COGNEX

Advanced machine vision made easy

L68 SERIES 3D LASER DISPLACEMENT SENSORS

High-Speed, High-Resolution 3D Vision Sensors

The L68 Series includes a range of 3D vision sensors, designed to optimize quality and automate challenging manufacturing tasks. These easy-to-use sensors combine laser triangulation with advanced image formation to create three-dimensional renderings of parts under inspection. From these highly-detailed renderings, 3D features can be measured such as length, width, height, and tilt.

The L68 Series can be used by manufacturers, machine builders, and system integrators across all industries to solve inspection, guidance, and measurement applications. Able to work in the harshest factory settings, these innovative 3D vision sensors offer high-performance, in a rugged, yet compact form factor.

Features

- Blue laser technology generates high-quality 3D images, up to 4000 3D points and 0.9-1.4 µm vertical resolution
- Off-the-shelf, pre-calibrated hardware allows for easy factory integration
- High-speed 3D image acquisition increases production line speed and maximizes throughput
- Full software suite and access to extensive 3D vision libraries enable rapid application setup
- Low operating temperature reduces power consumption and improves metrology performance
- Industrial, compact housing offers better stability and flexibility for machine and robot integration

Core Technologies

Several core technologies differentiate the L68 Series in the 3D sensor market. These include integrated optics, resolution, calibration, software integration, size, and reflectivity.

Integrated Optics

Embedded optics and laser illumination eliminate the need for lenses and lighting to be evaluated, tested, and purchased for every application.

Software Integration

A flexible toolset and support for different communication protocols ensure compatibility with a range of third-party vision software.

Resolution

Integration of the latest technology enables more precise measurements, detection of smaller defects, and more reliable control than other 3D sensors.

Size

Minimization of every hardware component creates a small, lightweight form factor that can easily fit into any production line.

Calibration

Pre-calibrated hardware delivers precise, repeatable measurements, down to the micrometer range.

Reflectivity

Unique filtering process generates highly accurate images of products with complex surface features, such as glass, specular, and highly reflective surfaces.

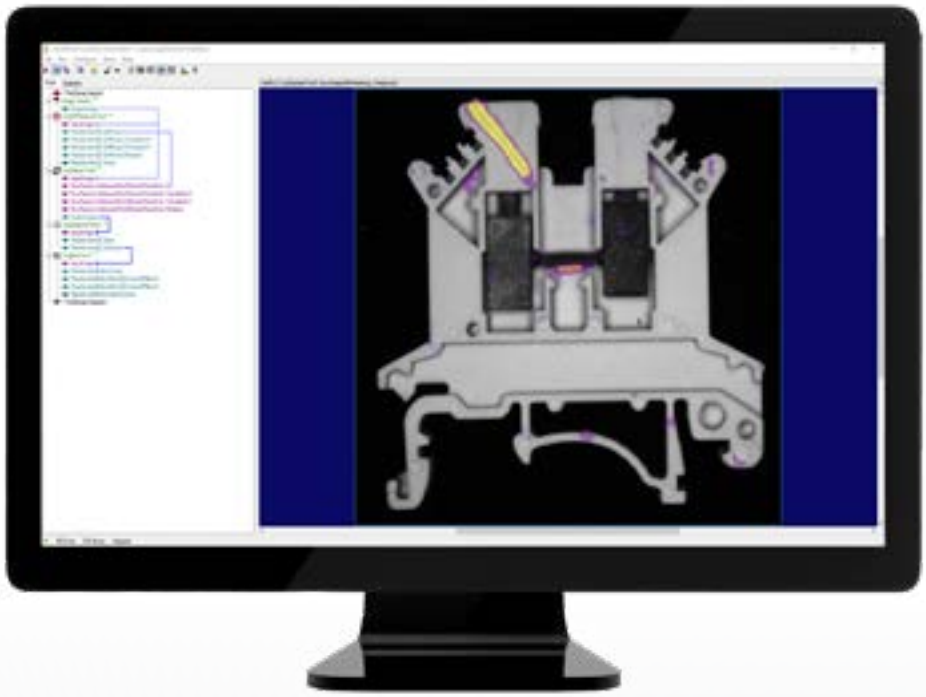
Proprietary Calibration Technique

Each sensor unit in the L68 Series is individually calibrated using multiple reference points within the field of view and measurement range. This unique calibration method provides micron-level accuracy and corrects for different types of distortions and deviations including:

- Perspective distortion
- Lens distortion
- Laser non-linearity
- Manufacturing tolerances

Software

The L68 Series runs on Cognex VisionPro® software. VisionPro is a PC-based software combining best-in-class vision technologies in an easy-to-use development environment. Powerful enough to automate the most challenging applications, VisionPro leverages extensive tool prototyping to enable rapid deployment of highly-customizable applications.

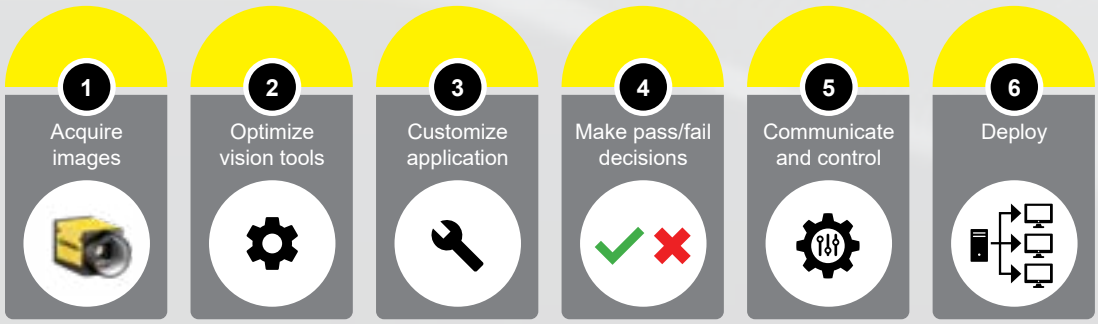


QuickBuild Workflow

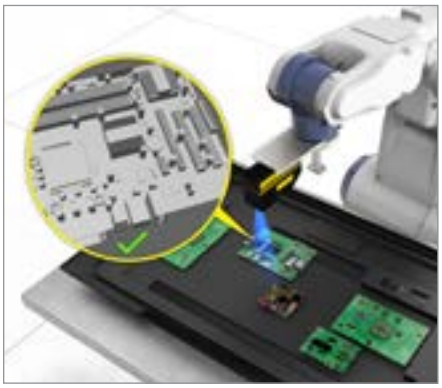
Using the QuickBuild™ graphical interface and point-and-click training, you can easily configure acquisition settings, select and optimize tools, and make pass/fail decisions, with no prior programming experience required. Modular tool blocks enable users to quickly create and reuse components, further supporting fast and flexible deployment.

Key features

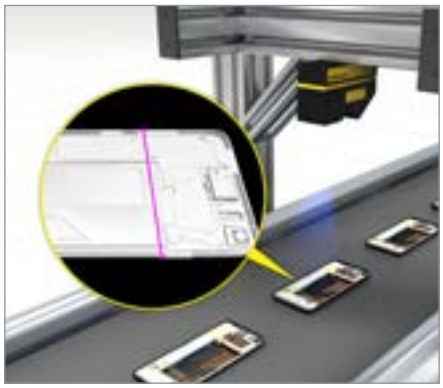
- **Industry-leading vision tools**–Full set of AI- and rule-based tools solves a range of applications
- **Intuitive development environment and modular tool blocks**–Graphical interface with drag-and-drop programming simplifies setup
- **Performance optimization**–Robust design accommodates multi-core and multi-threaded processors



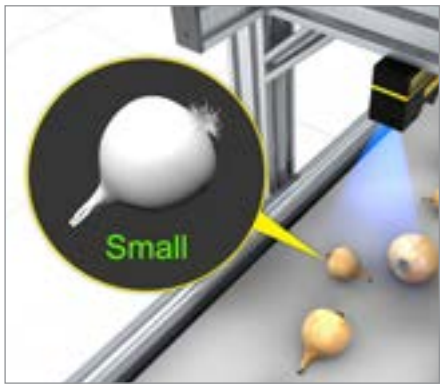
Application examples



Verify proper assembly of components.

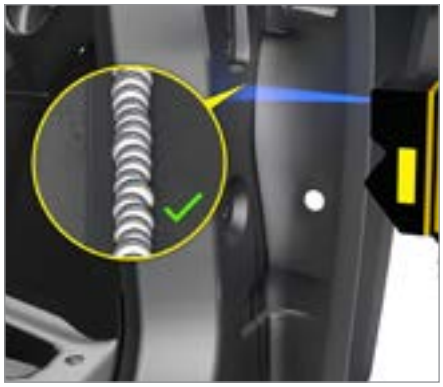


Measure gaps to ensure correct alignment.

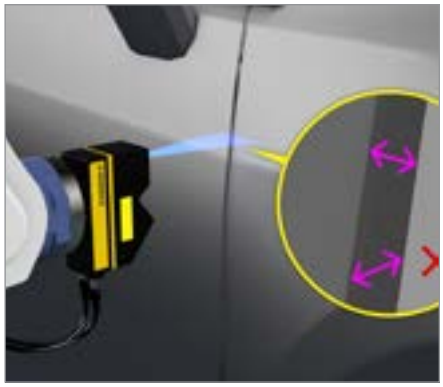


Build a 3-dimensional model to manage automatic sorting systems.

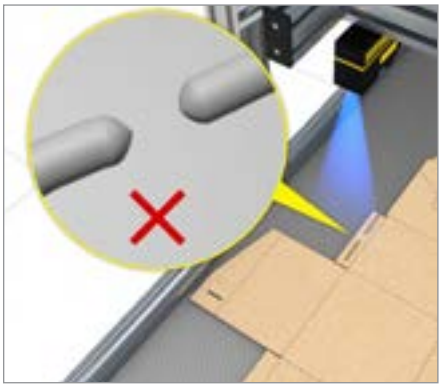
Read text on low-contrast backgrounds



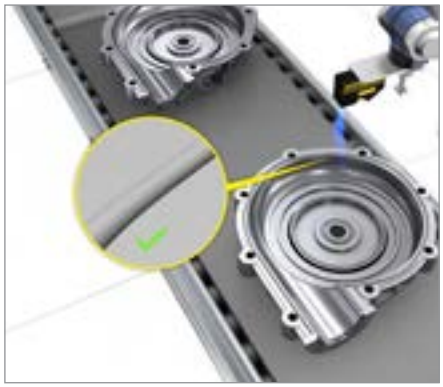
Detect defects in complex welded assemblies.



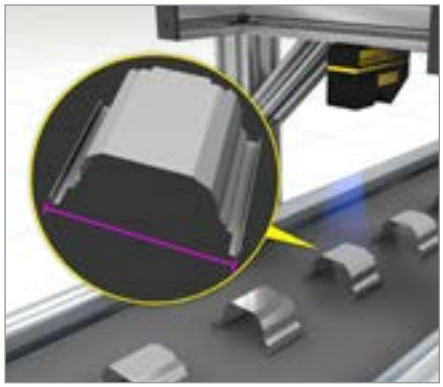
Perform flush and gap inspections to check for misalignment and variations.



Inspect and measure the volume of glue on boxes.



Measure sealant on the housing to ensure even application.



Check that parts conform to original CAD data.

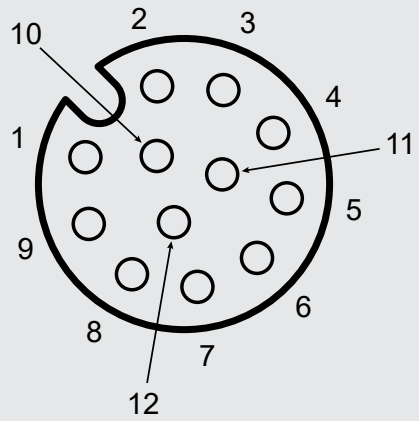
Specifications

	L68-20	L68-100
Field of view (FOV (Near, Middle, Center))	22 mm (near), 25 mm (middle), 29 mm (center)	79 mm (near), 100 mm (middle), 121 mm (center)
Typical measurement range	20 mm	100 mm
Clearance distance	55 mm	191 mm
Typical vertical resolution	0.9–1.4 µm	4.0–9.5 µm
Typical lateral resolution	5.0 –7.0 µm depending on FOV	17.0–30.0 µm
Z-linearity	0.005%	0.0023%
Z-repeatability	0.2 µm	0.5 µm
Laser wavelength	450 nm (brilliant blue laser)	
Laser class	2 (standard)	
Maximum points / 3D profile	4096	
Weight	742g	850g
Typical scan rate 1	Up to 40 kHz	
Typical 3D point rate 1	Up to 163 million points/sec	
Interface	Gigabit Ethernet (1 Gbit/sec)	
Inputs	2x Inputs (5–24 VDC) Quadrature Encoder (AB-Channel, RS-422 standard)	
Outputs	2x Outputs, 24 VDC (max. 20 mA)	
Trigger	The following triggers are supported: START Trigger support on Input 1 DATA Trigger support on Quadrature Encoder Input (Max. DATA trigger rate: 1 MHz) DATA Trigger support on Input 2 (Max. DATA trigger rate: 5 kHz)	
Input voltage	24 VDC, ±15%	
Power	10 W	
Maximum ambient light	10,000 lx	
EMC test	as per EN 61 000-6-2, EN 61 000-6-4, EN 61326-1:2013-07	
Electrical safety	as per EN 61 010-1	
Protection class	as per EN 61 010-3	
Laser safety inputs	24 VDC ±15%	
Enclosure rating	IP67	
Air humidity	Maximum 90%, non-condensing	
Temperature	0–40 °C (operation), -20–70 °C (storage)	
Compatible accessories	Power and I/O Breakout Cable, M12-12 to Flying Lead: CCB-PWRIO-XX, Straight Ethernet Cable, X-coded M12-8 to RJ-45: CCB-84901-2001-XX, Straight (XX specifies length, either 5m or 10m)	

Connectors and Display

L68 Bottom *L68 Back*

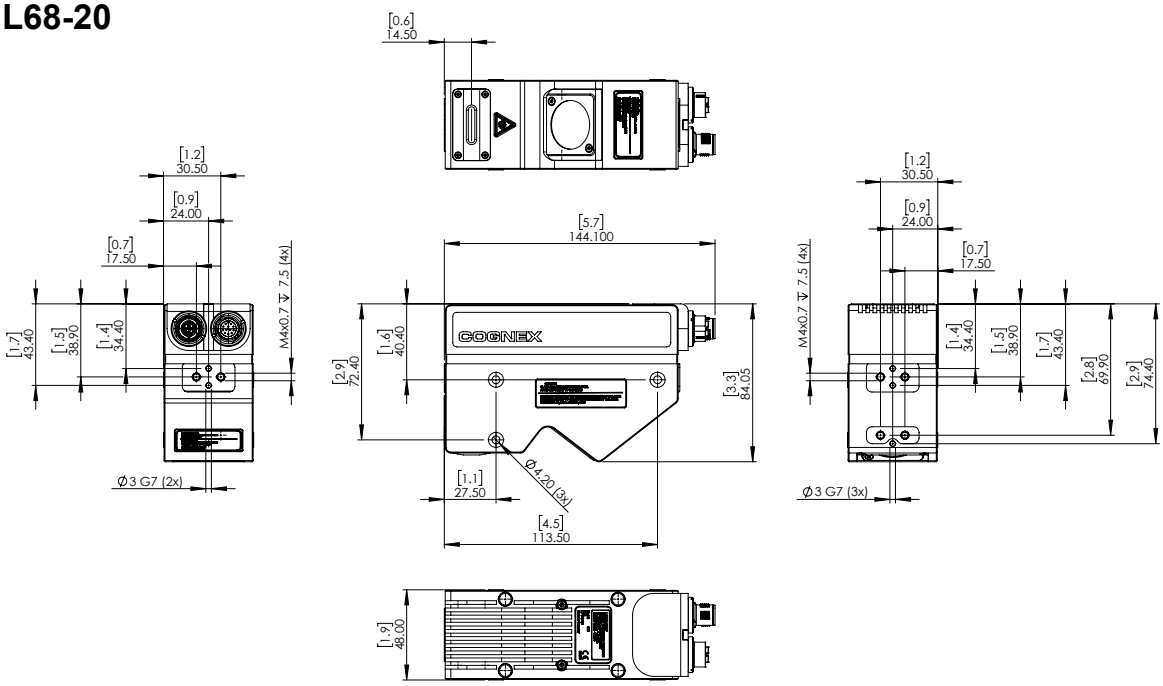
Power, I/O, Encoder Open-Ended Cable Wiring



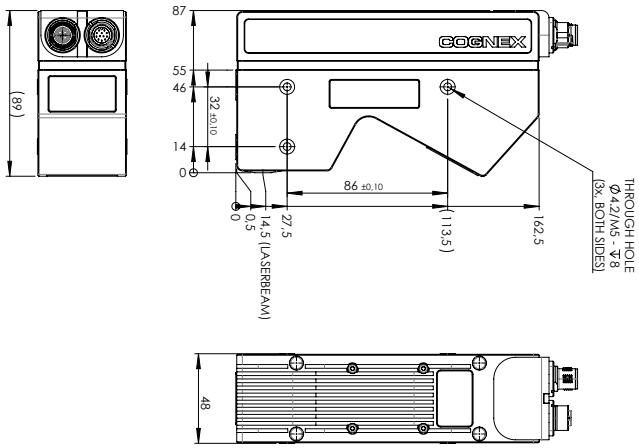
Pin	Wire color	Designation	Description
1	Yellow	Ground	Operating voltage -, 0 V
2	White/Yellow	VCC	Operating voltage +, 24 VDC ±15% ripple
3	Brown	Input 1	5 – 24 V
4	White/Brown	Output 2	24 V (max. 20 mA)
5	Violet	Output 1	24 V (max. 20 mA)
6	White/Violet	Encoder B-	RS-422 complaint
7	Red	Encoder A+	RS-422 complaint
8	Black	Input 3	Laser safety input -, GND
9	Green	Input 4	Laser safety input +, 24 VDC
10	Orange	Input 2	5 – 24 V
11	Blue	Encoder B+	RS-422 complaint
12	Grey	Encoder A-	RS-422 complaint

Dimensions

L68-20



L68-100



COGNEX

Companies around the world rely on Cognex vision and barcode reading solutions to optimize quality, drive down costs, and control traceability.

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