Cognex is the world’s most trusted vision company. With over one million systems installed in facilities around the world, and over thirty years of experience, Cognex is solely focused on machine vision and image-based industrial ID technology. Deployed by many of the world’s top manufacturers, suppliers, and machine builders, Cognex products ensure that manufactured items meet the stringent quality requirements of each industry.

Cognex vision technology helps companies improve their manufacturing quality and performance by eliminating defects, verifying assembly, and tracking and capturing information at every stage of the production process. Smarter automation using Cognex vision and ID systems means fewer production errors, which equates to lower manufacturing costs and higher customer satisfaction. Cognex offers the widest range of solutions to meet most application requirements.
Cognex vision systems, sensors, and 3D laser displacement sensors provide the widest range of application solutions with greater reliability and repeatability than any other supplier. Cognex also has a global network of vision experts with the knowledge to assist you wherever and whenever needed. With Cognex machine vision systems in place, you can perform 100% inspection, ensure brand quality and instantly improve your production processes.

Cognex vision technology performs tasks that are difficult or impossible for people to do reliably and consistently. Our vision systems help to automate and error-proof production, minimizing defects and reducing costs.

2D and 3D vision systems address the following applications:

**Inspection**
Inspect for assembly errors, surface defects, damaged parts and missing features. Identify the orientation, shape and position of objects and features.

**Guide/Align**
Guide automation equipment and robotic devices. Align parts for high accuracy assembly operations and other manufacturing processes.

**Gauge/Measure**
Gauge parts to check critical dimensions. Measure components for sorting and classification.

**OCR/OCV**
Read and verify alphanumeric characters marked directly on parts and printed on labels.

**Presence/Absence**
Detect the presence or absence of simple features and objects to give basic pass/fail results.

**Code Reading**
Read 1-D barcodes and 2-D matrix codes as part of an overall inspection. For applications that are ID specific, also look to DataMan® ID readers.
CHECKER VISION SENSORS

Easy, affordable vision sensors replace photoelectric sensors delivering more reliable inspection and part detection. Checker® vision sensors allow multiple inspections with a single device.

Benefits:
- Fast, easy setup
- Color and monochrome versions available
- Patented part detection and inspection
- Industry standard Ladder Logic editor allows for customization
- EtherNet/IP and PROFINET PLC communication
- Unlimited image storage to FTP server
- Remote setup and display through the SensorView® 2 device (no PC required) or through your PC
- Up to four discrete outputs
- Up to 32 job changes for maximum flexibility
- Color lighting and filter options to optimize image contrast

www.cognex.com/Checker

IN-SIGHT VISION SYSTEMS

Cognex In-Sight® vision systems are unmatched in their ability to inspect, identify and guide parts. These self-contained, industrial-grade vision systems combine a library of advanced vision tools with high-speed image acquisition and processing. A wide range of models, including line scan and color systems, meet most price and performance requirements.

Benefits:
- Powerful vision tools, including PatMax®, IDMax®, and OCRMax™ algorithms
- World-class color vision tools
- Unmatched ease-of-use
- EasyBuilder® user interface for quick and easy application setup
- Spreadsheet programming environment delivers more power and flexibility
- Wide range of form factors, including IP67-rated housings
- Multiple lens and lighting options, including autofocus and integrated lighting
- Acquisition speeds up to 400 frames per second
- Resolution up to 5 megapixels

www.cognex.com/InSight
3D LASER DISPLACEMENT SENSORS

3D laser displacement sensors optimize product quality by providing three-dimensional inspection of your products. These industrial sensors come bundled with vision controller, Cognex Designer software and world-class 3D and 2D vision tools.

Benefits:
Cognex 3D laser displacement sensors are factory-calibrated to deliver results in real units of measurement with micron-level accuracy. Unlike traditional 2D machine vision, laser displacement sensors provide a topographical representation of the 3D features relative to any surface.

- Inspects and measures in 3D: Volume, area, height, tilt, circle fitting and curvature removal tools
- Performs OCR on raised or embossed characters
- Calibrated to micron-level accuracy in real-world units (mm)
- Provides contrast independent inspection: Dark object on dark background
- Combines 3D sensors and 2D cameras with world-class 3D and 2D vision tools: PatMax, IDMax and OCRMax algorithms
- Industrial IP65 housing: IP69K enclosure option
- Fast scan rates: up to 10KHz

www.cognex.com/DS1000

COGNEX DESIGNER

The Cognex Designer™ development environment allows quick creation and deployment of high-performance vision applications. Providing all that's needed to configure vision tools, design professional graphical user interfaces, synchronize with external hardware, and connect to the factory network, Cognex Designer includes the rich, factory-proven VisionPro® library of alignment, inspection and identification tools that are optimized for fast, accurate performance.

Benefits:
- Graphically create vision applications that are easy to deploy and maintain
- Connect Cognex 3D displacement sensors, or a wide range of other Cognex and third-party industrial cameras
- Efficiently inspect, identify, and guide parts using PatMax, IDMax and OCRMax vision tools
- Interact with robots, motion stages, reject mechanisms and other industrial hardware
- Deploy on a Cognex Vision Controller for standalone operation, or integrate in a high-speed industrial PC

www.cognex.com/CognexDesigner
PatMax Part Location
Locating the object within the camera’s field of view is the very first step in any machine vision application. It’s the one that usually determines whether the application succeeds or fails, and it relies on a machine vision process known as pattern matching.

Pattern matching can be extremely challenging, as many variables can alter the way an object appears to a vision system. To overcome these challenges, Cognex developed PatMax technology which revolutionized the process to accurately find objects despite changes in angle, size and shading.

The patented software tool is the industry’s gold standard for part and feature location, providing accuracy and repeatability under the most challenging conditions. PatMax technology is the basis for such companion tools as PatQuick, PatMax AutoTune and Multi-model PatMax covering the broadest range of pattern matching and inspection in the industry.

www.cognex.com/PatMax

Breakthrough Robotic Guidance
Cognex delivers unmatched accuracy and ease of use in vision guided robotics (VGR) applications. Advanced software tools provide precise part location and accurate inspection to:
- Eliminate costly precision fixturing
- Simplify robot calibration
- Process various part types without tooling changeover
- Add pre- and post-placement inspection

Advanced Color Tools
Locate, sort, extract match, identify, and monitor color images with powerful Cognex color tools that make it easy to:
- Find color features despite translation, rotation, scale and skew
- Simplify color definition for complex color scenes
- Extract complex colors for color-based inspection, location, and identification applications
- Accurately differentiate between subtle color variations
- Create a grayscale image from segmented colors to enable other tools to be applied

www.cognex.com/Color

Robust Optical Character Recognition (OCR)
OCRMax technology delivers the power to achieve the highest character read rates while keeping misreads to a minimum.

What makes OCRMax technology different?
This powerful algorithm prevents misreads, handles process variations and provides easy font management. It’s fast, easy to set up with a unique AutoTune feature, and simple to use across all platforms with minimal training for the user.

www.cognex.com/OCRMax
3D Measurement and Inspection

Factory-calibrated 3D laser displacement sensors from Cognex make it easy to create custom solutions and professional graphical user interfaces for 3D inspections. These sensors deliver fast performance with micron-level accuracy on the widest range of inspections using world-class 3D and 2D vision tools - regardless of lighting or contrast challenges.
Complete Visualization

VisionView® visualization is ideal for real-time monitoring and controlling In-Sight vision systems and DataMan® barcode readers on the factory floor, and allows operator controls specific to the application. The SensorView® 2 smart display allows users to set up, edit and monitor Checker vision sensor activity on a large industrial IP65 panel without a PC.

- Multiple platform options
- Automatically detect Cognex systems on your network
- Display full color images, with graphic overlays and operator controls

www.cognex.com/VisionView
www.cognex.com/SensorView

Comprehensive Communications Suite

Whether you connect directly to a PLC or robot controller or manage multiple systems remotely from a networked PC or HMI, Cognex Connect™ communications suite provides a seamless, reliable communications link between Cognex products and factory floor equipment.

www.cognex.com/Connect

<table>
<thead>
<tr>
<th>Factory Devices</th>
<th>Protocols</th>
<th>Protocol Types</th>
<th>Robots</th>
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<tbody>
<tr>
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<td></td>
<td>Modbus/TCP</td>
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- Mitsubishi
- Rockwell
- Siemens
- B & R
- Omron
- ...and more

- EtherNet/IP
- PROFINET
- MC Protocol
- CC-Link
- PROFIBUS
- FTP
- Modbus
- POWERLINK
- Modbus/TCP

- Industrial
- Ethernet
- Fieldbus
- Serial
Cognex Designer software is not just a vision programming tool, but it’s also a full environment for creating factory-ready solutions. With Cognex Designer software, it’s simple to add application recipes, record and play back image data, or communicate with cameras, lights and PLCs. It includes everything you need for rapid, professional application development, with the simplicity of a graphical flow-chart interface.

- Share application templates and interfaces between developers on the same or different projects
- Save time with pre-existing system tools for user access levels, real-time alarms, localizable controls, and SQL database logging
- Create plug-ins to drive external equipment, from automatic light control to robot pick and place
- Incorporate third-party .NET controls to customize professional user interfaces

www.cognex.com/CognexDesigner

Centralized Control and Maintenance

The Cognex Explorer™ control center provides a unified network view of all Cognex In-Sight, DataMan, and VisionView systems. Cognex Explorer control center provides powerful yet simple maintenance tools, the ability to backup/restore or clone projects, upgrade firmware and much more.

Cognex Explorer control center is very intuitive and requires no programming knowledge to use. The control center offers control and maintenance engineers the ability to:

- Find all Ethernet-connected Cognex hardware on the network
- View online/offline status of all systems on the network
- View device settings: IP addresses, firmware/software versions, and job files
- Execute vision system and ID reader firmware updates
- Backup and restore multiple systems simultaneously
- Clone systems for emergency replacements or product changeovers
- Upgrade system licenses

www.cognex.com/Explorer

CALL NORTH AMERICA COGNEX SALES: 844-999-CGNX (844-999-2469)
The industry-leading Cognex vision tool library provides reliable, repeatable performance in even the most challenging vision applications.

**Part Location Tools**
- Locate parts and assemblies for inspection
- Identify locations of parts for robotic handling, tolerate changes in rotation, scale and lighting variations

**Inspection Tools**
- Verify correct assembly parts
- Verify and inspect attributes of parts

**Measurement Tools**
- Measure and verify tolerances of parts, assemblies and product labels

**Robot Guidance Tools**
- High-speed precision pick-and-place
- Place or remove parts or locate unфиксured parts on conveyor, and place them in package
- Use robot to manipulate part or camera to inspect critical features of part

**Flexible Flaw Detection Tools**
- Find edge, boundary and surface defects
- Find surface defects—like discoloring and scratches

**Color Tools**
- Identify, inspect, sort and verify products based on color attributes
- Match products based on color

**Edge Inspection Tools**
- Verify the correct assembly of components and find flaws
- Find deviations in edge position and defects and gaps
- Find width variations or gaps in beads along the bead path in bead tracking applications

**OCV/OCR Tools**
- Read or verify date/lot codes and SKUs
- Verify character legibility and proper printer operation

**Code Reading Tools**
- Read direct part marked (DPM) 2-D codes
- Read and verify 1-D and 2-D codes and evaluate mark quality to industry standards

**Non-Linear Calibration Tools**
- High-accuracy robotic pick-and-place for standard mounting and off-axis mounting due to space or robot motion constraints
- High-accuracy measurements of part location and critical dimensions
### MODEL COMPARISON
**IN-SIGHT 7000**

<table>
<thead>
<tr>
<th>Model</th>
<th>Speed Rating</th>
<th>Acquisition (fps)</th>
<th>Resolution</th>
<th>User Interface</th>
<th>Supported Tools</th>
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#### Notes:

1) In-Sight 7000 vision systems have 1 dedicated trigger input, 3 high-speed inputs, and 4 high-speed outputs.

2) Speed rating compared to In-Sight Micro 1020 model and does not include image acquisition rate. The 5604 and 5614 models have acquisition speed rated in lines per second.

3) Acquisition rate is based on minimum exposure, and a full image frame capture.

4) Supported Tools:

- **B** Base tool set includes brightness, contrast, pattern, edge, point-to-point geometry, distance, angle, plot and blob tools.
- **E** Essential Tool Set includes blob, edge, curve and line finding, histogram and geometry tools, image filters, pattern matching, and standard calibration.
- **O** Extended Tool Set includes non-linear calibration, caliper, Flaw Detection and InspectEdge tools.
- **I** ID tool set includes: 1-D/2-D barcode reading and verification, text reading and verification (OCR/OCV) and image filters.
- **C** Color tool set includes MatchColor, ExtractColor, color histogram, color to grayscale filters and color to grayscale distance filter. Exception: In-Sight 7010C has Color ID tool only.
- **F** Includes PatMax, Cognex patented geometric pattern matching technology. PatMax tool is required for Flexible Flaw Detection Tool.
- **O** Tools for OCR applications.

For additional In-Sight vision system technical information, please visit www.cognex.com/support/insight
# Model Comparison

## In-Sight 5000 & 5600

<table>
<thead>
<tr>
<th>Model</th>
<th>Speed Rating</th>
<th>Acquisition (fps)</th>
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1) In-Sight 5000 series has 1 dedicated trigger input and 2 high-speed outputs.
## MODEL COMPARISON
### IN-SIGHT MICRO

<table>
<thead>
<tr>
<th>Model¹</th>
<th>Speed Rating²</th>
<th>Acquisition³ (fps)</th>
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<td>ISM1500-11 (PatMax)</td>
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</tbody>
</table>

1) In-Sight Micro vision systems have 1 dedicated trigger input and 2 high-speed outputs.

* Software configurable in In-Sight Explorer: 150 fps at 800 x 600.

** Software configurable in In-Sight Explorer: 400 fps at 640 x 240.

---

For additional In-Sight vision system technical information, please visit www.cognex.com/support/insight
## Model Comparison Checker

<table>
<thead>
<tr>
<th>Model Comparison</th>
<th>4G7C</th>
<th>4G1</th>
<th>4G7</th>
<th>4G7X</th>
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<tbody>
<tr>
<td>Part Finding Sensor</td>
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<td>✔️</td>
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<td>Inspection Sensors: Presence, Measurement OR Position</td>
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<td>Inspection Sensors: Presence, Measurement AND Position</td>
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<td>Inspection Sensors: Color Presence</td>
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<td>Internal Triggering</td>
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<td>Pattern Retrain</td>
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<td>Job Change</td>
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<td>PC Software Setup</td>
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<td>Encoder-Based Part Tracking</td>
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<td>Number of Inspection Sensors</td>
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<td>Maximum Inspection Rate</td>
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<td>400 Hz</td>
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<td>Resolution</td>
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<td>752 x 480</td>
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<td>PLC Communication – EtherNet/IP with AOP</td>
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* Options to increase inspection rates to 125 Hz or 250 Hz are available through binning and digital zoom.
### Model Comparison

<table>
<thead>
<tr>
<th>Specifications</th>
<th>DS1050</th>
<th>DS1101</th>
<th>DS1300</th>
<th>DS925B</th>
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<tbody>
<tr>
<td>Near Field of View (mm)</td>
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<td>Far Field of View (mm)</td>
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<td>Clearance Distance (mm)</td>
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<td>Measurement Range (mm)</td>
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<td>Resolution X (mm)</td>
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<td>0.101-0.457</td>
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<td>Resolution Z (mm)</td>
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<td>0.010-0.052</td>
<td>0.016-0.265</td>
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</tbody>
</table>

**VC5 Controller**
- Intel i5 processor
- Precision real time IO
- PLC connection
- Connect up to 4 DS Sensor heads

**Software**
- Cognex Designer IDE software

**World-class 3D and 2D vision tools**
- Volume, area, height, tilt, circle fitting, curvature removal, PatMax, and OCRMax
VISION FOR EVERY INDUSTRY

With over one million systems installed worldwide, Cognex machine vision systems are accepted in nearly every industry and used by most major manufacturers. Cognex vision systems perform 100% inspection, ensure brand quality and improve your production processes.

Automotive
The manufacturing processes for building virtually every system and component within an automobile can benefit from the use of machine vision.

Medical Devices
Quality inspection is critical to success. Liability for defective products, inconsistent quality, rapidly changing costs and pending regulations, all challenge medical device manufacturers.

Pharmaceutical
The need to comply with patient safety and traceability requirements is imperative, and machine vision helps meet compliance goals.

Semiconductor
Cognex vision provides the precise, sub-pixel alignment and identification that is essential to every step of the semiconductor manufacturing process, despite increasingly fine geometries and process effect challenges.

Mobile Devices
Machine-vision-enabled robots provide scalable, final assembly of mobile phones, tablets, and wearable devices. Cognex vision technology also enables high precision touchscreen display manufacturing and 3D quality inspection.

Consumer Products
Improve production and packaging operations with high-speed image acquisition, advanced color tools, and 3D inspection systems.

Food & Beverage
Food and beverage applications require vision that can perform precisely, accurately and quickly to keep up with the fast-paced production lines.

Electronics
Machine vision provides the high-speed alignment and traceability for electronics assembly, even on the newest miniaturized components and flexible circuits.

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

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