

## Inclination Sensor with current interface

1-dimensional 360° - 2-dimensional ±90°

### Characteristics:

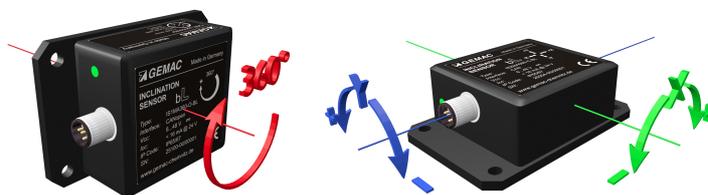
- Inclination sensor with measurement range: 360°/±90°
- High sampling rate and bandwidth
- High resolution (up to 0.01°) and accuracy (±0.1° typ.)
- Compensated cross sensitivity
- Programmable vibration suppression (digital filter)
- Free programmable current interface
- compact and robust aluminium housing
- Temperature range: -40 °C to +80 °C
- Degree of protection: IP65/67



Figure similar

The inclination sensor IS1MA360-I-BL is suitable to measure the inclination in the measurement range of 360°. The 2-dimensional inclination sensor IS2MA090-I-BL is suitable to measure the inclination in 2 dimensions (X/Y) in the measurement range of 90°. To ensure a high accuracy, the sensors are calibrated at the factory.

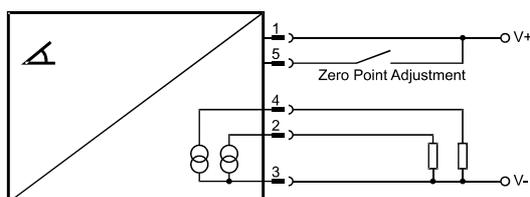
The compact and robust design makes the sensor a suitable angle measurement device in rough surroundings for different applications in industry and automotive technology. A simple setting of all parameters which are stored in the internal permanent memory is possible using the programming adapter ISPA1.



### Applications:

- Solar thermal and photo-voltaic systems
- Agricultural and forestry machinery
- Construction machinery
- Crane and hoisting technology

### Connection diagram:



Current interface

**Technical Data:**

General Parameters*	IS1MA360-I-BL			IS2MA090-I-BL		
Measurement range	360°			±90°		
Resolution	0.01°			0.01°		
Accuracy	Range	typical	maximum	Range	typical	maximum
	0 ... 360°	±0.15°	±0.25°	bis ±60°	±0.10°	±0.20°
				bis ±80°	±0.20°	±0.40°
Cross Sensitivity (compensated)	-			typ. ±0.09° (±0.10 %FS) max. ±0.45° (±0.50 %FS)		
Temperature coefficient (zero point)	typ. ±0.01 °/K					
Sampling rate	100 Hz					
Cut-off frequency	typ. 20 Hz, 2 <sup>nd</sup> order (without digital filter) / 0.1 ... 25Hz, 8 <sup>th</sup> order (with digital filter)					

**Interface**

Current interface	freely adjustable output in the range 4...20 mA freely adjustable angle in the range 0...360° / ±90°
Functions	Teach input for zero point adjustment when installed Limit value, Axis direction and assignment of the outputs are adjustable Digital filter (critically damped (default) or Butterworth lowpass, 8 <sup>th</sup> order)

**Electrical Parameters**

Supply voltage	16 ... 35 VDC
Current consumption	35 mA @ 24 V + I <sub>loop</sub>
Outputs (short-circuit proof)	inductive load less than 50 mH, permitted load resistance depends on supply voltage (see user manual for detailed information)

**Mechanical Parameters**

Connector	1x sensor connector 5-pole M12 (male)
Degree of protection, Operating temp.	IP65/67, -40 °C ... +80 °C
Dimensions / Weight	58 mm x 90 mm x 31 mm / ca. 200 g

**CE conformity to EC Directive 2006/42/EC**

**EC Directives**

RL 2004/108/EC	EMC Directive
RL 2006/95/EC	Low Voltage Directive (LVD)

**Harmonized standards**

DIN EN 50498:2010	EMC - Product family standard for aftermarket electronic equipment in vehicles
EN 60950-1:2006/A1:2010	Information technology equipment. Safety. General requirements
EN ISO 14982:2009	Agricultural and forestry machinery - EMC. Test methods and acceptance criteria
DIN EN 13309:2010	Construction machinery - EMC of machines with internal power supply

\* All indicated angle accuracies are valid after a running time of 10 minutes at 25 °C, Cut-off frequency 0.3 Hz

**Ordering Information:**

Article Number	Product Type	Description/Distinction
PR-25400-00	IS1MA360-I-BL	Current 1-dimensional, 360°
PR-25404-00	IS2MA090-I-BL	Current 2-dimensional, ±90°
PR-23999-02	ISPA1	Starter kit including programming adapter, cables and PC software