

V4L2

Install

Install v4l utilities first.

```
sudo apt install v4l-utils
```

Measure actual frame rate

Set video format, and start streaming to `/dev/null`

```
v4l2-ctl --device /dev/video1 -p 30
v4l2-ctl --device /dev/video1 --set-fmt-video=width=1920,height=1080,pixelformat=H264
```

Start capturing and calculating

```
v4l2-ctl --device /dev/video1 --stream-mmap=3 --stream-count=1000 --stream-to=/dev/null
```

Output from last command

[illegible]

Get supported video formats

```
/dev/video1 supports h.264 video stream
```

```
v4l2-ctl --device /dev/video1 --list-formats
```

```
ioctl: VIDIOC_ENUM_FMT
      Index      : 0
      Type       : Video Capture
      Pixel Format: 'H264' (compressed)
```

Name : H.264

/dev/video0 support MJPG and YUYV streams

```
v4l2-ctl --device /dev/video0 --list-formats
```

```
ioctl: VIDIOC_ENUM_FMT
  Index      : 0
  Type       : Video Capture
  Pixel Format: 'MJPG' (compressed)
  Name       : Motion-JPEG

  Index      : 1
  Type       : Video Capture
  Pixel Format: 'YUYV'
  Name       : YUYV 4:2:2
```

Get UVC control list

```
v4l2-ctl -d /dev/video0 --list-ctrls
```

```
      brightness 0x00980900 (int) : min=-64 max=64 step=1 default=0
value=0

      contrast 0x00980901 (int) : min=0 max=64 step=1 default=32
value=32

      saturation 0x00980902 (int) : min=0 max=128 step=1 default=64
value=64

      hue 0x00980903 (int) : min=-40 max=40 step=1 default=0 value=0
white_balance_temperature_auto 0x0098090c (bool) : default=1
value=1

      gamma 0x00980910 (int) : min=72 max=500 step=1 default=100
value=100

      gain 0x00980913 (int) : min=0 max=63 step=1 default=0
value=0

      power_line_frequency 0x00980918 (menu) : min=0 max=2 default=1 value=1
white_balance_temperature 0x0098091a (int) : min=2800 max=10000 step=1 default=4600
value=4600 flags=inactive

      sharpness 0x0098091b (int) : min=0 max=6 step=1 default=3
value=3

      backlight_compensation 0x0098091c (int) : min=0 max=2 step=1 default=1
```

```
value=1
        exposure_auto 0x009a0901 (menu) : min=0 max=3 default=3
value=3
        exposure_absolute 0x009a0902 (int) : min=1 max=10000 step=1 default=156
value=156 flags=inactive
        exposure_auto_priority 0x009a0903 (bool) : default=0 value=0
```

Set white ballance

```
v4l2-ctl -d /dev/video0 -c white_balance_temperature_auto=0
v4l2-ctl -d /dev/video0 -c white_balance_temperature=3000
```

Get supported video formats

```
v4l2-ctl -d /dev/video0 --list-formats-ext
```

```
ioctl: VIDIOC_ENUM_FMT
  Index      : 0
  Type       : Video Capture
  Pixel Format: 'MJPG' (compressed)
  Name       : Motion-JPEG
    Size: Discrete 1920x1080
      Interval: Discrete 0.033s (30.000 fps)
      Interval: Discrete 0.040s (25.000 fps)
      Interval: Discrete 0.050s (20.000 fps)
      Interval: Discrete 0.067s (15.000 fps)
    Size: Discrete 1280x1024
      Interval: Discrete 0.033s (30.000 fps)
      Interval: Discrete 0.040s (25.000 fps)
      Interval: Discrete 0.050s (20.000 fps)
      Interval: Discrete 0.067s (15.000 fps)
    Size: Discrete 1280x720
      Interval: Discrete 0.033s (30.000 fps)
      Interval: Discrete 0.040s (25.000 fps)
      Interval: Discrete 0.050s (20.000 fps)
      Interval: Discrete 0.067s (15.000 fps)
    Size: Discrete 720x576
      Interval: Discrete 0.033s (30.000 fps)
      Interval: Discrete 0.040s (25.000 fps)
      Interval: Discrete 0.050s (20.000 fps)
```

Interval: Discrete 0.067s (15.000 fps)
Interval: Discrete 0.100s (10.000 fps)
Interval: Discrete 0.200s (5.000 fps)
Size: Discrete 720x480
Interval: Discrete 0.033s (30.000 fps)
Interval: Discrete 0.040s (25.000 fps)
Interval: Discrete 0.050s (20.000 fps)
Interval: Discrete 0.067s (15.000 fps)
Interval: Discrete 0.100s (10.000 fps)
Interval: Discrete 0.200s (5.000 fps)
Size: Discrete 640x480
Interval: Discrete 0.033s (30.000 fps)
Interval: Discrete 0.040s (25.000 fps)
Interval: Discrete 0.050s (20.000 fps)
Interval: Discrete 0.067s (15.000 fps)
Size: Discrete 1920x1080
Interval: Discrete 0.033s (30.000 fps)
Interval: Discrete 0.040s (25.000 fps)
Interval: Discrete 0.050s (20.000 fps)
Interval: Discrete 0.067s (15.000 fps)

Index : 1

Type : Video Capture

Pixel Format: 'YUYV'

Name : YUYV 4:2:2

Size: Discrete 1920x1080
Interval: Discrete 0.200s (5.000 fps)
Size: Discrete 1280x1024
Interval: Discrete 0.200s (5.000 fps)
Size: Discrete 1280x720
Interval: Discrete 0.100s (10.000 fps)
Interval: Discrete 0.200s (5.000 fps)
Size: Discrete 800x600
Interval: Discrete 0.100s (10.000 fps)
Interval: Discrete 0.200s (5.000 fps)
Size: Discrete 720x576
Interval: Discrete 0.100s (10.000 fps)
Interval: Discrete 0.200s (5.000 fps)
Size: Discrete 720x480
Interval: Discrete 0.050s (20.000 fps)

```
Interval: Discrete 0.067s (15.000 fps)
Interval: Discrete 0.100s (10.000 fps)
Interval: Discrete 0.200s (5.000 fps)
Size: Discrete 640x480
Interval: Discrete 0.033s (30.000 fps)
Interval: Discrete 0.040s (25.000 fps)
Interval: Discrete 0.050s (20.000 fps)
Interval: Discrete 0.067s (15.000 fps)
Interval: Discrete 0.100s (10.000 fps)
Interval: Discrete 0.200s (5.000 fps)
Size: Discrete 1920x1080
Interval: Discrete 0.200s (5.000 fps)
```

Tell everything about camera

```
v4l2-ctl --all
```

Driver Info:

```
Driver name      : uvcvideo
Card type        : C2: C2 RVN-3Q4WH
Bus info         : usb-0000:00:14.0-1.1.2
Driver version   : 5.11.21
Capabilities     : 0x84a00001
```

```
Video Capture
Metadata Capture
Streaming
Extended Pix Format
Device Capabilities
```

```
Device Caps      : 0x04200001
Video Capture
Streaming
Extended Pix Format
```

Priority: 2

Video input : 0 (Camera 1: ok)

Format Video Capture:

```
Width/Height      : 1920/1080
Pixel Format       : 'MJPG' (Motion-JPEG)
Field             : None
Bytes per Line     : 0
Size Image        : 4147789
```

Colorspace : Default
Transfer Function : Default (maps to Rec. 709)
YCbCr/HSV Encoding: Default (maps to ITU-R 601)
Quantization : Default (maps to Full Range)
Flags :

Crop Capability Video Capture:

Bounds : Left 0, Top 0, Width 1920, Height 1080
Default : Left 0, Top 0, Width 1920, Height 1080
Pixel Aspect: 1/1

Selection Video Capture: crop_default, Left 0, Top 0, Width 1920, Height 1080, Flags:

Selection Video Capture: crop_bounds, Left 0, Top 0, Width 1920, Height 1080, Flags:

Streaming Parameters Video Capture:

Capabilities : timeperframe
Frames per second: 10000000.000 (10000000/1)
Read buffers : 0

brightness 0x00980900 (int) : min=-64 max=64 step=1 default=0
value=0

contrast 0x00980901 (int) : min=0 max=64 step=1 default=32
value=32

saturation 0x00980902 (int) : min=0 max=128 step=1 default=64
value=64

hue 0x00980903 (int) : min=-40 max=40 step=1 default=0 value=0
white_balance_temperature_auto 0x0098090c (bool) : default=1
value=1

gamma 0x00980910 (int) : min=72 max=500 step=1 default=100
value=100

gain 0x00980913 (int) : min=0 max=48 step=1 default=0
value=0

power_line_frequency 0x00980918 (menu) : min=0 max=2 default=2
value=2

0: Disabled

1: 50 Hz

2: 60 Hz

white_balance_temperature 0x0098091a (int) : min=2800 max=9300 step=1 default=4600
value=4600 flags=inactive

sharpness 0x0098091b (int) : min=0 max=6 step=1 default=3
value=3

backlight_compensation 0x0098091c (int) : min=0 max=2 step=1 default=1
value=1

exposure_auto 0x009a0901 (menu) : min=0 max=3 default=3
value=3

1: Manual Mode

3: Aperture Priority Mode

exposure_absolute 0x009a0902 (int) : min=1 max=5000 step=1 default=156
value=156 flags=inactive

exposure_auto_priority 0x009a0903 (bool) : default=0 value=0

Revision #14

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