NEW

Deep learning inference capable and ready for a hefty boost

Matrox **Iris GTX** »

Enhanced smart camera for machine vision at the edge

MATROX
IMAGING

Overview

Machine vision and deep learning edge IoT device

Matrox® Iris GTX is the next evolution of smart cameras from Matrox Imaging. Offering faster, higher-resolution sensors and substantially more processing power than its immediate predecessor, Matrox Iris GTX provides exceptional performance for a compact all-in-one vision system. Paired with flowchart-based Matrox Design Assistant® X[1] software, engineers and technicians can quickly configure and deploy machine vision applications directly to the Matrox Iris GTX smart cameras. Video capture, analysis, classification, location, measurement, reading, verification, communication, and I/O operations—as well as a web-based operator interface—are all set up within the same software. Matrox Iris GTX smart cameras are model edge IoT devices, performing data acquisition and analytics, and providing results nearest to the manufacturing process requiring guidance or inspection, thus ensuring consistent, timely response and action.

An Intel® Atom® x6000 series embedded processor allows the use of faster, higher-resolution image sensors that together deliver new levels of performance to the Matrox Iris GTX. The efficient processor enables the Matrox Iris GTX smart cameras to handle both traditional machine vision workloads as well as deep learning inference. These smart cameras also offer real-time digital I/Os for interfacing directly to automation devices. They provide GigE and USB ports, and a VGA video output to enable full integration within an automation cell or machine.

Compact footprint for harsh industrial spaces

Matrox Iris GTX smart cameras are designed for challenging environments. Boasting the same small footprint and cabling connections as its immediate predecessor, the Matrox Iris GTX smart cameras features a sturdy IP67-rated housing and robust M12 connectors for its external interfaces, allowing them to operate in dusty, wet, and other demanding conditions. These smart cameras accept standard C-mount lenses within a dust- and liquid-proof protective cap. Contained within this cap is an interface to a Corning® Varioptic® C-C-Series auto-focus lens for focus adjustment from within on-device software. Matrox Iris GTX also feature an LED lighting intensity control output—compatible with Advanced illumination Inline Control System (ICS) 3 lighting control and Smart Vision Lights brick spot lights—for direct adjustments within the on-device software. The ability to adjust the lens focus and control illumination intensity directly from within on-device software eliminates the need for manual intervention in hard-to-reach places.

Quick and reliable response

Matrox Iris GTX smart cameras offer real-time digital I/Os for interfacing directly to automation devices. Each digital I/O on the Matrox Iris GTX is managed by a dedicated hardware engine for real-time performance. The real-time I/O engine enables an output event to occur at a precise moment in time, after a certain elapsed time, or following a specific input event. An input event can come directly from an input, including from an incremental rotary

encoder or a count derived from an input. A programmed output event is stored in a hardware list, which is traversed based on a clock or an input event. The carrying out of an output event results in a state transition, pulse, or pulse train on a specific output. Multiple hardware timers, which can be cascaded together, are available to count or generate specific events.

Matrox Iris GTX also feature a hardware-assisted mechanism for PROFINET communication, ensuring timely response when the automation controller is set up for a short cycle time or when the processor is too busy performing other tasks.
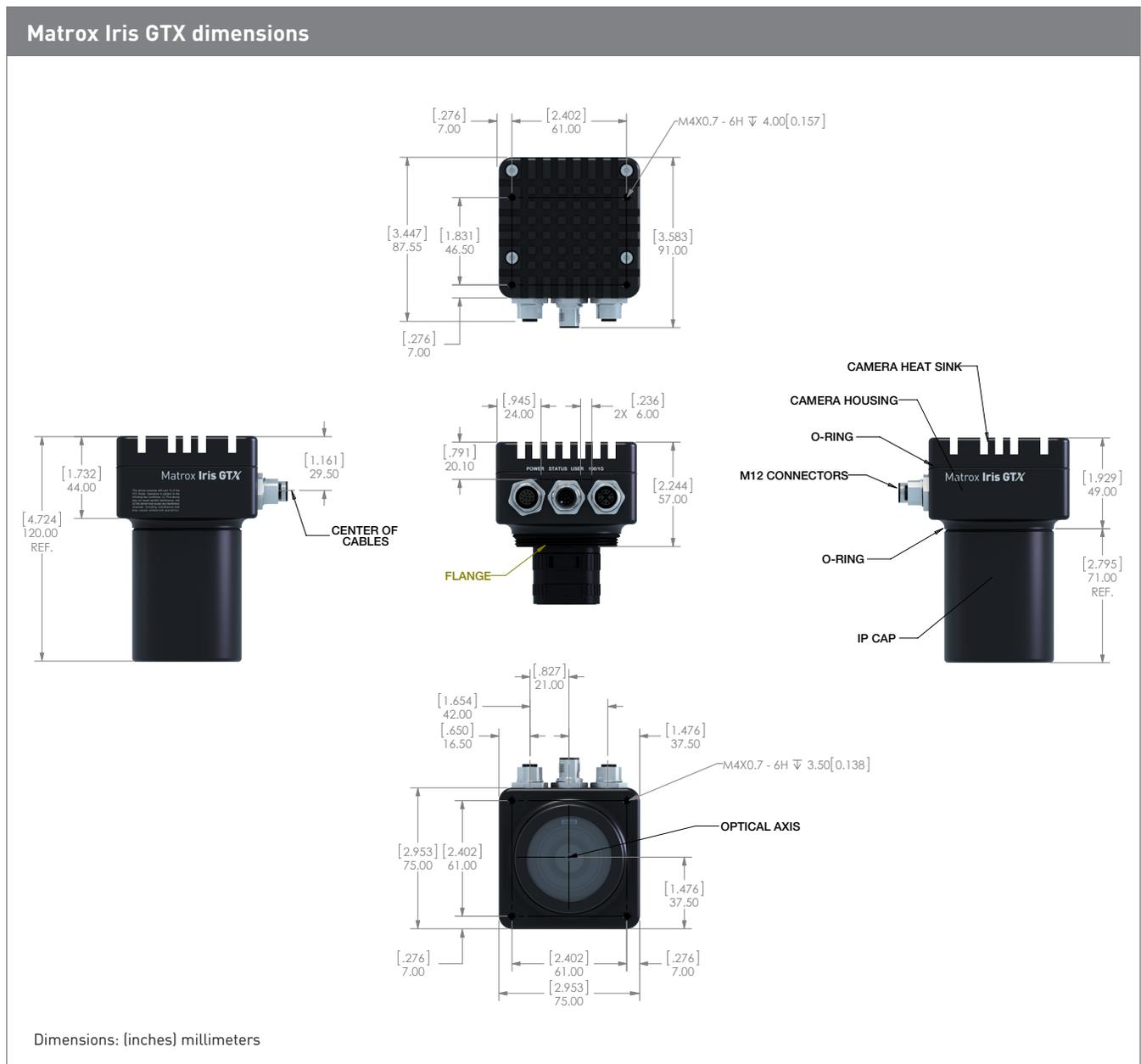

Matrox Iris GTX at a glance

Boost performance by up to 3x over its precursor thanks to an Intel x6000 series embedded processor

Capture high-resolution images at high speed through a choice of CMOS sensors from two to 16 Megapixels

Deploy in dirty, humid, or harsh industrial environments by way of a compact IP67-rated design

Communicate actions and results to other automation and enterprise equipment via real-time digital I/Os, and Ethernet (TCP/IP, CC-Link IE Field Basic, EtherNet/IP™[2], Modbus®, PROFINET®, and native robot interfaces)

Handle Human-Machine Interface (HMI) function by way of VGA and USB connectivity

Simplify vision setup and upkeep via integrated lens focusing and illumination intensity control

Synchronize to the manufacturing line through the support for incremental rotary encoders

Solve machine vision applications efficiently with Matrox Design Assistant X software by constructing flowcharts instead of writing program code

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

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

Leverage deep learning for visual inspection through image classification and segmentation tools

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Software Environment

Flowchart-based vision software

Matrox Iris GTX smart cameras come ready for running applications developed using <u>Matrox Design Assistant X</u>[1]—an integrated development environment (IDE) for Microsoft® Windows®. Users can easily configure flowcharts to create machine vision applications, rather than write program code. The IDE also lets users design a graphical web-based operator interface for the application. The flowchart-based approach streamlines development to get applications up and running quickly. Refer to the Matrox Design Assistant X datasheet for more information.

Dimensions

Matrox Iris GTX dimensions

Dimensions: (inches) millimeters

Specifications

Matrox Iris GTX										
Hardware										
Model	GTX 2000	GTX 2000C	GTX 5000	GTX 5000C	GTX 8000	GTX 8000C	GTX 12000	GTX 12000C	GTX 16000	GTX 16000C
Sensor model	XGS 2000		XGS 5000		XGS 8000		XGS 12000		XGS 16000	
Sensor type	CMOS									
Sensor geometry	1/1.25 in		2/3 in		1/1.1 in		1 in		1.1 in	
Format	Mono-chrome	Color	Mono-chrome	Color	Mono-chrome	Color	Mono-chrome	Color	Mono-chrome	Color
Resolution	1920 x 1200		2592 x 2048		4096 x 2160		4096 x 3072		4000 x 4000	
Frame rate (effective)	Up to 70 fps	Up to 17 fps	Up to 41.7 fps	Up to 10 fps	Up to 39.6 fps	Up to 10 fps	Up to 28 fps	Up to 7 fps	Up to 21.6 fps	Up to 5 fps
Pixel size	3.2 x 3.2 µm									
Gain range	1x to 11.875x (0 to 21.5 dB)									
Shutter speeds	50 µsec to 4.2 sec									
External trigger latency	TBD		TBD		TBD		TBD		TBD	
External trigger to strobe output delay	TBD		TBD		TBD		TBD		TBD	
Processor	Intel Atom x6211E with two cores and 1.3 GHz base (3.0 GHz burst) frequency									
Memory	4 GB LPDDR4/x									
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 or Smart Vision Lights brick spot light 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-X 8-pin (female) for Gigabit Ethernet									
	M12-A 12-pin (female) for power, digital I/Os, and LED lighting intensity control									
	M12-A 12-pin (male) for VGA and USB 2.0									
Power consumption	TBD									
	TBD									
Dimensions	75 x 57 x 75 mm (2.95 x 2.24 x 2.95 in) lens Note: Refer to Dimensions diagram for more details.									
Weight	TBD									
Lens type	C-mount									
Operating temperature	0°C to 45°C (32°F to 113°F)									
Ventilation requirements	Natural convection									

Specifications (cont.)

Matrox Iris GTX	
Hardware	
Certifications	FCC Part 15 Class A, CE mark
	EN55011 Class A, EN61326-1 industrial environment
	ICES-003/NMB-003 Class A
	IEC 61010-1: 2010/AMD 1: 2016
	CAN/CSA-C22.2 No. 61010-1-12,UPD1: 2015, UPD2: 2016, AMD1:2018
	UL 61010-1, 3rd edition (2012), AMD1:2018
	RCM Class A: IP67 enclosure (IEC 60529: dust-tight and protected against temporary immersion)

Ordering Information

Part number	Description
Hardware	
GTX2000	Matrox Iris GTX smart camera with monochrome 1920x1200 sensor, dual-core Intel Atom CPU, 4 GB of memory, 32 GB eMMC storage.
GTX2000C	Matrox Iris GTX smart camera with color 1920x1200 sensor, dual-core Intel Atom CPU, 4 GB of memory, 32 GB eMMC storage.
GTX5000	Matrox Iris GTX smart camera with monochrome 2592x2048 sensor, dual-core Intel Atom CPU, 4 GB of memory, 32 GB eMMC storage.
GTX5000C	Matrox Iris GTX smart camera with color 2592x2048 sensor, dual-core Intel Atom CPU, 4 GB of memory, 32 GB eMMC storage.
GTX8000	Matrox Iris GTX smart camera with monochrome 4096x2160 sensor, dual-core Intel Atom CPU, 4 GB of memory, 32 GB eMMC storage.
GTX8000C	Matrox Iris GTX smart camera with color 4096x2160 sensor, dual-core Intel Atom CPU, 4 GB of memory, 32 GB eMMC storage.
GTX12000	Matrox Iris GTX smart camera with monochrome 4096x3072 sensor, dual-core Intel Atom CPU, 4 GB of memory, 32 GB eMMC storage.
GTX12000C	Matrox Iris GTX smart camera with color 4096x3072 sensor, dual-core Intel Atom CPU, 4 GB of memory, 32 GB eMMC storage.
GTX16000	Matrox Iris GTX smart camera with monochrome 4000x4000 sensor, dual-core Intel Atom CPU, 4 GB of memory, 32 GB eMMC storage.
GTX16000C	Matrox Iris GTX smart camera with color 4000x4000 sensor, dual-core Intel Atom CPU, 4 GB of memory, 32 GB eMMC storage.
Accessories	
GTX-STRKIT	Matrox Iris GTX starter kit for 2 and 5 MP models. Includes power supply, 16 mm C-mount lens, Ethernet cable, power cable, VGA/USB cable, and breakout box for digital I/Os.
GTX-STRKIT2	Matrox Iris GTX starter kit for 8, 12, and 16 MP models. Includes power supply, 16 mm C-mount lens, Ethernet cable, power cable, VGA/USB cable, and breakout box for digital I/Os.
M12-CBL-PWRIO/3	9.8 ft (3 m) cable for Matrox Iris GTX to connect power, discrete I/Os, and LED lighting intensity control. M12 to open end.
M12-CBL-ETH/5	16.4 ft (5 m) Ethernet cable for Matrox Iris GTX. M12 to RJ45 connector.
M12-CBLVGAUSB	3.2 ft (1 m) cable for Matrox Iris GTX to connect VGA and USB. M12 to HD-15 and USB connectors.
IO-BREAKOUT-BOX	Matrox I/O Breakout Box for digital I/O and power connector for Matrox Iris GTX.
IO-BOB-AC	60 W AC/DC power adapter for the Matrox I/O Breakout Box.

Ordering Information (cont.)

Part number	Description
Software	
Matrox Design Assistant X Development Package	
Included with GTX...0(C)	Matrox Iris GTX comes with the Matrox Design Assistant X IDE installation media 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; GTX...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 instead of coding; setting up an operator view; choosing analysis and processing tools; interfacing to automation controllers. 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	ICS 3 Inline Control System: Continuous and strobe mode inline controller
Buechner	Rondo-LX IP67: Ring light with mechanical adapter
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
Cables	
Components Express	MI-1-X-L0-XXM: M12 X-Code Gigabit Ethernet cable, straight
Components Express	MI-1-X-L2-XXM: M12 X-Code Gigabit Ethernet cable, right angle
Components Express	MI-K0-X-L0-XXM: M12 X-Code to industrial Ethernet cable
Components Express	GTR-VGA-USB: VGA/USB I/O breakout cable (contact CEI for application and configuration details)
Components Express	GTR-LTYCBL: Light breakout cable (contact CEI for application and configuration details)
Components Express	GTR-YCBL: Power breakout cable for camera and light (contact CEI for application and configuration details)
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
Light Brackets	
Components Express	E-GTR-LB: Iris GTR flip-light bracket with light plate
Components Express	EN-SL-A: Swivel link mount adapter, fits SLM-1 and ASFB-1
Lens Covers	
Components Express	EN-DC55-xx: 55 mm O.D., clear LP286 filter available in either 30 mm, 40 mm, 50 mm, 60 mm, 70 mm, 75 mm, 80 mm, 90 mm, or 100 mm lengths
Components Express	EN-DC55-55x: 55 mm O.D., LP286 filter of 55 mm length available in either clear, red, blue, orange, VIS Bandpass/UV/NIR Block, and Near IR Bandpass formats
Components Express	EN-DC55-25-XR: Lens cover extension ring
Components Express	GMLC-75-PW: Disposable protective window for EN-DC55 lens covers

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 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.

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