Vision For Today And Tomorrow »

Vision Software • Smart Cameras • 3D Sensors • Vision Controllers • I/O Cards • Frame Grabbers

matrox.com/imaging

MATROX IMAGING

About Matrox Imaging

Founded in 1976, Matrox® Imaging is an established and trusted supplier to top OEMs and integrators involved in machine vision, image analysis, and medical imaging industries. The systems and components consist of smart cameras, 3D sensors, vision controllers, I/O cards, and frame grabbers, all designed to provide optimum price-performance within a common software environment.

Matrox Imaging has earned its reputation as a leading developer of reliable vision solutions, leveraging more than 40 years of continuous innovation. All products are backed by meticulous in-house design expertise and come with dedicated customer support. Matrox Imaging proudly builds lasting relationships with customers by meeting evolving needs over multiple product generations.

The Matrox Imaging Advantage

Assured quality & longevity

Matrox Imaging adheres to industry best practices for hardware design and manufacturing, and software development. Particular attention is placed on component selection to secure consistent long-term availability. All products are backed by a dedicated team of QA specialists to ensure the highest quality is delivered to our customers.

Trusted industry standards

Matrox Imaging champions industry standards in its design and production. Leveraging these standards to deliver quality compatible products, Matrox Imaging protects its customers' best interests by ensuring hardware and software components work with as many third-party products as possible.

Comprehensive customer support

Devoted front-line support and applications teams are on call to offer timely product installation, usage, and integration assistance. Matrox Professional Services delivers deep technical assistance to help customers develop their particular applications in a timely fashion. Services include personalized training and device interfacing as well as application feasibility, prototyping, troubleshooting, and debugging.

Tailored customer training

Matrox Vision Academy comprises online and on-premises training for Matrox Imaging vision software tools. On-premises intensive training courses are regularly held at Matrox headquarters, and can also be customized for onsite delivery. The Matrox Vision Academy online training platform hosts a comprehensive set of on-demand videos available when and where needed.

Long-standing global network

Matrox Imaging customers benefit from a global network of distributors who offer complementary products and support, and integrators who build customized vision systems. These relationships are built on years of mutual trust and span the globe, ensuring customer access to only the best assistance in the industry.

Industries

Industrial imaging technology continues to make its presence felt across a wide variety of industries—whether it be used for enhancing yields, improving efficiency, or meeting compliance requirements.

From simple image acquisition all the way through to tools for complex inspection, recognition, and guidance tasks, Matrox Imaging delivers the foundational building blocks for machine vision applications.

Automotive manufacturing	Logistics	Pharmaceutical production
Electronics manufacturing	Medical device manufacturing	Semiconductor manufacturing
Flat panel display manufacturing	Medical imaging	Surveillance
Food & beverage production	Packaging	Transportation

Applications

Industry leaders rely on Matrox Imaging technology. Customers stay with Matrox Imaging over multiple product generations because of a commitment to cutting-edge technology, technical assistance, integration support, and the highest manufacturing standards.

Image processing and analysis software readies images for effective examination using grey scale, edge, and color information for study, diagnoses, and quality control. The software is also capable of offloading to field-programmable gate array (FPGA)-based hardware.

Machine and robot guidance employs vision software to accurately locate and determine the pose of objects and features; great repeatability is crucial for guiding automated fabrication and manufacturing using machines and industrial robots. Intensity and geometric-based pattern-recognition tools are key aspects of the software.

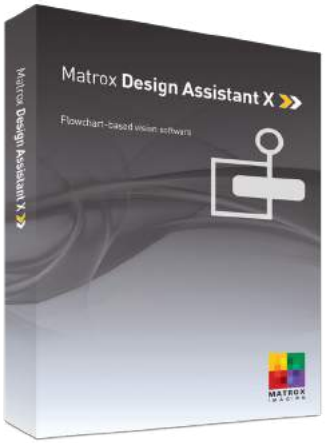
ID mark reading and verification software helps ensure effective item tracking and tracing during manufacturing, packaging, and distribution, as well as general automated handling. It reads widely used barcodes and 2D symbologies, including direct part marking (DPM), and verifies decodability against established standards. Matrox Imaging software performs OCR on product information text made up of solid-stroke and dot-matrix characters.

Image and video capture comes via software and hardware that reliably captures SD, HD, UHD, and non-standard definition images and video delivered using the Camera Link®, CoaXPress®, DisplayPort™, GenTL, GigE Vision®, HDMI™, SDI, and USB3 Vision® digital interfaces as well as legacy analog formats.

Visual inspection and measurement software inspects assemblies, components, packaging, parts, and materials for presence/absence, anomalies, defects, flaws, and conformity to quality standards. The software includes tools to take accurate and repeatable measurements in both 2D and 3D.

Comprehensive 3D hardware and software offerings deliver the necessary tools to acquire, display, process, and analyze depth maps and point clouds for the next dimension in machine vision.

Classification tools leveraging machine learning, including deep learning, streamline the resolution of challenging identification and inspection applications.



Software

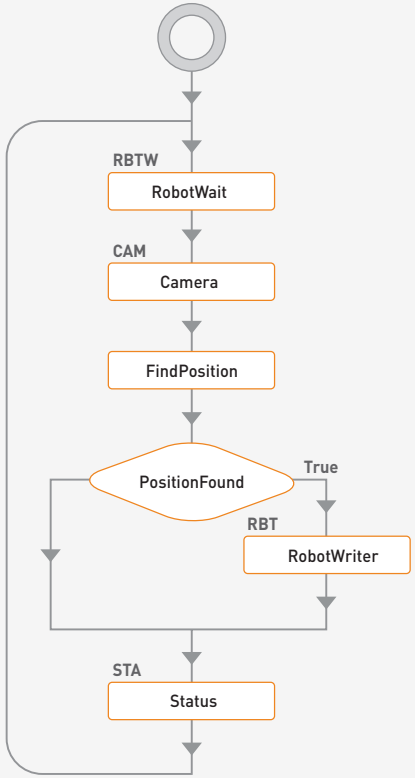
Matrox Design Assistant X

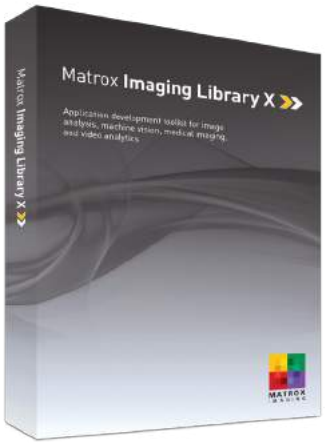
Matrox Design Assistant® X is an integrated development environment (IDE) for Microsoft® Windows® for creating machine vision applications using a flowchart instead of traditional program code. In addition to building a flowchart, users can design a graphical web-based operator interface for the application within the IDE.

With enhanced deep learning and 3D tools

Matrox Design Assistant X at a glance

- **Solve machine vision applications** efficiently by constructing flowcharts instead of writing program code
- **Choose the best platform for the job** within a hardware-independent environment that supports Matrox Imaging smart cameras and vision controllers and third-party PCs with CoaXPress, GigE Vision, or USB3 Vision cameras
- **Tackle machine vision applications with utmost confidence** using field-proven tools for analyzing, locating, measuring, reading, and verifying
- **Use a single program** for creating both the application logic and operator interface
- **Work with multiple cameras** all within the same project or per project running concurrently and independently from one another, platform permitting
- **Interface to Matrox AltiZ and third-party 3D sensors** to process and analyze their depth map data
- **Rely on a common underlying vision library** for the same results with a Matrox Imaging smart camera, vision system, or third-party computer
- **Maximize productivity** with instant feedback on image analysis and processing operations
- **Receive immediate, pertinent assistance** through an integrated contextual guide
- **Communicate actions and results to other automation and enterprise equipment** via discrete Matrox I/Os, RS-232, and Ethernet (TCP/IP, CC-Link IE Field Basic, EtherNet/IP™, Modbus®, and PROFINET®, and native robot interfaces)
- **Test communication with a programmable logic controller (PLC)** using the built-in PLC interface emulator
- **Maintain control and independence** through the ability to create custom flowchart steps
- **Increase productivity and reduce development costs** with access to Matrox Vision Academy, the online and on-premises training and support resource for Matrox Imaging vision software tools
- **Protect against inappropriate changes** with the Project Change Validator tool

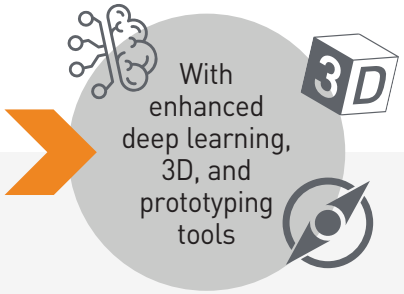




Software

Matrox Imaging Library (MIL) X

MIL X is a software development kit (SDK) with a comprehensive collection of tools for coding machine vision, image analysis, and medical imaging applications. The SDK includes tools for every step in the process, from application feasibility to prototyping, through to development and ultimately deployment. Carefully optimized for speed, these robust tools help address the severe time constraints encountered in demanding vision applications.

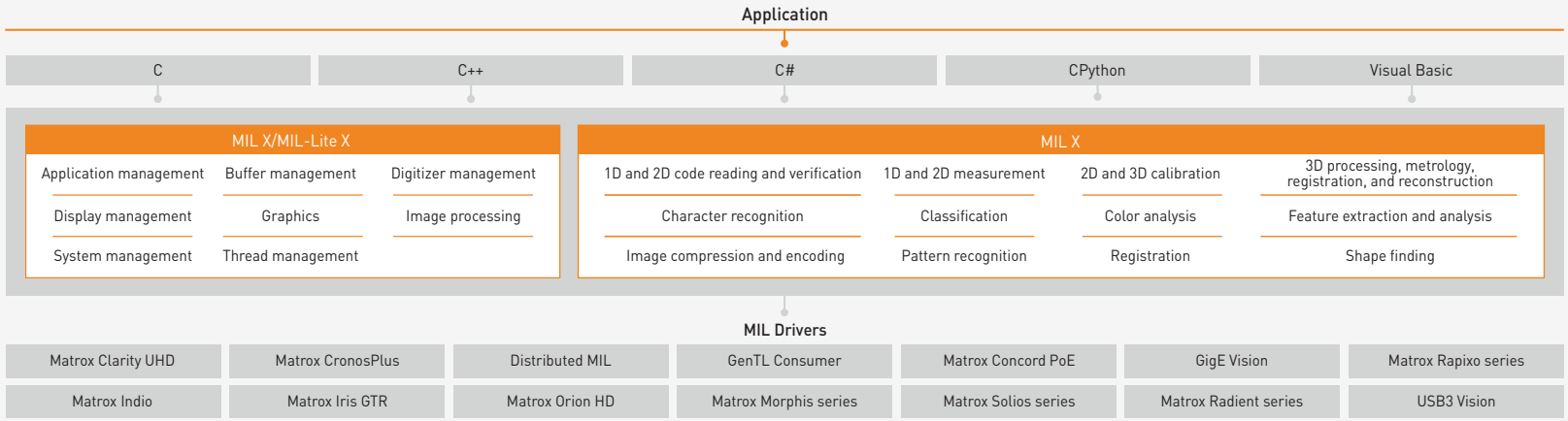


MIL X at a glance

- **Solve applications rather than develop underlying tools** by leveraging a toolkit with a more than 25-year history of reliable performance
- **Tackle applications with utmost confidence** using field-proven tools for analyzing, classifying, locating, measuring, reading, and verifying
- **Base analysis** on monochrome and color 2D images as well as 3D profiles, depth maps, and point clouds
- **Harness the full power of today's hardware** through optimizations exploiting SIMD, multi-core CPU, and multi-CPU technologies
- **Support platforms ranging from smart cameras to high-performance computing (HPC) clusters** via a single consistent and intuitive application programming interface (API)
- **Obtain live data in different ways**, with support for analog, Camera Link, CoaXPress, DisplayPort, GenTL, GigE Vision, HDMI, SDI, and USB3 Vision interfaces
- **Maintain flexibility and choice** by way of support for Windows and Linux®
- **Leverage available programming know-how** with support for C, C++, C#, CPython, and Visual Basic® languages
- **Experiment, prototype, and generate program code** using MIL CoPilot interactive environment
- **Increase productivity and reduce development costs** with access to Matrox Vision Academy, the online and on-premises training and support resource for Matrox Imaging vision software tools

MIL X for Arm®

The majority processing, analysis, annotation, display, and archiving functionality in MIL X is also available to run on Arm Cortex®-A family processors, specifically those employing the Armv8-A 64-bit architecture. The processing and analysis functions are optimized for speed using the Neon™ SIMD architecture extension. MIL X for Arm is supported on appropriate 64-bit Linux distributions, like the one from Ubuntu. Image capture can be accomplished using the GenTL, GigE Vision, or Video4Linux2 interfaces. For more information, contact Matrox Imaging sales.



MIL X provides a comprehensive set of APIs, imaging tools, and hardware support as part of its integrated architecture.

Systems »

Matrox Iris GTR series

Matrox Iris GTR is a series of compact, capable smart cameras designed for systems integrators, machine builders, and OEMs alike. Combining fast image sensing, efficient embedded processing, and comprehensive I/O capabilities, these powerful smart cameras encompass an effective all-in-one vision system. Dust-proof, immersion-resistant, and extremely rugged, Matrox Iris GTR are right at home in tight spots and dirty industrial environments.

Matrox Iris GTR at a glance

- **Install comfortably in confined and dirty industrial environments** by way of a compact IP67-rated design
- **Run typical vision jobs efficiently** using an Intel® dual-core embedded processor
- **Capture images at high speed** through a choice of CMOS sensors
- **Simplify vision setup and upkeep** via integrated lens focusing and illumination intensity control
- **Interact with vision and automation devices** by way of real-time digital I/Os
- **Synchronize to the manufacturing line** through support for incremental rotary encoders
- **Communicate with automation controllers and enterprise networks** via a Gigabit Ethernet interface
- **Take on Human-Machine Interface (HMI) function** by way of VGA and USB connectivity
- **Streamline application development** using the Matrox Design Assistant X flowchart-based IDE or MIL X SDK
- **Deploy with either leading embedded operating system**, through support for both Windows and Linux

Systems

Matrox AltiZ series

Matrox AltiZ is a series of high-fidelity 3D profile sensors. Each sensor features a dual-camera single-laser design that greatly lessens the scanning gaps often encountered at critical surface junctures because of optical occlusions. Unique algorithms running inside the sensor automatically generate various types of reliable 3D data—individual profiles, depth maps, or point clouds—obtained by smartly combining or selecting the pixel data from the two integrated image sensors, which is automatically sampled for a constant horizontal resolution.

Matrox AltiZ at glance

- **Leverage dual-camera single-laser design** to deliver exceptionally high 3D reproduction fidelity
- **Gain from unique embedded algorithms** to generate consistent profiles, depth maps, or point clouds
- **Benefit from truly standard GigE Vision interface** to work directly with Matrox Imaging and third-party vision software
- **Simplify cabling** with Power-over-Ethernet (PoE) support
- **Deploy confidently in tough industrial settings** thanks to a solid IP67-rated aluminum housing and M12 connectors
- **Benefit from several fastening points** to facilitate fixing one or more sensors to gantries and robots
- **Streamline sensor setup and verification** via the Matrox Capture Works utility for Windows and Linux

Sample 3D point cloud

With one camera

With two cameras

Merged for comparison

Systems »

Matrox 4Sight series

Matrox Imaging delivers a suite of powerful vision controllers with a unique combination of embedded PC technology, compact size, and ruggedness.

Built on a quad-core processor, Matrox 4Sight EV6 industrial computers competently handle demanding or multi-camera applications. Matrox 4Sight XV6 offers desktop-level performance and substantial expansion capabilities. Backed by a proven track record of reliable performance, Matrox 4Sight series vision controllers are right at home in any manufacturing facility.

Matrox 4Sight EV6 at a glance

- **Reduce service stoppages** with a fanless design
- **Inspect multiple sites** through support for four GigE Vision and four USB3 Vision cameras
- **Simplify cabling for GigE Vision installations** using PoE-enabled ports
- **Tackle typical vision workloads** with a mobile-class embedded Intel Core™ processor
- **Connect separately to the factory floor and enterprise networks** via two additional Gigabit Ethernet ports
- **Synchronize with other equipment** using integrated real-time digital I/Os with rotary encoder support and RS-232/RS-485 ports
- **Install in space-limited hostile environments** because of its small footprint and rugged casing
- **Run applications in a familiar, reliable, and customizable environment** using the provided Windows 10 IoT Enterprise
- **Streamline application development** using the Matrox Design Assistant X flowchart-based IDE or MIL X SDK
- **Deploy with confidence** thanks to Matrox Imaging's commitment to extended lifecycle management

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Matrox 4Sight XV6 at a glance

- **Tackle demanding imaging applications** using a desktop-class embedded Intel Core processor
- **Capture directly** from GigE Vision and USB3 Vision cameras
- **Broaden support** for Camera Link, CoaXPress, DisplayPort, HDMI, and SDI video interfaces using Matrox Imaging frame grabbers
- **Customize I/O capabilities** through four PCIe® slots accepting full-height, half-length cards
- **Install in space-limited industrial environments** given its small footprint and rugged design

Systems

Matrox Supersight series

Matrox Supersight series industrial computers provide considerable expansion capabilities and desktop-level functionality, offering a solid foundation for demanding machine vision applications.

Matrox Supersight Solo accommodates a broad range of image-acquisition interfaces into a single, pre-validated platform, allowing for greater focus on developing cutting-edge applications instead of working to integrate components. Matrox Supersight Uno offers considerable expansion capabilities, support for all major video interfaces, and a carefully managed lifecycle that ensures maximum return on initial investments.

Matrox Supersight Solo and Matrox Supersight Uno at a glance

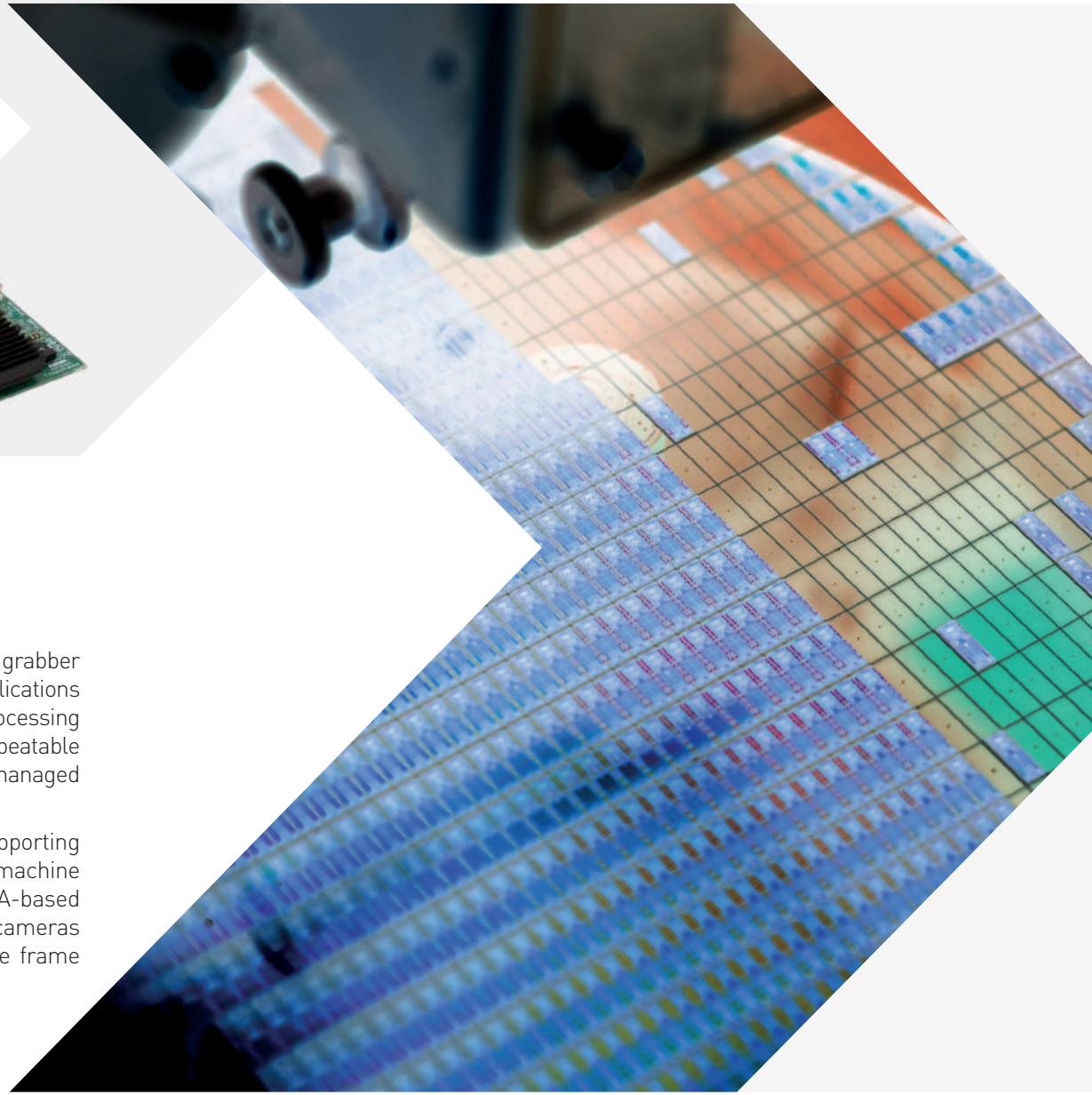
- **Harness the full power of today's multi-core CPU, GPU, and FPGA technology** for image processing
- **Leverage desktop-class embedded Intel Core processor** to handle demanding imaging applications
- **Support for all major video interfaces**—Camera Link, CoaXPress, DisplayPort, HDMI, and SDI—when used in conjunction with Matrox Imaging frame grabbers
- **Maximize density** in a 4U chassis with up to 13 full-length full-height PCIe 2.0 slots
- **Increase host data transfer bandwidth** through PCIe 2.0 x16 and x4 interfaces
- **Interface directly to external process equipment** via integrated Gigabit Ethernet and USB 3.0/2.0 connectivity
- **Minimize the need for revalidation** by utilizing a lifecycle-managed platform with consistent long-term availability
- **Simplify system integration** by using an integrated platform from a single vendor
- **Solve applications rather than develop underlying tools** by leveraging standard Microsoft development tools and MIL X software

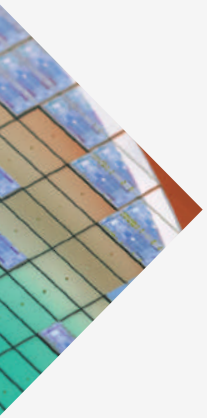
Components »

Matrox Rapixo CXP series

Matrox Imaging provides the industry's most comprehensive frame grabber lineup, ranging from entry-level models for very cost-sensitive applications to boards integrating flexible, high-rate acquisition and preprocessing capabilities. These frame grabbers combine rich functionality and unbeatable value, and help reduce development and validation costs through a managed lifecycle offering consistent long-term availability.

Matrox Rapixo CXP is a new generation of frame grabbers, supporting version 2.0 of the CoaXPress digital interface standard for machine vision applications. The Pro models provide optional custom FPGA-based image-processing offload using the Matrox FDK. The support for cameras with the highest resolution and highest frame rate makes these frame grabbers ideal for demanding machine vision applications.





Matrox Rapixo CXP at a glance

- **Capture from the next generation of higher-resolution and higher-speed cameras** with the CoaXPress 2.0 interface
- **Acquire from multiple cameras** with up to four CoaXPress connections, or combine connections for even higher data rates
- **Eliminate data loss** with ample on-board buffering and a PCIe host interface that matches the CoaXPress connections
- **Free up host processor by offloading image processing** using onboard FPGA device with Pro models
- **Develop custom onboard image processing** using the Matrox FDK
- **Synchronize with sensors, encoders, and controllers** via auxiliary I/Os available per CoaXPress connection
- **Simplify cabling** between cameras and vision computer thanks to Power-over-CoaXPress (PoCXP) support
- **Streamline application development** using the MIL X SDK or the Matrox Design Assistant X IDE

Components

Matrox Rapixo CL Pro and Matrox Radient eV-CL

With the most comprehensive features currently available in the industry, Matrox Rapixo CL Pro boards are multi-input high-performance Camera Link 2.1 frame grabbers with FPGA-based image processing offload using the Matrox FDK. Matrox Radient eV-CL boards offer reliable high-rate image acquisition.

Both series support the highest-performance Camera Link interface standards, making these frame grabbers ideal for demanding machine vision applications.

Matrox Rapixo CL Pro and Matrox Radient eV-CL at a glance

- **Support the most high-performance Camera Link cameras** with available support for Full and 80-bit mode at up to 85 MHz
- **Perform deterministic image acquisition** by way of the jitter-free Camera Link 2.1 interface
- **Offload host computer of custom image processing** using a FPGA device on Matrox Rapixo CL Pro
- **Eliminate missed frames** through a PCIe x8 host interface and ample onboard buffering
- **Optimize multi-camera applications** via support for up to four Base or two Full/80-bit Camera Link cameras per board
- **Minimize space requirements and maximize PC compatibility** through a half-length design with mini Camera Link connectivity for true single-slot operation
- **Improve and simplify system connectivity** with Power-over-Camera-Link (PoCL) support at extended cable lengths
- **Maintain flexibility and choice** by way of Windows and Linux support

Components

Matrox Concord PoE and Matrox Indio

Both Matrox Concord PoE and Matrox Indio boards deliver support for the GigE Vision interface standard, as well as providing PoE connectivity, making these boards ideal for conventional industrial vision applications.

Matrox Concord PoE network interface cards (NICs) are available with two or four Gigabit Ethernet ports, as well as optional trigger-over-Ethernet (ToE) capability for multiple cameras working together. Meanwhile, Matrox Indio cards provide industrial I/O and communication capabilities to turn any PC running Matrox Imaging vision software into a genuine vision controller.

Matrox Concord PoE at a glance

- **Enable ready-to-go acquisition** from GigE Vision cameras using Matrox Imaging software
- **Facilitate multi-camera configurations** with two or four Gigabit Ethernet ports
- **Simplify cabling between cameras and vision computer** through PoE support
- **Protect cameras, board, and vision computer** from potential electrical faults and secure camera detection via isolated PoE
- **Trigger multiple cameras simultaneously and reliably** using hardware-assisted ToE
- **Synchronize to automation devices in real-time** through digital I/Os with hardware-assisted management
- **Avoid the need for a separate hardware key** through a license fingerprint for additional Matrox Imaging software features
- **Streamline application development** using the Matrox Design Assistant X flowchart-based IDE or MIL X SDK

Matrox Indio at a glance

- **Facilitate computer integration** by means of a PCIe x1 interface
- **Enable real-time synchronization** via 16 discrete digital I/Os with hardware-assisted management
- **Gain straightforward access to I/Os** through a standard D-Sub connector
- **Use on the factory-floor and in a lab environment** thanks to 24 V and TTL-compatible signaling support
- **Protect against unintended use** with options for optical isolation and resettable fuses
- **Track moving production lines** with support for two rotary incremental encoders
- **Troubleshoot issues** using convenient status indicator LED for each I/O assist
- **Conduct industrial communication or video capture** using the Gigabit Ethernet interface
- **Manage using field-proven and established software**, either the MIL X SDK or Matrox Design Assistant X flowchart-based IDE

Components

Matrox Clarity UHD

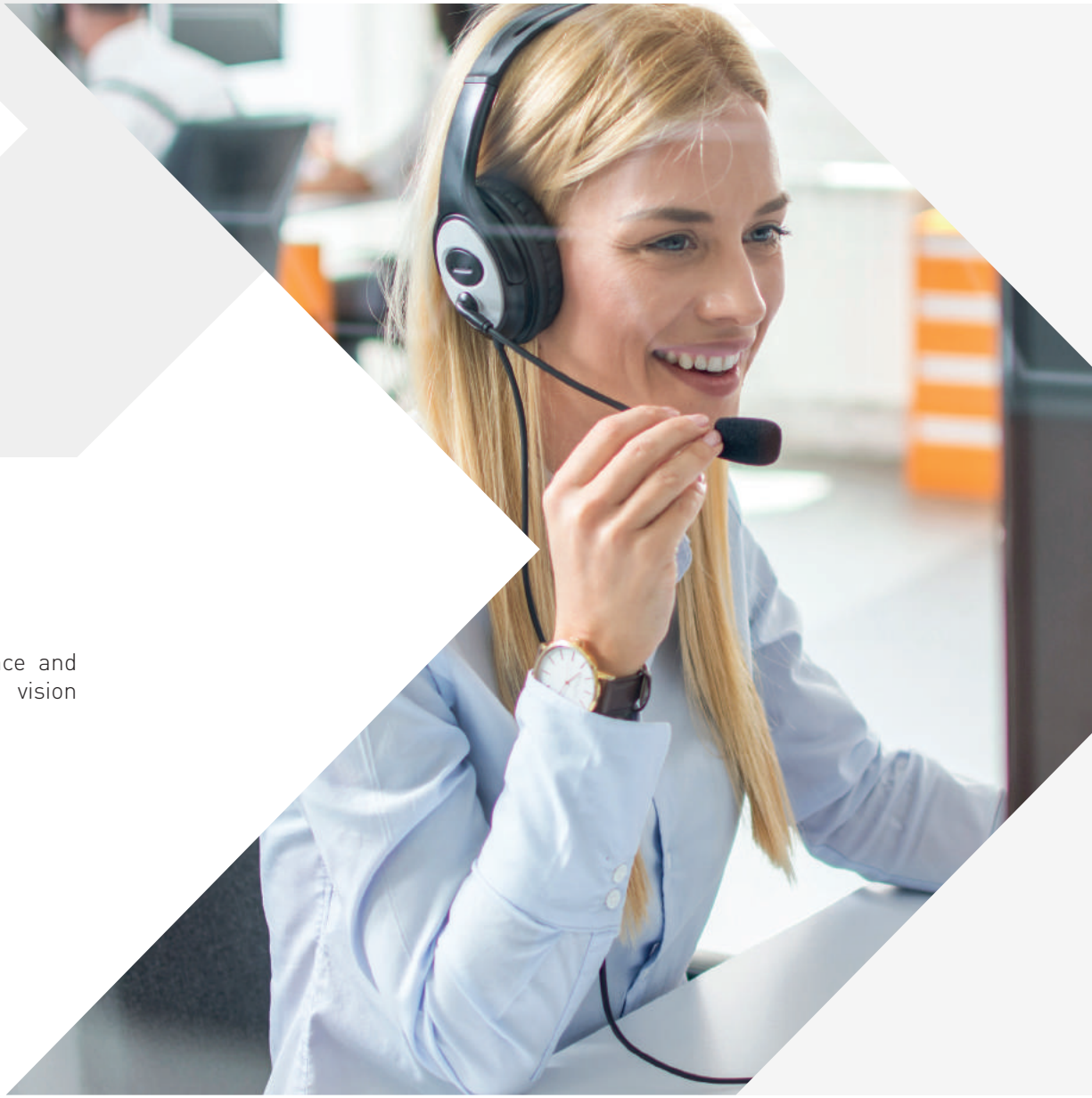
A multi-format multi-input UHD video capture card with optional H.264 encoding, Matrox Clarity UHD connects different types of legacy and modern video sources—from SD, to HD, all the way to UHD—used in medical, surveillance, and simulation-training applications.

Matrox Clarity UHD at a glance

- **Capture from legacy to the latest video sources** through support for SD analog to UHD digital formats
- **Connect and switch between different video sources** via Mini DisplayPort, HD-BNC, HDMI, and custom analog DVI connectivity
- **Handle multiple video sources** with the simultaneous capture of up to eight HD or two UHD streams
- **Optimize video transmission and storage** through onboard multi-stream H.264 encoding
- **Minimize system footprint** by way of a single-slot PCIe card design
- **Simplify application development** using the MIL X SDK
- **Deploy on a current platform of choice** with support for Windows and Linux

1. Alternatively, a maximum combined bandwidth of 4 GB/sec.

MATROX
PROFESSIONAL
SERVICES



Services »

Matrox Professional Services

Matrox Professional Services deliver deep technical assistance and customized trainings to help customers develop machine vision applications more efficiently.

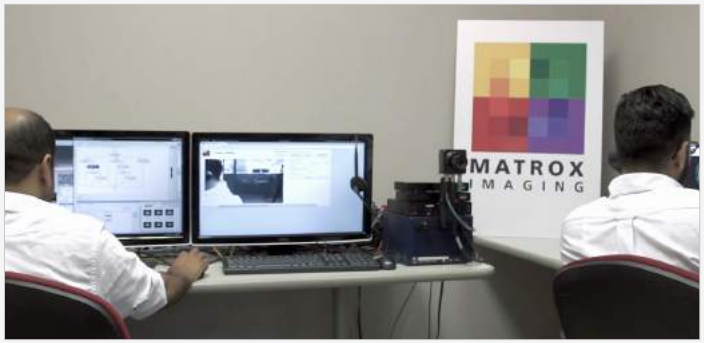
Matrox Professional Services

These services comprise:

- Training, either in person at Matrox Imaging headquarters or at a customer site, or through personalized remote sessions
- Assessing application or project feasibility, including illumination, image acquisition, and vision algorithms
- Demonstrating and prototyping applications and projects
- Optimizing and troubleshooting user applications and projects, including through remote debugging
- Interfacing with video and camera equipment

Backed by Matrox Applications Engineers and the Matrox Vision Squad—a team of high-level vision professionals—Matrox Professional Services offer in-depth support, recommending best methods with the aim of helping customers save valuable development time and deploy solutions more quickly.

For further information on pricing and scheduling, contact Matrox Imaging Sales at www.matrox.com/imaging/en/buy/.

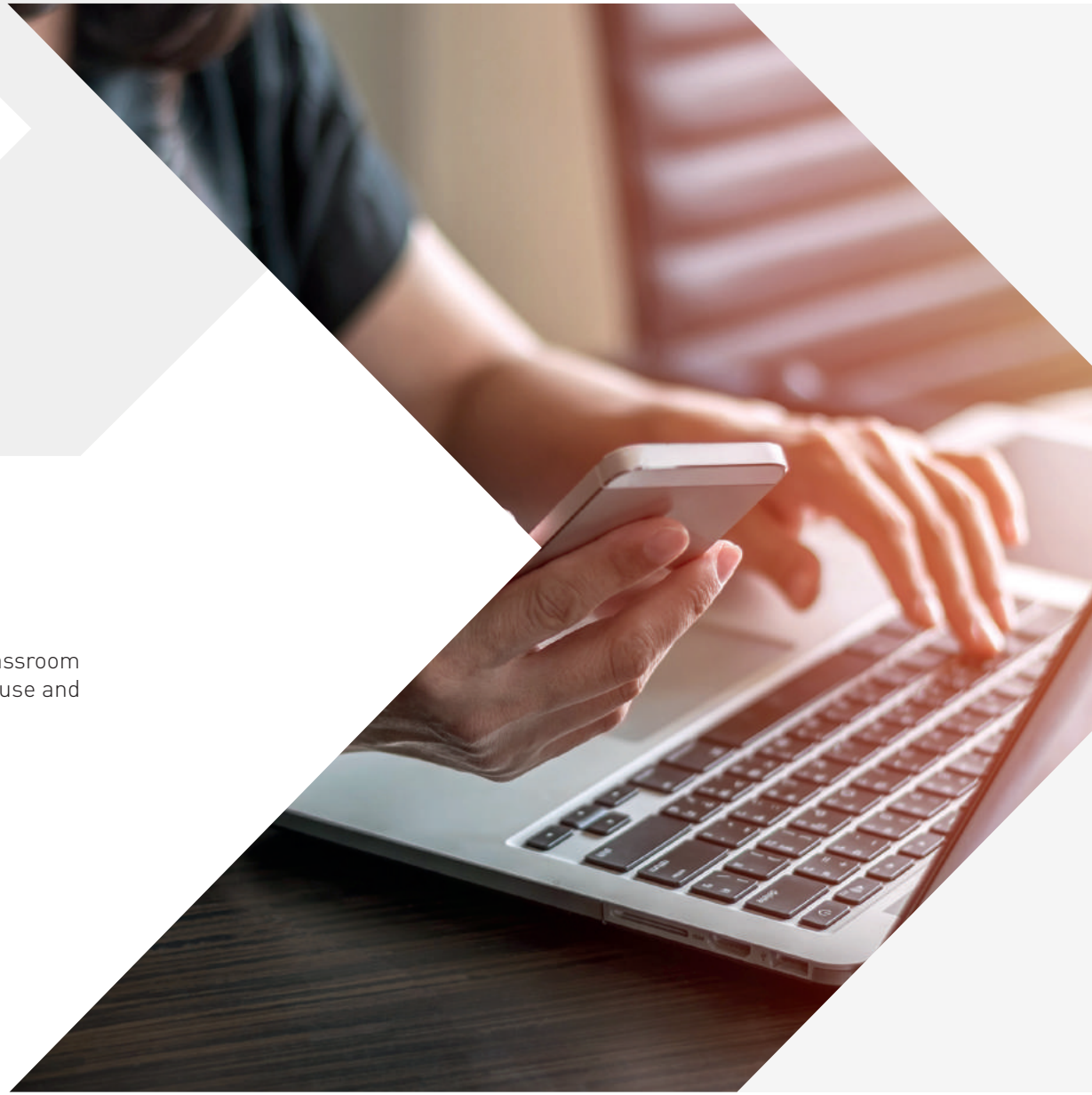


MATROX
VISION ACADEMY

Services »

Matrox Vision Academy

Matrox Vision Academy provides all the expertise of live classroom training, with the convenience of online videos outlining how to use and deploy MIL X and Matrox Design Assistant X vision software.

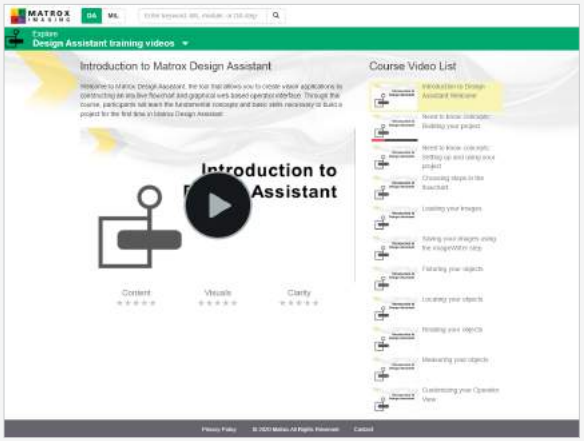


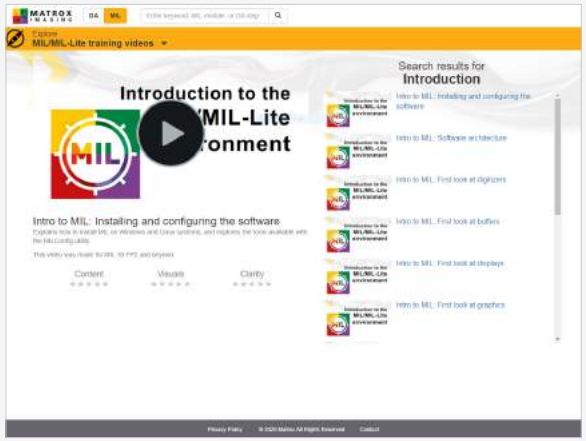
Matrox Vision Academy

The portal hosts a comprehensive library of on-demand instructional material designed to deconstruct complex topics into micro-learning modules, thus facilitating self-directed learning. Matrox Vision Academy also offers courses, which are a series of videos that unfold in a logical, sequential manner. These courses aim to help users obtain a deeper understanding of a broader topic, or progressive insight on how to use certain tools.

Available to customers with MIL X or Matrox Design Assistant X maintenance subscriptions, as well as those evaluating either software, Matrox Vision Academy users can seek out training on specific topics of interest, when needed, however often needed, and from the convenience of the office, home, or on the go.

Matrox Vision Academy also offers regularly scheduled on-premises training sessions at Matrox Imaging headquarters. For more information, visit info.matrox.com/imaging/form/vision-academy.





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Contact Matrox

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Serving: Canada, United States, Latin America, Europe, Asia, Asia-Pacific, and Oceania

www.matrox.com/imaging

The use of the terms "industrial" or "factory-floor" do not indicate compliance to any specific industrial standards.

MATROX IMAGING