LMI TECHNOLOGIES

ENGINEERING POSSIBILITIES

PROVEN LEADERS IN 3D SCANNING AND INSPECTION

FOR THE PACKAGING INDUSTRY

Gocator®

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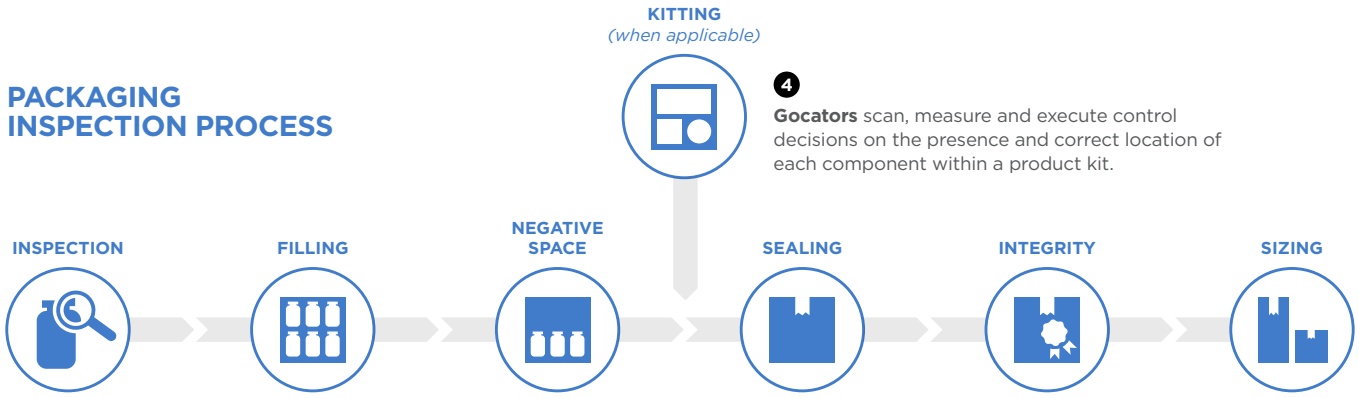
ENGINEERING POSSIBILITIES

Ensure Your Products are Packaged to Perfection

LMI Technologies has a proven track record for supplying high-performance, non-contact 3D scanning and inspection solutions for a wide array of quality control applications essential to the packaging process — from product and package quality, to sealing and sizing.

PACKAGING INSPECTION PROCESS



1 **Gocators** are used to scan and inspect products and containers before the packaging process begins and during packing — checking a wide variety of criteria including edges, inserts, folds, and surface integrity.

2 After products are loaded into a package, Gocators scan to verify that the package is filled correctly (e.g., checking for underfilling or overfilling).

3 **Gocator** scans for volume of negative space, meaning it can identify how much product/material is needed to fill the unoccupied volume of a package.

4 **Gocators** scan, measure and execute control decisions on the presence and correct location of each component within a product kit.

5 **Gocators** scan packages such as bottles or boxes and use 3D information to ensure proper closure and sealing.

6 **Gocators** scan, measure and execute pass/fail decisions on the integrity of product seals.

7 **Gocators** scan package size to determine optimal shipping strategies.

QUALITY CONTROL AND PROCESS OPTIMIZATION

GOCATOR: The Smartest All-In-One 3D Sensors on the Planet

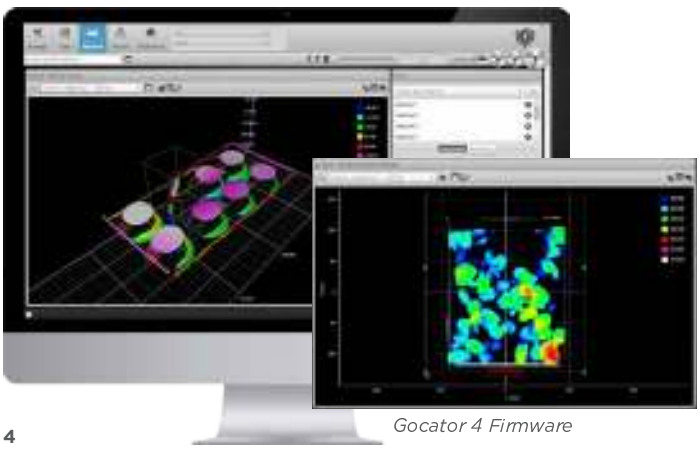
Gocator all-in-one 3D Smart Sensors are trusted worldwide for automated packaging inspection. Combining 3D scanning, measurement and control in a single device — with no external PCs or controllers required — Gocator is a powerfully effective all-in-one sensor that easily fits into any inspection system and reduces cost and complexity on the factory floor.

SCAN, MEASURE & CONTROL

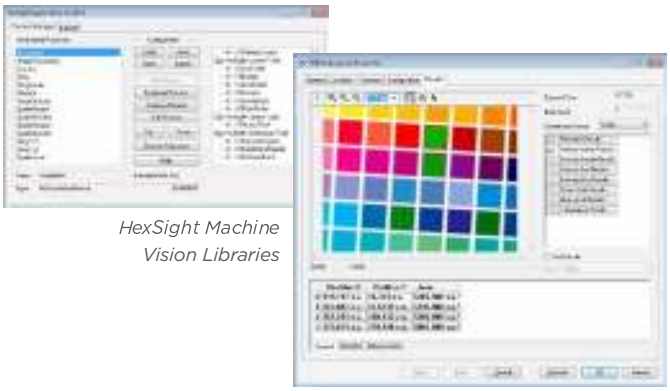
All Gocators are factory pre-calibrated so technicians can simply connect a computer to the sensor, open a web browser and configure the necessary sensor functions such as exposure, triggering logic, dimensional measurement tools and communication method. Once setup is complete, Gocator provides high-speed, micron-level measurement and controls that can automatically identify and execute pass/fail decisions on the entire range of critical packaging inspection requirements.

Gocator Firmware and HexSight: The Best of Both Worlds

Every Gocator comes with proprietary built-in measurement tools. You can also extend your Gocator packaging inspection system with HexSight's integrated, robust 2D machine vision library for unique part location and barcode tracking, OCR and GD&T.



Gocator 4 Firmware



HexSight Machine Vision Libraries

GOCATOR IN-THE-FIELD

All-in-One 3D Scanning Solution for Product and Pre-Filling Package Inspection

Product Inspection Before Packing

Prior to packaging, product technicians must ensure the product itself meets specification. Gocator 3D smart sensors are used to scan, measure and execute pass/fail decisions on a wide range of manufactured parts and products — ensuring they meet the highest quality standards before being packaged for shipment.

Package Inspection Before Filling

Packages have to satisfy specific size and shape tolerances before they can be filled with product. Gocator 3D smart sensors are ideal for this application, inspecting packages for a wide variety of criteria including edges, inserts, folds, and surface integrity — all of which help identify imperfections early on in the packaging process.

CASE STUDY:
Yogurt Cup Inspection

Gocator is used to inspect the rim and surface quality of empty yogurt cups and reject defective cups when necessary. Gocator's ease-of-integration, rapid scan rate (up to 5 kHz), real-time data processing, and built-in measurement tools make it easy and accurate to scan at a rate of 600 cups per minute on the production line.

GOCATOR IS SMARTER:

- Rapid and precise 3D scans
- All-in-one functionality
- Inspects stationary and moving objects
- Real time data processing

GOCATOR IN-THE-FIELD

All-in-One 3D Scanning Solution for Package Filling and Negative Space Inspection

GOCATOR IS SMARTER:

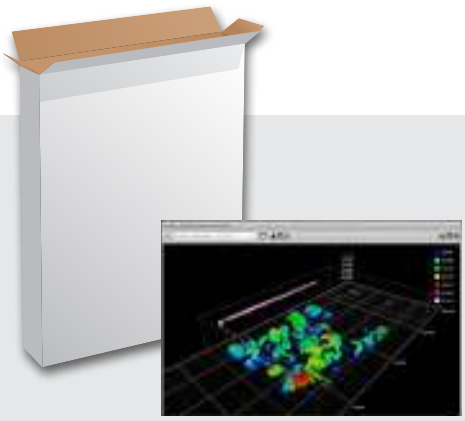
- Easy to set up, connect and integrate
- Minimizes system cost and complexity
- Flexible platform for variable inspection applications

Package Filling Inspection

The filling process starts once product and package quality are verified independently. At this stage, products are loaded into the package and Gocator scans to verify that the package has been filled correctly — checking for underfilling or overfilling, for example. This type of application would be impossible to accomplish with 2D technology alone.

Negative Space Inspection

Gocator can even scan for volume of negative space, meaning it can identify how much product/material is needed to fill the unoccupied volume of a package in order to achieve the correct fill-level.



CASE STUDY:
Detergent Filling Inspection

Gocator is used to scan and deliver rapid 3D measurements for verifying whether or not a box of dry detergent has been packed to the correct fill-level. If a deficit or excess of detergent has been loaded into the box, Gocator identifies the discrepancy and rejects the package so it can be returned for proper re-filling and quick re-entry into the QC chain.

GOCATOR IN-THE-FIELD

All-in-One 3D Scanning Solution for Kitting and Package Sealing Inspection

Kitting Inspection

Many manufacturers offer multi-component product sets that need to be packaged into a single container (i.e., a product kit). In these types of kitting applications, Gocator is able to scan, measure and execute decisions on the presence and correct location of each component within the product kit to ensure customers receive all the individual pieces in their product set. Adding HexSight to the Gocator for kitting inspection adds an additional toolset when necessary.

Package Sealing Inspection

Gocator can scan packages such as bottles or boxes and use 3D information to ensure proper closure and sealing. Whether measuring the height and tilt of bottle caps or ensuring properly closed box flaps, Gocator provides a robust 3D approach for package sealing inspection not easily accomplished with 2D approaches.

CASE STUDY:
Bottle Cap Integrity Inspection

Verifying that container caps have been installed tightly is an important quality control application in packaging. This type of inspection is achieved by measuring the height and tilt of the caps using Gocator 3D smart sensors. For wide production lines, multiple smart 3D sensors can be easily integrated to provide high resolution over branded areas.

GOCATOR IN-THE-FIELD

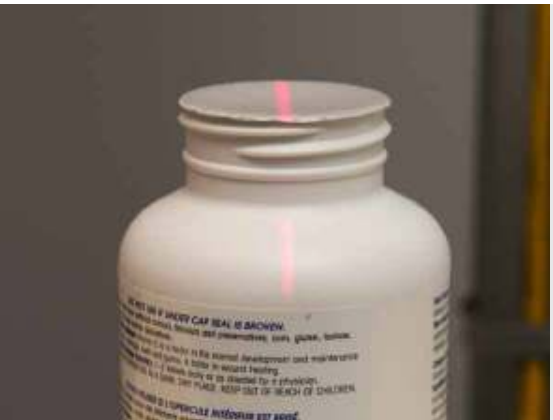
All-in-One 3D Scanning Solution for Package Integrity and Package Sizing Inspection

Package Integrity Inspection

Once a package is sealed and closed it still requires one final inspection to ensure production quality. At this point in the packaging process Gocator is used to verify that the package dimensions are as expected and that the package has not been damaged.

Package Sizing Inspection

Gocator is used to scan package size to determine optimal shipping strategies. The 3D data acquired through Gocator is used to verify box sizes — allowing shipping and receiving professionals to design highly efficient manifests and ultimately maximize cost-savings on their deliveries.



CASE STUDY:

Thermoseal Integrity Verification

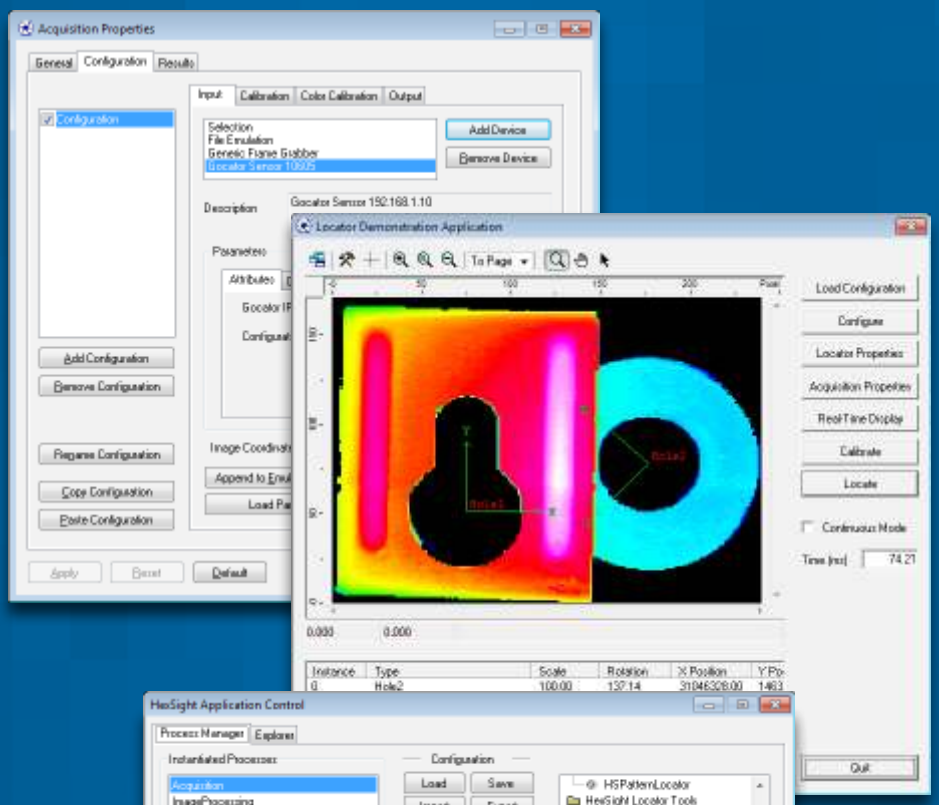
Gocator 3D smart sensors make inspecting the integrity of thermoseals easy and efficient. As the product passes under the field-of-view of the sensor, Gocator scans the seal and generates a complete 3D point cloud that is then measured, analyzed and used to make a pass/fail decision and ensure complete seal integrity. Using 3D provides precise inspection, not affected by ambient light or component color.

HEXSIGHT

EXTEND YOUR PACKAGING INSPECTION SYSTEM WITH 2D TECHNOLOGY

HEXSIGHT Makes Packaging Inspection Even Easier with Robust 2D Vision Libraries

Combine HexSight's powerful 2D geometric part location capability with Gocator's 3D measurement technology for a more complete scanning and inspection solution.



HIGH ACCURACY 2D PART LOCATION AND METROLOGY

HexSight geometric part location technology provides flexible and robust contour-based 2D pattern matching to locate parts and features regardless of their scale or orientation.

COMBINE 2D AND 3D FOR A MORE COMPLETE INSPECTION PROCESS

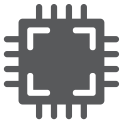
HexSight and Gocator work seamlessly together to maximize your inspection process. With HexSight, you can now combine 3rd party machine vision camera images or the Gocator intensity output to perform 2D inspection alongside Gocator's 3D height maps for 3D measurement to produce a more comprehensive 2D and 3D solution.

SEAMLESS INTEGRATION WITH GOCATOR

HexSight is tightly integrated with Gocator so acquisition of 3D point clouds and 2D intensity images can stream into inspection processing on a PC to produce results that are scheduled on Gocator hardware for output.

THE LMI ADVANTAGE

What makes LMI different from catalog-based companies is that **our sole focus is 3D technology**. Four pillars support this specialized approach and drive our commitment to accelerate customer profitability by delivering the highest performing and most cost-effective 3D scanning and inspection solutions.



Chip Level Engineering

LMI's core strength is engineering at the chip level, which means we design and build the critical components that go into our 3D products. This allows us to provide our customers with exceptional quality, pricing and performance.

OEM Business Model

LMI's business is built on the OEM model. This model is defined by close and long-lasting relationships with our partners; allowing us to research, develop and continuously provide flexible and effective solutions that meet real-world business and application needs.

Simple User Experience

LMI is dedicated to developing 3D scanning solutions that deliver simple and intuitive user experiences, with the promise of continuous feature development and exceptional customer service for the duration of a product's lifecycle.

Custom Solutions

Our ability to provide customers with solutions tailored to their individual application needs is what separates LMI from the rest of the field. In our 35 years, we have designed a large number of customized solutions for some of the most demanding 3D measurement applications.

"LMI provides OEMs with a flexible 3D technology platform that can be customized to meet their unique business demands. Unlike our competitors, 3D scanning and inspection is all we do, and it is this specialized knowledge and experience that helps drive profitability, reduce time to market, and open up new possibilities for our clients."

TERRY ARDEN, CEO

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