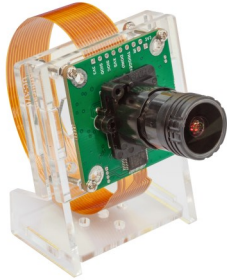# ArduCam®

Pivariety Low Light Camera Module for Raspberry Pi

2MP IMX462

(SKU: B0333)

QUICK START GUIDE

INTRODUCTION

• About Arducam

Arducam has been a professional designer and manufacturer of SPI, MIPI, DVP and USB cameras since 2012. We also offer customized turnkey design and manufacturing solution services for customers who want their products to be unique.

• About Pivariety Camera

Arducam Pivariety is a Raspberry Pi camera solution to take the advantage of using its hardware ISP functions. Using Arducam Pivariety camera modules, users can get better performance and a wider variety of camera, lens options. For a long time, Raspberry Pi users are limited to use the closed-source official supported camera driver and camera modules (V1/V2/HQ). Now Arducam made it possible to provide well-tuned ISP for Pivariety camera modules with Auto Exposure, Auto White Balance, Auto Gain Control, Lens Shading Correction, etc.

• About Customer Service

If you need our help or want to customize other models of Pi cameras, feel free to contact us at **support@arducam.com.**

Website: https://www.arducam.com/docs/cameras-for-raspberry-pi/pivariety/

SPECS

Image Sensor	2MP IMX462
Max. Resolution	1920H×1080V
Pixel Size	2.9um x 2.9um
Optical Format	1/2.8"
Lens Spec	Mount: M16
	Focal length: 4mm±5%
	F.NO: 0.95±5%
	FOV: 92.23deg (H)
Minimum Illumination	0.01Lux
IR Sensitivity	Integral IR filter, visible light only
Frame Rate	Adjustable, 5-60fps@1080P
Sensor Output Format	RAW10
ISP Output Format	Output image format of JPG, YUV420, RAW, DNG; output video format of MJPEG, H.264
Interface Type	2-Lane MIPI
Board Size	38mm×38mm

SOFTWARE

1. Driver Installation

```
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
```

```
. /install_pivariety_pkgs.sh -p kernel_driver
```

press y to reboot

NOTE: The kernel driver installation only supported by the latest version 5.10. For other kernel versions, please go to our Doc page: https://www.arducam.com/docs/cameras-for-raspberry-pi/pivariety/how-to-install-kernel-driver-for-pivariety-camera/#2-how-to-build-raspberry-pi-kernel-driver-for-arducam-pivariety-camera

You can also visit this doc page to refer to the hardware connection: https://www.arducam.com/docs/cameras-for-raspberry-pi/pivariety/2mp-imx462-pivariety-low-light-camera-module/

2. Test the Driver and Camera

After you've finished the hardware assembly and driver installation, you can test whether the camera is detected and working.

- **View the Status of Driver and Camera**

```
dmesg | grep arducam
```

It will display arducam-pivariety if driver installed successfully and firmware version if the camera can be detected.

The display should be probe failed if the camera can't be detected, you might have to check the ribbon connection, then reboot the Raspberry Pi.

- **View the Video Node**

The Pivariety camera modules are emulated as the standard video device under /dev/video* node, so you can use the ls command for listing the contents in the /dev folder.

```
ls /dev/video* -l
```

Since the camera module is V4L2 compliant, you can use the V4l2 controls to list the supported color space, resolutions, and frame rates.

```
v4l2-ctl --list-formats-ext
```

NOTE: Although V4L2 interface is supported, only RAW format images can be obtained, without ISP support.

```
cd ~/libcamera
```

```
export GST_PLUGIN_PATH=$(pwd)/build/src/gstreamer
```

```
gst-launch-1.0 libcamerasrc ! 'video/x-raw,width=1920,height=1080' ! videoconvert ! autovideosink
```

3. Official Libcamera App Installation

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

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

4. Capture Image and Record Video

- **Capture image**

For example, preview for 5s and save the image named test.jpg

```
cd libcamera-apps/build
```

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

- **Record video**

For example, record a H.264 10s video with the frame size 1920W × 1080H

```
cd libcamera-apps/build
```

```
./libcamera-vid -t 10000 --width 1920 --height 1080 -o test.h264
```

- **Plugin gstreamer installation**

Install gstreamer

```
sudo apt update
```

```
sudo apt install -y gstreamer1.0-tools
```

TROUBLESHOOT

1. Cannot Allocate Memory

```
〔3:45:35.833744413〕 [6019] INFO RPI raspberrypi.cpp:611 Sensor: /base/soc/i2c0mux/i2c@1/arducam@0c – Selected mode: 5344×4012-pRAA
[3:45:35.948442507] [6019] ERROR V4L2 v4l2_videodevice.cpp:1126 /dev/video14[17:cap]: Unable to request 4 buffers: Cannot allocate memory
[3:45:35.948551358] [6019] ERROR RPI raspberrypi.cpp:808 Failed to allocate buffers
ERROR: *** failed to start camera ***
```

Edit /boot/cmdline.txt and add cma=400M at the end

More details: https://lists.libcamera.org/pipermail/libcamera-devel/2020-December/015838.html

2. The Image Displays Color Dots

Add code --denoise cdn_off at the end of command

```
./libcamera-still -t 5000 -o test.jpg --denoise cdn_off
```

More details: https://github.com/raspberrypi/libcamera-apps/issues/19

3. Failed to Install the Driver

Please check the kernel version, we only provide the driver for the latest official kernel version image when this Pivariety camera released. You can follow Arducam Doc page to get the drivers for other kernel versions.

Other problems, please feel free to contact us at

support@arducam.com.