

07362E00

Analog Input Module HART Ex n / NI Inputs, 8 Channels Series 9461/15

- 8 channels for 2-wire HART transmitters
- Inputs for Ex nL, Ex nA and Nonincendive
- Galvanic isolation between inputs and 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
Installation in			X			X ^{*)}

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

^{*)} suitable enclosure necessary



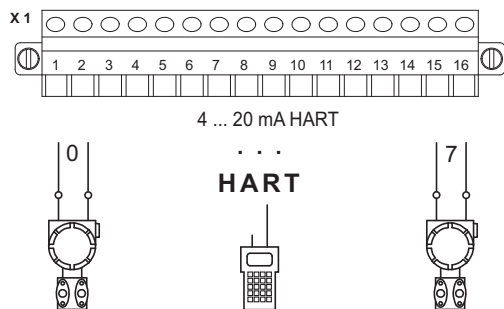
The Analog Input Module HART is used for the connection and supply of up to 8 x 2-wire HART transmitters with 0 ... 20 mA or 4 ... 20 mA signals. Each input is individually monitored for open and short circuits.

Inputs and power supplies are short-circuit proof and energy limited.

The interface of the Analog Input Module with the internal data bus of the BusRail has integrated redundancy.

The integrated HART multiplexer allows bidirectional HART communication between HART field devices and the automation and engineering system.

Analog transmitters (non-HART) can also be operated.



05689E00

Selection Table

Version	Description	Order number	Weight kg / lbs
Analog Input Module HART	8 channels for 2-wire HART transmitters	9461 / 15-08-12	0.241 / 0.531

Explosion Protection

Certificates		
Europe (ATEX)	KEMA 06 ATEX 0261 X	
USA (NEC)	3007532 (FM)	
Marking		
Europe (ATEX)	⊕ I/3 (2) GD Ex nA [nL] [ib] IIC T4	
USA (NEC)	NI/1/2/ABCD/T4 Ta = 65 °C, I/2/IIC/T4 Ta = 65°C	
Other certificates		
Marine (DNV)		
Safety data		
Maximum values	max. voltage U_o / V_{oc}	23.8 V
	max. voltage U_i / V_{max}	32 V
	max. current I_o / I_{sc}	36 mA
	max. current I_i / I_{max}	any
	max. power P_o	567 mW
	max. power P_i	any
Cable parameters (ATEX)	max. capacitance C_o / C_a for IIC	94 nF
	max. capacitance C_o / C_a for IIB	0.88 μ F
	max. inductance L_o / L_a for IIC	2 mH
	max. inductance L_o / L_a for IIB	20 mH
	effective internal capacitance C_i	2.5 nF
	effective internal inductance L_i	0
Further information		
see respective certificate		

Technical Data

Ex n / NI inputs				
Number of channels	8 (for 2-wire transmitter with / without HART)			
Signal				
Signal range	0 .. 20 mA, 4 .. 20 mA + HART (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 transmitters			
Signal transmission	Filter time constant (adjustable parameters)			
	small	medium	50 Hz, 60 Hz	
	Resolution in the range 4 ... 20 mA	12.75 bit	12.75 bit	12.75 bit
	Maximum delay from input to internal bus, 0 ... 90 % of signal span	32 ms	120 ms	840 ms
Note: For HART operation, the time setting "medium" or 50 Hz, 60 Hz is recommended				
Maximum short-circuit current	35 mA			




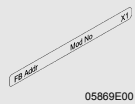
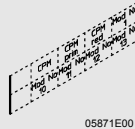


Technical Data

Galvanic isolation			
between power supply and system components	1500 V AC		
between two input / output modules	1500 V AC		
between inputs and system components	1500 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	36.2 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		
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	< 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			
Maximum power consumption	6 W		
Maximum power dissipation	3.6 W		
Mechanical data			
Module enclosure	Polyamide 6GF		
Fire protection class (UL 94)	V2		
Degree of protection (IEC 60529)			
Modules	IP30		
Connections	IP20		

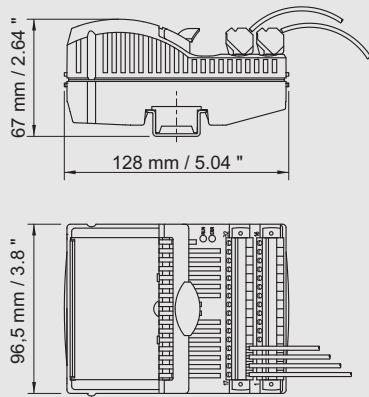
Technical Data

Electrical connection	Ex n / NI field signals	Plug-in terminals 16-pole with catch, 2.5 mm ² / 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
Engineering notes		<ul style="list-style-type: none"> • Versions 946./5 only for installation in Zone 2 or in safe area. • Mixing of Zone 1 modules (946./2) and Zone 2 modules (946./5) on same BusRail is allowed. • For separation between intrinsically safe and non-intrinsically safe circuits (≥ 50 mm / 2 in), a partition (162740) is required.

Accessories and Spare Parts

Designation	Illustration	Description	Order number
Plug-in terminal	 09898E00	Screw connection, 2.5 mm ² with catch, 16-pole, black, for connecting Ex nL/Ex nA field signals Labelling: 1 ... 16	162708
	 09899E00	Spring connection, 2.5 mm ² with catch and test jacks, 16-pole, black, for connecting Ex nL/Ex nA field signals Labelling: 1 ... 16	162710
Labelling strips	 05869E00	„FB No ... Mod No ...“ for plug-in terminals, sheet with 26 labels	162788
Designation strips	 05871E00	For BusRail, for 1 BusRail with 16 I/O modules	162793
Warning sign	 05872E00	„Only clean modules with damp cloths“	162796
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



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

09879E00

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.