



OBISP 2MP HDR Camera Module



2MP AR0230

(SKU:B0247)

QUICKS TART GUIDE

INTRODUCTION

• About Arducam

Arducam has been a professional designer and manufacturer of SPI, MIPI, DVP and USB cameras since 2012. We also offer customized turnkey design and manufacturing solution services for customers who want their products to be unique.

• About This OBISP Camera

Arducam 2MP OBISP MIPI camera features onboard ISP (Image Signal Processor) with extraordinary highlight contrast HDR performance with upto 105dB dynamic range. It uses standard Raspberry pi zero 22pin MIPI CSI-2 interface, and works seamlessly on Raspberry pi, Jetson Nano, and can also be ported to other platforms which compliant to MIPI CSI-2 interface protocol.

• About Customer Service

If you need our help or want to customize other models of USB cameras, feel free to contact us at support@arducam.com.

Website: <https://www.arducam.com/docs/arducam-obisp-mipi-camera-module/>

• List the Video Device

The OBISP MIPI camera modules are emulated as the standard video device under `/dev/video*` node, so you can use the `ls` command for listing the contents in the `/dev` folder.

```
ls /dev/video0
```

• List the available video modes

Since the camera module is V4L2 compliant, you can use the V4L2 controls to list the supported color space, resolutions, and frame rates.

```
v4l2-ctl --list-formats-ext
```

If you run the commands without results, you might have to check the ribbon connection or install the drivers correctly, then reboot the Raspberry Pi.

3. Use the Camera with Supplied Command Line Applications (arducamstill)

```
arducamstill -t 0
```

```
arducamstill -o test.jpg -w 4160 -h 3120
```

```
arducamstill -t 0 -e h264
```

4. Control Image Settings with Linux Webcam Software QtCam

• Download the Arducam-QtCam

```
wget https://github.com/ArduCAM/Arducam_OBISP_MIPI_Camera_Module/releases/download/Arducam_QtCam/Arducam_QtCam.zip
```

• Unzip the downloaded file

```
sudo unzip Arducam_QtCam.zip
```

• Enter the folder

```
cd Arducam_QtCam/
```

• Alter the permissions

```
sudo chmod +x Arducam_QtCam
```

• Run the program

```
./Arducam_QtCam
```

SPECS

Image Sensor	2MP AR0230
Max. Resolution	1920 x 1080
Optical Format	1/2.7"
Lens Mount	M12 default, optional CS mount
Stock Lens FOV	Horizontal 70 degrees
Output Format	YUV422
Output Interface	2-Lane MIPI CSI-2
Max data rate	1.2Gbps/lane
Supported Resolution&Frame rate	1920x1080@30fps, 1280x720@30fps, 640x480@30fps
Support ISP Functions	AWB, AE, Flip, Mirror, Gamma, Sharpness, Saturation etc
Night Vision Ability	Optional with proper lens combination
Responsivity	4.0V /lux-sec
SNRmax	41dB
Dynamic Range	Max 105dB
Power Consumption	Max 300mA@3.3V
Board Size	40x40mm

Used on Raspberry Pi

1. Driver Installation

• Download the driver for OBISP MIPI camera

```
wget https://github.com/ArduCAM/Arducam_OBISP_MIPI_Camera_Module/archive/v1.0.tar.gz
```

• Extract the Archive files

```
tar -zxvf v1.0.tar.gz
```

• Enter the extracted folder

```
cd Arducam_OBISP_MIPI_Camera_Module-1.0/Release/
```

• Install the driver

```
./install_driver.sh
```

• Reboot the device

Press **y**, and then hit **Enter** to reboot.

2. Check and Test the Camera

After you've finished the hardware assembly and driver installation, you can test whether the camera is detected and working.

5. Play the Video Feed with VLC Media Player

• Open VLC with command line `vlc`, or click the icon to launch.

• Hit the **▶** (Play) button to call the open media window.

• In **Capture Device** >> **Device Selection** >> **Video device name**, select the camera video node.

• Hit **Advanced Options...** Button

• In **Advanced Options** window >> **Video input chroma format**, type **UYUV**.

• Type in the **width** and **height**, for example, **1920** and **1080**.

• Hit **OK** to save the settings and see the video feed.

Notice: VLC might not be able to support very high resolution.

Used on Jetson Nano

1. Driver Installation

• Check the Kernel Version

The driver package should match with your current kernel version, then you have to check your kernel version before downloading the corresponding driver package. Using `cat /etc/nv_tegra_release` command to determine the L4T release number. Using `uname -a` command to determine the kernel number.

• Download the Driver Package

Download the Arducam camera driver package for Jetson Nano from https://github.com/ArduCAM/MIPI_Camera/tree/master/Jetson/Jetvariety/driver. Please download the corresponding package mentioned above.

• Installation

Using the command below to install the Arducam driver package, reboot is required after installation.

```
sudo dpkg -i arducam-nvidia-l4t-kernel_4.9.140-32.3.1-20200314151719_arm64.deb
```

• Uninstallation

If you want to roll back to original Jetson Nano camera driver, just run the following command to uninstall the Arducam driver, a reboot is also required.

```
sudo dpkg -r arducam-nvidia-l4t-kernel
```

2. Check and Test the Camera

After you've finished the hardware assembly and driver installation, the following steps can help you diagnose to make sure the camera is detected and supported.

- List the video device

The OBISP MIPI camera modules are emulated as the standard video device under `/dev/video*` node, so you can use the `ls` command for listing the contents in the `/dev` folder.

```
ls /dev/video0
```

- List the available video modes

Since the camera module is V4L2 compliant, you can use the V4L2 controls to list the supported color space, resolutions, and frame rates. The results might vary from camera to camera (The screen shot is only apply for 13MP OBISP camera).

```
v4l2-ctl --list-formats-ext
```

If you run the commands without results, you might have to check the ribbon connection or install the drivers correctly, then reboot the Jetson Nano or Xavier NX board.

4. Live View the Video using OpenCV with Python

- Download the demo code

```
git clone https://github.com/ArduCAM/MIPI_Camera.git
cd MIPi_Camera/Jetson/Jetvariety/example
```

- Check the help message of the parameters


```
python arducam_displayer.py -d 0
```

- Run the Demo

```
python arducam_displayer.py
```

3. Play the Video Feed with VLC

Media Player

- Open VLC with command line `vlc`, or click the icon to launch.
- Hit the  (Play) button to call the open media window.
- In `Capture Device >> Device Selection >> Video device name`, select the camera video node.
- Hit `Advanced Options...` Button
- In `Advanced Options window >> Video input chroma format`, type `UYUV`.
- Type in the `width` and `height`, for example, `1920` and `1080`.

Notice: VLC might not be able to support video width or height larger than 4000.

- Hit `OK` to save the settings and see the video feed.
- Open `Adjustments and Effects >> v4l2 controls` property page, you can adjust the camera control parameters manually.

5. GStreamer Example

- GStreamer Server on Jetson

```
gst-launch-1.0 v4l2src device="/dev/video0" ! "video/x-raw, width=1920, height=1080, format=(string)UYVY" !
nvvidconv ! 'video/x-raw(memory:NVMM), format=(string)I420' ! omxh264enc profile=high cabac-entropy-coding=true insert-sps-pps=true iframeinterval=30 !
'video/x-h264, level=(string)4.2, stream-format=(string)byte-stream' ! tcpserversink host=localhost port=5001
```

- GStreamer Client on Jetson

```
gst-launch-1.0 -v tcpclientsrc port=5001 ! decodebin !
nvoverlaysink
```

- GStreamer Client on PC

```
gst-launch-1.0 -v tcpclientsrc host=192.168.1.105
port=5001 ! decodebin ! autovideosink
```