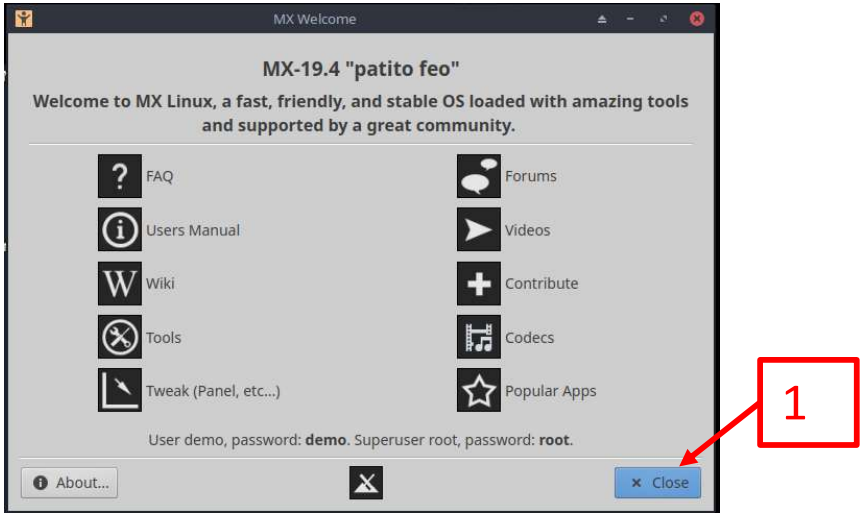
Section 4 - Required - Configure MX Linux 19.4 OS

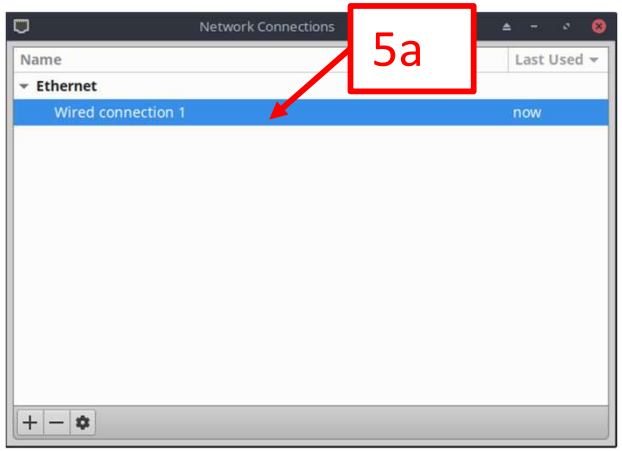
1. After reboot, Click “Close”



Section 4 - Required - Configure MX Linux 19.4 OS (cont.)

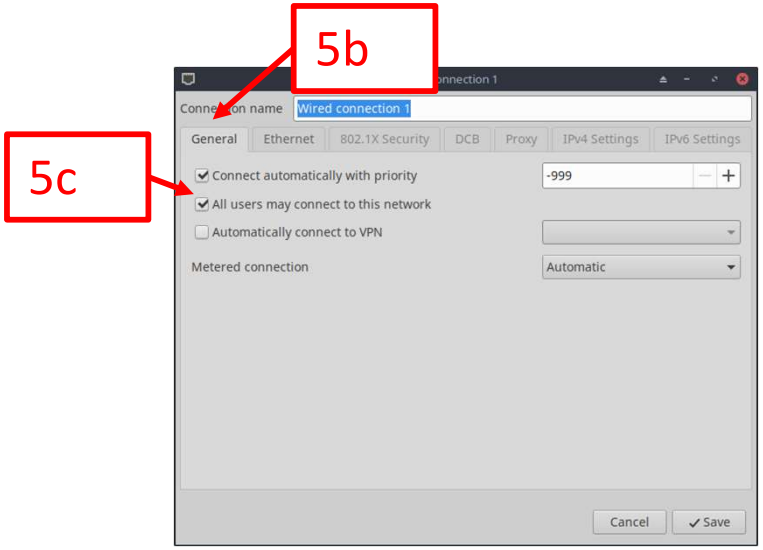
2. On the task bar, find and **RIGHT** click on the networking icon: 
   a. If there is no network icon, open a terminal and enter the following command: **nm-connection-editor**
3. Choose “Edit Connections…”
4. For Mesa Ethernet card only (these steps may be skipped for a wired network with a PCI Mesa card or a Parallel card):

5a. Double click on “Wired connection 1”



5b. Click on “General”

5c. Ensure “All users may connect to this network is checked.



Section 4 - Required - Configure MX Linux 19.4 OS (cont.)

5d. Click on IPv4 Settings tab

5e. Click the “Method” drop down and change it to “Manual”

5f. Click “Add”

5g. Click in the “Address” field and enter:

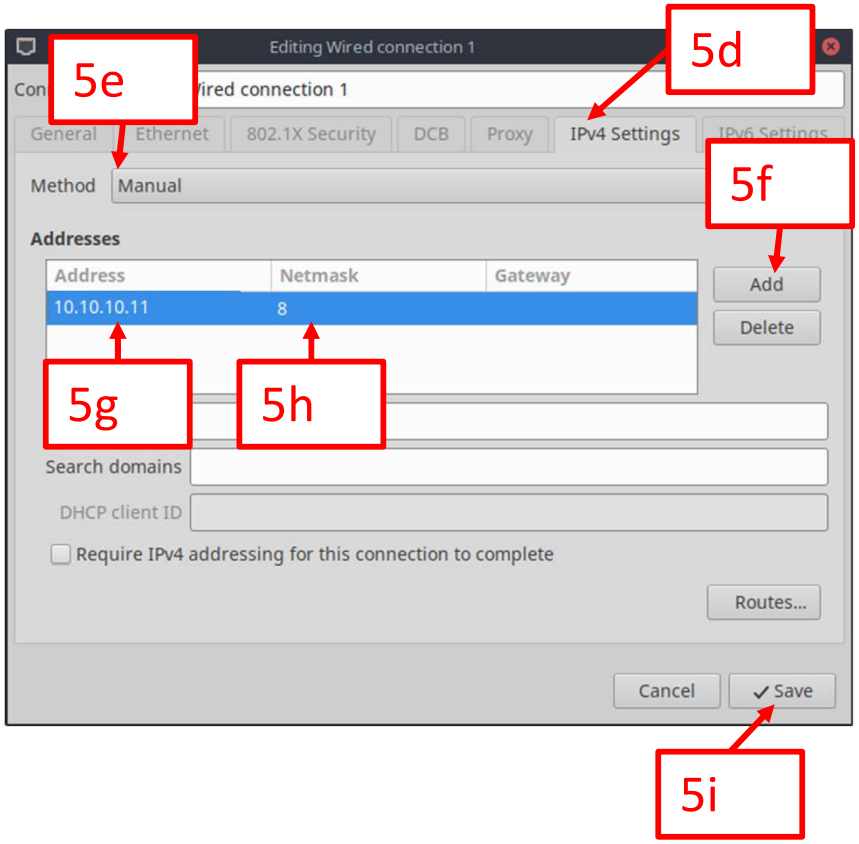
10.10.10.11

5h. Click in the “Netmask” field and enter:

8

5i. Click “Save”

Note: Step 5g assumes the user has the jumpers set on the Mesa ethernet card to choose 10.10.10.10 as the default address and not the default address of 192.168.1.121. The latter of which can interfere with wifi connections.



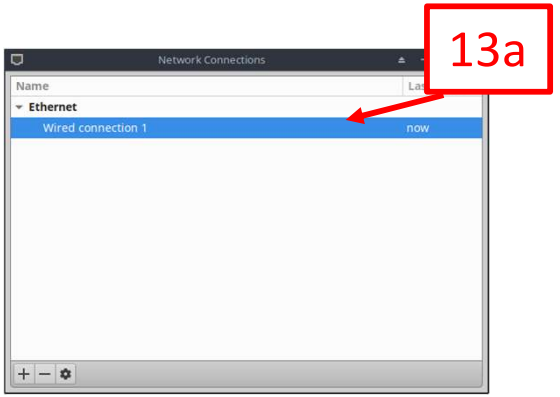
Section 4 - Required - Configure MX Linux 19.4 OS (cont.)

6. Close the “Network Connections” window
7. On the task bar, find and **LEFT** click on the Network Connections icon: 
    a. If there is no network icon, open a terminal and enter “nm-connection-editor”
8. In the Wireless section, chose the SSID that matches the user’s network
9. Enter the Password in the “Wi-Fi Network Authentication Required” window
10. Click “Connect”

Note: **The system must have internet access before proceeding.** It is prudent to start a browser and visit a known-good website.

The following applies to a Mesa Ethernet card only, if one is not installed, these steps can be skipped.

11. On the task bar, RIGHT click on the networking icon:
    a. If there is no network icon, open a terminal and enter “nm-connection-editor”
12. Choose “Edit Connections…”
13a. Double click on “Wired connection 1”



Section 4 - Required - Configure MX Linux 19.4 OS (cont.)

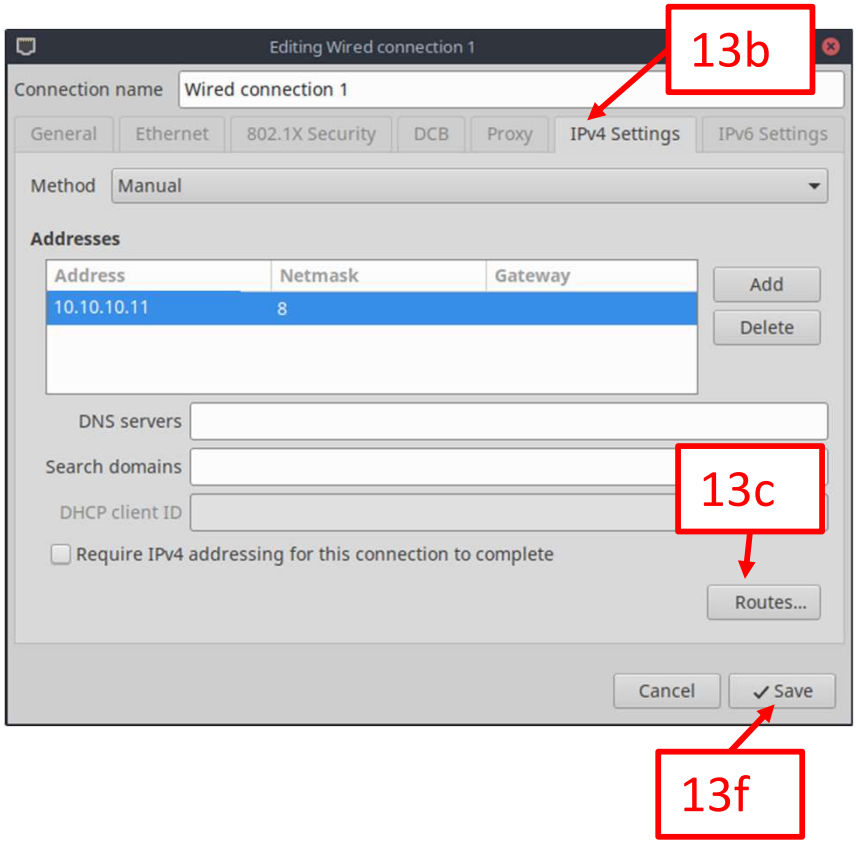
13b. Click on IPv4 Settings tab

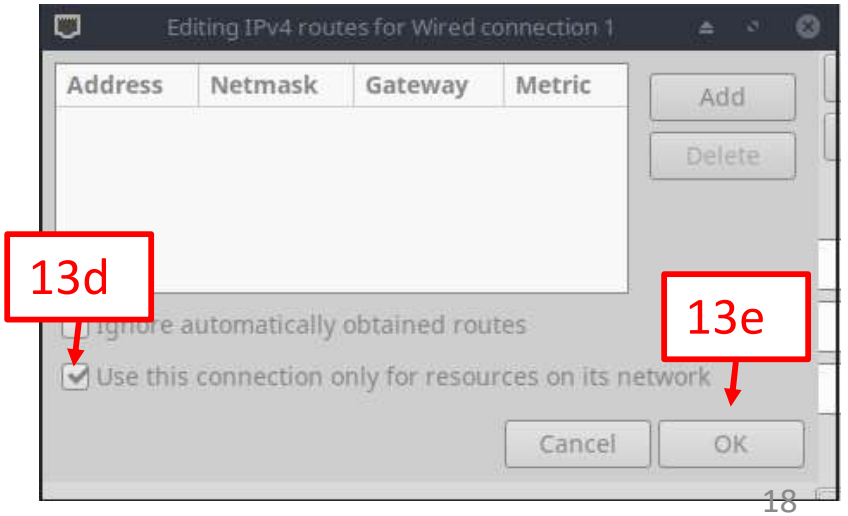
13c. Click “Routes”

13d. Click “Use this connection only for resources on the network”

13e. Click “OK”

13f. Click “Save”





Section 4 - Required - Configure MX Linux 19.4 OS (cont.)

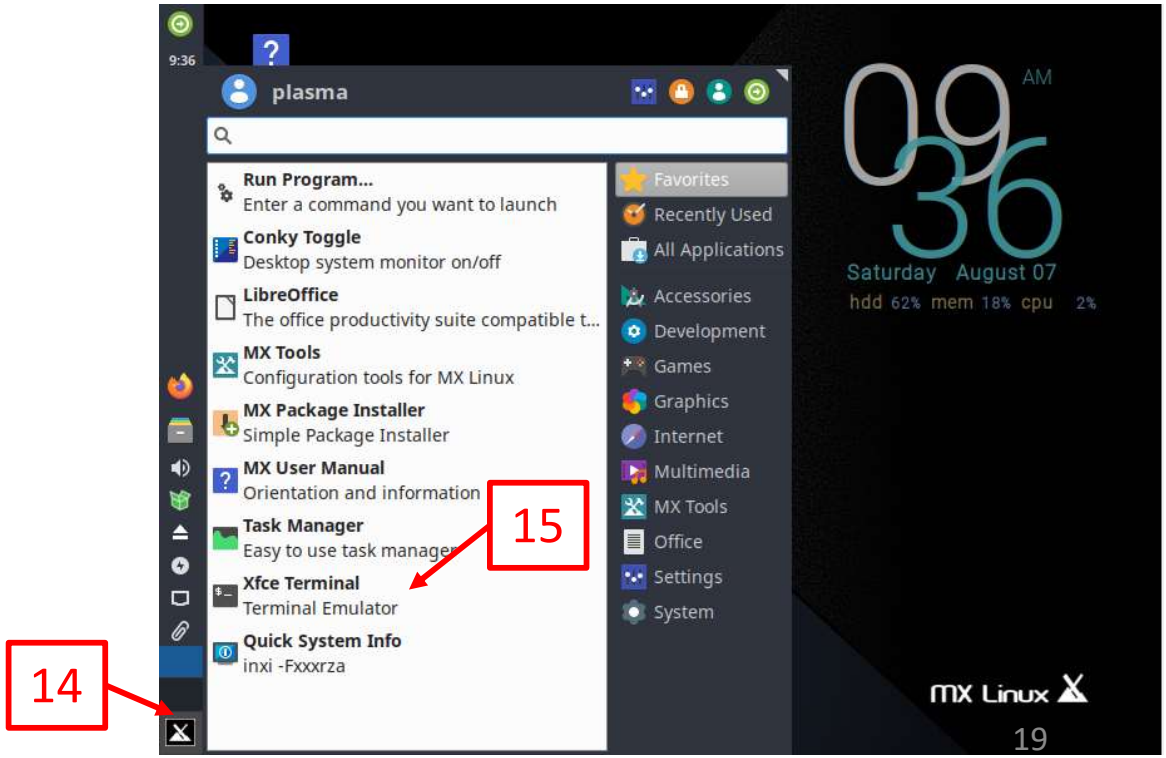
14. Click the MX Linux symbol
15. Click Xfce Terminal
16. The background can be made solid by clicking:
    a. Edit
    b. Preferences
    c. Click the Appearance Tab
    d. Click drop down under “Background” and change to “None (use solid color)”
    e. Click Close

IMPORTANT THINGS TO NOTE:

1. Reminder: All terminal commands are case sensitive and must be entered exactly as shown.

2. The user must press “Enter” after entering each command.

3. Passwords entered into terminal will not show up as anything on the screen. Simply type the password and press “Enter”.



Section 4 - Required - Configure MX Linux 19.4 OS (cont.)

17. Enter the following command:

    sudo apt update

Note: The user will be asked to input the user password (which will not show up when typed in)

18. Enter the following command:

    sudo apt upgrade --fix-missing

Note: Enter a “Y” if prompted “Do you want to continue? [Y/n]”

19. Enter the following case sensitive command:

    sudo apt install linux-image-rt-amd64

Note: Enter a “Y” if prompted “Do you want to continue? [Y/n]”

20. Enter the following command:

    sudo shutdown -r now

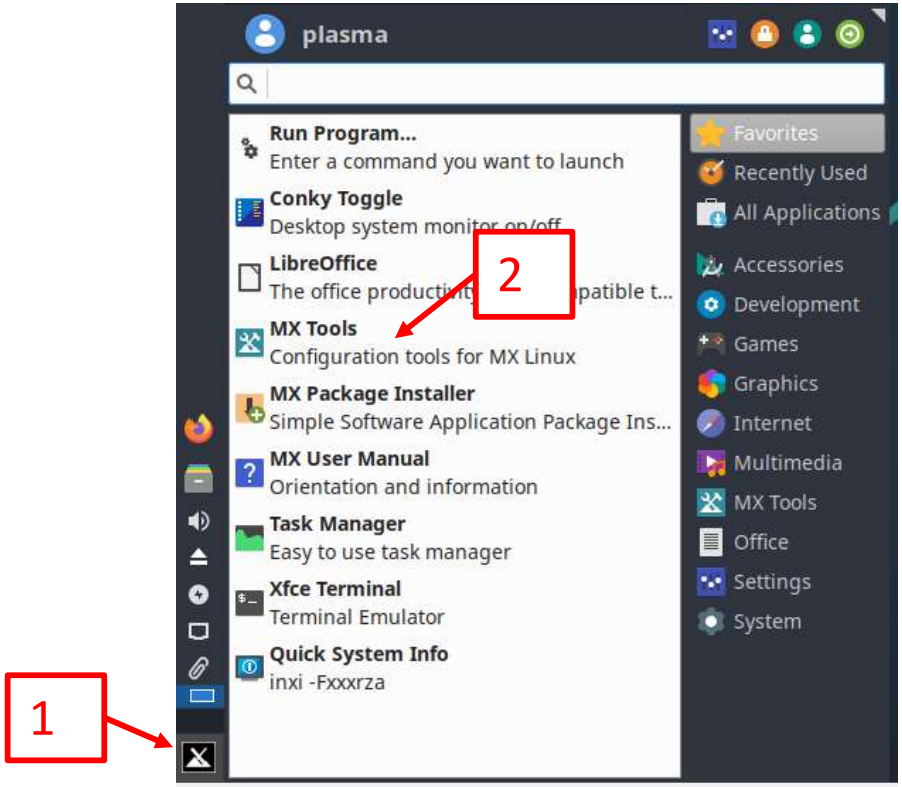
Note: The computer will now reboot

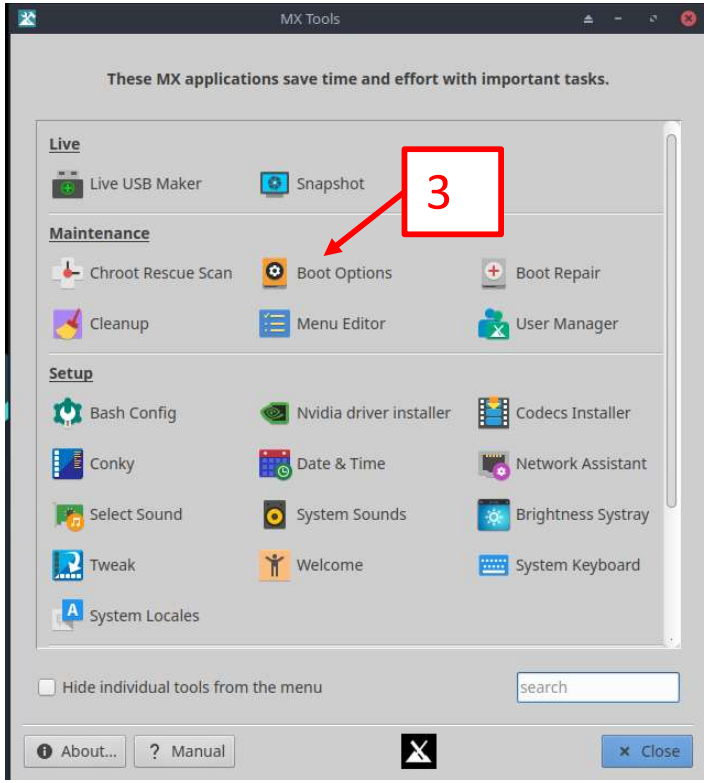
21. After reboot, open a new terminal window and enter the following command: uname -a

Note: The results must contain “rt” in the kernel name similar to the picture below. If the results do not show this, follow the steps on the next slide.

** ONLY PERFORM THESE STEPS IF THE KERNEL NAME RESULTS FROM STEP 56 DO NOT CONTAIN “RT” **

1. Click the MX Linux icon
2. Click “MX Tools”
3. Click “Boot Options”, enter the root password, click “Authenticate”
4. In the “Boot to” dropdown, select the kernel name that contains “rt” without “(systemd)”





Section 5 - Required - Install MesaFlash

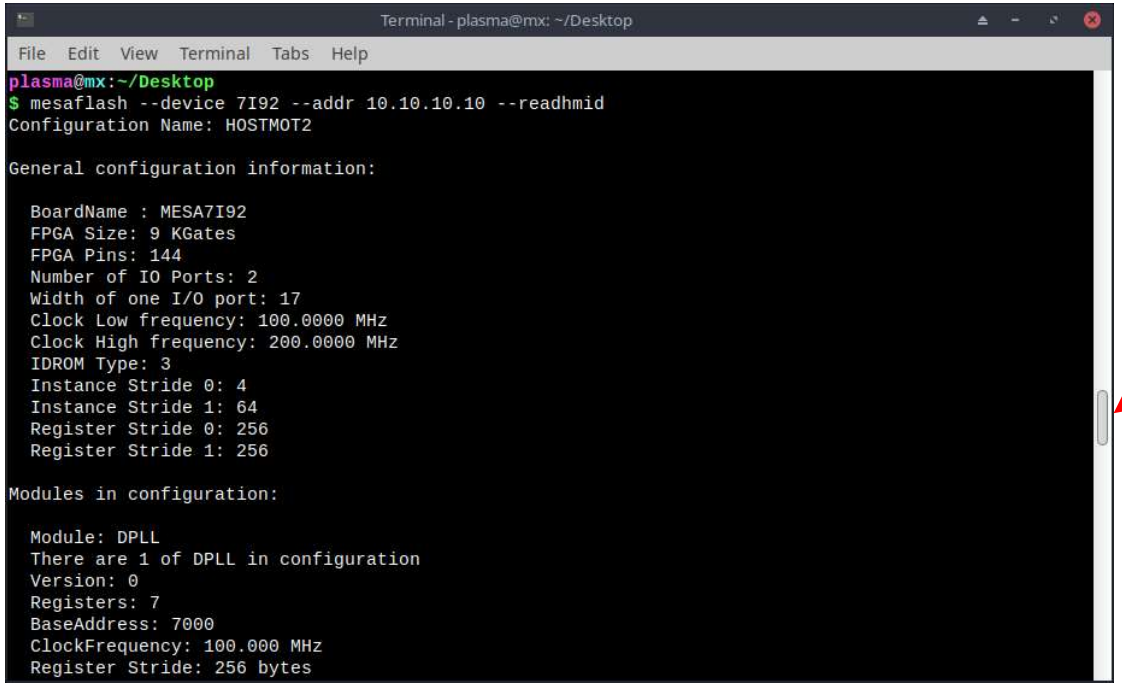
The following steps will add MesaFlash to the PC which will enable the user to update their firmware, or use the tool to check connectivity, etc.

1. Open a browser window
2. Proceed to the following site and follow the instructions in the “Quickstart:” section:
   https://github.com/LinuxCNC/mesaflash#readme

Section 6 - Required - Test Connection to Mesa Ethernet Card

Now is a good time to test the connectivity to the Mesa Ethernet Card. Make sure the Mesa card is connected to the PC, and that the Mesa card is turned on (has power).

1. Open a terminal window
2. Enter the following command, dependent on Mesa card model:
   a. 7i76e → **mesaflash --device 7i76e --addr 10.10.10.10 --readhmid**
   b. 7i96 → **mesaflash --device 7i96 --addr 10.10.10.10 --readhmid**
   c. 7i92 → **mesaflash --device 7i92 --addr 10.10.10.10 --readhmid**
3. The result should generate a list of stepgens, PWM's, I/O's, etc. if not, seek help on the LinuxCNC forum.
4. Example of the beginning of a successful output:



Note the position of the slider. When successful, this command will output a lot of useful data.

Section 7 - Required - Install LinuxCNC Package Version

The following steps will walk the user through the installation of LinuxCNC. Note that whether or not the user intends to use a Package (buildbot) install or a Run In Place (RIP) installation, the process starts with installing the Package version first as it satisfies many of the dependencies required for LinuxCNC.

1. Open a terminal window
2. Enter the following command:
   sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-key EF1B07FEE0EE663E

Note: Sometimes the keys change. The author will try to keep this document up to date, however should a key installation fail, the user will have to seek the new key from either the linuxcnc buildbot page, or the linuxcnc forum.

A successful key installation looks like this:

```
$ sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-key EF1B07FEE0EE663E
[sudo] password for plasma:
Executing: /tmp/apt-key-gpghome.CWITcBDDZV/gpg.1.sh --keyserver keyserver.ubuntu.com --recv-key EF1B
07FEE0EE663E
gpg: key EF1B07FEE0EE663E: public key "LinuxCNC Buildbot <nomail@linuxcnc.org>" imported
gpg: Total number processed: 1
gpg:               imported: 1
```

In the event that the key installation fails, another keyserver to try:
sudo apt-key adv --keyserver hkp://pgpkeys.eu --recv-key EF1B07FEE0EE663E