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Application Note FAN4203

Calibrating Touch Screens

This application note is part 2 of our 2 part TFT LCD screen series. Part 1 discusses configuring the screen resolution of a TFT with a Raspberry Pi. Part 2 discusses calibrating the touch screen of a TFT. Click here to read part 1.

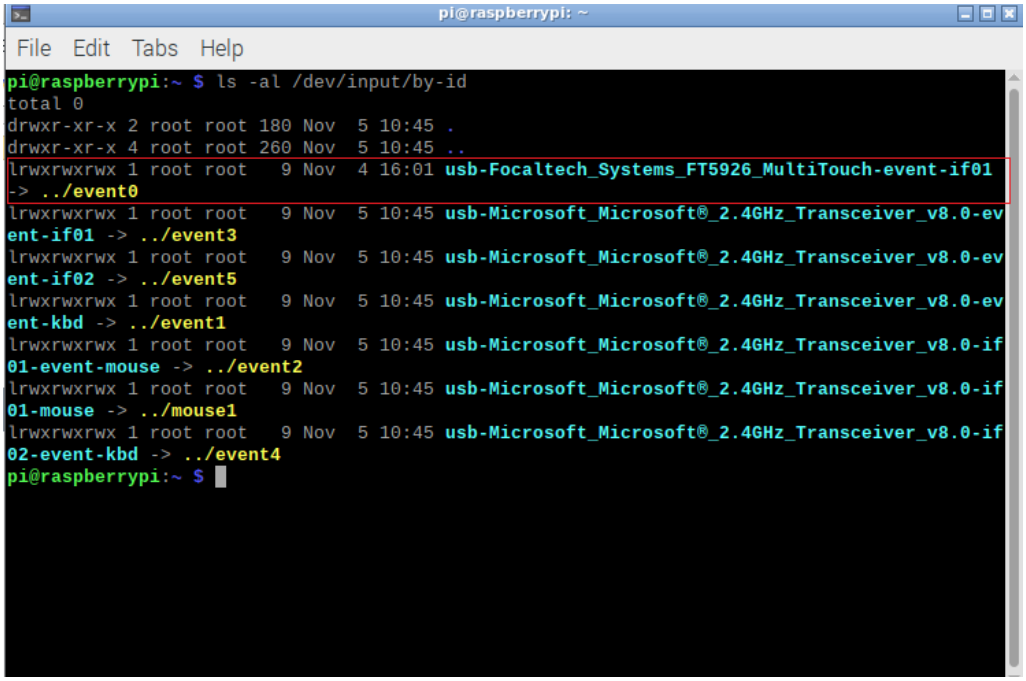
Calibrating the Touch Screen on Raspberry Pi

After the display is setup with the Raspberry Pi you may want to calibrate the touch feature for accuracy. The display used in this example is a 7" TFT with capacitive touch (E70RA-HW520-C). This is a continuation of a previous application with the same display. The touch feature is auto enabled upon download of the Raspbian software; however, it may be inconsistent with actual motion. Calibrating the touch feature of a display can be done in just a few simple steps.

1.) First, we will verify that the Raspberry Pi recognizes the display. To do this we will run a command that specifies where the input devices are connected. Open Terminal and execute the following command:

```
ls -al /dev/input/by-id
```

You will get a list of the various connection ports and where they are located. The display is recognized and is located at event0 as specified below.

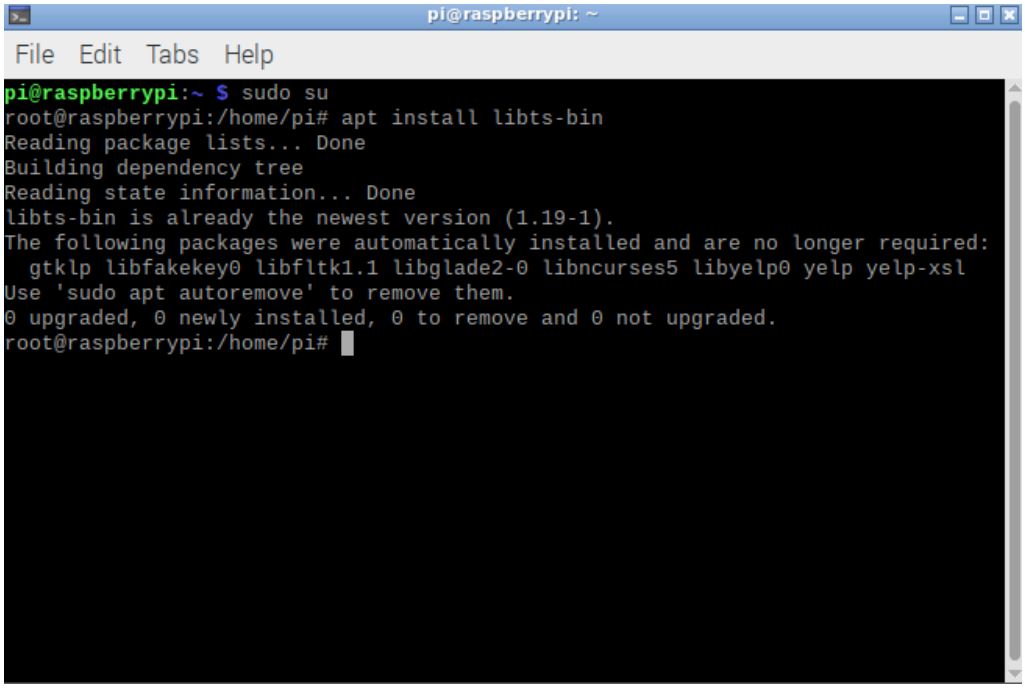


2.) Next, we find the program that calibrates the display. There are a few options of programs that calibrate the touch setting, the one I will be using is called ts_lib. We can install this through the Terminal. Root privileges will need to be enabled to install the program that is used. Enable super user mode by entering:

```
sudo su
```

Now we will download the program that calibrates the display. This program runs a quick test that verifies user input. Make sure the Raspberry Pi is connected to the internet for this step. To download this file, enter the following in the Terminal:

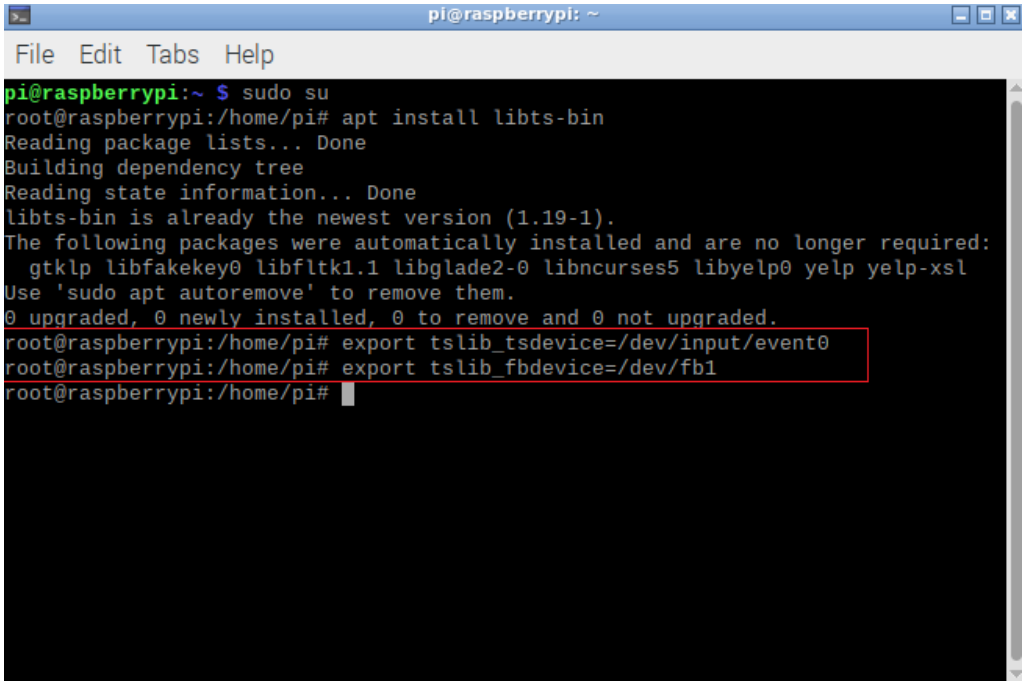
```
apt install libts-bin
```



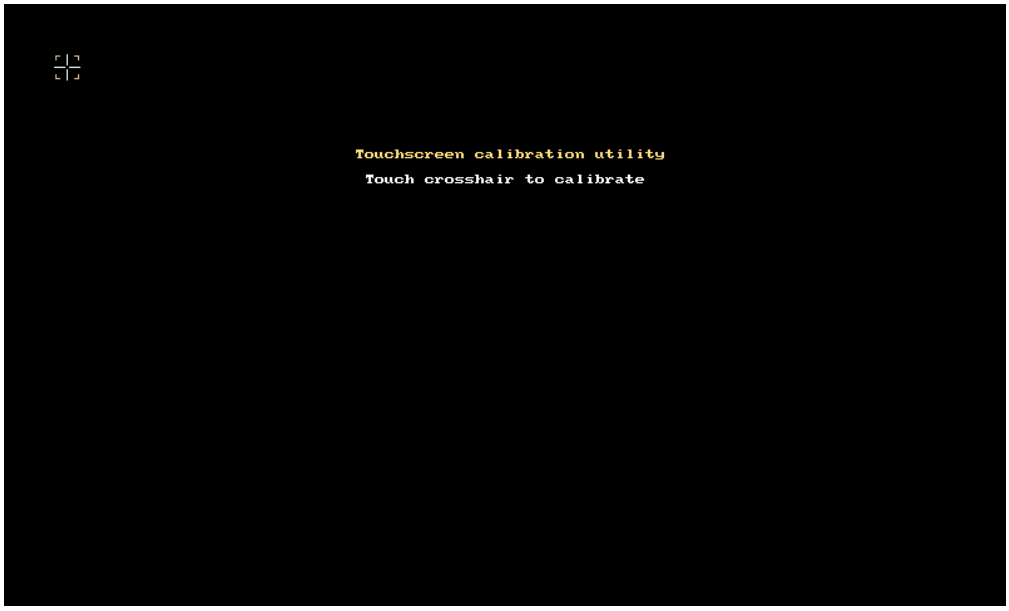
This will install a configuration file for the touch screen. Before the test we need to specify which device we're using and where it is located. The display is located at "event0" as verified in the previous step. This could be a different value for you depending on the setup so be sure to refer to the results of step one. Enter the following commands to define the display variables.

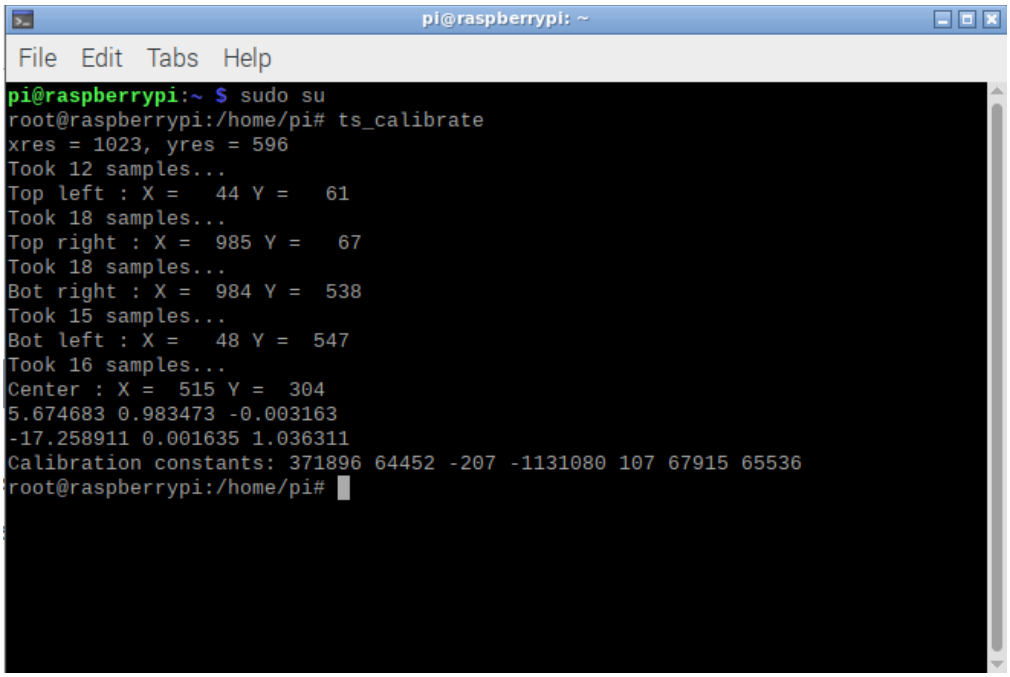
```
export tslib_tsdevice=/dev/input/event0
```

```
export tslib_fbdevice=/dev/fb1
```

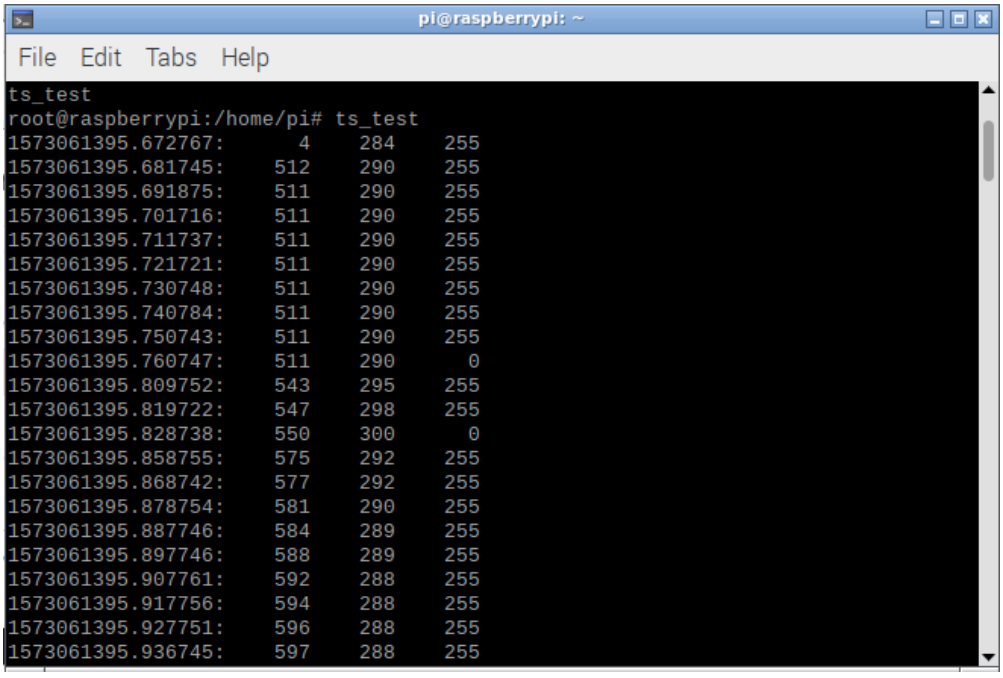


3.) Now we can run the calibration test. To do this enter the `ts_calibrate` command in the Terminal. You will need to be in super user mode for the calibration test to run. A screen will pop up asking you to touch five different points on the screen, try to touch them as accurately as possible. After the test is finished a list of the results will be displayed in the Terminal.





4.) You can now test the calibration by running the `ts_test` command in the Terminal. This will run a short program to verify the calibration results by dragging a pointer or drawing an image. When you are finished testing, press quit, and the test information will be displayed in the Terminal. If you are unsatisfied with the accuracy of the test you can run through the `ts_calibrate` program again.



Once you are satisfied with the results and the reboot the system.

```
sudo reboot
```

The touch screen should now be configured to a precise setting. This is just a brief overview of how to calibrate the capacitive touch feature of a display. For further calibration settings you can visit the "ts.config" file. You can open this file from Terminal by entering:

```
sudo nano /etc/ts.conf
```

For more information on these calibration settings and others visit the tslib documentation website.

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