

09384E02

## Analog Input Module Ex i / I.S. Inputs, 8 Channels Series 9460

- 8 channels for 2-wire transmitters and 4 channels for 3- and 4-wire transmitters and current sources
- Intrinsically safe inputs Ex ia IIC
- Galvanic isolation between the inputs and the system
- Open-circuit and short-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 <sup>*)</sup>	X <sup>*)</sup>

Class	I		II / III	
Division	1	2	1	2
Ex interface	X	X	X	X
Installation in	X	X	X <sup>*)</sup>	X <sup>*)</sup>

<sup>\*)</sup> suitable enclosure necessary



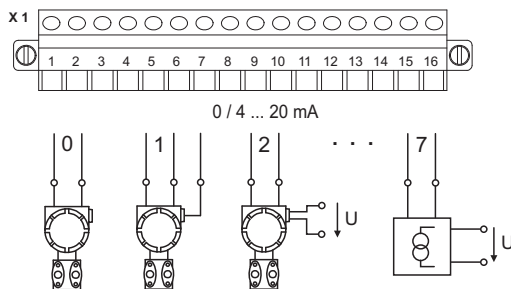
The Analog Input Module is used for the connection and supply of up to 8 x 2-wire or 3-wire transmitters with 0 ... 20 mA or 4 ... 20 mA signals. Each input is individually monitored for open and short circuits.

Inputs and power supplies are short-circuit proof and intrinsically safe.

The power supply for 4-wire transmitters is provided by an external voltage source.

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

For operation of HART field devices see Series 9461.



06301E00

### Selection Table

Version	Description	Order number	Weight kg / lbs
Analog Input Module	8 channels for 2-wire transmitters and 4 channels for 3- and 4-wire transmitters and current sources	<b>9460 / 12-08-11</b>	0.321 / 0.708

### Explosion Protection

<b>Certificates</b>				
IECEX	PTB 06.0001X			
Europe (ATEX)	PTB 99 ATEX 2175			
USA (NEC)	3007532 (FM)			
Russia (GOST-R)	04.B00806 (CTB)			
Other countries	Canada (CSA), Brazil (INMETRO), Belarus (Promatomnadzor)			
<b>Marking</b>				
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/II/1/ABCD/T4 Ta = 65 °C, IS/II/1/IIC/T4 Ta = 65 °C, AIS/I,II,III/1/ABCDEFG, [AEx ia] IIC, NI/II/2/ABCD/T4 Ta = 65 °C, NI/II/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)			
<b>Safety data</b>				
Maximum values		2-wire transmitter	3-wire transmitter	4-wire transmitter
max. voltage $U_o / V_{oc}$		26.2 V	26.2 V	0 V
max. voltage $U_i / V_{max}$		--	--	28 V
max. current $I_o / I_{sc}$		86 mA	86 mA	0 mA
max. current $I_i / I_{max}$		--	--	150 mA
max. power $P_o$		561 mW	561 mW	0 mW
Cable parameters (ATEX)		2-wire transmitter	3-wire transmitter	4-wire transmitter
max. capacitance $C_o / C_a$ for IIC		97 nF	97 nF	--
max. capacitance $C_o / C_a$ for IIB		0.75 µF	0.75 µF	--
max. inductance $L_o / L_a$ for IIC		2.71 mH	2.71 mH	--
max. inductance $L_o / L_a$ for IIB		15.8 mH	15.8 mH	--
effective internal capacitance $C_i$		0	0	0
effective internal inductance $L_i$		37 µH	73 µH	73 µH
Further information	see respective certificate			

## Technical Data

Ex i / I.S. inputs				
Number of channels	8 (3-wire, 4-wire transmitters, or active mA sources occupy 2 channels)			
Grounding	The field circuits must not be grounded			
Signal				
Signal range	0 ... 20 mA, 4 ... 20 mA (adjustable parameters for each channel)			
Minimum signal	0 mA			
Maximum signal	23.5 mA			
Supply voltage	16.0 V at 20 mA for 2-wire and 3-wire transmitters			
Maximum input resistance	14 Ω (for 4-wire transmitter / active mA source)			
Signal transmission	Filter time constant (adjustable parameters)			
	small	medium	50 Hz, 60 Hz	
Resolution in the range 4 ... 20 mA	12.75 bit	14.75 bit	14.75 bit	
Maximum delay from the input to the internal bus, 0 ... 90 % of the signal span	32 ms	120 ms	840 ms	
Max. short-circuit current	35 mA for 2-wire and 3-wire transmitters			
Galvanic isolation				
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			
	The inputs and outputs of an I/O module have a common negative conductor			
Measuring accuracy				
Note	All values in % of the signal span, at 23 °C / 73.4 °F			
Measurement deviation	Filter time constant (adjustable parameters)			
	small	medium	50 Hz, 60 Hz	
Maximum measurement deviation	0.075 %	0.05 %	0.05 %	
Ambient temperature effect	0.1 % / 10 K			
MTBF acc. to MIL	38 years (at 40 °C / 104 °F)			
Settings				
Open-circuit and short-circuit monitoring	ON, OFF (for each channel)			
Value to fieldbus during open circuit, short circuit	-10 %, 0 %, 100 % of the signal, alarm code, hold last value			

## Technical Data

### Diagnostics

Retrievable parameters      Manufacturer, type, version, serial number

Module faults

- Internal primary bus faults
- Internal redundant bus faults
- No response
- Module does not correspond to configuration
- Hardware fault

### Signal faults per channel

Open circuit      < 2.4 / < 3.6 mA (adjustable parameters, 4 ... 20 mA)

Short circuit      > 23.5 / > 22.8 / > 21 mA (adjustable parameters, 0/4 ... 20 mA)

Measuring range      Over range / under range

### Operator interface

Operation      LED green "RUN"

Fault      LED red "ERR"

### Power supply

	2-wire transmitter	3-wire transmitter	4-wire transmitter
Maximum power consumption	6.6 W	6.6 W	1.6 W
Maximum power dissipation	3.7 W	3.7 W	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<sup>2</sup> / up to 14 AWG, screw or spring type

### 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


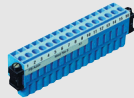


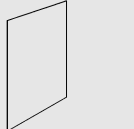

Maximum relative humidity      95 % (no condensation)

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)

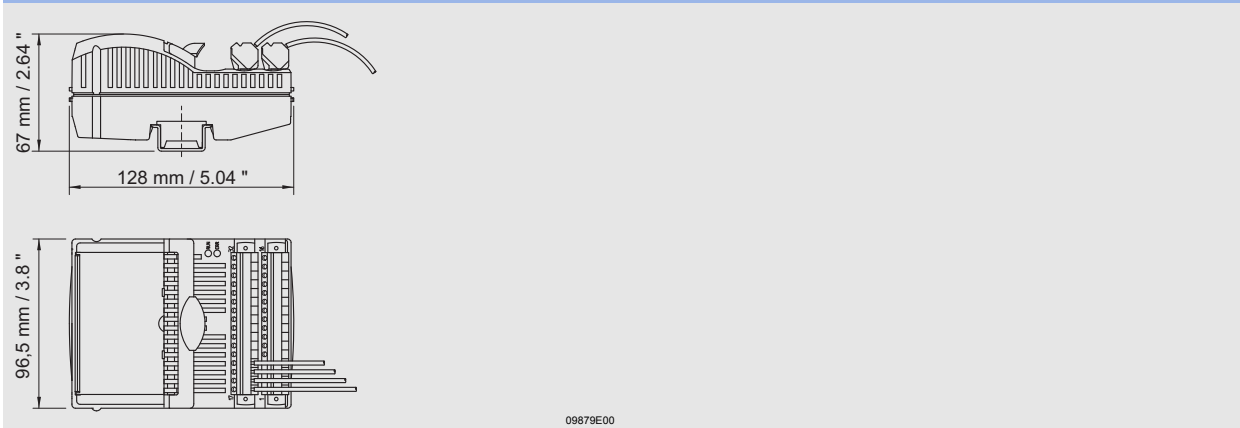
Electromagnetic compatibility      Tested according to the following standards and regulations:  
EN 61 326-1 (1998) IEC 1000-4-1...6, NAMUR NE 21



Accessories and Spare Parts			
Designation	Illustration	Description	Order number
Plug-in terminal	 02079E00	2.5 mm <sup>2</sup> / 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
	 02077E00	2.5 mm <sup>2</sup> / 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	 05869E00	„FB No ... Mod No ...“ for plug-in terminals, sheet with 26 labels	162788
Partition	 02078E00	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
DIN A4 sheet	 09900E00	For I/O module labels; 6 labels each sheet; print out with IS Wizard software; packaging unit = 20 sheets	162832
Warning sign	 05872E00	„Only clean modules with damp cloths“	162796



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



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

Representante oficial de:



[Argentina – Uruguay – Paraguay – Bolivia – Ecuador.]



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