

# Universal Input/Output (HART) LB7104A

- 4-channel
- Inputs Ex ia, Outputs Ex ia
- Analog input, digital input, analog output, digital output
- Mounting in Zone 2, Class I/Div.2 or in the safe area
- Supply circuit 15 V (20 mA)
- HART communication via field bus or service bus
- Simulation mode for service operations (forcing)
- Line fault detection (LFD): one LED per channel
- Permanently self-monitoring
- Module can be exchanged under voltage



## Function

The device is a configurable universal module. Each channel can operate in the following modes:

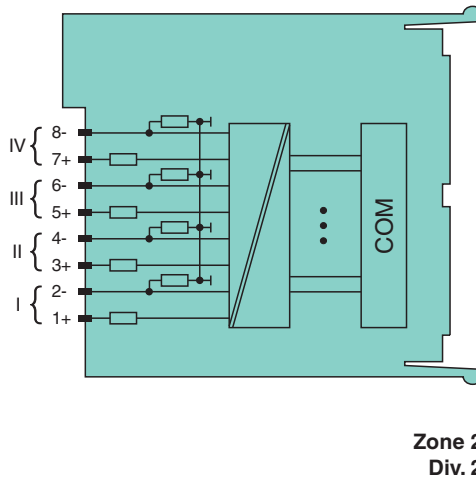
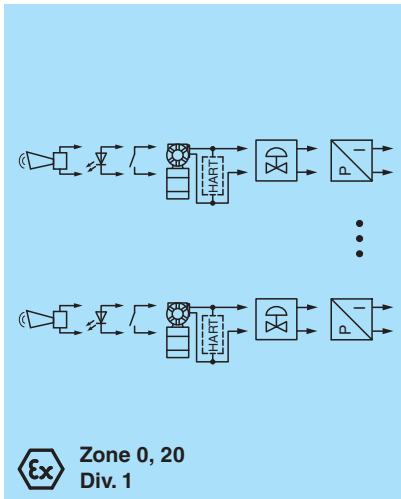
- As an analog input (AI) it feeds 2-wire transmitters.
- As an analog output (AO) it can drive proportional valves, I/P converters, or local indicators.
- As a digital input (DI) it reads dry contacts.
- As a digital output (DO) it can drive solenoids, sounders, or LED.

A combination of analog and digital I/O is possible.

Channel LEDs indicate the status of each channel. White LEDs indicate whether AI, AO, DI, DO are selected.

The intrinsically safe signals are galvanically isolated from the bus and the power supply.

## Connection



## Technical Data

<b>Slots</b>	
Occupied slots	1
<b>Supply</b>	
Connection	backplane bus
Rated voltage	$U_r$ 12 V DC , only in connection with the power supplies LB9***
Power dissipation	2 W
Power consumption	3 W
<b>Internal bus</b>	
Connection	backplane bus

Release date: 2023-10-19 Date of issue: 2023-10-19 Filename: 254847\_eng.pdf

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**Technical Data**

Interface	manufacturer-specific bus to standard com unit
<b>Analog input</b>	
Number of channels	4
Suitable field devices	
Field device	pressure converter
Field device [2]	flow converter
Field device [3]	level converter
Field device [4]	Temperature Converter
Field device interface	
Connection	2-wire transmitter
Connection	terminals 1+, 2-; 3+, 4-; 5+, 6-; 7+, 8-
Transmitter supply voltage	min. 15 V at 20 mA ; 21.5 V at 4 mA
Input resistance	15 Ω
Line fault detection	can be switched on/off for each channel via configuration tool , configurable via configuration tool
Short-circuit	factory setting: > 21 mA Can be parameterized in the range 0 ... 22 mA
Open-circuit	factory setting: < 3.6 mA Can be parameterized in the range 0 ... 22 mA
HART communication	yes
HART secondary variable	yes
<b>Analog output</b>	
Number of channels	4
Suitable field devices	
Field device	Proportional Valve
Field device [2]	I/P converters
Field device [3]	on-site display
Connection	terminals 1+, 2-; 3+, 4-; 5+, 6-; 7+, 8-
Current	0 ... 20 mA short-circuit protected
Line fault detection	can be switched on/off for each channel via configuration tool , configurable via configuration tool
Short-circuit	factory setting: < 50 Ω configurable between 0 ... 26 mA
Open-circuit	deviation of preset output value > 0.5 mA
Load	max. 750 Ω at 20 mA
HART communication	yes
HART secondary variable	yes
Watchdog	output off 0.5 s after serious fault
<b>Digital input</b>	
Number of channels	4
Sensor interface	
Connection [2]	volt-free contact
Connection	terminals 1+, 2-; 3+, 4-; 5+, 6-; 7+, 8-
Line fault detection	can be switched on/off for each channel via configuration tool
Connection	mechanical switch with additional resistors (see connection diagram)
Short-circuit	> 7 mA
Open-circuit	< 0.1 mA
Digital signals (active)	
Switching point: ON	> 2.1 mA
Switching point: OFF	< 1.2 mA
<b>Digital output</b>	
Number of channels	4
Suitable field devices	
Field device	Solenoid Valve
Field device [2]	audible alarm
Field device [3]	visual alarm
Connection	terminals 1+, 2-, 3+, 4-, 5+, 6-, 7+, 8-

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Drive capability		12 V / 22 mA
Internal resistor	R <sub>i</sub>	385 Ω
Current limit	I <sub>max</sub>	22 mA
Open loop voltage	U <sub>s</sub>	min. 22.7 V
Line fault detection		can be switched on/off for each channel via configuration tool
Test current		0.4 mA
Short-circuit		< 50 Ω
Open-circuit		< 0.2 mA
<b>Transfer characteristics</b>		
Deviation		
After calibration		0.1 % of the signal range at 20 °C (68 °F)
Influence of ambient temperature		0.1 %/10 K of the signal range
Refresh time		approx. 100 ms (4 channels)
<b>Indicators/settings</b>		
LED indication		Power LED (P) green: supply Diagnostic LED (I) red: module fault , red flashing: communication error , white: fixed parameter set (parameters from com unit are ignored) , white flashing: requests parameters from com unit Status LED (1-4) red: line fault (lead breakage or short circuit) , yellow: state of digital I/O (0/1) Configuration LED (AI, AO, DI, DO) white: selected channel mode
Coding		optional mechanical coding via front socket
<b>Directive conformity</b>		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013
<b>Conformity</b>		
Electromagnetic compatibility		NE 21:2007
Degree of protection		IEC 60529:2000
Environmental test		EN 60068-2-14:2009
Shock resistance		EN 60068-2-27:2009
Vibration resistance		EN 60068-2-6:2008
Damaging gas		EN 60068-2-42:2003
Relative humidity		EN 60068-2-78:2001
<b>Ambient conditions</b>		
Ambient temperature		-40 ... 60 °C (-40 ... 140 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Relative humidity		95 % non-condensing
Altitude		max. 2000 m
Shock resistance		shock type I, shock duration 11 ms, shock amplitude 15 g, number of shocks 18
Vibration resistance		frequency range 10 ... 150 Hz; transition frequency: 57.56 Hz, amplitude/acceleration ± 0.075 mm/1 g; 10 cycles frequency range 5 ... 100 Hz; transition frequency: 13.2 Hz amplitude/acceleration ± 1 mm/0.7 g; 90 minutes at each resonance
Damaging gas		designed for operation in environmental conditions acc. to ISA-S71.04-1985, severity level G3
<b>Mechanical specifications</b>		
Degree of protection		IP20 when mounted on backplane
Connection		removable front connector with screw flange (accessory) wiring connection via spring terminals (0.14 ... 1.5 mm <sup>2</sup> ) or screw terminals (0.08 ... 1.5 mm <sup>2</sup> )
Mass		approx. 100 g
Dimensions		16 x 100 x 102 mm (0.63 x 3.9 x 4 inch)
<b>Data for application in connection with hazardous areas</b>		
EU-type examination certificate		BVS 11 ATEX E 116 X
Marking		Ⓜ II 3(1) G Ex nA [ia Ga] IIC T4 Gc Ⓜ I (M1) [Ex ia Ma] I Ⓜ II (1) D [Ex ia Da] IIIC
Input		

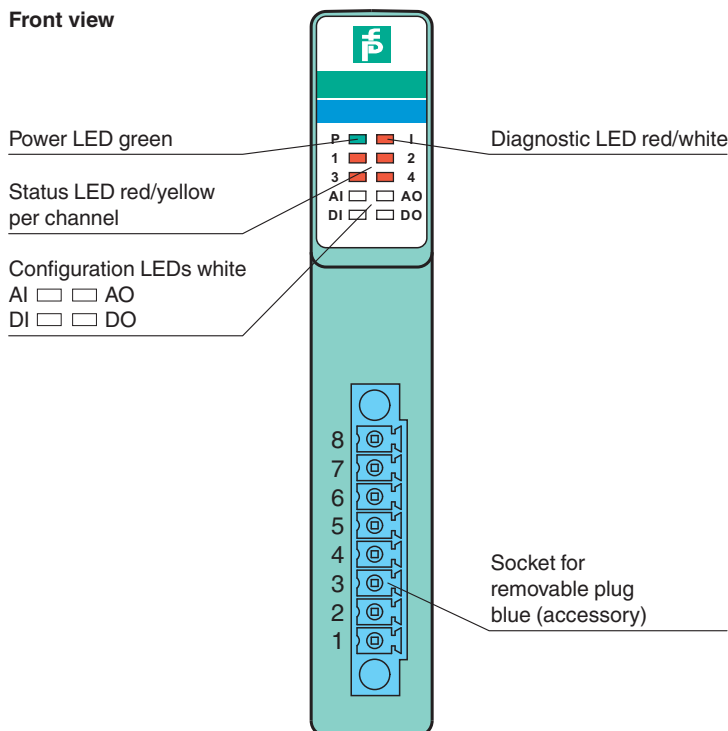
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**Technical Data**

Voltage	$U_o$	27 V
Current	$I_o$	87 mA
Power	$P_o$	575 mW (linear characteristic)
<b>Output</b>		
Voltage	$U_o$	27 V
Current	$I_o$	87 mA
Power	$P_o$	575 mW (linear characteristic)
<b>Galvanic isolation</b>		
Rated voltage	$U_m$	250 V field circuits to control and supply circuits
Input/power supply, internal bus		safe electrical isolation acc. to EN 60079-11, voltage peak value 375 V
Output/power supply, internal bus		safe electrical isolation acc. to EN 60079-11, voltage peak value 375 V
<b>Directive conformity</b>		
Directive 2014/34/EU		EN IEC 60079-0:2018+AC:2020 EN 60079-11:2012 EN 60079-15:2010
<b>International approvals</b>		
ATEX approval		BVS 11 ATEX E 116X
UL approval		E106378
<b>IECEX approval</b>		
IECEX certificate		IECEX BVS 11.0068X
IECEX marking		Ex nA [ia Ga] IIC T4 Gc [Ex ia Da] IIIC [Ex ia Ma] I
<b>General information</b>		
System information		The module has to be mounted in appropriate backplanes (LB9***) in Zone 2 or outside hazardous areas. Here, observe the corresponding declaration of conformity. For use in hazardous areas (e. g. Zone 2, Zone 22 or Div. 2) the module must be installed in an appropriate enclosure.
Supplementary information		EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

**Assembly**

**Front view**



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