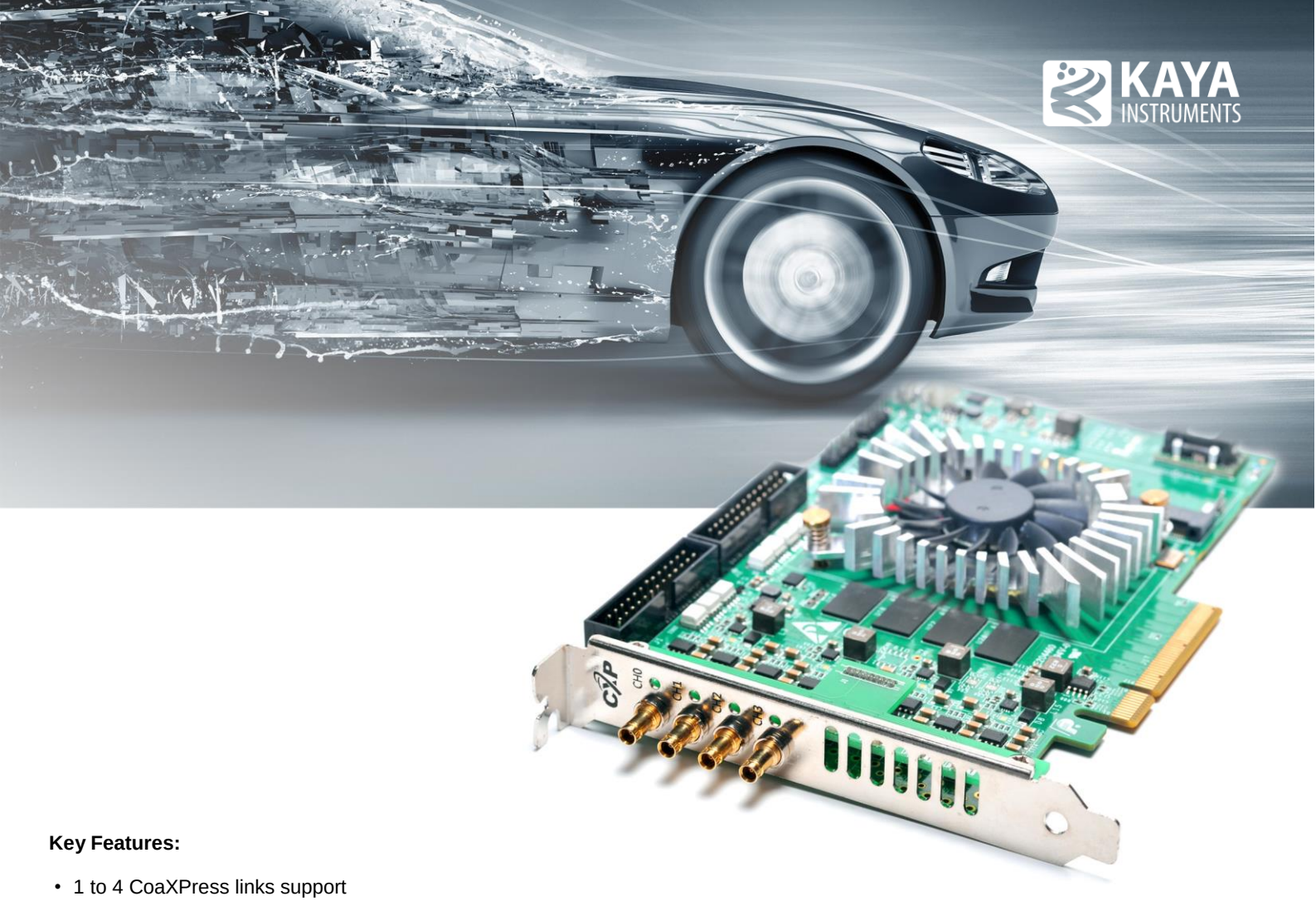


Key Features:

- 1 to 4 CoaXPress links support
- PCIe Gen3 x8 Half-length card
- Up to 136 Gb image buffer
- Camera controls and triggers
- Up to 4 re-transmit links
- Per-link LED indication on card bracket
- Flexible machine I/O:
  - 4 TTL configurable I/Os
  - 4 LVTTL configurable I/Os
  - 2 LVDS inputs/2 LVDS outputs
  - 4 opto-isolated outputs/4 opto-isolated inputs
  - 2 quadrature rotary encoders
  - Integrated strobe controller
  - 8 timers
- CoaXPress V1.1 compliant
- Power over CoaXPress with 13W per link
- Multiple Camera synchronization
- Multiple Frame Grabbers synchronization
- DIN 1.0/2.3 connectors for CoaXPress links
- GUI interface
- Supporting Windows and Linux OS
- API for developing custom applications
- Plug-ins modules for Matlab, HALCON and Labview
- Gen<i>Cam compliant
- GenTL support
- Data rates up to 6.25 Gbps per link
- Transfer Rate of up to 55 Gbps
- 0°C to 55°C operating environment temperature

Komodo™ CoaXPress™

Frame Grabber with 4 channels

Innovative Approach

Komodo is best in class Frame Grabber supporting CoaXPress standard. The Komodo is capable of receiving video streams from up to 4 CoaXPress links in single, dual or quad modes. It is can be used for simultaneous capture from multiple cameras. Each link supports standard CoaXPress bitrates up to 6.25 Gbps. This CoaXPress Frame Grabber is ideally suited for industrial, defense and aerospace Machine Vision Systems and applications.

Intelligent Design

The Komodo can easily receive video streams on the CoaXPress links and transmit them to computer memory through the PCIe interface. This product also provides GPIO for machine control signals, such as triggers, timers, shaft encoders, exposure control and general I/O, which can be control aside video stream acquisition.
The Komodo uses standard DIN connectors as a CoaXPress interface to the camera and standard 100 mil headers for general purpose I/O.
The Frame Grabber utilizes PCIe Gen3 x8 links for communication with Host PC for video uploading and configuration

Datasheet | Komodo™ CoaXPress™ Frame Grabber with 4 channels

Product Name	**Komodo CoaXPress Frame Grabber with 4 channels**
Form Factor	PCI Express card
Format	Standard profile, half length, 8-lane PCI Express card
Cooling method	Air cooling, fan-cooled heatsink
Mounting	For insertion in a standard height, 8-lane or higher, PCI Express card slot
Connectors	Ports 0 through 3 on bracket 4x DIN 1.0/2.3 female connectors CoaXPress host interface Internal I/O connector 1 26-pin 2-row 0.1" pitch pin header with shrouding for I/O lines Internal I/O connector 2 26-pin 2-row 0.1" pitch pin header with shrouding for I/O lines Auxiliary power input (PoCXP) on PCB 6-pin PEG power socket 12 VDC power input for PoCXP camera(s)
Dimensions	L 167.65 mm x H 111.15 mm L 6.6 in x H 4.38 in
Weight	225gr
Host bus Standard	PCI Express 3.0
Link width	8 lanes, 1, 2 or 4 lanes with reduced performance
Link speed	• 8.0 GT/s (PCIe 3.0) • 5.0 GT/s (PCIe 2.0) with reduced performance
Maximum payload size	512 bytes
DMA	• 32- and 64-bit • Scatter gather support • Physical address support (GPU transfers)
Peak delivery bandwidth	7,880 MB/s
Effective (sustained), delivery bandwidth	6,710 MB/s (Host PC motherboard dependent)
Power consumption	Typ. 16.8 W (3.8 W @ +3.3V, 13 W @ +12V), excluding camera and I/O power output
Camera / video inputs	
Interface standard(s)	CoaXPress 1.0 and 1.1
Status LEDs	1 CoaXPress Host connection status per connector 4 System status LEDs
Number of cameras	Up to 4
Number of links, per single camera	Up to 4
Synchronization between cameras	Yes
Line-scan cameras supported,	Yes
Maximum aggregated camera data transfer rate	50 Gbit/s

Supported CXP down-connection speeds	
	• 1.25 GT/s (CXP-1) • 2.5 GT/s (CXP-2) • 3.125 GT/s (CXP-3) • 5 GT/s (CXP-5) • 6.25 GT/s (CXP-6)
Number of data streams (per camera)	1 data stream per camera
Maximum stream packet size	8.192 bytes
PoCXP (Power over CoaXPress)	• PoCXP Safe Power • 13 W of 24V DC regulated power per CoaXPress connector • PoCXP Device detection and automatic power-on • Overload and short-circuit protections • On-board 12V to 24V DC/DC converter • A +12V power source must be connected to the auxiliary power input connector

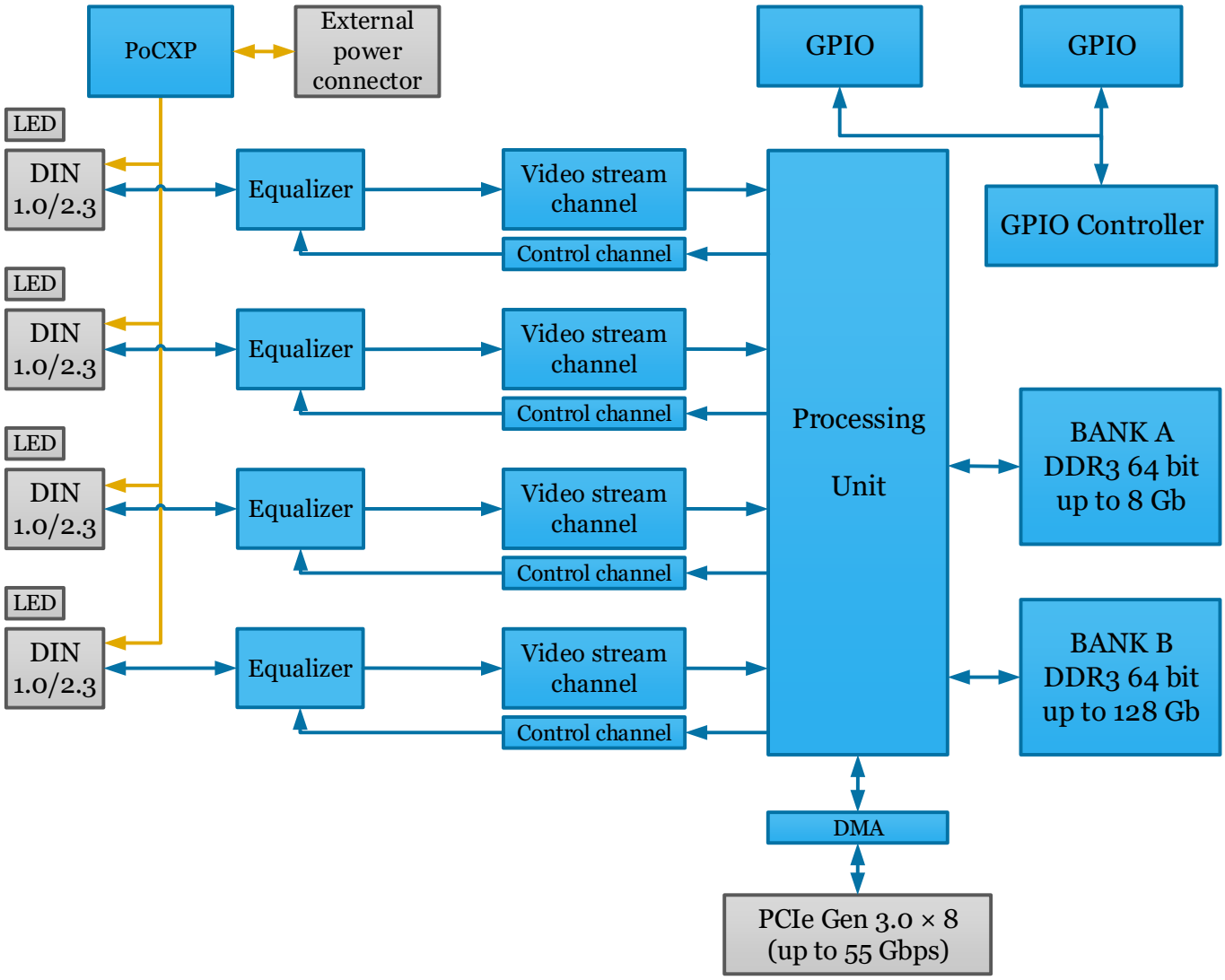
Camera types	• Area-scan cameras:
	  • Gray-scale and color (RGB and Bayer CFA)
	  • Single-tap (1X-1Y) progressive-scan
	• Line-scan cameras:
	  • Gray-scale and color RGB

Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, YUV, YCbCr and RGBA (PFNC names): • Raw • Mono8, Mono10, Mono12, Mono14, Mono16 • BayerXX8, BayerXX10, BayerXX12, BayerXX14, BayerXX16 where XX = GR, RG, GB, or BG • RGB8, RGB10, RGB12, RGB14, RGB16 • RGBA8, RGBA10, RGBA12, RGBA14, RGBA16 • YUV411_8, YUV411_10, YUV411_12, YUV411_14, YUV411_16 • YUV422_8, YUV422_10, YUV422_12, YUV422_14, YUV422_16 • YUV444_8, YUV444_10, YUV444_12, YUV444_14, YUV444_16 • YCbCr601_411_8, YCbCr601_411_10, YCbCr601_411_12, YCbCr601_411_14, YCbCr601_411_16 • YCbCr601_422_8, YCbCr601_422_10, YCbCr601_422_12, YCbCr601_422_14, YCbCr601_422_16 • YCbCr601_444_8, YCbCr601_444_10, YCbCr601_444_12, YCbCr601_444_14, YCbCr601_444_16
Area-scan camera control	
Trigger	Precise control of asynchronous reset cameras, with exposure control. Support of camera exposure/readout overlap. Support of triggering from encoder or timer. Support of external hardware trigger, with optional delay, filtering and trigger decimation.
Strobe	Accurate control of the strobe position for strobe light sources. Support of early and late strobe pulses.
Line-scan camera control	
Scan/page trigger	Precise control of start-of-scan and end-of-scan triggers. Support of external hardware trigger, with optional delay and filtering. Support of triggering from encoder. Support of infinite acquisition, without missing lines.
Line trigger	Support for quadrature motion encoders, with programmable filters, selection of acquisition direction and backward motion compensation.
Line strobe	Accurate control of the strobe position for strobe light sources.
On-board processing	
On-board memory	• 1 GB • Up to 16GByte SODIMM (optional)
Bayer De-Mosaic	Full 16bit resolution • Bilinear 3x3 • Bilinear 3x2 for linescan with gradient correction

Color Transformation	Full 16bit resolution 18bit coefficients table: • Color space conversion • Gain and Offset
Decimation	Line skip
Additional features	Unpacking of 10-/12-/14-bit to 16-bit with justification to LSB
Frame Timestamp	64bit with 8ns precision
Data stream statistics	Measurement of: • Frame/Line rate • CRC Errors • Dropped frames • Received packets • Test packets
Event signaling and counting	The application software can be notified of the occurrence of various events: • Newly acquired buffers • Camera and Illumination control events • I/O events • Timer events • Encoder events
General Purpose Inputs and Outputs	
Number of lines	40 I/O lines: 4 differential inputs 4 differential outputs 8 singled-ended TTL inputs/outputs 8 singled-ended LVTTL inputs/outputs 8 opto-isolated inputs 8 opto-isolated outputs
Usage	Any System I/O input lines can be connected to any I/O line Any I/O line can be used to decode A/B and Z signals of a motion encoder Any I/O line can generate any trigger event Any I/O line can trigger a timer
Electrical specifications	Differential lines - LVDS compatible TTL lines - 5V TTL compliant LVTTL lines - 3.3V LVTTL compliant Isolated lines - opto isolated lines with voltage range up to 30V
Filter control	Glitch removal filter available on all System I/O input lines Configurable filter time constants: for DIN and TTLIO lines: 50 ns, 100 ns, 200 ns, 500 ns,1 µs for IIN lines: 500 ns, 1 µs, 2 µs, 5 µs, 10 µs
Polarity control	Yes
Encoders	4 quadrature encoders with A/B and Z inputs 32bit position counter Forward and backward counting Position trigger support Noise filtering
Timers	8 general purpose timers Configurable delay and duration 32bit accumulator
Event reporting	64 bit system timestamp event reporting Each I/O line can generate event on configurable edge Each Timer can generate event Each encoder can generate event
Frame grabber synchronization	
Synchronization	Precise area and linscan cameras synchronization across different frame grabbers
Software	
Host PC Operating System	Microsoft Windows 7/10 32- and 64-bit versions, Linux open source driver compatible with a wide range of distributions, tested and precompiled for Ubuntu 14.04 , RedHat 6.5 , CentOS 7 32- and 64-bit versions

Gen<i>Cam	Support of Gen<i>Cam up to 2.4 Full camera and frame grabber parameters configuration
Environmental conditions	
Operating ambient air temperature	0°C to +50°C / +32°F to +122 °F
Operating ambient air humidity	10% to 90% RH non-condensing
Storage ambient air temperature	-20°C to +70°C / -4°F to +158°F
Storage ambient air humidity	10% to 90% RH non-condensing
Certifications	
Electromagnetic - EMC standards	The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15
EMC - Emission	EN 55022:2010 Class B FCC 47 Part 15 Class B
EMC - Immunity	EN 55024:2010 Class B EN 61000-4-3 EN 61000-4-4 EN 61000-4-6
Flammability	PCB compliant with UL 94 V-0
RoHS	Compliant with the European Union Directive 2011/65/EU (ROHS2)
REACH	Compliant with the European Union Regulation No 1907/2006
WEEE	Must be disposed of separately from normal household waste and must be recycled according to local regulations
Ordering Information	KY-FGK-400
Optional accessories	
	• GPIO Expansion bracket • DDR3 Extra memory SODIMM 2GB, 4GB, 8GB or 16GB
Buffer management	Circular buffer support Accumulation of several frames/lines to single buffer to reduce CPU load DMA Buffer filling directly to system memory
GUI	Supported for Windows and Linux OS Multi camera display and configuration Flexible buffer queuing Image/video recording and playback
Debugging capabilities	Event logging Statistics counters

Komodo Frame Grabber HW Block Diagram



Compatibility

Supported vision standard

Supported vision libraries

Supported operating systems

Windows Linux

Compatible with most popular machine vision libraries

KAYA Instrument strives to create and maintain compatibility and interfaces for the most common and advanced vision image processing libraries and applications. Major support is available for **MVTec Halcon, National Instruments LabVIEW** and **MathWorks MATLAB**. Please check our KAYA website for an up-to-date list of other supported libraries and software package.

Contact

Get in touch with our teams at **info@kayainstruments.com**.
We will be glad to assist and consult you regarding our products.

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The information provided here is subject to change without notice

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http://www.kayainstruments.com/products/frame-grabbers/