



LMI TECHNOLOGIES

ENGINEERING POSSIBILITIES



Gocator

Gocator®

THE SMARTEST 3D SENSORS
ON THE PLANET

WHAT WE DO

Gocator is our labor of love. We have a dedicated research and development team that takes every factor into consideration when designing the Gocator: from product design, to user experience, to the quality of the output data.

SPEED. PRECISION. PERFORMANCE.

1

COMPACT
FOOTPRINT FOR
SMALL SPACE
AND ROBOT
ARM DEPLOYMENT

2

RUGGED IP67
CONSTRUCTION
FOR THE
HARSHEST
INDUSTRIAL
ENVIRONMENTS

3

BUILT-IN DATA
PROCESSING
PUTS THE SMART
IN GOCATOR
3D SMART
SENSOR



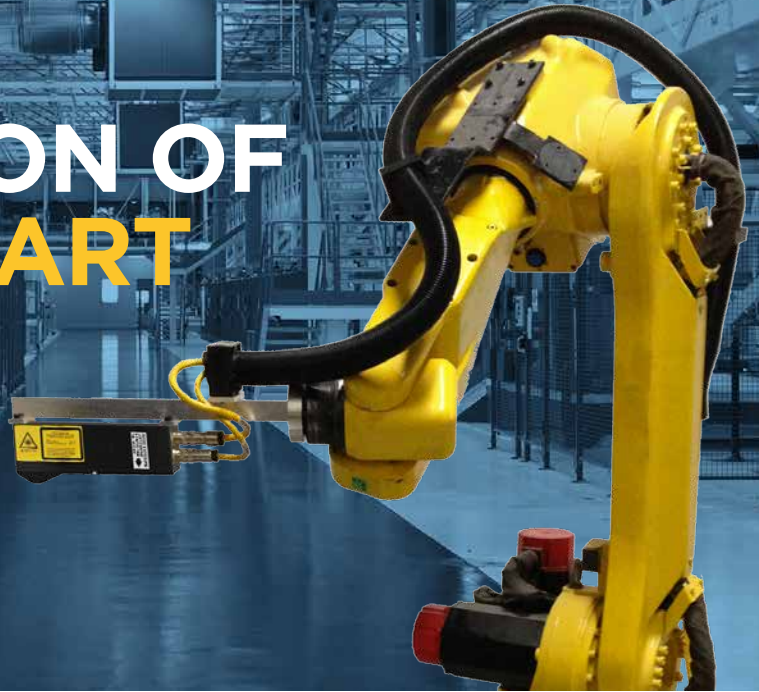
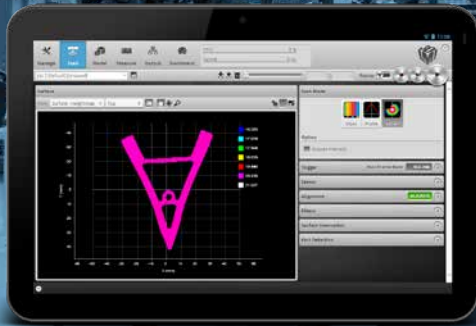
4

FACTORY
PRE-CALIBRATED
OPTICS AND
TEMPERATURE
STABLE MOUNTING
DELIVER HIGHLY
ACCURATE,
REPEATABLE
RESULTS
RIGHT OUT OF
THE BOX

5

RICH I/O FOR
COMMUNICATING
WITH YOUR
HARDWARE AND
CHOOSING HOW
YOU TRIGGER
AND SCAN

THE DEFINITION OF #FACTORYSMART



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 and 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

- Available in single point profile, line profile and snapshot technologies
- Choice of 2M, 3R, and 3B laser classes
- Open source SDK for custom application development
- Gocator Development Kit (GDK) for custom firmware development
- Emulator for simulation of pre-recorded data sets

WEB ENABLED

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

HIGH PERFORMANCE

- Scan rates up to 32,000 Hz
- Micron resolution with large field of view
- Gigabit Ethernet real-time data delivery

FACTORY PRE-CALIBRATED

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

RICH I/O

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

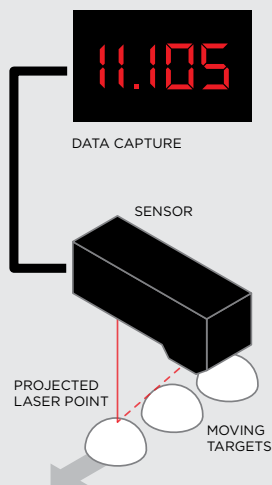
COMPACT FOOTPRINT

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

CORE 3D SCANNING TECHNOLOGIES

SINGLE POINT PROFILE SENSORS

Laser Distance Profile Triangulation

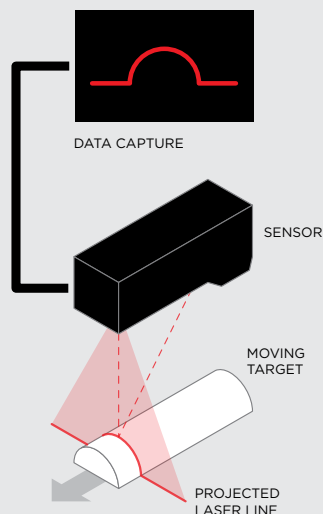


HIGH-SPEED POINT PROFILING

Gocator Single Point Profile Sensors are high-speed (32 kHz) single point measurement devices capable of profiling along the direction of part travel or inspecting displacement of a fast moving process. Ideal for contour analysis of parts moving at very high speed, these point profilers are unique all-in-one solutions to many applications.

LINE PROFILE SENSORS

Laser Line Profile Triangulation

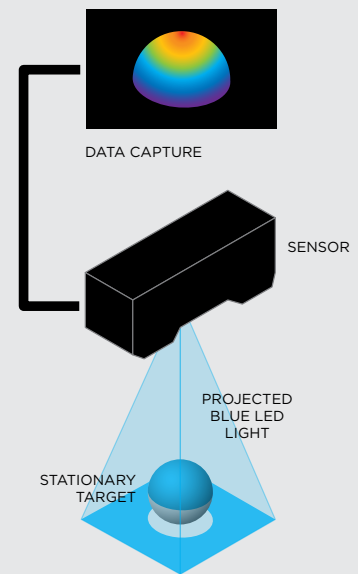


THE ORIGINAL 3D SMART SENSOR

Gocator Line Profile Sensors measure a cross-sectional shape. Cross sections can be collected to form 3D point clouds representing discrete whole parts. A profile sensor can measure shape of very small (10 mm) to large width objects (1.5m) moving at high speed. The sensor can also simultaneously output calibrated 2D intensity images for use with common 2D imaging libraries.

SNAPSHOT SENSORS

Stereo Full-Field Structured Light



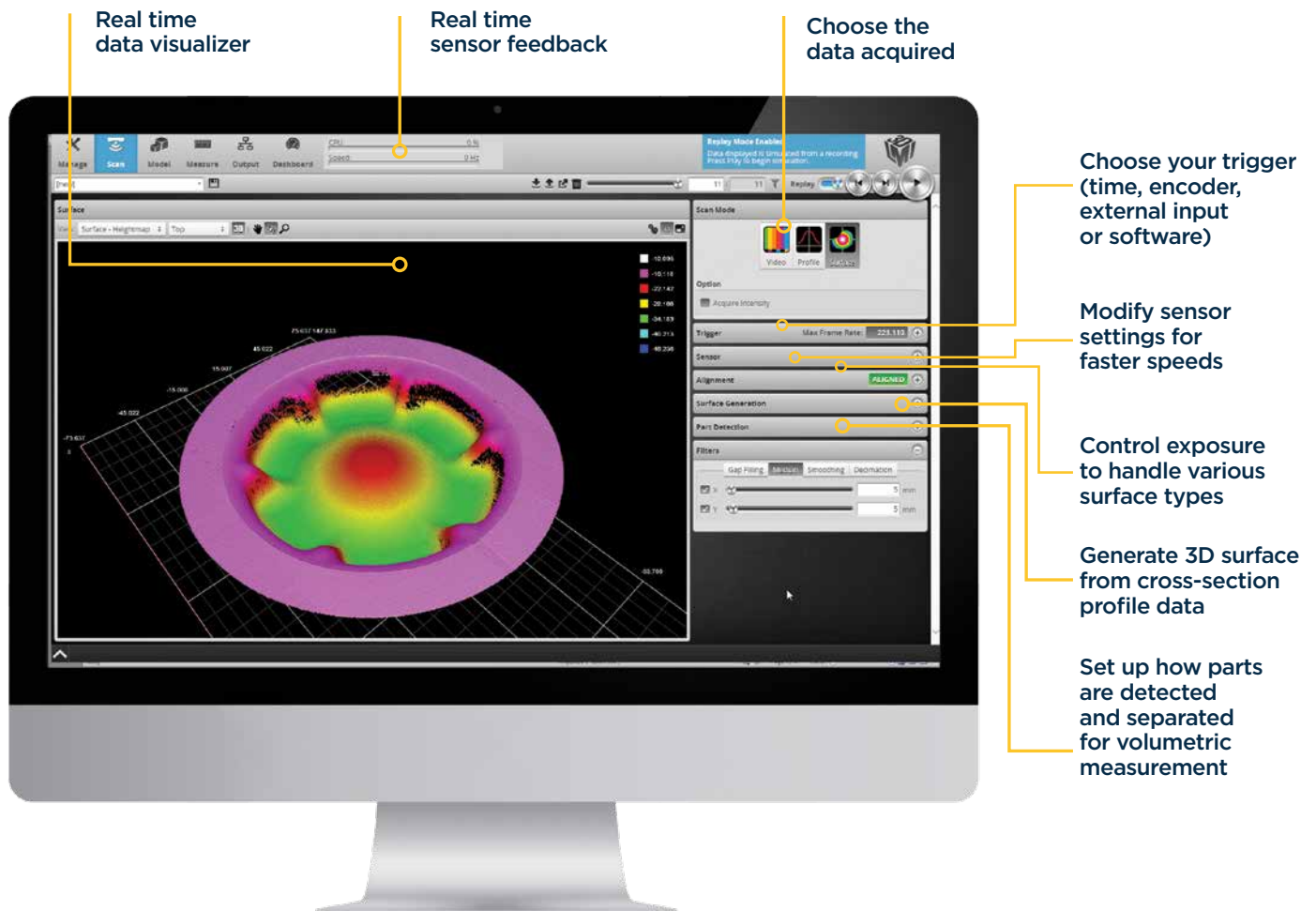
WORLD'S FIRST ALL-IN-ONE SNAPSHOT SENSOR

Gocator Snapshot Sensors are the first family of 3D smart sensors to combine full-field 3D point cloud acquisition using fringe projection with 3D measurement tools for specific 3D features. These sensors are ideal for inline inspection like in robot pick and place applications where objects are momentarily stationary.

SIMPLE SETUP

Setting up your Gocator is fast, easy and trouble free.

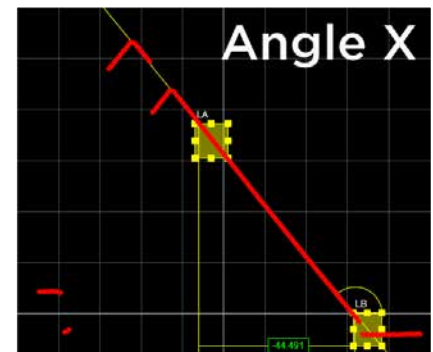
- Use your favorite web browser to access and control the Gocator
- Multi-language ready for non-English speakers to set up and fully utilize
- With a few mouse clicks, you can set up Gocator to work within your control system
- Intuitive control panels make setup fast and easy



POWERFUL BUILT-IN TOOLS

Gocator's built-in tools provide a full suite of measurement capabilities to solve a wide range of inspection challenges.

- No need for highly specialized knowledge, intensive training or writing of code. Just point, click and measure
- Write your own script to perform tailored calculations using measurement results
- Download free firmware updates to access new Gocator functionality



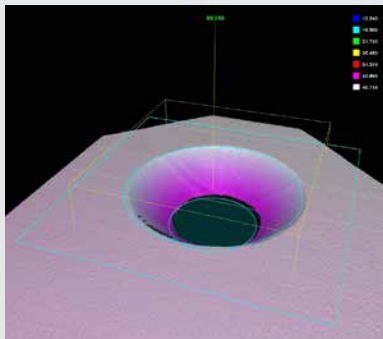
```
Script #0
ID: 0
Press save to store and apply script
8
9
10 // Get the values from Width/Height measurement
11 // Values are accessed with the 'value' function
12 // decisions with the 'decision' function.
13 signed long long width = value("Width");
14 signed long long height = value("Height");
15
16 // Calculate Manhattan Distance value and decision
17 signed long long manhattan;
18 int result;
19 manhattan = abs(width) + abs(height);
20 result = (manhattan > decisionMin) ? (manhattan) : (decisionMax);
21 // Emit final value and decision using the 'output' function
22 output(manhattan, result);
Save Remove
```

3D SURFACE MEASUREMENT

3D surface measurement involves measuring surface properties such as volume and height at a certain position. Gocator's volumetric tools have the ability to operate on the entire surface or the full object or within a region of interest at a given position in relation to the object's surface.

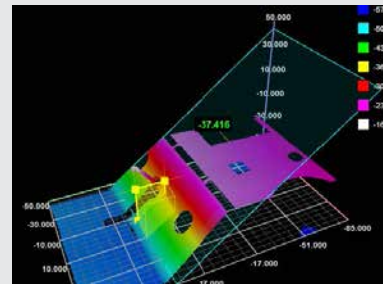
COUNTERSUNK HOLE TOOL

The countersunk hole tool automatically locates a countersunk circular opening on the object surface and provides measurements to evaluate its characteristics — including position (X, Y, and Z), outside radius, bevel angle and depth.



SURFACE PLANE TOOL

The Plane tool provides measurements of the surface angle X, angle Y and offset Z with respect to the alignment target. The results of the Plane Angle X and Plane Angle Y measurements can be used to customize the tilt angle in the hole, opening, and stud tools.



Other Gocator profile measurement tools include:

- Bounding Box
- Opening
- Stud
- Hole
- Position
- Volume

3D + 2D FUSION

Gocator combines 3D with 2D technology for a more robust inspection system.



INTENSITY OUTPUT (ACQUIRE INTENSITY)

Use one sensor to perform both 2D vision & 3D measurements

- Produces a calibrated, grayscale image from sensor light reflected off the part
- Easily integrate 2D image processing libraries to identify defects or patterns on a surface



ROBUST 2D VISION LIBRARIES

HIGH ACCURACY 2D PART LOCATION AND METROLOGY

HexSight geometric part location technology provides flexible and robust contour-based 2D pattern matching to locate parts and features regardless of their scale or orientation.

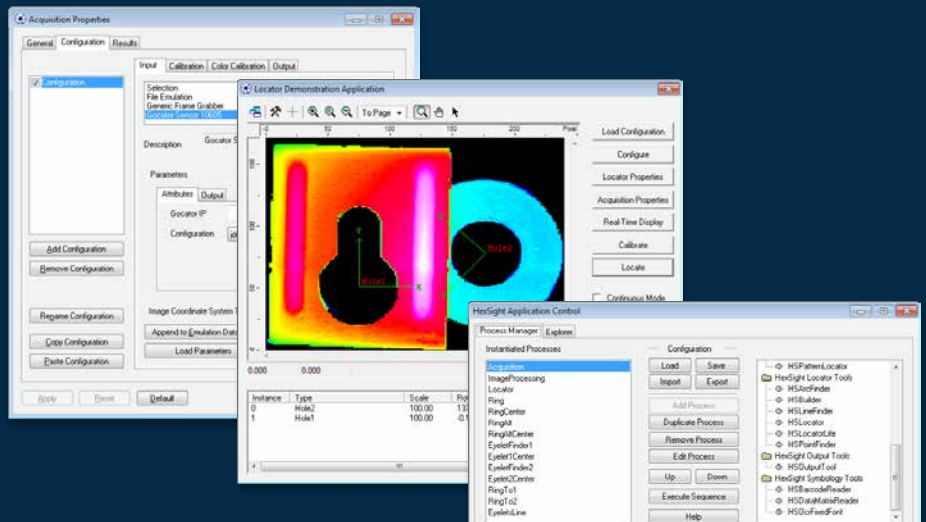
COMBINE 2D AND 3D FOR A MORE COMPLETE INSPECTION PROCESS

HexSight and Gocator work seamlessly together to create a more robust inspection system. With HexSight you can combine 3rd party machine vision camera images for 2D inspection with Gocator's 3D height maps for 3D measurement.

SEAMLESS INTEGRATION WITH GOCATOR

HexSight is tightly integrated with Gocator so acquisition of 3D point clouds and 2D intensity images can stream into inspection processing on a PC to produce results that are scheduled on Gocator hardware for output.

* Included at no cost with every Gocator 3D smart sensor.



FLEXIBLE INPUT/OUTPUT

Output measurement results to analog, digital, Ethernet and PLC protocols. Quickly and easily integrate with Halcon, LabVIEW and other common vision libraries such as HexSight.

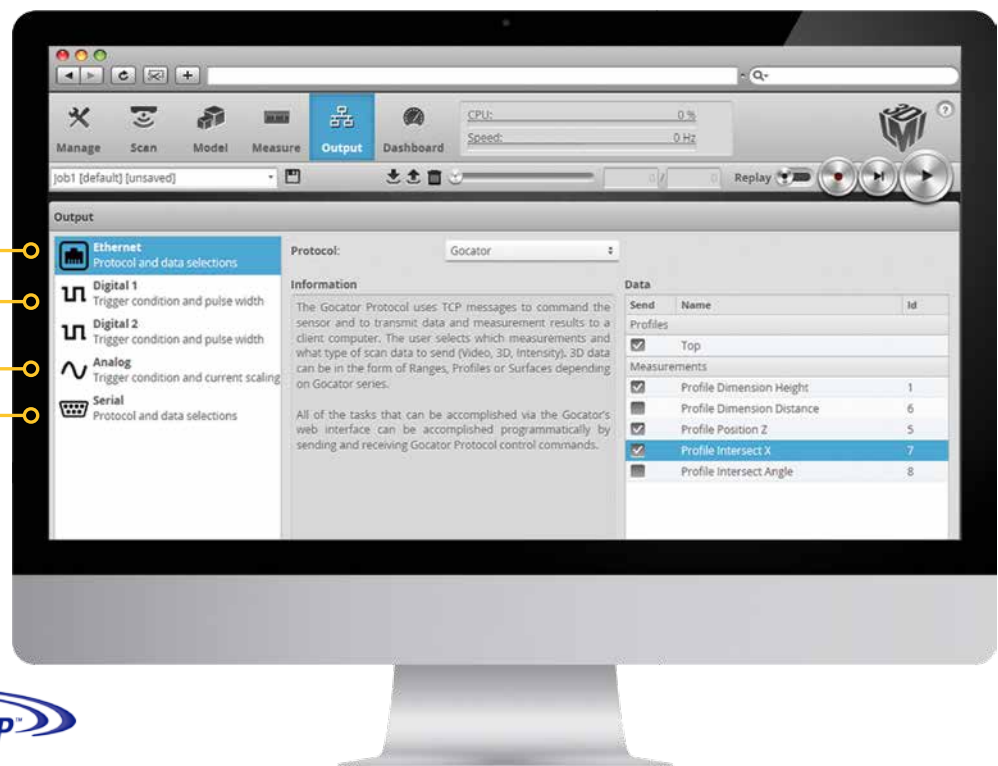
- Simply click on your choice to enable various outputs and decisions
- Gocator has the flexibility to simultaneously output data and decisions to a wide variety of I/O
- Tag and track parts for reject or sorting at a later time, or position with scheduled outputs
- Easily communicate with your existing 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



DUAL SENSOR SYSTEMS

Easily create a dual sensor system to increase 3D scan coverage.

- 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



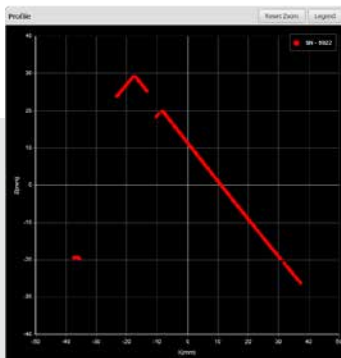
WIDE ORIENTATION

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

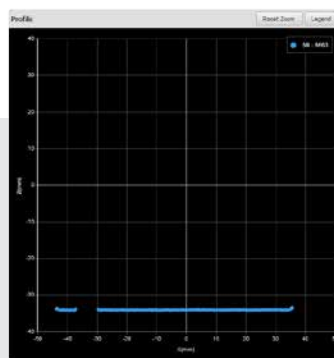


OPPOSITE ORIENTATION

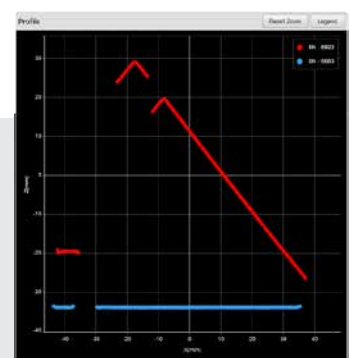
The Main and Buddy perform top and bottom differential measurements to calculate true thickness when the object cannot be referenced to a known surface such as a conveyor



MAIN



BUDDY

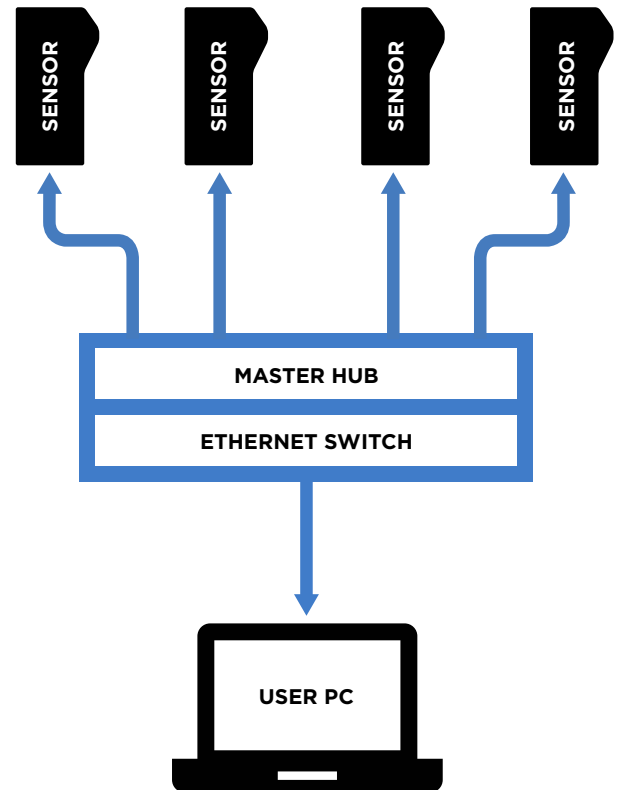


COMBINED

MULTI-SENSOR NETWORKING

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

- The Master product line offers models that support 4, 8, 12, or 24 Gocator connections
- Masters provide power, laser safety and distributed synchronization (time, encoder, external trigger)
- Each Gocator transmits 3D profile data to the host computer through standard Ethernet switches



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