COGNEX

L38 with VisionPro

3D laser displacement sensor with PC-based development environment

The L38 with VisionPro® is a 3D laser displacement sensor designed for high-speed, high-resolution inspections. It leverages advanced image formation to create detailed surface renderings, enabling precise measurement of 3D features like length, width, height, tilt, and volume. With industry-proven vision software and a full set of 3D and 2D tools, the L38 offers complete customization for tackling complex inspection, identification, measurement, and alignment challenges.

Key features

Wide range of models and robust toolset

Meet diverse application needs with different models and the ability to combine 3D and 2D vision tools

Up to 65% faster acquisition rates*

Increase throughput with PC-based processing to keep pace with high-speed lines

Micron-level accuracy

Reduce misalignment and motion errors for reliable, consistent results

Measurements in real-world units

Get practical, actionable data for optimized performance

Enhanced 3D imaging

Detect objects against difficult backgrounds, including reflective surfaces and dark objects on dark backgrounds

*Compared to previous generation system

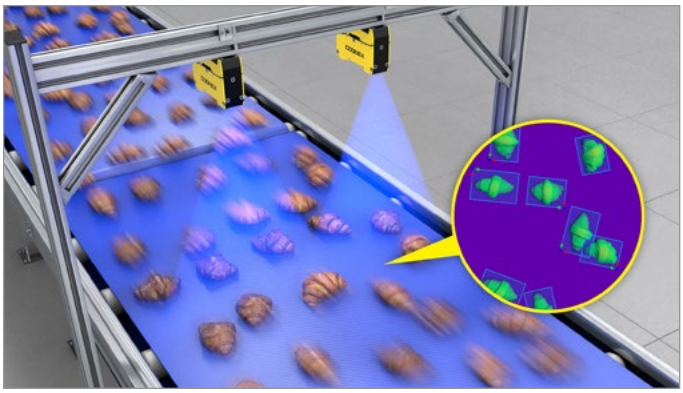
Application examples

Measurement and inspection

Detect missing objects in packages by measuring height

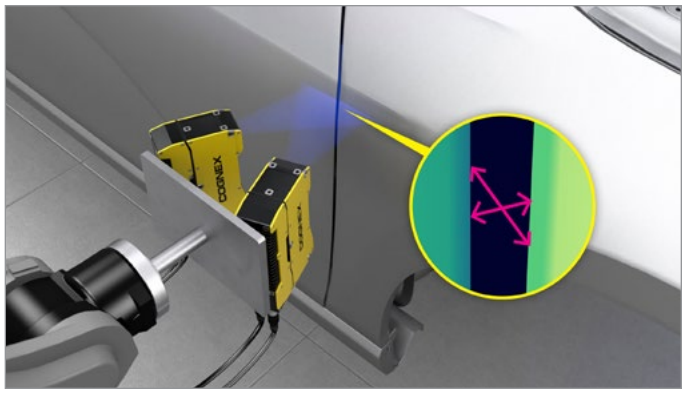
Optical character recognition (OCR)

Read embossed or raised characters on challenging surfaces



Multiple sensors to expand views

Combine multiple side-by-side sensors to inspect wide production lines without losing resolution



Multiple sensors to enhance views

Combine multiple angled or head-to-head sensors to remove occlusions and see inside cavities

VisionPro software

Ultimate customization for the most challenging manufacturing applications

The L38 with VisionPro uses a PC-based development environment that combines best-in-class vision technologies in a graphical programming environment. Powerful enough to solve the most challenging vision tasks, it enables rapid deployment of highly customizable applications.

- **Graphical development interface** enables users to visually define and tune their application
- **Modular tool blocks** allow users to create and reuse components, shortening cycle times
- **Advanced scripting** and .NET C# programming options offer additional flexibility
- **Future-oriented design** supports current and future vision needs

Software compatibility

- VisionPro 9.22 and beyond
- Cognex Designer 4.5

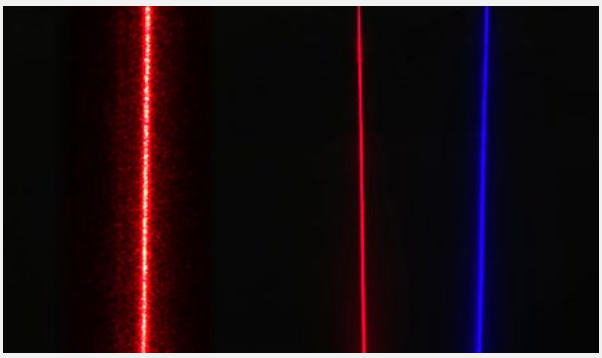
VisionPro QuickBuild workflow for setting up jobs

Powerful, integrated lighting technology optimizes image formation

L38 with VisionPro offers advanced optics on-device, no external lighting required, to simplify deployment. Speckle-free and high-powered laser lines maximize contrast, even against challenging surfaces, and generate high-resolution images to improve the accuracy of automated inspections.

Patented, speckle-free laser

- Minimizes speckle and glare, common problems for 3D laser systems
- Captures higher resolution images than traditional laser displacement sensors
- Delivers the most consistent laser line in the industry for more reliable scanning
- Available on the following models: L38-33, L38-50, L38-100, and L38-300.



Conventional laser line (left) and speckle-free laser line red and blue (right)

High-powered laser

- Delivers fast acquisition rates to support high line speeds
- Meets Class 2 safety standards, eliminating the need for expensive enclosures and allowing users to make adjustments without stopping the line
- Offers 5X more light than conventional lasers to enable image acquisition at greater distances
- Available on the following model: L38-500.

Conventional laser line (left) and high-powered laser line red and blue (right)

L38 with VisionPro Series Specifications

Model			L38-33	L38-50	L38-100	L38-300	L38-500
Measurement range	Clearance distance		93	92	130	180	600
	Z-axis (height)	Measurement range (mm)	44	106	235	745	1100
	X-axis (width)	Near field of view (mm)	33	55	75	95	405
		Middle field of view (mm)	36	73	128	278	744
		Far field of view (mm)	39	90	180	460	1082
Laser (light source, Blue or Red)	Wavelength (nm)		450 (blue)	450 (blue), 640 (red)			450 (blue), 640 (red)
	Laser class		2M				
	Output power (mW)		45	45 (blue), 48 (red)			300 (blue), 280 (red)
Spot size (middle field of view) µm			72	110 (blue), 140 (red)	181 (blue), 235 (red)	240 (blue), 350 (red)	360 (blue), 480 (red)
Sensor	Data points/profile		1920	1920	1920	1920	1920
	X resolution	Top (µm)	17.2	28.6	39.1	49.5	213
		Bottom (µm)	20.3	46.9	93.8	239.6	574
	Z resolution	Top (µm)	1.7	2.5	4.4	6.9	42
		Bottom (µm)	2.7	6.9	25.9	147.5	302
	Z repeatability [*1]	Mid (µm)	0.5	0.5	1	2	10
	Z linearity (% of full scale [F.S.]) [*2]		±0.06	±0.06	±0.04	±0.05	±0.1
	Temperature characteristics (% of F.S./°C)		0.01				
Environmental resistance	Housing protection		IP65				
	Operation temperature (°C) [*3]		0°C—35°C without heat sink, 0°C—45°C with heat sink				
	Storage temperature (°C)		-20°C to 70°C				
	Relative humidity		<80% (no condensation)				
	Vibration (Hz)		10 to 57, double amplitude 1.5 mm X, Y, Z, 3 hours in each direction				
	Shock (G)		15G / 6 msec				
Scan rate			Up to 7kHz (after reducing the measurement range size: up to 10kHz[4])				
Housing material			Aluminum				
Weight (Kg)			0.94				1.28
Dimensions (mm)			150.5 x 101 x 45				200.5 x 101 x 45
Power supply requirements			24VDC ±10%, 750mA minimum				
Inputs			Trigger, differential/single ended encoder, laser interlock				
Trigger	Input voltage limits		Trig+ — Trig - = - 24VDC to +24VDC				
	Input ON		> 10 VDC (> 6 mA)				
	Input OFF		< 2 VDC (< 1.5 mA)				
Encoder specifications	Differential		A+/B+: 5—24V (1.0 MHz max) A-/B-: Inverted (A+/B+)				
	Single ended		A+/B+: 12—24V (1.0 MHz max) A-/B-: VDC = ½ (A+/B+)				
Interface			Gigabit Ethernet interface; Integrated link and traffic LEDs; Standard M12-8 X-Coded female connector				
Software compatibility			VisionPro 9.22 and beyond, Cognex Designer 4.5				

1 Z Repeatability is measured an average of 100 times over a point cloud using a 4x4 mm area, at the middle of the Measurement Range.

2 Z Linearity is the max deviation of 250 position measurements on the Measurement Range, where a measurement is the average of 2 profiles using the standard Cognex target.

3 Mounted to a 400 mm aluminum bar on top of the camera.

4 When enable binning and the FOV is windowed down.

Calibration at 21°C ambient temperature

Product IDs and descriptions

L38 with VisionPro Series

Product ID	Points/Profile	Laser Color
L38-33B-N	2K	Blue
L38-50B-N	2K	Blue
L38-50R-N	2K	Red
L38-100B-N	2K	Blue
L38-100R-N	2K	Red
L38-300B-N	2K	Blue
L38-300R-N	2K	Red
L38-500B-N	2K	Blue
L38-500R-N	2K	Red

*Product IDs listed here have access to VisionPro only. To upgrade to an In-Sight L38, please contact Cognex sales.

Components and accessories

Cables

	Product ID	Description
	CCB-84901-2001-XX	X-Coded Ethernet Cable, Straight (XX specifies length: 2m, 5m, 10m, 30m)
	CCB-84901-2002-XX	X-Coded Ethernet Cable, Right-Angled (XX specifies length: 2m, 5m,10m)
	CCB-PWIO17-S-XX	M12 Power I/O cable with 17 pins to Flying Lead, Straight (XX specifies length: 2m, 5m, 10m, 20m)
	CCB-PWIO17-R-XX	M12 Power I/O cable with 17 pins to Flying Lead, Right Angle (XX specifies length: 2m, 5m, 10m, 20m)

Correction Targets

	Product ID	Description
	3DCAL05-KIT-00	1x 5mm 3D Monolith Correction target
	3DCAL10-KIT-00	1x 10mm 3D Monolith Correction target
	3DCAL20-2PK-00	2x 20mm 3D Correction targets
	3DCAL40-2PK-00	2x 40mm 3D Correction targets
	3DCAL100-KIT-00	1x 100mm 3D Correction target

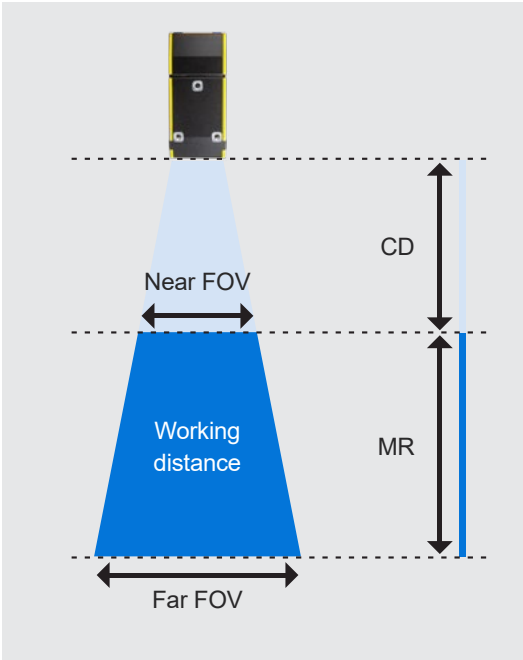
L38 Series Encoder

	Product ID	Description
	LS-Encoder-1000-00	Incremental differential encoder 1000 ticks per revolution, RS422 output
	LS-Encoder-2500-00	Incremental differential encoder 2500 ticks per revolution, RS422 output
	LS-Encoder-5000-00	Incremental differential encoder 5000 ticks per revolution, RS422 output

For more information on encoders, please download the L38 Series Encoder datasheet.

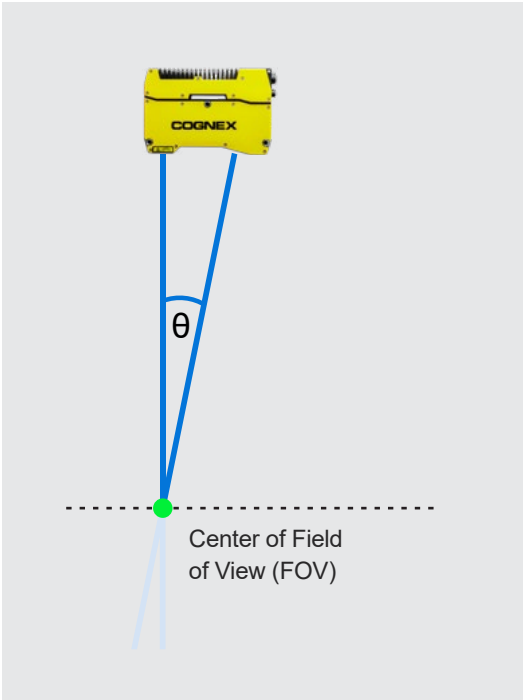
Working distance and field of view

	L38-33	L38-50	L38-100	L38-300	L38-500
Clearance distance (CD)	93 mm	92 mm	130 mm	180 mm	600 mm
Near field of view (FOV)	33 mm	55 mm	75 mm	95 mm	405 mm
Far field of view (FOV)	39 mm	90 mm	180 mm	460 mm	1082 mm
Measurement range (MR)	44 mm	106 mm	235 mm	745 mm	1100 mm



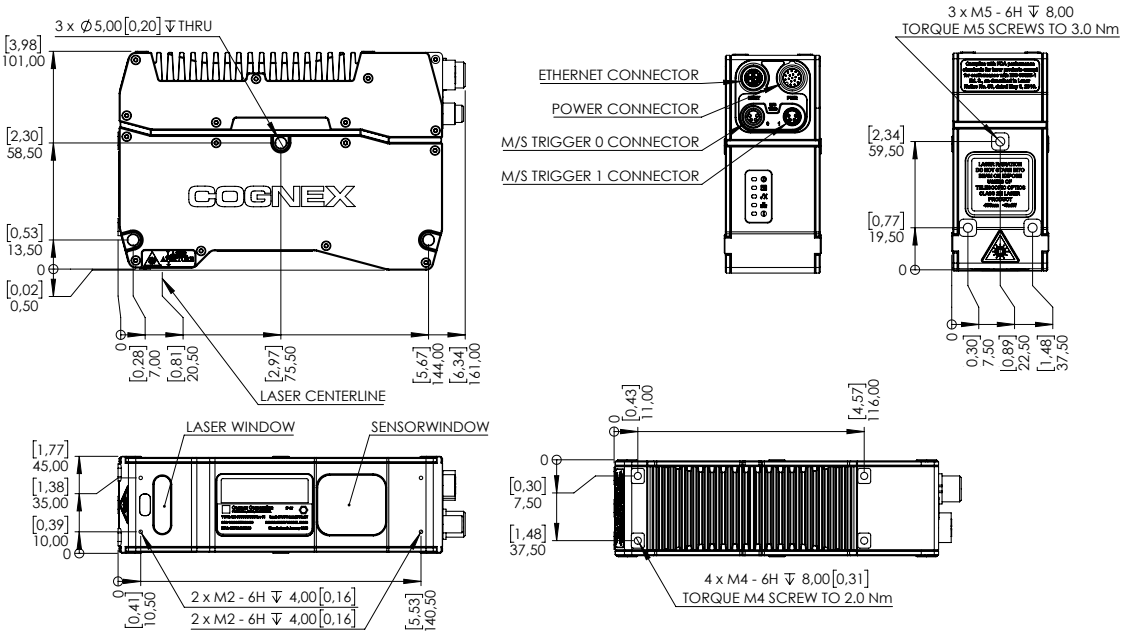
Lens to laser angle (measured at the center of field of view)

	L38-33	L38-50	L38-100	L38-300	L38-500
Lens to Laser Angle	41.0°	34.6°	22.0°	10.3°	9.6°



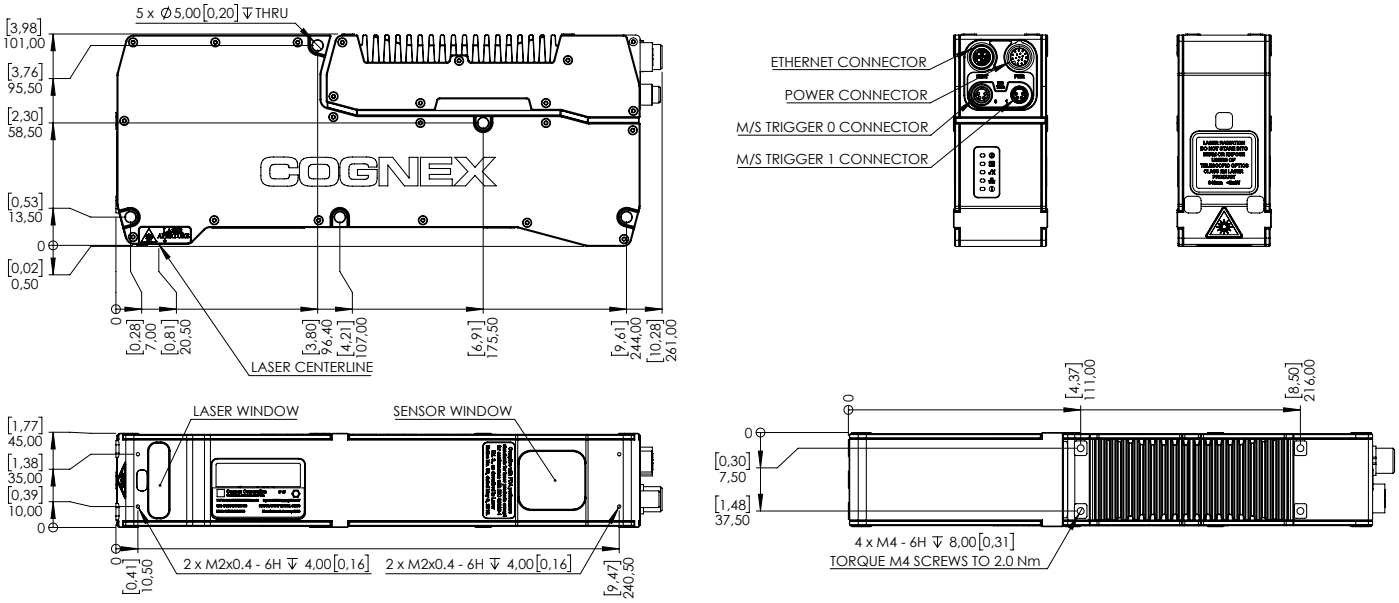
L38

Download CAD files



L38-500

Download CAD files



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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