

# COGNEX

PRODUCT GUIDE 2007

In-Sight® vision sensors provide breakthrough performance and unmatched ruggedness for the most challenging vision applications.

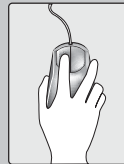


**In-Sight®**  
Vision Sensors

# Contents

Introduction	1
Model Overview	2-3
In-Sight Explorer	4
OPC	5
Model Comparison Chart	6-7
Vision Tools	8-9
Robotics and Networking	10
Accessories	11
Support and Training	12

Cognex® provides the broadest range of machine vision products in the industry. This enables our customers to meet all of their machine vision requirements with a single vendor.



To learn more about In-Sight vision sensors, as well as our other machine vision product families, please visit us at [www.cognex.com/products](http://www.cognex.com/products)

## New!

### Unmatched performance and resolution

- **5600 and 5610 models ... for the highest performance.**

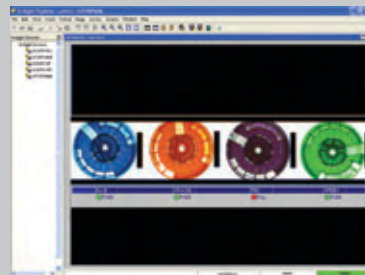
The 5600 is the fastest vision sensor on the market... and the 5610 is ideal for high-speed code reading, mark quality assessment, and for difficult-to-read codes

- **Highest performance *and* highest resolution with 5603/5613 models.** The 5603 adds the highest resolution to model 5600 performance. The 5613 extends these features to code reading applications

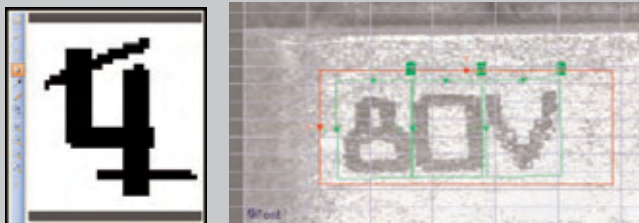


### Price/performance ... plus color

- New In-Sight 5100C model offers the best price/performance color in the In-Sight 5000 Series
- Provides reliable color detection of a wide range of part types
- Converts color images to grayscale for additional types of inspections

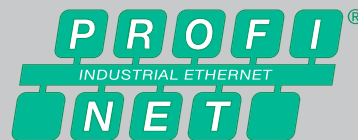


### Advanced OCV/OCR Tools



- Handles low-contrast, confusing, and unevenly-spaced characters
- Font editor improves readability of poorly-trained or degraded fonts
- All In-Sight models include OCV/OCR tools

### PROFINET



- In-Sight vision sensors now support PROFINET communications, the open Industrial Standard Ethernet protocol from PROFIBUS
- Point-and-click data setup allows the communications dialogue to handle all data formatting. Users only have to identify the data to be sent or received
- Included documentation provides sample code for both In-Sight vision sensors and Siemens S7 PLCs

# The Cognex Advantage

## Industry-Leading Performance and Ruggedness

In-Sight sensors are the standard for machine vision on the factory floor. Their unprecedented vision power and unmatched ruggedness are helping manufacturers around the world improve productivity, ensure product quality, and lower manufacturing costs. And, an array of In-Sight models means that there's one just right for your application.

## Breakthrough Performance

Since the inception of Cognex a quarter century ago, we've recognized the importance of performance in successful machine vision applications. Not only the need for high-speed image acquisition and processing, but also the need for a library of powerful vision tools. And that's what Cognex In-Sight delivers today. This assures users of reliable, repeatable performance in the most challenging vision applications.

## Industrial-Grade Design

In-Sight is the the only family of vision sensors available today that provides industrial-grade features as standard. That means rugged die-cast aluminum and stainless steel cases that can withstand the punishment of vibration, and sealed M12 connectors and protective lens cover for IP-rated protection against dust and moisture. It all adds up to peace of mind on the factory floor.

**INDUSTRIAL  
GRADE VISION**

# Industrial-Grade Vision Sensors

Whether it's solving a single-point inspection task or building an entire factory-wide network of vision sensors, the In-Sight product family provides a choice of models to help meet the cost and functionality requirements of the application.

## General-Purpose Vision Sensor



### In-Sight 5000 Series

These vision sensors provide users with the highest level of In-Sight performance, and are the only vision sensors available today that provide industrial-grade features as standard.

- Highest-performance models of the In-Sight family
- Die-cast aluminum housing, sealed M12 connectors, and included protective lens cover provide an IP67 (NEMA 6) rating for dust and wash-down protection
- Includes powerful IDMax™ Data Matrix™ code reading software
- Revolutionary PatMax® object location software is optionally available

A protective lens cover is provided for dust and wash-down protection.

**INDUSTRIAL  
GRADE VISION**

Unmatched  
Speed and  
Ruggedness!



### General Applications

#### In-Sight 5100

Best price/performance of the In-Sight 5000 Series

#### In-Sight 5400

High-performance In-Sight 5000 model

#### In-Sight 5600

Fastest vision sensor on the market

### High Resolution

#### In-Sight 5401

High resolution (1024 x 768) imaging

#### In-Sight 5403

Highest resolution (1600 x 1200) imaging

#### In-Sight 5603

Highest resolution (1600 x 1200) at fastest speed

### Color

#### In-Sight 5100C

General color applications

#### In-Sight 5400C

Differentiates colors at high production speeds

## Stainless Steel Vision Sensors



IP68-rated protection for wash-down environment

### In-Sight 5400S

- Highest In-Sight performance level

### In-Sight 5400CS

- High-speed color on fast production lines

### In-Sight 5403S

- Highest resolution (1600 x 1200) images

## Remote Head Vision Sensors



### In-Sight 5400R

- In-Sight 5400 performance in the smallest size available
- Ideal for robotic applications, or wherever mounting space is limited

### In-Sight 3400

- Standalone configuration (no PC required for setup)

## Industrial-Grade ID Readers



Shown with optional Diffuse Ring Light

### In-Sight 5110

- Provides 1D and 2D decoding for Direct Part Mark Identification. Now with OCV and OCR for verifying and reading alphanumeric strings.
- Supports AIM DPM, ISO and AS 9132 mark quality metrics for code quality assessment.

### In-Sight 5410/5410S/5410R/5610

- The 5410 and 5610 models provide all In-Sight 5110 capabilities at higher speeds, with the 5610 providing the highest processing power for high-speed reading and mark quality assessment, and for reading difficult-to-read codes.
- 5410S stainless and 5410R remote head models extend the application versatility of the 5410 model.

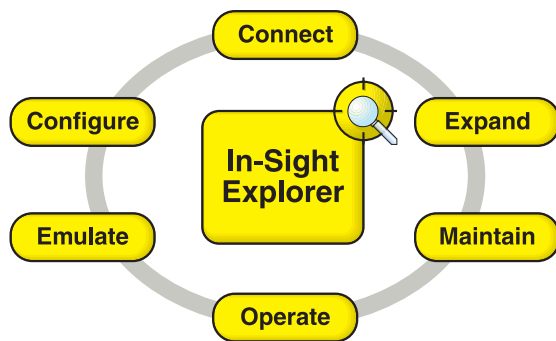
### In-Sight 5411/5413/5613

- Model 5411 adds high-resolution (1024 x 768) imaging to model 5410 functionality; model 5413 adds the highest resolution (1600 x 1200) imaging. Model 5613 adds the highest resolution (1600 x 1200) at the fastest speed.

# The In-Sight Explorer Advantage

**In-Sight Explorer provides a powerful and completely integrated vision sensor configuration, management and operator interface all within the single software package.**

## A Completely Integrated User Environment



## Advantages

- Integrated software lowers total cost of implementation
- Microsoft Windows XP "look and feel" provides a familiar user environment
- Simple and flexible interface to HMI/SCADA systems via OPC
- Environment is consistent across all In-Sight products
- Provides backward compatibility with existing In-Sight jobs
- Develop Custom View interface for runtime operation



In-Sight Explorer Interface

- **Connect** ... use a step-by-step tool to quickly connect the PC to a single vision sensor or multiple vision sensors networked together.
- **Configure** ... develop an application and Custom View interface with the powerful In-Sight spreadsheet for single or multiple networked vision sensors. Provides drag and drop vision tools and graphics palette, familiar Windows XP look and feel, and easy access to camera images and security settings.
- **Emulate** ... create applications in the In-Sight spreadsheet and run them in a full emulator using stored images on a PC. Job emulation can be done simulating multiple In-Sight vision sensor models. Use the job/auditing tools to graphically monitor execution and job results.
- **Operate** ... monitor multiple vision sensor results through their respective Custom View interface. Control online/offline status, zoom and pan camera images and monitor vision sensor status.
- **Maintain** ... generate HTML based reports with settings and spreadsheet data; graphically print spreadsheet configurations; manage job and image files; update firmware and backup/restore vision sensor configurations.
- **Expand** ... add new vision sensors to existing vision networks; use file utilities to quickly backup and "clone" additional vision sensors on the network for new production lines.

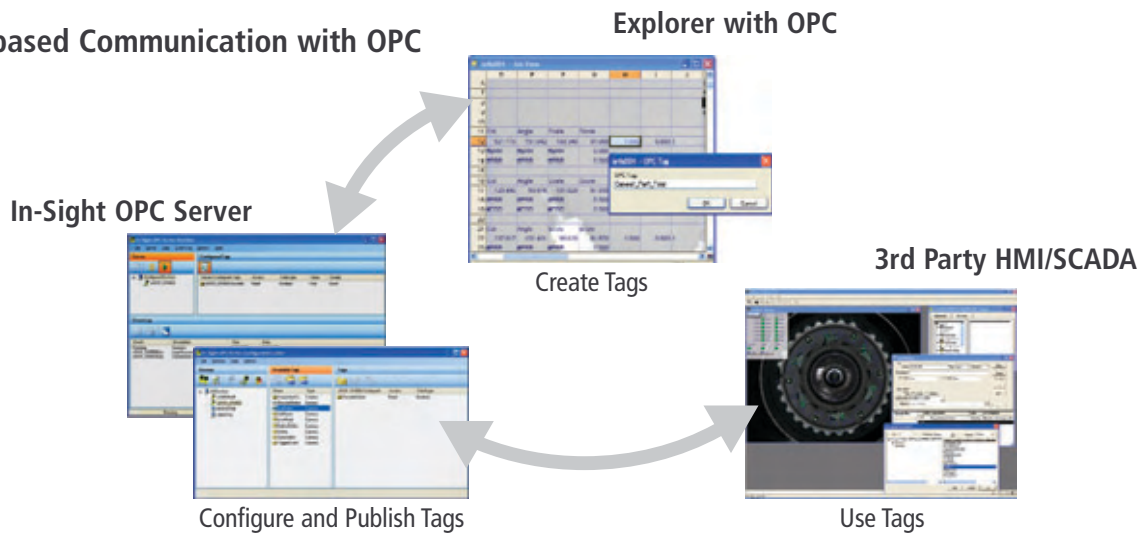
## Why a Spreadsheet for Vision?

The spreadsheet environment provides a familiar look and feel with the commonly-used Microsoft Excel® format. A spreadsheet provides a robust, flexible and efficient way to configure the vision tools and handle the data created from a vision application. A drag and drop vision tools and interface graphics palette along with menu driven tool property sheets makes job configuration simpler. The In-Sight spreadsheet includes specialized functions, options and operations that allow you to solve complex applications without ever writing a line of code.

# Powerful OPC and Operator Interface

In-Sight provides powerful yet simple ways to interface vision sensors with today's advanced machine or line interfaces, including HMI and SCADA.

## Simple Tag-based Communication with OPC



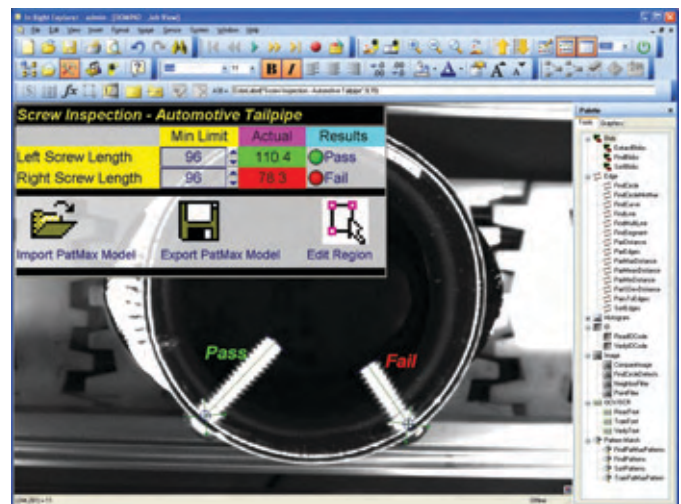
## Powerful OPC Server

OPC (OLE for Process Control) provides a simple and seamless way to communicate data and control the functionality of an In-Sight job using the OLE (Object Linking and Embedding) standard. An OPC "tag" (contains user-defined information) is easily created in a job spreadsheet, after which the In-Sight OPC Server provides a simple way to configure a tag and determine the tags to be published to other OPC programs, such as common HMI and SCADA packages.

The In-Sight OPC Server provides tag configuration and publishing for any In-Sight vision sensor with declared job tags on a network attached to the PC. The server also provides a convenient way to monitor tag status and event logging for any attached vision sensors from a single program.

## Integrated Operator Interface

In-Sight Explorer provides a Custom View interface that simplifies In-Sight use for the operator, while eliminating the cost of additional interface software to monitor single or networked In-Sight vision sensors. From within the spreadsheet, a custom operator interface can be created, making it easy for line operators, technicians, and maintenance staff to use and monitor In-Sight vision sensors.



## ActiveX® Display Control

Integrate an In-Sight vision sensor Custom View interface and camera image into third-party HMI programs using the In-Sight ActiveX Display Control. This control can be easily placed and configured within several top HMI software packages including Rockwell® Software RSVIEW®, Invensys Wonderware® InTouch®, and Parker/CTC InteractX.

# In-Sight Model Comparison

## General-Purpose Vision Sensors



		STANDARD	COLOR		HIGH PERFORMANCE		REMOTE HEAD	HIGH RESOLUTION		
		5100	5100C	5400C 5400CS	5400 5400S	5600	640 X 480	1024 X 768	1600 X 1200	
		5100	5100C	5400C 5400CS	5400 5400S	5600	5400R	5401	5403 5403S	5603
Performance Multiplier	Average overall performance vs. a Model 5100 <sup>1</sup>	1X	1X	2X	2.5X	5X	2.5X	2X	2.5X	5X
Memory	Firmware & Job Storage	32MB	32MB		32MB	64MB	32MB	32MB	32MB	64MB
Camera	Resolution	640 x 480	640 x 480		640 x 480		640 x 480	1024 x 768	1600 x 1200	
	CCD Sensor Size	1/3"	1/3"		1/3"		1/3"	1/3"	1/1.8"	
	Color	No	Yes		No		No	No	No	
	Acquisition Rate <sup>2</sup> (frames per second)	60fps	60fps		60fps		40fps	20fps	15fps	
	Partial Image Acquisition	Yes	No		Yes		Yes	Yes	Yes	
	Protection Rating	IP67/NEMA6 <sup>3</sup>	Note 10		Note 10		Note 11	IP67/NEMA6 <sup>3</sup>	Note 10	
Display Options	VGA Port	No	No		No		No	No	No	
	PC	Yes	Yes		Yes		Yes	Yes	Yes	
I/O Options	Trigger/No. of High-speed Outputs	Yes/2 <sup>6</sup>	Yes/2 <sup>6</sup>		Yes/2 <sup>6</sup>		Yes/2 <sup>6</sup>	Yes/2 <sup>6</sup>	Yes/2 <sup>6</sup>	
	I/O Breakout/Expansion Modules	Yes	Yes		Yes		Yes	Yes	Yes	
	Ethernet I/O Support (up to 512in/ 512out)	Yes	Yes		Yes		Yes	Yes	Yes	
Communication Options	Ethernet & RS232 (w/ Rx/Tx & RTS/CTS <sup>7</sup> )	Yes	Yes		Yes		Yes	Yes	Yes	
Lighting	Integrated Ring Light Options	Yes	Yes		Yes		No	Yes	Yes	
Application Development	Control Pad/VGA Monitor	No	No		No		No	No	No	
	In-Sight Explorer/PC	Yes	Yes		Yes		Yes	Yes	Yes	
Lens Mount	C or CS	C	C		C		C/CS	C	C	
Vision Tool Support	PatMax <sup>®</sup> (optionally available)	Yes	Yes		Yes		Yes	Yes	Yes	
	PatFind <sup>®</sup>	Yes	Yes		Yes		Yes	Yes	Yes	
	1D Code Reading and Quality Metrics <sup>8</sup>	Yes	Yes		Yes		Yes	Yes	Yes	
	2D Code Reading and Quality Metrics <sup>9</sup>	Yes	Yes		Yes		Yes	Yes	Yes	
	IDMax <sup>™</sup> (for Data Matrix and QR 2D codes)	Yes	Yes		Yes		Yes	Yes	Yes	
	Edge	Yes	Yes		Yes		Yes	Yes	Yes	
	Blob	Yes	Yes		Yes		Yes	Yes	Yes	
	Histogram	Yes	Yes		Yes		Yes	Yes	Yes	
	Image Processing	Yes	Yes		Yes		Yes	Yes	Yes	
	OCV/OCR	Yes	Yes		Yes		Yes	Yes	Yes	
	Color Tools	No	Yes		No		No	No	No	
Power Consumption	Voltage Requirement	24VDC +/-10%	24VDC +/-10%		24VDC +/-10%		24VDC +/-10%	24VDC +/-10%	24VDC +/-10%	
	Maximum Current (Not including lighting)	350mA	350mA		350mA		250mA	350mA	500mA	
Max. Oper. Temp.	Camera	45 deg C	45 deg C		45 deg C		45/50 <sup>5</sup> deg C	45 deg C	45 deg C	
Approvals	CE, UL/CUL, FCC	Yes	Yes		Yes		Yes	Yes	Yes	

Notes:

- 1) Performance rating does not include image acquisition rate
- 2) Acquisition rate is based on 1ms exposure, and a full image frame capture
- 3) Requires lens cover (included) for IP/NEMA rated protection
- 4) Requires optional camera enclosure for IP/NEMA rated protection

- 5) Temperature ratings: processor/remote camera head
- 6) One high-speed output can be used for strobing
- 7) When used with an I/O Expansion Module (CIO-1450 or CIO-1460)
- 8) 1D codes include: Code 3 of 9, Code 128, Interleaved 2 of 5, Reduced Space Symbology (RSS), UPC/EAN, PostNet, Planet Code, Pharma Code, UPU-57, and ISO mark quality metrics

## General-Purpose Vision Sensors



## ID Readers



		STANDALONE	STANDARD	HIGH PERFORMANCE		REMOTE HEAD	HIGH RESOLUTION		
		3400	5110	5410 5410S	5610	5410R	5411	5413	5613
Performance Multiplier	Average overall performance vs. a Model 5100 <sup>1</sup>	2X	1X	2.5X	5X	2.5X	2X	2.5X	5X
Memory	Firmware & Job Storage	16MB	32MB	32MB	64MB	32MB	32MB	32MB	64MB
Camera	Resolution	640 x 480	640 x 480	640 x 480		640 x 480	1024 x 768		1600 x 1200
	CCD Sensor Size	1/3"	1/3"	1/3"		1/3"	1/3"		1/1.8"
	Color	No	No	No		No	No		No
	Acquisition Rate <sup>2</sup> (frames per second)	40fps	60fps	60fps		40fps	20fps		15fps
	Partial Image Acquisition	Yes	Yes	Yes		Yes	Yes		Yes
	Protection Rating	Note 11	IP67/NEMA6 <sup>3</sup>	Note 10		Note 11	IP67/NEMA6 <sup>3</sup>		IP67/NEMA6 <sup>3</sup>
Display Options	VGA Port	Yes	No	No		No	No		No
	PC	Yes	Yes	Yes		Yes	Yes		Yes
I/O Options	Trigger/No. of High-speed Outputs	Yes/2 <sup>12</sup>	Yes/2 <sup>6</sup>	Yes/2 <sup>6</sup>		Yes/2 <sup>6</sup>	Yes/2 <sup>6</sup>		Yes/2 <sup>6</sup>
	I/O Breakout/Expansion Modules	Yes	Yes	Yes		Yes	Yes		Yes
	Ethernet I/O Support (up to 512in/ 512out)	Yes	Yes	Yes		Yes	Yes		Yes
Communication Options	Ethernet & RS232 (w/ Rx/Tx & RTS/CTS <sup>7</sup> )	Yes	Yes	Yes		Yes	Yes		Yes
Lighting	Integrated Ring Light Options	No	Yes	Yes		No	Yes		Yes
Application Development	Control Pad/VGA Monitor	Yes	No	No		No	No		No
	In-Sight Explorer/PC	Yes	Yes	Yes		Yes	Yes		Yes
Lens Mount	C or CS	C/CS	C	C		C/CS	C		C
Vision Tool Support	PatMax <sup>®</sup> (optionally available)	Yes	No	No		No	No		No
	PatFind <sup>®</sup>	Yes	No	No		No	No		No
	1D Code Reading and Quality Metrics <sup>8</sup>	Yes	Yes	Yes		Yes	Yes		Yes
	2D Code Reading and Quality Metrics <sup>9</sup>	Yes	Yes	Yes		Yes	Yes		Yes
	IDMax <sup>™</sup> (for Data Matrix and QR 2D codes)	Yes	Yes	Yes		Yes	Yes		Yes
	Edge	Yes	No	No		No	No		No
	Blob	Yes	No	No		No	No		No
	Histogram	Yes	No	No		No	No		No
	Image Processing	Yes	Yes	Yes		Yes	Yes		Yes
	OCV/OCR	Yes	Yes	Yes		Yes	Yes		Yes
	Color Tools	No	No	No		No	No		No
Power Consumption	Voltage Requirement	24VDC +/-10%	24VDC +/-10%	24VDC +/-10%		24VDC +/-10%	24VDC +/-10%		24VDC +/-10%
	Maximum Current (Not including lighting)	500mA	350mA	350mA		250mA	350mA		500mA
Max. Oper. Temp.	Camera	60/50 <sup>5</sup> deg C	45 deg C	45 deg C		45/50 <sup>5</sup> deg C	45 deg C		45 deg C
Approvals	CE, UL/CUL, FCC	Yes	Yes	Yes		Yes	Yes		Yes

Notes (continued):

9) 2D codes include: Data Matrix, QR Code, PDF417, Composite Symbology (CS); ISO and AS 9132 mark quality metrics

10) 5400, 5400C, 5403, and 5410 models are IP67/NEMA 6 rated. 5400S, 5400CS, 5403S, and 5410S are IP68/NEMA 6 rated. All of these models require lens cover for IP/NEMA protection.

11) Requires optional camera enclosure for IP67/NEMA 6 rating

12) Also has two high-speed inputs

# Advanced Vision System Performance

The industry-leading Cognex vision tool library provides reliable, repeatable performance in even the most challenging vision applications.

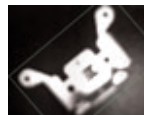
## Powerful Location Tools

### PatMax® Powerful Location Technology

Inspection yield and reliability depend upon repeatably locating parts. PatMax, the industry's performance standard for part and feature location software, utilizes advanced geometric pattern-matching technology to locate parts under difficult conditions.



Scale Change and Dim Lighting



Out of Focus



Confusing Background



Occlusion



Reversed Polarity



+/-180° Rotation

PatMax significantly reduces or eliminates fixturing requirements, and lowers cost, while providing best-in-class inspection quality.

## OCV/OCR: Advanced Character Recognition

Train fonts with a higher level of confidence with powerful, yet simple, training tools that include:

**Font Editor** – Removes background noise from trained characters

**Difference Table** – Identifies characters most likely to be confused

**Pre-Trained Fonts** – Eliminate training for OCR-A and OCR-B fonts

**Add New Characters Only** – Speeds training time for large numbers of characters

Mode selection balances speed and accuracy:

**Speed Mode** – Minimizes cycle time for high-contrast text

**Accuracy Mode** – Grayscale correlation allows reading difficult text, even on confusing backgrounds



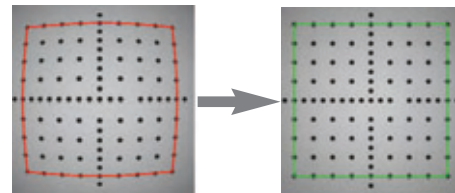
Reliably Train Fonts



Tolerate Confusing Backgrounds

## Non-Linear Calibration Wizard

In-Sight Explorer includes a step-by-step wizard that facilitates calibration, guiding users through the process of correlating image pixels to robot or real world coordinates. The Non-Linear Calibration Wizard improves accuracy and repeatability by correcting for lens and perspective distortion.



Non-Linear Calibration corrects lens and perspective distortion.

## Breakthrough Code Reading

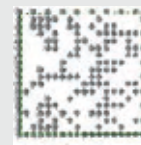
### IDMax™

2D Data Matrix code reading in Direct Part Mark Identification (DPMI) applications is, increasingly, an important part of manufacturing processes. IDMax, breakthrough Data Matrix reading software, handles degradation in code appearance, such as those shown below, to deliver the consistently high read rates that are key to the success of part traceability programs.

### Outstanding Performance with 2D Codes Having Degradation and Background Problems



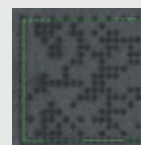
Rotation



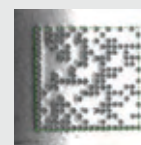
Model Image



Poor Focus



Low Contrast



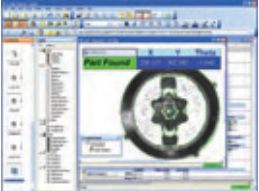
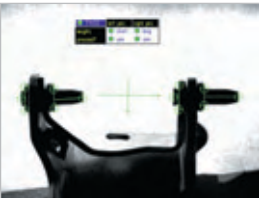
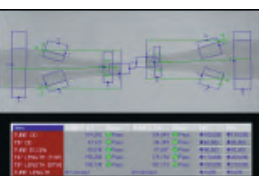

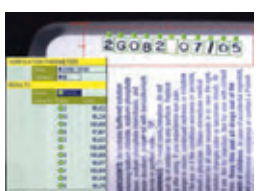
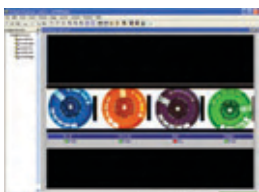
Background



Washed Out

IDMax provides consistently high read rates regardless of changes in contrast, focus, and orientation.

# Powerful Vision Tools

Tool Category	Advantages	Applications
<b>PART LOCATION TOOLS ... LOCATE PARTS IN WIDELY-VARYING CONDITIONS RELIABLY AND ACCURATELY</b>		
	<ul style="list-style-type: none"> <li>• Handles wide variations in part orientation, size, and appearance</li> <li>• Simplifies mechanical fixturing and lighting, making vision projects easier and less expensive to implement</li> </ul>	<ul style="list-style-type: none"> <li>• Locate automotive, electronic, pharmaceutical, and consumer parts and assemblies for inspection</li> <li>• Identify locations of parts for robotic handling</li> </ul>
<b>INSPECTION TOOLS ... VERIFY THE CORRECT ASSEMBLY OF COMPONENTS AND FIND FLAWS IN PART APPEARANCE</b>		
	<ul style="list-style-type: none"> <li>• Provides robust, repeatable inspection results despite changes in part orientation</li> <li>• Allows users to easily classify defects by defect type</li> </ul>	<ul style="list-style-type: none"> <li>• Verify correct assembly of automotive parts</li> <li>• Verify the contents and seals of packaged goods for food, consumer, and pharmaceuticals</li> <li>• Inspect correct assembly of electronics</li> </ul>
<b>MEASUREMENT TOOLS ... MEASURE DISTANCES BETWEEN FEATURES, VERIFY TOLERANCES, AND LOCATE EDGES</b>		
	<ul style="list-style-type: none"> <li>• Enables high-accuracy gauging of critical part dimensions despite changes in part orientation and ambient lighting</li> </ul>	<ul style="list-style-type: none"> <li>• Measure and verify tolerances of automotive parts, assemblies, and product labels</li> <li>• Measure critical tolerances of medical and surgical devices</li> </ul>
<b>INDUSTRIAL CODE READING TOOLS ... RELIABLY READ 1D AND 2D CODES ON LABELS OR DIRECTLY MARKED ON PARTS</b>		
	<ul style="list-style-type: none"> <li>• Handles low-contrast, poorly formed codes resulting from process degradation and marking techniques such as dot peen and laser etch</li> <li>• Reads up to 7200 parts per minute</li> </ul>	<ul style="list-style-type: none"> <li>• Read direct-marked 2D parts for automotive, aerospace, and pharmaceutical products</li> <li>• Read and track 1D and 2D codes, and verify print quality for consumer, food and beverage, and pharmaceutical products</li> </ul>
<b>ADVANCED OCV/OCR TOOLS ... VERIFY AND READ ALPHANUMERIC TEXT STRINGS</b>		
	<ul style="list-style-type: none"> <li>• Handles low-contrast characters, as well as confusing or unevenly-spaced characters</li> <li>• Inspection speeds of faster than 1ms per character</li> <li>• Font editor improves the readability of poorly-trained or degraded fonts</li> </ul>	<ul style="list-style-type: none"> <li>• Read or verify date/lot codes and SKUs of food and beverage, pharmaceutical, and consumer items</li> <li>• Verify character legibility and proper printer operation</li> <li>• Read direct-marked numbers and characters on automotive components</li> </ul>
<b>COLOR VISION TOOLS * ... VERIFY AND SORT A WIDE RANGE OF PART TYPES BASED ON COLOR</b>		
	<ul style="list-style-type: none"> <li>• Provides robust, reliable color detection of a wide range of part types</li> <li>• Converts color images to grayscale for additional types of inspections</li> </ul>	<ul style="list-style-type: none"> <li>• Verify label color of food and beverage, consumer, and pharmaceutical packaging</li> <li>• Sort parts by color on processing and packaging lines, and verify components prior to assembly</li> </ul>

\* Available on In-Sight 5100C and 5400C models

# Robotics and Networking

Whether communicating directly to a robot controller, or to a factory network, In-Sight does it easily and affordably.



## Robot Communications with In-Sight

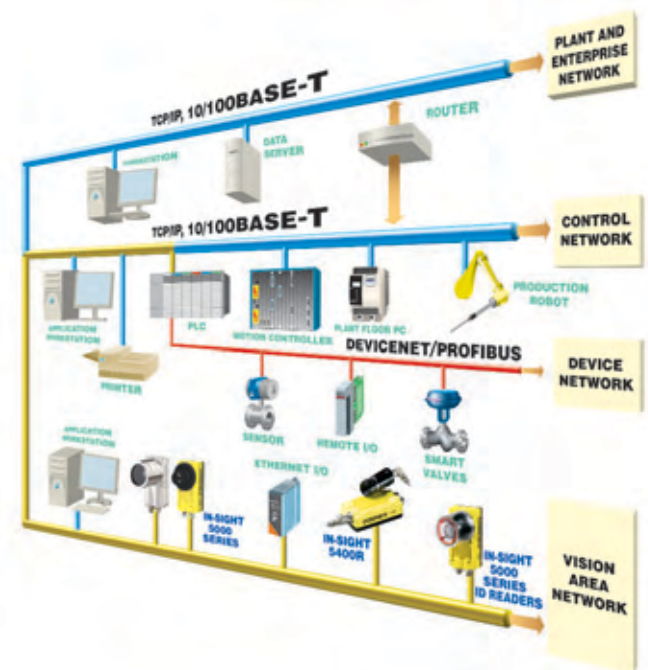
In addition to locating parts for pick-and-place, or guiding a robot to assemble components, In-Sight vision sensors also inspect, measure, and read 1D and 2D codes as products are being handled or assembled. In-Sight simplifies Vision-Guided Robotics (VGR) calibration and communication, and provides reliable part location and easy integration.

- **PatMax** ... the performance standard for part and feature location
- **Non-Linear Calibration Wizard** ... facilitates calibration, to correlate image pixels to robot coordinates
- **Tight, Seamless Communication** ... through new robot drivers, robot sample code, string formatter, and spreadsheet snippets
- **In-Sight SDK** ... this Software Development Kit allows integrators to develop customer or application-specific VGR and robotic inspection solutions

## Vision Area Networks™

Ethernet provides the most flexible and affordable way to connect and manage devices on the factory floor. All In-Sight vision sensors are designed to take full advantage of Ethernet technology, providing users with communications flexibility and cost savings.

- Easily access single or multiple In-Sight vision sensors, and link them across the factory floor
- Group two or more In-Sight units to create a Vision Area Network™ (VAN)
- Display vision results, images, statistical data, and other information on any PC with TCP/IP capability
- Easily share data using OPC on the VAN
- Share data to an HMI or SCADA system and uplink to plant and enterprise networks using a VAN
- Easily link In-Sight vision sensors to PLCs and other devices having EtherNet/IP support



**Networkable In-Sight vision sensors support many standard network and Fieldbus protocols, including:**

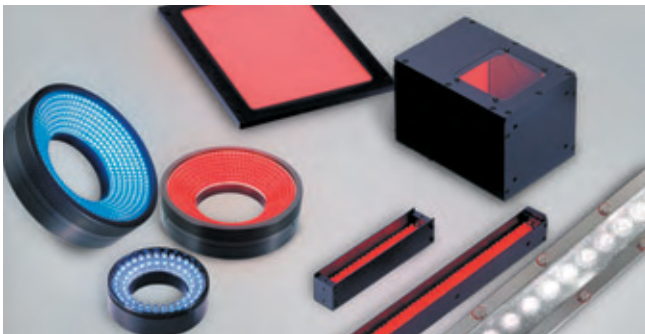
- TCP/IP, FTP, Telnet, SMTP (standard)
- EtherNet/IP, ModBus/TCP (Fieldbus)

A Vision Area Network can be easily uplinked to plant and enterprise networks, allowing any workstation with TCP/IP capability to display results, images, statistical data, and other information.

# Complete Range of Accessories

To simplify and speed up the system integration process, Cognex offers a wide range of optional accessories designed specifically for use with In-Sight vision sensors.

## Lighting



In order to achieve the highest quality images possible, Cognex offers a wide array of lighting accessories. When basic lighting works for the application, integrated ring lights are ideal for In-Sight vision sensors. Easily mounted directly to the vision sensor, these lights provide basic front lighting without having to purchase and install a separate light. Integrated ring lights are available in red LEDs, red diffuse LEDs, and white LEDs.



LED array for typical bar light applications. An optional diffuser allows it to be used as a backlight.



Integrated ring lights provide basic lighting for In-Sight vision sensors.



Integrated ring lights provide basic lighting for In-Sight ID readers.

And, for In-Sight ID readers, Image Formation Systems are available in 7 different lens focal lengths.

## I/O Modules

The I/O Breakout Module provides easy connection of In-Sight sensors to power, acquisition triggers, outputs, and serial devices.

I/O Expansion Modules increase the number of I/O points available to In-Sight sensors, and provide full RS232 handshaking.

## Lenses

Cognex offers a full range of high-quality compact camera lenses designed specifically for machine vision applications.



## In-Sight Remote Head Camera Enclosure

The compact remote head camera of the In-Sight 3400 and 5400R models can be protected by an optional NEMA6/IP67-rated enclosure.



## Cables

In-Sight cables provide superior performance with rugged, stainless steel M12 connectors and are rated for ten million linear and thirty thousand torsional flex cycles ... ideal for robot-mounted applications.



# Support and Training Programs

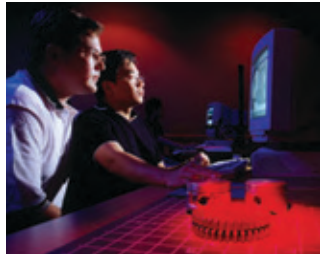
Cognex offers a variety of In-Sight Support and Training Programs to make using In-Sight sensors simple and intuitive.

## Documentation

**HTML-based In-Sight Guide and Reference** – Comprehensive, searchable help file.

## Training

**Classroom Courses** – Free training, offered at our training centers located worldwide, gets you up and running quickly with In-Sight vision sensors. Learn more at [www.training.cognex.com](http://www.training.cognex.com)



**Online Courses** – Live and recorded, instructor-led courses are offered over the Internet. Access expert instruction from your office or factory location.

### Continuing Education

**Credits** – Our classroom and online courses award continuing education credits for students that successfully complete these programs.

### Lighting & Optics

**Instructional Video** – Helps you to improve the resolution and reliability of your vision inspection application by covering a variety of optics and lighting techniques. Available on our website and on CD.



## Support

**Download Area** – A variety of downloadable files including firmware updates, documentation and support materials, *Sample Jobs*, and a *Hardware Troubleshooting Guide*.

**Case Submission** – Simply submit your technical questions for quick resolution by our team of technical support professionals. You also have online access to past cases submitted to Cognex Tech Support.

**Knowledge Database** – A searchable database of *Frequently Asked Questions*.

**Telephone Support** – Direct telephone support is provided by experienced vision engineers dedicated to assisting our customers.

**Fast-Track (optional)** – Personalized on-site assistance designed to accelerate the setup and deployment of In-Sight sensors. Ideal for those working in exceptionally tight timeframes.

## Advantages

- In-Sight courses right from your desktop
- Learn at your own pace
- Immediate, 24-hour access to a wide range of support services

# About Cognex

Cognex Corporation designs, develops, manufactures, and markets machine vision systems. As the world leader in the machine vision industry, Cognex has shipped over 300,000 machine vision systems, representing over \$2 billion in cumulative revenue, since the company's founding in 1981. The Modular Vision Systems Division, headquartered in Natick, Massachusetts, specializes in systems used for automating the manufacture of a wide range of items, and for assuring their quality. The Surface Inspection Systems Division, located in Alameda, California, specializes in systems used to inspect surfaces of products manufactured in a continuous fashion, such as metals, paper, and plastics. Cognex has regional offices located worldwide. Visit us online at [www.cognex.com](http://www.cognex.com)



## Free Training Worldwide

Cognex offers *free* training on its world-class vision sensors at our training centers in Atlanta (shown below), Detroit, Singapore, Shanghai and Milton Keynes (UK). More information is available at [www.training.cognex.com](http://www.training.cognex.com)



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