

ArduCam

5MP Camera Module for Raspberry Pi



Program Controllable Motorized
Lens with Adjustable Focus

SKU: B0176

Instruction Manual

Specs

Brand	Arducam
Camera Sensor	
Sensor	OV5647
Resolution	5MP
Still Picture	2592×1944 Max
Video	1080P Max
Frame Rate	30fps@1080P, 60fps@720P
Lens	
IR sensitivity	Integral IR filter, visible light only
Focus Type	Motorized focus
Field of View	54°×44°(Horizontal × Vertical)
Camera Board	
Board Size	24 × 24mm
Connector	15pin MIPI CSI

Support Raspberry Pi Model A/B/B+/2/3/3 B+/3A+/4. Raspberry Pi Zero and Raspberry Pi Compute Module need 15pin to 22pin FPC cable to work.

The Arducam Team

Arducam has been designing and manufacturing camera modules for Raspberry Pi since 2013. Feel free to contact us if you need our help.

Email: support@arducam.com

Website: www.arducam.com

Skype: [arducam](https://www.skype.com/en/contacts/arducam)

Doc: arducam.com/docs/cameras-for-raspberry-pi

Introduction

The official Raspberry Pi camera boards have fixed-focus lenses, which are either glued or need manual adjustment with a tool. Sometimes you want to see the object both closer and far away from the camera through the software control without human intervention.

This Arducam camera module with motorized lens enables you to control your Pi camera focus precisely through the software.

Connect the Camera

You need to connect the camera module to the Raspberry Pi's camera port, then start up the Pi and ensure the software is enabled.

1. Locate the camera port (between the HDMI and audio port) and gently pull up on the plastic edges.
2. Push in the camera ribbon, and make sure the silver connectors is facing the HDMI port. Do not bend the flex cable, and make sure it's firmly inserted.
3. Push the plastic connector down while holding the flex cable until the connector is back in place.
4. Enable the camera with either way below:
 - a. Open the raspi-config tool from the Terminal. Run `sudo raspi-config`, select **Enable camera** and hit **Enter**, then go to **Finish** and you'll be prompted to reboot
 - b. **Main Menu > Preferences > Raspberry Pi Configuration > Interfaces > In Camera** select **Enabled > OK**

Use the Camera

The instruction for assembling the acrylic camera case:

<https://www.arducam.com/docs/cameras-for-raspberry-pi/camera-case/>

Python scripts for focus control (also instructed in the “Software” section of the next page):

https://github.com/ArduCAM/RaspberryPi/tree/master/Motorized_Focus_Camera

General libraries for raspberry pi camera:

Shell (Linux command line):

<https://www.raspberrypi.org/documentation/usage/camera/raspicam/README.md>

Python:

<https://www.raspberrypi.org/documentation/usage/camera/python/README.md>

Troubleshoot

If the camera module is not working correctly, please try the following things:

1. Run `apt-get update` and `sudo apt-get upgrade` before you start the troubleshooting.
2. Make sure you have enough power supply. This Camera module adds 200-250mA power consumption to your Raspberry Pi. You'd better go with an adapter with a bigger power budget.
3. Run `vcgencmd get_camera` and check the output.

The output should be `supported=1 detected=1`. If `supported=0`, the camera is not enabled. Please enable the camera as instructed in the “Connect the ” chapter. If `detected=0`, the camera is not correctly connected, then check the following points, reboot, and rerun the command.

The ribbon cable should be seated firmly in the connectors and facing the right direction. It should be straight in its connectors.

Make sure the sensor module connector that connects the sensor to the board is firmly attached. This connector could bounce or become loose from the board during shipping or when you put the camera in a case. Use your fingernail to flip up and reconnect the connector with gentle pressure, and it will engage with a slight click.

Always reboot after each attempt to fix it. Please contact Arducam (emails in “The Arducam Team” chapter) if you have tried the steps above and still cannot get it to work.

Software

Install Python Dependency libraries

```
sudo apt-get install python-opencv
```

Enable the I2C0 port

```
chmod +x enable_i2c_vc.sh
./enable_i2c_vc.sh
```

A reboot is required after running this script.

Run the examples

```
sudo python Motorized_Focus_Camera_Preview.py
```

Manual focus in preview mode. Use the keyboard up and down keys to see the focusing process.

```
sudo python Motorized_Focus_Camera_snapshot.py
```

Take pictures with keyboard up and down keys and save the image to the local file system after each focus.

```
sudo python Autofocus.py
```

Software auto focus powered by OpenCV. Image is saved to the local file system after each successful auto focus.

FAQ

Q: Do you offer 8MP V2 Auto Focus Camera?

A: Yes, We offer a lens-sensor combination IMX219 8MP drop-in replacement with auto focus support, but you need your own Raspberry Pi Camera Module V2, and you will need to detach the original sensor module.

Q: Do you offer Pi cameras with focus control even higher than 8MP?

A: Yes, Arducam offers 13MP IMX135 and 16MP IMX298 MIPI camera modules with programmable motorized lens to use with the Raspberry Pi. However, those are for advanced users with a development background. They are not compatible with native Raspberry Pi camera drivers, commands and software. You need to use Arducam SDK and examples. Go to arducam.com to learn more about the Arducam MIPI Camera Project.

Q: How do I get better low light performance?

This camera has a built-in IR filter and does not work great in low light conditions. If your project operates in low light, please prepare a external light source or contact us for NoIR versions.