

Overview

- 2-dimensional, measuring range up to $\pm 90^\circ$
- High measurement accuracy in dynamic applications
- Sensor fusion for gyro-based motion compensation
- Designed for Mobile Maschinen
- E1 compliant design
- Load dump protection
- Protection up to IP 69K
- Corrosion protection CX (C5-M)
- Connection cable / cable with M12 connector
- Interface CANopen®
- Redundant versions (2-channel architecture)



Picture similar

Technical data

Technical data - electrical ratings

Voltage supply	8...36 VDC
Reverse polarity protection	Yes
Short-circuit proof	Yes
Consumption typ.	30 mA (24 VDC, w/o load, redundant)
Initializing time typ.	≤ 1 s after power on
Interface	CANopen®
Measuring range	$\pm 90^\circ$
Resolution	1 ... 0.001 ° CANopen®
Dynamic accuracy typ.	$\pm 0.5^\circ$ (see general information)
Static accuracy typ.	$\pm 0.1^\circ$ (+25 °C)
Static accuracy max. (horizontal)	$\pm 0.28^\circ$ (+25 °C) $\pm 0.42^\circ$ (0...+50 °C) (measuring range $\pm 10^\circ$, see general information)
Sensing method	MEMS technology
Sensing rate	1000 Hz (1 ms)
Output stages	CAN-Bus compatible ISO 11898
Load dump protection	ISO 16750-2 for 12 V / 24 V systems Pulse 5b (test criteria B)
Interference immunity	EN 61000-6-2 ISO 7637-2* ISO 7637-3* ISO 11452-2* ISO 11452-4* ISO 11452-5* EN 61000-4-2 (CD ± 8 kV, AD ± 15 kV) * Severity level according to ECE R10 (Rev. 6 + Amd 02:2021-12)
Emitted interference	EN 61000-6-3 EN 61000-6-4 ISO 7637-2* CISPR 25:2008 (30...1000 MHz) * Severity level according to ECE R10 (Rev. 6 + Amd 02:2021-12)

Technical data - electrical ratings

Programmable parameters	Preset / zero position Resolution Rotating direction
Diagnostic function	Supply voltage monitoring Temperature control
Approval	UL approval / E217823

Technical data - mechanical design

Dimensions W x H x L	72 x 24 x 64 mm
Protection EN 60529	IP 66 IP 67 IP 68 (without connector) IP 69K (without connector)
Material	Housing: polyamide (glass fiber reinforced) Base plate: metal
Corrosion protection	IEC 60068-2-52 Salt mist for ambient conditions CX (C5-M) according to ISO 12944-2
Operating temperature	-40...+85 °C (see general information)
Resistance	EN 60068-2-6 Vibration 30 g, 60-2000 Hz EN 60068-2-27 Shock 100 g, 6 ms EN 60068-2-64 Random vibration 10 gRMS, 20-1000 Hz
Temperature changes	EN 60068-2-14, -40...+85 °C
Weight approx.	150 g
Connection	Flylead connector 2xM12, 5-pin, (Bus-in/Bus-out), length 300 mm

Optional

- Euler angle / quaternion output PDO mappable (see general information)
- 3-axis acceleration / rotation rate output PDO mappable (see general information)

General information

For a precise thermal design, the self-heating of the inclination sensor must be considered depending on the mounting and ambient conditions as well as the electronics and supply voltage. As an approximation, 5 K self-heating applies when the sensor is mounted on a painted metal base. If the inclination sensor is operated close to the maximum characteristic values, the actual temperature at the housing of the inclination sensor must be measured.

Reference the zero position of the inclination sensor after installation. Regularly check the zero-point stability of the inclination sensor when installed.

Dynamic accuracy depends on characteristics of movement patterns in application. It's highly recommended to validate the sensor performance in the application. Acceleration, rotation rate, Euler and Quaternion values are additionally available. Further information on request.

Description

The inclination sensor GIM600DR incorporate 6-DOF MEMS sensors for acceleration and rotation. It offers high precision in dynamic applications:

- Biaxial inclination measurement with compensation of external accelerations
- High signal quality and fast response time due to powerful, field-proven sensor fusion algorithms
- Six-degree-of-freedom inertial measurement unit (IMU)
- Output of raw data for acceleration and rotation rate for additional applications

The rugged design offers highest availability under harshest environmental conditions.

Installation position



Horizontal installation

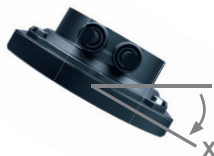
When installing the 2-dimensional inclination sensor with the housing in horizontal position, make sure the base plate is aligned parallel to the horizontal line. The X and Y axes of the sensor can each be inclined relative to the horizontal plane, which corresponds to a rotation about the other axis. There is one measured value supplied for each axis.

Plumb angle measuring range $\pm 90^\circ$

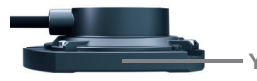
Inclination angle 0°
X-axis, Slope long



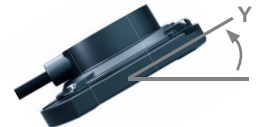
Inclination angle $+30^\circ$
X-axis, Slope long



Inclination angle 0°
Y-axis, Slope lateral



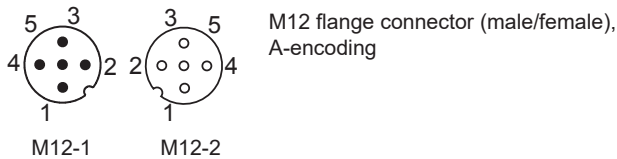
Inclination angle -30°
Y-axis, Slope lateral



Terminal assignment

Flylead connector 2xM12, 5-pin (Bus-in/Bus-out)

Pin	Assignment	Description
1	CAN_GND	Ground connection relating to CAN
2	+Vs	Voltage supply
3	GND	Ground connection relating to +Vs
4	CAN_H	CAN Bus Signal (dominant High)
5	CAN_L	CAN Bus Signal (dominant Low)



For all connection types

Terminals GND and CAN_GND are internally connected and identical in their functions. Max. load on the terminals Vs and GND is 1.5 A each. Daisy chain current max. 1.5 A.

CANopen® features

Device profile	CANopen® CiA DS 301 V4.2 Inclinometer profile DS 410 V2.0 LSS service profile DS 305 V3.0
Default	Resolution 0.1° Baud rate 250 kbit/s Node-ID 1 Node-ID 2 (redundant version) Time-driven: 100 ms
Secondary data - acceleration	Resolution 0.1 mg Range -3.2768...+3.2767 g
Secondary data - rotation rate	Resolution 0.01 dps Range -327.68...+327.67 dps
Secondary data - Euler angles	Resolution 0.01 deg Range -180°...+180°

Data transfer

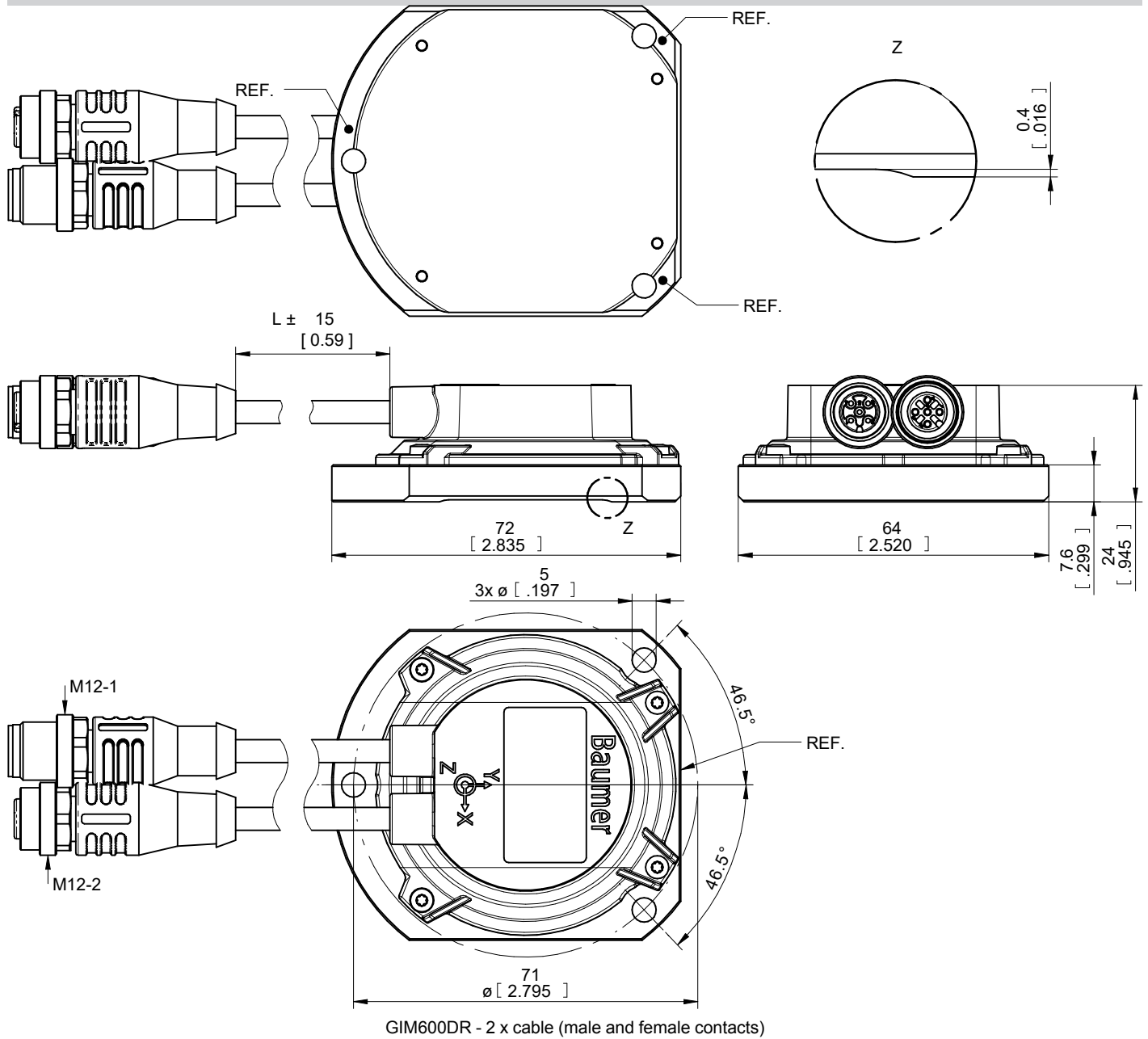
CANopen - PDO Mapping / Node-ID 1 / PDO 1

LSB	MSB	LSB	MSB	LSB	MSB
Byte 0	1	2	3	4	5
Temperature		Inclination angle X-axis Slope long16		Inclination angle Y-/Z-axis Slope lateral16	

CANopen - PDO Mapping / Node-ID 2 / PDO 1 (redundant)

LSB	MSB	LSB	MSB	LSB	MSB
Byte 0	1	2	3	4	5
Temperature		Inclination angle X-axis Slope long16		Inclination angle Y-/Z-axis Slope lateral16	

Dimensions



Dimensions

