LEADERS IN 3D SCANNING AND INSPECTION

FOR THE ELECTRIC VEHICLE (EV) BATTERY INDUSTRY

Gocator®

CONTENTS

WELCOME TO **FactorySmart**®
EV BATTERY INSPECTION

Gocator® 3D SMART SENSORS

Gocator® smart 3D laser profilers, snapshot, and line confocal sensors are used during various stages of EV battery manufacturing in order to ensure component and assembly tolerances are met, and that maximum cycle life and safety are achieved.

Gocator® SOFTWARE

Intuitive and Easy to Use

- OS independent (PC, Mac, Linux)
- Point-and-click functionality
- Firmware included, no separate software required
- Process 2D intensity and 3D height data for high repeatability

EV BATTERY TYPES
SOLVED WITH GOCATOR

Prismatic Battery

- Top cover step height and clearance inspection
- Appearance inspection of top cover after welding
- Injection port sealing nail welding inspection
- Battery thickness inspection
- Cell Appearance Inspection
- Explosion-proof valve aluminum foil defect inspection
- Explosion-proof valve PP film defect detection
- Battery cell insultating film inspection

Cylindrical Battery

- Collector plate detection
- Sealing nail detection
- Roof welding inspection
- Sealing ring detection
- Insulation gap inspection
- Dimensional inspection
- Surface defect detection

Pouch Battery

- Module side seam inspection after welding
- Busbar post-welding inspection
- Module full size inspection
- Connecting sheet welding inspection
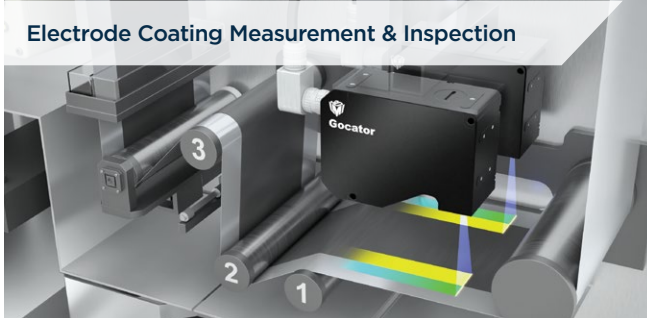- Pallet flatness inspection

Blade Battery

- FTT tab weld bead inspection
- Pole welding inspection
- Pre-spot welding inspection
- Pulse-welding seam detection
- Cell Appearance Inspection

EV BATTERY INSPECTION APPLICATIONS
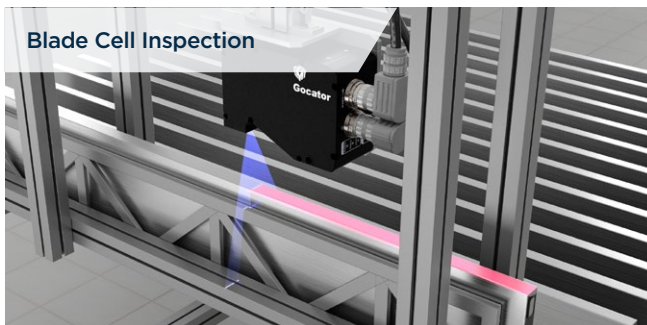## SOLVED WITH GOCATOR

Electrode Coating Measurement & Inspection
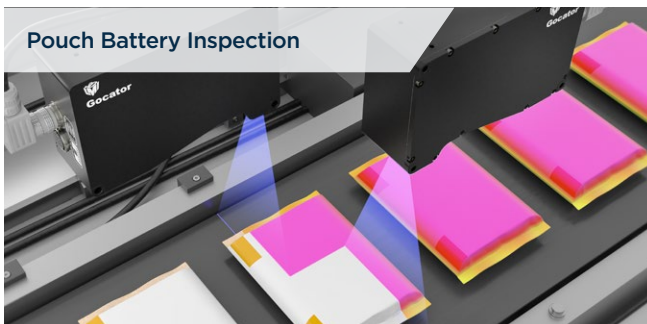
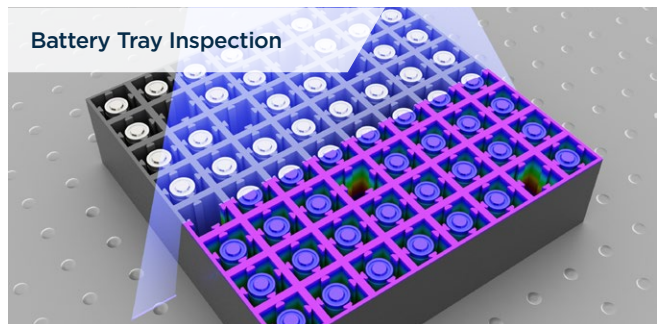**Prismatic Surface Flatness Inspection**

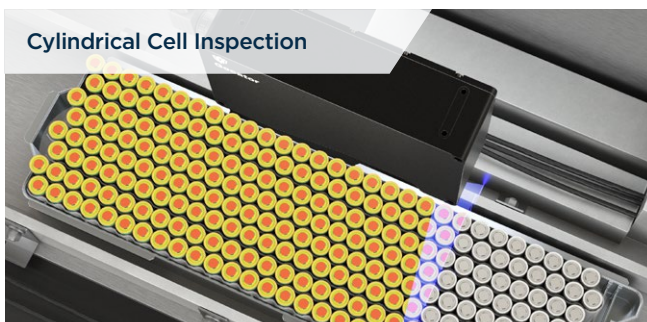**Blade Cell Inspection**

Battery Pre-Welding Inspection

Pouch Battery Inspection

Battery Tray Inspection

Cylindrical Cell Inspection

Module Pack Inspection

PRE-ASSEMBLY INSPECTION
ELECTRODE DIMENSIONAL MEASUREMENT

Electrode slurry is coated onto copper and aluminum foil to facilitate electric flow. The metal surface, separator, and coating must be inspected for potential surface or edge defects as well as uniform shape and thickness.

Electrode Width Gauging

Gocator® provides accurate width gauging of the dimensions of the separator and electrode.
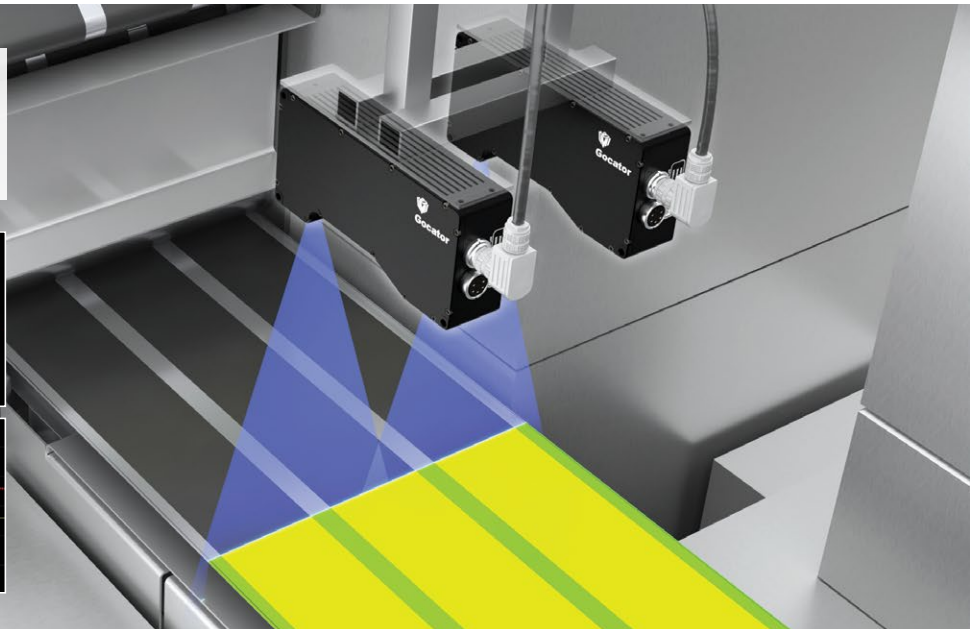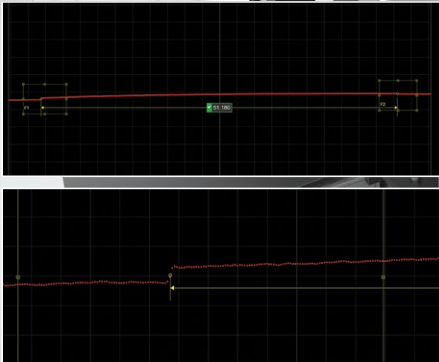
Electrode Edge Profile Measurement

Gocator® provides high-speed profiling of the edges of coated electrode sheets to ensure the correct dimensional tolerances are met.
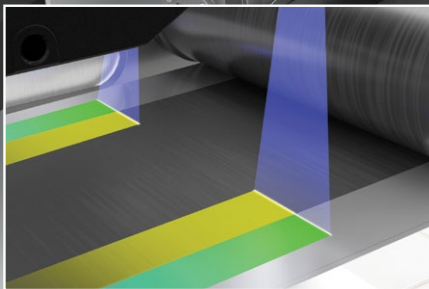
PRE-ASSEMBLY INSPECTION
ELECTRODE TAB WELD DEFECT DETECTION
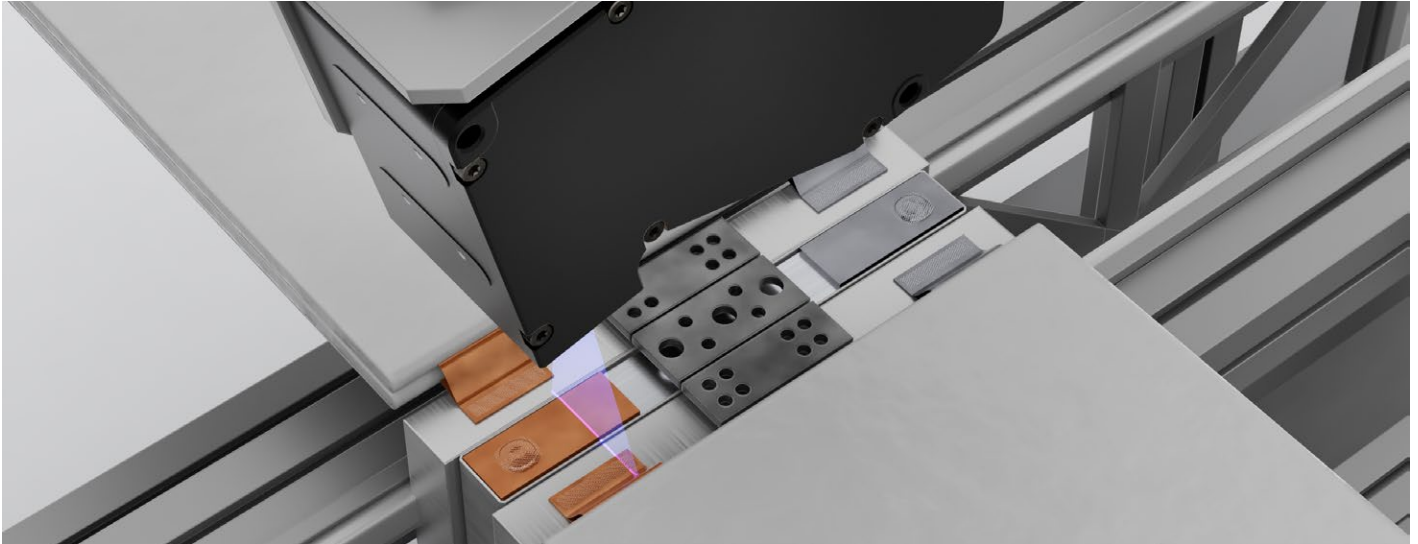
High-Speed, High-Precision Tab Weld Defect Detection

Gocator scans and verifies whether or not the adapter pole is correctly welded to the tab of the bare cell (located on the inside of the top cover of prismatic battery)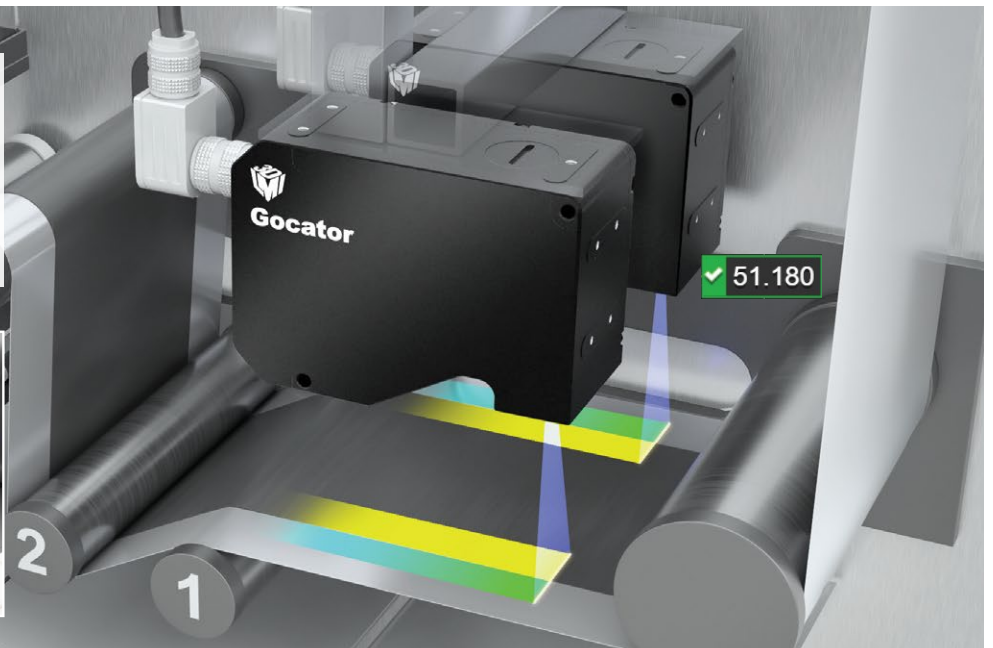. The sensor accurately and reliably detects small defects such as blast holes, weld breaks, and other potential deviations that can occur in the welding process caused by fluctuation of laser power and the presence of foreign objects.

Application Requirements

- Scan speed up to 50mm/s or higher
- 100% inline detection of defects such as length of broken weld, leakage deviation, area and depth of blast hole, area and height of weld and non-welded surface

Pulse-welding Blast Hole

7
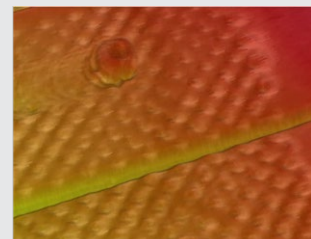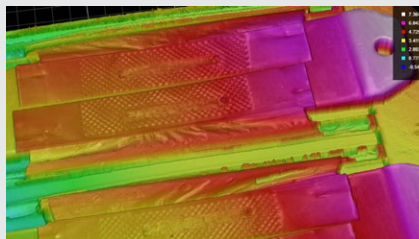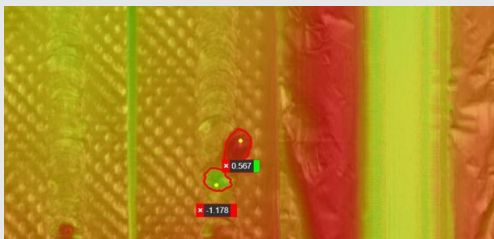
PRE-ASSEMBLY INSPECTION
FLAT/PRISMATIC BATTERY PRE-WELD

Gocator generates precision 3D scans of prismatic battery cells for pre-weld gap & flush measurement.

Gocator®
2618

Data Points / Profile	**4192**
Resolution X (µm) (Profile Data Interval)	**5.0 - 5.4**
Scan Rate (kHz)	**700 - 10000**
Linearity Z (+/- % of MR)	0.015%
Repeatability Z (µm)	0.38
Clearance Distance (CD) (mm)	44.5
Measurement Range (MR) (mm)	12
Field of View (FOV) (mm)	20 - 23
Dimensions (mm)	46 * 80 * 110

CELL ASSEMBLY INSPECTION
ELECTRODE AND SEPARATOR

A separator and electrode are joined together, and the joined cell (including anode and cathode) is either wound, rolled, or stacked. Stacked cells are then housed in a metal casing and sealed by welding.

Position Verification

Weld Seam defects Inspection Gocator® scans weld seams for correct height using a native height detection tool based on blob analysis. The sensor also inspects for weld quality (e.g., breaks, overflow).
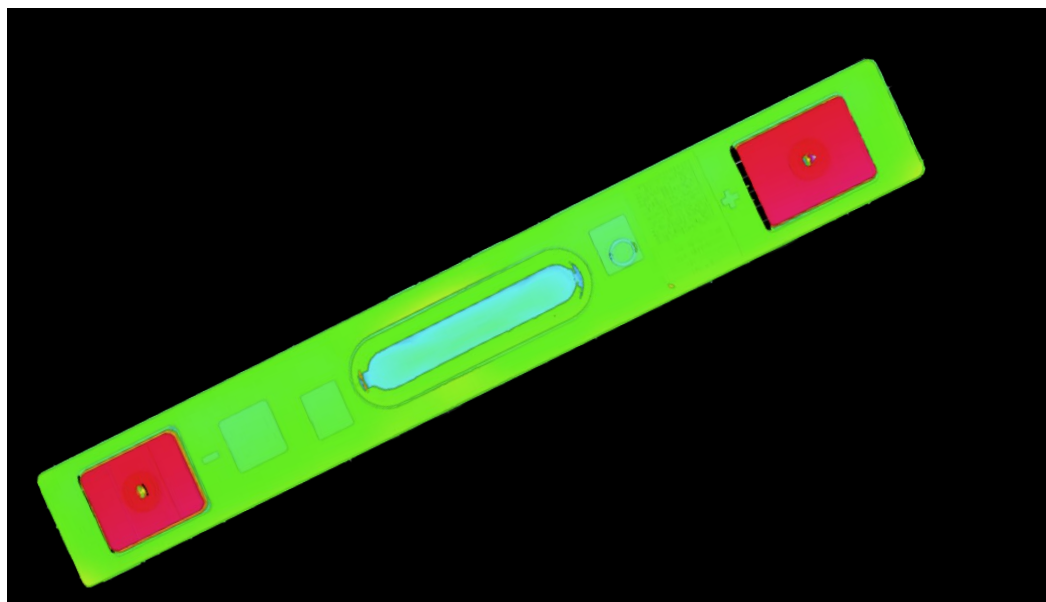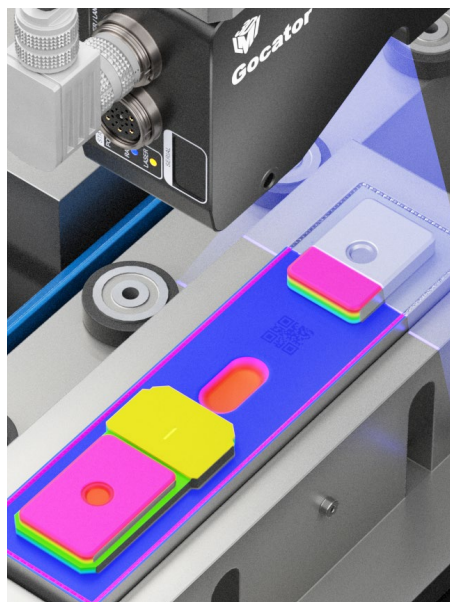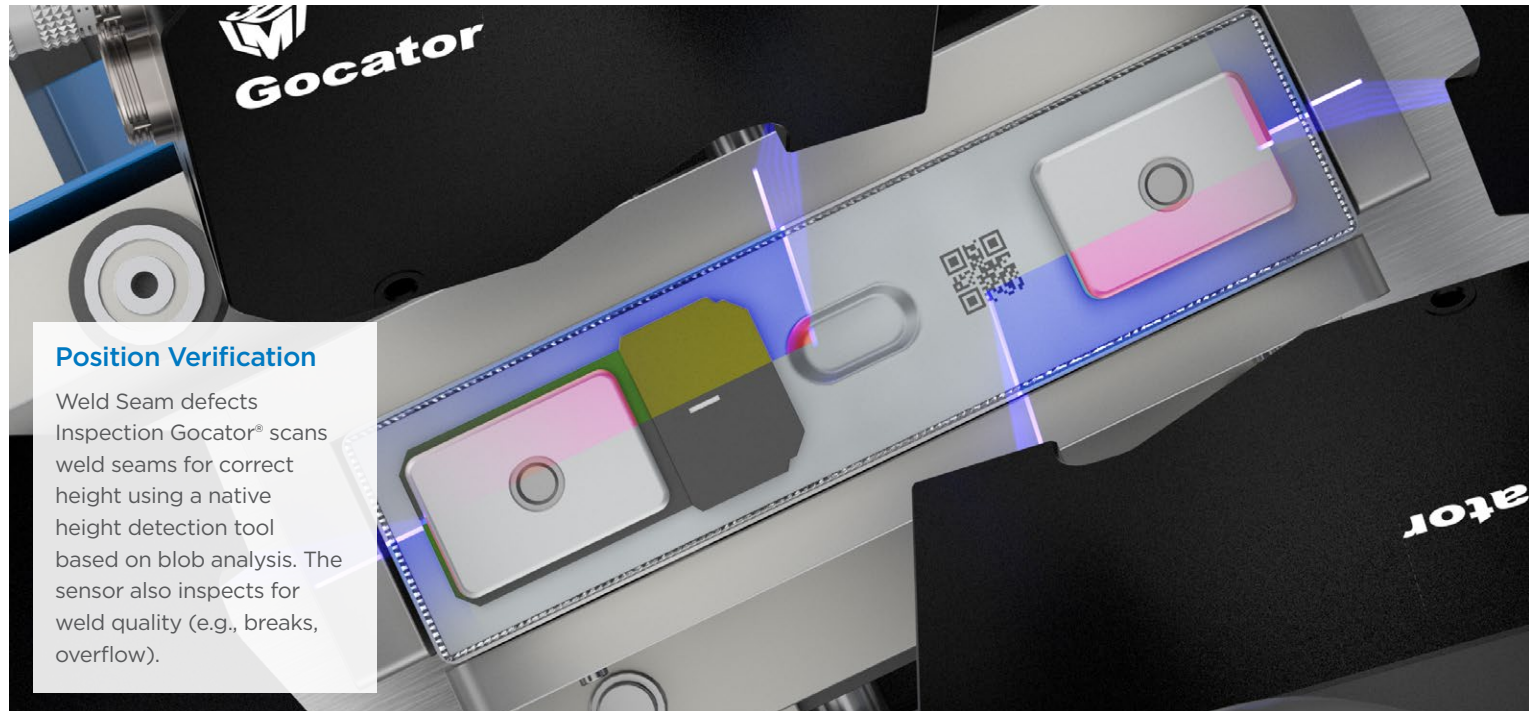
CELL ASSEMBLY INSPECTION
FLAT/PRISMATIC BATTERY (TOP COVER)

Gocator® 2520

Data Points / Profile	1920
Resolution X (µm) **(Profile Data Interval)**	**13.0 - 17.0**
Scan Rate (kHz)	**10**
Linearity Z (+/- % of MR)	0.006%
Repeatability Z (µm)	0.4
Clearance Distance (CD) (mm)	47.5
Measurement Range (MR) (mm)	25
Field of View (FOV) (mm)	25 - 32.5
Dimensions (mm)	46 * 80 * 110

Comparison of 3D Data Quality for Top Cover Weld

Gocator 2520 Scan Data

Competitor Scan Data
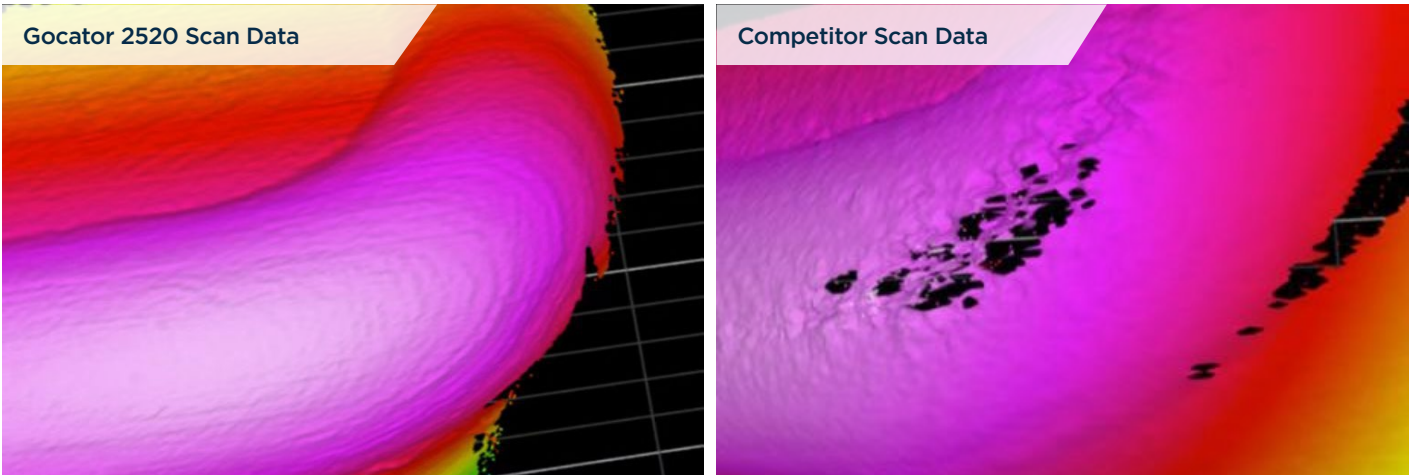
CELL ASSEMBLY INSPECTION
CYLINDRICAL BATTERY (TOP COVER AND SEAL)

HDR Mode NEW!

This feature in Gocator 2600 Series laser profilers improves scan quality on highly reflective EV battery surfaces, allowing the sensor to detect faint and bright features to be captured with a single scan and faster cycle time.
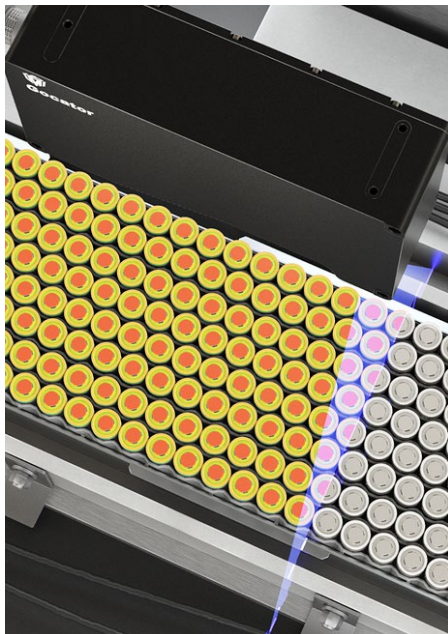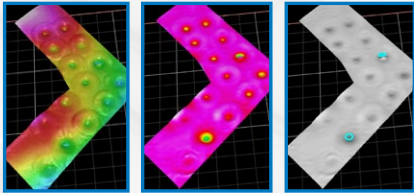
Surface Quality Inspection

Gocator provides powerful surface defect detection of the entire battery surface, identifying grooves, tilt, and 3D height variation in the top cover and potential surface defects on the sides.

SURFACE QUALITY INSPECTION
POUCH CELL

After assembly is completed, battery cells are inspected for surface flatness, potential defects such as outliers, cracks, and edge breaks.
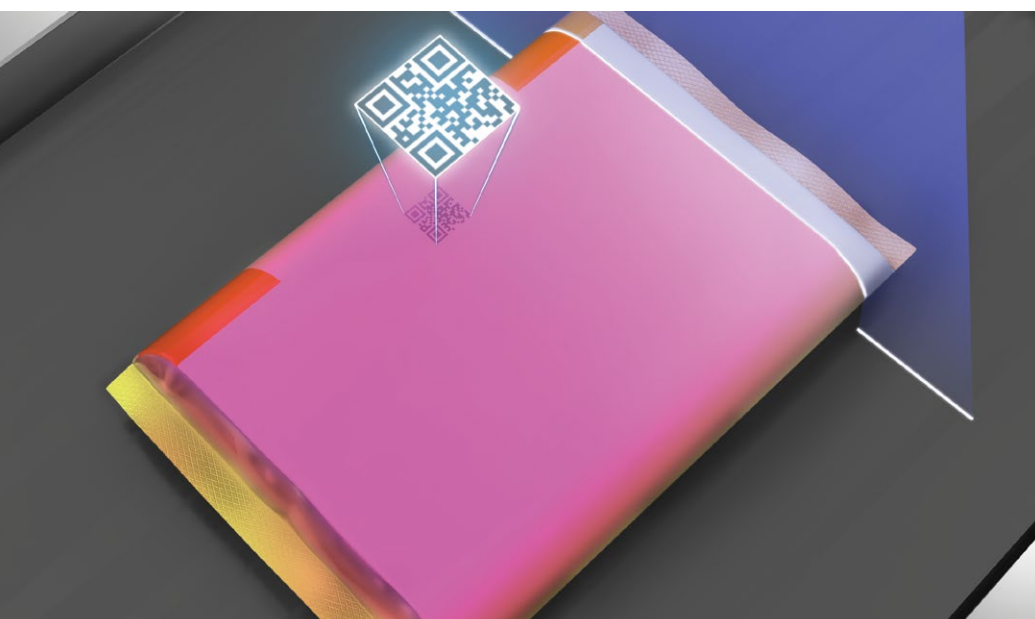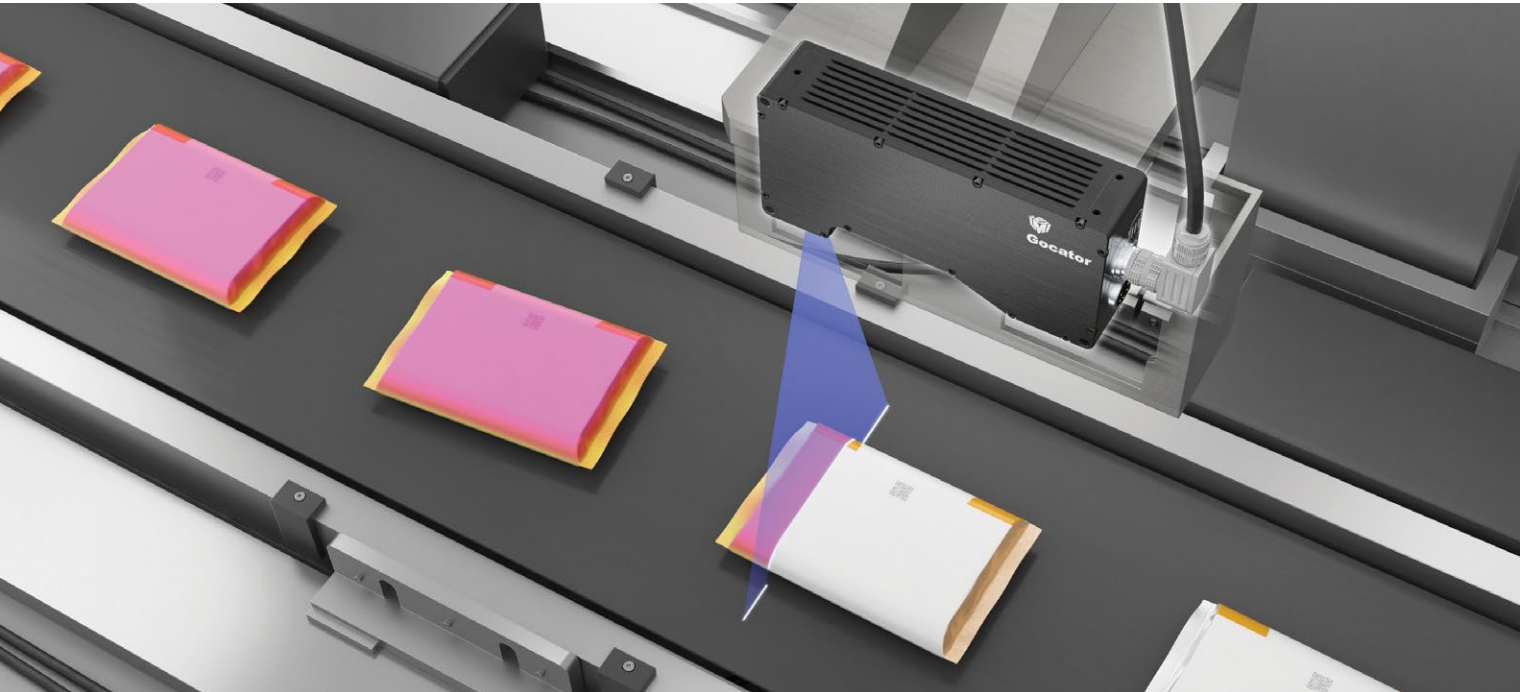
Blue Laser Technology

Shorter-wavelength blue light generates higher-quality scan data (i.e., less noisy) on highly specular battery surfaces such as polished metal.

SURFACE QUALITY INSPECTION
BLADE CELL (SIX-SIDED COVERAGE)

Gocator sensors can be networked to provide 3D scans of all six-sides of the battery cell for 100% finished surface inspection.

Blue Film Scratch Inspection

Blue Film Bump Inspection

Blue Film Pit Inspection

	0.437
	0.242
	0.046
	-0.150
	-0.345
	-0.541

NG

GOOD
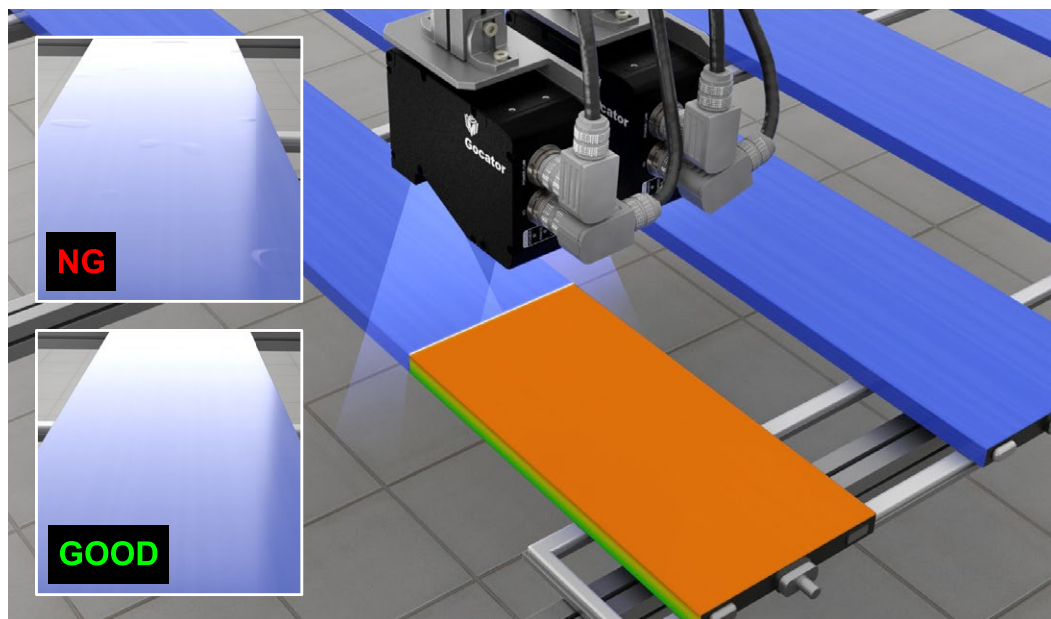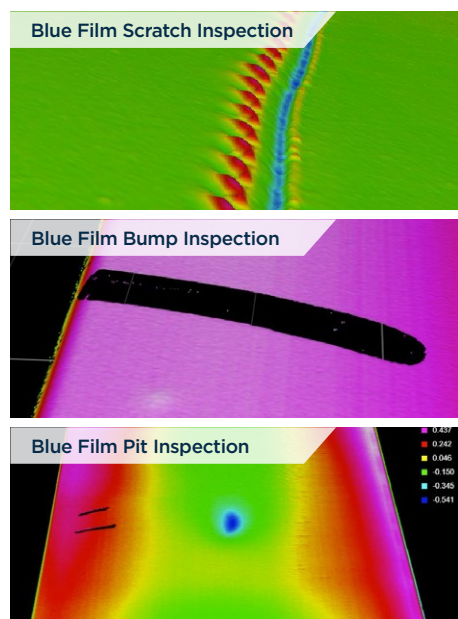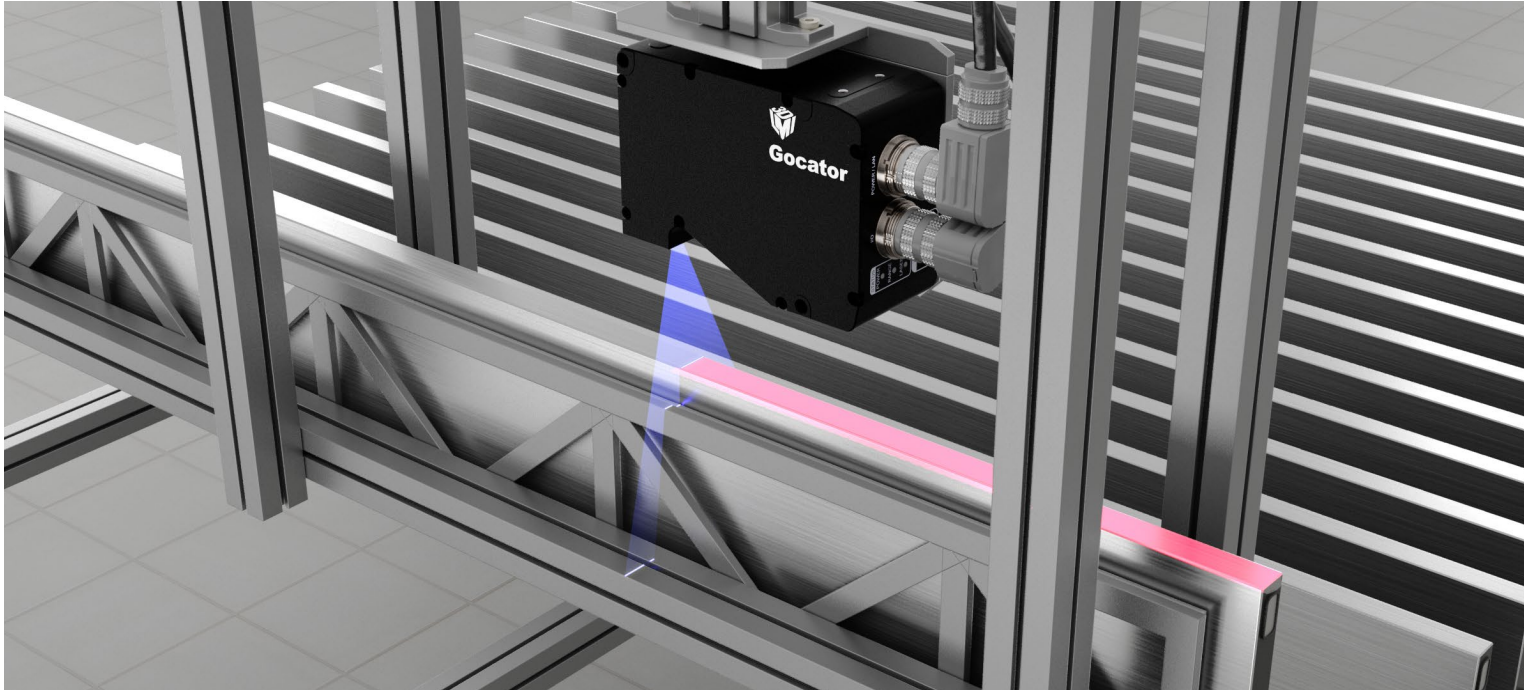
CELL MANUFACTURING INSPECTION
RECOMMENDED SENSOR MODELS

Gocator® 2520

Data Points / Profile	1920
Resolution X (µm) (Profile Data Interval)	13.0 - 17.0
Scan Rate (kHz)	10
Linearity Z (+/- % of MR)	0.006%
Repeatability Z (µm)	0.4
Clearance Distance (CD) (mm)	47.5
Measurement Range (MR) (mm)	25
Field of View (FOV) (mm)	25 - 32.5
Dimensions (mm)	46 * 80 * 110

Gocator® 2530

Data Points / Profile	1920
Resolution X (µm) (Profile Data Interval)	28.0 - 54.0
Scan Rate (kHz)	10
Linearity Z (+/- % of MR)	0.01%
Repeatability Z (µm)	0.5
Clearance Distance (CD) (mm)	40
Measurement Range (MR) (mm)	80
Field of View (FOV) (mm)	48 - 100
Dimensions (mm)	46 * 80 * 110

Gocator 2500 3D smart sensors are designed for high-precision part inspection. These trusted line profilers achieve inspection rates up to 10 kHz (including scan, measure, and control) and high X resolutions up to 8 microns. A custom 2MP high speed imager, optimized optical design, and blue laser light generate excellent data with highly repeatable results on shiny EV battery surfaces.
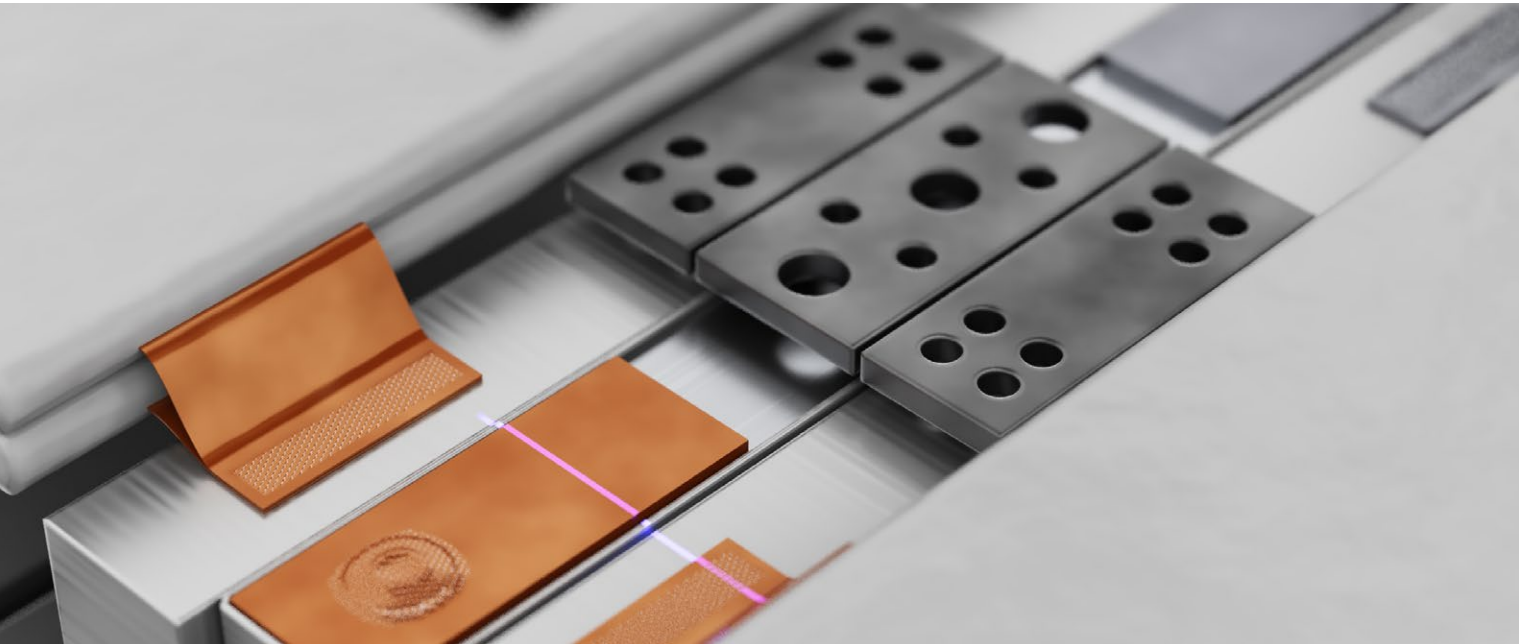
MODULE AND PACK ASSEMBLY INSPECTION
BUSBAR WELD SEAM

In the next phase of the manufacturing process, multiple cells are stacked together to form modules. Modules are then combined to form battery packs. Both at the module and pack level, components have to be inspected for correct assembly and weld quality.
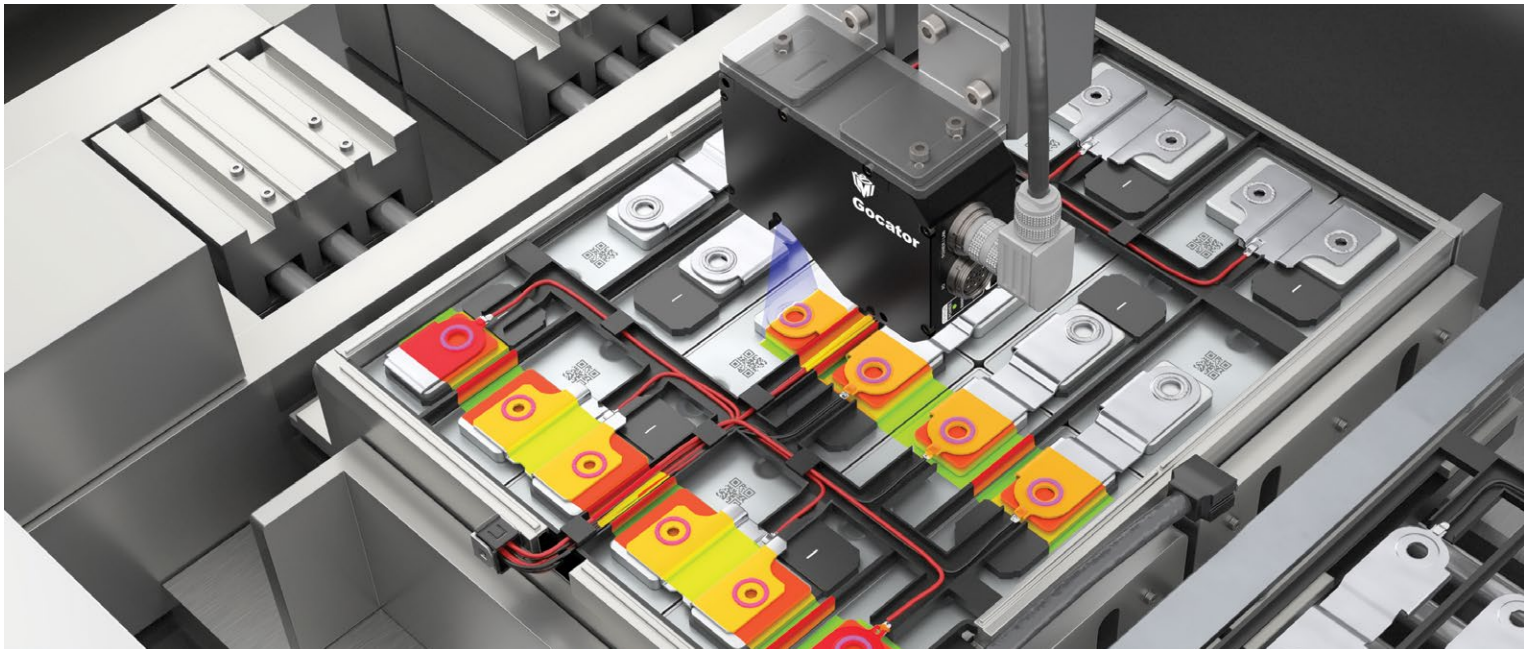
Module Busbar Weld Inspection

Gocator scans and inspects the quality of the busbar weld and the height difference between the busbar and connector pole.
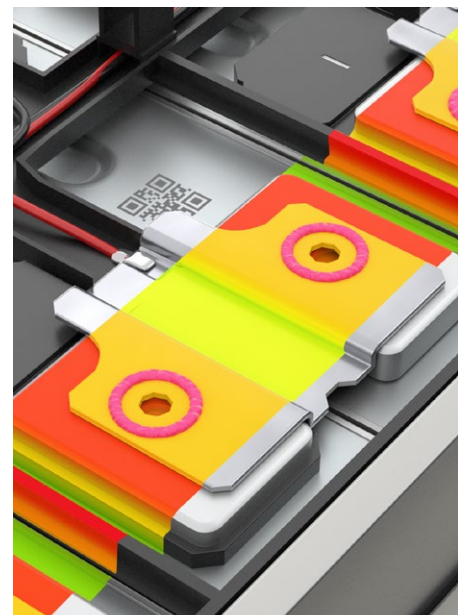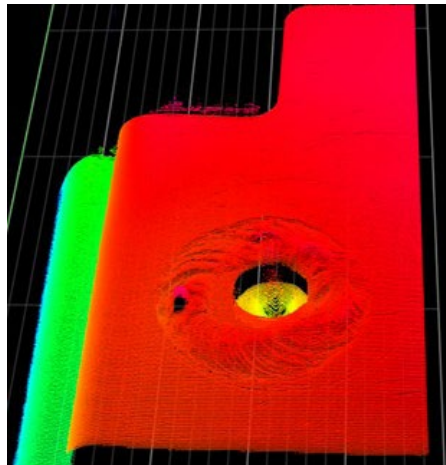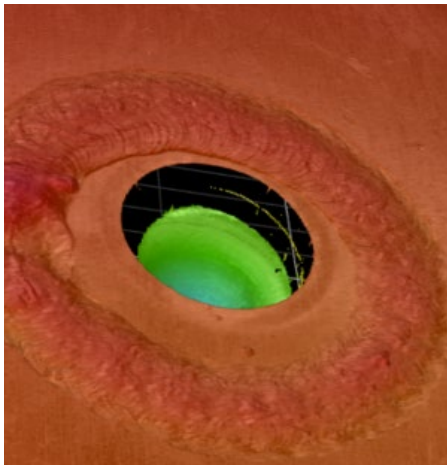
CELL MANUFACTURING INSPECTION
RECOMMENDED SENSOR MODELS

High-Performance Scanning of Specular Surfaces

Gocator® 5500 Line Confocal Sensors are able to generate precision 3D data even on challenging materials such as the highly specular surfaces of metal weld seams.

SMART CONFOCAL

Battery Weld Seam Inspection

Explosion Proof Valve Inspection
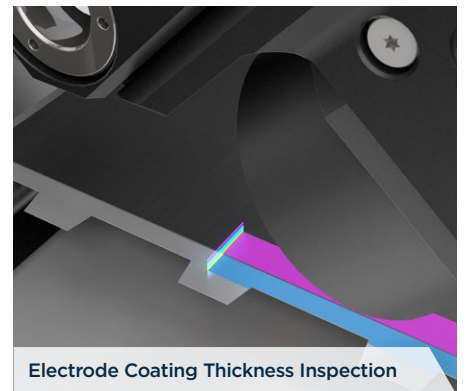
Electrode Coating Thickness Inspection

FINAL INSTALLATION INSPECTION
EV BATTERY TRAY

In electric vehicles, a large tray/pan sits under the floor panel. The lithium-ion battery module is glued to this tray. The glue bead application in this assembly has to be inspected for correct dimensions and surface quality.
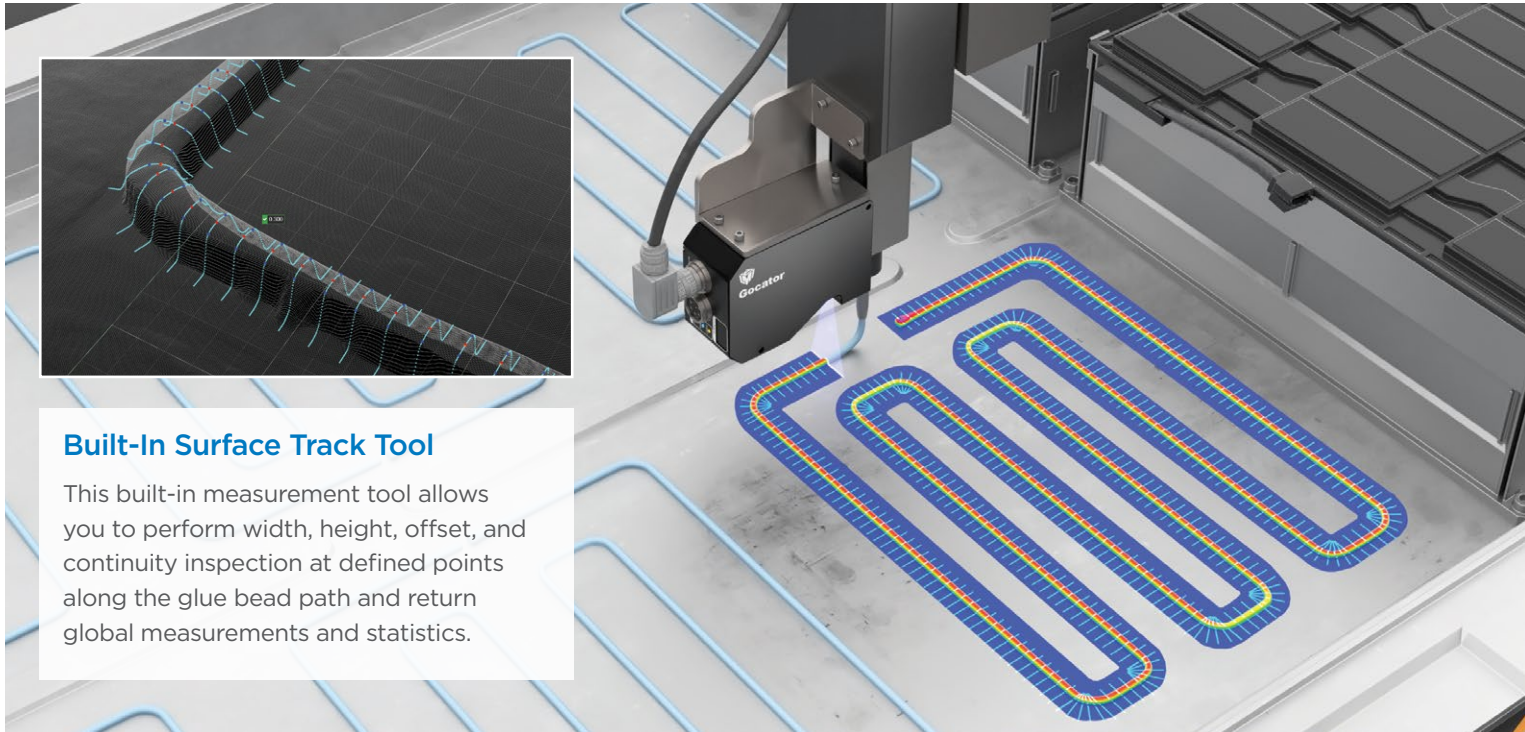
Built-In Surface Track Tool

This built-in measurement tool allows you to perform width, height, offset, and continuity inspection at defined points along the glue bead path and return global measurements and statistics.
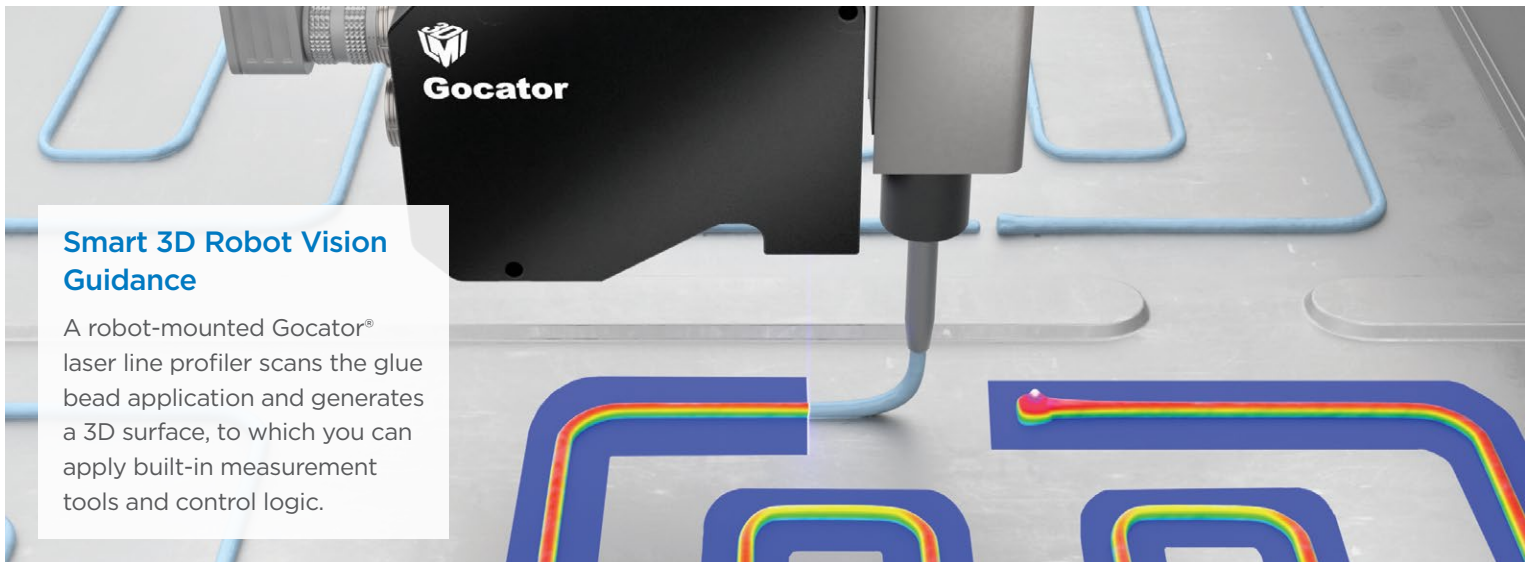
Smart 3D Robot Vision Guidance

A robot-mounted Gocator® laser line profiler scans the glue bead application and generates a 3D surface, to which you can apply built-in measurement tools and control logic.

POWERFUL MEASUREMENT AND INSPECTION SOFTWARE

DEPLOYED ON GOCATOR® 3D SMART SENSORS
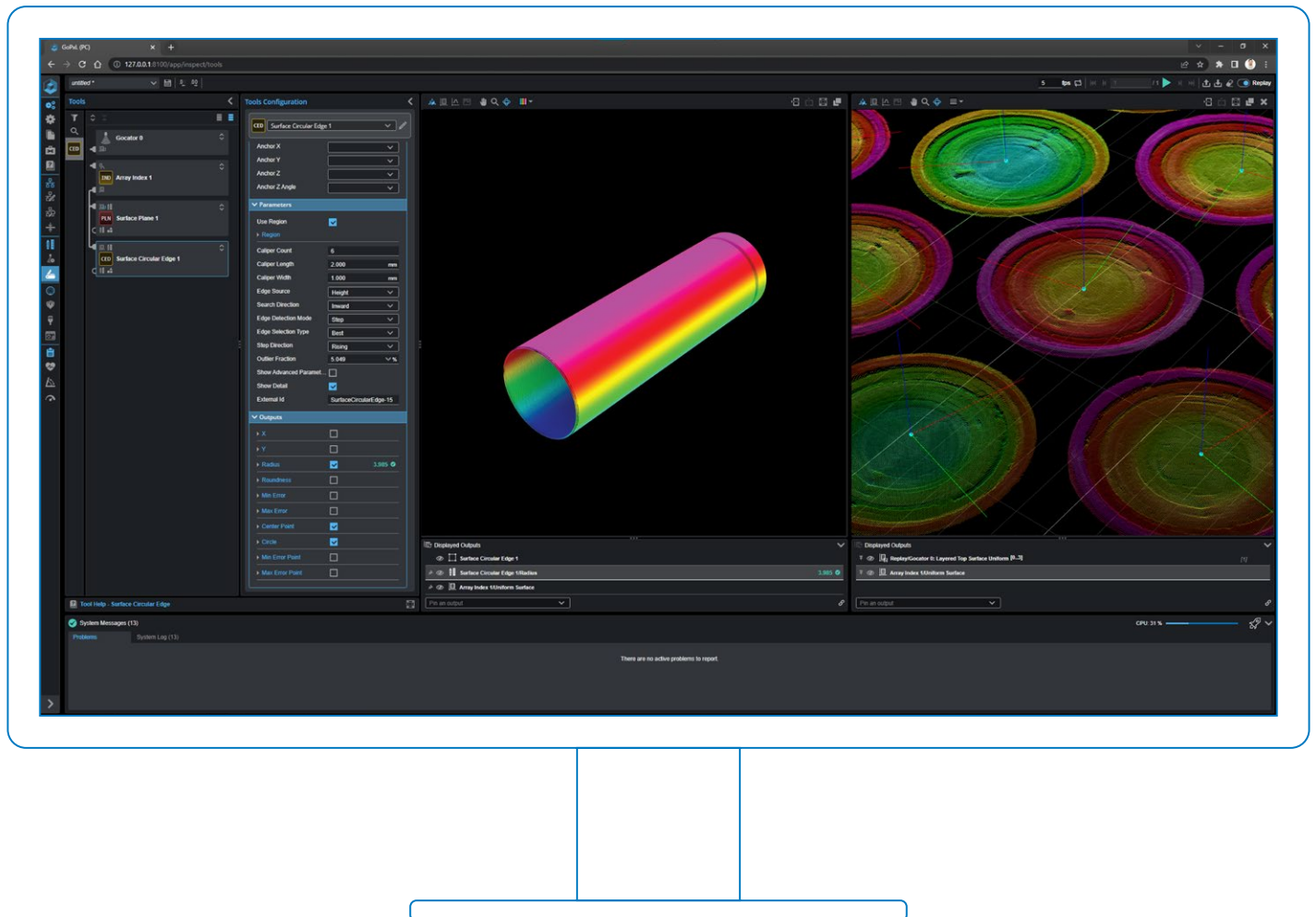
GoPxL® is our software application for creating end-to-end, web-based, inline measurement and inspection solutions deployed on a Gocator® 3D Smart Sensor.

Vision engineers can use GoPxL® to solve a wide range of industrial inspection tasks leveraging a combination of on-sensor measurement filters and tools running on Gocator's industry-leading laser, snapshot, and line confocal sensors. GoPxL takes advantage of 30 years of 3D experience at LMI to create a user experience that helps engineers develop measurement and inspection solutions more efficiently and effectively than ever before.

Why Should You Try **GoPxL**

- Create an accurate and repeatable measurement solution, without expert machine vision or 3D knowledge and experience

- Extract real world measurements directly from the sensor and connect outcomes and decisions to PLC using industrial protocols

- Create a custom end-user interface connected to Gocator outputs and accessed using a browser on PC, touchscreen, or mobile device

POWERFUL MEASUREMENT AND INSPECTION SOFTWARE

DEPLOYED ON GOCATOR® 3D SMART SENSORS

Modern Web-Based User Interface

Access and control the full power of Gocator sensors from any web browser.

Easy Single and Multi-Sensor Alignment

Leverage an inline wizard that makes single and multi-sensor alignment effortless.
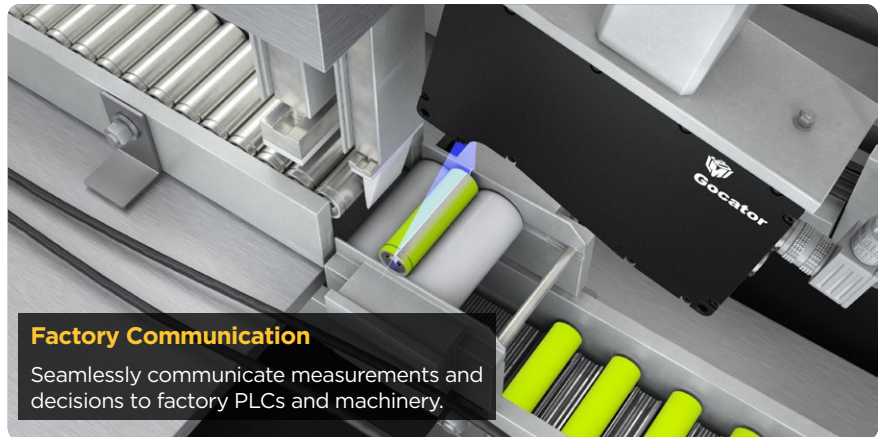
Factory Communication

Seamlessly communicate measurements and decisions to factory PLCs and machinery.
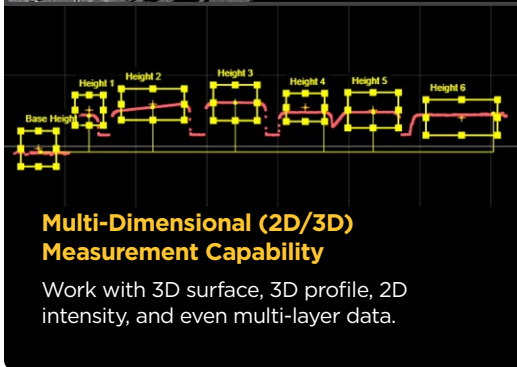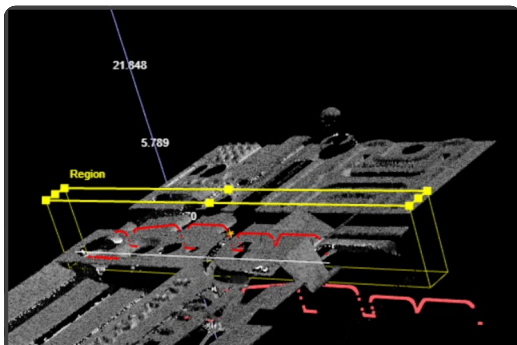
Multi-Dimensional (2D/3D) Measurement Capability

Work with 3D surface, 3D profile, 2D intensity, and even multi-layer data.

Distributed Multi-Sensor Data Processing and Acceleration

Future-proof your factory with scalable technology capabilities.
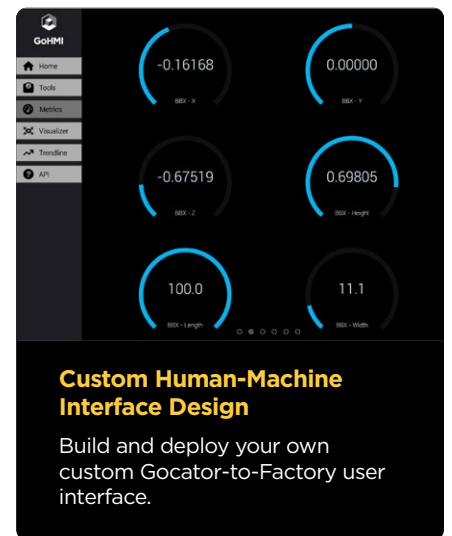
Custom Human-Machine Interface Design

Build and deploy your own custom Gocator-to-Factory user interface.

NOTE: While users are encouraged to evaluate GoPxL, previous Gocator firmware releases will continue to be supported and maintained. G2 and G3 products are currently shipping with Gocator firmware 6.1.42.10 or later.

READ. RECOGNIZE. VALIDATE
OCR AND BARCODE READING

Leverage the ability to read, recognize, and validate printed barcodes, labels, and alphanumeric text using 2D intensity or 3D heightmap "embossed" data.
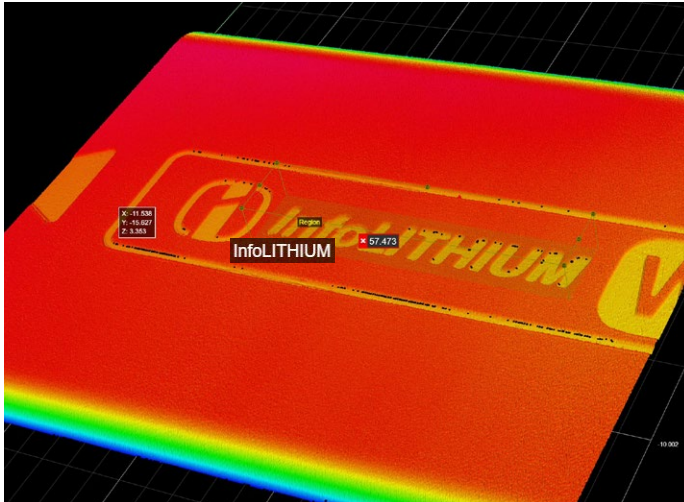
Smart 3D Optical Character Recognition

The Surface OCR tool recognizes and extracts a string of text from surfaces, using either 3D height map scan data or 2D intensity scan data.

Surface OCR adds a valuable capability for inspection applications that decode flat or embossed characters in markets such as automotive (stamped parts), battery and packaging (track and trace), and rubber & tire sidewall (DOT codes).

*Note: This tool runs on GoMax® Smart Vision Accelerator, or with Gocator Accelerator (GoX) on a PC.

- Read characters in 2D and 3D scan data, out-of-the-box
- Works on both flat or raised (e.g., embossed) characters
- Leverages pre-trained data sets on GoMax®
- Blacklist and Whitelist modes allow you to isolate specific characters for increased measurement control and repeatability
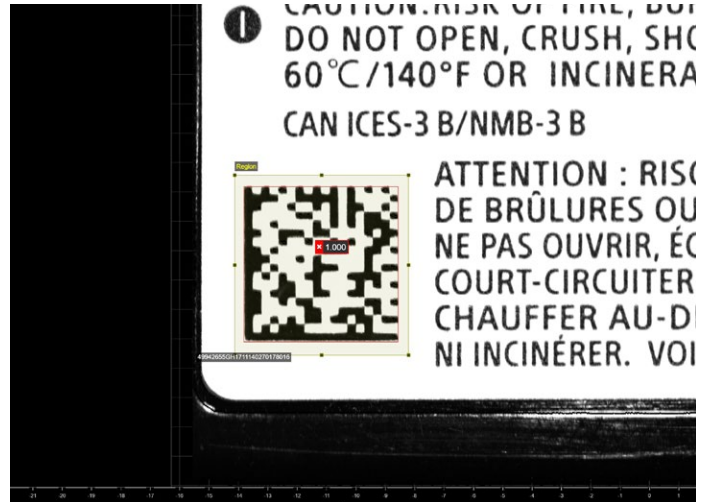
Smart 3D Barcode Reading

The Surface Barcode tool allows you to read data encoded in 1D (linear) and 2D barcodes from surface data, without the need for 2D vision cameras or specialized barcode readers.

- Decode 1D and 2D barcodes
- Works with 2D intensity and 3D heightmap data
- Determine and validate barcode position in XYZ space
- Supports 14 different barcode types including Data Matrix and QR code

Gocator® LASER LINE PROFILE SENSORS

Gocator 2100 Series — Laser Line Profile

MODELS	2120	2130	2140	2150	2170	2180
Data Points / Profile	640	640	640	640	640	640
Linearity Z (+/- % of MR)	0.01	0.01	0.01	0.01	0.04	0.04
Resolution Z (mm)	0.0018-0.0030	0.006 - 0.014	0.013 - 0.037	0.019 - 0.060	0.055 - 0.200	0.092 - 0.488
Resolution X (mm) (Profile Data Interval)	0.028-0.042	0.088 - 0.150	0.19 - 0.34	0.3 - 0.6	0.55 - 1.10	0.75 - 2.20
Repeatability Z (μm)	0.4	0.8	1.2	2	8	12
Clearance Distance (CD) (mm)	40	90	190	300	400	350
Measurement Range (MR) (mm)	25	80	210	400	500	800
Field of View (FOV) (mm)	18 - 26	47 - 85	96 - 194	158 - 365	308 - 687	390 - 1260
Dimensions (mm)	Side Mount 35x120x149.5	Top Mount 49x75x142	Top Mount 49x75x197	Top Mount 49x75x272	Top Mount 49x75x272	Top Mount 49x75x272
Weight (kg)	0.8	0.74	0.94	1.3	1.3	1.3

Optical models, laser classes, and packages can be customized. Contact LMI for more details. Specifications stated are based on standard laser classes. Linearity Z, Resolution Z, and Repeatability Z may vary for other laser classes. Refer to specifications in the Gocator Line Profile Sensor user manual for more details.

ALL 2100 SERIES MODELS

Scan Rate	Approximately 170 Hz to 5000 Hz
Interface	Gigabit Ethernet
Inputs	Differential Encoder, Laser Safety Enable, Trigger
Outputs	2x Digital output, RS-485 Serial (115 kBaud)
Factory Communication	PROFINET, Modbus, EtherNet/IP, ASCII, Gocator
Input Voltage (Power)	+24 to +48 VDC (13 Watts); Ripple +/- 10%
Housing	Gasketed aluminum enclosure, IP67
Operating Temperature	0 to 50°C
Storage Temperature	-30 to 70°C
Vibration Resistance	10 to 55 Hz, 1.5 mm double amplitude in X, Y, and Z directions, 2 hours per direction
Shock Resistance	15 g, half sine wave, 11 ms, positive and negative for X, Y, and Z directions
Scanning Software	Browser-based GUI and open source SDK for configuration and real-time 3D visualization. Open source SDK, native drivers, and industrial protocols for integration with user applications, third-party image processing applications, and PLCs.

Gocator 2300 Series — Laser Line Profile

MODELS	2320	2330	2340	2350	2370	2380
Data Points / Profile	1280	1280	1280	1280	1280	1280
Linearity Z (+/- % of MR)	0.01	0.01	0.01	0.01	0.04	0.04
Resolution Z (mm)	0.0018 - 0.0030	0.006 - 0.014	0.013 - 0.037	0.019 - 0.060	0.055 - 0.200	0.092 - 0.488
Resolution X (mm) (Profile Data Interval)	0.014 - 0.021	0.044 - 0.075	0.095 - 0.170	0.150 - 0.300	0.275 - 0.550	0.375 - 1.100
Repeatability Z (μm)	0.4	0.8	1.2	2	8	12
Clearance Distance (CD) (mm)	40	90	190	300	400	350
Measurement Range (MR) (mm)	25	80	210	400	500	800
Field of View (FOV) (mm)	18 - 26	47 - 85	96 - 194	158 - 365	308 - 687	390 - 1260
Dimensions (mm)	Side Mount 35x120x149.5	Top Mount 49x75x142	Top Mount 49x75x197	Top Mount 49x75x272	Top Mount 49x75x272	Top Mount 49x75x272
Weight (kg)	0.8	0.74	0.94	1.3	1.3	1.3

Optical models, laser classes, and packages can be customized. Contact LMI for more details. Specifications stated are based on standard laser classes. Linearity Z, Resolution Z, and Repeatability Z may vary for other laser classes. Refer to specifications in the Gocator Line Profile Sensor user manual for more details.

ALL 2300 SERIES MODELS

Scan Rate	Approximately 170 Hz to 5000 Hz
Interface	Gigabit Ethernet
Inputs	Differential Encoder, Laser Safety Enable, Trigger
Outputs	2x Digital output, RS-485 Serial (115 kBaud)
Factory Communication	PROFINET, Modbus, EtherNet/IP, ASCII, Gocator
Input Voltage (Power)	+24 to +48 VDC (13 Watts); Ripple +/- 10%
Housing	Gasketed aluminum enclosure, IP67
Operating Temperature	0 to 50°C
Storage Temperature	-30 to 70°C
Vibration Resistance	10 to 55 Hz, 1.5 mm double amplitude in X, Y, and Z directions, 2 hours per direction
Shock Resistance	15 g, half sine wave, 11 ms, positive and negative for X, Y, and Z directions

Gocator® LASER LINE PROFILE SENSORS

Gocator 2400 Series — Laser Line Profile

MODELS	2410	2420	2430	2440	2450	2490
Data Points / Profile	1710	1940	1500	1500	1800	1920
Linearity Z (+/- % of MR)	0.015	0.006	0.01	0.01	0.01	0.04
Resolution X (μm) (Profile Data Interval)	5.8 - 6.2	14.0 - 16.5	37 - 57	90 - 130	100 - 255	250 - 1100
Repeatability Z (μm)	0.2	0.4	0.8	1.2	2.0	12
Clearance Distance (CD) (mm)	19	60	75	183	270	350
Measurement Range (MR) (mm)	6	25	80	210	550	1525
Field of View (FOV) (mm)	10 - 10	27 - 32	47 - 85	96 - 194	145 - 425	390 - 2000
Dimensions (mm)	44x90x145	44x90x145	44x90x155	44x90x190	44x90x240	49x85x272
Weight (kg)	0.88	0.88	1.0	1.2	1.2	1.5

Optical models, laser classes, and packages can be customized. Contact LMI for more details. Specifications stated are based on Recommended laser classes. Linearity Z, Resolution Z, and Repeatability Z may vary for other laser classes.

ALL 2400 SERIES MODELS

Scan Rate	200 Hz, up to 5 kHz. (Note: 2400 series provides up to 2x scan rate for equivalent window size as 2300 series)
Interface	Gigabit Ethernet
Inputs	Differential Encoder, Laser Safety Enable, Trigger
Outputs	2x Digital output, RS-485 Serial (115 kBaud)
Factory Communication	PROFINET, Modbus, EtherNet/IP, ASCII, Gocator
Input Voltage (Power)	+24 to +48 VDC (9 Watts); Ripple +/- 10%
Housing	Gasketed aluminum enclosure, IP67
Operating Temperature	0 to 50°C (10 to 50°C for Class 2 Blue)
Storage Temperature	-30 to 70°C
Vibration Resistance	10 to 55 Hz, 1.5 mm double amplitude in X, Y, and Z directions, 2 hours per direction
Shock Resistance	15 g, half sine wave, 11 ms, positive and negative for X, Y, and Z directions
Scanning Software	Browser-based GUI and open source SDK for configuration and real-time 3D visualization. Open source SDK, native drivers, and industrial protocols for integration with user applications, third-party image processing applications, and PLCs.

Gocator 2500 Series — Laser Line Profile

MODELS	2510	2512	2520	2522	2530	2540	2550
Data Points / Profile	1920	1920	1920	1920	1920	1920	1920
Scan Rate (Hz) [1]	2400 - 20000	1600 - 20000	1600 - 20000	1600 - 20000	2000 - 20000	1700 - 20000	1800 - 20000
Linearity Z (+/- % of MR) [2]	0.015	0.015	0.006	0.006	0.01	0.05	0.06
Resolution X (μm) (Profile Data Interval)	8.0	8.0	13.0 - 17.0	13.0 - 17.0	28.0 - 54.0	64.0 - 160.0	80.0 - 270.0
Repeatability Z (μm) [2]	0.2	0.2	0.4	0.4	0.5	1.2	2.0
Clearance Distance (CD) (mm)	17.0	17.0	47.5	17.75	40.0	152	216
Measurement Range (MR) (mm)	6	6	25	25	80	295	595
Field of View (FOV) (mm)	13.0 - 14.5 (diffuse)	13.0 - 14.5 (diffuse & specular)	25.0 - 32.5 (diffuse)	25.0 - 32.5 (diffuse); 25.0 (specular)	48.0 - 100.0 (diffuse)	120.0 - 292.0 (diffuse)	154.0 - 518.0 (diffuse)
Dimensions (mm)	46x80x110	46x80x110	46x80x110	46x110x110	46x80x110	55 x 105 x 195	55 x 105 x 195
Protective Cover [3]	-	-	-	-	-	●	●
Weight (kg)	0.65	0.65	0.65	0.65	0.65	1.48	1.48

Optical models, laser classes, and packages can be customized. Contact LMI for more details. Specifications stated are based on Recommended laser classes. Linearity Z and Repeatability Z may vary for other laser classes.

ALL 2500 SERIES MODELS

Interface	Gigabit Ethernet
Inputs	Differential Encoder, Laser Safety Enable, Trigger
Outputs	2x Digital output, RS-485 Serial (115 kBaud)
Factory Communication	PROFINET, Modbus, EtherNet/IP, ASCII, Gocator
Input Voltage (Power)	+24 to +48 VDC (15 Watts); Ripple +/- 10%
Housing	Gasketed aluminum enclosure, IP67
Operating Temperature	0 to 40°C
Storage Temperature	-30 to 70°C
Vibration Resistance	10 to 55 Hz, 1.5 mm double amplitude in X, Y, and Z directions, 2 hours per direction
Shock Resistance	15 g, half sine wave, 11 ms, positive and negative for X, Y, and Z directions
Scanning Software	Browser-based GUI and open source SDK for configuration and real-time 3D visualization. Open source SDK, native drivers, and industrial protocols for integration with user applications, third-party image processing applications, and PLCs.

(1) **Speed Ranges** are from default configuration (full field-of-view and full measurement range) to high speed configuration (reduced field-of-view and measurement range, uniform spacing disabled, optimized data spacing and output, acceleration enabled).
(2) These results are achieved with LMI standard target and optimized sensor configuration.
(3) **Protective Covers** are now available for specific G2 sensor models. The cover protects the sensor's camera and laser windows from scratching caused by dust, debris, and cleaning.

Gocator® LASER LINE PROFILE SENSORS

Gocator 2600 Series — Laser Line Profile

MODELS	2610	2618	2629	2630	2640	2650	2670	2690
Data Points / Profile	4192	4192	4192	4192	4192	4192	4192	3700
Scan Rate (Hz) [1]	1100 - 9000	700 - 10000	2500 - 9000	600 - 9000	600 - 9000	600 - 9000	600 - 9000	900 - 10000
Linearity Z (+/- % of MR) [2]	0.015	0.015	0.03	0.03	0.04	0.04	0.05	0.08
Resolution X (µm) (Profile Data Interval)	2.5	5.0 - 5.4	18 - 23	18 - 33	28 - 46	47 - 104	67 - 197	124 - 550
Repeatability Z (µm) [2]	0.22	0.38	0.30	0.30	1.00	2.70	10.00	12.00
Clearance Distance (CD) (mm)	19.4	44.5	110	110	170	330	495	325
Measurement Range (MR) (mm)	5.0	12	45	130	190	475	1060	1550
Field of View (FOV) (mm)	10.2 - 10.8	20 - 23	71 - 93	71 - 135	105 - 198	190 - 430	272 - 817	385 - 2000
Dimensions (mm)	50 x 116 x 125	46 x 80 x 110	55 x 105 x 165	55 x 105 x 165	55 x 105 x 195	55 x 105 x 280	55 x 105 x 280	55 x 105 x 280
Protective Cover [3]	-	-	-	●	●	●	●	●
Weight (kg)	0.9	0.65	1.34	1.34	1.48	2.12	2.12	2.12

Optical models, laser classes, and packages can be customized. Contact LMI for more details. Specifications stated are based on Recommended laser classes. Linearity Z and Repeatability Z may vary for other laser classes.

ALL 2600 SERIES MODELS

Interface	Gigabit Ethernet
Inputs	Differential Encoder, Laser Safety Enable, Trigger
Outputs	2x Digital output, RS-485 Serial (115 kBaud)
Factory Communication	PROFINET, Modbus, EtherNet/IP, ASCII, Gocator
Input Voltage (Power)	+24 to +48 VDC (15 Watts); Ripple +/- 10%
Housing	Gasketed aluminum enclosure, IP67
Operating Temperature	0 to 50°C (Gocator 2610: 0 to 40°C)
Storage Temperature	-30 to 70°C
Vibration Resistance	10 to 55 Hz, 1.5 mm double amplitude in X, Y, and Z directions, 2 hours per direction
Shock Resistance	15 g, half sine wave, 11 ms, positive and negative for X, Y, and Z directions
Scanning Software	Browser-based GUI and open source SDK for configuration and real-time 3D visualization. Open with user applications, third-party image processing applications, and PLCs.

(1) **Speed Ranges** are from default configuration (full field-of-view and full measurement range) to high speed configuration (reduced field-of-view and measurement range, uniform spacing disabled, optimized data spacing and output, acceleration enabled).
(2) These results are achieved with LMI standard target and optimized sensor configuration.
(3) **Protective Covers** are now available for specific G2 sensor models. The cover protects the sensor's camera and laser windows from scratching caused by dust, debris, and cleaning.

Gocator® LINE CONFOCAL SENSORS

Gocator 5500 Series — Line Confocal

MODELS	5504	5512	5516
Data Points / Profile	1792	1792	1792
Resolution X (µm) (Profile Data Interval)	2.5	6.5	9.9
Linearity Z (+/- % of MR)	0.06	0.07	0.07
Repeatability Z (µm)	0.05	0.2	0.25
Clearance Distance (CD) (mm)	7.8	19.1	61.3
Measurement Range (MR) (mm)	1.1	3.0	5.5
Field of View (FOV) (mm)	4.3	11.6	17.0
Max. surface slope on mirror (deg)	± 15.0	± 20.0	± 13.5
Dimensions (mm)	60x90x303	91x345x419	113x358x440
Housing	IP67	IP55	IP50
Weight (kg)	5	19	21

ALL 5500 SERIES MODELS

Scan Rate	> 16 kHz (when accelerated using PC, without acceleration 300 Hz) (Full MR: G5504 2100 Hz, G5512 4200 Hz, G5516 3800 Hz)
Interface	Gigabit Ethernet
Inputs	Differential / Single Ended Encoder, Trigger
Outputs	2x Digital output
Factory Communication	PROFINET, Modbus, EtherNet/IP, ASCII, Gocator
Input Voltage (Power)	Gocator 5512/5516: +24-48 VDC (+/- 5%) @ 62 W, Gocator 5504: +24-48 VDC (+/-5%) @ 48 W
Operating Temperature	15 to 35°C
Storage Temperature	-30 to 70°C
Vibration Resistance	10 to 55 Hz, 1.5 mm double amplitude in X, Y, and Z directions, 2 hours per direction
Shock Resistance	15 g, half sine wave, 11 ms, positive and negative for X, Y, and Z directions
Scanning Software	Browser-based GUI and open source SDK for configuration and real-time 3D visualization. Open source SDK, native drivers, and industrial protocols for integration with user applications, third-party image processing applications, robots, and PLCs.

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