NEW

Matrox **GevIQ** »

Smart network interface cards for efficient high-bandwidth GigE Vision acquisition

MATROX
IMAGING

Overview

Efficient high-bandwidth GigE Vision acquisition

Matrox® GevIQ is the industry's first network interface card (NIC) offering generic GigE Vision® acquisition offload at speeds up to 25 Gigabits/s per port. With GigE Vision packet processing performed directly onboard, Matrox GevIQ boards enable capture from one or more cameras without any image data loss.

GigE Vision is a camera interface standard that delivers rapid image transfer over distances up to 100 m using standard copper, and up to 5,000 m using standard fiber-optic Ethernet cabling. The standard supports physical links from 1 to 25 Gigabit Ethernet (GbE). Use of 10 and 25 GbE by cameras are gaining industry popularity as they are ideal for vision applications requiring the utmost imaging speed and resolution. Machine vision applications requiring cameras with a 10+ GbE interface can, however, be challenging—they benefit from a high data transmission rate but suffer from increased demands on the host system, resulting in corrupted or dropped image frames, and increased processing latency.

Matrox GevIQ NICs provide a more versatile and widely compatible alternative to custom-built or proprietary solutions based on 10+ GbE. The board is equipped with two 25 GbE ports and acquires from these with very little host CPU usage. Multiple 1, 2.5, 5, or 10 GbE cameras can be aggregated at each port for a total of up to 32 input sources. Support of the standard SFP28 connector allows users to select from standard RJ45, direct attach copper (DAC) or fiber-optic Ethernet cables for their specific installation requirements.

Matrox GevIQ at a glance

Reliably and efficiently acquire at up to 25 Gigabit/s per port through onboard packet processing

Maintain maximum flexibility with support for generic GigE Vision cameras

Readily and cost-effectively support multi-camera setups through two ports, together capable of handling up to 32 cameras

Cater to a range of cabling needs with support for copper and fiber-optic Ethernet cabling

Directly license Matrox Imaging software with integrated license fingerprint and storage

Monitor and troubleshoot acquisition performance in detail using Matrox Gecho event-logging tool

Software Environment

Pairs with MIL X[1] software

Matrox GevIQ boards support 64-bit Windows® and Linux®[2] through the latest MIL X software. The cards also act as a license fingerprint and can store a supplemental license for Matrox Imaging software, avoiding the need for a separate hardware key.

Camera configuration and test utility

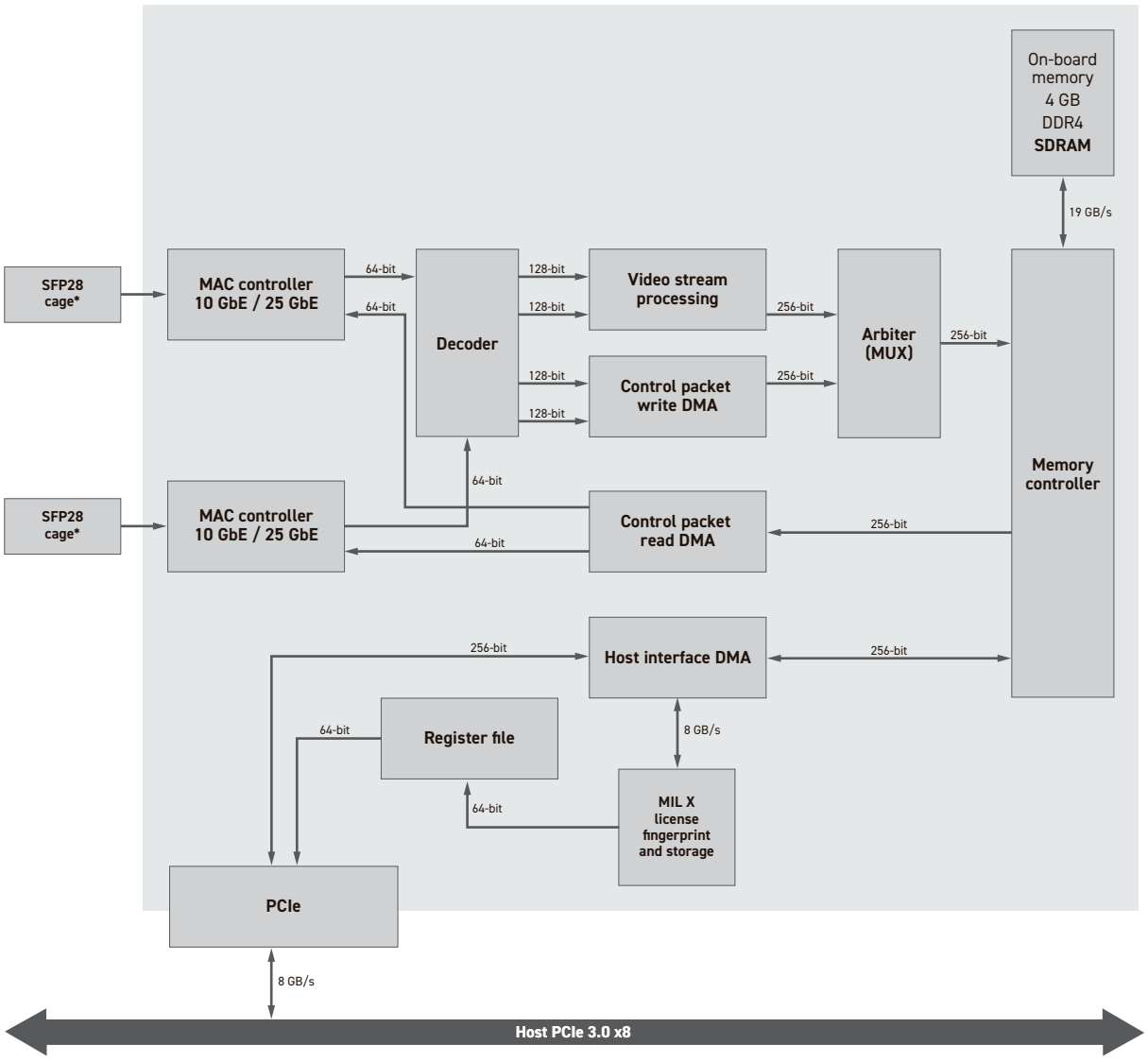
Matrox Capture Works is a utility that allows users to rapidly evaluate the performance and functionality of virtually any GigE Vision-compliant camera or 3D sensor. Matrox Capture Works will list all detected GigE Vision-compliant devices connected to each allocated board. It can start or stop capturing images, display acquired images, save the last grabbed image, send a software trigger, as well as browse and control the selected device's features. Users can view and change acquisition properties, as well as view acquisition statistics. Matrox Capture Works is distributed with MIL X software; it is also available with MIL-Lite X.

Thorough acquisition monitoring utility

Offered with the above-mentioned software is Matrox Gecho, a logging utility that records events generated by the Matrox GevIQ device driver and saves these to a JSON or CSV file. The utility is made to run concurrently with the application to log acquisition activity for the purpose of troubleshooting capture errors as well as measuring latencies and execution times to identify performance bottlenecks. Resulting trace files can be loaded into Google Perfetto for viewing on an interactively navigable graphical timeline. Matrox Gecho helps developers optimize image capture and make sure it runs as intended.

Connectivity

Matrox GevIQ block diagram



*SFP28 transceiver modules available separately from third-parties.

Specifications

Matrox GevIQ	
Hardware	
Model	Matrox GevIQ
Host interface	
Interconnect	PCIe® 3.1 x8
Camera/video interface	
Standard	GigE Vision
Configuration	Two (2) network ports
Speeds	1 / 2.5 / 5 / 10 / 25 Gbps
Video inputs	Up to 32 cameras through network switches
Connectors	SFP28
Miscellaneous	Connection-status indicator LEDs
Memory	
Type	DDR4 SDRAM
Quantity	4 GB
Purpose	Image buffering
Image processing capabilities	
Onboard look-up tables	8-/10-/12-bit support
Onboard Bayer interpolation	GB, BG, GR, and RG pattern support
Onboard color space conversion	Input formats: 8-/16-bit mono/Bayer, 24-/48-bit packed BGR
	Output formats: 8-/16-bit mono, 24-/48-bit packet/planar BGR, 16-bit YUV, 16-bit YCbCR, 32-bit BGRa
Physical	
Form factor	Half-length, half-height, PCIe add-in card
Dimensions (L x W x H)	4.86 x 2.16 x 6.91 cm (5.85 x 0.85 x 2.72 in)
Environmental	
Operating temperature	With passive heatsink: 0°C to 45°C (32°F to 113°F)[3]
Relative humidity (operating)	20% to 80% (non-condensing)
Relative humidity (storage)	10% to 90% relative humidity (non-condensing)
Certifications	
Electromagnetic compatibility	FCC Class A
Software	
Compatible software	MIL X
Operating system support	Windows 10 and 11 (64-bit)
	Linux[2]
Licensing provisions	MIL X license fingerprint and storage

Ordering Information

Part number	Description
Hardware	
GIQ4G2SF28	Matrox GevIQ PCIe 3.1 x8 add-in card for GigE Vision interface and offload with 4 GB DDR4 SDRAM, two SFP28 ports and a passive heatsink[3]. Partially licensed for MIL X software.
Software	
Included with GIQ4G2SF28	Licensed for the MIL X Interface (GigE Vision) run-time package. See Matrox Imaging Library (MIL) X datasheet for more information. MIL-Lite X software available for download from www.matrox.com/imaging → Support → MIL-LITE X DOWNLOAD.
Accessories	
Available from third parties	SFP28 direct attach copper and active optical connectors and cables.

Endnotes:
1. The software may be protected by one or more patents; see www.matrox.com/patents for more information.
2. Ask for availability.
3. Operating temperature rating assumes airflow of 150 LFM (linear feet per minute) over the board.
   Contact a Matrox Imaging sales representative for ventilation requirement for multiple board configurations.

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