

Remote I/O

IS1+ Remote I/O HART analog universal module

For Zone 1 Ex i

9468/32-08-10 Art. No. 296070



- Eight channels can be used individually as inputs or outputs
- Intrinsically safe Ex ia IIC inputs/outputs with line fault monitoring
- Module in Zone 1 and Class I, Div. 1 can be replaced during operation (hot swap)

WebCode **9468A**



The 9468/32 series HART Analog Universal Module for Zone 1 and Class I, Div. 1 has eight channels that can be used individually for I.S. operating two-/three-wire HART transmitters, four-wire transmitters or control valves/positioners with 0/4 to 20 mA signals. HART communication is bidirectional.

All inputs/outputs are short-circuit proof, galvanically isolated from the system and individually monitored to check for line faults.

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
IECEEx gas certificate	IECEEx DEK 12.0054X
IECEEx gas explosion protection	Ex ia [ia Ga] IIC T4 Gb
IECEEx dust certificate	IECEEx DEK 12.0054X
IECEEx dust explosion protection	[Ex ia Da] IIIC
ATEX gas certificate	DEKRA 12 ATEX0173 X
ATEX gas explosion protection	Ex II 2 (1) G Ex ia [ia Ga] IIC T4 Gb
ATEX dust certificate	DEKRA 12 ATEX0173 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. 9468 6 031 001 1
Certificates	ATEX (DEK), Brazil (ULB), Canada (FM), IECEEx (DEK), India (PESO), USA (FM)
Ship approval	ABS, BVIS, EU RO MR (DNV), KR, LR

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Explosion Protection

Notes	CCC, UKCA certificate available from 2022 onward
Installation	Zone 1, Zone 2 and safe area
Further information	see operating instructions and certificate

Safety Data

Max. voltage U_o	24.4 V
Max. current I_o (2-conductor)	80 mA
Max. power P_o (2-conductor)	488 mW
Max. current I_o (3-conductor)	81.8 mA
Max. power P_o (3-conductor)	499 mW
Internal capacitance	Negligible
Internal inductance	Negligible

Max. connectable inductance L_o / capacity C_o									
2-wire input/output									
IIC	L_o [mH]	3.8	2	1	0.5	0.2			
	C_o [nF]	53	59	71	88	119			
IIB	L_o [mH]	23	10	2	1	0.5	0.2	0.1	0.05
	C_o [nF]	370	430	430	470	550	700	860	890
3-wire input									
IIC	L_o [mH]	3.6	2	1	0.5	0.2			
	C_o [nF]	53	58	70	87	119			
IIB	L_o [mH]	21	10	2	1	0.5	0.2	0.1	0.05
	C_o [nF]	380	420	420	470	550	700	860	890

Limits			
4-conductor transmitter	U _o , I _o , P _o , C _i and L _i are negligible. Maximum connectable safety characteristic values during operation with active 4-wire-transmitters:		
	Max. input voltage U _i [V]	Max. input current I _i [mA]	Max. ambient temperature T _{amb} [°C]
	28	150	55
	28	140	60
	28	130	65
	28	115	70
	28	105	75

Electrical Data

Number of channels	8 Ex i inputs/outputs
Channels	each with adjustable parameters as input or output (3-wire, 4-wire transmitters, or active mA-sources occupy 2 channels)
Nominal signal	0 to 20 mA 4 to 20 mA
Min. signal	0 mA

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Electrical Data

Supply voltage	16 V
Communication signal	HART protocol
Connection Ex i field signals	Pluggable, blue terminals, 16-pole, 2.5 mm ² , screw- or spring-type versions with lock
Notes	In order to operate an active 4-wire HART transmitter, a 9164 must be connected between each channel. 9164 is not required when operating 4-wire transmitter without HART communication.

Signal transmission	Filter time constant (adjustable parameters)			
		small	medium	50 Hz, 60 Hz
	Resolution in the range 4 ... 20 mA	14.75 bit (with HART: 12.75 bit)	14.75 bit	14.75 bit
	Maximum delay from signal / internal bus	32 ms	120 ms	500 ms

Auxiliary Power

Power supply connection	BusRail types 9494
Auxiliary power version	Intrinsically safe Ex ia via BusRail
Current consumption	220 mA (at 20 mA per channel)
Max. power consumption	5.3 W
Max. power dissipation outputs	3.7 W
Max. power dissipation inputs	2.7 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

Max. signal for input	23.5 mA
Max. input short-circuit current	24 mA
Max. input resistance	14.1 Ω per channel

Output

Output step response (10 to 90%)	40 ms
Max. output short-circuit current	22,8 mA (4 ... 20 mA) 23,5 mA (0 ... 20 mA)
Max. signal for output	22.8 mA (4 to 20 mA) 23.5 mA (0 to 20 mA)
Output max. load resistance	700 Ω at 21.8 mA 750 ohm at 20 mA
Open-circuit voltage U _a	22.5 V

Device Specific Data

Signal type	Input Output
Diagnostics message module	OFF ON

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Device Specific Data

Signal filter module	50 Hz large 60 Hz large medium small
Scan HART live list module	OFF ON
Signal range	0 ... 20 mA 4 ... 20 mA
Input measuring range	2.4 to 22.8 or 23.5 mA 3.6 to 21 mA (acc. to NAMUR)
Line fault monitoring	OFF ON
Input behaviour in case of error	-10% 0% 100% 110% Alarm code, keep last value
Output behaviour in case of error	-10% 0% 100% 110% Keep last value
Cyclical data transmission of HART variants	4HV 8HV No
LED module requires maintenance	"M/S" LED, blue
LED operating conditions	"RUN" LED, green
LED group error	"ERR" LED, red
LED channel error	without
Channel status LEDs	no
Retrievable parameters	Hardware revision Manufacturer Serial number Software revision Type
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
Wire breakage input	< 2,4 mA / 3,6 mA (adjustable parameters, at 4 to 20 mA)
Short circuit input	(adjustable parameters) > 22.8 mA/> 21 mA > 23.5 mA
Wire breakage output	Terminal voltage > 16 V (response range 16 ... 16.5 V) or output current can not longer be set
Short circuit output	Output load < 60 Ω (response range 40 ... 60 Ω)
Influence of ambient temperature	< 0,03 % / 10 K

Accuracy of measurement

Error of measurement with filter time constant	small	medium	50 Hz, 60 Hz
Maximum error of measurement	0.075 % (12 µA at 4 ... 20 mA)	0.05 % (8 µA at 4 ... 20 mA)	0.05 % (8 µA at 4 ... 20 mA)

Note: All values in % of the signal span at 23 °C

Ambient Conditions

Ambient temperature	-40 °C ... +75 °C Observe operating instructions
Ambient temperature	-40 °F ... +167 °F Observe operating instructions
Storage temperature	-40 °C ... +80 °C
Storage temperature	-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

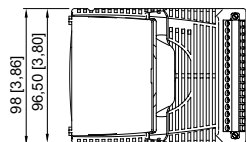
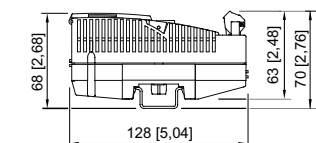
Mechanical Data

IP degree of protection (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
Depth	68 mm
Length	128 mm
Length, inches	5.04 in
Mounting depth, inches	2.64 in
Weight	0.275 kg
Weight	0.61 lb

Mounting / Installation

Mounting orientation	Horizontal Vertical
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Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



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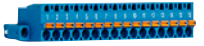
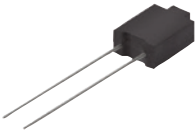
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Accessories

Pluggable terminal		Art. No.
	2.5 mm ² 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 9482. Labelling: 17 ... 32	162702
	2.5 mm ² 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 9482. Labelling: 17 ... 32	162695
Electronic relay		Art. No.
	The electronic relay modules are used to switch from Ex e loads via intrinsically safe (Ex i) or non-intrinsically safe (Ex e) control. Coil circuit: Ex i or non-Ex i (Ex e)* Contact circuit: Non-Ex i (Ex e) *You can switch between Ex i and non-Ex i circuits, or vice-versa, at any time without restriction.	282457
Ex i/Ex e relay module for Zone 1		Art. No.
	The Ex i/Ex e relay module is used for the galvanically isolated switching of intrinsically safe (Ex i) and non-Ex i (Ex e) electrical circuits. Coil circuit: Ex i or non-Ex i (Ex e) Contact circuit: Ex i or non-Ex i (Ex e) Thanks to the integrated safeguarding for the contact and coil circuit, additional safeguarding is not necessary.	273000
mA-Isolating repeater		Art. No.
	The mA isolating repeaters are used for the connection of 4-wire transmitters to active 2-wire inputs and for the galvanic separation. Input: sink, Ex e Output: sink, Ex i	224365
	The mA isolating repeaters are used for the connection of 4-wire transmitters to active 2-wire inputs and for the galvanic separation. Input: sink, Ex i Output: sink, Ex i	224364
Resistor error message suppression		Art. No.
	The resistors are used to suppress error messages for unused I/O channels Resistance value: 5K6 / 0.5 W Suitable for: AIM 9468; UMH 9469; DIOM 9470; DIOM 9471; DIOM 9472; DOM 9475 For intrinsically safe circuits (simple apparatus according to EN 60079-11)	244911
	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
Partition		Art. No.
	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

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Warning sign

Art. No.



"Clean modules only with a damp cloth."

162796

DIN A4 sheet

Art. No.

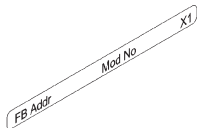


For the label plate on I/O modules, 6 labels per sheet
Print IS Wizard, packaging unit = 20 sheets

162832

Labelling strips

Art. No.



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

162788

Vibration bracket set

Art. No.



For installations with extreme vibrations (> 0.7 g and max. 4 g), the vibration brackets 9490 can be used as an additional measure and provide mechanical stability for the individual modules.

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

Number of brackets in the set: 8

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

271920

Screw set

Art. No.

Screw set M5 x 14 (thread-forming) for vibration brackets 9490
Number of screws in the 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.