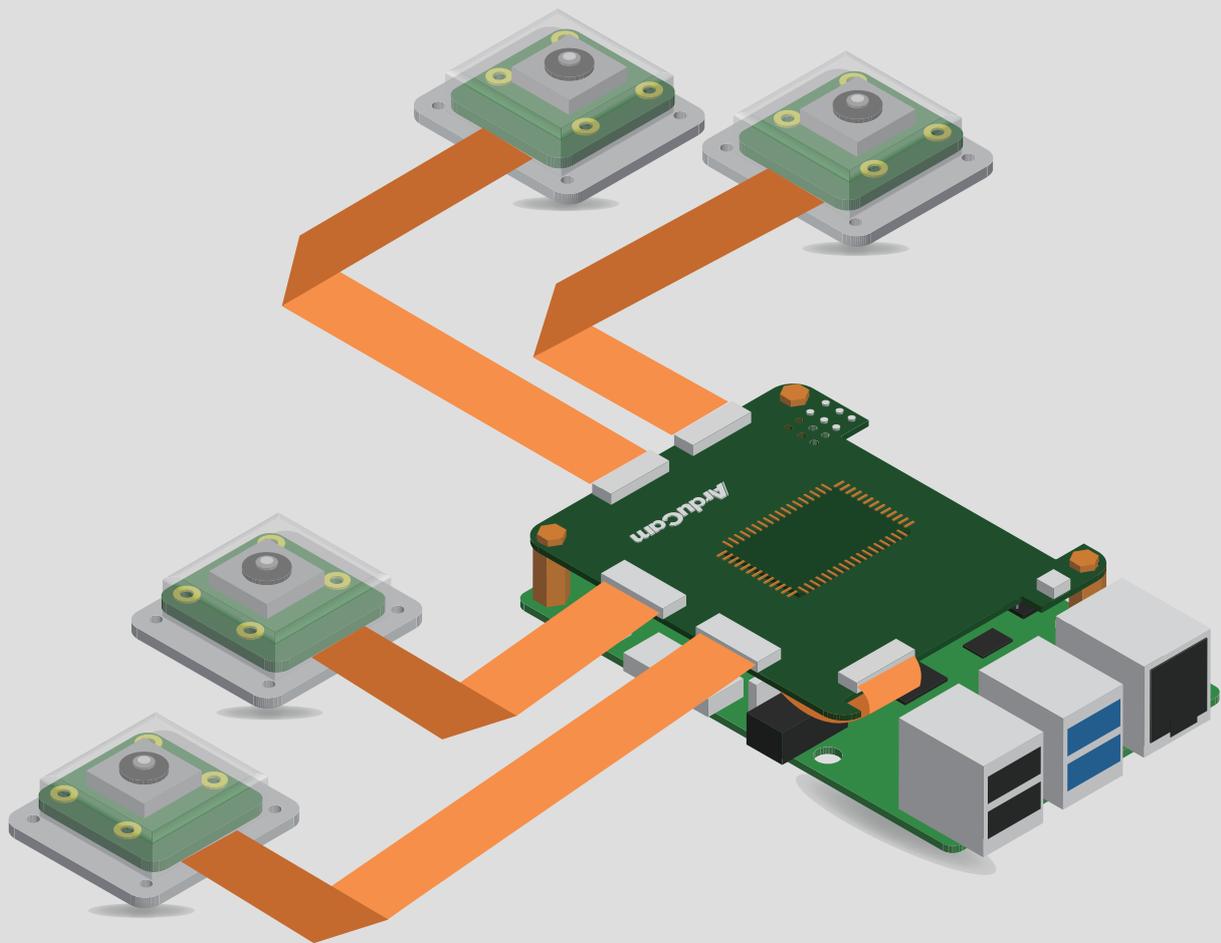


ArduCam

64MP-AF Synchronized Quad-Camera Kit for Raspberry Pi

Getting Started



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by ARDUCAM TECHNOLOGY CO., LIMITED

Installation

Packing List



3 x Screw



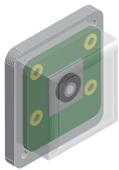
3 x Spacer



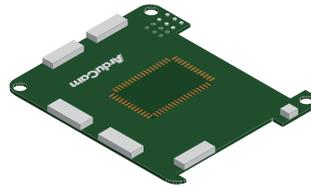
3 x Nut



1 x Flex Cable (For Raspberry Pi)



4 x 64MP Autofocus
Camera Module
(Exclusive Version)



1 x Quad-Camera HAT

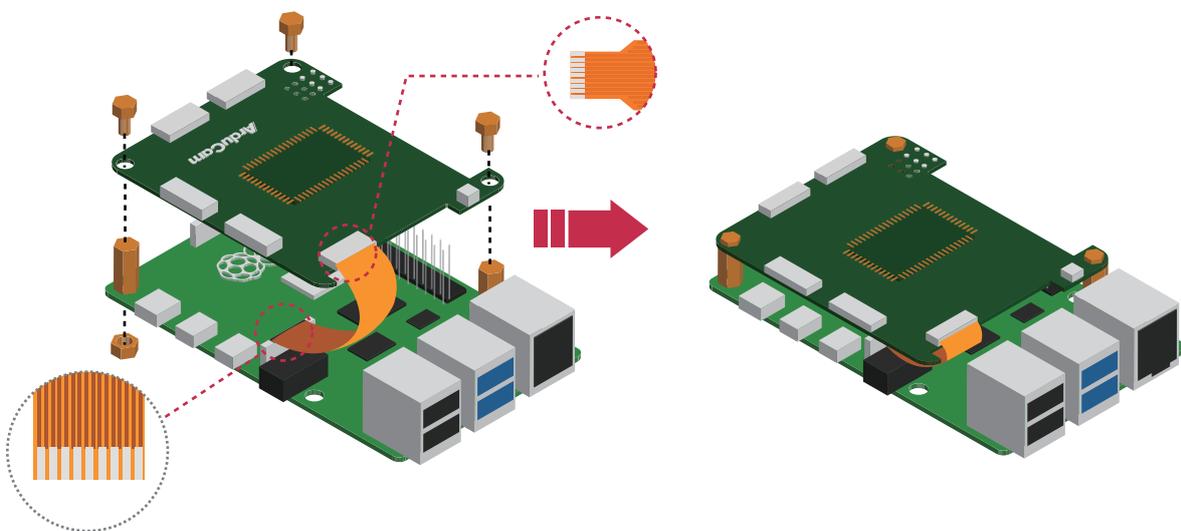


4 x Flex Cable (For Cameras)



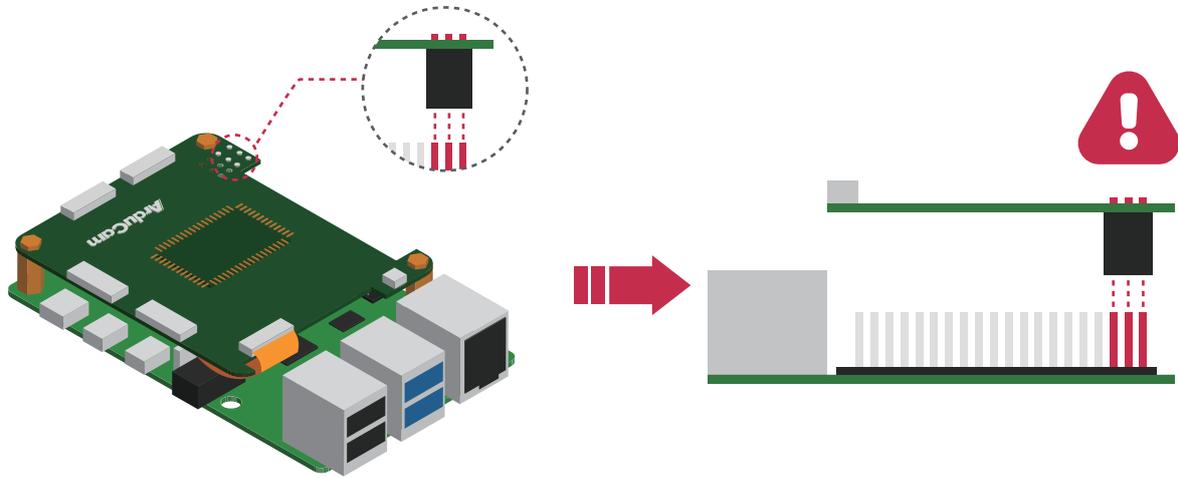
Turn off your Raspberry Pi and disconnect the power supply.

1. Connect the HAT's MIPI_TX0 port to Raspberry Pi's camera port.

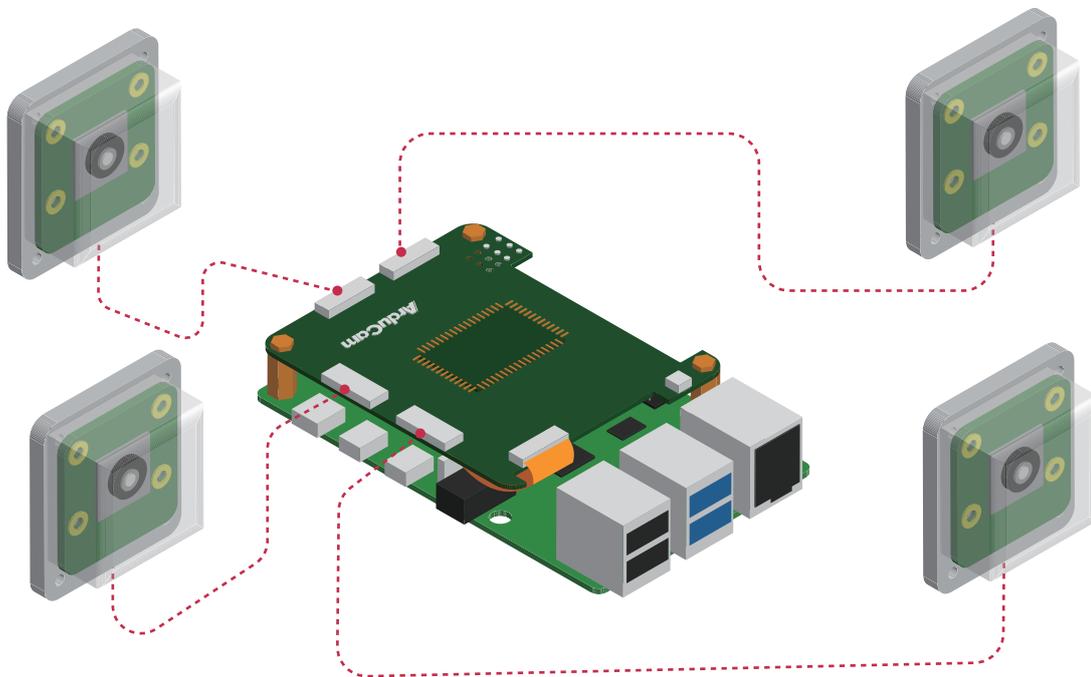


Installation

2. Connect the Quad-Camera HAT.



3. Connect the 4 camera modules to the Rx ports.



4. Power your Raspberry Pi on.

Operating The Camera



Before You Start

- Connecting any of the 64MP camera modules directly to Raspberry Pi will not work, the cameras in the kit must be used with the quad-camera HAT.
- 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 libcamera-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)

2. Taking a picture with autofocus enabled

Pi 4:

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

Other Pi models:

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

If you are using 64MP camera with older Pi models, pls set the resolution to 16MP (superpixel mode):

```
--width 4624 --height 3472
```

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.

Operating The Camera

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.

Switch the Channel

There are four channels available with the quad-camera kit. Each channel represents a camera, and you can switch channels to achieve different camera composition modes, including single-channel, dual-channel, and the default four-channel.

1. Set to single channel 0
`i2cset -y 10 0x24 0x24 0x02`
2. Set to single channel 1
`i2cset -y 10 0x24 0x24 0x12`
3. Set to single channel 2
`i2cset -y 10 0x24 0x24 0x22`
4. Set to single channel 3
`i2cset -y 10 0x24 0x24 0x32`
5. Set to double channel (single channel 0 and single channel 1)
`i2cset -y 10 0x24 0x24 0x01`
6. Set to double channel (single channel 2 and single channel 3)
`i2cset -y 10 0x24 0x24 0x11`
7. Set to four in one mode (Default)
`i2cset -y 10 0x24 0x24 0x00`

After setting the channel, you can use `libcamera` apps to run the camera.

By default, the quad-camera kit works in synchronized 4-channel mode (more modes will be added in future updates), and Raspberry Pi recognizes the whole kit as one camera. Any manual focus or camera control adjustments (exposure/gain/white balance/etc.) will also be applied to 4 cameras at the same time.

For advanced instructions please visit:

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

Instructions for Safe Use

To properly use the Arducam quad-camera kit, 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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