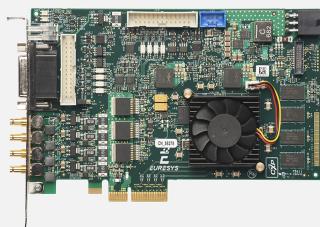




Coaxlink Quad 3D-LLE

Quad CXP-II 图像采集卡，板载激光线抽提用于三维分析



特性一览

- 激光线提取，零主机CPU占用
- 支持单/双激光线提取生成深度图
- 实时生成16位3D高度图
- 算法选择：最大值、峰值、重心(COG)
- 精度：高达 1/256 像素（使用峰值和 COG 算法）
- 性能：每秒 19,000 组数据 (profile)，来自 1024 x 128 图像。每秒 38,000 组数据 (profile)，来自 1024 x 64 图像。
- Memento 事件日志工具

优势

激光线提取，零主机CPU占用

Coaxlink的板载FPGA在图像采集过程中测量激光线的位置，没有给主机CPU增加负荷。

实时生成16位3D高度图

Coaxlink直接将计算的3D高度图实时传输到主机PC内存，无延迟。

连接最快速最高分辨率的相机来采集图像

- 在同行业中最高的数据采集速率
- 25 Gbit/s (2,500 MB/s) 带宽（从相机到主机 PC 内存）

Power over CoaXPress

- Power over CoaXPress : Feed your camera up to 17 W per channel under 24 VDC with automatic device detection, measurement and overload protection.
- Total and per-channel voltage and current measurement is possible, allowing validation and performance deviation monitoring.

双激光线提取

在软硬件实现的支持之下，双激光线提取过程减轻了遮挡的影响。当对象的某些部分未被任何激光照到时，便会发生遮挡。使用两条具有不同角度的激光可以减少这些不确定的区域。运用 Easy3DLaserLine 中包含的基于对象的校准，可将采集的数据整合到单独一个校准过的点云中。

长线缆支持

- CXP-6 速度时 40 米 (6.25 Gbps)
- CXP-3 速度时 100 米 (3 Gbps)

使用标准同轴电缆

- 只需一条并不昂贵的电缆，就可完成数据传输、相机控制、触发器和电源供应
- 顶级的可靠性和灵活性，可在恶劣环境执行

稳健的连接器，确保可靠连接

- Coaxlink CXP-6 使用 DIN 1.0/2.3 连接器，带推/拉闩锁系统

Memento 事件日志工具

- Memento 是供 Coaxlink 卡使用的高级开发和调试工具。
- Memento 记录与相机、图像采集卡及其驱动程序以及应用程序相关的所有事件的准确日志。
- 对于包含时间戳的时间，它为开发人员提供精确的时间表，也提供上下文信息和逻辑分析器视图。
- 它可以在应用程序开发和调试，以及机器操作期间提供宝贵的协作。

通用 I/O 线

- 兼容多种传感器和运动编码器。
- 高速差分输入：正交运动编码器，支持高达 5 MHz。
- 隔离式电流感应输入：接受 5V、12V、24V 信号电压，最高 50 kHz，个别电气隔离高达 250VDC 和 170VAC RMS。
- 隔离触式输出。
- 高速 5V 兼容 TTL 输入/LVTTL 输出。

高性能 DMA（直接存储器存取）

- 直接传输到用户分配的内存和显示 PCI 地址的硬件板
- 硬件分散 – 聚集支持
- 64 位寻址能力

区域扫描触发功能

- 触发器用于在零件就位时启动采集。硬件触发器来自 Coaxlink 的 I/O 线。软件触发器来自于应用程序。
- 可控的延时触发器，用来控制推迟图像采集的时间点。
- 触发抽取功能允许跳过某些触发器。
- 相机曝光控制允许应用来控制相机的曝光时间。
- 当系统开始采集图像时，Coaxlink 采集卡会在一个适当的时间点生成信号来控制连接在输出端的照明设备。

兼容 eGrabber

- eGrabber Studio : eGrabber 新型交互式评估和演示应用程序
- GenICam 浏览器：该应用程序提供对 GenTL Producer 中 GenICam 功能的访问渠道。
- GenTL 控制台：该命令行工具提供对 Euresys GenTL Producer 功能和命令的访问渠道。

符合 Genicam 标准

- 包括支持
- GenApi
 - 标准功能命名约定 (SFNC)
 - GenTL

Windows、Linux 和 macOS 驱动程序可用

- 包含对英特尔 32 位和 64 位平台以及 ARM 64 位平台的支持

在 DG06 技术开发部的支持下开发的

应用

电子制造业的机器视觉

- 用于电子检测机的 3D 图像采集

一般制造业的机器视觉

- 用于检测机的3D图像采集

规格

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	<ul style="list-style-type: none">• 'A', 'B', 'C', 'D' on bracket:<ul style="list-style-type: none">– 4x DIN 1.0/2.3 female connectors– CoaXPress host interface• 'EXTERNAL I/O' on bracket:<ul style="list-style-type: none">– 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:<ul style="list-style-type: none">– 2x 26-pin 2-row 0.1" pitch pin header with shrouding– I/O lines and power output• 'AUXILIARY POWER INPUT' on module:<ul style="list-style-type: none">– 6-pin PEG power socket– 12 VDC power input for PoCXP camera(s) and I/O power• 'C2C-LINK' on module:<ul style="list-style-type: none">– 6-pin 2-row 0.1-in header– Card to card link
LED indicators	<ul style="list-style-type: none">• 'A', 'B', 'C', 'D' on bracket:<ul style="list-style-type: none">– Bi-color red/green LEDs– CoaXPress Host connector indicator• 'FPGA STATUS LAMP' on PCB:<ul style="list-style-type: none">– Bi-color red/green LED– FPGA status indicator• 'BOARD STATUS LAMP' on PCB:<ul style="list-style-type: none">– Bi-color red/green LED– Board status indicator
Switches	'RECOVERY' on card PCB: <ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 4 lanes• 1 lane or 2 lanes with reduced performance
Link speed	<ul style="list-style-type: none">• 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 connection
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)	<ul style="list-style-type: none"> • PoCXP Safe Power: <ul style="list-style-type: none"> – 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	<ul style="list-style-type: none"> • Grayscale area-scan cameras
Camera pixel formats supported	Monochrome 8-bit (Mono8)

Area-scan camera control

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

On-board processing

On-board memory	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:
	<ul style="list-style-type: none"> • Maximum Detection algorithm <ul style="list-style-type: none"> – 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 <ul style="list-style-type: none"> – Maximum ROI width: 8192 pixels – Maximum ROI height: 256 pixels – Depth map format: 8-bit unsigned integer number – Accuracy: 1 pixel • Peak Detection algorithm <ul style="list-style-type: none"> – 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 <ul style="list-style-type: none"> – 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 <ul style="list-style-type: none"> – 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 <ul style="list-style-type: none"> – 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	<ul style="list-style-type: none"> • Measurement of: <ul style="list-style-type: none"> – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval

- | | |
|------------------------------|---|
| Event signaling and counting | <ul style="list-style-type: none"> • The application software can be notified of the occurrence of various events: <ul style="list-style-type: none"> – Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers – A large set of custom events • Custom events sources: <ul style="list-style-type: none"> – I/O Toolbox events – Camera and Illumination control events – CoaXPress data stream events – CoaXPress host interface events • Each custom event is associated with a 32-bit counter that counts the number of occurrences • The last three 32-bit context data words of the event context data can be configured with event-specific context data: <ul style="list-style-type: none"> – Event-specific data – State of all System I/O lines sampled at the event occurrence time – Value of any event counter |
|------------------------------|---|
-

General Purpose Inputs and Outputs

Number of lines	20 I/O lines: <ul style="list-style-type: none"> • 4 differential inputs (DIN) • 4 singled-ended TTL inputs/outputs (TTLIO) • 8 isolated inputs (IIN) • 4 isolated outputs (IOUT)
Usage	<ul style="list-style-type: none"> • Any I/O input lines can be used by any LIN tool of the I/O Toolbox • Selected pairs of I/O input lines can be used by any QDC tool of the I/O toolbox to decode A/B signals of a motion encoder • The LIN and QDC tools outputs can be further processed by the other tools (DIV, MDV, DEL) of the I/O toolbox to generate any of the following "trigger" events: <ul style="list-style-type: none"> – The "cycle trigger" of the Camera and Illumination controller – The "cycle sequence trigger" of the Camera and Illumination controller – 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	<ul style="list-style-type: none"> • DIN: High-speed differential inputs compatible with ANSI/EIA/TIA-422/485 differential line drivers and complementary TTL drivers • TTLIO: High-speed 5V-compliant TTL inputs or 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	<ul style="list-style-type: none"> • Glitch removal filter available on all System I/O input lines • Configurable filter time constants: <ul style="list-style-type: none"> – for DIN and TTLIO lines: 50 ns, 100 ns, 200 ns, 500 ns, 1 µs – for IIN lines: 500 ns, 1 µs, 2 µs, 5 µs, 10 µs
Polarity control	Yes
Power output	Non-isolated, +12V, 1A, with electronic fuse protection

I/O Toolbox tools

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	<ul style="list-style-type: none">• European Council EMC Directive 2004/108/EC• United States FCC rule 47 CFR 15
EMC - Emission	<ul style="list-style-type: none">• EN 55022:2010 Class B• FCC 47 Part 15 Class B
EMC - Immunity	<ul style="list-style-type: none">• EN 55024:2010 Class B• EN 61000-4-3• EN 61000-4-4• EN 61000-4-6
KC Certification	Korean Radio Waves Act, Article 58-2, Clause 3
Flammability	PCB compliant with UL 94 V-0
RoHS	European Union Directive 2015/863 (ROHS3)
REACH	European Union Regulation 1907/2006
WEEE	Must be disposed of separately from normal household waste and must be recycled according to local regulations

Ordering Information

Product code - Description	<ul style="list-style-type: none">• 1637 - Coaxlink Quad 3D-LLE
Optional accessories	<ul style="list-style-type: none">• 1625 - DB25F I/O Adapter Cable• 1636 - InterPC C2C-Link Adapter• 3303 - C2C-Link Ribbon Cable• 3304 - HD26F I/O Adapter Cable



EMEA

Euresys SA

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

Phone: +32 4 367 72 88
Email: sales.europe@euresys.com

EMEA

Sensor to Image GmbH

Lechtorstrasse 20 -
86956 Schongau - Germany
Phone: +49 8861 2369 0
Email: sales.europe@euresys.com

AMERICA

Euresys Inc.

27132-A Paseo Espada - Suite 421
San Juan Capistrano, CA 92675 - United States
Phone: +1 949 743 0612
Email: sales.americas@euresys.com

ASIA

Euresys Pte. Ltd.

750A Chai Chee Road - #07-15 ESR BizPark @ Chai Chee
Singapore 469001 - Singapore
Phone: +65 6445 4800
Email: sales.asia@euresys.com

CHINA

Euresys Shanghai Liaison Office

Unit 802, Tower B, Greenland The Center - No.500 Yunjin Road, Xuhui District
200232 Shanghai - China
Euresys 上海联络处
上海市徐汇区云锦路500号绿地汇中心B座802室
200232
Phone: +86 21 33686220
Email: sales.china@euresys.com

JAPAN

Euresys Japan K.K.

Expert Office Shinyokohama - Nisso Dai 18 Building, Shinyokohama 3-7-18, Kohoku
Yokohama 222-0033 - Japan
〒222-0033
神奈川県横浜市港北区新横浜3-7-18 日総第18ビル エキスパートオフィス新横浜
Phone: +81 45 594 7259
Email: sales.japan@euresys.com

More at www.euresys.com

