

# Harrier USB SDK

## Software Development Kit

- SDK for the development of USB Video Class (UVC) applications for the Harrier and BlueBird product range
- Enables rapid system development and integration
- Working examples of USB/UVC applications
- NET API support enables SDK code to be called from C++/CLI, C# and Visual Basic

## FEATURES

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- Live capture and low-latency display of UVC video streams up to 1080p60.
- Simultaneous capture, display and recording of video data.
- Camera resolution/mode control over USB/UVC.
- Supports Active Silicon UVC compatible products e.g. BlueBird SDI Adapter, Harrier USB/HDMI Camera Interface Board.
- Hardware-accelerated video encoding (H.264) using NVIDIA or Intel hardware.
- Still image capture (JPEG/TIFF).
- Text and image overlay.
- Windows SDK based on Microsoft Media Foundation.
- Includes UVC application and virtual COM port driver.
- Windows and Linux supported.
- Source code available on request.



## OVERVIEW

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The **Harrier USB SDK** has been developed for use with USB Video Class (UVC) compatible [Harrier and BlueBird USB products](#). It provides a library of functions, classes and example applications that acquire UVC video/images from Active Silicon UVC compatible products, e.g. the [BlueBird SDI Adapter](#) and the [Harrier USB/HDMI Camera Interface Board](#). Active Silicon UVC compatible devices stream video from their input ports (e.g. 3GSDI/HD-VLC/LVDS) to their USB 3 output port. The **Harrier USB SDK** example Windows 10 application acquires video/images (over USB) from Active Silicon UVC compatible products and can also be used to change the camera video output mode, and other UVC properties, via the USB connection. Harrier USB products are UVC compliant and they will operate under Linux when a suitable UVC driver is installed.

## Harrier USB SDK

With Active Silicon UVC compatible devices, the Windows application software can use several standard APIs, including Microsoft Media Foundation or DirectShow. The **Harrier USB SDK** is based on Microsoft Media Foundation. It is a set of modules, classes and example source code designed to enable quick and easy development of UVC based applications that capture video/images from Active Silicon UVC compatible products. Microsoft Media Foundation enables the development of applications for using digital media on Windows 7 and later versions of the Windows OS. The SDK provides objects that acquire, encode and display video. The classes in the SDK can be used as-is in an application, or as an example to develop a custom application based on Media Foundation.

The SDK example of video encoding uses a Media Foundation Transform (MFT) which must be installed on the host machine. The default H.264 MFT available under Windows runs entirely in software and does not use any hardware acceleration. Hardware-accelerated MFTs are available from Intel or NVIDIA; both require the appropriate acceleration hardware to be available (e.g. an Intel CPU with QuickSync support, or an NVIDIA GPU with built-in NVENC support).

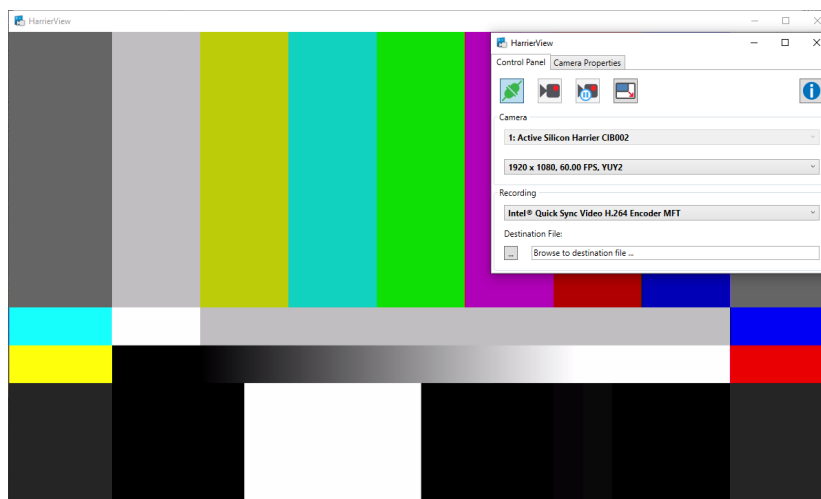
## C#, VB or C++/CLI support

The **Harrier USB SDK** for Windows contains a .NET wrapper that enables the SDK API to be called from .NET based languages (C#, Visual Basic [VB], C++/CLI). This enables developers to write code in C#, VB or C++/CLI to implement image acquisition, display and video recording functionality using the **Harrier USB SDK**. The HarrierView example video application has been written in C#.

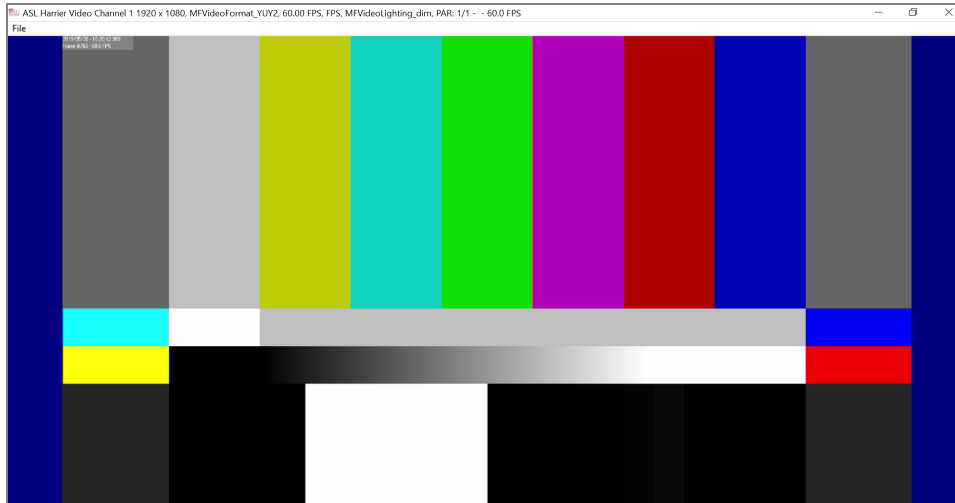
## Harrier Example Applications

The example applications included with the **Harrier USB SDK** show how the Active Silicon and Media foundation functions/classes can be used to create working Windows applications. Full source code for the applications is available from Active Silicon on request. There are two examples:

1. HarrierView: implements UVC video, H.264 encoding, video recording and camera control using UVC properties.
2. HarrierEx: implements UVC video, H.264 encoding, video recording, still image capture (JPEG/TIFF) and, Text and image overlay.



**Figure 1. Harrier USB SDK – HarrierView Example Application (showing 1920 x 1080 @ 60FPS test pattern from camera)**



**Figure 2. Harrier USB SDK - HarrierEx Example Application (showing 1920 x 1080 @ 60FPS test pattern from camera)**

### Harrier Windows Virtual COM Port

The Harrier Windows Virtual COM port driver is installed with the Harrier USB SDK on Windows 10/11. When a PC (with the driver installed) is connected to a Harrier USB/HDMI Camera Interface Board, the Harrier Windows Virtual COM Port Driver will start. The COM port will appear in Windows 10/11 and can be used to read and write VISCA data to the camera in the same way as a standard serial COM port. The COM port does not need to be set up with parameters such as baud rate, parity, etc. as the VISCA data is sent over the USB connection. Note: The Harrier USB/HDMI interface board must have the DIP switches set to enable USB communication; also the virtual COM port must be closed before disconnecting the USB camera. For Linux support please see the section below.

### Linux Support

As Harrier USB products are UVC compliant, they will operate under Linux when a suitable UVC driver is installed. For more information on working with video and UVC drivers please see the relevant documentation for your Linux distribution, for example:

<https://help.ubuntu.com/community/Webcam>

<http://www.ideasonboard.org/uvc/>

<https://www.kernel.org/doc/html/v4.13/media/v4l-drivers/uvccvideo.html>

Direct VISCA communication with the camera is possible using the Harrier USB Linux SDK C/C++ API. This simple API/library enables VISCA messages to be sent to and received from the camera over the same USB cable that is used for transporting the video data. The Linux USB SDK library and API example code is available from the Downloads tab on the Harrier USB SDK product web page.

The Harrier Linux USB SDK also provides a pre-compiled daemon (HarrierUSBDAEMON) that supports a text based virtual serial port interface for issuing VISCA commands to cameras via a serial console (such as minicom) and a binary based virtual serial port for issuing VISCA commands to cameras via standard Linux system calls. Harrier USB cameras can be addressed by serial number, system defined USB port path or by a user defined USB port label.

The SDK includes a custom uvccvideo kernel module that can improve the camera performance under certain conditions, and a udev script that disables USB3 Link Power Management (LPM) for Harrier USB Cameras (as this can be problematic on some platforms).



## ORDERING INFORMATION

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The **Harrier USB SDK** is available for free from the Active Silicon website. The latest versions for Windows, Linux or Linux with ARM support can be downloaded from the downloads tab on the [Harrier USB SDK product page](#).

### Active Silicon UVC Compatible Products

[BlueBird SDI Adapter](#) - AS-ADP-SDI-001-A

Harrier USB/HDMI Camera Interface Board - AS-CIB-USBHDMI-001-A

[Harrier USB/HDMI Camera Interface Board](#) - AS-CIB-USBHDMI-002-A

Harrier camera interface boards are also available as pre-assembled camera units with a range of autofocus-zoom block cameras. For available camera combinations with the Harrier USB/HDMI Camera Interface Board please see our [camera product page](#) on [www.activesilicon.com](http://www.activesilicon.com).



## CONTACT DETAILS

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