

COGNEX

VISIONPRO

Machine Vision Systems

2004

VisionPro Systems...Fast Deployment of Powerful Applications

Cognex® VisionPro® systems combine the world's leading machine vision technology with quick and powerful application development. VisionPro QuickStart™ utilizes drag-and-drop tools to speed application prototyping...the results of which can be utilized during the application development phase. Applications are developed through the use of VisionPro COM/ActiveX-based machine vision software tools and graphical programming environments such as Visual Basic® and Visual C++®. Coupled with the MVS-8100™ and MVS-8500™ Series of PC-based frame grabbers, VisionPro enables OEMs, system integrators, and advanced manufacturing engineers to quickly develop and deploy powerful machine vision applications.

Quick Prototyping and Easy Integration

VisionPro two-tier software allows easy prototyping and integration. The interactive tier utilizes drag-and-drop tools and ActiveX controls to speed application development; in the programmatic tier, the prototype application is developed into a customized solution. The COM/ActiveX-based architecture allows VisionPro applications to easily include third-party utilities (such as charting

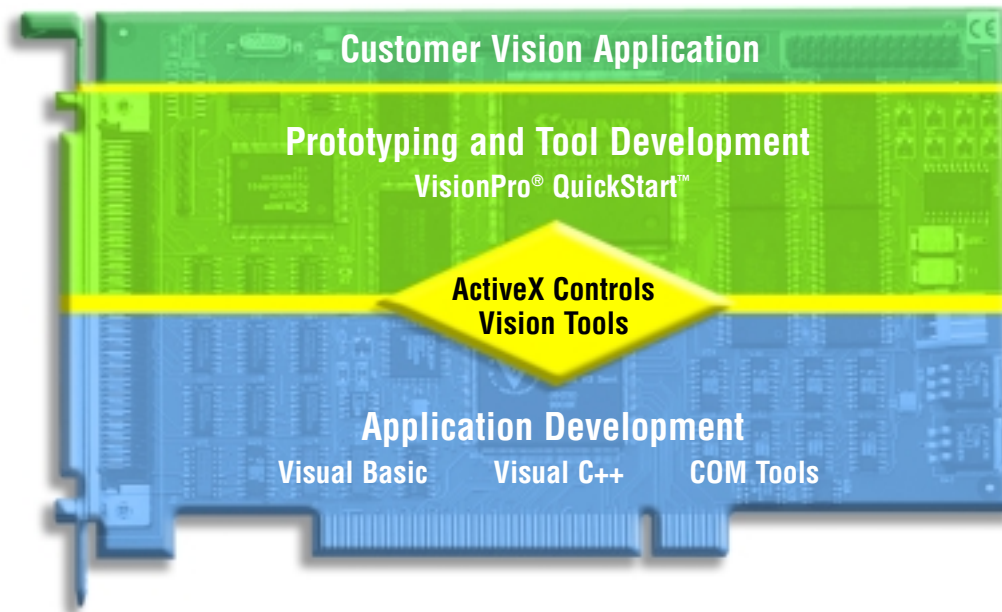
functions) and also provides easy integration of COM-based control applications for the entire machine (such as I/O, robotic control, and factory communications).

Advanced Machine Vision Software

The industry-leading Cognex vision tool library offers an array of vision software for gauging, inspection, guidance, and identification tasks. Proven in over 200,000 installations worldwide, these tools provide reliable, repeatable performance in even the most challenging vision applications.

Hardware Flexibility

VisionPro users can choose from a wide range of Cognex MVS-8100 and MVS-8500™ Series frame grabbers on which to develop and run vision applications. Tested and proven with VisionPro software, the frame grabbers provide high-speed image transfer to the host for processing and display, enabling fast vision application operation. Multichannel camera inputs, high-speed, and high-resolution camera support further enhance the acquisition flexibility of VisionPro systems.



Advantages

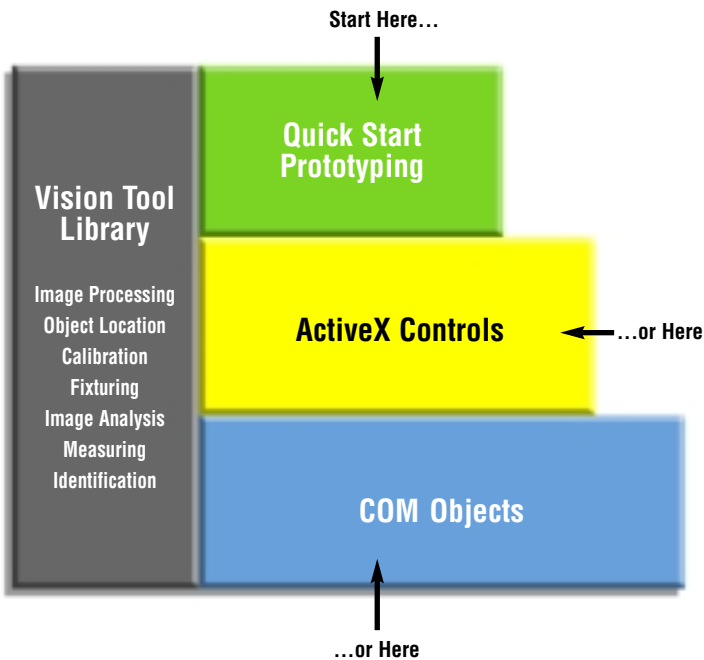
- Enables the fast development of powerful PC-based vision applications
- Simplifies the process of merging vision applications with other host control programs
- Runs on a variety of Cognex MVS-8100 and MVS-8500™ Series frame grabbers
- Speeds application prototyping via QuickStart drag-and-drop tools
- Incorporates the industry-leading vision tool library for reliable and repeatable performance

VisionPro Software Architecture

VisionPro provides easy application prototyping, development, and deployment. In the interactive tier, the VisionPro QuickStart graphical prototyping environment speeds the development of powerful machine vision applications through a palette of drag-and-drop tools. Users can easily define links between tools, test tool behavior, and validate run-time parameters. The ActiveX controls can be accessed via QuickStart or Visual Basic.

Then, in the programmatic tier, the prototype application can be enhanced with Visual Basic or Visual C++ to develop a customized solution. These development options result in considerable application development time savings.

The VisionPro architecture enables users to start their application at any one of the three levels provided ... QuickStart, ActiveX, or COM Objects.



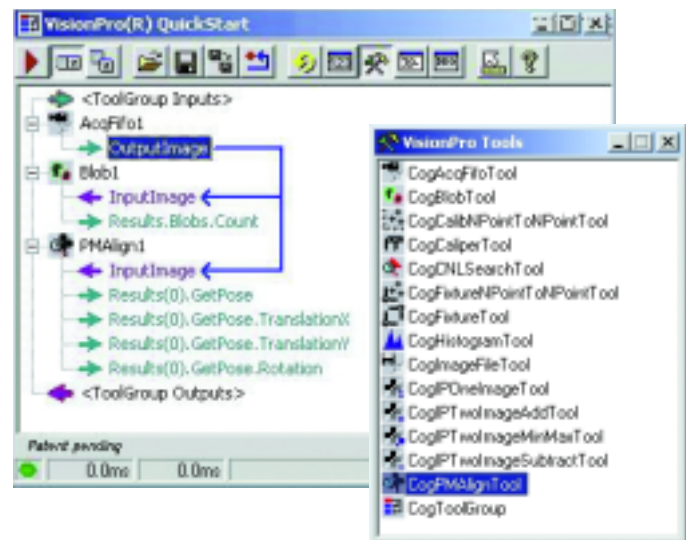
Architecture Advantages

- Fast application prototyping
- Choice of programming in ActiveX or COM layer
- Customizable ActiveX controls

Prototype Phase

The Prototype Phase results in the preliminary definition of vision tools, their parameters, and data flow. This phase provides the option of utilizing VisionPro QuickStart or prototyping directly with ActiveX controls in Visual Basic. Tests on sample images can be performed, and the prototype can be saved for use in the Development Phase.

- The easy-to-use QuickStart environment facilitates prototyping, where tools, concepts, and acquisition can be tested without programming
- Provides the capability to add tools, set tool attributes, and validate sequence of tools
- ActiveX controls allow vision tool configuration without programming
- Recalculates results automatically as parameters change, for immediate feedback



VisionPro QuickStart utilizes drag-and-drop tools to speed the prototyping of powerful machine vision applications.

Advanced Vision Software for All Applications

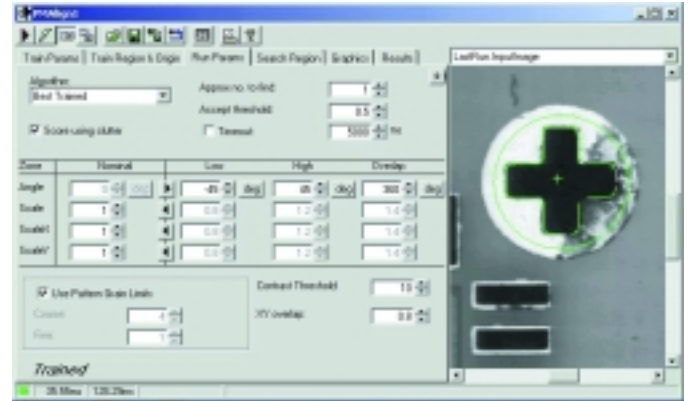
Whether the result of product design changes, or the need to inspect for new types of defects on the same part, having a broad set of proven vision software tools is essential to accommodating changes.

The VisionPro family provides a comprehensive and robust set of vision software tools — proven in more than 200,000 installations worldwide. The library includes a wide range of vision tools for high-accuracy part location, image analysis/processing, geometric analysis, and identification/verification.

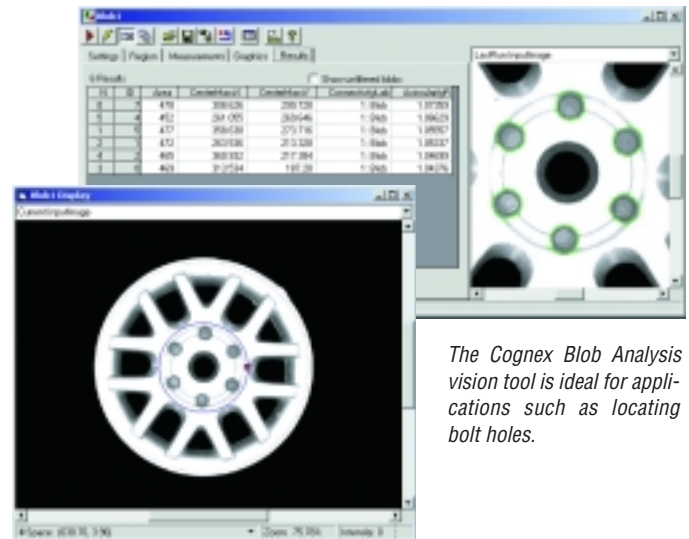
For the highest possible accuracy and robustness, all VisionPro systems can be equipped with revolutionary Cognex PatMax® geometric pattern matching software. PatMax is able to locate objects under wide changes in object angle and size, with up to 10 times greater accuracy than other pattern matching technologies. It can also tolerate variations in part appearance caused by process variations, reflective surfaces, partial occlusion, nonlinear changes in lighting, or uneven image formation. This minimizes fixturing and lighting requirements, resulting in lower manufacturing costs and greater production line flexibility.

Advantages

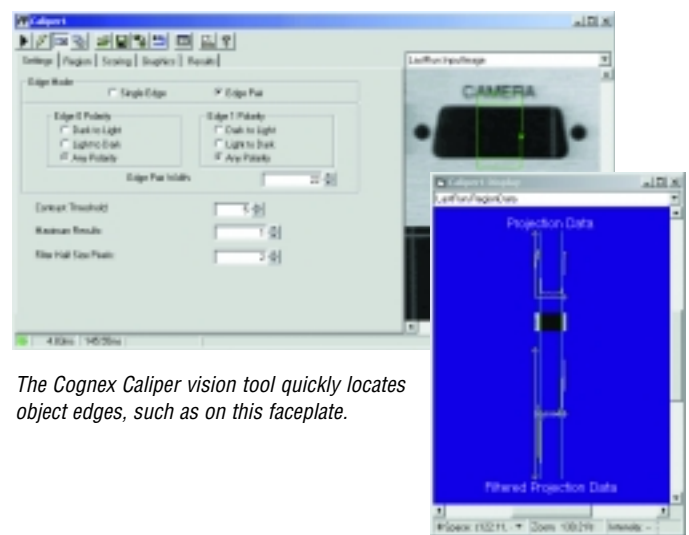
- Vision tool library proven in more than 200,000 installations worldwide
- PatMax geometric pattern matching software lowers manufacturing costs and increases production line flexibility
- Grey-scale vision tools provide high-accuracy, repeatability, and reliability
- Vision tool library optimized to deliver high-speed solutions



PatMax can accurately locate objects in instances when they vary in size or orientation, when their appearance is degraded — even when they are partially hidden from view. In this photo, PatMax locates the cross fiducial even though the image differs from what was previously trained.



The Cognex Blob Analysis vision tool is ideal for applications such as locating bolt holes.



The Cognex Caliper vision tool quickly locates object edges, such as on this faceplate.

Library of Vision Software

Geometric Pattern Matching and Inspection

PatMax	High-accuracy, high-speed, high-yield, geometric pattern matching under any orientation and size difference
Synthetic PatMax	Trains PatMax from geometric descriptions, such as CAD data, rather than from acquired images
PatQuick	High-speed, high-yield object location under any orientation and size difference
PatInspect	Detects defects by comparing runtime images against a trained model
PatFlex	Locates an object whose perspective has changed or whose surface is curved, warped, wrinkled or stretched

Image Analysis

Caliper	High-speed, sub-pixel location of multiple edges, and edge pairs
Blob Analysis	Grey-scale blob tool for highly repeatable measurements of connectivity, area, size, and shape of objects
Calibration	Calibrates camera pixels to real-world units and camera orientation
CNLSearch	High-accuracy, high reliability normalized correlation-based object location
Checkerboard Calibration	Models optical and perspective distortion to create a “corrected” or “undistorted” image based on calibration data
Fixturing	Automatically compensates for translation, rotation, and changes in scale based on any PatMax, PatQuick, Search, Caliper, or Blob result

Image Processing

Grey-scale Morphology	Reliable image pre-processing for erosion, dilation, opening, and closing
Constant Time Gaussian Filter	Image smoothing and sampling, with no speed penalty for variations in filter size
Sobel Edge Detection	High-accuracy detection of edge location, intensity and direction
Image Addition	Adds the pixels in two input images to produce a single output image
Image Subtraction	Subtracts the pixels in one image from those in a second image to produce a new output image
Histogram Analysis	Count of pixels by grey value for a region of interest
Copy Region	Copies multiple images, or portions of images, into a single consolidated image
Polar Unwrap	“Unwraps” an annular region into a rectangular image
Affine Transform	Creates a transformed image based on an input image and the user’s specified transformation
Image Averaging	Creates a composite image based on the average of several previous images
Pixel Mapping	Re-assigns the grey value of each pixel based on the values defined in a lookup table
3x3 Convolution	Convolve the input image with a user-specified 3x3 kernel to produce an output image
Multiply/Divide	Multiplies the input pixel grey values by a user-specified constant to produce an output image
Image Sharpness	Measures the minimum feature size present in an image. This can be combined with a Maximizer routine to support auto-focus techniques

Geometric Tools

Best Fit Geometry	Create best fit lines and circles through a series of points
Find Geometry	Find lines and circles within a specified region of interest
Measure Geometry	Measure distances, angles, and intersections between geometry
Data Analysis	Analyze results of vision tools to determine passing status, statistics, and basic charting of results

Identification & Verification

2D Symbol Reading	Reads Data Matrix™, QR, and PDF 417 codes
Bar Code Reading	Reads most commonly-used bar codes
2D Symbol Verification	Provides IAQG verification (e.g position, size), and AIM verification (e.g contrast, print growth)
Optical Character Verification	High-speed optical character verification

VisionPro Frame Grabbers and Cameras

High-speed Frame Grabbers

VisionPro offers users a choice of proven Cognex MVS-8100 and MVS-8500 Series frame grabbers. These PCI frame grabbers provide high-speed, host-based vision processing, and are designed to support a wide range of digital and analog vision cameras. This flexibility enables OEMs, system integrators, and advanced manufacturing engineers to create tailored solutions for a broad range of vision applications. The Cognex commitment to long-term hardware availability helps ensure a stable configuration for the customer's system.



MVS-8100 and MVS-8500 Series frame grabbers meet a wide array of acquisition, cost and functionality requirements.

Analog Acquisition

MVS-8100L...a monochrome vision system for applications requiring high-speed image transfer at low cost. Utilizing pipelined processing, this frame grabber captures and transfers high-quality grey-scale images from up to four multiplexed RS-170 or CCIR cameras.

MVS-8100M...a monochrome vision system for applications requiring high-speed image transfer and display at low cost. High-quality grey-scale images from up to four multiplexed RS-170 or CCIR cameras can be captured, then transferred via pipelined processing. In order to achieve higher throughput, rapid reset cameras are supported (for high acquisition rates of rapidly moving parts), as are non-interlaced progressive scan cameras.

MVS-8120 Series...high-performance frame grabbers that support:

- RS-170/CCIR analog cameras
- RS-644 digital cameras
- Digital linescan cameras

Contact your Cognex sales engineer for the availability of MVS-8120 frame grabbers having other video capabilities.

MVS-8500 Series...these frame grabbers support the new generation of high-speed analog cameras. The Cognex MVS-8501 frame grabber supports up to four multiplexed cameras, and the MVS-8504 model supports up to four independent cameras. These frame grabbers are backward compatible with standard-speed analog interlaced and progressive scan cameras. As a result, they are ideally suited for equipment builders and factory automation engineers currently migrating to the new generation of 60 frame-per-second standard resolution analog cameras.

Digital Acquisition

MVS-8100D... The MVS-8100D is a fully-digital frame grabber that supports any combination of up to three Cognex CMOS digital cameras (described on page eight of this brochure), with asynchronous acquisition, enabling each camera to accept triggers and acquire images independently of one another. By supporting both standard and large format cameras on a single board, the 8100D eliminates the need to purchase a separate frame grabber for different camera types.

The 8100D also provides a high-speed digital camera interface for simultaneous, two-way communication between the camera and frame grabber. This enables ROI and shutter speed settings, for example, to be configured at the same time the camera is acquiring images.

Advantages

- Frame grabbers provide acquisition and camera flexibility for a variety of applications
- All frame grabbers are performance-tested with VisionPro software
- Frame grabber series offers models for all price/performance requirements
- All frame grabber models are designed for high-speed performance over PCI bus

See pages 8-9 for frame grabber specifications

CDC Machine Vision Cameras

Cognex offers the CDC Series™ of digital machine vision cameras, with models that support a wide range of machine vision applications running on the MVS-8100D frame grabber.

CDC Series machine vision cameras combine the latest in digital camera technology with low-cost CMOS sensor technology. Unlike analog video cameras, which often filter and sample the image before it is processed, CDC Series cameras perform a direct 1:1 conversion of the digitized image, providing images with no “pixel jitter”.

The CDC-200 camera – the world’s smallest high-resolution digital CMOS camera – is the cost-effective choice for applications where high-resolution images are required. Whether the application requires increased resolution for inspecting small objects or capturing images of larger parts, the CDC-200 delivers full resolution images (1280 x 1024) up to 26 frames per second. For high-speed applications, the standard resolution (640 x 480) CDC-50 offers acquisition rates up to 60 frames per second. The MVS-8100D frame grabber supports any combination of CDC cameras (up to three) with asynchronous acquisition. For applications that require more than three cameras, VisionPro supports the use of two MVS-8100D frame grabbers in a single PC.

CDC Series cameras are roughly half the size and weight of conventional digital machine vision cameras and fit easily on a variety of mounting configurations, including robotic arms and other moving X-Y stages typically used in vision applications.

A rugged enclosure offers protection from harsh factory environments and features a small, 9-pin micro cable connector. The enclosure also has an optically-isolated trigger and strobe connector built in, so no external connector module is required.



Cognex CDC Series cameras merge high-performance digital camera technology with low-cost CMOS image sensing, and are available in both large format and standard resolution models.

Advantages
<ul style="list-style-type: none"> • Choice of large format and standard resolution cameras • Configurable ROI (region of interest) feature increases frame rate • Delivers images with no pixel jitter • Compact, lightweight enclosure

Feature	CDC-50	CDC-200
Full Frame resolution	640 x 480	1280 x 1024
Optical Format	1/3" (5.0mm x 3.7mm)	2/3" (8.58mm x 6.86mm)
Pixel Size	7.8um	6.7um
Saturation Signal	45000 electrons	60000 electrons
Dynamic Range	49dB	54dB
Frame Rate (max.)	60 fps	26 fps
Minimum Sensitivity	10 Lux @60 fps, F2 lens	6 Lux @26 fps, F2 lens
Shutter Style	Global or Rolling	Global
Sub-sampling	2:1, 4:1, or 8:1 in either direction	2:1 in either direction
Camera Body Size	34mm (1.3")W x 31mm (1.2")H x 47mm (1.8")D	
Camera Body Weight	61.6 grams (2.18 oz); 78 grams (3.5 oz) with mounting block	
Region of Interest Window	Independent horizontal and vertical control	
Image Sensor Type	CMOS APS (Active Pixel Sensor)	

Hardware Specifications – MVS-8100/8500 Series

	MVS-8100L	MVS-8100M	MVS-8120
	Low-cost monochrome; 4:1 MUX; pipelined processing	High-performance monochrome; 4:1 MUX; rapid reset progressive scan cameras; pipelined processing	High-performance monochrome family offering video input options; 8MB frame buffer per channel; flexible I/O interfacing
Physical Configuration	<ul style="list-style-type: none"> • Half-slot PCI card • 4.20" x 6.875" (106.7mm x 174.6mm) 	<ul style="list-style-type: none"> • Half-slot PCI card • 4.20" x 6.875" (106.7mm x 174.6mm) 	<ul style="list-style-type: none"> • Half-slot PCI card • 4.20" x 6.875" (106.7mm x 174.6mm)
PC Requirements	<ul style="list-style-type: none"> • 166MHz Pentium class CPU or greater (MMX required for PatMax[®] software) • AGP-based video display adaptor with at least 8MB of RAM, support for Direct Draw, and operating in a minimum 256 color mode. • One open +5V/32-bit PCI expansion slot • Microsoft Windows NT4.0, 2000, or XP operating system; Internet Explorer 6.0 • Microsoft Visual Basic 6.0 • Visual C++ 6.0, Visual C++ .NET (unmanaged) 	<ul style="list-style-type: none"> • 166MHz Pentium class CPU or greater (MMX required for PatMax[®] software) • PCI- or AGP-based video display adaptor with at least 8MB of RAM, support for Direct Draw, and operating in a minimum 256 color mode. AGP is preferred. • One open +5V/32-bit PCI expansion slot • Microsoft Windows NT4.0, 2000, or XP operating system; Internet Explorer 6.0 • Microsoft Visual Basic 6.0 • Visual C++ 6.0, Visual C++ .NET (unmanaged) 	<ul style="list-style-type: none"> • 166MHz Pentium class CPU or greater (MMX required for PatMax[®] software) • PCI- or AGP-based video display adaptor with at least 8MB of RAM, support for Direct Draw, and operating in a minimum 256 color mode. AGP is preferred. • One open +5V/+3.3V PCI expansion slot • Microsoft Windows NT4.0, 2000, or XP operating system; Internet Explorer 6.0 • Microsoft Visual Basic 6.0 • Visual C++ 6.0, Visual C++ .NET (unmanaged)
Memory	<ul style="list-style-type: none"> • Line buffer 	<ul style="list-style-type: none"> • 512K frame buffer 	<ul style="list-style-type: none"> • 32MB frame buffer
Video Input	<ul style="list-style-type: none"> • Up to four multiplexed RS-170 or CCIR cameras • Full or half resolution acquisition • Supports external camera sync 	<ul style="list-style-type: none"> • Up to four multiplexed RS-170 or CCIR cameras • Supports rapid reset cameras • Full or half resolution acquisition • Supports external camera sync 	<ul style="list-style-type: none"> • Area scan models support external camera synch, rapid reset cameras, and full or half resolution acquisition • Independent, asynchronous acquisition channels MVS-8120/CVM1 – Four RS-170/CCIR analog cameras MVS-8120/CVM9 – Two RS-644 digital cameras – One RS-170/CCIR analog camera MVS-8120/CVM11 – Two digital linescan channels
PC-based Display	<ul style="list-style-type: none"> • PCI bus master • DMA to PC memory in parallel with acquisition • Color graphics overlay 	<ul style="list-style-type: none"> • PCI bus master • DMA to PC memory in parallel with acquisition • Color graphics overlay 	<ul style="list-style-type: none"> • PCI bus master • DMA to PC memory in parallel with acquisition • Color graphics overlay • On-the-fly hardware conversion for PCI-based display in 16/32-bit desktop modes
Parallel I/O	<ul style="list-style-type: none"> • High-speed opto-isolated trigger input • Strobe output • Opto-isolated accept/reject output 	<ul style="list-style-type: none"> • High-speed opto-isolated trigger input • Opto-isolated strobe output • Opto-isolated accept/reject output 	<p>Accommodates one of the following PCI breakout cards:</p> <ul style="list-style-type: none"> • Standard I/O: 8 TTL in, 8 TTL out, 8 TTL bidirectional, 4 opto out • External I/O: 8 TTL in / 8 TTL out via converter box; 4 additional TTL bidirectional, 8 additional TTL out
Power Consumption	<ul style="list-style-type: none"> • +12V@2A maximum • -12V@0.2A maximum • +5V@3.0A maximum • Dissipates approximately 27 watts 	<ul style="list-style-type: none"> • +12V@2A maximum • -12V@0.2A maximum • +5V@3.0A maximum • Dissipates approximately 27 watts 	<ul style="list-style-type: none"> • +12V@1A maximum • -12V@0.2A maximum • +5V@5A maximum • Dissipates approximately 18 watts
Environmental	<ul style="list-style-type: none"> • Operating temperature: 10 to 45°C • Humidity: 10 to 90%, non-condensing 	<ul style="list-style-type: none"> • Operating temperature: 10 to 45°C • Humidity: 10 to 90%, non-condensing 	<ul style="list-style-type: none"> • Operating temperature: 0 to 50°C • Humidity: 10 to 90%, non-condensing

MVS-8100D	MVS-8501	MVS-8504
<p>Fully-digital image acquisition; up to three asynchronous channels; supports any combination of CDC cameras; pipelined processing</p>	<p>4:1 MUX of high-speed and standard analog cameras; pipelined processing</p>	<p>Supports mixed asynchronous or simultaneous acquisitions, in color and monochrome, on four high-speed independent analog channels; pipelined processing</p>
<ul style="list-style-type: none"> • Half-slot PCI card • 4.20" x 6.875" (106.7mm x 174.6mm) 	<ul style="list-style-type: none"> • Half-slot PCI card • 4.20" x 6.875" (106.7mm x 174.6mm) 	<ul style="list-style-type: none"> • Half-slot PCI card • 4.20" x 6.875" (106.7mm x 174.6mm)
<ul style="list-style-type: none"> • 166MHz Pentium class CPU or greater (MMX required for PatMax[®] software) • PCI- or AGP-based video display adaptor with at least 8MB of RAM, support for Direct Draw, and operating in a minimum 256 color mode. AGP is preferred. • One open +5V/+3.3V PCI expansion slot • Microsoft Windows NT4.0, 2000, or XP operating system; Internet Explorer 6.0 • Microsoft Visual Basic 6.0 • Visual C++ 6.0, Visual C++ .NET (unmanaged) 	<ul style="list-style-type: none"> • 166MHz Pentium class CPU or greater (MMX required for PatMax[®] software) • An AGP-based video display adaptor with at least 8MB of RAM. • Direct Draw, and operating in a minimum 256 color mode. AGP is preferred. • One open +5V or 3.3V 32-bit PCI expansion slot • Microsoft Windows, 2000, or XP operating system; Internet Explorer 6.0 • Microsoft Visual Basic 6.0 • Visual C++ 6.0, Visual C++ .NET (unmanaged) 	<ul style="list-style-type: none"> • 166MHz Pentium class CPU or greater (MMX required for PatMax[®] software) • An AGP-based video display adaptor with at least 8MB of RAM. • Direct Draw, and operating in a minimum 256 color mode. AGP is preferred. • One open +5V or 3.3V 32-bit PCI expansion slot • Microsoft Windows, 2000, or XP operating system; Internet Explorer 6.0 • Microsoft Visual Basic 6.0 • Visual C++ 6.0, Visual C++ .NET (unmanaged)
<ul style="list-style-type: none"> • 8MB frame buffer 	<ul style="list-style-type: none"> • 8MB FIFO 	<ul style="list-style-type: none"> • 16MB FIFO
<ul style="list-style-type: none"> • Up to three CDC cameras • Independent, asynchronous acquisition channels • VGA or SXGA resolutions • Configurable region of interest (ROI) • Sub-sampling • 8-bit images 	<ul style="list-style-type: none"> • Up to four multiplexed analog cameras • Supports standard and high-speed analog • Supports high resolution, rapid reset, progressive scan, and interlaced cameras • Selectable anti-aliasing filter for high image quality 	<ul style="list-style-type: none"> • Four independent standard and high-speed analog channels, with mixed camera formats • Supports high resolution, rapid reset, progressive scan, and interlaced cameras • Supports gray scale
<ul style="list-style-type: none"> • PCI bus master • DMA to PC memory in parallel with acquisition • Color graphics overlay 	<ul style="list-style-type: none"> • PCI bus master • One DMA channel • DMA to PC memory in parallel with acquisition • Color graphics overlay • Image decimation for display 	<ul style="list-style-type: none"> • PCI bus master • Four independent DMA channels • DMA to PC memory in parallel with acquisition • Color graphics overlay • Image decimation for display
<ul style="list-style-type: none"> • Eight or twelve TTL bi-directional I/O lines depending on number of channels • Opto-isolated I/O available via breakout box 	<ul style="list-style-type: none"> • 16 bi-directional TTL I/O • Four lines can be configured as trigger inputs • Four lines can be configured as strobe outputs • Opto-isolation available via a breakout box 	<ul style="list-style-type: none"> • 16 bi-directional TTL I/O • Four lines can be configured as trigger inputs • Four lines can be configured as strobe outputs • Opto-isolation available via a breakout box
<ul style="list-style-type: none"> • +5V@3.0A maximum • Dissipates maximum of 15 watts 	<ul style="list-style-type: none"> • 5V@ 2.5 A normal operation (4 A max. instantaneous) • +12V@ 0.1 A normal operation (0.2 A max. instantaneous) • -12V@ 0.1 A normal operation (0.2 A max. instantaneous) • Dissipates approximately 14 watts 	<ul style="list-style-type: none"> • 5V@ 2.5 A normal operation (4 A max. instantaneous) • +12V@ 0.1 A normal operation (0.2 A max. instantaneous) • -12V@ 0.1 A normal operation (0.2 A max. instantaneous) • Dissipates approximately 14 watts
<ul style="list-style-type: none"> • Operating temperature: 10 to 50°C • Humidity: 10 to 90%, non-condensing 	<ul style="list-style-type: none"> • Operating temperature 0°C to 50°C • Humidity 10 to 90%, non-condensing 	<ul style="list-style-type: none"> • Operating temperature 0°C to 50°C • Humidity: 10 to 90%, non-condensing

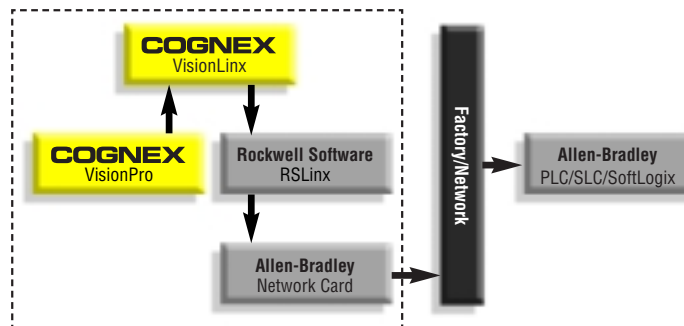
Communications Flexibility

New Communications Options Simplify Integration

Establishing communications between a vision system and PLCs, robots, and motion controllers has traditionally been a very complex, programming-intensive task. This effort may involve spending weeks writing custom communications software, and still more weeks testing and debugging the program. For this reason, VisionPro offers optional Cognex VisionLinX communications software to greatly accelerate and simplify the process of integrating vision with other factory automation devices, applications, and networks.

Connecting to Factory Control Products

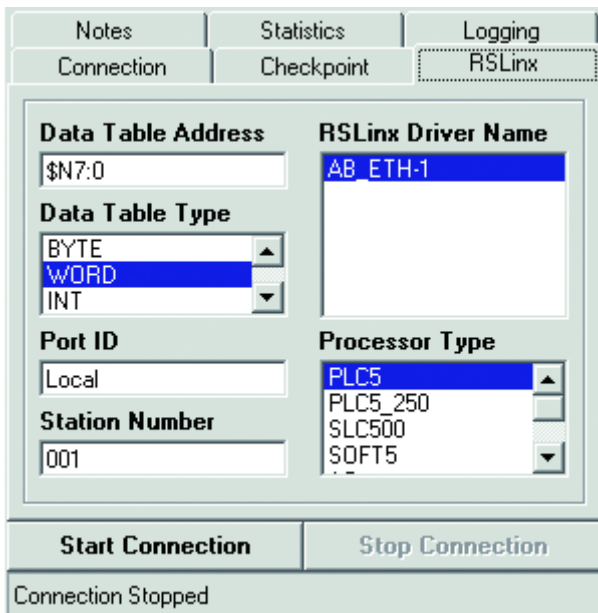
VisionLinX software allows users to configure two-way communications between VisionPro and PLCs, SLCs, and PC-based controllers quickly and easily with a single, easy-to-use user interface. The software runs directly on the VisionPro host PC, and enables data to be sent over a wide range of factory automation networks including ControlNet, Data Highway Plus, Ethernet, as well as the DF1 communications protocol.



The above connectivity diagram illustrates the data flow for an output connection between VisionPro and Allen-Bradley control products.

With its easy to use ActiveX control and COM objects, VisionLinX allows users to easily add a wide assortment of communication options to their custom VisionPro application. The VisionLinX ActiveX control provides an easy way to add “point and click” configuration for communications, and the VisionLinX COM objects allow users to streamline the data flow to their PLC. Data from VisionPro can be sent to specific data tables or memory locations within a PLC. Users can control the amount of data buffering, direction of data flow, display statistics for each connection and log the activity of each connection.

New to VisionLinX 2.0 is a PLC Simulator application that allows users to test their communications software without connecting to a PLC. (PLCs and communications networks aren't always available when the programmer wants to test out a communications solution). Valuable time and money is wasted when the communications software debugging has to wait for the entire control system to be in place. VisionLinX solves this problem by replacing RSLinx, communications hardware, and the PLC with VisionLinXSimulator. Invisible to the programmer's code, VisionLinXSimulator responds to reads and writes as if it were a PLC. When the application is brought online for the first time, users know it will work. If problems do occur, they know the source is in the PLC configuration or network wiring and not their code.



With easy-to-use dialog boxes, VisionLinX provides a simple means of managing all aspects of the data transfer between VisionPro and the selected destination.

VisionPro Support and Education Programs

To accommodate the wide range of experience and skill levels among machine vision users, Cognex offers a variety of support and learning programs to make using VisionPro simple and intuitive. From classroom, online, and video courses to technical support, these programs get users up and running quickly and easily — providing information when and where it's needed.

Classroom Courses at Cognex

Cognex offers a course that covers VisionPro setup, programming, and system operation. Small class sizes allow students to benefit from individualized attention. Students configure, test, debug, and interface the VisionPro system to solve a variety of inspection, gauging, and alignment tasks.

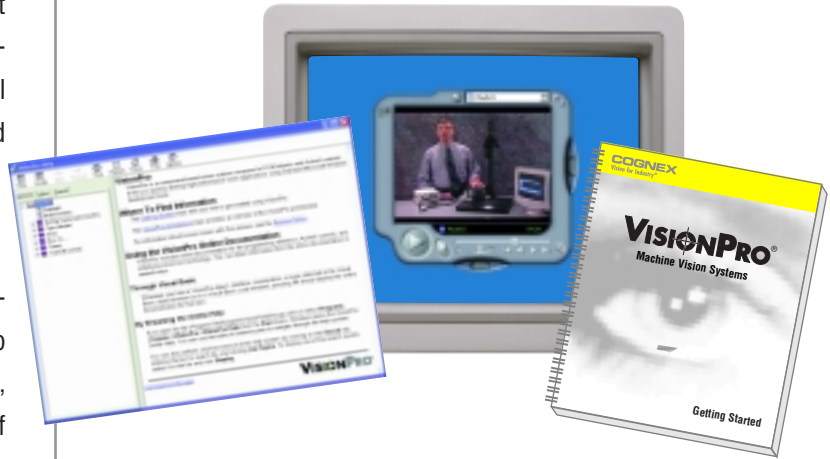
The course alternates between lecture and lab exercises that solve real-world vision problems. Participants spend fifty percent of their time in class performing hands-on lab exercises. Learning by doing improves both student comprehension and retention of the course material.

Online Learning



Live instructor-led courses are offered over the Internet. Completing a series of online modules (60 - 90 minute sessions) provides the same content provided by the classroom course. Recorded sessions are available for playback at any time. Specific topics include *QuickStart*, *Vision Tools*, *Building an Interface*, *Calibration*, *Fixturing* and *Graphics*.

Documentation and Support Materials



- **Microsoft HTML Help System** – A comprehensive and searchable help system is provided.
- **Printed Documentation** – In your Starter Kit you will find *Getting Started* and *VisionPro Hardware* manuals.
- **Lighting and Optics Instruction Video** – This video covers the fundamentals of optics and lighting for machine vision, and shows the setup of many lighting techniques.

Direct Support

Direct support, via phone or e-mail, is provided by experienced machine vision engineers dedicated to assisting our customers.

Web-based Support

- **Download Area** – A variety of downloadable files, including documentation and support materials, sample templates, and a *Hardware Troubleshooting Guide*.
- **Case Submission** – Allows you to describe the specific area in which you would like assistance, via e-mail, to a Cognex Technical Support Engineer.
- **Knowledge Database** – A searchable database of Frequently Asked Questions.

About Cognex

Cognex Corporation designs, develops, manufactures, and markets machine vision systems. As the world leader in the machine vision industry, Cognex has shipped more than 200,000 systems to date, representing over \$1.5 billion in cumulative revenue. 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.



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