IN-SIGHT 2000

VISION SENSORS

COGNEX

THE GLOBAL LEADER

IN MACHINE VISION AND INDUSTRIAL BARCODE READING

Cognex,® the leading supplier of machine vision and industrial barcode reading solutions.

With over 3.5 million systems installed in facilities around the world and over forty one years of experience, Cognex is focused on industrial machine vision and image-based barcode reading technology. Deployed by the world's top manufacturers, suppliers and machine builders, Cognex products ensure that manufactured items meet the stringent quality requirements of each industry.

Cognex solutions help customers improve manufacturing quality and performance by eliminating defects, verifying assembly and tracking information at every stage of the production process. Smarter automation using Cognex vision and barcode reading systems means fewer production errors, which equates to lower manufacturing costs and higher customer satisfaction. With the widest range of solutions and largest network of global vision experts, Cognex is the best choice to help you **Build Your Vision.™**

$1.04 BILLION
2021 REVENUE

OVER 41
YEARS IN THE BUSINESS

500+
CHANNEL PARTNERS

GLOBAL OFFICES IN
20+ COUNTRIES

3,500,000+
SYSTEMS SHIPPED

THE NEED FOR AUTOMATED INSPECTION

Increased throughput, higher quality, and lower costs are key drivers for automated inspection in manufacturing. Manual inspection can be slow, prone to errors, and often impossible considering the product size, lighting conditions, or line speed.

Given these factors, companies in a wide range of industries rely on vision sensors to perform simple pass/fail inspections that help ensure products and packaging are error-free and meet strict quality standards. Cognex vision sensors provide easy and reliable inspections thanks to powerful vision tools, integrated lighting, modularity, and an easy-to-use setup environment.

IN-SIGHT 2000 SERIES
VISION SENSORS

The power, ease-of-use, and flexibility to solve any error-proofing application

Cognex In-Sight® 2000 series vision sensors combine the power of In-Sight vision systems with the simplicity and affordability of an industrial sensor. Ideal for error-proofing applications, these vision sensors set new standards for value, ease of use, and flexibility thanks to a powerful combination of proven In-Sight vision tools, simple setup, and a modular design featuring field-changeable lighting and optics.

- Intuitive EasyBuilder® interface allows even novice users to achieve reliable inspection performance in nearly any production environment
- Proven, reliable Cognex In-Sight vision tools
- Compact, modular design with field-changeable, integrated optics and lighting
- Autofocus lens eliminates the need to manually refocus or adjust the mounting height of the sensor during line changeovers
- Single-cable Power over Ethernet (PoE) models simplify installation

IN-SIGHT
2D VISION SOFTWARE

In-Sight Explorer

All In-Sight 2D products, from vision sensors to vision systems, are configured with the powerful, yet intuitive In-Sight Explorer software. The easy-to-use interface walks you step by step through the setup process and provides the power and flexibility of the vision spreadsheet for more difficult applications. In-Sight Explorer also offers the widest range of built-in communication protocols that interface directly to any PLC, robot, or HMI on the factory network.

EasyBuilder

The EasyBuilder configuration environment guides users through a step-by-step setup process allowing both novice and experienced operators to configure vision applications quickly and easily on vision sensors and vision systems.

Spreadsheet

Access to the spreadsheet provides ultimate application development flexibility without programming.

Easy-to-deploy HMI

Cognex In-Sight sensors and systems offer multiple runtime visualization options, including VisionView — available as a ready-to-deploy LCD touch panel and as a PC application — and a platform independent Web HMI that runs in any internet browser. Both VisionView and the Web HMI allow users to view inspection images and results and to modify setup parameters.

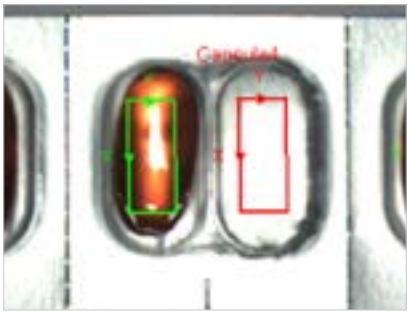
Visit www.cognex.com/explorer

POWERFUL IN-SIGHT VISION TOOLS

The EasyBuilder interface provides access to a selection of powerful vision tools:

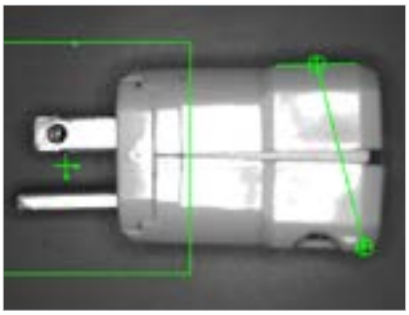
Location

Pattern, edge, and circle tools locate (or fixture) the part so other vision tools can use this as a reference to complete their inspections.



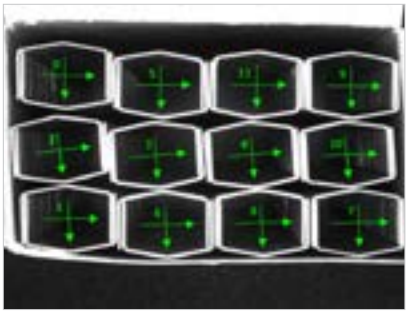
Presence/absence

Brightness, contrast, pattern, pixel count, edge, and circle tools determine the presence or absence of a part.



Measurement

Distance, angle, and circle diameter measurements verify a part's features are the correct size and in the correct position and orientation.

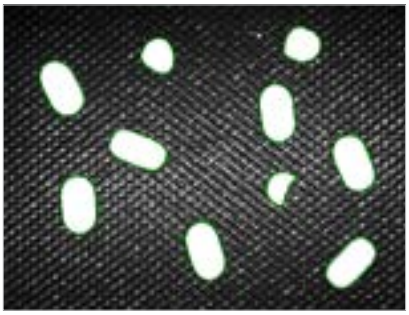


Counting

Counting patterns and edge features confirm the correct number of items are present on a conveyer or in a package.

OCR*

Uses Cognex's OCRMax auto-tune feature to quickly and easily read high-quality characters on a variety of surfaces.

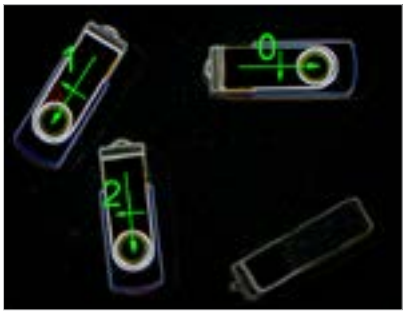


Blob*

Determines the presence or absence of non-uniform objects.

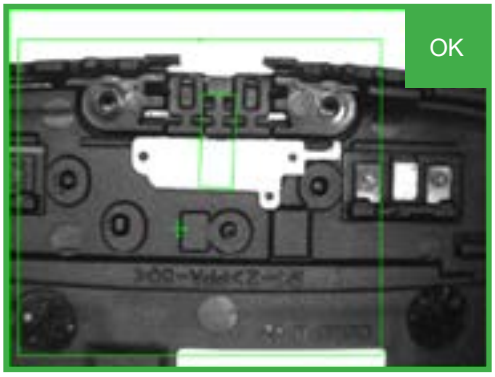
Image Filters*

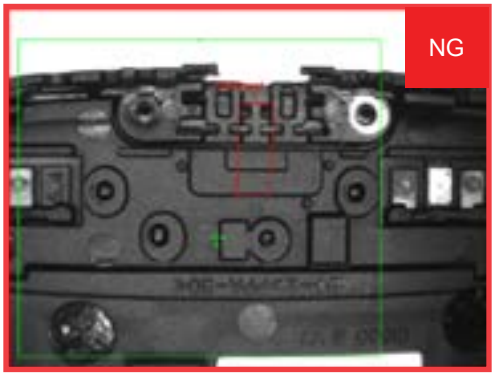
More than 25 unique image filtering tools including binarize, edge magnitude, and stretch which can be used as a pre-processing step for subsequent vision tools.



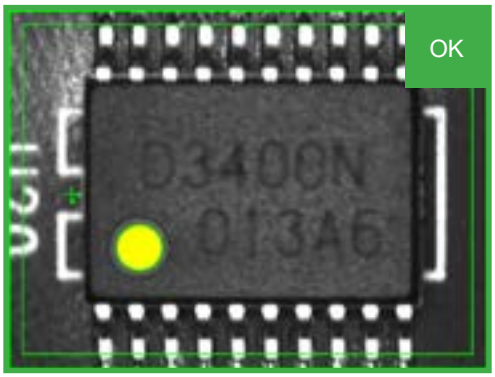
*Available on IS2000-230 and IS20001-230 models.

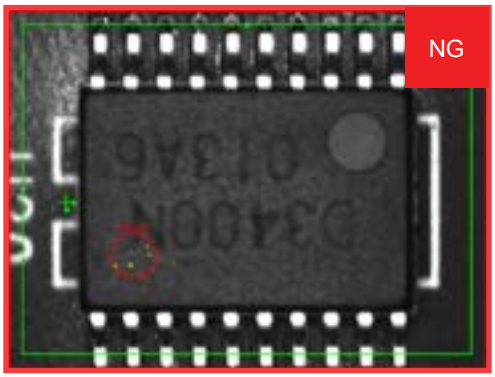
ELECTRONICS



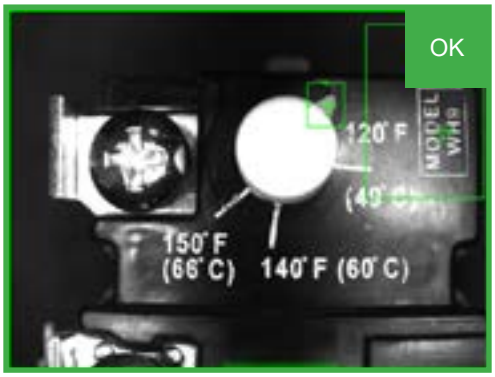


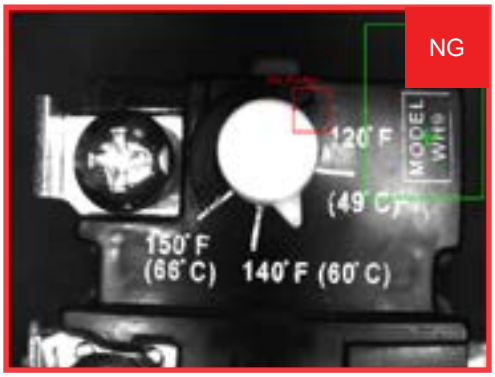
The presence of a rubber gasket attached to a molded plastic part is verified before an automated final assembly step.





The presence of a fiducial is used to verify that an integrated circuit has been soldered onto the PCB in the correct orientation.

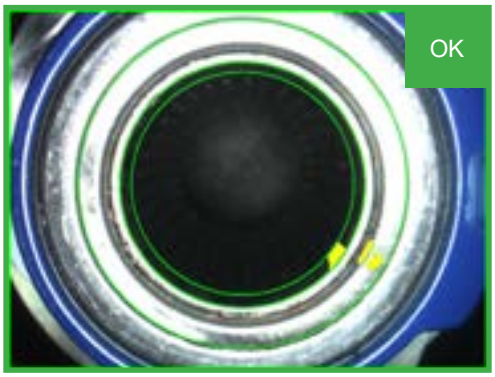


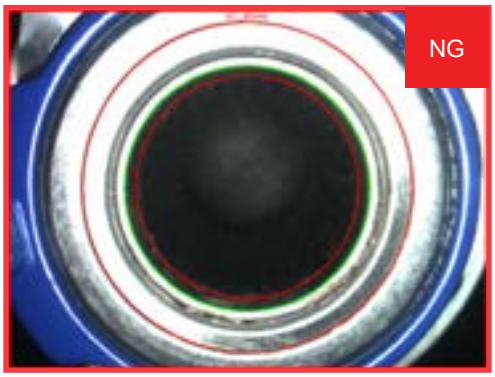


The dial on a thermostat is checked to confirm that it is in the correct position, which helps to ensure proper installation.

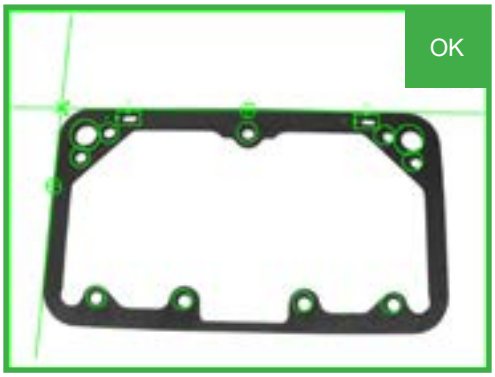
AUTOMOTIVE

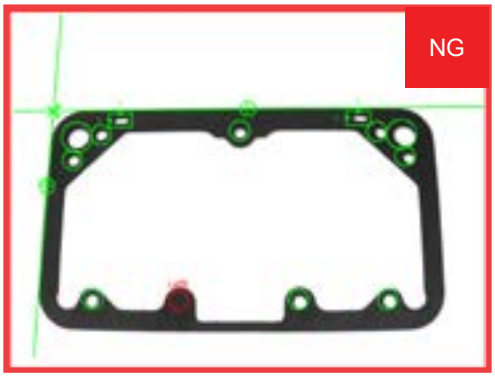
A fuel filter assembly is checked for the presence of an O-ring installed in the proper location before final packaging.





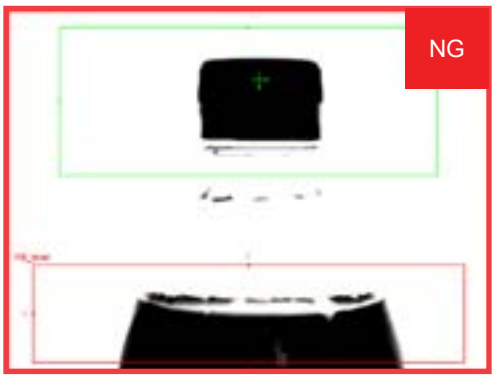
A wheel hub bearing is checked for the presence of quality control (QC) marks before moving to the next stage of assembly. The absence of the QC marks indicates that the hub bearing has not yet been inspected.





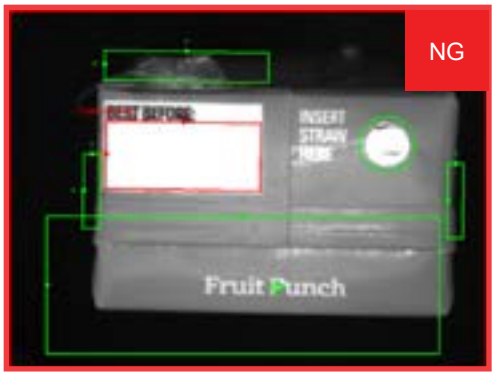
A fuel bowl gasket is inspected to verify that all 13 through holes have been punched out. A missing hole will cause the part to fail.

FOOD AND BEVERAGE



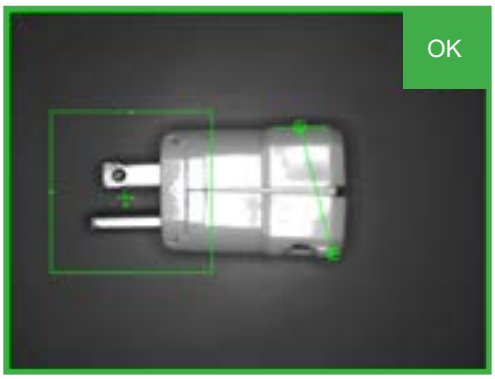
In-Sight vision sensors allow you to perform multiple inspections with each image. In this example, a bottle passes in front of the sensor, and both fill level and cap assembly are validated before the product is packaged.

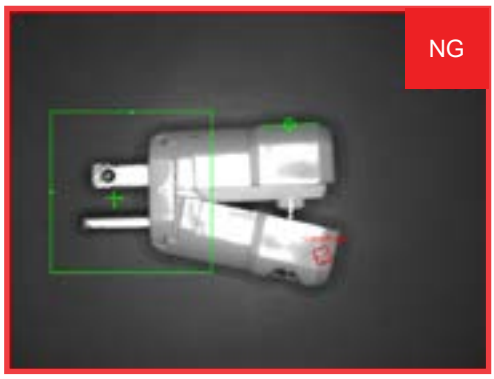
A color pixel count tool verifies that the correct fruit snack flavor is present to ensure that it is packaged in the correct order.



Inspections on a juice box verify that the date/lot code has been printed, confirm the safety seal is intact, check for the presence of a straw, and confirm that the flaps are fully secured.

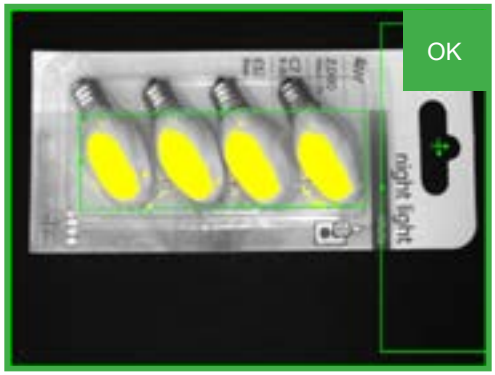
CONSUMER PRODUCTS





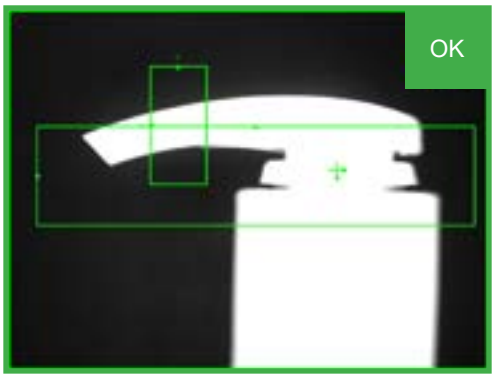
The distance between the two halves of an enclosure is measured to verify that the electrical plug has been assembled correctly. An open plug will cause a failure in the downstream packaging equipment.

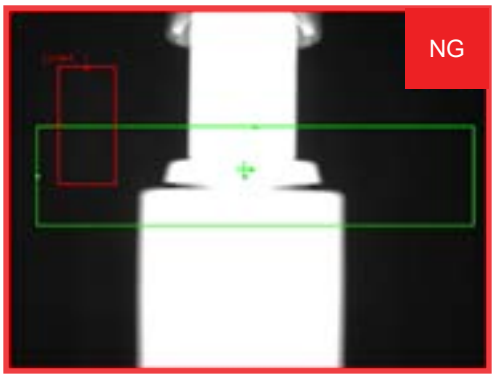
A pattern counting tool is used in this example to inspect the carton and to verify that the correct number of staple strips have been added.



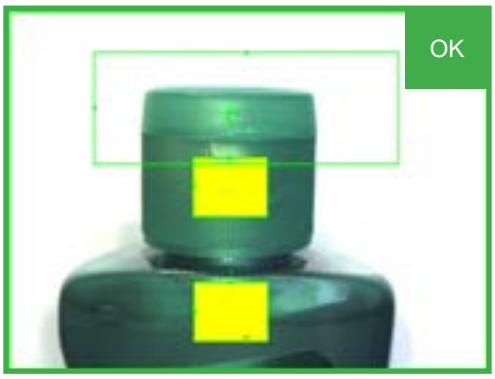
A package of light bulbs is inspected to confirm that all 4 bulbs are present and that none of the bulbs are broken.

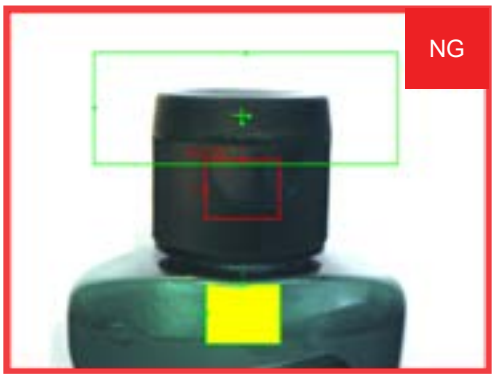
HEALTH AND PHARMACEUTICALS



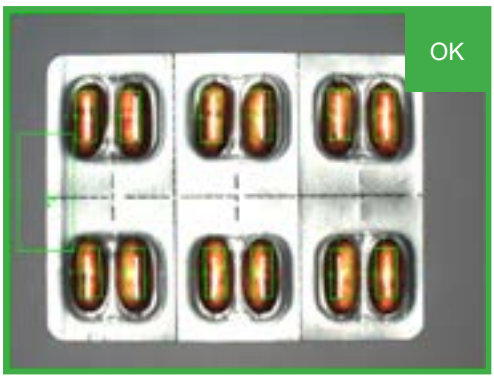


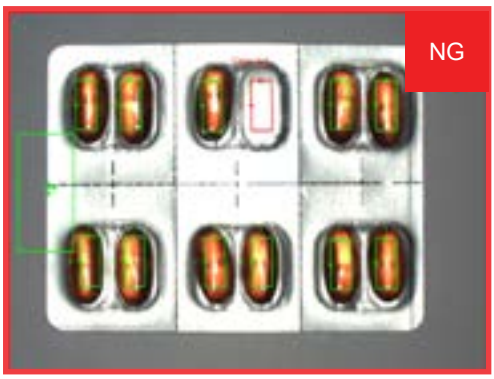
A lotion bottle is checked to confirm that the pump dispenser is in the locked position before the bottle is packed into a carton.





A shampoo bottle is inspected to confirm that the cap and bottle colors match.



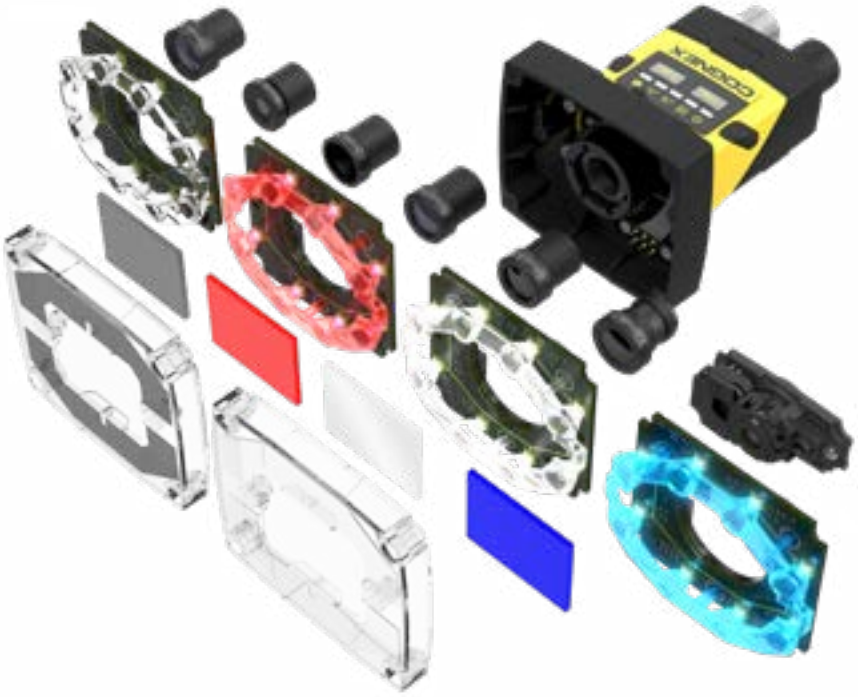


A blister pack is inspected to verify that all the capsules are present after sealing.

Modular Design

In-Sight 2000 series models include an integrated lens and LED illumination that eliminate the need for costly external lighting. Lenses and lighting are field-interchangeable to adjust to different application requirements. The In-Sight 2000 Mini has a smaller form factor making it ideal for mounting in tight spaces.

In-Sight 2000



In-Sight 2000 Mini

A Model for Any Application

Available in both monochrome and color image models, and with different combinations of vision tools, the In-Sight 2000 series lets you choose the level of capability you need. Whatever your inspection application, there's an In-Sight 2000 vision sensor model that's right for the job.

IN-SIGHT 2000 MODELS

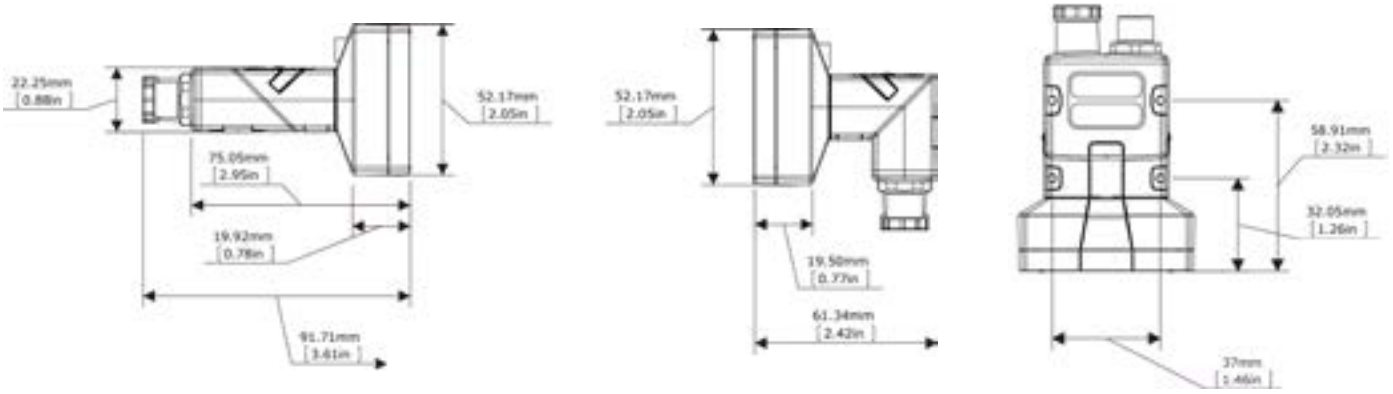
		2000-110	2000-120	2000-130	2000-230	2001-230
User Interface		In-Sight Explorer EasyBuilder, Cognex VisionView PC Software, and VisionView 900 HMI touchscreen panel				
1/3" CMOS Imager, Global Shutter		Monochrome and Color				
S-Mount/M12 Lenses		Standard: Autofocus (liquid lens) 6.2 mm or manual focus 8 mm Optional: Manual focus 3.6 mm, 6 mm, 12 mm, 16 mm, 25 mm				
Image Modes	640 x 480 (standard)	✓	✓	✓	✓	✓
	640 x 480 (2x magnification)	×	✓	✓	✓	✓
	800 x 600 (2x magnification)	×	×	✓	✓	✓
	1280 x 960[1]	×	×	×	×	✓
Lighting	Standard	Diffuse white LED ring light				
	Options	Red, blue and IR LED ring lights and lens filters, and polarized light cover				
Maximum Acquisition Speed[2]		40 fps	75 fps (mono) 55 fps (color)			40 fps (mono) 24 fps (color)
Relative Processing Speed		1x	2x			
Location Tools	Pattern	✓	✓	✓	✓	✓
	Edge, Circle	×	×	✓	✓	✓
Inspection Tools	Pattern	✓	✓	✓	✓	✓
	Pixel Count	×	Grayscale and color			
	Brightness & Contrast	×	✓	✓	✓	✓
	Edges	×	×	✓	✓	✓
Measurement & Counting Tools	Distance, Angle & Diameter	×	×	✓	✓	✓
	Patterns & Edges	×	×	✓	✓	✓
Advanced Features	OCR	×	×	×	✓	✓
	Blob Detection	×	×	×	✓	✓
	Image Filters	×	×	×	✓	✓
Data Output		Pass/Fail		Pass/Fail, Numeric[3]		
Communications & I/O	General Protocols	TCP/IP, UDP, FTP, Telnet, RS-232C				
	Industrial Protocols	OPC UA, EtherNet/IP with AOP, PROFINET Class B, iQSS, SLMP, SLMP Scanner, CC-Link IE Field Basic, Modbus TCP				
	Connectors	(1) Industrial M12 Ethernet, (1) M12 Power & I/O				
	Inputs & Outputs	(1) Acquisition trigger, (1) General purpose input[4], (4) General purpose outputs[4]				
Mechanical	Dimensions	In-line configuration: 92 mm (3.61 in) x 60 mm (2.38 in) x 52 mm (2.05 in) Right-angle configuration: 61 mm (2.42 in) x 60 mm (2.38 in) x 52 mm (2.05 in)				
	Weight	200 g (7.05 oz)				
	Material and Protection	Painted aluminum, IP65-rated housing				
Operating	Power	24 VDC ±10%, 48 W (2.0 A) maximum when the illumination is on				
	PoE Configuration Available	No				
	Temperature	0 °C to 40 °C (32 °F to 104 °F)				

[1] Available in select regions. Ask your Cognex sales representative for more information.

[2] Maximum framerate with minimum exposure; no vision tools; and 640 x 480 image with 2x Image Magnification enabled (for 2000-120/130/230 models).

[3] Limited to Measurement & Counting Tools only.

[4] (7) general purpose inputs and (8) general purpose outputs when using optional CIO-1400 I/O Expansion Module.



IN-SIGHT 2000 MINI MODELS

		2000-110 Mini	2000-120 Mini	2000-130 Mini	2000-230 Mini	2001-230 Mini
User Interface		In-Sight Explorer EasyBuilder, Cognex VisionView PC Software, and VisionView 900 HMI touchscreen panel				
1/3" CMOS Imager, Global Shutter		Monochrome	Monochrome and Color			
S-Mount/M12 Lenses		Autofocus (liquid lens) 6.2 mm or 16 mm				
Image Modes	640 x 480 (standard)	✓	✓	✓	✓	✓
	640 x 480 (2x magnification)	×	✓	✓	✓	✓
	800 x 600 (2x magnification)	×	×	✓	✓	✓
	1280 x 960[1]	×	×	×	×	✓
Lighting	Standard	Modular red LEDs	Modular red (mono) and white (color) LEDs			
	Options	White, blue & IR LED lights, band-pass filters & polarizing filter	White, blue & IR LED lights, band-pass filters, polarizing filter, and polarized light cover			
Maximum Acquisition Speed[2]		40 fps	75 fps (mono) 55 fps (color)			40 fps (mono) 24 fps (color)
Relative Processing Speed		1x	2x			
Location Tools	Pattern	✓	✓	✓	✓	✓
	Edge, Circle	×	×	✓	✓	✓
Inspection Tools	Pattern	✓	✓	✓	✓	✓
	Pixel Count	×	Grayscale			Grayscale and color
	Brightness & Contrast	×	✓	✓	✓	✓
	Edges	×	×	✓	✓	✓
Measurement & Counting Tools	Distance, Angle & Diameter	×	×	✓	✓	✓
	Patterns & Edges	×	×	✓	✓	✓
Advanced Features	OCR	×	×	×	✓	✓
	Blob Detection	×	×	×	✓	✓
	Image Filters	×	×	×	✓	✓
Data Output		Pass/Fail		Pass/Fail, Numeric[3]		
Communications & I/O	General Protocols	TCP/IP, UDP, FTP, Telnet, RS-232C				
	Industrial Protocols	OPC UA, EtherNet/IP with AOP, PROFINET Class B, iQSS, SLMP, SLMP Scanner, CC-Link IE Field Basic, Modbus TCP				
	Connectors	(1) Industrial M12 Ethernet, (1) M12 Power & I/O				
	Inputs & Outputs	(1) Acquisition trigger, (1) General purpose input[4], (4) General purpose outputs[4]				
Mechanical	Dimensions	In-line configuration: 43.1 mm (1.69 in) x 22.4 mm (0.88 in) x 64 mm (2.51 in) Right-angle configuration: 43.1 mm (1.69 in) x 35.8 mm (1.40 in) x 49.3 mm (1.94 in)				
	Weight	142 g (5 oz)				
	Material and Protection	Painted aluminum, IP65-rated housing				
Operating	Power	24 VDC ±10%, <3.0 W or Class 1 Power over Ethernet (PoE)[5]				
	PoE Configuration Available	×	✓	✓	✓	✓
	Temperature	0 °C to 40 °C (32 °F to 104 °F)				

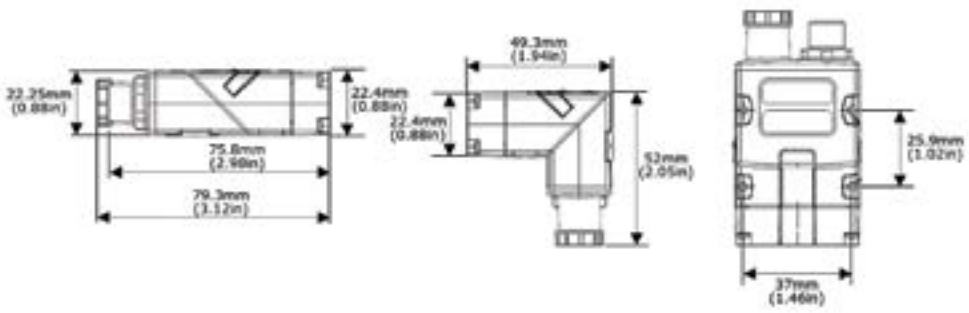
[1] Available in select regions. Ask your Cognex sales representative for more information.

[2] Maximum framerate with minimum exposure; no vision tools; and 640 x 480 image with 2x Image Magnification enabled (for 2000-120/130/230 models)

[3] Limited to Measurement & Counting Tools.

[4] (7) general purpose inputs and (8) general purpose outputs when using optional CIO-1400 I/O Expansion Module.

[5] PoE models cannot use a 24 VDC power supply and vice versa.



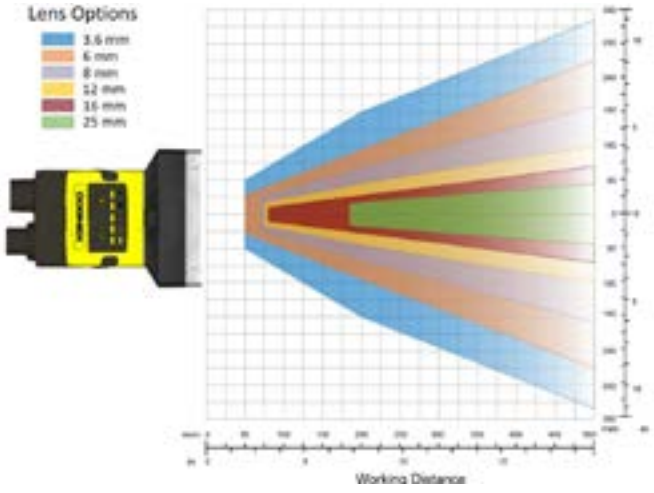
Flexible Mounting Configurations

In-Sight vision sensors can be configured for in-line and right-angle mounting installation. This modular body design provides maximum flexibility to mount in tight spaces, simplifies wiring and optical paths, and minimizes the need to design new mechanical fixtures.

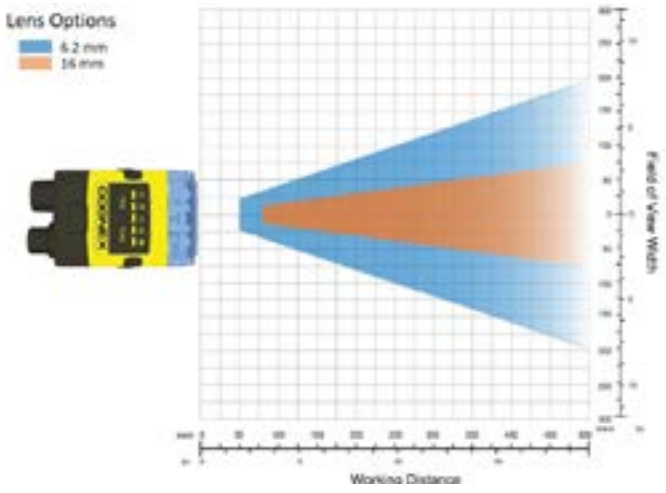
Field of View Options

In-Sight 2000 vision sensors support a wide variety of modular lens options, making it easy to choose the correct configuration for your work cell. Simply choose the desired working distance and the minimum field of view to determine the appropriate lens. This will minimize the amount of time spent choosing and troubleshooting accessories for the application.

In-Sight 2000



In-Sight 2000 Mini

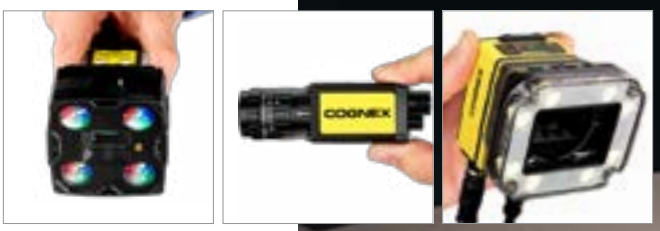


BUILD YOUR VISION

2D VISION SYSTEMS

Cognex machine vision systems are unmatched in their ability to inspect, identify and guide parts. They are easy to deploy and provide reliable, repeatable performance for common to complex tasks.

www.cognex.com/machine-vision



3D VISION SYSTEMS

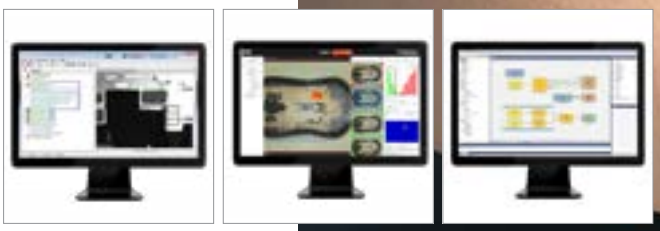
Cognex laser profilers and area scan 3D vision systems provide ultimate ease of use, power and flexibility to achieve reliable and accurate measurement results for the most challenging 3D applications.

www.cognex.com/3D-vision-systems

VISION SOFTWARE

Cognex vision software provides industry leading vision technologies, from traditional machine vision to deep learning-based image analysis, to meet any development needs.

www.cognex.com/vision-software



BARCODE READERS

Cognex industrial barcode readers and mobile terminals with patented algorithms provide the highest read rates for 1D, 2D and DPM codes regardless of the barcode symbology, size, quality, printing method or surface.

www.cognex.com/barcodereaders

COGNEX

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

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