

PERFECT SOLUTIONS FOR GAS ALARM SYSTEMS



Technical Datasheet



PolyGard®2

Multi-Gas-Controller MGC2

DESCRIPTION

APPLICATION

FEATURES

SPECIFICATIONS

SHORT DESCRIPTION OF FUNCTIONS

ORDERING INFORMATION

ELECTRICAL CONNECTION



Specifications subject to change without notice.
PolyGard® is a registered trademark of MSR-Electronic GmbH.
www.msr-electronic.de

■ All Products
■ 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-Gas-Controller is designed for the connection of max. 3 analog sensors with 4–20 mA signal, e.g. of the MC2 series. 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 a superior BMS via an RS-485 interface and also as 4–20 mA output.

The SIL2 compliant self-monitoring function in the MGC2 activates the fault message in case of an internal error as well as in case of a fault at the 4–20 mA input/output current signals.

Other options such as LCD display, 3-color status LED, warning 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 MGC2 can be pre-configured and parametrised with factory-set defaults.

APPLICATION

The PolyGard®2 MGC2 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 MC2 sensor or via comfortable on-site calibration
- Modular technology (plug-in and exchangeable)
- Reverse polarity protected, overload and short-circuit proof
- 3 analog inputs 4–20 mA, e. g. MC2 series
- 3 relays with change-over 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
- 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 MC2

SPECIFICATIONS

ELECTRICAL	
Power supply	24 V DC \pm 20 %, reverse-polarity protected 24 V AC \pm 15 %
Oversvoltage category	I
Power consumption (24 V DC)	
- Control Board	Max. 60 mA (1.5 VA), w/o sensor, w/o WAO
- Per sensor (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, change-over 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 (3)	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
SERIAL INTERFACE	
Field bus	RS-485 / 19200 Baud
Tool bus	2-wire / 19200 Baud
AMBIENT CONDITIONS	
Temperature range	-25 $^{\circ}$ C to +60 $^{\circ}$ C (-13 $^{\circ}$ F to +140 $^{\circ}$ F)
Humidity range	15–95 % RH non-condensing
Pollution degree	2 (indoor use only), not suitable for wet environment
Altitude up to	1500 m
Storage temperature	+5 $^{\circ}$ C to +40 $^{\circ}$ C (+41 $^{\circ}$ F to +104 $^{\circ}$ F)
Storage time	6 months
PHYSICAL	
Housing type A, C, E	Polycarbonate
Combustion	UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimension housing (W x H x D) Type A	94 x 130 x 57 mm (3.7 x 5.12 x 2.24 in.)
Type C	130 x 130 x 75 mm (5.12 x 5.12 x 2.95 in.)
Type E	130 x 130 x 99 mm (5.12 x 5.12 x 3.87 in.)
Weight	Ca. 0.6 kg (1.32 lb.)
Protection class (delivery status*)	Nema 4X (IP65)
Installation	Wall mounting
Knockouts for cable and sensor entry	Standard 6 x M20/25
Wire connection:	
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)
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 in 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 (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 MGC2 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

MGC2-	X-	X	3	X	X	X	3	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
								3		3x 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	
								4		Buzzer & status-LED (red, yellow, green)	Visual/audible indicator (WAO)
								3		3x Alarm relays	Alarm relays
								1*		12 V DC	
								2		24 V DC / AC	
								5		100–240 V AC / 24 V DC, 5 VA	
								7		100–240 V AC / 24 V DC, 15 VA	
								8*		USV 100–240 V AC / 12 V DC, 15 VA, 0.8 Ah	
								9		USV 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 only with housing type E

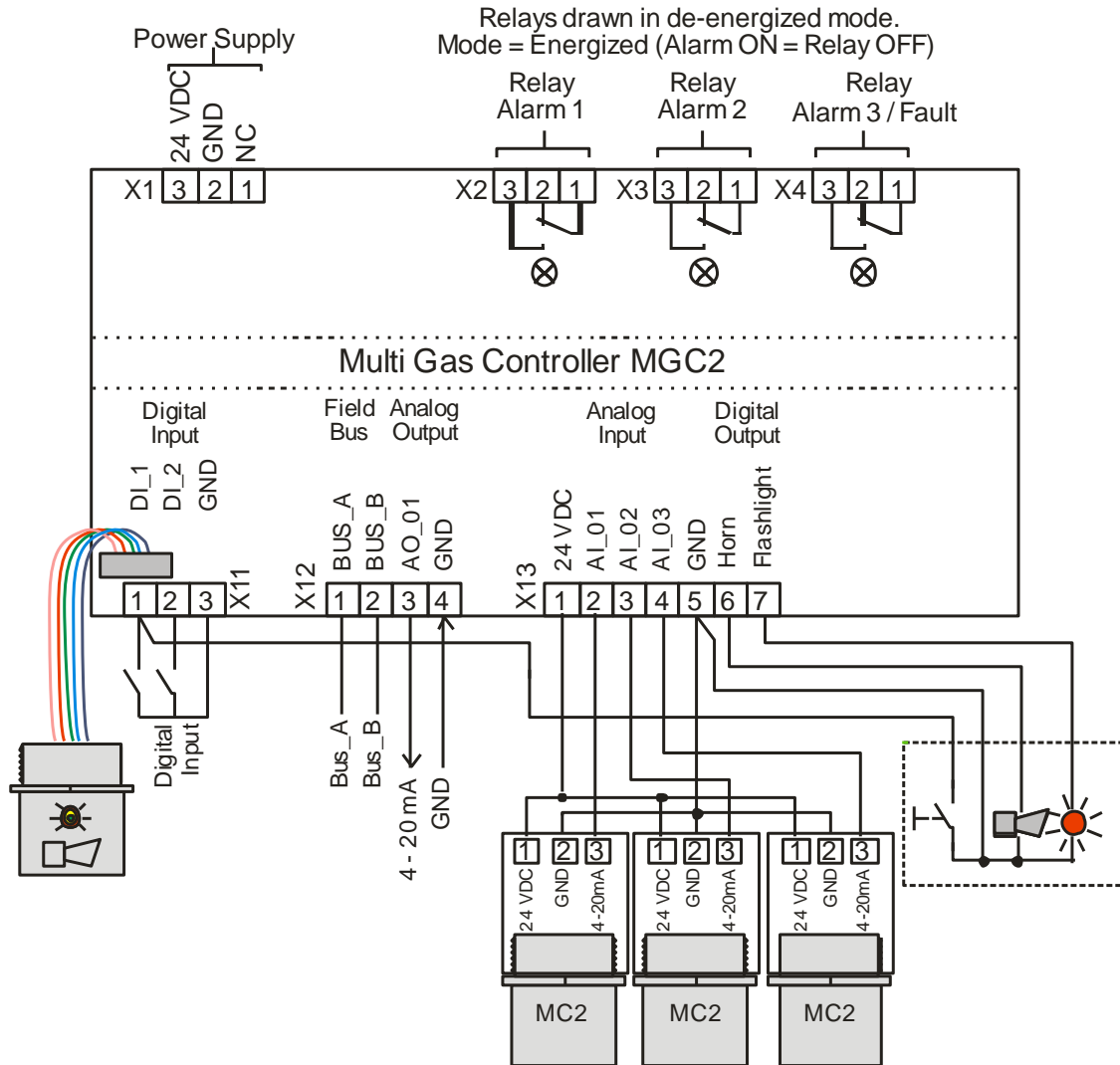
² Only 1x MC2 mountable, w/o visual/audible indicator, w/o 100–240 V AC/15 VA, w/o UPS

STANDARD VERSIONS

Order number MGC2-C-230323000
MGC2-C-730323000

ELECTRICAL CONNECTION

Connection diagram for version 24 V DC



Note:

When connecting 3 MC2, at least 1x must be from the MC2-E11XX series.