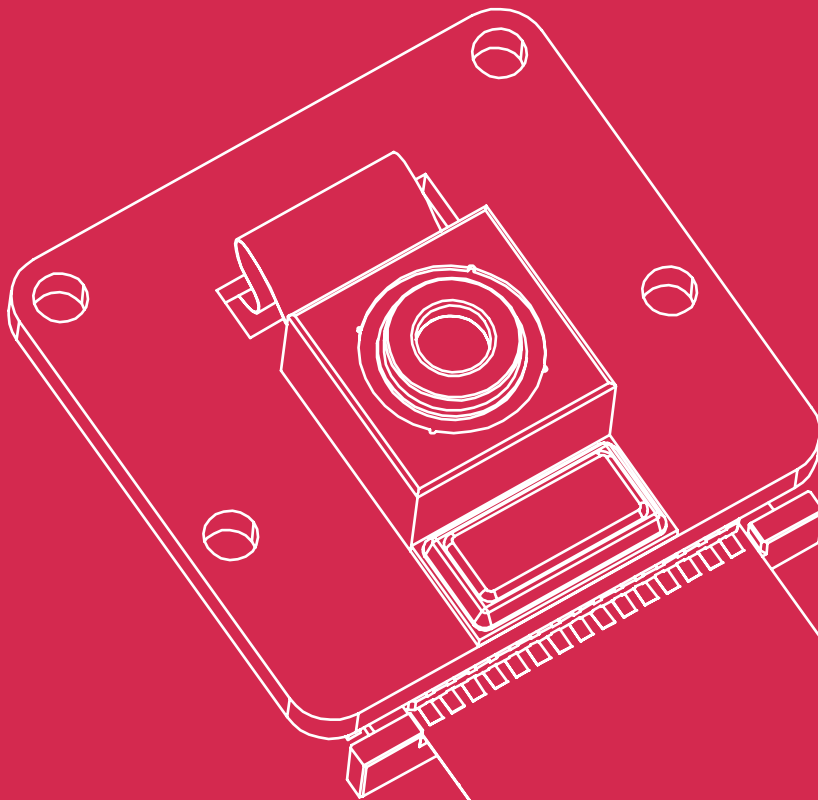


High-Resolution Autofocus Camera for Raspberry Pi Getting Started

Operating instructions, safety
information, etc.

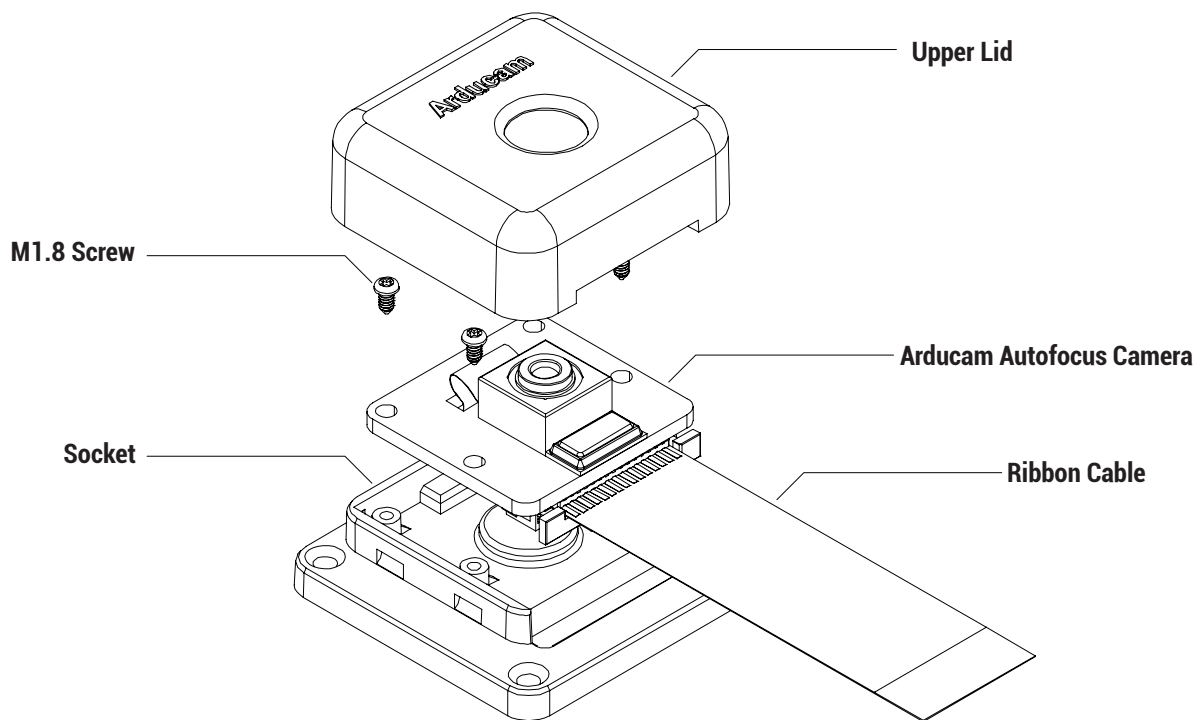


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ArduCam
www.arducam.com

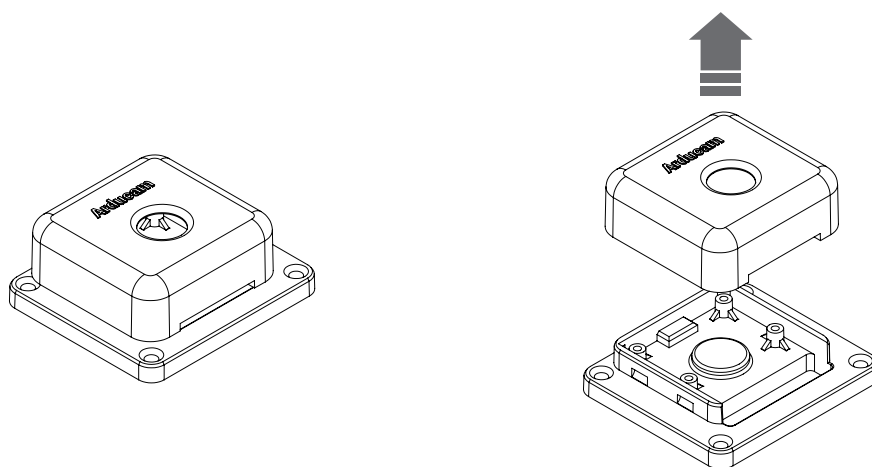
Installation

Camera Enclosure



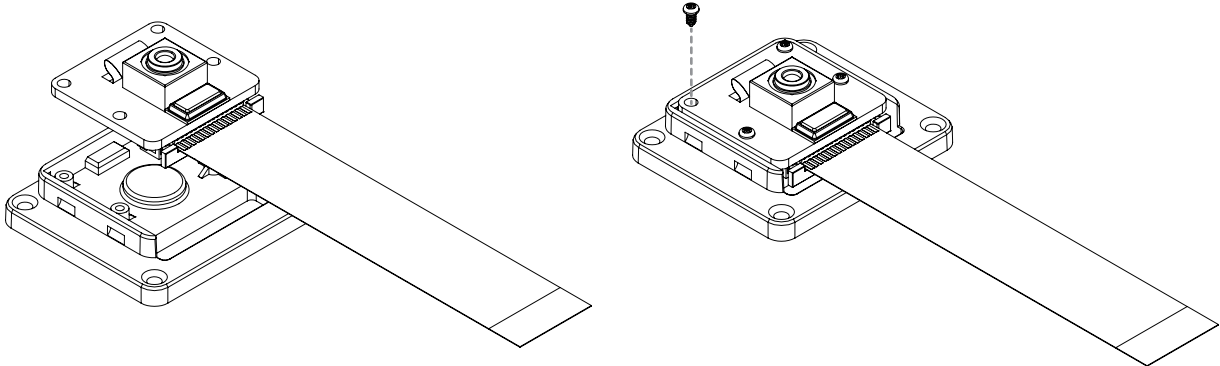
To fit a camera board (High-Resolution Autofocus Camera/V1/V1.3/V2/V2.1):

1. Open the upper lid of the enclosure.

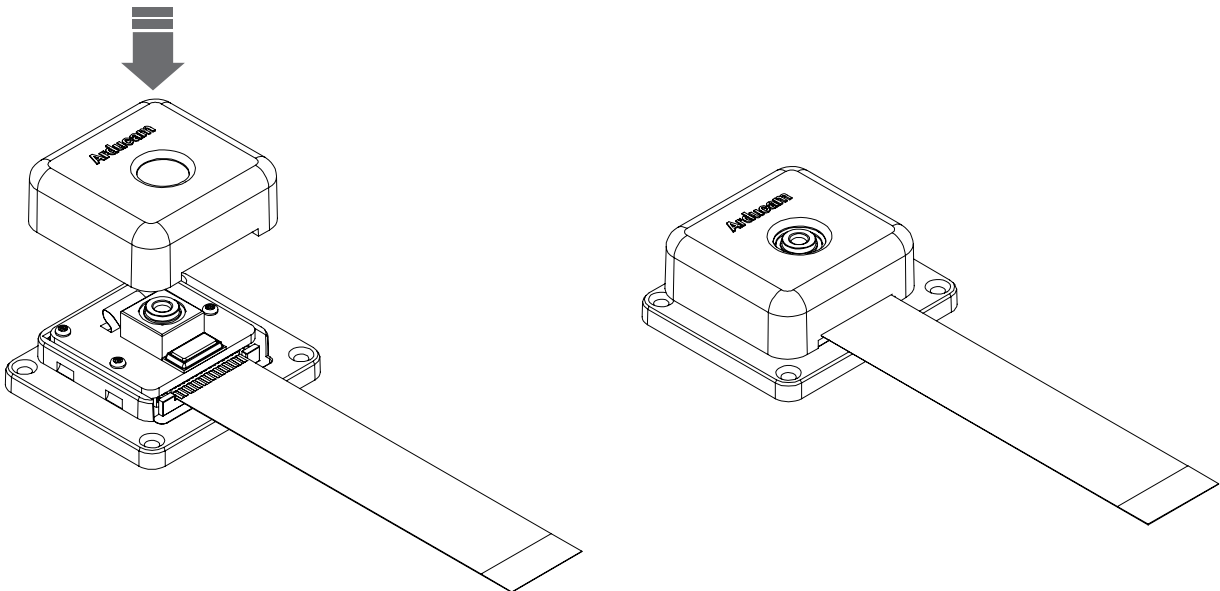


Installation

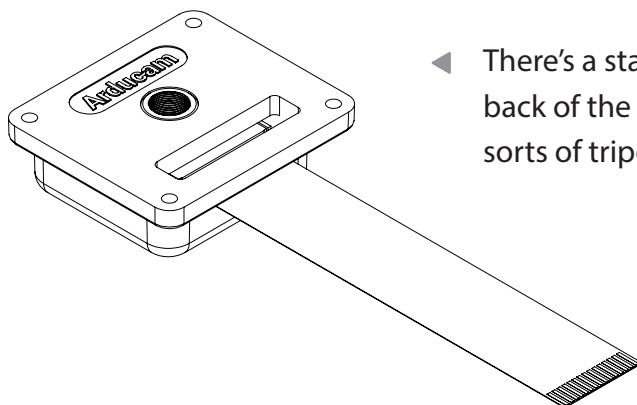
2. Put the module into the socket and install the screws.



3. Put the upper lid back.



Tripod Mount

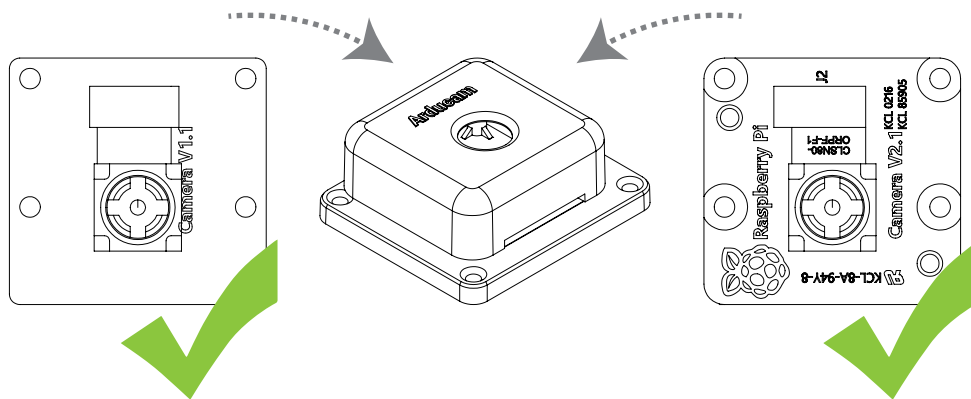


◀ There's a standard tripod mount (1/4"-20) at the back of the enclosure, you can use it with all sorts of tripods.

Installation

Camera Enclosure

The camera enclosure that comes with the Arducam High-Resolution Autofocus Camera is also compatible with Raspberry Pi camera module V1/V1.3 and V2/V2.1.

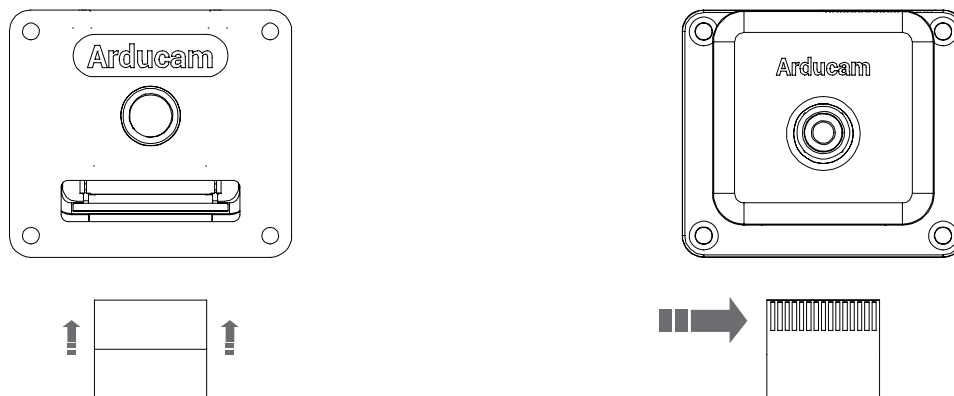


Before Connecting The High-Resolution Autofocus Camera to Your Raspberry Pi

1. Find the camera connector, gently pull the plastic catch up.

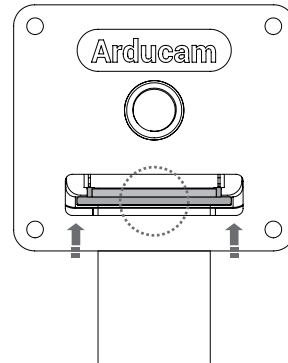
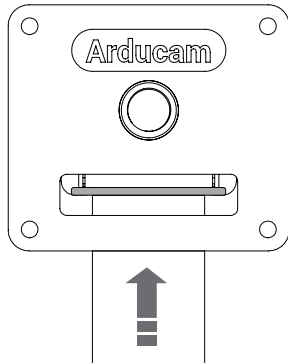


2. Insert the ribbon cable with pins facing away from the catch.



Installation

3. Push the catch back in.



Operating The Camera

Please make sure you are running the latest version of Raspberry Pi OS. (March 4th or later releases).

1. Download the shell scripts

```
wget -O install_pivariety_pkgs.sh https://github.com/ArduCAM/Arducam-Pivariety-V4L2-Driver/releases/download/install_script/install_pivariety_pkgs.sh
```

```
chmod +x install_pivariety_pkgs.sh
```

2. Update your Pi

```
sudo apt update
```

3. Install libcamra-dev

```
./install_pivariety_pkgs.sh -p libcamera_dev
```

4. Install libcamera-apps

```
./install_pivariety_pkgs.sh -p libcamera_apps
```

5. Install the kernel driver

```
./install_pivariety_pkgs.sh -p imx519_kernel_driver
```

6. enjoy.

Operating The Camera

Before You Start

Please make sure you are running the latest version of Raspberry Pi OS. (January 28th 2022 or later releases, Debian version:11(Bullseye))

- For Bullseye users running on Pi 0 ~ 3, please also:

1. Open a terminal
2. Run `sudo raspi-config`
3. Navigate to Advanced Options
4. Enable Glamor graphic acceleration
5. Reboot your Pi

If you encounter the display issues, please also execute the following steps:

1. Open a terminal
2. Run `sudo raspi-config`
3. Navigate to Advanced Options
4. Navigate to GL Driver
5. Select GL (Full KMS)
6. Reboot your Pi

- For Raspberry Pi Compute Module 3/4

The latest software only supports one camera at this time, CM4 uses CAM1 by default.

`libcamera-still` is an advanced command line tool for capturing still images with the High-Resolution Autofocus Camera Module.

```
libcamera-still -t 5000 -o test.jpg
```

This command will give you a live preview of the camera module, and after 5 seconds, the camera will capture a single still image. The image will be stored in your home folder and named `test.jpg`.

```
-t 5000: Live preview for 5 seconds.
```

```
-o test.jpg: take a picture after the preview is over and save it as test.jpg
```

If you only want to see the live preview, use the following command:

```
libcamera-still -t 0
```

Manually adjusting the focus

1. Download the software:

```
git clone https://github.com/ArduCAM/Arducam-Pivariety-V4L2-Driver.git
```

Operating The Camera

2. See the camera in live preview:

```
libcamera-still -t 0
```

3. Use our focus adjustment tool:

```
cd Arducam-Pivariety-V4L2-Driver/focus  
python3 FocuserExample.py -d /dev/v4l-subdev1
```

4. Press the Up/Down Arrow for focus adjustment, press “ctrl + c” to save, or “r” to reset.

One-time autofocus

For one-time autofocus, use `--autofocus`:

```
libcamera-still -t 3000 -o test.jpg --autofocus
```

Continuous Autofocus

You can enable Continuous Autofocus simply by adding `--continue-autofocus`

Example:

```
libcamera-still -t 0 --viewfinder-width 2312 --viewfinder-height 1736 --continue-autofocus
```

Digital Zoom

Use `-k` to enable digital zoom.

```
libcamera-still -t 0 --viewfinder-width 2312 --viewfinder-height 1736 -k
```

When the preview window pops up, navigate back to the terminal and press the following keys on your keyboard:

- W: Zoom in
- S: Zoom out
- I: Move upward
- K: Move downward
- J: Move left
- L: Move right
- R: Reset
- M: 10x Zoom

For more advanced information about controlling the camera, please visit:

<https://www.arducam.com/docs/cameras-for-raspberry-pi/raspberry-pi-libcamera-guide/>

Instructions for Safe Use

To properly use the Arudcam High-Resolution Autofocus Camera, kindly note:

- Before connecting, you should always power the Raspberry Pi off and remove the power supply first.
- Make sure the cable on the camera board is locked in place.
- Make sure the cable is correctly inserted in the Raspberry Pi board's MIPI CSI-2 connector.
- Avoid high temperatures.
- Avoid water, moisture, or conductive surfaces while in operation.
- Avoid folding, or straining the flex cable.
- Avoid cross-threading with tripods.
- Gently push/pull the connector to avoid damaging the printed circuit board.
- Avoid moving or handling the printed circuit board excessively while it's in operation. Handle by the edges to avoid damages from electrostatic discharge.
- Where the camera board is stored should be cool and as dry as possible.
- Sudden temperature/humidity changes can cause dampness in the lens and affect the image/video quality.

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