USB MPEG Capture Device
Software Manual (Linux)

Models 314/614/2250/2251 | Ver.X | July 2011

SENSORAY | embedded electronics

Designed and manufactured in the U.S.A

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Feature Summary

The 2250 uses the standard USB drivers for Linux through the video4linux2 (V4L2) library. The driver supports MPEG capture through the V4L2 API, and can be used with any video capture application that supports V4L2. The driver has ALSA audio support.

Installation

The software may be distributed on a CD or downloaded from the Sensoray's web site. If the file is downloaded, it will need to be unzipped into a folder on the local drive prior to connecting the 2250 to the USB port.

The software must be compiled in a v4l-dvb source tree before it can be installed. The makefile will automatically download the v4l-dvb source tree from Mercurial in tar.bz2 format and compile the drivers. If the installation machine is isolated from the internet, download the v4l-dvb source package from http://linuxtv.org/hg/v4l-dvb (click on the "bz2" link and save as "v4l-dvb.tar.bz2") and copy it to the installation machine into the sensoray-v4l2-driver-patchX directory.

Kernel versions supported by the v4l-dvb package will work. At the time of this writing, this is 2.6.10 or later. The kernel configuration requires USB support, I2C support, ALSA sound support (OSS emulation is optional, but recommended.) The v4l-dvb package is no longer being maintained however, and may not work on kernels newer than 2.6.35.

The Linux kernel headers must be installed. On Ubuntu, the Linux Ubuntu module headers will also be required. Type "apt-get install linux-headers-lum-`uname -r`" if it is not currently installed. On other distributions, install linux-headers from the CD or otherwise. Missing or incorrect kernel headers may result in errors during the "make" step below.

Setup is performed as follows.

1) Untar the 2250 package. "tar xzf sensoray-v4l2-driver-patchX.tar.gz"

2) Type "cd sensoray-v4l2-driver-patchX"

3) Type "./install.sh". This will download the v4l-dvb sources, apply the patches, and compile the drivers. This will also install the kernel modules and copy the firmware files to /lib/firmware.

4) Plug in 2250 to USB port.

After the 2250 has been connected, a /dev/videoN device will be added by the driver, where N is the next available video device. The ALSA audio device id will appear under the ALSA device subsystem under /proc/asound. If OSS emulation is enabled, a /dev/dspN audio device will also appear.

For the 314/614 devices, after the kernel module has been loaded, two video device entries should appear. The first /dev/videoX device will be the uncompressed capture device, and the /dev/videoY device will the be compressed capture device.

Troubleshooting

If no video device appears after plugging in the 2250, check the kernel log to verify the driver has been loaded properly. The dmesg command will print the most recent kernel messages. For a working 2250, it should appear like this.

```
Enter s2250loader_probe 2.6 kernel

vendor id 0x1943, device id 0xa250 devnum:3

s2250loader_probe: Device 3 on Bus 1 Minor 0

loading 2250 loader

usb 1-7: firmware: requesting s2250_loader.fw

usb 1-7: firmware: requesting s2250.fw

usbcore: registered new interface driver s2250-loader

s2250loader_init: driver registered

s2250: disconnect

go7007-usb: probing new GO7007 USB board

Sensoray 2250 found

go7007 1-7:1.0: firmware: requesting go7007fw.bin

go7007: registering new Sensoray 2250/2251

s2250: initializing video decoder on WIS GO7007SB EZ-USB

s2250: initialized successfully

go7007: registered device video0 [v4l2]
```

If the expected kernel output does not appear, use the “lsmod” command to verify the kernel modules “go7007” “go7007_usb” and “s2250” are loaded. If not loaded, the “modprobe” command with the name of the missing module may be able to load them and initialize the device.

If in doubt, send the output from the “dmesg” “lsmod” “lsusb” “uname -a” commands to Sensoray Technical Support.

API Reference

The Video4linux2 API can be found online http://www.linuxtv.org/downloads/video4linux/API/V4L2_API/

The driver supports the following USER CLASS controls, and acceptable values:

V4L2_CID_BRIGHTNESS	**0 .. 100**
V4L2_CID_CONTRAST	**0 .. 100**
V4L2_CID_SATURATION	**0 .. 100**
V4L2_CID_HUE	**-50 .. 50**

The driver supports the following MPEG CLASS controls, and acceptable values:

V4L2_CID_MPEG_STREAM_TYPE	**V4L2_MPEG_STREAM_TYPE_MPEG2_DVD** **V4L2_MPEG_STREAM_TYPE_MPEG_ELEM**
V4L2_CID_MPEG_VIDEO_ENCODING	**V4L2_MPEG_VIDEO_ENCODING_MPEG_1** **V4L2_MPEG_VIDEO_ENCODING_MPEG_2** **V4L2_MPEG_VIDEO_ENCODING_MPEG_4**
V4L2_CID_MPEG_VIDEO_ASPECT	**V4L2_MPEG_VIDEO_ASPECT_1x1** **V4L2_MPEG_VIDEO_ASPECT_4x3** **V4L2_MPEG_VIDEO_ASPECT_16x9**
V4L2_CID_MPEG_VIDEO_GOP_SIZE	**integer**
V4L2_CID_MPEG_VIDEO_BITRATE	**64000 .. 10000000**

Demo Application

A simple video and audio application “capture” is provided to demonstrate the features of the device. The application options are presented below. By default, only a limited number of frames are captured. If more useful functionality is required, the provided application source code must be modified. To recompile the application, type “make demo”.

```
./capture -h

Options:

-d | --device name   Video device name [/dev/video0]

-h | --help          Print this message

-j | --mjpeg         Motion Jpeg

-4 | --mpeg4         MPEG4

-1 | --mpeg1         MPEG1

-2 | --mpeg2         MPEG2

-a | --audio name    Audio device [/dev/dsp]

-i | --ainput        Select audio input

-w | --wavefile name dump audio to wav file

-s | --size          size 0=vga, 1=1/2 VGA

-o | --out name      output file name (MPEG only)

-b | --br bitrate    change bitrate(MBs)

-p | --pal           Set Standard to PAL

-v | --svideo        Use S-Video input
```