USER MANUAL

Gocator Snapshot Sensors

Gocator 3210 & 3500 Series Sensors

Firmware version: 6.3.x.xx

Document revision: C

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Contact Information

LMI Technologies, Inc.
9200 Glenlyon Parkway
Burnaby BC V5J 5J8
Canada

Telephone: +1 604-636-1011
Fax: +1 604-516-8368

www.lmi3D.com

Installation

The following sections provide grounding, mounting, and orientation information.

> When connecting cordset connectors to the sensor's connectors, do not exceed a torque of 2 Nm (18 in-lbs). Ensure that you properly secure the cordset cabling to avoid stress loading on the sensor connectors.

Gocator 3210: 24 VDC Operation

Although LMI recommends operating Gocator 3210 at 48 VDC to fully exploit the sensor's capabilities, starting with Gocator firmware 4.7, Gocator 3210 can operate when connected to a 24 VDC power supply. This may sometimes be necessary, for example, because of local regulations.

When running the sensor with a 24 VDC power supply, because of limitations in the sensor and in cordsets, the projector intensity is reduced. As a result, when running a 3210 sensor at 24 VDC, you may need to increase exposure time with darker targets to compensate for the reduced projector intensity. For information on setting exposure, as well as the impact of running the sensor at 24 VDC on projector intensity, see *Exposure* on page 104.

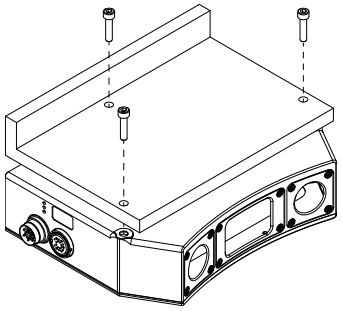
Note that because projector intensity decreases with longer cordsets (caused by the increased resistance and higher current), if limiting exposure time is important, try to limit the length of the cordset.

Note that if you run a 3210 sensor on 24 VDC, you must specify this voltage and the cordset length in the web interface. For more information, see *Networking and Power* on page 83.

Mounting

Sensors should be mounted using a model-dependent number of screws. Some models also provide the option to mount using bolts in through-body holes. Refer to the dimension drawings of the sensors in *Specifications* on page 1036 for the appropriate screw diameter, pitch, and length, and bolt hole diameter.

> Proper care should be taken in order to ensure that the internal threads are not damaged from cross-threading or improper insertion of screws.



Sensors should not be installed near objects that might occlude a camera's view of the projected light.

```
        printf("Error: GoSystem_FindSensorByIpAddress:%d\n", status);
        return;
}

// construct accelerator
if ((status = GoAccelerator_Construct(&accelerator, kNULL)) != kOK)
{
        printf("Error: GoAccelerator_Construct:%d\n", status);
        return;
}
// start accelerator
if ((status = GoAccelerator_Start(accelerator)) != kOK)
{
        printf("Error: GoAccelerator_Start:%d\n", status);
        return;
}
printf ("GoAccelerator_Start completed\n");
if ((status = GoAccelerator_Attach(accelerator, sensor)) != kOK)
{
        printf("Error: GoAccelerator_Attach:%d\n", status);
        return;
}

// create connection to GoSensor object
if ((status = GoSensor_Connect(sensor)) != kOK)
{
        printf("Error: GoSensor_Connect:%d\n", status);
        return;
}
```

After, the SDK application can control an accelerated sensor in the same way as an unaccelerated sensor.

Estimated Performance and Scan Rates

This section provides estimated scan rates and measurement tool performance.

Note that the estimates are based on tests done using Gocator firmware 5.2 SR1.

The following tables provide estimates of the scan rates of Gocator 3210, 3506, and 3504 under different field-of-view and resolution settings.

For these estimates, the following settings were used:

- Exposure was set to 4 milliseconds.
- No measurement tools added.
- **Reduce Occlusion** and **Acquire Intensity** were disabled.
- **Uniform Spacing** was enabled.

The estimated PC-based performance and scan rates (the "With PC Accelerator" columns) are based on the following hardware specifications:

PC

- Processor: Intel i7 5960X
- RAM: 16 GB
- Operating system: Windows 8.1 Pro

Graphics Card (only applies to the "+ CUDA" column)

- Processor: NVIDIA GeForce GTX 970
- RAM: 12 GB DDR5

Gocator 3210 Estimated Scan Rates

Field of View (X x Y x MR)	Spacing (mm)	Sensor-only (Hz)	With GoMax (Hz)	With PC Accelerator (Hz)	With PC Accelerator + CUDA (Hz)
100x154x110	0.5	6	10	10	10
100x154x110	0.2	1.8	10	10	10
100x154x110	0.1	0.5	4.7	10	10
100x154x110	**0.08**	0.3	4.0	10	10
100x154x110	0.05	0.15	2.1	5.4	7.2

Gocator 3506 Estimated Scan Rates

Field of View (X x Y x MR)	Spacing (mm)	Sensor-only (Hz)	With GoMax (Hz)	With PC Accelerator (Hz)	With PC Accelerator + CUDA (Hz)
30x45x25	0.2	4.3	8.5	8.5	8.5
30x45x25	0.1	3.2	8.5	8.5	8.5
30x45x25	**0.02**	0.2	2.7	7.7	8.5

Gocator 3504 Estimated Scan Rates

Field of View (X x Y x MR)	Spacing (mm)	Sensor-only (Hz)	With GoMax (Hz)	With PC Accelerator (Hz)	With PC Accelerator + CUDA (Hz)
14x18x7	0.05	2.9	7.5	7.5	7.5
14x18x7	0.02	1	6.4	7.5	7.5
14x18x7	0.01	0.3	2.9	6.4	7.4
14x18x7	**0.006**	0.15	2.0	5.4	6

The following table lists the scan rate speed increase factor when accelerating Gocator 3210, 3506, and 3504 with GoMax. Sensors are set at their default resolutions. The same settings listed above were used for these results.

Gocator 3210 Sensor

The Gocator 3210 is defined below:

MODEL	3210
Scan Rate (Hz)	6
Imagers (megapixels)	2
Clearance Distance (CD) (mm)	164.0
Measurement Range (MR) (mm)	110.0
Field of View (mm)	71.0 x 98.0 - 100.0 x 154.0
Repeatability Z (µm)	4.7
Resolution XY (mm)	0.060 - 0.090
VDI/VDE Accuracy (mm)*	0.035
Dimensions (mm)	49 x 146 x 190
Weight (kg)	1.7
Light Source	Blue LED (465 nm)
Interface	Gigabit Ethernet
Inputs	Differential Encoder, Trigger
Outputs	2x Digital output, RS-485 Serial (115 kBaud) Analog Output (4 – 20 mA)
Input Voltage (Power)	+24 to +48 VDC (50 Watts); Ripple +/- 10%
Housing	Gasketed aluminum enclosure, IP67
Operating Temp.	0 to 45° C
Storage Temp.	-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

* Based on 2634, Part 2.

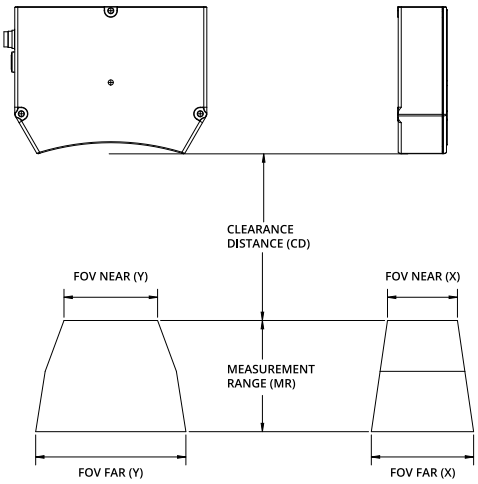
Linearity Z values and Resolution Z are typical values.

Field of View and Resolution XY are specified as [X] x [Y], near to far.

Differential encoder requires the use of Master 400/800/810/1200/2400/2410.

For details on scan rates, see *Estimated Performance and Scan Rates* on page 612.

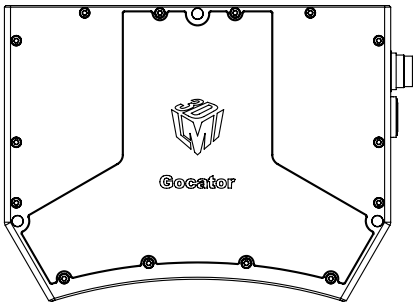
The following diagram illustrates some of the terms used in the table above.

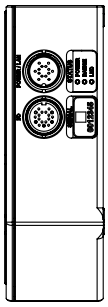


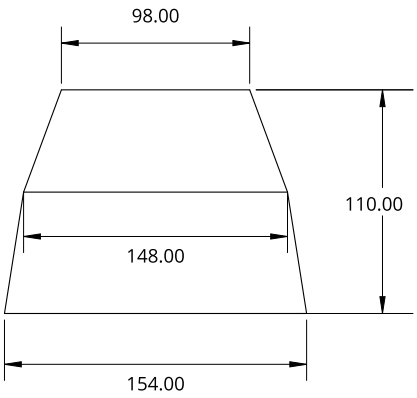
Mechanical dimensions, CD/FOV/MR, and the envelope for each sensor model are illustrated on the following pages.

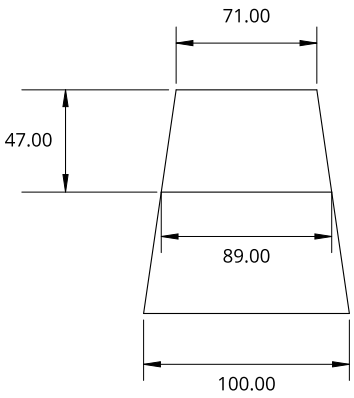
Gocator 3210

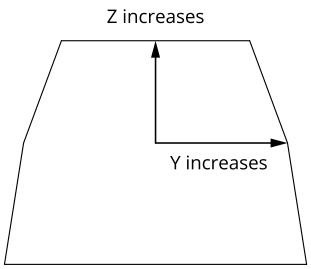
Field of View / Measurement Range / Coordinate System Orientation

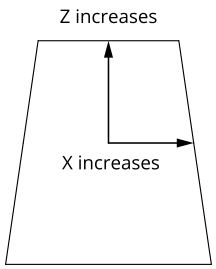












Dimensions

The following drawings include the optional shop air heat sink. For more information, see *APPNOTE_Gocator_3210_Heatsink.pdf*, available on LMI's website.

Envelope