Arducam

OBISP 13MP Low Distortion Camera Module

13MP AR1335

(SKU: B0277)

QUICK START 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 13MP OBISP MIPI camera features onboard ISP (Image Signal Processor), it uses standard Raspberry pi 15pin 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/

SPECS

Image Sensor	13MP AR1335
Max. Resolution	4160×3120
Optical Format	1/3"
Lens Mount	M12 default, optional CS mount
Stock Lens FOV	horizontal 50 degrees
Output Format	YUV422, RGB888
Output Interface	2-Lane MIPI CSI-2
Max data rate	1.2Gbps/lane
Supported Resolution&Frame rate	UYUV: 4160×3120@7fps, 1920×1080@41fps, 1600×1200@45fps, 1280×720@60fps, 640×480@55fps RGB3: 2560×1440@15fps, 1920×1080@27fps, 1600×1200/1280×720/640×480@30fps

Support ISP Functions	AWB, AE, Flip, Mirror, Denoise, Gamma, Sharpness, Saturation, Contrast Digital Zoom, Digital Pan/Tilt, Speical Effects etc.
Responsivity	4.7k e/lux-sec
IR Sensitivity	650nm IR filter, visible light only
SNRmax	37dB
Dynamic Range	69dB
Power Consumption	270mW
Temperature Range	-10 ~ 70 degrees Celcius
Camera Driver	V4L2 Compliant driver for Raspberry pi and Jetson Nano
Board Size	38x38mm

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.

- **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
```

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 complaint, 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.

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.

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
```

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 Clinet on Jetson

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

• GStreamer Clinet on PC

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