

Matrox 4Sight GPm >>>

with Matrox Design Assistant 5.1



Vision controller with an intuitive, versatile, and extendable integrated development environment (IDE) for machine vision applications.



Overview

Matrox 4Sight GPM with Matrox Design Assistant¹

Matrox 4Sight GPM is a line of rugged, capable, and configurable vision controllers; paired with Matrox Design Assistant, an intuitive, versatile, and extendable IDE. Equipped with up to four Gigabit Ethernet ports (with power) and up to four SuperSpeed USB ports, Matrox 4Sight GPM supports the use of multiple GigE Vision[®] and USB3 Vision[®] industrial cameras to keep an eye on one or many production lines. Powered by a range of mobile-class embedded Intel[®] processors, it has the ability to handle typical multi-camera inspection applications in a cost-effective manner. It connects easily and directly to factory automation equipment and enterprise systems through discrete I/Os, Ethernet, RS-232 / RS-485, and USB ports. An industrial-strength design and careful component selection ensure its long-term availability.

Real-time discrete I/O management is achieved on the Matrox 4Sight GPM through a dedicated hardware-assisted mechanism. The mechanism enables output events to occur at precise moments in time, based on elapsed time or specific input events. An input event can come directly from a discrete input—including from a rotary encoder—or a count derived from a discrete input. Programmed output events are stored in a hardware list, which is traversed based on a clock or an input event. The execution of an output event results in a state transition, pulse, or pulse train on a specific discrete output. Multiple cascadable hardware timers are available to count or generate specific events. The Matrox 4Sight GPM has what it takes to effectively synchronize a typical vision application with a manufacturing line.

Matrox 4Sight GPM comes with Microsoft[®] Windows[®] Embedded Standard (WES) 7, which provides the familiarity, performance, and reliability of Windows, along with embedded features like the Enhanced Write Filter (EWF) to prevent corruptions caused by unanticipated power downs. The unit is pre-loaded with the 64-bit WES 7.

Matrox 4Sight GPM at a glance

Tackle typical vision workloads with a mobile-class embedded Intel processor

Employ the right image sensor format, resolution, and frame rate for the job by connecting any GigE Vision or USB3 Vision camera

Inspect multiple sites through the support for up to four GigE Vision and up to four USB3 Vision cameras

Simplify cabling for GigE Vision installations using Power-over-Ethernet (PoE) enabled ports

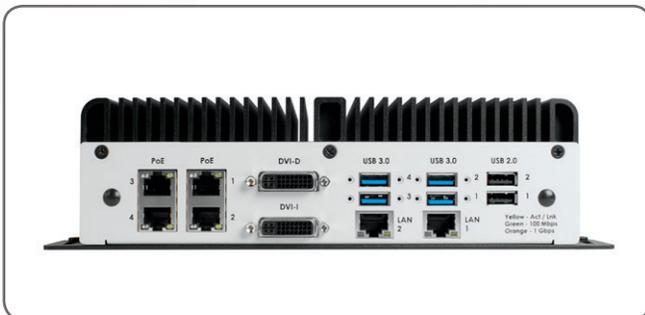
Connect separately to the factory floor and enterprise networks via up to two more Gigabit Ethernet ports

Synchronize with other automation equipment using the integrated real-time digital I/Os with rotary encoder support and RS-232 / RS-485 ports

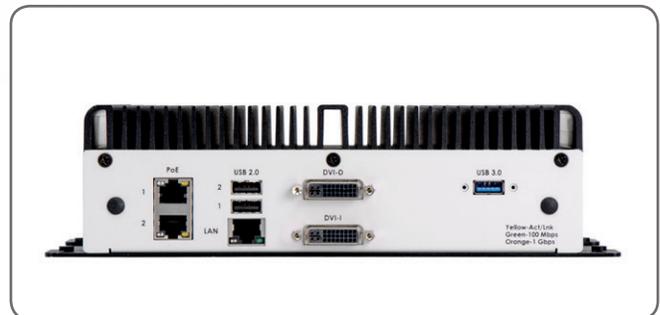
Install in space-limited, hostile environments with a small footprint and rugged casing

Reduce service stoppages with a fanless design

Employ with assurance of a managed, extended lifecycle



Matrox 4Sight GPM (Ivy Bridge)



Matrox 4Sight GPM (Bay Trail)

Matrox Design Assistant

Matrox Design Assistant 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 is hardware independent, you can choose any computer with GigE Vision or USB3 Vision cameras and get the processing power you need. This field proven software is also a perfect match for the Matrox 4Sight GPM vision controller or the Matrox Iris GTR smart camera. Matrox Design Assistant gives you the freedom to choose the ideal platform for your next vision project.

Application design

Flowchart and operator interface design are done within the Matrox Design Assistant 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 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.

Matrox Design Assistant can be used on a Matrox 4Sight GPM vision controller or in emulation mode. The latter allows for the design and testing of a flowchart and the creation of an operator interface without requiring the Matrox vision controller. Matrox Design Assistant's emulation mode is used to enable parallel project work, resulting in greater development efficiency.

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 at a glance

Solve machine vision applications quickly and easily without writing program code by using an intuitive flowchart-based methodology

Choose the best platform for the job within a hardware-independent environment that supports any PC with any GigE Vision or USB3 Vision camera

Deploy the same project simultaneously on a rugged and reliable Matrox vision controller and smart camera

Tackle machine vision applications with utmost confidence using field-proven tools for analyzing, locating, measuring, reading, and verifying

Use a single program for creating both the application logic and operator interface

Work with multiple cameras within the same project

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 the ability to create custom flowchart steps

Communicate actions and results to other automation and enterprise equipment via discrete Matrox I/Os, RS-232 / RS-485, and Ethernet (TCP / IP, EtherNet / IP™, Modbus®, PROFINET®, and native robot interfaces)

Maintain control and independence through the ability to create custom flowchart steps

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

Protect against inappropriate changes with the Project Change Validator tool

Matrox Design Assistant (cont.)

Create custom flowchart steps

Users have the ability to extend the capabilities of Matrox Design Assistant by way of the included Custom Step software development kit (SDK). The SDK, in combination with Microsoft Visual Studio® 2013/2015/2017, 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 Matrox 4Sight GPM vision controller as was used for development. Remote deployment is to a different computer, including a Matrox 4Sight GPM vision controller, or a Matrox smart camera.

Project templates for quicker start-up

Matrox Design Assistant 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
- 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 software.

Release 5.1 highlights

Project Change Validator tool guards against detrimental changes to a project

Image-centric configuration lets measurements be set up directly on an image instead of through a configuration pane

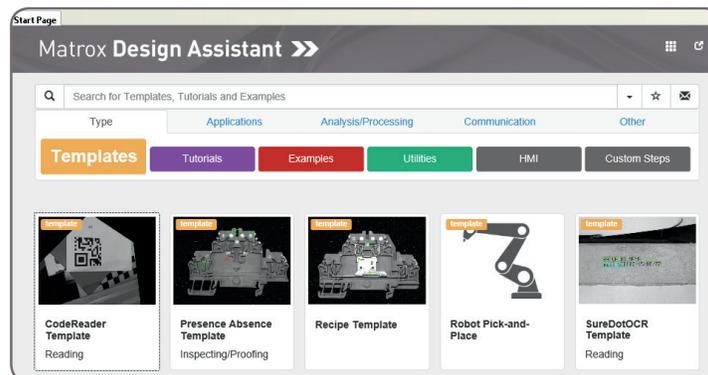
QuickComm provides ready-to-go communication with a programmable logic / automation controller

Events & Actions put the management of specific events and actions into secondary flowcharts thus simplifying the main flowchart

Persistent recipes enable the creation of a simpler flowchart with different settings for inspecting similar object types

HTML-5-based Operator View provides access to the operator interface from any HTML-5 capable browser

SureDotOCR™ step enables the reading of dot-matrix text even when distorted, rotated and on irregular backgrounds



Project templates

IDE

Customizable developer interface

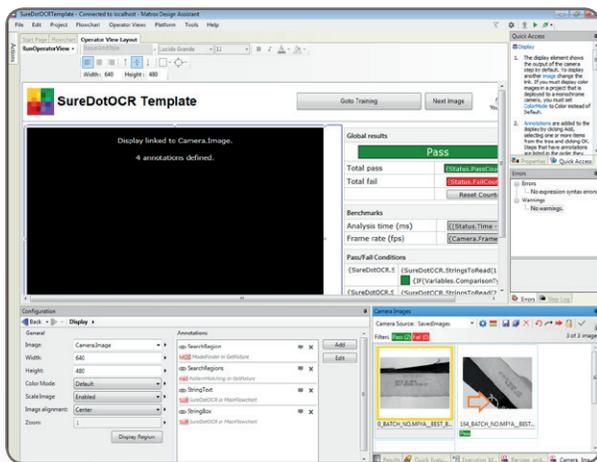
The Matrox Design Assistant user interface can be tailored by each developer. The workspace can be rearranged, even across multiple monitors, to suit individual preferences and further enhance productivity.

The screenshot displays the Matrox Design Assistant IDE interface. At the top, three callout boxes highlight key features: 'Select the action to perform from a context-based list' (pointing to the toolbar), 'Conveniently switch between the flowchart and image, or operator views' (pointing to the main workspace), and 'Get quick access to context sensitive help' (pointing to the 'Quick Access' panel). The main workspace is divided into several sections: a flowchart on the left showing a loop with steps like 'Camera', 'HLLine', 'GetFixture', 'FixtureFound', 'SureDotOCR', and 'Status'; a central image of a document with text 'BATCH NO. MFYA' and 'BEST BEFORE: 15/06/27'; a 'Quick Access' panel on the right with 'String Models' and 'Other step annotation'; and a 'Results' panel at the bottom right. A callout box 'View results for features within the image' points to the 'Results' panel. At the bottom, three callout boxes highlight: 'Configure each step without losing sight of flowchart and image' (pointing to the 'Configuration' panel), 'Instantly view results after each step' (pointing to the 'Results' panel), and 'Track and navigate the flowchart execution history without losing sight of the image' (pointing to the flowchart).

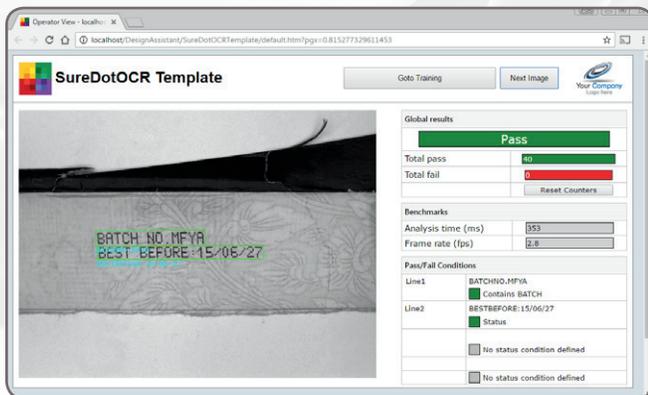
Callout boxes:

- 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 browser³. Local viewing is done on the same Matrox 4Sight GPM vision controller used for development. 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 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

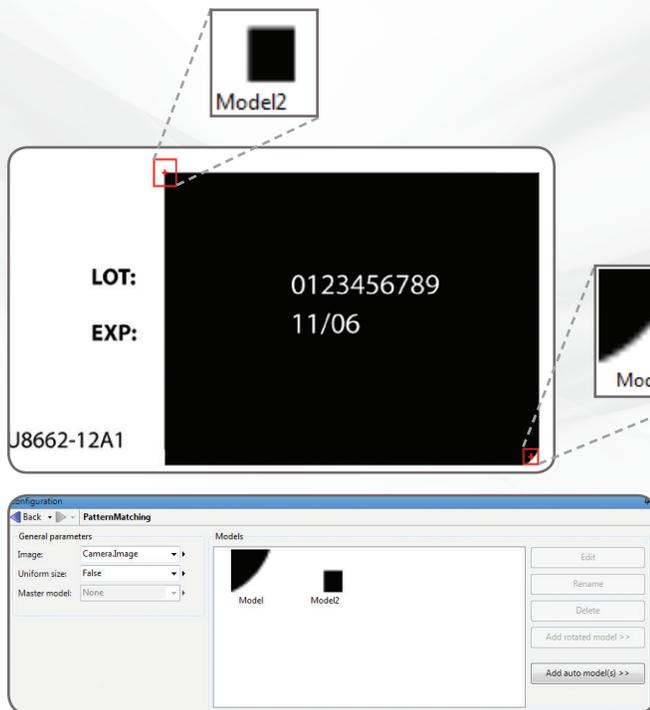
Image analysis and processing

Central to Matrox Design Assistant 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

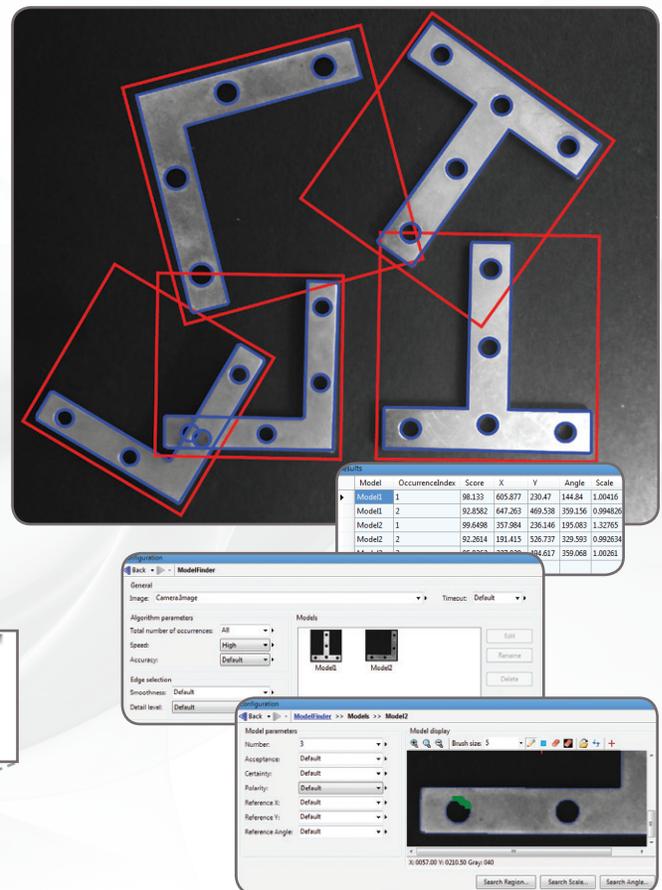
Matrox Design Assistant includes two steps for performing pattern recognition: Pattern Matching and Model Finder. These steps are primarily used to locate complex objects for guiding a gantry, stage, or robot, or for directing subsequent measurement steps.

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.



Pattern Matching

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 and search parameters can be manually adjusted and models can be manually edited to tailor performance.

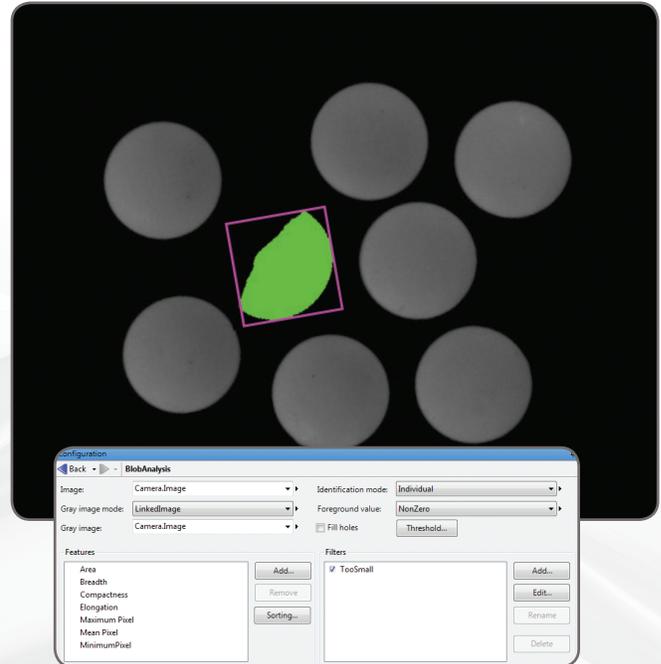


Model Finder

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

Vision Tools (cont.)

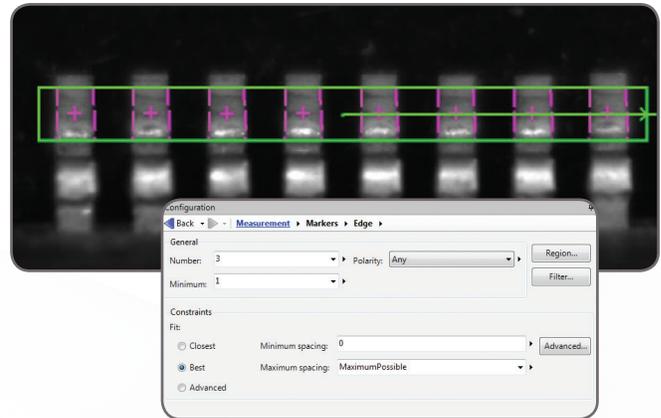
1D and 2D measurements

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

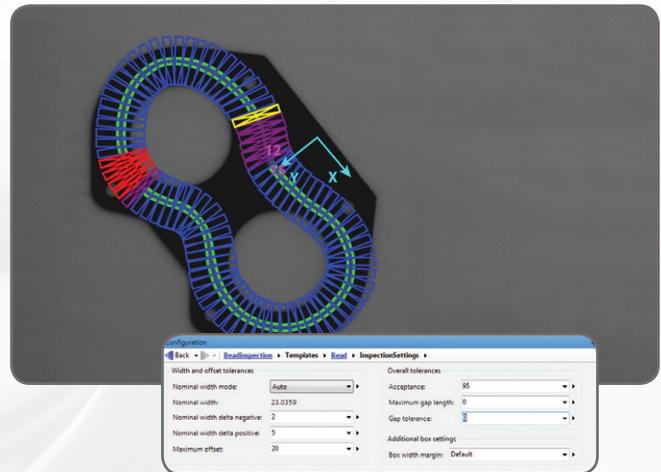
The Measurement step uses the projection of image intensity to very quickly locate and measure straight edges or stripes within a carefully defined rectangular region. The tool can make several 1D measurements on edges and stripes, as well as between edges or stripes.

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.

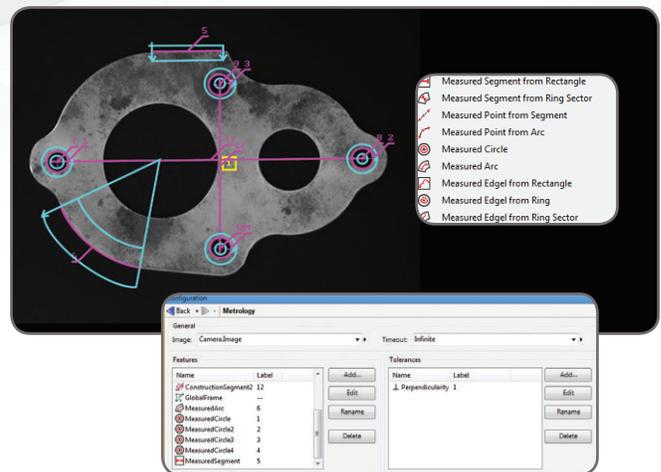
The Metrology step is intended for 2D geometric dimensioning and tolerancing applications. The step extracts edges within defined regions to best fit geometric features. It also supports the construction of geometric features derived from measured ones or defined mathematically. Geometric features include 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 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.



| Region | Best Match | Status | Match Score | Distance | Area pixel count | Area Relevance | Pixel cov |
|------------|------------|--------|-------------|----------|------------------|----------------|-----------|
| Region[0] | Y | Pass | 96.7607 | 4.87436 | 200 | N/A | N/A |
| Region[1] | R | Fail | 0 | 113.133 | | N/A | N/A |
| Region[2] | G | Fail | 0 | 158.259 | | N/A | N/A |
| Region[3] | Y | Pass | 80.6436 | 32.7195 | 941 | 100 | N/A |
| Region[4] | R | Fail | 0 | 134.832 | | N/A | N/A |
| Region[5] | R | Fail | 0 | 71.3813 | | N/A | N/A |
| Region[6] | G | Pass | 80.6436 | 32.7195 | | N/A | N/A |
| Region[7] | R | Pass | 94.7382 | 8.02827 | 898 | 100 | N/A |
| Region[8] | Y | Fail | 0 | 125.879 | | N/A | N/A |
| Region[9] | R | Pass | 94.7382 | 8.02827 | | N/A | N/A |
| Region[10] | G | Fail | 0 | 75.0877 | | N/A | N/A |

Color Matcher

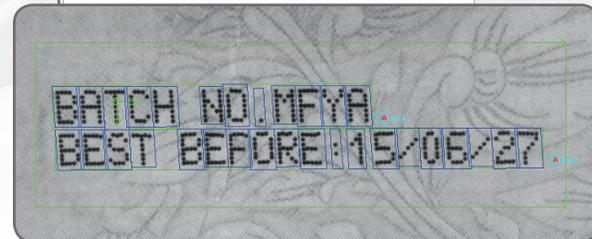
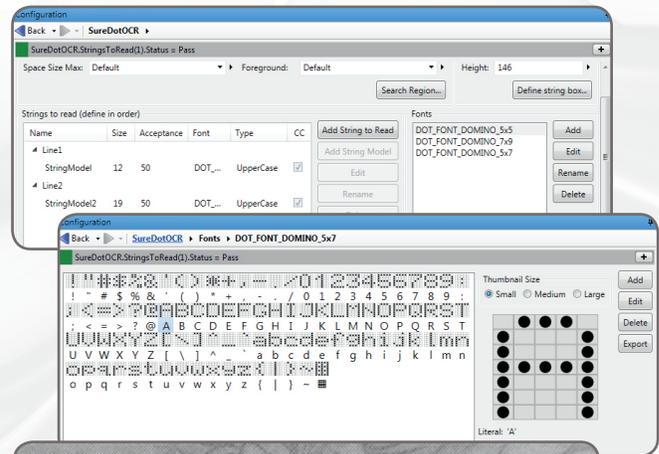
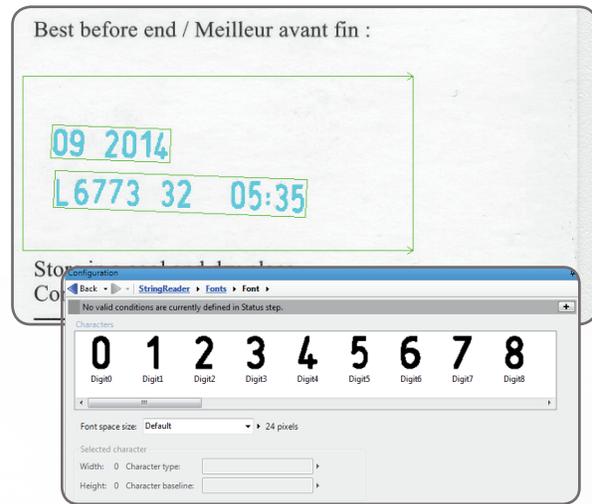
Vision Tools (cont.)

Character recognition

Matrox Design Assistant 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 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.



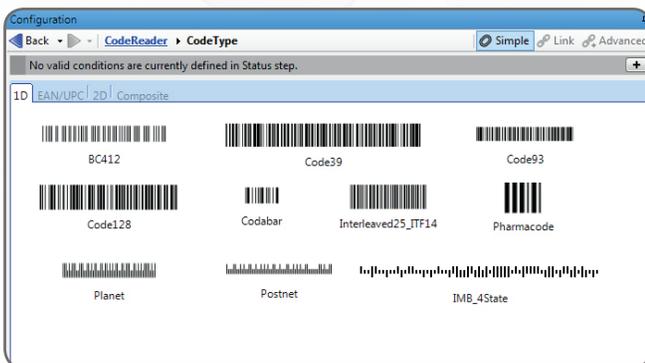
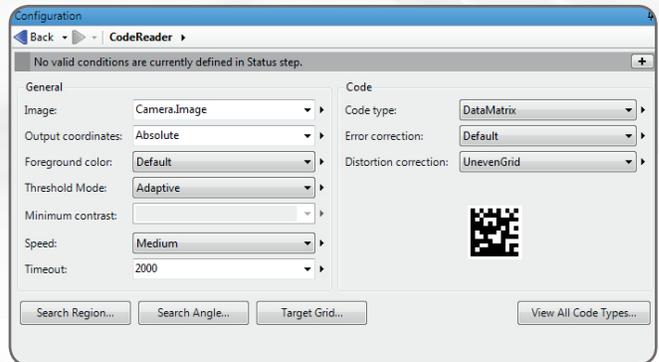
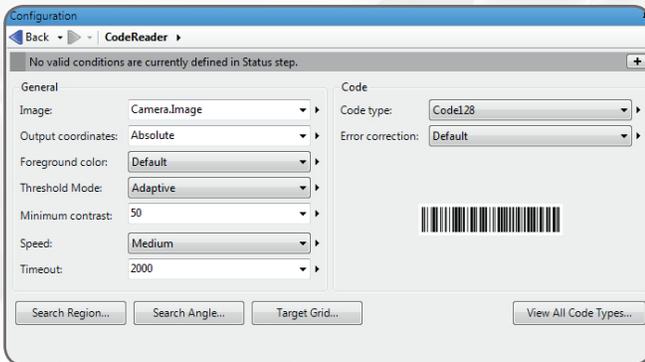
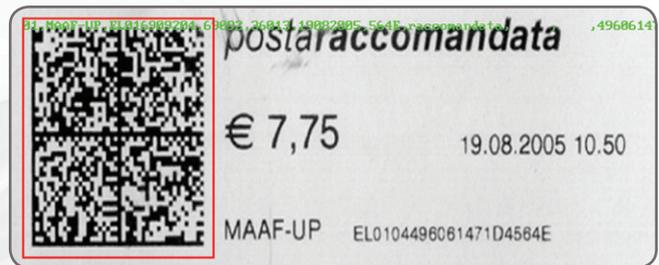
SureDotOCR

Vision Tools (cont.)

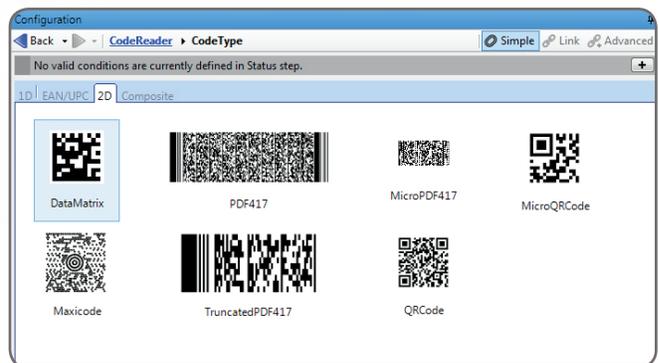
1D and 2D code reading and verification

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]



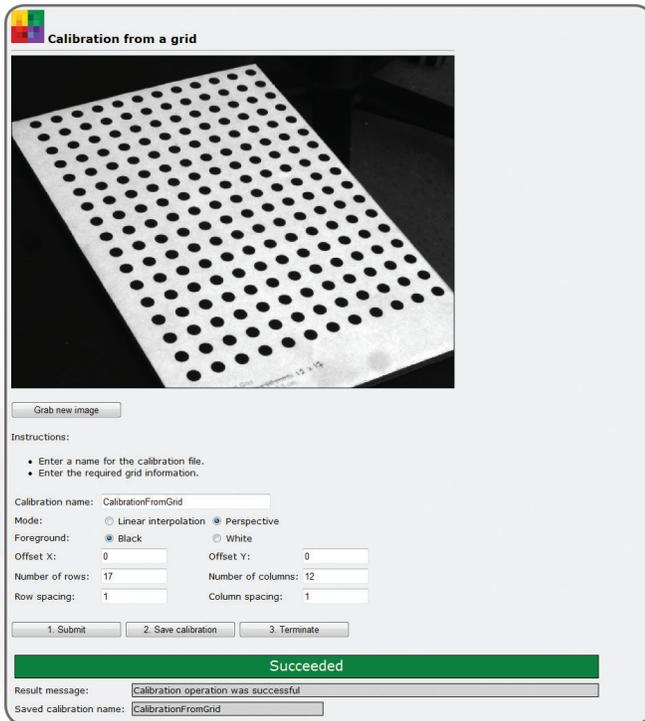
Code Reader [2D]

Vision Tools (cont.)

Calibration

Calibration is a routine requirement for machine vision. Matrox Design Assistant 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 configuration portal.



Calibration

Basic image processing

Matrox Design Assistant 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 also includes Edge Locator and Intensity Checker. Edge Locator finds objects by locating straight edges and Intensity Checker is used to analyze an object using image intensity.

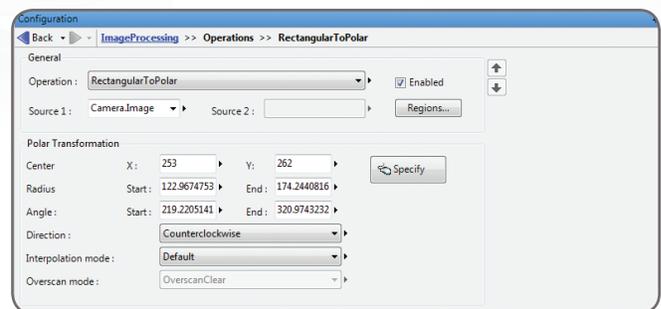
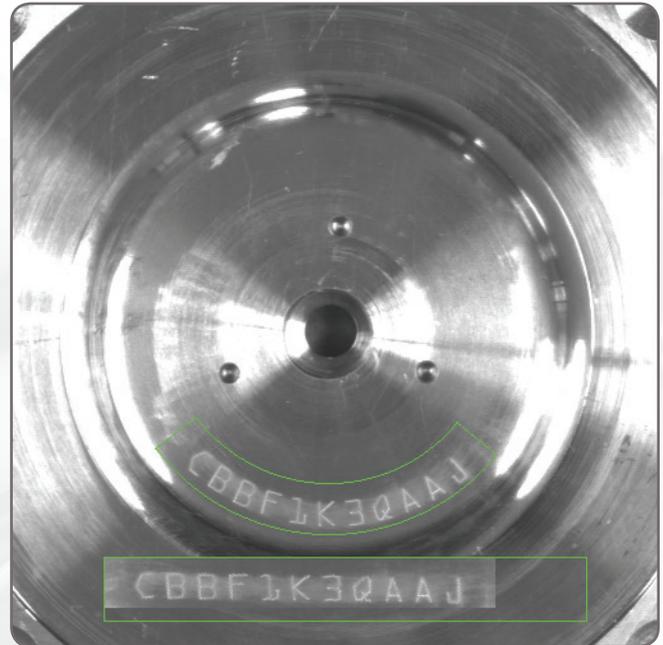
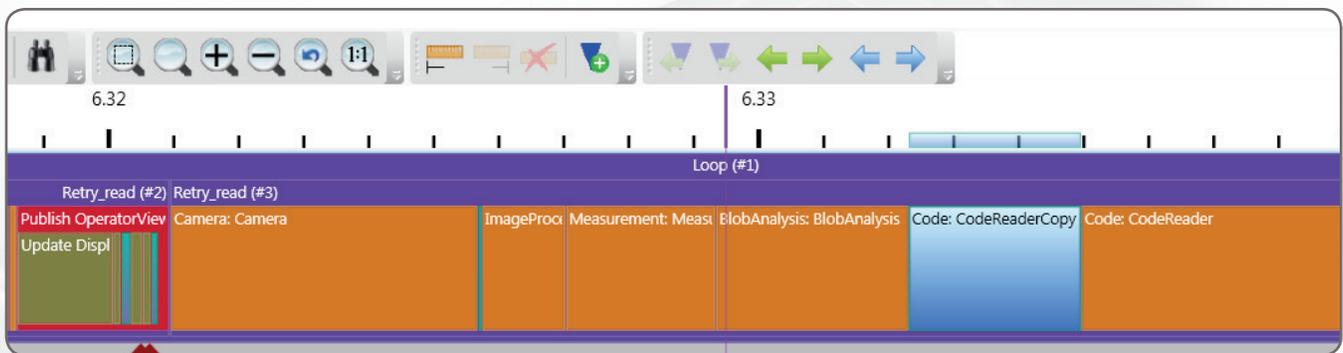


Image Processing

Utilities

Matrox Profiler

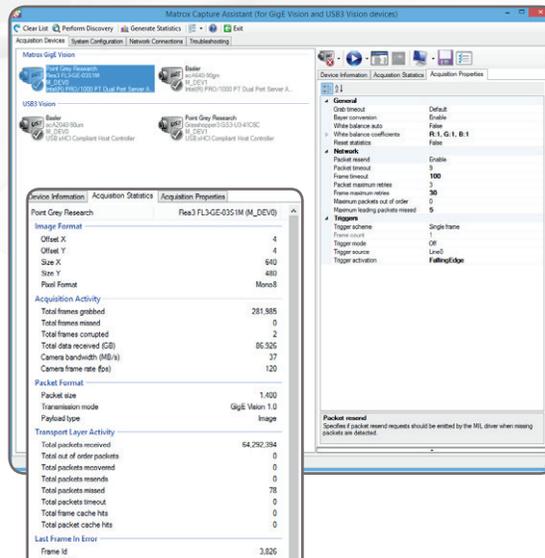
Matrox Design Assistant includes Matrox Profiler, a separate utility to post-analyze the execution of a vision project for performance bottlenecks and timing issues. It presents the flowchart steps executed over time on a navigable timeline. Matrox Profiler permits searching for and selecting specific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



Matrox Profiler

Matrox Capture Assistant

Matrox Capture Assistant is another separate utility included with Matrox Design Assistant to verify the connection to one or more GigE Vision or USB3 Vision cameras and testing video acquisition. It can obtain GigE Vision and USB3 Vision device information, collect and present acquisition statistics and provide access to acquisition (GenICam™) properties. The gathering and display of statistics can be performed when acquiring within or outside of Matrox Capture Assistant. Matrox Capture Assistant also allows the adjustment of GigE Vision driver settings and provides the means to troubleshoot connectivity issues.



Information - Basler acA640-90gm (M_DEV1)

Your device's packet size is not optimal. The packet size is negotiated during device allocation. If the packet size problem persists after allocation, please verify your firewall settings as they might prevent packet size negotiation.

Matrox Capture Assistant GigE Vision and USB3 Vision configuration and test tool.

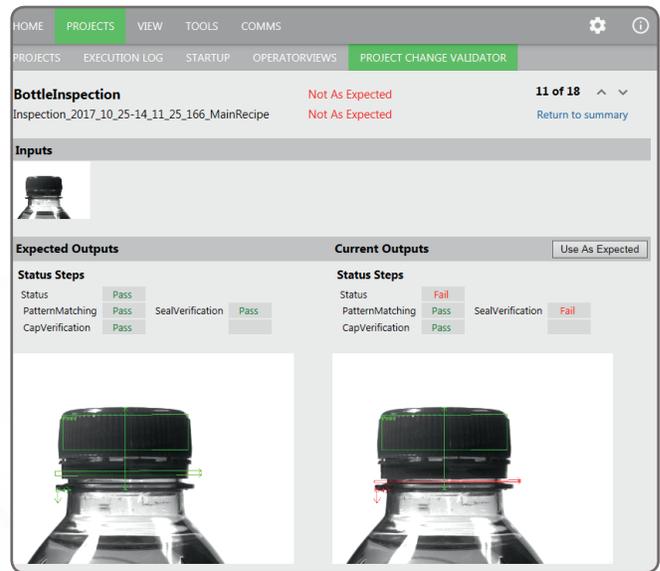
Utilities (cont.)

Project Change Validator

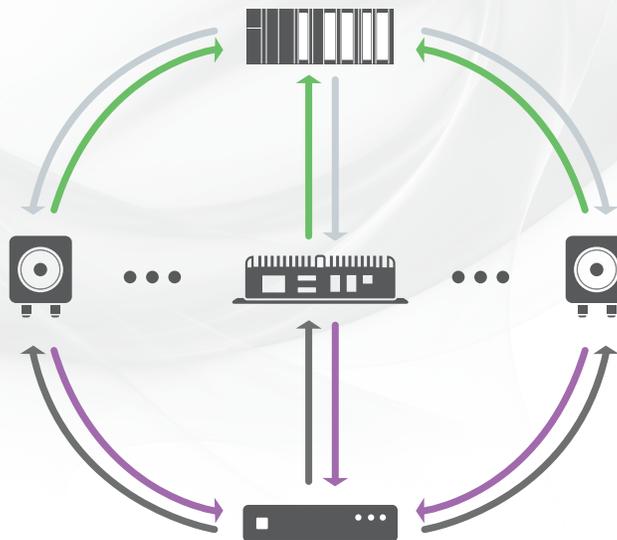
Project Change Validator is a utility employing a client-server architecture for ensuring that changes made to a deployed project are not detrimental to the functioning of that project. It provides the ability to record reference images, along with the associated inspection settings and results, for 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 computer⁴—which is reachable over a network.

The Matrox Design Assistant 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 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

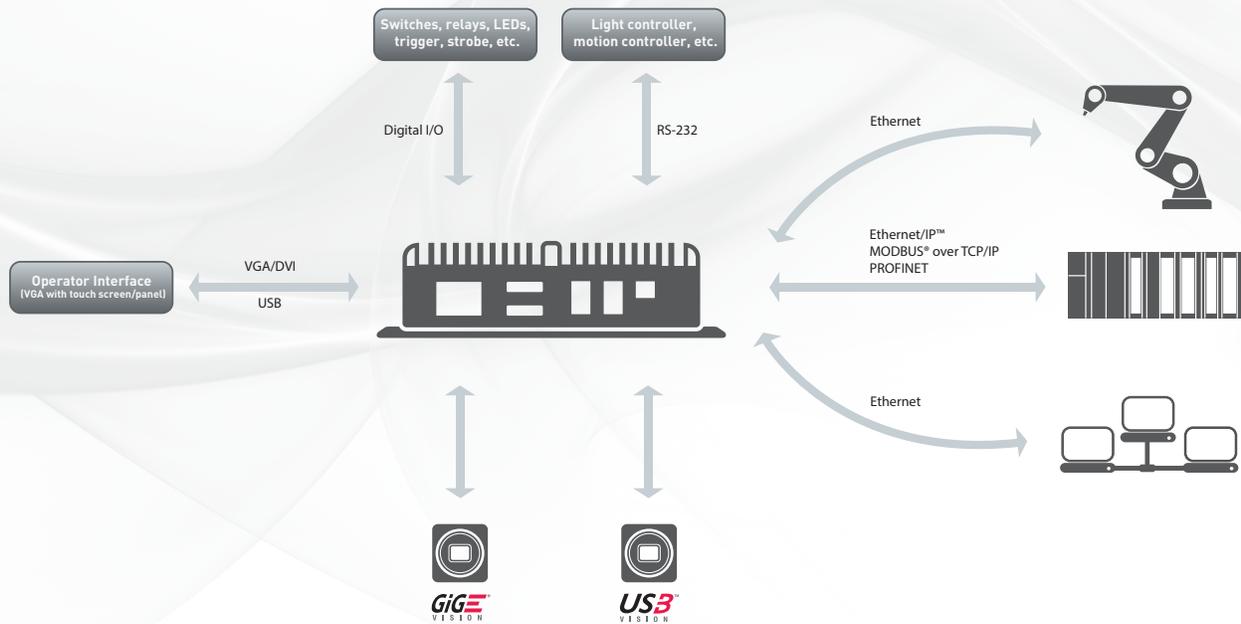
Connectivity

Connect to devices and networks

Matrox 4Sight GPM features four PoE Gigabit Ethernet ports for connecting to GigE Vision cameras, and four USB 3.0 ports for connecting to USB3 Vision cameras. Additionally, two more Gigabit Ethernet ports allow for direct connection to factory-floor and enterprise networks.

Communication over these networks is configured through Matrox Design Assistant; the Matrox 4Sight GPM and Matrox Design Assistant can employ TCP/IP protocols, as well as EtherNet/IP², Modbus over TCP/IP, and PROFINET protocols, enabling interaction

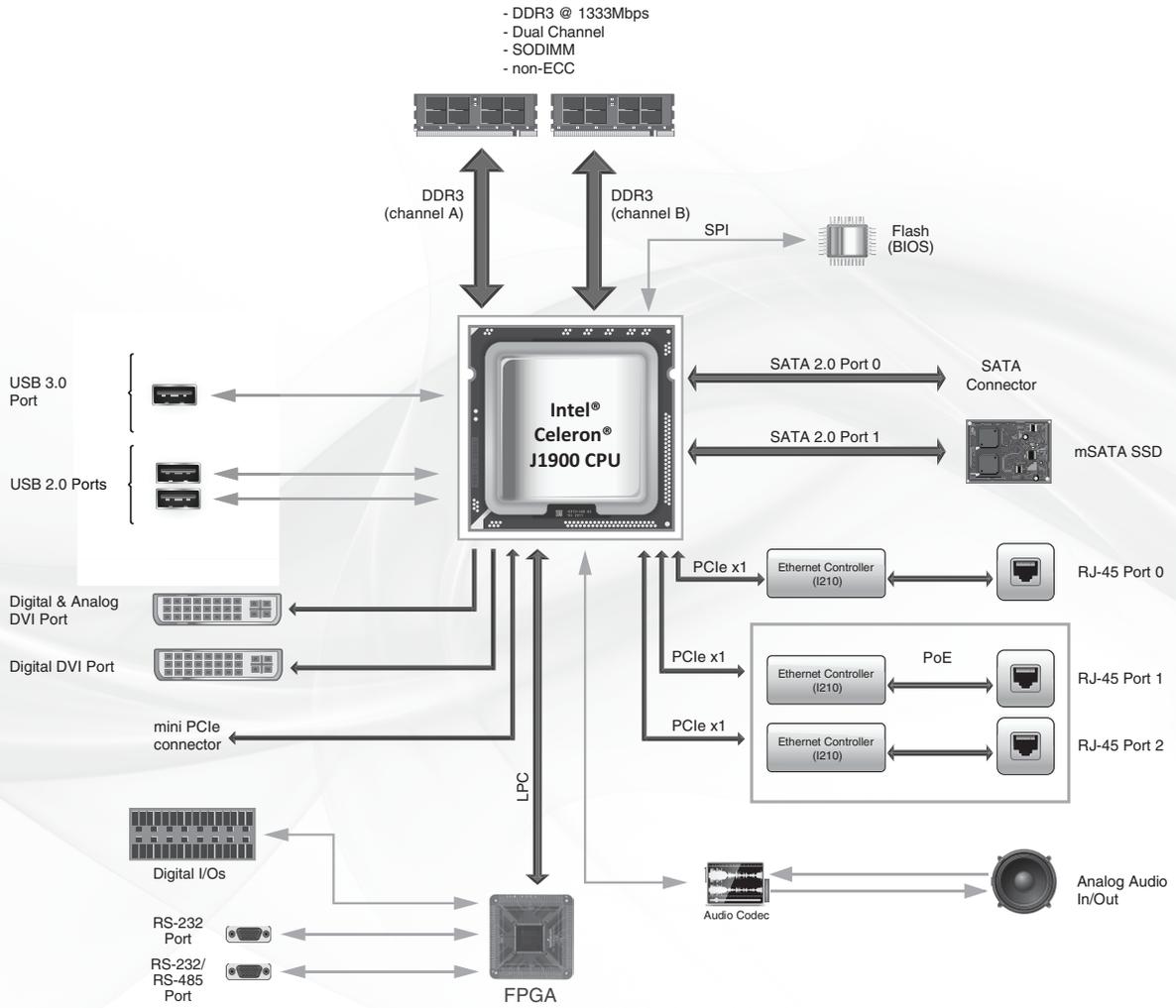
with programmable logic / automation controllers. Its QuickComm facility provides ready-to-go communication with these controllers. Direct communication can be established with select robot controllers⁵ for 2D vision-guided robotic applications. Matrox 4Sight GPM can also be configured to directly interact with automation devices through two RS-232 / RS-485 serial interfaces as well as 16 industrial real-time digital I/Os (eight inputs and eight outputs). These I/Os have dedicated hardware to reliably count time-intervals and pulses from rotary encoders.



Connectivity (cont.)

Matrox 4Sight GPM (Bay Trail)

Block diagram



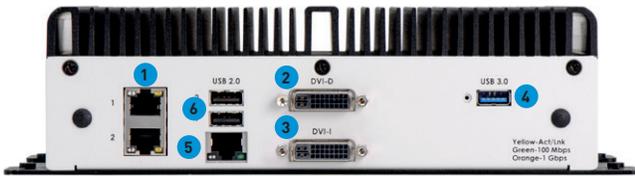
Connectivity (cont.)

Matrox 4Sight GPM Front and back views

Matrox 4Sight GPM (Ivy Bridge)



- | | | | | |
|-----------------------|------------------|--------------------|----------------------|------------------|
| 1. GbE ports with PoE | 4. USB 3.0 ports | 7. Power button | 11. Audio in | 14. Power input |
| 2. DVI-D output | 5. GbE ports | 8. Digital inputs | 12. RS232/RS485 port | 15. HDD LED |
| 3. DVI-I output | 6. USB 2.0 ports | 9. Digital outputs | 13. RS232 port | 16. Power on LED |
| | | 10. Audio out | | |



Matrox 4Sight GPM (Bay Trail)

Matrox 4Sight GPM chassis

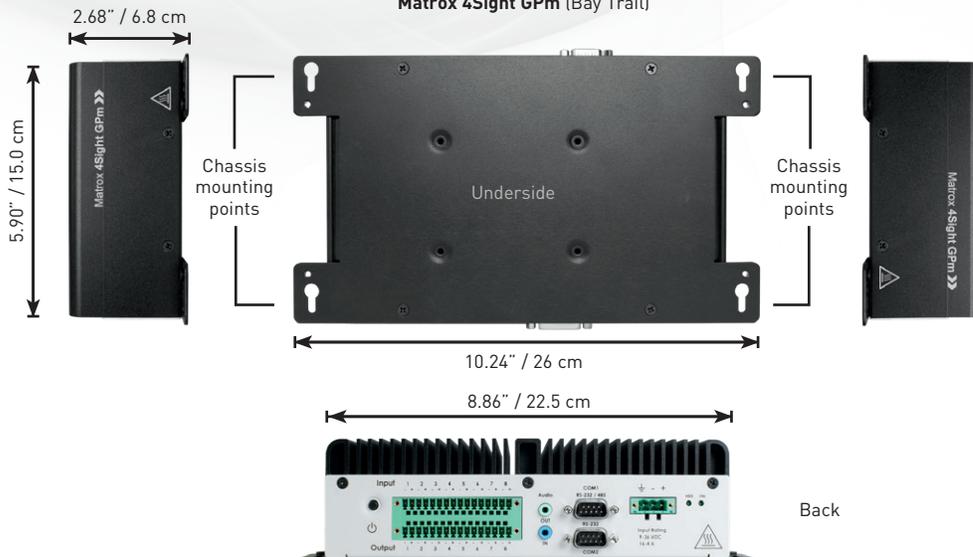
Matrox 4Sight GPM (Ivy Bridge)



Front



Matrox 4Sight GPM (Bay Trail)



Specifications

Matrox 4Sight GPM

System (Ivy Bridge / Bay Trail)

- Intel HM76 Platform Controller Hub (PCH) / NA
- Two (2) 204-pin DDR3-1600 / 1333 SODIMM slots (dual-channel)
 - Dual-head graphics support
 - One (1) DVI display output: DVI-D 1.0 compliant, up to 1920x1200 @60Hz
 - One (1) DVI-I display output: Up to 1920x1200 @60Hz digital; up to 2048x1536 @75Hz / 60Hz analog
- Six (6) / three (3) Gigabit Ethernet ports (10/100/1,000)
 - Four (4) / two (2) GigE ports with PoE; up to 15.4 watts per port
 - Two (2) / one (1) standard GigE ports
- Four (4) / one (1) USB 3.0 ports
- Two (2) USB 2.0 ports
- One (1) SATA port (internal)
- One (1) mSATA connector; used by supplied 64 GB mSATA MLC SSD
- One (1) mini PCIe connector (internal)
- One (1) 24-bit stereo audio input and 24-bit stereo output
- One (1) RS-232 port
- One (1) RS-232 / RS-485 port
- Sixteen (16) digital I/Os
 - Eight (8) inputs; up to 24 V
 - Eight (8) outputs; open collector; 100mA max. @24VDC
- 64 GB / 32 GB mSATA SSD
- Power input: 10 to 32 VDC (nominal 24 VDC @ 4.2 Amps)
- Fanless enclosure
- Dimensions (length x width x height): 22.5x5.0x6.8 cm (8.86x5.90x2.68 in)
- Mounting:
 - Four (4) mounting slots

Environmental Information

- Operating temperature: 0°C (32°F) to 50°C (122°F)
- Storage temperature: -40° C (-40° F) to 85° C (185° F)
- Up to 90% (non-condensing) relative humidity

Certifications

- FCC part 15 class A
- CE Class A (ITE)
- CSA certified to CSA60950 and UL60950
- RoHS-compliant

Matrox 4Sight GPM (cont.)

Configuration (Bay Trail)

- Intel Celeron® J1900
 - Quad core
 - 2.0 GHz - 2.4 GHz
 - 2 MB cache
 - Intel HD Graphics (688 MHz – 854 MHz)
- 4 GB dual-channel DDR3-1333

Configuration (Ivy Bridge)

- Intel Core™ i7-3517UE
 - Dual core with hyperthreading
 - 1.7 GHz – 2.8 GHz
 - 4 MB cache
 - Intel HD Graphics 4000 (350 MHz – 1 GHz)
- Intel Core i3-3217UE
 - Dual core with hyperthreading
 - 1.6 GHz
 - 3 MB cache
 - Intel HD Graphics 4000 (350 MHz – 900 MHz)
- Intel Celeron 1047UE
 - Dual core
 - 1.4 GHz
 - 2 MB cache
 - Intel HD Graphics (350MHz – 900 MHz)
- 4 GB dual-channel DDR3-1600
- 8 GB dual-channel DDR3-1600

Training and Support

Matrox Vision Academy

Matrox Vision Academy provides online and on-premises training for Matrox Design Assistant.

Online, Vision Academy comprises an on-demand training resource, with a multitude of categorized instructional videos on how to use Matrox Design Assistant to create vision applications. Available to customers with valid Matrox Design Assistant maintenance subscriptions, as well as those evaluating the software, users can seek out training on specific topics of interest, where and when needed.

On-premises intensive instructor-led training courses are regularly held at Matrox headquarters, and can also be customized for onsite delivery. These courses cover the main aspects of using Matrox Design Assistant to develop vision applications. Each course combines lectures—delivered by support and/or development staff—with hands-on labs to get attendees going with either software environment.

Matrox Vision Academy aims to help users increase productivity, reduce development costs, and bring applications to market sooner. For more information, please visit www.matrox.com/imaging/en/support/training/.

Matrox Vision Squad

Matrox Imaging's devoted front-line support and applications teams are on call to offer timely product installation, usage, interoperability, and integration assistance matters.

We also offer the assistance of our exclusive Matrox Vision Squad. The Vision Squad's knowledgeable staff provides more in-depth support, helping assess application feasibility, recommend best methods, and even prototype solutions for Matrox Design Assistant users.

Matrox Design Assistant maintenance program

Matrox Design Assistant provides registered users automatic enrollment in the maintenance program for one year. This maintenance program entitles registered users to technical support and free software upgrades from Matrox Imaging, as well as access to Matrox Vision Academy, our online repository of on-demand training resources for Matrox Design Assistant. Just before the expiration of the maintenance program, registered users will have the opportunity to extend the program for another year. For more information, refer to the Matrox Imaging Software Maintenance Programs brochure or visit www.matrox.com/imaging/en/support/support_maintenance/.



Ordering Information

Matrox 4Sight GPM

| Part number | Description |
|-------------|--|
| 4GPMJM4DA* | Matrox 4Sight GPM integrated unit with Intel Celeron J1900, 4 GB DDR3 RAM, 64 GB mSATA MLC SSD, Microsoft Windows Embedded Standard 7 (64-bit) ⁶ . |
| 4GPMCM4DA* | Matrox 4Sight GPM integrated unit with Intel Celeron 1047UE, 4 GB DDR3 RAM, 64 GB mSATA MLC SSD, Microsoft Windows Embedded Standard 7 (64-bit) ⁶ . |
| 4GPMI3M8DA* | Matrox 4Sight GPM integrated unit with Intel Core i3-3217UE, 8 GB DDR3 RAM, 64 GB mSATA MLC SSD, Microsoft Windows Embedded Standard 7 (64-bit) ⁶ . |
| 4GPMI7M8DA* | Matrox 4Sight GPM integrated unit with Intel Core i7-3517UE, 8 GB DDR3 RAM, 64 GB mSATA MLC SSD, Microsoft Windows Embedded Standard 7 (64-bit) ⁶ . |
| 4GPMPS* | 100 W AC/DC power adapter (90-264 VAC input/24 VDC output) for Matrox 4Sight GPM. |

Matrox Design Assistant 5.1

| Part number | Description |
|-------------|---|
| Included | Matrox 4Sight GPM with Matrox Design Assistant comes fully pre-loaded with the latter and includes a Matrox Design Assistant Maintenance registration number. Note: Matrox 4Sight GPM with Matrox Design Assistant is pre-licensed for Bead, Blob Analysis, Calibration, Code Reader, Color Analysis, Edge Locator ⁷ , Image Processing, Intensity Checker, Measurement, Metrology, Pattern Matching, calibration, I/O, and communication features. Additional features, such as Model Finder, String Reader, and SureDotOCR, require the installation of an additional license (see MIL datasheet – MIL 10 Run-Time Licenses section). |

Matrox Design Assistant Maintenance Program

| Part number | Description |
|--------------|---|
| DAMAINTEANCE | One-year extension to Matrox Design Assistant maintenance program per developer. Included in the original purchase price of the Matrox 4Sight GPM with Matrox Design Assistant, it entitles registered users to one year of technical support, access to updates, and Matrox Vision Academy online training web site. Note: 75% discount for DAMAINTEANCE if purchased with MIL Maintenance (i.e., MILMAINTENANCE) for the same user. 50% educational discount for DAMAINTEANCE with proof of affiliation with an academic institution. Discounts cannot be combined. |

Ordering Information (cont.)

Matrox Vision Academy Training

Online

| For access | Description |
|---|---|
| https://www.matrox.com/imaging/vision_academy/login/ | <p>Matrox Vision Academy Online provides a range of categorized instructional videos on how to use the software to create vision applications.</p> <p>Vision Academy Online is available to customers with current Matrox Design Assistant maintenance subscriptions, as well as those evaluating the software.</p> <p>Visit www.matrox.com/imaging/en/support/training/ for more information.</p> |

Matrox Vision Academy Training

On-Premises

| Part number | Description |
|----------------------------------|---|
| DATRAIN Ask for availability. | <p><i>Matrox Design Assistant</i>: Three-day instructor-led training on developing machine vision applications using the Matrox Design Assistant IDE.</p> <p><i>Key topics</i>: Developing a vision or inspection system; using flowcharts to replace coding; setting up operator view; choosing analysis and processing tools; interfacing with IDE.</p> <p>Visit www.matrox.com/imaging/en/support/training/classroom/ for more information.</p> |

Endnotes:

- The software may be protected by one or more patents; see www.matrox.com/patents for more information.
- Certification pending.
- Internet Explorer®, Google Chrome™ / Chromium, and Firefox®.
- With the Matrox Design Assistant run-time environment running natively, or in a virtual machine if the project to validate involves a Matrox Iris GTR smart camera.
- Currently supports ABB IRC5, DENSO RC8, Epson RC420+ / RC520+, Fanuc LRMate200iC / LRMate200iD, KUKA KR C2, and Stäubli CS8 / CS8C HP / CS9 controllers.
- With support for multiple languages. Note:
 - Only one language version can be used at any given time.
 - Une seule version de langue peut être utilisée à la fois.
 - Nur eine Sprachversion kann zu jeder gegebenen Zeit verwendet werden.
 - Solo una versione di ogni lingua può essere utilizzata allo stesso tempo.
 - Solo puede ser utilizada la versión de un idioma a la vez.
 - いかなる時でも一言語毎の使用のみが可能になります。
 - 한 가지 언어로만 제공되며 언제든지 사용이 가능하다
 - 两种以上的语言版本不可以同时使用
- 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.

Corporate headquarters

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