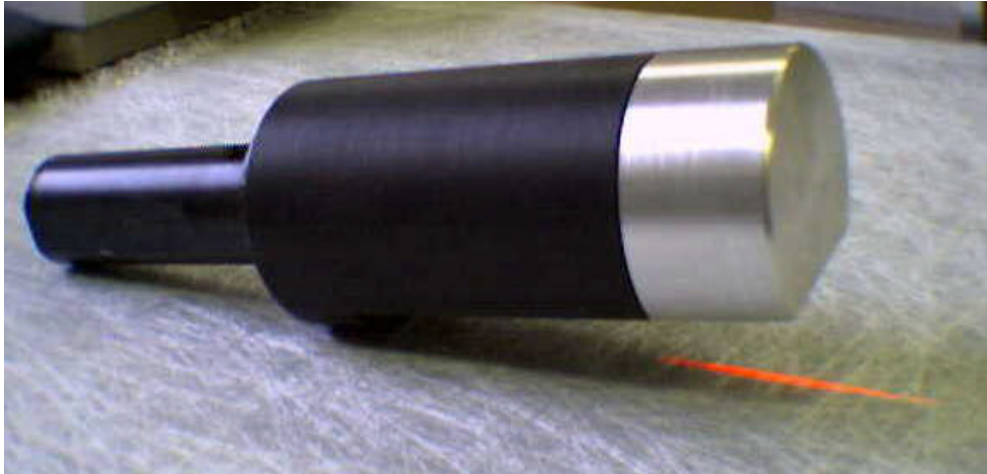


Wireless Profile Measurement System



Optical CMM capabilities “within” the machine tool!

A new optical product from *Lightway Systems Corp.* provides the speed and accuracy of an optical CMM, with the benefits of performing this measurement function at the process (in-situ). Automated inspection and process correction can be achieved before the part leaves the machine.

- Increased process capability and control
- Reduce scrap and rework
- Intermediate inspection before final step.
- Trouble shoot manufacturing problems
- Direct communication within CNC Machine controls

Features of measurement;

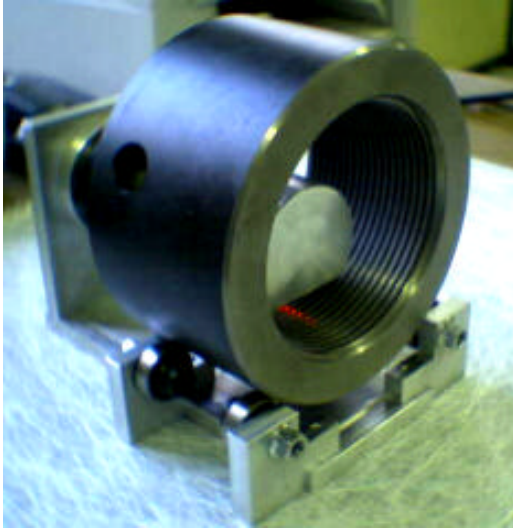
- Lengths
- Diameters
- Radii
- Angles
- Thread forms (minor/ major/ pitch diameters)

Sensor Arrangement:

The “Sensing” device houses the laser line source, an area scan camera and communication electronics. The Sensor is fitted with a standard machine mount adaptor. Various adaptor standards are also available such as *CAT, VDI, NST*. Built to withstand the harsh machining environment the sealed housing protects optics and electronics. Wireless RF communication ensures fast, accurate communication.

System Description:

System consists of the remote shape sensor, and a computer with communication receiver, which can interface with most CNC controls. Sensor is loaded as a tool in the CNC machine tool carousel or turret. After the CNC machine completes a critical machining operation, it calls-up the “sensor” tool and locates it to the feature to be measured. The sensor receives a “wake up” signal, captures a measurement, and transmits the measurement data via RF to the sensor’s computer. Upon confirming communication, the sensor switches back to “sleep” mode. The computer receives and analyzes the data, which results in processing of a cloud of points. The sensor-computer communicates with the machine CNC control to adjust tool offsets, completing the measurement/manufacturing loop.



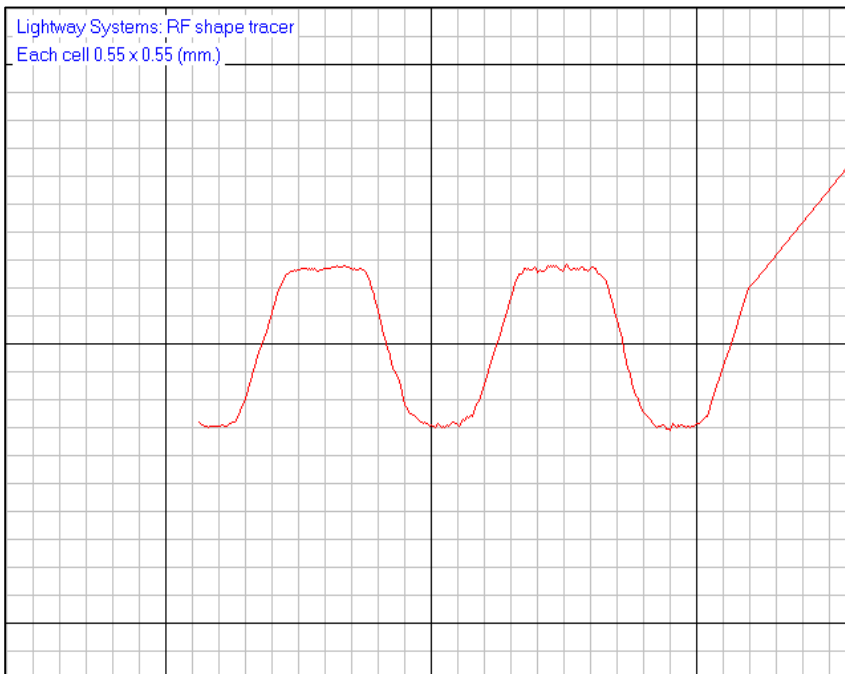
Simulated Test Set-up

In this demo set-up, the sensor is shown in position for data capture, with the laser line source visible. The part can be rotated for successive inspections, if desired. This feature allows measurement of roundness, concentricity or TIR.

In the application shown, features of the complex thread form are inspected to ensure the part is not released from the machine chuck until it is correct.

Field of view is 10 mm axial and 7 mm radial, with a working distance of 20 mm.

The sensor head shown is our standard unit; custom configurations are available specific to the application.



Measurement Format

The image capture is a “cloud of points” typical of the data generation from a CMM. The data has been calculated to represent cross-sectional values of the profile. This data can be handled as desired through simple programming to compare against high-low thresholds or direct measurement.

Complete the manufacturing loop... the “Shape Sensor” now allows manufacturers to develop a work cell that is truly automated. The cell can be self-correcting to fully utilize the automation capabilities of CNC machines, and robotic part handling. The technician can finally take their “hands off the controls” now free from the process inspection responsibilities. The process can operate in a “lights out” mode with the confidence of 100% inspection and controlled “fail-safe” shutdown.

Discuss or email your application to a Lightway Systems engineer for evaluation.



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We build intelligence into every sensor!