

# FIREBIRD CAMERA LINK

## Low Profile Frame Grabber

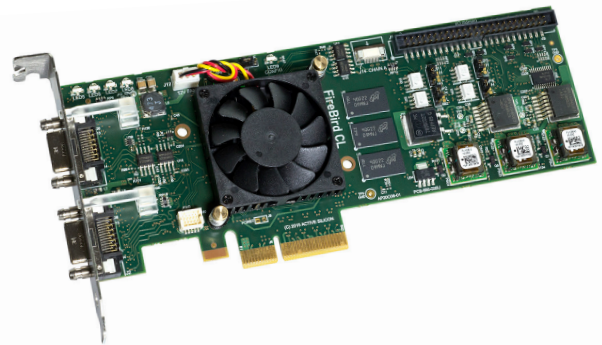


- Camera Link Frame Grabber
- Low Profile (half-height) PC form-factor
- Supports Base, dual Base, Medium, Full and 80-bit (Deca) modes, with PoCL
- 4-lane Gen2 PCI Express interface

### FEATURES

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- Supports the latest v2.0 Camera Link interface.
- Half-length PCI Express form-factor.
- Low profile or full height bracket options available.
- Camera Link mini connectors (HDR/SDR).
- Supports PoCL (Power over Camera Link).
- Comprehensive I/O.
- ActiveDMA engine – acquisition with zero CPU usage.
- Supported by the proven ActiveSDK.
- Supports GenICam for CLProtocol & GenCP cameras.
- Includes GenICam GenTL Producer.



### OVERVIEW

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**FireBird Camera Link 80-bit Low Profile** is a member of Active Silicon's state-of-the-art FireBird frame grabber family. The low profile design allows the **FireBird Low Profile** board to be used in small embedded PC enclosures and 2U rack mount cases where the full height PC cards are not suitable.

**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 zero CPU intervention, high speed and low latency image data transfers.

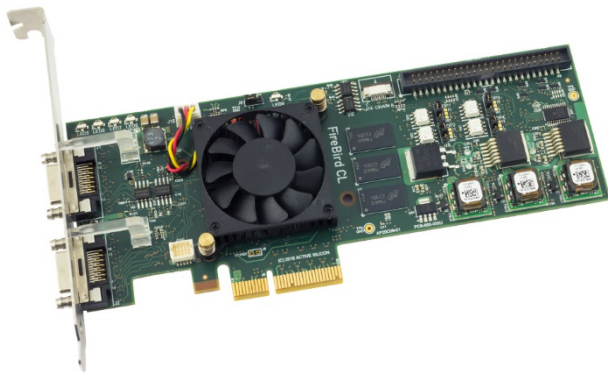
**FireBird** supports the latest version 2.0 Camera Link specification, including both 80-bit modes: 8-bit 10-tap and 10-bit 8-tap modes – often referred to as Camera Link "Deca", at clock rates up to 85 MHz. The 4-lane Gen2 interface used on the **FireBird** is fast enough to cope with the full data rate that the Camera Link 80-bit interface can support. The **FireBird** also supports capture from two simultaneous Base Camera Link cameras as well as single Base, Medium and Full configurations.

**FireBird** is supported by 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 runtime libraries, and supports a variety of operating systems via a common API, including Windows, Linux and QNX.

Drivers for third party applications are also available such as Cognex VisionPro, HALCON, Common Vision Blox, StreamPix, LabVIEW etc. As well as functions that control the hardware, the libraries include general purpose functions for the manipulation and display of images.

**FireBird** also supports GenICam for Camera Link cameras which support CLProtocol, including those using GenCP. A GenTL Producer is provided as part of the **FireBird** driver installation which allows the frame grabber to be used with GenICam GenTL compliant applications.

The **FireBird Camera Link 80-bit Low Profile** can be purchased with either a full height PC card bracket for use in regular PCs or with a low profile PC card bracket to fit into small embedded PC enclosures and 2U rack mount cases.



With full height bracket



With low profile bracket

## SPECIFICATION SUMMARY

<i>Camera Link Interface:</i>	<b>FireBird</b> is fitted with the 26-way mini Camera Link connectors (HDR/SDR) and screwlocks as specified in the Camera Link v2.0 specification. LEDs by each connector show the link status.
<i>Camera Clock:</i>	<b>FireBird</b> supports effective clock rates from DC to the Camera Link maximum of 85MHz, using the Camera Link Strobe (STB) and Data Valid (DVAL) signals.
<i>PoCL:</i>	<b>FireBird</b> supports Power over Camera Link (PoCL) functionality and is able to provide power to PoCL enabled cameras via the Camera Link data cable, therefore removing the need for a separate power supply. In addition to this <b>FireBird</b> implements <i>SafePower</i> , an intelligent sense mechanism which detects the presence of a PoCL camera before applying power to it. This safety mechanism ensures that power is not applied to conventional non-PoCL cameras. <b>FireBird</b> can supply up to 4W at a nominal 12V to a Base mode PoCL camera, or 8W to Medium/Full/80-bit cameras, as required by the Camera Link specification. Both Camera Link connectors support PoCL, which with <i>SafePower</i> allows the use of any combination of PoCL and conventional cameras.
<i>Buffer Memory:</i>	320 MBytes of DDR3 memory is fitted for buffering between the Camera Link interface and the PCI Express bus.
<i>PCI Express:</i>	4-lane Gen2 interface to support up to 20 Gbps transfer from <b>FireBird</b> to the PC.

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<i>I/O:</i>	<p>The following I/O lines are provided for triggers, optical shaft encoders, exposure control and general I/O:</p> <ul style="list-style-type: none"> <li>• 4 opto-isolated inputs.</li> <li>• 4 opto-isolated outputs.</li> <li>• 4 TTL inputs, 5V tolerant.</li> <li>• 4 TTL I/O, 5V logic.</li> <li>• 4 RS-422 inputs.</li> <li>• 4 RS-422 outputs.</li> </ul> <p>All these I/O signals are provided on a 50-way header on the <b>FireBird</b> board.</p>
<i>Fan Controller:</i>	<p>The fan speed is linked to the temperature of the FPGA die for optimum cooling and noise level.</p>

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## CONFORMANCE

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<i>PCI Express Interface:</i>	<p>PCI Express Bus 4-lane Gen2 interface to Specification Revision 3.1, with a max payload size of 512 bytes.</p> <p><b>FireBird Camera Link 80-bit Low Profile</b> supports both Short (32-bit) and Long (64-bit) Address packets. It also generates Posted Writes for image data, thus achieving transfer rates in excess of 1.7 GBytes/sec, subject to host performance.</p> <p>The board requires 16 MBytes of address space.</p>				
<i>Camera Link:</i>	<p><b>FireBird Camera Link 80-bit Low Profile</b> conforms to v2.0 of the Camera Link specification.</p>				
<i>Approvals:</i>	<table> <tr> <td>EU</td> <td> <p>CE mark for compliance with EMC EN 55022:2010 (class A) and EN 55024:2010 in accordance with EU directive 2014/30/EU.</p> <p>RoHS compliance to RoHS3 directive 2015/863/EU.</p> </td> </tr> <tr> <td>USA</td> <td> <p>EMC FCC Class A.</p> </td> </tr> </table> <p>The printed circuit board is manufactured by UL recognised manufacturers and has a flammability rating of 94V-0.</p>	EU	<p>CE mark for compliance with EMC EN 55022:2010 (class A) and EN 55024:2010 in accordance with EU directive 2014/30/EU.</p> <p>RoHS compliance to RoHS3 directive 2015/863/EU.</p>	USA	<p>EMC FCC Class A.</p>
EU	<p>CE mark for compliance with EMC EN 55022:2010 (class A) and EN 55024:2010 in accordance with EU directive 2014/30/EU.</p> <p>RoHS compliance to RoHS3 directive 2015/863/EU.</p>				
USA	<p>EMC FCC Class A.</p>				

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## PHYSICAL AND ENVIRONMENTAL DETAILS

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<i>Dimensions:</i>	<table> <tr> <td>PCB:</td> <td>168mm by 69mm.</td> </tr> <tr> <td>Overall:</td> <td>175mm by 69mm.</td> </tr> </table>	PCB:	168mm by 69mm.	Overall:	175mm by 69mm.	
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Overall:	175mm by 69mm.					
<i>Weight:</i>	<table> <tr> <td>100g (with low profile PC card bracket)</td> </tr> <tr> <td>104g (with full height PC card bracket)</td> </tr> </table>	100g (with low profile PC card bracket)	104g (with full height PC card bracket)			
100g (with low profile PC card bracket)						
104g (with full height PC card bracket)						
<i>Power consumption (typical):</i>	<table> <tr> <td>+3.3V</td> <td>+12V</td> <td rowspan="2">Measured during acquisition from a single 80-bit camera running at 85MHz.</td> </tr> <tr> <td>200mA</td> <td>400mA</td> </tr> </table>	+3.3V	+12V	Measured during acquisition from a single 80-bit camera running at 85MHz.	200mA	400mA
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200mA	400mA					
<i>Storage Temperature:</i>	-15°C to +85°C.					
<i>Operating Temperature:</i>	0°C to +85°C (ambient environment).					
<i>Relative Humidity:</i>	10% to 90% non-condensing (operating and storage).					

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## ORDERING INFORMATION

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<i>PART NUMBER</i>	<i>DESCRIPTION</i>
<b>AS-FBD-1XCLD-2PE4L-L</b>	<b>FireBird Camera Link 80-bit Low Profile</b> frame grabber, low profile PCI Express form factor with a low profile PC card bracket.
<b>AS-FBD-1XCLD-2PE4L-F</b>	<b>FireBird Camera Link 80-bit Low Profile</b> frame grabber, low profile PCI Express form factor with a full height PC card bracket.
<b>AS-ACTIVESDK-xxx</b>	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.
<b>AS-CBL-CL-SP-E-xM</b>	Camera Link cable x metres in length, Camera Link Mini (HDR/SDR) to Camera Link Mini (HDR/SDR), suitable for both PoCL and conventional cameras.  Standard stock lengths are 1m, 3m, 5m, and 7m.  High-flex rating and longer length cables also available as well as cables MDR to Mini Camera Link (HDR/SDR) connectivity – contact your distributor for details.

## THE FIREBIRD RANGE

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The following products are also available in the range:

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

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