

# COGNEX

## VISIONPRO Vision Software

PRODUCT GUIDE 2009



Vision software from the world leader.

**Powerful and adaptable  
vision software offering:**

- **VisionPro Power Tools**
- **Fast and flexible  
application development**
- **Total hardware  
independence**

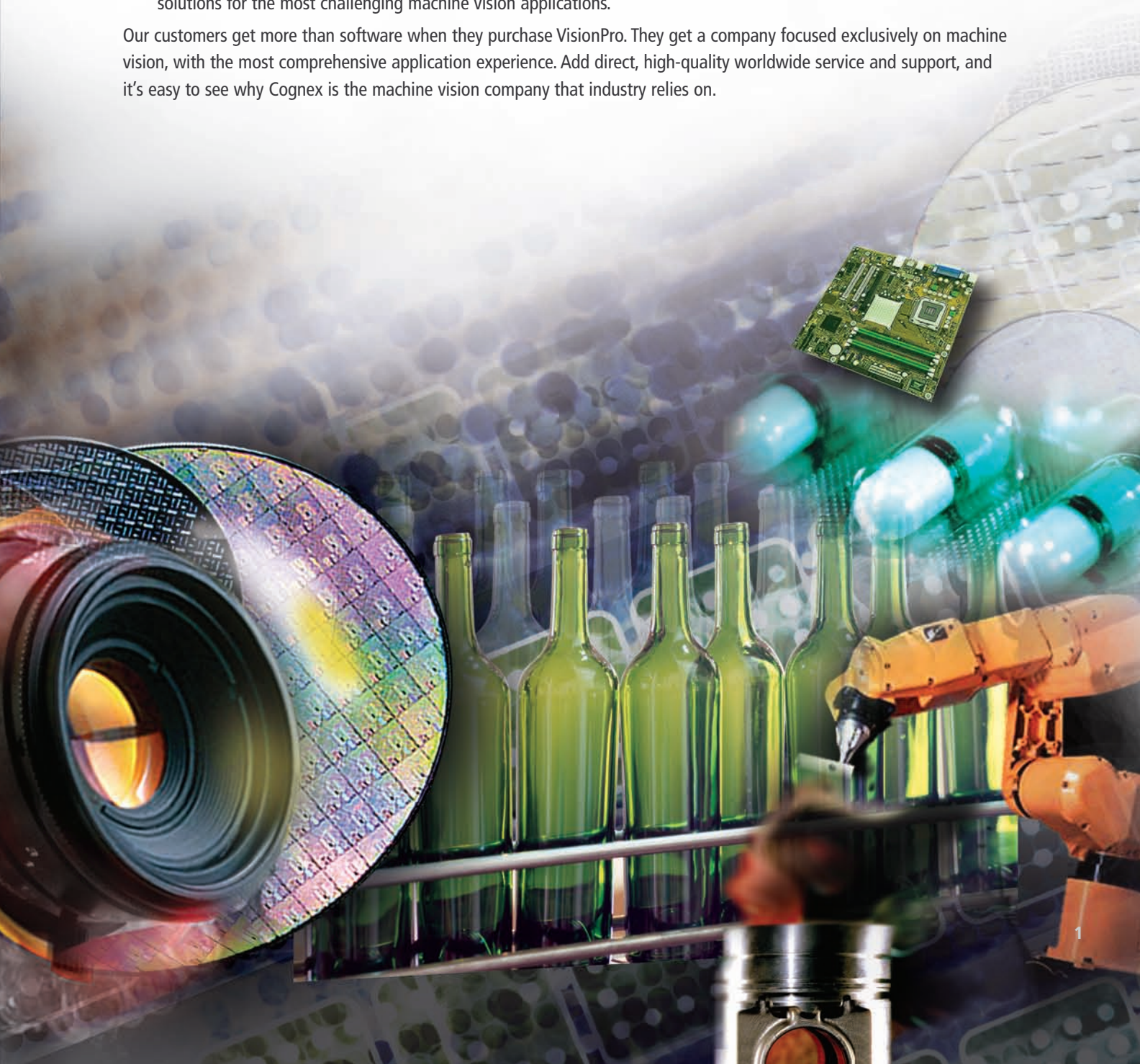


# Vision Software from the World Leader

**VisionPro® vision software has been set free. Now you can get the world's top vision software, with its robust tool library—no matter what camera or frame grabber you use. That means all applications benefit from this broad-based, industrial-grade tool set from Cognex®.**

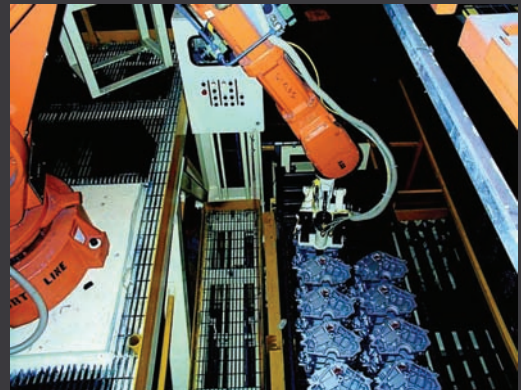
- Proven in more than 450,000 installations worldwide, the VisionPro tool library spans all vision needs... from geometric object location and inspection to identification and measurement.
- Combined with flexible and powerful PC-based development, VisionPro makes it faster than ever to create and deploy solutions for the most challenging machine vision applications.

Our customers get more than software when they purchase VisionPro. 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 industry relies on.



# Solutions for All Applications

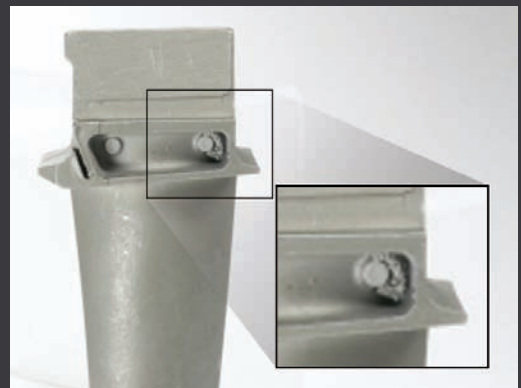
The power and versatility of VisionPro software extends to applications in all industries.



Part Location & Robot Guidance



Part Identification

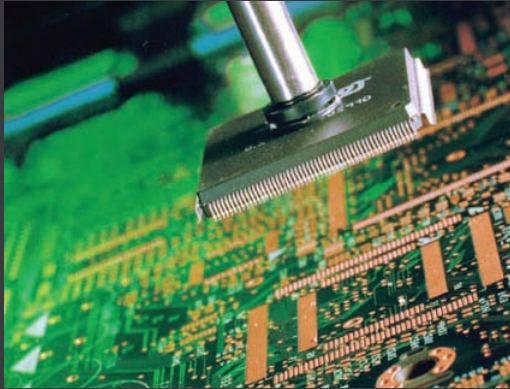


Inspection



Gauging & Dimensional Measurement

# Reliable Vision for All Industries



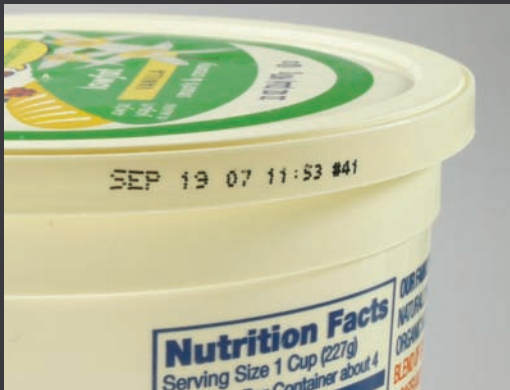
## Semiconductor and Electronics

- High precision alignment
- Board, wafer, and die inspection
- Metrology
- Lead frame inspection
- LED and LCD functional testing
- Solar wafer, cell, and panel inspection



## Automotive

- Robot guidance
- Part traceability
- Gauging critical dimensions
- Presence of weld nuts, springs, and fasteners
- Bead tracking for sealants
- Racking and de-racking



## Pharmaceutical, Food and Beverage

- Verify date and lot codes
- Picking and packaging
- Label inspection
- Presence of caps, labels, and tamper seals
- Whole package inspection
- Verifying bag closure



## Consumer products

- Cosmetic defect inspection
- Dimensional measurement
- Presence of critical features
- Label inspection
- Control of continuous processes
- Packaging verification

# The Industry Benchmark for Vision Performance

VisionPro Power Tools have the intelligence to ignore non-critical variations in appearance while focusing on the critical features that determine a product's acceptability. Power Tools don't require extensive image pre-processing to achieve the final solution, resulting in faster application development for the vision engineer and lower lifecycle costs for the company.

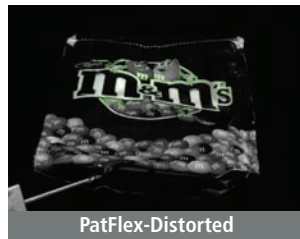
## Geometric Pattern Matching and Inspection

Provides high-accuracy object location and inspection



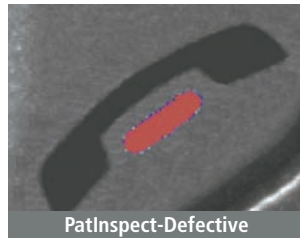
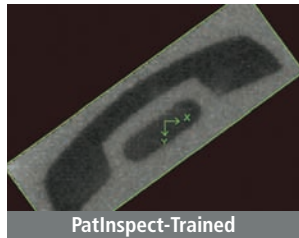
**PatMax®** The industry's gold standard for part and feature location, providing accuracy and repeatability under the most challenging conditions

**PatFlex®** Locates objects despite surface perspective or distortion, enabling the use of tools on complex surfaces



**PatMax Synthetic** Automates model training using CAD data or our unique Model Maker

**PatInspect® Area** Provides high-accuracy inspection, statistical training and normalization techniques to compensate for lighting variations



**PatMax XLC** Finds barely visible patterns in images, reducing the need for expensive lighting and optical systems

**PatMax SA** Provides accurate results for partial-match alignment when the entire pattern is not present in the image, reducing false rejects

## Multicore

CPUs that have multiple cores can help to solve applications with large demand for computing power. To meet common vision application requirements, a powerful implementation of core utilization is required. Key demands are maximum performance and flexibility.

VisionPro supports Multicore on two levels. On an application level, acquisition and processing by default run on separate cores. This allows overlapped acquisition and processing, providing maximum application throughput. On a tool level, VisionPro not only has an optimized implementation of filter tools, but also offers high level tools such as PatMax and PatInspect.

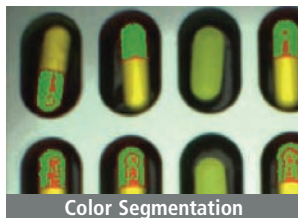
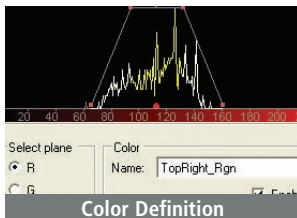
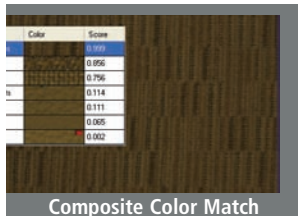
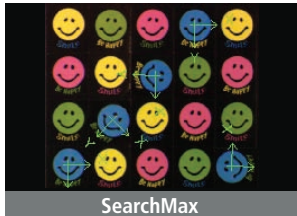
The user can either choose to utilize all cores, or manually select how many cores should be used on the application or vision tool level, to achieve maximum flexibility.

- 4 VisionPro's Multicore support is the most simple and powerful way to get the best performance and speed from your applications, regardless of the number of cores in the system.

# Vision Power Tools

## Color Tools

Locate, sort, extract match, identify, and monitor color images



**SearchMax** The ultimate tool to find color samples allowing translation, rotation, scale and skew

**Color Extractor** Simple color definition for complex color scenes. High-speed color extraction for food and packaging.

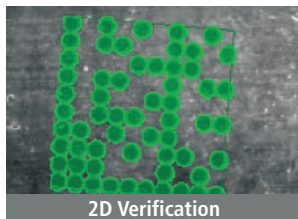
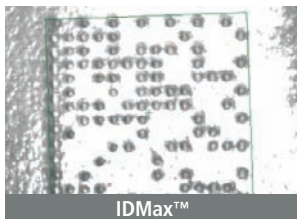
**Composite Color Match** Accurately discriminates between subtle color variations

**Color Match** High-speed identification and sorting of colored parts

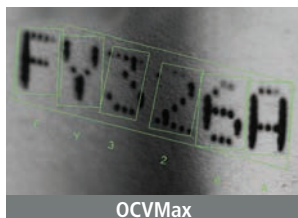
**Color Segmentation** Creates a greyscale image from selected colors, enabling other tools to be applied

## Identification and Verification

Achieve optimum ID reading and character verification



**IDMax™** Reads even the most degraded data matrix codes, delivering consistent high read rates needed for part traceability



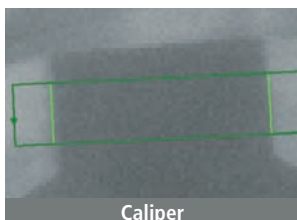
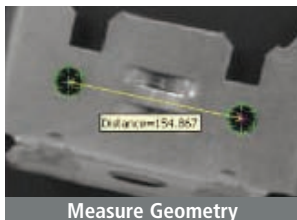
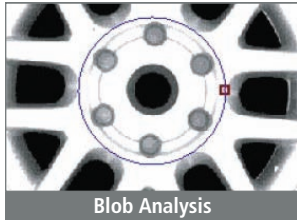
**Industrial Code Reading** Reads multiple symbologies—without being told how many or which standard—even when codes are randomly positioned and rotated

**2D Symbol Verification** Verifies the quality of 2D symbols using both AIM DPM Quality Guidelines and AS 9132

**OCVMax™** High-speed character verification, even when the print is extremely distorted, using both image-based and printer font-based training

# Essential Vision Tools

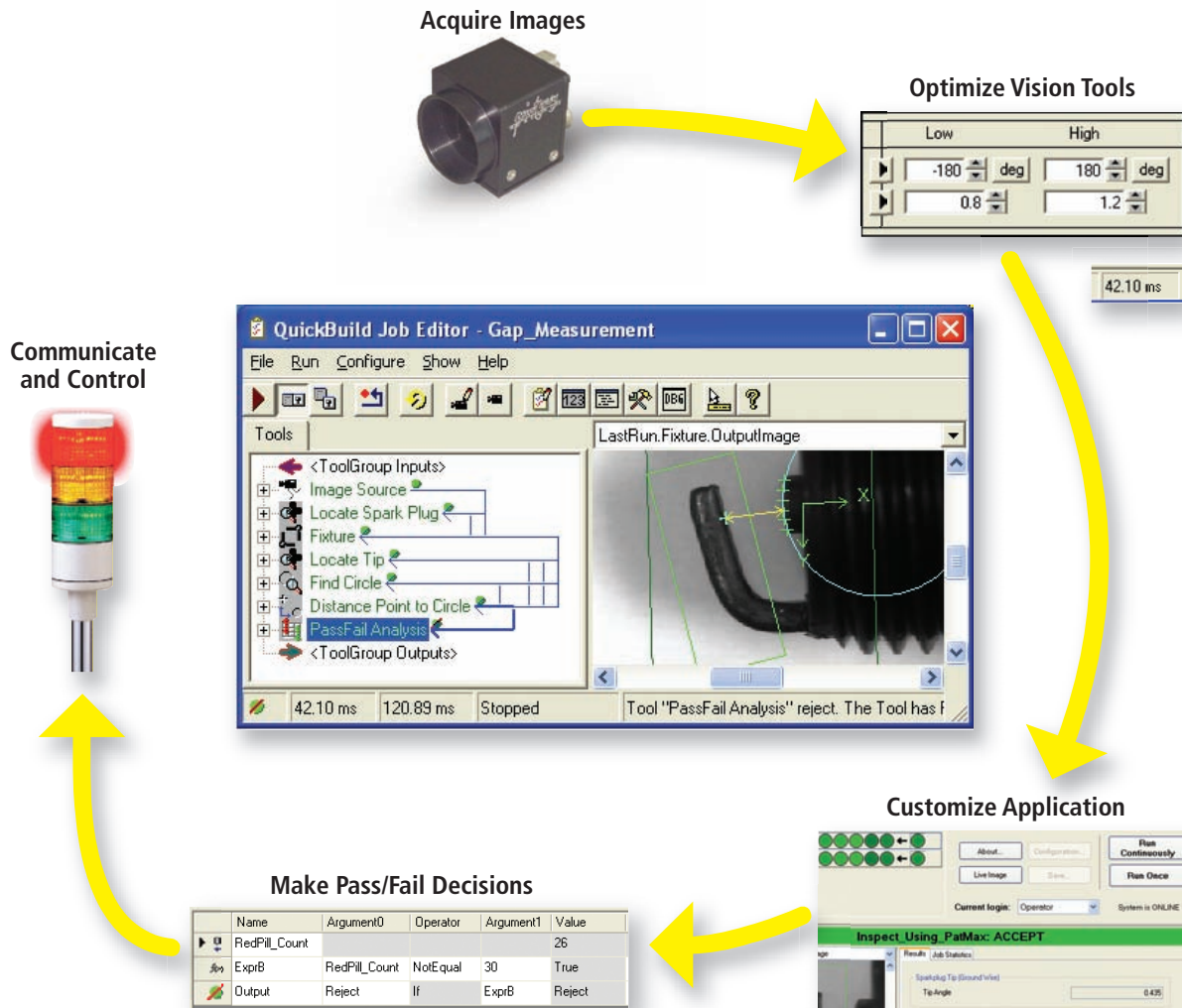
Essential Tools, combined with Power Tools, provide the most comprehensive set of industrial-grade vision tools, optimized to deliver high-speed performance in all applications.



Find Geometry	Find lines and circles
Best Fit Geometry	Create best fit lines and circles
Measure Geometry	Measure distances, angles, and intersections
Create Geometry	Construct reference geometry
Blob Analysis	Measure area, size, shape, other geometric properties
Checkerboard Calibration	Correct for non-linear, optical, and perspective distortion
Calibration	Calibrate camera pixels to real-world units
Caliper	Measure sub-pixel location of edges
CNLSearch	Locate an object using normalized correlation
Fixturing	Position tools dynamically, based on location tool results
Sobel Edge Detection	Detect edge location, intensity and direction
Polar Unwrap	"Unwrap" an annular region into a rectangular image
Image Averaging	Create images based on the average of previous images
Grayscale Morphology	Erode, dilate, open, and close
Gaussian Filter	Smooth or sample images
Image Add/Subtract	Add or subtract pixels in two images
Histogram Analysis	Count pixels by gray value
Copy Region	Copy multiple images into a single image
Affine Transform	Rotate, scale, or translate an image
Pixel Mapping	Re-assign the gray value of pixels based on a lookup table
NxM Filters	Convolve, median, erode, dilate, with any filter size
Multiply/Divide	Multiply pixel gray values by a constant
Image Sharpness	Measure the minimum feature size
Image Convert	Transform color images for analysis with other tools

# Fast and Flexible Application Development

**Something for everyone**—drag and drop, scripting, or programming—VisionPro seamlessly supports all modes of development. VisionPro QuickBuild™ lets you configure acquisition, select, and optimize vision tools, and make pass/fail decision... all without programming.



**OR...** develop managed applications with C++, C# or VB.NET. Use Quickbuild to easily load and execute jobs or opt to manually configure your tools by code. Whatever your preference, VisionPro offers maximum flexibility with the least coding effort.

# Total Hardware Independence

Now you can get the world's top vision software—no matter which camera, frame grabber, or direct-connect digital standard you use.

## Support for all image capture needs

### Broad Camera Support

VisionPro captures images from hundreds of industrial cameras, covering the complete range of video formats and acquisition requirements. Strategic Cognex relationships with major camera suppliers enable early support of new cameras and technology.

VisionPro provides open camera support, as well as configuration and diagnostic tools. This enables customers to configure, analyze, and modify cameras for numerous acquisition platforms.



### Acquisition Independence

VisionPro software provides pre-configured, tightly integrated acquisition from both Cognex hardware and direct-connect digital cameras. For images from any other source, such as microscopes or 3rd-party frame grabbers, VisionPro provides a flexible acquisition architecture. This allows customers and vision partners to develop custom interfaces for any programmable image source.

### Direct-Connect Technology

FireWire and GigE Vision acquisition provide a broad range of digital cameras with attractive features and high performance. Direct-connect technology takes advantage of the latest PC architectures to provide reliable image acquisition without a traditional frame grabber.

### Frame Grabber

Both Camera Link and analog frame grabbers can be used with VisionPro. This provides fail-safe image capture with image buffers, advanced error detection, and dedicated multi-channel hardware.

### Acquisition Alliance

Cognex maintains strategic relationships with major camera suppliers through our Acquisition Alliance program. Through the Acquisition Alliance, Cognex establishes cooperative sales and marketing efforts and strong technical relationships, leading to rapid integration of new cameras with VisionPro. Cognex supports hundreds of industrial cameras and video formats covering the complete range of acquisition requirements typically used in machine vision.

# Try it... then Buy it

## Try VisionPro. Download the Free VisionPro 30-day Trial Software

Vision software is what made Cognex the world leader in machine vision. But don't take our word for it. Download the free trial software at [www.cognex.com/software](http://www.cognex.com/software) and see for yourself how powerful vision tools can be!

## Get Started with VisionPro

Once you've seen what VisionPro has to offer, get started with our low-cost VisionPro Starter Kit which includes:

- VisionPro software CD
- Two VisionPro development licenses, enabled with all VisionPro tools
- Quick Reference documentation
- One year of telephone support
- One year of new VisionPro software releases



## Go to Production

When you're ready to deploy VisionPro on the factory floor, we offer production licenses at a range of price/performance levels. Then, simply select the software package that best suits the application. All packages include the QuickBuild interactive development environment, along with the .NET programming toolkit.

- **VisionPro Base** provides fundamental machine vision tools
- **VisionPro Plus** adds PatQuick geometric pattern matching, OCV, and ID tools
- **VisionPro Max** completes the suite, including PatMax and all VisionPro tools for ultimate flexibility

For complete pricing and accessory information, please contact your local Cognex Sales Engineer or go to [www.cognex.com/contactus](http://www.cognex.com/contactus).

## Direct Support and Training from the World Leader

Machine vision is critical to your company's success... rely on the experts.

**Cognex is a global company** with over 70 offices worldwide, providing local support and product training from our own team of highly-trained engineers.

**Our experienced team of engineers** provides first-class support. With a direct line to the VisionPro engineering team, Cognex Support Engineers investigate and resolve issues faster and more accurately than distribution channels.

**A comprehensive online Support Center** includes a Download Area for software releases and related material, a searchable Knowledge Database, and Case Submissions for customers to send issues directly to Cognex.

**A range of educational courses**, both classroom and online, are available to meet your specific needs. Please visit [www.cognex.com/training](http://www.cognex.com/training) for additional information.



# COGNEX Companies around the world rely on Cognex vision to optimize quality and drive down costs.

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