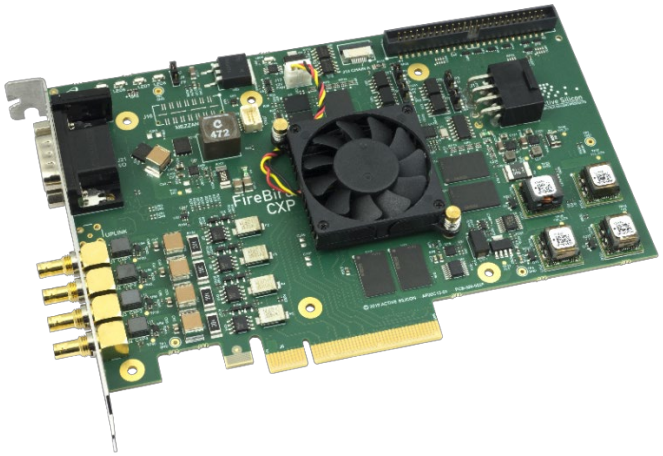
FIREBIRD COAXPRESS
CXP-12 Frame Grabbers

Active Silicon
COMPUTER IMAGING PRODUCTS

- **CoaXPress v2.0 Frame Grabber Family**
- **Supports CoaXPress speeds up to CXP-12**
- **RISC based ActiveDMA engine technology**
- **Gen3 PCI Express 4-lane and 8-lane options**

FEATURES

- CoaXPress gives high speed data, power, and camera control all over a single cable.
- High performance CXP 2.0 with up to 50 Gigabits per second input rate.
- Fast PCI Express 4-lane and 8-lane Gen3 interfaces.
- ActiveDMA engine – acquisition with zero CPU usage.
- Comprehensive I/O including end bracket I/O.
- Supports PoCXP (Power over CoaXPress).
- Micro-BNC connectors.
- Standard half-length PCI form-factor.
- Full GenICam support (including GenTL Producer).
- Supported by the proven ActiveSDK.



OVERVIEW

FireBird CXP-12 products are the latest members of Active Silicon's state-of-the-art FireBird frame grabber family.

FireBird is designed for ultimate performance using Active Silicon's proprietary DMA Engine technology, "ActiveDMA". This technical innovation applies RISC based processor techniques and guarantees high speed and low latency image data transfers and zero CPU intervention.

CoaXPress is a leading transmission standard for high-speed imaging in professional and industrial applications, recently updated to include the faster CXP-10 and CXP-12 speeds. Each CoaXPress link supports up to 12.5 Gbps data rates, along with device power up to 13W and device control at up to 42 Mbps – all on a single coax cable. For faster devices, the links can be concatenated to provide multiples of the single coax bandwidth. Very long cable lengths are supported – up to 35m at 12.5 Gbps and 100m at 3.125 Gbps using Belden 1694A cable – or even longer lengths using thicker cables. Active Silicon was one of the primary authors of the international CoaXPress standard, which is hosted by the JIIA (Japan Industrial Imaging Association). All our CoaXPress products are certified compliant to the specification through the JIIA CoaXPress Product Certification Program.

FireBird is supported by Active Silicon's software development kit, ActiveSDK. This is available as a separate item and allows rapid system development and integration. It provides comprehensive example applications and optimized libraries, and supports a variety of operating systems via a common API, including Windows, Linux (64-bit environments) and QNX. Drivers for third party applications are also available such as Cognex VisionPro, HALCON, Common Vision Blox, StreamPix, LabVIEW etc.

Full GenICam support is included in the drivers and this includes a GenTL Producer for data streaming as well as register accesses. Additional to functions that control the hardware, the libraries include general purpose functions for the manipulation and display of images. A separate datasheet describes ActiveSDK in detail.

SPECIFICATION SUMMARY

CoaXPress Interface:	Four 75 Ohm Micro-BNC connectors (also known as HD-BNC) each operate at all CXP speeds up to 12.5 Gbps. Up to 17W is available to power cameras on each Micro-BNC via Power over CoaXPress (PoCXP), with 13W available at the camera according to the CoaXPress specification. **FireBird** supports one camera using all four links, two cameras each using two links, or up to four cameras each using one link. LEDs on the end bracket show the link status according to the CoaXPress specification.
Buffer Memory:	Up to 5 GBytes of DDR4 memory is fitted for buffering between the CoaXPress interface and the PCI Express bus.
PCI Express:	Options for a four-lane or eight-lane Gen3 interface to support up to 6.8 Gbytes/sec transfer from **FireBird** to the PC. See the ordering information for more details.
I/O:	The following I/O lines are provided for triggers, optical shaft encoders, exposure control and general I/O: • 4 opto-isolated inputs. • 4 opto-isolated outputs. • 4 TTL inputs, 5V tolerant. • 4 TTL I/O, 5V logic. • 4 RS-422 inputs. • 4 RS-422 outputs. All these I/O signals are provided on a 50-way header on the **FireBird** board. A 15-way D-Type connector is located on the end bracket and allows access to a subset of the above I/O: • 2 opto-isolated inputs. • 3 TTL I/O, 5V logic. • 2 RS-422 inputs. • 1 RS-422 output.
Power Input:	An 8-way PCI Express Graphics (PEG) connector is provided to connect to a 6 or 8-way PEG connector from the PC power supply. This is only needed for PoCXP.
Fan Controller:	The fan speed is linked to the temperature of the FPGA die for optimum cooling and noise level.

CONFORMANCE

PCI Express Interface:	PCI Express Bus four or eight lane Gen3 interface to Specification Revision 3.1, with a max payload size of 512 bytes. **FireBird Quad CXP-12** supports both Short (32-bit) and Long (64-bit) Address packets. It also generates Posted Writes for image data, thus achieving transfer rates up to 6.8 Gbytes/sec, subject to host performance.	
CoaXPress:	**FireBird Quad CXP-12** conforms to v2.0 of the CoaXPress specification.	
Approvals:	EU	CE mark for compliance with EMC EN 55022:2010 (class A) and EN 55024:2010 in accordance with EU directive 2014/30/EU. RoHS compliance to RoHS3 directive 2015/863/EU.
	USA	EMC FCC Class A.
	The printed circuit board is manufactured by UL recognised manufacturers and has a flammability rating of 94V-0.	

PHYSICAL AND ENVIRONMENTAL DETAILS

Dimensions:	PCB: 168mm by 111mm. Overall: 181mm by 111mm.		
Approximate weight:	190g.		
Power consumption (typical):	+3.3 V	+12 V	+12V PEG Connector
(3PE4, measured while acquiring from 4 CXP-6 links)	80mA	940mA	Up to 68W for PoCXP
(3PE4, measured while acquiring from 2 CXP-12 links)	80mA	990mA	Up to 34W for PoCXP
(3PE8, measured while acquiring from 4 CXP-12 links)	80mA	1220mA	Up to 68W for PoCXP
Storage Temperature:	-15°C to +85°C.		
Operating Temperature:	0°C to +60°C (ambient environment).		
Relative Humidity:	10% to 90% non-condensing (operating and storage).		

ORDERING INFORMATION

PART NUMBER	*DESCRIPTION*
AS-FBD-4XCXP12-3PE8	**FireBird Quad CXP-12** frame grabber with eight lane Gen3 interface, supporting: • One quad-link camera up to CXP-12 • Two dual-link cameras up to CXP-12 • Four single-link cameras up to CXP-12
AS-FBD-4XCXP12-3PE4	**FireBird Quad CXP-12** frame grabber with four lane Gen3 interface, supporting: • One dual-link camera up to CXP-12 (*) • Two single-link cameras up to CXP-12 (*) • One quad-link camera up to CXP-6 • Two dual-link cameras up to CXP-6 • Four single-link cameras up to CXP-6 (*) more CXP-12 cameras may be connected, but the numbers stated above can simultaneously stream data.
AS-ACTIVESDK-xxx	Software Development Kit for *xxx* operating system. For a full list of all supported operating systems please refer to the ActiveSDK datasheet or contact your distributor.
AS-CBL-1MM-0010-xM	Micro-BNC to Micro-BNC cable *x* metres in length for use with CoaXPress video sources. Made from Belden 4855R cable rated to CXP-12. The standard stock length is 3m. High-flex rating and much longer length cables also available – contact your distributor for details.
AS-CBL-1BM-0010-xM	As above, but Micro-BNC to BNC.
AS-CBL-1DM-0001-xM	As above, but Micro-BNC to DIN1.0/2.3 and made from Belden 1855A cable rated to CXP-6 (DIN connectors are only supported in CXP up to CXP-6 speeds).

THE FIREBIRD RANGE

The following products are also available in the range:

- High performance CoaXPress CXP-12 and CXP-6 frame grabbers in single, dual and quad configurations.
- Camera Link frame grabbers in Base, Medium, Full, 80-bit (Deca) and Dual 80-bit configurations.

Some variants in the range are also available in industrial form-factors such as PC/104-Express and CompactPCI Serial.

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