Raspberry Pi RPI-CAM-V2

Raspberry Pi Camera Module V2 User Manual

Model: RPI-CAM-V2

1. Introduction

The Raspberry Pi Camera Module V2 is a high-quality 8-megapixel Sony IMX219 image sensor custom-designed add-on board for Raspberry Pi. It is capable of taking still photographs and recording full 1080p30, 720p60, and 640x480p90 video. This module connects to the Raspberry Pi via a short flexible ribbon cable to the CSI (Camera Serial Interface) port. It is ideal for various projects, including home security, wildlife monitoring, and time-lapse photography.

Figure 1: Front view of the Raspberry Pi Camera Module V2 with its attached ribbon cable.

2. Package Contents

- Raspberry Pi Camera Module V2 (8 Megapixel)
- 15cm Flexible Ribbon Cable

3. Setup Guide

Follow these steps to properly connect your Camera Module V2 to your Raspberry Pi board.

1. **Prepare your Raspberry Pi:** Ensure your Raspberry Pi is powered off and disconnected from any power source.
2. **Locate the CSI Port:** On your Raspberry Pi board, locate the CSI (Camera Serial Interface) port. This is typically a long, narrow connector.

Figure 2: Rear view of the camera module, highlighting the ribbon cable connector.

3. **Open the CSI Port Latch:** Gently pull up the plastic latch on the CSI port. Do not force it, as it should open easily.
4. **Insert the Ribbon Cable:** Insert the ribbon cable from the camera module into the CSI port. Ensure the silver contacts on the ribbon cable are facing towards the CSI port latch (i.e., towards the DSI port on a Raspberry Pi 3/4, or towards the Ethernet port on a Raspberry Pi 2/B+).

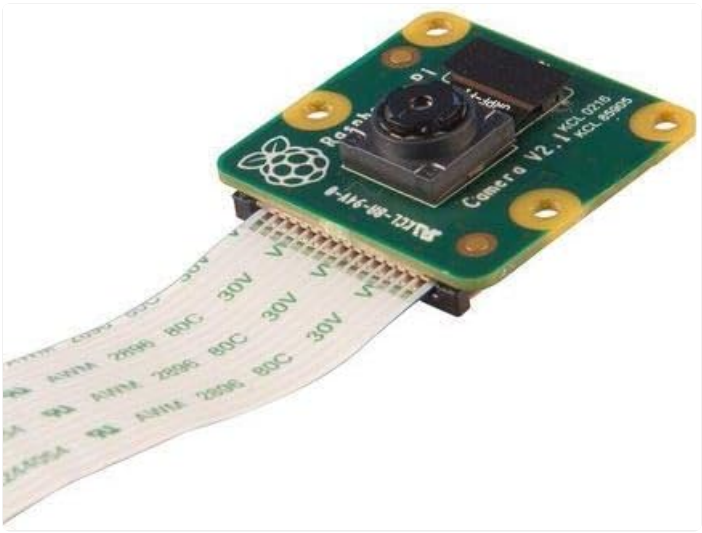


Figure 3: Side view illustrating the connection of the ribbon cable to the camera module.

5. **Close the Latch:** Gently push down the plastic latch on the CSI port to secure the ribbon cable in place. Ensure the cable is firmly seated and straight.
6. **Power On:** Reconnect power to your Raspberry Pi.
7. **Enable Camera Interface:**
    - Boot your Raspberry Pi.
    - Open a terminal window.
    - Run sudo raspi-config.
    - Navigate to "Interface Options" -> "Camera" and enable it.
    - Reboot your Raspberry Pi when prompted.

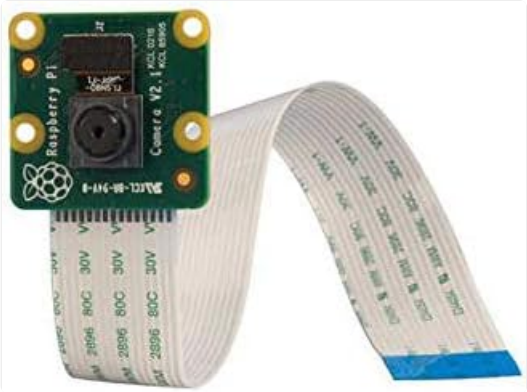


Figure 4: The camera module with its flexible ribbon cable, demonstrating its adaptability for various setups.

4. Operating Instructions

Once the camera module is connected and enabled, you can use various commands and applications to capture images and videos.

4.1. Basic Commands (Raspbian/Raspberry Pi OS)

- **Capture a still image:**

  ```
  raspistill -o image.jpg
  ```

  This command will capture an image and save it as 'image.jpg' in the current directory.

- **Record a video:**

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

  This command will record a 10-second (10000 milliseconds) video and save it as 'video.h264'.

- **Preview the camera feed:**

  ```
  raspistill -t 0
  ```

  This command will display a live preview from the camera until you press Ctrl+C.

4.2. Advanced Usage

For more advanced control, consider using the Picamera Python library, which offers extensive functionality for image and video capture, including custom resolutions, frame rates, and effects. Many third-party applications like OctoPrint (for 3D printer monitoring) and MotionEyeOS (for surveillance) also integrate with the Raspberry Pi Camera Module.

5. Maintenance

The Raspberry Pi Camera Module V2 requires minimal maintenance. Follow these guidelines to ensure its longevity:

- **Handle with Care:** The camera module and its ribbon cable are delicate. Avoid bending the ribbon cable sharply or applying excessive force to the module.
- **Keep Lens Clean:** Use a soft, lint-free cloth specifically designed for optical lenses to gently clean the camera lens if it becomes dusty or smudged. Do not use abrasive materials or harsh chemicals.
- **Storage:** When not in use, store the camera module in an anti-static bag or a protective enclosure to prevent dust accumulation and static discharge damage.
- **Environmental Conditions:** Avoid exposing the module to extreme temperatures, high humidity, or direct sunlight for prolonged periods.

6. Troubleshooting

Problem	Possible Cause	Solution
Camera not detected / No output	Ribbon cable incorrectly connected. Camera interface not enabled in raspi-config. Faulty ribbon cable or camera module.	Ensure ribbon cable is fully inserted and correctly oriented (silver contacts facing the latch). Run sudo raspi-config, go to Interface Options -> Camera, and enable it. Reboot. Try a different ribbon cable or test the module on another Raspberry Pi if available.
Poor image quality / Out of focus	Dirty lens. Incorrect focus (for adjustable lens models). Insufficient lighting.	Clean the lens gently with a microfibre cloth. The V2 module has a fixed focus lens, but ensure the subject is within the optimal focal range. Provide adequate lighting for your scene.
"Out of memory" errors	GPU memory split is too low.	Run sudo raspi-config, go to Performance Options -> GPU Memory, and increase the value (e.g., to 128MB or higher). Reboot.

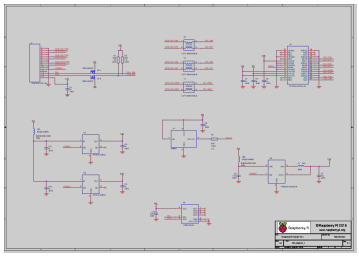
7. Specifications

Feature	Detail
Sensor	Sony IMX219
Resolution	8 Megapixels
Still Image Resolution	3280 x 2464 pixels
Video Modes	1080p30, 720p60, 640x480p90
Lens	Fixed Focus
Interface	CSI (Camera Serial Interface)
Dimensions	0.98 x 0.94 x 0.35 inches (approx. 25 x 24 x 9 mm)
Weight	0.106 ounces (approx. 3 grams)
Included Components	15cm flexible ribbon cable, Sony IMX219 image sensor, fixed-focus lens

8. Warranty and Support

The Raspberry Pi Camera Module V2 is designed and manufactured by Raspberry Pi. For specific warranty information, please refer to the official Raspberry Pi website or the retailer from whom you purchased the product.
For technical support, community forums, and extensive documentation, please visit the official Raspberry Pi documentation website: raspberrypi.com/documentation/computers/camera.html
Community support is also available through various online forums and communities dedicated to Raspberry Pi projects.

Documents - Raspberry Pi – RPI-CAM-V2



[pdf] Datasheet

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