

Installing the DSO-101 Oscilloscope on Ubuntu Linux

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1 Overview

This application note describes how to install the DSO-101 oscilloscope software on a Ubuntu Linux system. This procedure was tested on an Edubuntu system, Hardy Heron, April 2008. Similar instructions apply to installation of the WGM-101 Waveform Generator and CGR-101 CircuitGear (with the corresponding file names).

This application note assumes some familiarity with Linux. Specifically, you must know how to use an editor to modify files. You should know how permissions work, and how to use the `chmod` command to change them. You should have some familiarity with the directory structure and the location of your home directory vs system directories such as `/etc` and `/dev`. You must know how the `ls` command works.

2 Download and Unpack the Software

The software is available for download from the Syscomp website:

www.syscompdesign.com/download.htm

Use the `mkdir` command to reate a directory on your computer. In my case, this directory is:
`/home/peter/eelab`.

Click on the file `Linux (x86bin)` to download it to your computer, check that it is in the `eelab` directory (figure 1).

The file that you downloaded is an *archive*, from which you must extract the files. Right click on the file and select `Extract Here`.

A directory is created with the extracted files in it. Change to that directory and examine the contents (figure 2).

Check that `main.tcl` is present in the file list. This is the file to execute to start the oscilloscope program.



Figure 1: Checking that the File has Downloaded

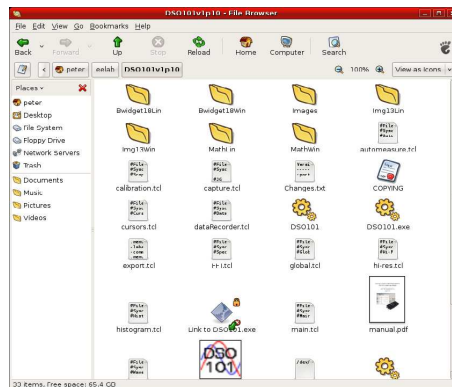


Figure 2: Directory with Files

Check that the Tcl Interpreter *wish* is present on your machine:
`which wish`

If *wish* is present, the *which* command will show the directory:
`/usr/bin/wish`

Since `/usr/bin` is usually on your PATH, *wish* is present and should execute.

Now you can execute the DSO-101 software with the command:
`wish main.tcl`.

However, the oscilloscope software will not connect properly to a USB port until the permissions are corrected. That's the next step.

3 Configure Permissions on the USB Ports

Plugging a Syscomp oscilloscope, waveform generator or CircuitGear unit causes the system to create a 'serial USB port' at `/dev/ttyUSB0`. (Notice that this is yew-ess-bee-zero, not yew-ess-bee-oh. If you have another usb-serial device plugged in, the number might be some other digit than zero.)

This port has read-write permissions for root and for the 'dialout' group. It does not have read-write permissions for a lowly user, so the instrument will not connect in this state.

You can change the permissions on `/dev/ttyUSB0`, but the port is transient and disappears when you shut down or disconnect. So you would need to do that every time you start the instrument.

To make this permanent, add your name to the 'dialout' group. I tried to do it using the edubuntu system administration tool, but for some reason the dialout group did not appear.

To do this the old-fashioned command-line way, use the command 'groups' to see which groups you belong to. Probably dialout does not appear. We will edit the groups file to add you. Find the file `/etc/group`. Probably read-write permission is disabled for users on this file as well.

```
ls -l /etc/group
-rw----- 1 root root 934 2008-05-22 10:17 /etc/group
```

In order to edit it, change the permissions to allow any user to edit that file, using the command:

```
sudo chmod 777 group
<your password here>
ls -l /etc/group
-rwxrwxrwx 1 root root 954 2008-10-24 22:02 /etc/group
```

Now you can edit and save the file. Load that file into a text editor. Find the line with 'dialout' in it. If the line ends in a colon, that means that no one yet belongs to this group. Add your login name. If there already is some other login name, add a comma and then your login name. Here's what it might look like with me (peter) added to the dialout group, after gabe.

```
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:gabe,peter
fax:x:21:
voice:x:22:
.... and so on
```

Save the file. Reboot the computer. Execute the groups command. You should see that you are a member of the dialout group.

```
groups
peter dialout
```

Now you should be able to start the instrument code by executing `wish main.tcl` in the directory where `main.tcl` is located. The instrument should find and connect to the USB port (figure 3).

For security, you may want to return the permissions on `/etc/group` as they were originally:

```
sudo chmod 600 /etc/group
<your password here>
ls -l /etc/group
-rw----- 1 root root 934 2008-05-22 10:17 /etc/group
```

Acknowledgement

Special thanks to my friend Gabriel Guillen, who loaned me an edubuntu system for this exploration.

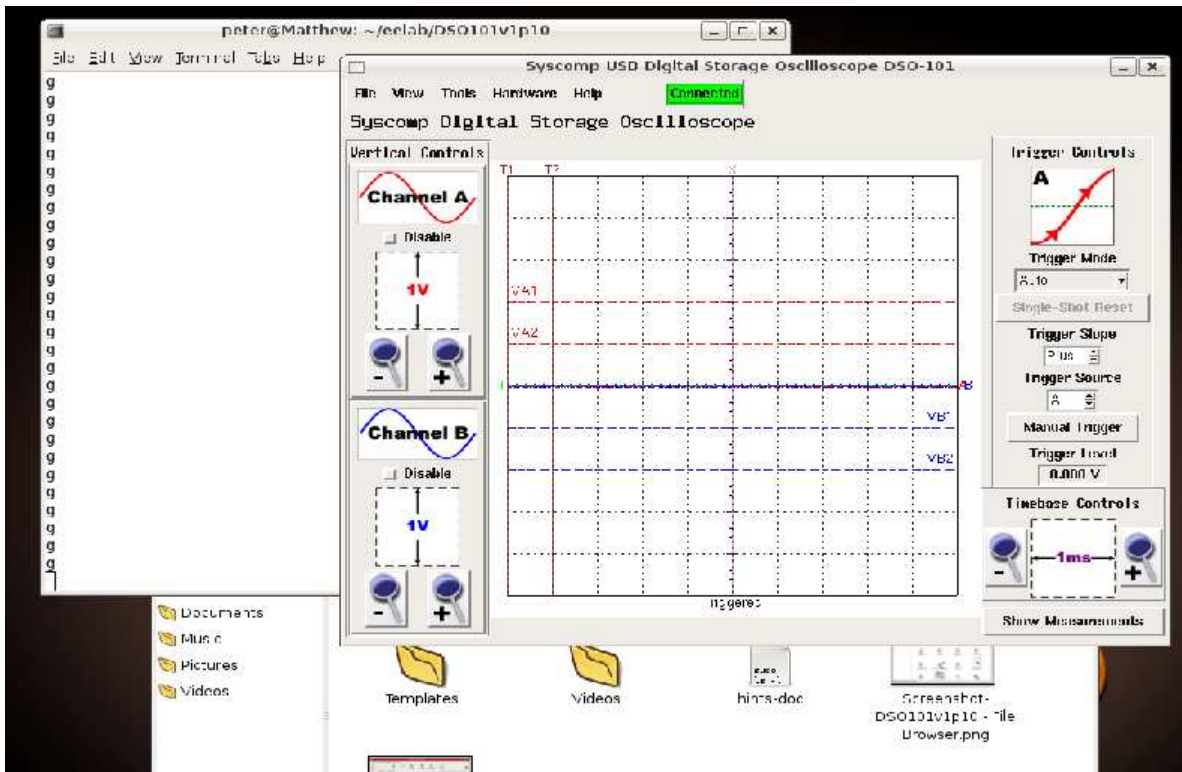


Figure 3: DSO-101 Oscilloscope is Operational