Laser triangulation sensors

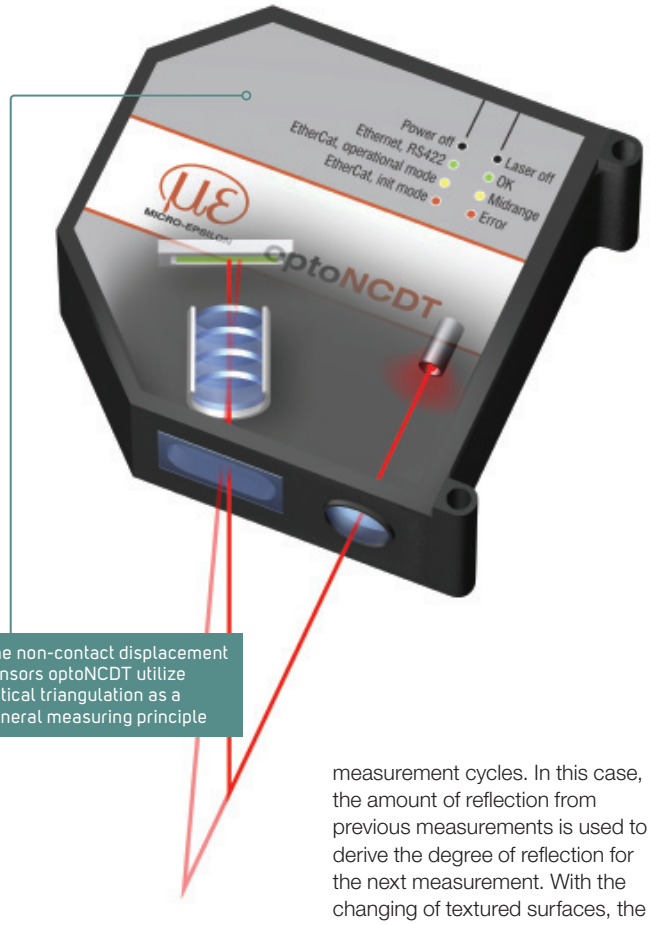
Offering extreme resolution and high measuring rates, laser triangulation sensors accurately measure displacement, position and vibrations on an engine manifold, powertrain or car body

The measurement principle of laser triangulation is simple: the sensor operates with a laser diode, which projects a visible light spot onto the measurement target. The reflected light is imaged by an optical receiving system onto a position-sensitive element. If the light spot changes its position, this change is imaged on the receiving element and evaluated. Nearly all models of the product group optoNCDT by Micro-Epsilon work with a high-resolution CCD- or CMOS-line. The product group optoNCDT includes nine series of laser sensors. Sensors vary from basic models for easy tasks, to standard models for very economical laser measurements, up to high-end products for fast, high-resolution measurements. The 49 different sensor models, with measuring ranges from 0.5mm up to 1,000mm, cater for a wide range of applications. In addition, all sensors can be customized to find the appropriate sensor for each measurement task.

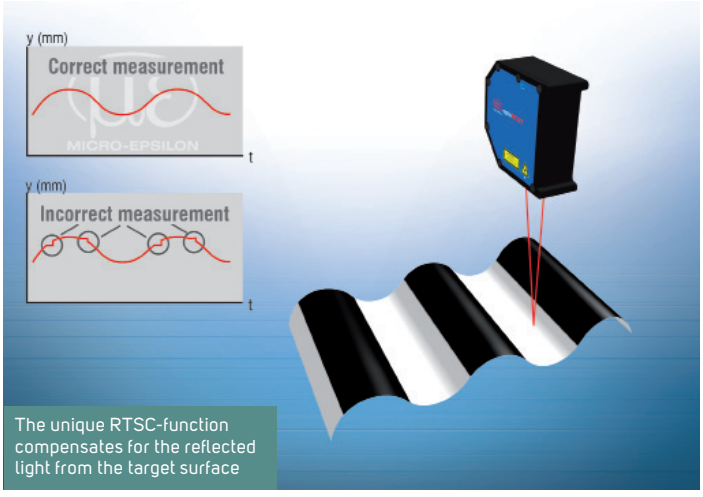
The optoNCDT 2300 is the latest high-precision model from Micro-Epsilon's range of laser triangulation sensors. This new series offers adjustable measuring rates up to 49kHz. The sensor is offered as a set of five models with measuring ranges between 2mm and 200mm. With the entire electronics integrated, the sensor is very compact and measures 80 x 75mm. The optoNCDT 2300 offers a resolution of up to 0.03µm and a linearity of up to +0.6µm. The advanced real-time surface compensation, with its improved dynamic range, enables a more precise real-time surface compensation during the measuring process. This works by adjusting the automatic exposure regulation to customer requirements to an even greater extent than before. Data output is performed via RS422, Ethernet or EtherCAT. The sensor configuration is handled in an ergonomically designed web interface. The optoNCDT 2300 is used for extremely high-speed applications. The sensor can be used to monitor vibrations on difficult, uneven surfaces.

Micro-Epsilon is offering its laser triangulation sensors with the unique real-time surface compensation (RTSC). With the RTSC function, the amount of reflected light from the target surface is compensated for during continuous exposure and in real time. The exposure time or the amount of light produced by the laser is optimally matched to the reflection characteristics of the target surface. Unique to Micro-Epsilon sensors, this innovative real-time control achieves optimum results, even with rapidly changing reflection characteristics.

Standard, commercially available laser triangulation sensors normally operate with a time-shift control, which builds on previous measurement cycles. In this case, the amount of reflection from previous measurements is used to derive the degree of reflection for the next measurement. With the changing of textured surfaces, the measurement results therefore deviate noticeably from the actual measurement value. In contrast, optoNCDT is automatically controlled in real time and, as such, is adjusted to the optimum reflection conditions without the need to apply averaging filters.



The non-contact displacement sensors optoNCDT utilize optical triangulation as a general measuring principle



The unique RTSC-function compensates for the reflected light from the target surface

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