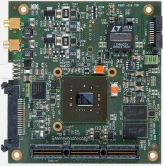


Coaxlink Duo PCIe/104

双连接加强型 CoaXPress 图像采集卡



一览

- 用于工业和军事嵌入式应用的坚固耐用的 COTS 板
- 小型可堆叠的 PCIe/104 结构
- 扩展温度范围：-40 到 +85° C / -40 到 +185° F，带有传导冷却（机箱内环境温度测量）
- 持续的冲击：20 克/11 毫秒（所有轴 - 半正弦和锯齿波）
- 可选的保形涂层
- 2 个 CoaXPress CXP-6 连接：1,250 MB/s 摄像机带宽
- PCIe 2.0 (Gen 2) x4 总线：传输带宽 1,700 MB/s
- 特征丰富的 10 条数字 I/O 线

优势

Ruggedized CoaXPress Frame Grabber

- Compliant with the PCIe/104 form factor.
- Extended operating temperature range.
- Withstand high levels of shock and vibration.
- Two CoaXPress CXP-6 (6 Gbit/s) camera connections.
- PCIe 2.0 (Gen 2) x4 bus.

PCIe/104 加强型板设计

- 紧凑尺寸：90 x 96 mm 模块尺寸 - 减少小型电子设备占用空间
- 自堆叠式：无需背板或卡笼即可扩展
- 坚固耐用、可靠的接头：在恶劣环境下可靠
- 四角安装孔：耐冲击和振动
- 完全兼容 PC：降低开发成本和上市时间
- 与当前 PC/104 规格和板卡结构的向后兼容性
- 具有快速投入使用和低开发成本特点的商用现货 (COTS)
- 跨厂商互操作性

CoaXPress 用于安防和监控

CoaXPress 室外相机可提供能够满足最苛刻安防和高端监控应用的功能。

使用重负型同轴电缆

- 只需一条并不昂贵的电缆，就可完成数据传输、摄像机控制、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

使用可靠的远程接头

- 远程 DIN 1.0/2.3 接头（可根据要求提供其他类型的接头）
- 单独板上的远程 I/O 接头
- 连接器可定制并安装在方便地点的机箱上

模块化结构

可提供以下可选附件：

- 3300 HD26F I/O 模块，用于 Coaxlink Duo PCIe/104：一个远程模块，可以安装在机箱上的方便位置。
- 3301 热疏水（型号1），用于 Coaxlink Duo PCIe/104
- 3302 DIN1.0/2.3 同轴电缆，用于Coaxlink Duo PCIe/104

长线缆支持

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

从速度最快、分辨率最高的摄像机采集图像

- 在同行业中最高的数据采集速率
- 12.5 Gbit/s (1,250 MB/s) 带宽（从摄像机到主机 PC 内存）

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 记录与摄像机、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。
- 它为开发者提供时间标记的精确时间表以及上下文信息。
- 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。

AMD 的 DirectGMA 支持

- 图像数据直接传送到 GPU 内存。
- 消除了不必要的系统内存拷贝，显著降低 CPU 开销，并减少延迟，从而为使用了 AMD FirePro W5x00 及以上以及所有的 AMD FirePro S 系列产品的应用程序带来数据传输时间方面的显著性能改进。

PCIe 2.0 (Gen 2) x4 通用扩展总线 (1 型或 2 型)

- 1,700 MB/s 持续总线带宽

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。
- 隔离电流检测输入：接受 5V、12V、24V 信号电压，最高 50 kHz，各个电隔离高达 500 VAC 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）

- 直接传送到用户分配的内存
- 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。
- 可选的触发器延时，用于按可编程的时间来推迟采集。
- 触发抽取功能允许跳过某些触发器。
- 摄像机曝光控制允许应用来控制摄像机的曝光时间。
- 在适当的时间启动采集时，Coaxlink 卡生成一个信号来控制连接到一条输出线的照明设备。

Coaxlink 驱动程序包括如下工具：

- Genicam 浏览器：该应用程序提供访问系统中 GenTL Producer 披露的 GenICam 功能。
- GenTL 控制台：该命令行工具提供访问 Euresys GenTL Producer 披露的功能和命令。

符合 Genicam 标准

包括支持

- GenApi
- 标准功能命名约定（SFNC）
- GenTL

提供 Windows 和 Linux 驱动程序

应用

电子制造业的机器视觉

用于检查机器的高速图像采集。

Coaxlink 和 Grablink 卡是可靠的工业图像采集卡，从最快的数码摄像机提供强大和稳定的图像采集。它们的特点是精确的摄像机控制和同步功能。

- AOI（自动光学检测）机
- 3D SPI（锡膏检测）机
- 3D 引线/球型检查机

一般制造业的机器视觉

用于检查机的高帧率图像采集

玻璃检测：瓶、小瓶

印刷业的机器视觉

用于印刷检查机的高速线扫描图像采集

- 包装打印检查
- 标签打印检查

生命科学与医疗

科学研究

CoaxPress 高光谱成像器可安装在飞机或无人机上，进行环境和农业监测、土地分析或机载遥感。

视频采集和录制

用于运动分析和记录的高帧速率视频采集

军事与国防

通过长距离同轴电缆传输和采集高清视频

CoaXPress 是最近出现的强大标准，提供了摄像机和 PC 图像采集卡之间的高速接口。在高速公路上，高速摄像机可以高速连拍图像。更清晰的图像将提高车牌识别的准确率。可容纳高频实时触发和曝光时间调整到低照度的情况。

机载 ISR

视觉系统往往集成高分辨率和高速 CoaXPress 摄像机，用于机载情报、监视和侦察任务。

运输安全

Coaxlink Duo PCIe/104 板具有极佳的耐高温、抗震颤和耐湿气性能，特别适用于铁路和公路运输、警用车辆设备或者任何移动或户外视频监视中使用的嵌入式安全系统。

用于机载监视或炮塔的摄像机转塔

利用滑环，CoaXPress 可轻松集成到 360° C 旋转工位以允许连续平移。高分辨率视频提供更清晰的图像和更大的可视面积，从而可能减少所需摄像机的数量。

无人操作应用，车载视频采集

CoaXPress 标准可在几毫秒内将视频传输到 PC。该系统的超低延迟将允许控制陆地车辆或远程控制无人机。

视频监视、监控和安全

通过长距离同轴电缆传输和采集高清视频，进行交通监控、监视和控制

规范

Mechanical

Form Factor	PCIe/104 card
Format	4-lane PCIe/104, stack-down only, universal peripheral module
Cooling method	Conduction cooling
Mounting	For stacking down directly under the Host PC: <ul style="list-style-type: none">• 1 or 2 modules on Type 1 and Type 2 Host PC's
Connectors	<ul style="list-style-type: none">• 'CAMERA POWER INPUT'<ul style="list-style-type: none">– 4-pin 0.1-in Molex KK 7478 male connector• 'C2C-Link'<ul style="list-style-type: none">– 6-pin 2-row 0.1-in header• 'I/O' on '3300 HD26F I/O module for Coaxlink Duo PCIe/104' (optional)<ul style="list-style-type: none">– 26-pin 3-row high-density female sub-D connector– GPIO lines and power output• 'A', 'B' on 3302 DIN1.0/2.3 Coaxial cable for Coaxlink Duo PCIe/104' (optional)<ul style="list-style-type: none">– DIN 1.0/2.3 female connectors– CoaXPress host interface
Lamp indicators	<ul style="list-style-type: none">• 'A', 'B' on 3300 HD26F I/O module for Coaxlink Duo PCIe/104' (optional)<ul style="list-style-type: none">– 2x bi-color red/green LEDs– CoaXPress Host connector indicator lamps• 'FPGA STATUS LAMP' on '3300 HD26F I/O module for Coaxlink Duo PCIe/104' (optional)<ul style="list-style-type: none">– Bi-color red/green LED• 'BOARD STATUS LAMP' on '3300 HD26F I/O module for Coaxlink Duo PCIe/104' (optional)<ul style="list-style-type: none">– Bi-color red/green LED
Switches	'RECOVERY' on card PCB: <ul style="list-style-type: none">• 3-pin 1-row 0.1" header• Firmware emergency recovery
Dimensions	96 mm x 90 mm 3.775 in x 3.555 in

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. 8.4 W @ +12V excluding I/O power output <ul style="list-style-type: none">• +3.3V and +5.0V rails are not used

Camera / video inputs

Interface standard(s)	CoaXPress 1.0 and 1.1
Connectors	2x CXP-6
Status LEDs	1 CoaXPress Host connection status per connector
Number of cameras	<ul style="list-style-type: none">• One 1- or 2-connection area-scan camera• Two 1-connection area-scan cameras
Line-scan cameras supported	No
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)	<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• A +24V DC power source must be connected to the AUXILIARY POWER INPUT connector on the module
Camera types	<ul style="list-style-type: none">• Area-scan cameras:<ul style="list-style-type: none">– Gray-scale and color (RGB and Bayer CFA)– Single-tap (1X-1Y) progressive-scan
Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, and RGBA (PFNC names): <ul style="list-style-type: none">• Raw• Mono8, Mono10, Mono12, Mono14, Mono16• BayerXX8, BayerXX10, BayerXX12, BayerXX14, BayerXX16 where XX = GR, RG, GB, or BG• RGB8, RGB10, RGB12, RGB14, RGB16• RGBA8, RGBA10, RGBA12, RGBA14, RGBA16

Area-scan camera control

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

On-board processing

On-board memory	512 MB
Image data stream processing	<ul style="list-style-type: none">• Unpacking of 10-/12-/14-bit to 16-bit with selectable justification to LSb or MSb• Optional swap of R and B components• Little endian conversion
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 on 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 3 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– Count value of any event counter

General Purpose Inputs and Outputs

Number of lines	<p>10 I/O lines:</p> <ul style="list-style-type: none"> • 2 differential inputs (DIN) • 2 singled-ended TTL inputs/outputs (TTLIO) • 4 isolated inputs (IIN) • 2 isolated outputs (IOUT)
Usage	<ul style="list-style-type: none"> • Any System I/O input lines can be used by any LIN tool of the I/O Toolbox • 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 • 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 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	<ul style="list-style-type: none"> • Glitch removal filter available on all System I/O input lines • Configurable filter time constants: <ul style="list-style-type: none"> – for DIN and TTLIO lines: 50 ns, 100 ns, 200 ns, 500 ns, 1 μs – for IIN lines: 500 ns, 1 μs, 2 μs, 5 μs, 10 μs
Polarity control	Yes
Power output	Non-isolated, +12V, 1A, with electronic fuse protection
I/O Toolbox tools	<p>The I/O Toolbox is a configurable interconnection of tools that generates events (usually triggers) from input lines. The composition of the toolset is product- and firmware-dependent.</p> <ul style="list-style-type: none"> • Line Input tool (LIN): Edge detector delivering events on rising or falling edges of any selected input line. • Quadrature Decoder tool (QDC): A composite tool including: <ul style="list-style-type: none"> – A quadrature edge detector delivering events on selected transitions of selected pairs of input lines. – An optional backward motion compensator for clean line-scan image acquisition when the motion is unstable. – A 32-bit up/down counter for delivering a position value. • Divider tool (DIV): to generate an event every nth input events from any I/O toolbox event source. • Multiplier/divider tool (MDV): to generate m events every d input events from any I/O toolbox event source. • Delay tool (DEL): to delay up to 16 events from one or two I/O toolbox event sources, by a programmable time or number of motion encoder ticks (any QDC events).
I/O Toolbox composition	<p>Firmware-dependent I/O toolbox composition:</p> <ul style="list-style-type: none"> • 1-camera: 8 LIN, 1 QDC, 1 DIV, 1 MDV, 2 DEL • 2-camera: 8 LIN, 1 QDC, 1 DIV

C2C-Link

Description	<ul style="list-style-type: none">• Allows to accurately synchronize the trigger and start-of-exposure of multiple grabber-controlled area-scan and line-scan cameras.• C2C-Link is able to synchronize cameras connected<ul style="list-style-type: none">– to the same Coaxlink 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)
Specification	<ul style="list-style-type: none">• Maximum distance<ul style="list-style-type: none">– 60 cm inside a PC– 1200 m cumulated adapter to adapter cable length• Maximum trigger rate<ul style="list-style-type: none">– 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<ul style="list-style-type: none">– Less than 10 ns for cameras on the same Coaxlink card or on different Coaxlink cards in the same PC– Less than 265 ns for cameras on different Coaxlink cards in different PCs (3 PCs and 40m total C2C-Link cable length)

Software

Host PC Operating System	<ul style="list-style-type: none">• Microsoft Windows 10, 8.1, 8, 7• Linux Kernel version 3.13, compatible with a wide range of distributions, tested with Ubuntu 14.04• 32- and 64-bit versions
APIs	<p>EGrabber class, with C++ and .NET APIs:</p> <ul style="list-style-type: none">• .NET assembly designed to be used with development environments compatible with .NET frameworks version 2.0 or higher <p>GenICam GenTL producer libraries compatible with C/C++ compilers:</p> <ul style="list-style-type: none">• 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
Memento	Compatible with Memento Event Logging tool, version 4.0 and later

Environmental conditions

Operating ambient air temperature	-40 to +85 °C / -40 to +185 °F, with conduction cooling (ambient temperature measured inside the enclosure)
Operating ambient air humidity	0 to 100% RH non-condensing
Storage ambient air temperature	-55 to +100 °C / -67 to +212 °F
Storage ambient air humidity	0 to 100% RH non-condensing
Shock and vibration	<ul style="list-style-type: none">• Shock: 20 g/11ms (all axes - half-sine and saw tooth)

Certifications

Electromagnetic - EMC standards	<ul style="list-style-type: none">• The European Council EMC Directive 2004/108/EC• The 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 61000-4-5• EN 61000-4-6
Flammability	PCB compliant with UL 94 V-0
RoHS	Compliant with the European Union Directive 2011/65/EU (ROHS2)
REACH	Compliant with the European Union Regulation No 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">• 1634 - Coaxlink Duo PCIe/104
Optional accessories	<ul style="list-style-type: none">• 3300 - HD26F I/O module for Coaxlink Duo PCIe/104• 3301 - Thermal drain (Model 1) for Coaxlink Duo PCIe/104• 3302 - DIN1.0/2.3 Coaxial cable for Coaxlink Duo PCIe/104



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