Vision for Today and Tomorrow

Software • Smart Cameras • Vision Controllers and I/O Cards • Frame Grabbers

matrox.com/imaging
About Matrox Imaging

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

Assured quality & longevity
We adhere to industry best practices in all hardware manufacturing and software development; product designs pay careful attention to component selection to secure consistent long-term availability. Matrox Imaging is able to meet Copy Exact and Revision Change Control procurement requirements in particular circumstances, backed by our dedicated team of QA specialists.

Trusted industry standards
Matrox Imaging champions industry standards in our design and production. We leverage these standards to deliver quality compatible products, protecting our customers’ best interests by ensuring our hardware and software components work with as many third-party products as possible.

Comprehensive customer support
Our 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. 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 accuracy, 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.
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 FPGA-based hardware.

Image compression and video encoding uses software and hardware to prepare images and video for optimal storage and distribution. Matrox Imaging products offer support for the JPEG, JPEG2000, and H.264 standards.

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®, Camera Link HS™, CoaXPress®, DVI-D, GigE Vision®, SDI, and USB3 Vision® digital interface standards 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.
Software
Matrox Design Assistant

Matrox Design Assistant 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.
Matrox Design Assistant 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, vision controllers, and third-party PCs with a GigE Vision or USB3 Vision camera
- **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
- **Interface to 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 smart camera, vision controller, 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, EtherNet/IP™, Modbus®, PROFINET®, and native robot interfaces)
- **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 for Matrox Imaging vision software tools
- **Protect against inappropriate changes** with the Project Change Validator tool
Matrox Imaging Library (MIL) 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 tools help address the severe time constraints encountered in many applications.
MIL at a glance

- **Solve applications rather than develop underlying tools** by leveraging a toolkit with a 25-year history of reliable performance.
- **Tackle applications with utmost confidence** using field-proven tools for analyzing, locating, measuring, reading, and verifying.
- **Harness the full power of today’s hardware** through optimizations exploiting SIMD, multi-core CPU, multi-CPU, and FPGA 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 images from the interface of choice**, with support for analog, Camera Link, Camera Link HS, CoaXPress, DVI-D, GigE Vision, SDI, and USB3 Vision transmission formats.
- **Process and analyze monochrome and color images as well as 3D sensor data**.
- **Maintain flexibility and choice** by way of support for 32-/64-bit Windows, Linux®, and RTX64 (RTOS).
- **Leverage available programming know-how** with support for C, C++, C#, CPython, and Visual Basic® languages.
- **Experiment before coding using MIL CoPilot interactive environment** for prototyping and code generation.
- **Increase productivity and reduce development costs** with access to Matrox Vision Academy, the online and on-premises training and support for Matrox Imaging vision software tools.

MIL Drivers
- Matrox Clarity family
- Matrox CronosPlus
- Distributed MIL
- GenTL Consumer
- Matrox Concord family
- GigE Vision
- Matrox Rapixo family
- Matrox Indio
- Matrox Iris GTR
- Matrox Orion HD
- Matrox Morphis family
- Matrox Solios family
- Matrox Vio family
- Matrox Radient family
- USB3 Vision

**MIL provides a comprehensive set of application programming interfaces (APIs), imaging tools, and hardware support as part of its integrated architecture.**

1. The software may be protected by one or more patents; see www.matrox.com/patents for more information. 2. Only under Windows.
Matrox Iris GTR is a line of compact, capable smart cameras designed for systems integrators, machine builders, and OEMs alike. These smart cameras are dust-proof, immersion-resistant, extremely rugged, and right at home in tight spots and dirty industrial environments.
Matrox Iris GTR at a glance

- **Install comfortably in confined and dirty industrial environments** because 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** in real time by way of digital I/Os
- **Synchronize to the manufacturing line** via support for incremental rotary encoders
- **Communicate with automation controllers and enterprise networks** using standard 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 flowchart-based IDE or MIL SDK
- **Deploy with either leading embedded operating systems**, through support for both Windows and Linux
Vision Controllers and I/O Cards

Matrox 4Sight EV6

Matrox 4Sight EV6 vision controller boasts a unique combination of embedded PC technology, compact size, and ruggedness, making it an ideal solution for more demanding or multi-camera applications.
Matrox 4Sight EV6 at a glance

- Reduce service stoppages with a fanless design
- Inspect multiple sites through the 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 seventh-generation Intel Core™ processor
- Connect separately to the factory floor and enterprise networks via two Gigabit Ethernet ports
- Synchronize with other equipment using integrated real-time digital I/Os with rotary encoder support and RS-232/RS-485 ports
- Drive up to two operator displays
- 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 flowchart-based IDE or MIL SDK
- Deploy with confidence thanks to Matrox Imaging’s commitment to extended lifecycle management
**Vision Controllers and I/O Cards**

Matrox Supersight Solo

Matrox Supersight Solo accommodates a broad range of image-acquisition interfaces into a single, pre-validated HPC platform designed for demanding industrial imaging applications.
Matrox Supersight Solo at a glance

- Harness the full power of today’s multi-core CPU, GPU, and FPGA technology to offload image processing and enhance acceleration
- Interface to any camera type by adding appropriate Matrox Imaging frame grabber board[s]
- Eliminate I/O bottlenecks with a PCIe® 2.0 switched fabric backplane architecture
- 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
- Run applications in a familiar, reliable, and customizable environment using the provided Windows 7 Professional for Embedded Systems
- Streamline application development using the MIL SDK

1. Using optional 13-slot backplane. The standard 8-slot backplane provides only a single host interface.
Vision Controllers and I/O Cards ▶️

Matrox Indio provides industrial I/O and communication capabilities to turn any PC running Matrox vision software into a genuine vision controller. The versatile card offers discrete hardware-managed I/Os for the real-time synchronization of a vision application with automation devices. It also provides Gigabit Ethernet connectivity for interfacing with programmable logic/automation controllers or GigE Vision cameras equipped for PoE.
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 24V 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
- **Operate easily** using the Matrox Design Assistant IDE or MIL SDK
Frame Grabbers
Matrox Rapixo and Radient families

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 pre-processing 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 and Matrox Radient families support CoaXPress, Camera Link, and Camera Link HS interface standards, ideal for demanding machine vision applications.
Matrox Rapixo family 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 or at even higher rates with up to four CoaXPress connections
- Eliminate data loss with ample on-board buffering and a PCIe host interface that matches the CoaXPress connections
- Free up host processor by offloading some image processing using onboard FPGA device
- Develop custom onboard image processing using the Matrox FPGA Development Kit (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 SDK

Matrox Radient family at a glance

- Capture data from high-resolution and high-speed cameras via Camera Link or Camera Link HS interfaces
- Acquire from multiple cameras or at even higher rates with up to four Camera Link connectors
- Eliminate data loss with ample on-board buffering and a PCIe host that matches the interface links
- Reduce cabling complexity and simplify system connectivity with power-over-Camera Link (PoCL) support
- Streamline application development using the MIL SDK
Frame Grabbers ➞
Matrox Concord and Clarity families

The Matrox Concord family of network interface cards (NICs) supports the GigE Vision interface standard, ideal for conventional industrial vision applications. Meanwhile, the Matrox Clarity family 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 Concord family at a glance

- Enable ready-to-go acquisition from GigE Vision cameras using Matrox Imaging software
- Simplify cabling with power-over-Ethernet (PoE) support between cameras and vision computer
- Facilitate multi-camera configurations with access to either two or four Gigabit Ethernet ports
- Protect cameras, board, and vision computer from potential electrical faults and secure camera detection via isolated PoE
- Synchronize multi-camera acquisition with high accuracy through support for hardware-assisted trigger-over-Ethernet (ToE)
- Streamline application development using the Matrox Design Assistant flowchart-based IDE or MIL SDK

Matrox Clarity family at a glance

- Capture video sources—legacy to the latest—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

1. Alternatively, a maximum combined bandwidth of 4 GB/sec.
Support and Services
Matrox Professional Services

Matrox Professional Services delivers deep technical assistance and customized trainings to help customers develop their machine vision applications.
Matrox Professional Services

These professional services comprise:

- Training—either personalized remote or in-person—at Matrox Imaging headquarters or at a customer site
- Assessing application or project feasibility, including illumination, image acquisition, and vision algorithms
- Delivering demonstration or prototype 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 Sales at https://www.matrox.com/imaging/en/buy/representatives/.
Support and 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 and Matrox Design Assistant vision software tools.
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 in a fixed order that will bring users up to speed on a larger topic.

Available to customers with MIL or Matrox Design Assistant 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 https://info.matrox.com/imaging/form/vision-academy.
About Matrox Imaging
Founded in 1976, Matrox® is a privately held company based in Montreal, Canada. Imaging, Graphics, and Video divisions provide leading component-level solutions, leveraging the others’ expertise and industry relations to provide innovative, timely products.

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Contact Matrox
imaging.info@matrox.com

North America Corporate Headquarters: 1 800-804-6243 or 514-822-6020
Serving: Canada, United States, Latin America, Europe, Asia, Asia-Pacific, and Oceania

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