

Gocator®

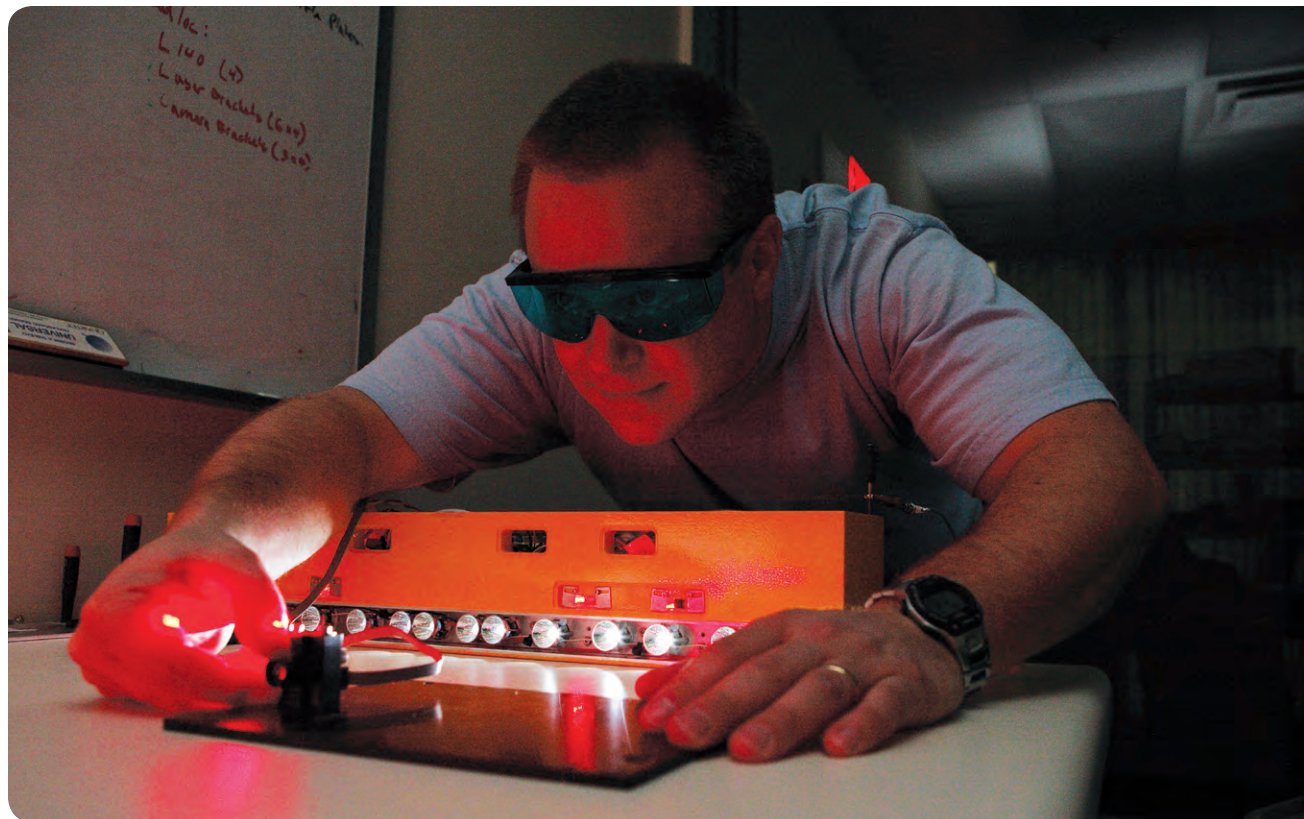
ALL-IN-ONE 3D SMART SENSOR



LMI TECHNOLOGIES
www.lmi3d.com

3D MEASUREMENT AND CONTROL, MADE EASY™

LMI Technologies is a global leader in 3D scanning, visualization, measurement, and control technology. We focus on developing products to deliver a customer experience centered on ease of use, flexibility, and reliability. With over 30 years of sensor design expertise, our solutions are making part inspection, 100% quality control, optimization, and automation simpler to accomplish in some of the harshest industrial conditions around the world. Today, many of the world's largest companies rely on the expertise, innovation, accuracy, and reliability built into every LMI sensor.



Today's manufacturing facilities need 3D solutions to inspect materials, improve quality control, and introduce factory automation easily and without advanced engineering know-how. Gocator is an evolutionary leap in 3D sensor technology that solves this challenge and delivers an unparalleled user experience.

Gocator's unique all-in-one design puts everything needed for set up, measurement, and control in one web-enabled, pre-calibrated package. Everyone from production floor staff to the most experienced 3D systems engineer can use Gocator to precisely scan 3D shape, measure critical dimensions, and communicate to factory floor equipment - all from a web browser.

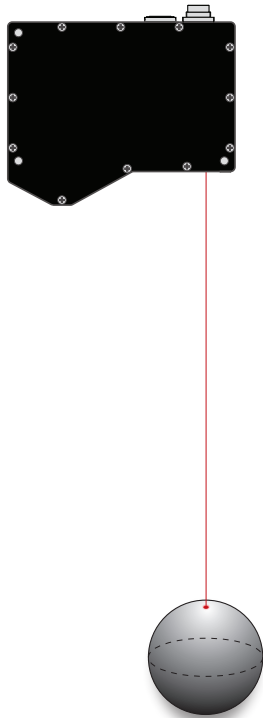
Simple. Smart. Complete.

Gocator is 3D measurement and control for everyone.



DISPLACEMENT SENSORS

Laser Distance Triangulation

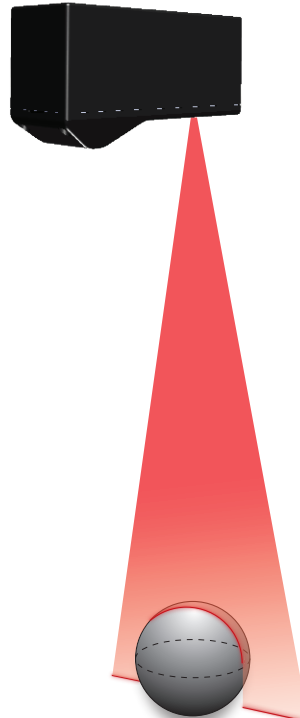


REAL-TIME CLOSED LOOP AUTOMATION

Gocator Displacement Sensors are high speed (up to 32 kHz) distance measuring devices. Ideal for non-contact dimensional measurements, such as height and thickness, or surface roughness, these sensors are easy to network and integrate.

PROFILE SENSORS

Laser Line Profile Triangulation

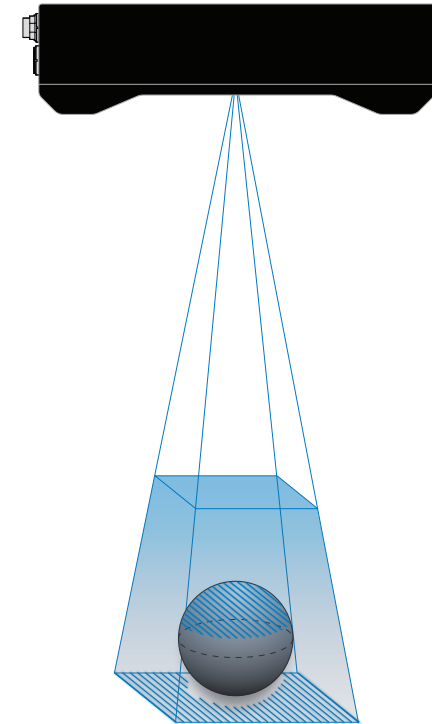


THE ORIGINAL 3D SMART SENSOR

Gocator Profile Sensors measure a cross sectional shape. Cross sections can be collected to form 3D point clouds representing whole parts for performing volumetric measurements. The same sensor can also provide valuable calibrated 2D intensity images for use with common 2D imaging libraries.

SNAPSHOT SENSORS

Stereo Full Field Structured Light



WORLD'S FIRST ALL-IN-ONE SNAPSHOT SENSOR

Gocator Snapshot Sensors are the first family of 3D smart sensors to combine 3D point cloud acquisition and measurement tools in a single industrial package. With a rich set of built-in volumetric and specific 3D feature measurement tools, Gocator snapshot sensors are ideal for a wide variety of non-contact, in-line inspection applications where objects must remain stationary.

WEB ENABLED

- Built-in web server, no separate software required
- Use a standard web browser for setup & control
- Easy to use, intuitive, multi-language interface
- View real-time data on any computer, any OS

APPLICATION READY

- Built-in measurement tools, no coding necessary
- Easy setup allows real 3D measuring in minutes, not days
- Tag and track parts for sorting & rejecting defects right from the sensor
- Use as a single sensor, dual sensor system, or scale up to a network of sensors
- Measure profiles or volumes and detect surface patterns all with the same sensor

FLEXIBLE SOLUTION

- Available in displacement, line profile, and snapshot technologies
- Choice of 2M, 3R, and 3B laser classes
- Open source SDK for custom application development

HIGH PERFORMANCE

- Scan rates up to 32,000 Hz
- Resolution to microns with large fields of view
- Gigabit Ethernet data delivery

FACTORY PRE-CALIBRATED

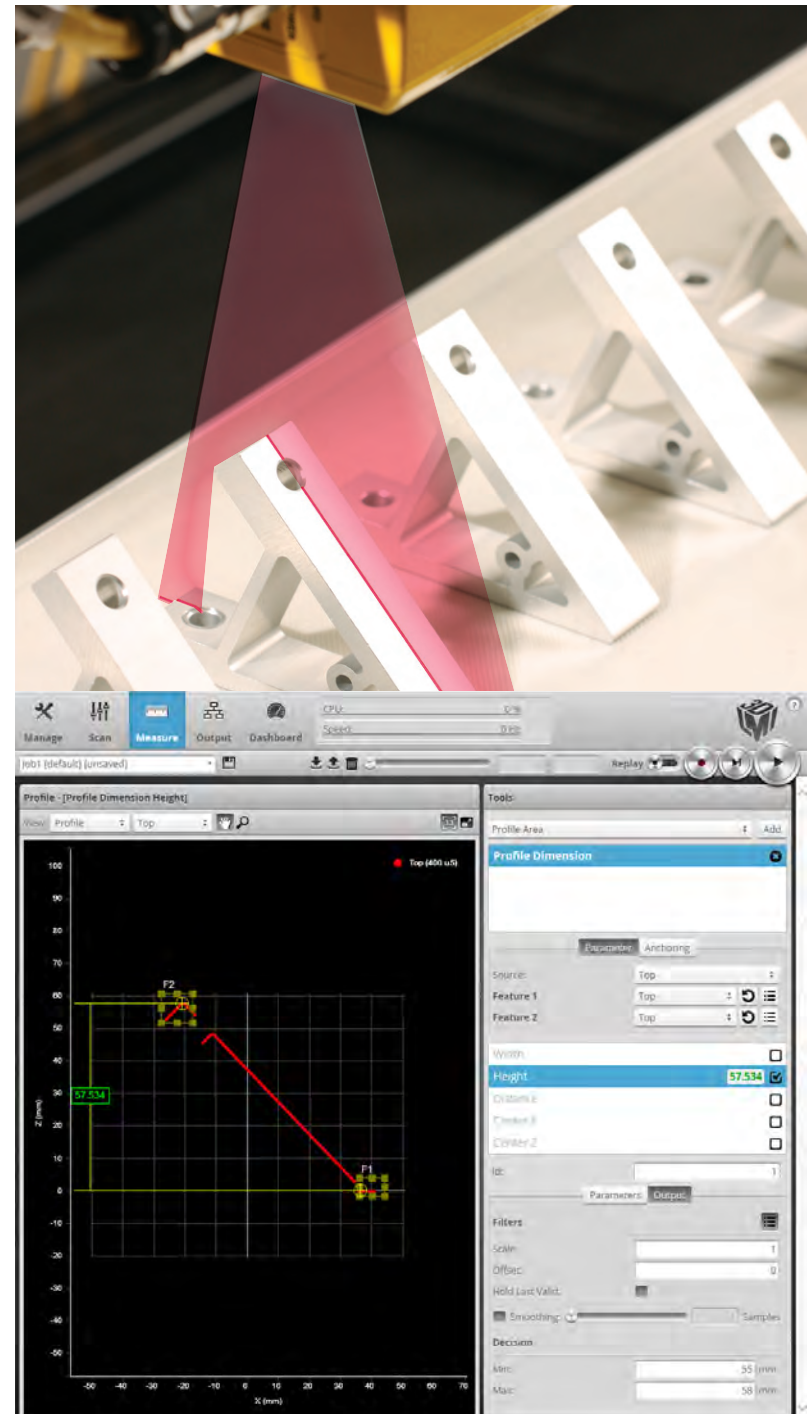
- Delivers real world coordinates, right out of the box
- Highly accurate assembly process for consistent, reliable, & precise measurement

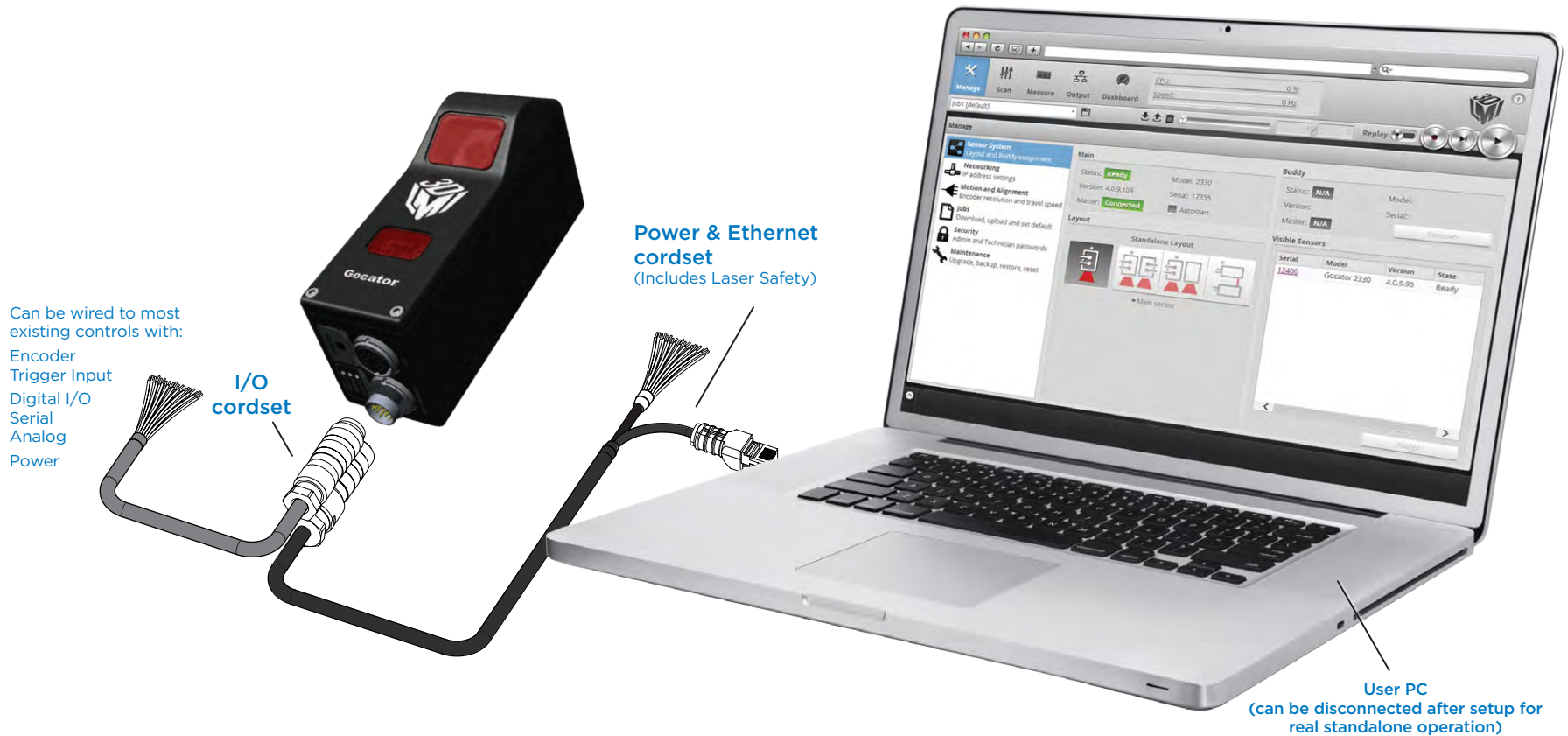
RICH I/O

- Interface to your existing control systems, including PLCs
- Choose how you want to trigger and scan
- Select Ethernet, digital, analog, and/or serial data output

COMPACT FOOTPRINT

- Easily fits in small spaces
- Can be used on robotic arms
- Fits your application without costly modifications





The onboard web server allows for fast setup on any computer
Connect via industry standard Ethernet
Simple cabling for inputs, outputs, and power
True standalone operation allows you to setup and walk away
Modbus TCP, EtherNet/IP™, and simple ASCII string support for “plugging into” PLCs or robot controllers
No hidden costs or additional hardware required



Use your favorite web browser to access and control the Gocator
Multi-language ready for non-English speakers to setup and fully utilize
With a few mouse clicks, you can setup Gocator to work within your control system
Intuitive control panels make setup fast & easy

The screenshot displays the Gocator web interface within a browser window. The main area shows a 3D surface scan of a part, with a cross-section profile highlighted. The interface includes a top navigation bar with tabs for Manage, Scan, Measure, Output, and Dashboard. On the right side, there are several control panels: Scan Mode (with icons for Video, Profile, and 3D), Trigger (with Source: Time and Frame Rate), Sensor (with Exposure Mode and Intensity), Alignment (with a green ALIGN button), Filters, Surface Generation, and Part Detection. Yellow callout lines point to specific features: 'Real time sensor feedback' points to the top status bar; 'Choose the data acquired' points to the Scan Mode icons; 'Real time data visualizer' points to the 3D surface plot; 'Choose your trigger (time, encoder, external input, or software)' points to the Trigger panel; 'Modify sensor settings for faster speeds' points to the Sensor panel; 'Control exposure to handle various surface types' points to the Exposure Mode settings; 'Generate 3D surface from cross section profile data' points to the ALIGN button; and 'Set up how parts are detected and separated for volumetric measurement' points to the Part Detection panel.

Real time sensor feedback

Choose the data acquired

Real time data visualizer

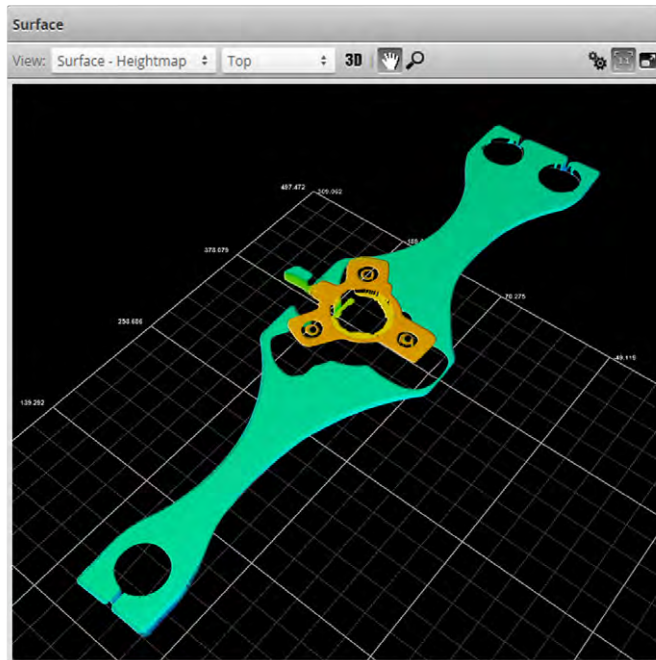
Choose your trigger (time, encoder, external input, or software)

Modify sensor settings for faster speeds

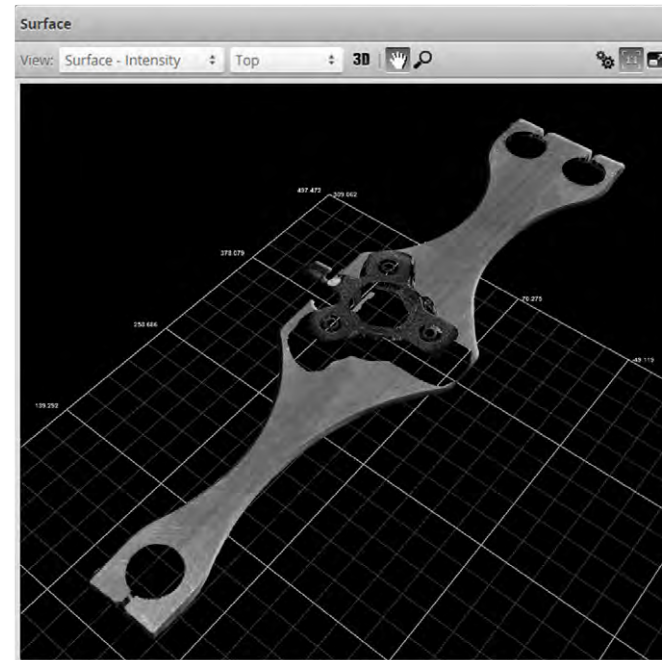
Control exposure to handle various surface types

Generate 3D surface from cross section profile data

Set up how parts are detected and separated for volumetric measurement



WHOLE PART



INTENSITY OUTPUT (Acquire Intensity)

- Detects individual parts and builds a 3D model ready for measurement
- Built-in 3D volumetric tools to measure dimensions, location, & orientation of each part
- Auto detects and sorts multiple parts
- Save system cost & reduce complexity with Gocator's all-in-one whole part capability
- Fully interactive pan, zoom, orbit controls for responsive 3D visualization

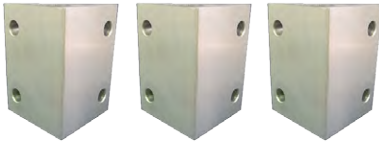
- Use one sensor to perform both 2D vision & 3D measurement
- Produces a calibrated, gray scale image from sensor light reflected by the part
- Easily integrate 2D image processing libraries to identify defects or patterns on a surface



Exposure is key to achieving optimal measurement results

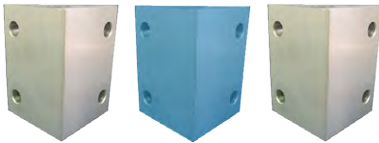
Gocator sensors provide up to three exposure modes for the flexibility needed to scan different types of target surfaces

Adjusting Gocator's exposure is as easy as dragging a slider



SINGLE EXPOSURE

Single Exposure is ideal for scanning parts with similar reflectivity.



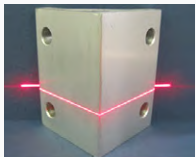
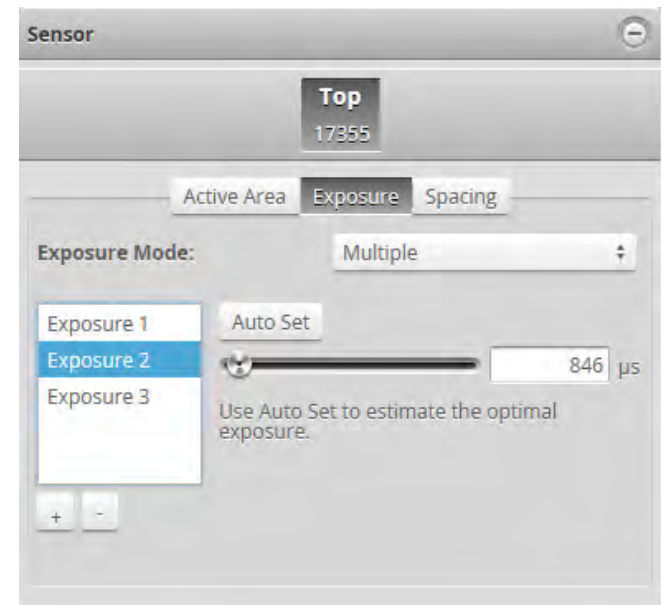
DYNAMIC EXPOSURE

With Dynamic Exposure, Gocator adjusts exposure automatically between a min/max range to handle varying surface reflectivity between one scan and the next.

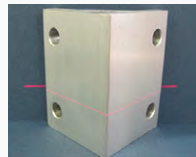


MULTIPLE EXPOSURE

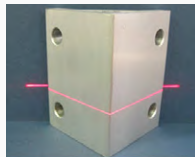
Gocator creates a single laser profile from Multiple Exposure settings, making it easy to measure objects with both light and dark surfaces simultaneously.



Over Exposure



Under Exposure



Correct Exposure

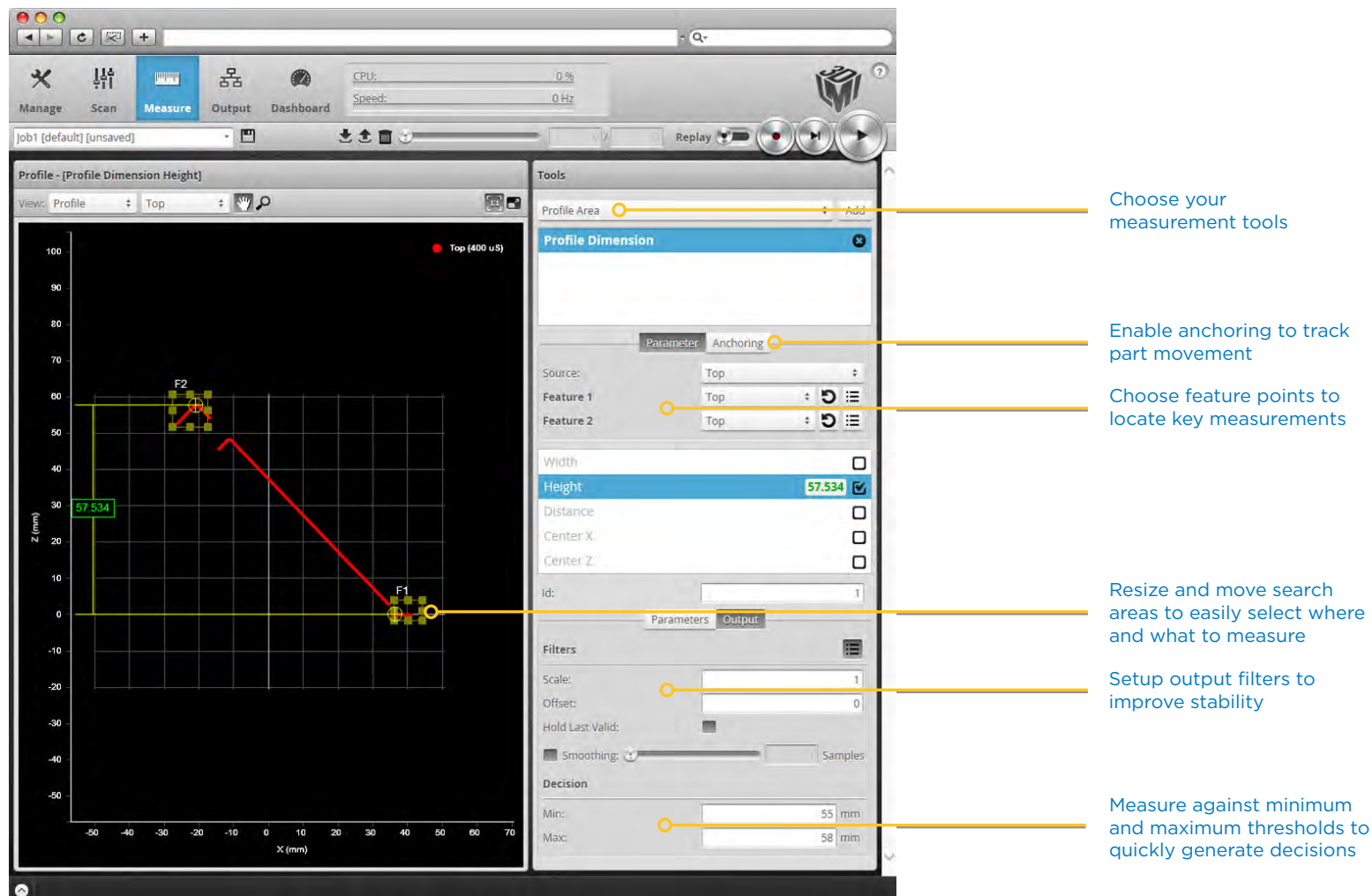
Powerful built-in tools turn 3D data into real-time measurements with pass/fail decisions

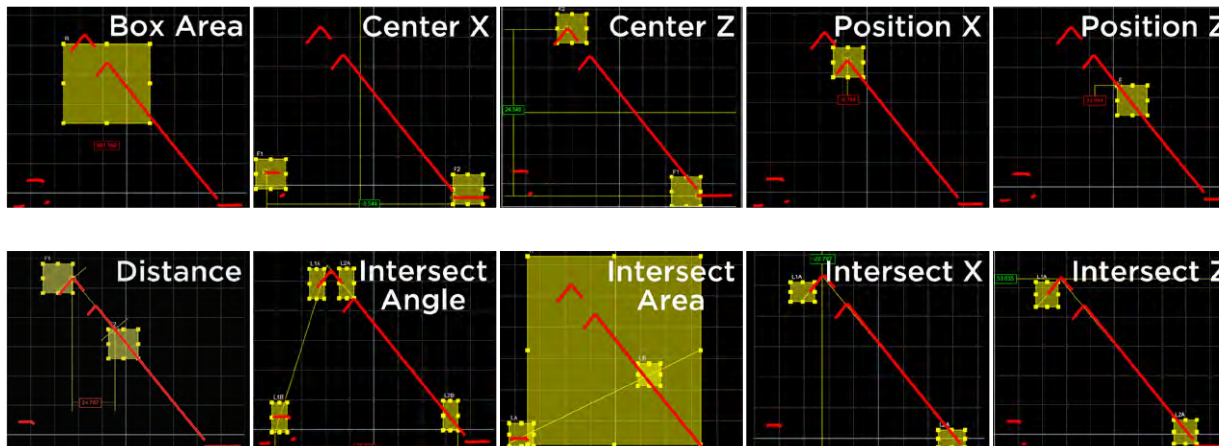
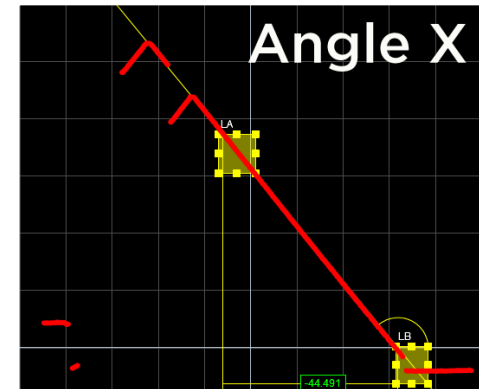
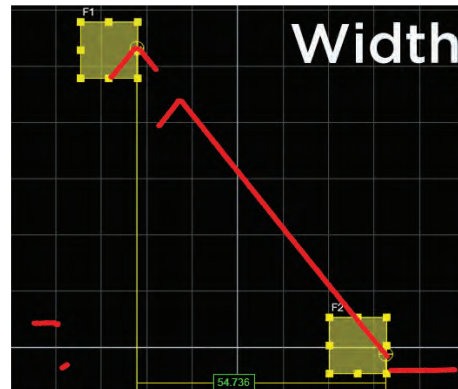
Select the type of measurement and see live results with pass/fail limits

Fixturing maintains valid measurements by tracking part movement

Record and playback features allow refinement of tolerances or export to CSV for later analysis

Output filtering settings add extra stability to measurements





Script #0

65806.000

ID: 0

Press save to store and apply script

```
8 }
9 // Get the values from Width/Height measurement
10 // Values are accessed with the 'value' function
11 // decisions with the 'decision' function.
12 signed long long width = value("Width");
13 signed long long height = value("Height");
14 // Calculate Manhattan Distance value and decision
15 signed long long manhattan;
16 int result;
17 manhattan = abs(width) + abs(height);
18 result = (manhattan > decisionMin) % (manhattan);
19 // Emit final value and decision using the 'output' function
20 output(manhattan, result);
21
22
```

Save Remove

Gocator's built-in flexible tools provide a full suite of measurement capabilities to solve most inspection challenges

No need for highly specialized knowledge, intensive training, or writing any code, just point, click, & measure

Use Gocator's tools or write your own script to perform tailored calculations using "C"

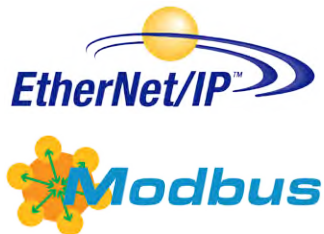
Download firmware updates, for free, to access new Gocator functionality

Simply click on your choice to enable various outputs and decisions

Gocator has the flexibility to simultaneously output data and decisions to a wide variety of I/O

Tag and track parts for reject or sorting at a later time or position with scheduled outputs

Easily communicate with your existing hardware including PLCs and robot controllers via Modbus TCP, EtherNet/IP™ or custom ASCII strings

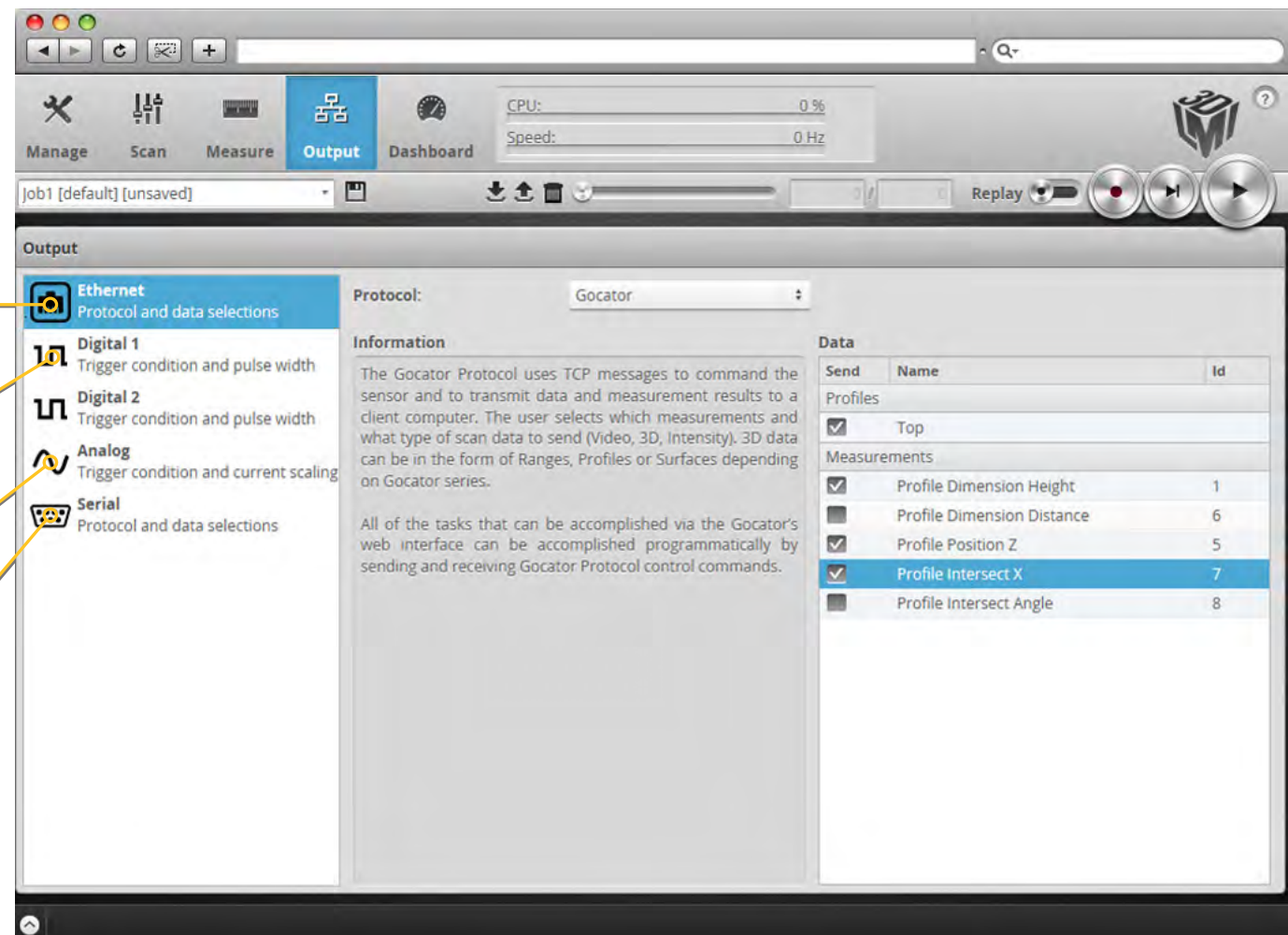


Send profile and measurement information using binary, ASCII, and standard PLC protocols via Ethernet

Control simple external devices with digital outputs

Convert measurement values and decisions to analog output signals

Transmit data and decisions via RS-485 serial output channel




```

ReceiveSync.c
// establish a Gocator data connection
if ((status = Go2System_ConnectData(system, GO2_NULL, GO2_NULL)) != GO2_OK)
{
    printf("Error: Go2System_ConnectData:%d\n", status);
    return;
}

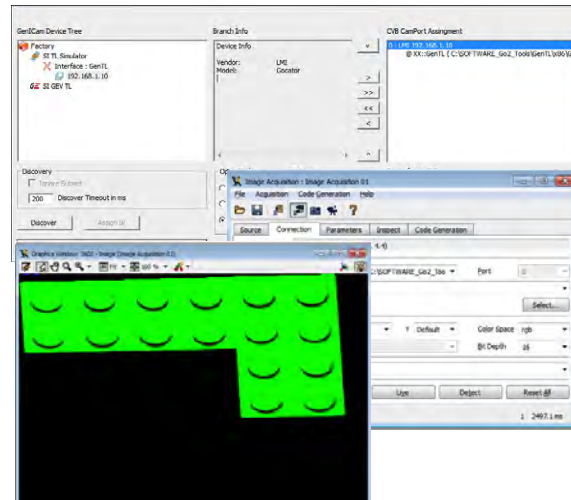
// Start Gocator system
if ((status = Go2System_Start(system)) != GO2_OK)
{
    printf("Error: Go2System_Start:%d\n", status);
    return;
}

//loop until 10 results are received
i = 0;
while (i < NUM_PROFILES)
{
    if (Go2System_ReceiveData(system, RECEIVE_TIMEOUT, &data) == GO2_OK)
    {
        printf("Data message received!\n");
        printf("Timestamp: %llu\n", Go2Data_Timestamp(data));
        printf("Encoder: %ld\n", Go2Data_Encoder(data));
        printf("Frame Index: %ld\n", Go2Data_FrameIndex(data));
        printf("Item count: %ld\n", Go2Data_ItemCount(data));

        //each result can have multiple data items
        for (j = 0; j < Go2Data_ItemCount(data); ++j)
        {
            Go2Data_dataItem = Go2Data_ItemAt(data, j);
            if (Go2Object_Type(dataItem) == GO2_TYPE_MEASUREMENT_DATA)
            {
                Go2MeasurementType mtype = Go2MeasurementData_Type(dataItem);
                Go2Double mvalue = Go2MeasurementData_Value(dataItem);
                printf(" mtype: %u -- value: %3.3f\n", mtype, mvalue);
            }
        }
    }
}
    
```

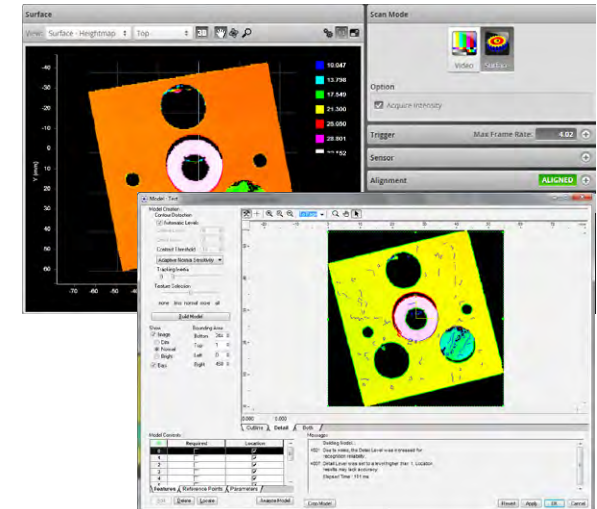
OPEN SOURCE SDK

- A single C based SDK to control, acquire, and manage any Gocator
- Unified library for all Gocator technologies - learn it once and use it everywhere
- Compile and execute on any target environment



GENICAM TRANSPORT LAYER

- Real-time streaming of 3D data from Gocator to PC applications for external image processing
- GenTL driver support enables Gocator to interface with: Halcon, CVB, Sherlock, and AQ Sense



NATIVE DRIVER

- Real-time streaming of 3D data from Gocator to HexSight and NI LabVIEW
- Export 3D data from Gocator in CSV or ASCII format - suitable for use by Excel, various CAD software, and MATLAB



Gocator automatically recognizes a second sensor called a “Buddy”

Dual sensor mode seamlessly combines profile data from both Main and Buddy sensors as if they were one

Dual Sensor Systems use a single GUI to configure, measure, make decisions, and show results

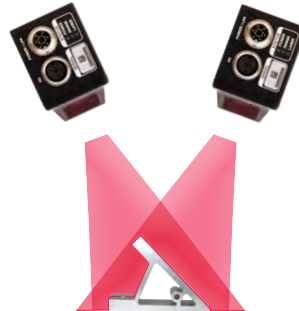
FLEXIBLE LAYOUTS

WIDE ORIENTATION

Mount a Main (left) with a Buddy (right) to measure objects that are wider than a single sensor's field of view - sensors can be angled to avoid occlusions



OR

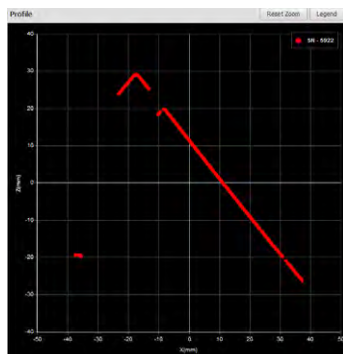


OPPOSITE ORIENTATION

The Main and Buddy performs top and bottom differential measurements to calculate true thickness when the object cannot be referenced to a known surface such as a conveyor

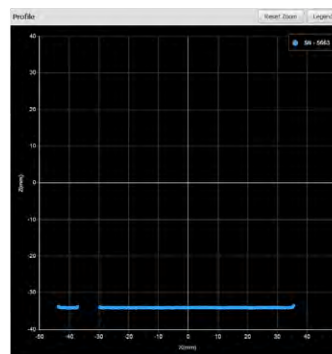


MAIN



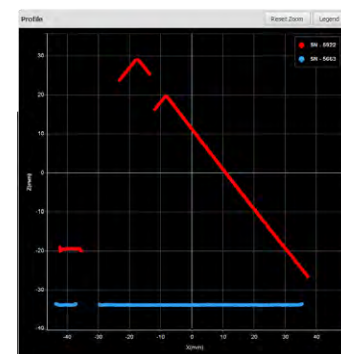
+

BUDDY



=

COMBINED



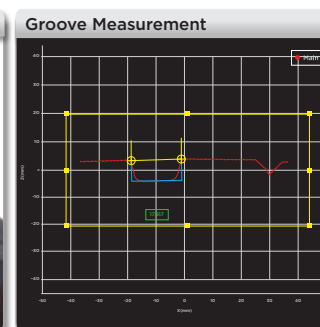
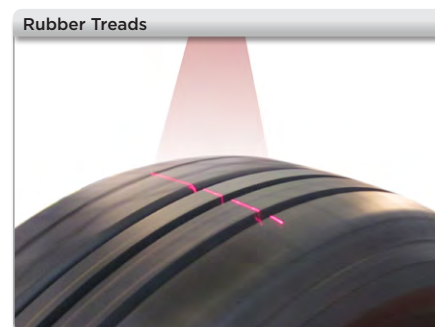
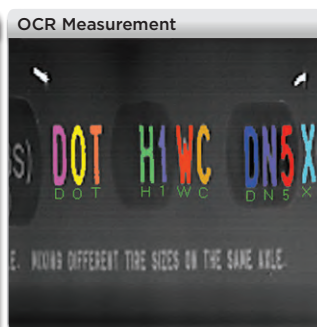
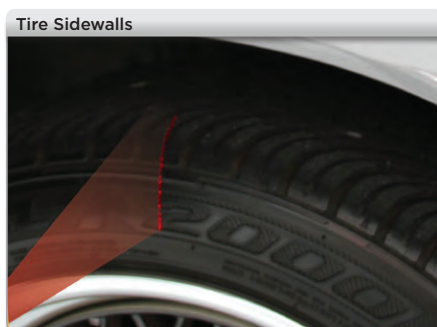
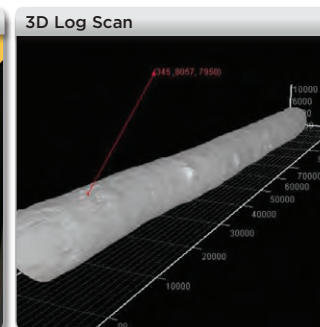
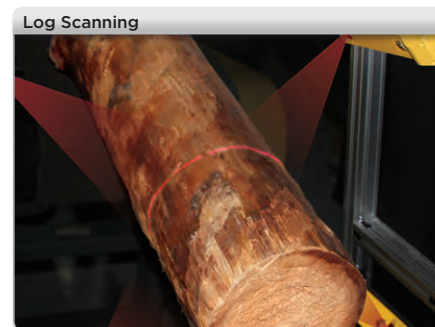
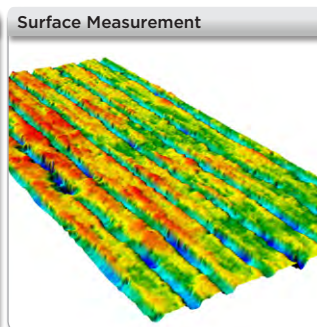
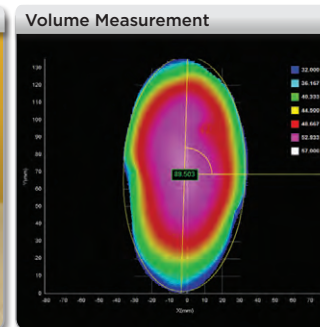
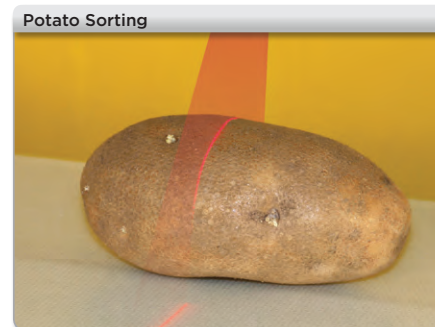
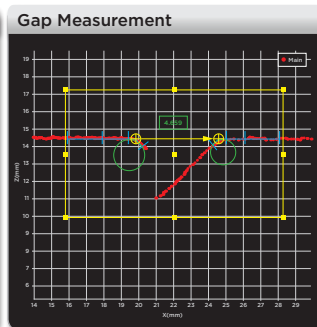
When an application calls for more than a dual sensor system, multiple sensors can be networked using an LMI Master

The Master product line offers models that support 4, 8, 12, or 24 Gocator connections

Masters provide power, laser safety, and synchronization (time, encoder, external trigger)

Each Gocator transmits 3D profile data to the host computer through standard Ethernet switches





TO ARRANGE YOUR GOCATOR DEMONSTRATION, CONTACT US:

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