

PERFECT SOLUTIONS FOR GAS ALARM SYSTEMS



Technical Datasheet



PolyGard®2

Multi-Sensor Controller MSC2

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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

The Multi-Sensor-Controller is designed for the connection of max. 3 sensors, 2 of them may be different cartridges of the SC2 series via local bus and/or 2 of them analog sensors with 4–20 mA signal. 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 SIL2 compliant self-monitoring function in the MSC2 and in the connected Sensor Cartridge activates the fault message in case of an internal error as well as in case of a fault in the local bus communication (SC2) 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 MSC2 is designed for detection and warning of gases in many commercial and industrial applications.

FEATURES

- Internal function monitoring with integrated hardware watchdog
- Hardware and software according to SIL compliant development process
- Easy maintenance/calibration by replacing the sensor cartridge or via comfortable on-site calibration
- Modular technology (plug-in and exchangeable)
- Reverse polarity protected, overload and short-circuit proof
- Local bus connection for 2 Sensor Cartridges SC2 & 2 analog inputs 4–20 mA, e.g. MC2 series (max. 3 sensors)
- 3 relays with SPDT contacts, potential-free max. 240 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
- Different types of housing with IP65
- 2 digital inputs
- LCD display (option)
- Warning buzzer and status LED for alarm, fault, operation and service (option)
- Reset button (option)
- Operating voltage 230 V AC with wide range input 100 to 240 V AC (option)
- UPS (option)
- Conformity to:
 - EN 50271
 - IEC/EN 61508-1-3
 - EN 60079-29-1
- ANSI/UL 61010 1 & CAN/CSA-C22.2 No. 61010-1 (optional)
- Duct mounting kit (accessory): See datasheet SC2/MC2

SPECIFICATIONS

ELECTRICAL	
Power supply	24 V DC \pm 20 %, reverse-polarity protected 24 V AC \pm 15 %, (only 1x SC2 connected)
Power consumption (24 V DC)	
- Control Board	Max. 60 mA (1.5 VA), w/o sensor, w/o WAO
- Per sensor (SC2 or MC2)	Max. 85 mA (2.1 VA)
- Horn / warning light	Max. 40 mA (1.0 VA)
Alarm relays (3)	240 V AC, 5 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)	4–20 mA overload and short-circuit proof, input resistance 200 Ω
Analog output signal (1)	Proportional, overload and short-circuit proof, load \leq 500 Ohm 4–20 mA = measuring range 2.4–< 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
SERIAL INTERFACE	
Local bus	1-wire / 19200 Baud
Field bus	RS-485 / 19200 Baud
Tool bus	2-wire / 19200 Baud
AMBIENT CONDITIONS	
Temperature range	-25 $^{\circ}$ C to +60 $^{\circ}$ C
Humidity range	15–95 % RH non-condensing
Temperature - storage	+5 $^{\circ}$ C to +40 $^{\circ}$ C
Storage time	6 months
PHYSICAL	
Housing type C	Polycarbonate
Burning behaviour	UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimensions housing (B x H x T)	Type C: 130 x 130 x 75 mm (5.11 x 5.11 x 2.95 in.)
Weight	Max. 0.6 kg (1.32 lbs)
Protection class (delivery state*)	IP65
Installation	Wall mounting
Cable entry	Standard 6 x M20/25
Connection type: Local bus (SC2)	Plug-in connector, 3-pin
Digital input, analog output	Screw-type terminals, min. 0.25, max. 1.3 mm ²
Power supply, relays	Screw-type terminals, min. 0.25, max. 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 IEC/EN 61508-1-3 EN 60079-29-1 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	
Colour / mode	Red/yellow/green (alarm-fault-operation-service)
Protection class	IP65
WAO - BUZZER	
Acoustic pressure	> 85 dB (A) (distance 0.1 m)
Frequency	2300 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	
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	
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 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.

SHORT DESCRIPTION OF THE FUNCTIONS: DIGITAL OUTPUTS WITH 3 RELAYS

Action	Reaction Relay 1 (Alarm 1)	Reaction Relay 2 (Alarm 2)	Reaction Warning light (Alarm 2)	Reaction Horn (Alarm 2)	Reaction Relay 3 (Alarm 2 + fault)	Reaction LED
Gas signal < alarm threshold 1	OFF	OFF	OFF	OFF	ON	GREEN
Gas signal > alarm threshold 1	ON	OFF	OFF	OFF	OFF	RED
Gas signal > alarm threshold 2	ON	ON	ON	ON	ON	RED
Gas signal ≥ alarm threshold 2, but button Horn OFF activated	OFF		ON	OFF after delay ON		RED
Gas signal < (alarm threshold 2 - hysteresis) but ≥ threshold 1	ON	OFF	OFF	OFF	OFF	RED
No alarm, no fault	OFF	OFF	OFF	OFF	ON	GREEN
No fault, but maintenance due	OFF	OFF	OFF	OFF	ON	GREEN flashing
Internal error	OFF	OFF	ON	OFF	OFF	YELLOW

Note 1: Status OFF = Relay is configured "Alarm ON = Relay" or the MSC is free from tension.

Note 2: Alarm thresholds can have the same value, therefore the relays and/or the horn and flashlight can be triggered together.

ORDERING INFORMATION

MSC2-	X-	X	3	X	X	X	2	X	0	X	
									0	No further options	
									A	Version UL/CSA 61010-1(housing A, C, E)	Further options
									0	Without built-on warning device	Warning device
									0	Without display	
									2	With display / keypad	Display
								2	2x Analog input		Analog input
								2	2x Digital input		
								4	1x Digital input and 1x reset button on the housing		Digital input
								2	RS-485 with DGC-06 protocol (Modbus incl.)		
								3	Analog output & RS-485 with DGC-06 protocol (Modbus incl.)		
								5	Analog output & RS-485 with Modbus protocol		Output signal
								0	Without visual/audible indicator		Visual/audible indicator (WAO)
								4	Buzzer & status-LED (red, yellow, green)		
								3	3x Alarm relays		Alarm relays
								1*	12 V DC		
								2³	24 V DC / AC		
								5⁴	100–240 V AC / 24 V DC, 5 VA		
								7	100–240 V AC / 24 V DC, 15 VA		
								8*	UPS 100–240 V AC / 12 V DC, 15 VA, 0.8 Ah		
								9	UPS 100–240 V AC / 24 V DC, 15 VA, 0.8 Ah		Power supply
								0	Without housing		
								A²	Housing type A 94 x 130 x 57 mm		
								C¹	Housing type C 130 x 130 x 75 mm		
								E	Housing type E 130 x 130 x 99 mm		
								P*	Door installation housing type P 150 x 96 x 50 mm		
								U*	In-wall housing type U 150 x 120 x 80 mm		
								V*	In-wall housing type V 145 x 90 x 70 mm		
								W*	In-wall housing type W 110 x 90 x 70 mm		Housing

* Only on request

¹ Version with display and voltage supply 15 VA combined, only in housing type E

² Only 1x SC2 or 1x MC2 mountable, w/o visual/audible indicator, w/o 100–240 V AC/15 VA, w/o UPS

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

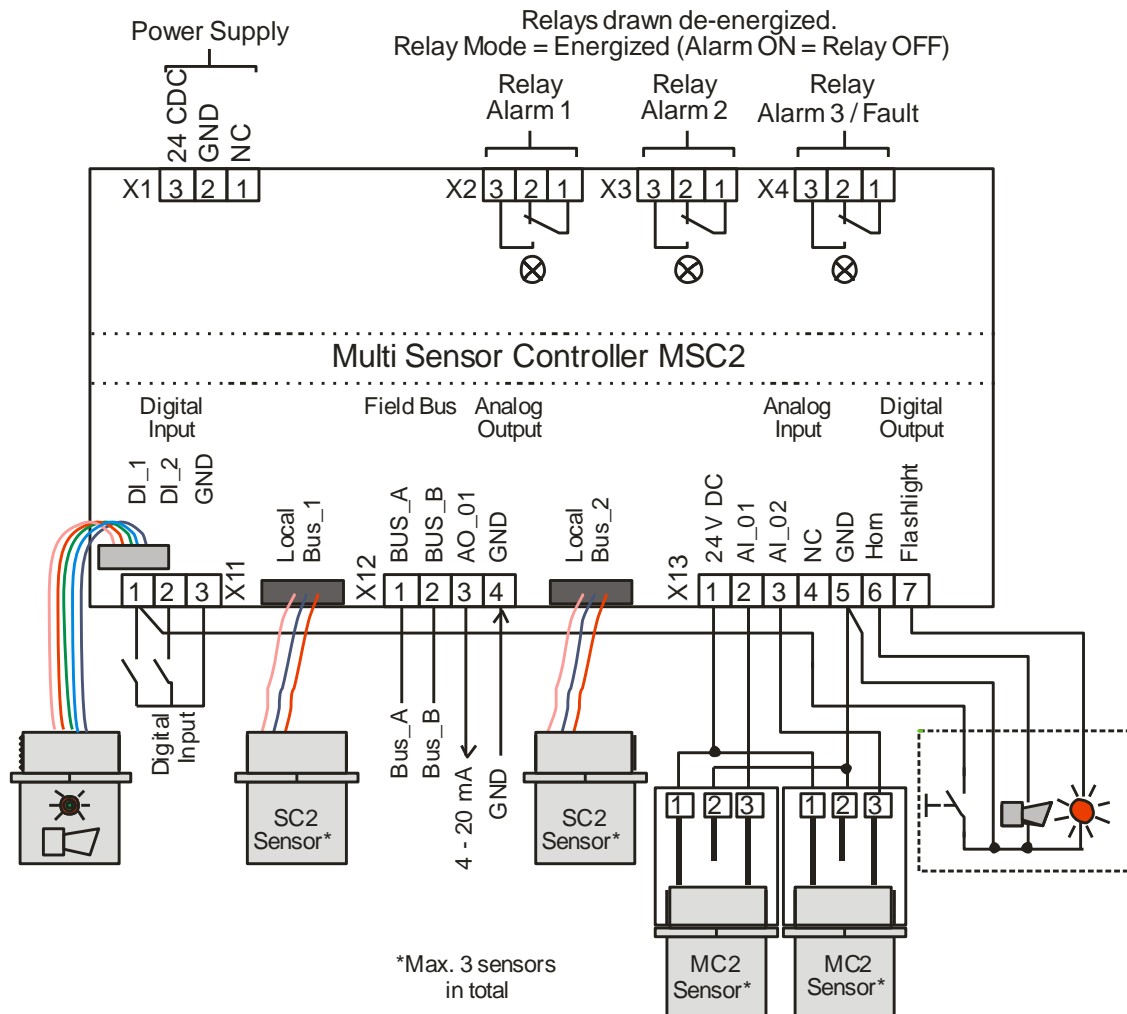
⁴ For the 5 VA version, only 1x of all connected MC2/SC2 sensors may be from the P34XX, SXXX, I-S11XX or I4XX series due to the required power.

STANDARD VERSIONS

Order number MSC2-C-230322000
MSC2-C-730322000

ELECTRICAL CONNECTION

Connection diagram for version 24 V DC



Note:

The connection of 2 SC2 sensor heads with IR sensor is not allowed.

It is not allowed to connect 2 SC2 sensor heads of the same gas or the same gas group (Freons).

When connecting 2 MC2, at least 1x must be from the MC2-E11XX series.