



Arducam USB2 Camera Shield Data Sheet

Rev 2.0, July 2018

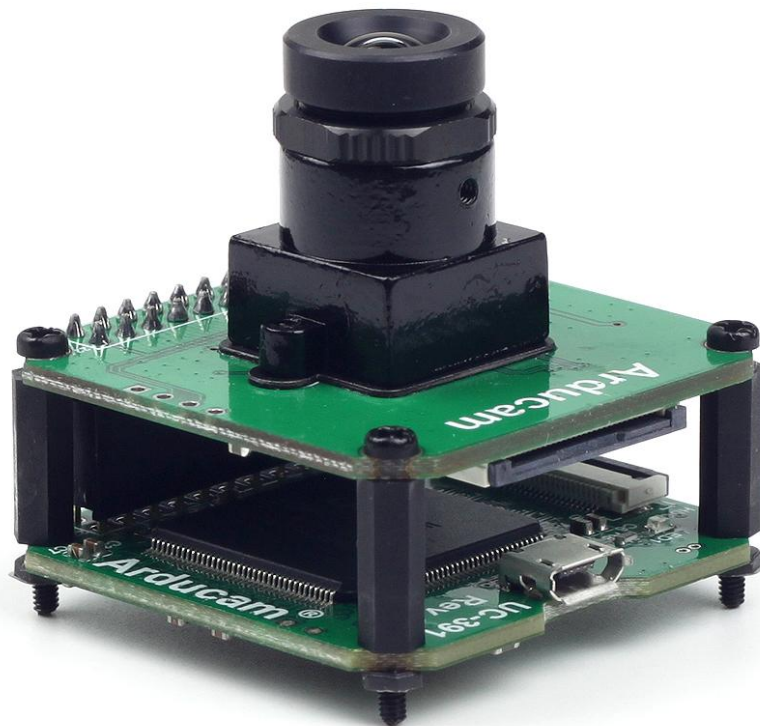


Table of Contents

1	Introduction	2
2	Application	3
3	Features	3
4	Key Specifications	3
5	Pin Definition	4
5.1	Primary Camera Interface	4
5.2	Secondary Camera Interface	5
6	Mechanical Dimension	7
7	Order Information	7

1 Introduction

Arducam series USB camera shield is a general purpose USB camera control board for PC and embedded signal board computer. It hides the complex nature of the camera and provides the plug and play camera control interface as well as the ready to use SDK library and demo software source code. The Arducam supports variety camera modules from 0.3MP to 14MP or even higher.

Arducam USB2 camera shield is the second generation USB2.0 camera shields, it offers the improved performance and enhanced functions than the old USB2.0 camera shield. The highlight of the new USB2.0 camera shield is that it has onboard 8MByte hardware frame buffer, and overcome the bandwidth and dropping frames issue when using the software frame buffer scheme. In addition, with onboard frame buffer it supports synchronized multi-camera system taking images at the same time. With the given camera configuration files, user can switch between different cameras without any effort. It is the ideal solution for camera evaluation/testing, robot/drone, IoT, machine vision and scientific applications.

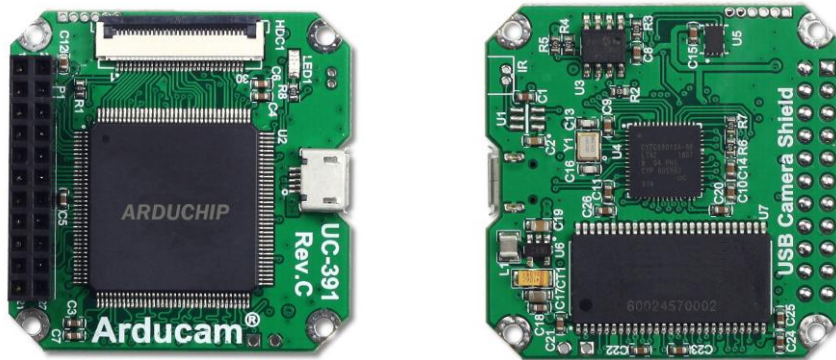


Figure 1 Arducam USB2 Camera Shield

2 Application

- IoT cameras
- Robot cameras
- Wildlife cameras
- Machine vision
- Scientific cameras

3 Features

- Support any parallel image sensors
- Support 8/10/12 bit pixel color depth
- Build-in IRCUT control
- Need extra MIPI to parallel adapter board for supporting MIPI interface sensors
- Support x86, ARM 32/64bit hardware platforms
- Support Windows, Linux OS
- Fully customizable and can be ported to other hardware platform and software OS
- Provide free binary SDK library and demo software source code, please visit [github.org/Arducam](https://github.com/Arducam)
- Fully customizable and can be ported to other hardware platforms and software OS like Odroid, Beaglebone Black, Nvidia JETSON TK/TX boards.

Table 1 Featured Camera Modules Supported

Resolution	Frame Rate	Camera Module	Sensor Vendor
0.3MP	60fps	MT9V022/MT9V034	Aptina
0.3MP	30fps	OV7670/OV7675	Omnivision
0.3MP	60fps	OV7725/OV7740	Omnivision
1.3MP	25fps	AR0134/AR0135	Aptina
1.3MP	15fps	MT9M001	Aptina
2MP	15fps	OV2640	Omnivision
5MP	15fps	OV5640/OV5642	Omnivision
9MP	4fps	MT9N001	Aptina
10MP	3fps	MT9J001/MT9J003	Aptina
14MP	2fps	MT9F002	Aptina

4 Key Specifications

- Bandwidth:480Mbps USB2.0
- I/O Voltage Standard: 3.3V
- Connector: Micro-USB2.0
- Onboard Frame Buffer 8MBytes
- Size: 40 x 40 mm
- Weight: 20g
- Power Consumption: 5V/300mA
- Operation Temperature: -10°C ~+55°C

5 Pin Definition

Figure 2 shows the connectors of the USB2 camera shield. There are one Micro-USB2.0 connector which can be connected to USB2.0 host controller, and one connector for motorized IR-Cut filter for both daylight and night vision. There are two different camera interface provided on the USB camera shield, but only one camera interface can be used at a time see Table 2 and Table 3.

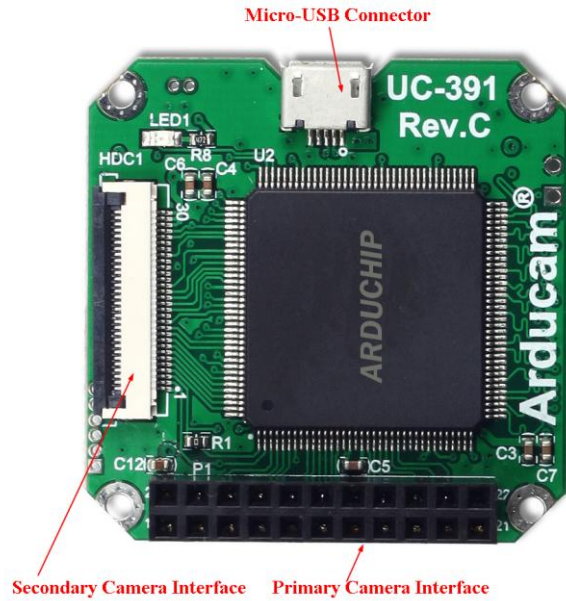


Figure 2 Interface Diagram

5.1 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.

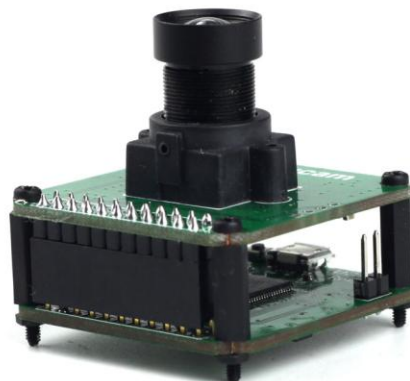


Table 2 P1 Connector Pin Definition

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

5.2 Secondary Camera Interface

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



Table 3 HDC1 Connector Pin Definition
(Connector Part Number: Hirose FH28D-30S-0.5SH(05))

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

6 Mechanical Dimension

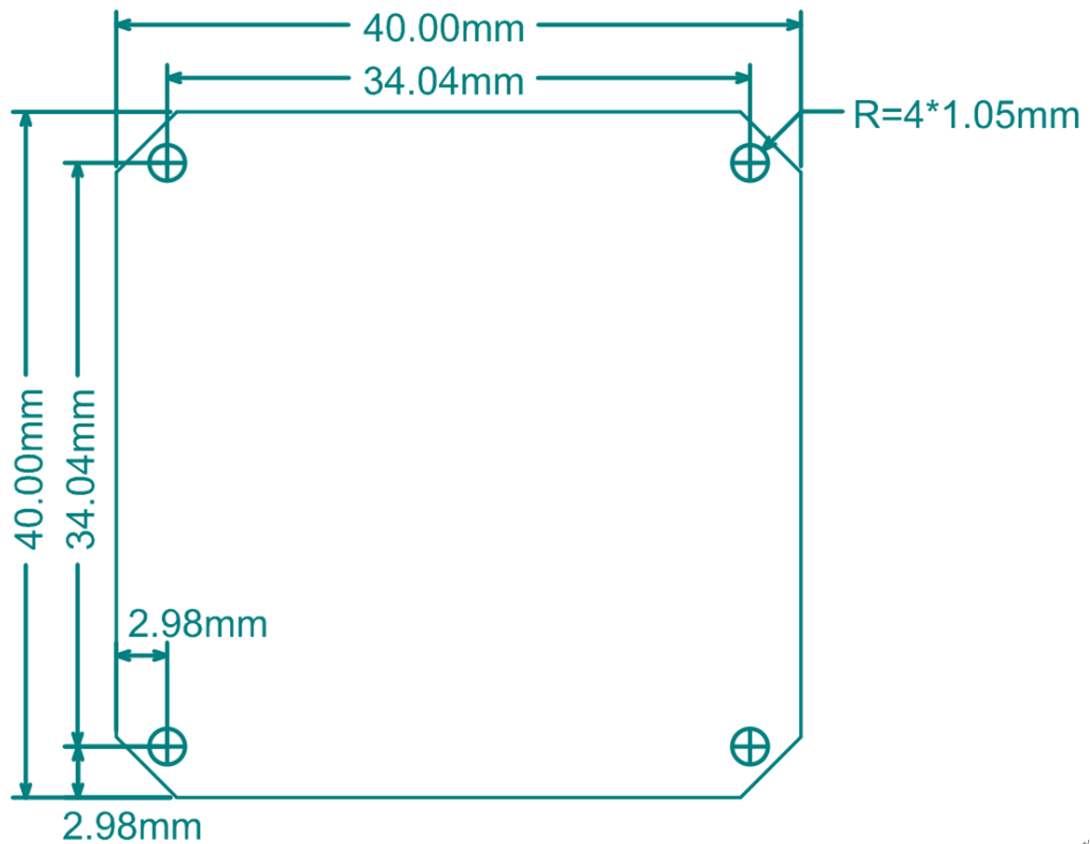


Figure 3 Mechanical Dimension

7 Order Information

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