

Inclination sensors

1-dimensional, measuring range 0...360°

CANopen® / SAE J1939 / Analog

GIM500R - 1-dimensional



GIM500R with housing in aluminium

Technical data - electrical ratings

Voltage supply	8...36 VDC
Reverse polarity protection	Yes
Short-circuit proof	Yes
Consumption w/o load	≤40 mA (24 VDC)
Initializing time	≤1 s after power on
Interfaces	CANopen®, SAE J1939, Analog (4...20 mA, 0...5 V or 0...10 V)
Measuring range	0...90°, 0...120°, 0...180°, 0...270°, 0...360°
Load resistor	≥1 kΩ / voltage output ≤800 Ω / current output
Resolution	0.025 °
Accuracy (+25 °C)	Typ. ±0.1°
Temperature coefficient	0.008 °/K
Repeatability	0.1 ° (+25 °C)
Sensing rate	800 Hz
Limit frequency	0.1...25 Hz, 2. order / low-pass filter (Default: 5 Hz)
Interference immunity	DIN EN 61000-6-2 ECE Reg. No. 10R04 ISO 7637-2 ISO 11452-2 / ISO 11452-5
Emitted interference	DIN EN 61000-6-4 ECE Reg. No. 10R04 ISO 7637-2 / EN 55025
Programmable parameters	Preset and offset Filter
Diagnostic function	Parameter error
Status indicator	DUO-LED integrated in housing
Approval	UL approval / E63076

Features

- Size 50 mm
- MEMS capacitive measuring principle
- EN13849 compliant firmware
- E1 compliant design
- Interface CANopen®, SAE J1939, Analog
- Measuring range 1-dimensional: 0...360°
- Connection M12 and cable
- Protection up to IP 69K

Optional

- With integrated terminating resistor
- Connection: DEUTSCH connector

Technical data - mechanical design

Dimensions W x H x L	48 x 24 x 52 mm
Protection DIN EN 60529	IP 66, IP 67, IP 68, IP 69K
Material	Housing: aluminium, coated
Corrosion protection	IEC 60068-2-52 Salt mist Complies to ISO 12944-5:1998 Protective paint systems (C5-M)
Operating temperature	-40...+85 °C (see general information)
Resistance	DIN EN 60068-2-6 Vibration ±1.5 mm - 10-58 Hz 20 g - 58-2000 Hz DIN EN 60068-2-27 Shock 200 g, 6 ms
Weight approx.	95 g
Connection	Flange connector M12, 8-pin Flange connector M12, 5-pin Cable 1 m

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Part number

GIM500R-

M	1		.			.A	
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Option

Without option

/4816 With integrated terminating resistor

Voltage supply / interface

C6 8...36 VDC / CANopen®

C9 8...36 VDC / SAE J1939

V5 8...36 VDC / Analog 0...5 V

V1 8...36 VDC / Analog 0...10 V

C4 8...36 VDC / Analog 4...20 mA

Connection

K Cable 1 m, Standard 4x2x0.14 mm²
(Analog, CANopen®, SAE J1939)

A Flange connector M12, 5-pin, male contacts
(CANopen®, SAE J1939)

B Flange connector 2xM12, 5-pin, male and female contacts
(CANopen®, SAE J1939)

F Flange connector M12, 8-pin, male contacts
(Analog)

Measuring range

09 0...90° (Analog)

12 0...120° (Analog)

18 0...180° (Analog)

27 0...270° (Analog)

36 0...360° (Analog, CANopen®, SAE J1939)

Number of axes

1 1-dimensional

Housing

M Metal

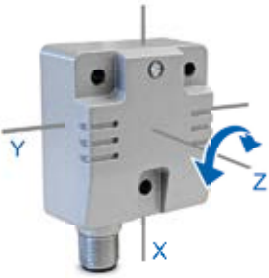
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Installation position




The 1-dimensional inclination sensor must be installed with its x-axis in line with the force of gravity, as illustrated below.

The 1-dimensional sensor default position is 0° as shown in the following illustration, but may be configured at will using the teach function.


Default 0°




Measured value 90°



Measured value 180°



Measured value 270°



CANopen® features	
Bus protocoll	CANopen®
Device profile	CANopen® - CiA DSP 301 V4.2 Inclinometer profile DS 410 V1.3 LSS service profile DS 305 V2.2
Default	Baud rate 50 kbit/s Node ID 1

General information

Self-heating correlated to installation and ambient conditions as well as to electronics and supply voltage must be considered for precise thermal dimensioning. The inclination sensor is supposed to self-heating to approximately 5 K when attached to a varnished ground metal. Operating the inclination sensor close to the maximum limits requires measuring the currently prevailing temperature at the housing.

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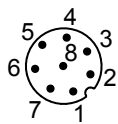
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Terminal assignment

Analog – M12 flange connector, 8-pin

Pin	Assignment	Description
1	UB	Voltage supply 8...36 VDC
2	GND	Ground connection relating to UB
3	OUT	Output
4	n.c.	Do not use
5	Teach ¹⁾	Teach-Input
6	n.c.	Do not use
7	n.c.	Do not use
8	A_GND	Ground connection relating to Analog



M12 flange connector (male),
A-coded

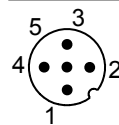
Analog – cable

Core color	Assignment	Description
White	UB	Voltage supply 8...36 VDC
Brown	GND	Ground connection relating to UB
Green	OUT	Output
Yellow	n.c.	Do not use
Grey	Teach ¹⁾	Teach-Input
Pink	n.c.	Do not use
Blue	n.c.	Do not use
Red	A_GND	Ground connection relating to Analog

1) $U_{\text{teach}} \geq 0.7 \cdot U_B$ longer than 250 ms / inclination = 0°

CANopen® / SAEJ1939 – M12 flange connector, 5-pin

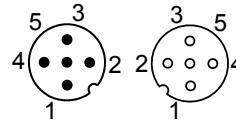
Pin	Assignment	Description
1	CAN_GND	Ground connection relating to CAN
2	UB	Voltage supply 8...36 VDC
3	GND	Ground connection relating to UB
4	CAN_H	CAN Bus Signal (dominant High)
5	CAN_L	CAN Bus Signal (dominant Low)



M12 flange connector (male),
A-coded

CANopen® / SAEJ1939 – 2xM12 flange connector, 5-pin

Pin	Assignment	Description
1	CAN_GND	Ground connection relating to CAN
2	UB	Voltage supply 8...36 VDC
3	GND	Ground connection relating to UB
4	CAN_H	CAN Bus Signal (dominant High)
5	CAN_L	CAN Bus Signal (dominant Low)



M12 flange connector (male /
female), A-coded

Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.

CANopen® – Cable

Core color	Assignment	Description
White	UB	Voltage supply 8...36 VDC
Brown	GND	Ground connection relating to UB
Green	n.c.	–
Yellow	n.c.	–
Grey	n.c.	–
Pink	CAN_H	CAN Bus Signal (dominant High)
Blue	CAN_L	CAN Bus Signal (dominant Low)
Red	CAN_GND	Ground connection relating to CAN

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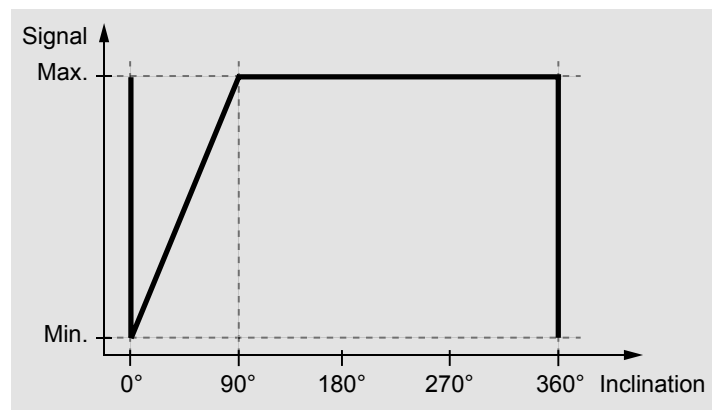
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GIM500R - 1-dimensional

Output signals

Analog output

Measuring range 0...90°



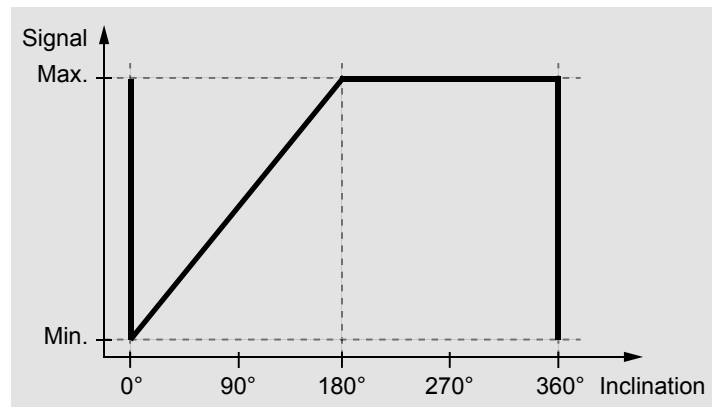
Inclination 0°



Inclination 90°



Measuring range 0...180°



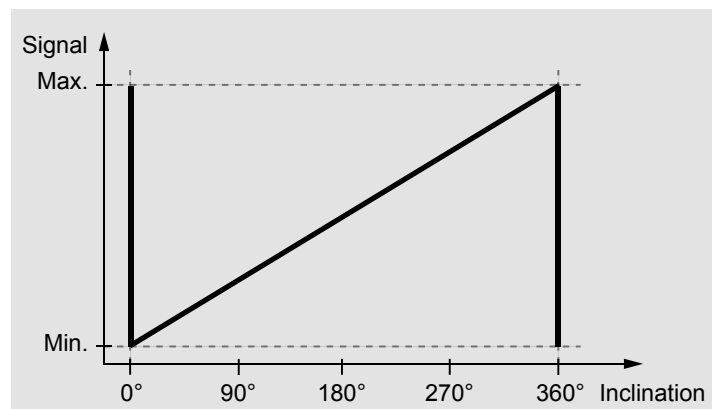
Inclination 0°



Inclination 180°



Measuring range 0...360°



Inclination 0°



Inclination 360°



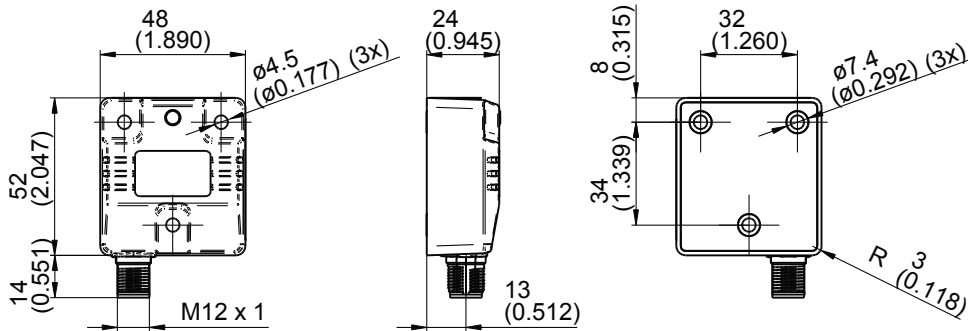
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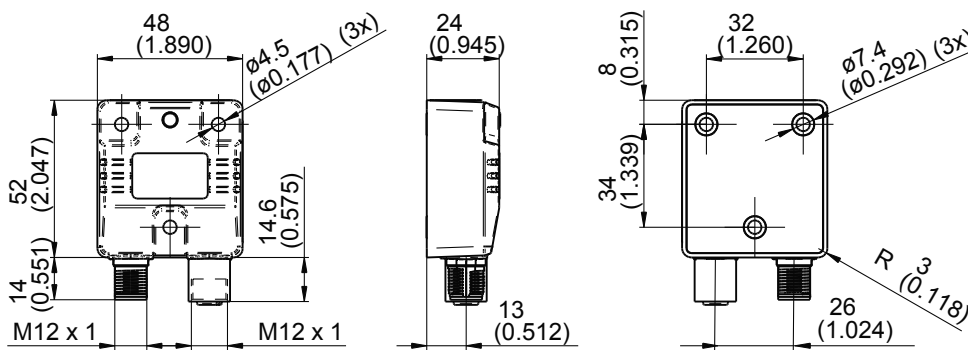
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Dimensions

GIM500R - 1 x connector M12



GIM500R - 2 x connector M12



GIM500R - cable

