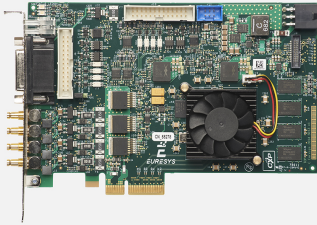


# Coaxlink Quad 3D-LLE

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
- 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

### Long cable support

- 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

Coaxlink uses DIN 1.0/2.3 connectors with push/pull latching system for reliable connections

## **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.
- 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 500VAC RMS.
- Isolated contact outputs.
- High-speed 5V-compliant TTL inputs/ LVTTTL outputs.

## **High-performance DMA (Direct Memory Access)**

- Direct transfer into user-allocated memory
- 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 and Linux drivers available**

- Including support for the AArch64 64-bit ARM architecture for Linux

## **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

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Form Factor     | PCI Express card                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 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      | <ul style="list-style-type: none"><li>• 'A', 'B', 'C', 'D' on bracket:<ul style="list-style-type: none"><li>– 4x DIN 1.0/2.3 female connectors</li><li>– CoaXpress host interface</li></ul></li><li>• EXTERNAL I/O' on bracket:<ul style="list-style-type: none"><li>– 26-pin 3-row high-density female sub-D connector</li><li>– I/O lines and power output</li></ul></li><li>• INTERNAL I/O 1' and 'INTERNAL I/O 2' on PCB:<ul style="list-style-type: none"><li>– 2x 26-pin 2-row 0.1" pitch pin header with shrouding</li><li>– I/O lines and power output</li></ul></li><li>• 'AUXILIARY POWER INPUT' on module:<ul style="list-style-type: none"><li>– 6-pin PEG power socket</li><li>– 12 VDC power input for PoCXP camera(s) and I/O power</li></ul></li><li>• 'C2C-LINK' on module:<ul style="list-style-type: none"><li>– 6-pin 2-row 0.1-in header</li><li>– Card to card link</li></ul></li></ul> |
| Lamp indicators | <ul style="list-style-type: none"><li>• 'A', 'B', 'C', 'D' on bracket:<ul style="list-style-type: none"><li>– 4x bi-color red/green LEDs</li><li>– CoaXPress Host connector indicator lamps</li></ul></li><li>• 'FPGA STATUS LAMP' on PCB:<ul style="list-style-type: none"><li>– Bi-color red/green LED</li><li>– FPGA status lamp</li></ul></li><li>• 'BOARD STATUS LAMP' on PCB:<ul style="list-style-type: none"><li>– Bi-color red/green LED</li></ul></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Switches        | <p>'RECOVERY' on card PCB:</p> <ul style="list-style-type: none"><li>• 3-pin 1-row 0.1" header</li><li>• Firmware emergency recovery</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Dimensions      | L 167.65 mm x H 111.15 mm<br>L 6.6 in x H 4.38 in                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Weight          | 180 g, 6.35 oz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Host bus

|                                          |                                                                                                                              |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Standard                                 | PCI Express 2.0                                                                                                              |
| Link width                               | <ul style="list-style-type: none"><li>• 4 lanes</li><li>• 1 lane or 2 lanes with reduced performance</li></ul>               |
| Link speed                               | <ul style="list-style-type: none"><li>• 5.0 GT/s (PCIe 2.0)</li><li>• 2.5 GT/s (PCIe 1.0) with reduced performance</li></ul> |
| 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 and 1.1                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Connectors                                   | 4x DIN1.0/2.3 CXP-6                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Status LEDs                                  | 1 CoaXPress Host connection status per connector                                                                                                                                                                                                                                                                                                                                                                                                  |
| Number of cameras                            | One 1- or 2- or 4-connection area-scan camera                                                                                                                                                                                                                                                                                                                                                                                                     |
| Line-scan cameras supported                  | No                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 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)                 | <ul style="list-style-type: none"><li>• PoCXP Safe Power:<ul style="list-style-type: none"><li>– 17 W of 24V DC regulated power per CoaXPress connector</li><li>– PoCXP Device detection and automatic power-on</li><li>– Overload and short-circuit protections</li></ul></li><li>• On-board 12V to 24V DC/DC converter</li><li>• A +12V power source must be connected to the AUXILIARY POWER INPUT connector using a 6-pin PEG cable</li></ul> |
| Camera types                                 | <ul style="list-style-type: none"><li>• Gray-scale Area-scan cameras</li></ul>                                                                                                                                                                                                                                                                                                                                                                    |
| Camera pixel formats supported               | Monochrome 8-bit (Mono8)                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Area-scan camera control

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

## On-board processing

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

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Image data stream processing | <p>Laser Line Extraction (LLE) processing core to compute the vertical position of one detected laser line along of a ROI using one of the following algorithms:</p> <ul style="list-style-type: none"> <li>• Maximum Detection algorithm <ul style="list-style-type: none"> <li>– Maximum ROI height: 65536 pixels</li> <li>– Depth map format: 16-bit unsigned integer number</li> <li>– Accuracy: 1 pixel</li> </ul> </li> <li>• 8-bit Maximum Detection algorithm <ul style="list-style-type: none"> <li>– Maximum ROI height: 256 pixels</li> <li>– Depth map format: 8-bit unsigned integer number</li> <li>– Accuracy: 1 pixel</li> </ul> </li> <li>• Peak Detection algorithm <ul style="list-style-type: none"> <li>– Maximum ROI height: 2048 pixels</li> <li>– Depth map format: UQ11.5 fixed-point unsigned number</li> <li>– Accuracy: 1/32 pixel</li> </ul> </li> <li>• High accuracy Peak Detection algorithm <ul style="list-style-type: none"> <li>– Maximum ROI height: 256 pixels</li> <li>– Depth map format: UQ8.8 fixed-point unsigned number</li> <li>– Accuracy: 1/256 pixel</li> </ul> </li> <li>• Center Of Gravity algorithm <ul style="list-style-type: none"> <li>– Maximum ROI height: 2048 pixels</li> <li>– Depth map format: UQ11.5 fixed-point unsigned number</li> <li>– Accuracy: 1/32 pixels</li> </ul> </li> <li>• High accuracy Center Of Gravity algorithm <ul style="list-style-type: none"> <li>– Maximum ROI height: 256 pixels</li> <li>– Depth map format: UQ8.8 fixed-point unsigned number</li> <li>– Accuracy: 1/256 pixels</li> </ul> </li> </ul> |
| Data stream statistics       | <ul style="list-style-type: none"> <li>• Measurement of: <ul style="list-style-type: none"> <li>– Frame rate (Area-scan only)</li> <li>– Line rate</li> <li>– Data rate</li> </ul> </li> <li>• Configurable averaging interval</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Event signaling and counting | <ul style="list-style-type: none"> <li>• The application software can be notified of the occurrence of various events: <ul style="list-style-type: none"> <li>– Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers</li> <li>– A large set of custom events</li> </ul> </li> <li>• Custom events sources: <ul style="list-style-type: none"> <li>– I/O Toolbox events</li> <li>– Camera and Illumination control events</li> <li>– CoaXPress data stream events</li> <li>– CoaXPress host interface events</li> </ul> </li> <li>• Each custom event is associated with a 32-bit counter that counts the number of occurrences</li> <li>• The last three 32-bit context data words of the event context data can be configured with event-specific context data: <ul style="list-style-type: none"> <li>– Event-specific data</li> <li>– State of all System I/O lines sampled at the event occurrence time</li> <li>– Value of any event counter</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## General Purpose Inputs and Outputs

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of lines           | <p>20 I/O lines:</p> <ul style="list-style-type: none"> <li>• 4 differential inputs (DIN)</li> <li>• 4 singled-ended TTL inputs/outputs (TTLIO)</li> <li>• 8 isolated inputs (IIN)</li> <li>• 4 isolated outputs (IOUT)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Usage                     | <ul style="list-style-type: none"> <li>• Any System I/O input lines can be used by any LIN tool of the I/O Toolbox</li> <li>• Selected pairs of System 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</li> <li>• The LIN and QDC tools outputs can be further processed by the other tools (DIV, MDV, DEL) of the I/O toolbox to generate any of the following "trigger" events: <ul style="list-style-type: none"> <li>– The "cycle trigger" of the Camera and Illumination controller</li> <li>– The "cycle sequence trigger" of the Camera and Illumination controller</li> <li>– The "start-of-scan trigger" of the Acquisition Controller (line-scan only)</li> <li>– The "end-of-scan trigger" of the Acquisition Controller (line-scan only)</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Electrical specifications | <ul style="list-style-type: none"> <li>• DIN: High-speed differential inputs compatible with ANSI/EIA/TIA-422/485 differential line drivers and complementary TTL drivers</li> <li>• 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</li> <li>• 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</li> <li>• IOUT: Isolated contact outputs compatible with 30V / 100mA loads</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Filter control            | <ul style="list-style-type: none"> <li>• Glitch removal filter available on all System I/O input lines</li> <li>• Configurable filter time constants: <ul style="list-style-type: none"> <li>– for DIN and TTLIO lines: 50 ns, 100 ns, 200 ns, 500 ns, 1 µs</li> <li>– for IIN lines: 500 ns, 1 µs, 2 µs, 5 µs, 10 µs</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Polarity control          | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Power output              | Non-isolated, +12V, 1A, with electronic fuse protection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| I/O Toolbox tools         | <p>The I/O Toolbox is a configurable interconnection of tools that generates events (usually triggers) from input lines. The composition of the toolset is product- and firmware-dependent.</p> <ul style="list-style-type: none"> <li>• Line Input tool (LIN): Edge detector delivering events on rising or falling edges of any selected input line.</li> <li>• Quadrature Decoder tool (QDC): A composite tool including: <ul style="list-style-type: none"> <li>– A quadrature edge detector delivering events on selected transitions of selected pairs of input lines.</li> <li>– An optional backward motion compensator for clean line-scan image acquisition when the motion is unstable.</li> <li>– A 32-bit up/down counter for delivering a position value.</li> </ul> </li> <li>• Divider tool (DIV): to generate an event every nth input events from any I/O toolbox event source.</li> <li>• Multiplier/divider tool (MDV): to generate m events every d input events from any I/O toolbox event source.</li> <li>• 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).</li> <li>• 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.</li> </ul> |

## C2C-Link

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description   | <ul style="list-style-type: none"> <li>Allows to accurately synchronize the trigger and start-of-exposure of multiple grabber-controlled area-scan and line-scan cameras.</li> <li>C2C-Link is able to synchronize cameras connected               <ul style="list-style-type: none"> <li>to the same Coaxlink card</li> <li>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)</li> <li>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)</li> </ul> </li> </ul>                                                                                                                                                                                             |
| Specification | <ul style="list-style-type: none"> <li>Maximum distance               <ul style="list-style-type: none"> <li>60 cm inside a PC</li> <li>1200 m cumulated adapter to adapter cable length</li> </ul> </li> <li>Maximum trigger rate               <ul style="list-style-type: none"> <li>2.5 MHz for configurations using a single PC, or up to 10 PCs and 100 m total C2C-Link cable length</li> <li>200 kHz for configurations up to 32 PCs and 1200m total C2C-Link cable length</li> </ul> </li> <li>Trigger propagation delay from master to slave devices               <ul style="list-style-type: none"> <li>Less than 10 ns for cameras on the same Coaxlink card or on different Coaxlink cards in the same PC</li> <li>Less than 265 ns for cameras on different Coaxlink cards in different PCs (3 PCs and 40m total C2C-Link cable length)</li> </ul> </li> </ul> |

## Software

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Host PC Operating System | <ul style="list-style-type: none"> <li>Microsoft Windows 10, 8.1, 8, 7 for x86 (32-bit) and x86-64 (64-bit) processor architectures</li> <li>Linux kernel versions 3.10 to 4.10, compatible with a wide range of distributions, tested with CentOS 7, Ubuntu 14.04 and Ubuntu 17.04, for x86 (32-bit) and x86-64 (64-bit) processor architectures</li> <li>Linux kernel version 3.10.96-tegra, tested with Ubuntu 16.04 LTS, for aarch64 (64-bit) processor architecture</li> </ul>                                                                                                                                                                                                                                                        |
| APIs                     | <p>EGrabber class, with C++ and .NET APIs:</p> <ul style="list-style-type: none"> <li>.NET assembly designed to be used with development environments compatible with .NET frameworks version 2.0 or higher</li> </ul> <p>GenICam GenTL producer libraries compatible with C/C++ compilers:</p> <ul style="list-style-type: none"> <li>x86 dynamic library designed to be used with ISO-compliant C/C++ compilers for the development of x86 applications</li> <li>x86_64 dynamic library designed to be used with ISO-compliant C/C++ compilers for the development of x86_64 applications</li> <li>aarch64 dynamic library designed to be used with ISO-compliant C/C++ compilers for the development of aarch64 applications</li> </ul> |
| Memento                  | Compatible with Memento Event Logging tool                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## Environmental conditions

|                                   |                               |
|-----------------------------------|-------------------------------|
| Operating ambient air temperature | 0 to +50 °C / +32 to +122 °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 | <ul style="list-style-type: none"><li>• European Council EMC Directive 2004/108/EC</li><li>• United States FCC rule 47 CFR 15</li></ul>      |
| EMC - Emission                  | <ul style="list-style-type: none"><li>• EN 55022:2010 Class B</li><li>• FCC 47 Part 15 Class B</li></ul>                                     |
| EMC - Immunity                  | <ul style="list-style-type: none"><li>• EN 55024:2010 Class B</li><li>• EN 61000-4-3</li><li>• EN 61000-4-4</li><li>• EN 61000-4-6</li></ul> |
| Flammability                    | PCB compliant with UL 94 V-0                                                                                                                 |
| 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 | <ul style="list-style-type: none"><li>• 1637 - Coaxlink Quad 3D-LLE</li></ul>                                                                                                                                                   |
| Optional accessories       | <ul style="list-style-type: none"><li>• 1625 - I/O Cable for Grablink DualBase and Coaxlink</li><li>• 1636 - InterPC C2C-Link Adapter</li><li>• 3303 - C2C-Link Ribbon Cable</li><li>• 3304 - HD26F I/O Adapter Cable</li></ul> |



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