

PolyGard®2

Multi-Gas-Controller MGC2



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 combustibile gases, refrigerants or oxygen.

The Multi-Gas-Controller is designed for the connection of max. three 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 SIL 2 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, three-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 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 SIL2 compliant development process
- Easy maintenance / calibration by replacing the MC2 sensors or via comfortable on-site calibration
- Modular technology (plug-in and exchangeable)
- Reverse polarity protected, overload and short-circuit proof
- Three analog inputs 4-20 mA, e.g. MC2 series
- Three relays with change-over contact, potential-free max. 240 V AC, 5 A
- Two transistor outputs, 24 V DC, 0.1 A (plus switching)
- Serial RS 485 interface with protocol for DGC06, or Modbus protocol as an option
- Different types of housing with IP 65
- Two digital inputs
- Warning buzzer and status LED for alarm, fault, operation and service (option)
- LCD display (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



Multi-Gas-Controller MGC2 with sensor



Multi-Gas-Controller MGC2 with display



MSR-Electronic GmbH ::: Würdinger Str. 27 & 27A ::: 94060 Pocking ::: Germany

Specifications subject to change without notice
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SPECIFICATIONS

Electrical

Power supply	24 V DC \pm 20 %, reverse-polarity protected 24 V AC \pm 15 %
Overvoltage category	I
Power consumption (24 V DC)	
- Control Board	Max. 60 mA (1.5 VA), w/o sensor, w/o horn, w/o flashlight
- 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 contact (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 3.0 < 4 mA = underrange > 20 - 21.2 mA = overrange 2.0 mA = fault

Ambient conditions

Temperature range	-25 °C to +50 °C (-13 °F to +122 °F)
Humidity range	15 - 95 % RH not-condensing
Pollution degree	2 (indoor use only, and not suitable for wet environment)
Altitude up to	1500 m
Storage temperature	+5 °C to +40 °C (+41 °F to +104 °F)
Storage time	6 months

Serial interface

Field bus	RS 485 / 19200 Baud
Tool bus	2-wire / 19200 Baud

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 (IP 65)
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)

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.



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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
Status LED	
Colour / mode	Red / yellow / green (alarm – fault – operation - service)
Protection class	IP 65
Warning buzzer	
Acoustic pressure	> 85 dB (A) (distance 0.1 m)
Frequency	2300 Hz
Protection class	IP 65
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	15 VA
Rechargeable battery	12 V, 0.8 Ah
Operating time	> 60 min
Power supply 12 V DC	
Power consumption (12 V DC)	12 V DC reverse-polarity protected
- 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)

SHORT DESCRIPTION OF THE FUNCTION: DIGITAL OUTPUTS WITH THREE RELAYS

Action	Reaction Relay 1 (Alarm1)	Reaction Relay 2 (Alarm2)	Reaction Warning light (Alarm 2)	Reaction Horn (Alarm 2)	Reaction Relay 3 (Alarm2 + 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 ≥ alarm 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.



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ORDERING INFORMATION

MGC2-X X 3 X X X 3 X 0 X

FURTHER OPTIONS

- 0** No further options
- A** Version UL/CSA 61010-1 (only housing type A, C & E)

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
- 4** 1 x Digital input & reset button on the housing

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

- 3** 3 x Alarm relays

POWER SUPPLY

- 1*** 12 V DC
- 2** 24 V AC/DC
- 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

HOUSING

- 0** Without housing
- A²** Housing type A 90 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

***only on request**

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

² Only 1x SC2 or 1x MC2 mountable, w/o optical/acoustical indicator, w/o 100-240 V AC/15 VA, w/o UPS

Standard versions: MGC2-C-2-3-0-3-2-3-0-0-0
 MGC2-C-7-3-0-3-2-3-0-0-0



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ELECTRICAL CONNECTION

