

Inertial Measurement Unit

A 6-DOF sensor



Inertial measurement unit with micromechanical spring-mass-system continuously measures the acceleration and rotation rate

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General characteristics

- Acceleration measurement range $\pm 2 \text{ g}$ (x, y, z)
- Rotation rate measurement range $\pm 500 \text{ }^\circ/\text{s}$ (x, y, z)
- Inclination measurement range
 - Pitch $\pm 180^\circ$
 - Roll $\pm 85^\circ$
 - Tilt x/ tilt y $\pm 90^\circ$
- Flexible zero-point-setting
- Configuration of sensor parameters
- High operating temperature range
- Polyamid housing (IP68)

Specifications

Parameter	Acceleration	Rotation rate	Inclination
Measurement range	$\pm 2 \text{ g}$ (x, y, z)	$\pm 500 \text{ }^\circ/\text{s}$ (x, y, z)	Pitch/ roll $\pm 180^\circ \pm 85^\circ$ Tilt x/ tilt y $\pm 90^\circ$
Resolution	0.1 mg	0.004 $^\circ/\text{s}$	0.01 $^\circ$
Noise density	120 $\mu\text{g}/\sqrt{\text{Hz}}$	0.014 $^\circ/\text{s}/\sqrt{\text{Hz}}$	$\leq 0.05^\circ$
Zero offset (typ. over life time)	$\pm 20 \text{ mg}$	$\pm 1 \text{ }^\circ/\text{s}$	
Accuracy, static			$\pm 0.3^\circ$ (typ.)
Accuracy, dynamic			$\pm 0.5^\circ$ (typ.)
Temperature coefficient	$\pm 0.2 \text{ mg/K}$	$\pm 0.015 \text{ }^\circ/\text{s}/\text{K}$	$\pm 0.01^\circ/\text{K}$ (typ.)

Parameter	Unit	
Supply voltage	9 ... 32	VDC
Current consumption	$\leq 50 \text{ mA}$ at 12 VDC $\leq 25 \text{ mA}$ at 24 VDC	
Sample rate	200	Hz
Interface, mechanical	2 x M12-connector, 5pol. A-coded (plug and socket)	
Interface, digital	CANopen (CiA DS-301, CiA DSP410)	
CANopen data rate	125k, 250k, 500k, 800k, 1M	bit/s
CANopen functions	Read measurements, cyclic and synced transmit, configuration	
Device orientation	Free selectable	
Dimensions	51 x 72 x 28	mm
Weight	Approx. 120	g
MTTF according SN29500	331.6	a

Applied standards

EMC	DIN EN 50121-3-2:2017-11
	- EN 55011: Conducted emission (150 kHz – 30 MHz)
	- EN 55011: Emission (30 MHz – 1 GHz)
	- EN 61000-4-2: ESD (6 kV/ 8 kV)
	- EN 61000-4-3: Radiated RF fields (80 MHz - 6 GHz, 10 V/m)
	- EN 61000-4-4: Fast transients (burst) (± 2 kV, 5/50 ns)
	- EN 61000-4-5: Surge (± 2 kV, 1.2/50 μ s)
	- EN 61000-4-6: Conducted RF (0.15 ... 80 MHz, 10 VRMS)
Fire protection	EN 45545-2:2020-10
Declaration of conformity	EMC Directive 2014/30/EU
	RoHS Directive 2011/65/EU incl. update 2015/863, annex II

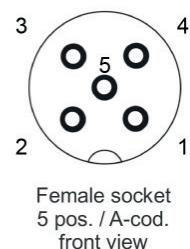
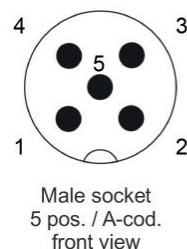
Environmental data

Parameter

Shock and Vibration	DIN EN 61373
	Category 1, Class B – body mounted
Operating temperature	DIN EN 50125
	-25 ... 85 °C, Class OT3, H1 Extended operating temperature at start-up: ST0
Protection class	EN 60529 IP68
Rel. humidity	DIN EN 50125 Class TX
Altitude	DIN EN 50125 Class AX
Housing material	Polyamid PA6.0 GF30 - black

Pin assignment

Pin	Assignment
1	CAN GND
2	Power supply
3	GND
4	CAN high
5	CAN low



Installation and assembly

The sensor is fixed into place with the help of three through bores for M4 screws. It shall be mounted at the moving/ accelerated measurement object. The orientation of the measurement axes x, y, z is to be respected in relation to the expected moves of the component.

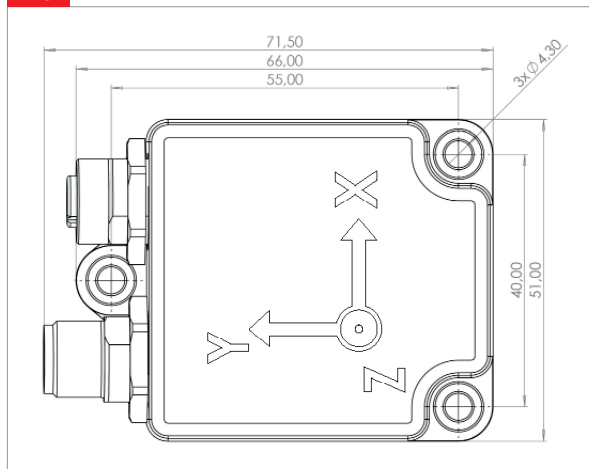
Decommissioning and disposal

Remove the power and output cable with M12 Connector from the sensor. Incorrect disposal may cause harm to the environment.

Dispose of the device, its components and accessories, as well as the packaging materials in compliance with the applicable country-specific waste treatment and disposal regulations of the region of use.

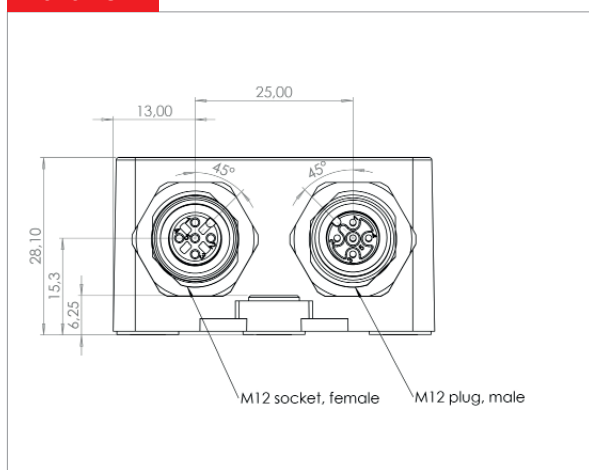
Mechanical drawings

Top



➔ All geometrical dimensions in mm

Front view



Disclaimer

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