

QUICK START GUIDE

HARRIER HDMI CAMERA INTERFACE BOARD

Introduction

This guide is designed to get you up and running with the **Harrier HDMI Camera Interface Board** (AS-CIB-HDMI-001-A) and the Harrier USB/HDMI Evaluation Kit (AS-CIB-USBHDMI-001-EVAL-A). The interface board can be purchased as a pre-assembled unit with a range of cameras. Two examples are pictured below, Figure 1 shows the Harrier 10x AF-Zoom HDMI Camera (Tamron MP1010M) and Figure 2 the Harrier 36x AF-Zoom HDMI Camera.

This document should be read in conjunction with the Harrier HDMI datasheet and other documents available on [Active Silicon's website](https://www.activesilicon.com), (see Harrier HDMI Camera Interface Board - Downloads section): <https://www.activesilicon.com/products/harrier-hdmi-camera-interface-board/>



Figure 1. Harrier HDMI Interface Board mounted on a Tamron MP1010M camera (J1 – KEL cable not connected).



Figure 3. Reverse side of Harrier HDMI Camera Interface Board.



Figure 2. Harrier HDMI Interface Board mounted on Harrier 36x AF-Zoom Camera.

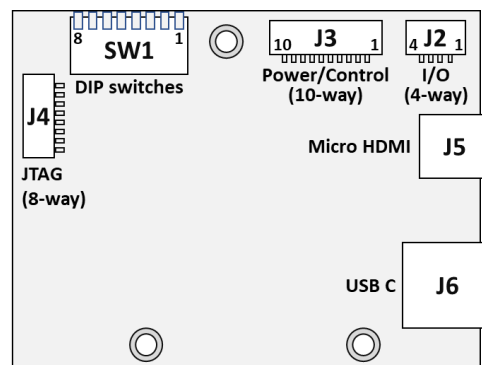


Figure 4. Block diagram showing position of connectors and DIP switches.

The Harrier HDMI Camera Interface Board can also be supplied in USB/HDMI or USB-only variants. A 3G-SDI/HD-SDI interface board is also available. For more details contact Active Silicon.

Evaluation Kit Contents

The Evaluation Kit (AS-CIB-USBHDMI-001-EVAL-A) contains all the parts needed to evaluate the Harrier HDMI Camera Interface Board (and the Harrier USB/HDMI board).

Note that the evaluation kit does not include a Camera Interface Board or camera, these need to be ordered separately.

Please check that you have all the parts listed below:

- Harrier Evaluation Board (Figure 5)
- 10-way cable (Figure 6)
- 4-way cable (Figure 6)
- White 8-way cable (Figure 6)
- Micro HDMI cable
- 30-way micro coax cable (KEL cable; Figure 7)
- USB Type-A to mini USB cable
- USB-C plug to USB-A socket adapter (not required for HDMI interface board evaluation)
- USB3 USB Type C SuperSpeed cable (not required for HDMI interface board evaluation)
- Multi-region 12V power supply (please fit the adapter suitable for your region)

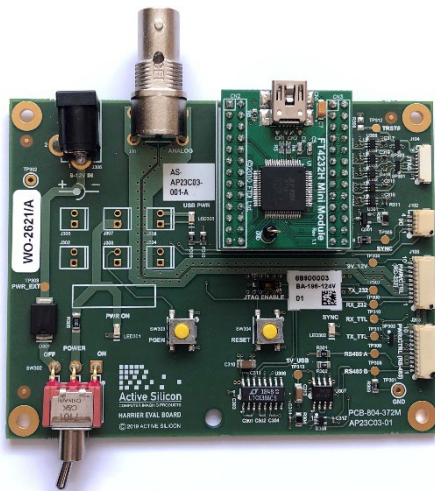


Figure 5. Harrier Evaluation Board



Figure 6. Harrier Evaluation Board cables



Figure 7. 30-way micro coax KEL cable

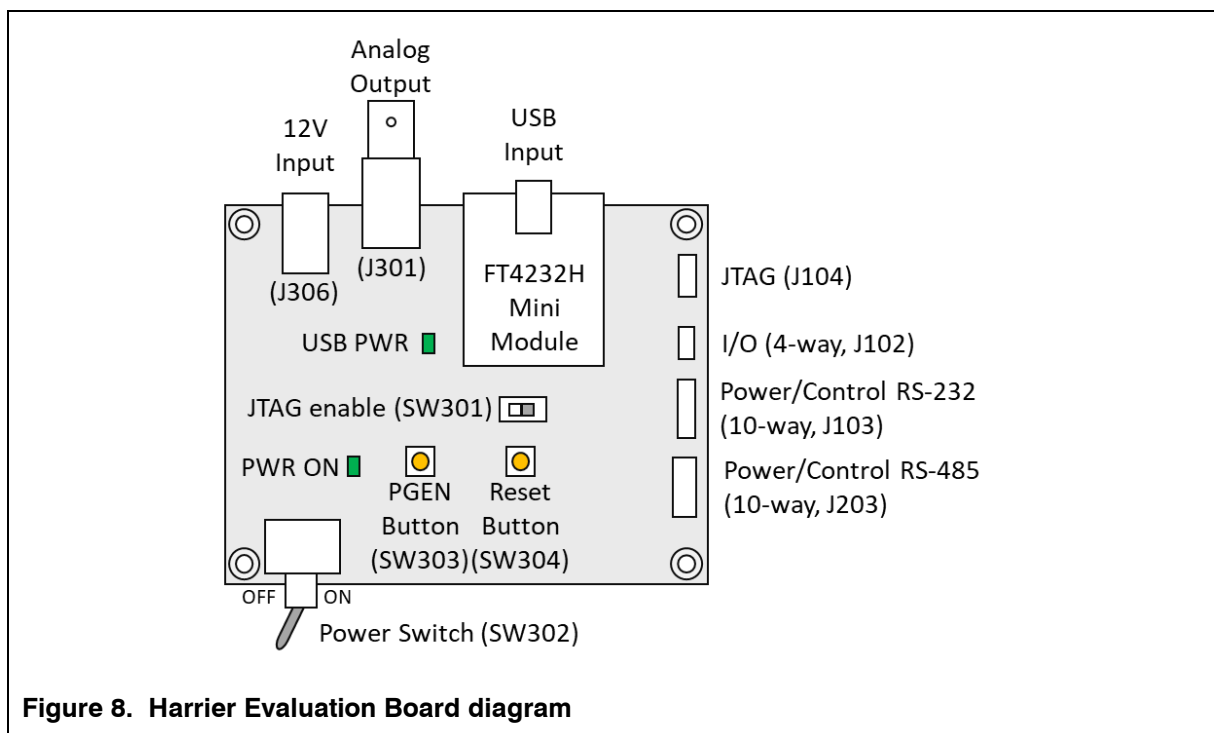
Tamron Camera Control Application

To evaluate the serial communications capability, you will need an application that can provide TTL serial communication. The [HarrierControl](#) command line software can be used for this, or if you have a Tamron camera you can use the [Tamron Camera Control Application](#). Both of these can be downloaded from www.activesilicon.com from the [Software](#) products page.

For information on how to use the Tamron application please see the section [Using the Tamron Camera Control Application](#) below.

Note: In its default build configuration, the Harrier HDMI Camera Interface Board only supports TTL communications.

Harrier Evaluation Board Overview



The Harrier Evaluation Board connects to the camera interface board using the supplied cable kit.

- JTAG (J104) - white 8-way cable (connects to J4; not required for normal use).
- I/O (J102) - black 4-way cable (connects to J2).
- Power/control, RS-232 (J103) - red 10-way cable (connects to J3).

The board is powered by the 12V power supply via a barrel connector (J306). This supply is also used as a power supply for the camera and is connected to the camera via the Power Switch (SW302). When the Power Switch (and camera power supply) is switched ON the PWR ON LED will illuminate.

For more information please see the [Harrier Evaluation Board datasheet](#) on the [Active Silicon website](#) (see Harrier HDMI Camera Interface Board - Downloads section).

Setting the Camera Video Mode

Changing the video output mode of the Harrier HDMI Camera Interface Board can be done using an external controller over the serial interfaces. For more information on setting this up see the section [Setting the Camera Control Interface \(DIP Switches\)](#) above.

Most block cameras always start up in the same video mode that was set when the camera was powered down. Immediately after power-up completes, the camera interface board can change the camera video mode to a user chosen mode; this ensures that on application start-up the camera is always in a known video mode. This is done by setting DIP switches 1 to 4 on the Harrier HDMI Camera Interface Board as shown below. VISCA commands can be used at any time to change the camera video mode (requires camera reset). Please check that your camera can support the selected mode.

SW1-4	SW1-3	SW1-2	SW1-1	VIDEO FORMAT	MODE	HDMI
OFF	OFF	OFF	OFF	Default Camera Mode ⁽¹⁾	0	✓
OFF	OFF	OFF	ON	1080p60 ⁽²⁾	1	✓
OFF	OFF	ON	OFF	1080p59.94 ⁽²⁾	2	✓
OFF	OFF	ON	ON	1080p50 ⁽²⁾	3	✓
OFF	ON	OFF	OFF	1080p30	4	✓
OFF	ON	OFF	ON	1080p29	5	✓
OFF	ON	ON	OFF	1080p25	6	✓
OFF	ON	ON	ON	1080i60	7	✓
ON	OFF	OFF	OFF	1080i59.94	8	✓
ON	OFF	OFF	ON	1080i50	9	✓
ON	OFF	ON	OFF	720p60	10	✓
ON	OFF	ON	ON	720p59.94	11	✓
ON	ON	OFF	OFF	720p50	12	✓
ON	ON	OFF	ON	720p30	13	✓
ON	ON	ON	OFF	720p29	14	✓
ON	ON	ON	ON	720p25	15	✓

Table 1. DIP switch settings for selecting camera video output mode

Notes table1:

- 1) "Default camera mode": on power-up, the camera will start in the video format/mode that was set/being used when it was last powered down. The video mode can then be changed using a VISCA serial command, followed by a camera reset (there is also the camera hard reset in the extended VISCA commands which will also serve this purpose).
- 2) Due to the high data bandwidth required, these video modes (above 1080p30) require the camera to be set to dual LVDS mode. Other modes (1080p30 and below) require the camera to be set to single LVDS mode. When using VISCA commands to change camera video mode the LVDS mode must also be set correctly, otherwise there will be no video output from the camera. See your camera documentation for more information on VISCA commands for setting LVDS mode.
- 3) The DIP switches to select the video format are only read on power-up. Therefore, to change mode using the DIP switches, power down the camera, set the switches and then power up the camera. DIP switches will only be effective for the operating modes supported by the camera currently in use.

Setting up the System

The Harrier HDMI Camera Interface Board needs to be connected to a camera and power supply. To get the board running please follow the instructions below:

1. Connect the camera to the camera interface board connector (J1) using the 30-way coax cable (connector type: KEL USL00-30L). If you have purchased a pre-assembled camera module, this cable will already be connected.
2. Connect the camera interface board I/O connector (J2) to the Harrier Evaluation board I/O connector (J102) using the 4-way cable.
3. Connect the camera interface board PWR/CTRL connector (J3) to the Harrier Evaluation Board PWR/CTRL connector J103 using the 10-way cable.
4. For **HDMI camera output**, use the micro HDMI cable to connect the camera interface board micro HDMI out connector (J5) to a monitor that can display the video modes that you intend to use (maximum 1080p60).
5. For **serial communications** with the camera, connect the mini USB connector to the USB connector on the Harrier Evaluation Board and connect the USB A plug to a PC. The USB PWR LED should light up indicating a live connection to the PC. The serial interfaces will appear as COM ports on the PC and be accessible to PC software. These COM ports can be tested using the [HarrierControl](#) command line software; if you have a Tamron camera, the [Tamron Camera Control Application](#) can be used (see section [Using the Tamron Camera Control Application](#) below). The Tamron application can be used with other cameras, but as the VISCA commands vary between cameras the controls may not be compatible. Both of these applications can be downloaded from the downloads section of the appropriate product page under the [Products -> Software](#) section of www.activesilicon.com.
6. Set/check the DIP switch settings, e.g. SW1(1-4) OFF (no video mode change on power up).
7. Connect the power supply barrel connector to the Harrier Evaluation Board power input connector (J306).
8. Set the Harrier Evaluation Board power switch (SW302) to OFF (left viewed from above).

9. Plug in the power supply and switch ON the Harrier Evaluation Board power switch (SW302). The PWR ON should light up.
10. The camera will make audible mechanical noises as it goes through its power up sequence and after a short time the video output will be working.
Note: if the DIP switches have been used to set the camera mode, and the mode last used was different to the DIP switch setting, it will take a few seconds for the camera interface board to detect this, change the camera mode and reset the camera.
11. If the HDMI cable is connected you will see the camera video on the monitor (if the monitor supports the mode set on the camera).

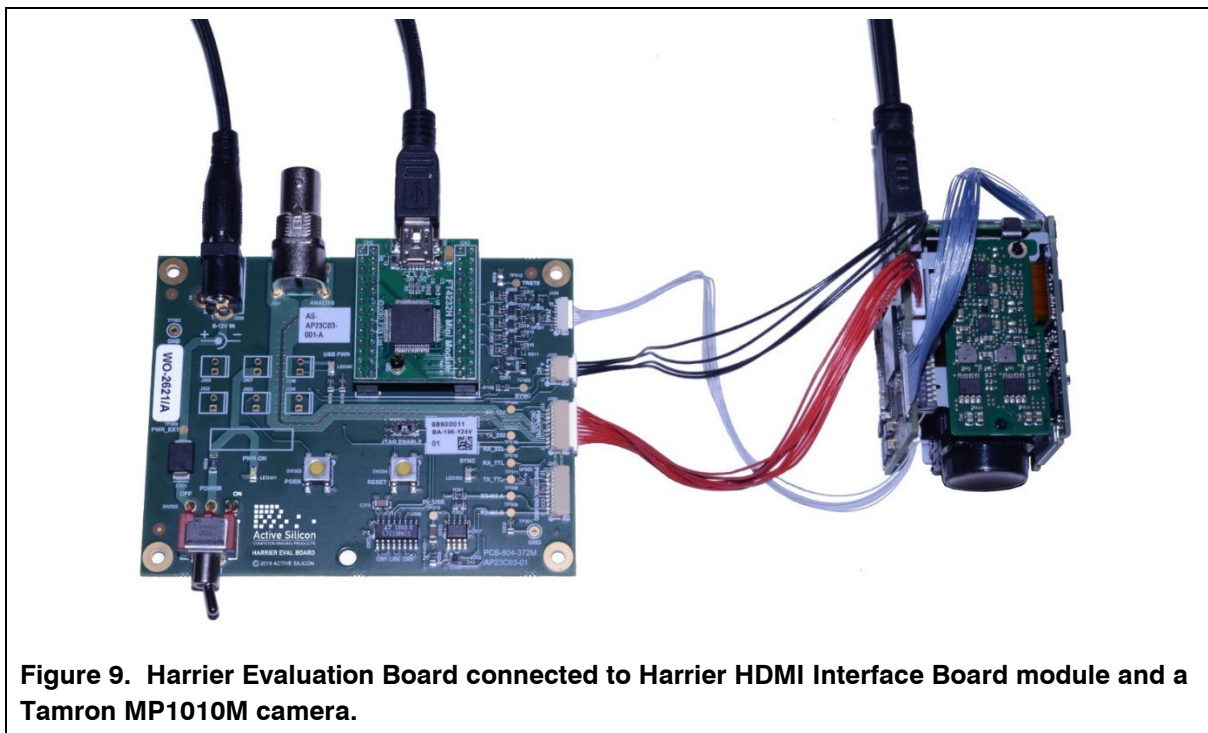


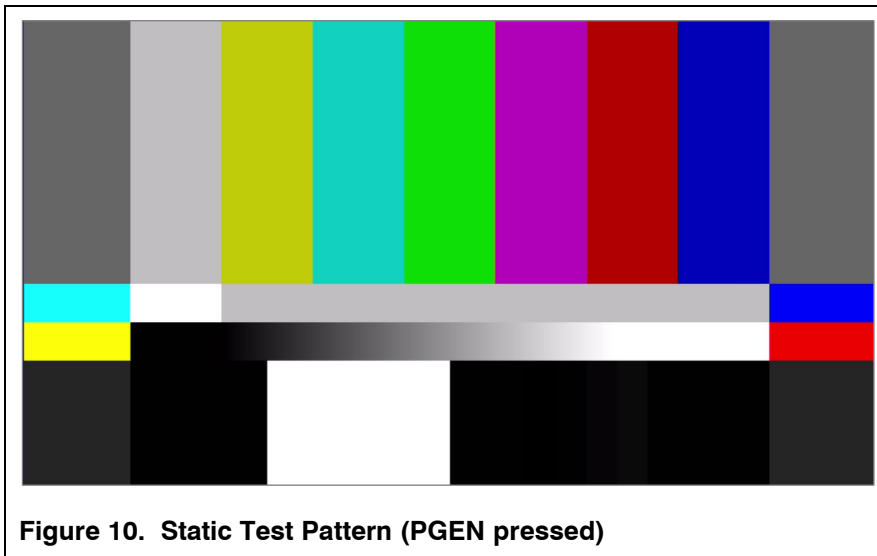
Figure 9. Harrier Evaluation Board connected to Harrier HDMI Interface Board module and a Tamron MP1010M camera.

Test Pattern

With no video input connected, a simple blue screen is displayed. You may see this when the camera resets.

To display a 1080p60 static test pattern (Figure 10), press the PGEN button on the Harrier Evaluation Board

Note: this will only work if the 4-way cable is connected between the Harrier Evaluation Board (J102) and the camera interface board (J2).



Analog Output

The BNC connector on the Harrier Evaluation Board will supply the analog video output of the camera interface board. Note: this signal is generated by the camera and sent over the KEL micro-coax cable, but not all cameras will support this feature, please check your camera documentation. This output is enabled by setting the camera into PAL/NTSC output mode using the appropriate VISCA command and (usually) a camera reset. When this mode is set there is usually no digital video output from the camera (and the HDMI video interface will not work).

Reset Button

Pressing this button on the Harrier Evaluation Board causes the camera interface board and camera to reset. Some features require a camera Reset to activate them (e.g. change of video mode).

Note: this button only works if the 4-way cable is connected between the Harrier Evaluation Board (J102) and the camera interface board (J2).

Using the Tamron Camera Control Application

Go to the Active Silicon website, download the Tamron Camera Control Application for your camera from the [Software](#) page.

Unzip the executable and move it to a suitable folder on your PC.

The Tamron Camera Control Application is only supported on Windows. If Windows 7 is used, then it is recommended that the latest drivers from FTDI are installed. These are available here:

<https://www.ftdichip.com/Drivers/D2XX.htm>

Please check that the Harrier HDMI Camera Interface Board DIP switches are set for the interface standard that you intend to use and check that you have connected the 10-way cable to the correct connector on the Harrier Evaluation Board.

For more information please see the sections [Setting The Camera Control Interface \(DIP switches\)](#) and [Setting Up The System](#).

Run the Tamron Camera Control Application executable (see Figure 11 below).

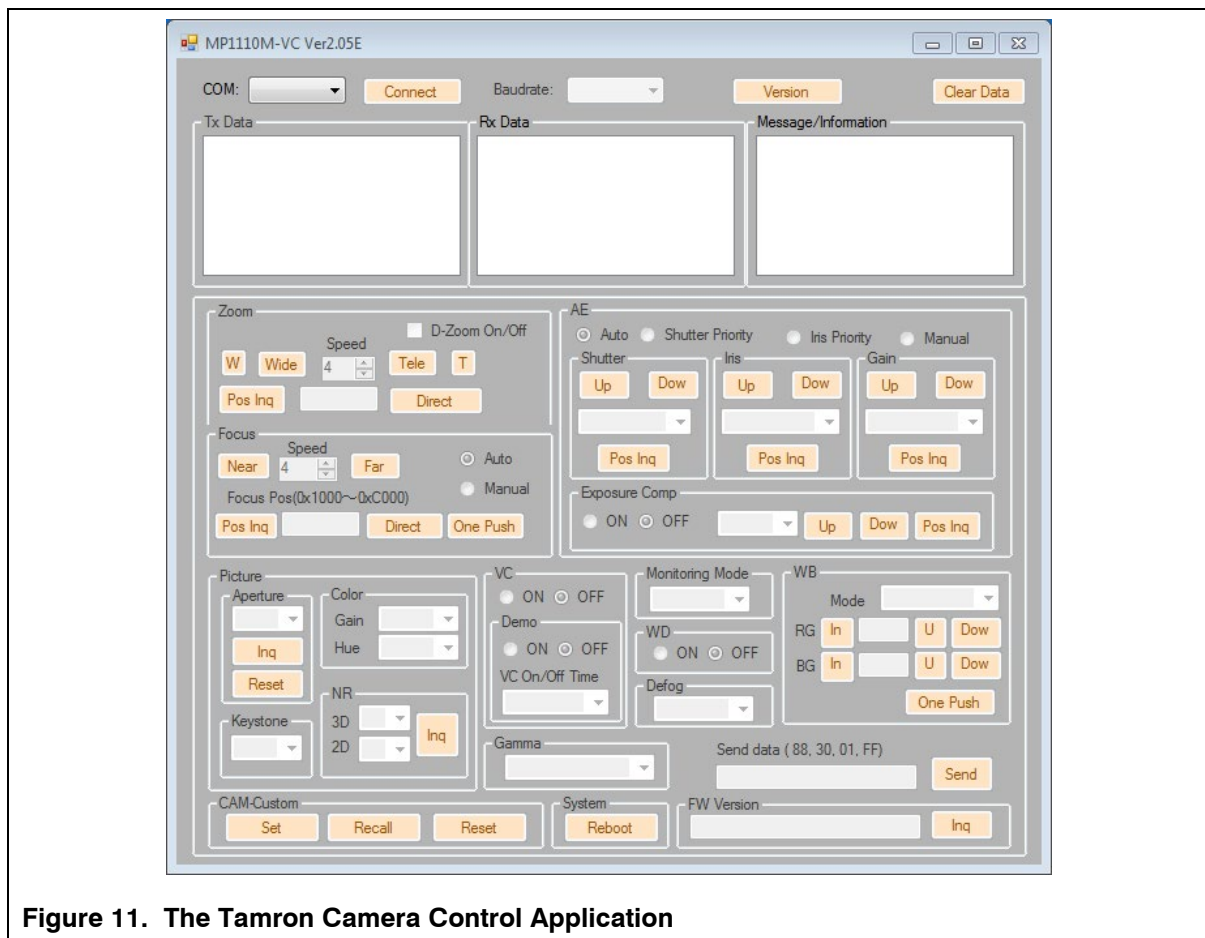


Figure 11. The Tamron Camera Control Application

When the Harrier Evaluation Board is plugged in using the mini USB cable, the Windows operating system will see three virtual COM ports; these ports are automatically assigned (incrementing) numbers by Windows. To successfully use the Tamron application, it is necessary to identify the COM port numbers which Windows has assigned to the board and use the correct one.

Open Device Manager and look at the COM & LPT ports. You can identify the three port numbers by comparing reported port numbers with the board connected and the board disconnected.

- The lowest port number added is the RS-232 interface.
- The second added port number is the RS-485 interface.
- The highest port number added is the TTL interface.

In the Tamron Application, use the **COM:** drop-down box at the top left of the application window to select the COM port that supports the interface standard you want to use.

Then click on the **Connect** button.

Click on the **Inq** button on the bottom right hand side of the window. You should see the application send a VISCA command enquiry and the camera sending a response in the TxData and RxData dialog boxes.

Technical Support

In case of any issues, please contact Active Silicon Technical Support on the telephone numbers below or by email to techsupport@activesilicon.com.



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