



ArduCAM USB Camera Shield

User Guide

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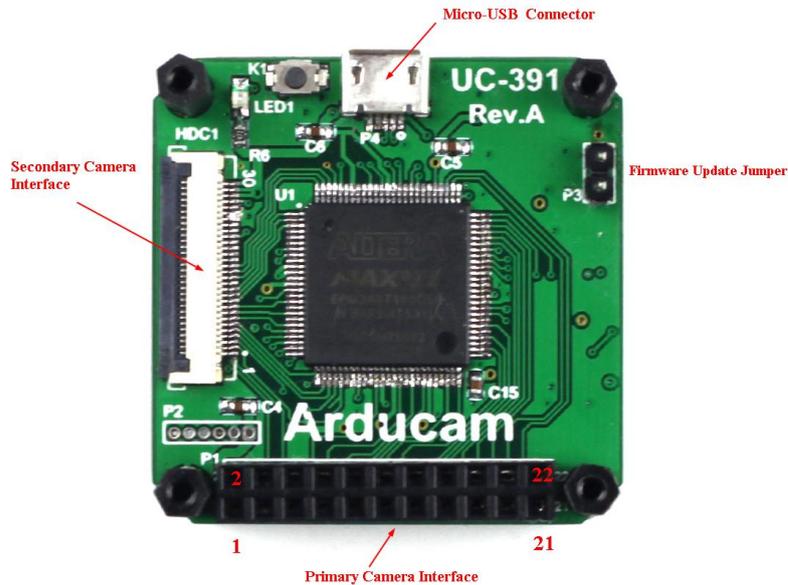
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1 Introduction

This user guide describes the detail operation of ArduCAM USB camera. 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 different camera interface provided on the USB camera shield, but only one camera interface can be used at a time.

2.1 Primary Camera Interface

The primary camera interface is used for 18-22 pin camera breakout board, and should align the pin 1 of the camera breakout board to the USB camera shield camera connector pin 1.

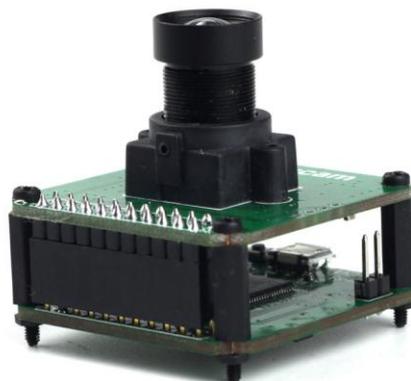


Table 1 P1 Connector Pin Definition

Pin No.	PIN NAME	TYPE	DESCRIPTION
1	VCC	POWER	3.3v Power supply
2	GND	Ground	Power ground
3	SCL	Input	Two-Wire Serial Interface Clock
4	SDA(SDATA)	Bi-directional	Two-Wire Serial Interface Data I/O
5	VS(VSYNC)	Input	Active High: Frame Valid; indicates active frame
6	HS(HREF)	Input	Active High: Line/Data Valid; indicates active pixels
7	PCLK	Input	Pixel Clock output from sensor
8	XCLK	Output	Master Clock into Sensor
9	D7	Input	Pixel Data Output 7 (MSB)
10	D6	Input	Pixel Data Output 6
11	D5	Input	Pixel Data Output 5
12	D4	Input	Pixel Data Output 4
13	D3	Input	Pixel Data Output 3
14	D2	Input	Pixel Data Output 2
15	D1	Input	Pixel Data Output 1
16	D0	Input	Pixel Data Output 0(LSB)
17		NC	
18		NC	
19		NC	
20		NC	
21		NC	
22	Trigger(EXP)	Output	External trigger output

2.2 Secondary Camera Interface

The secondary camera interface is used for camera breakout board with 30pin ribbon cable.



Table 2 HDC1 Connector Pin Definition

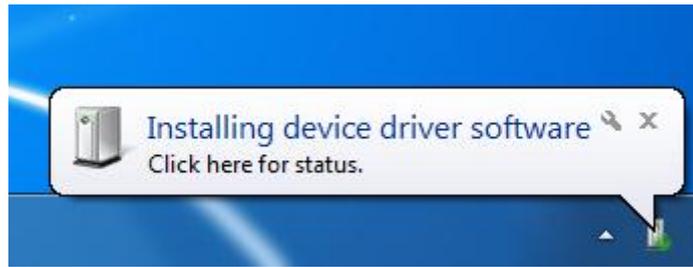
Pin No.	PIN NAME	TYPE	DESCRIPTION
1	GND	Ground	Power ground
2	FLASH	Input	Flash output control
3	Trigger	Output	Exposure synchronization input
4	VSYNC	Input	Active High: Frame Valid; indicates active frame
5	HREF	Input	Active High: Line/Data Valid; indicates active pixels
6	DOUT11	Input	Pixel Data Output 11 (MSB)
7	DOUT10	Input	Pixel Data Output 10
8	DOUT9	Input	Pixel Data Output 9
9	DOUT8	Input	Pixel Data Output 8
10	DOUT7	Input	Pixel Data Output 7
11	DOUT6	Input	Pixel Data Output 6
12	DOUT5	Input	Pixel Data Output 5
13	GND	Ground	Power ground
14	DOUT4	Input	Pixel Data Output 4
15	DOUT3	Input	Pixel Data Output 3
16	DOUT2	Input	Pixel Data Output 2
17	DOUT1	Input	Pixel Data Output 1
18	DOUT0	Input	Pixel Data Output 0(LSB)
19	XCLK	Output	Master Clock into Sensor
20	PCLK	Input	Pixel Clock output from sensor
21	SCL	Input	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

The firmware update jumper should be left open when normal operation.

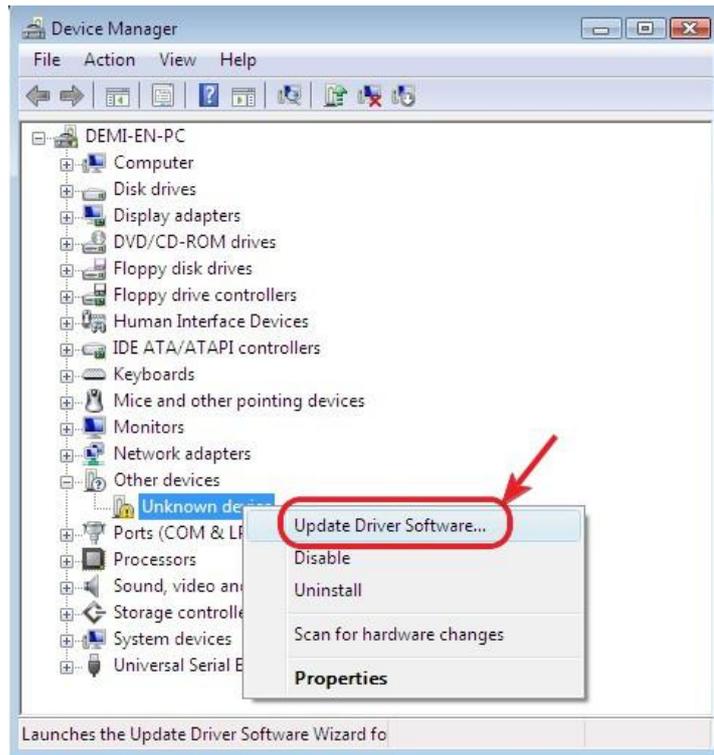
3 Device Driver Installation

Please download the device driver from [github](https://github.com). The Windows device driver is located in Drivers folder, Windows 10 operating system can use the same driver as Win7 or Win8. In each driver folder there are x64 and x86 folders for 64bit and 32bit system respectively.

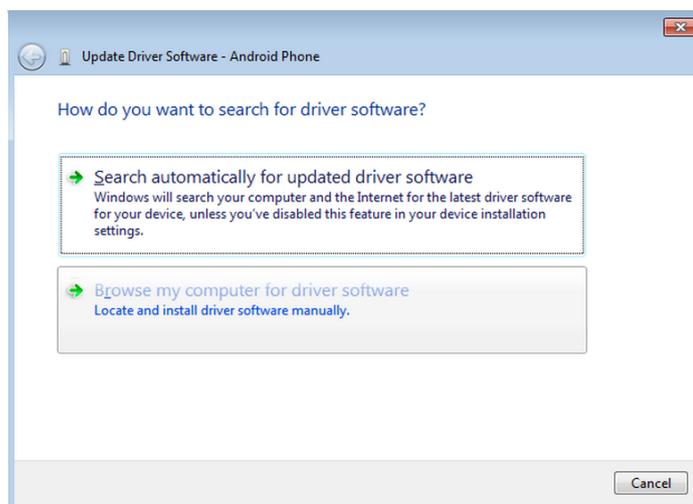
Plug in the USB cable to the camera and the host PC USB port, there is notification from the lower right of the task bar. The auto installation of the driver will fail, so we have to install the USB camera driver manually.



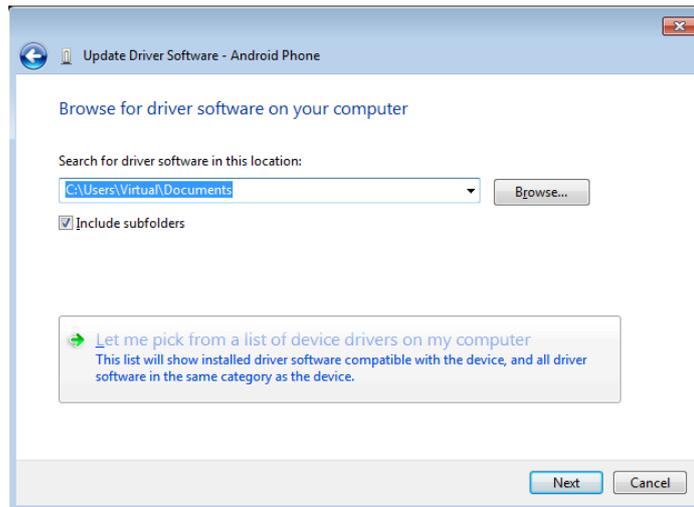
Go to Start->Settings->Control-Panel->[Device Manager](#), right click the unknown device and select "Update Driver Software".



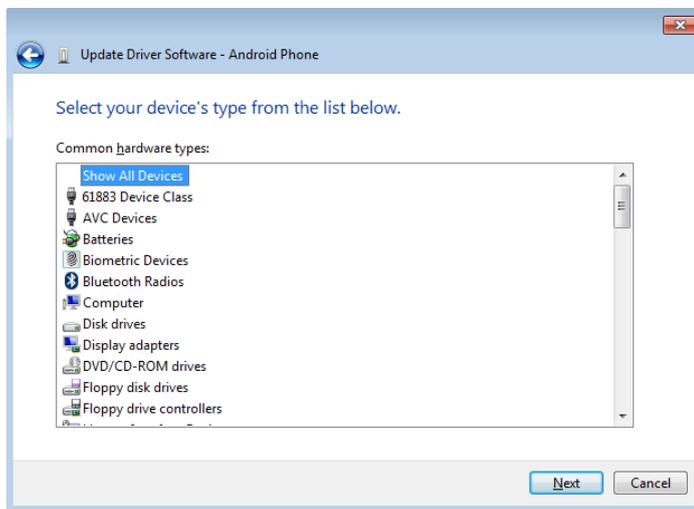
Select the "Browse my compute for driver software"



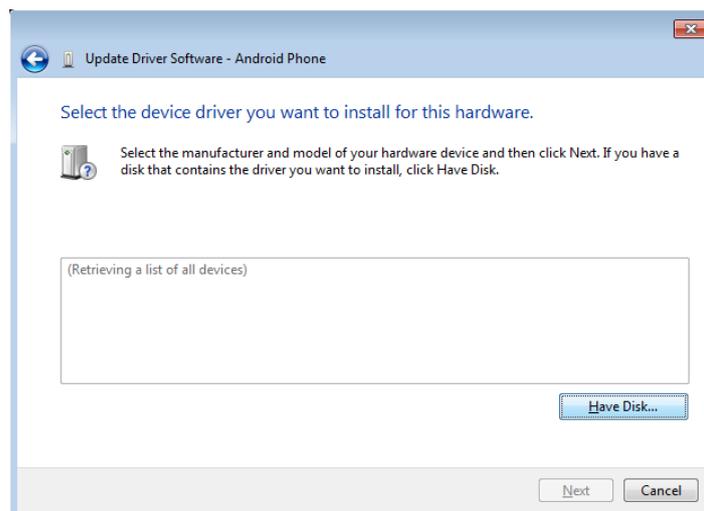
Select "Let me pick from a list of device drivers on my computer".



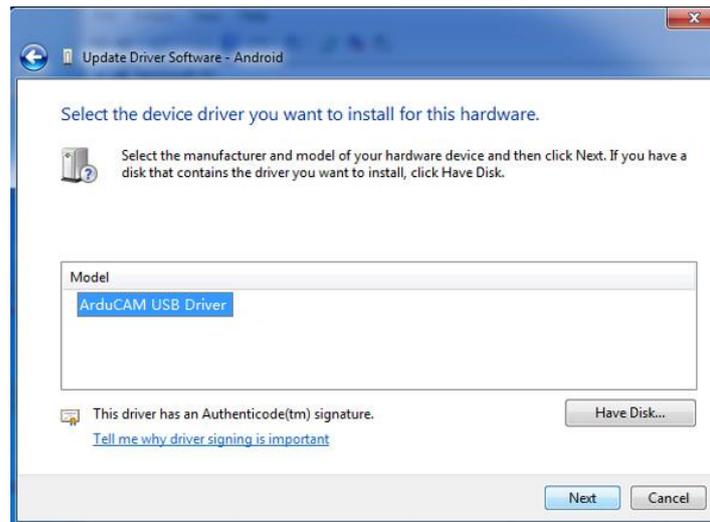
Select "Show All Devices".



Press the "Have Disk" button.

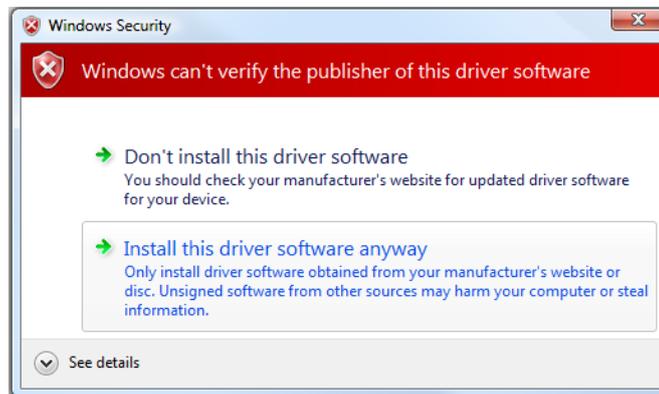


Enter the path to the ArduCAM USB driver, where you save the downloaded file from github.

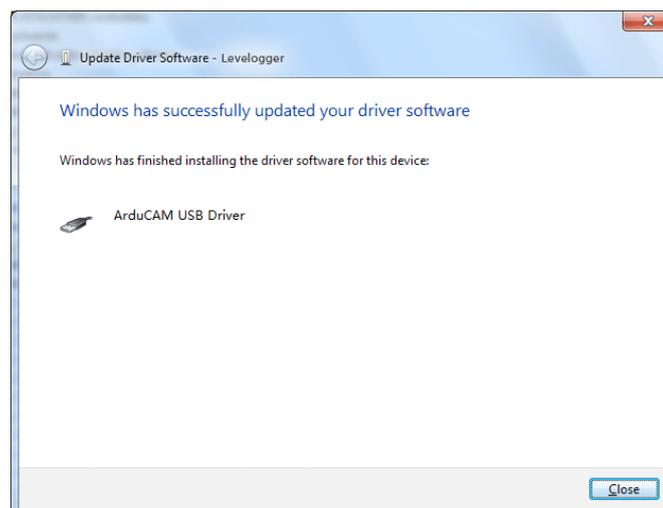


Confirm the installation of the driver by pressing "Yes".

Confirm the installation again by pressing "Install".



You will successfully install the driver like this.

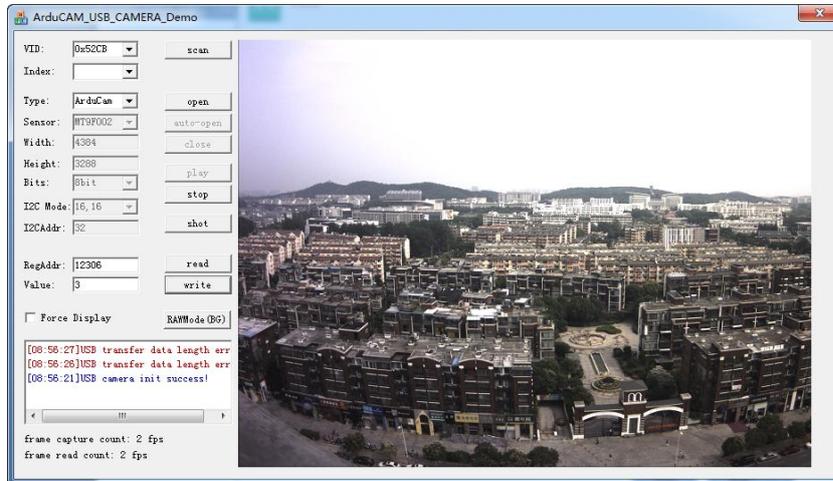


4 Demo Code

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 2008 and

based on MFC frame work .

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



4.1 Camera Settings

This USB demo software can work with different cameras provided by ArduCAM. Basically the different camera settings is predefined by the *Sensor Type* selected by the user. User also can override these settings after select a certain *Sensor Type*. All the following parameters are in decimal.

The *Width* and *Height* is to define the image size to be captured and displayed, they should exactly match the resolution output by the image sensor.

The *Bits* is the sensor output data bits , now ArduCAM shield only supports 8bits mode.

The *I2C Mode* select different sensor register read/write mode according to different sensor type. 8,8 means one byte address phase and one byte data phase; 8,16 means one byte address phase and two bytes data phase; and so on.

The *I2CAddr* is the image sensor I2C 8bit slave address, it is in decimal. For example MT9V034 sensor I2C slave address is 0x90, so we have to use 144 for it in decimal.

4.2 Open the Camera

There are two ways to open the camera.

Auto-open is useful when there is only one ArduCAM USB camera connected.

Scan then open is used when more than one ArduCAM USB camera connected. You have to scan how many cameras are on the USB bus, and select the correct one to open.

4.3 Play the Video

Click the *Play* to capture and display the video in realtime.

4.4 Stop the Video

Click the *Stop* button to stop the video capture and display.

4.5 Take a Snapshot

Click the *Snapshot* to take both BMP and RAW image to files.

4.6 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.

4.7 RAW Mode Selection

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