

Technical Datasheet



PolyGard®2

Multi-Sensor-Controller MSC2 Multi-Sensor-Board MSB2

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WET AREA VERSION



YouTube Video



Specifications subject to change without notice.
Up-to-date data sheets and user manuals can be found in the download area of www.msr-24.com.
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■ Made
■ in Germany

DESCRIPTION

Gas measuring, monitoring and warning controller based on state-of-the-art micro-technology for continuous monitoring of the ambient air to detect toxic and combustible gases, refrigerants or oxygen.

MSC2

The Multi-Sensor-Controller MSC2 is designed for the connection of max. 3 sensors in total, max. 2 of them may be different sensors of the SC2 series via local bus and/or max. 2 of them analog sensors with 4–20 mA signal. As an option, an ATEX-compliant SSAX1-2 sensor (zone 2) can be connected to one of the slots for SC2, in which case no other sensors can be connected. The controller monitors the measured values and activates the alarm relays if the set alarm thresholds for pre-alarm and main alert are exceeded. In addition, the values are provided for direct connection to the BMS via an RS-485 interface and also as 4–20 mA output.

The MSC2 system for wet areas has an input for remote connection of a digital sensor (SC2-Remote) via the local bus that transmits the temperature-compensated measurement value in digital form. The main alarm is additionally signalized by the remote optical and acoustic warning unit WAO (buzzer and the 3-colour status LED, alarm-fault-operation-service). Sensor and warning unit are protected against splash water.

MSB2

The Multi-Sensor-Board MSB2 is designed for the connection of max. 3 sensors in total, max. 2 of them may be different sensors of the SC2 series via local bus and/or max. 3 of them analog sensors with 4–20 mA signal. As an option, an ATEX-compliant SSAX1-2 sensor (zone 2) can be connected to one of the slots for SC2, in which case no other sensors can be connected. The MSB2 provides the power supply of the SC2/SSAX1-2 and makes the measured data available for digital communication and for the 4–20 mA output. Communication with the DGC-06 controller takes place via the RS-485 field bus interface with DGC-06 protocol. The 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.

General

The SIL2 compliant self-monitoring function in the board and in the connected sensor activates the fault message in case of an internal error as well as in case of a fault in the local bus communication (SC2/SSAX1-2) and/or at the 4–20 mA input / output current signals.

Other options such as LCD display, 3-color status LED, buzzer, digital input for acknowledgment or test function, various communication protocols ensure proper adaptation to the wide range of applications in gas detection technology. For convenient commissioning the MSC2 can be pre-configured and parametrised with factory-set defaults.

APPLICATION

The **PolyGard® 2 series MSC2 and MSB2** is designed for detection and warning of toxic and combustible gases, refrigerants or oxygen in many commercial and industrial applications.

In industrial applications with increased electromagnetic interference fields, technical malfunctions may occur with the MSC2.

MSC2: Stand-Alone-Controller for SC2/MC2/SSAX1-2 and for wet area

MSB2: Board for DGC-06 Bus System

FEATURES

- Internal function monitoring with integrated hardware watchdog
- Hardware and software according to SIL compliant development process
- Easy maintenance/calibration by replacing the sensor or via comfortable on-site calibration
- Modular technology (plug-in and exchangeable)
- Reverse polarity protected, overload and short-circuit proof
- **MSC2 standard:** Local bus connection for 2x sensor SC2 & 2x analog inputs 4–20 mA, for e.g. MC2 series (max. 3 sensors in total) or for 1x SSAX1-2 sensor or
- **MSC2 for wet area:** Local bus connection for 1x sensor SC2 incl. splash protection in separate housing type A, remote WAO unit (**Warning Acoustic-Optic**) with splash guard, mounted on D housing, with status LED (for warning, fault, operation and service) and warning buzzer
- **MSB2:** Local bus connection for 2x sensor SC2 & 3x analog inputs 4–20 mA, for e.g. MC2 series (max. 3 sensors in total) or for 1x SSAX1-2 sensor
- 3 relays with SPDT contacts, potential-free max. 250 V AC, 5 A
- 2 transistor outputs, 24 V DC, 0.1 A (plus switching)
- Serial RS-485 interface with protocol for DGC-06 or Modbus protocol
- 2 digital inputs
- LCD display (option)
- Warning buzzer and status LED for alarm, fault, operation and service (option)
- Acknowledgment button (option)
- Operating voltage 230 V AC with wide range input 100–240 V AC (option)
- UPS (option)
- Conformity to:
 - EN 50271
 - EN 50270 Type I
 - IEC/EN 61508-1–3
 - EN 45544-1, -3
 - EN 14624
 - EN 60335
 - EN 378
- ANSI/UL 61010 1 & CAN/CSA-C22.2 No. 61010-1 (option)

SPECIFICATIONS

ELECTRICAL	
MSC2 power supply	24 V DC \pm 20 %, reverse-polarity protected 24 V AC \pm 15 %, (only 1x SC2 connected)
MSB2 power supply	16–29 V DC, reverse-polarity protected
Power consumption (24 V DC)	
<ul style="list-style-type: none"> Control Board Per sensor (SC2/SSAX1-2 or MC2) Horn / warning light 	Max. 60 mA (1.5 VA), w/o sensor, w/o WAO Max. 85 mA (2.1 VA) Max. 40 mA (1.0 VA)
Alarm relay (3)	250 V AC, 5 A; 30 V DC, 2 A, potential-free, contacts (SPDT)
Transistor output (2)	24 V DC/0,1 A (switching to plus) only at 24 V DC power supply
Digital input (2)	Potential-free
Analog input (2/3)	4–20 mA, overload and short-circuit proof, input resistance 130 Ω
Analog output signal (1)	Proportional, overload and short-circuit proof, load \leq 500 Ω 4–20 mA = measuring range 2.4–< 4 mA = tolerable underrange > 20–21.2 mA = tolerable overrange \geq 21,2 mA = error overrange \leq 2,0 mA = fault
Output for local bus	5 V DC, 250 mA max., overload, short-circuit & reverse-pol. protect.
SERIAL INTERFACE	
Local bus (MSC2/MSB2)	1-wire / 19200 Baud
Field bus	RS-485 / 19200 Baud
Tool bus	2-wire / 19200 Baud
AMBIENT CONDITIONS	
Temperature range	-25 °C to +60 °C (with option LC-Display -20°C to +60°C)
Humidity range	15–95 % RH non-condensing
Storage temperature	-20 °C to +65 °C
Storage time	Ca. 6 months
MODBUS PROTOKOLL RTU RS-485	
Function	Transmission of measured values & alarm stages (see GA_SB2_MSC2_PX2_Modbus_supplement_E)
PHYSICAL	
Housing type C/E	Polycarbonate
Burning behaviour	UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimensions housing (B x H x D)	
<ul style="list-style-type: none"> Housing type C Housing type E 	130 x 130 x 75 mm (5.12 x 5.12 x 2.95 in.) 130 x 130 x 99 mm (5.12 x 5.12 x 3.90 in.)
Weight	Max. 0.6 kg (1.32 lbs)
Protection class (delivery state)*	IP65
Installation	Wall mounting
Knockouts for cable entry	Standard 6x M20/25
Connection type:	
<ul style="list-style-type: none"> Local bus (SC2/SSAX1-2) Digital input, analog output Power supply, relays, field bus 	Plug-in connector, 3-pin Screw-type terminals, 0.25–1.3 mm ² Screw-type terminals, 0.25–2.5 mm ²
REGULATIONS	
Directives	EMC Directives 2014/30/EU Low Voltage Directive 2014/35/EU CE EN 61010-1:2010 Conformity to: EN 50271, EN 50270 Type I, IEC/EN 61508-1–3, EN 45544-1, -3, EN 14624, EN 60335, EN 378 Option: 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

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

OPTIONS	
DISPLAY	
LC-Display	2 lines, 16 characters each, background highlighted, 2 colours
Operation	Menu driven via 6 pushbuttons
Power consumption	5 V, 60 mA, 0.3 VA
WAO STATUS-LED/BUZZER	
Colour/mode	Red/yellow/green (alarm-fault-operation-service)
Acoustic pressure	> 85 dB (A) (distance 0.1 m)
Frequency	2300 Hz ± 300 Hz
Protection class	IP65
POWER SUPPLY 110 / 230 V AC	
Wide range input	100–240 V AC - 50/60 Hz
Output rating type 5	5 VA
Output rating type 7	15 VA
UPS (NOT FOR MSC2 WET AREA VERSION)	
Power unit with wide range input	100–240 V AC - 50/60 Hz
Output rating power pack	15 VA
Rechargeable battery (2x)	12 V, 0.8 Ah
Operating time	> 60 min
POWER SUPPLY 12 V DC (NOT FOR MSC2 WET AREA VERSION)	
Power supply	12 V DC reverse-polarity protected
Power consumption (12 V DC)	
• Control Board	Max. 120 mA (1.5 VA), w/o sensor, w/o WAO
• per sensor (SC2/SSAX1-2 or MC2)	Max. 170 mA (2.1 VA)
• horn / warning light	Max. 80 mA (1.0 VA)

All specifications were collected under optimal test conditions.

We confirm compliance with the minimum requirements of the applicable standard.

SENSOR CONNECTION OPTIONS

Sensor Connection Options	SC2 Sensors via Local Bus	MC2 Sensors with 4–20 mA Signal	SSAX1-2 Sensor via Local Bus
MSC2 Standard Max. 3	0	0	1
	0	1–2	0
	1	0–2	0
	2	0–1	0
MSC2 Wet Area Version Max. 1	1 (remote)	0	0
MSB2	0	0	1
	0	1–3	0
	1	0–2	0
	2	0–1	0

ELECTRICAL CONNECTION

Note:

- Relay No. 3 is always energized.
- The connection of 2x sensor heads with IR sensor is not allowed.
- It is not allowed to connect 2x SC2 sensor heads of the same gas or the same gas group (Freons).
- When connecting 2x MC2, at least 1x must be an electrochemical sensor from the MC2-E11XX series.
- When connecting 3x MC2, at least 2x must be an electrochemical sensor from the MC2-E11XX series.
- In AC mode, only 1x SC2 sensor head from the P34XX, SXXX, I-S11XX or I4XX series may be connected.
- For the 5 VA version, only 1x of all connected MC2/SC2 sensors may be from the P34XX, SXXX, I-S11XX or I4XX series due to the required power.

MSC2, 24 V DC or 230 V AC, 5 VA

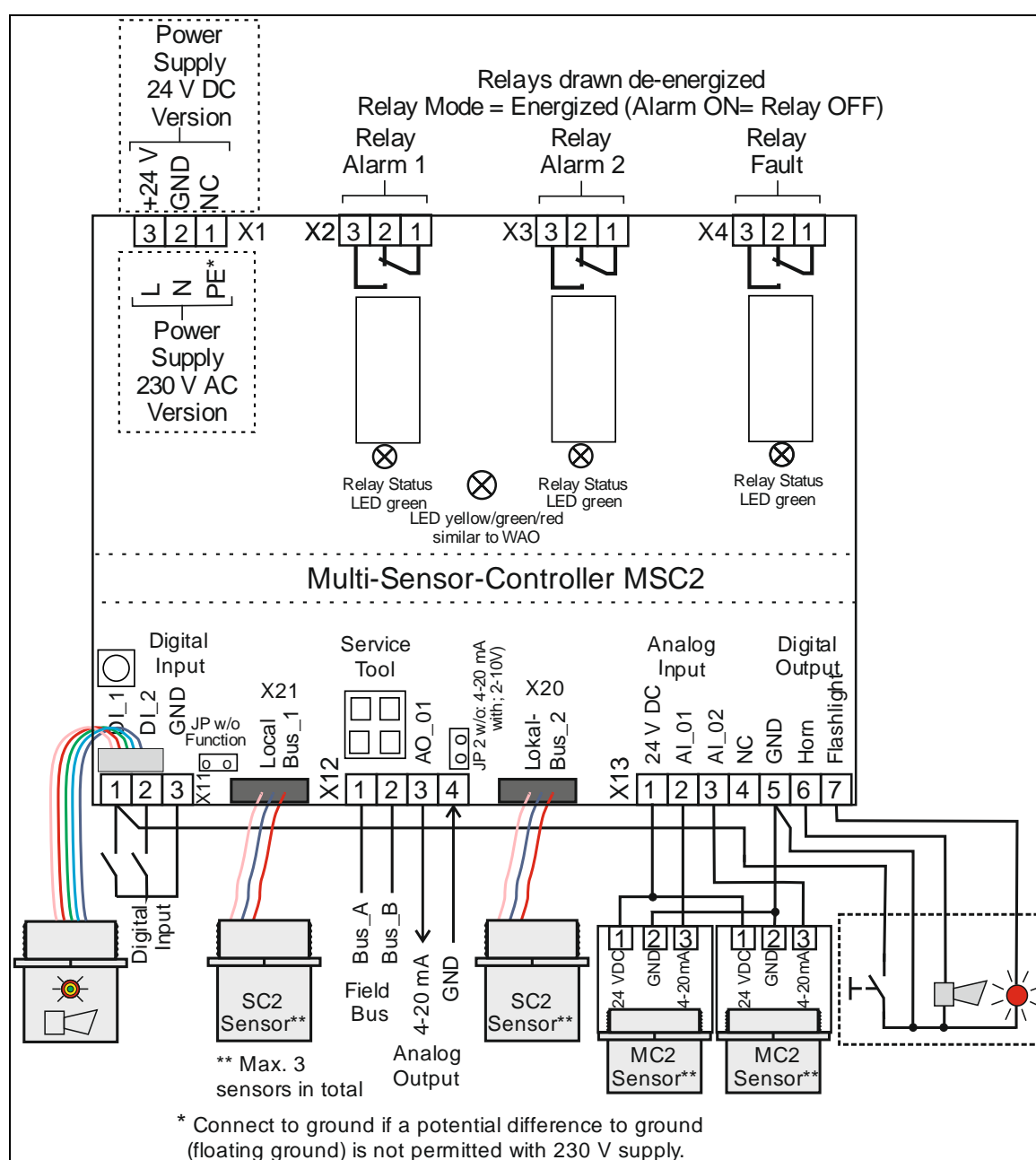


Figure 1: MSC2, Type 24 V DC or Type 230 V AC, 5 VA

MSC2, 230 V AC, 15 VA, Option UPS

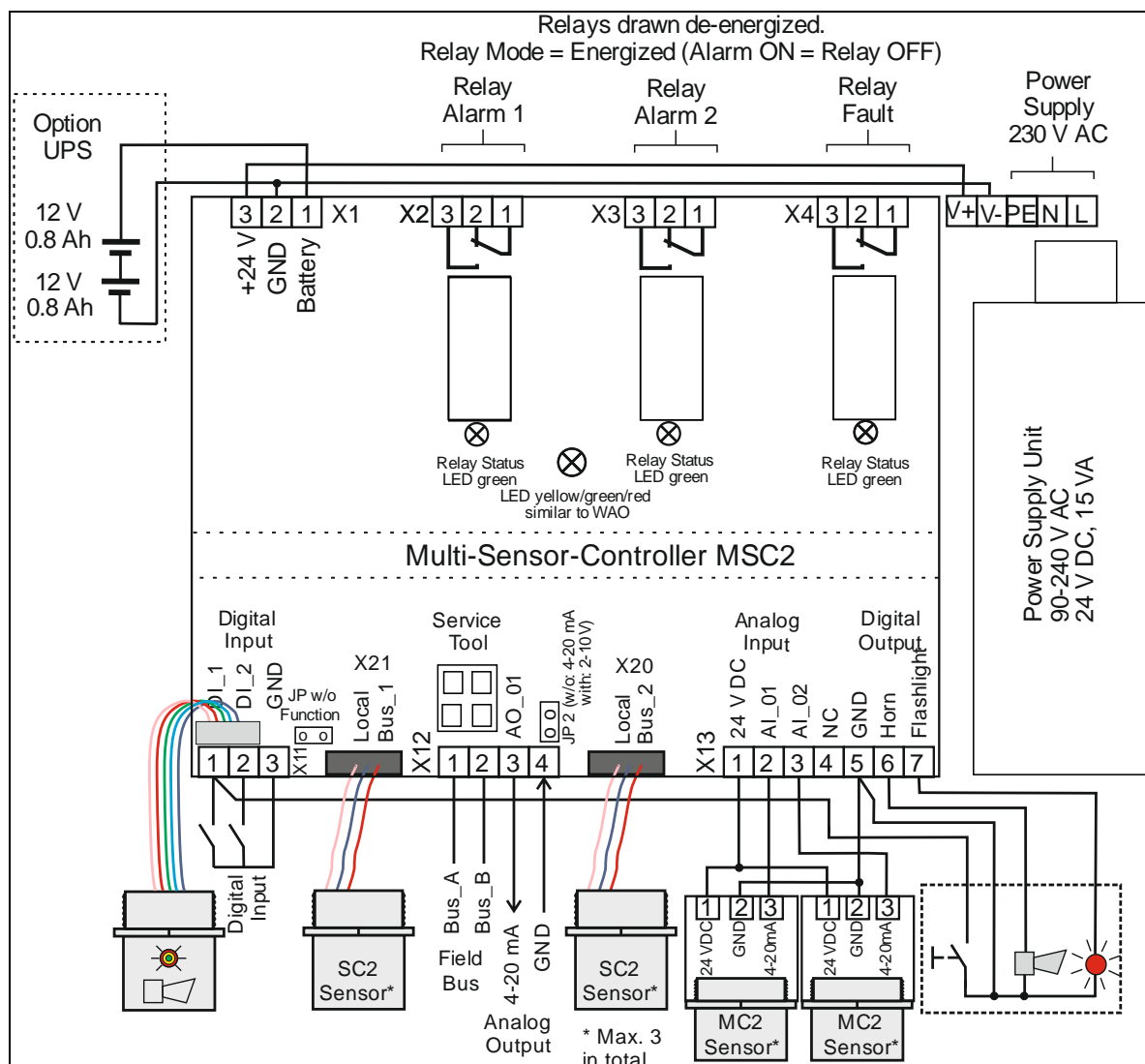


Figure 2: MSC2, Type 230 V AC, 15 VA, UPS

MSC2, 24 V DC / 230 V AC, Wet Area

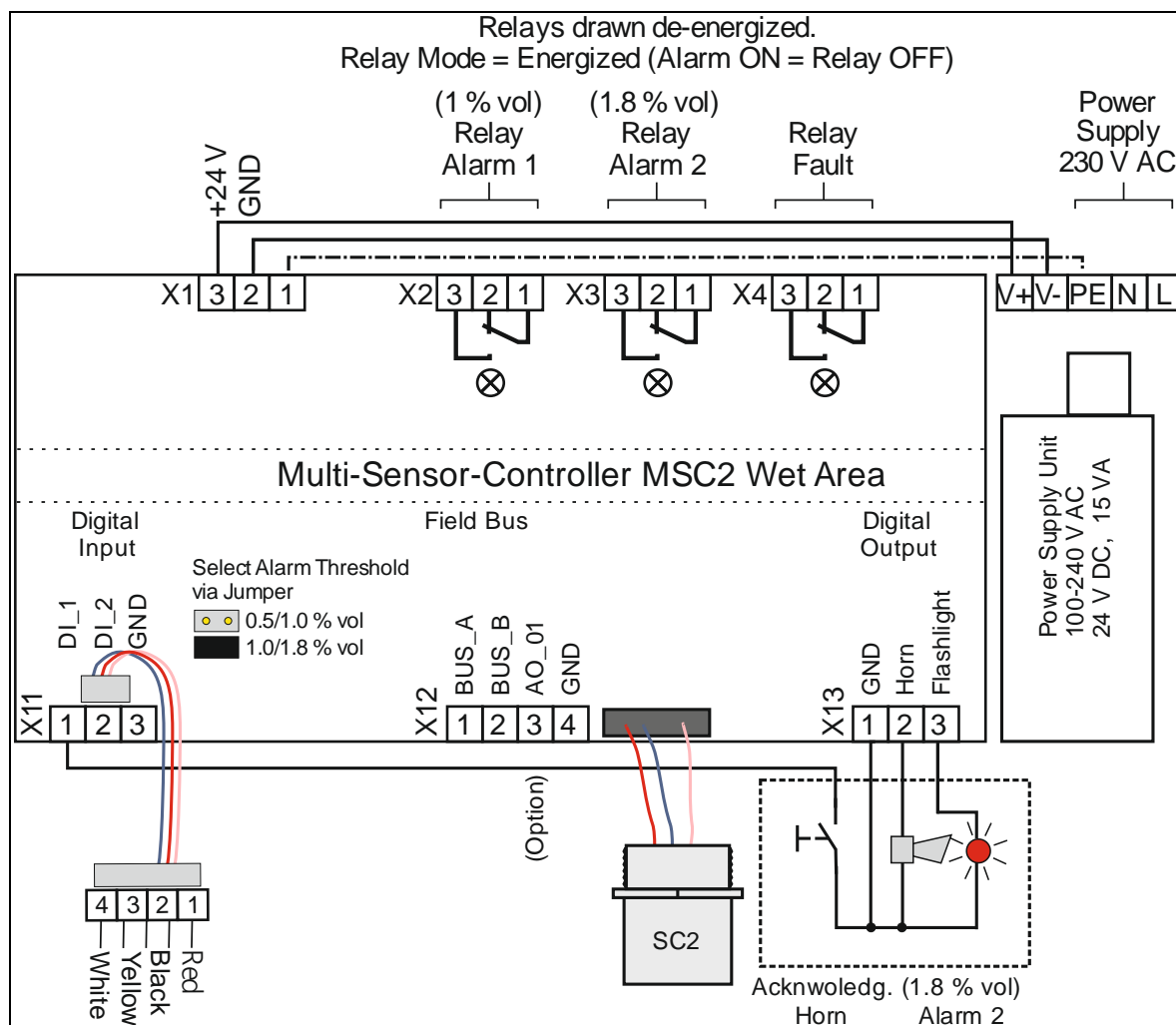


Figure 3: MSC2, Type 24 V DC or Type 230 V AC, Wet Area (Example SC2-I-S1164-B)

MSB2

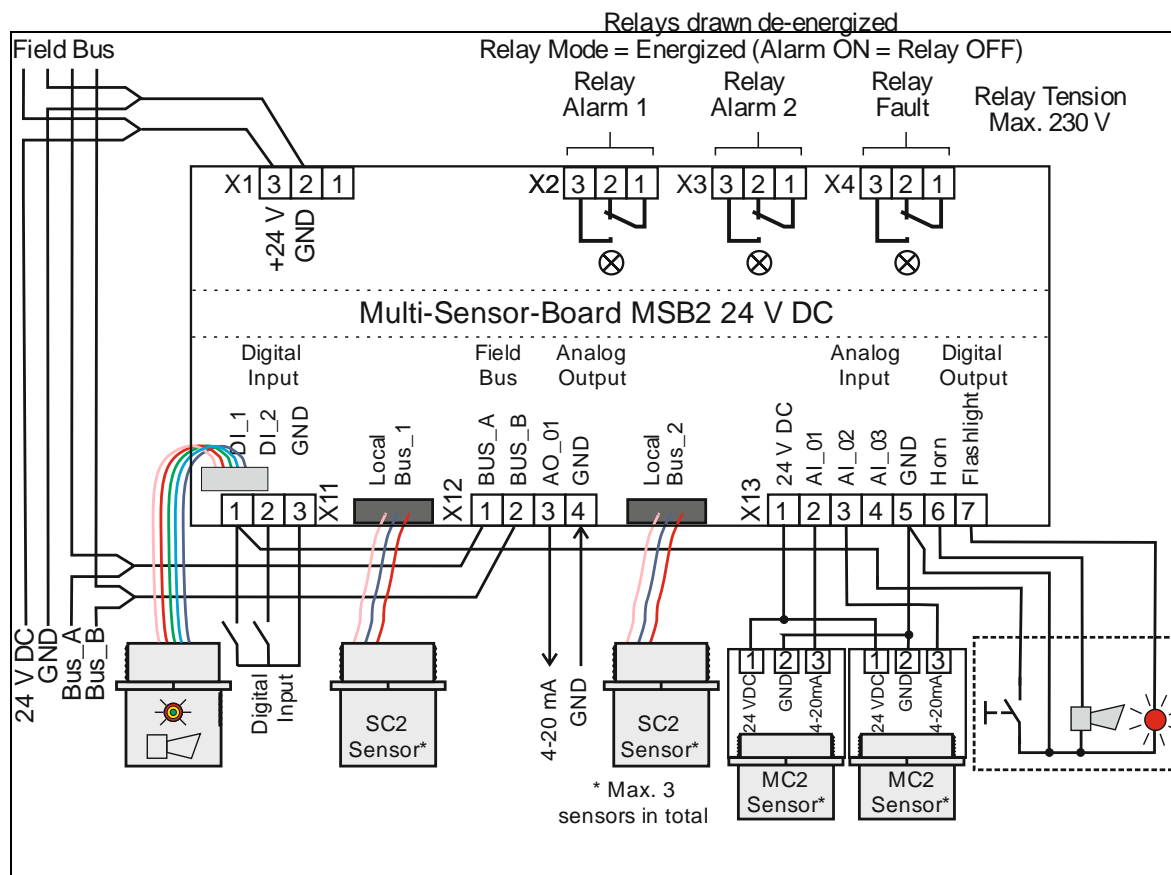


Figure 4: MSB2, Type 24 V DC

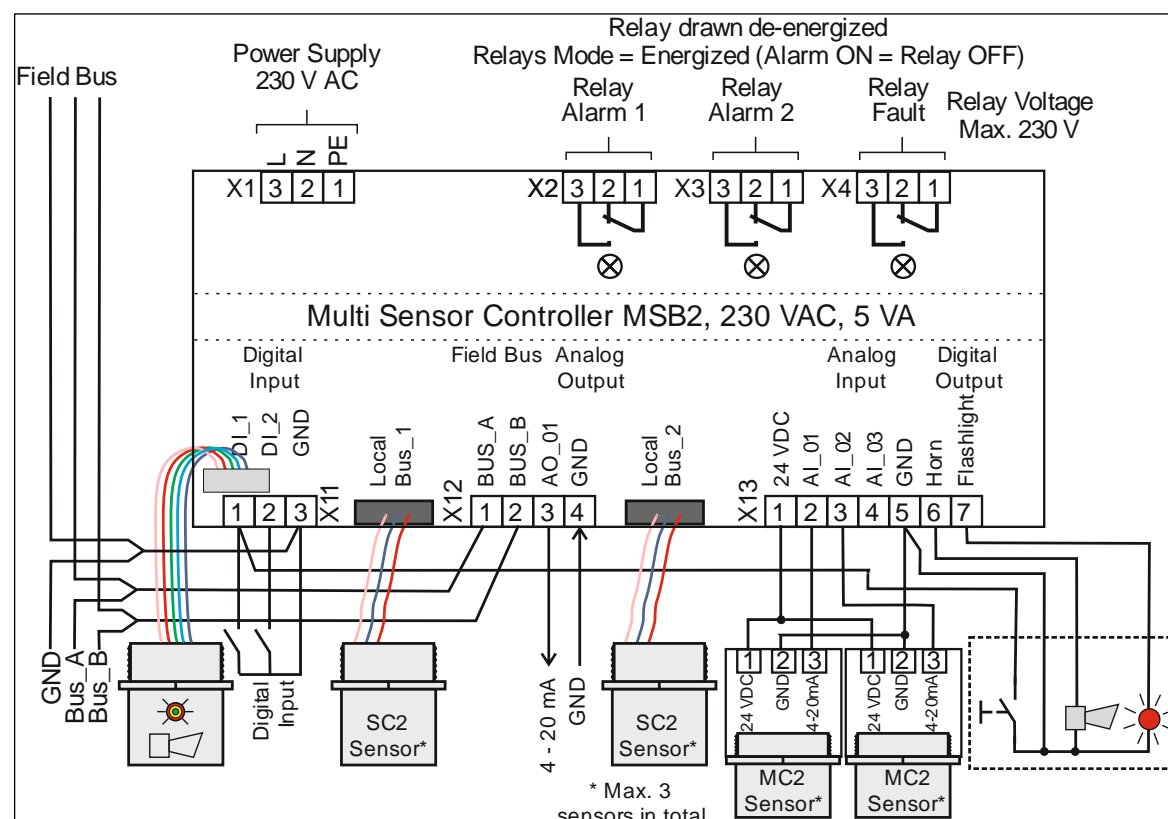


Figure 5: MSB2, Type 230 V AC

ORDERING INFORMATION

Option	Description	Feature
MSC2- MSB2-	X- X 3 X 3 X X X X X	
0	No further options	
A	Version UL/CSA 61010-1(housing C, E)	Further options
0	No built-on warning device	Warning device
0	No display	
2	With display/keypad	Display
2	2x Analog input (MSC2)	
3	3x Analog input (MSB2)	
5	1x SSAX1-2 slot ATEX-compliant sensor (MSC2, MSB2)	Version
2	2x Digital input	
4 ¹	1x Digital input and 1x reset button on the housing	Digital input
3	Analog output & RS-485 with DGC-06 protocol (Modbus incl.)	Output signal
0	No buzzer & status LED	
4	Buzzer & status LED (red, yellow, green)	
N	WAO-NB buzzer & status LED (red, yellow, green) with SplashGuard, on separate housing D (wet area version only)	WAO
3	3x Alarm relays	Alarm relays
1 ^{*2}	12 V DC	
2 ³	24 V DC / AC	
5 ⁴	100–240 V AC / 24 V DC, 5 VA	
7	100–240 V AC / 24 V DC, 15 VA	
8 ^{*2}	UPS 100–240 V AC / 12 V DC, 15 VA, 0.8 Ah	
9 ²	UPS 100–240 V AC / 24 V DC, 15 VA, 0.8 Ah	Power supply
0	No housing	
C ⁵	Housing type C, 130 x 130 x 75 mm	
E	Housing type E, 130 x 130 x 99 mm	Housing

* On request

¹ Not possible for MSB2.

² Not possible for MSC2 wet area version.

³ In AC mode, only 1x **SC2** sensor head from the P34XX, SXXX, I-S11XX or I4XX series may be connected.

⁴ Only 1x of all connected MC2/SC2 sensors may be from the P34XX, SXXX, I-S11XX or I4XX series due to the required power.

⁵Version with display and power supply 15 VA combined, only in housing type E

Standard versions MSC2

Order number:

MSC2-C-230322000

MSC2-C-730322000

VERSION WET AREA

SC2-Remote for Wet Area

SC2-	XXXX(X)-X(X)-(X)-	N-	0,14			
			0,14	Special cable 140 mm	Cable extension	
		N	Wet area: Sensor with SplashGuard, mounted in A housing			Sensor housing
			Gas type	Measuring range		
		Gas type and measuring range, see data sheets DB_SC2				

Example: MSC2 version wet area with 1x WAO and with 1x SC2 sensor for CO₂

Multi-Sensor-Controller MSC2 in housing type C with separate, splash protected WAO unit on housing type D and 1x SC2 Sensor for CO₂ with splash protection integrated in housing type A

Order number: MSC2-C-X3NXX2X0X and SC2-I-S1164-X-N-0,14

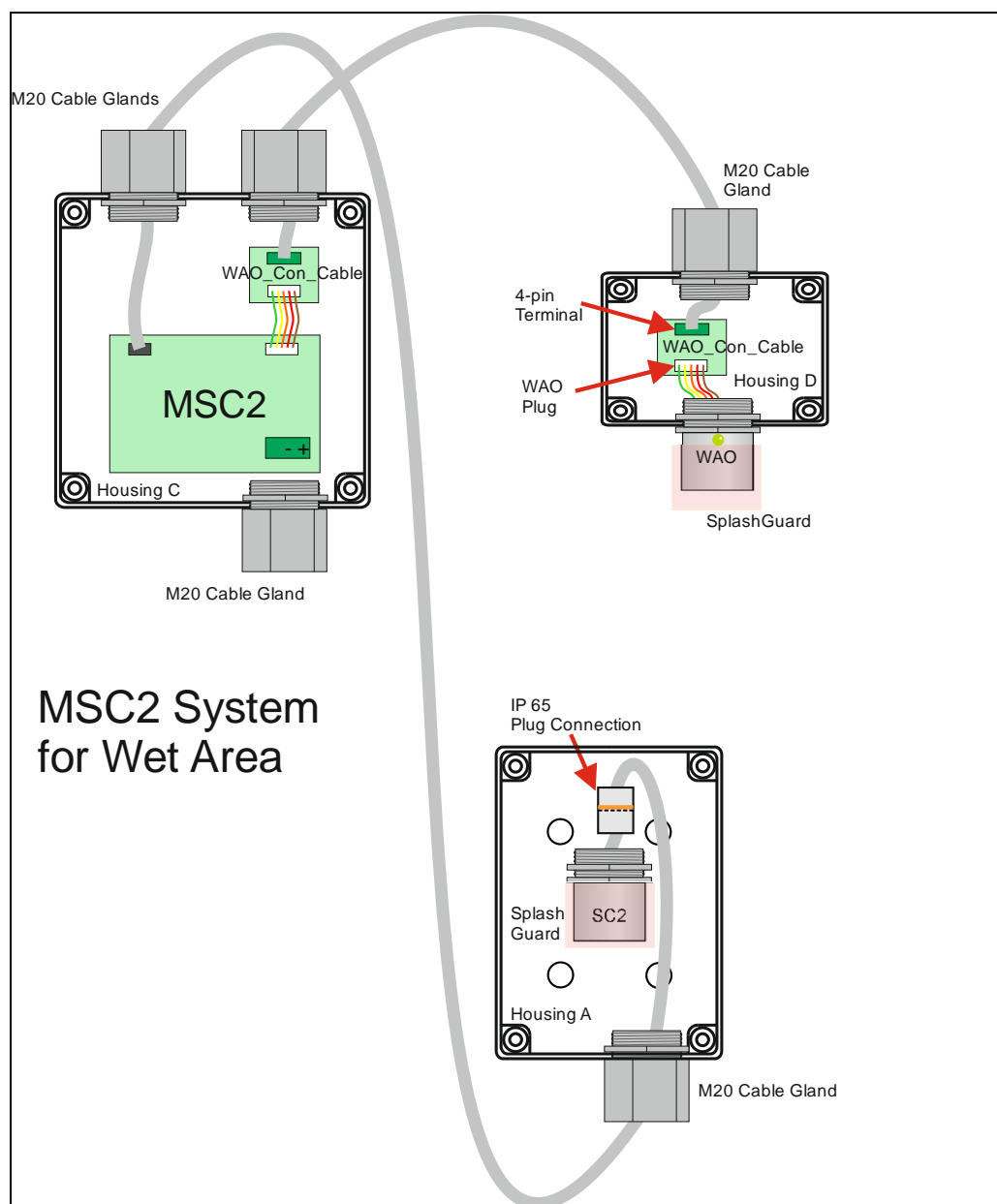


Figure 8: System for Wet Area