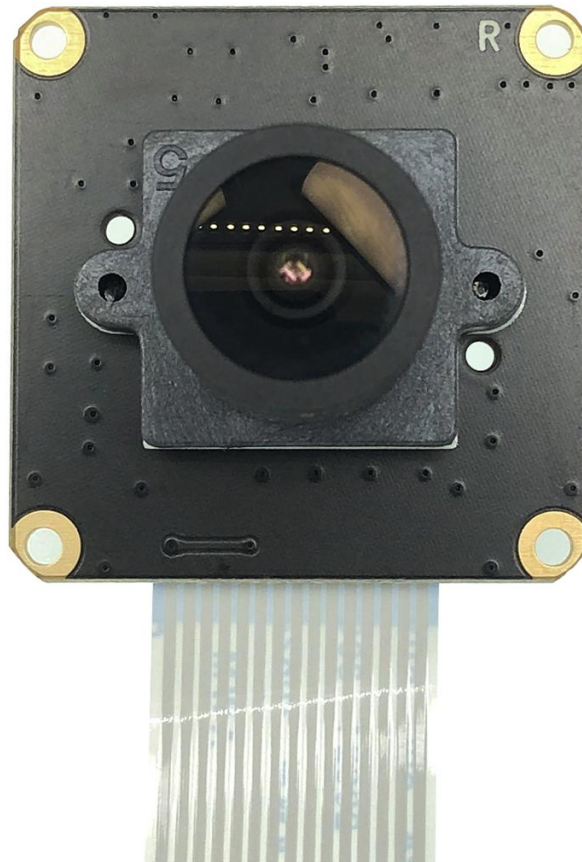


PICAM-IMX219-FOV90 User Manual



DATE	Change History	Change Chapter
2022/12/01	Add libcamera usage method	Chapter 3.1-3.3

Catalog

PICAM-IMX219-FOV90 User Manual	1
1. Features	3
1.1 Sensor:	3
1.2 Video:	3
1.3 Size:	3
1.4 LENS Features:	4
2. For Raspberry PI OS(Legacy)	4
2.1 Load image	4
2.2 Enable Camera	5
2.3 Take Photos	7
2.4 Take H.264 Video	7
2.5 Reference	7
3. For Raspberry PI OS(Bullseye)	8
3.1 Load Image	8
3.2 Check --Tuning-file For IMX219	8
3.3 Preview By Libcamera	8
4. For Raspberry PI Computer Module	9
4.1.1 Wiring use cam1 only	9
enable cam1 only	9
4.1.2 use cam0 and cam1 dual camera	10
enable dual cam	10
5. For Jetson Nano	11
5.1 Connection	11
Check video status	11
5.2 Download Config file	12
Get and install setting files	12
Get video0 working	12
Get video1 working	12

1. General

PICAM-IMX219-FOV90 is a low-cost 8 megapixel Camera Module with M12 FOV90 Degree

Camera Lens, Sony IMX219 image sensor, Plug And Play, support:

- Pi4/ PI3B+/ PI3/ PI2/ PI B+/ PI A/ PI ZERO/ CM4/ CM3+/ CM3/ Jetson Nano
- M12/M16/CS LENS SEAT
- FOV90/FOV160/FOV75
- Support raspberry pi legacy os(Buster), raspistill, raspivid ,raspiyuv command line
- Support raspberry pi 32/64 bit os(bullseye), libcamera-hello commands.

1. Features

1.1 Sensor:

Sensor type: IMX219PQ[Color CMOS 8-megapixel.

Sensor size: 3.674 x 2.760 mm (1/4" format).

Pixel Count: 3280 x 2464 (active pixels) 3296 x 2512 (total pixels).

Pixel Size: 1.12 x 1.12 um

1.2 Video:

-1080P30 cropped (680 pixels off left/right, 692 pixels off top/bottom), up to 30fps

- 3240x2464 Full 4:3, up to 15fps

- 3240x2464 Full 4:3, up to 15fps (identical to 2)

- 1640x1232 binned 4:3, up 40fps

- 1640x922 2x2 binned 16:9 (310 px crop T/B before binning), up to 40fps

- 720P bin+crop (360 px L/R, 512 px T/B before binning), 40..90fps (OC: 120fps)

- VGA bin+crop (1000 px L/R, 752 px T/B before binning), 40..90fps (OC: 120fps)

1.3 Size:

Board size: 32 x 32 mm

Mounting Holes: 4xD=2.20 mm

1.4 LENS Features:

FOCAL LENGTH: 2.8

LENS DIAMETER: 12mm

Lens Seat Spacing: 22mm

F/NO : 2.2

FIELD OF VIEW: 90°

TV DISTORTION: < -17%

Element: 4G+IR

CRA: 10°

Relative Illumination:

2. For Raspberry PI OS (Legacy)

2.1 Load image

Prepare a capacity of more than 8GB TF card and a card reader. Load the image file on to the SD card, using the instructions provided on the Raspberry Pi website for Linux, Mac or PC:

<https://www.raspberrypi.org/documentation/installation/installing-images/README.md>

Raspbian Image download:

<https://www.raspberrypi.com/software/operating-systems/>

Operating system images

Many operating systems are available for Raspberry Pi, including Raspberry Pi OS, our official supported operating system, and operating systems from other organisations.

[Raspberry Pi Imager](#) is the quick and easy way to install an operating system to a microSD card ready to use with your Raspberry Pi. Alternatively, choose from the operating systems below, available to download and install manually.

Download:

[Raspberry Pi OS](#)

[Raspberry Pi OS \(64-bit\)](#)

[Raspberry Pi OS \(Legacy\)](#)

[Raspberry Pi Desktop](#)

If your Rasobian is not the latest version. You can use below command update.

```
sudo apt-get update
```

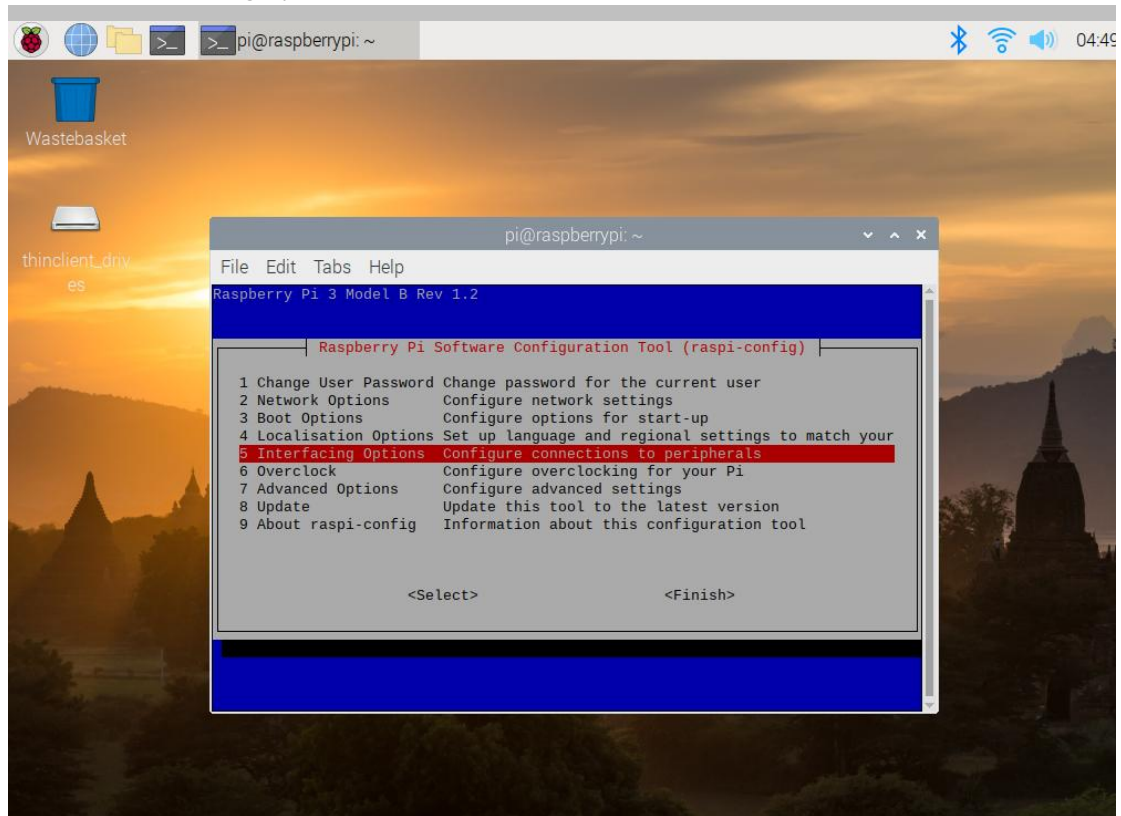
```
sudo apt-get upgrade
```

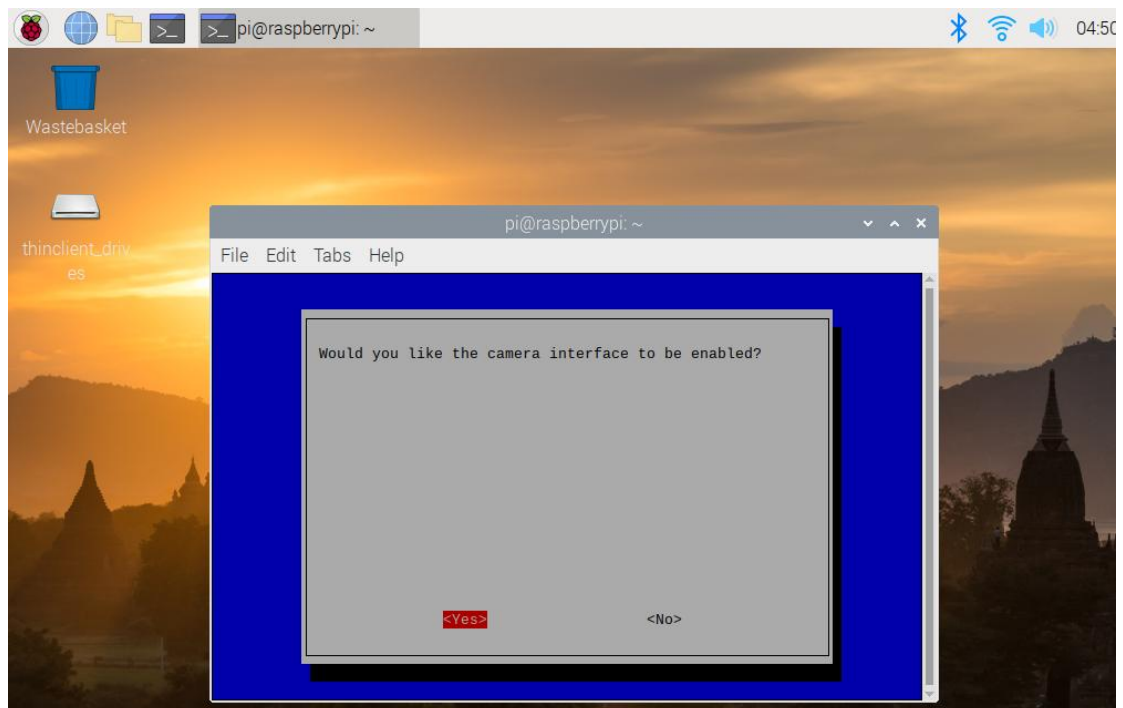
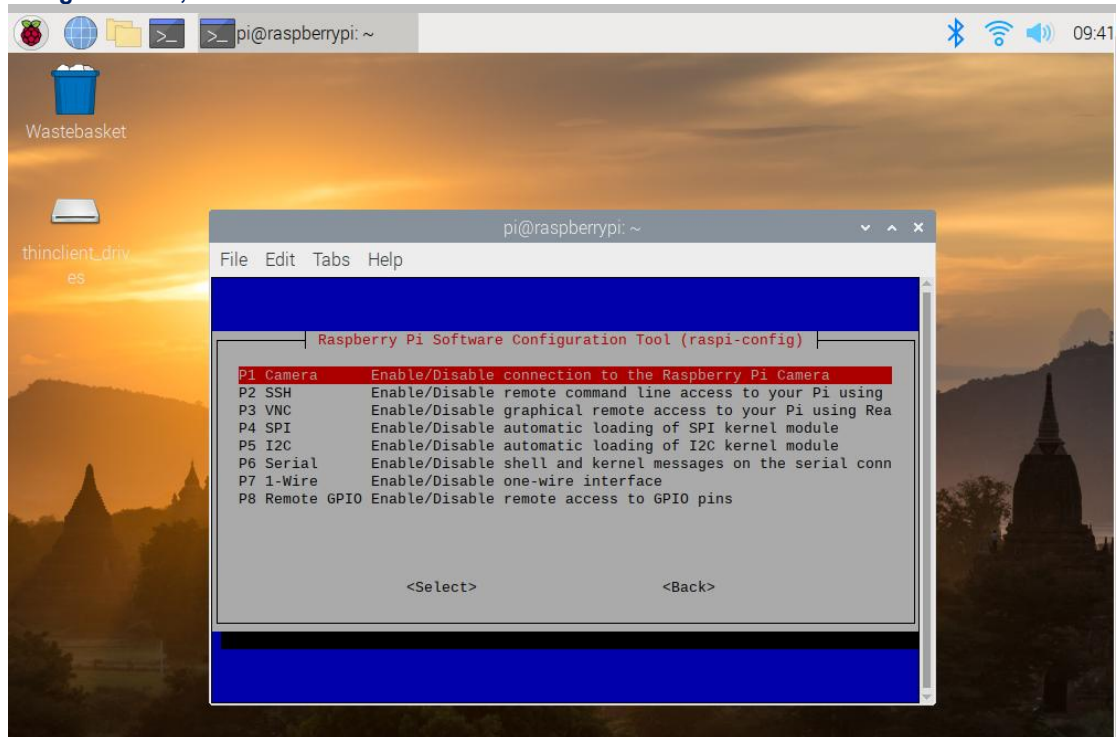
2.2 Enable Camera

(1) Open the raspi-config tool when you first set up your Raspberry Pi:

```
sudo raspi-config
```

(2) Select 'Interfacing Options' → 'Camera'. and then enable camer and reboot.





2.3 Take Photos

(1) take a picture name 'test'.

```
raspistill -o test.jpg
```

(2) take a picture name 'test' with resolution 640*480

```
raspistill -o test.jpg -w 640 -h 480
```

(3) take a picture name 'test' after 10 seconds(10000ms).

```
raspistill -t 10000 -o test.jpg
```

(4) Take a picture name 'test' with PNG format(raw date) . If will take more time to save.

```
raspistill -o test.png -e png
```

2.4 Take H.264 Video

(1) take a 10s(10000ms) video name 'test'.

```
raspivid -o test.h264 -t 10000
```

(2) take a 10s(10000ms) video name 'test' with resolution 1280*720.

```
raspivid -o test.h264 -t 10000 -w 1280 -h 720
```

2.5 Reference

PICAM-IMX219-FOV90 can be use same as Pi camera.

For more information, please refer to below link:

<https://projects.raspberrypi.org/en/projects/getting-started-with-picamera>

<https://www.raspberrypi.org/forums/viewforum.php?f=43&sid=7b94c5651e50c2fc2af0a049066cdfda>

3. For Raspberry PI OS (Bullseye)

3.1 Load Image.

Prepare a capacity of more than 8GB TF card and a card reader. Load the image file on to the SD card, using the instructions provided on the Raspberry Pi website for Linux, Mac or PC:

<https://www.raspberrypi.org/documentation/installation/installing-images/README.md>

Raspbian Image download:

<https://www.raspberrypi.com/software/operating-systems/>

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Download:

[Raspberry Pi OS](#)

[Raspberry Pi OS \(64-bit\)](#)

[Raspberry Pi OS \(Legacy\)](#)

[Raspberry Pi Desktop](#)

3.2 Check --Tuning-file For IMX219

```
ls /usr/share/libcamera/ipa/raspberrypi/
```

3.3 Preview By Libcamera

For IR Version

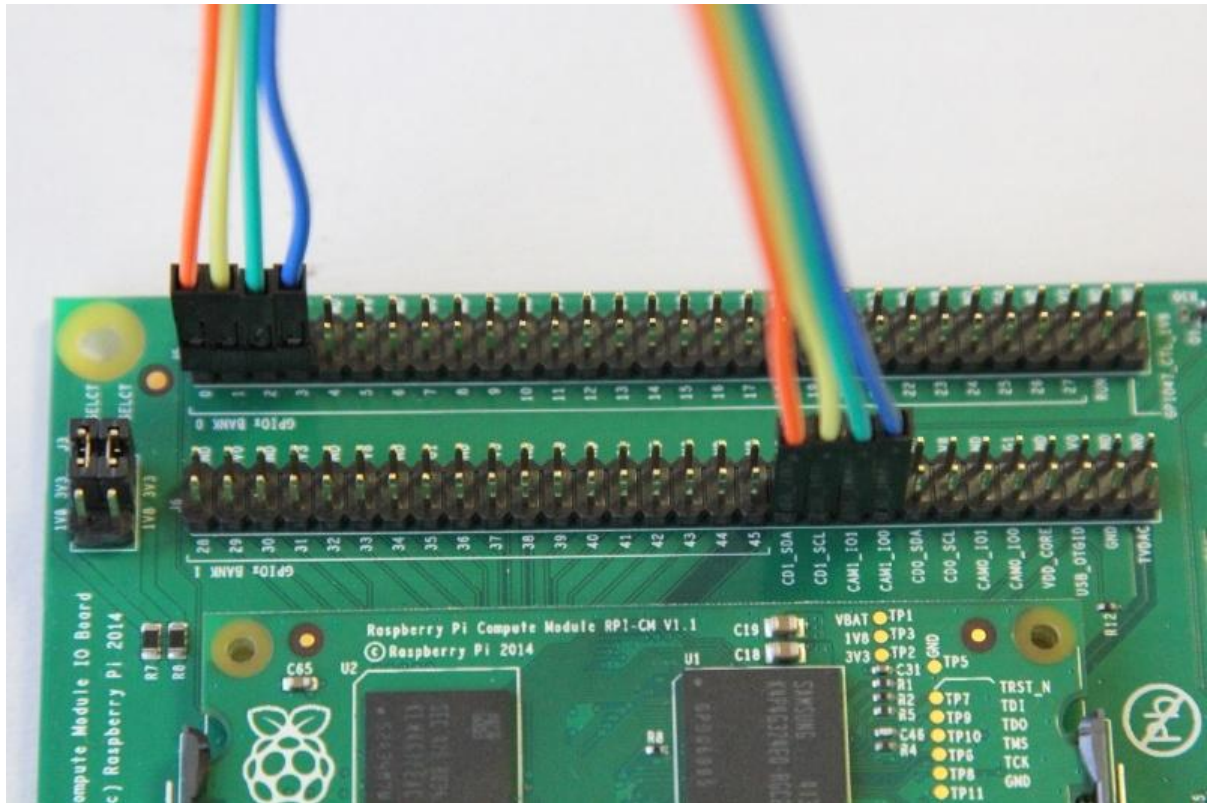
```
libcamera-hello --tuning-file /usr/share/libcamera/ipa/raspberrypi/imx219.json -t 0
```

For NOIR Version

```
libcamera-hello --tuning-file /usr/share/libcamera/ipa/raspberrypi/imx219_.json -t 0
```


4. For Raspberry PI Computer Module

4.1.1 Wiring use cam1 only

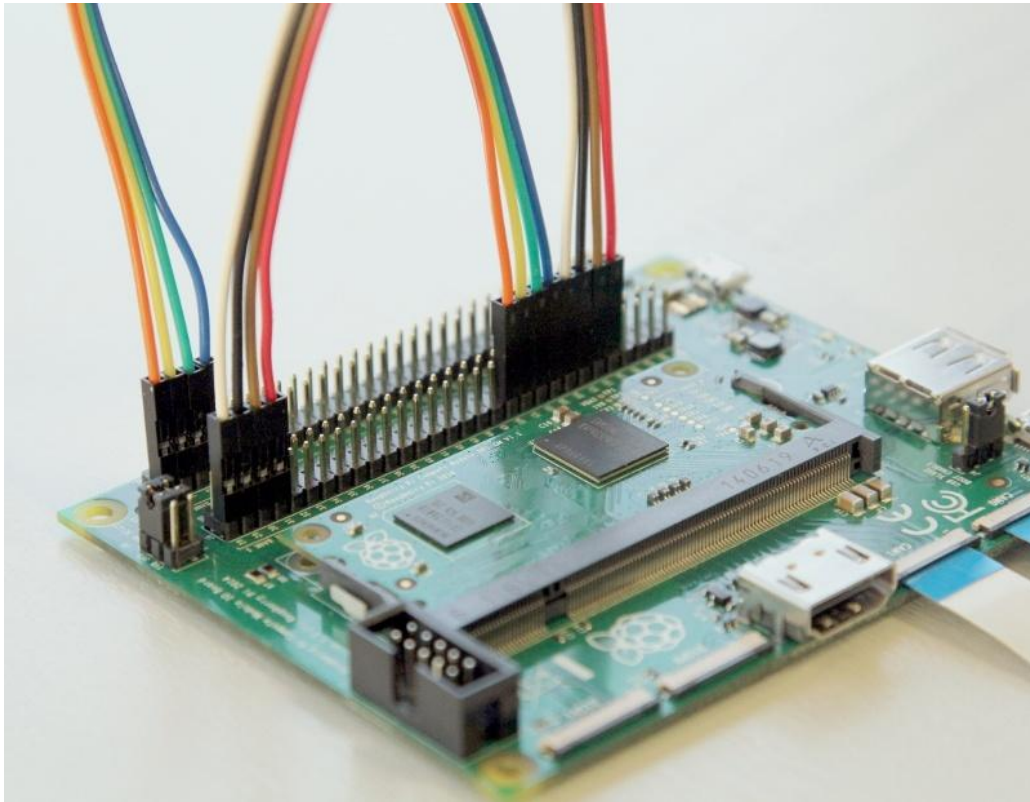


1. Attach CD1_SDA (J6 pin 37) to GPIO0 (J5 pin 1).
2. Attach CD1_SCL (J6 pin 39) to GPIO1 (J5 pin 3).
3. Attach CAM1_IO1 (J6 pin 41) to GPIO2 (J5 pin 5).
4. Attach CAM1_IO0 (J6 pin 43) to GPIO3 (J5 pin 7).

enable cam1 only

- `$sudo dtc -I dts -O dtb -o /boot/dt-blob.bin dt-blob-cam1.dts`
- `$sudo reboot`

4.1.2 use cam0 and cam1 dual camera



1. Attach CD0_SDA (J6 pin 45) to GPIO28 (J6 pin 1).
2. Attach CD0_SCL (J6 pin 47) to GPIO29 (J6 pin 3).
3. Attach CAM0_IO1 (J6 pin 49) to GPIO30 (J6 pin 5).
4. Attach CAM0_IO0 (J6 pin 51) to GPIO31 (J6 pin 7).

enable dual cam

- `$sudo dtc -I dts -O dtb -o /boot/dt-blob.bin dt-blob-dualcam.dts`
- `$sudo reboot`

5. For Jetson Nano

5.1 Connection

WORK WITH JETSON NANO



Check video status

\$ ls /dev/video* #You'll see video0 and video1 as below picture

5.2 Download Config file

Get and install setting files

- `$ sudo git clone https://github.com/pibiger-tech/picam-imx219`
- `$ cd PICAM-IMX219-FOV90`
- `$ sudo cp camera_overrides.isp /var/nvidia/nvcam/settings/`
- `$ sudo chmod 664 /var/nvidia/nvcam/settings/camera_overrides.isp`
- `$ sudo chown root:root /var/nvidia/nvcam/settings/camera_overrides.isp`

Get video0 working

```
$ DISPLAY=:0.0 gst-launch-1.0 nvarguscamerasrc
sensor-id=0 ! 'video/x-raw(memory:NVMM), width=3280, height=2464,
format=(string)NV12, framerate=(fraction)20/1' ! nvoverlaysink -e
```

Get video1 working

```
$ DISPLAY=:0.0 gst-launch-1.0 nvarguscamerasrc
sensor-id=1 ! 'video/x-raw(memory:NVMM), width=3280, height=2464,
format=(string)NV12, framerate=(fraction)20/1' ! nvoverlaysink -e
```