

### COGNEX

### **IN-SIGHT 3800 SERIES**

All-in-one vision system meets all your vision needs

High speed, high resolution, high flexibility. The In-Sight® 3800 has it all.

This advanced vision system provides a powerful, yet easy-to-use, solution for automated inspections. Embedded with a full set of robust rule-based tools and innovative edge learning technology, In-Sight 3800 solves a range of manufacturing applications, from defect detection and assembly verification to character reading and more.

- · Run more inspections in less time.
- Improve the accuracy of your results.
- Seamlessly scale your solution.



## Run more inspections in less time

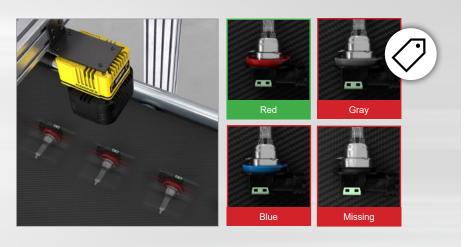
Maximize throughput with high-speed processing and quick setup.

Tools running 2X faster than previous generation vision systems offer ultimate power and performance for any job



Advanced classification and OCR functionality automates a variety of tasks, from simple to complex







### Improve the accuracy of your results

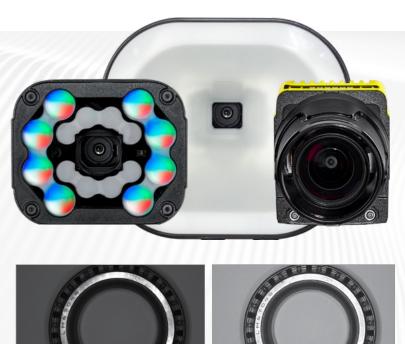
Generate high-resolution, high-contrast images that detect even the most subtle defects.

Integrated multi-color lighting accommodates a range of application requirements and operating conditions

**PAGE 11** 

Unique high-dynamic range plus (HDR+) technology optimizes image formation in a single acquisition

PAGE 12







### **Seamlessly scale** your solution

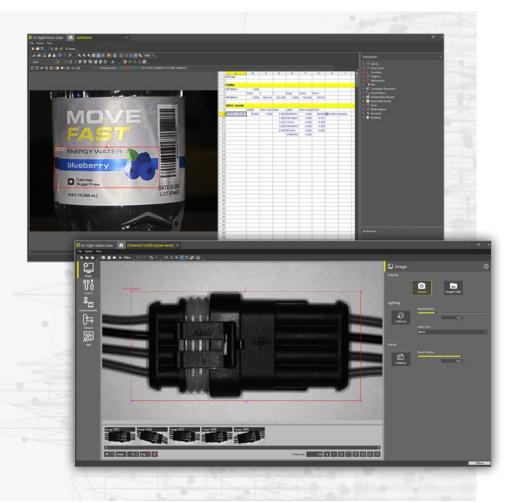
Create jobs in a common software platform that supports scalability across In-Sight products and offers both point-and-click and advanced setup options.

Robust spreadsheetbased job creation enables more control over tool parameters for complex tasks

PAGE 8

Intuitive EasyBuilder® interface simplifies the training workflow for quick deployment

PAGE 9



# Comprehensive toolset solves tasks of varying complexity

Integrating AI and rule-based tools in a single vision system, the In-Sight 3800 addresses a wide range of error-proofing applications. The tools can be used individually for simple jobs or combined to automate more challenging problems.







### Al tools

The In-Sight 3800 is embedded with powerful edge learning tools that leverage AI technology to process images on device, or "at the edge" of where the data is collected, to deliver accurate results in real time.

Edge learning tools are easy-to-use and simple to deploy with example-based training and no experience needed.













Go beyond the standard OK/NG output with ViDi™ EL Classify. The tool identifies and sorts parts based on multiple features or characteristics. This enables users to classify defects into different categories and correctly identify parts with variation, allowing you to automate a wider range of tasks.



Read characters on reflective, low-contrast, and non-flat surfaces with ease. The ViDi EL Read tool deciphers a range of text, including multi-line text, using advanced optical character recognition (OCR) technology.



#### **Training**

ViDi EL tools can be trained in minutes, using as few as five to ten example images of the relevant classes or characters.









#### Confidence score

Get real-time, visual feedback on the accuracy of your results. The confidence score verifies whether the ViDi EL tool correctly predicted the output, leading to less manual intervention and more reliable inspections.

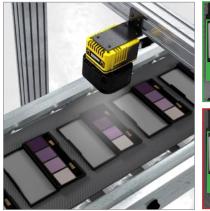


<sup>\*</sup>Rule-based tool performance is 2x faster than In-Sight 7800/7900 series. Al tool performance is 3-4x faster than In-Sight 2800 series.



### **Classification examples**

### Consumer products: Detect presence/absence in kitted products and run multi-ROI classification





Electric vehicle (EV) batteries: Check parts for surface-level defects







Automotive electronics: Detect presence/absence of components and classify defects







Missing

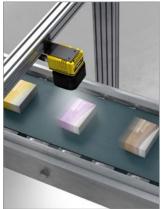
Gray



Automotive parts: Inspect for mechanical flaws



Consumer products: Classify scents or flavors on packaging





Blue







Food & beverage: Identify damaged or missing components













Logistics: Read multiple lines of text on different package types



Consumer product: Decipher lot codes against variable backgrounds



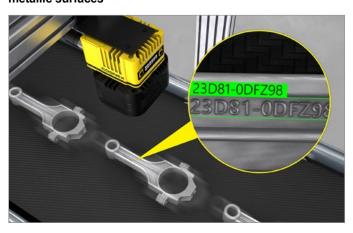
Automotive: Read codes on low-contrast and reflective surfaces



Pharmaceutical: Perform on-line verification at high speeds



Automotive: Decipher hard-to-read text etched on metallic surfaces



Food & beverage: Read lot codes and expiration dates on uneven surfaces



### **Rule-based vision tools**

In-Sight 3800 is also equipped with an extensive library of industry-proven traditional vision tools that allow you to measure distance and blobs, count pixels, and patterns, read codes, guide robots, perform math and logic, and more. These tools run 2X faster on In-Sight 3800 than previous generation products, so you can solve applications more quickly and accommodate faster line speeds.

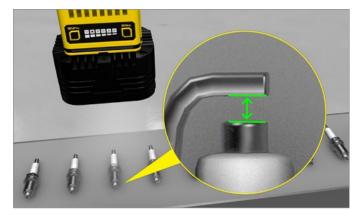
#### Barcode reading: Read codes on curved surfaces



Brightness: Detect presence/absence of components based on varying brightness levels



Gauging: Measure the distance between components



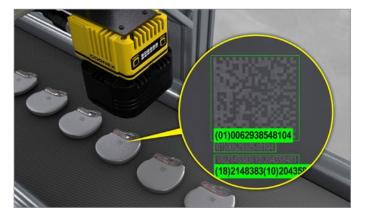
Robotic guidance: Pick and place finished products into bins



Counting: Count components to verify completeness



Code reading and OCR: Read 2D codes and text simultaneously



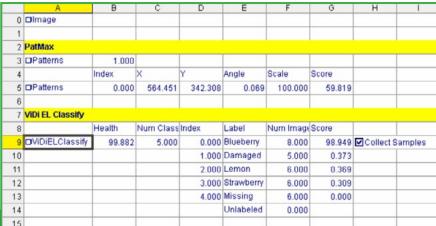
### Common software platform offers flexible development options

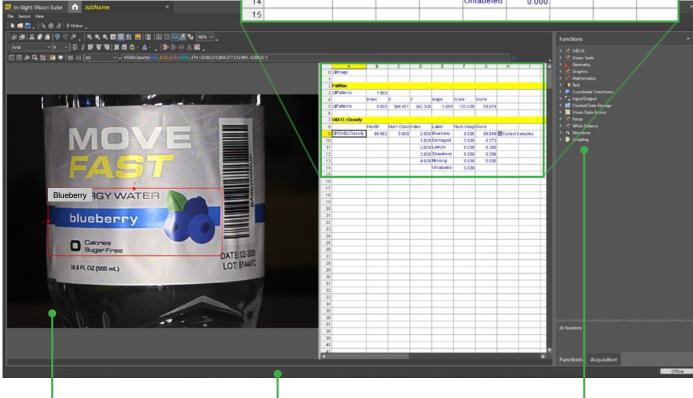
In-Sight Vision Suite software is common across all In-Sight products and includes two programming environments — spreadsheet and EasyBuilder — which allows you to seamlessly scale your solution as your business needs evolve.

# Spreadsheet guides users through advanced applications

The In-Sight spreadsheet interface allows you to quickly set up and run jobs without the need for programming. This robust development environment provides you with the flexibility to make critical adjustments to job parameters, so you can adapt your applications as your requirements change.

Powerful spreadsheet interface allows users to solve complex applications





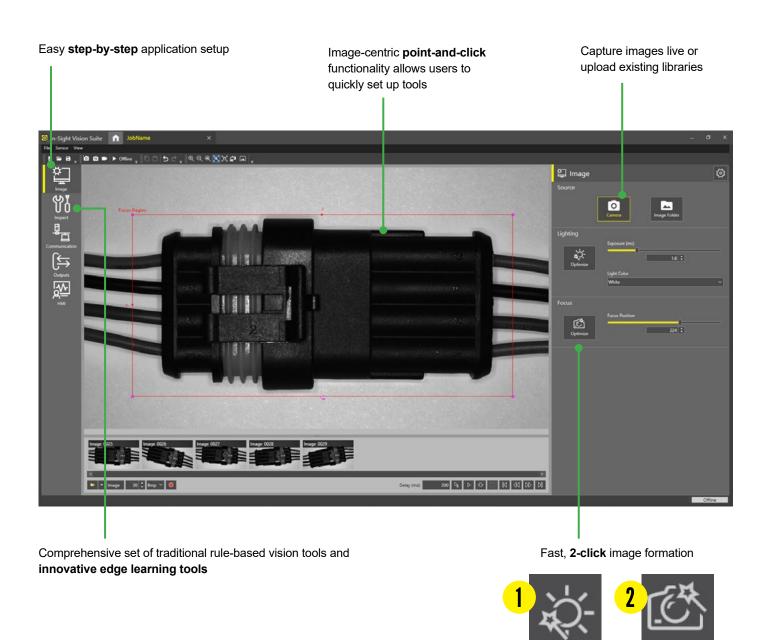
Easily review and recall files with image playback

**Full I/O and communications** function set streamlines factory integration

Full suite of AI- and rule-based **vision tools** 

### EasyBuilder development environment simplifies setup and delivers rapid turnaround

With its point-and-click programming, the EasyBuilder interface within In-Sight Vision Suite is ideal for developing simple or common jobs. The intuitive process guides developers step-by-step through setup — from image capture to the final result and beyond — allowing both new and experienced users to configure vision applications.

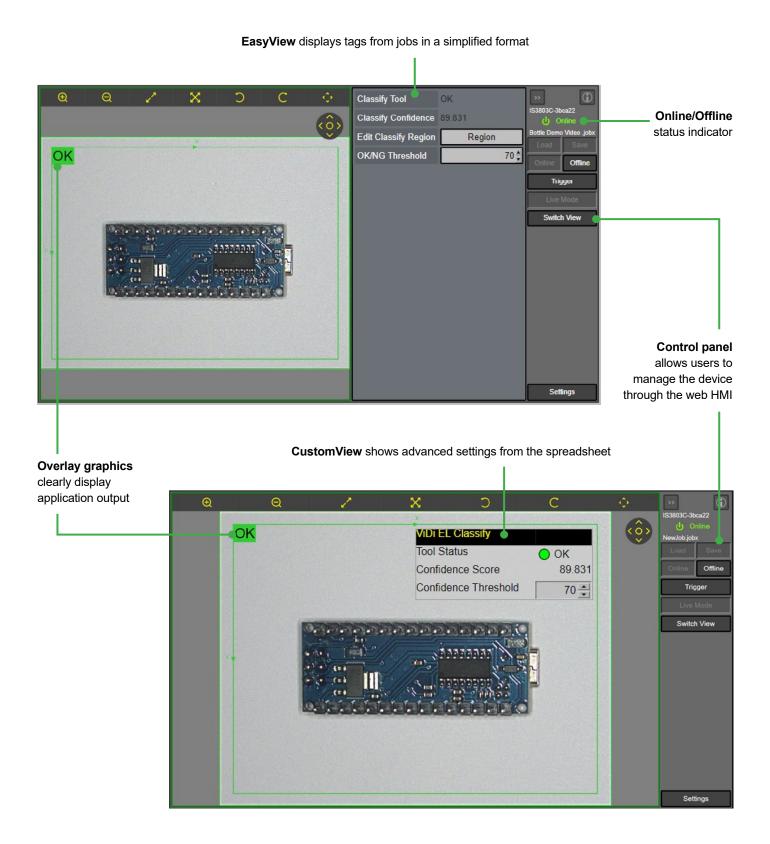


Optimize Focus

Optimize Exposure

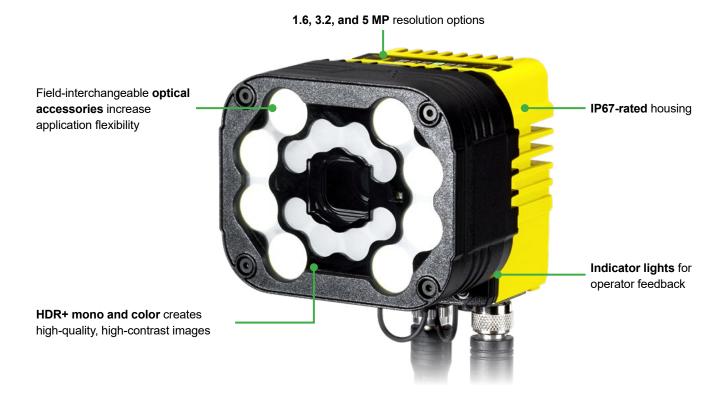
### Web-based HMI offers real-time application testing and optimization

The In-Sight 3800 provides access to a web-based human-machine interface (HMI) that enables runtime visualization. From the HMI, users can view inspection results and modify setup parameters to optimize their application.



### Full-featured vision system solves wide range of applications

The In-Sight 3800 is engineered with the entire suite of innovative Cognex vision tools and convenient features that deliver fast, reliable automation.



### Powerful, flexible integrated lighting

Multi-color (RGBW and IR) lighting options allow you to optimize image contrast for your application, regardless of operating conditions. Simply click a button in In-Sight Vision Suite to change the light color and generate high-resolution images for more accurate inspections.



Actual part



Red light: Numbers are unclear



Blue light: Numbers are clear



### Innovative technology pushes the boundaries of HDR

HDR+ enhances the capabilities of HDR technology by optimizing contrast automatically. This creates a more uniformed, more detailed image in a single acquisition. Available in both monochrome and color options, HDR+ delivers higher contrast and image quality that allow you to:

- See features that were not visible before
- Reduce light intensity
- Increase depth of field

#### Part inspection and OCR



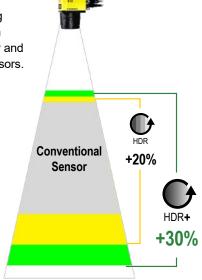
Without HDR: Embedded parts are unclear.



With HDR+: Serial code and bearings are both visible.

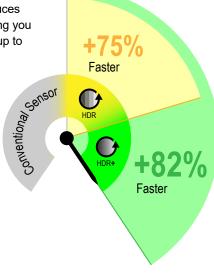
#### Greater depth-of-field

HDR+ reduces over- and under-exposure, providing greater depth-of-field than standard HDR technology and conventional imaging sensors.



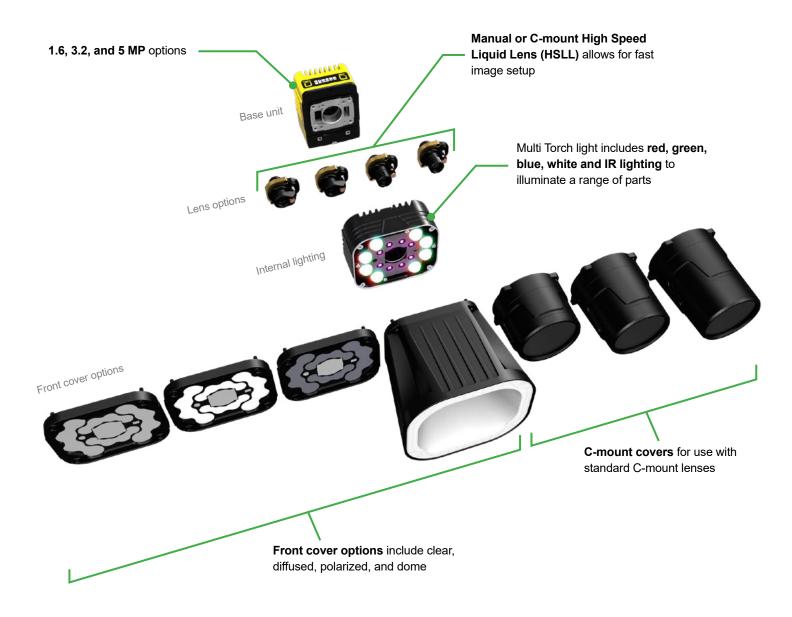
#### **Faster line speeds**

HDR+ significantly reduces exposure times, enabling you to accommodate lines up to 80% faster.



### Scalable architecture for current and future needs

The In-Sight 3800 series offers a variety of accessories and modular components. This flexibility enables users to adapt to keep up with changing demands, such as new changes, faster line speeds, and higher quality standards.

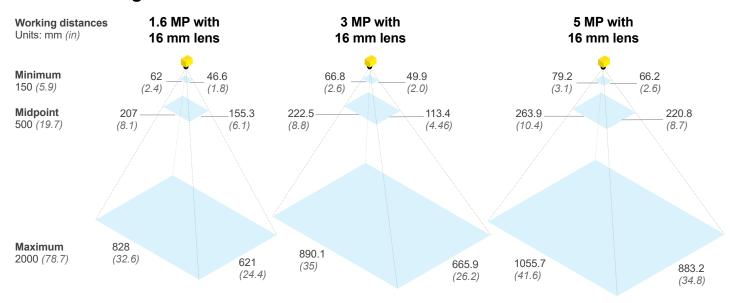


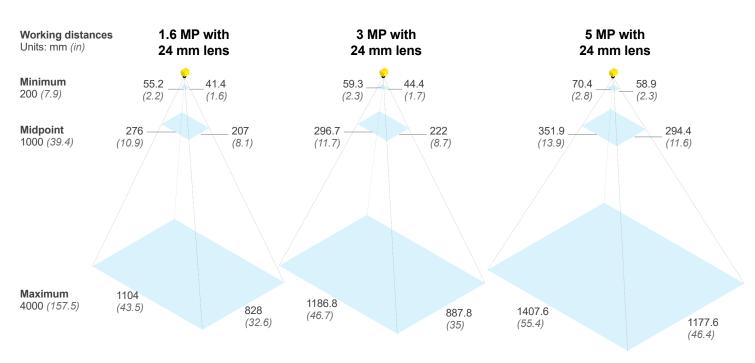


IN-SIGHT 3800 SERIES SPECIFICATIONS							
Image Sensor	IS3801M	IS3801C	IS3803M	IS3803C	IS3805M	IS3805C	
Bit Depth	8-bit monochrome	24-bit color	8-bit monochrome	24-bit color	8-bit monochrome	24-bit color	
Frames per Second (Maximum, Full Resolution)	125 fps	52 fps	47 fps	30 fps	32 fps	21 fps	
Sensor Type	1/2.3" CMOS,	global shutter	1/1.8" CMOS,	global shutter	2/3" CMOS, g	global shutter	
Sensor Properties	6.3 mm diagonal, 3.45 x 3.45 µm square pixels		8.9 mm diagonal, 3.45 x 3.45 µm square pixels		11.1 mm 3.45 x 3.45 µm		
Maximum Image Resolution (pixels)	1440 x 1080		2048 x 1536		2448 x 2048		
Electronic Shutter Speed	19.5 µs to 2	200,000 µs	25.1 µs to	25.1 µs to 200,000 µs		19.1 µs to 200,000 µs	

Vision System	
Memory	4 GB
Lens Type	C-Mount, Cognex High Speed Liquid Lens Autofocus, or Cognex manual focus lens (used with Multi-Torch Illumination accessory).
Trigger	1 opto-isolated, acquisition trigger input.
Discrete Inputs	1 opto-isolated, acquisition trigger input. Up to 3 general-purpose inputs when connected to the Breakout cable.
Discrete Outputs	Up to 4 high-speed outputs when connected to the Breakout cable.
Status LEDs	Pass/Fail LED and Indicator Ring, Network LED and Error LED.
High Speed Liquid Lens Lifespan	Number of Focus Cycles: 1800 M cycles
Job/Program Memory	7.2 GB non-volatile flash memory; unlimited storage via remote network device.
Image Processing Memory	512 MB SDRAM
Network Communication	2 Ethernet ports, 10/100/1000 BaseT with auto MDIX. IEEE 802.3 TCP/IP Protocol. Supports DHCP, static, and link-local IP address configuration.
Power Consumption	24 V DC ± 10%, 2.0 A maximum.
Power Output	24 V DC at 1.0 A maximum to external light.
Material	Die-cast and extruded aluminum housing.
Finish	Painted.
Mounting	Four M3 threaded mounting holes. See Accessories for supported mounts.  Pattern: 38.5 × 58.5 mm (1.52 × 2.60 in)
Weight	In-Sight 3800 with no accessories attached: 570 g (20.10 oz).  With 45 mm plastic C-Mount cover (COV-380-CMNT-45): 625 g (22.0 oz.) - no lens included.  With 60 mm plastic C-Mount cover (COV-380-CMNT-60): 635 g (22.4 oz.) - no lens included.  With 75 mm plastic C-Mount cover (COV-380-CMNT-75): 650 g (22.9 oz.) - no lens included.  With Multi-Torch Illumination, High Speed Liquid Lens (16 mm), and standard front cover: 840 g (29.6 oz.).  With Multi-Torch Illumination, High Speed Liquid Lens (16 mm), and dome attachment: 970 g (34.2 oz.).
Case Temperature	0° C to 40° C (32° F to 122° F)
Storage Temperature	-20° C to 80° C (-4° F to 176° F)
Humidity	<95% non-condensing
Protection	IP67 with all cables properly attached (or the provided connector plug installed), the IP67-rated cover, or Multi Torch attachment properly installed.
Shock (Shipping and Storage)	IEC 60068-2-27: 18 shocks (3 shocks in each polarity in each (X, Y, Z) axis) 80 Gs (800 m/s2 at 11 ms, half-sinusoidal) with cables or cable plugs and a 150 gram or lighter lens attached.
Vibration (Shipping and Storage)	IEC 60068-2-6: vibration test in each of the three main axis for 2 hours at 10 Gs (10 to 500 Hz at 100 m/s2 / 15 mm) with cables or cable plugs and a 150 gram or lighter lens attached.
Regulations/Conformity	CE, FCC, KCC, TÜV SÜD NRTL, EU RoHS, China RoHS

### Field of view diagrams\*





\*Field of view diagrams are based on the minimum and maximum focus distances of the High Speed Liquid Lens. If using a High Speed Liquid Lens with the Multi Torch light accessory, the system will perform best at distances between 150–500 mm (5.9–19.7 in) in terms of light intensity/uniformity.



### Find the right lens for your application

The Cognex lens advisor makes it easy to select the right lens for your application. Plug in your specifications, hit "Calculate," and let the advisor take care of the rest.

cognex.com/lens-advisor

### ${\bf Product~IDs~and~descriptions^*}$

IN-SIGHT 3	IN-SIGHT 3801							
	Product ID	Resolution	Mono/Color	Performance	Light	Lens	Cover	Toolset
	IS3801MP-00001-SA	1.6 MP	Mono	Performance	None	None	None	EB/SS1, all tools
STATE OF THE PARTY	IS3801CP-00001-SA	1.6 MP	Color	Performance	None	None	None	EB/SS, all tools
ioi	IS3801MS-00001-SA	1.6 MP	Mono	Standard	None	None	None	EB/SS, all tools
	IS3801CS-00001-SA	1.6 MP	Color	Standard	None	None	None	EB/SS, all tools
· ·	IS3801MP-14621-SA	1.6 MP	Mono	Performance	Multi Torch	16 mm HSLL	Diffused	EB/SS, all tools
	IS3801CP-14621-SA	1.6 MP	Color	Performance	Multi Torch	16 mm HSLL	Diffused	EB/SS, all tools
(C)	IS3801MP-14821-SA	1.6 MP	Mono	Performance	Multi Torch	24 mm HSLL	Diffused	EB/SS, all tools
	IS3801CP-14821-SA	1.6 MP	Color	Performance	Multi Torch	24 mm HSLL	Diffused	EB/SS, all tools

IN-SIGHT 3	IN-SIGHT 3803							
	Product ID	Resolution	Mono/Color	Performance	Light	Lens	Cover	Toolset
	IS3803MP-00001-SA	3.2 MP	Mono	Performance	None	None	None	EB/SS, all tools
S. Land	IS3803CP-00001-SA	3.2 MP	Color	Performance	None	None	None	EB/SS, all tools
	IS3803MS-00001-SA	3.2 MP	Mono	Standard	None	None	None	EB/SS, all tools
	IS3803CS-00001-SA	3.2 MP	Color	Standard	None	None	None	EB/SS, all tools
	IS3803MP-14621-SA	3.2 MP	Mono	Performance	Multi Torch	16 mm HSLL	Diffused	EB/SS, all tools
	IS3803CP-14621-SA	3.2 MP	Color	Performance	Multi Torch	16 mm HSLL	Diffused	EB/SS, all tools
(0)	IS3803MP-14821-SA	3.2 MP	Mono	Performance	Multi Torch	24 mm HSLL	Diffused	EB/SS, all tools
	IS3803CP-14821-SA	3.2 MP	Color	Performance	Multi Torch	24 mm HSLL	Diffused	EB/SS, all tools

IN-SIGHT 3	IN-SIGHT 3805							
	Product ID	Resolution	Mono/Color	Performance	Light	Lens	Cover	Toolset
	IS3805MP-00001-SA	5 MP	Mono	Performance	None	None	None	EB/SS, all tools
G. W.	IS3805CP-00001-SA	5 MP	Color	Performance	None	None	None	EB/SS, all tools
	IS3805MS-00001-SA	5 MP	Mono	Standard	None	None	None	EB/SS, all tools
	IS3805CS-00001-SA	5 MP	Color	Standard	None	None	None	EB/SS, all tools
	IS3805MP-14621-SA	5 MP	Mono	Performance	Multi Torch	16 mm HSLL	Diffused	EB/SS, all tools
	IS3805CP-14621-SA	5 MP	Color	Performance	Multi Torch	16 mm HSLL	Diffused	EB/SS, all tools
(C)	IS3805MP-14821-SA	5 MP	Mono	Performance	Multi Torch	24 mm HSLL	Diffused	EB/SS, all tools
	IS3805CP-14821-SA	5 MP	Color	Performance	Multi Torch	24 mm HSLL	Diffused	EB/SS, all tools

<sup>\*</sup>This table includes only the most common product models. To get information on other available models, please contact Cognex Sales at cognex.com/contact-sales.

<sup>1</sup> EasyBuilder/Spreadsheet

### **Components and accessories**

MULTI TORCH LIGHT					
	Product ID	Description			
(a)	380-TORCH-MULTI-AF	Multi Torch Accessory Kit for autofocus lenses. Includes: Multi Torch illumination module, mount for illumination module (High Speed Liquid Lenses only), diffused cover, illumination PCB, 2 mm hex tool.			
	380-TORCH-MULTI-MF	Multi Torch Accessory Kit for manual focus lenses. Includes: Multi Torch illumination module, mount for illumination module (manual focus lenses only), diffused cover, illumination PCB, 2 mm hex tool.			

MULTI TO	MULTI TORCH FRONT COVERS					
	Product ID	Description				
	380-TORCH-COVDIF	Multi Torch diffused front cover				
	380-TORCH-COVPOL	Multi Torch cross-polarized front cover				
	380-TORCH-COVCLR	Multi Torch clear front cover				
	380-TORCH-DOME	Multi Torch dome attachment				

BANDPAS	S FILTERS	
	Product ID	Description
	380-TORCH-BP470	Blue bandpass filter for Multi Torch
	380-TORCH-BP635	Red bandpass filter for Multi Torch

LENSES		
	Product ID	Description
	CLN-C16F8FS-HSLL	16 mm HSLL
	CLN-C24F6FS-HSLL	24 mm HSLL
	CLN-C16F8FS	16 mm manual focus lens
	CLN-C24F6FS	24 mm manual focus lens

LENS COVERS				
	Product ID	Description		
	COV-380-CMNT-45	45 mm plastic lens cover		
	COV-380-CMNT-60	60 mm plastic lens cover		
	COV-380-CMNT-75	75 mm plastic lens cover		
	COV-7000-CMNT-LGX	30 mm lens cover extender		

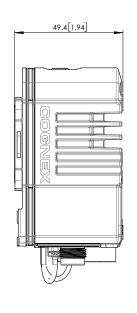
MOUNTING BRACKETS				
	Product ID	Description		
	BKT-INS-01	Mounting bracket with M3, M4 and 1/4 - 20 mounting holes		
	ISB-7000-7K	Converter mounting bracket with M3 socket head screws/wrench		
	ISB-7000-5K	Converter mounting bracket with Phillips flat head M3 screws and M4 screws		

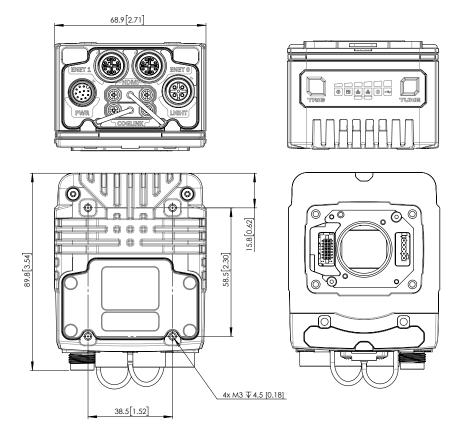
OARLEO		
CABLES		
	Product ID	Description
0	IVSL-5PM12-J300 IVSL-5PM12-J500 IVSL-5PM12-J1000 IVSL-5PM12-J2000	External light cable, yellow (300 mm, 500 mm, 1000 mm, 2000 mm)
0	IVSL-M12-NSB-300 IVSL-M12-NSB-1000 IVSL-M12-NSB-2000	External light cable, black (300 mm, 1000 mm, 2000 mm)
0	CCB-M12LTF-05 CCB-M12LTF-100 CCB-M12LTF-200 CCB-M12LTF-500	External light cable, gray (0.5 m, 1 m, 2 m, 5 m)
	ICQ-CB-0.5-IFL-M12	Black M12 to M12 cable with a small in-line capacitor (2 m)
	CCB-84901-2001-02 CCB-84901-2001-05 CCB-84901-2001-10 CCB-84901-2001-15 CCB-84901-2001-30	Ethernet cable, X-coded M12-8 to RJ-45 (2 m, 5 m, 10 m, 15 m, 30 m)
	CCB-84901-2RBT-02 CCB-84901-2RBT-05 CCB-84901-2RBT-10	Ethernet cable, X-coded M12-8 to RJ-45 (2 m, 5 m, 10 m)
0	CCB-PWRIO-05 CCB-PWRIO-10 CCB-PWRIO-15	Breakout cable, M12-12 to flying lead (5 m, 10 m, 15 m)

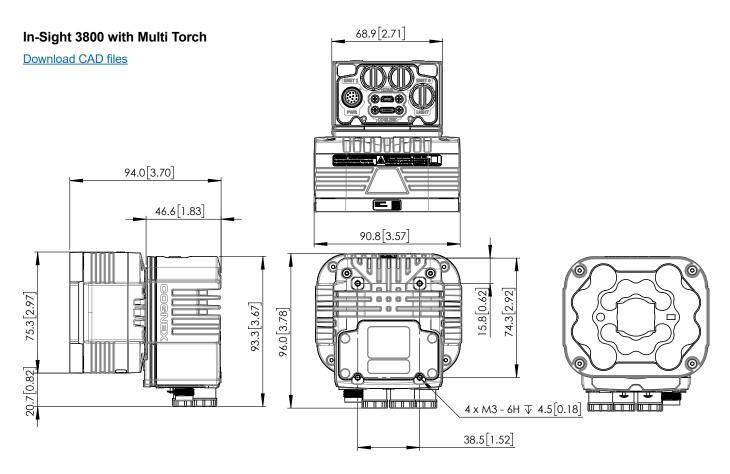
### **Dimensions** Units: mm, [in]

### In-Sight 3800 base unit

**Download CAD files** 

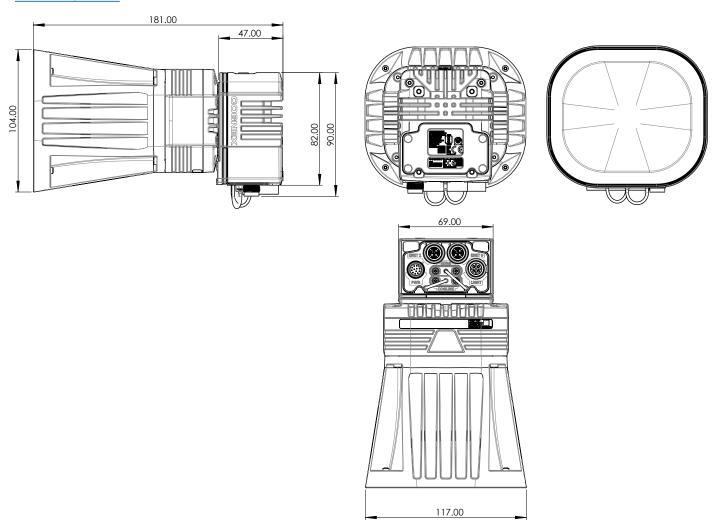






### In-Sight 3800 with Dome

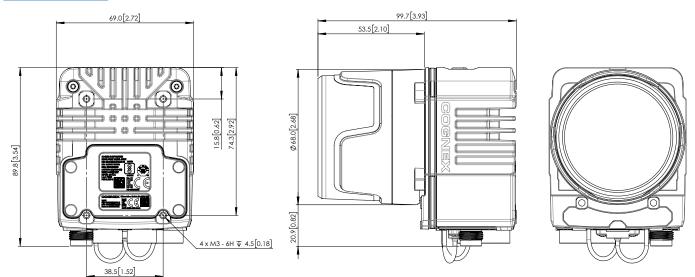
#### **Download CAD files**



#### In-Sight 3800 with C-mount

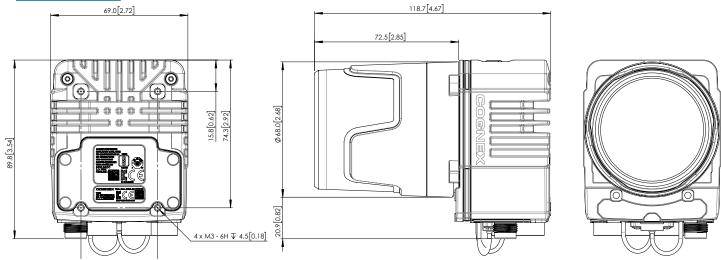
#### 45 mm C-mount cover

#### **Download CAD files**



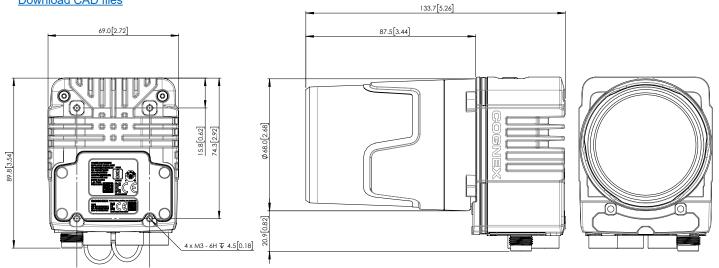
#### 60 mm C-mount cover

#### **Download CAD files**

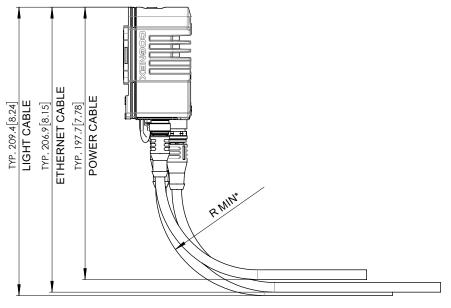


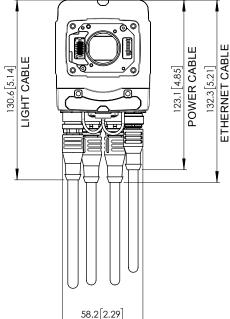
#### 75 mm C-mount cover

#### **Download CAD files**



#### Cable bend radius





\*R MIN = 10X CABLE DIAMETER

TYPICAL: POWER CABLE Ø7.1 [0.28] ETHERNET CABLE Ø7.1 [0.28] LIGHT CABLE Ø7.5 [0.3]

### 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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