2-conductor	500 ms	450 ms	800 ms	750 ms
	2-conductor	500 ms	450 ms	800 ms	800 ms

To achieve the times with "error control deactivated", the error control must be "OFF" for all channels. As soon as the error control is "ON" for just one channel, the times for "error control activated" apply.

### Device Specific Data

Diagnostics message module	OFF ON
Selection reference junction	Internal/external 3-conductor
External reference junction type	PT1000 PT100 GOST PT100
Sensor type	see table (connectable sensors)
Type of connection	2-, 3- and 4-wire circuit
Line fault monitoring	OFF ON
Input behaviour in case of error	hold last value
LED module requires maintenance	"M/S" LED, blue
LED operating conditions	"RUN" LED, green
LED channel error	LED for each channel, red
Retrievable parameters	Hardware revision Manufacturer Serial number Software revision Type

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### Device Specific Data

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 status bit	1 = Signal valid 0 = Signal interrupted
Wire breakage input	Thermocouples > 1000 ohm Resistance transmitter > 100 Ω Resistance thermometer > 100 ohm mV transmitter > 1000 ohm
Short circuit input	Resistance transmitter < 15 ohm Res.temp. detector < 15 ohm
Measuring range	Shortfall Overshoot
Influence of ambient temperature	0,025 % / 10 K

### Diagnostics

LED group error	"ERR" LED, red
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### Ambient Conditions

Ambient temperature °C	-40°C ... +75°C
Ambient temperature °F	-40°F ... +167°F
Storage temperature °C	-40°C ... +80°C
Storage temperature °F	-40°F ... +176°F
Max. operating altitude	< 2000 m
Max. relative humidity	95% (without condensation)
Shock (semi-sinusoidal)	(IEC EN 60068-2-27) 15 g (3 shocks per axis and direction)
Vibration (sinusoidal)	(IEC EN 60068-2-6) Frequency range 2 ... 13.2 Hz    Amplitude 1 mm (peak value) Frequency range 13.2 ... 100 Hz    Acceleration amplitude 0.7 g
Electromagnetic compatibility	Tested to the following standards and regulations: EN 61326-1 (2006) IEC 61000-4-1 to 61000-4-6, NAMUR NE 21 0.1 % (8 channel precise) under strong electromagnetic influence
Note	(observe operating instructions)

### Mechanical Data

Degree of protection (IP) (IEC 60529)	IP20
Module enclosure	Polyamide 6GF
Fire resistance (UL 94)	V2
Pollutant class	Corresponds to G3
Width	96.5 mm
Width, inches	3.8 in
Height	67 mm
Length	128 mm
Length, inches	5.04 in
Mounting depth, inches	2.64 in
Weight	275 g

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### Mechanical Data

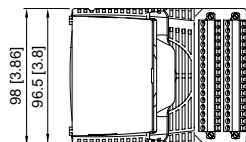
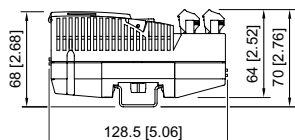
Weight	0.61 lb
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### Mounting / Installation

Mounting orientation	Vertical Horizontal
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Connection type 1	2-, 3- and 4-wire circuit
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### Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



### Accessories

#### External reference junction

#### Art. No.



External reference junction for 2 x thermocouple (1 x Pt100 for 2-, 3- or 4-wire connection) integrated into the 4-pin terminal block. Mounted on a DIN rail.

160675

#### Pluggable terminal

#### Art. No.



2.5 mm<sup>2</sup> with lock, 16-pin, screw connector, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits  
Labelling: 1 to 16  
Note: A second terminal is additionally required for I/O module Series 9470 and 9482  
Labelling: 17 to 32

162702



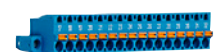
2.5 mm<sup>2</sup> with lock, 16-pin, screw connector, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits  
Labelling: 17 to 32

162718



2.5 mm<sup>2</sup> with lock, 16-pin, spring clamp connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits, incl. test jacks  
Labelling: 1 to 16  
Note: A second terminal is additionally required for I/O module Series 9470 and 9482  
Labelling: 17 to 32

162695



2.5 mm<sup>2</sup> with lock, 16-pin, spring clamp connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits, incl. test jacks  
Labelling: 17 to 32

162716



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### Partition

### Art. No.

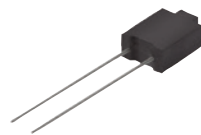


For mounting between intrinsically safe and non-intrinsically safe connections between I/O modules to maintain a tight string length of 50 mm

220101

### Resistor error message suppression

### Art. No.



The resistors are used to suppress error messages for unused I/O channels  
Resistance value: 62R/0.5 W  
Suitable for: AOM 9468; UMH 9469; DIOM 9472; TIM 9482

244912

### Warning label

### Art. No.



"Clean modules only with a damp cloth."

162796

### DIN A4 sheet

### Art. No.

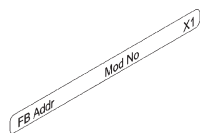


For label plate on I/O modules; 6 plates per sheet;  
IS Wizard printout; packaging unit = 20 sheets

162832

### Labelling strips

### Art. No.



"FB Addr ... Mod No ..." for pluggable terminal, 26 pieces on the sheet

162788

### Vibration bracket set

### Art. No.



When installed in environments with extreme vibration (> 0.7 g and max. 4 g), the 9490 vibration brackets may be used as an additional measure and provide mechanical stability for the individual modules.

For mounting: All I/O modules, except 9477/12 and 9478

Number of brackets in a set: 8

Screws (item no. 275516) must be ordered separately.

271920

### Set of screws

### Art. No.

Set of M5 x 14 screws (self-tapping) for 9490 vibration brackets

Number of screws in a set: 25

275516

We reserve the right to make alterations to the technical data, dimensions, weights, designs and products available without notice. The illustrations cannot be considered binding.