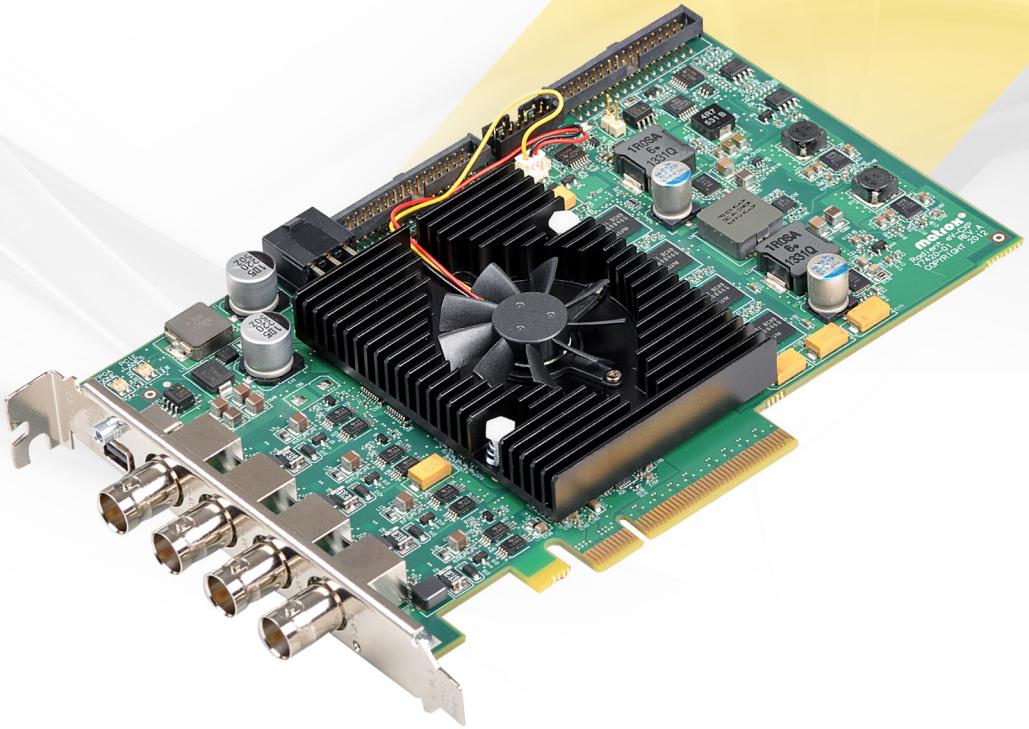


Matrox **Radient eV-CXP** »

Value-packed high-performance CoaXPress frame grabber

MATROX
IMAGING

Overview

Cost-effective, high-performance, dependable frame grabber

Matrox® Radient eV-CXP is a cost-effective CoaXPress® frame grabber with specific models supporting up to two (Dual) or four (Quad) simultaneous connections. By combining a field-proven design with the new CoaXPress interface, the Matrox Radient eV-CXP is a dependable, high-performance image capture solution for today and the foreseeable future.

Moving forward with CoaXPress

CoaXPress is a camera interface standard that takes advantage of common coax cabling to transmit images at rates and distances above and beyond previous standards. With CoaXPress, image data can be transmitted at up to 6.25 Gbps using a single coaxial cable and up to 25 Gbps using four cables to a maximum of 40 m[3]. The high bandwidth of CoaXPress makes it the right match for a new generation of cameras with larger and faster image sensors.

The full duplex design of CoaXPress enables the transmission of camera configuration and control along with image data on the same cable. The PoCXP capability further simplifies cabling by providing a camera with up to 13 W per cable. This unified cabling facilitates the upgrade of legacy imaging systems from analog to digital.

Reliable high-performance image acquisition

The Matrox Radient eV-CXP provides two (Dual) or four (Quad) independent CoaXPress connections through BNC connectors. This allows for simultaneous capture from up to two (Dual) or four (Quad) cameras each running at different CoaXPress speeds (i.e., 1.25, 2.5, 3.125, 5.0, or 6.25 Gbps). For high-bandwidth applications, the Matrox Radient eV-CXP frame grabber can also capture from a single camera transmitting image data at up to 12.5 Gbps (Dual) or 25 Gbps (Quad) using connection aggregation.

To reliably handle these high data rates, the Matrox Radient eV-CXP uses a PCIe 2.0 x8 host interface—with a peak transfer rate of up to 4 GB/s—combined with up to 4 GB SDRAM of on-board buffering. The frame grabber can also offload the host CPU from having to perform image pre-processing task (i.e., peak location for 3D profiling[2], Bayer interpolation, color space conversion, and LUT mapping).

The Matrox Radient eV-CXP further simplifies overall system integration by providing camera power, trigger, and control over each CoaXPress connection, as well as two (Dual) or four (Quad) independent sets of auxiliary I/O for interfacing with rotary encoders, photoelectric sensors, and strobe controllers. By having the primary set of auxiliary I/Os on the same bracket as the BNC connections, the Matrox Radient eV-CXP offers a true single PCIe slot solution for single-camera applications[1].

Matrox Radient eV-CXP at a glance

Capture from the next generation of higher-resolution and higher-speed cameras using the CoaXPress interface

Acquire from multiple independent cameras at once by way of two (Dual) or four (Quad) CoaXPress connections each supporting up to 6.25 Gbps of input bandwidth

Interface to the highest performance cameras through the ability to combine CoaXPress connections for up to 25 Gbps of input bandwidth

Ensure reliable delivery to host memory by way of PCIe® 2.0 x8 host interface and ample on-board buffering

Maximize PC compatibility and minimize slot usage through a half-length design with video inputs and auxiliary I/Os on the same bracket[1]

Reduce cabling complexity and eliminate power supplies by way of Power-over-CoaXPress (PoCXP) support

Offload host processing with on-board peak location for 3D profiling[2], Bayer interpolation, color space conversion, and look-up tables (LUT)

Simplify application development using the Matrox Imaging Library (MIL) X toolkit on 32-/64-bit Windows® 7/10 and 64-bit Linux®

Overview (cont.)

Lifecycle managed for consistent long-term supply

Each component on the Matrox Radient eV-CXP has been carefully selected to ensure product availability in excess of five years. The Matrox Radient eV-CXP is also subject to strict change control to provide consistent supply. Longevity of stable supply lets OEMs achieve maximum return on the original investment by minimizing the costs associated with the repeated validation of constantly changing products.

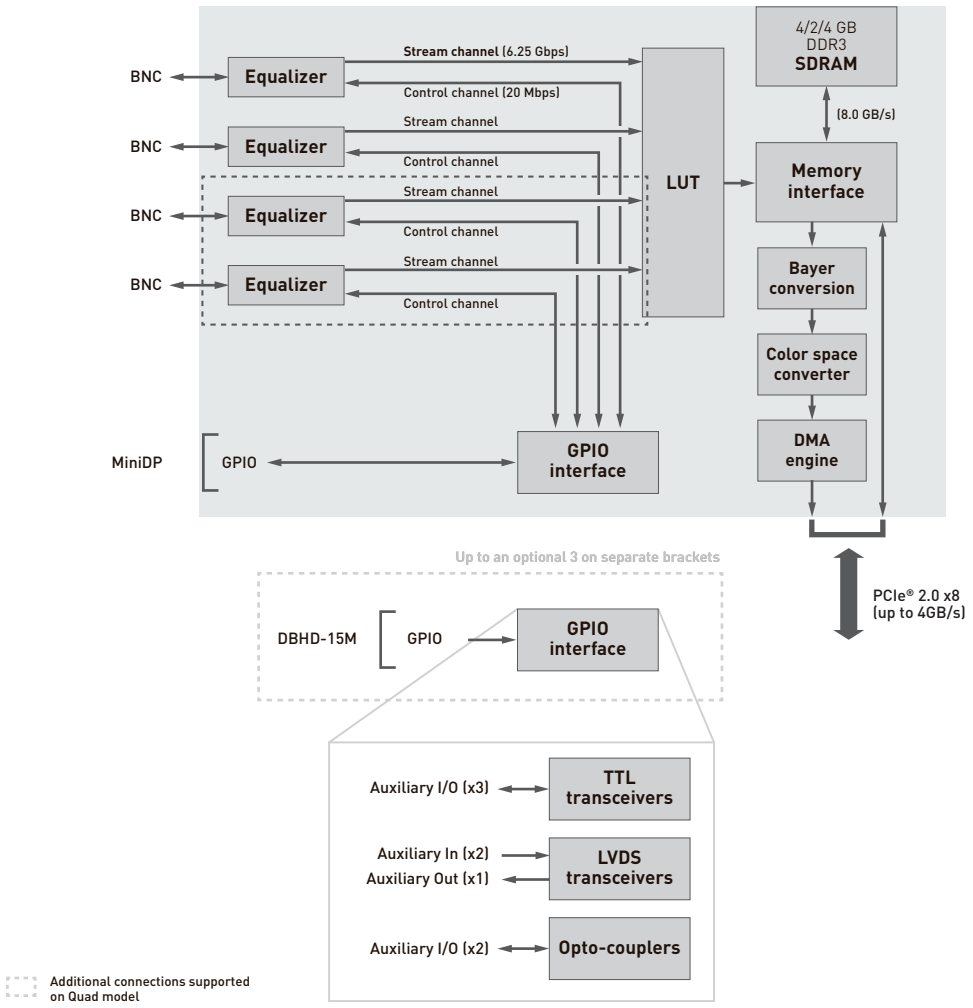
Software Environment

Field-proven application development software

The Matrox Radient eV-CXP is supported by MIL X, a comprehensive collection of software tools for developing industrial imaging applications. MIL X features interactive software and programming functions for image capture, processing, analysis, annotation, display, and archiving. These tools are designed to enhance productivity, thereby reducing the time and effort required to bring solutions to market. Refer to the MIL X datasheet for more information.

Connectivity

Matrox Radient eV-CXP block diagram



Specifications

Matrox Radient eV-CXP
Hardware
PCIe 2.0 x 8 host bus interface
1, 2, or 4 GB of DDR3 SDRAM
CoaXPress acquisition
JIIA NIF-001-2010 Ver. 1.0 certified
Two (Dual) or four (Quad) independent CXP connections (up to 6.25 Gbps)
BNC connector
PoCXP with Safe Power (up to 13 W)
Auto connection speed detection
LED indicator of connection state
Supports frame and line scan sources
On-board image reconstruction
On-board color space conversion
Input formats
8-/16-bit mono/Bayer
24/48-bit packed BGR
Output formats
8-/16-bit mono
24-/48-bit packed/planar BGR
16-bit YUV
16-bit YCbCr
32-bit BGRa
On-board LUTs
8-/10-/12-bit support
On-board Bayer conversion
GB, BG, GR, and RG pattern support
On-board peak location for 3D profiling[2]
Up to three (3) peaks per frame
Maximum frame height of 512 lines
Up to four (4) DBHD-15 male GPIO connectors (one (1) on main board through Mini DisplayPort adaptor cable and three (3) on separate brackets)
Three (3) TTL configurable auxiliary I/Os
Two (2) LVDS auxiliary inputs
One (1) LVDS auxiliary output
Two (2) opto-isolated auxiliary inputs
Support for one (1) quadrature rotary encoder per CoaXPress connection
Physical
Half-length, full-height board
Dimensions (L x W x H): 167.6 x 111.1 x 18.7 mm (6.6 x 4.38 x 0.74 in)
Power consumption (typical)
250 mA @ 3.3 V
1.25 @ 12 V
15.85 W total

Specifications (cont.)

Matrox Radient eV-CL
Certifications
FCC class A
CE class A
RoHS-compliant
Environmental
Operating temperature: 0°C to 55°C (32°F to 131°F)
Software
MIL X license fingerprint and storage
Software drivers: MIL drivers for 32-/64-bit Windows 7
Software drivers: MIL drivers for 32-/64-bit Windows 10
Software drivers: MIL drivers for 64-bit Linux

Ordering Information

Part number	Description
Hardware	
RAD EV 1G 2C6*	Matrox Radient eV-CXP Dual CXP-6 (6.25 Gbps) frame grabber with 1 GB DDR3 SDRAM. Includes cable adaptor.
RAD EV 1G 4C6*	Matrox Radient eV-CXP Quad CXP-6 (6.25 Gbps) frame grabber with 1 GB DDR3 SDRAM. Includes cable adaptor.
RAD EV 1G 4C6/3D*	Matrox Radient eV-CXP Quad CXP-6 (6.25 Gbps) frame grabber with 1 GB DDR3 SDRAM for 3D profiling. Includes cable adaptor.
Software	
Refer to MIL X datasheet.	
Accessories	
RADACCPAK01*	Accessory kit for RAD EV 1G 2C6*, RAD EV 1G 4C6*, and RAD EV 1G 4C6/3D*. Includes two (2) auxiliary I/O cable adaptors, each with two (2) DBHD-15 male connectors.
Cables	
CoaXPress cables are available from camera manufacturers, Components Express, Inc. (www.componentsexpress.com), or other third parties. GPIO cables are available from third parties.	

Endnotes:
1. Applies to single camera applications. Multi-camera applications may require auxiliary I/Os located on additional brackets.
2. With Matrox Radient eV-CXP for 3D profiling (RAD EV 1G 4C6/3D*) and MIL 10 Update 29 (or successor).
3. Distances of over 100 m can be achieved at 3.125 Gbps.

The Matrox Imaging advantage

Assured quality & longevity
Adhering to industry best practices in all hardware manufacturing and software development, product designs pay careful attention to component selection to secure consistent long-term availability. Matrox Imaging is able to meet Copy Exact and Revision Change Control procurement requirements in particular circumstances, backed by a dedicated team of QA specialists.

Trusted industry standards
Matrox Imaging champions industry standards in its design and production. Leveraging these standards to deliver quality compatible products, Matrox Imaging protects its customers' best interests by ensuring hardware and software components work with as many third-party products as possible.

Comprehensive customer support
Devoted front-line support and applications teams are on call to offer timely product installation, usage, and integration assistance. Matrox Professional Services delivers deep technical assistance to help customers develop their particular applications in a timely fashion. Services include personalized training and device interfacing as well as application feasibility, prototyping, troubleshooting, and debugging.

Tailored customer training
Matrox Vision Academy comprises online and on-premises training for Matrox Imaging vision software tools. On-premises intensive training courses are regularly held at Matrox headquarters, and can also be customized for onsite delivery. The Matrox Vision Academy online training platform hosts a comprehensive set of on-demand videos available when and where needed.

Long-standing global network
Matrox Imaging customers benefit from a global network of distributors who offer complementary products and support, and integrators who build customized vision systems. These relationships are built on years of mutual trust and span the globe, ensuring customer access to only the best assistance in the industry.

About Matrox Imaging

Founded in 1976, Matrox is a privately held company based in Montreal, Canada. Imaging, Graphics, and Video divisions provide leading component-level solutions, leveraging the others' expertise and industry relations to provide innovative, timely products.

Matrox Imaging is an established and trusted supplier to top OEMs and integrators involved in machine vision, image analysis, and medical imaging industries. The components consist of smart cameras, vision controllers, I/O cards, and frame grabbers, all designed to provide optimum price-performance within a common software environment.

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www.matrox.com/imaging

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