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Multi-Sensor-Controller MSC2

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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. three sensors, two of them may be different cartridges of the SC2 series via local bus and/or two 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 SIL 2 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, three-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.

Multi-Sensor-Controller MSC2 with sensors

Multi-Sensor-Controller MSC2 with display

APPLICATION

The 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 SIL2 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 two Sensor Cartridges SC2 & two analog inputs 4-20 mA, e.g. MC2 series (max. 3 sensors)
- Three relays with SPDT contacts, 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
- 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

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SPECIFICATIONS

Electrical

Power supply	24 V DC ± 20 %, reverse-polarity protected
	24 V AC ± 15 %, (only one 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 ≤ 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

Ambient conditions

Temperature range	-25 °C to +60 °C (-13 °F to +140 °F)
Humidity range	15 - 95 % RH not-condensing
Storage temperature	+5 °C to +40 °C (+41 °F to +104 °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

Housing type C		Polycarbonate
Combustion		UL 94 V2
Housing colour		RAL 7032 (light grey)
Dimension housing (W x H x D)		130 x 130 x 75 mm (5.12 x 5.12 x 2.95 in.)
Weight		ca. 0.6 kg (1.32 lb.)
Protection class (delivery status*)		IP 65
Installation		Wall mounting
Cable entry		Standard 6 x M20/25
Wire connection:	Local bus (SC2)	3-pin connector
	Digital input, analog output	Screw-type terminal min. 0.25 mm², max. 1.3 mm² (24 to 16 AWG)
	Power supply, relays	Screw-type terminal min. 0.25 mm², max. 2.5 mm² (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 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.

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

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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 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	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)

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 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.

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ORDERING INFORMATION

MSC2- **X** **X** **3** **X** **X** **X** **2** **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
2   **2 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
A[2]   Housing type A 94 x 130 x 57 mm
C[1]   **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: MSC2-C-2-3-0-3-2-2-0-0-0
                            MSC2-C-7-3-0-3-2-2-0-0-0

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ELECTRICAL CONNECTION

*Max. 3 sensors in total

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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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