PolyGard®2

Sensor Board MSB2

MSR ELECTRONIC

Sensor board with RS 485 interface, 4 – 20 mA output and further options for integration of the Sensor Cartridge SC2 and/or for connection of analog sensors

Sensor Board for the connection of max. three sensors in total, two of them may be Sensor Cartridges of the SC2 series via local bus and/or up to three of them analog sensors with 4 to 20 mA signal. The MSB2 provides the power supply of the SC2(s) and makes the measured data available for digital communication and for the 4 to 20 mA output. Communication with the DGC06 controller takes place via the RS 485 field bus interface with DGC06 protocol. The optional alarm relays can be controlled both via the DGC 06 controller and locally via the measurement signals. The digital input for acknowledgment or test function and other options such as display or various communication protocols for direct connection to superordinate BMS ensure the adaptation to the wide range of applications in gas detection technology.

The SC is connected to the local bus via a plug connection enabling simple SC exchange instead of an on-site calibration. The internal X-Change routine recognizes the exchanged SC after the exchanging process and starts the measurement mode automatically. An LED indicates the correct procedure of the exchange operation. As an alternative, the on-site calibration via the DGC06 Service Tool can be used with the integrated, comfortable calibration routine.

Sensor board with 1x SC in housing A

APPLICATION

The PolyGard®2 Sensor Board MSB2 is used for integration of the SC2 Sensor Cartridges
and for transmission or local processing of the measured values.

FEATURES

- Digital measurement value processing incl. temperature compensation
- Internal functional control with integrated Hardware Watchdog
- Data / measured values in µC Sensor Cartridge, therefore simple exchange of SC uncalibrated <> calibrated
- Local bus connection for up to two different Sensor Cartridges SC2 and/or up to three analog inputs 4-20 mA, e.g. MC2 series (max. 3 sensors in total)
- Software according to SIL2 compliant development process
- Modular technology (pluggable and exchangeable)
- Easy maintenance and calibration by exchange of the sensor cartridge or by comfortable on-site calibration
- Serial RS 485 interface with protocol for DGC06. Modbus as option.
- Analog input 4 – 20 mA analog for external sensors
- 4 – 20 mA analog output with selectable signal output for special mode, fault etc.
- Digital inputs
- LCD display (option)
- Three relays with change-over contact, potential-free, max. 250 V AC, 5 A, (option), local control or via DGC06
- Reverse polarity protected, overload and short-circuit proof
- IP 65 version
- Conformity to
    - EN 50271,
    - EN 61010-1;
    - ANSI/UL 61010 1;
    - CAN/CSA-C22.2 No. 61010-1
- Duct mounting kit (accessory): See datasheet SC2 / MC2

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SPECIFICATIONS

Electrical	
Power supply	16 – 29 V DC, reverse-polarity protected
Power consumption (24 V DC) only MSB2 board	100 mA (2.4 VA)
Analog input	
Input signal	4 -20 mA, overload and short-circuit proof, input resistance 200 Ω
Tension for external analog sensors	24 V DC, max. 100 mA
Digital input	
Signal input	Potential-free contact
Function	Acknowledge or test function
Analog output signal	Proportional, overload and short-circuit proof, load $\leq$ 500 Ohm
	4 - 20 mA = measuring range
	3.0 <4 mA = underrange
	> 20 - 21.2 mA = overrange
	2.0 mA = fault
Output for local bus	5 V DC, 250 mA max.
	Overload, short-circuit and reverse-polarity protected
General	
Temperature range	-35 °C to +50 °C (-31 °F to +122 °F)
Humidity range	15 - 95 % RH not-condensing
Storage temperature	+5 °C to +30 °C (+41 °F to +86 °F)
Storage time	6 months
Serial interface	
Local bus	1-wire / 19200 Baud
Field bus	RS 485 / 19200 Baud
Tool bus	2-wire / 19200 Baud
Physical	
Protection class (delivery status*)	IP 65
Wire connection: Field bus	Screw-type terminal min. 0.25 mm^2, max. 2.5 mm^2 (24 to 10 AWG)
Local bus	3-pin connector
Digital input, analog output	Screw-type terminal min. 0.25 mm^2, max. 1.3 mm^2 (24 to 16 AWG)
Power supply, relays	Screw-type terminal min. 0.25 mm^2, max. 2.5 mm^2 (24 to 10 AWG)
Directives	EMC directives 2014/30/EU
	Low voltage directive 2014/35/EU
	CE
	Conformity to:
	EN 50271
	EN 61010-1:2010
	ANSI/UL 61010-1
	CAN/CSA-C22.2 No. 61010-1
Warranty	1 year on sensor (not if poisoned or overloaded)
	2 years on device
	Options
LCD display	
LCD	Two lines, 16 characters each, background highlighted in two colours
Operation	Menu driven via six push-buttons
Power consumption	5 V, 60 mA, 0.3 VA
Power relays (3)	
	250 V AC, 5 A, potential-free, change-over contact (SPDT)
Modbus protocol RTU RS-485	
	Transmission of current measured values & alarm stages

*If there are changes on the housing, it has to be re-evaluated.

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Sensor Board MSB2

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ORDER INFORMATION

MSB2-**X X X X X 2 3 X 0**

WARNING DEVICES
0   **Without built-on warning device**

DISPLAY
0   **Without Display**
2   With display/keypad

ANALOG INPUT
3   **3 x Analog input**

DIGITAL INPUT
2   **2 x Digital input**

OUTPUT SIGNAL – ANALOG / BUS
2   RS 485 with DGC 06 protocol
3   **Analog output & RS 485 with DGC 06 protocol**
5   Analog output & RS 485 with Modbus protocol

VISUAL/ AUDIBLE WARNING DEVICES
0   **Without visual / acoustic indicator**
4   Buzzer & status-LED (red, yellow, green)

ALARM RELAYS
0   **No alarm relays**
3   3 x alarm relays

POWER SUPPLY
1*   12 V DC
2   **24 V AC/DC**
5*   90 – 240 V AC / 24 V DC, 5 VA
7*   90 – 240 V AC / 24 V DC, 15 VA
8*   USV 90 – 240 V AC /12 V DC, 15 VA, 0.8 Ah
9*   USV 90 – 240 V AC /24 V DC, 15 VA, 0.8 Ah

HOUSING
0   Without housing
A   **Housing type A 90 x 130 x 57**[1]
C   Housing type C 130 x 130 x 75[1]
E   Housing type E 130 x 130 x 99

* only on request

[1] Version with display and voltage supply 15 VA only with housing type E
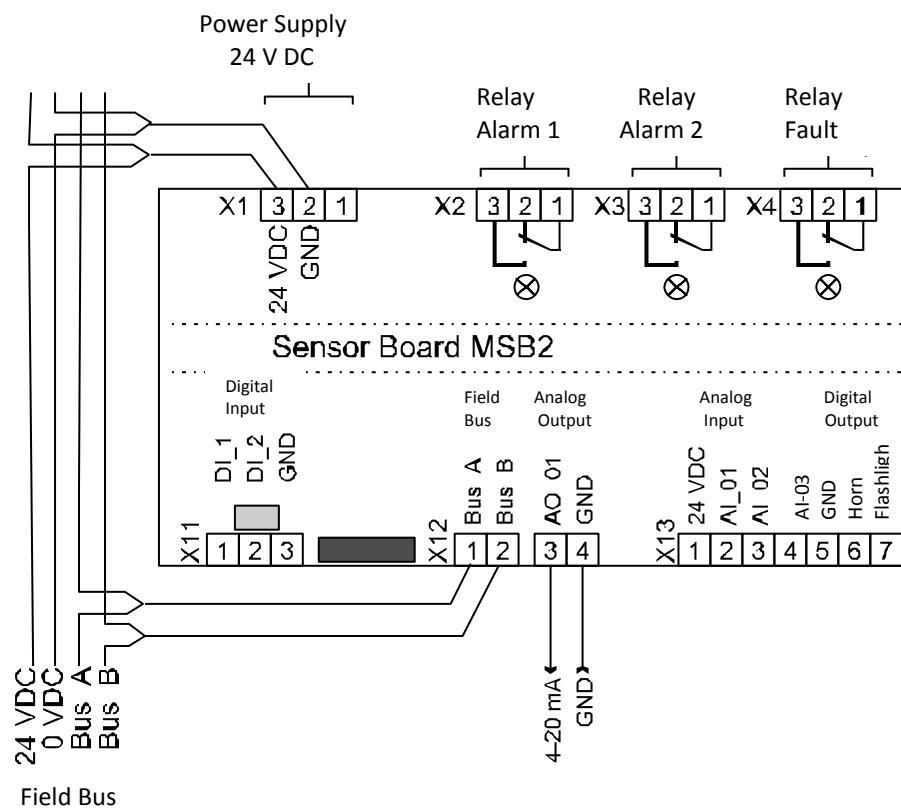
Standard version: MSB2-A-2-0-0-3-2-3-0-0

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ELECTRICAL CONNECTION

Power Supply
24 V DC

Relay
Alarm 1

Relay
Alarm 2

Relay
Fault

| X1 | 3 | 2 | 1 |
| 24 VDC | GND |

X2	3	2	1
X3	3	2	1
X4	3	2	**1**

Sensor Board MSB2

Digital
Input

Field
Bus

Analog
Output

Analog
Input

Digital
Output

| X11 | DI_1 | DI_2 | GND |
| 1 | 2 | 3 |

| X12 | Bus A | Bus B |
| 1 | 2 |

| AO_01 | GND |
| 3 | 4 |

| X13 | 24 VDC | AI_01 | AI_02 | AI-03 | GND | Horn | Flashligh |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

4-20 mA

GND

24 VDC
0 VDC
Bus A
Bus B

Field Bus

Connection to MSB2	**SC2 sensors via local bus**	**Analog sensors with 4-20 mA signal**
Number	0	1 - 3
Number	1	0 - 2
Number	2	0 - 1

Table connection options for sensors

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TÜV
SÜD

PG