LMI TECHNOLOGIES

# Gocator Firmware 5.3 – Release Notes

## Firmware Version 5.3.20.26

Document Revision D

## Compatibility

The Gocator 5.x web interface requires Chrome, Firefox or Edge. IE 11 is supported in a limited fashion (see known issues for details).

The 5.x releases are compatible with 4.x SDK.

General support for older hardware models continues, but new measurement tools and PROFINET are not available on the following sensor models:

- G1300
- G2300 A and B revisions

The new Surface OCR tool is only available on GoMax and emulator. Refer to the Hardware and Firmware Capabilities page in the user manual for details.

## New Features

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| *Profile Template Matching* | Compares and aligns profiles to a master template. With this tool you can quickly find differences from a desired profile while also compensating for offset and rotation. |
| *Surface Mask* | Extracts data in circular, elliptical, polygon and rectangular regions. Use the output as input into any other tool to operate only on the desired surface data even with complex geometry. |
| *Profile Line Advanced* | Expands on the functionality of the Profile Line tool, adding outlier rejection and roughness measurements (Ra and Rz). |
| *Surface Curvature* | Allows removing curvature from a surface through polynomial fitting. The fitted polynomial surface or difference surface can be output. |
| *Profile Circle Radii* | Measures the radius of a circular shaped profile at a user-definable number of points around the circumference. |
| *Surface Arithmetic* | Combines two input surfaces with logical and arithmetic operators, allowing masking, difference image and more. |
| *Surface Direction Filter* | Removes noise or undesired surfaces, only passing through surface data points with a specific surface orientation. |

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| *Surface Barcode* | Supports decoding a wide variety of 1D and 2D barcodes in either intensity or heightmap data. The decoded string can be passed to an SDK application for analysis, or converted to measurements for output using the String Encoding tool. |
| *Surface OCR* | Reads text from heightmap or intensity data. The output string can be processed by an SDK application for analysis, or converted to measurements for output using the String Encoding tool. This measurement tool is supported on GoMax and Emulator. |
| *String Encoding* | Encodes the characters from Barcode and OCR tools into measurements for output to a PLC. |
| *Add On tool package* | This new package includes Beta measurement tools that can be added to firmware upgrade packages allowing early evaluation of measurement tools before they are incorporated in the standard firmware. |
| *Beta GoRobot API* | A new beta API for robot integration is provided in the Utilities package as “GoRobot”. |

## Improvements

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| *GO_Tools package now GO_Utilities* | The GO_Tools package has been renamed to GO_Utilities to distinguish it from measurement tools. |
| *Multi-sensor alignment* | Moving bar alignment now achieves more accurate results for Y offset and Z angle alignment. Additional feedback on the alignment status and accuracy is also provided to the user. |
| *G2 performance* | For G2300 and G2400 sensors, the uniform spacing implementation has been optimized, significantly reducing processing time, leading to up to 10-25% higher achievable frame rates.<br>With non-zero X or Z angle, the frame rate of a sensor is improved by up to 50% (on-sensor or while accelerated by GoMax). |
| *GoMax with G3 performance* | For G3 sensors accelerated by GoMax, the GoMax acceleration has been optimized, leading to 15% or more higher frame rates. |
| *Measure page responsiveness* | The responsiveness of elements in the Measure page has been improved, allowing quicker editing of jobs with many tools or tools with many parameters and outputs. |
| *GoMax - Second Ethernet port* | The GoMax now supports use of both ethernet ports. Sensors can now also be connected on a separate subnet through the ETH 2 port, allowing network segmentation. |
| *Software Trigger from PLC* | Sensors can now receive software trigger commands over Modbus, EtherNet/IP and PROFINET. |

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| *Software Start Trigger* | “Software Trigger” has been added as an option for the Start Trigger modes for Fixed Length Surface generation. This allows starting fixed length surfaces on command from PLC or PC. |
| *GDK Add-on libraries* | A GDK based upgrade package can now contain more than one library. The libraries loaded are listed in the web interface. |
| *Historical usage tracking* | Sensors now record operating history and report the time the light (laser or projector) has been in operation in the dashboard. |
| *Surface Track* | All cross-section profiles are output as a profile list. |
| *G2 Upgrade Package Separation* | G2 sensors now have different upgrade packages for each series. This includes 2100, 2300, 2400, 2500 and 2800. |
| *G3 Contrast Threshold* | A new setting has been added to control the contrast threshold on G3 sensors. This allows tuning the detection of points based on the intensities observed in video mode. |
| *G3 Pattern View* | In Video mode, it is now possible to see images of the patterns projected during regular scanning. This allows analysis and tuning of 3D scan data generation including exposure and contrast threshold. |
| *Parameter names in EDS file* | The EtherNet/IP EDS file has been expanded to include names for all parameters for the input and output assemblies. This allows automatic creation of named tags in compatible software such as Rockwell Studio 5000. |
| *SDK Include one-sided data* | The “Include one-sided data” option for Part Detection with opposing buddies is now available through the SDK. |
| *Surface Circular Edge* | A new circle fitting method was added offering better fit accuracy and reduced execution time. |
| *Surface Filter – Relative Height* | The Relative Height operation in Surface Filter was renamed to Relative Threshold and improved to work on Intensity data. |
| *Feature Robot Pose* | Added Matrix data output for use with the new GoRobot API. This data output |

## Bug Fixes

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| ***G1 bug fixes*** | |
| *Selcom Serial processing drops* | With Selcom Serial output enabled a G1 sensor was not able to reach the maximum frame rate of 32kHz without processing drops. |
| *G1 Encoder value* | With filtering enabled, the encoder value on a G1 sensor could be reported as 0 regardless of the actual value. |
| *G1 Decimation filter* | With a G1 sensor in profile mode with Decimation filter enabled, no data may be produced. |
| ***G2 bug fixes*** | |
| *G2400 coordinate system* | The illustrations for Layout Types Normal and Reversed did not apply for G2400 series sensors where connectors are on the opposite end of the sensor. |
| *G2500 Processing drops* | With the web user interface open and at maximum frame rate, G2500 sensors could produce processing drops which would not occur with the web interface closed. |
| *G2500 Multiplexing* | With a buddy system of two G2500, certain exposure combinations and multiplexing enabled, some laser light interference was possible. |
| *Tracking Processing Latency* | The processing latency was reported as 0 when Tracking window was enabled with a G2500 sensor. |
| *Video mode reverse layout* | The orientation of video image for buddied G2500 sensors in reverse layout could be rotated 180 degrees. |
| *Continuity spot selection* | With a G2500 sensor, ¼ subsampling in X and continuity spot selection, no profile data was shown in the renderer. |
| *Continuity spot selection* | With non zero X or Z angle, and Continuity Spot Selection, no data could be generated from sensor. |
| *Recording with Y Decimation* | Decimation in the Y direction on a G2 sensor could cause recording to not function correctly. |
| *Large Max Part Length* | A data processing error could occur if the maximum part length in Part Detection is set very large (e.g., 600k). |
| *Video mode show spots* | Using Show Spots in video mode with multiple exposures could make the video image go black. |
| *Opposite layout* | With a buddy system in Opposite layout and Part Detection Edge Filtering enabled, a data processing error could be generated, and no data was produced. |
| *G2880 spot overlay* | With a G2880 sensor in Video mode, the Spot overlay feature did not consistently show the spots correctly. |

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| *Tracking* | With the tracking threshold at certain values, sensors may get stuck in Search mode and not be able to enter Track mode. |
| *Polygon alignment* | With no sensors assigned to corners, the alignment appears to run without errors. |
| *Multiple exposure* | Multiple exposures, with Uniform spacing disabled, and non zero X or Z angle, were not displayed with correct colors in the visualizer. |
| ***G3 bug fixes*** | |
| *G3 with 24V* | Some G3 sensors with 24V power supply at certain exposure settings were not able to successfully acquire a scan. |
| *G3 autoset exposure* | Using the autoset exposure feature did not always work with the Independent Exposures feature enabled. |
| ***GoMax bug fixes*** | |
| *GoMax and Autoset Exposure* | With a sensor accelerated by GoMax, and using the Autoset exposure feature, the exposure was not set correctly every time. |
| ***Measurement tool bug fixes*** | |
| *Surface Segmentation crash* | A sensor crash could occur with specific data conditions when using the Surface Segmentation tool. |
| *Surface Edge regions* | The Surface Edge tool could show four regions after switching to Video mode and back to Surface mode again. |
| *Profile Line Advanced* | Min and Max Error points included outliers that were rejected by the outlier percentile setting. |
| *Surface Vibration Correction* | With very large input surfaces, the Surface Vibration tool did not always correctly operate. |
| *Surface Vibration Correction* | Operation on surfaces with Uniform Spacing disabled was not functioning correctly. Support for Uniform Spacing disabled has been removed. |
| *Surface Ball Bar* | Operation on surfaces with Uniform Spacing disabled was not functioning correctly. Support for Uniform Spacing disabled has been removed. |
| *Bounding Box Global Y* | When taking in Surface output from other tools, the Global Y measurement of the Surface Bounding Box tool was not always correct. |
| *Surface Stitch* | The Surface Stitch output was not always correct after start and stop operations. |
| ***Output bug fixes*** | |
| *Factory restore with running EIP command* | Factory restore did not complete when performing a get attributes operation over EtherNet/IP at the same time. |
| *PROFINET job switch* | Switching jobs was not always successful if the .job extension was missing or if two switch commands were sent shortly after each other. |

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| *Job switch failure* | When failing to switch jobs via industrial ethernet protocols, an error was not always reported. |
| *Sensor not discoverable* | After a temporary IP address set via PROFINET, followed by a reset, the sensor is correctly set to have 0.0.0.0 IP address. However, the sensor was not discoverable via kDiscovery or the SDK in this state. |
| ***SDK bug fixes*** | |
| *SDK Memory Leak* | With many sensors connected to an SDK application, the SDK library may show a memory leak related to the discovery of sensors on the network. |
| *.NET SDK* | When attempting to obtain a geometric feature from a measurement tool by calling GetFeature(), a MemberAccessException could be generated. |
| ***General bug fixes*** | |
| *Sectioning* | The grid shown in the Section profile view was not always updated when modifying the start and end point of a Model page cross section. |
| *Emulator buddy filter* | The buddy filter in the emulator scenario list did not always correctly filter. |
| *Intensity visualization updates* | The intensity visualization did not always update with measurement tool changes. |
| *Visualizer update to tool output* | When switching between Measurement and Data output, the visualizer did not always update to show the selected output. |
| *Visualization of tool data output* | The visualization of tool data output did not always update consistently. |
| *Feature point* | A geometric Point feature could be drawn at the center of the visualizer when no feature was being generated by a measurement tool. |
| *Stale geometric features* | Geometric features from a previous frame could still be seen from tools after switching modes to clear the visualizer. |
| *Profile visualization cleared* | When using non-zero values for X and Z angle transforms, the profile visualization could be cleared when making tool changes such as moving a region. |
| *Browser crash at high zoom level* | A browser crash could occur after zooming in extremely close to data. |
| *Part Matching* | The Quality measure from Part Matching could show 100% even when there is no scan data. |
| *Part Matching with large surface* | A crash could occur when an accelerated sensor with Part Matching enabled and Part Detection with a large maximum part length. |
| *Running state* | The state of the “Start” button could stay in the playing state when playing recorded data. |
| *Job switch in emulator* | With specific job files, the emulator could crash when switching between jobs. |
| *CSV export* | Multiple lines per frame were output when enabling Data output from a tool. |

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| *CSV export* | With a full recording buffer on a buddy system the CSV data from sensor could fail to export. |

## Known Issues

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| *Internet Explorer* | Several issues exist with Internet Explorer 11 when using large data sets due to browser memory limitations. Refer to the Gocator user manual for IE 11 specific instructions to work around some of the issues. |
| *Translations incomplete* | Not all English text is translated in every language. |
| *Surface Track* | The Surface Track tool is not supported on the GoMax device. |
| *G3504 with Interreflection Material* | The G3504 does not support the Interreflection Material setting at full field of view due to memory limitations. Reducing the field of view allows the sensor to run reliably with Interreflection enabled. |
| *Script Tool* | Memory leaks can occur when using *arrays* and *structs* within a script. Both should be avoided when possible or tested thoroughly to ensure stability. |
| *Moving Bar Alignment* | When using Moving Bar alignment with “Encoder or Speed Calibration”, only “X, Z, Y Angle” alignment is preformed even when selecting more degrees of freedom. To perform higher degree alignment, “Encoder or Speed Calibration” *must not be selected*. |

## SDK and Protocol Changes — Protocol Version 101.14

Protocol version is specified as [Major].[Minor]. Firmware releases with the same Protocol Major version are backward compatible and users do NOT need to recompile their applications unless features in the newer version are used.
Note that these are protocol and SDK changes from the most recent previous release. Refer to the Gocator 4.x SDK migration guide for details on how to port your 3.x application to Gocator 4.x or 5.x firmware.

### SDK

| *Action* | Name | Description of change |
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| *Added* | `GO_HEALTH_LIGHT_OPERATIONAL_TIME_TOTAL` | New indicator for total light (laser or projector) operation time. |
| *Renamed* | `GoProfileLineRegion` renamed to `GoProfileLineFittingRegion` | Renamed and deprecated old name to remove ambiguity. |

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| *Added* | `GoAdvanced_IsSurfaceEncodingUsed()`<br>`GoAdvanced_SurfaceEncodingSystemValue()` | Returns the surface encoding type and system's surface encoding type. |
| *Added* | `GoAdvanced_*ContrastThreshold()` | Functions related to new G3 ConstrastThreshold parameter |
| *Renamed* | `GO_BUDDY_STATE_STANDALONE_SENSOR` to `GO_BUDDY_STATE_STANDALONE_NOBUDDY` | |
| *Added* | `GO_SURFACE_GENERATION_START_TRIGGER_SOFTWARE` | New software trigger mode for fixed length surface generation. |
| *Renamed* | `GO_PATTERN_SEQUENCE_TYPE_FOCUS_AID` to `GO_PATTERN_SEQUENCE_TYPE_FOCUS` | |
| *Added* | `GO_PATTERN_SEQUENCE_TYPE_STANDARD_SEQUENCE`<br>`GoSetup_*PatternSequence*` | New G3 video standard sequence images. |

## Configuration and Protocol changes

| *Action* | Type | Name | Description of change |
|---|---|---|---|
| *Modified* | Configuration | Setup/Devices/Device/ PatternSequenceType | Added Focus and Standard Sequence options. |
| *Added* | Configuration | Setup/Devices/Device/ PatternSequenceIndex | Pattern index for use with Standard Sequence option in PatternSequenceType. |
| *Modified* | Configuration | Setup/Devices/Device/Material/ SpotThreshold attributes:<br>- min<br>- max<br>- readonly | Added attributes. |
| *Modified* | Configuration | Setup/Devices/Device/Material/ SurfaceEncoding attribute:<br>- readonly | Added attribute. |
| *Added* | Configuration | Setup/Devices/Device/Material/ ContrastThreshold and attributes | Contrast detection threshold. |
| *Modified* | Configuration | Setup/SurfaceGeneration/ FixedLength/StartTrigger | Added "2- Software trigger" option. |

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| *Modified* | Protocol (Gocator) | Get System Info v2 | Added modelNumber and modelDisplayName fields to Local Info (previously Device Info) and Remote Info |
| *Modified* | Protocol (Gocator) | Get States | Added the following fields:<br>- voltage<br>- cableLength<br>- quickEditEnabled<br>- securityLevel<br>- brandingType |
| *Added* | Protocol (Gocator) | Health messages | Added the following messages:<br>- Light Operational Time<br>- Bar Alignment Status |
| *Added* | Protocol (Modbus) | Command Register command set | Added command “7” (Software trigger) to 16-bit command set for use in Command Register. |
| *Added* | Protocol (Profinet) | Control module | Added command “7” (Software trigger) for use in Command Register in Control module. |

## GDK Changes

Note that with 5.3, GDK build tool versions have been updated. Use the “Gocator GDK Prerequisites – Version 4.0” from the LMI website.

| ***Action*** | **Name** | **Description of change** |
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| *Removed* | `GdkParams_FeatureParamsCount()` | |
| *Removed* | `GdkToolCfg_SetVersion()` | |
| *Removed* | `GdkPointSetRegion` | |