Matrox **Iris GTR** with Matrox **Design Assistant X**

Compact, capable smart cameras with an intuitive, versatile, and extendable IDE for machine vision applications

MATROX
IMAGING

Overview

Powerful smart camera with flowchart-based vision software

Matrox® Iris GTR is a line of compact, capable smart cameras paired with Matrox Design Assistant® X, an intuitive, versatile, and extendable integrated development environment (IDE)[1]. Manufacturing engineers and technicians can easily and quickly configure and deploy machine vision applications on a highly integrated platform without the need for conventional programming. Video capture, analysis, location, measurement, reading, verification, communication, and I/O operations—as well as a web-based operator interface—are all set up within the single IDE.

Matrox Iris GTR smart camera

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 the 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

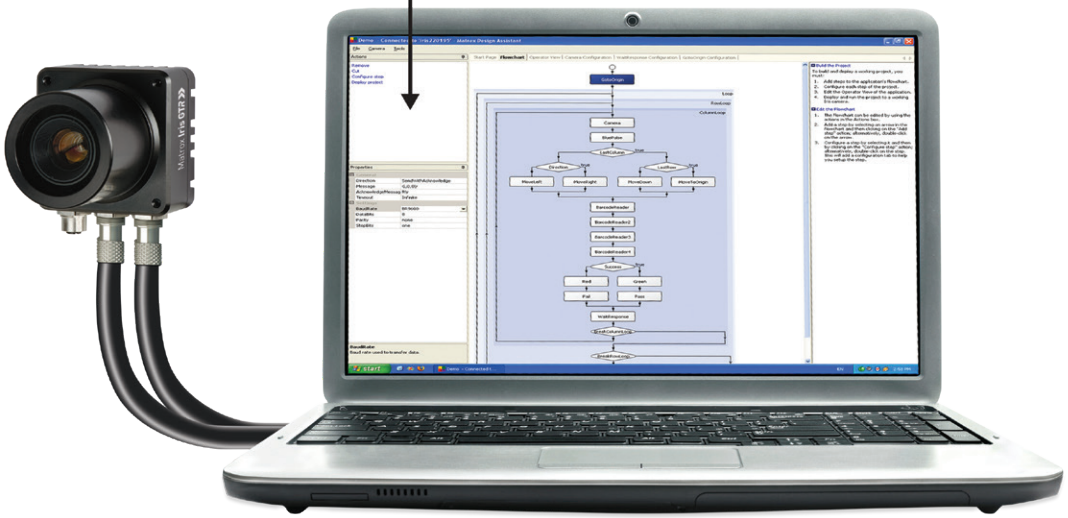
Configure with ease for vision inspection and guidance using Matrox Design Assistant X flowchart-based vision software

Smart Camera Development Platform

Application development and deployment

1. Develop an application, including the operator interface, using Matrox Design Assistant X running on a PC.

2. Use Matrox Design Assistant X to deploy the application from the PC to the Matrox Iris GTR smart camera.



3. Run the application on a Matrox Iris GTR independent of the PC. View the application's operator interface from a PC.

Matrox Design Assistant X

Flowchart-based vision software

Matrox Design Assistant X[1] an IDE for Microsoft® Windows® where vision applications are created by constructing an intuitive flow-chart instead of writing traditional program code. In addition to building a flowchart, the IDE enables users to design a graphical web-based operator interface for the application.

Matrox Design Assistant X can operate independent of hardware, allowing users to choose any computer with CoaXPress®, GigE Vision®, or USB3 Vision® cameras and get the processing power needed. Image capture from CoaXPress cameras requires the use of a Matrox Rapixo CXP frame grabber. This field-proven software is also a perfect match for a Matrox Imaging vision controller or smart camera. Matrox Design Assistant X offers the freedom to choose the ideal platform for any vision project.

Application design

Flowchart and operator interface design are done within the Matrox Design Assistant X IDE hosted on a computer running 64-bit Windows. A flowchart is put together using a step-by-step approach, where each step is taken from an existing toolbox and is configured interactively. The toolbox includes steps for image analysis and processing, communication, flow-control, and I/O. Outputs from one step—which can be images and/or alphanumeric results—are easily linked to the appropriate inputs of any other step. Decision-making is performed using a conditional step, where the logical expression is described interactively. Results from image analysis and processing steps are immediately displayed to permit the quick tuning of parameters. A contextual guide provides assistance for every step in the flowchart. Flowchart legibility is maintained by grouping steps into sub-flowcharts.

In addition to flowchart design, Matrox Design Assistant X enables the creation of a custom, web-based operator interface to the application through an integrated HTML visual editor. Users alter an existing template using a choice of annotations (graphics and text), inputs (edit boxes, control buttons, and image markers), and outputs (original or derived results, and status indicators). A filmstrip view is also available to keep track of and navigate to previously analyzed images. The operator interface can be further customized using a third-party HTML editor.

Why a flowchart?

The flowchart is a universally accessible, recognized, and understood method of describing the sequence of operations in a process. Manufacturing engineers and technicians in particular have all been exposed to the intuitive, logical, and visual nature of the flowchart.

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

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™[2], Modbus®, 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

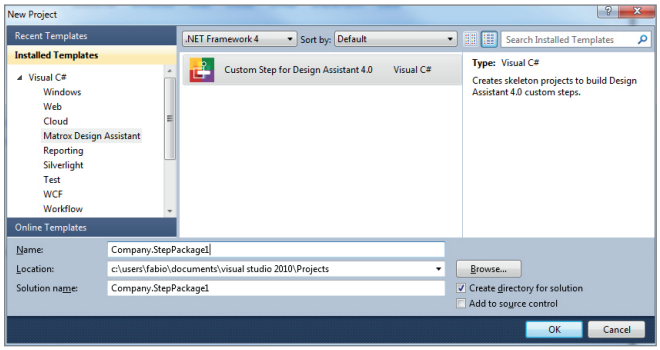
Increase productivity and reduce development costs with Matrox Vision Academy online and on-premises training

Protect against inappropriate changes with the Project Change Validator tool

Matrox Design Assistant X (cont.)

Create custom flowchart steps

Users have the ability to extend the capabilities of Matrox Design Assistant X by way of the included Custom Step software development kit (SDK). The SDK, in combination with Microsoft Visual Studio® 2017, enables the creation of custom flowchart steps using the C# programming language. These steps can implement proprietary image analysis and processing, as well as proprietary communication protocols. The SDK comes with numerous project samples to accelerate development.



Custom Step SDK

Application deployment

Once development is complete, the project—with flowchart and operator interface—is deployed either locally or remotely. Local deployment is to the same computer or Matrox Imaging vision controller as was used for development. Remote deployment is to a different computer, including Matrox Imaging vision controllers, or a Matrox Imaging smart camera.

Deployment

Latest key additions and enhancements

Image classification coarse segmentation that leverages deep learning to detect defects in highly textured materials

CC-Link IE Field Basic communication to connect directly to Mitsubishi Electric® PLCs

PLC interface emulator to test communication with a PLC without needing one

Matrox Design Assistant X (cont.)

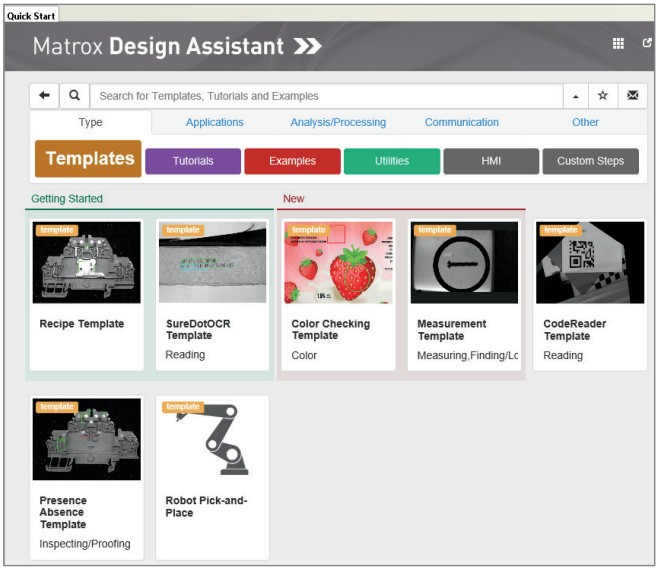
Project templates for quicker start-up

Matrox Design Assistant X includes a series of project templates and video tutorials to help new developers get up and running quickly.

These templates serve as either functional applications or application frameworks intended as a foundation for a target application. Templates also permit dynamic modifications, allowing users to tweak functionality at run-time and immediately see the outcome of any adjustments. The project templates address typical application areas, with examples for:

- Barcode and 2D code reading
- Measurement
- Presences/absence
- Recipes
- Robot guidance (Pick-and-Place)
- Dot-matrix text reading (SureDotOCR®)
- Color checking

More information on templates can be found on the Quick Start page of Matrox Design Assistant X software.

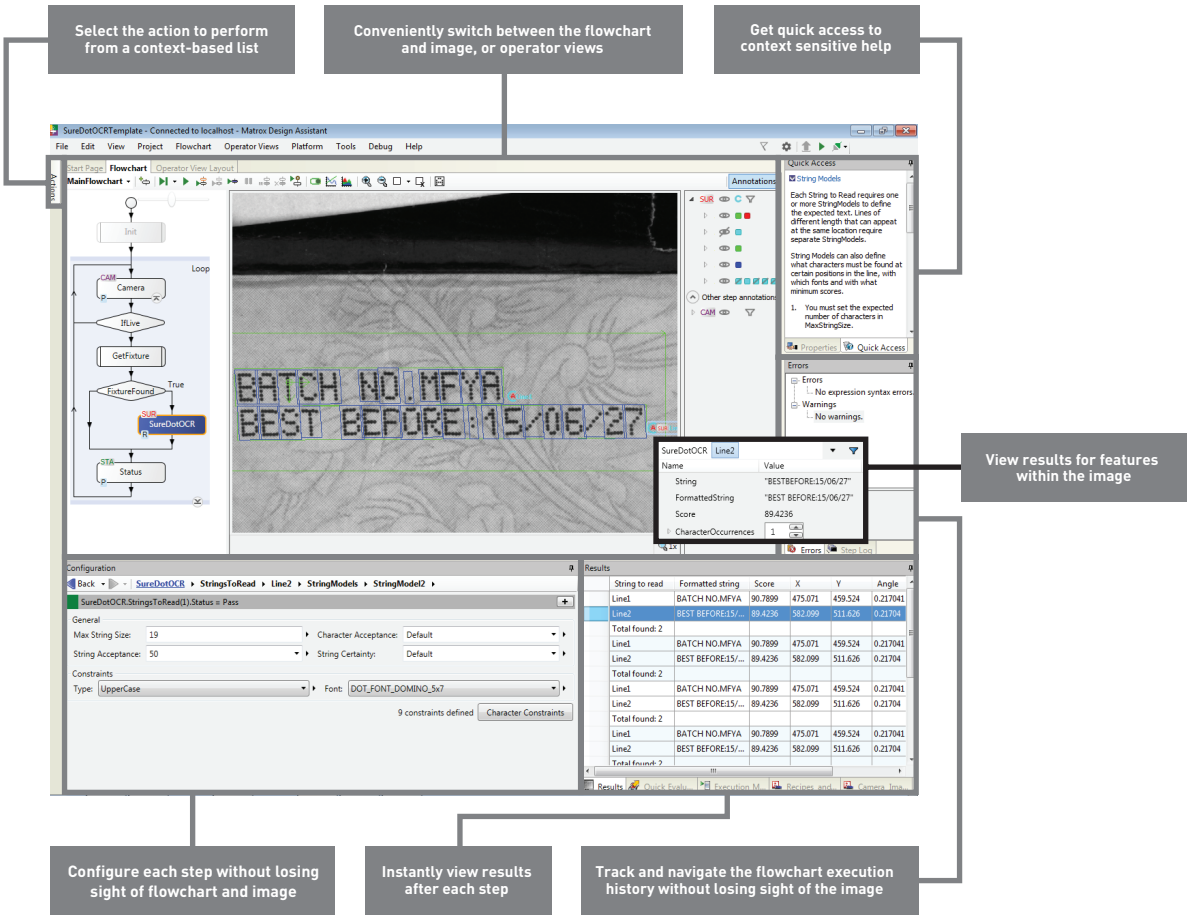


Project templates

Integrated Development Environment

Customizable developer interface

The Matrox Design Assistant X user interface can be tailored by each developer. The workspace can be rearranged, even across multiple monitors, to suit individual preferences and further enhance productivity.



Operator View

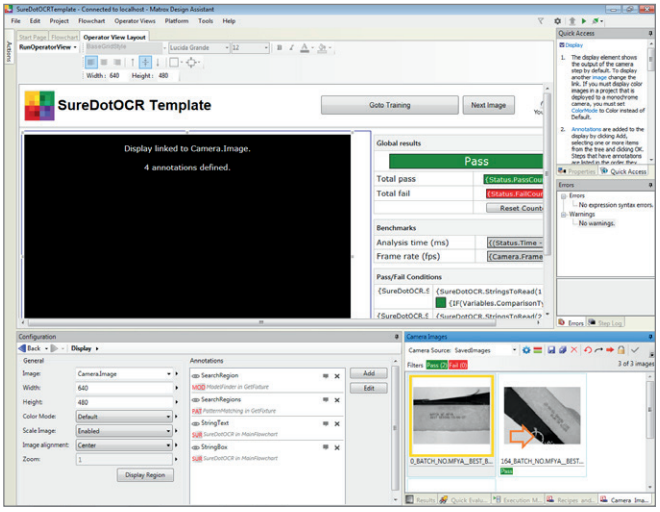
Operator interface viewable anywhere

The web-based operator interface, or Operator View, can be accessed locally or remotely through a HTML-5-capable web browser such as Google Chrome™ and Chromium, Mozilla Firefox®, and Microsoft Internet Explorer® and new Edge. Local viewing is done on the same computer or Matrox Imaging vision controller as was used for development. Local viewing is also available with a Matrox Imaging smart camera through a simple touch screen connected to its video output and USB interface, which eliminates the need for an additional computer. Remote viewing is done from any computer, including dedicated HMI or touch-panel PCs.

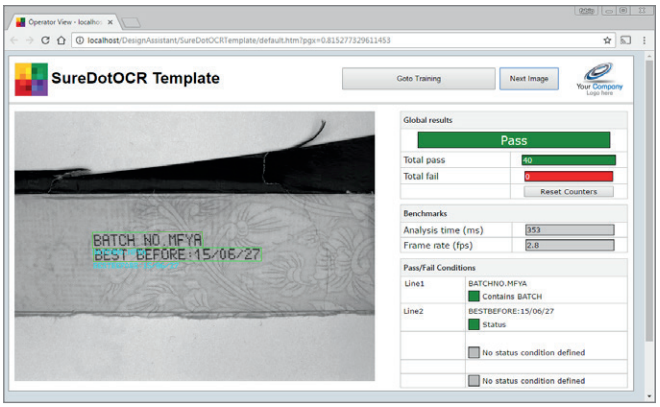
A stand-alone HMI application can be created using Microsoft Visual Studio to run on the local or a remote computer as an alternative to the web-based operator interface.

Security features

Access to specific Operator Views can be made to require user authentication (i.e., username and password) so only authorized personnel can modify key parameters of a running project. A project can be locked to a specific Matrox Imaging smart camera or vision controller when deployed, preventing it from running on an unauthorized platform. A project can also be encrypted during deployment to a platform, insuring that the project cannot be read or changed by unauthorized users. Projects locked to a platform are automatically encrypted.



Design a customized Operator View



Resulting Operator View as seen in a web browser

Field-Proven Vision Tools

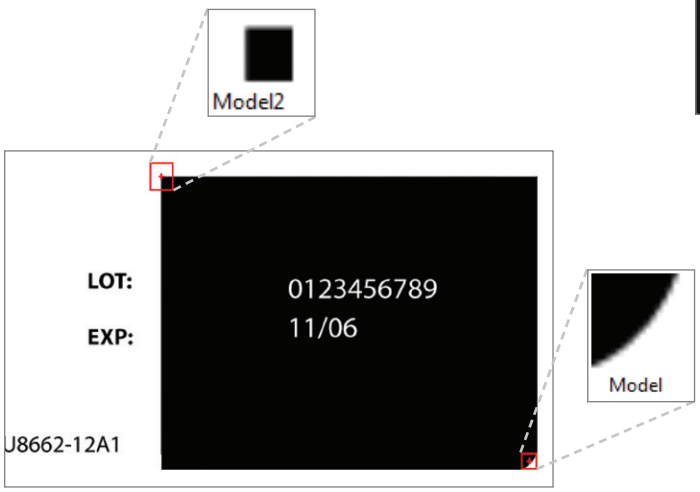
Image analysis and processing

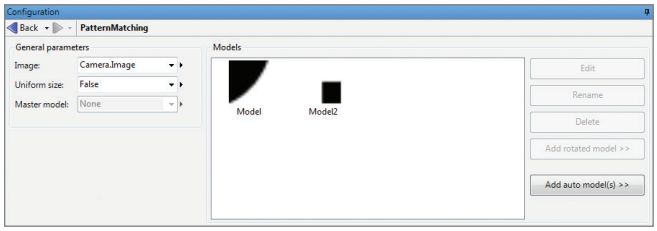
Central to Matrox Design Assistant X are flowchart steps for calibrating, enhancing, and transforming images; locating objects; extracting and measuring features; reading character strings; and decoding and verifying identification marks. These steps are designed to provide optimum performance and reliability.

Pattern recognition steps

Matrox Design Assistant X includes two steps for performing pattern recognition: PatternMatching and ModelFinder. These steps are primarily used to locate complex objects for guiding a gantry, stage, or robot, or for directing subsequent measurement steps.

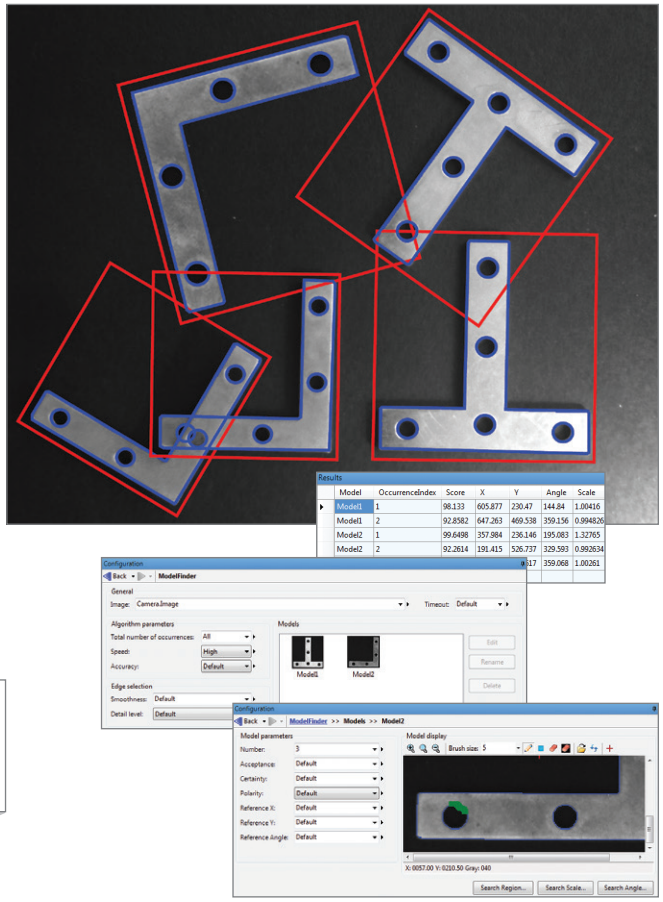
The PatternMatching step finds a pattern by looking for a similar spatial distribution of intensity. The step employs a smart search strategy to quickly locate multiple patterns, including multiple occurrences, which are translated and slightly rotated. The step performs well when scene lighting changes uniformly, which is useful for dealing with attenuating illumination. A pattern can be trained manually or determined automatically for alignment. Search parameters can be manually adjusted and patterns can be manually edited to tailor performance.





PatternMatching step

The ModelFinder step employs an advanced technique to locate an object using geometric features (e.g., contours). The step finds multiple models, including multiple occurrences that are translated, rotated, and scaled. Model Finder locates an object that is partially missing and continues to perform when a scene is subject to uneven changes in illumination, thus relaxing lighting requirements. A model is manually trained from an image and search parameters can be manually adjusted and models can be manually edited to tailor performance.



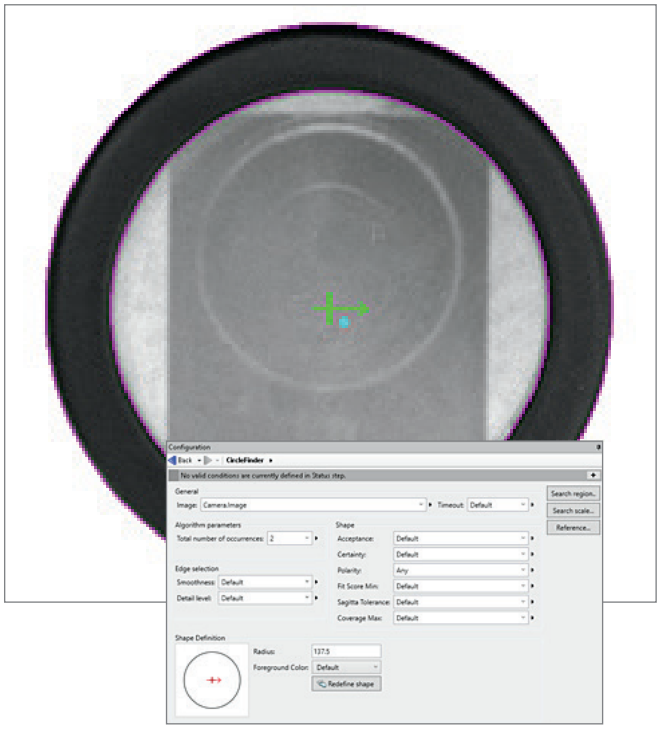
ModelFinder step

Field-Proven Vision Tools (cont.)

Shape finding steps

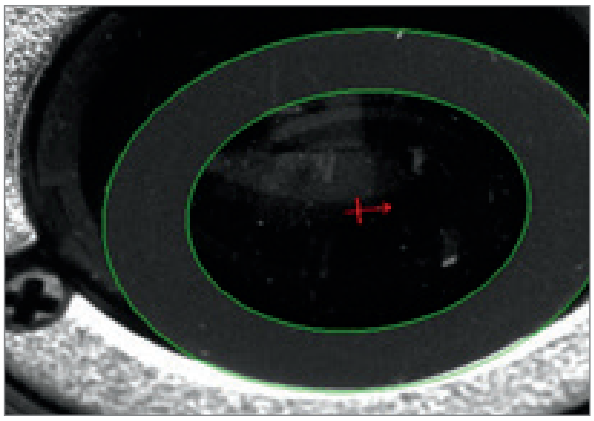
Matrox Design Assistant X includes dedicated steps for finding circles, ellipses, rectangles, and line segments. Circle finding is defined by the anticipated radius, the possible scale range, and the number of expected occurrences. Ellipse and rectangle finding are defined by the anticipated width and height, the possible scale and aspect ratio ranges, and the number of expected occurrences. Line segment finding is defined by the anticipated length and the number of expected occurrences. Continuous and broken edges lying within an adjustable variation tolerance produce the requested shape.

The shape-finding step computes the total number of found occurrences; for each occurrence, the tool can provide the center position and score relative to the reference. It can also give the radius and scale for circles; the angle, aspect ratio, width, and scale for ellipses and rectangles; and the start and end positions as well as the length for line segments. These specialized modes are generally faster and more robust at finding the specific shapes than generic pattern recognition.



CircleFinder step

RectangleFinder step

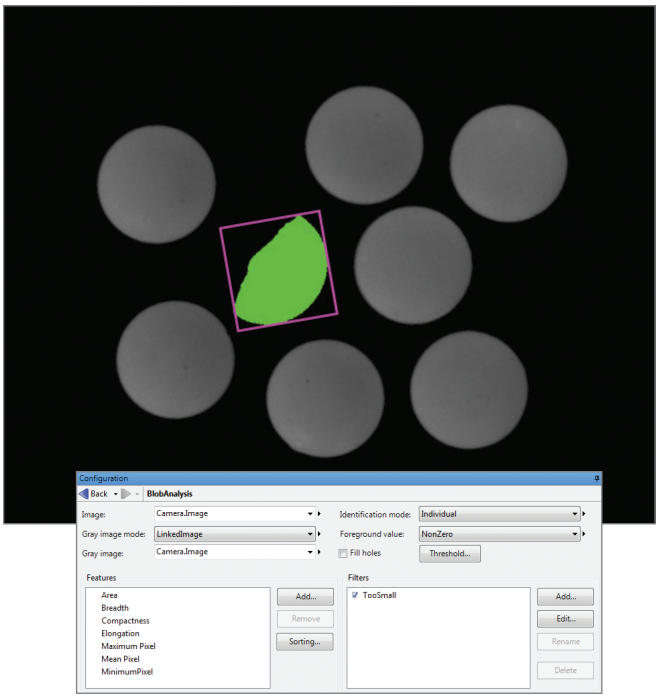


EllipseFinder step

Field-Proven Vision Tools (cont.)

Feature extraction and analysis step

The BlobAnalysis step in Matrox Design Assistant X is used to identify, count, locate, and measure basic features and objects (i.e., blobs) to determine presence and position, and enable further inspection. The step works by segmenting images where blobs are separated from the background and one another before quickly identifying the blobs. Over 50 characteristics can be measured and these measurements can be used to eliminate or keep certain blobs.



BlobAnalysis step

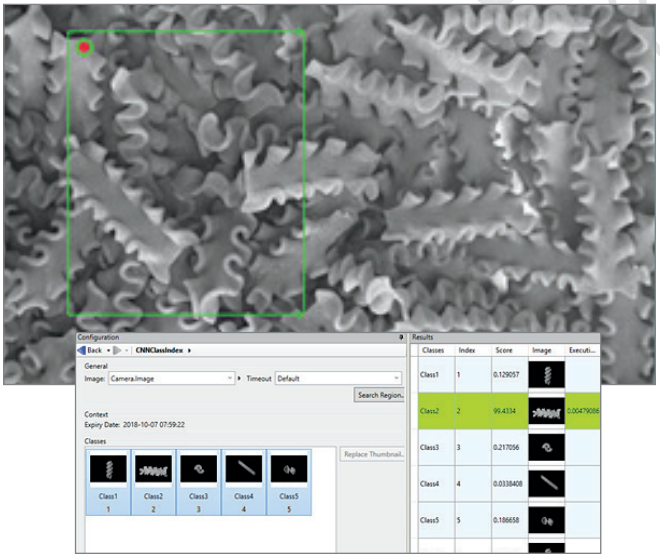
Field-Proven Vision Tools (cont.)

Classification steps

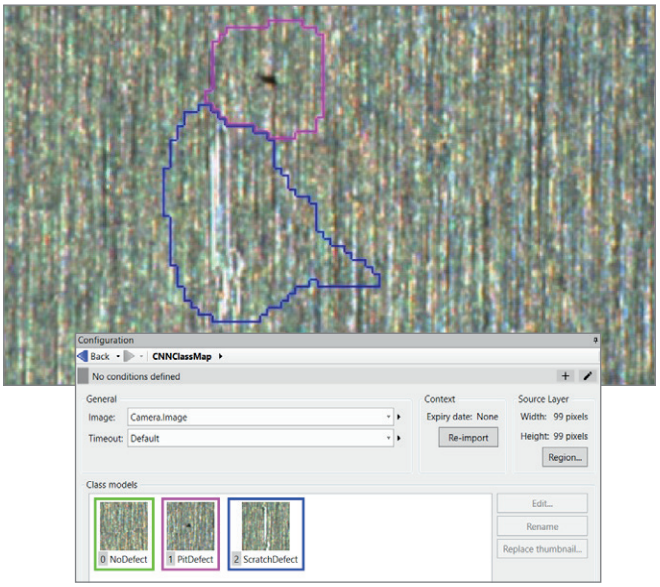
Matrox Design Assistant X includes classification steps for automatically categorizing image content using machine learning. These steps make use of deep learning—specifically convolutional neural network (CNN)—technology in two distinct approaches.

The first approach—implemented by the CNNClassIndex step—assigns images or image regions to pre-established classes. Results for each image or image region consist of the most likely class and a score for each class. The second approach—implemented by the CNNClassMap step—generates maps indicating the pre-established class and score for all image neighborhoods. These classification steps are particularly well suited for analyzing images of highly textured, naturally varying, and acceptably deformed goods.

Users can train a CNN on their own—using the MIL CoPilot interactive environment available separately as part of Matrox Imaging Library (MIL) X software—or commission Matrox Imaging to do so using previously-collected images that are both adequate in number and representative of the expected application conditions. Different types of training, such as transfer learning and fine-tuning, are supported, all starting from one of the supplied pre-defined CNN architectures. MIL CoPilot provides what is needed to build the required training dataset, including the labeling of images and augmenting the dataset with synthesized images, as well as to monitor and analyze the training process. Training is accomplished using a NIVIDIA GPU or x64-based CPU while inference is performed on a CPU in a Matrox Imaging vision controller, smart camera, or third-party computer, avoiding the need for specialized GPU hardware.



CNNClassIndex step



CNNClassMap step

Field-Proven Vision Tools (cont.)

1D and 2D measurement steps

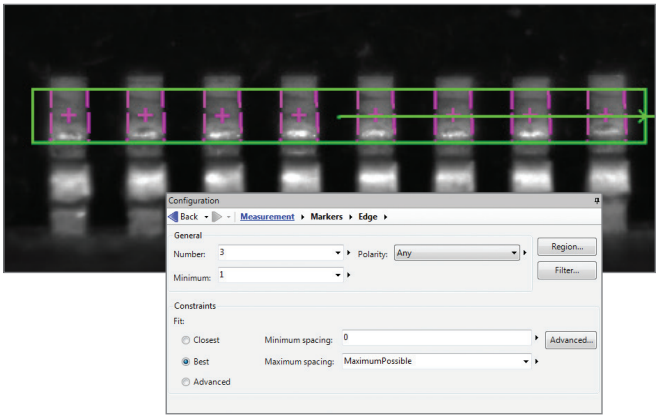
Matrox Design Assistant X includes three steps for measuring: Measurement, BeadInspection, and Metrology. These tools are predominantly used to assess manufacturing quality.

The Measurement step uses the projection of image intensity to very quickly locate and measure straight edges or stripes within a carefully defined rectangular region. The tool can make several 1D measurements on edges and stripes, as well as between edges or stripes.

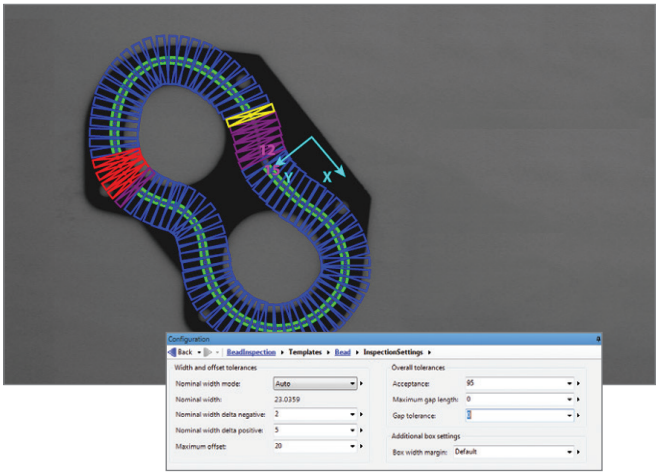
The BeadInspection step is for inspecting material that is applied as a continuous sinuous bead, such as adhesives and sealants, or its retaining channel. The step identifies discrepancies in length, placement, and width, as well as discontinuities. The BeadInspection step works by accepting a user-defined coarse path as a list of points on a reference bead and then automatically and optimally placing search boxes to form a template. The size and spacing of these search boxes can be modified to change the sampling resolution. The allowable bead width, offset, gap, and overall acceptance measure can be adjusted to meet specific inspection criteria.

The Metrology step is intended for 2D geometric dimensioning and tolerancing applications. The step extracts edges within defined regions to best fit geometric features. It also supports the construction of geometric features derived from measured ones or defined mathematically. Geometric features include arcs, circles, points, and segments. The step validates tolerances based on the dimensions, positions, and shapes of geometric features. The Metrology step can also analyze profiles extracted from point clouds and depth maps.

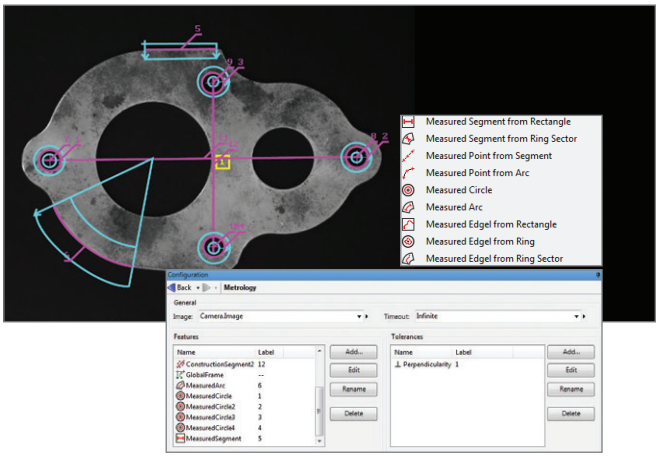
The Metrology step's effectiveness is maintained when subject to uneven changes in scene illumination, which relaxes lighting requirements. The expected measured and constructed geometric features, along with the tolerances, are kept together in a template which is easily repositioned using the results of other locating steps.



Measurement step



BeadInspection step



Metrology step

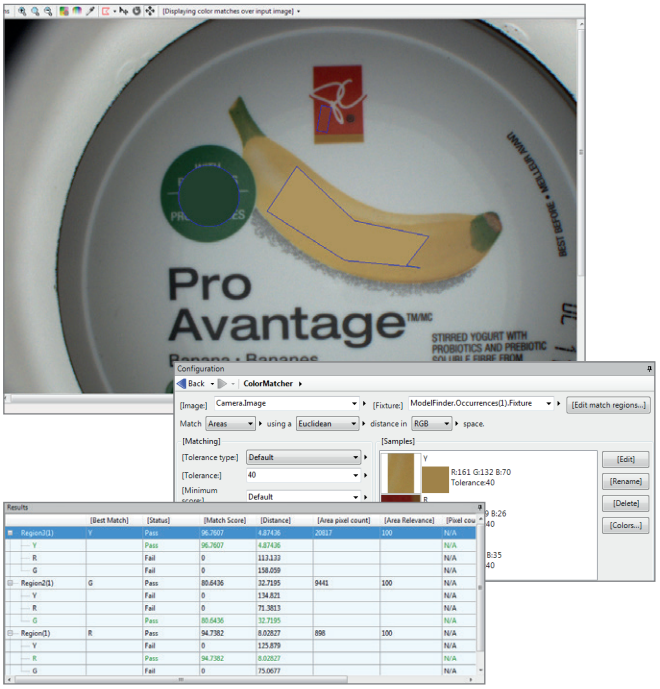
Field-Proven Vision Tools (cont.)

Color analysis steps

Matrox Design Assistant X includes a set of tools to identify parts, products, and items using color, assess quality from color, and isolate features using color.

The ColorMatcher step determines the best matching color from a collection of samples for each region of interest within an image. A color sample can be specified either interactively from an image—with the ability to mask out undesired colors—or using numerical values. A color sample can be a single color or a distribution of colors (i.e., a histogram). The color matching method and the interpretation of color differences can be manually adjusted to suit particular application requirements. The ColorMatcher step can also match each image pixel to color samples to segment the image into appropriate elements for further analysis using other steps such as BlobAnalysis.

The ImageProcessing step includes operations to calculate the color distance and perform color projection. The distance operation reveals the extent of color differences within and between images, while the projection operation enhances color to grayscale image conversion for analysis using other grayscale processing steps.



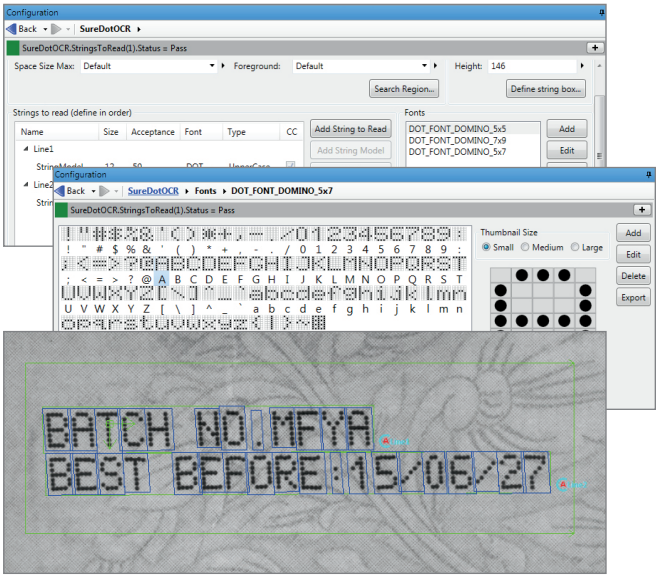
ColorMatcher step

Field-Proven Vision Tools (cont.)

Character recognition steps

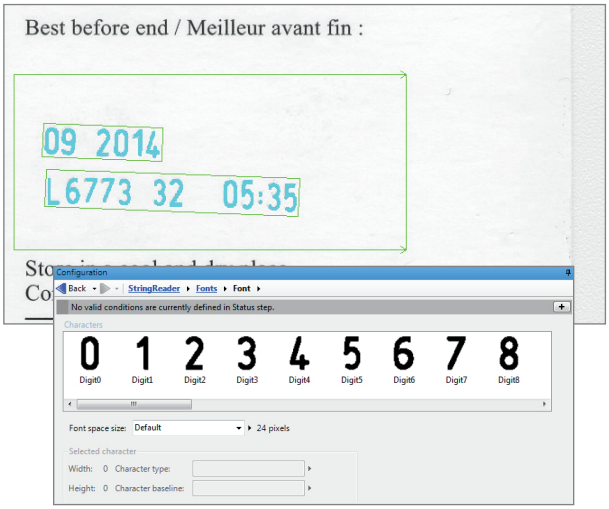
Matrox Design Assistant X provides two steps for character recognition: SureDotOCR and StringReader. These steps combine to read text that is engraved, etched, marked, printed, punched, or stamped on surfaces.

The SureDotOCR step is uniquely designed for the specific challenge of reading dot-matrix text produced by inkjet printers. Its use is straightforward, just needing to specify the dot size, the number of characters in a text string, and the dimension—but not the location—of the text region. The step reads strings located at any angle, with varying contrast, and on an uneven background. It interprets distorted characters and handles some variability to character scale. The step recognizes punctuation marks and blank spaces. It includes pre-defined fonts that can be edited. The step automatically reads multiple lines of text where each line can be in a different font. It supports user-defined constraints, overall and at specific character positions, to further enhance recognition rates. The SureDotOCR step provides greater robustness and flexibility than case-specific techniques that convert dot-matrix characters into solid ones for reading with traditional character recognition tools.



SureDotOCR step

The StringReader step is based on a sophisticated technique that uses geometric features to quickly locate and read text made up of solid characters in images where these characters are well separated from the background and from one another. It handles text strings with a known or unknown number of evenly or proportionally spaced characters. The step accommodates changes in character angle with respect to the string, aspect ratio, scale, and skew, as well as contrast reversal. It accepts strings located across multiple lines and at a slight angle. The step reads from multiple pre-defined or user-defined Latin-based fonts. It supports user-defined constraints, overall and at specific character positions, to further increase recognition rates.



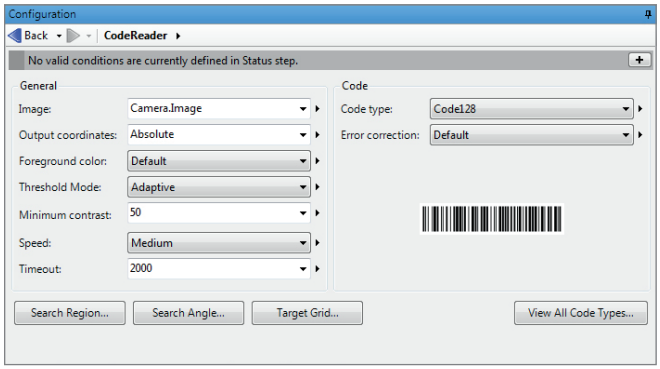
StringReader step

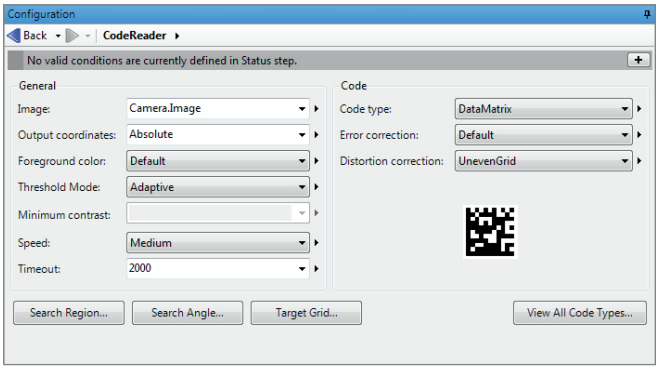
Field-Proven Vision Tools (cont.)

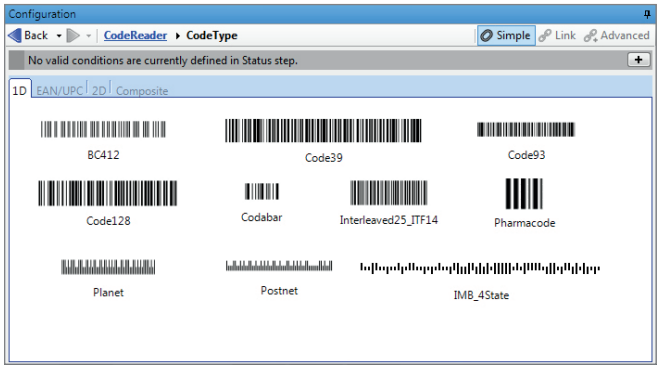
1D and 2D code reading and verification steps

The CodeReader step in Matrox Design Assistant X locates and reads 1D, 2D, and composite identification marks. The step handles rotated, scaled, and degraded codes in tough lighting conditions. The step can provide the orientation, position, and size of a code.

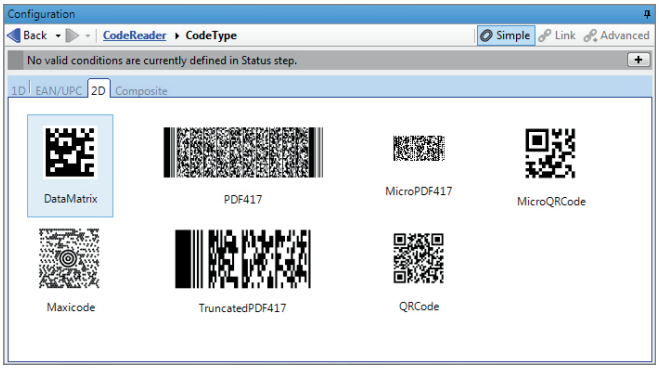
In addition, the CodeGrade step verifies the quality of a code based on the ANSI/AIM and ISO/IEC grading standards.







CodeReader step (1D)



CodeReader step (2D)

Field-Proven Vision Tools (cont.)

Photometric stereo step

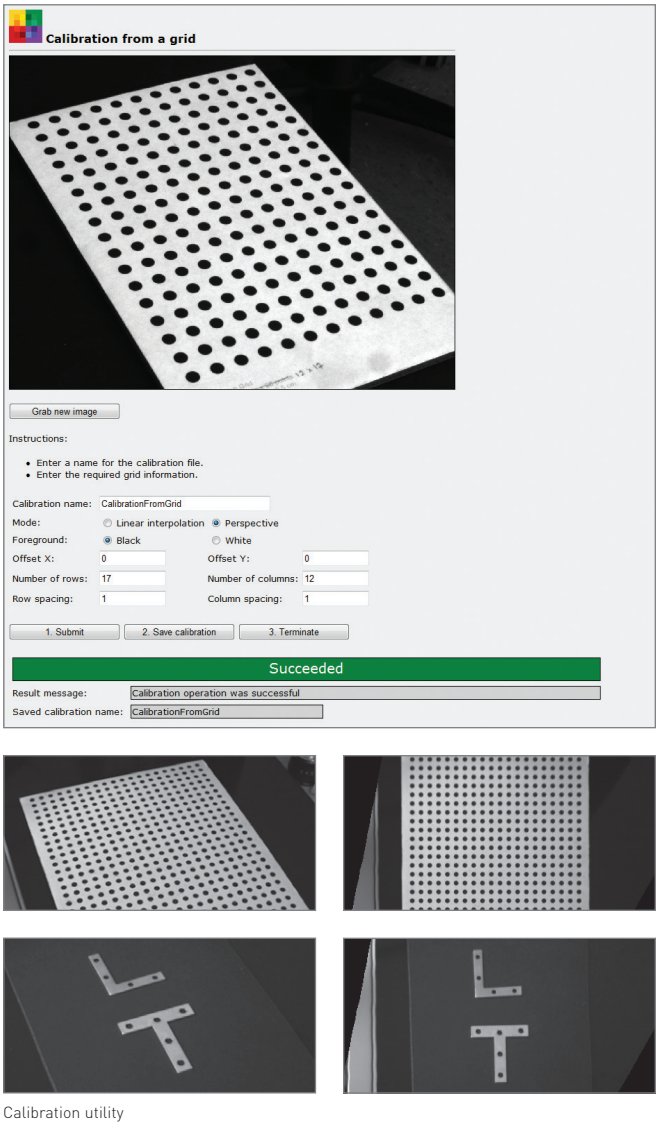
A PhotometricStereo step in Matrox Design Assistant X produces an image that emphasizes surface irregularities, such as embossed or engraved features, scratches, or indentations. The image is produced from a series of images of the same scene taken with directional illumination as driven by a Quad (X2) Controller from Advanced Illumination (Ai), a Light Sequence Switch (LSS) from CCS, a LED Light Manager (LLM) from Smart Vision Lights, or similar light controller.

PhotometricStereo step

2D calibration utility

Calibration is a routine requirement for machine vision. Matrox Design Assistant X includes 2D calibration capabilities to convert results (i.e., positions and measurements) from pixel to real-world units and vice-versa. The capability can compensate results and even an image itself for camera lens and perspective distortions.

Calibration is achieved using an image of a grid or just a list of known points and is performed through a utility project accessed from the Matrox Design Assistant X configuration portal.



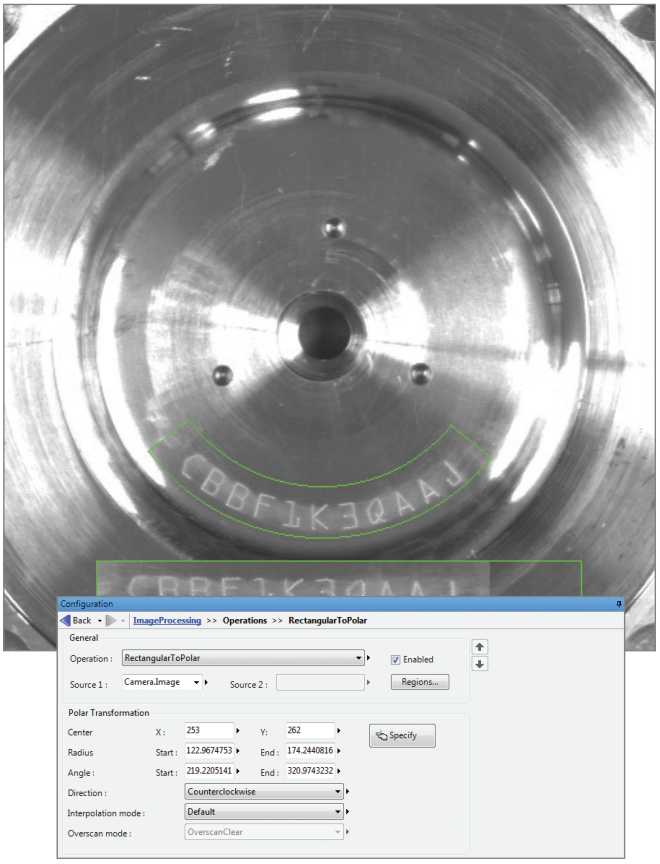
Calibration utility

Field-Proven Vision Tools (cont.)

Basic image processing steps

Matrox Design Assistant X includes the ImageProcessing step for enhancing and transforming images in preparation for subsequent analysis. Supported operations include arithmetic, color space conversions, color distance and projection (refer to Color analysis section for details), filtering, geometric transformations, logic, LUT mapping, morphology, and thresholding.

Matrox Design Assistant X also includes EdgeLocator and IntensityChecker steps. The step finds objects by locating straight edges and the IntensityChecker step is used to analyze an object using image intensity.

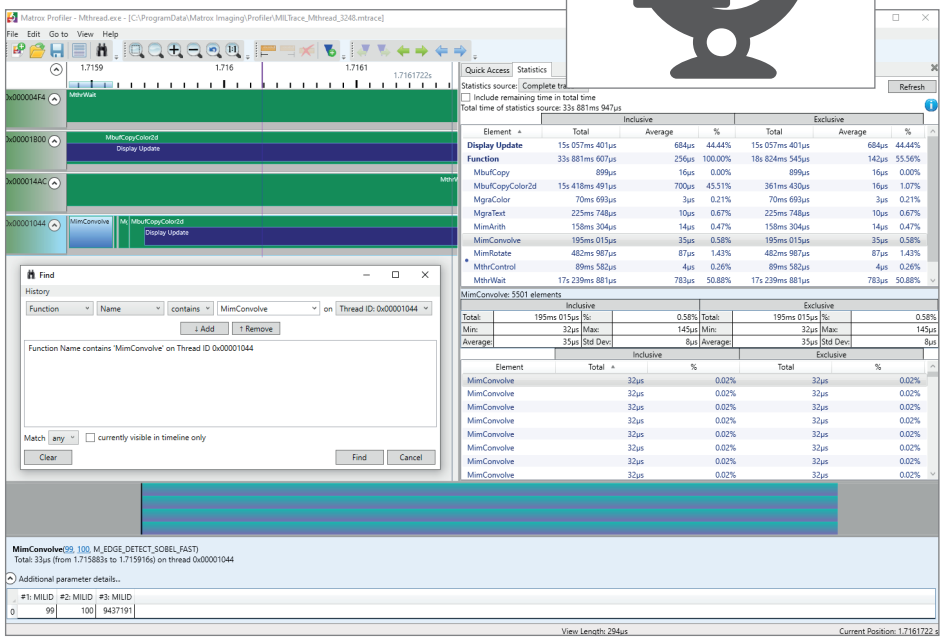


ImageProcessing step

Utilities

Matrox Profiler

Matrox Design Assistant X includes Matrox Profiler, a separate utility to post-analyze the execution of a vision project for performance bottlenecks and timing issues. It presents the flowchart steps executed over time on a navigable timeline. Matrox Profiler permits searching for and selecting specific steps and their execution times for analysis. It computes statistics on execution times and presents these on a per-step basis.



Matrox Profiler

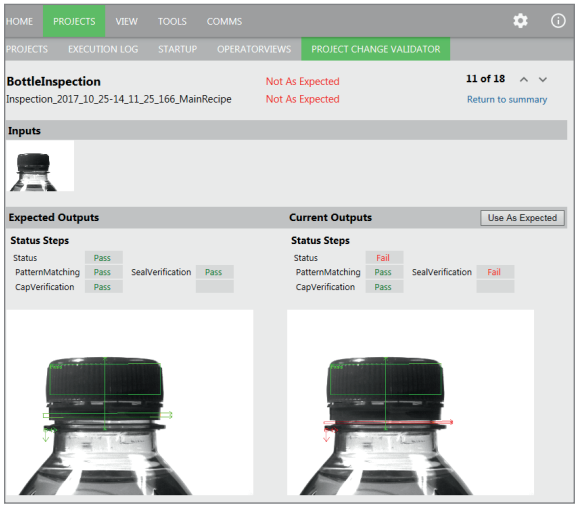
Utilities (cont.)

Project Change Validator

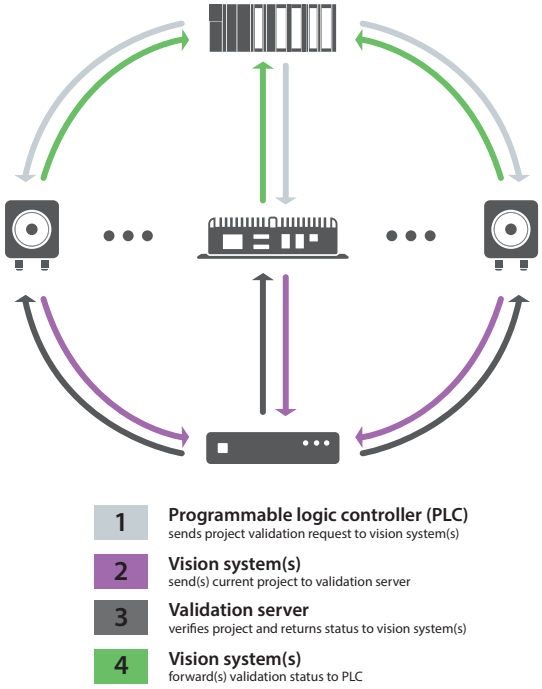
Project Change Validator is a utility employing a client-server architecture for ensuring that changes made to a deployed project are not detrimental to the functioning of that project. It provides the ability to record reference images—along with the associated inspection settings and results—for a given project.

This archived reference data is then used to validate changes made to the project. Changes are validated by running the modified project with the reference data and comparing the projects' operation against this data. Validation is performed by the server—typically running on a separate computer—which is reachable over a network.

The Matrox Design Assistant X portal provides access to the validation data for management as well as the validation results. Validation requests are made on demand from the Matrox Design Assistant X portal, an automation controller, or an HMI panel.



Project Change Validator (view from portal)



1 **Programmable logic controller (PLC)**
sends project validation request to vision system(s)

2 **Vision system(s)**
send(s) current project to validation server

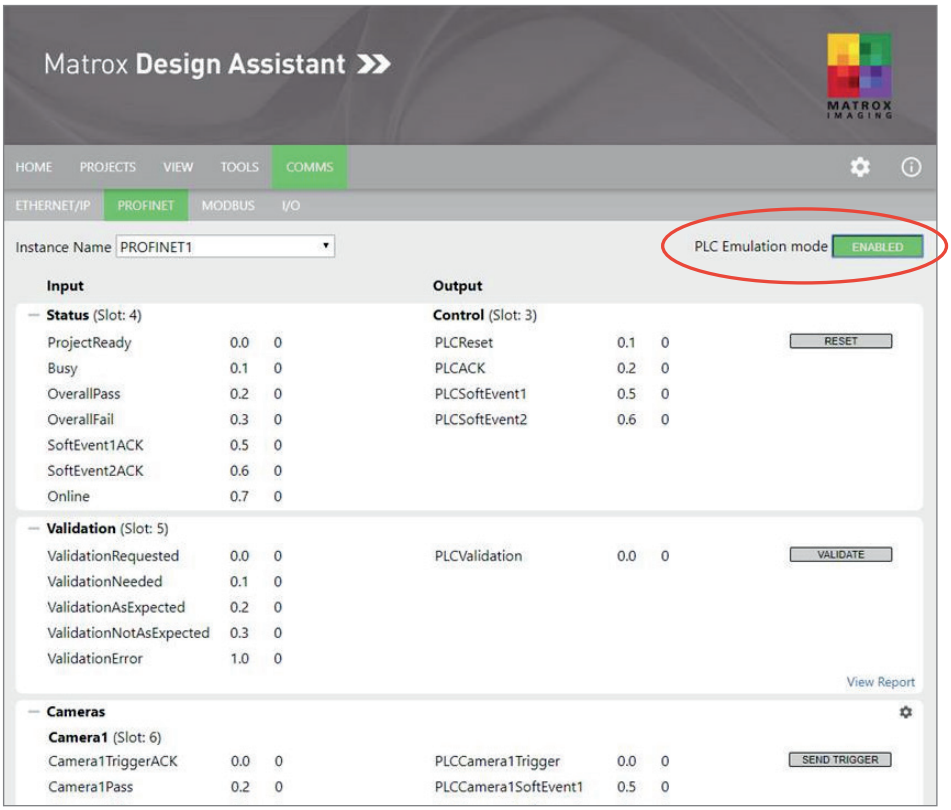
3 **Validation server**
verifies project and returns status to vision system(s)

4 **Vision system(s)**
forward(s) validation status to PLC

Utilities (cont.)

PLC interface emulation

While developing a project in Matrox Design Assistant X, the PLC interface emulator is to be used to test communication in instances when a physical one is not connected. Values can be changed and viewed dynamically to test the communication between the project and the PLC. The PLC interface emulator supports CC-Link IE Field Basic, EtherNet/IP[2], MODBUS over TCP/IP, and PROFINET protocols for communication; these can be activated and controlled from the portal pages.

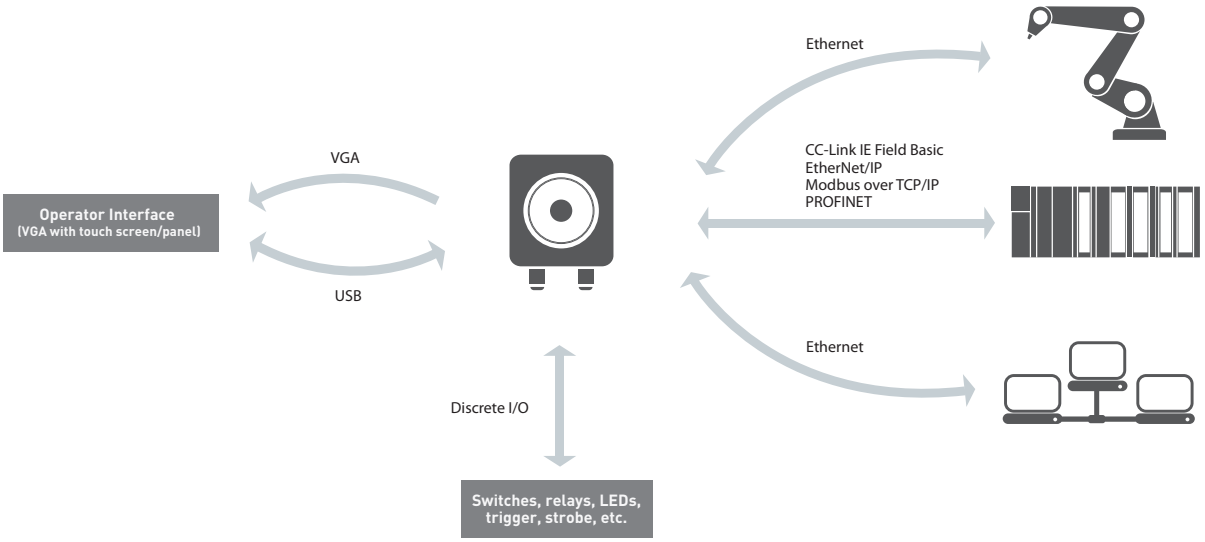


Connectivity

Connect to devices and networks

The Matrox Iris GTR features a 10/100/1,000 Mbit Ethernet interface for connecting over factory-floor and enterprise networks. Communication over these networks is configured through Matrox Design Assistant X; the software can communicate over Ethernet networks using the TCP/IP as well as the CC-Link IE Field Basic, EtherNet/IP[2], Modbus over TCP/IP, and PROFINET protocols, enabling interaction with programmable logic/automation controllers. Its QuickComm facility provides ready-to-go communication with these controllers.

Direct communication can be established with robot controllers for 2D vision-guided robotic applications. Supported robot-controller makes and models currently include the ABB IRC5; DENSO RC8; Epson RC420+ and RC520+; Fanuc LRMate200iC and LRMate200iD; KUKA KR C2; and Stäubli CS8, CS8C HP, and CS9 controllers. The Matrox Iris GTR can also be configured to directly interact with automation devices through seven industrial digital I/Os (four inputs and three outputs).



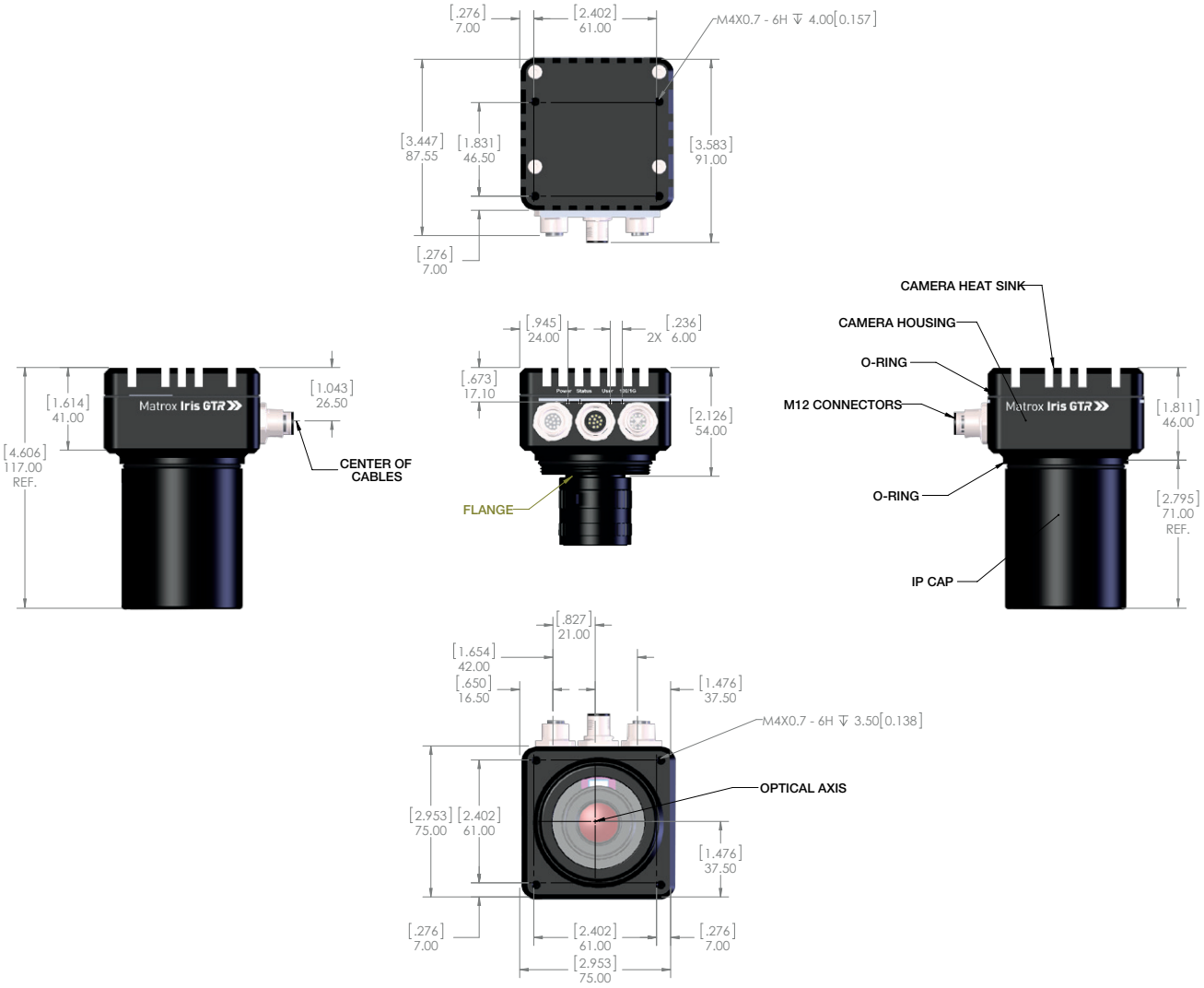
Supported Environments

For Windows

- 64-bit Windows 7 with SP1 and Windows 10 (versions 1607 to 2004)

Dimensions

Matrox Iris GTR



Dimensions: (inches) millimeters

Specifications

Matrox Iris GTR								
Hardware								
Model	GTR300	GTR300C	GTR1300	GTR1300C	GTR2000	GTR2000C	GTR5000	GTR5000C
Sensor model	PYTHON 300		PYTHON 1300		PYTHON 2000		PYTHON 5000	
Sensor type	CMOS							
Sensor geometry	1/4 in		1/2 in		2/3 in		1 in	
Format	Mono-chrome	Color	Mono-chrome	Color	Mono-chrome	Color	Mono-chrome	Color
Resolution	640 x 480		1280 x 1024		1920 x 1200		2592 x 2048	
Frame rate (effective)	Up to 293 fps	Up to 147 fps	Up to 85 fps	Up to 35 fps	Up to 45 fps	Up to 20 fps	Up to 21 fps	Up to 8.5 fps
Pixel size	4.8 x 4.8 µm							
Gain range	0 to 19.4 dB							
Shutter speeds	50 µsec to 4 sec							
External trigger latency	7.1 µs		7.2 µs		8.0 µs			
External trigger to strobe output delay	9.1 µs		9.2 µs		10 µs			
Processor	Intel Celeron N2807 (dual core 1.58 GHz)							
Memory	2 GB DDR3L SDRAM							
Storage	32 GB eMMC							
Network	Gigabit Ethernet							
HMI	VGA							
	USB 2.0 (for keyboard and mouse)							
Others	Dedicated 0 V-10 V LED lighting intensity control for Advanced illumination ICS 3 Note: See Third-party Accessories for more details.							
	Dedicated interface for Corning Varioptic C-C Series auto-focus lens Note: See Third-party Accessories for more details.							
Digital I/Os	Three (3) opto-coupled inputs (with incremental rotary encoder support)							
	One (1) dedicated opto-coupled trigger input							
	Three (3) opto-coupled trigger outputs							
Connectors	M12-8 pins (female) for Ethernet							
	M12-12 pins (female) for power, digital I/Os, and LED lighting intensity control							
	M12-12 pins (male) for VGA and USB							
Power consumption	450 mA @ 24 VDC							
	10.8 W (typical)							
Dimensions	Refer to Dimensions diagram							
Weight	460 g							
Lens type	C-mount							
Operating temperature	0°C to 50°C (32°F to 122°F)							
Ventilation requirements	Natural convection							

Specifications (cont.)

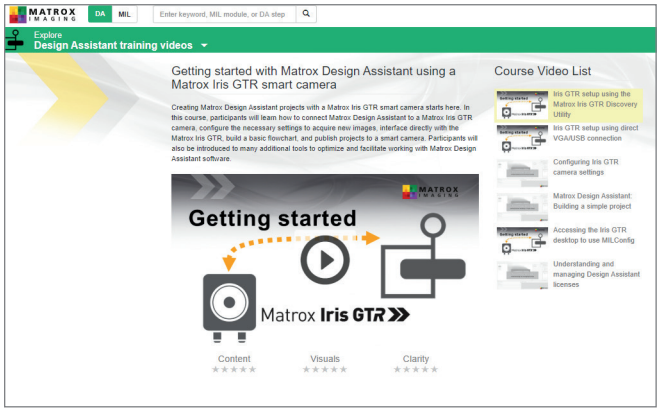
Matrox Iris GTR	
Hardware	
Certifications	FCC Part 15 Class A, CE mark
	EN55011 Class A, EN61326-1 industrial environment
	ICES-003/NMB-003 Class A
	RCM Class A: IP67 enclosure (IEC 60529: dust-tight and protected against temporary immersion)
	Shock and vibration: EN60721-3-3/A2, Category 3M8
	Shock: IEC 60068-2-27, 50 g, 3 ms, type II, half sine
	Random vibration: IEC60068-2-64, 10 Hz to 500 Hz, 5 g, 100 min
	Sine vibration: IEC60068-2-6, 10 Hz to 500 Hz, 5 g

Training and Support

Matrox Vision Academy

Matrox Vision Academy provides all the expertise of live classroom training, with the convenience of on-demand instructional videos outlining how to get the most out of Matrox Design Assistant X vision software. Available to customers with valid Matrox Design Assistant X maintenance subscriptions, as well as those evaluating the software, users can seek out training on specific topics of interest, where and when needed. Regularly scheduled live classroom training is also offered at Matrox Imaging Headquarters.

Matrox Vision Academy aims to help users increase productivity, reduce development costs, and bring applications to market sooner. For more information, contact Matrox Vision Academy.



Matrox Professional Services

Matrox Professional Services delivers deep technical assistance and customized trainings to help customers develop their particular applications. These professional services comprise personalized training; assessing application or project feasibility (e.g., illumination, image acquisition, and vision algorithms); demo and prototype applications and/or projects; troubleshooting, including remote debugging; and video and camera interfacing.

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

Matrox Design Assistant X maintenance program

Matrox Design Assistant X users have access to a Maintenance Program, renewable on a yearly basis. This maintenance program entitles registered users to free software updates and entry-level technical support from Matrox Imaging, as well as access to Matrox Vision Academy.

For more information, please refer to the Matrox Imaging Software Maintenance Programs.

Ordering Information

Part number	Description
Hardware	
GTR300	Matrox Iris GTR smart camera with monochrome 640x480 sensor, dual-core Celeron® CPU, 2 GB of memory, 32 GB eMMC storage.
GTR300C	Matrox Iris GTR smart camera with color 640x480 sensor, dual-core Celeron CPU, 2 GB of memory, 32 GB eMMC storage.
GTR1300	Matrox Iris GTR smart camera with monochrome 1280x1024 sensor, dual-core Celeron CPU, 2 GB of memory, 32 GB eMMC storage.
GTR1300C	Matrox Iris GTR smart camera with color 1280x1024 sensor, dual-core Celeron CPU, 2 GB of memory, 32 GB eMMC storage.
GTR2000	Matrox Iris GTR smart camera with monochrome 1920x1200 sensor, dual-core Celeron CPU, 2 GB of memory, 32 GB eMMC storage.
GTR2000C	Matrox Iris GTR smart camera with color 1920x1200 sensor, dual-core Celeron CPU, 2 GB of memory, 32 GB eMMC storage.
GTR5000	Matrox Iris GTR smart camera with monochrome 2592x2048 sensor, dual-core Celeron CPU, 2 GB of memory, 32 GB eMMC storage.
GTR5000C	Matrox Iris GTR smart camera with color 2592x2048 sensor, dual-core Celeron CPU, 2 GB of memory, 32 GB eMMC storage.
GTR-STARTERKIT	Matrox Iris GTR starter kit for all models except GTR5000(C). Includes power supply, 12 mm C-mount lens, Ethernet cable, power cable, VGA/USB cable, and breakout board for digital I/Os. Note: For development purposes only. Not to be used for deployment.
GTR5000-STRKIT	Matrox Iris GTR starter kit for GTR5000(C). Includes power supply, 12 mm C-mount lens for 5 MPixel sensor, Ethernet cable, power cable, VGA/USB cable, and breakout board for digital I/Os. Note: For development purposes only. Not to be used for deployment.
GTR-CBL-PWR/3	9.8 ft (3 m) cable for Matrox Iris GTR to connect power, discrete I/Os, and LED lighting intensity control. M12 to open end.
GTR-CBL-ETH/5	16.4 ft (5 m) Ethernet cable for Matrox Iris GTR. M12 to RJ45 connector.
GTR-CBLVGAUSB	3.2 ft (1 m) cable for Matrox Iris GTR to connect VGA and USB. M12 to HD-15 and USB connectors.

Ordering Information (cont.)

Part number	Description
Software	
Matrox Design Assistant X Development Package	
Included with GTR...0(C)	Matrox Iris GTR with Matrox Design Assistant X comes with installation media for the IDE and a software maintenance registration number. This smart camera is pre-loaded with the Matrox Design Assistant X run-time environment, and allows the IDE to run when the smart camera is connected to it. The smart camera is pre-licensed for pattern recognition (PatternMatching step), feature extraction and analysis (BlobAnalysis step), 1D and 2D measurements (Measurement, BeadInspection, and Metrology steps), color analysis (ColorMatcher step; GTR...C model only), 1D and 2D code reading and verification (CodeReader and CodeGrade steps), 2D calibration, basic image processing (IntensityChecker, ImageProcessing, and EdgeLocator steps; not EdgeFinder), image compression, and industrial communication. Note: The use of additional pattern recognition (ModelFinder), shape finding (RectangleFinder, CircleFinder, EllipseFinder, and SegmentFinder), character recognition (StringReader and SureDotOCR), classification (CNNClassIndex and CNNClassMap) and registration (PhotometricStereo) steps requires an additional license purchased separately. Refer to the MIL X datasheet – MIL X Run-Time Licenses section for ordering details.
Matrox Design Assistant X Maintenance Program	
DAMAINTENANCE	One-year extension to the Matrox Design Assistant X maintenance program per developer. Note: 50% educational discount for DAMAINTENANCE with proof of affiliation with an academic institution. Included in the original purchase price of the Matrox Design Assistant X development package, registered users are entitled to one year of technical support, access to updates, and Matrox Vision Academy online training website.
Matrox Vision Academy Online Training	
Included with Matrox Design Assistant X Maintenance Program	Matrox Vision Academy Online provides a range of categorized instructional videos on how to use the software to create applications. Matrox Vision Academy Online is available to customers with current Matrox Design Assistant X maintenance subscriptions, as well as those evaluating the software. Visit www.matrox.com/imaging/en/vision_academy/ for more information.
Matrox Vision Academy On-Premises Training	
DATRAIN *Ask for availability.*	*Introduction to Matrox Design Assistant*: Three-day instructor-led training on developing machine vision applications using the Matrox Design Assistant IDE. *Key topics*: Developing a vision or inspection system; using flowcharts to replace coding; setting up operator view; choosing analysis and processing tools; interfacing with IDE. Visit www.matrox.com/imaging/en/vision_academy/on_premises/ for more information.
Matrox Design Assistant X Run-Time/Supplemental License Software Keys	
	Refer to MIL X datasheet – MIL X/MIL-Lite X Run-Time/Supplemental Licenses section. Note: Distributed MIL package license is required on a third-party PC in order to connect to it remotely from the design-time environment. Contact Matrox Imaging or a local representative for more information.

Third-Party Accessories

Supplier	Description
Optics	
Corning Varioptic	C-Series C-39N0-160-I2C: Variable focus 16 mm effective focal length (EFL) liquid lens with I2C control
Corning Varioptic	C-Series C-390N0-250-I2C: Variable focus 25 mm EFL liquid lens with I2C control
Illumination	
Advanced illumination	EZ Mount Ring Light: Ring light with built-in driver
Smart Vision Lights	EZ Mount Ring Light: Ring light with built-in driver
Smart Vision Lights	Mini Ring Light: Ring light with built-in driver
Buchner	Rondo-LX IP67: Ring light with mechanical adapter
Buchner	Helios IP67: Ring light with mechanical adapter
Cables	
Phoenix Contact	SAC-12P-MS/5,0-PVC SCO: 5 m cable to connect power, discrete I/Os, and LED lighting intensity control. M12 to open end.
Phoenix Contact	SAC-12P-MS/10,0-PVC SCO: 10 m cable to connect power, discrete I/Os, and LED lighting intensity control. M12 to open end.
Phoenix Contact	NBC-MSX/2,0-94F/R4AC SCO: 2 m Ethernet cable. M12 to RJ45 connector.
Phoenix Contact	NBC-MSX/10,0-94F/R4AC SCO: 10 m Ethernet cable. M12 to RJ45 connector.

Endnotes:
1. The software may be protected by one or more patents; see www.matrox.com/patents for more information.
2. Certification pending.

The Matrox Imaging advantage

Assured quality & longevity
Adhering 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 a dedicated team of QA specialists.

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.

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.

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, 3D sensors, vision controllers, I/O cards, and frame grabbers, all designed to provide optimum price-performance within a common software environment.

Industries served

Matrox Design Assistant is used to put together solutions for the aerospace, agricultural, automotive, beverage, cosmetic, construction material, consumer, electronic, energy, flat panel display, food, freight, machining, medical device, packaging, paper, pharmaceutical, printing, resource, robotics, semiconductor, shipping, textile, and transportation industries.

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
www.matrox.com/imaging

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

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