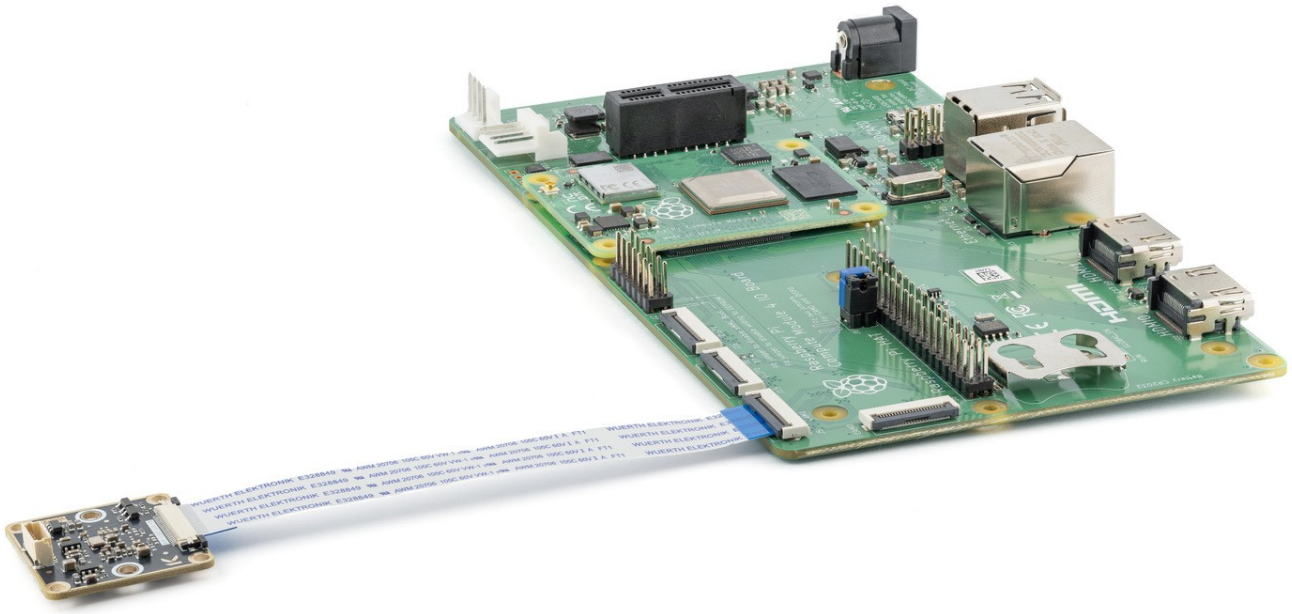
Raspberry Pi 4 CM Bookworm

Prepare SD card

- Device: Raspberry Pi 4 (Models B, 400, and compute Modules 4, 4S)
- OS: Raspberry Pi OS (64-bit) (tested with release 2025-07-13)

Connect CSI2 camera



> In this picture camera is connected to cam1 port.

OS Prepare

Login to your Raspberry device and update it first.

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

AR0234

Camera 234x-CSI-M12x

> Install AR0234 kernel driver, follow instructions on github. This will take some time.

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=ar0234,cam1
camera_auto_detect=0
```

> Reboot

Test camera

Check if camera is detected

```
rpicam-hello --list-cameras

Available cameras
-----------------
0 : ar0234 [1920x1200 10-bit GRBG] (/base/soc/i2c0mux/i2c@1/ar0234@10)
    Modes: 'SGRBG10_CSI2P' : 1280x800 [90.11 fps - (314, 190)/1280x800
crop]
                             1920x1200 [60.47 fps - (0, 0)/1920x1200 crop]
           'SGRBG8' : 1280x800 [90.11 fps - (314, 190)/1280x800 crop]
                      1920x1200 [60.47 fps - (0, 0)/1920x1200 crop]
```

Capture picture to /tmp/test.jpg

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

[0:01:49.868191487] [1657]  INFO Camera camera_manager.cpp:326 libcamera v0.0.0+5529-1565507d
```

```
[0:01:49.909305340] [1658]  WARN RPiSdn sdn.cpp:40 Using legacy SDN tuning - please consider moving SDN inside rpi.denoise
[0:01:49.911981503] [1658]  INFO RPI vc4.cpp:447 Registered camera /base/soc/i2c0mux/i2c@1/ar0234@10 to Unicam device /dev/media3 and ISP device /dev/media1
[0:01:49.912148873] [1658]  INFO RPI pipeline_base.cpp:1121 Using configuration file '/usr/local/share/libcamera/pipeline/rpi/vc4/rpi_apps.yaml'
Mode selection for 960:600:12:P
    SGRBG10_CSI2P,1280x800/0 - Score: 1130
    SGRBG10_CSI2P,1920x1200/0 - Score: 1390
    SGRBG8,1280x800/0 - Score: 2130
    SGRBG8,1920x1200/0 - Score: 2390
Stream configuration adjusted
[0:01:49.914289833] [1657]  INFO Camera camera.cpp:1205 configuring streams: (0) 960x600-YUV420 (1) 1280x800-SGRBG10_CSI2P
[0:01:49.914856314] [1658]  INFO RPI vc4.cpp:622 Sensor: /base/soc/i2c0mux/i2c@1/ar0234@10 - Selected sensor format: 1280x800-SGRBG10_1X10 - Selected unicam format: 1280x800-pgAA
Mode selection for 1920:1200:12:P
    SGRBG10_CSI2P,1280x800/0 - Score: 3080
    SGRBG10_CSI2P,1920x1200/0 - Score: 1000
    SGRBG8,1280x800/0 - Score: 4080
    SGRBG8,1920x1200/0 - Score: 2000
Stream configuration adjusted
[0:01:55.234584045] [1657]  INFO Camera camera.cpp:1205 configuring streams: (0) 1920x1200-YUV420 (1) 1920x1200-SGRBG10_CSI2P
[0:01:55.238675782] [1658]  INFO RPI vc4.cpp:622 Sensor: /base/soc/i2c0mux/i2c@1/ar0234@10 - Selected sensor format: 1920x1200-SGRBG10_1X10 - Selected unicam format: 1920x1200-pgAA
Still capture image received
```

AR0822

Camera 822x-CSI-M12x

> Install AR0822 kernel driver, follow instructions on github. This will take some time.

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=ar0822,cam1
camera_auto_detect=0
```

Reboot

Test camera

Check if camera is detected

```
rpicam-hello --list-cameras

Available cameras
-----------------
0 : ar0822 [3840x2160 12-bit GRBG] (/base/soc/i2c0mux/i2c@1/ar0822@10)
    Modes: 'SGRBG10_CSI2P' : 1920x1080 [59.96 fps - (0, 0)/3840x2160
crop]
                             3840x2160 [41.11 fps - (0, 0)/3840x2160 crop]
           'SGRBG12_CSI2P' : 1920x1080 [59.97 fps - (0, 0)/3840x2160
crop]
                             3840x2160 [34.79 fps - (0, 0)/3840x2160 crop]
```

Capture picture to /tmp/test.jpg

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

[0:00:59.855859555] [1653]  INFO Camera camera_manager.cpp:326 libcamera v0.0.0+5543-710ba35b
[0:00:59.886255555] [1654]  WARN RPiSdn sdn.cpp:40 Using legacy SDN tuning - please consider
moving SDN inside rpi.denoise
[0:00:59.886959036] [1654]  WARN RPiAlsc alsc.cpp:171 no luminance table - assume unity
everywhere
[0:00:59.888168759] [1654]  INFO RPI vc4.cpp:447 Registered camera
/base/soc/i2c0mux/i2c@1/ar0822@10 to Unicam device /dev/media1 and ISP device /dev/media2
[0:00:59.888231999] [1654]  INFO RPI pipeline_base.cpp:1121 Using configuration file
'/usr/local/share/libcamera/pipeline/rpi/vc4/rpi_apps.yaml'
Mode selection for 1920:1080:12:P
    SGRBG10_CSI2P,1920x1080/0 - Score: 1000
    SGRBG10_CSI2P,3840x2160/0 - Score: 1750
    SGRBG12_CSI2P,1920x1080/0 - Score: 0
```

```
    SGRBG12_CSI2P,3840x2160/0 - Score: 750
Stream configuration adjusted
[0:01:00.144875759] [1653]  INFO Camera camera.cpp:1205 configuring streams: (0) 1920x1080-YUV420 (1) 1920x1080-SGRBG12_CSI2P
[0:01:00.145326036] [1654]  INFO RPI vc4.cpp:622 Sensor: /base/soc/i2c0mux/i2c@1/ar0822@10 - Selected sensor format: 1920x1080-SGRBG12_1X12 - Selected unicam format: 1920x1080-pgCC
[0:01:00.269357907] [1654]  INFO V4L2 v4l2_videodevice.cpp:1801 /dev/video0[13:cap]: Zero sequence expected for first frame (got 1)
[0:01:00.602825018] [1654]  INFO V4L2 v4l2_videodevice.cpp:1801 /dev/video1[14:cap]: Zero sequence expected for first frame (got 11)
Mode selection for 3840:2160:12:P
    SGRBG10_CSI2P,1920x1080/0 - Score: 7000
    SGRBG10_CSI2P,3840x2160/0 - Score: 1000
    SGRBG12_CSI2P,1920x1080/0 - Score: 6000
    SGRBG12_CSI2P,3840x2160/0 - Score: 0
Stream configuration adjusted
[0:01:05.274603885] [1653]  INFO Camera camera.cpp:1205 configuring streams: (0) 3840x2160-YUV420 (1) 3840x2160-SGRBG12_CSI2P
[0:01:05.282028681] [1654]  INFO RPI vc4.cpp:622 Sensor: /base/soc/i2c0mux/i2c@1/ar0822@10 - Selected sensor format: 3840x2160-SGRBG12_1X12 - Selected unicam format: 3840x2160-pgCC
Still capture image received
```

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