Arducam Arducam Pi

Arducam 16MP Autofocus Camera Module for Raspberry Pi User Manual

Model: Arducam Pi

1. Introduction

This manual provides detailed instructions for the installation, operation, and maintenance of the Arducam 16MP Autofocus Camera Module for Raspberry Pi. This camera module features an IMX519 sensor, offering 16 megapixels of resolution and autofocus capabilities, making it suitable for various applications with Raspberry Pi and Jetson Developer Kit boards.

Image 1.1: Arducam 16MP Autofocus Camera Module with Raspberry Pi.

2. Package Contents

Verify that all items listed below are included in your package. If any components are missing or damaged, please contact Arducam support.

- Camera board with IMX519 sensor and autofocus lens
- FPC cable

- Camera housing (ABS case)
- Manual (this document)

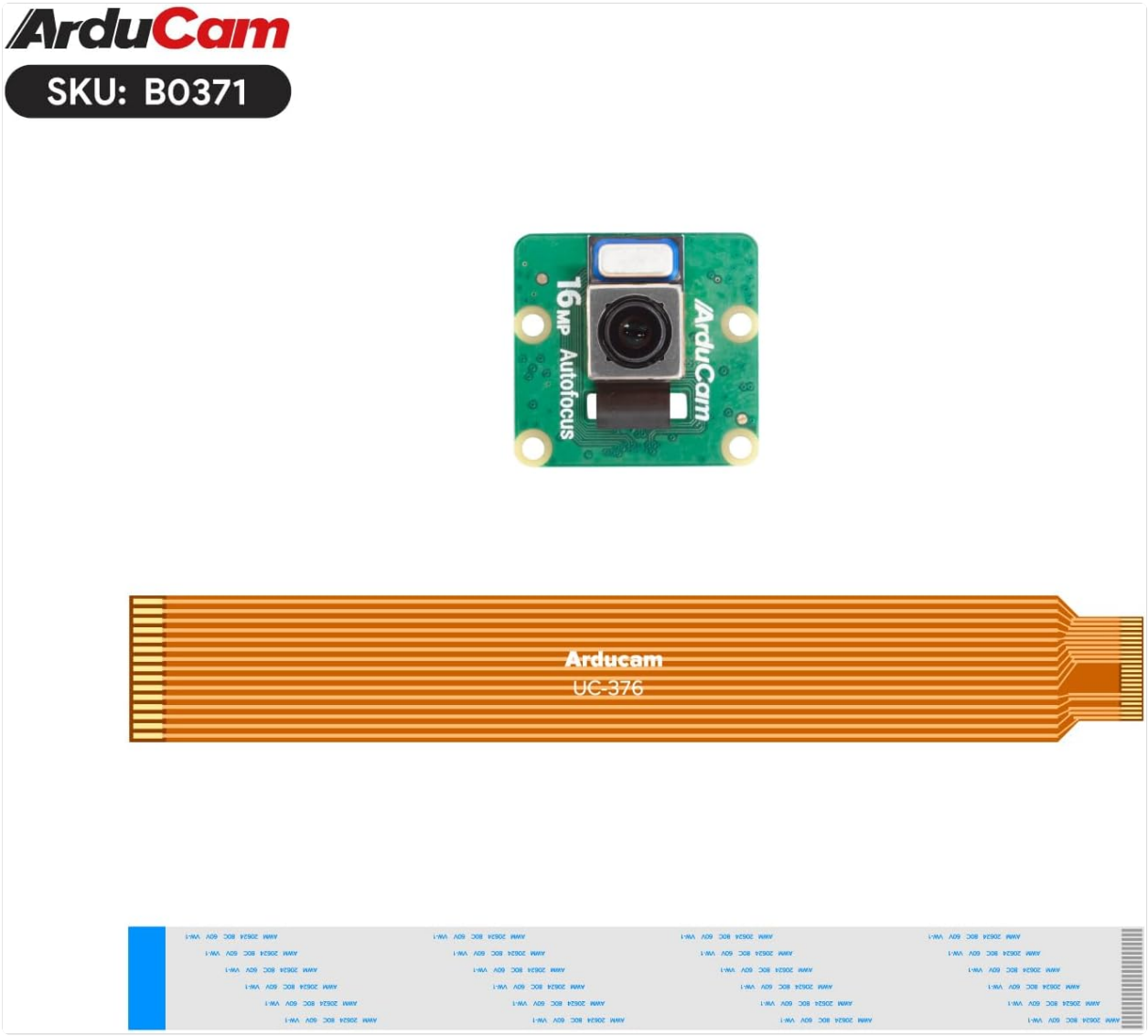


Image 2.1: Contents of the Arducam 16MP Autofocus Camera Module package, including the camera board, FPC cable, and ABS housing.

3. Key Features

- **16 Megapixel Resolution:** Features an IMX519 sensor with 4656 x 3496 pixel resolution.
- **Autofocus Lens:** Integrated autofocus motor for quick focusing, with a minimum focus distance of 10cm.
- **High-Quality Video:** Supports 1080p Full HD video at up to 30 frames per second and 720p HD video at up to 60 frames per second.
- **Wide Compatibility:** Compatible with all Raspberry Pi models featuring a MIPI/CSI interface and Jetson Developer Kit.
- **Compact Design:** Similar form factor to Raspberry Pi Camera Module V3/V2/V1.
- **Protective Housing:** Includes an ABS case with an integrated 1/4-inch tripod mounting hole.

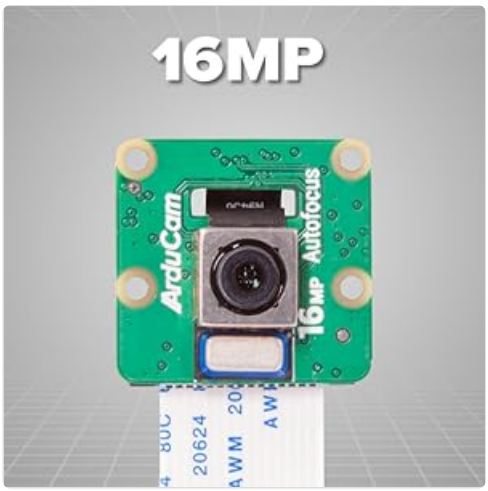


Image 3.1: Front view of the 16MP camera module.

Image 3.2: Close-up of the autofocus lens mechanism.

Image 3.3: The camera module housed within its protective ABS shell.

4. Setup Instructions

4.1. Hardware Connection

1. **Prepare your Raspberry Pi:** Ensure your Raspberry Pi is powered off before connecting the camera module.
2. **Connect the FPC Cable:** Gently lift the plastic clip on the CSI camera port of your Raspberry Pi. Insert the FPC cable with the silver contacts facing the CSI port. Ensure the cable is fully seated and then push the clip back down to secure it.

3. **Attach the Camera Module:** Connect the other end of the FPC cable to the camera module's connector.
4. **Install ABS Case (Optional):** If using the provided ABS case, carefully place the camera module into the bottom part of the case, then snap the top cover into place. The case provides protection and a tripod mounting point.

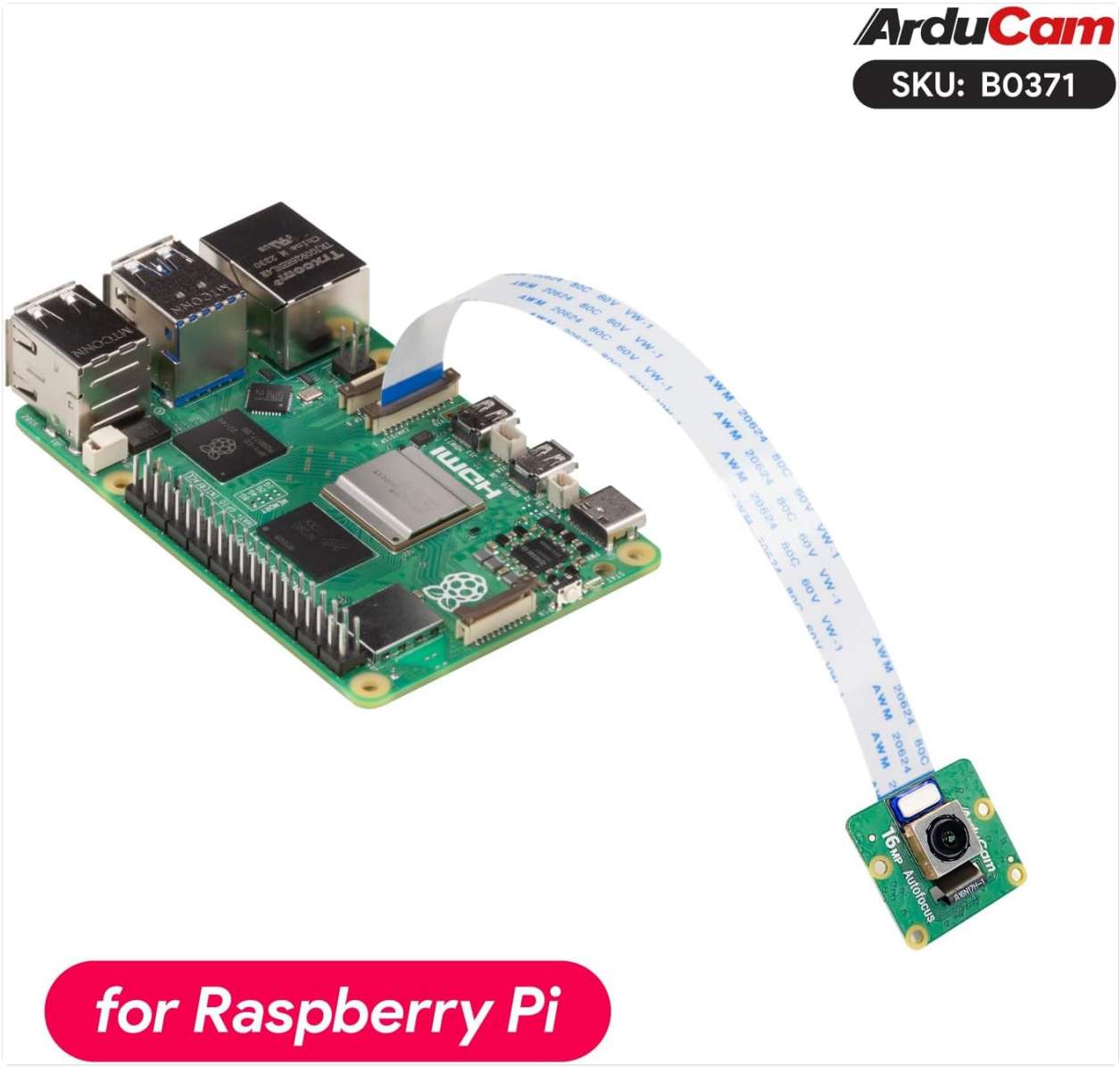


Image 4.1: Arducam 16MP camera module connected to a Raspberry Pi via the FPC cable.

4.2. Software Configuration

The Arducam 16MP camera module requires specific driver installation and script configuration. It is designed for Raspberry Pi OS Bullseye and does not support Raspbian Buster or older versions. For Jetson Nano, specific guides are available.

1. **Operating System:** Ensure your Raspberry Pi is running Raspberry Pi OS Bullseye (64-bit recommended for RPi 3B+).
2. **Driver Installation:** Follow the official Arducam guide for IMX519 driver installation. An automatic installation script is available for beginners. Refer to the Arducam documentation for the latest instructions.
3. **PiCamera2 Library:** The camera works with the PiCamera2 library. Ensure it is installed and configured correctly.

4. **Jetson Nano Compatibility:** For Jetson Nano users, refer to the specific Arducam guide for Jetson Nano setup.

Image 4.2: Arducam 16MP camera module connected to an NVIDIA Jetson Developer Kit.

5. Operating Instructions

5.1. Capturing Images and Videos

Once the camera is set up and drivers are installed, you can use the PiCamera2 library or command-line tools to capture images and videos.

- **Image Capture:** Use appropriate commands or Python scripts with PiCamera2 to capture still images at 16MP resolution.
- **Video Recording:** Record videos in 1080p at 30fps or 720p at 60fps.

5.2. Autofocus Functionality

The integrated autofocus motor allows the camera to quickly adjust its focus. This feature is particularly useful for applications requiring clear images at varying distances, from close-up objects (minimum 10cm) to infinity.

Image 5.1: Detailed view of the autofocus lens on the Arducam 16MP camera module.

ArduCam

SKU: B0371

Image 5.2: Examples of image capture demonstrating the camera's capabilities in different scenarios, including macro and landscape shots.

6. Maintenance

To ensure the longevity and optimal performance of your Arducam 16MP Autofocus Camera Module, follow these maintenance guidelines:

- **Cleaning the Lens:** Use a soft, lint-free cloth specifically designed for optics to gently clean the lens. Avoid abrasive materials or harsh chemicals.
- **Handling:** Always handle the camera module by its edges to avoid touching the lens or electronic components.
- **Storage:** Store the camera in a dry, dust-free environment when not in use. The included ABS case can provide additional protection.
- **Environmental Conditions:** Avoid exposing the camera to extreme temperatures, high humidity, or direct sunlight for extended periods.

7. Troubleshooting

If you encounter issues with your Arducam 16MP Autofocus Camera Module, refer to the following common problems and solutions:

- **Camera Not Detected:**

    - Ensure the FPC cable is correctly and securely connected to both the Raspberry Pi and the camera module.
    - Verify that the correct drivers are installed for your operating system (Raspberry Pi OS Bullseye is required).
    - Check if the camera interface is enabled in your Raspberry Pi configuration (e.g., via `raspi-config`).
- **Fuzzy or Out-of-Focus Images:**
    - Ensure the autofocus mechanism is functioning. Some applications or scripts might require specific commands to trigger autofocus.
    - Check for any physical obstructions or smudges on the lens.
- **Compatibility Issues with Third-Party OS:**
    - The camera is fully compatible with Octoprint. For other third-party OS like Motioneye, Klipper, and Octolapse, official support may not yet be available. Refer to Arducam's official documentation or community forums for potential workarounds.
- **Performance Issues (e.g., low frame rate):**
    - Ensure your Raspberry Pi has sufficient power and resources.
    - Check for background processes that might be consuming CPU or memory.

If these steps do not resolve your issue, please contact Arducam Support for further assistance. They can provide manual configuration scripts or remote support if needed.

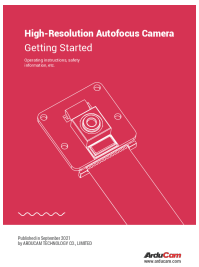
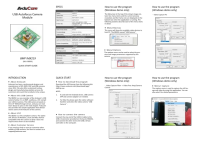
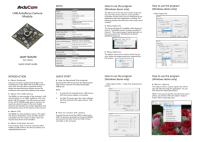
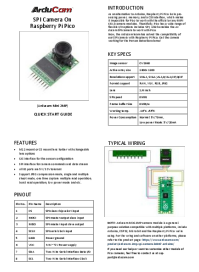
8. Specifications

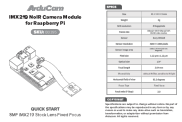
Feature	Specification
Brand	Arducam
Model Number	Arducam Pi
Sensor	IMX519
Resolution	16 Megapixels (4656 x 3496)
Autofocus	Yes
Minimum Focus Distance	10 cm
Video Capture Resolution	1080p (30fps), 720p (60fps)
Field of View	80 degrees
Interface	MIPI/CSI
Dimensions (Package)	2.44 x 2.05 x 1.06 inches
Item Weight	0.634 ounces
Color	Black, Green
Special Features	Lightweight, Low Light

9. Warranty and Support

For technical support, warranty information, or any inquiries regarding your Arducam 16MP Autofocus Camera Module, please contact Arducam directly. Detailed support resources, including guides and forums, are available on the official Arducam website.
If there is any issue with the camera, feel free to contact Arducam, and they will provide technical support.

Related Documents - Arducam Pi

	Arducam High-Resolution Autofocus Camera: Getting Started Guide A comprehensive guide to installing and operating the Arducam High-Resolution Autofocus Camera, including safety instructions and compatibility information with Raspberry Pi.
	Arducam B0292 8MP USB Autofocus Camera Module Quick Start Guide Quick start guide for the Arducam B0292, an 8MP USB autofocus camera module with IMX219 sensor. Includes specifications, setup instructions, and software usage details for Windows.
	ArduCam 16MP Autofocus USB Camera Module (IMX298, B0290) Quick Start Guide ArduCam's Quick Start Guide for the 16MP Autofocus USB Camera Module (Model B0290) featuring the IMX298 sensor. Learn about its specifications, setup, and usage with Windows.
	Arducam Mini 2MP SPI Camera for Raspberry Pi Pico Quick Start Guide A quick start guide for the Arducam Mini 2MP SPI camera module, detailing its features, specifications, pinout, and setup instructions for use with the Raspberry Pi Pico.
	ArduCAM-Mini-5MP-Plus OV5642 Camera Module User Guide User guide for the ArduCAM-Mini-5MP-Plus OV5642 Camera Module, detailing its features, specifications, pin definitions, functions, and mechanical dimensions. This 5MP SPI camera module is compatible with various platforms like Arduino and Raspberry Pi.

	[Arducam IMX219 NoIR Camera Module for Raspberry Pi - Quick Start Guide] Quick start guide for the Arducam 8MP IMX219 NoIR Camera Module for Raspberry Pi, detailing package contents, camera connection, software setup, and operation using libcamera-still.