

GStreamer

GStreamer is a powerful tool which allows streaming complex video pipes over network. Simple pipelines to stream and receive video provided below.

Stream h.264@30fps over network

Show MJPEG stream on the LCD

```
gst-launch-1.0 -v v4l2src device=/dev/video0 ! image/jpeg, width=1920, height=1080,
framerate=30/1 ! jpegdec ! videoconvert ! queue ! autovideosink
```

Stream h.264 compressed video over UDP socket

```
gst-launch-1.0 -v v4l2src device=/dev/video2 do-timestamp=true ! video/x-h264, width=1920, \
height=1080, framerate=30/1 ! h264parse ! queue ! \
rtph264pay config-interval=10 pt=96 ! udpsink \
host=192.168.0.111 port=5600 sync=false
```

Receive stream and display on monitor

```
gst-launch-1.0 -e -v udpsrc port=5600 ! application/x-rtp, encoding-name=H264, payload=96 ! \
rtppjitterbuffer ! rtph264depay ! avdec_h264 ! autovideosink
```

Some other helpful pipelines

Receive, display and record video

```
gst-launch-1.0 -e -v udpsrc port=5600 ! tee name=STREAMOUT ! \
tee name=VIDEOWINDOW ! queue ! application/x-rtp, encoding-name=H264, payload=96 ! \
rtph264depay ! h264parse ! mp4mux ! filesink location=myvideo.mp4 STREAMOUT. ! \
queue ! udpsink port=5700 VIDEOWINDOW. ! queue ! application/x-rtp, \
payload=96 ! rtph264depay ! avdec_h264 ! autovideosink
```

Display h.264 stream (Windows)

```
gst-launch-1.0.exe ksvideosrc ! \
video/x-raw, format=H264, width=1920 ! \
```

```
capssetter caps=video/x-h264,format=byte-stream join=false ! \
queue ! \
h264parse ! \
avdec_h264 ! \
autovideosink
```

Not all firmware modifications are supported by gstreamer. If you experiencing streaming issues, feel free to [contact](#) us. Update procedure is detailed [here](#).

Inspect video device capabilities

Video device details can be inspected with video4linux command `v4l2-ctl --device /dev/video2 --all` Video device should support H.264 pixel format. Various firmware modifications can have different configuration parameters and

Driver Info:

```
Driver name      : uvcvideo
Card type        : KurokesuC1_536      : Kurokesu C
Bus info         : usb-0000: 01: 00. 0-1.3
Driver version   : 5.10.11
Capabilities     : 0x84a00001
    Video Capture
    Metadata Capture
    Streaming
    Extended Pix Format
    Device Capabilities
Device Caps      : 0x04200001
    Video Capture
    Streaming
    Extended Pix Format
```

Media Driver Info:

```
Driver name      : uvcvideo
Model            : KurokesuC1_536      : Kurokesu C
Serial           : SN0000000
Bus info         : usb-0000: 01: 00. 0-1.3
Media version    : 5.10.11
Hardware revision: 0x00000100 (256)
Driver version   : 5.10.11
```

Interface Info:

```
ID              : 0x03000008
```

```

    Type          : V4L Video
Entity Info:
    ID            : 0x00000007 (7)
    Name          : KurokesuC1_536      : Kurokesu C
    Function      : V4L2 I/O
    Pad 0x01000011 : 0: Sink
        Link 0x0200001e: from remote pad 0x1000010 of entity 'Extension 4': Data, Enabled,
Immutable
Priority: 2
Video input : 0 (Camera 1: ok)
Format Video Capture:
    Width/Height   : 1920/1080
    Pixel Format    : 'H264' (H.264)
    Field          : None
    Bytes per Line  : 3840
    Size Image      : 2073600
    Colospace      : sRGB
    Transfer Function : Rec. 709
    YCbCr/HSV Encoding: 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: crop_default, Left 0, Top 0, Width 1920, Height 1080, Flags:
Selection: crop_bounds, Left 0, Top 0, Width 1920, Height 1080, Flags:
Streaming Parameters Video Capture:
    Capabilities    : timeperframe
    Frames per second: 30.000 (30/1)
    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=52
value=52
        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=100 step=1 default=0
value=0

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

                                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

```

Debugging

Useful commands:

- `|gst-launch-1.0 --gst-version|` - read gstreamer version (tested with **GStreamer Core Library version 1.14.4**)

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