

Linux Installation

I'm going to assume that this program set is going to be installed in an Ubuntu-like distribution of Linux. That is, that the user has a directory which is under the /home directory. The program files are put into a directory named 'impedance_meter' which is in this home directory. For example, on my computer which is running Mint 19.1, my home directory is /home/jim and so the files are all put into a directory named /home/jim/impedance_meter. All that is necessary is to copy the various programs which are mainly bash or python program into a similar directory on your machine. To do this, in the files on the ARRL QEX Web site, there is a zipped file named "R-Pi_files.zip". Simply, download this zip file and extract the folder named 'impedance_meter' into your home directory and you're done.

Firstly, you should make sure that all the bash and python files are executable and you can do that with the command line from a terminal. After navigating to that directory, just type;

```
sudo chmod a+x *.sh
```

```
sudo chmod a+x *.py
```

Most modern distros come with python3 by default; if it isn't installed, you should do so. Also, some utility programs are needed from the internet and they can be installed by invoking the terminal and typing, at the prompt:

```
sudo apt-get install gnuplot feh python3-scipy python3-pip python3-tk
```

You will see a lot of activity and you will have to respond (type a 'y') to a question and these utilities will be installed.

Next, using pip, you will need to install pyserial by typing;

```
sudo pip3 install pyserial
```

Finally, you will need to make the serial port available to you as the user. To do so, type:

```
sudo usermod -a -G dialout $USER
```

Now, navigate to the `impedance_meter` directory you have just created and you will have to edit a few of the files. One of these is `'z_meter.desktop'`. You must edit it with a text editor, not a word processor. In that file, look for the two lines which have a file address starting with `'/home/pi/'`. You should change the name `'pi'` with the name of your home directory. So, for example in my case, I would change the first of those lines to read:

```
Icon=/home/jim/impedance_meter/Z.ico
```

Similarly, edit the second of those lines. After this file has been edited, you need to copy it to your Desktop directory.

The other two files which need to be edited are the two `.sh` files; `zed_all.sh` and `VSWR_scan.sh`. In both these files, you need to replace the `'pi'` in the directory name with your home file name. Again, be sure to edit with a text editor and not a word processor. That's it ... you're done.

To run the various z-meter programs, just start by double-clicking on the `'z_meter'` icon on the Desktop. You will need to connect the z_meter to your computer with a USB cable, first, of course. It sometimes takes a few seconds for the z-meter to flush its USB buffer so give it a bit of time after first plugging it in.

The first thing you will want to do is to calibrate your impedance meter, with a good termination in place, using the calibration program. I did not include this program as one of the programs you can invoke normally. Instead, using the file manager, you need to navigate to the `'impedance_meter'` folder and there, double-click on the `'calibrate'` icon. This icon shows a gear wheel in my distro. You will be asked how you want to execute this file so select `'Execute in Terminal'`. A terminal window will

appear and the program will start its long execution. This calibration can take up to an hour or so ... but, you only have to do it once.