

All in one sensor

3D Vision Solution: Sensor with Software

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Many of today's applications in measurement and control require 3D sensing, based on either laser triangulation or structured light projection. Several options are available to integrators and users. The most complex option is acquiring components (camera, laser or other light projector, and other modules) and integrating them into a sensor. The assembled sensor requires software development and application of calibration procedures. This can be a significant task. A second option is to acquire an assembled, calibrated 3D sensor. Most of these products provide only data acquisition and require measurement software development and an external PC for analysis of 3D data.



A new category of 3D smart sensors are available, with all-in-one operation - all functionality is contained within the sensor. Under the trade name of Gocator, these sensors are designed for simple implementation in general factory automation applications. Families of laser line sensors provide a selection of different fields of view, measurement ranges, laser classes, resolutions down to microns, and levels of customization to suit specific application needs. A further family of high speed displacement sensors, measuring at a single point, is also available. Sensor configuration is made easy with a built-in web server and an intuitive GUI for rapid setup and control. Users can connect, set exposure and speeds, visualize profiles, measure dimensions, select communication outputs, and monitor results, all with the use of web browsers from any PC, and without installing additional software. To eliminate the need for users to develop application specific measurement software, the sensors include built-in user configurable measurement tools. For profile measurements, tools include functions such as length, width, height, angles, vertex locations, groove dimensions, and many more common metrology requirements.

Measuring an entire part

For applications requiring volumetric measurements, Whole Part Measurement Tools are provided to measure parameters such as area, volume, heights, centroid, ellipse and bounding box parameters. Whole Part mode automatically detects the edges of a component so that the whole part can be scanned and measured, and can automatically detect and track multiple parts on a conveyor.

Measuring an entire part rather than analyzing a series of profile scans makes implementation of volumetric measurements easy. Recently, new profile tools have been added to measure the gap and flush of adjacent panels on assembled automotive bodies, which must conform to precise specifications. Set up parameters for the full spectrum of body panel geometries is included to insure gap and flush measurements meet industry standards. In most gap and flush implementations, the sensor is mounted on a robot, which is programmed to position the sensor to critical measurement points for any vehicle model geometry. The compact, lightweight sensors easily mount on the robot end effector.

Detect and Quantify easy

Beyond 3D measurement, Gocator also include an intensity output to expand inspection capabilities where 2D and 3D are required. Intensity output uses laser intensity data to produce a 2D grey scale image of surfaces, calibrated to actual dimensions, and synchronized with 3D profiles. Intensity output data can be processed with 2D image processing libraries to easily detect and quantify surface defects or automatically provide optical character recognition or decode barcodes. The 2D intensity images can be visualized on the Gocator viewer, and are transmitted to the host computer via an Ethernet output.

Sensors can be triggered based on time, external triggers or from an encoder mounted to the transport conveyor. For encoder based systems, travel calibration can be done automatically with a simple object of known dimension. For applications requiring multiple sensors, capability is provided to connect up to 24 sensors in a single inspection station. An open source SDK can be used to synchronize sensor timing to eliminate cross talk and control station operation. Gocator 3D smart sensors are all-in-one measurement solutions that set a new standard for introducing measurement and control in today's 3D world, designed for easy implementation in general purpose factory automation applications and therefore suitable for factory floor production engineers to implement in-house solutions.

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