Installing Comedi Drivers
Kernel drivers for data acquisition cards, instructions for installation on Redhat 9 systems (kernel 2.4.20)

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V2.0

1 Location of files (tarballs)

Tarballs for the current most stable versions can be found in `/home/share/packages/comedi/`
 At the time of writing, these are:
`comedi-0.7.67sds.tar.gz`
`comedilib-0.7.21.tar.gz`
 The `comedi-0.7.67sds.tar.gz` tarball is a modified version of `comedi-0.7.67.tar.gz`, i.e. it has been untarred, modified, then retarred. See appendix B for details.
 The comedi website is `http://www.comedi.org`
 The latest versions of comedi and comedilib can be found at:
`http://www.comedi.org/download.php`

2 Installation

2.1 Extracting the code

- Copy the tarballs to the directory of your choice—strongly suggest a directory on the *local* hard drive (ie *not* anywhere in `/home`) because there is a lot of compiling to do. Suggested place: `/usr/local/src/comedi/`

- Untar the tarballs:
  `tar -xvzf comedi-0.7.67sds.tar.gz`
  `tar -xvzf comedilib-0.7.21.tar.gz`

2.2 Twiddling with the Linux source tree, making proper configuratation files

- `su` to root

- `cd /usr/src/`

- If there is not already a link `linux->linux-2.4` create one:
  `ln -s linux-2.4 linux`

- `cd /usr/src/linux/configs/`

- Select a config file closest to your architecture, eg `kernel-2.4.20-athlon.config` or `kernel-2.4.20-i686.config` (your kernel version may be slightly different)

- `cp -p kernel-2.4.20-i686.config ../.config` Note the dot (.) in `.config`

- `cd /usr/src/linux/`

- `make mrproper`

- `make oldconfig`

- Edit `Makefile`
  Near the top, change the line:
  `EXTRAVERSION = -24.9custom`
  (your version might be slightly different) to:
  `EXTRAVERSION = -24.9`
  ie remove the `custom` bit

- `make dep`

2.3 Compiling the comedi driver

- `cd {INSTALL_DIR}/comedi-0.7.67/`

- `su` to root[*]

- `./configure`

- `make`

- `make install`

- `make dev`

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[*]You must usually `su` to root *before* you `./configure`, as the configuration script looks up and modifies the `CFLAGS` in the linux source directory.

2.4 Compiling the comedi user libraries

- `cd {INSTALL_DIR}/comedilib-0.7.21/`

- `./configure`

- `make`
  (will complain about jade errors—ignore)

- `su` to root

- `make install`
  (will complain about jade errors—ignore)

3 Installing the [compiled] drivers

This assumes you have an Amplicon PCI230 card. Both these methods configure the device `/dev/comedi0` to be your PCI 230 card.

3.1 Manual loading

- `su` to root

- `/sbin/insmod comedi`

- `/sbin/insmod amplc_pci230`

- `comedi_config /dev/comedi0 amplc_pci230`

3.2 Module autoloading

Add the following lines to `/etc/modules.conf`:
```
alias char-major-98 comedi
alias char-major-98-0 amplc_pci230
keep
path=/lib/modules/'uname -r'/comedi
post-install amplc_pci230 PATH=/sbin:/usr/sbin:/usr/local/sbin:$PATH;\
comedi_config /dev/comedi0 amplc_pci230
```
(note the backslash (\) at the end of the `post-install` line).
    Add the following line to `/etc/rc.d/rc.local`:
```
modprobe amplc_pci230
```
The module should now load up on bootup... use `dmesg` and `cat /proc/comedi` to check.

4 Demo programs

- `cd {INSTALL_DIR}/comedilib-0.7.21/demo/`

- Have a look at the `README` file

- You could try `./info` to display information about the card, or `./inpn` which should list all the voltages on all the inputs

A Appendix—abbreviations etc

tarball File ending in `.tar.gz` or `.tgz`—uncompress using `tar -xvzf filename.tar.gz`

B Appendix—local modifications to comedi driver

Two files have been modified in order to get the driver working correctly, and the changes are detailed below. If you untar `comedi-0.7.67sds.tar.gz`—rather than `comedi-0.7.67.tar.gz`—you will not need to make these modifications, they have already been done for you.

B.1 `comedi-0.7.67/include/linux/mm.h`

The line:
`#if LINUX_VERSION_CODE < KERNEL_VERSION(2,5,0)`
has been replaced with:
`#if LINUX_VERSION_CODE < KERNEL_VERSION(2,4,20)`

This is something to do with the number of arguments passed to the `remap_page_range()` function. The idea was that for all version 2.4 kernels, this would have four arguments, and from version 2.5.0 onwards it would have 5. However, apparently RedHat backported the modifications to "their" version of the kernel, from about 2.4.20 onwards.

B.2 `comedi-0.7.67/comedi/drivers/amplc_pci230.c`

This is the driver for our specific card, the Amplicon PCI230. After I first installed the driver, I noticed (unfortunately after a few days) that the kernel log file was getting rather large. This is due to the driver logging interrupts from devices other than the PCI230 card; if the card shared an interrupt line with something that generated, say, 50 interrupts per second, then every second 50 log messages would be written to the kernel log. As you can imagine, it didn't take long for `/var/log/messages` to get *very* large indeed!

I wrote to the comedi mailing list about this, and David Schleef (the comedi driver originator) wrote back and said this was obviously a bug. The issue has now been corrected in the comedi CVS repository, and will

be included in future versions, but for now we need to make our own modifications to get rid of those annoying log messages.

The line:
```
printk("comedi%d:  amplc_pci230::pci230_interrupt spurious
interrupt",dev->minor);
```
has been replaced with:
```
return IRQ_NONE;
```

C   Appendix—location of this document

```
/home/share/documentation/hardware/installing_comedi.pdf
```