

# VISION SOFTWARE

## POWER AND FLEXIBILITY FOR VISION APPLICATIONS

# THE GLOBAL LEADER

## IN MACHINE VISION AND INDUSTRIAL BARCODE READING

**Cognex®**, the world's most trusted machine vision and industrial barcode reading company.

With over 1.5 million systems installed in facilities around the world and over thirty-six 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.™**

**\$748**  
**MILLION**  
**2017 REVENUE**

**OVER 36**  
YEARS IN THE BUSINESS

**500+**  
CHANNEL PARTNERS

GLOBAL OFFICES IN  
**20+ COUNTRIES**

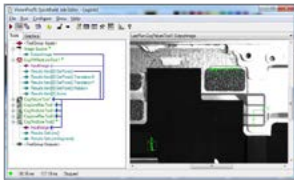
**1,500,000+**  
SYSTEMS SHIPPED



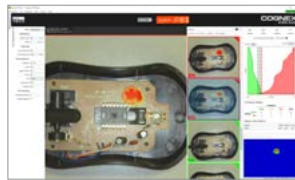


# BUILD YOUR VISION

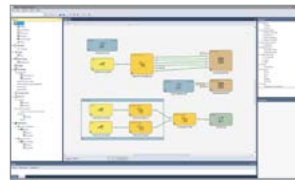
Cognex vision software provides the power and flexibility to solve your most challenging machine vision applications in a PC environment. In addition to a programmatic interface, VisionPro and Cognex Designer offer an easy-to-use graphical interface to develop even the highest speed applications—all on the camera of your choice. With VisionPro ViDi, customers now have a combination of the best traditional and new deep learning vision libraries.



**VisionPro**



**VisionPro ViDi**



**Cognex Designer**



**Cognex Vision Library (CVL)**

## Fast and flexible application development

Whether you need vision for inspection or for robotic guidance, Cognex vision software stands apart from the competition with proven tools available in prototyping environments to support all modes of development. These tools, found only in the Cognex vision tool library, have made Cognex the industry's benchmark for vision performance.

## Proven, reliable vision tools

A robust library of industry-leading pattern matching, alignment, inspection, ID, and OCR vision tools solve all of your vision application needs.

## Total hardware independence

With a wide range of camera types and acquisition technology, users have the flexibility to select the camera and frame grabber that's right for their application.

## VISION SOFTWARE ARCHITECTURE

### Solution

*Vision, user interface, machine control, data logging, etc.*

### Cognex Designer for VisionPro

*Graphical application development interface*

### VisionPro

*.NET vision tool library + graphical prototyping*

### VisionPro ViDi

*Deep learning-based image analysis software*

### CVL

*Cognex Vision Library, C++*

**Core Vision, Deep Learning Technologies**

# VISIONPRO

## PC-BASED VISION SOFTWARE FOR THE MOST CHALLENGING VISION APPLICATIONS

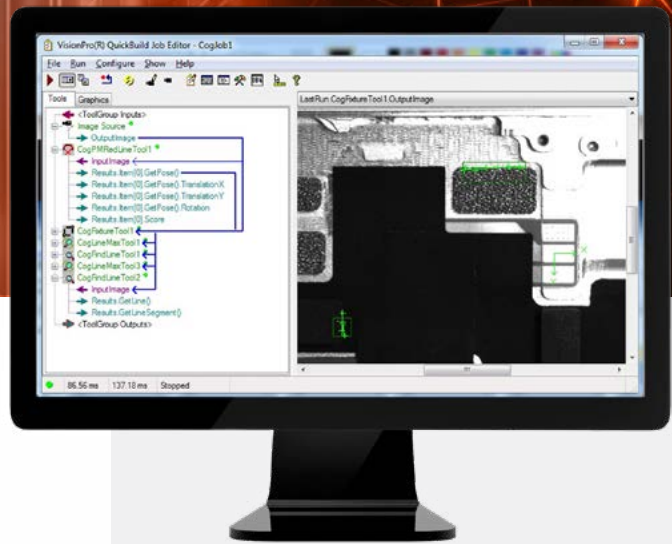
Cognex VisionPro offers a development environment powerful enough to tackle any vision challenge. Extensive tool prototyping allows you to visually define and tune your application. VisionPro's seamless integrated programming interface enables the deployment of highly-customizable applications on your PC platform.

### Fast and flexible application development with QuickBuild

The VisionPro QuickBuild prototyping environment combines the power and flexibility of programming with the ease of development of a graphical interface. Configure acquisition, select and optimize vision tools, and make pass/fail decisions—all without the need for programming. Modular tool blocks also allow the user to easily create and reuse components, simplifying and shortening the development process.

### Programming flexibility

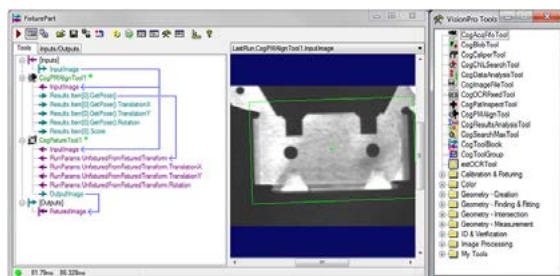
VisionPro provides a .NET programming interface that allows programmatic access to all tools for the efficient development of customized vision solutions.






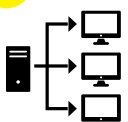


### Key benefits

- Intuitive drag-and-drop graphical interface easily chains tools together.
- Modular design blocks simplify and shorten the development cycle.
- Optimized for multi-core and multi-threaded processors for maximum performance.
- Supports Microsoft Windows® operating system, which combines the simplicity of graphical prototyping with the power and flexibility of programming.
- Access VisionPro ViDi, breakthrough deep learning-based image analysis, via API.

### QuickBuild workflow



- 1 Acquire images 
- 2 Optimize vision tools 
- 3 Customize application 
- 4 Make pass/fail decisions 
- 5 Communicate and control 
- 6 Deploy 

# VISIONPRO ViDi

## DEEP LEARNING-BASED SOFTWARE FOR COMPLEX COSMETIC INSPECTION, LOCATION, CLASSIFICATION, AND CHARACTER RECOGNITION

VisionPro ViDi is a best-in-class, deep learning-based image analysis software designed specifically for factory automation. It solves complex applications that are too complicated and time-consuming to program and maintain with traditional machine vision rules-based algorithms. VisionPro ViDi simplifies the development of highly variable vision applications.

### A breakthrough in complex inspection, part location, classification, and OCR

Deep learning-based software tolerates deviation and unpredictable defects and is ideal for:

- Defect detection
- Texture and material classification
- Assembly verification and deformed part location
- Character reading, including distorted print

### Human-like, powerful, and fast

VisionPro ViDi combines the specificity and flexibility of human visual inspection with the reliability, repeatability, and power of a computerized system—all in an easy-to-use interface.

### Optimized for factory automation

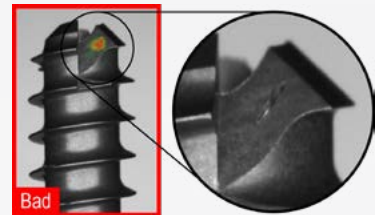
Cognex ViDi's deep learning-based algorithms are optimized for real-world industrial image analysis, requiring vastly smaller image sets and shorter training and validation periods. Non-vision experts can train applications and solve inspections in minutes. VisionPro ViDi delivers fast, accurate results and saves images for process control.



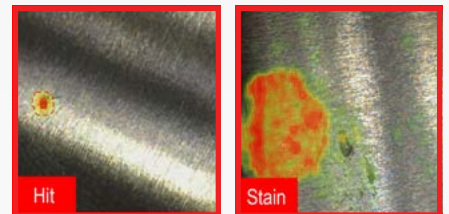
**Locate** Finds and counts complex features and objects



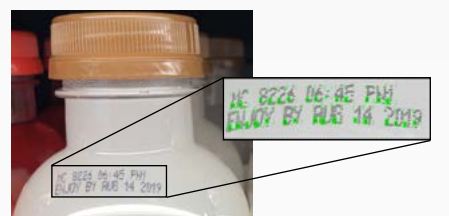
**Analyze** Detects anomalies and cosmetic defects



**Classify** Classifies and sorts objects and complete scenes

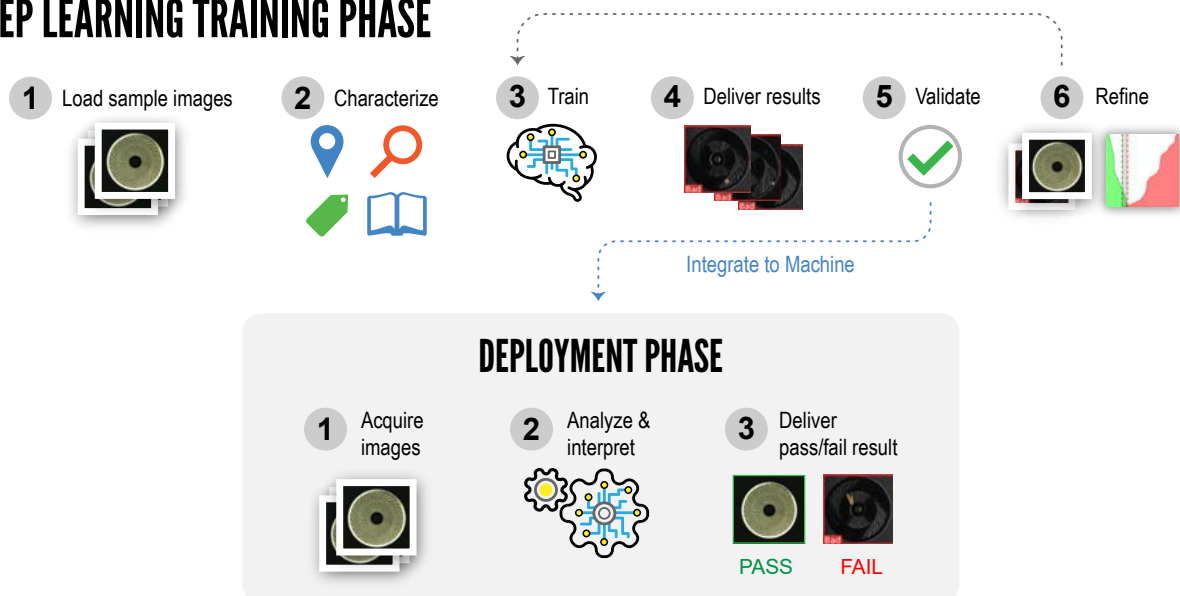


**Read** Reads challenging, deformed characters





## ViDi DEEP LEARNING TRAINING PHASE



## COGNEX DESIGNER

### DEVELOPMENT ENVIRONMENT FOR VISIONPRO

Cognex Designer makes it easy to develop, deploy, and maintain vision applications without the need for programming. Build powerful interfaces simply by dropping components onto the page. Cognex Designer offers the full set of VisionPro and ViDi vision tools in a convenient drag-and-drop format that speeds application setup and reduces development time



### Build complete vision applications in four simple steps

1. Configure the application with interactive edit controls
2. Create a professional HMI with the built-in user interface
3. Connect to factory devices
4. Install on an industrial PC or vision controller

## COGNEX VISION LIBRARY

### HIGH-PERFORMANCE C++ CLASS LIBRARY

Cognex Vision Library (CVL) provides the ultimate in development flexibility. High-performance C++ libraries integrate with Cognex vision technologies. CVL properties and options enable the highest level of customization and configurability.



# VISION TOOLS

## THE INDUSTRY'S LEADING VISION TOOLSET

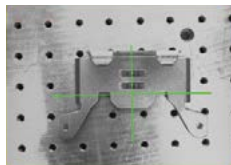
From inspection to robotic guidance, Cognex vision software offers the most proven and reliable vision tools.

### PatMax

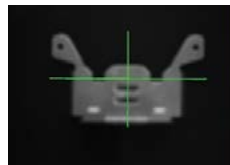
The industry standard for part and feature location



Trained image



Confusing background



Out of focus



Rotation and scale changes



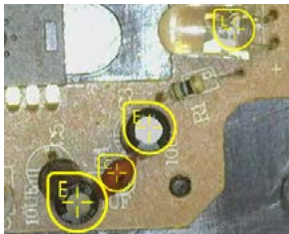
Occlusions

### ViDi Deep Learning

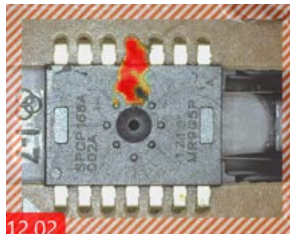
A best-in-class, deep learning-based image analysis software for factory automation



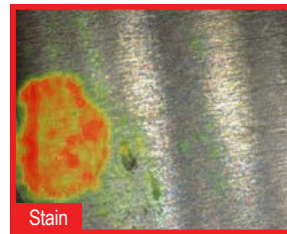
Locate



Analyze



Classify



Stain

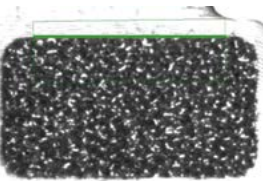


Read

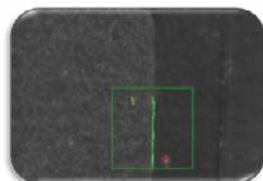


### LineMax

Advanced line finding under low contrast and noisy conditions



Noisy background

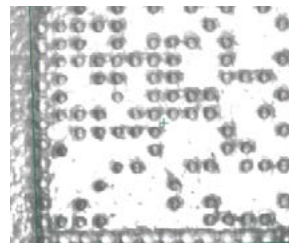


Low contrast

### Identification and Verification

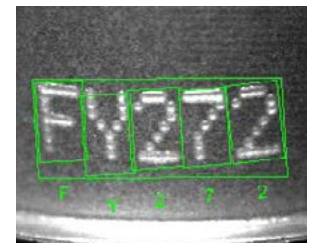
Achieve optimum ID reading and character verification

IDMax



Degraded DataMatrix codes

OCVMax



Vertical shift dot-matrix font

# VISION TOOL PACKAGES

You can get the world's top vision software package with its robust tools at the BASE, PLUS, or MAX level. Choose the tool package that suits your development needs.

	BASE	PLUS	MAX
Advanced Alignment (PatMax, PatMax Redline, LineMax)			✓
Advanced ID Capabilities (OCVMax, Symbol Verification)			✓
Advanced Image Formation (SurfaceFX)			✓
Alignment		✓	✓
ID (1D, 2D code, OCR)		✓	✓
Color		✓	✓
Multi-Threading		✓	✓
Geometry and Gauging	✓	✓	✓
Calibration	✓	✓	✓
Caliper	✓	✓	✓
Blob	✓	✓	✓
Display and Acquisition	✓	✓	✓
(Optional) Cognex Designer	(✓)	(✓)	(✓)



# VISION ACCESSORIES

Cognex vision accessories easily integrate with VisionPro, Cognex Designer, and Cognex Vision Library and include a wide selection of industrial cameras, frame grabbers, and I/O cards to meet your system requirements. Cognex offers a variety of industrial cameras in area scan and line scan formats, ranging from value solutions to high-performance hardware.

## Cognex Industrial Cameras (CIC)

Cognex Industrial Cameras are designed to easily integrate with Cognex vision software. These small, lightweight cameras in signature Cognex black and yellow show that your system has the leading machine vision technology inside.



## GigE Vision Frame Grabber

Compatible with high-speed and high-resolution cameras from many manufacturers.

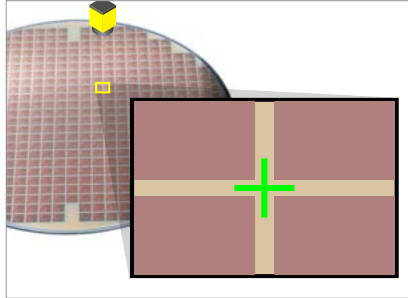
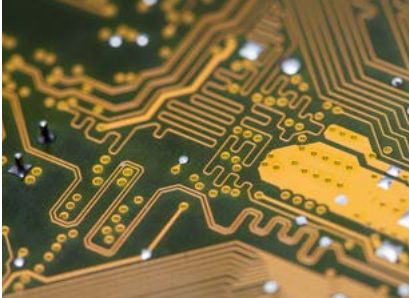


## CC24 I/O Card

I/O cards connect to factory devices using industrial protocols.



# THE MOST INDUSTRY EXPERIENCE



## Semiconductor

- Wafer and die alignment
- Wafer and IC package ID
- Semiconductor and PCBA inspection
- Fiducial alignment



## Consumer Electronics

- Pre-assembly component check
- Robot guidance and alignment
- Touch panel assembly and alignment
- Barcode reading



## Medical

- Medical device ID and traceability
- Weld and adhesive inspection
- Surface defect detection
- Optical character recognition



## Pharmaceutical

- Package and tablet inspections
- Safety seal presence and verification
- 1D, 2D, date and lot code reading
- Label presence and verification



## Automotive

- Part inspection
- Part orientation and presence detection
- Part and assembly inspections
- DPM code reading



# COGNEX GLOBAL SERVICES

Customers get more than software when they purchase from Cognex. They get a company focused exclusively on machine vision, with the most comprehensive application experience. Add direct, high-quality worldwide service and support, and it's easy to see why Cognex is the machine vision company that industries rely on.

**Technical Support**  
**Product Training**  
**Hardware Programs**  
**Product Lifecycle**

When it comes to protecting your machine vision investment, Cognex understands that responsive, expert service is an expectation all customers should have. Cognex serves an international customer base from offices located throughout the Americas, Europe, and Asia and through a global network of highly-trained partners, system integrators, and distributors.

From development to deployment, Cognex is there to help you get your vision systems up and running as fast as possible. Whether you're considering machine vision for the first time or are already an expert user, Cognex global services provide the expertise to help your organization succeed.

[cognex.com/support/Cognex-services](http://cognex.com/support/Cognex-services)



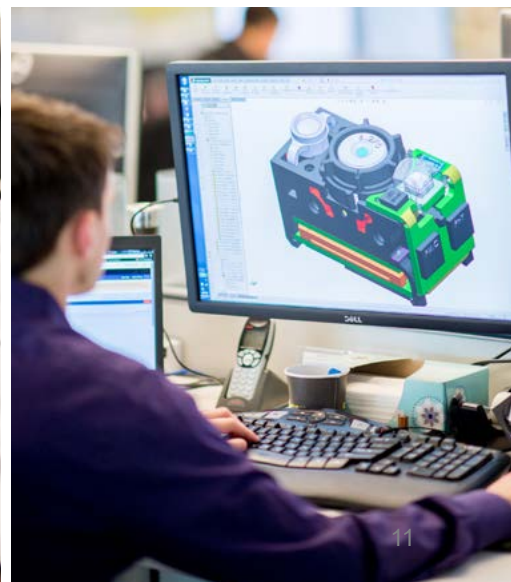
OFFICES IN

20+

COUNTRIES

500+

GLOBAL PARTNERS  
IN 30 COUNTRIES





# BUILD YOUR VISION

## 2D VISION

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 the most challenging applications.

[www.cognex.com/machine-vision](http://www.cognex.com/machine-vision)



## 3D VISION

Cognex In-Sight laser profilers and 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-laser-profilers](http://www.cognex.com/3D-laser-profilers)



## DEEP LEARNING

Deep learning-based vision algorithms now tackle applications too challenging for traditional machine vision using a small set of representative images.

[www.cognex.com/deep-learning](http://www.cognex.com/deep-learning)



## 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](http://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.

Corporate Headquarters One Vision Drive Natick, MA 01760 USA

### Regional Sales Offices

#### Americas

North America +1 844-999-2469  
Brazil +55 (11) 2626 7301  
Mexico +01 800 733 4116

#### Europe

Austria +49 721 958 8052  
Belgium +32 289 370 75  
France +33 1 7654 9318  
Germany +49 721 958 8052

Hungary +36 800 80291  
Ireland +44 121 29 65 163  
Italy +39 02 3057 8196  
Netherlands +31 207 941 398  
Poland +48 717 121 086  
Spain +34 93 299 28 14  
Sweden +46 21 14 55 88  
Switzerland +41 445 788 877  
Turkey +90 216 900 1696  
United Kingdom +44 121 29 65 163

#### Asia

China +86 21 6208 1133  
India +9120 4014 7840  
Japan +81 3 5977 5400  
Korea +82 2 539 9980  
Malaysia +6019 916 5532  
Singapore +65 632 55 700  
Taiwan +886 3 578 0060  
Thailand +66 88 7978924  
Vietnam +84 2444 583358

[www.cognex.com](http://www.cognex.com)

© Copyright 2018, Cognex Corporation. All information in this document is subject to change without notice. Cognex, In-Sight, EasyBuilder, PatMax, VisionView, VisionPro, IDMax, 1DMax and PatQuick are registered trademarks of Cognex Corporation. Build Your Vision, In-Sight Explorer, PatMax RedLine, Cognex Connect, Cognex Designer, LineMax, OCRMax, QuickBuild, SurfaceFX and 2DMax are trademarks of Cognex Corporation. All other trademarks are the property of their respective owners. Printed in the USA. Lit. No. VSPG-2018-12-EN