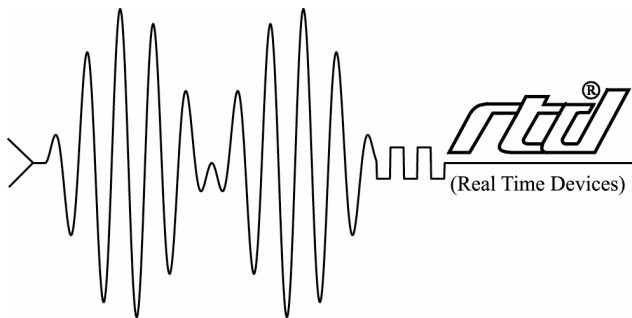


APPLICATION NOTE

Using LinuxTV.org 2.4 Kernel CM7326/CM7327 Linux Drivers



RTD Embedded Technologies, Inc.
"Accessing the Analog World"®

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rev A

ISO9001 and AS9100 Certified

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Introduction

To use an RTD CM7326 or CM7327 frame grabber utilityModule™ under Linux, you need a device driver. LinuxTV.org hosts an open source Linux CM7326 driver (written by Miguel Freitas and Michael Hunold) and an open source Linux CM7327 driver (written by Miguel Freitas, Michael Hunold, and Robert W. Boone). Please see the LinuxTV web site (<http://www.linuxtv.org>) for more information.

This document provides a general overview of setting up and utilizing the open source drivers.

Procedure for 2.4 Kernels

Preparing the CM7326 or CM7327 driver for use on a 2.4 kernel requires that you perform the following steps: 1) obtain the source code, 2) create a video-aware kernel, 3) build the driver, and 4) load the necessary kernel modules.

Obtaining Source Code

The CM7326 and CM7327 drivers exist as part of LinuxTV's DVB (Digital Video Broadcasting) project and must be built from source code downloaded from LinuxTV.org's CVS repository. Issue the

```
cvs -d :pserver:anonymous@linuxtv.org:/cvs/linuxtv co -P dvb-kernel
```

command to transfer the code. The directory `dvb-kernel/` will be created in your current working directory. Keep in mind that because the CVS repository contains code under development, you may experience difficulty with the source code.

Creating a Video-Aware Kernel

According to DVB project documentation, the 2.4 kernel drivers require at least a 2.4.18 kernel. The easiest way to ensure you have the proper kernel version is to download the latest stable 2.4 kernel from kernel.org. Once you have the latest kernel source, you can configure and build the kernel.

Red Hat 9.0 with a 2.4.27 kernel was used for the creation of this document.

When configuring the kernel prior to building it, there are a few items which must be addressed for the CM7326 or CM7327 driver to work:

- * Under the **Multimedia devices** configuration submenu, set the **Video For Linux** option so that the code is compiled as a module.
- * Under the **Multimedia devices / Video For Linux** configuration submenu, turn on the **V4L information in proc filesystem** option.
- * Under the **Character devices / I2C support** configuration submenu, set the **I2C support** option so that the code is compiled as a module.

Once the kernel builds, install it in `/boot` and install the loadable modules in `/lib/modules`. Boot the new kernel to continue.

Building the Driver

Unfortunately, the 2.4 kernel does not contain all necessary components for using an RTD frame grabber; examples of missing items include video4linux-1 support, Philips SAA7146 multimedia bridge chip driver, and video4linux-2 support. However, the DVB project fills in these holes. This additional code must be compiled into kernel modules along with the CM7326 or CM7327 driver itself. To transform the source code into loadable kernel modules, perform these actions:

- * Change your current directory to `dvb-kernel/analog-2.4/`
- * Issue the `./getlinks` command
- * Issue the `make` command

Loading the Kernel Modules

Now that all kernel modules have been created, they can be inserted into the executing kernel. The subsequent steps allow you to make the modules available for use:

- * Change your current directory to `dvb-kernel/analog-2.4/`
- * Issue the `modprobe videodev` command
- * Issue the `modprobe i2c-core` command
- * Issue the `insmod ./v4l1-compat.o` command
- * Issue the `insmod ./v4l2-common.o` command
- * Issue the `insmod ./video-buf.o` command
- * Issue the `insmod ./saa7146.o` command
- * Issue the `insmod ./saa7146_vv.o` command
- * If you want the CM7326 driver, issue the `insmod ./cm7326.o` command
- * If you want the CM7327 driver, issue the `insmod ./cm7327.o` command

At this point, you should be able to invoke `xawtv` (a Linux TV application) and watch video coming from the CM7326 or CM7327 card.