

Feel the approach

new microwave proximity sensor with a continuous distance measurement accuracy better than 1 μm*



Features

- ⇒ *distance measurement accuracy down to submicrons*
- ⇒ *continuous distance measurement with up to 5kHz update rate*
- ⇒ *range proportional to diameter*
- ⇒ *mounting of several sensors next to each other without interference*
- ⇒ *the complete series of sensors will be M18, M12 and M8*

* US patent 6,445,191 and EU patent 1 000 314.



To improve the performance of actual ESP-car systems measurement of the applying forces on each wheel during driving is needed. The sensor is excellent suited to measure the shift between the inner and outer housing of the bearing caused by radial and axial forces when driving through curves and on bad road surface.



A similar application is found in electro motors. The control of the driving axle enables the sensor system to measure the unbalance of the shaft and to perform the diagnosis of the bearing. In case of damage a signal indicates the defect long before the motor breaks down.

To control the rolled metal process in rolling mills sensors are needed to measure the thickness of the metal sheet. A set up of two sensors is proposed - one looking on top side, the other looking on backside of the metal sheet.



By comparing the signals of both sensors the thickness can be calculated and the vibration of the rolled metal during production is taken out.

The increasing level of automation requires intelligent hydraulic and pneumatic cylinders and valves which demand the integration of sensors. Sensors must measure very accurate position and speed in order to generate the commands for removal, analysis, evaluation and production which control, for example, production robots in car manufacturing.



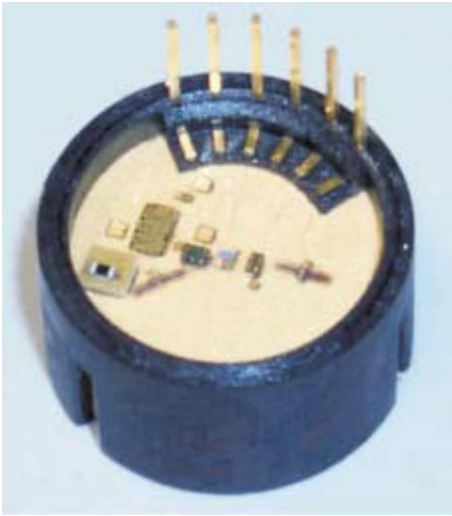
1 μ m

10 μ m

100 μ m

The microwave technology

The frontend



At the absolute nearfield the high frequency technology offers an extremely accurate (better than 1 micron) distance measuring proximity sensor principle. The function is based on the tuning of a cylindrical ceramic filled resonator by approaching conductive targets. The RF electronics is located on the back side of the gold metallized ceramic cylinder. The coplanar feeding network couples the electromagnetic wave through slots to the resonator.

Typical settings of the sensor for high accuracy output

- ⇒ Version 1: Range from 200µm to 4mm
- ⇒ Version 2: Range from 200µm to 2mm
- ⇒ Version 3: Range from 200µm to 500µm
- ⇒ Version 4: Range from 200µm to 350µm

The typical output rate for all types is 1kHz but is also available up to 6kHz.

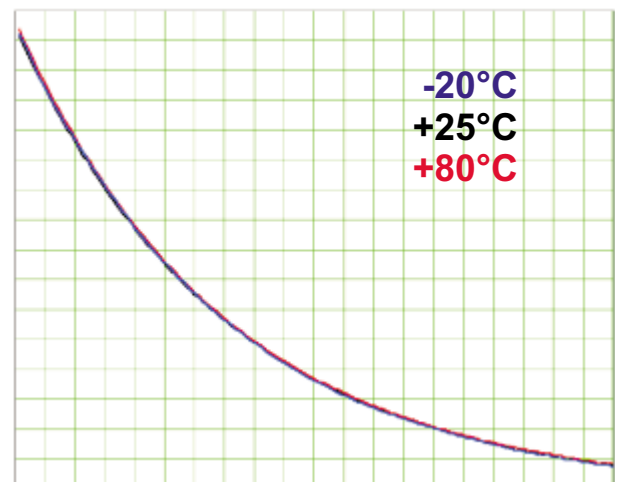
Temperature stability

Version 1 sensor:

The picture shows the digital output values of the version 1 type sensor over a target range movement from 0 to 4 millimeter at three different temperatures.

Vesion 3 sensor:

The measurement accuracy over the temperature range of -20°C to +80°C varies only by 6µm.



This great temperature stability is based on advanced microwave techniques which leads to very low range fluctuations over a wide temperature range.

Commerical information

Properties

The sensor measures distances to metallic surfaces like steel, alumina, brass, copper, gold, chrome and more. The measurement is accurate for the surface quality and environments like:

- ⇒ roughness, glance, oxidations
- ⇒ dust, oil or water drops and fog
- ⇒ external electric or magnetic fields

The sensor frontend is temperature compensated without the need of calibration.

The sensor (special type) measures the thickness or counts the number of layers of material sheets like paper, cardboard etc.

Technical data

Power supply	12 - 30Vdc
Data transmission	RS232, others on request
Output rate	1kHz (typ.)
Range observation	continuously in 256 steps (typ.)
Operating temperature	-20° .. +80°C
Housing and length	M18 x 1 with 92mm
Sensor connector	M8 x 1, sensor type

Availability

Samples of the sensor are available in M18 threaded barrel configuration within the setting of version 1 to 4 or custom specific.

The sensor in M12 threaded barrel configuration is released for special applications.

Contact

For more commercial information or setting up the proximity sensor for your application please contact us under info@astyx.de or visit us at our homepage www.astyx.de .

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