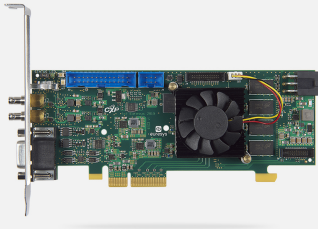


Coaxlink Duo CXP-12

Two-connection CoaXPress CXP-12 frame grabber



At a Glance

- Two CoaXPress CXP-12 connections: 2,500 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.
- Fan-cooled 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
- 25 Gbit/s (2,500 MB/s) bandwidth from camera to host PC memory

Long cable support for Coaxlink CXP-12

- 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

Robust connectors

- 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.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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, fan-cooled heatsink
Mounting	• 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', 'B' on bracket: – Micro-BNC female connectors – 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', 'B' on bracket: – Bi-color red/green LEDs – 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	125g, 4.40 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. 14.8 W (4.3W @ 3.3V + 10.5 W @12V), 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	Two micro-BNC 75 Ohms (also known as HD-BNC™) CXP-12
Status LEDs	One CoaXPress Host connection status LED per connector
Number of cameras	• Area-scan cameras: – One 1- or 2-connection camera – One or two 1-connection cameras
Maximum aggregated camera data transfer rate	25 Gbit/s (2,500 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)* NOTE: mixing CXP-10 and CXP-12 is not allowed!
Supported CXP up-connection speeds	• Low-speed 20.83* Mbps (CXP-1 to CXP-6) • Low-speed 41.6* 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)	• PoCXP Safe Power: – 17 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 using a 6-pin PEG cable
Camera types	• Area-scan cameras: – 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): • 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	• 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	• Accurate control of the strobe position for strobed light sources. • Support of early and late strobe pulses.

On-board processing

On-board memory	1 GB
Image data stream processing	• 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)	Only available for monochrome cameras: • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Bayer CFA to RGB decoder	• '1-camera' firmware variant: – 5x5 gradient-based interpolation method
Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval

Event signaling and counting

- The application software can be notified of the occurrence of various events:
 - Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers
 - A large set of custom events
- Custom events sources:
 - 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:
 - 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	10 I/O lines: • 2 differential inputs (DIN) • 2 singled-ended TTL inputs/outputs (TTLIO) • 4 isolated inputs (IIN)* • 2 isolated outputs (IOUT)* 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.
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads
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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection

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.

- 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:
 - 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

Determined by the selected firmware variant:

- 1-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
 - 2-camera: 8 LIN, 2 QDC, 2 DIV, 2 MDV, 2 DEL, 1 UAS
-

C2C-Link

Description

- 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
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	• 3622 - Coaxlink Duo CXP-12
Optional accessories	• 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 Viva Business Park
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

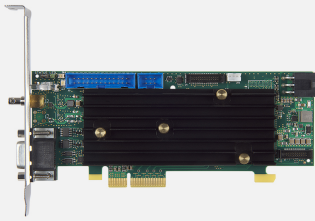
Email: sales.japan@euresys.com

More at www.euresys.com



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

Long cable support for Coaxlink CXP-12

- 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

Robust connectors

- 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.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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	• 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 connector
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	• Low-speed 20.83* Mbps (CXP-1 to CXP-6) • Low-speed 41.6* 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)	• PoCXP Safe Power: – 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	• Area-scan cameras: – 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): • 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	• 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	• 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	• 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)	Only available for monochrome cameras: • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval

Event signaling and counting

- The application software can be notified of the occurrence of various events:
 - Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers
 - A large set of custom events
- Custom events sources:
 - 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:
 - 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	10 I/O lines: • 2 differential inputs (DIN) • 2 singled-ended TTL inputs/outputs (TTLIO) • 4 isolated inputs (IIN)* • 2 isolated outputs (IOUT)* 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.
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads
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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection

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.

- 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:
 - 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

- 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	• 3621-LH - Coaxlink Mono CXP-12 LH
Optional accessories	• 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 Viva Business Park
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

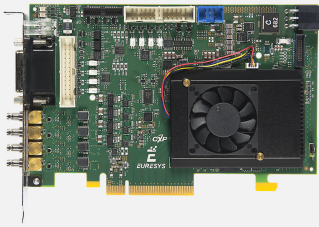
More at www.euresys.com





Coaxlink Quad CXP-12

Four-connection CoaXPress CXP-12 frame grabber



At a Glance

- Four CoaXPress CXP-12 connections: 5,000 MB/s camera bandwidth
- PCIe 3.0 (Gen 3) x8 bus: 6,700 MB/s bus bandwidth
- Feature-rich set of 20 digital I/O lines
- Extensive camera control functions
- Memento Event Logging Tool

Benefits

PCIe 3.0 (Gen 3) x8 bus

- 7,800 MB/s peak bus bandwidth
- 6,700 MB/s sustained bus bandwidth

Acquire images from the fastest and highest resolution cameras

- Highest data acquisition rate in the industry
- 50 Gbit/s (5,000 MB/s) bandwidth from camera to host PC memory

Long cable support for Coaxlink CXP-12

- 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

Robust connectors

- Micro-BNC (HD-BNC™) connectors for reliable connection
- Trusted push and turn, bayonet-style positive lock
- Allows for quick and easy connects and disconnects

Connect up to 4 cameras to a single Coaxlink card

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.

CustomLogic Design

- CustomLogic is an FPGA design kit enabling the design and upload of FPGA code to a Coaxlink board
- It is compatible with the Coaxlink Octo and Coaxlink Quad CXP-12 for which up to 70% of their Xilinx Kintex Ultrascale XCKU035 FPGA resources are available.
- The design phase uses the Xilinx Vivado development tools (not provided)
- Using CustomLogic does not require any additional hardware

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.

Line-scan triggering capabilities 1/2

Coaxlink supports continuous web scanning (to inspect infinite, continuously moving surfaces without losing a single line) and discrete object scanning (to acquire the image of objects moving in front of the camera).

- A trigger is used to start the acquisition when the part is in position. Hardware triggers come from the board's I/O lines. Software triggers come from the application.
- After it is started, the acquisition either:
 - Continues indefinitely (for web inspection applications)
 - Continues for a programmable number of lines (to acquire the image of objects of a known length)
 - Continues until an end trigger is received (to acquire the image of objects of a variable length)

- An optional trigger delay is available to postpone the beginning of the acquisition for a programmable number of lines.

Line-scan triggering capabilities 2/2

- The Coaxlink frame grabber controls the camera scanning rate based on the signals received from a motion encoder. When the parts move faster, the acquisition line rate of the camera increases. When the parts move slower, the acquisition line rate of the camera decreases.
- The Coaxlink boards interpret A/B signals from quadrature motion encoders to know in which direction (forward or backward) the part is moving.
- Optionally, the Coaxlink board can be instructed to acquire lines only when the object is moving forward or only when the object is moving backward.
- A feature called Backward Motion Cancellation stops the acquisition when a backward motion is detected. The line acquisition automatically resumes when the motion is again in the forward direction, at the exact place where the acquisition was interrupted.
- A Rate Converter allows the camera to acquire lines at any programmable resolution lower or higher than the resolution of the motion encoder. This gives the designer incredible freedom and flexibility during the development of the application.
- A Rate Divider allows the camera to acquire lines at a resolution lower than the resolution of the motion encoder. It divides the frequency of the incoming encoder signal by a programmable integer.

Flexible line-scan camera operation with the rate converter.

- The rate converter is a smart, programmable frequency multiplier/divider.
- Used with motion encoders and line-scan cameras, it allows the user to choose the aspect ratio of the pixels in the image.
- It provides a way to calibrate the acquisition chain to easily reach square (1:1 aspect ratio) pixels.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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	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	• 'A', 'B', 'C', 'D' on bracket: – 4x Micro-BNC female connectors – CoaXPress host interface • 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O 1' and 'INTERNAL I/O 2' on PCB: – 2x 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-in header – Card to card link
LED indicators	• 'A', 'B', 'C', 'D' on bracket: – Bi-color red/green LEDs – 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 111.15 mm L 6.6 in x H 4.38 in
Weight	196 g, 6.91 oz
Host bus	
Standard	PCI Express 3.0

Link width	• 8 lanes • 1 lane, 2 lanes 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
Peak delivery bandwidth	7,800 MB/s
Effective (sustained) delivery bandwidth	6,700 MB/s (Host PC motherboard dependent)
Power consumption	Typ. 17.1 W (7.3 W @ +3.3V, 9.8 W @ +12V), 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	Four micro-BNC 75 Ohms (also known as HD-BNC™) CXP-12
Status LEDs	One CoaXPress Host connection status LED per connector
Number of cameras	• Area-scan cameras: – One 1- or 2- or 4-connection camera – Four 1-connection cameras • Line-scan cameras: – One 1- or 2- or 4-connection camera
Maximum aggregated camera data transfer rate	50 Gbit/s (5,000 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	• Low-speed 20.83* Mbps (CXP-1 to CXP-6) • Low-speed 41.6* 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)	• PoCXP Safe Power: – 17 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 using a 6-pin PEG cable
Camera types	• Area-scan cameras: – Grayscale and color (YCbCr, YUV, RGB and Bayer CFA) – Single-tap (1X-1Y) progressive-scan • Line-scan cameras and contact imaging sensors: – Grayscale and color RGB

Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, 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 • YCbCr601_422_8, YCbCr601_422_10 • YCbCr709_422_8, YCbCr709_422_10 • YUV422_8, YUV422_10
--------------------------------	---

Area-scan camera control

Trigger	• 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	• Accurate control of the strobe position for strobed 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. • Support of infinite acquisition, without missing line, for web inspection applications.
Line trigger	• Support for quadrature motion encoders, with programmable noise filters, selection of acquisition direction and backward motion compensation. • Rate Converter tool for fine control of the pixel aspect ratio: Rate Conversion Ratio in the range 0.001 to 1000 with an accuracy better than 0.1%. • Rate Divider tool
Line strobe	• Accurate control of the strobe position for strobed light sources.

On-board processing

On-board memory	2 GB
Image data stream processing	• 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)	Only available for monochrome cameras: • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Bayer CFA to RGB decoder	• '1-camera' firmware variant: – 3x3 linear interpolation method – 3x3 median-based interpolation method
CustomLogic firmware variants	• 1-camera, customlogic firmware variant – one 1- or 2- or 4-connection area-scan camera – 91% DSP, 82% FF, 74% LUT and 56% BRAM resources of the Xilinx Kintex Ultrascale XCKU035 FPGA available for user programming – 2GB capacity, 12GB/s bandwidth, shared on-board DRAM memory

Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval
Event signaling and counting	• The application software can be notified of the occurrence of various events: – Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers – A large set of custom events • Custom events sources: – 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: – 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	20 I/O lines: • 4 differential inputs (DIN) • 4 singled-ended TTL inputs/outputs (TTLIO) • 8 isolated inputs (IIN) • 4 isolated outputs (IOUT) NOTE: The number of I/O lines can be extended using I/O modules attached to the I/O EXTENSION connector.
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – The "start-of-scan trigger" of the Acquisition Controller (line-scan only) – The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads

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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection
I/O Toolbox tools	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. • 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: – 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	Determined by the selected firmware variant: • 1-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 1-camera, line-scan: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 4-camera: 8 LIN, 4 QDC, 4 DIV, 4 MDV, 4 DEL, 1 UAS

C2C-Link

Description	• 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
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	• 3603 - Coaxlink Quad CXP-12
Optional accessories	• 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 • 3613 - JTAG Adapter Xilinx for Coaxlink

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 Viva Business Park
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

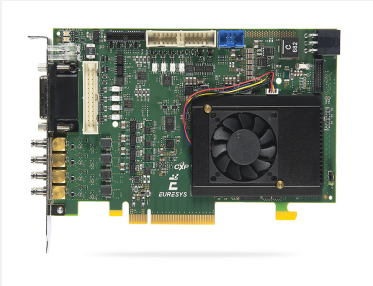
Email: sales.japan@euresys.com

More at www.euresys.com



Coaxlink Quad CXP-12 JPEG

Four-connection CoaXPress CXP-12 frame grabber with JPEG compression



At a Glance

- Four 250 MPixels/s JPEG encoders
- Compatible with 8-bit/pixel Bayer CFA cameras
- Two streams per camera: JPEG stream and RGB preview stream
- Four CoaXPress CXP-12 connections: 5,000 MB/s camera bandwidth
- PCIe 3.0 (Gen 3) x8 bus: 6,700 MB/s bus bandwidth

Benefits

Applications

The Coaxlink Quad CXP-12 JPEG enables the compact implementation of a multi-channel ultra-high-resolution image acquisition and recording system. The embedded pixel processing drastically reduces the CPU workload to monitor and compress image streams.

Description

- The 4-camera firmware variant of the Coaxlink Quad CXP-12 JPEG implements four independent image acquisition channels with, for each of them, a Bayer CFA decoder and a baseline JPEG encoder that can process up to 250 Megapixels/s, for a total of 1 billion color pixels per second.
- Each channel delivers two concurrent streams: a "JPEG" encoded stream for recording and a "Preview" stream for monitoring.
- The JPEG stream delivers, with a typical latency of only 20 lines, 4:2:2 full-resolution JFIF-compliant encoded images compatible with standard JPEG decoders. The JPEG encoding quality is configurable from 1 to 100.
- The Preview stream provides 8-bit Bayer full-resolution, 24-bit RGB full-resolution or 24-bit RGB low-resolution images.

Support of JFIF image format

The GenICam Browser and GenTL Viewer applications now support JFIF images.

PCIe 3.0 (Gen 3) x8 bus

- 7,800 MB/s peak bus bandwidth
- 6,700 MB/s sustained bus bandwidth

Acquire images from the fastest and highest resolution cameras

- Highest data acquisition rate in the industry
- 50 Gbit/s (5,000 MB/s) bandwidth from camera to host PC memory

Long cable support for Coaxlink CXP-12

- 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

Robust connectors

- Micro-BNC (HD-BNC™) connectors for reliable connection
- Trusted push and turn, bayonet-style positive lock
- Allows for quick and easy connects and disconnects

Connect up to 4 cameras to a single Coaxlink card

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

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- GenTL Console: A command-line tool giving access to the functions and commands exposed by the Euresys GenTL Producer.

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.

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

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	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	• 'A', 'B', 'C', 'D' on bracket: – 4x Micro-BNC female connectors – CoaXPress host interface • 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O 1' and 'INTERNAL I/O 2' on PCB: – 2x 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-in header – Card to card link

LED indicators	• 'A', 'B', 'C', 'D' on bracket: – Bi-color red/green LEDs – 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 111.15 mm L 6.6 in x H 4.38 in
Weight	196 g, 6.91 oz

Host bus

Standard	PCI Express 3.0
Link width	• 8 lanes • 1 lane, 2 lanes 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
Peak delivery bandwidth	7,800 MB/s
Effective (sustained) delivery bandwidth	6,700 MB/s (Host PC motherboard dependent)
Power consumption	Typ. 18.1 W (6.3 W @ +3.3V, 11.8 W @ +12V), 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	Four micro-BNC 75 Ohms (also known as HD-BNC™) CXP-12
Status LEDs	One CoaXPress Host connection status LED per connector
Number of cameras	Four 1-connection area-scan cameras
Maximum aggregated camera data transfer rate	50 Gbit/s (5,000 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	• Low-speed 20.83* Mbps (CXP-1 to CXP-6) • Low-speed 41.6* 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)	• PoCXP Safe Power: – 17 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 using a 6-pin PEG cable
Camera types	Area-scan cameras: • 8-bit Bayer CFA single-tap (1X-1Y) progressive-scan • Image resolution (H x V): from 128 x 16 up to 5120 x 3840; width and height must be multiples of 8
Camera pixel formats supported	Bayer (PFNC names): • BayerGR8, BayerRG8, BayerGB8, BayerBG8

Area-scan camera control

Trigger	• 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	• Accurate control of the strobe position for strobed light sources. • Support of early and late strobe pulses.

On-board processing

On-board memory	2 GB
Image data stream processing	• Optional swap of R and B components • 1:8 image downscaling available on RGB8 output (Stream0, a.k.a. "preview stream")
Bayer CFA to RGB decoder	• '4-camera' firmware variant: – 3x3 median-based interpolation method
Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval
Event signaling and counting	• The application software can be notified of the occurrence of various events: – Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers – A large set of custom events • Custom events sources: – 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: – Event-specific data – State of all System I/O lines sampled at the event occurrence time – Value of any event counter

On-board video codec

Video encoders	JPEG • Baseline profile • 4 encoders • Up to 250 Mpixels/second per encoder • JFIF compliant output
----------------	---

General Purpose Inputs and Outputs

Number of lines	20 I/O lines: • 4 differential inputs (DIN) • 4 singled-ended TTL inputs/outputs (TTLIO) • 8 isolated inputs (IIN) • 4 isolated outputs (IOUT) NOTE: The number of I/O lines can be extended using I/O modules attached to the I/O EXTENSION connector.
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads
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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection

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.

- 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:
 - 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, 4 QDC, 4 DIV, 4 MDV, 4 DEL, 1 UAS

C2C-Link

Description

- 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
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	• 3620 - Coaxlink Quad CXP-12 JPEG
Optional accessories	• 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 • 3613 - JTAG Adapter Xilinx for Coaxlink

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 Viva Business Park
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

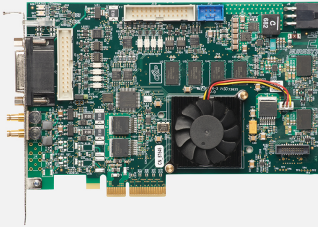
Email: sales.japan@euresys.com

More at www.euresys.com



Coaxlink Duo

Two-connection CoaXPress frame grabber



At a Glance

- Two CoaXPress CXP-6 connections: 1,250 MB/s camera bandwidth
- PCIe 2.0 (Gen 2) x4 bus: 1,700 MB/s delivery bandwidth
- Feature-rich set of 20 digital I/O lines
- Extensive camera control functions
- Memento Event Logging Tool

Benefits

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

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

Long cable support for Coaxlink CXP-6

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

Robust connectors for reliable connections

- Coaxlink CXP-6 uses DIN 1.0/2.3 connectors with push/pull latching system

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.

PCIe 2.0 (Gen 2) x4 bus

- 1,700 MB/s sustained bus bandwidth

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.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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.

Machine Vision for the General Manufacturing Industries

- High frame rate image acquisition for inspection machines
- Image acquisition for robots

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	Standard profile, half length, 4-lane PCI Express card
Cooling method	Air cooling, fan-cooled heatsink
Mounting	For insertion in a standard height, 4-lane or higher, PCI Express card slot
Connectors	• 'A', 'B' on bracket: – 2x DIN 1.0/2.3 female connectors – CoaXPress host interface • 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O 1' and 'INTERNAL I/O 2' on PCB: – 2x 26-pin 2-row 0.1" pitch pin header with shrouding – I/O 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-in header – Card to card link
LED indicators	• 'A', 'B' on bracket: – Bi-color red/green LEDs – 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 111.15 mm L 6.6 in x H 4.38 in
Weight	160 g, 5.64 oz

Host bus

Standard	PCI Express 2.0
Link width	• 4 lanes • 1 lane or 2 lanes with reduced performance

Link speed	• 5.0 GT/s (PCIe2.0) • 2.5 GT/s (PCIe 1.0) with reduced performance
Maximum payload size	512 bytes
DMA	32- and 64-bit
Peak delivery bandwidth	2,000 MB/s
Effective (sustained) delivery bandwidth	1,700 MB/s (Host PC motherboard dependent)
Power consumption	Typ. 11.4 W (2.7 W @ +3.3V, 8.7 W @ +12V), excluding camera and I/O power output

Camera / video inputs

Interface standard(s)	CoaXPress 1.0, 1.1 and 1.1.1
Connectors	Two DIN1.0/2.3 75 Ohms CXP-6
Status LEDs	One CoaXPress Host connection status LED per connector
Number of cameras	• Area-scan cameras: – One 1- or 2-connection camera – One or two 1-connection cameras • Line-scan cameras: – One 1- or 2-connection camera – One or two 1-connection cameras
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), and 6.25 GT/s (CXP-6)
Number of CXP data streams (per camera)	1 data stream per camera
Maximum CXP stream packet size	16,384 bytes
PoCXP (Power over CoaXPress)	• PoCXP Safe Power: – 17 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 using a 6-pin PEG cable
Camera types	• Area-scan cameras: – Grayscale and color (YCbCr, YUV, RGB and Bayer CFA) – Single-tap (1X-1Y) progressive-scan • Line-scan cameras and contact imaging sensors: – Grayscale and color RGB
Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, 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 • YCbCr601_422_8, YCbCr601_422_10 • YCbCr709_422_8, YCbCr709_422_10 • YUV422_8, YUV422_10

Area-scan camera control

Trigger	• 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	• Accurate control of the strobe position for strobed 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. • Support of infinite acquisition, without missing line, for web inspection applications.
-------------------	---

On-board processing

On-board memory	1 GB
Image data stream processing	• 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)	Only available for monochrome cameras: • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval
Event signaling and counting	• The application software can be notified of the occurrence of various events: – Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers – A large set of custom events • Custom events sources: – 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: – 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	20 I/O lines: • 4 differential inputs (DIN) • 4 singled-ended TTL inputs/outputs (TTLIO) • 8 isolated inputs (IIN) • 4 isolated outputs (IOUT)
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – The "start-of-scan trigger" of the Acquisition Controller (line-scan only) – The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads
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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection
I/O Toolbox tools	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. • 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: – 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.

- 1-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 1-camera, line-scan: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 2-camera: 8 LIN, 2 QDC, 2 DIV, 2 MDV, 2 DEL, 1 UAS
- 2-camera, line-scan: 8 LIN, 2 QDC, 2 DIV, 2 MDV, 2 DEL, 1 UAS

C2C-Link

Description	• 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
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 61000-4-5 • 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	• 1631 - Coaxlink Duo
Optional accessories	• 1625 - DB25F I/O Adapter Cable • 1636 - InterPC C2C-Link Adapter • 3303 - C2C-Link Ribbon Cable • 3304 - HD26F I/O Adapter Cable

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 Viva Business Park
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

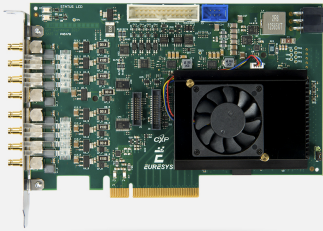
Email: sales.japan@euresys.com

More at www.euresys.com



Coaxlink Octo

PCIe 3.0 eight-connection CoaXPress frame grabber



At a Glance

- Eight CoaXPress CXP-6 connections: 5,000 MB/s camera bandwidth
- Connect up to eight CoaXPress cameras to one card
- PCIe 3.0 (Gen 3) x8 bus: 6,700 MB/s bus bandwidth
- Feature-rich set of 10 digital I/O lines
- Extensive camera control functions
- Memento Event Logging Tool

Benefits

PCIe 3.0 (Gen 3) x8 bus

- 7,800 MB/s peak bus bandwidth
- 6,700 MB/s sustained bus bandwidth

Acquire images from the fastest and highest resolution cameras

- Highest data acquisition rate in the industry
- 50 Gbit/s (5,000 MB/s) bandwidth from camera to host PC memory

Long cable support for Coaxlink CXP-6

- 40 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

Robust connectors for reliable connections

- Coaxlink CXP-6 uses DIN 1.0/2.3 connectors with push/pull latching system

Connect up to 8 cameras to a single Coaxlink card

Coaxlink Octo also supports a 16-connection cameras connected to two cards.

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.

CustomLogic Design

- CustomLogic is an FPGA design kit enabling the design and upload of FPGA code to a Coaxlink board
- It is compatible with the Coaxlink Octo and Coaxlink Quad CXP-12 for which up to 70% of their Xilinx Kintex Ultrascale XCKU035 FPGA resources are available.
- The design phase uses the Xilinx Vivado development tools (not provided)
- Using CustomLogic does not require any additional hardware

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.

Line-scan triggering capabilities 1/2

Coaxlink supports continuous web scanning (to inspect infinite, continuously moving surfaces without losing a single line) and discrete object scanning (to acquire the image of objects moving in front of the camera).

- A trigger is used to start the acquisition when the part is in position. Hardware triggers come from the board's I/O lines. Software triggers come from the application.
- After it is started, the acquisition either:
 - Continues indefinitely (for web inspection applications)
 - Continues for a programmable number of lines (to acquire the image of objects of a known length)
 - Continues until an end trigger is received (to acquire the image of objects of a variable length)
- An optional trigger delay is available to postpone the beginning of the acquisition for a programmable number of lines.

Line-scan triggering capabilities 2/2

- The Coaxlink frame grabber controls the camera scanning rate based on the signals received from a motion encoder. When the parts move faster, the acquisition line rate of the camera increases. When the parts move slower, the acquisition line rate of the camera decreases.
- The Coaxlink boards interpret A/B signals from quadrature motion encoders to know in which direction (forward or backward) the part is moving.
- Optionally, the Coaxlink board can be instructed to acquire lines only when the object is moving forward or only when the object is moving backward.
- A feature called Backward Motion Cancellation stops the acquisition when a backward motion is detected. The line acquisition automatically resumes when the motion is again in the forward direction, at the exact place where the acquisition was interrupted.
- A Rate Converter allows the camera to acquire lines at any programmable resolution lower or higher than the resolution of the motion encoder. This gives the designer incredible freedom and flexibility during the development of the application.
- A Rate Divider allows the camera to acquire lines at a resolution lower than the resolution of the motion encoder. It divides the frequency of the incoming encoder signal by a programmable integer.

Flexible line-scan camera operation with the rate converter.

- The rate converter is a smart, programmable frequency multiplier/divider.
- Used with motion encoders and line-scan cameras, it allows the user to choose the aspect ratio of the pixels in the image.
- It provides a way to calibrate the acquisition chain to easily reach square (1:1 aspect ratio) pixels.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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

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	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	• 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H' on bracket: – 8x DIN 1.0/2.3 female connectors – CoaXPress host interface • 'INTERNAL I/O' 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 PCB: – 6-pin PEG power socket – 12 VDC power input for PoCXP camera(s) and I/O power • 'C2C-LINK' on PCB: – 6-pin 2-row 0.1-in header – Card to card link
LED indicators	• 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H' on bracket: – Bi-color red/green LEDs – 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 111.15 mm L 6.6 in x H 4.38 in
Weight	189 g, 6.67 oz

Host bus

Standard	PCI Express 3.0
Link width	• 8 lanes • 1 lane, 2 lanes 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
Peak delivery bandwidth	7,800 MB/s

Effective (sustained) delivery bandwidth	6,700 MB/s (Host PC motherboard dependent)
Power consumption	Typ. 16 W (4.2 W @ +3.3V, 11.8 W @ +12V), excluding camera and I/O power output
Camera / video inputs	
Interface standard(s)	CoaXPress 1.0, 1.1 and 1.1.1
Connectors	Eight DIN1.0/2.3 75 Ohms CXP-6
Status LEDs	One CoaXPress Host connection status LED per connector
Number of cameras	- Area-scan cameras: - One 1- or 2- or 4- or 8-connection camera - One or two 1- or 2- or 4-connection cameras - Up to four 1- or 2-connection cameras - One 1- or 2- or 4-connection camera and up to four 1-connection cameras - Up to eight 1-connection cameras - Line-scan cameras: - One 1- or 2- or 4- or 8-connection camera - One or two 1- or 2- or 4-connection cameras - Up to four 1- or 2-connection cameras
Maximum aggregated camera data transfer rate	50 Gbit/s (5,000 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), and 6.25 GT/s (CXP-6)
Number of CXP data streams (per camera)	1 data stream per camera
Maximum CXP stream packet size	16,384 bytes
PoCXP (Power over CoaXPress)	- PoCXP Safe Power: 17 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 using a 6-pin PEG cable
Camera types	- Area-scan cameras: - Grayscale and color (YCbCr, YUV, RGB and Bayer CFA) - Single-tap (1X-1Y) progressive-scan - Line-scan cameras and contact imaging sensors: - Grayscale and color RGB
Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, 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 - YCbCr601_422_8, YCbCr601_422_10 - YCbCr709_422_8, YCbCr709_422_10 - YUV422_8, YUV422_10

Area-scan camera control

Trigger	• 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	• Accurate control of the strobe position for strobed 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. • Support of infinite acquisition, without missing line, for web inspection applications.
Line trigger	• Support for quadrature motion encoders, with programmable noise filters, selection of acquisition direction and backward motion compensation. • Rate Converter tool for fine control of the pixel aspect ratio: Rate Conversion Ratio in the range 0.001 to 1000 with an accuracy better than 0.1%. • Rate Divider tool
Line strobe	• Accurate control of the strobe position for strobed light sources.

On-board processing

On-board memory	2 GB
Image data stream processing	• 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
Flat-field correction	Only available with the '2-camera' firmware variant
Input LUT (Lookup Table)	Only available for monochrome cameras: • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Bayer CFA to RGB decoder	• '1-camera' firmware variant: – 3x3 linear interpolation method – 3x3 median-based interpolation method – 5x5 gradient-based interpolation method • '2-camera' firmware variant: – 3x3 linear interpolation method – 3x3 median-based interpolation method
CustomLogic firmware variants	• 1-camera, customlogic firmware variant – one 1- or 2- or 4-connection area-scan camera – 91% DSP, 84% FF, 75% LUT and 62% BRAM resources of the Xilinx Kintex Ultrascale XCKU035 FPGA available for user programming – 2GB capacity, 12GB/s bandwidth, shared on-board DRAM memory
Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval

Event signaling and counting

- The application software can be notified of the occurrence of various events:
 - Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers
 - A large set of custom events
- Custom events sources:
 - 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:
 - 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	10 I/O lines on INTERNAL I/O connector: • 2 differential inputs (DIN) • 2 singled-ended TTL inputs/outputs (TTLIO) • 4 isolated inputs (IIN) • 2 isolated outputs (IOUT) NOTE: The number of I/O lines can be extended using I/O modules attached to the I/O EXTENSION connector.
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – The "start-of-scan trigger" of the Acquisition Controller (line-scan only) – The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads
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

Power output	• From AUXILIARY POWER connector to INTERNAL I/O and I/O EXTENSION connectors: – Non-isolated +12V, 1A, with electronic fuse protection • From PCI Express connector to I/O EXTENSION connector: – Non-isolated, +3.3V, unprotected
I/O Toolbox tools	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. • 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: – 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	Determined by the selected firmware variant: • 1-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 1-camera, line-scan: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 2-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 2-camera, line-scan: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 4-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 4-camera, line-scan: 8 LIN, 4 QDC, 4 DIV, 4 MDV, 4 DEL, 1 UAS • 5-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 8-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS

C2C-Link

Description	• 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
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	• 3602 - Coaxlink Octo
Included accessories	• 3304 - HD26F I/O Adapter Cable
Optional accessories	• 1625 - DB25F I/O Adapter Cable • 1636 - InterPC C2C-Link Adapter • 3303 - C2C-Link Ribbon Cable • 3610 - HD26F I/O Extension Module TTL-RS422 • 3612 - HD26F I/O Extension Module TTL-CMOS5V-RS422 • 3613 - JTAG Adapter Xilinx for Coaxlink • 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 Viva Business Park
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

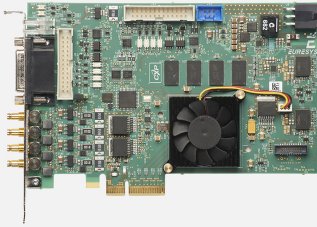
Email: sales.japan@euresys.com

More at www.euresys.com



Coaxlink Quad

Four-connection CoaXPress frame grabber



At a Glance

- Four CoaXPress CXP-6 connections: 2,500 MB/s camera bandwidth
- PCIe 2.0 (Gen 2) x4 bus: 1,700 MB/s delivery bandwidth
- Feature-rich set of 20 digital I/O lines
- Extensive camera control functions
- Memento Event Logging Tool

Benefits

Acquire images from the fastest and highest resolution cameras

- Highest data acquisition rate in the industry
- 25 Gbit/s (2,500 MB/s) bandwidth from camera to host PC memory

Long cable support for Coaxlink CXP-6

- 40 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

Robust connectors for reliable connections

- Coaxlink CXP-6 uses DIN 1.0/2.3 connectors with push/pull latching system

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.

PCIe 2.0 (Gen 2) x4 bus

- 1,700 MB/s sustained bus bandwidth

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.

Line-scan triggering capabilities 1/2

Coaxlink supports continuous web scanning (to inspect infinite, continuously moving surfaces without losing a single line) and discrete object scanning (to acquire the image of objects moving in front of the camera).

- A trigger is used to start the acquisition when the part is in position. Hardware triggers come from the board's I/O lines. Software triggers come from the application.
- After it is started, the acquisition either:
 - Continues indefinitely (for web inspection applications)
 - Continues for a programmable number of lines (to acquire the image of objects of a known length)
 - Continues until an end trigger is received (to acquire the image of objects of a variable length)
- An optional trigger delay is available to postpone the beginning of the acquisition for a programmable number of lines.

Line-scan triggering capabilities 2/2

- The Coaxlink frame grabber controls the camera scanning rate based on the signals received from a motion encoder. When the parts move faster, the acquisition line rate of the camera increases. When the parts move slower, the acquisition line rate of the camera decreases.
- The Coaxlink boards interpret A/B signals from quadrature motion encoders to know in which direction (forward or backward) the part is moving.
- Optionally, the Coaxlink board can be instructed to acquire lines only when the object is moving forward or only when the object is moving backward.
- A feature called Backward Motion Cancellation stops the acquisition when a backward motion is detected. The line acquisition automatically resumes when the motion is again in the forward direction, at the exact place where the acquisition was interrupted.
- A Rate Converter allows the camera to acquire lines at any programmable resolution lower or higher than the resolution of the motion encoder. This gives the designer incredible freedom and flexibility during the development of the application.

- A Rate Divider allows the camera to acquire lines at a resolution lower than the resolution of the motion encoder. It divides the frequency of the incoming encoder signal by a programmable integer.

Flexible line-scan camera operation with the rate converter.

- The rate converter is a smart, programmable frequency multiplier/divider.
- Used with motion encoders and line-scan cameras, it allows the user to choose the aspect ratio of the pixels in the image.
- It provides a way to calibrate the acquisition chain to easily reach square (1:1 aspect ratio) pixels.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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

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

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	Standard profile, half length, 4-lane PCI Express card
Cooling method	Air cooling, fan-cooled heatsink
Mounting	For insertion in a standard height, 4-lane or higher, PCI Express card slot

Connectors	• 'A', 'B', 'C', 'D' on bracket: – 4x DIN 1.0/2.3 female connectors – CoaXPress host interface • 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O 1' and 'INTERNAL I/O 2' on PCB: – 2x 26-pin 2-row 0.1" pitch pin header with shrouding – I/O 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-in header – Card to card link
LED indicators	• 'A', 'B', 'C', 'D' on bracket: – Bi-color red/green LEDs – 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 111.15 mm L 6.6 in x H 4.38 in
Weight	170 g, 6.00 oz

Host bus

Standard	PCI Express 2.0
Link width	• 4 lanes • 1 lane or 2 lanes with reduced performance
Link speed	• 5.0 GT/s (PCIe 2.0) • 2.5 GT/s (PCIe 1.0) with reduced performance
Maximum payload size	512 bytes
DMA	32- and 64-bit
Peak delivery bandwidth	2,000 MB/s
Effective (sustained) delivery bandwidth	1,700 MB/s (Host PC motherboard dependent)
Power consumption	Typ. 12.1W (2.5 W @ +3.3V, 9.6 W @ +12V), excluding camera and I/O power output

Camera / video inputs

Interface standard(s)	CoaXPress 1.0, 1.1 and 1.1.1
Connectors	Four DIN1.0/2.3 75 Ohms CXP-6
Status LEDs	One CoaXPress Host connection status LED per connector

Number of cameras	• Area-scan cameras: – One 1- or 2- or 4-connection camera – One or two 1- or 2-connection cameras • Line-scan cameras: – One 1- or 2- or 4-connection camera
Maximum aggregated camera data transfer rate	25 Gbit/s (2,500 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), and 6.25 GT/s (CXP-6)
Number of CXP data streams (per camera)	1 data stream per camera
Maximum CXP stream packet size	16,384 bytes
PoCXP (Power over CoaXPress)	• PoCXP Safe Power: – 17 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 using a 6-pin PEG cable
Camera types	• Area-scan cameras: – Grayscale and color (YCbCr, YUV, RGB and Bayer CFA) – Single-tap (1X-1Y) progressive-scan • Line-scan cameras and contact imaging sensors: – Grayscale and color RGB
Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, 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 • YCbCr601_422_8, YCbCr601_422_10 • YCbCr709_422_8, YCbCr709_422_10 • YUV422_8, YUV422_10

Area-scan camera control

Trigger	• 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	• Accurate control of the strobe position for strobed 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. • Support of infinite acquisition, without missing line, for web inspection applications.
-------------------	---

Line trigger	• Support for quadrature motion encoders, with programmable noise filters, selection of acquisition direction and backward motion compensation. • Rate Converter tool for fine control of the pixel aspect ratio: Rate Conversion Ratio in the range 0.001 to 1000 with an accuracy better than 0.1%. • Rate Divider tool
Line strobe	• Accurate control of the strobe position for strobed light sources.

On-board processing

On-board memory	1 GB
Image data stream processing	• 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)	Only available for monochrome cameras: • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval
Event signaling and counting	• The application software can be notified of the occurrence of various events: – Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers – A large set of custom events • Custom events sources: – 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: – 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	20 I/O lines: • 4 differential inputs (DIN) • 4 singled-ended TTL inputs/outputs (TTLIO) • 8 isolated inputs (IIN) • 4 isolated outputs (IOUT)
-----------------	---

Usage	- 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: - The "cycle trigger" of the Camera and Illumination controller - The "cycle sequence trigger" of the Camera and Illumination controller - The "start-of-scan trigger" of the Acquisition Controller (line-scan only) - The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	- 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 LVTTL outputs, compatible with totem-pole LVTTL, TTL, 5V CMOS drivers or LVTTL, TTL, 3V CMOS receivers - IIN: Isolated current-sense inputs with wide voltage input range up to 30V, compatible with totem-pole LVTTL, TTL, 5V CMOS drivers, RS-422 differential line drivers, potential free contacts, solid-state relays and opto-couplers - IOUT: Isolated contact outputs compatible with 30V / 100mA loads
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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection
I/O Toolbox tools	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. - 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: - 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	Determined by the selected firmware variant: 1-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS 1-camera, line-scan: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS 2-camera: 8 LIN, 2 QDC, 2 DIV, 2 MDV, 2 DEL, 1 UAS

C2C-Link

Description	• 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
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 61000-4-5 • 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	• 1632 - Coaxlink Quad
Optional accessories	• 1625 - DB25F I/O Adapter Cable • 1636 - InterPC C2C-Link Adapter • 3303 - C2C-Link Ribbon Cable • 3304 - HD26F I/O Adapter Cable

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 Viva Business Park
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

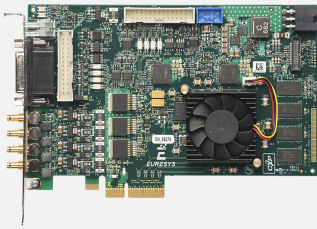
Email: sales.japan@euresys.com

More at www.euresys.com



Coaxlink Quad 3D-LLE

Quad CXP-6 frame grabber with on-board laser line extraction for 3D profiling



At a Glance

- Laser line extraction with zero host CPU usage
- Single and Dual Laser Line Extraction into a depth map
- Real-time generation of 16-bit 3D height maps
- Choice of algorithms: Maximum, Peak, Center of Gravity (COG)
- Precision: up to 1/256 pixel (with Peak and COG algorithms)
- Performance: 19,000 profiles/s from 1024 x 128 images. 38,000 profiles/s from 1024 x 64 images

Benefits

Laser line extraction with zero host CPU usage

The Coaxlink's on-board FPGA measures the position of the laser line during the image acquisition without loading the host CPU.

Real-time generation of 16-bit 3D height maps

The Coaxlink directly transfers the computed 3D height map to the host PC memory without delay, in real-time.

Acquire images from the fastest and highest resolution cameras

- Highest data acquisition rate in the industry
- 25 Gbit/s (2,500 MB/s) bandwidth from camera to host PC memory

Dual laser line extraction

Supported by software and hardware implementations, the dual laser line extraction process reduces the effect of occlusions. Occlusions occur when some parts of the objects are not lit by any laser. Using two lasers with different angles reduces these undefined areas. The object-based calibration included in Easy3DLaserLine allows combining the acquired data into a single calibrated point cloud.

Long cable support for Coaxlink CXP-6

- 40 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

Robust connectors for reliable connections

- Coaxlink CXP-6 uses DIN 1.0/2.3 connectors with push/pull latching system

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.

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.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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

Developed with the support of the DG06 Technology Development Department

Applications

Machine Vision for the Electronic Manufacturing Industry

- 3D image acquisition for electronic inspection machines

Machine Vision for the General Manufacturing Industries

- 3D image acquisition for inspection machines

Specifications

Mechanical

Format	Standard profile, half length, 4-lane PCI Express card
Cooling method	Air cooling, fan-cooled heatsink
Mounting	For insertion in a standard height, 4-lane or higher, PCI Express card slot
Connectors	• 'A', 'B', 'C', 'D' on bracket: – 4x DIN 1.0/2.3 female connectors – CoaXPress host interface • 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O 1' and 'INTERNAL I/O 2' on PCB: – 2x 26-pin 2-row 0.1" pitch pin header with shrouding – I/O 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-in header – Card to card link
LED indicators	• 'A', 'B', 'C', 'D' on bracket: – Bi-color red/green LEDs – 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 111.15 mm L 6.6 in x H 4.38 in
Weight	180 g, 6.35 oz

Host bus

Standard	PCI Express 2.0
Link width	• 4 lanes • 1 lane or 2 lanes with reduced performance
Link speed	• 5.0 GT/s (PCIe 2.0) • 2.5 GT/s (PCIe 1.0) with reduced performance

Maximum payload size	512 bytes
DMA	32- and 64-bit
Peak delivery bandwidth	2,000 MB/s
Effective (sustained) delivery bandwidth	1,700 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, 1.1 and 1.1.1
Connectors	Four DIN1.0/2.3 75 Ohms CXP-6
Status LEDs	One CoaXPress Host connection status LED per connector
Number of cameras	One 1- or 2- or 4-connection camera
Maximum aggregated camera data transfer rate	25 Gbit/s (2,500 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), and 6.25 GT/s (CXP-6)
Number of CXP data streams (per camera)	1 data stream per camera
Maximum CXP stream packet size	16,384 bytes
PoCXP (Power over CoaXPress)	• PoCXP Safe Power: – 17 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 using a 6-pin PEG cable
Camera types	• Grayscale area-scan cameras
Camera pixel formats supported	Monochrome 8-bit (Mono8)

Area-scan camera control

Trigger	• 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	• Accurate control of the strobe position for strobed light sources. • Support of early and late strobe pulses.

On-board processing

On-board memory	1 GB
-----------------	------

Image data stream processing

Laser Line Extraction (LLE) processing core to compute the vertical position of one detected laser line along a ROI using one of the following algorithms:

- Maximum Detection algorithm
 - Maximum ROI width: 8192 pixels
 - Maximum ROI height: 65536 pixels
 - Depth map format: 16-bit unsigned integer number
 - Accuracy: 1 pixel
- 8-bit Maximum Detection algorithm
 - Maximum ROI width: 8192 pixels
 - Maximum ROI height: 256 pixels
 - Depth map format: 8-bit unsigned integer number
 - Accuracy: 1 pixel
- Peak Detection algorithm
 - Maximum ROI width: 8192 pixels
 - Maximum ROI height: 2048 pixels
 - Depth map format: UQ11.5 fixed-point unsigned number
 - Accuracy: 1/32 pixel
- High accuracy Peak Detection algorithm
 - Maximum ROI width: 8192 pixels
 - Maximum ROI height: 256 pixels
 - Depth map format: UQ8.8 fixed-point unsigned number
 - Accuracy: 1/256 pixel
- Center Of Gravity algorithm
 - Maximum ROI width: 8192 pixels
 - Maximum ROI height: 2048 pixels
 - Depth map format: UQ11.5 fixed-point unsigned number
 - Accuracy: 1/32 pixel
- High accuracy Center Of Gravity algorithm
 - Maximum ROI width: 8192 pixels
 - Maximum ROI height: 256 pixels
 - Depth map format: UQ8.8 fixed-point unsigned number
 - Accuracy: 1/256 pixel

Data stream statistics

- Measurement of:
 - Frame rate (Area-scan only)
 - Line rate
 - Data rate
 - Configurable averaging interval
-

Event signaling and counting

- The application software can be notified of the occurrence of various events:
 - Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers
 - A large set of custom events
- Custom events sources:
 - 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:
 - 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	20 I/O lines: • 4 differential inputs (DIN) • 4 singled-ended TTL inputs/outputs (TTLIO) • 8 isolated inputs (IIN) • 4 isolated outputs (IOUT)
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – The "start-of-scan trigger" of the Acquisition Controller (line-scan only) – The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads
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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection

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.

- 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:
 - 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

- 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
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	• 1637 - Coaxlink Quad 3D-LLE
Optional accessories	• 1625 - DB25F I/O Adapter Cable • 1636 - InterPC C2C-Link Adapter • 3303 - C2C-Link Ribbon Cable • 3304 - HD26F I/O Adapter Cable

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 Viva Business Park
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

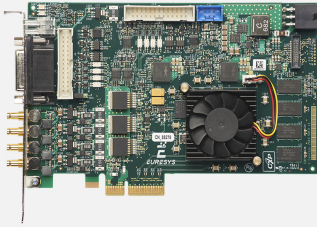
Email: sales.japan@euresys.com

More at www.euresys.com



Coaxlink Quad G3

PCIe 3.0 four-connection CoaXPress frame grabber (fan-cooled heatsink)



At a Glance

- Four CoaXPress CXP-6 connections: 2,500 MB/s camera bandwidth
- PCIe 3.0 (Gen 3) x4 bus: 3,300 MB/s bus bandwidth
- Feature-rich set of 20 digital I/O lines
- Fan-cooled heatsink
- Extensive camera control functions
- Memento Event Logging Tool

Benefits

PCIe 3.0 (Gen 3) x4 bus

- 3,300 MB/s sustained bus bandwidth

Cooling method

- Fan-cooled heatsink
- Also available with a passive (fanless) heatsink.

Acquire images from the fastest and highest resolution cameras

- Highest data acquisition rate in the industry
- 25 Gbit/s (2,500 MB/s) bandwidth from camera to host PC memory

Long cable support for Coaxlink CXP-6

- 40 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

Robust connectors for reliable connections

- Coaxlink CXP-6 uses DIN 1.0/2.3 connectors with push/pull latching system

Connect up to 4 cameras to a single Coaxlink card

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.

Line-scan triggering capabilities 1/2

Coaxlink supports continuous web scanning (to inspect infinite, continuously moving surfaces without losing a single line) and discrete object scanning (to acquire the image of objects moving in front of the camera).

- A trigger is used to start the acquisition when the part is in position. Hardware triggers come from the board's I/O lines. Software triggers come from the application.
- After it is started, the acquisition either:
 - Continues indefinitely (for web inspection applications)
 - Continues for a programmable number of lines (to acquire the image of objects of a known length)
 - Continues until an end trigger is received (to acquire the image of objects of a variable length)
- An optional trigger delay is available to postpone the beginning of the acquisition for a programmable number of lines.

Line-scan triggering capabilities 2/2

- The Coaxlink frame grabber controls the camera scanning rate based on the signals received from a motion encoder. When the parts move faster, the acquisition line rate of the camera increases. When the parts move slower, the acquisition line rate of the camera decreases.
- The Coaxlink boards interpret A/B signals from quadrature motion encoders to know in which direction (forward or backward) the part is moving.

- Optionally, the Coaxlink board can be instructed to acquire lines only when the object is moving forward or only when the object is moving backward.
- A feature called Backward Motion Cancellation stops the acquisition when a backward motion is detected. The line acquisition automatically resumes when the motion is again in the forward direction, at the exact place where the acquisition was interrupted.
- A Rate Converter allows the camera to acquire lines at any programmable resolution lower or higher than the resolution of the motion encoder. This gives the designer incredible freedom and flexibility during the development of the application.
- A Rate Divider allows the camera to acquire lines at a resolution lower than the resolution of the motion encoder. It divides the frequency of the incoming encoder signal by a programmable integer.

Flexible line-scan camera operation with the rate converter.

- The rate converter is a smart, programmable frequency multiplier/divider.
- Used with motion encoders and line-scan cameras, it allows the user to choose the aspect ratio of the pixels in the image.
- It provides a way to calibrate the acquisition chain to easily reach square (1:1 aspect ratio) pixels.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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

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	Standard profile, half length, 4-lane PCI Express card
Cooling method	Air cooling, fan-cooled heatsink
Mounting	For insertion in a standard height, 4-lane or higher, PCI Express card slot
Connectors	• 'A', 'B', 'C', 'D' on bracket: – 4x DIN 1.0/2.3 female connectors – CoaXPress host interface • 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O 1' and 'INTERNAL I/O 2' on PCB: – 2x 26-pin 2-row 0.1" pitch pin header with shrouding – I/O 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-in header – Card to card link
LED indicators	• 'A', 'B', 'C', 'D' on bracket: – Bi-color red/green LEDs – 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 111.15 mm L 6.6 in x H 4.38 in
Weight	• 180 g, 6.35 oz (Standard) • 265 g, 9.35 oz (LH option)

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. 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, 1.1 and 1.1.1
Connectors	Four DIN1.0/2.3 75 Ohms CXP-6
Status LEDs	One CoaXPress Host connection status LED per connector
Number of cameras	- Area-scan cameras: - One 1- or 2- or 4-connection camera - One 1- or 2- or 4-connection multi-stream camera (up to 4 data streams) - One or two 1- or 2-connection cameras - One 1- or 2-connection and one or two 1-connection cameras - Up to four 1-connection cameras - One 4-connection sub-link of an 8-connection camera - Line-scan cameras: - One 1- or 2- or 4-connection camera - One or two 1- or 2-connection cameras - Up to four 1-connection cameras
Maximum aggregated camera data transfer rate	25 Gbit/s (2,500 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), and 6.25 GT/s (CXP-6)
Number of CXP data streams (per camera)	4 (1-camera, 4 data-stream firmware variant) 1 per camera (other firmware variants)
Maximum CXP stream packet size	16,384 bytes
PoCXP (Power over CoaXPress)	- PoCXP Safe Power: 17 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 using a 6-pin PEG cable
Camera types	- Area-scan cameras: - Grayscale and color (YCbCr, YUV, RGB and Bayer CFA) - Single-tap (1X-1Y) progressive-scan - Line-scan cameras and contact imaging sensors: - Grayscale and color RGB
Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, 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 - YCbCr601_422_8, YCbCr601_422_10 - YCbCr709_422_8, YCbCr709_422_10 - YUV422_8, YUV422_10

Area-scan camera control

Trigger	• 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	• Accurate control of the strobe position for strobed 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. • Support of infinite acquisition, without missing line, for web inspection applications.
Line trigger	• Support for quadrature motion encoders, with programmable noise filters, selection of acquisition direction and backward motion compensation. • Rate Converter tool for fine control of the pixel aspect ratio: Rate Conversion Ratio in the range 0.001 to 1000 with an accuracy better than 0.1%. • Rate Divider tool
Line strobe	• Accurate control of the strobe position for strobed light sources.

On-board processing

On-board memory	1 GB
Image data stream processing	• 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
Flat-field correction	Only available with the '1-camera' and '1-camera, line-scan' firmware variants
Input LUT (Lookup Table)	Only available for monochrome cameras on all the firmware variants but '1-camera, 4-data-stream': • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Bayer CFA to RGB decoder	• '1-camera' firmware variant: – 3x3 linear interpolation method – 3x3 median-based interpolation method
Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval

Event signaling and counting

- The application software can be notified of the occurrence of various events:
 - Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers
 - A large set of custom events
- Custom events sources:
 - 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:
 - 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	20 I/O lines: • 4 differential inputs (DIN) • 4 singled-ended TTL inputs/outputs (TTLIO) • 8 isolated inputs (IIN) • 4 isolated outputs (IOUT)
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – The "start-of-scan trigger" of the Acquisition Controller (line-scan only) – The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads
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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection

I/O Toolbox tools

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.

- 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:
 - 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

Determined by the selected firmware variant:

- 1-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 1-camera, 4-data-stream: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 1-camera, line-scan: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 1-slm-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 1-sls-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 2-camera: 8 LIN, 2 QDC, 2 DIV, 2 MDV, 2 DEL, 1 UAS
- 2-camera, line-scan: 8 LIN, 2 QDC, 2 DIV, 2 MDV, 2 DEL, 1 UAS
- 3-camera: 8 LIN, 2 QDC, 2 DIV, 2 MDV, 2 DEL, 1 UAS
- 4-camera: 8 LIN, 4 QDC, 4 DIV, 4 MDV, 4 DEL, 4 UAS
- 4-camera, line-scan: 8 LIN, 4 QDC, 4 DIV, 4 MDV, 4 DEL, 4 UAS

C2C-Link

Description

- 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
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	• 1633 - Coaxlink Quad G3
Optional accessories	• 1625 - DB25F I/O Adapter Cable • 1636 - InterPC C2C-Link Adapter • 3303 - C2C-Link Ribbon Cable • 3304 - HD26F I/O Adapter Cable

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 Viva Business Park
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

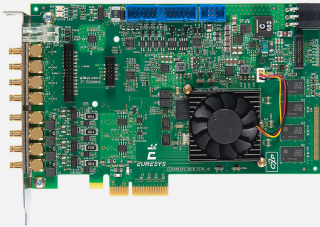
Email: sales.japan@euresys.com

More at www.euresys.com



Coaxlink Quad G3 DF

PCIe 3.0 four-connection CoaXPress frame grabber with data forwarding



At a Glance

- Four CoaXPress CXP-6 connections and four Data Forwarding outputs: 2,500 MB/s camera bandwidth
- PCIe 3.0 (Gen 3) x4 bus: 3,300 MB/s bus bandwidth
- Feature-rich set of 10 digital I/O lines
- Extensive camera control functions
- Memento Event Logging Tool

Benefits

CoaXPress Data Forwarding

- Allows to distribute the image processing workload among several host PCs

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
- 25 Gbit/s (2,500 MB/s) bandwidth from camera to host PC memory

Long cable support for Coaxlink CXP-6

- 40 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

Robust connectors for reliable connections

- Coaxlink CXP-6 uses DIN 1.0/2.3 connectors with push/pull latching system

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.

Line-scan triggering capabilities 1/2

Coaxlink supports continuous web scanning (to inspect infinite, continuously moving surfaces without losing a single line) and discrete object scanning (to acquire the image of objects moving in front of the camera).

- A trigger is used to start the acquisition when the part is in position. Hardware triggers come from the board's I/O lines. Software triggers come from the application.
- After it is started, the acquisition either:
 - Continues indefinitely (for web inspection applications)
 - Continues for a programmable number of lines (to acquire the image of objects of a known length)
 - Continues until an end trigger is received (to acquire the image of objects of a variable length)
- An optional trigger delay is available to postpone the beginning of the acquisition for a programmable number of lines.

Line-scan triggering capabilities 2/2

- The Coaxlink frame grabber controls the camera scanning rate based on the signals received from a motion encoder. When the parts move faster, the acquisition line rate of the camera increases. When the parts move slower, the acquisition line rate of the camera decreases.
- The Coaxlink boards interpret A/B signals from quadrature motion encoders to know in which direction (forward or backward) the part is moving.
- Optionally, the Coaxlink board can be instructed to acquire lines only when the object is moving forward or only when the object is moving backward.

- A feature called Backward Motion Cancellation stops the acquisition when a backward motion is detected. The line acquisition automatically resumes when the motion is again in the forward direction, at the exact place where the acquisition was interrupted.
- A Rate Converter allows the camera to acquire lines at any programmable resolution lower or higher than the resolution of the motion encoder. This gives the designer incredible freedom and flexibility during the development of the application.
- A Rate Divider allows the camera to acquire lines at a resolution lower than the resolution of the motion encoder. It divides the frequency of the incoming encoder signal by a programmable integer.

Flexible line-scan camera operation with the rate converter.

- The rate converter is a smart, programmable frequency multiplier/divider.
- Used with motion encoders and line-scan cameras, it allows the user to choose the aspect ratio of the pixels in the image.
- It provides a way to calibrate the acquisition chain to easily reach square (1:1 aspect ratio) pixels.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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

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

Specifications

Mechanical

Format	Standard profile, half length, 4-lane PCI Express card
Cooling method	Air cooling, fan-cooled heatsink
Mounting	For insertion in a standard height, 4-lane or higher, PCI Express card slot

Connectors	• 'A', 'B', 'C', 'D' on bracket: – 4x DIN 1.0/2.3 female connectors – CoaXPress host interface • 'DA', 'DB', 'DC', 'DD' on bracket: – 4x DIN 1.0/2.3 female connectors – CoaXpress data forwarding interface • 'INTERNAL I/O 2' on PCB: – 26-pin 2-row 0.1" pitch pin header with shrouding – I/O 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 • 'C2C-LINK' on module: – 6-pin 2-row 0.1-in header – Card to card link
LED indicators	• 'A', 'B', 'C', 'D' on bracket: – Bi-color red/green LEDs – 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 111.15 mm L 6.6 in x H 4.38 in

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. 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, 1.1 and 1.1.1
Connectors	Four DIN1.0/2.3 75 Ohms CXP-6
Status LEDs	One CoaXPress Host connection status LED per connector

Number of cameras	• Area-scan cameras: – One 1- or 2- or 4-connection camera • Line-scan cameras: – One 1- or 2- or 4-connection camera
Maximum aggregated camera data transfer rate	25 Gbit/s (2,500 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), and 6.25 GT/s (CXP-6)
Number of CXP data streams (per camera)	1 data stream per camera
Maximum CXP stream packet size	16,384 bytes
PoCXP (Power over CoaXPress)	• PoCXP Safe Power: – 17 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 using a 6-pin PEG cable
Camera types	• Area-scan cameras: – Grayscale and color (YCbCr, YUV, RGB and Bayer CFA) – Single-tap (1X-1Y) progressive-scan • Line-scan cameras and contact imaging sensors: – Grayscale and color RGB
Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, 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 • YCbCr601_422_8, YCbCr601_422_10 • YCbCr709_422_8, YCbCr709_422_10 • YUV422_8, YUV422_10

Area-scan camera control

Trigger	• 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	• Accurate control of the strobe position for strobed 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. • Support of infinite acquisition, without missing line, for web inspection applications.
Line trigger	• Support for quadrature motion encoders, with programmable noise filters, selection of acquisition direction and backward motion compensation. • Rate Converter tool for fine control of the pixel aspect ratio: Rate Conversion Ratio in the range 0.001 to 1000 with an accuracy better than 0.1%. • Rate Divider tool

Line strobe	• Accurate control of the strobe position for strobed light sources.
-------------	--

On-board processing

On-board memory	1 GB
Image data stream processing	• 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
Flat-field correction	Only available with the '1-camera,line-scan' and '1-df-camera, line-scan' firmware variants
Input LUT (Lookup Table)	Only available for monochrome cameras: • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Bayer CFA to RGB decoder	• '1-camera' and '1-df-camera' firmware variants: – 3x3 linear interpolation method – 3x3 median-based interpolation method
Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval
Event signaling and counting	• The application software can be notified of the occurrence of various events: – Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers – A large set of custom events • Custom events sources: – 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: – 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	10 I/O lines: • 2 differential inputs (DIN) • 2 singled-ended TTL inputs/outputs (TTLIO) • 4 isolated inputs (IIN) • 2 isolated outputs (IOUT)
-----------------	---

Electrical specifications	• 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	• 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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection
I/O Toolbox tools	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. • 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: – 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	Determined by the selected firmware variant: • 1-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 1-df-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 1-line-scan: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS • 1-df-line-scan: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS, 2 EIN

C2C-Link

Description	• 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
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
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	• 1635 - Coaxlink Quad G3 DF
Optional accessories	• 1625 - DB25F I/O Adapter Cable
	• 1636 - InterPC C2C-Link Adapter
	• 3303 - C2C-Link Ribbon Cable
	• 3304 - HD26F I/O Adapter Cable

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 Viva Business Park
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

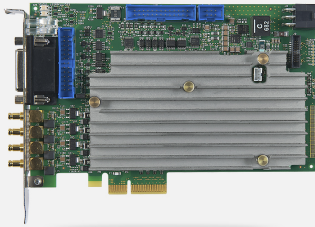
Email: sales.japan@euresys.com

More at www.euresys.com



Coaxlink Quad G3 LH

PCIe 3.0 four-connection CoaXPress frame grabber (passive heatsink)



At a Glance

- Four CoaXPress CXP-6 connections: 2,500 MB/s camera bandwidth
- PCIe 3.0 (Gen 3) x4 bus: 3,300 MB/s bus bandwidth
- Passive (fanless) heatsink
- Feature-rich set of 20 digital I/O lines
- Extensive camera control functions
- Memento Event Logging Tool

Benefits

PCIe 3.0 (Gen 3) x4 bus

- 3,300 MB/s sustained bus bandwidth

Cooling method

- Passive (fanless) heatsink
- Also available with a fan-cooled heatsink.

Acquire images from the fastest and highest resolution cameras

- Highest data acquisition rate in the industry
- 25 Gbit/s (2,500 MB/s) bandwidth from camera to host PC memory

Cable support

Long cable support for Coaxlink CXP-6

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

Long cable support for Coaxlink CXP-12

- 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

Robust connectors for reliable connections

- Coaxlink CXP-6 uses DIN 1.0/2.3 connectors with push/pull latching system
- Coaxlink CXP-12 uses Micro-BNC (HD-BNC) connectors with trusted push and turn, bayonet-style positive lock, for quick and easy connects and disconnects

Connect up to 4 cameras to a single Coaxlink card

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.

Line-scan triggering capabilities 1/2

Coaxlink supports continuous web scanning (to inspect infinite, continuously moving surfaces without losing a single line) and discrete object scanning (to acquire the image of objects moving in front of the camera).

- A trigger is used to start the acquisition when the part is in position. Hardware triggers come from the board's I/O lines. Software triggers come from the application.
- After it is started, the acquisition either:
 - Continues indefinitely (for web inspection applications)
 - Continues for a programmable number of lines (to acquire the image of objects of a known length)
 - Continues until an end trigger is received (to acquire the image of objects of a variable length)

- An optional trigger delay is available to postpone the beginning of the acquisition for a programmable number of lines.

Line-scan triggering capabilities 2/2

- The Coaxlink frame grabber controls the camera scanning rate based on the signals received from a motion encoder. When the parts move faster, the acquisition line rate of the camera increases. When the parts move slower, the acquisition line rate of the camera decreases.
- The Coaxlink boards interpret A/B signals from quadrature motion encoders to know in which direction (forward or backward) the part is moving.
- Optionally, the Coaxlink board can be instructed to acquire lines only when the object is moving forward or only when the object is moving backward.
- A feature called Backward Motion Cancellation stops the acquisition when a backward motion is detected. The line acquisition automatically resumes when the motion is again in the forward direction, at the exact place where the acquisition was interrupted.
- A Rate Converter allows the camera to acquire lines at any programmable resolution lower or higher than the resolution of the motion encoder. This gives the designer incredible freedom and flexibility during the development of the application.
- A Rate Divider allows the camera to acquire lines at a resolution lower than the resolution of the motion encoder. It divides the frequency of the incoming encoder signal by a programmable integer.

Flexible line-scan camera operation with the rate converter.

- The rate converter is a smart, programmable frequency multiplier/divider.
- Used with motion encoders and line-scan cameras, it allows the user to choose the aspect ratio of the pixels in the image.
- It provides a way to calibrate the acquisition chain to easily reach square (1:1 aspect ratio) pixels.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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

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	Standard profile, half length, 4-lane PCI Express card
Cooling method	Air-cooling, fanless
Mounting	For insertion in a standard height, 4-lane or higher, PCI Express card slot
Connectors	• 'A', 'B', 'C', 'D' on bracket: – 4x DIN 1.0/2.3 female connectors – CoaXPress host interface • 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O 1' and 'INTERNAL I/O 2' on PCB: – 2x 26-pin 2-row 0.1" pitch pin header with shrouding – I/O 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-in header – Card to card link
LED indicators	• 'A', 'B', 'C', 'D' on bracket: – Bi-color red/green LEDs – 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 111.15 mm L 6.6 in x H 4.38 in

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. 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, 1.1 and 1.1.1
Connectors	Four DIN1.0/2.3 75 Ohms CXP-6
Status LEDs	One CoaXPress Host connection status LED per connector
Number of cameras	- Area-scan cameras: - One 1- or 2- or 4-connection camera - One 1- or 2- or 4-connection multi-stream camera (up to 4 data streams) - One or two 1- or 2-connection cameras - One 1- or 2-connection and one or two 1-connection cameras - Up to four 1-connection cameras - One 4-connection sub-link of an 8-connection camera - Line-scan cameras: - One 1- or 2- or 4-connection camera - One or two 1- or 2-connection cameras - Up to four 1-connection cameras
Maximum aggregated camera data transfer rate	25 Gbit/s (2,500 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), and 6.25 GT/s (CXP-6)
Number of CXP data streams (per camera)	4 (1-camera, 4 data-stream firmware variant) 1 per camera (other firmware variants)
Maximum CXP stream packet size	16,384 bytes
PoCXP (Power over CoaXPress)	- PoCXP Safe Power: 17 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 using a 6-pin PEG cable
Camera types	- Area-scan cameras: - Grayscale and color (YCbCr, YUV, RGB and Bayer CFA) - Single-tap (1X-1Y) progressive-scan - Line-scan cameras and contact imaging sensors: - Grayscale and color RGB

Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, 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 • YCbCr601_422_8, YCbCr601_422_10 • YCbCr709_422_8, YCbCr709_422_10 • YUV422_8, YUV422_10
--------------------------------	---

Area-scan camera control

Trigger	• 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	• Accurate control of the strobe position for strobed 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. • Support of infinite acquisition, without missing line, for web inspection applications.
Line trigger	• Support for quadrature motion encoders, with programmable noise filters, selection of acquisition direction and backward motion compensation. • Rate Converter tool for fine control of the pixel aspect ratio: Rate Conversion Ratio in the range 0.001 to 1000 with an accuracy better than 0.1%. • Rate Divider tool
Line strobe	• Accurate control of the strobe position for strobed light sources.

On-board processing

On-board memory	1 GB
Image data stream processing	• 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
Flat-field correction	Only available with the '1-camera' and '1-camera, line-scan' firmware variants
Input LUT (Lookup Table)	Only available for monochrome cameras on all the firmware variants but '1-camera, 4-data-stream': • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Bayer CFA to RGB decoder	• '1-camera' firmware variant: – 3x3 linear interpolation method – 3x3 median-based interpolation method
Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval

Event signaling and counting

- The application software can be notified of the occurrence of various events:
 - Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers
 - A large set of custom events
- Custom events sources:
 - 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:
 - 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	20 I/O lines: • 4 differential inputs (DIN) • 4 singled-ended TTL inputs/outputs (TTLIO) • 8 isolated inputs (IIN) • 4 isolated outputs (IOUT)
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – The "start-of-scan trigger" of the Acquisition Controller (line-scan only) – The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads
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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection

I/O Toolbox tools

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.

- 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:
 - 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 *n*th 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

Determined by the selected firmware variant:

- 1-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 1-camera, 4-data-stream: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 1-camera, line-scan: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 1-slm-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 1-sls-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL, 1 UAS
- 2-camera: 8 LIN, 2 QDC, 2 DIV, 2 MDV, 2 DEL, 1 UAS
- 2-camera, line-scan: 8 LIN, 2 QDC, 2 DIV, 2 MDV, 2 DEL, 1 UAS
- 3-camera: 8 LIN, 2 QDC, 2 DIV, 2 MDV, 2 DEL, 1 UAS
- 4-camera: 8 LIN, 4 QDC, 4 DIV, 4 MDV, 4 DEL, 4 UAS
- 4-camera, line-scan: 8 LIN, 4 QDC, 4 DIV, 4 MDV, 4 DEL, 4 UAS

C2C-Link

Description

- 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
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	• 1633-LH - Coaxlink Quad G3 LH
Optional accessories	• 1625 - DB25F I/O Adapter Cable • 1636 - InterPC C2C-Link Adapter • 3303 - C2C-Link Ribbon Cable • 3304 - HD26F I/O Adapter Cable

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 Viva Business Park
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

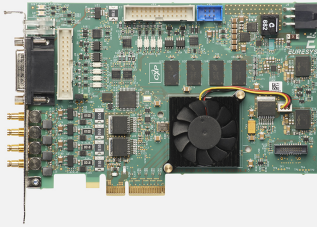
More at www.euresys.com





Coaxlink Quad CXP-3

Four-connection CXP-3 CoaXPress frame grabber



At a Glance

- Four CoaXPress CXP-3 connections: 1,250 MB/s camera bandwidth
- Connect four cameras to one card
- Works with extra-long camera cables (100+ meters)
- PCIe 2.0 (Gen 2) x4 bus: 1,700 MB/s delivery bandwidth
- Extensive camera control functions
- Memento Event Logging Tool

Benefits

Long cable support: 100+ meters

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

Robust connectors for reliable connections

- Coaxlink CXP-3 uses DIN 1.0/2.3 connectors with push/pull latching system

Connect up to 4 cameras to a single Coaxlink card

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.

PCIe 2.0 (Gen 2) x4 bus

- 1,700 MB/s sustained bus bandwidth

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.

The Coaxlink driver includes the following tools:

- Genicam Browser: An application giving access to the Genicam features exposed by the GenTL Producer(s) in the system.
- 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.

Machine Vision for the General Manufacturing Industries

- High frame rate image acquisition for inspection machines
- Image acquisition for robots

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	Standard profile, half length, 4-lane PCI Express card
Cooling method	Air cooling, fan-cooled heatsink
Mounting	For insertion in a standard height, 4-lane or higher, PCI Express card slot
Connectors	• 'A', 'B', 'C', 'D' on bracket: – 4x DIN 1.0/2.3 female connectors – CoaXPress host interface • 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O 1' and 'INTERNAL I/O 2' on PCB: – 2x 26-pin 2-row 0.1" pitch pin header with shrouding – I/O 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-in header – Card to card link
LED indicators	• 'A', 'B', 'C', 'D' on bracket: – Bi-color red/green LEDs – 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 111.15 mm L 6.6 in x H 4.38 in
Weight	170 g, 6.00 oz

Host bus

Standard	PCI Express 2.0
Link width	• 4 lanes • 1 lane or 2 lanes with reduced performance
Link speed	• 5.0 GT/s (PCIe 2.0) • 2.5 GT/s (PCIe 1.0) with reduced performance
Maximum payload size	512 bytes
DMA	32- and 64-bit
Peak delivery bandwidth	2,000 MB/s

Effective (sustained) delivery bandwidth	1,700 MB/s (Host PC motherboard dependent)
Power consumption	Typ. 12.1W (2.5 W @ +3.3V, 9.6 W @ +12V), excluding camera and I/O power output

Camera / video inputs

Interface standard(s)	CoaXPress 1.0, 1.1 and 1.1.1
Connectors	Four DIN1.0/2.3 75 Ohms CXP-3
Status LEDs	One CoaXPress Host connection status LED per connector
Number of cameras	Up to four 1-connection cameras
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)
Number of CXP data streams (per camera)	1 data stream per camera
Maximum CXP stream packet size	8,192 bytes
PoCXP (Power over CoaXPress)	• PoCXP Safe Power: – 17 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 using a 6-pin PEG cable
Camera types	• Grayscale • Color (RGB and Bayer CFA)
Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, 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 • YCbCr601_422_8, YCbCr601_422_10 • YCbCr709_422_8, YCbCr709_422_10 • YUV422_8, YUV422_10

Area-scan camera control

Trigger	• 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	• Accurate control of the strobe position for strobed light sources. • Support of early and late strobe pulses.

On-board processing

On-board memory	1 GB
Image data stream processing	• 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

Data stream statistics	• Measurement of: – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval
Event signaling and counting	• The application software can be notified of the occurrence of various events: – Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers – A large set of custom events • Custom events sources: – 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: – 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	20 I/O lines: • 4 differential inputs (DIN) • 4 singled-ended TTL inputs/outputs (TTLIO) • 8 isolated inputs (IIN) • 4 isolated outputs (IOUT)
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – The "start-of-scan trigger" of the Acquisition Controller (line-scan only) – The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads
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
Power output	Non-isolated, +12V, 1A, with electronic fuse protection
I/O Toolbox tools	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. • 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: – 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. • 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).
I/O Toolbox composition	8 LIN, 1 QDC, 1 DIV, 1 DEL

C2C-Link

Description	• 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
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 61000-4-5 • 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	• 1638 - Coaxlink Quad CXP-3
Optional accessories	• 1625 - DB25F I/O Adapter Cable • 1636 - InterPC C2C-Link Adapter • 3303 - C2C-Link Ribbon Cable • 3304 - HD26F I/O Adapter Cable

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 Viva Business Park
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

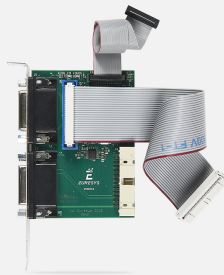
Email: sales.japan@euresys.com

More at www.euresys.com



HD26F I/O Extension Module - Standard I/O Set

General Purpose I/O module for Coaxlink Octo



At a Glance

- Robust HD26F Sub-D connector for I/O set #1
- Second standard I/O set with 10 additional I/O lines
- Robust HD26F Sub-D connector for I/O set #2
- Flat cable header connector for I/O set #2
- Self-powered module

Specifications

Mechanical

Format	Standard profile PC card
--------	--------------------------

Connectors	• 'EXTERNAL I/O 1' on bracket: – 26-pin 3-row high-density female sub-D connector – standard I/O lines set #1 and power output • 'EXTERNAL I/O 2' on bracket: – 26-pin 3-row high-density female sub-D connector – standard I/O lines set #2 and power output • 'INTERNAL I/O 2 ' on PCB: – 26-pin 2-row 0.1" pitch IDC female connector – standard I/O lines set #2 • 'INTERNAL I/O 1' on PCB: – 26-pin right-angled 2-row 0.1" pitch IDC female connector – connected via the provided INTERNAL I/O cable to the INTERNAL I/O 1 connector of the 3602 Coaxlink Octo card • 'I/O EXTENSION' on PCB – 26-pin 2-row 0.05" pitch IDC female connector – connected via the provided EXTENSION I/O cable to the EXTENSION I/O connector of the 3602 Coaxlink Octo card
Dimensions	• PCB: 80 mm x 61.5 mm , 3.15 in x 2.4 in • I/O Extension cable length: 150 mm, 5.9 in • Internal I/O cable length: 160 mm, 6.3 in

General Purpose Inputs and Outputs

Number of lines	20 I/O lines: • 4 differential inputs (DIN) • 4 singled-ended TTL inputs/outputs (TTLIO) • 8 isolated inputs (IIN) • 4 isolated outputs (IOUT)
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – The "start-of-scan trigger" of the Acquisition Controller (line-scan only) – The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	• 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 • IOUT: Isolated contact outputs compatible with 30V / 100mA loads
Power output	Non-isolated, +12V, 1A delivered by the Coaxlink card though the I/O EXTENSION cable

Electrical

Supply voltage	3.3 V DC delivered by the Coaxlink card through the I/O EXTENSION cable
Power consumption	Max. 3 W (excluding 12 V POWER output)

Environmental conditions

Operating ambient air temperature	0 to +55 °C / +32 to +131 °F
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

RoHS	European Union Directive 2011/65/EU (ROHS2)
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	• 3614 - HD26F I/O Extension Module - Standard I/O Set
----------------------------	--



EMEA

Euresys SA

Liège Science Park - Avenue du Pré Aily, 14
4031 Angleur - 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.

27126-B Paseo Espada - Suite 704
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 Viva Business Park
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
Kouhoku-Ku, Yokohama-Shi 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

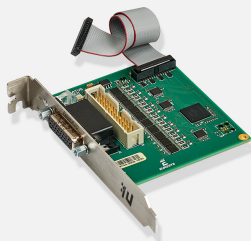
Email: sales.japan@euresys.com

More at www.euresys.com



HD26F I/O Extension Module TTL-CMOS5V-RS422

General purpose I/O module for Coaxlink Octo and Coaxlink Quad CXP-12



At a Glance

- Highly configurable
- Up to 20 TTL I/Os or 10 RS-422 I/Os
- Fast TTL I/O: up to 1 MHz
- Ultra-Fast RS-422 I/O: up to 10 MHz
- CMOS 5V Output Level

Specifications

Mechanical

Format	Standard profile PC card
Connectors	• 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O' on PCB: – 26-pin 2-row 0.1" pitch IDC female connector – I/O lines and power output • 'I/O EXTENSION' on PCB – 26-pin 2-row 0.05" pitch IDC female connector – I/O control, data and power

Lamp indicators	• "ACTIVITY LED's" on bracket – Two bicolor red and green LED's – Activity on input and output ports respectively • "STATUS LED" on PCB – Bicolor red and green LED's – Power status – I/O EXTENSION link status
Dimensions	• PCB: 80 mm x 74 mm , 3.15 in x 2.9 in • Cable length: 150 mm, 5.9 in

General Purpose Inputs and Outputs

Number of lines	Configurable mix of 4 types of I/O ports • Up to 20 TTL inputs • Up to 20 5V CMOS outputs • Up to 10 RS-422 inputs • Up to 10 RS-422 outputs
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – The "start-of-scan trigger" of the Acquisition Controller (line-scan only) – The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	• TTL inputs: High-speed 5V-compliant TTL inputs compatible with totem-pole LVTTTL, TTL, 5V CMOS drivers • 5V CMOS outputs: High-speed 5 V CMOS outputs compatible with 5V CMOS and 5V TTL receivers • RS-422 inputs: High-speed differential inputs compatible with ANSI/EIA/TIA-422 differential line drivers • RS-422 outputs: High-speed differential inputs compatible with ANSI/EIA/TIA-422 differential line receivers
Power output	Non-isolated, +12V, 1A delivered by the Coaxlink card through the I/O EXTENSION cable

Electrical

Supply voltage	12 V DC delivered by the Coaxlink card through the I/O EXTENSION cable
Power consumption	Max. 5 W (excluding 12 V POWER output)

Environmental conditions

Operating ambient air temperature	0 to +55 °C / +32 to +131 °F
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

RoHS	European Union Directive 2011/65/EU (ROHS2)
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	• 3612 - HD26F I/O Extension Module TTL-CMOS5V-RS422
----------------------------	--



EMEA

Euresys SA

Liège Science Park - Avenue du Pré Aily, 14
4031 Angleur - 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.

27126-B Paseo Espada - Suite 704
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 Viva Business Park
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
Kouhoku-Ku, Yokohama-Shi 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

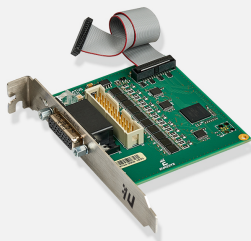
Email: sales.japan@euresys.com

More at www.euresys.com



HD26F I/O Extension Module TTL-RS422

General Purpose I/O module for Coaxlink Octo and Coaxlink Quad CXP-12



At a Glance

- Highly configurable
- Up to 20 TTL I/Os or 10 RS-422 I/Os
- Fast TTL I/O: up to 1 MHz
- Ultra-Fast RS-422 I/O: up to 10 MHz
- LVTTTL 3.3V Output Level

Specifications

Mechanical

Format	Standard profile PC card
Connectors	• 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O' on PCB: – 26-pin 2-row 0.1" pitch IDC female connector – I/O lines and power output • 'I/O EXTENSION' on PCB – 26-pin 2-row 0.05" pitch IDC female connector – I/O control, data and power

Lamp indicators	• "ACTIVITY LED's" on bracket – Two bicolor red and green LED's – Activity on input and output ports respectively • "STATUS LED" on PCB – Bicolor red and green LED's – Power status – I/O EXTENSION link status
Dimensions	• PCB: 80 mm x 74 mm , 3.15 in x 2.9 in • Cable length: 150 mm, 5.9 in

General Purpose Inputs and Outputs

Number of lines	Configurable mix of 4 types of I/O ports • Up to 20 TTL inputs • Up to 20 TTL outputs • Up to 10 RS-422 inputs • Up to 10 RS-422 outputs
Usage	• 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: – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – The "start-of-scan trigger" of the Acquisition Controller (line-scan only) – The "end-of-scan trigger" of the Acquisition Controller (line-scan only)
Electrical specifications	• TTL inputs: High-speed 5V-compliant TTL inputs compatible with totem-pole LVTTTL, TTL, 5V CMOS drivers • TTL outputs: High-speed 3.3 V LVTTTL outputs compatible with LVTTTL and TTL receivers • RS-422 inputs: High-speed differential inputs compatible with ANSI/EIA/TIA-422 differential line drivers • RS-422 outputs: High-speed differential inputs compatible with ANSI/EIA/TIA-422 differential line receivers
Power output	Non-isolated, +12V, 1A delivered by the Coaxlink card through the I/O EXTENSION cable

Electrical

Supply voltage	12 V DC delivered by the Coaxlink card through the I/O EXTENSION cable
Power consumption	Max. 5 W (excluding 12 V POWER output)

Environmental conditions

Operating ambient air temperature	0 to +55 °C / +32 to +131 °F
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

RoHS	European Union Directive 2011/65/EU (ROHS2)
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	• 3610 - HD26F I/O Extension Module TTL-RS422
----------------------------	---



EMEA

Euresys SA

Liège Science Park - Avenue du Pré Aily, 14
4031 Angleur - 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.

27126-B Paseo Espada - Suite 704
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 Viva Business Park
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
Kouhoku-Ku, Yokohama-Shi 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

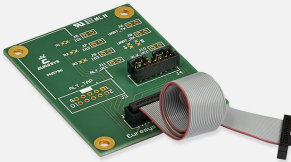


JTAG Adapter Xilinx for Coaxlink

Adapter for Xilinx platform cable USB II programmer to Coaxlink

At a Glance

- Compatible with CustomLogic
- Allows using the debugging feature of Xilinx Vivado (ChipScope)



Specifications

Ordering Information

Product code - Description	
	• 3613 - JTAG Adapter Xilinx for Coaxlink



EMEA

Euresys SA

Liège Science Park - Avenue du Pré Aily, 14
4031 Angleur - 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.

27126-B Paseo Espada - Suite 704
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 Viva Business Park
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
Kouhoku-Ku, Yokohama-Shi 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

