



ArduCam USB3 Camera Shield User Guide

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ArduCam USB3 Camera Shield User Guide



1 Introduction

This user guide describes the detail operation of ArduCAM USB3 camera shield. The latest device driver, SDK library and examples can be downloaded from the https://github.com/ArduCAM/ArduCAM_USB_Camera_Shield.

2 Hardware Installation



There are two camera interface provided on the USB3 camera shield, but only one camera interface can be used at a time.

2.1 8-bit Camera Interface

The primary camera interface is used for camera breakout board with 30pin ribbon cable. The pin definition is shown in Table 1. Although the camera breakout board might has more than 8bit data bus, only the upper 8bit connected to the USB camera shield through this FPC connector.



Table 1 8-bit Camera Interface Pin Definition
(Connector Part Number: Hirose FH28D-30S-0.5SH(05))

Pin No.	PIN NAME	TYPE	DESCRIPTION
1	GND	Ground	Power ground
2	Reserved	NC	
3	Reserved	NC	
4	VSYNC	Input	Active High: Frame Valid; indicates active frame
5	HREF	Input	Active High: Line/Data Valid; indicates active pixels
6	DOUT11	Input	Camera Pixel Data Input 11 (MSB)
7	DOUT10	Input	Camera Pixel Data Input 10

8	DOUT9	Input	Camera Pixel Data Input 9
9	DOUT8	Input	Camera Pixel Data Input 8
10	DOUT7	Input	Camera Pixel Data Input 7
11	DOUT6	Input	Camera Pixel Data Input 6
12	DOUT5	Input	Camera Pixel Data Input 5
13	GND	Ground	Power ground
14	DOUT4	Input	Camera Pixel Data Input 4 (LSB)
15	DOUT3	Input	Camera Pixel Data Input 3 (Unconnected)
16	DOUT2	Input	Camera Pixel Data Input 2 (Unconnected)
17	DOUT1	Input	Camera Pixel Data Input 1 (Unconnected)
18	DOUT0	Input	Camera Pixel Data Input 0 (Unconnected)
19	Reserved	NC	
20	PCLK	Input	Pixel Clock output from Camera
21	SCL	Output	Two-Wire Serial Interface Clock

22	SDATA	Bi-directional	Two-Wire Serial Interface Data I/O
23	RST	Output	Sensor reset signal, active low
24	GND	Ground	Power ground
25	GND	Ground	Power ground
26	STANDBY	Output	Standby-mode enable pin (active HIGH)
27~30	VCC	POWER	3.3v Power supply

2.2 16-bit Camera Interface

The secondary camera interface is used for MIPI camera, stereo-camera or customized camera adapter boards which support up to 16bit data bus. The pin definition is shown in Table 2.



Table 2 16-bit Camera Interface Pin Definition (Connector Part Number: Harwin M50-4302045)

Pin No.	PIN NAME	TYPE	Pin No.	PIN NAME	TYPE
1	VCC3.3	POWER	2	VCC3.3	POWER

3	GND	Ground	4	GND	Ground
5	SDATA	Bi-directional	6	SCL	Input
7	Data10	Input	8	Data12	Input
9	Data11	Input	10	Data13	Input
11	Data8	Input	12	Data6	Input
13	Data3	Input	14	Data0	Input
15	RST	Output	16	Data4	Input
17	Data7	Input	18	Data9	Input
19	Reserved	NC	20	STANDBY	Output
21	Reserved	NC	22	Reserved	NC
23	Data14	Input	24	HREF	Input
25	Reserved	NC	26	VSYNC	Input
27	Reserved	NC	28	GND	Ground
29	PCLK	Input	30	GND	Ground

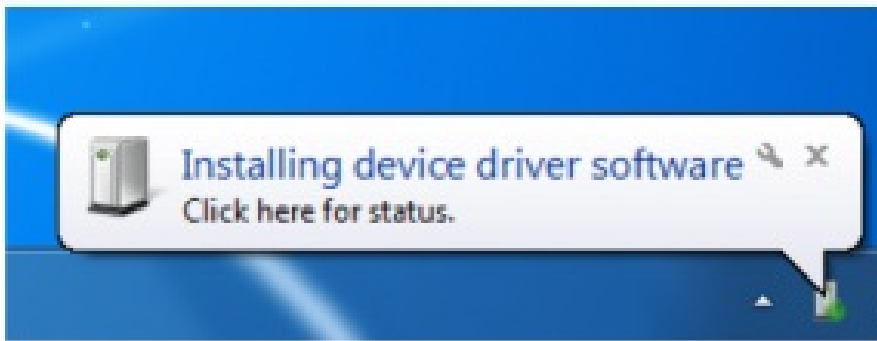
31	Data1	Input	32	Data5	Input
33	Reserved	NC	34	Data15	Input
35	Data2	Input	36	Reserved	NC
37	Reserved	NC	38	Reserved	NC
39	Reserved	NC	40	USB_RST	Input

3 Device Driver Installation

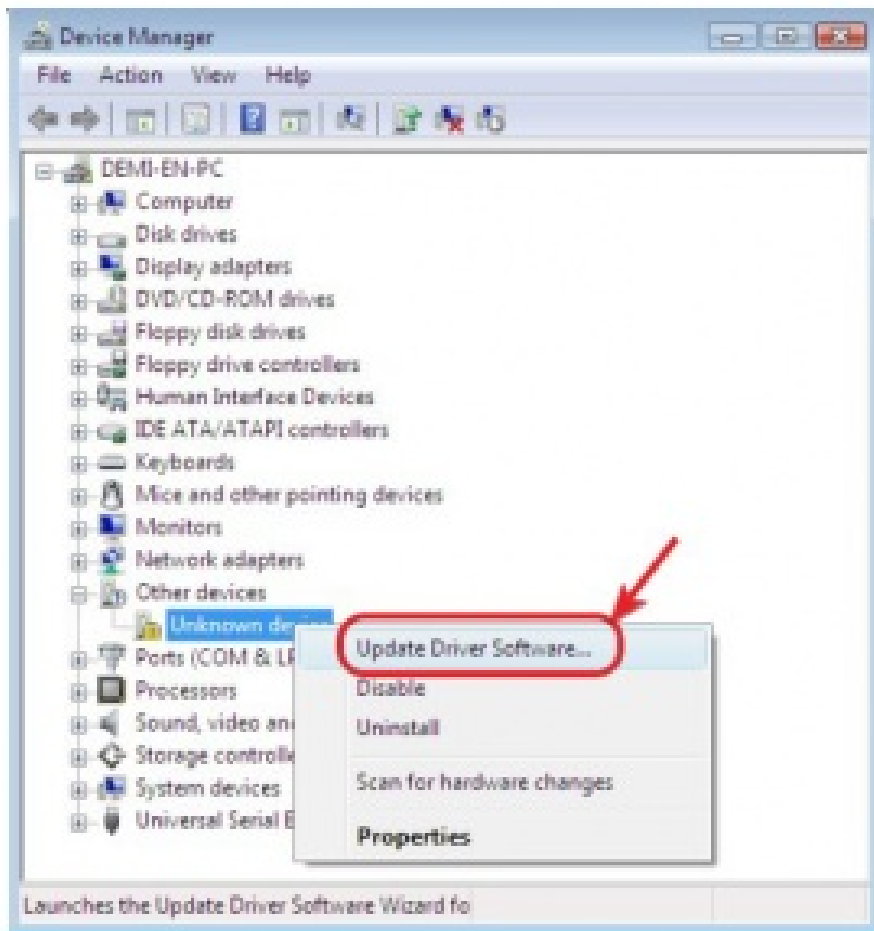
Please download the device driver from github. The Windows device driver is located in Drivers folder like WinXP, Win7 or Win10. In each driver folder there are x64 and x86 folders for 64bit and 32bit system respectively. When install the driver on Windows, you might need to disable the Windows driver signature by following the two video below:

<https://youtu.be/gOTkrFp8oM4>

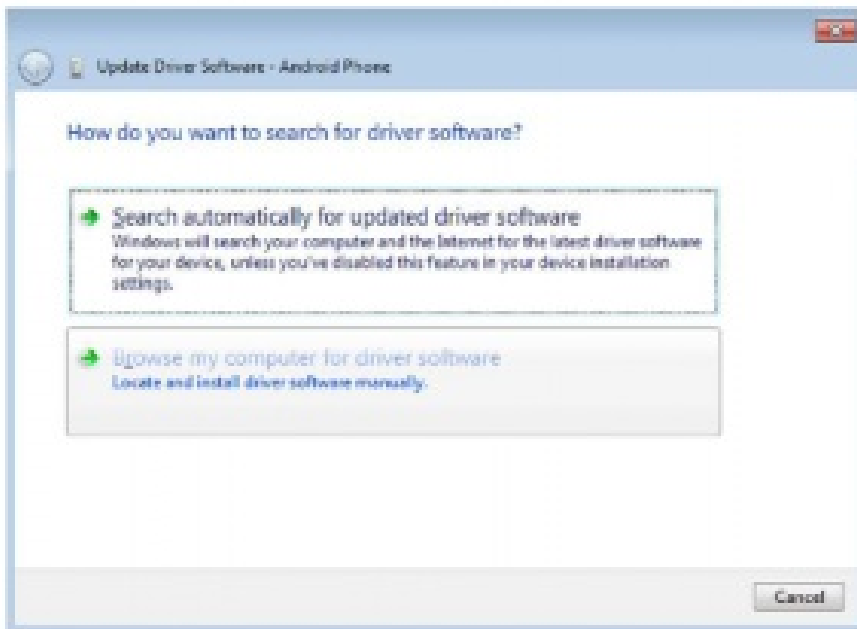
Plug in the USB cable to the camera and the host PC USB port, there is notification from the lower right of the task bar. The auto installation of the driver will fail, so we have to install the USB camera driver manually.



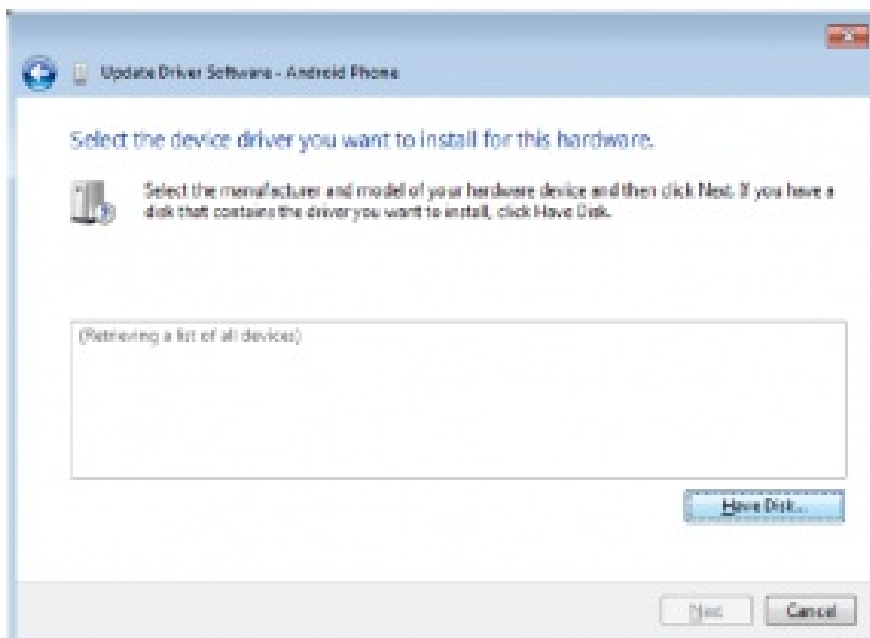
Go to Start->Settings->Control-Panel->Device Manager, right click the unknown device and select "Update Driver Software".



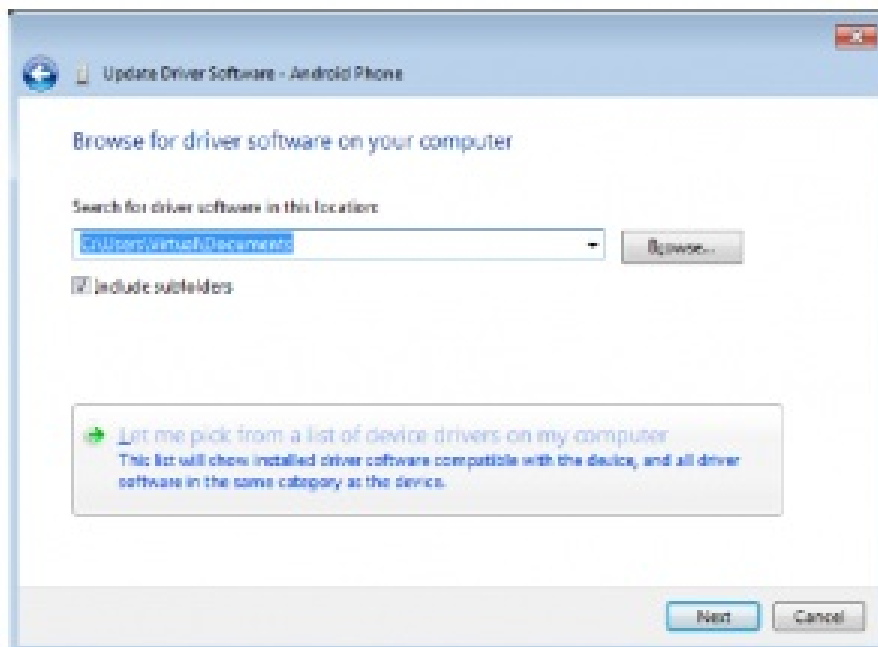
Select the "Browse my compute for driver software"



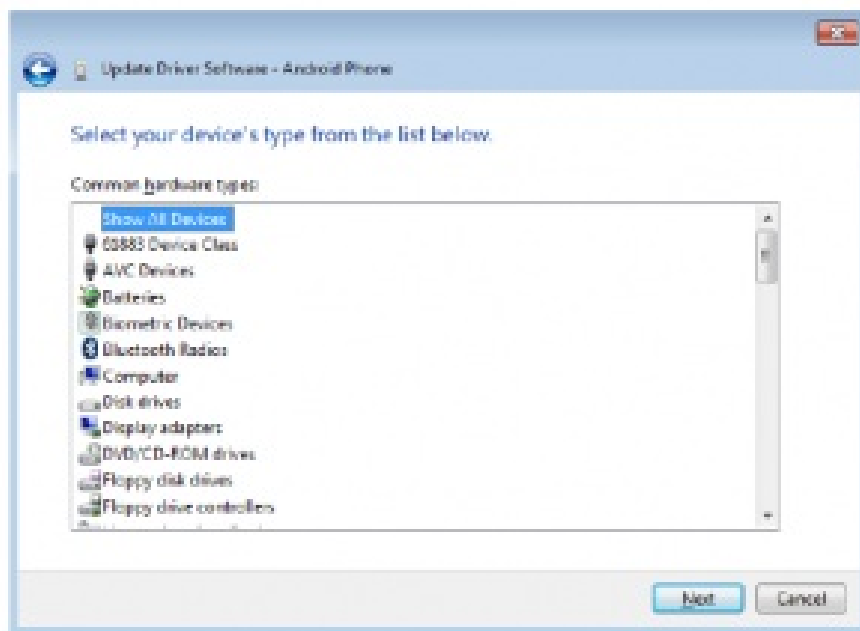
Select "Let me pick from a list of device drivers on my computer".



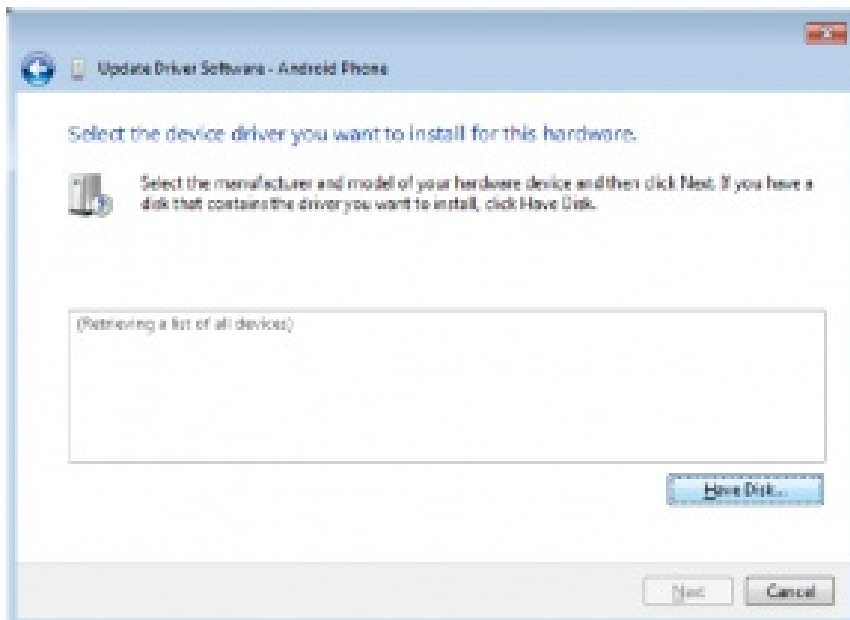
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Select "Show All Devices".

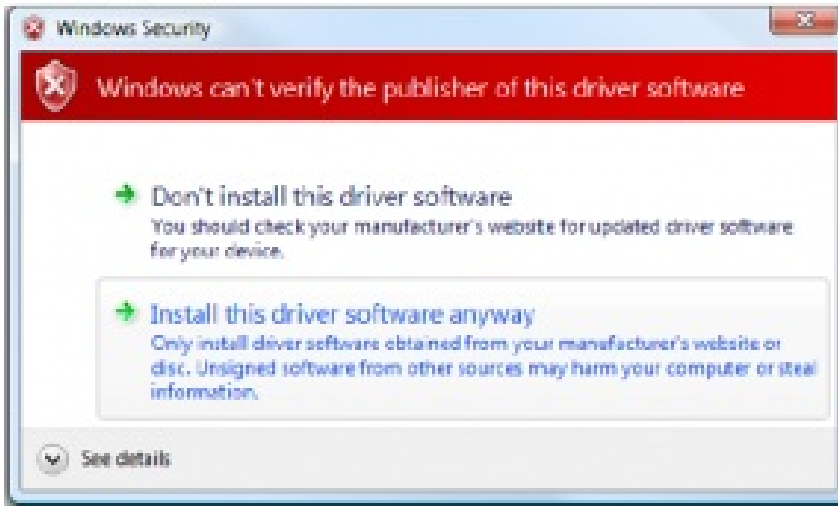


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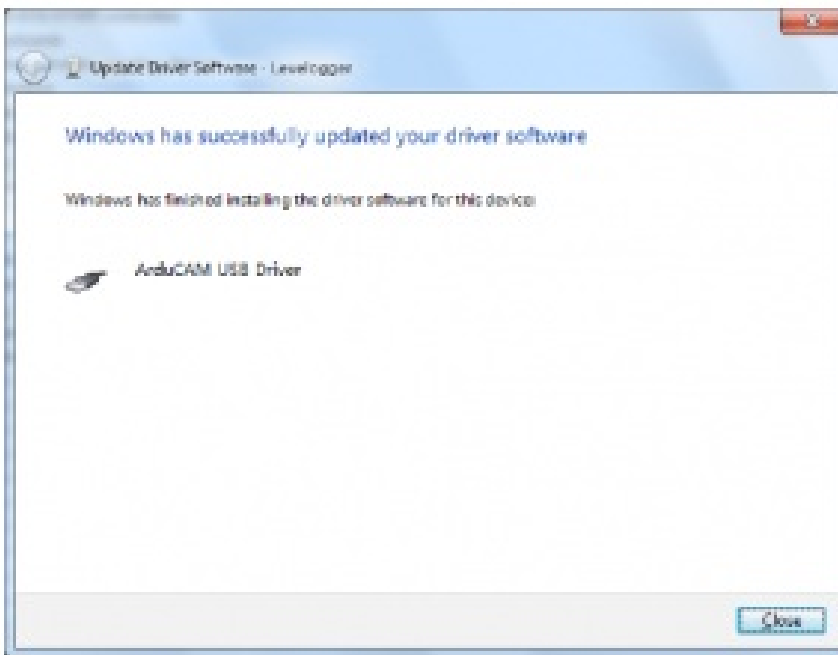


Confirm the installation of the driver by pressing “Yes”.

Confirm the installation again by pressing “Install”.



You will successfully install the driver like this.

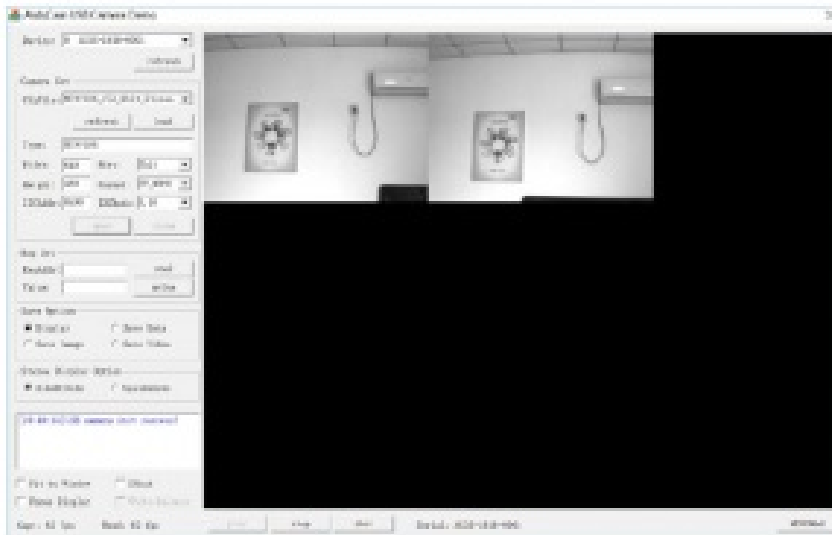


4 Demo Code

The demo code is provided in source code form to help user to understand the operation the ArduCAM USB camera and SDK library. It is created with Microsoft Visual Studio 2013 and

based on MFC frame work.

The Windows demo code is located in ../Winodws/USBTest folder and the release executable software is located in ../Winodws/USBTest/USBTest.exe.



4.1 Scan Cameras

Click the scan button, the drop down list will show all supported cameras with serial number,

4.2 Load the Camera Settings

There are several preset of the camera settings in the Config folder, select one of the corresponding camera setting from the drop list and click load to load the setting. The camera type, width, height, bits, format, I2CAddr, I2CMode will be loaded with the correct values.

4.3 Open the Camera

Click Open to open the camera selected from the camera drop list.

4.4 Play the Video

Click the Play to capture and display the video in real-time.

4.5 Stop the Video

Click the Stop button to stop the video capture and display

4.6 Take a Snapshot

Click the Shot to take BMP image to files.

4.7 Sensor Register Read/Write

This is very useful to access the sensor register in order to adjust the sensor settings on the fly. For example you want to manually change the exposure settings you can input the exposure register address and value then click write, you can video how the brightness changes from the video.

4.8 RAW Mode Selection

There are four combination of the RAW format R-G, G-R, B-G, G-B. It is predefined for tested camera, you can also changes the mode match your target sensor RAW display order

4.9 Camera Control

4.9.1 Fit to Window

To fit the captured image to the GUI windows size. If this is unchecked, user can use mouse scroll wheel to zoom in and out the real-time video, or drag the mouse cursor to move the video position.

4.9.2 Force Display

Force display is useful to debug the problem by force displaying the wrong video data which is mismatch with the camera preset values.

4.9.3 IRCut

It can be used to manual control extra motorized IRCUT filter for both daylight and night vision.

4.9.4 Frame Rate Information

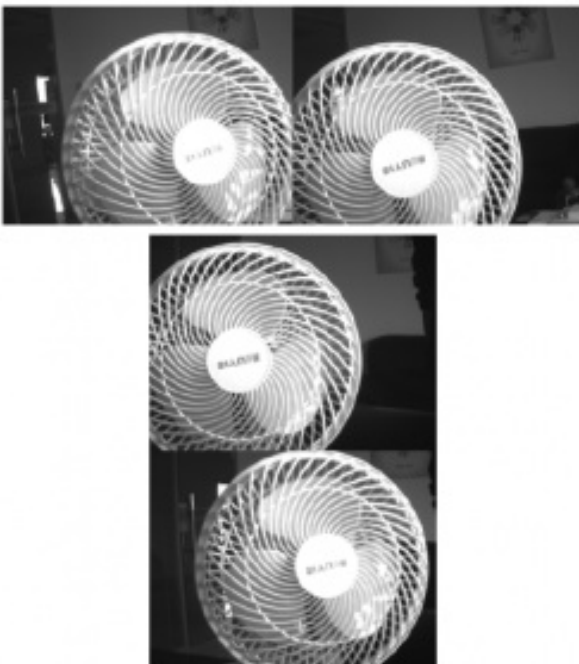
The frame rate information show the capture frame rate and GUI display frame rate. These two values might be mismatched, due to the performance of the demo GUI software and computer hardware.

4.10 Image Save Options

There are several options for saving image files and format. The Display option doesn't save any file just real-time display the video from the camera. The Save Data option is used to save the continuous images in the same format as the camera output like RAW, RGB, YUV or JPEG. The Save Image option is used to save the BMP images. The Save Video options is used to save the AVI format video. Except the Display option, when checking other options, the video is not updated on the display region.


4.11 Stereo Display Options

This options are only available when using stereo camera adapter board. The SideBySide option displays the video in left and right order. The UpsideDown option displays the video up and down order.







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	<p>ArduCam USB3 Camera Shield [pdf] User Guide USB3 Camera Shield</p>
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References

-  [Simplifying embedded vision for all. - Arducam](#)
-  [GitHub - ArduCAM/ArduCAM_USB_Camera_Shield: This is the repository for ArduCAM USB Camera Shield](#)
-  [How To Disable Driver Signature Enforcement in Windows 10 - YouTube](#)
-  [- YouTube](#)