ArduCam
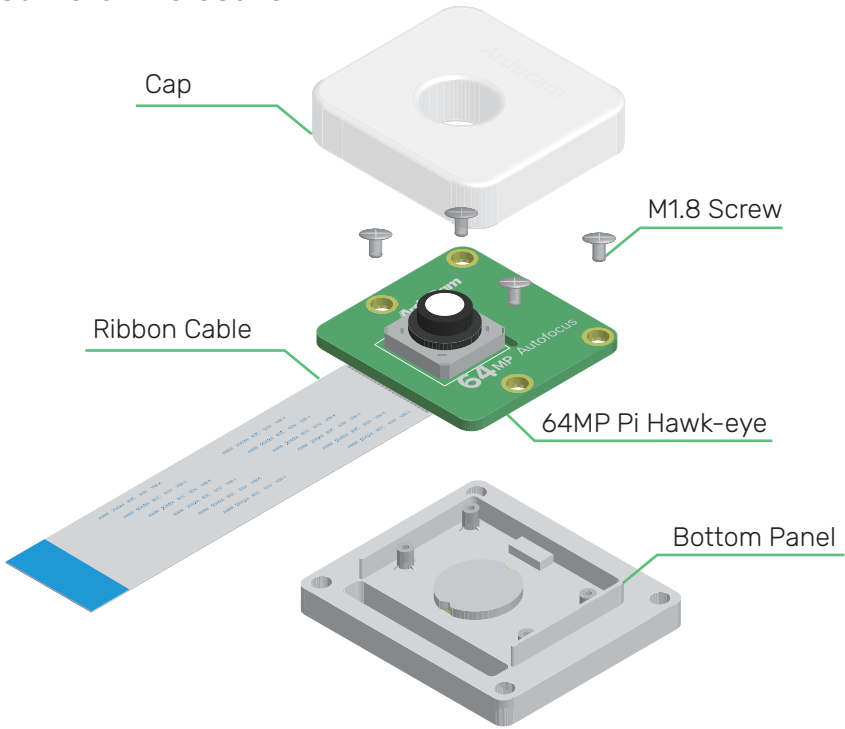
64-Megapixel
Autofocus Camera
for Raspberry Pi
Getting Started

Operating instructions,
safety information, etc.

Installation
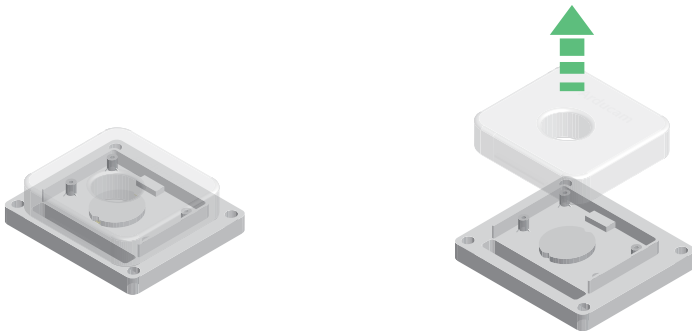
Camera Enclosure

Cap

M1.8 Screw

Ribbon Cable

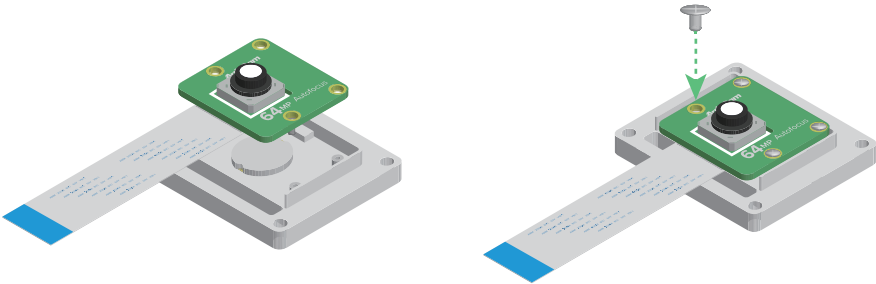64MP Pi Hawk-eye

Bottom Panel

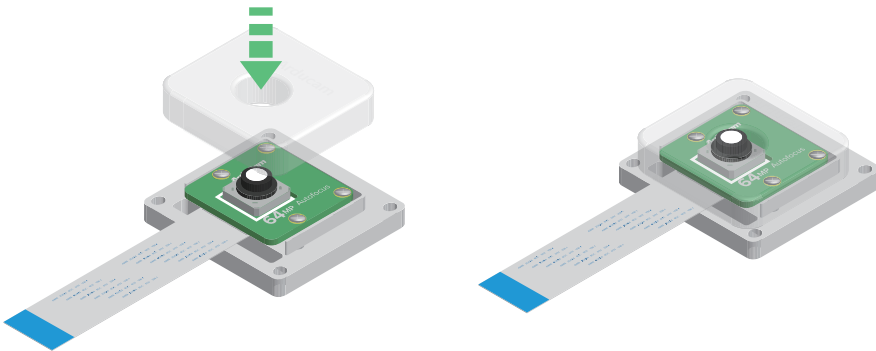## To fit a camera board (64MP Autofocus Camera for Raspberry Pi)

1. Pull the cap up.

Installation

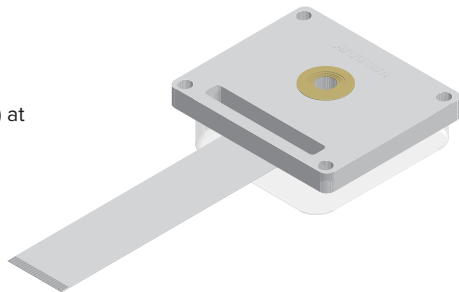2. Put the module into the bottom panel and install the screws.

3. Put the cap 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.

64MP Autofocus Camera for Raspberry Pi

Operating The Camera

Make sure you are running a newer version of Raspberry Pi OS, a fresh install is highly recommended. (01/28/22 or later releases)

Driver Installation

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. Install libcamra-dev

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

3. Install libcamera-apps

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

4. Install the kernel driver

```
./install_pivariety_pkgs.sh -p 64mp_pi_hawk_eye_kernel_driver
```

5. Configuration

Open **/boot/config.txt**, under **[all]**, add the following line:

```
dtoverlay=vc4-kms-v3d,cma-512
```

Example:

```
[all]
# Run as fast as firmware / board allows
arm_boost=1
dtoverlay=vc4-kms-v3d,cma-512
```

For Pi 0 ~ 3 users, pls also:

1. Open a terminal
2. Run sudo raspi-config
3. Navigate to Advanced Options
4. Enable Glamor graphic acceleration
5. Go back to Advanced Options
6. Navigate to GL Driver
7. Select GL (Full KMS)
8. Reboot your Pi

For more details, please refer to the official forum guide on how to configure the camera module >>

Operating The Camera

For Raspberry Pi Compute Module 3/4

You need to install the latest Raspberry Pi OS (after 2022/01/28), and do not execute rpi-update
After installing the system and drivers (follow the above instructions), add the following
information to /boot/config.txt:

```
[cm4]
dtoverlay=arducam_64mp
dtoverlay=arducam_64mp,cam0
```

Then reboot.

List all cameras:

```
libcamera-still -list-cameras
```

Specify a camera:

```
libcamera-still -t 0 -camera 0
libcamera-still -t 0 -camera 1
```

Quick Start

1. Previewing the camera

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

--viewfinder-width
Set the width of the preview resolution.

--viewfinder-height
Set the height of the preview resolution.

We've done numerous tests to find out that the most-balanced preview resolution for this camera sits at 2312 x 1736. (pretty decent quality with best performance)

If you are using Pi Hawk-eye with older Pi models, pls set the resolution to 16MP (superpixel mode):

--width 4624
Set the width of the capture.

--height 3472
Set the height of the capture.

```
libcamera-still -t 5000 --viewfinder-width 2312 --viewfinder-height 1736 --width 4624
--height 3472 -o 64mp.jpg --autofocus
```

2. Taking a picture with autofocus enabled

```
libcamera-still -t 5000 --viewfinder-width 2312 --viewfinder-height 1736 -o pi_hawk_eye.jpg
--autofocus --denoise cdn_off
```

To take full-res photos without overwrite, use:

```
libcamera-still --autofocus --timestamp
```

Operating The Camera

3. Focus Control/Adjustment

```
git clone https://github.com/ArduCAM/Arducam-Pivariety-V4L2-Driver.git
cd Arducam-Pivariety-V4L2-Driver/focus
python3 FocuserExample.py -d /dev/v4l-subdev1
```

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

4. Step Adjustments

```
python3 FocuserExample.py -d /dev/v4l-subdev1 --focus-step 10
```

While you are trying manual focus control, you can use **--focus-step [number]** to configure how many steps the motor in the lens should move when the Up/Down key is pressed.
By default, it's set to 50, and you can change it to any value between 1 ~ 1023.

5. 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

Continuous Autofocus

Note: This is a beta version, and we are still making improvements.

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

Example:

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

Instructions for Safe Use

To properly use the 64MP 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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