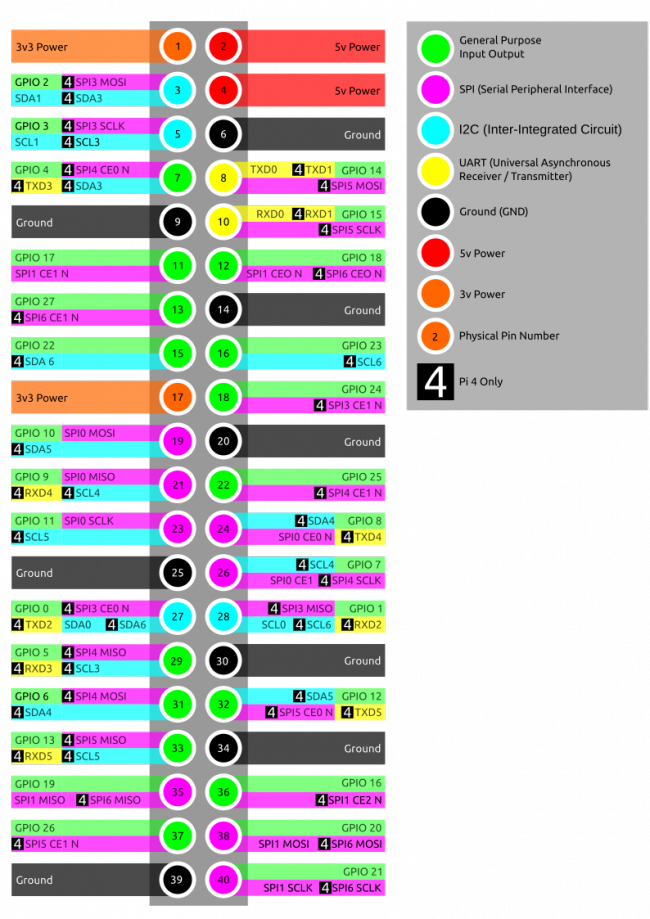
1. Install Raspbian
   1. Download the Raspbian with desktop image from raspberry pi website
   2. Extract the zip
   3. Flash the image to an SD card using balena etcher
   4. Remove the SD card and plug it into the raspberry pi
   5. First boot will have a pop up that states “Root filesystem resized” then will reboot
   6. Follow the guided setup
      1. Set locality to USA, English, US Keyboard
      2. Time zone: New York
      3. Password: thinfilm1
      4. Skip network setup
      5. Skip software update
      6. Reboot
   7. Use a wifi hotspot to provide internet to:
      1. Install network manager:
         1. Follow the guide here, skip step 3
         2. <https://raspberrypi.stackexchange.com/questions/29783/how-to-setup-network-manager-on-raspbian>
   8. After reboot, right click network manager icon and select “Connect to hidden network…”
      1. Network Name: wahoo
      2. Security Type: None
      3. If connection fails, contact ITS about resetting wahoo registration
   9. Run update and upgrade
      1. sudo apt update && sudo apt upgrade
   10. Install necessary software
       1. sudo apt install minicom ipython ipython3 qt5-default pyqt5-dev pyqt5-dev-tools
       2. sudo pip3 install pyvisa pyvisa-py pyvisa-sim
   11. Run the configuration script
       1. Sudo raspi-config
       2. 8. Update the config tool
       3. 2. Network Settings
          1. N1: Set hostname: laser-brain
          2. N2: Enable predictable network interface names
       4. 3. Boot options
          1. B3: Disable boot splash screen
       5. 5. Interfacing Options
          1. P2: Enable SSH
          2. P3: Enable VNC
          3. P6: Disable serial login shell, enable serial hardware
       6. Finish
   12. Configure SSH (Change to non-default port for a little better security)
       1. Sudo nano /etc/ssh/sshd\_config
       2. Add a line below “#Port 22”:
          1. Port 242
          2. Exit and save (Ctrl+X, Y, <enter>)
          3. Reboot
   13. Enable extra serial connections
       1. Ls -l /dev/ttyA\*
          1. List currently available serial interfaces
             1. ttyACM0 = usb-serial interface to Arduino
             2. ttyAMA0 = default serial, currently consumed by the bt radio
       2. Enable the dtoverlays for uart0, uart4, uart5
          1. Sudo nano /boot/config.txt
          2. Add the following lines to the end of the file after “enable\_uart=1” to move the bt radio to the miniuart, then enable uarts 4 and 5, 0 is automatically moved to /dev/ttyAMA0 when you move bt to miniuart
             1. dtoverlay=pi3-miniuart-bt
             2. dtoverlay=uart4
             3. dtoverlay=uart5
          3. Exit and save (Ctrl+X, Y, <enter>)
          4. Reboot
       3. Download the PLD Laser Brain software files for testing
          1. cd ~
          2. git clone <https://github.com/ibrummel/PLD-Laser-Brain.git>
          3. cd PLD-Laser-Brain
   14. Set up the power button on GPIO3
       1. Run ./install\_power\_button.sh from the PLD-Laser-Brain/pi-power-button
          1. Work based on this tutorial <https://howchoo.com/g/mwnlytk3zmm/how-to-add-a-power-button-to-your-raspberry-pi>



Troubleshooting:

|  |  |
| --- | --- |
| Symptoms | Solution |
| -Python GUI fails to read data from microcontroller  -Not solved with full power cycle  -Cannot reflash microcontroller via Arduino IDE (ERROR: Selected serial port does not exist or your board is not connected), but can read serial and “lsusb” shows Arduino device as connected. | -Physically open case and unplug/replug the microcontroller USB cable |
|  |  |