Raspberry Pi and IMX283 and IMX477 CSI-2 cameras - How To

Explains how to use IMX283 and IMX477 CSI-2 cameras with Raspberry Pi computers

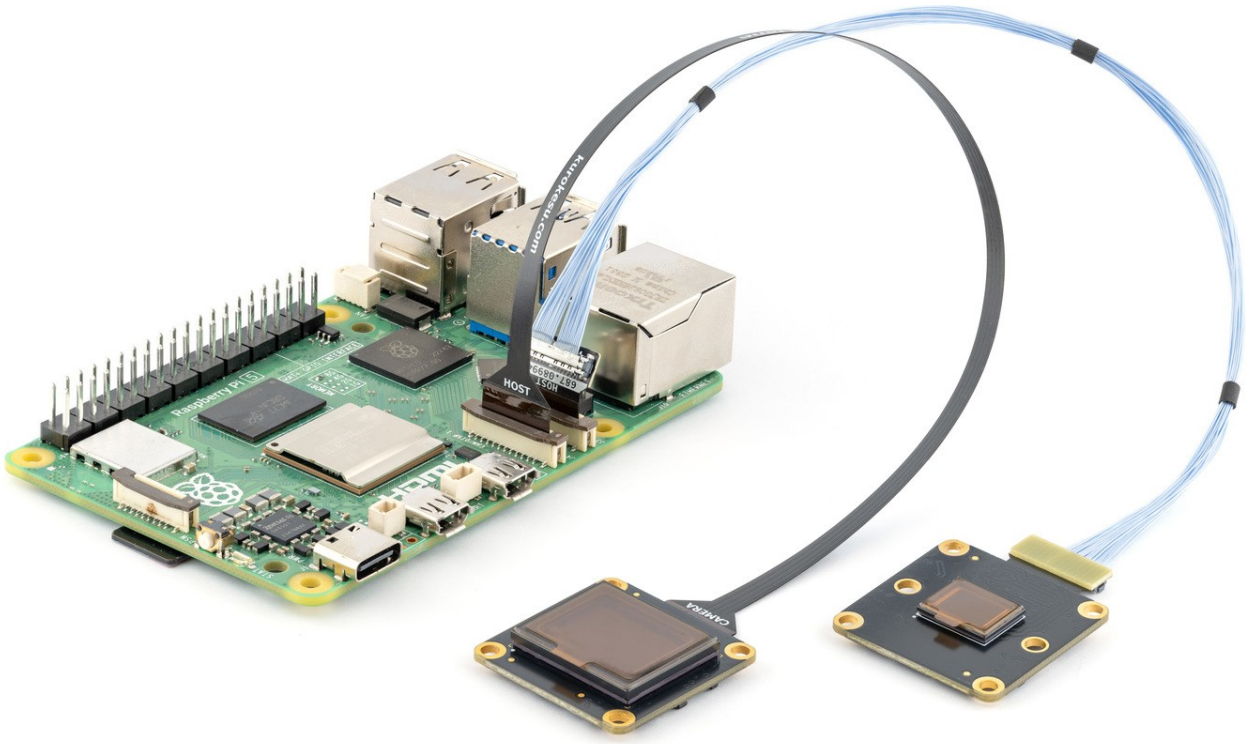
- Raspberry Pi5 (and CM5) Bookworm

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Prepare SD card

- Device: Raspberry Pi 5 (Raspberry Pi 5, 500, and Compute Module 5)
- OS: Raspberry Pi OS (64-bit) (tested with release 2025-05-13)

Connect CSI2 camera



For demonstration purposes we have connected both IMX282 and IMX477 to a the single host.

Using 2 compact 4 lane cables 687.0812.N20A Slim CSI2 FFC and 687.089MC1A Micro coaxial.

OS Prepare

Login to your Raspberry device and update it first.

```
sudo apt update
sudo apt upgrade -y
```

IMX283

> IMX283 sensor can function only with 4 CSI2 lanes. Make sure selected CAM1 port 4 lanes. CAM0 has only 2 lanes!

> For CAM1 and RPI Compute module (CM5) - do not forget to fit 2 jumpers

Camera 283C-CSI-x

Setup camera

Edit config file:

```
sudo nano /boot/firmware/config.txt
# camera_auto_detect=1 --- Find camera_auto_detect=1 and comment it out.

# Paste these lines at the end of the config file
dtoverlay=imx283,cam1
camera_auto_detect=0
```

Reboot

Test camera

Check if camera is detected

```
rpicam-hello --list-cameras

Available cameras
-----------------
0 : imx283 [5472x3648 12-bit RGGB] (/base/axi/pcie@1000120000/rp1/i2c@70000/imx283@1a)
    Modes: 'SRGGB10_CSI2P' : 5472x3648 [18.31 fps - (0, 0)/5472x3648 crop]
           'SRGGB12_CSI2P' : 1824x1216 [49.60 fps - (0, 0)/5472x3648
crop]
                             2736x1824 [36.17 fps - (0, 0)/5472x3648
crop]
```

```
5472x3648 [18.31 fps - (0, 0)/5472x3648 crop]
```

Capture picture to /tmp/test.jpg

```
rpicam-jpeg -o /tmp/test.jpg -n

[0:00:37.385658272] [1813]  INFO Camera camera_manager.cpp:326 libcamera v0.5.1+100-e53bdf1f
[0:00:37.392611606] [1816]  INFO RPI pisp.cpp:720 libpisp version v1.2.1 981977ff21f3 29-04-
2025 (14:13:50)
[0:00:37.403498439] [1816]  INFO RPI pisp.cpp:1179 Registered camera
/base/axi/pcie@1000120000/rp1/i2c@70000/imx283@1a to CFE device /dev/media0 and ISP device
/dev/media1 using PiSP variant BCM2712_D0
Mode selection for 2736:1824:12:P
    SRGGB10_CSI2P,5472x3648/0 - Score: 2140
    SRGGB12_CSI2P,1824x1216/0 - Score: 3040
    SRGGB12_CSI2P,2736x1824/0 - Score: 0
    SRGGB12_CSI2P,5472x3648/0 - Score: 1140
Stream configuration adjusted
[0:00:37.549741050] [1813]  INFO Camera camera.cpp:1205 configuring streams: (0) 2736x1824-
YUV420/sYCC (1) 2736x1824-RGGB_PISP_COMP1/RAW
[0:00:37.549825717] [1816]  INFO RPI pisp.cpp:1483 Sensor:
/base/axi/pcie@1000120000/rp1/i2c@70000/imx283@1a - Selected sensor format: 2736x1824-
SRGGB12_1X12 - Selected CFE format: 2736x1824-PC1R
[0:00:37.549942254] [1816]  INFO IPARPI ipa_base.cpp:610 Adjusting mode minimum line length
from 6.62us to 7.20us because of ISP constraints.
Mode selection for 5472:3648:12:P
    SRGGB10_CSI2P,5472x3648/0 - Score: 1000
    SRGGB12_CSI2P,1824x1216/0 - Score: 12160
    SRGGB12_CSI2P,2736x1824/0 - Score: 9120
    SRGGB12_CSI2P,5472x3648/0 - Score: 0
Stream configuration adjusted
[0:00:42.588051603] [1813]  INFO Camera camera.cpp:1205 configuring streams: (0) 5472x3648-
YUV420/sYCC (1) 5472x3648-RGGB_PISP_COMP1/RAW
[0:00:42.594387103] [1816]  INFO RPI pisp.cpp:1483 Sensor:
/base/axi/pcie@1000120000/rp1/i2c@70000/imx283@1a - Selected sensor format: 5472x3648-
SRGGB12_1X12 - Selected CFE format: 5472x3648-PC1R
[0:00:42.594502936] [1816]  INFO IPARPI ipa_base.cpp:610 Adjusting mode minimum line length
from 12.32us to 14.40us because of ISP constraints.
Still capture image received
```

IMX477

> RPI5 CAM1 port has CSI2 MIPI 4 lanes, CAM0 - has 2 lanes. For higher performance connect camera to CAM1 port.

> For CAM1 and RPI Compute module (CM5) - do not forget to fit 2 jumpers

Camera 477x-CSI-M12x

Setup camera

Edit config file:

```
sudo nano /boot/firmware/config.txt
# camera_auto_detect=1 --- Find camera_auto_detect=1 and comment it out.

# Paste these lines at the end of the config file
dtoverlay=imx477,cam1
camera_auto_detect=0
```

Reboot

```
rpicam-hello --list-cameras

Available cameras
-----------------
0 : imx477 [4056x3040 12-bit RGGB] (/base/axi/pcie@1000120000/rp1/i2c@70000/imx477@1a)
    Modes: 'SRGGB10_CSI2P' : 1332x990 [120.05 fps - (696, 528)/2664x1980 crop]
           'SRGGB12_CSI2P' : 2028x1080 [50.03 fps - (0, 440)/4056x2160
crop]
                             2028x1520 [40.01 fps - (0, 0)/4056x3040
crop]
                             4056x3040 [10.00 fps - (0, 0)/4056x3040 crop]
```

Capture picture to /tmp/test.jpg

```
rpicam-jpeg -o /tmp/test.jpg -n
```

```
[0:02:17.859446029] [1807]  INFO Camera camera_manager.cpp:326 libcamera v0.5.1+100-e53bdf1f
[0:02:17.869907952] [1810]  INFO RPI pisp.cpp:720 libpisp version v1.2.1 981977ff21f3 29-04-2025 (14:13:50)
[0:02:17.884499792] [1810]  INFO RPI pisp.cpp:1179 Registered camera /base/axi/pcie@1000120000/rp1/i2c@70000/imx477@1a to CFE device /dev/media3 and ISP device /dev/media0 using PiSP variant BCM2712_D0
Mode selection for 2028:1520:12:P
    SRGGB10_CSI2P,1332x990/0 - Score: 3456.22
    SRGGB12_CSI2P,2028x1080/0 - Score: 1083.84
    SRGGB12_CSI2P,2028x1520/0 - Score: 0
    SRGGB12_CSI2P,4056x3040/0 - Score: 887
Stream configuration adjusted
[0:02:18.029377668] [1807]  INFO Camera camera.cpp:1205 configuring streams: (0) 2028x1520-YUV420/sYCC (1) 2028x1520-BGGR_PISP_COMP1/RAW
[0:02:18.029506115] [1810]  INFO RPI pisp.cpp:1483 Sensor: /base/axi/pcie@1000120000/rp1/i2c@70000/imx477@1a - Selected sensor format: 2028x1520-SBGGR12_1X12 - Selected CFE format: 2028x1520-PC1B
Mode selection for 4056:3040:12:P
    SRGGB10_CSI2P,1332x990/0 - Score: 10552.2
    SRGGB12_CSI2P,2028x1080/0 - Score: 8179.84
    SRGGB12_CSI2P,2028x1520/0 - Score: 7096
    SRGGB12_CSI2P,4056x3040/0 - Score: 0
Stream configuration adjusted
[0:02:23.062382996] [1807]  INFO Camera camera.cpp:1205 configuring streams: (0) 4056x3040-YUV420/sYCC (1) 4056x3040-BGGR_PISP_COMP1/RAW
[0:02:23.069631253] [1810]  INFO RPI pisp.cpp:1483 Sensor: /base/axi/pcie@1000120000/rp1/i2c@70000/imx477@1a - Selected sensor format: 4056x3040-SBGGR12_1X12 - Selected CFE format: 4056x3040-PC1B
Still capture image received
```