MICRO-EPSILON

More Precision.

inertialSENSOR INC5502D // Dynamic and precise inclination sensor

Dynamic and precise inclination sensor
inertialSENSOR INC5502D

- 1-axis or 2-axis inclination measurement
- High precision for dynamic measurement tasks up to ±0.3°
- Angle measurement with disturbance compensation
- Compact and robust plastic housing (IP67/IP69K)
- Application-specific parameter sets optimize your series solution

Precise inclination measurement in highly dynamic applications

The robust INC5502D inclination sensors are used for precise measurement of angles, alignment of machine parts and position or attitude detection of moving components. Thanks to the intelligent sensorFUSION algorithm, the measurement signal remains stable and free of overshoots even during sudden movements, e.g. due to shocks or start-up and braking processes. The high signal quality and a very short response time enable extremely accurate measurements during motion.

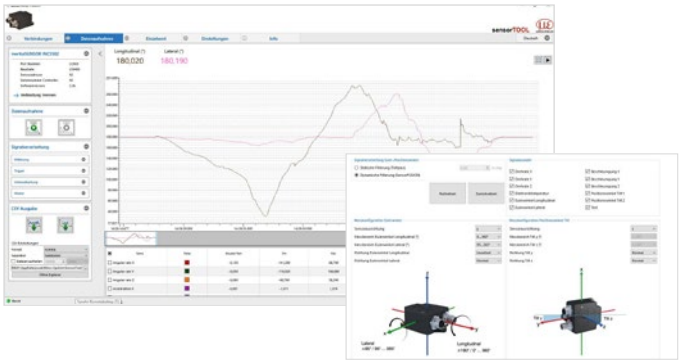
Depending on the measurement task, different types of angles (Euler or position angle) can be detected and output simultaneously in one or two axes. Other parameters such as accelerations or rotational speeds can also be displayed and output.

Small design, great performance

A slim design and individual alignment options reduce installation effort and facilitate mounting on moving machinery and vehicles (construction machinery, agricultural machinery, forestry machinery), cranes and lifting platforms or ships. Integrated analog and digital interfaces allow direct output of measured values as well as easy setting of sensor parameters.

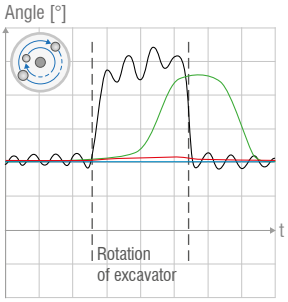
Combination with sensorTOOL software

For a quick functional test and to check the measured values, the INC5502D can also be connected to the sensorTOOL software. The sensorTOOL enables you to adjust parameters and to display the measured values immediately.



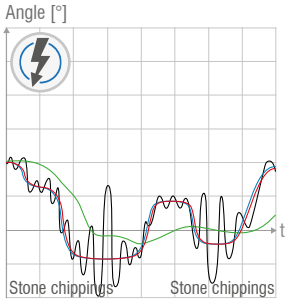
Micro-Epsilon provides predefined, application-specific parameter sets on request. These optimize the measurement settings of the sensor and further improve accuracy. We can also provide individual parameter sets for new series applications.

Centrifugal force compensation



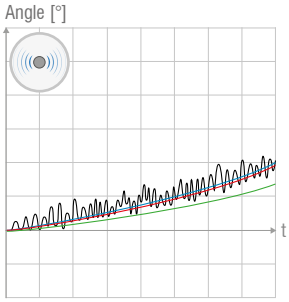
Examples
Swinging an excavator arm,
heavy braking on vehicles

Shock compensation

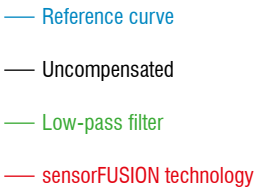


Examples
Stone impacts on excavators,
setbacks on milling machines

Vibration suppression



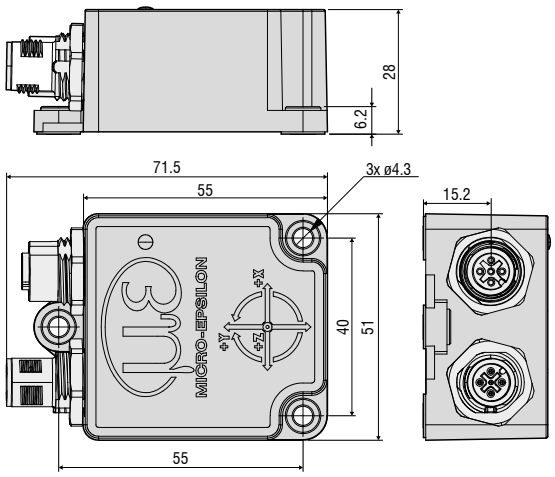
Examples
Compactors on inclines,
engine vibration in mobile machinery



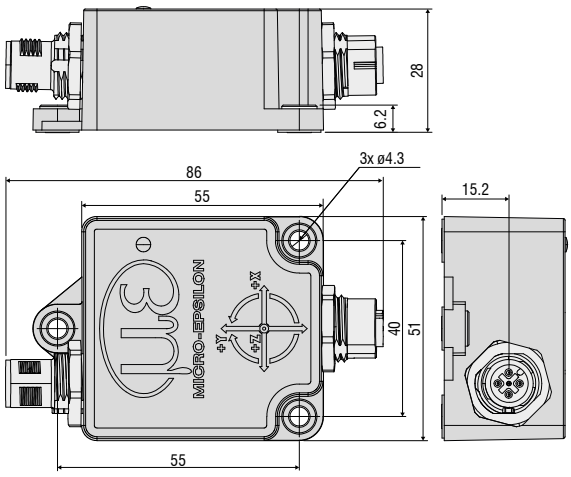
Model		INC5502D CO/J1939	INC5502D U/I
Number of measuring axes		1 or 2	
Measuring range	Euler angle	longitudinal (roll): ±180° (switchable to 0° … 360°) lateral (pitch): ±85° (switchable to 95° … 265°) (sign reversible, axis orientation selectable)	
	Position angle	Tilt x and Tilt y: ±90° (sign reversible, axis orientation selectable)	
Resolution		0.01°	
Repeatability		≤ ±0.05°	
System accuracy [1]		static: ±0.15° (measuring range ≤ ±30°) and ±0.25° (measuring range > ±30°) dynamic: up to ±0.3° (typ. ±0.5°)	static: ±0.2° (measuring range ≤ ±30°) and ±0.25° (measuring range > ±30°) dynamic: up to ±0.3° (typ. ±0.5°)
Measuring rate		200 Hz	
Temperature stability [2]		±0.008°/ K	
Supply voltage		9 … 32 VDC	
Max. current consumption		< 50 mA at 12 VDC; < 25 mA at 24 VDC	
Digital interface [3]		CANopen, SAE J1939	RS485, Ethernet, EtherCAT, PROFINET, EtherNet/IP
Analog output		-	4...20 mA, 0...10 V and 0.5...4.5 V (configurable)
Connection [4]		1 or 2x plug connector 5-pin M12 (plug socket, daisy-chained)	1 x 8-pin M12 plug connector
Mounting		Mounting holes Ø 4 mm	
Temperature range	Storage	-40 … +85 °C	
	Operation	-40 … +85 °C	
Shock (DIN EN 60068-2-27)		1500 g / 0.5 ms in 3 axes	
Protection class (DIN EN 60529)		IP67 / IP69K	
Material		Glass fiber reinforced polyamide (housing) PUR (potting)	
Weight		approx. 120 g	
Control and indicator elements		bicolor LED for status	
Special features		adjustable filters: sensorFUSION, low-pass filter (critically damped). On request, predefined, application-specific config files can be provided. We can also set up individual parameter sets for series applications. Output of further measurement parameters (raw values): acceleration x, y, z axes, measuring range ±2 g; angular velocity x, y, z, axes, measuring range ±500°/s	

[1] All specifications are typical for 25 °C, unless otherwise stated.
[2] Typically in the temperature range -40...+85 °C
[3] Ethernet, EtherCAT, PROFINET and EtherNet/IP require connection via interface module
[4] Further connection options on request (e.g. integrated cable, Deutsch plug)

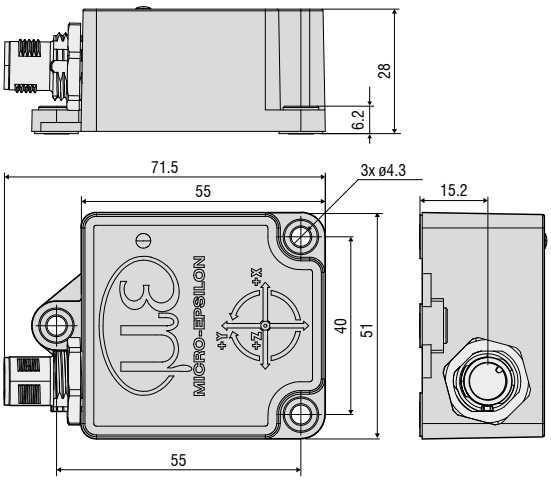
INC5502D-360/90-P-OS



INC5502D-360/90-P-DS



INC5502D-360/90-P-S



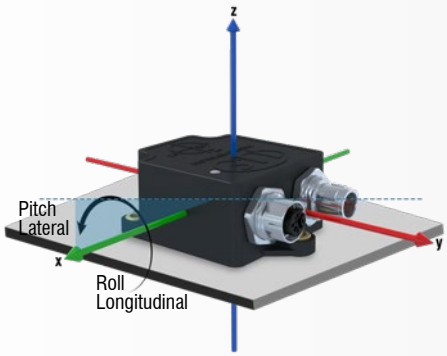
Article designation

INC5502D	-360/90	-P	-S	-CO
				Interface: CO = CANOpen J1939 = SAE J1939 U/I = RS485, 4…20 mA, 0…10 V and 0.5…4.5 V
			Connection: S = 1 x M12 OS = 2 x M12 one-sided DS = 2 x M12 two-sided	
		Housing: P = glass fiber reinforced plastic		
	Measuring range: 1-axis / 2-axis			
Series				

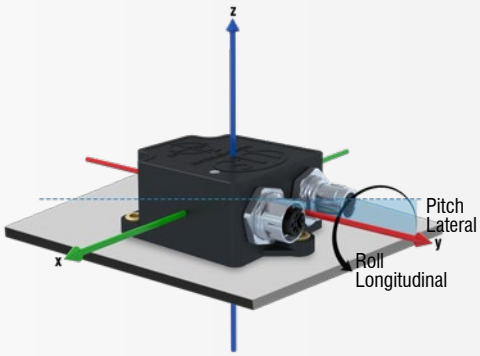
Measurement parameters and mounting options

The sensor can be mounted both horizontally and vertically. Depending on the orientation and position of the sensor, the measuring axes can be freely defined and the desired angles selected.

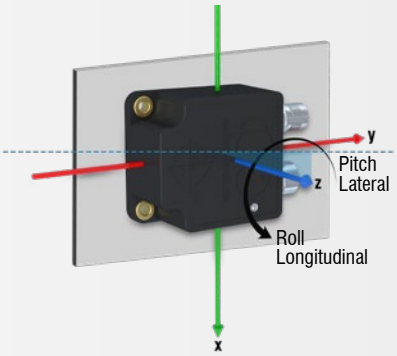
Euler angle (pitch & roll)
The Euler angle Longitudinal indicates the rotation around the rotation axis (roll). The Euler angle Lateral indicates the lateral tilt angle of the rotation axis (pitch). Depending on the mounting position, the desired axis can be set as the axis of rotation, and therefore the maximum measuring range can be used.



Horizontal mounting
Rotation axis X

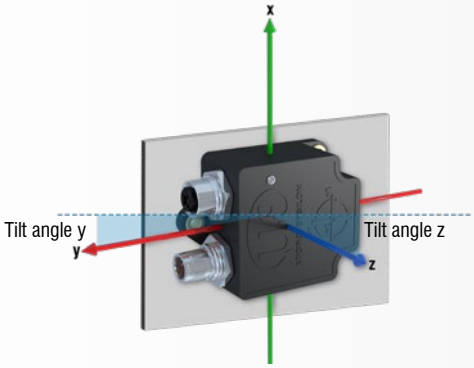


Horizontal mounting
Rotation axis Y

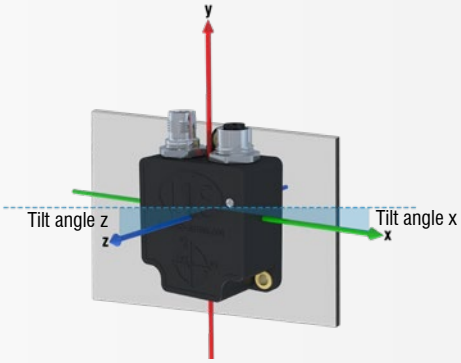


Vertical mounting
Rotation axis Z

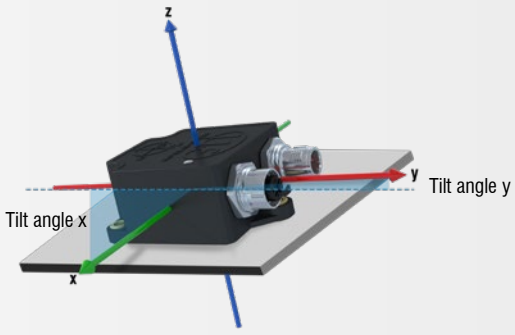
Position angle (tilt)
In contrast to the Euler angles, the position angles indicate the tilt angle in the Earth's gravitational field, i.e. the tilt angle of two axes with respect to the global horizontal plane perpendicular to gravity. The alignment can also be adapted to the mounting situation.



Vertical mounting
Gravitational force in X



Vertical mounting
Gravitational force in Y



Horizontal mounting
Gravitational force in Z

MICRO-EPSILON
MICRO-EPSILON Headquarters
Koenigbacher Str. 15 · 94496 Ortenburg / Germany
Tel. +49 (0) 8542 / 168-0 · Fax +49 (0) 8542 / 168-90
info@micro-epsilon.com · **www.micro-epsilon.com**