



MACHINE VISION PROFESSIONAL

VISION 2018 REVIEW – LOOKING FIRMLY AHEAD

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DISCOVER THE NEXT EVOLUTION

IN HIGH-SPEED INLINE QUALITY INSPECTION
– GOCATOR® 2500 SERIES - LMI TECHNOLOGIES

The consumer electronics (CE), battery, and solar industries are pushing sensor design to new extremes of speed and performance. To meet this challenge, we created a new series of smart 3D laser line profilers that deliver 100% inspection of small parts at production speed.

RESOLUTION. REPEATABILITY. SPEED.

Gocator® 2510 and 2520 leverage a custom camera and advanced optics design to achieve 8 micron X resolution and +/-0.2 µm Z repeatability, at inspection rates **up to 10 kHz** (note: an inspection cycle includes scan, measurement, and control functions)—all from onboard the sensor.



Even at this high rate of speed, the sensor is able to collect 3D profiles to build a 3D point cloud, perform metrology, and transmit results, from within its advanced hardware accelerated pipeline design.

This degree of sensor autonomy is the key differentiator between Gocator® smart solutions and other 3D profilers on the market that require transfers of raw data to a PC for processing.

Users can leverage Gocator® 2500's high speed in several ways, depending on their application needs:

- (1) **Increase Y resolution (speed dependent)** for detection of smaller features along the direction of motion.
- (2) **Increase Z accuracy (via time averaging)** for more accurate height measurement, and tighter dimensioning tolerances as a result.
- (3) **Leverage multiple exposures (HDR)** to handle a wider variety of reflective targets (shiny black to white), even if they are in the same scan, and without a loss in effective speed.

ONBOARD DATA PROCESSING

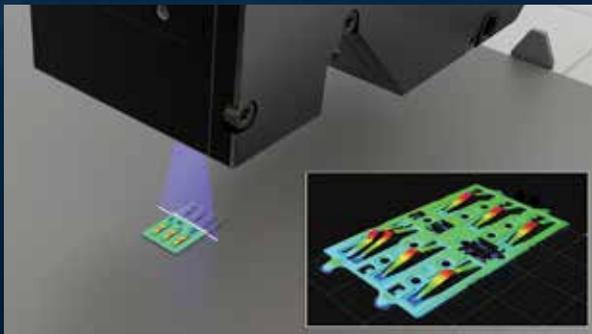
Gocator® 2500 has a custom embedded dual-core controller to support raw data processing at 3.2 Gpixels/sec. Embedded processing gives the 2500 a number of important "smart" capabilities, including the ability to execute onboard 3D alignment, part segmentation, and 3D feature extraction; run Gocator®'s 140+ built-in measurement tools; and, most importantly, handle the entire processing pipeline—from raw image data to 3D results.

The 2500 smart sensor can process highly detailed 3D surface scans and communicate decisions onboard without the need for an external controller. With no dependencies on external hardware, latency between scan data acquisition and the decision output is minimized, allowing the sensor to keep pace with modern factory speeds. This degree of sensor autonomy is the key differentiator between Gocator® smart solutions and other 3D profilers on the market that require transfers of raw data to a PC for processing.

Sensors that send raw pixel or profile data downstream to PCs or external controllers to carry out their 3D measurement dramatically increase latency and compound system cost and complexity. The situation is exacerbated when multiple sensors must stream and synchronize datasets before measurement can occur.

HIGH-DENSITY SCANNING

Increasing demand for higher resolution and speed in detecting small features led LMI to invest heavily in a custom 2-megapixel camera chip to support the 2500's design. The chip generates high-density scan data (up to **2.2 billion points per second**) and makes it possible to thoroughly inspect micro-features such as gaps and edge widths at blazing speed.



Application examples in which this level of scan detail is required include cell phone inspection, component verification, and glue bead tracking.

EASY WEB-BASED TECHNOLOGY

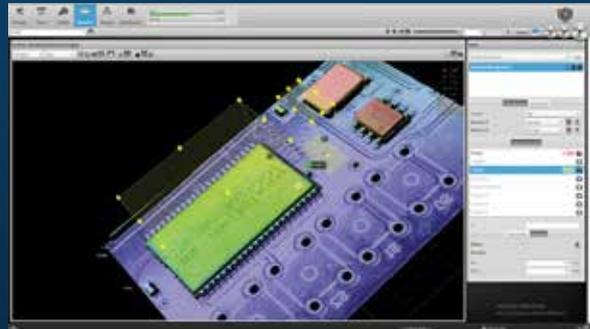
Gocator® 2500's built-in web user interface provides flexible configuration of settings and measurement tools using any browser running on PCs or mobile devices.

Sophisticated firmware is included at no extra cost, providing powerful built-in tools for filtering, profile and surface analysis, multi-sensor alignment, and support for various PLC and robot protocols. With no additional software to install, Gocator® 2500's out-of-the-box setup and configuration is intuitive and enjoyable.

ULTRA COMPACT INDUSTRIAL PACKAGE

With package dimensions of just 46 x 80 x 110 mm, Gocator® 2500 sensors have the smallest footprint of any 3D smart profiler available. This allows the sensor to be easily mounted or retrofitted into virtually any machine environment.

And, despite its small size, Gocator® 2500 maintains an IP67 housing rating—making it immune to common environmental stresses such as moisture and dust.



Bandpass filters limit the effects of ambient light, while the precision aluminum and optical design handle vibration and limit the effects of temperature.

GREATER SCAN COVERAGE WITH FEWER SENSORS

Gocator® 2500 sensors have a **large field-of-view** (FOV) and **large measurement range** (MR). As a result, the user can accomplish more with fewer sensors, while still capturing the finest surface and edge details of electronics and small parts.

Built-in support for multi-sensor networking (including automatic alignment and built-in stitching) delivers high density 3D models for users who want to expand the field of view or acquire multiple angles on the same target while maintaining ultra-high resolution.

BLUE-LASER FOR "CLEANER" SCAN DATA

Gocator® 2510 and 2520 are blue-laser line profile sensors. Due to its shorter wavelength, blue laser light performs better than red or green lasers on the highly specular metal surfaces commonly found on electronic and shiny parts. Blue lasers produce "cleaner" profiles (i.e., lower speckle) and as a result deliver higher measurement accuracy.

THE SMART ADVANTAGE

Smart technology advancements are at the heart of Gocator® 2500's sensor design. The result is a next generation 3D line profiler that provides state of the art 3D scanning combined with Gocator®'s flagship onboard firmware, and an industry-leading web browser user experience for rapidly setting up, scanning, measuring, and communicating control decisions to factory machinery. 

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