

Komodo II CoaXPress

Komodo II CoaXPress Frame Grabber With 4 Channels

Innovative Approach

Komodo II is the best in class Frame Grabber, supporting the CoaXPress 2.0 standard. It is capable of receiving video streams from up to 4 CoaXPress links in single, dual or quad modes. It can also be used for simultaneous capture from multiple cameras. Each link supports standard CoaXPress bitrates of up to 12.5 Gbps. These features make the Komodo II ideally suited for industrial, defense and aerospace Machine Vision Systems and applications.

Intelligent Design

The Komodo II 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 controlled aside video stream acquisition.

The Komodo II uses standard Micro-BNC connectors as a CoaXPress interface to the camera and standard HD DB26 D-sub panel mount connector for general purpose I/O. It utilizes PCIe Gen3 x8 links for communication with Host PC for video uploading and configuration.

Key Features:

- 1 to 4 CoaXPress links support
- PCIe Gen3 x8 Half-length card
- 4GB DDR4 SODIMM
- Camera controls and triggers
- Per-Link LED indication on front card bracket panel
- Flexible GPIO interface on front bracket panel:
 - 4 TTL configurable I/Os
 - 4 LVTTL configurable I/Os
 - 4 LVDS inputs and outputs
 - 4 opto-isolated outputs and inputs
 - 4 quadrature rotary encoders
 - Integrated strobe controller
 - 4 timers
- CoaXPress 2.0 compliant
- Power over CoaXPress with 13W per link
- Multiple camera synchronization
- Multiple Frame Grabbers synchronization
- Micro-BNC connectors for CoaXPress links
- GUI Interface
- Supporting Windows and Linux OS
- API for custom application development
- Plug-in modules for Matlab, HALCON, Cognex and Labview
- Gen<i>Cam compliant
- GenTL support
- Data rates up to 12.5 Gbps per link
- Transfer rates of up to 55 Gbps
- 0°C to 55°C operating environment temperatures

Datasheet | Komodo II CoaXPress





Technical Data

Feature	
Form factor	PCI Express card
Format	Standard profile, half length, 8-lane PCI Express card
Cooling method	Air cooling, fan-cooled heatsink (optional passive heatsink)
Mounting	For insertion in a standard height, 8-lane or higher, PCI Express card slot
Connectors	 Ports 0 through 3 on bracket for 4x Micro-BNC female connectors CoaXPress host interface 1x External I/O connector on front bracket panel HD DB26 D-sub panel mount (26-pin 3-row, through hole, right angle) 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 2.0 (CoaXPress 1.1 backward compatible)
Status LEDs	1 bicolor status LED 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
MAX aggregated camera data transfer rate	50 Gbit/s
Supported CXP down-connection speeds	 1.25 GT/s (CXP-1) 6.25 GT/s (CXP-6)
	 2.5 GT/s (CXP-2) 10 GT/s (CXP-10)
	 3.125 GT/s (CXP-3) 12.5 GT/s (CXP-12)
	 5 GT/s (CXP-5)

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
	- YIIV444_8_YIIV444_10_YIIV444_12_YIIV444_14_YIIV444_16
	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	4GByte DDR4 SODIMM
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	 20 I/O lines:
	- 2 differential inputs
	- 2 differential outputs
	- 4 singled-ended TTL inputs/outputs
	- 4 singled-ended LVTTL inputs/outputs
	- 4 opto-isolated inputs
	- 4 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 IN 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	 4 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 line-scan cameras synchronization across different frame grabbers
Software	
Host PC operating system	 Microsoft Windows 10 32-bit and 64-bit versions
	 Open source kernel driver
	 Tested and precompiled for Ubuntu 18.04, RedHat 7.x, CentOS 7.x 64-bit versions
	 Nvidia Xavier AGX
Gen <i>Cam</i>	 Support of Gen<i>Cam 2.4 and 3.0</i>
	 Full camera and Frame Grabber parameters configuration
Buffer management	Circular buffer support
	 Accumulation of several frames/lines to single buffer to reduce CPU load
	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
APIs	 Gen<i>Cam, GenTL producer libraries, C/C++, Python and NET bindings</i>
	Compilers:
	- x86 and x86_64 dynamic library designed to be used with ISO-compliant C runtime
	Allows for development of x86 and x86_64 applications
	 Plug-in modules for Matlab, HALCON, Cognex and Labylew
Environmental Conditions	 Plug-in modules for Matlab, HALCON, Cognex and Labview
Environmental Conditions	• Pidg-in modules for Matlab, HALCON, Cognex and Labylew 0° C to $\pm 50^{\circ}$ C / $\pm 32^{\circ}$ E to $\pm 122^{\circ}$ E
Environmental Conditions Operating ambient air temperature Operating ambient air humidity	 Pidg-in modules for Matlab, HALCON, Cognex and Labview 0°C to +50°C / +32°F to +122 °F 10% to 90% BH pop-condensing
Environmental Conditions Operating ambient air temperature Operating ambient air humidity Storage ambient air temperature	• Pidg-in modules for Matlab, HALCON, Cognex and Labylew 0° C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°E to +158°E
Environmental Conditions Operating ambient air temperature Operating ambient air humidity Storage ambient air temperature Storage ambient air humidity	 Pidg-in modules for Matlab, HALCON, Cognex and Labview 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing
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Environmental Conditions Operating ambient air temperature Operating ambient air humidity Storage ambient air temperature Storage ambient air humidity Certifications	 Pidg-in modules for Matlab, HALCON, Cognex and Labview 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing
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Environmental Conditions Operating ambient air temperature Operating ambient air humidity Storage ambient air temperature Storage ambient air humidity Certifications Electromagnetic - EMC standards EMC - Emission	 Pidg-in modules for Matlab, HALCON, Cognex and Labview 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 EN 55022:2010 Class B
Environmental Conditions Operating ambient air temperature Operating ambient air humidity Storage ambient air temperature Storage ambient air humidity Certifications Electromagnetic - EMC standards EMC - Emission	 Pidg-in modules for Matlab, FALCON, Cognex and Labview 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 EN 55022:2010 Class B FCC 47 Part 15 Class B
Environmental Conditions Operating ambient air temperature Operating ambient air humidity Storage ambient air temperature Storage ambient air humidity Certifications Electromagnetic - EMC standards EMC - Emission EMC - Immunity	 Program modules for Mathab, HALCON, Cognex and Labview 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 EN 55022:2010 Class B FCC 47 Part 15 Class B EN 55024:2010 Class B EN 55024:2010 Class B
Environmental Conditions Operating ambient air temperature Operating ambient air humidity Storage ambient air temperature Storage ambient air humidity Certifications Electromagnetic - EMC standards EMC - Emission EMC - Immunity	 Program modules for Mathab, PALCON, Cognex and Labview 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 EN 55022:2010 Class B FCC 47 Part 15 Class B EN 55024:2010 Class B EN 55024:2010 Class B EN 61000-4-3
Environmental Conditions Operating ambient air temperature Operating ambient air humidity Storage ambient air temperature Storage ambient air humidity Certifications Electromagnetic - EMC standards EMC - Emission EMC - Immunity	 Prog-in modules for Maltab, PALCON, Cognex and Labylew 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 EN 55022:2010 Class B FCC 47 Part 15 Class B EN 55024:2010 Class B EN 61000-4-3 EN 61000-4-4
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Environmental Conditions Operating ambient air temperature Operating ambient air humidity Storage ambient air temperature Storage ambient air humidity Certifications Electromagnetic - EMC standards EMC - Emission EMC - Immunity Flammability	 Prog-in modules for Matab, PALCON, Cognex and Labylew 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 EN 55022:2010 Class B FCC 47 Part 15 Class B EN 55024:2010 Class B EN 61000-4-3 EN 61000-4-4 EN 61000-4-6 PCB compliant with UL 94 V-0
Environmental ConditionsOperating ambient air temperatureOperating ambient air humidityStorage ambient air temperatureStorage ambient air humidityCertificationsElectromagnetic - EMC standardsEMC - EmissionEMC - ImmunityFlammabilityRoHS	 Progent modules for Mariab, PALCON, Cognex and Labylew 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 EN 55022:2010 Class B FCC 47 Part 15 Class B EN 55024:2010 Class B EN 61000-4-3 EN 61000-4-4 EN 61000-4-6 PCB compliant with UL 94 V-0 Compliant with the European Union Directive 2011/65/EU (RoHS2)
Environmental ConditionsOperating ambient air temperatureOperating ambient air humidityStorage ambient air temperatureStorage ambient air humidityCertificationsElectromagnetic - EMC standardsEMC - EmissionEMC - ImmunityFlammabilityRoHSREACH	 Pidg-in modules for Matuab, PALCON, Cognex and Labylew 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing • The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 EN 55022:2010 Class B FCC 47 Part 15 Class B EN 55024:2010 Class B EN 61000-4-3 EN 61000-4-4 EN 61000-4-6 PCB compliant with UL 94 V-0 Compliant with the European Union Directive 2011/65/EU (RoHS2) Compliant with the European Union Regulation No 1907/2006
Environmental ConditionsOperating ambient air temperatureOperating ambient air humidityStorage ambient air temperatureStorage ambient air humidityCertificationsElectromagnetic - EMC standardsEMC - EmissionEMC - ImmunityFlammabilityRoHSREACHWEEE	 Progent modules for Mattab, FACCON, Cognex and Labylew 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing • The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 EN 55022:2010 Class B FCC 47 Part 15 Class B EN 550224:2010 Class B EN 61000-4-3 EN 61000-4-4 EN 61000-4-4 EN 61000-4-4 EN 61000-4-4 Orghiant with UL 94 V-0 Compliant with UL 94 V-0 Compliant with the European Union Directive 2011/65/EU (RoHS2) Compliant with the European Union Regulation No 1907/2006 Must be disposed of separately from normal household waste and must be recycled
Environmental Conditions Operating ambient air temperature Operating ambient air humidity Storage ambient air temperature Storage ambient air humidity Certifications Electromagnetic - EMC standards EMC - Emission EMC - Immunity Flammability RoHS REACH WEEE	 Progent modules for Mattab, FACCON, Cognex and Labylew 0°C to +50°C / +32°F to +122 °F 10% to 90% RH non-condensing -20°C to +70°C / -4°F to +158°F 10% to 90% RH non-condensing The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 EN 55022:2010 Class B FCC 47 Part 15 Class B EN 55024:2010 Class B EN 61000-4-3 EN 61000-4-4 EN 61000-4-4 EN 61000-4-6 PCB compliant with UL 94 V-0 Compliant with the European Union Directive 2011/65/EU (RoHS2) Compliant with the European Union Regulation No 1907/2006 Must be disposed of separately from normal household waste and must be recycled according to local regulations
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Komodo II CoaXPress Frame Grabber HW Block Diagram



Compatibility

KAYA Instruments creates and maintains 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.

Supported vision standards:



Please check our website for an up-to-date list of other supported libraries and software package

Contact Us

Please feel free to contact our team with any question or further inquiry at info@kayainstruments.com - we will be happy to provide assistance and consultation.

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