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

Matrox Iris GTR with Matrox Design Assistant X[1]

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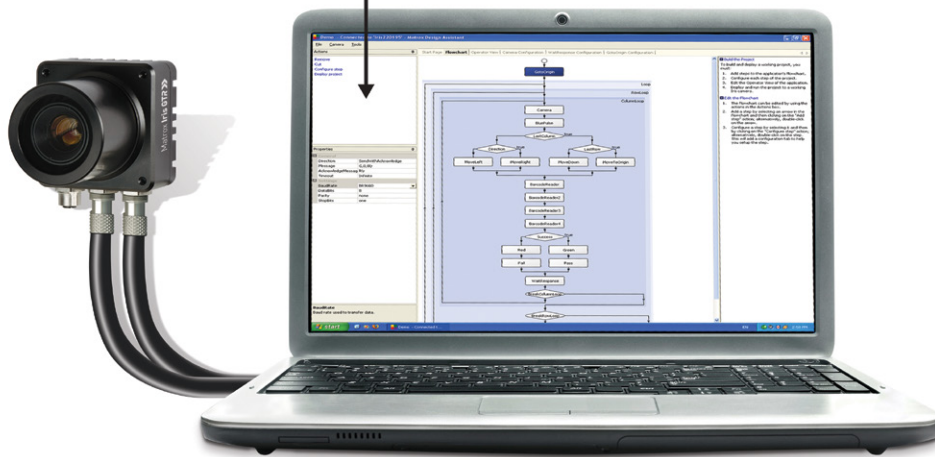
3. Run the application on a Matrox Iris GTR independent of the PC. View the application's operator interface from a PC.

Matrox Design Assistant X

Matrox Design Assistant X is an IDE for Windows where vision applications are created by constructing an intuitive flowchart 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. Since Matrox Design Assistant X is hardware independent, choose any computer with GigE Vision® or USB3 Vision® cameras and get the processing power needed. This field-proven software is also a perfect match for the Matrox Iris GTR smart camera or the Matrox 4Sight EV6 vision controller. 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 smart cameras and vision controllers, and third-party PCs with 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 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 and Ethernet (TCP/IP, EtherNet/IP™[2], Modbus®, PROFINET®, and native robot interfaces)[3]

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.

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 vision controller as was used for development. Remote deployment is to a different computer, including Matrox vision controllers or a Matrox smart camera.

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
- Presence/absence
- Recipes
- Robot guidance (Pick-and-Place)
- Dot-matrix text reading (SureDotOCR®)

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

Version 1905 highlights

Photometric stereo tool enhances surface irregularities such as embossed or engraved features, scratches or indentations

Classification step that leverages deep learning to inspect images of highly textured, naturally varying, and acceptably deformed goods

Shape-finding tools for locating circular, elliptical, rectangular, and line segment features
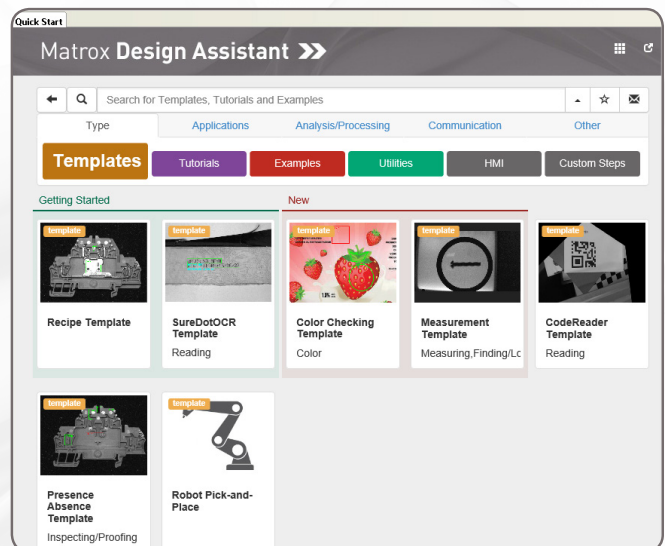
Project templates

IDE

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.
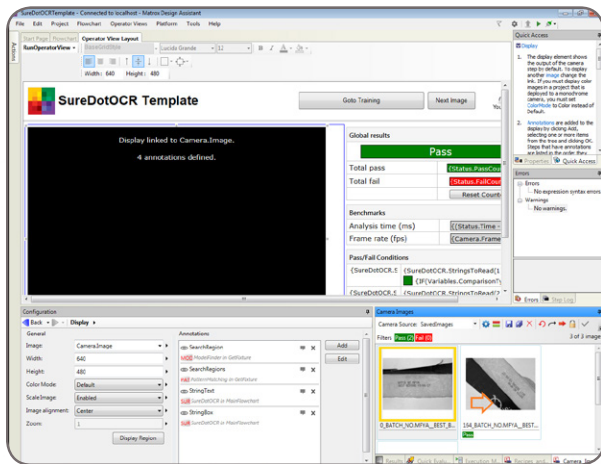

Select the action to perform from a context-based list

Conveniently switch between the flowchart and image, or operator views

Get quick access to context sensitive help

View results for features within the image

Configure each step without losing sight of flowchart and image

Instantly view results after each step

Track and navigate the flowchart execution history without losing sight of the image

Operator View

Design a customized Operator View
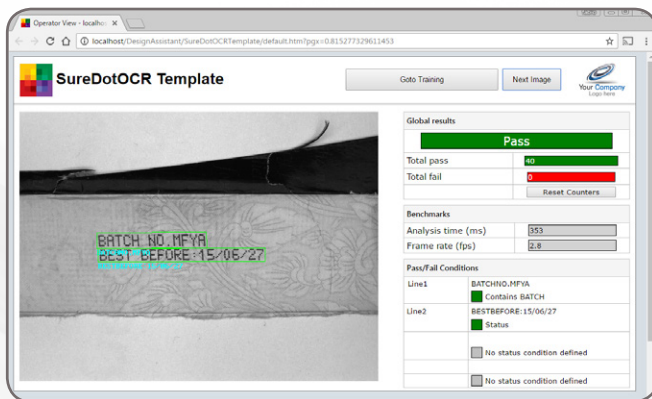
Resulting Operator View as seen in a web browser

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[4]. Local viewing is done on the same computer or Matrox vision controller as was used for development. Local viewing is also available with a Matrox 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 smart camera or Matrox 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.
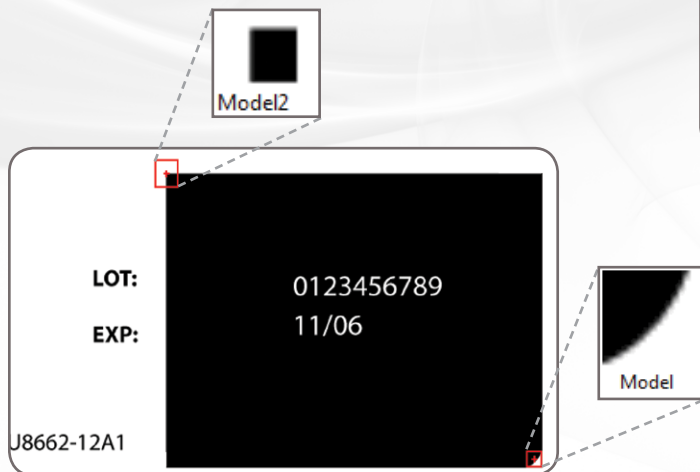
Vision Tools

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

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

The Pattern Matching 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.

The Model Finder 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; search parameters can thus be manually adjusted and models manually edited to tailor performance.


Model Finder

Pattern Matching
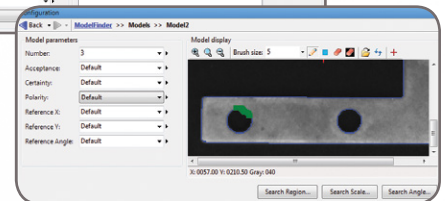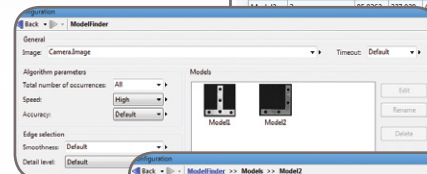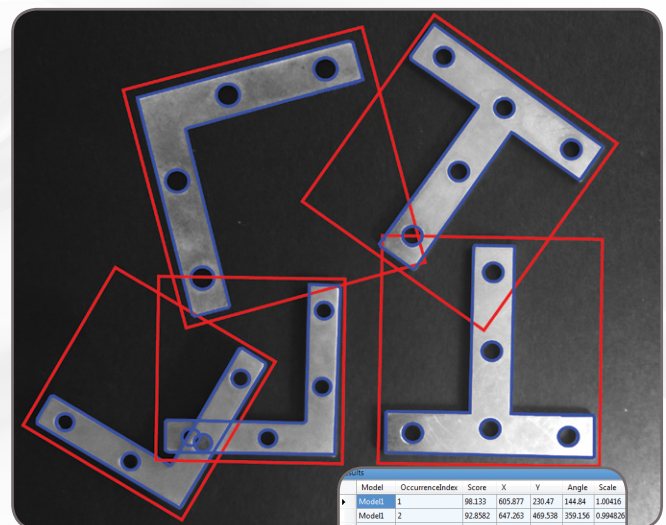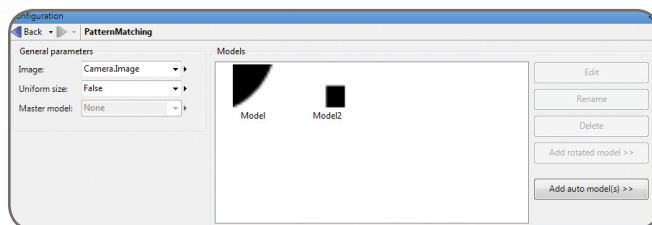
Vision Tools (cont.)

Shape finding

Matrox Design Assistant X includes dedicated steps for finding circles, ellipses, rectangles, and line segments. The anticipated radius, the possible scale range, and the number of expected occurrences define circle finding. 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 specific shapes than generic pattern recognition.
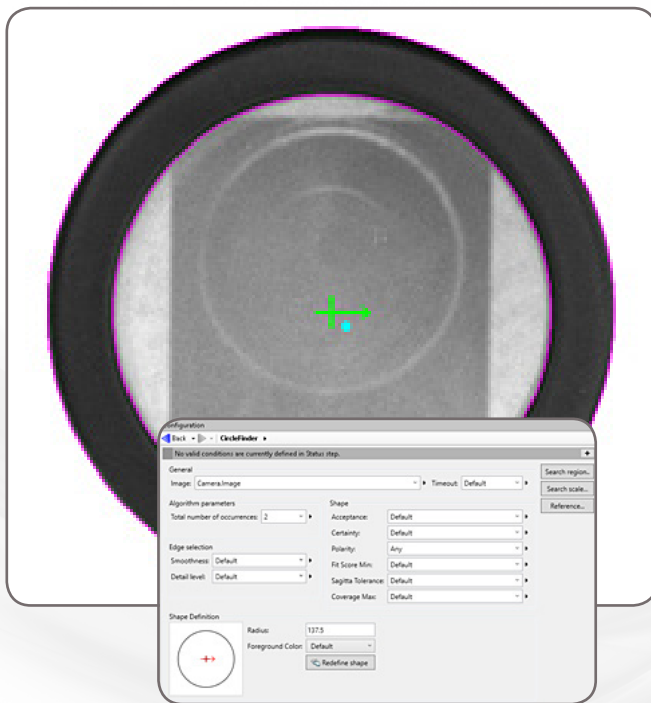
Circle Finder

Rectangle Finder
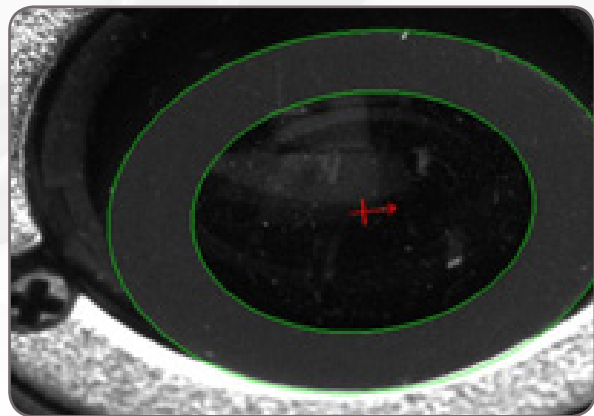
Ellipse Finder

Vision Tools (cont.)

Feature extraction and analysis

The Blob Analysis step 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.
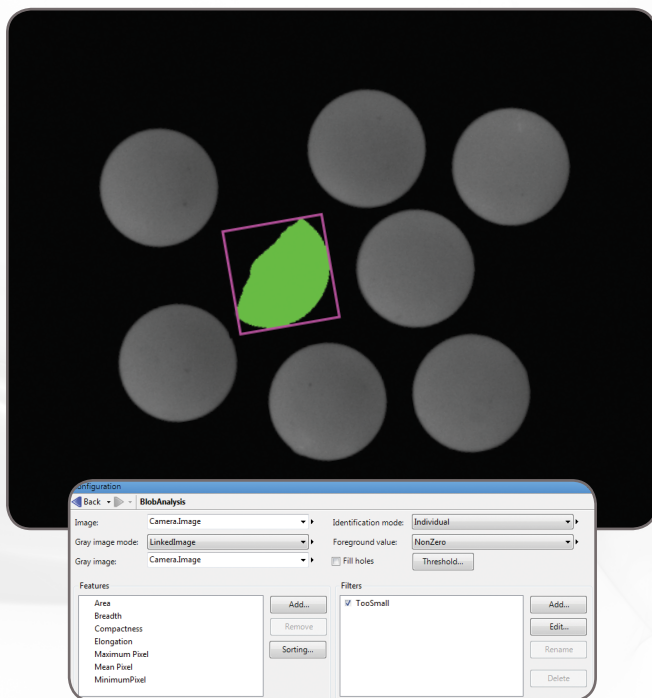
Blob Analysis

Classification

Matrox Design Assistant X includes a Classification step for automatically categorizing image content using machine learning. It makes use of deep learning—specifically convolutional neural network (CNN)—technology for assigning images or image regions to pre-established classes. The tool is particularly well-suited for analyzing images of highly textured, naturally varying, and acceptably deformed goods. The intricate design and training of a neural network is carried out by Matrox Imaging, taking advantage of the accumulated experience, knowledge, and skill of its experts in both machine learning and machine vision. Users simply need to submit an adequate set of images that are representative of the given application, categorized for the desired classes, and roughly distributed evenly among the latter. The prediction or inference with the neural network is then performed exclusively by Matrox Imaging-written code on a mainstream CPU, eliminating the dependence on third-party neural network libraries and the need for specialized GPU hardware.
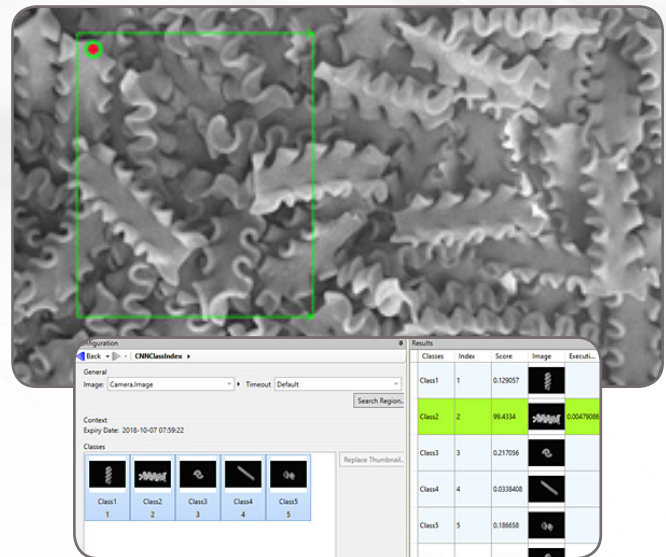
Classification

Vision Tools (cont.)

1D and 2D measurements

Matrox Design Assistant X includes three steps for measuring: Measurement, Bead inspection, 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 Bead inspection 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 Bead inspection 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 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.
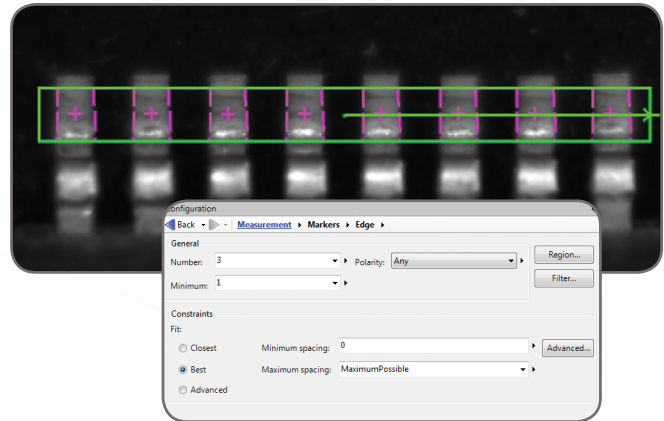
Measurement
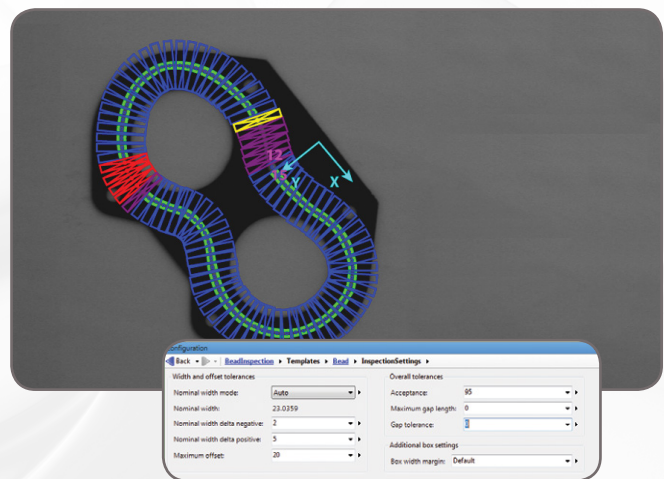
Bead Inspection
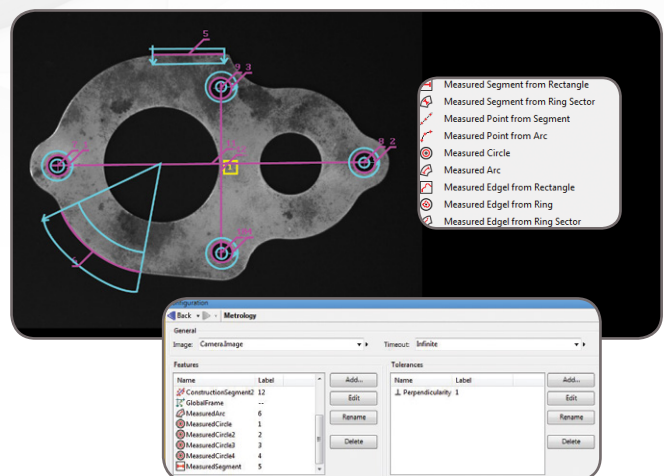
Metrology

Vision Tools (cont.)

Color analysis

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 Color Matcher 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 Color Matcher 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 Blob Analysis.

The Image Processing 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.


Color Matcher

Character recognition

Matrox Design Assistant X provides two steps for character recognition: SureDotOCR and String Reader. 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 SureDotOCR 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.

The String Reader 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.
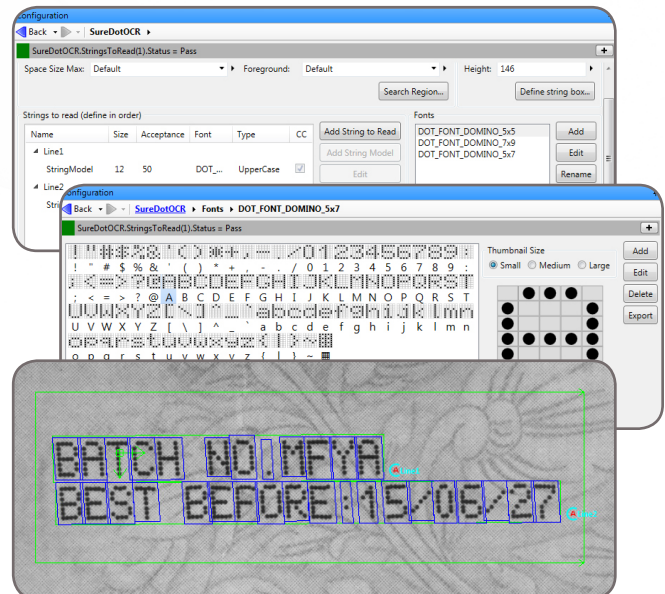
SureDotOCR

Vision Tools (cont.)

1D and 2D code reading and verification

Code Reader is a step for locating and reading 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 Code Verify step verifies the quality of a code based on the ANSI/AIM and ISO/IEC grading standards.
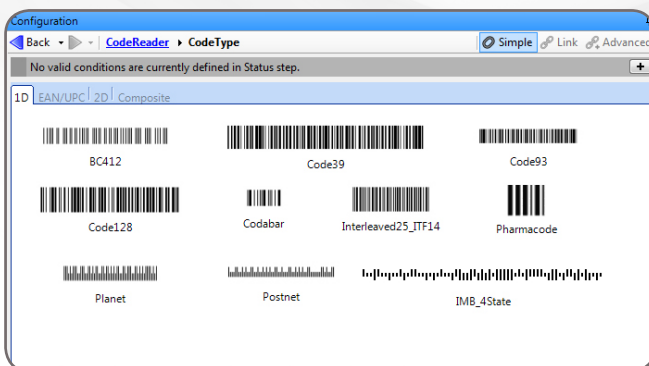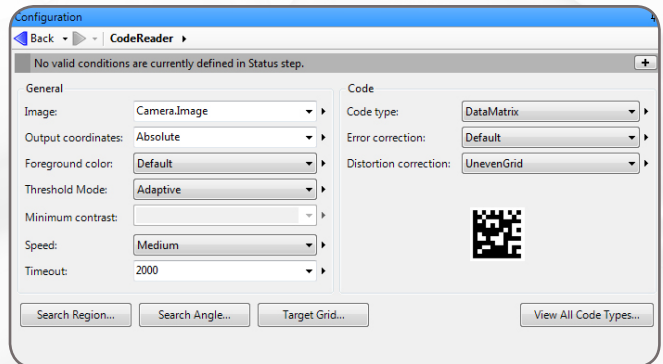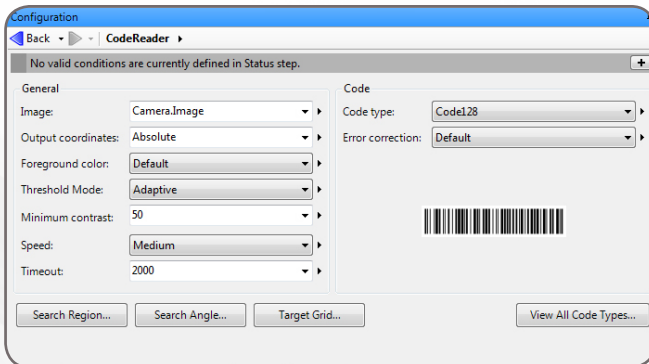
Code Reader (1D)
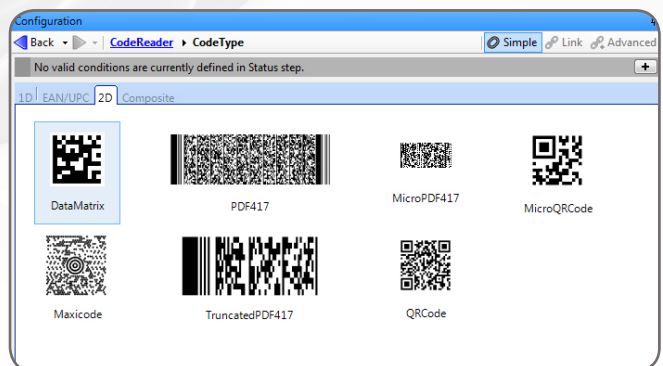
Code Reader (2D)

Vision Tools (cont.)

Registration

A Photometric Stereo tool produces produces an image that emphasizes surface irregularities—such as embossed or engraved features, scratches, or indentations—from a series of images taken with directional illumination as driven by a Light Sequence Switch (LSS) from CCS, a LED Light Manager (LLM) from Smart Vision Lights, or similar light controller.
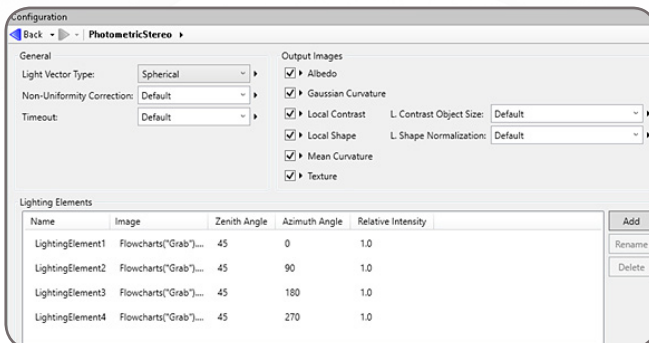
2D calibration

Calibration is a routine requirement for machine vision. Matrox Design Assistant X includes a 2D Calibration step to convert results (i.e., positions and measurements) from pixel to real-world units and vice-versa. The tool 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.

Registration (Photometric Stereo)

Photometric Stereo
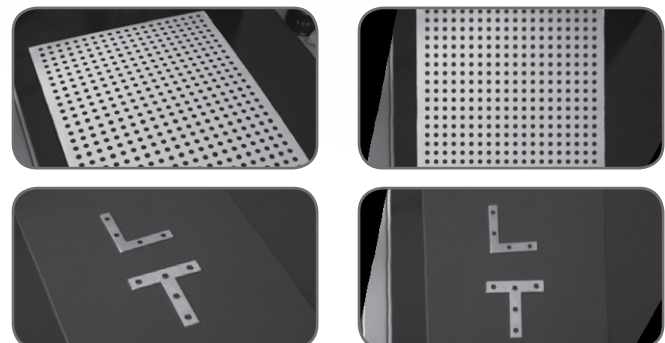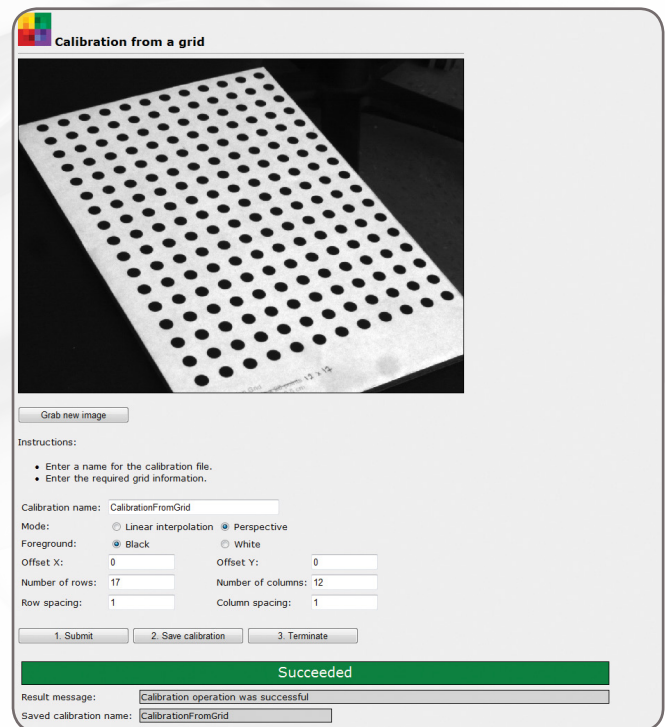
Calibration

Vision Tools (cont.)

Basic image processing

Matrox Design Assistant X includes the Image Processing 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 Edge Locator[5] and Intensity Checker. Edge Locator finds objects by locating straight edges and Intensity Checker is used to analyze an object using image intensity.
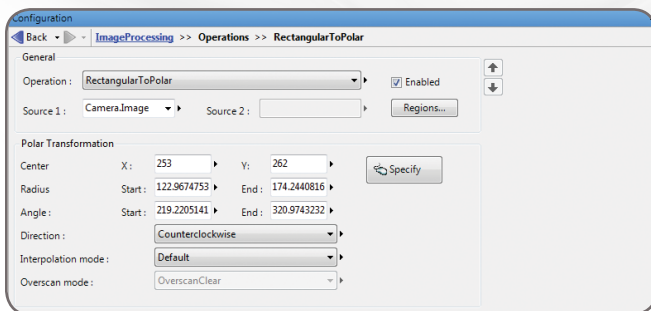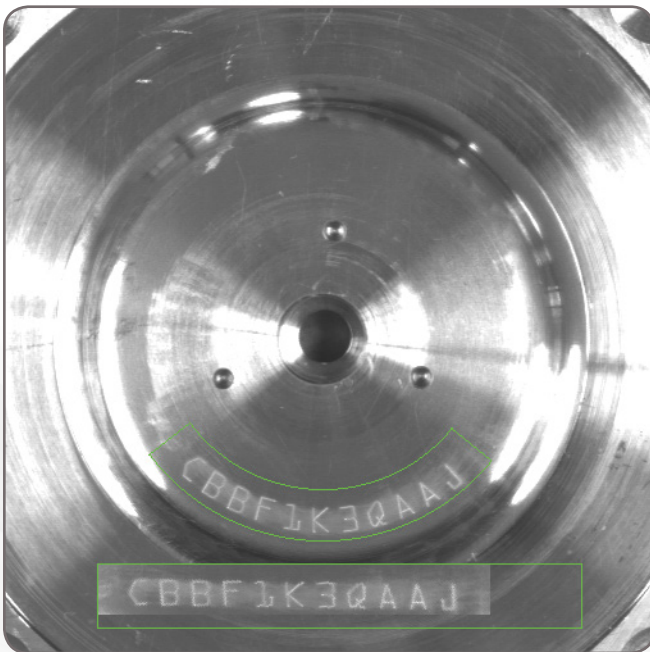
Image Processing

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.
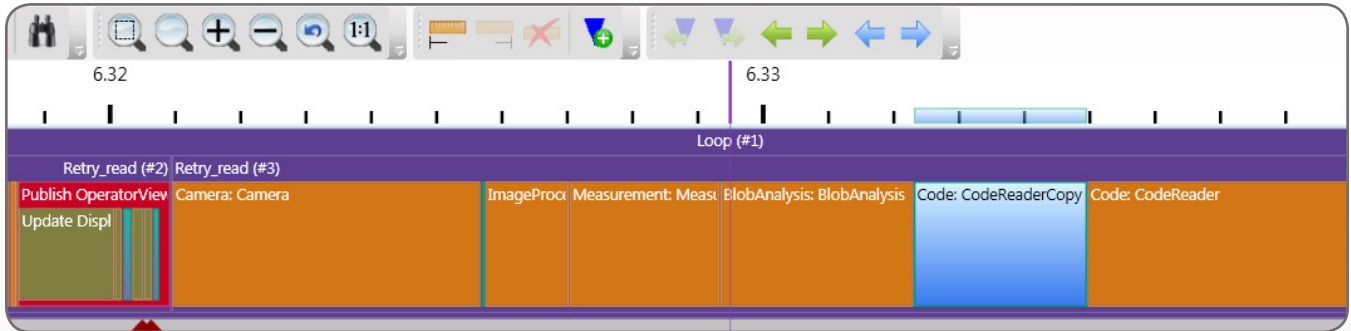
Matrox Profiler

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.
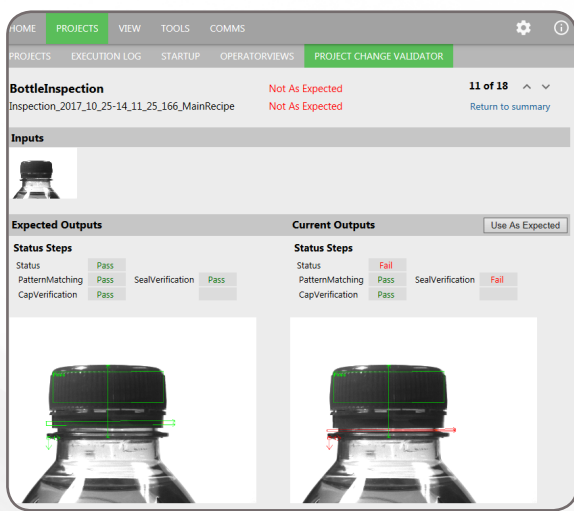
Project Change Validator (view from portal)
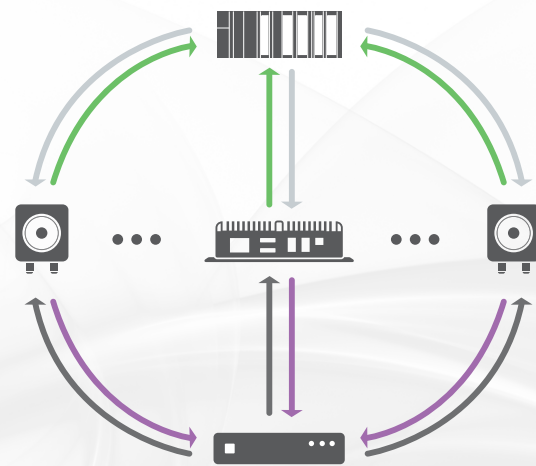
1 **Programmable logic controller (PLC)**
sends project validation request to vision system(s)

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

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 and can employ the TCP/IP as well as the EthertNet/IP[3], 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 select robot controllers[7] for 2D vision-guided robotic applications. 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).

Ethernet

VGA

Operator Interface
(VGA with touch screen/panel)

USB

EtherNet/IP
Modbus over TCP/IP
PROFINET

Ethernet

Discrete I/O

Switches, relays, LEDs,
trigger, strobe, etc.
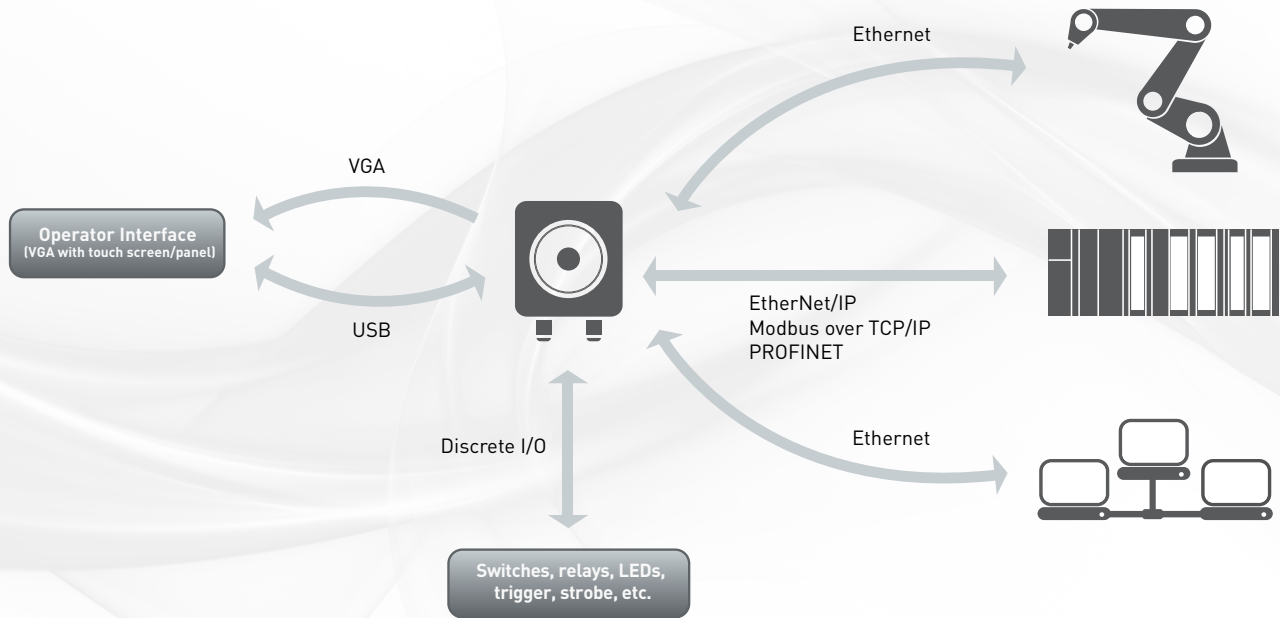
Specifications

Hardware								
Model	GTR300	GTR300C	GTR1300	GTR1300C	GTR2000	GTR2000C	GTR5000	GTR5000C
Sensor								
Model	PYTHON 300		PYTHON 1300		PYTHON 2000		PYTHON 5000	
Type	CMOS							
Geometry	1/4 in		1/2 in		2/3 in		1 in	
Format	Monochrome	Color	Monochrome	Color	Monochrome	Color	Monochrome	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 µm x 4.8 µm							
Gain range	0 dB to 19.4 dB							
Shutter speeds	50 µsec to 4 sec							
External trigger latency	7.1 µs		7.2 µs		8.0 µs		8.0 µs	
External trigger to strobe output delay	9.1 µs		9.2 µs		10 µs		10 µs	
Processor, memory, and storage								
Processor	Intel Celeron N2807 (dual core 1.58 GHz)							
Memory	2 GB DDR3L SDRAM							
Storage	32 GB eMMC							
Interfaces								
Network	Gigabit Ethernet							
HMI	VGA and USB 2.0 (for keyboard and mouse)							
Digital I/Os	Three (3) opto-coupled inputs (with incremental rotary encoder support) One (1) dedicated opto-coupled trigger input and three (3) outputs							
Others	Dedicated 0 V-10 V LED lighting intensity control for Advanced illumination ICS 3 Dedicated interface for Corning Varioptic C-C Series auto-focus lens Note: See Third-party Accessories for more details.							
Mechanical, electrical, and environmental information								
Dimensions	Refer to Dimensions section							
Lens type	C-mount							
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							
Weight	460 g							
Power consumption	450 mA @ 24 VDC or 10.8 W (typical)							
Operating temperature	0°C to 50°C (32°F to 122°F)							
Ventilation requirements	Natural convection							
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 - 500 Hz, 5 g, 100 min Sine vibration: IEC60068-2-6, 10 Hz to 500 Hz, 5 g							
Supported environments (for IDE)	64-bit Windows 7 with SPI and Windows 10 (versions 1607 to 1809)							

Dimensions

[.276] 7.00
[2.402] 61.00
M4X0.7 - 6H ⍌ 4.00[0.157]
[3.447] 87.55
[1.831] 46.50
[3.583] 91.00
[.276] 7.00

[1.614] 41.00
Matrox **Iris GTR** ≫
[1.043] 26.50
[4.606] 117.00 REF.
CENTER OF CABLES

[.945] 24.00
[.236] 2X 6.00
[.673] 17.10
Power   Status   User   10G1G
[2.126] 54.00
FLANGE

CAMERA HEAT SINK
CAMERA HOUSING
O-RING
M12 CONNECTORS
O-RING
IP CAP
Matrox **Iris GTR** ≫
[1.811] 46.00
[2.795] 71.00 REF.

[.827] 21.00
[1.654] 42.00
[.650] 16.50
[1.476] 37.50
M4X0.7 - 6H ⍌ 3.50[0.138]
OPTICAL AXIS
[2.953] 75.00
[2.402] 61.00
[1.476] 37.50
[.276] 7.00
[2.402] 61.00
[.276] 7.00
[2.953] 75.00

Dimensions: (inches) millimeters

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, visit info.matrox.com/imaging/form/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 or prototype applications/projects; troubleshooting, including remote debugging; and video/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 at www.matrox.com/imaging/en/buy/representatives/.

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 brochure or visit www.matrox.com/imaging/en/support/support_maintenance/.

Ordering Information

Matrox Iris GTR

Part number	Description
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-STARTER-KIT	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-STR-KIT	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' or 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' or 5 m Ethernet cable for Matrox Iris GTR. M12 to RJ45 connector.
GTR-CBL-VGAUSB	3.2' or 1 m cable for Matrox Iris GTR to connect VGA and USB. M12 to HD-15 and USB connectors.

Matrox Design Assistant X

Part number	Description
Included with GTR...0(C)	Matrox Iris GTR with Matrox Design Assistant comes with a DVD with the IDE and a maintenance registration number. It allows the IDE to run when the latter is connected to it. It is pre-loaded with the Matrox Design Assistant run-time environment. It 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), 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 registration (PhotometricStereo) steps requires an additional license purchased separately. Refer to the Matrox Imaging Library 10 datasheet – MIL 10 Run-Time Licenses section for ordering details.

Matrox Design Assistant X Maintenance Program

Part number	Description
DAMAINTENANCE	One-year extension to Matrox Design Assistant X maintenance program per developer. Included in the original purchase price of the Matrox Design Assistant X development package, it entitles registered users to one year of technical support, access to updates, and Matrox Vision Academy online training website. Note: 75% discount for DAMAINTENANCE if purchased with MIL Maintenance (i.e., MILMAINTENANCE) for the same user. 50% educational discount for DAMAINTENANCE with proof of affiliation with an academic institution. Discounts cannot be combined.

Ordering Information (cont.)

Matrox Vision Academy Training	
Online	
For access	**Description**
www.matrox.com/imaging/vision_academy/login	Matrox Vision Academy Online provides a range of categorized instructional videos on how to use the software to create vision applications.
	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 Training	
On-Premises	
Part number	**Description**
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.

Third-party Accessories

Compatible hardware	
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	ICS 3 Inline Control System: Continuous and strobe mode inline controller
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

Compatible hardware (cont.)	
Supplier	**Description**
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.
3. Internet Explorer®, Google Chrome™ / Chromium, and Firefox®.
4. Currently supports ABB IRC5, DENSO RC8, Epson RC420+ / RC520+, Fanuc LRMate200iC / LRMate200iD, KUKA KR C2, and Stäubli CS8 / CS8C HP / CS9 controllers.
5. Not Edge Finder.

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, 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

matrox®