FireBird Frame Grabbers - Installation and Use

# QUICKSTART GUIDE



**Active Silicon**

COMPUTER IMAGING PRODUCTS

## Contents

- Power off and open up the computer (taking the usual anti-static precautions).

- Please note: The boards are keyed so that they can only be fitted into a slot in which they will work. DO NOT modify the FireBird board or the motherboard in an attempt to override the keying as this could result in serious damage.

- For full performance this board must be fitted in a slot that supports PCI Express Gen 2 at x8 width. Check your computer documentation for details of the PCI Express connectors, and see the *FireBird Hardware Manual* for more information.

- **CoaXPress Boards Only:** If the board will be used to power cameras through the CoaXPress cables using PoCXP then the auxiliary power connector J13 must be connected to the computer power supply. The correct power supply cable is one intended for PCI Express Graphics (PEG) cards, and may have 6 or 8 ways. To distinguish it from other similar connectors in the computer, the connector should be black and may be marked 'PCI-E' or 'PEG'. Similar connectors that are not PEG should be white. However this is often not the case, so the cables should be carefully checked for the pattern of squares and chamfers on the plastic body of the connector at the end of the cable. See the images below.

Also, the wires should be black on the side with the connector clip, and colored (often yellow or blue) on the side opposite the connector clip.
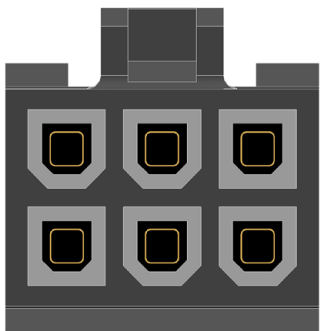
**If the connector does not match those shown above, DO NOT attempt to force it into FireBird as this could result in serious damage.**
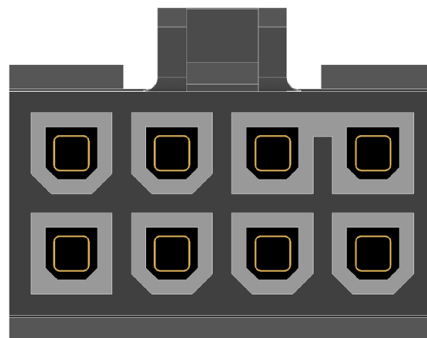
If a 6 way connector is plugged into FireBird, it should be aligned at the upper 6 ways of the 8 way FireBird connector as shown below.

PEG cable splitters, PEG to SATA adapters and PEG to 'Molex' adapters are available from Active Silicon and are included in the optional cable starter kit.
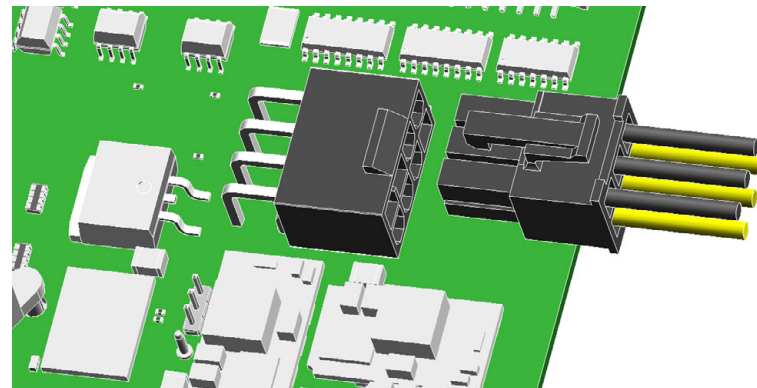
- Close and power on the computer.



6 way PEG cable Connector



8 way PEG cable connector



6 way cable alignment

The *Active Silicon FireBird Package* includes the FireBird Driver (device driver and core libraries), various applications including ASDemo, a GenICam-based GUI program, and the GenTL Producer.  It also installs the GenICam library if this is not on the computer.  Additionally, the *SDK Package* is for software developers.
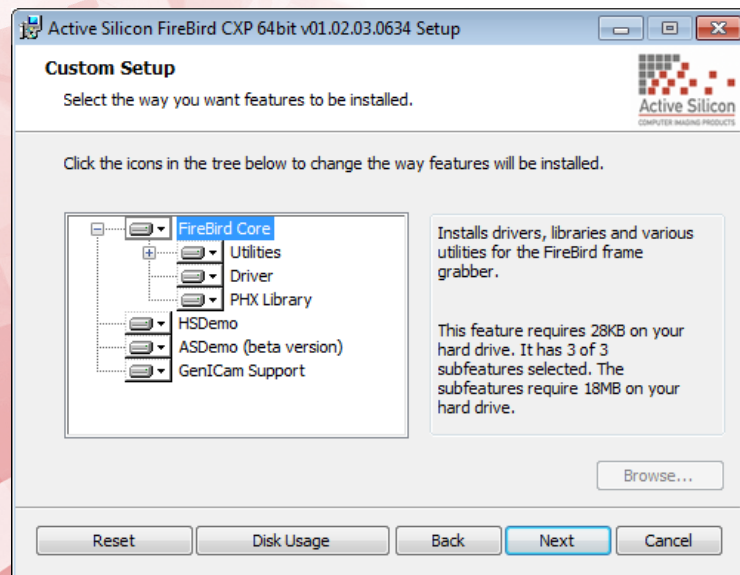
By default, selecting *Typical* installs everything, but individual options can be de-selected if required **(see image below)**.

The packages are supplied as a compressed file which includes the install package along with these instructions and the release notes.

The file naming convention is:

*as-<product>-<OS>- vXX_YY_ZZ*

where *<product>* is:

- *fbd-cxp* for the FireBird CoaXPress Package.
- *fbd-cl* for the FireBird Camera Link Package.
- *fbd-phx-sdk* for the FireBird and Phoenix SDK Package.

### Windows 7 & 8.1

- Uninstall any previous version of the *Active Silicon FireBird Package* (see later section).  Note: The previous SDK can be left on the PC to allow developers to refer to both old and new SDKs.

- If it is supplied with the *msi*, run **ActiveSiliconCleanUpTool.exe** to remove any unused files left behind from previous installations.

- Run the supplied *msi* package.

- Follow the on-screen prompts, including to reboot the PC once installation has completed.

- Note that the GenICam library is installed via a separate installer which is automatically run during the installation process.

- After completing installation it is recommended to update the FireBird firmware – see the next section.

### Windows 8.1 Notes

If the PC does not have a *Start Menu* utility installed, then all the applications and documentation referred to in this document can be found in the *Apps* view of the *Start Screen*, under *Active Silicon FireBird <xx>* or *Active Silicon SDK xXX.YY.ZZ*.

### Other Operating Systems

See the specific Quickstart Guide supplied with the installation package.



Software installation options

Note:  <xx> represents the camera interface, e.g. CXP or CL.

It is recommended to always update the firmware on FireBird boards to match that in the current driver set. To do this run the **FireBird Firmware Updater** utility

from the *Start Menu* under *Active Silicon FireBird <xx> – Utilities*.

The update utility also allows the **configuration mode** of the board to be changed – for example a four input CoaXPress board by default supports

one camera with up to four coax cables, but it can be configured e.g. to support four cameras each with one coax (select *Design 4xCXP: 4 Camera*).
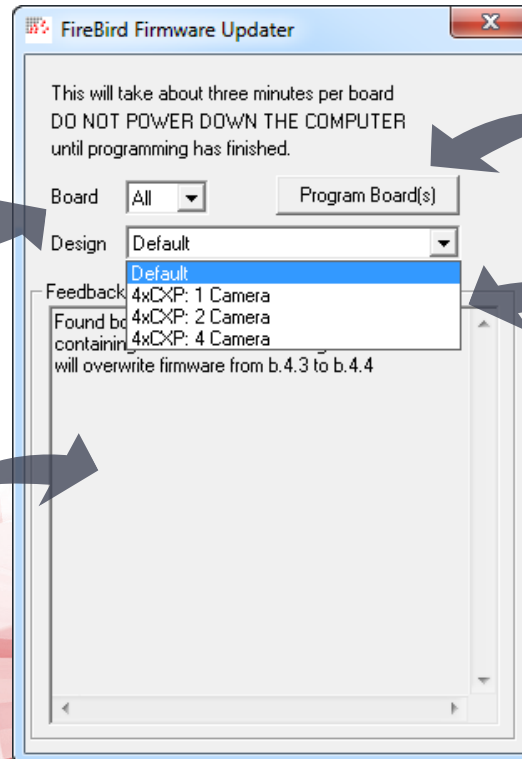
The *Board* option allows only selected boards in a system to be updated. By default all boards are updated. Note that the current version of the updater will update any Phoenix boards it finds in a system as well as FireBirds. To prevent this happening the Phoenix boards should be removed from the PC before the updater is run.

**FireBird Firmware Updater**

This will take about three minutes per board
DO NOT POWER DOWN THE COMPUTER
until programming has finished.

Board    [ All ▼ ]         [ Program Board(s) ]

Design   [ Default                    ▼ ]
         Default
         4xCXP: 1 Camera
Feedback 4xCXP: 2 Camera
         4xCXP: 4 Camera
Found bc
containing
will overwrite firmware from b.4.3 to b.4.4

Click the *Program Board(s)* button to start the update process. Wait for the process to complete, then reboot the PC.

The *Design* option controls the **configuration mode** of the board. The options presented depend on the board in use. This example shows the options with a 4xCXP FireBird.

*Default* updates the firmware keeping the same configuration mode as before the update. *4xCXP: 1 Camera* selects the configuration mode with 1 camera with up to 4 coax cables. *4xCXP: 2 Camera* selects the configuration mode with 2 cameras each with 2 coax cables. *4xCXP: 4 Camera* selects the configuration mode with 4 cameras each with 1 coax cable.

The *Feedback* window shows which boards will be updated, their current configuration and firmware version, what they will be updated to, and progress information during updating.

Note: The above refers to Windows. For the location of utilities and documentation for other for other operating systems refer to the specific Quickstart Guide.

Note: <xx> represents the camera interface, e.g. CXP or CL.

If the updater fails for any reason so that the board is no longer recognized, jumper J8 can be moved to the 'FF' position before rebooting the PC to allow

the board to configure from its 'Factory' design, to allow the update process to be run again. When the updater has finished, shut down the PC and move

the jumper back to its default position before powering up the board. See the *Jumpers* section of the **FireBird Hardware Manual** for more information.

### Check the PC BIOS:

■ Older BIOS versions in PCs can give noticeably lower PCI Express bandwidth.  It is recommended to check for available BIOS updates, especially if any bandwidth problems are seen.

■ Many PCs now support power saving features in the BIOS.  These can result in poor PCI Express bandwidth, maybe only occasionally.  Therefore Active Silicon recommends that the following settings are used (where available):

● *C-States* should be off.

● *Speedstep* should be off.

● *PCI Performance Mode* should be on.

### Check the Bandwidth:

Next run the *Bandwidth Test Utility*.  FireBird can transfer data at very high rates but if the PC cannot keep up the system will not work.  This utility, in the *Start Menu* under *Active Silicon FireBird xxx - Utilities*, shows the maximum rate that FireBird can transfer data to the PC.  A value around 3400 Mbytes/sec is typical of a good PC.  A low or unstable value means that problems are likely to be seen.

```
C:\Windows\system32\cmd.exe - test.bandwidth.cmd.win64.exe

Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Users\dev>cd C:\Program Files\Active Silicon\FireBird CXP\Bin\Win64

C:\Program Files\Active Silicon\FireBird CXP\Bin\Win64>test.bandwidth.cmd.win64.
exe
Active Silicon FireBird Bandwidth Test v1.0.1.0.
Copyright 2012 Active Silicon.
Usage: test.bandwidth.cmd.win64.exe <-b BoardNumber(1)> <-w Width(2048)> <-h Hei
ght(2048)> <-n Number of iterations>

Press any key to exit ...

Testing board #1 with 2048 x 2048 bytes      ..........

Bandwidth Measured= 3422 MB/sec (width=2048 and height=2048)

Testing board #1 with 2048 x 2048 bytes      ..........

Bandwidth Measured= 3423 MB/sec (width=2048 and height=2048)

Testing board #1 with 2048 x 2048 bytes      .....
```

Bandwidth test results

### Low Bandwidth?

If the bandwidth test reports a low or unstable value, here is a list of things to check:

■ Check that a suitable PCI Express slot is in use (see *Hardware Installation* page).  Sometimes motherboard restrictions mean that a Gen 2 x16 slot works much better than a Gen 2 x8 slot, so try using a x16 slot.

■ Check the BIOS settings (see *Check the PC BIOS* opposite).

■ How old is the motherboard?  Chipsets more than three years old may show worse performance than current ones.
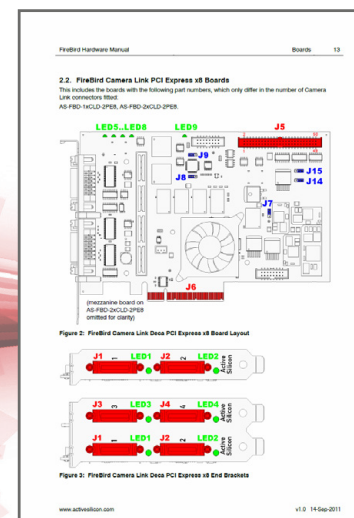
### Documentation:

The *Start Menu* under *Active Silicon FireBird <xx>* has this document, release notes, and the following key documents:

The *FireBird Hardware Manual* gives full details of all **connectors**, **LEDs** and jumpers on FireBird, **I/O support**, and PC requirements.

The *FireBird Programmer's Manual* is the first place for system developers and programmers to go.  It gives an overview of the options to configure a system, describes all the trigger modes in detail, and discusses system issues.

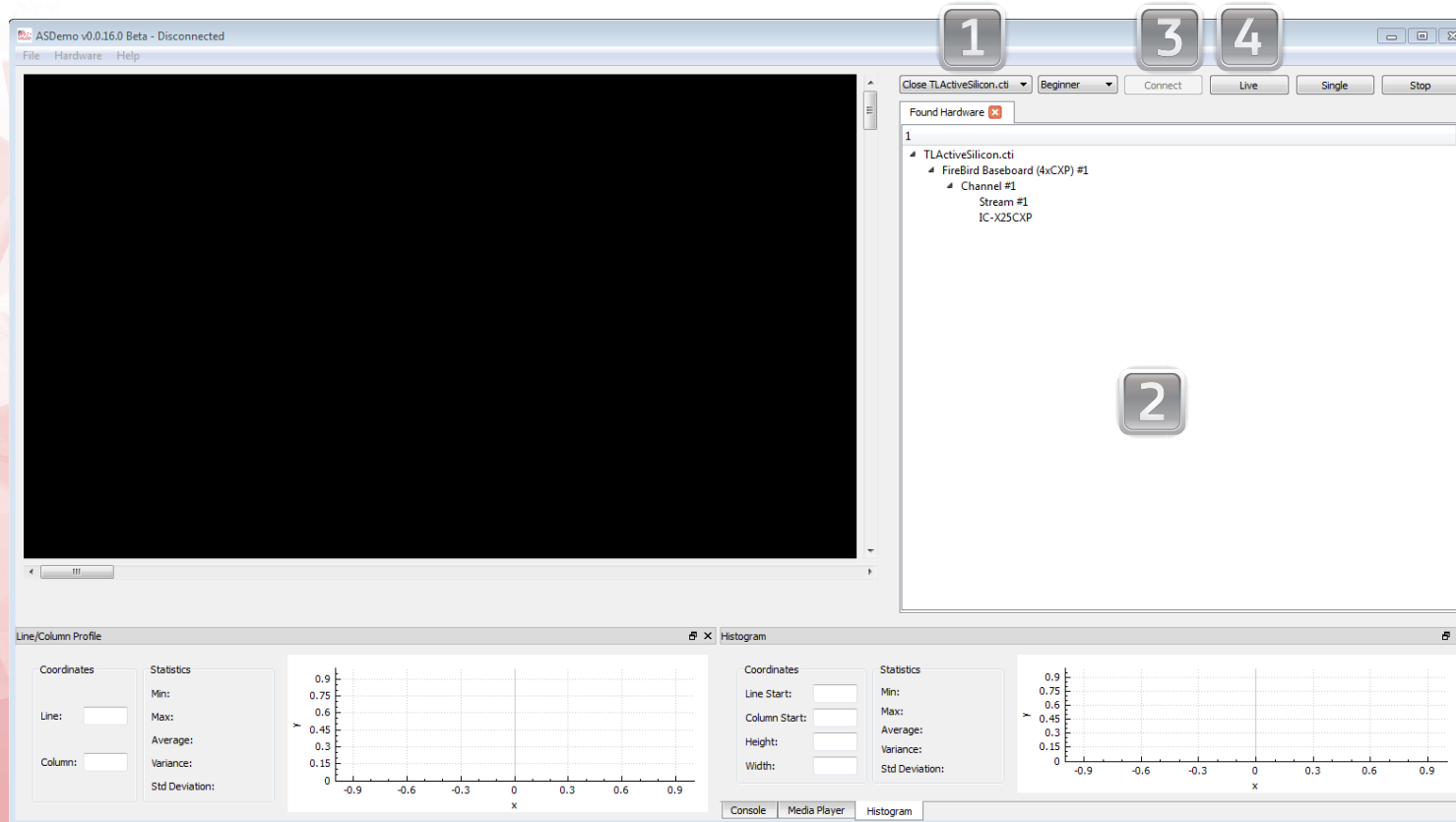For documentation on the API, see the SDK section later in this guide.

Hardware Manual example

Programmer's Manual example

This is a GenICam GenTL demo program that can be used with cameras supporting GenICam, such as CoaXPress ones.

Run the program from the *Start Menu* under *Active Silicon FireBird <xx> – ASDemo*. The use of GenICam means that no manual setup of the camera or frame grabber is needed to get a picture – simply connect and click *Live*.
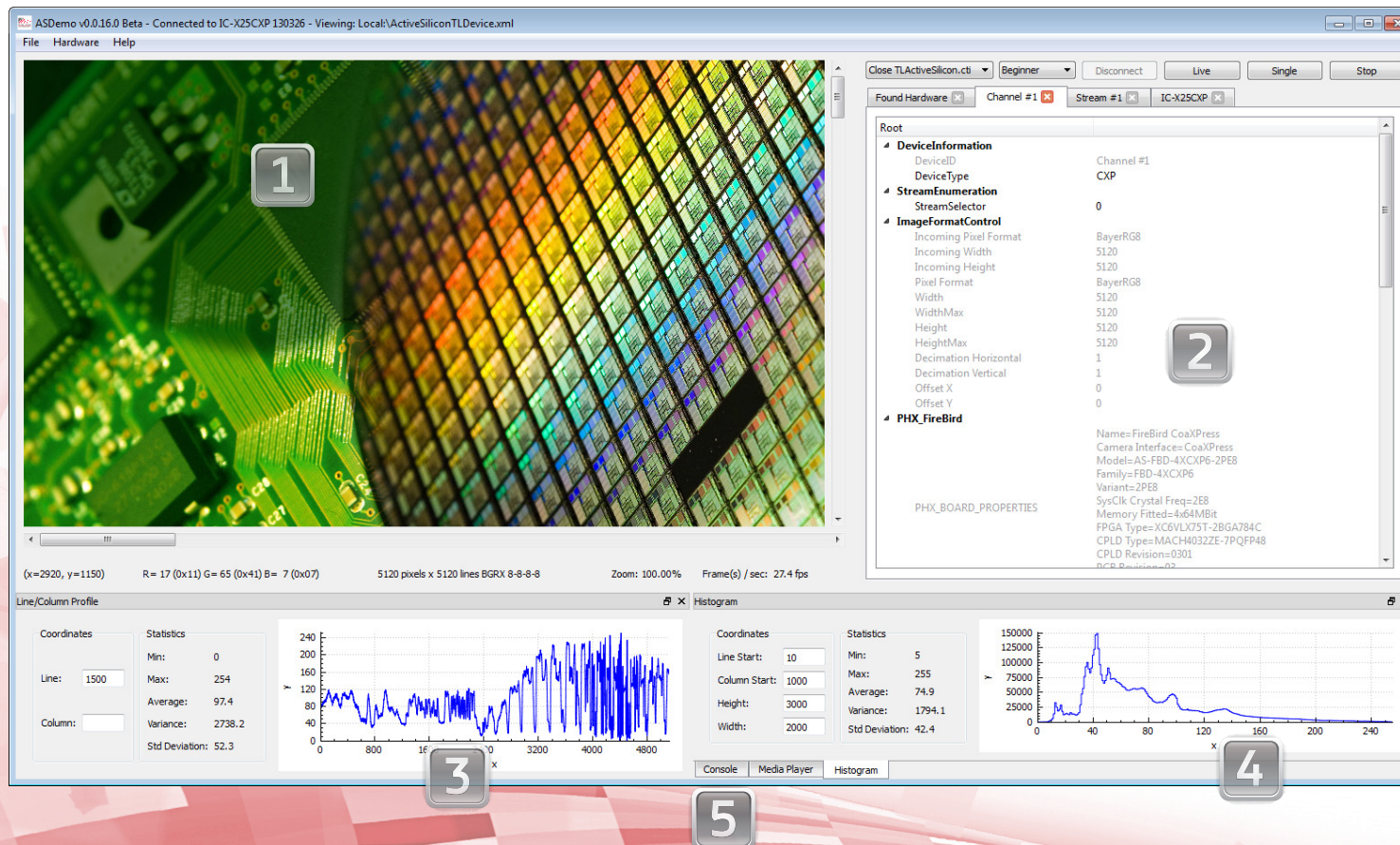


In common with standard GenICam programs, to get a live image:

1. Select *TLActiveSilicon.cti*. The program will then attempt to communicate with the camera and download the XML file from it.

2. The *Found Hardware* tab should show the frame grabber and camera as shown here. Click on *Stream#1*.

3. Click *Connect*.

4. Click *Live*.

Note:  The above refers to Windows.  For the location of utilities and documentation for other operating systems refer to the specific Quickstart Guide.

Note:  <xx> represents the camera interface, e.g. CXP or CL.

1. The image can be **zoomed** in or out using the scroll wheel on the mouse, or the "+" and "-" keys on the keyboard.

2. By double-clicking any of the devices in the *Found Hardware* tab, a new tab will open listing all the features of that device.

   Any feature that is not greyed out can be changed. Note that many features are greyed out while acquisition is in progress – first click *Stop* to change them.

   The FireBird features for pixel format, width and height are automatically set to match the camera. Therefore to change the values of these features, change them on the camera.

3. A live **line/column profile** can be displayed for the image, along with statistics on that line or column.

4. Similarly a **histogram** and statistics are displayed for the image, or by entering coordinates, for just part of the image.

5. The **console** shows details of any error messages.

# WHAT ELSE IS INSTALLED?

**Applications:**

**HSDemo:** There are various versions of this application pre-compiled for different cameras, which can be selected via the *Run HSDemo* launcher program in the *Start Menu* under *Active Silicon FireBird <xx>*. The application allows image display, high speed sequence capture, and supports various triggering modes. Source for this PHX API based application is available from Active Silicon.

**PhoenixCapture:** This is Active Silicon's original application to display images from cameras. For CoaXPress systems it is largely replaced by ASDemo, but the application is still useful for Camera Link and for some system debugging. The application is under *Start Menu* under *Active Silicon FireBird <xx> – Utilities*. The utility is best used in conjunction with PCF files (see below).

**GenTL Configuration Tool:** This allows various settings of Active Silicon's GenICam GenTL Producer to be controlled, including the ability to read an XML from disk rather than from the camera. The utility is in the *Start Menu* under *Active Silicon FireBird <xx> – Utilities*, and runs as Administrator.

**Bandwidth Test Utility:** See the *Where to go Next* page.

**Get System Information Utility:** This utility lists information about a system in a form that can be sent to Active Silicon technical support. The information is both displayed to the screen, and saved in file *as_sysinfo.txt* in *Public Documents \ Active Silicon*.

The *FireBird Programmer's Manual* is the first place for system developers and programmers to go. It gives an overview of the options to configure a system, describes all the trigger modes in detail, and discusses system issues.

**SDK:**

The various *API Manuals* describe the available SDK functions in detail. These are in the *Start Menu* under *Active Silicon SDK vXX.YY.ZZ – Documentation*. The main manuals have links under *Start Menu*; more are available via the *Open Documentation Directory* link.

**Example source code** and project files are in the *Start Menu* under *Active Silicon SDK vXX.YY.ZZ – Samples*.

**Miscellaneous:**

The **GenTL Producer** allows GenTL based GenICam applications to control the camera and FireBird. Third party applications described as '**GenTL Consumers'** should work with it, without needing any custom interface code. Note that some GenICam applications do not use GenTL, but rely on direct image transfer from GigE Vision cameras – these will not work with FireBird.

**PCF** setup files for many cameras are in *Public Documents \ Active Silicon \ PCFs* with a link from the *Start Menu*. These configure the FireBird board to match the camera. They can be used both with the *PhoenixCapture* application, and can be read into programs written using the PHX API.

Note: The above refers to Windows. For the location of utilities and documentation for other operating systems refer to the specific Quickstart Guide.

Note: <xx> represents the camera interface, e.g. CXP or CL.

**Windows 7 and 8.1**

- Windows 7: Open the Windows *Control Panel* and select *Programs and Features*.

- Windows 8.1: Right click the *Start Button* and select *Programs and Features*.

- Select the package you want to remove. e.g. *Active Silicon FireBird 64 bit vXX.YY.ZZ.BBBB*.

- Note that it is not necessary to remove previous SDKs before installing new ones. Multiple SDKs can be installed on the PC to allow developers to refer to both old and new SDKs.

- To remove the GenICam library remove package *GenICam vX.Y*.

- Note: XX.YY.ZZ.BBBB or X.Y.Z or X.Y represents the version number.

**Other Operating Systems**

See the specific Quickstart Guide supplied with the installation package.

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