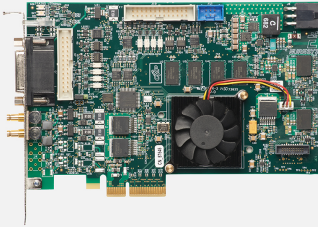


Coaxlink Duo

2CH CoaXPress 프레임 그래버



둘러보기

- 2CH CoaXPress CXP-6 연결: 카메라 대역폭 1,250 MB/s
- PCIe 2.0(Gen 2) x4 버스: 공급 대역폭 1,700 MB/s
- 다기능 디지털 I/O 라인
20개
- 폭넓은 카메라 제어 기능
- Memento 이벤트 로그 툴

장점

가장 빠르고 가장 높은 고해상도 카메라에서 이미지 캡처

- 업계 최고 수준의 데이터 캡처 속도
- 카메라 대 호스트 PC 메모리 대역폭 12.5 Gbit/s(1,250 MB/s)

표준 동축 케이블 사용

- 데이터 전송, 카메라 제어, 트리거, 전원 공급을 하나로 해결할 수 있는 저렴한 케이블
- 가장 혹독한 환경에서도 최고의 신뢰성, 유연성, 성능 제공

장거리 케이블 지원

- CXP-6 속도(6.25 Gbps)에서 40m
- CXP-3 속도(3 Gbps)에서 100m

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.

안정적인 연결을 위한 견고한 커넥터

- Coaxlink CXP-6은 push/pull 래치 시스템이 적용된 DIN 1.0/2.3 커넥터를 사용합니다

Memento 이벤트 로그 툴

- Memento는 Coaxlink 카드에서 이용할 수 있는 고급 개발 및 디버깅 툴입니다.
- Memento는 카메라, 프레임 그래버, 드라이버, 애플리케이션과 관련된 모든 이벤트 로그를 정확하게 기록합니다.
- 이 제품은 타임 스탬프 기록된 이벤트에 대한 정확한 시간 정보를 맥락 정보와 함께 개발자에게 제공합니다.
- 애플리케이션 개발, 디버깅뿐 아니라 기계 운용 중에도 유용한 장점을 제공합니다.

GPU 직접 전송

- AMD DirectGMA 및 NVIDIA(CUDA) 샘플 프로그램 제공 가능
- 직접 GPU 전송은 불필요한 시스템 메모리 복사본을 줄이고, CPU 오버헤드를 낮추고, 지연을 감소시켜서 애플리케이션을 위한 데이터 전송 시간에 상당한 성능 향상을 제공합니다.
- AMD DirectGMA를 사용하여 이미지 데이터를 GPU 메모리로 직접 캡처. AMD FirePro W5x00 이상 제품 및 모든 AMD FirePro S 시리즈 제품과 호환

PCIe 2.0(Gen 2) x4 버스

- 연속 버스 대역폭 1,700 MB/s

범용 IO 라인

- 광범위한 센서 및 모션 인코더와 호환:
- 고속 차동 입력: 최대 5 MHz까지 지원하는 쿼드러처 모션 인코더.
- 절연 전류 감지 입력: 5V, 12V, 24V 신호 전압 인가 가능, 최대 50 kHz, 최대 250VDC 및 170VAC RMS의 갈바닉 개별 절연.
- 절연 접점 출력.
- 고속 5V 규격 TTL 입력/LVTTL 출력.

고성능 DMA(Direct Memory Access)

- PCI 주소를 노출시키는 하드웨어 보드 및 사용자 할당 메모리로 직접 전송
- 하드웨어 분산-수집(scatter-gather) 지원
- 64비트 주소 지정 기능

Area 스캔 트리거 기능

- 트리거는 일부분이 위치에 들어 왔을 때 캡처를 시작하는 데 사용됩니다. 하드웨어 트리거는 Coaxlink의 I/O 라인에서 제공됩니다. 소프트웨어 트리거는 애플리케이션에서 제공됩니다.
- 옵션 트리거 지연을 사용하여 프로그래밍 가능한 시간 동안 캡처를 연기할 수 있습니다.
- 트리거 제거 기능은 일부 트리거를 무시하는 기능입니다.
- 카메라 노출 제어 기능을 사용하면 애플리케이션에서 카메라의 노출 시간을 제어할 수 있습니다.
- 캡처가 시작되면 적절한 시점에 Coaxlink 보드가 출력 라인 중 하나에 연결된 조명 장치를 제어하기 위한 신호를 생성합니다.

eGrabber과 호환

- eGrabber Studio: eGrabber의 새로운 대화형 평가 및 시연 애플리케이션
- GenICam 브라우저: GenTL Producer에 의해 노출된 GenICam 기능에 대한 액세스를 제공하는 애플리케이션.
- GenTL 콘솔: Euresys GenTL Producer에 의해 노출된 함수와 명령에 대한 액세스를 제공하는 커맨드 라인 툴

Genicam과 호환

다음 지원 포함

- GenApi
- 표준 기능 명명 규칙(SFNC)
- GenTL

Windows, Linux 및 macOS 드라이버 이용 가능

- Intel 32비트 및 64비트 플랫폼뿐 아니라 ARM 64비트 플랫폼에 대한 지원 포함

애플리케이션

전자제품 제조산업용 머신 비전

- AOI, 3D SPI, 3D 리드/볼 검사 기계용 고속 이미지 캡처

일반 제조산업용 머신 비전

- 검사 기계용으로 높은 프레임 레이트의 이미지 캡처

- 로봇용 이미지 캡처

비디오 캡처 및 기록

- 동작 분석 및 기록용 고 프레임 레이트 비디오 캡처

비디오 모니터링, 감시, 보안

- 장거리 동축 케이블을 통해 교통 감시, 모니터링, 통제용 HD 비디오 전송 및 캡처

사양

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' on bracket: <ul style="list-style-type: none"> – 2x 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' 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	160 g, 5.64 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. 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 connection
Number of cameras	<ul style="list-style-type: none"> • Area-scan cameras: <ul style="list-style-type: none"> – One 1- or 2-connection camera – One or two 1-connection cameras • Line-scan cameras: <ul style="list-style-type: none"> – 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)	<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"> • Area-scan cameras: <ul style="list-style-type: none"> – Grayscale and color (YCbCr, YUV, RGB and Bayer CFA) – Single-tap (1X-1Y) progressive-scan • Line-scan cameras and contact imaging sensors: <ul style="list-style-type: none"> – Grayscale and color RGB

Camera pixel formats supported	Raw, Monochrome, Bayer, RGB, and RGBA (PFNC names): <ul style="list-style-type: none"> • Raw • Mono8, Mono10, Mono12, Mono14, Mono16 • BayerXX8, BayerXX10, BayerXX12, BayerXX14, BayerXX16 where XX = GR, RG, GB, or BG • RGB8, RGB10, RGB12, RGB14, RGB16 • RGBA8, RGBA10, RGBA12, RGBA14, RGBA16 • YCbCr601_422_8, YCbCr601_422_10 • YCbCr709_422_8, YCbCr709_422_10 • YUV422_8, YUV422_10
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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.

Line-scan camera control

Scan/page trigger	<ul style="list-style-type: none"> • 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.
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On-board processing

On-board memory	1 GB
Image data stream processing	<ul style="list-style-type: none"> • Unpacking of 10-/12-/14-bit to 16-bit with selectable justification to LSb or MSb • Optional swap of R and B components • Little endian conversion
Input LUT (Lookup Table)	Only available for monochrome cameras: <ul style="list-style-type: none"> • 8 to 8 bits • 10 to 8, 10 or 16 bits • 12 to 8, 12 or 16 bits
Data stream statistics	<ul style="list-style-type: none"> • Measurement of: <ul style="list-style-type: none"> – Frame rate (Area-scan only) – Line rate – Data rate • Configurable averaging interval

Event signaling and counting

- 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: <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 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

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, 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	<ul style="list-style-type: none">• 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 <p>Refer to release notes for details</p>
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 4.0 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• 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 61000-4-5• 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	<ul style="list-style-type: none">• 1631 - Coaxlink Duo
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

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