



µGard®2

Infrared sensor unit MC2 with analog output for combustible gases and carbon dioxide

Exchangeable infrared sensor unit including digital value processing, temperature compensation and self control for the continuous monitoring of the ambient air.

The sensor unit MC2 houses a module with µController, analog output and power supply in addition to the high-quality infrared sensor element including amplifier. The IR measurement principle with integrated temperature compensation ensures highest accuracy, selectivity and reliability. The sensor head is gold-plated inside and therefore offers best performance characteristics in terms of drift, stability and reproducibility.

The µController calculates a linear 4 – 20 mA (or 2 – 10 V) signal out of the measurement signal and stores all relevant measured values and data of the sensor element.

Calibration is done either by simply replacing the sensor unit or by using the comfortable, integrated calibration routine directly at the system.

APPLICATION

The µGard®2 IR sensor MC2 is used for the detection of methane, propane, acetylene and carbon dioxide in the non-Ex zone when a typical 4 – 20 mA (or 2 – 10 V) signal is required.

FEATURES

- Digital measurement value processing incl. temperature compensation
- Internal function control with integrated hardware watchdog
- Data / measured values in µC of the sensor unit, therefore simple exchange uncalibrated <> calibrated
- High accuracy, selectivity and reliability
- Low zero-point drift
- Long sensor life time
- Good poisoning immunity
- Easy maintenance and calibration by exchange of the sensor unit or by comfortable on-site calibration
- 4 – 20 mA (or 2 – 10 V) analog output with selectable signal output for special mode, fault etc.
- Reverse polarity protected, overload and short-circuit proof
- Housing for integration of the sensor unit
- IP 65 version
- Display (option)
- Display with two open-collector outputs for horn (resettable) and warning lamp (option)
- Conformity to
 - EN 61010-1
 - ANSI/UL 61010 1
 - CAN/CSA-C22.2 No. 61010-1
- Duct mounting kit (accessory)



Exchangeable sensor unit in plastic housing without cable



Option housing "A" with sensor unit in plastic housing



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

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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IR sensor MC2 with AO for combustible gases & CO₂

SPECIFICATIONS

Electrical

Power supply	16 – 29 V DC, reverse-polarity protect.; 18 - 27 V AC (only for output signal 2-10 V)				
Power consumption	75 mA, max. (1.8 VA for 24 V)				
Analog output signal	Proportional, overload and short-circuit proof, load ≤ 500 Ohm for current signal, ≥ 50 kOhm for voltage signal 4 - 20 mA or 2 – 10 V = measuring range 3.2 < 4 mA or 1.6 - 2 V = underrange > 20 - 21.2 mA or 10 - 10.6 V = overrange 2 mA or 1 V = fault > 21.8 mA or 10.9 V = fault High				

Sensor performance

Gas type	See Order Information				
Sensor element	Infrared sensor				
Measuring range	See Order Information				
Accuracy	+/- 3 % for < 50 % of range +/- 5 % for > 50 % of range				
Resolution	0.04 % of range				
Repeatability	+/- 10 % of signal				
Response time t ₉₀	CH ₄	C ₃ H ₈	C ₂ H ₂	CO ₂ (% Vol)	CO ₂ (ppm)
	< 20 s	< 70 s	n. d.	< 50 s	< 25 s
Warm-up to operation	< 60 sec.				
Warm-up to specification	< 180 sec.				
Temperature range	-30 °C to +60 °C (-22 °F to 140 °F)				
Humidity range	0 - 95 % RH				
Pressure range	700 – 1300 hPa				
Sensor life time	> 5 years				
Calibration interval ¹	12 months (verification pending)				
Storage temperature range	-40 °C to +80 °C (-40 °F to 176 °F)				
Storage time	6 months				

Physical

Enclosure P	Polycarbonate UL 94 V2				
Enclosure colour	RAL 7032 (light grey)				
Dimensions	(D x H) 24 x 22 mm (0.94 x 0.87 in.)				
Weight	Ca. 30 g (0.066 lb)				
Protection class	IP 65				
Mounting	Screw mounting / M25				
Wire connection	Screw-type terminal min. 0.25 mm ² , max. 1.3 mm ² , 3-pin, 24 to 16 AWG				

Directives

EMC directives 2014/30/EU, CE
Compliance with: EN 61010-1:2010, 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

Options

Housing A for integration of the sensor unit	Polycarbonate UL 94 V2				
Enclosure colour	RAL 7032 (light grey)				
Dimensions (W x H x D)	94 x 130 x 57 mm (3.7 x 5.1 x 2.2 in.)				
Weight	Ca. 0.2 kg				
Packaging volume	Ca. 4.5 l				
Protection class	IP 65				
Mounting	Wall mounting				
Pre-embossed entries for cable / sensor unit	6 x M20/M25				

LCD display

LCD Two lines, 16 characters each, monochrome

Open-collector (transistor) output (2) For horn (resettable) and warning lamp

Switching capacity 24 V DC / 50 mA (+ switching)

¹ Manufacturer-recommended calibration interval for normal environmental conditions.

All specifications were collected under optimal test conditions.

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



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ORDER INFORMATION

<p>MC2- X</p> <p>I4XX-X -</p> <p>X-</p> <p>X</p> <p>I400-A</p> <p>I480-A</p> <p>I495-A</p> <p>I464-B</p> <p>I464-D</p> <p>0</p> <p>A</p> <p>5</p> <p>D</p> <p>N</p>	<p>P Sensor housing plastic</p> <p>S Sensor housing stainless steel</p> <p>0 Without display</p> <p>1 With display for indication of measurement values (only in housing A or N)</p> <p>2 With display for values & operation, 2x open-collector for horn & warning lamp (only housing A / N)</p>	<table border="0"> <thead> <tr> <th>Gas type</th> <th>Measuring range</th> <th>Gas density (air = 1)</th> <th>Mounting height</th> </tr> </thead> <tbody> <tr> <td>Methane, CH₄</td> <td>0 – 100 % LEL</td> <td>0.55</td> <td>Ceiling</td> </tr> <tr> <td>Propane, C₃H₈</td> <td>0 – 100 % LEL</td> <td>1.55</td> <td>Floor</td> </tr> <tr> <td>Acetylene, C₂H₂</td> <td>0 – 100 % LEL</td> <td>0.91</td> <td>Ceiling</td> </tr> <tr> <td>Carbon dioxide, CO₂</td> <td>0 – 5 Vol. %</td> <td>1.53</td> <td>0.6 m to 1.5 m (2 to 5 ft.)</td> </tr> <tr> <td>Carbon dioxide, CO₂</td> <td>0 – 5000 ppm</td> <td>1.53</td> <td>0.6 m to 1.5 m (2 to 5 ft.)</td> </tr> </tbody> </table> <p>HOUSING FOR INTEGRATION OF THE SENSOR UNIT</p> <p>0 Without housing</p> <p>A Plastic housing type A, 94 x 130 x 57 mm</p> <p>5 Stainless steel housing type 5, 113 x 135 x 45 mm</p> <p>D Plastic housing type D, 94 x 65 x 57 mm</p> <p>N Plastic housing type N, 80 x 82 x 55 mm</p>	Gas type	Measuring range	Gas density (air = 1)	Mounting height	Methane, CH₄	0 – 100 % LEL	0.55	Ceiling	Propane, C₃H₈	0 – 100 % LEL	1.55	Floor	Acetylene, C₂H₂	0 – 100 % LEL	0.91	Ceiling	Carbon dioxide, CO₂	0 – 5 Vol. %	1.53	0.6 m to 1.5 m (2 to 5 ft.)	Carbon dioxide, CO₂	0 – 5000 ppm	1.53	0.6 m to 1.5 m (2 to 5 ft.)
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EXAMPLE

CH₄ Methane sensor unit with infrared sensor element, measuring range 0 - 100 % LEL with plastic housing type A, without display, sensor unit in plastic housing

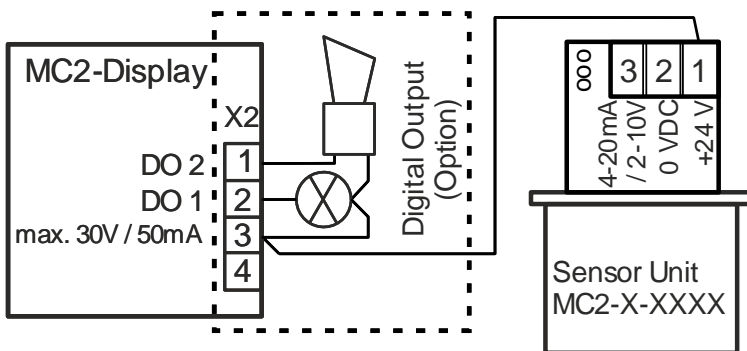
Order number: **MC2-A-I400-A-0-P**

ACCESSORY:

Duct mounting kit

Order number: **C2-Z2**

WIRING CONFIGURATION (including options)



Note:

The installation of the sensor unit MC2 directly on the MSC2, MGC2 or MSB2 housing isn't-possible, only external connection with separate housing!

For 4- 20 mA output signal you have to remove the resistor between pin 2 and pin 3.

