

High performance laser sensor designed for optical distance measurement with direct reflecting surfaces

A new high performance laser sensor, available from Micro-Epsilon, is specifically designed for optical distance measurement with direct reflecting materials, including highly polished metal, mirrored objects, glass and chrome plated products.

The optoNCDT 1700DR, developed by precision sensor manufacturer Micro-Epsilon, is the latest addition to the company's existing optoNCDT 1700 range of optical displacement sensors. The new sensor has a resolution of 1µm at a measuring rate of 2.5kHz (without using an averaging filter). The optoNCDT 1700DR comes in three measuring ranges: 2mm, 10mm and 20mm, the latter providing a much higher range than current competing laser sensors on the market, which tend to offer a range of just a few millimetres.

This means industrial automation and OEM production companies can more accurately measure and monitor a variety of object parameters, including thickness, roundness, position, deflection, tilt, displacement and vibration. The sensor can also be used for on- and off-line quality inspection tasks, dynamic part profiling and part recognition.

The optoNCDT 1700DR operates using the laser triangulation principle. A laser diode projects a visible point onto the surface of the target object. The light reflected from this point is then projected onto a CCD array. If the target changes position with respect to the sensor, the movement of the reflected light is projected on the CCD array and analysed to output the exact position of the target. The measurements are processed digitally in the integral controller. The data is output via an analogue (I/U) and digital interface RS422 or USB.

What sets the DR apart from current competing sensors on the market is that the sensor has an integral controller at this performance level, which automatically compensates in real time for difficult-to-measure surfaces. The sensor's unique real-time surface compensation (RTSC) feature patented high-speed software algorithms that dramatically reduce signal noise. When customers need to measure against a shiny surface, ideally they want to adjust the laser pulse duration (or laser on time) of the sensor to give them the optimum exposure time on the CCD for that particular surface. This, in turn, provides a high accuracy measurement due to lower noise level on the output signal.

Most suppliers can only offer sensors with a fixed measurement rate, which is selected by the manufacturer as a 'best case fits all'. This means that for most surfaces, other than matt white, the user then has to rely on averaging the output data to reduce the noise level or error on the output which gives lower accuracy. However, using Micro-Epsilon's software algorithms, the measurement rate on the sensor can be slowed down for difficult surfaces. This means it can compensate in real time, and the exposure time of the laser light on the CCD can be optimised for the surface of the object to be measured, resulting in higher accuracy measurements.

Chris Jones, managing director at Micro-Epsilon UK Ltd comments: "The optoNCDT 1700DR is optimised for the application, in terms of light intensity and the real-time surface compensation feature. In addition, at this kind of performance level, offering a sensor with an integrated controller is unique in the market. No other supplier can offer an integrated controller at these speeds and resolutions."

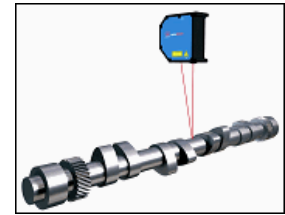
Micro-Epsilon's ILD 1700 configuration software tool comes as standard with each sensor. As well as an integrated controller, the optoNCDT 1700DR also incorporates a touch button keypad directly on the sensor, which enables the user to adjust parameters without using a PC. Another unique feature is the integrated limit switches, which allow the user to adjust the top and bottom warning or alarm limits for the sensor. "Some competing laser sensors do offer this type of functionality, but not at this level of performance," explains Mr Jones.

Micro-Epsilon in profile

Micro-Epsilon is a major global manufacturer of sensors, headquartered in Germany. The company's range of sensors measure everything from displacement to distance, position, vibration, dimensions and thickness, using both contact and non-contact measurement techniques. These techniques include inductive, differential transformer, eddy current, capacitive, laser-optical, potentiometric and draw wire principles.

With more than 30 years experience in the industry, Micro-Epsilon isn't just a sensor manufacturer. The company is highly innovative and understands the importance of providing complete solutions and support services for its customers. The firm is renowned for its expertise in consulting, development and application of industrial sensors to complex, customer-specific solutions for measurement, inspection and automation. The focus is on selling technical advantage to its clients.

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The optoNCDT 1700 DR laser sensor, available from Micro-Epsilon is specifically designed for optical distance measurement with direct reflecting materials, including highly polished metal; such as the crank-shaft pictured above. The optoNCDT 1700DR is pictured on the left.