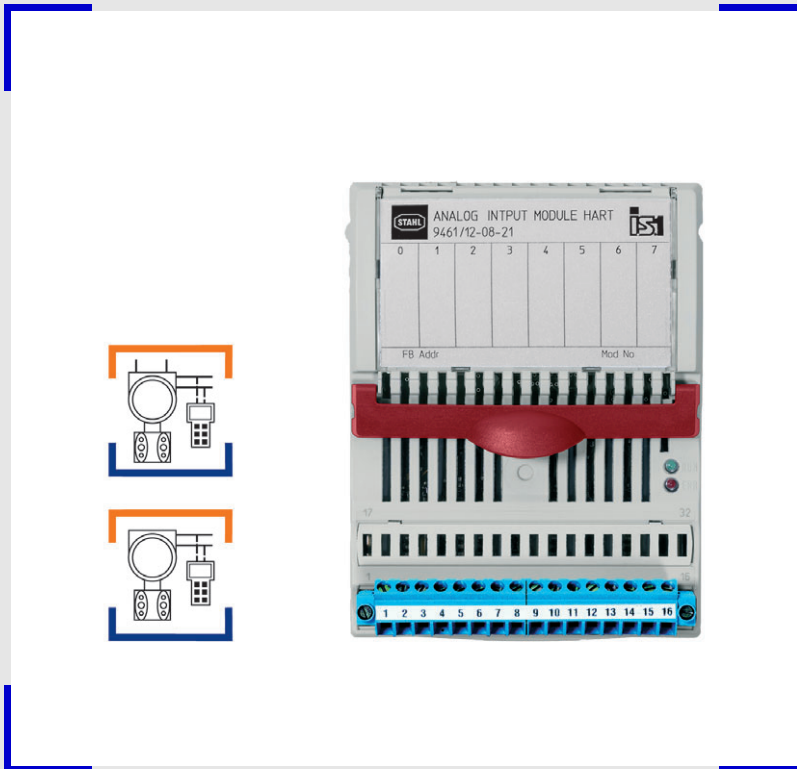


# Analog Input Module HART Ex i / I.S. Inputs, 4 + 4 Channels

Type 9461/12-08-21



www.stahl.de



02075E00

- > 4 channels for 2-wire HART transmitters and 4 channels for 4-wire HART transmitters
- > Intrinsically safe inputs Ex ia IIC
- > Galvanic separation between inputs and system
- > Open-circuit and short-circuit monitoring for each field circuit
- > Module can be replaced in operation (hot swap)
- > New version: Type 9468/32



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The Analog Input Module HART is used for the connection and supply of up to 4 x 2-wire and 4 x 4-wire HART transmitters with 0 ... 20 mA or 4 ... 20 mA signals. Each input is individually monitored for open and short circuits. 2-wire transmitters are supplied with power from the module. Signals and power supplies are short-circuit proof and intrinsically safe. 4-wire transmitters are powered from an external supply. The signals are connected intrinsically safe. The interface of the Analog Input Module with the internal data bus of the BusRail is designed with redundancy. The integrated HART multiplexer permits bidirectional HART communication between HART field devices and the automation and engineering system. Analog transmitters (non-HART) can also be operated.



	ATEX / IECEx						NEC 505						NEC 506						NEC 500								
	0	1	2	20	21	22	Class I						Class II						Class III								
Zone	0	1	2	20	21	22	Zone	0	1	2	20	21	22	Division	1	2	1	2	1	2	Division	1	2	1	2	1	2
Ex interface	x	x	x	x	x	x	Ex interface	x	x	x	x	x	x	Ex interface	x	x	x	x	x	x	Ex interface	x	x	x	x	x	x
Installation in		x	x		x <sup>*)</sup>	x <sup>*)</sup>	Installation in		x	x		x <sup>*)</sup>	x <sup>*)</sup>	Installation in	x	x	x <sup>*)</sup>	x <sup>*)</sup>	x <sup>*)</sup>	x <sup>*)</sup>	Installation in	x	x	x <sup>*)</sup>	x <sup>*)</sup>	x <sup>*)</sup>	x <sup>*)</sup>

<sup>\*)</sup> Restrictions see table explosion protection

**WebCode 9461B**

# Analog Input Module HART Ex i / I.S. Inputs, 4 + 4 Channels

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### Selection Table

Version	Description	Order number	Weight kg / lbs
Analog Input Module HART	4 channels for 2-wire HART transmitters and 4 channels for 4-wire HART transmitters	<b>9461 / 12-08-21</b>	0.321 / 0.708
Note	Please order terminal separately - see Accessories		

### Explosion Protection

#### Global (IECEX)

Gas	PTB 06.0001X Ex ib [ia] IIC/IIB T4
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#### Europe (ATEX)

Gas and dust	PTB 99 ATEX 2175 ⊕ II 2 (1) G Ex ib [ia] IIC T4 ⊕ II (1) D [Ex ia] IIIC
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#### Certificates

Certificates	IECEX, ATEX, Brazil (Inmetro), Canada (CSA), Kazakhstan (GOST K), Russia (GOST R), Serbia (SRPS), USA (FM), Belarus (operating authorisation)
Ship approval	ABS, BV, ClassNK, DNV, GL, LR

#### Safety data

Maximum values	2-wire transmitter		4-wire transmitter	
	max. voltage $U_o / V_{oc}$	26.2 V	28 V	28 V
max. voltage $U_i / V_{max}$	--	--	28 V	
max. current $I_o / I_{sc}$	91 mA	6 mA	6 mA	
max. current $I_i / I_{max}$	--	--	144 mA	
max. power $P_o$	591 mW	42 mW	42 mW	

Cable parameters (ATEX) (for inductive or capacitive circuits)	2-wire transmitter		4-wire transmitter	
	max. capacitance $C_o / C_a$ for IIC	97 nF	83 nF	83 nF
max. capacitance $C_o / C_a$ for IIC	0.75 $\mu$ F	0.65 $\mu$ F	0.65 $\mu$ F	
max. inductance $L_o / L_a$ for IIC	2.38 mH	50 mH	50 mH	
max. inductance $L_o / L_a$ for IIB	14 mH	50 mH	50 mH	
effective internal capacitance $C_i$	0	11 nF	11 nF	
effective internal inductance $L_i$	37 $\mu$ H	37 $\mu$ H	37 $\mu$ H	

Further information see respective certificate and operating instructions

#### Further parameters

Installation in	Zones 1 & 2, Div. 1 & 2, Zones 21 & 22
Further information	see respective certificate and operating instructions

# Analog Input Module HART Ex i / I.S. Inputs, 4 + 4 Channels

Type 9461/12-08-21



## Technical Data

### Electrical data

Ex i / I.S. inputs for 2-wire transmitters				
Number of channels	4			
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			
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 the input to the internal bus, 0 ... 90 % of the 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			
Ex i / I.S. inputs for 4-wire transmitters				
Number of channels	4			
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			
Maximum input resistance	450 Ω			
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 the input to the internal bus, 0 ... 90 % of the signal span	32 ms	120 ms	840 ms	
	Note: For HART operation the time setting medium or 50 Hz, 60 Hz is recommended			
Galvanic separation				
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.			
Accuracy of measurement				
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 influence	0.1 % / 10 K			
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			

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# Analog Input Module HART Ex i / I.S. Inputs, 4 + 4 Channels

## Type 9461/12-08-21



### Technical Data

#### Electrical data

Diagnostics  
 Retrievable parameters  
 Module faults

Manufacturer, type, version, serial number

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

Signal errors for each 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"

Auxiliary power

Maximum power consumption

4.1 W

Maximum power dissipation

2.7 W

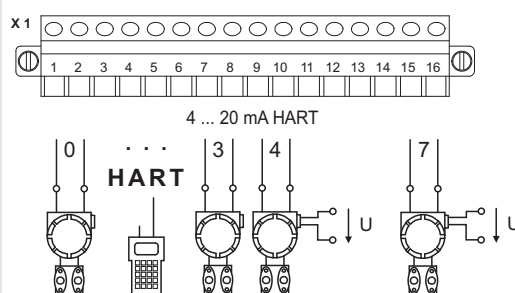
Electrical connection

Ex i field signals

Plug-in terminals 16-pole with catch, 2.5 mm<sup>2</sup> / up to 14 AWG, screw or spring type

Connection diagram

Plug-in terminals 16-pole with catch, 2.5 mm<sup>2</sup> / up to 14 AWG, screw or spring type



06304E00

#### Ambient conditions

Ambient temperature

-20 ... +65 °C / -4 ... +149 °F

Storage temperature

-40 ... +70 °C / -40 ... +158 °F

Maximum relative humidity

95 % (no condensation)

Sinusoidal vibration (IEC EN 60068-2-6)

1 g in frequency range between 10 ... 500 Hz

2 g in frequency range 45 ... 100 Hz

Semi-sinusoidal shock (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

#### Mechanical data

Module enclosure

Polyamide 6GF

Fire resistance (UL 94)

V2

Degree of protection (IEC 60529)

Modules

IP30

Connections

IP20

#### Mounting / installation

Installation conditions

Mounting type

on 35 mm DIN rail NS 35/15

Mounting orientation



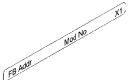
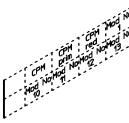


horizontal and vertical

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### Accessories and Spare Parts

Designation	Figure	Description	Art. no.
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	<b>162702</b>
	 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	<b>162695</b>
Labelling strips	 05869E00	"FB Addr ... Mod No ..." for pluggable terminal, sheet with 26 strips	<b>162788</b>
Designation strips	 05871E00	For BusRail, for 1 BusRail with 16 I/O modules	<b>162793</b>
Warning sign	 05872E00	"Clean modules only with a damp cloth."	<b>162796</b>
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	<b>162740</b>

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



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.