



Fundamentals

Inclination sensors ascertain the position of an object with relation to the field of gravitation of the earth. The possible applications of these sensors are multi-purpose: the inclination sensor can be attached to the boom of cranes or diggers to prevent them from overbalancing. Operating tables can be levelled by using the inclination sensor and a modern games console which integrates the inclination angle through a control joystick over the control system of the computer game.

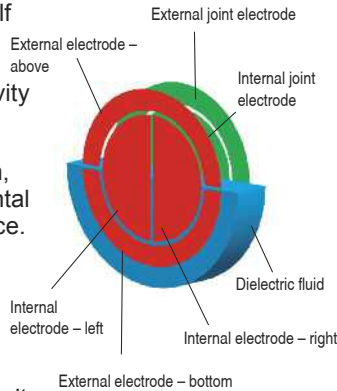
Features

Compared to current versions, this sensor can be used through a full 360° measurement range. The sensor which has an internal temperature compensation performs to a high accuracy of $< \pm 0.1^\circ$ over the entire measurement area and is suitable for all applications on the earth as the measurement value is independent from the earth's acceleration at the measuring position. The sensor's aluminium housing complies with protection class IP67 and is, therefore, also suitable for rough environments. The excellent cost/performance ratio offers the user a wide range of application possibilities.

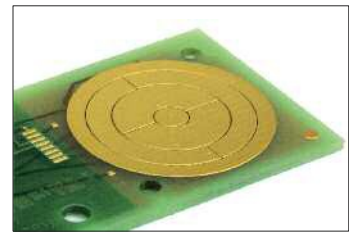
Functional Principles

The functional principle of the newly developed fluid inclination sensor is based on the change of capacity of an object in relation to the gravitational field of the Earth.

A cylindrical cavity is formed by two half housings and a spacer disk. This system is half filled with dielectric fluid. On one side of the cylindrical cavity there are two semicircular electrodes and a circular electrode on the other side. When changing the angle of aim, the dielectric fluid remains in a horizontal position as a result of gravitational force.



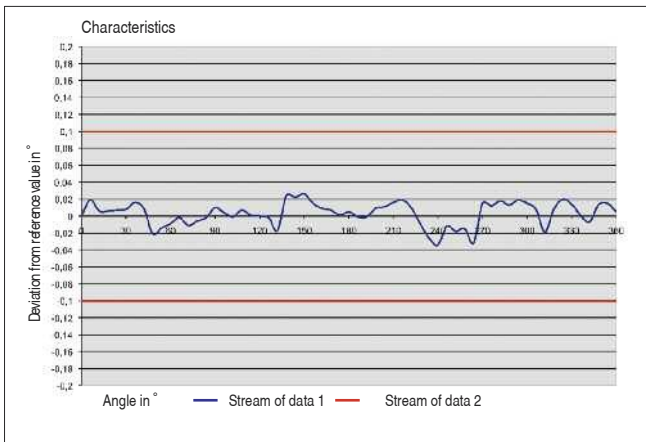
Through the configuration of the electrodes an inclination angle dependent on the differential capacity is formed between the electrode pairs and evaluated. The inclination angle can be read directly from the selected interface (for possible interfaces (see technical data). As a result of the modular design, customer specific requirements such as special interfaces or mountings are possible. The OEM version (without housing) enables the integration of the sensor into an existing application.



OEM model

Technical Data

- Measurement range 360°
- Max. Resolution $\pm 0,01^\circ$
- Dimensions 88(109) mm x 28 mm x 21 mm
- Operating Voltage 10V...30V
- Measurement Rate 150ms
- Protection Class IP67
- Temperature range -40°C to $+85^\circ\text{C}$
- Weight 80g
- Accuracy Digital $\pm 0,1^\circ$
- Analog $\pm 0,1\%$ fs
- Housing Aluminium, 2 mounting holes
- Interface Modbus (RS485) M8-4pol.
- CAN/CANopen M12-5pol.
- Analog (4-20mA) M8-4pol.
- I²C (OEM)
- RS232 (OEM)



Display software Evaluation Kit



Possible Applications

- Automotive Industry
- Special-purpose vehicle
- Household machines
- Medical Technology
- Mechanical Engineering
- Consumer Electronics
- Building and Construction Industry

- Aircraft Industry
- Marine Industry
- Measuring Instruments
- Technical and Electrical Systems
- Environmental Technology
- Solar Technology
- Safety Technology

Benefits

- Complete 360° measurement range
- Linear characteristics
- Low humidity sensitivity
- High degree of design flexibility in respect of user requirements
- Customer-specific interface and calibration
- OEM version for easier integration into existing systems
- Customer-specific fittings

- The inclination angle can be read at the selected interface
- Low lateral level sensitivity
- Favourable damping reaction
- Internal temperature compensation
- High degree of accuracy ($< \pm 0.1^\circ$)
- Robust housing design in aluminium (IP67) for applications in rough environments and for longer service life
- Excellent cost/performance ratio

About Us

2E manufactures components and systems for the mechatronics industry in the following areas.

- Automotive Industry
- Industrial Electronics
- Medical Technology
- Automation

The mass production of precision injection moulding for ESP® as well as side-airbag housings, electrical connectors and sensors systems are among our core areas of expertise in MID technology.

The evaluation kit offers the user the chance to test the inclination sensor for 4 weeks free of charge. It is possible for any PC to read the data via a USB interface. The evaluation kit comes with the necessary software.

