

# LML-M4 Manual

Linux Media Labs

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## 1 General Description

The LML-M4 board is al PCI MPEG-4 encoder board. These are the general LML-M4 features:

- BNC and S-Video Inputs
- Separate Audio Input

## 2 Notational Conventions

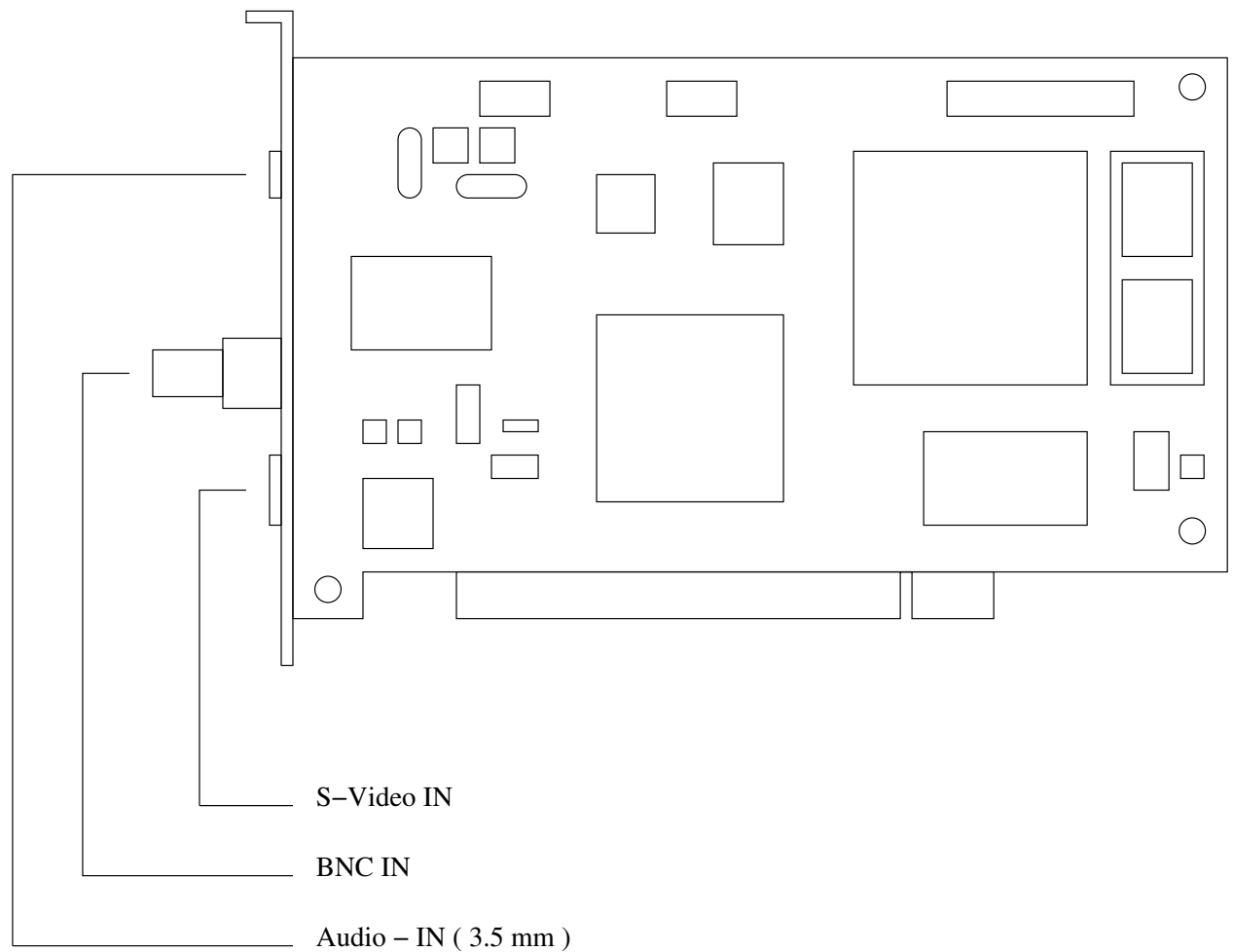
You input is designated with \$, for the command shell input prompt, and with # for superuser mode input. Your input and system response are presented in **bold face**. Filenames and URLs are underlined. System commands (line uname -r) are using San Serif font.

### 3 System Requirements

- RedHat Linux 7.3, 8.x (other modern 2.4 kernel based distributions should work as well)
- Tested with Kernels 2.4.20 (use `uname -r` to find your kernel version)
- CPU 200MHz or more
- RAM 32M or more
- EIDE or SCSI-2
- Any Video card

### 4 Physical Installation

Open the case of your computer and locate an empty PCI slot. Insert the LML-M4 board into the empty PCI slot and secure it with a screw. Before proceeding to driver installation, connect the input source: either S-Video or BNC ( or converted RCA ). The connections on the back are layed out in the following manner:



## 5 Driver Assembly and Installation

Once your system has booted up and is ready to work, insert the LMLCD into the CDROM drive and mount it.

```
$ mount /mnt/cdrom
```

Before beginning work on the LML-M4 installation, it is a good idea to make certain that your system recognizes the board's presence on the PCI bus.

```
$ /sbin/lspci
```

The result of this command should produce several lines describing the hardware connected to your motherboard through the PCI bus. The line for which you will need to look for should resemble this '01:09.0 Multimedia video controller: Unknown device 165f:1020'.

Once you have made certain that your system recognizes the card, please copy the LMLM4 folder from your LMLCD to a convenient working location such as /tmp or /home/yourdirectory. This is done by:

```
$ cp -r /mnt/cdrom/LMLM4/ /tmp/
```

Once this is complete, please enter the newly created directory on your hard drive to continue work on the LML-M4 driver and installation. The folder containing the driver is inside the LMLM4 directory and is named linvs.

```
$ cd /tmp/LMLM4/linvs/
```

The next step is to compile the driver on your machine.

```
# make
```

Once the driver has been assembled, it will create the following files: lmlm4-linvs.o lmlm4.o driver.o board.o codec.o linvsfops.o statusfops.o streamfops.o ioctl.o videomode.o audiomode.o xilinxdma.o microcode.o The **lmlm4-linvs.o** is the module that will be loaded. The next step is to insert the module into the kernel driver database, where it can be autoloaded when the driver is needed.

```
# make install
```

```
# depmod -a
```

Now you should be able to autoload the the driver by simply attempting to read any of the /dev/mvideo/\*devices:

```
$ cat /dev/mvideo/status
```

```
LMLM4 LinVS Driver version 0.1 Copyright (C) 2002
```

```
...
```

## 5.1 Manually Loading Driver Module

To manually load the driver:

```
$ su -
```

```
# /sbin/modprobe lmlm4-linvs
```

Do not forget to exit superuser mode:

```
# exit
```

Note: You can also use command `/sbin/insmod` to load the driver. In order to remove the driver from memory you can use the reverse of the two loading commands:

```
# modprobe -r lmlm4-linvs
```

or

```
# rmmmod lmlm4-linvs
```

## 5.2 Configuring the System to Load Driver Module Automatically

In order to load `lmlm4-linvs.o` module automatically you need to do the following:

```
# su -
```

Append the following lines to file `/etc/conf.modules` for LML-M4:

```
# vi /etc/modules.conf
```

In the VI editor, please add the following lines to your `modules.conf` file.

```
alias char-major-194 lmlm4-linvs
```

After you have altered the `modules.conf` file, you will need to run the following command:

```
# depmod -a
```

Once this is done, you should be able to autoload the driver whenever it is needed.

## 6 Video Capture with LML-M4

To capture a video stream through the LML-M4 Card:

```
$ dd if=/dev/mvideo/stream of=x.mp4 bs=100 count=10
```

`if` = input file source, in this case the LML-M4 card. Since the LML-M4 card is not a traditional capture card, its source will be a stream.

`of` = output file, simply the desired name of the file you wish to capture.

`bs` = block space, the number of kilobytes allotted to a block of information in the stream

`count` = the number of blocks you wish to capture.

So this command directs the LML-M4 card to capture and record an MPEG-4 stream that will take up approximately 1 MB and be named `x.mp4`.