



LMI TECHNOLOGIES

ENGINEERING POSSIBILITIES

PROVEN LEADERS IN 3D SCANNING AND INSPECTION

FOR THE ROAD INDUSTRY

Gocator

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ENGINEERING POSSIBILITIES

Paving the Way to Superior Road Quality and Safety

LMI Technologies designs and supplies high-performance, non-contact, all-in-one 3D scanning and inspection solutions for an array of applications essential to the road industry – including high-density surface profiling, roughness measurement, rut inspection and more.

ROAD SURFACE INSPECTION

Gocator all-in-one 3D smart sensors form the backbone of road profiling systems, delivering high-precision data at highway speed for the entire range of inspection applications related to pavement surface texture and quality.



QUALITY CONTROL AND ROAD SAFETY OPTIMIZATION



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

Gocator all-in-one 3D smart sensors are trusted worldwide for automated road and rail scanning and 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 3D sensor that easily integrates into existing road profiling systems and minimizes cost and system complexity.

SCAN, MEASURE & CONTROL

Complete 3D Scanning and Inspection Inside a Single Device

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, the user simply has to disconnect the computer and the Gocator delivers high-speed, micron-level pavement measurements in critical road inspection applications.

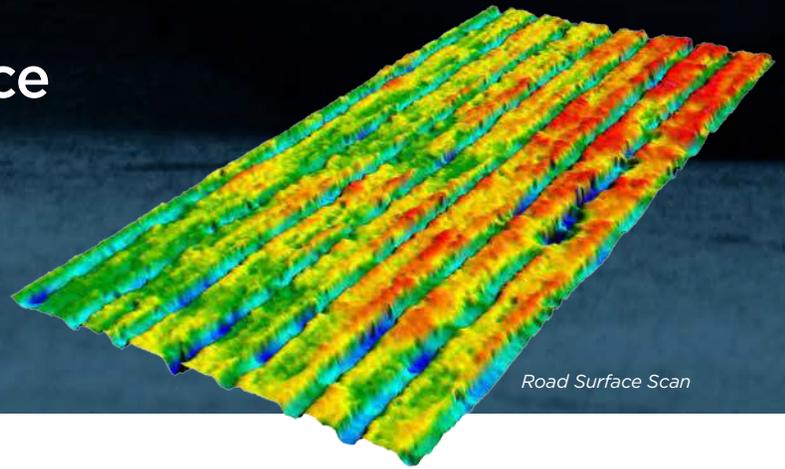


GOCATOR FIRMWARE

Every Gocator 3D Smart Sensor comes with a built-in web-based browser user interface and powerful measurement tools for maximum precision and productivity in the 3D inspection process.

GOCATOR IN-THE-FIELD

All-in-One 3D Scanning Solution for Road Surface Inspection



The primary goal of 3D road inspection is to provide engineers with detailed, accurate profiles of pavement surface textures at highway speed.

This is a critical quality control process because rough, uneven pavement increases mechanical wear on vehicles, decreases pavement lifetime, reduces safety for motorists and results in higher maintenance costs.

All-in-One 3D Smart Sensors for Road Inspection

Gocator's ease-of-integration into existing profiling systems, seamless communication with other system devices such as PCs and accelerometers, and reliable delivery of high-speed, high-density 3D profile measurements at highway speed (with zero data loss), make it the ideal solution for scientifically establishing pavement maintenance schedules and monitoring long term performance for road design improvement studies.

CASE STUDY: ICC's MDR408x Series of Road Profilers Rely on Gocator

Gocator 3D smart sensors are integrated into International Cybernetics Corporation's (ICC) MDR408x family of certified road profilers. ICC's state-of-the-art vehicle-mounted profiling systems are used to rate pavement Ride Quality (IRI, PI, RN, Rolling Straight-Edge), rutting, texture and cracking. With the help of Gocator, the MDR408x delivers high-precision road surface measurements at highway speed, and is immune to variation in temperature, sunlight, wind, pavement color and texture.

GOCATOR IS SMARTER:

- Rapid scan speeds of 3kHz
- Dynamic windowing delivers continuous high speed performance
- Buffered, real-time processing ensures no lost data
- Scalability allows for multi-sensor networks with full-lane scan coverage
- Ease-of-integration results in faster setup and lower system costs



GOCATOR IN-THE-FIELD

All-in-One 3D Scanning Solution for Road Surface Inspection

Road Roughness Inspection

Department of Transportation (DOT) professionals rely on Gocator all-in-one 3D smart sensors integrated into their road profiling systems to rapidly scan (3kHz) and collect real-time, continuous 3D data of surface textures including longitudinal profiles and roughness. They then use the rich 3D profile data acquired from Gocator to determine maintenance and repair priorities, as well as optimal road materials and construction methods.

Sag and Hump Inspection

Sags and humps are localized depressions or elevated areas of the pavement that result from settlement, pavement shoving, displacement due to subgrade swelling, or displacement due to tree roots. Gocator 3D smart sensors are used in road profiling systems to rapidly and accurately identify and measure this type of pavement distress on and off the wheel path.



CASE STUDY:

DOT Certified SSI Road Profilers Use Gocator 2342

Surface Systems & Instruments (SSI) inertial profilers are officially DOT certified for road profiling applications in regions across the USA (Auburn, CA, Manhattan, KS). SSI's truck-mounted systems are equipped with Gocator 2342 sensors, and are proven effective for high-precision 3D measurement of pavement roughness and ride quality at highway speed — regardless of outdoor conditions such as direct sunlight, dirt and rainwater, shock and vibration, ambient temperature and pavement geometry.

GOCATOR IS VERSATILE

ALSO USED TO 3D SCAN AND INSPECT FOR:

- Raveling and aging
- Pavement flushing and bleeding
- Patching
- Corrugation and waves

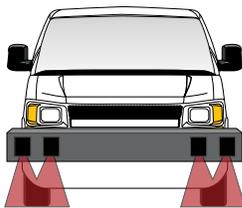


Rutting Inspection

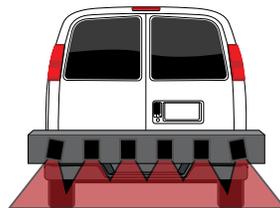
Rutting is the formation of surface depressions within the wheel path. Ruts pose a significant safety risk to motorists — especially in those places where rainwater collects — and are the primary source for vehicle accidents and damage caused by aquaplaning. Multiple Gocator 3D smart sensors mounted on a vehicle can conduct full-lane rut measurement, delivering the necessary high-density 3D data for technicians to accurately determine rut dimensions (i.e, width and depth).

Pavement Edge Inspection

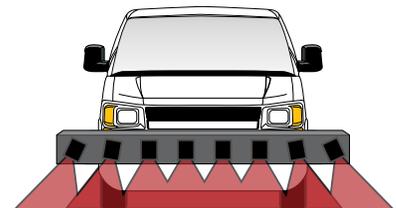
This application involves evaluating drop-off from the edge of the asphalt to the road's shoulder. Edges that are too steep or rough pose significant safety risks. With Gocator's ability to provide real-time 3D "depth" profiles, technicians are able to accurately measure this distance and ensure it meets standard safety requirements. Pavement edge inspection is especially important for driver safety on roads where the shoulder is narrow.



4 GOCATOR SYSTEM 1.15m FOV



6 GOCATOR SYSTEM 3.3m FOV



8 GOCATOR SYSTEM 4.2m FOV



GOCATOR IN-THE-FIELD

Dedicated Features for Effective Road Surface Inspection



BUILT ON ROLINE'S SUCCESS:

- Industry-standard RoLine technology built inside
- Improved flexibility with Gocator design
- Selectable output modes (bridged single value, Selcom Interface)
- Full profiles available over Ethernet for legacy profiling systems

DYNAMIC WINDOWING

Achieves Rapid Scan Rates (3kHz) at Highway Speed

Gocator offers a tracking window that optimizes sensor speed while scanning a large measurement range. The tracking window feature dynamically switches between two states: Searching and Tracking. In the Searching state, the sensor uses a larger search window to locate the laser line. After finding the laser, the sensor enters a Tracking state, where it dynamically positions a smaller tracking window to follow the laser. This increased operational efficiency maximizes the profiling speed of the sensor in order to meet stringent road inspection requirements.

DYNAMIC EXPOSURE

Enables the Surface Measurement of Different Pavement Types

Surface measurement is an especially challenging road inspection application because pavement comes in many different types including tined, grooved, and diamond-ground concrete asphalt — all of which feature variable marking standards such as yellow or white striping. To handle these variations in surface type, Gocator's dynamic exposure control automatically adjusts exposure based on laser signal strength to optimize data quality.

SCAN RATES
UP TO **3kHz**

HIGH-DENSITY
3D PROFILES AT
HIGHWAY SPEED



BRIDGING ALGORITHM

Outputs a Single Surface Measurement for Tire-to-Pavement Contact Area

Gocator provides a bridging algorithm as part of its built-in measurement tools to enable accurate calculation of pavement roughness (ex. IRI), independent of pavement type, tining or grooving. The algorithm filters profile data, corrects for tilt, and outputs a single “tire-pavement contact” measurement value by Ethernet output. This value is also available on Selcom Serial output (which was used with earlier sensor models) to simplify retrofitting latest generation profile sensors to earlier systems.

DATA SYNC

Synchronizes Data between the Profile Sensor, Accelerometer, GPS and other System Devices

Gocator provides an external sync pulse output when the sensor “exposes” its data capture. This pulse output is used to synchronize profile data to accelerometers with microsecond precision. Data synchronization allows Gocator to provide road inspection technicians with a unified data source for fast and integrated acquisition, analysis and reporting.

GOCATOR IS SMARTER:

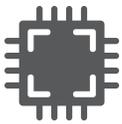
- Superior ambient light handling
- Industrial IP67 housing stands up to demanding outdoor conditions
- Compact, lightweight device with small footprint and simple cabling
- Easy-to-use web browser-based GUI connects to common web browser



Gocator Road
Surface Profile

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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