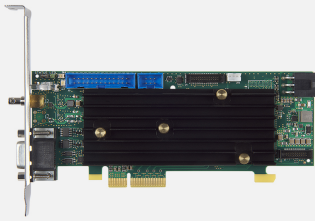




Coaxlink Mono CXP-12 LH

One-connection CoaXPress CXP-12 frame grabber



At a Glance

- One CoaXPress CXP-12 connection: 1,250 MB/s camera bandwidth
- PCIe 3.0 (Gen 3) x4 bus: 3,300 MB/s bus bandwidth
- Low-profile card. Delivered with standard and low-profile brackets
- Passive (fanless) heatsink
- Feature-rich set of 10 digital I/O lines
- Extensive camera control functions
- Memento Event Logging Tool

Benefits

Low-profile PCIe card

- Delivered with standard and low-profile brackets

PCIe 3.0 (Gen 3) x4 bus

- 3,300 MB/s sustained bus bandwidth

Acquire images from the fastest and highest resolution cameras

- Highest data acquisition rate in the industry
- 12.5 Gbit/s (1,250 MB/s) bandwidth from camera to host PC memory

Power over CoaXPress

- Power over CoaXPress : Feed your camera up to 25 W under 24 VDC with automatic device detection, measurement and overload protection.
- Voltage and current measurement is possible, allowing validation and performance deviation monitoring.

Long cable support

- 40 meters at CXP-12 speed (12.5 Gbps)
- 72 meters at CXP-6 speed (6.25 Gbps)
- 100 meters at CXP-3 speed (3 Gbps)

Use standard coaxial cables

- A single inexpensive cable for data transfer, camera control, trigger and power supply
- Top reliability and flexibility, performs in the harshest environments

Micro-BNC (HD-BNC™) connectors for reliable connection

- Trusted push and turn, bayonet-style positive lock
- Allows for quick and easy connects and disconnects

Memento Event Logging Tool

- Memento is an advanced development and debugging tool available for Coaxlink cards.
- Memento records an accurate log of all the events related to the camera, the frame grabber and its driver as well as the application.
- It provides the developer with a precise timeline of time-stamped events, along with context information and logic analyzer view.
- It provides valuable assistance during application development and debugging, as well as during machine operation.

Direct GPU transfer

- Sample programs for AMD DirectGMA and NVIDIA (CUDA) available.
- Direct GPU transfer eliminates unnecessary system memory copies, lowers CPU overhead, and reduces latency, resulting in significant performance improvements in data transfer times for applications.
- Direct capture of image data to GPU memory is available using AMD's DirectGMA. Compatible with AMD FirePro W5x00 and above and all AMD FirePro S series products.

General purpose I/O lines

- Compatible with a wide range of sensors and motion encoders.
- High-speed differential inputs: Quadrature motion encoder support up to 5 MHz.
- Isolated current-sense inputs: 5V, 12V, 24V signaling voltages accepted, up to 50 kHz, individual galvanic isolation up to 250VDC and 170VAC RMS.
- Isolated contact outputs.
- High-speed 5V-compliant TTL inputs/ LVTTTL outputs.

High-performance DMA (Direct Memory Access)

- Direct transfer into user-allocated memory and hardware boards that expose PCI addresses
- Hardware scatter-gather support
- 64-bit addressing capability

Area-scan triggering capabilities

- A trigger is used to start the acquisition when the part is in position. Hardware triggers come from the Coaxlink's I/O lines. Software triggers come from the application.
- An optional trigger delay is available to postpone the acquisition for a programmable time.
- A trigger decimation function allows to skip some of the triggers.
- Camera exposure control allows the application to control the exposure time of the camera.
- When the acquisition starts, at the appropriate timing, the Coaxlink board generates a signal to control an illumination device connected to one of its output lines.

Compatible with eGrabber

- eGrabber Studio: eGrabber's new interactive evaluation and demonstration application
- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s)
- GenTL Console: A command-line tool giving access to the functions and commands exposed by the Euresys GenTL Producer

Compliant with Genicam

Including support for

- GenApi
- The Standard Feature Naming Convention (SFNC)
- GenTL

Windows, Linux and macOS drivers available

- Including support for Intel 32-bit and 64-bit platforms as well as ARM 64-bit platforms

Applications

Machine Vision for the Electronic Manufacturing Industry

- High speed image acquisition for AOI, 3D SPI, 3D lead/ball inspection machines.
- Very high resolution line-scan image acquisition for Flat Panel Display inspection and solar cell inspection
- Mark inspection

Machine Vision for the General Manufacturing Industries

- High frame rate image acquisition for inspection machines
- Line-scan image acquisition for surface inspection machines
- Line-scan image acquisition for textile inspection
- Image acquisition for robots

Machine Vision for the Printing Industry

- High speed line-scan image acquisition for printing inspection machines

Video Acquisition and Recording

- High-frame-rate video acquisition for motion analysis and recording

Video Monitoring, Surveillance & Security

- Transmission and acquisition of high-definition video over long coaxial cables for traffic surveillance, monitoring and control

Specifications

Mechanical

Format	Low profile, half length, 4-lane PCI Express card
Cooling method	Air-cooling, fanless
Mounting	<ul style="list-style-type: none"> • For insertion in a 4-lane or higher, PCI Express card slot. • Delivered with standard- and low-profile brackets for insertion in a standard- or a low-profile chassis.

Connectors

- 'A' on bracket:
 - Micro-BNC female connector
 - CoaXPress host interface
- 'EXTERNAL I/O 1' on bracket:
 - 15-pin 3-row high-density female sub-D connector
 - I/O lines and power output
- 'INTERNAL I/O 1' on PCB:
 - 26-pin 2-row 0.1" pitch pin header with shrouding
 - I/O lines and power output
- 'I/O EXTENSION' on PCB:
 - 26-pin 2-row 0.05" pitch pin header with shrouding
 - I/O extension lines and power output
- 'AUXILIARY POWER INPUT' on module:
 - 6-pin PEG power socket
 - 12 VDC power input for PoCXP camera(s) and I/O power
- 'C2C-LINK' on module:
 - 6-pin 2-row 0.1" header
 - Card to card link

LED indicators

- 'A' on bracket:
 - Bi-color red/green LED
 - CoaXPress Host connector indicator
- 'FPGA STATUS LAMP' on PCB:
 - Bi-color red/green LED
 - FPGA status indicator
- 'BOARD STATUS LAMP' on PCB:
 - Bi-color red/green LED
 - Board status indicator

Switches

- 'RECOVERY' on card PCB:
- 3-pin 1-row 0.1" header
 - Firmware emergency recovery

Dimensions

L 167.65 mm x H 68,90 mm
L 6.6 in x H 2.71 in

Weight

160 g, 5.64 oz

Host bus

Standard

PCI Express 3.0

Link width

- 4 lanes
- 1 lane or 2 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

Peak delivery bandwidth

3,900 MB/s

Effective (sustained) delivery bandwidth

3,350 MB/s (Host PC motherboard dependent)

Power consumption

Typ. 11.5 W (3 W @ 3.3 V + 8.5 W @ 12 V), excluding camera and I/O power output

Camera / video inputs

Interface standard(s)	CoaXPress 1.0, 1.1, 1.1.1 and 2.0
Connectors	One micro-BNC 75 Ohms (also known as HD-BNC™) CXP-12
Status LEDs	One CoaXPress Host connection status LED per connection
Number of cameras	One 1-connection area-scan camera
Maximum aggregated camera data transfer rate	12.5 Gbit/s (1,250 MB/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), 10.0 GT/s (CXP-10), and 12.5 GT/s (CXP-12)
Supported CXP up-connection speeds	<ul style="list-style-type: none">• Low-speed 20.83... Mbps (CXP-1 to CXP-6)• Low-speed 41.66... Mbps (CXP-10, CXP-12)
Number of CXP data streams (per camera)	1 data stream per camera
Maximum CXP stream packet size	16,384 bytes
PoCXP (Power over CoaXPress)	<ul style="list-style-type: none">• PoCXP Safe Power:<ul style="list-style-type: none">– 25 W of 24V DC regulated power– 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 using a 6-pin PEG cable
Camera types	<ul style="list-style-type: none">• Area-scan cameras:<ul style="list-style-type: none">– Grayscale and color (RGB and Bayer CFA)– Single-tap (1X-1Y) progressive-scan
Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, and RGBA (PFNC names): <ul style="list-style-type: none">• 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• YCbCr601_422_8, YCbCr601_422_10• YCbCr709_422_8, YCbCr709_422_10• YUV422_8, YUV422_10

Area-scan camera control

Trigger	<ul style="list-style-type: none">• Precise control of asynchronous reset cameras, with exposure control.• Support of camera exposure/readout overlap.• Support of external hardware trigger, with optional delay and trigger decimation.
Strobe	<ul style="list-style-type: none">• Accurate control of the strobe position for strobed light sources.• Support of early and late strobe pulses.

On-board processing

On-board memory	512 MB
Image data stream processing	<ul style="list-style-type: none">• Unpacking of 10-/12-/14-bit to 16-bit with selectable justification to LSB or MSb• Optional swap of R and B components• Little endian conversion

Input LUT (Lookup Table)	<p>Only available for monochrome cameras:</p> <ul style="list-style-type: none"> • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Data stream statistics	<ul style="list-style-type: none"> • Measurement of: <ul style="list-style-type: none"> – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval
Event signaling and counting	<ul style="list-style-type: none"> • The application software can be notified of the occurrence of various events: <ul style="list-style-type: none"> – Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers – A large set of custom events • Custom events sources: <ul style="list-style-type: none"> – I/O Toolbox events – Camera and Illumination control events – CoaXPress data stream events – CoaXPress host interface events • Each custom event is associated with a 32-bit counter that counts the number of occurrences • The last three 32-bit context data words of the event context data can be configured with event-specific context data: <ul style="list-style-type: none"> – Event-specific data – State of all System I/O lines sampled at the event occurrence time – Value of any event counter

General Purpose Inputs and Outputs

Number of lines	<p>10 I/O lines:</p> <ul style="list-style-type: none"> • 2 differential inputs (DIN) • 2 singled-ended TTL inputs/outputs (TTLIO) • 4 isolated inputs (IIN)* • 2 isolated outputs (IOUT)* <p>NOTE: Only 2 IIN and 1 IOUT lines are available on the EXTERNAL I/O connector. NOTE: The number of I/O lines can be extended using I/O modules attached to the I/O EXTENSION connector.</p>
Usage	<ul style="list-style-type: none"> • Any I/O input lines can be used by any LIN tool of the I/O Toolbox • Selected pairs of I/O input lines can be used by any QDC tool of the I/O toolbox to decode A/B signals of a motion encoder • The LIN and QDC tools outputs can be further processed by the other tools (DIV, MDV, DEL) of the I/O toolbox to generate any of the following "trigger" events: <ul style="list-style-type: none"> – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller

Electrical specifications	<ul style="list-style-type: none"> • DIN: High-speed differential inputs compatible with ANSI/EIA/TIA-422/485 differential line drivers and complementary TTL drivers • TTLIO: High-speed 5V-compliant TTL inputs or LVTTTL outputs, compatible with totem-pole LVTTTL, TTL, 5V CMOS drivers or LVTTTL, TTL, 3V CMOS receivers • IIN: Isolated current-sense inputs with wide voltage input range up to 30V, compatible with totem-pole LVTTTL, TTL, 5V CMOS drivers, RS-422 differential line drivers, potential free contacts, solid-state relays and opto-couplers • IOOUT: Isolated contact outputs compatible with 30V / 100mA loads
Filter control	<ul style="list-style-type: none"> • Glitch removal filter available on all System I/O input lines • Configurable filter time constants: <ul style="list-style-type: none"> – 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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection
I/O Toolbox tools	<p>The I/O Toolbox is a configurable interconnection of tools that generates events (usually triggers) from input lines. The composition of the toolset is product- and firmware-dependent.</p> <ul style="list-style-type: none"> • Line Input tool (LIN): Edge detector delivering events on rising or falling edges of any selected input line. • Quadrature Decoder tool (QDC): A composite tool including: <ul style="list-style-type: none"> – A quadrature edge detector delivering events on selected transitions of selected pairs of input lines. – An optional backward motion compensator for clean line-scan image acquisition when the motion is unstable. – A 32-bit up/down counter for delivering a position value. • Divider tool (DIV): to generate an event every nth input events from any I/O toolbox event source. • Multiplier/divider tool (MDV): to generate m events every d input events from any I/O toolbox event source. • Delay tool (DEL): to delay up to 16 events from one or two I/O toolbox event sources, by a programmable time or number of motion encoder ticks (any QDC events). • User Actions Scheduler tool (UAS): to delegate the execution of User Actions at a scheduled time or encoder position. Possible user actions include setting low/high/toggle any bit of the User Output Register or generation of any User Events.
I/O Toolbox composition	8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS

C2C-Link

Description	<ul style="list-style-type: none"> • Accurate synchronization of the trigger and the start-of-exposure of multiple grabber-controlled area-scan cameras. • Accurate synchronization of the start-of-cycle, start-of-scan and end-of-scan of multiple grabber-controlled line-scan cameras.
-------------	--

Specification

- C2C-Link synchronizes cameras connected to:
 - the same card
 - to different cards in the same PC (requires an accessory cable such as the "3303 C2C-Link Ribbon Cable" or a custom-made C2C-Link cable)
 - to different cards in different PCs (requires one "1636 InterPC C2C-Link Adapter" for each PC and one RJ 45 CAT 5 STP straight LAN cable for each adapter but the last one)
- Maximum distance:
 - 60 cm inside a PC
 - 1200 m cumulated adapter to adapter cable length
- Maximum trigger rate:
 - 2.5 MHz for configurations using a single PC, or up to 10 PCs and 100 m total C2C-Link cable length
 - 200 kHz for configurations up to 32 PCs and 1200m total C2C-Link cable length
- Trigger propagation delay from master to slave devices:
 - Less than 10 ns for cameras on the same card or on different cards in the same PC
 - Less than 265 ns for cameras on different cards in different PCs (3 PCs and 40m total C2C-Link cable length)

Software

Host PC Operating System

- Microsoft Windows 10, 8.1, 7 for x86 (32-bit) and x86-64 (64-bit) processor architectures
- Linux for x86 (32-bit), x86-64 (64-bit) and aarch64 (64-bit) processor architectures
- macOS for x86-64 (64-bit) processor architecture

Refer to release notes for details

APIs

EGrabber class, with C++ and .NET APIs:

- .NET assembly designed to be used with development environments compatible with .NET frameworks version 4.0 or higher

GenICam GenTL producer libraries compatible with C/C++ compilers:

- x86 dynamic library designed to be used with ISO-compliant C/C++ compilers for the development of x86 applications
- x86_64 dynamic library designed to be used with ISO-compliant C/C++ compilers for the development of x86_64 applications
- aarch64 dynamic library designed to be used with ISO-compliant C/C++ compilers for the development of aarch64 applications

Environmental conditions

Operating ambient air temperature 0 to +55 °C / +32 to +131 °F, with minimum 150 LFM (Linear Feet per Minute) required airflow

Operating ambient air humidity 10 to 90% RH non-condensing

Storage ambient air temperature -20 to +70 °C/ -4 to +158 °F

Storage ambient air humidity 10% to 90% RH non-condensing

Certifications

Electromagnetic - EMC standards

- European Council EMC Directive 2004/108/EC
- United 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

KC Certification

Korean Radio Waves Act, Article 58-2, Clause 3

Flammability	PCB compliant with UL 94 V-0
RoHS	European Union Directive 2015/863 (ROHS3)
REACH	European Union Regulation 1907/2006
WEEE	Must be disposed of separately from normal household waste and must be recycled according to local regulations

Ordering Information

Product code - Description	<ul style="list-style-type: none"> • 3621-LH - Coaxlink Mono CXP-12 LH
Optional accessories	<ul style="list-style-type: none"> • 1625 - DB25F I/O Adapter Cable • 1636 - InterPC C2C-Link Adapter • 3303 - C2C-Link Ribbon Cable • 3304 - HD26F I/O Adapter Cable • 3610 - HD26F I/O Extension Module TTL-RS422 • 3612 - HD26F I/O Extension Module TTL-CMOS5V-RS422 • 3614 - HD26F I/O Extension Module - Standard I/O Set



EMEA

Euresys SA

Liège Science Park - Rue du Bois Saint-Jean, 20
4102 Seraing - Belgium

Phone: +32 4 367 72 88

Email: sales.europe@euresys.com

EMEA

Sensor to Image GmbH

Lechtorstrasse 20 -
86956 Schongau - Germany

Phone: +49 8861 2369 0

Email: sales.europe@euresys.com

AMERICA

Euresys Inc.

27132-A Paseo Espada - Suite 421
San Juan Capistrano, CA 92675 - United States

Phone: +1 949 743 0612

Email: sales.americas@euresys.com

ASIA

Euresys Pte. Ltd.

750A Chai Chee Road - #07-15 ESR BizPark @ Chai Chee
Singapore 469001 - Singapore

Phone: +65 6445 4800

Email: sales.asia@euresys.com

CHINA

Euresys Shanghai Liaison Office

Unit 802, Tower B, Greenland The Center - No.500 Yunjin Road, Xuhui District
200232 Shanghai - China

Euresys 上海联络处

上海市徐汇区云锦路500号绿地汇中心B座802室
200232

Phone: +86 21 33686220

Email: sales.china@euresys.com

JAPAN

Euresys Japan K.K.

Expert Office Shinyokohama - Nisso Dai 18 Building, Shinyokohama 3-7-18, Kohoku
Yokohama 222-0033 - Japan

〒222-0033

神奈川県横浜市港北区新横浜3-7-18 日総第18ビル エキスパートオフィス新横浜

Phone: +81 45 594 7259

Email: sales.japan@euresys.com

More at www.euresys.com

