

Coaxlink CXP-12 to QSFP+ Converter

Four-connection CoaXPress CXP-12 to CoaXPress-over-Fiber converter



At a Glance

- Provides easy cable length extension using CoaXPress-over-Fiber
- Allows connecting a CXP-12 camera to a Coaxlink QSFP+ frame grabber
- Four CoaXPress CXP-12 connections on the camera side
- One QSFP+ port compliant with 40 Gbps optical modules on the frame grabber side
- 5,000 MB/s camera bandwidth
- PoCXP camera power supply

Benefits

Connect a CXP-12 camera to a Coaxlink QSFP+ frame grabber

The Coaxlink CXP-12 to QSFP+ Converter allows connecting a CXP-12 camera to a Coaxlink QSFP+ frame grabber using fiber optics. With multi-mode fibers, the maximum cable length can reach 150 meters. With single-mode fibers, the maximum cable length can reach 40 kilometers.

What is CoaXPress-over-Fiber?

CoaXPress-over-Fiber is a light but significant extension of the existing CoaXPress specification to support transport over fiber optics.

CoaXPress (CXP) is the de-facto standard for high-bandwidth computer vision applications. CoaXPress2.0, the latest version of the specification, specifies the CXP-12 speed, a 12.5 Gbps (Gigabit per second) link over a coaxial copper cable. As link aggregation is common with CoaXPress, bandwidths of 5,000 MB/s (1,250 MB/s x 4) are easily achievable with four CXP-12 links. The CoaXPress specification is hosted by the JIIA (Japan Industrial Imaging Association).

CoaXPress-over-Fiber has been designed as an add-on to the CoaXPress 2.0 specification. It provides a way to run the CoaXPress protocol, as it is, unmodified, over a standard Ethernet connection, including fiber optics. As such, CoaXPress-over-Fiber uses standard electronics, connectors and cables designed for Ethernet, but the protocol is CoaXPress, not Ethernet, not GigE Vision.

Read more about CoaXPress-over-Fiber on our technology page.

Acquire images from the fastest and highest resolution cameras

- Highest data acquisition rate in the industry

- Up to 5,000 MB/s bandwidth from camera to host PC memory

What are the pros and cons of using fiber optics?

Pros

- First and foremost, cable length is not an issue anymore as fiber connectivity is basically not limited in length.
- Fiber optics provide more bandwidth, as connectivity at 10 and 25 Gbps per fiber is standard today and widely used in data centers.
- Fiber optics are immune to electrical noise, which will be a significant advantage on the production floor and in some medical applications.
- Fiber optics are lighter and smaller in size than the equivalent copper cabling, making it appropriate for applications where this characteristic is essential, like in aircrafts or vehicles.

Cons

- There is no "power over fiber". As signals in fiber optics are transmitted using light, there is no way to transfer power over fiber optics and devices such as cameras must be powered separately.

What are the cable options for CoaXPress-over-Fiber?

One of the most important benefits of CoaXPress-over-Fiber is the wide variety of connectivity options already available from multiple companies. The initial connectivity options for CoaXPress-over-Fiber and the Coaxlink QSFP+ at 10 Gbps are SFP+ and QSFP+ (Quad, or four times SFP+) modules.

The advantage of using modules compared to fixed interfaces is that ports can be equipped with any suitable type of transceiver as required by the application. A variety of transmitter and receiver types is available, allowing users to select the appropriate transceiver to provide the required optical reach over multi-mode or single-mode fiber.

What are the benefits of using CoaXPress-over-Fiber for my application?

- Ultra-high data and frame rates
- Many accessory and cabling options to cover any length requirement
- Low CPU overhead, low latency, low jitter image acquisition
- Highest camera count per PC performance
- Very competitive cost/performance ratio
- Wide industry acceptance due to J11A and IEEE standardization

What are the jitter and latency of CoaXPress-over-Fiber? How do they compare to "traditional" CoaXPress?

CoaXPress-over-Fiber is based on the CoaXPress protocol and it exhibits the same high performance as CoaXPress in terms of jitter and latency. In addition, as CoaXPress-over-Fiber supports higher transmission speed compared to CoaXPress, the jitter and latency will be further improved in these versions.

What is the maximum cable length with multi-mode fibers?

With a standard 40GBASE-SR4 QSFP+ Optical Transceiver Module and an MTP/MPO multi-mode fiber cable, the maximum cable length is 150 meters. This solution is suitable for machine vision applications.

What is the maximum cable length with single-mode fibers?

With a standard 40GBASE-ER4 QSFP+ LC DOM Optical Transceiver Module and an LC-Duplex single-mode fiber cable, the maximum cable length is 40 kilometers. This solution is suitable, for example, for video transmission applications.

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.

Compatible with eGrabber

- eGrabber Studio: eGrabber's new interactive evaluation and demonstration application
- GenICam Browser: An application giving access to the GenICam features exposed by the GenTL Producer(s)

- 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

Applications

Machine Vision for the Electronic Manufacturing Industry

- High speed image acquisition for AOI, 3D SPI, 3D lead/ball inspection machines.
- Very high resolution line-scan image acquisition for Flat Panel Display inspection and solar cell inspection

Machine Vision for the General Manufacturing Industries

- High frame rate image acquisition for inspection machines
- Line-scan image acquisition for surface inspection machines
- Line-scan image acquisition for textile inspection

Machine Vision for the Printing Industry

- High speed line-scan image acquisition for printing inspection machines

Video Acquisition and Recording

- High-frame-rate video acquisition for motion analysis and recording

Specifications

Mechanical

Cooling method	Air cooling, fan-cooled heatsink
Housing	Aluminum housing
Mounting	Desktop
Connectors	<ul style="list-style-type: none"> • 'A', 'B', 'C', 'D' on front panel: <ul style="list-style-type: none"> – 4x Micro BNC female connectors – CoaXPress host interface • 'QSFP+' on rear panel: <ul style="list-style-type: none"> – Enhanced Quad Small Form-factor Pluggable port – CoaXPress-over-Fiber device interface • 'POWER IN' on rear panel: <ul style="list-style-type: none"> – 2-pin 5.08mm pitch terminal socket – 24 V DC power input for internal use and PoCXP

LED indicators	<ul style="list-style-type: none"> • 'A', 'B', 'C', 'D' on front panel: <ul style="list-style-type: none"> – Bi-color red/green LEDs – CoaXPress Host connector indicator • 'A', 'B', 'C', 'D' on rear panel: <ul style="list-style-type: none"> – Bi-color red/green LEDs – CoaXPress Device connector indicator • 'FPGA OK' on rear panel: <ul style="list-style-type: none"> – Bi-color red/green LED – FPGA status indicator • 'BOARD OK' on rear panel: <ul style="list-style-type: none"> – Bi-color red/green LED – Board status indicator
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Dimensions	L 112 mm x H 55 mm x D 208 mm
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Weight	TBD g, TBD oz (3629)
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Camera / video inputs

Interface standard(s)	CoaXPress 1.0, 1.1, 1.1.1 and 2.0, CoaXPress-over-Fiber Bridge Protocol 1.0
Connectors	Four micro-BNC 75 Ohms (also known as HD-BNC™) CXP-12
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- or 4-connection camera • Line-scan cameras: <ul style="list-style-type: none"> – One 1- or 2- or 4-connection camera
Maximum aggregated camera data transfer rate	50 Gbit/s (5,000 MB/s)
Supported CXP down-connection speeds	1.25 GT/s (CXP-1), 2.5 GT/s (CXP-2), 3.125 GT/s (CXP-3), 5 GT/s (CXP-5), 6.25 GT/s (CXP-6), 10.0 GT/s (CXP-10), and 12.5 GT/s (CXP-12)
Supported CXP up-connection speeds	<ul style="list-style-type: none"> • Low-speed 20.83... Mbps (CXP-1 to CXP-6) • Low-speed 41.66... Mbps (CXP-10, CXP-12)
Number of CXP data streams (per camera)	1 data stream per camera
Maximum CXP stream packet size	16,384 bytes
PoCXP (Power over CoaXPress)	<ul style="list-style-type: none"> • PoCXP Safe Power: <ul style="list-style-type: none"> – PoCXP Device detection and automatic power-on – Overload and short-circuit protections • A +24V power source must be connected to the POWER IN connector

Electrical

Supply voltage	24 V DC (tolerance. TBD), via external power supply block (not included)
Power connector	POWER IN connector: 2-pin 5.08 mm pluggable terminal block socket
Power consumption	<ul style="list-style-type: none"> • 29 W for internal use (estimation TBC) • 4 x 17 W for PoCXP

Environmental conditions

Operating ambient air temperature	0 to +50 °C / +32 to +122 °F (TBC)
Operating ambient air humidity	10% to 90% RH non-condensing (TBC)
Storage ambient air temperature	-20 to +70 °C / -4 to +158 °F (TBC)
Storage ambient air humidity	10% to 90% RH non-condensing (TBC)

Certifications

Electromagnetic - EMC standards	<ul style="list-style-type: none">• European Council EMC Directive 2004/108/EC (TBC)• United States FCC rule 47 CFR 15 (TBC)
EMC - Emission	TBD
EMC - Immunity	TBD
KC Certification	TBD
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">• 3629 - Coaxlink CXP-12 to QSFP+ Converter
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For more information please contact:

BOCK OPTRONICS INC.

14 Steinway Blvd., Unit 7
Toronto, Ontario M9W 6M6

Tel: (416) 674-2804
sales@bockoptronics.ca
www.bockoptronics.ca