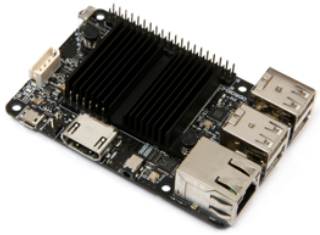


Throughput Testing Single-Board Computer for Wireless LAN Professionals

Setting up Odroid C2 As Test End-Point

Inventory Project Items

Unpack and knoll the following items

- ❑ Impact Strong 5200 mAh USB Battery
    - And it has a flashlight as well!
- ❑ USB Micro Power Cable (comes with Battery)
- ❑ Micro SD Card to eMCC adapter (Blueish green)
- ❑ eMCC Memory Card (small with Red label)
- ❑ Transcend USB 3.0 SD Card Reader
- ❑ Odroid Wi-Fi 4 NIC – (Black)
- ❑ USB 'U-bend' Adaper (Black
- ❑ Odroid C2 – Single Board Computer
- ❑ #WLPC_EU USB Drive (has the Image)
- ❑ Odroid Case Kit (Black)

Later we will have you use as part of the testing (not in your own kit)

- Small Phillips Screwdriver (to assemble your case)
- Short Ethernet Cable (to test your unit when attached to a switch port)

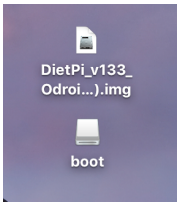
- ❑ If you are running Windows copy the Win32DiskImager-0.9.5-binary executable as well.

If you are running Windows follow the Windows directions, if Mac OS – move to the Mac OS directions.

Mac OS Version

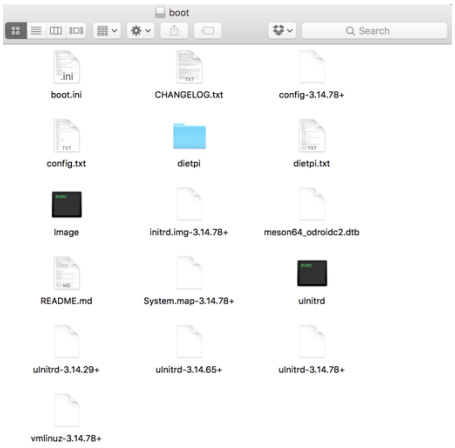
Configure Image

- ❑ Copy Image File from the #WLPC_EU USB drive (in the Odroid for #WLPC_EU folder) to your Desktop… the file name is DietPi_v133_OdroidC2-arm64-(WLAN_PRO)



- ❑ Open Image File – Boot Drive

- ❑ Should have a Folder Call "Boot"



- ❑ Find the dietpi.txt
  We are changing setting so your Odroid device can join a local SSID and download more files we'll need.

- ❑ Under the Wi-Fi Details section change the Wi-Fi SSID to `WLPC_EU-01` with a PSK of `password`.

```
#Enter your wifi details below, if applicable (Case Sensitive).
Wifi_SSID=WLPC_EU-01
Wifi_KEY=password
```

- ❑ Under WiFi Hotspot Settings, change this to be Firstname_Lastname and Change wpa_passphrase from change me to 'password' or a password you can remember

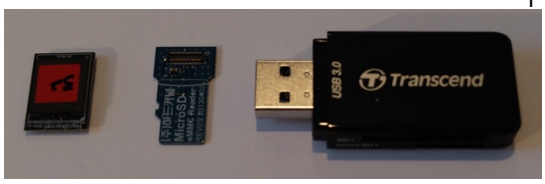
(remember PSKs are case-senstive)

```
# >> Wifi Hotspot/AP Settings --------------------------

# - Set Wi-Fi Name/SSID
wifi_hotspot_ssid=Firstname_Lastname

# - Set Wi-Fi PSK - minimum of 8 characters
wifi_hotspot_key=password
```

- ❑ Save the changes in dietpi.txt
- ❑ Open the file again to confirm the changes
- ❑ Eject 'Boot' Image *(REMEMBER TO DO THIS!)*

Move Configured Image to eMMC Card

- ❑ Put MicroSD Adapter into Transcend SD/Micro SD USB Adapter



- ❑ Mount eMMC card into MicroSD adapter

- ❑ Place combination into Laptop USB Port
- ❑ You should find a new drive labeled "boot" on your desktop

This is the default image – we will be overwriting this.

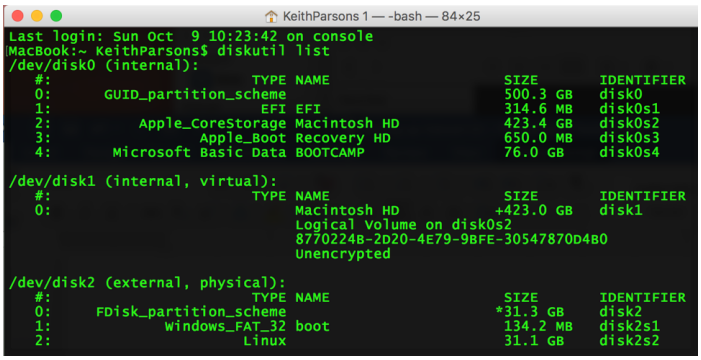
- ❑ Open Terminal window

- ❑ Type in command "`diskutil list`"

  You are looking for the External Disk with a Linux partition

  In this case it is /dev/disk2 – write this down

  **very important* always triple check that is the correct device, if you mess up the next step you could risk data loss on your main system*



- ❑ Type in command "`diskutil unmountdisk /dev/diskX`"
  Should receive a successful report

```
MacBook:~ KeithParsons$ diskutil unmountdisk /dev/disk2
Unmount of all volumes on disk2 was successful
```

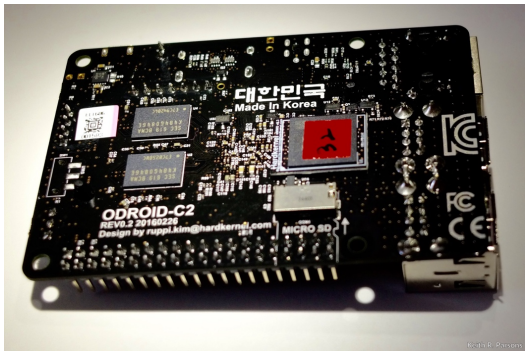
In this next step we will copy over the image on the eMMC with the image we want.

- ❑ The command is "`sudo dd if=file.img bs=1m of=/dev/rdisk2`"
  It is easiest to just drag the file to the placeholder `file.img` following the "`if=`"
  Remember to to keep the '`r`' in '`rdiskX`'
- ❑ Enter your SUDO password – your machine password

```
MacBook:~ KeithParsons$ sudo dd if=/Users/KeithParsons\ 1/Desktop/DietPi_v133_Odro
idC2-arm64-\(WLAN_PRO\).img bs=1m of=/dev/rdisk2
497+0 records in
497+0 records out
521142272 bytes transferred in 11.781195 secs (44235095 bytes/sec)
```

It will take a bit to do this process… wait for the prompt to return.

- ❑ To confirm – check the 'Boot' disk and it should have your changes.
- ❑ Now – Unmount drive from your laptop (Eject 'boot)
- ❑ Remove the USB Adapter
- ❑ Remove the eMCC card and place it in the bottom of the Odroid device. (It should only go one way)



Now jump to the Prepare Odroid C2 Section

Windows Version

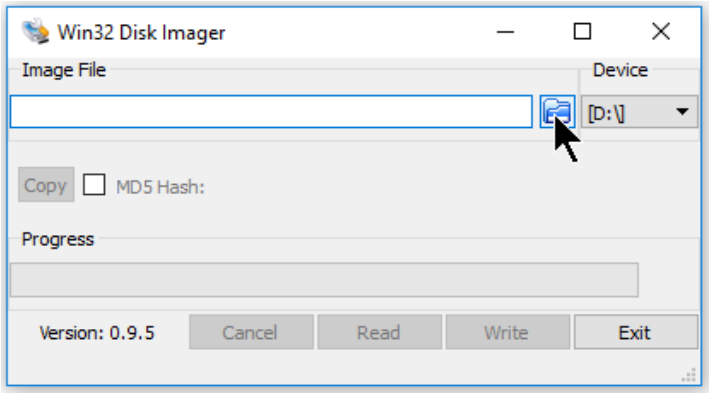
Instructions to create image on SD card and customize dietpi.txt file on a machine running Windows OS:

Configure Image

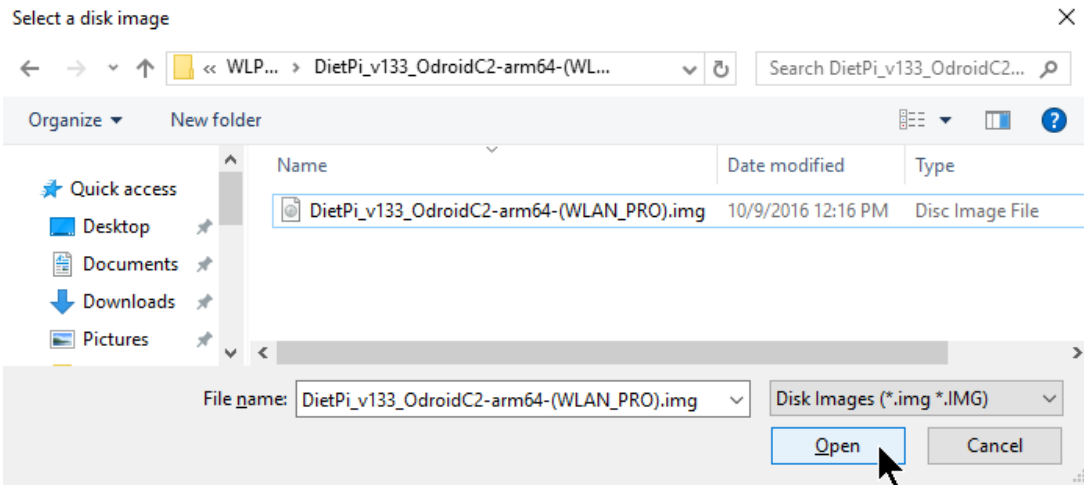
- ❑ Copy Image File from the #WLPC_EU USB drive (in the Odroid for #WLPC_EU folder) to your Desktop… the file name is DietPi_v133_OdroidC2-arm64-(WLAN_PRO)

- ❑ Install disk burning software by running the **Win32DiskImager-0.9.5-install.exe** file provided with your USB drive. Follow all installation defaults.

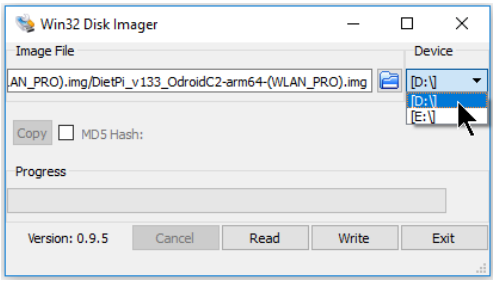
- ❑ Once installed, run **Win32DiskImager** from your start menu. Click on the *Image File* icon to select the image to burn.



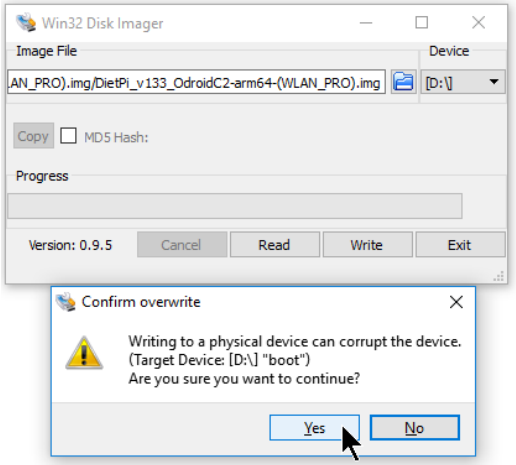
Locate the *WLPC_EU Image* folder in the USB provided and select the file image named
DietPi_v133_OdroidC2-arm64-(WLAN_PRO).img and click ***Open***:



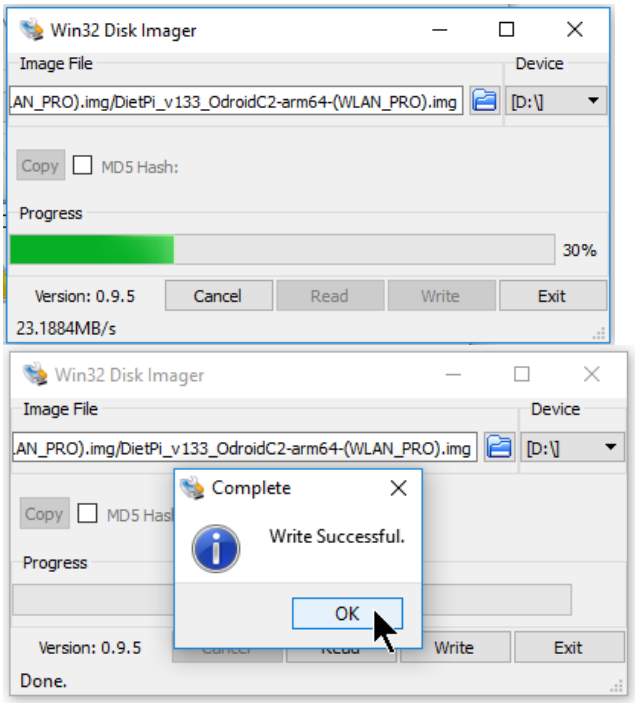
- ❑ Insert the USB adapter with the SD memory card into your computer and verify that your drive is listed under the Device area. If the drive listed is not correct, select the drop down list and select the right drive unit. In this example we are selecting drive **D:**



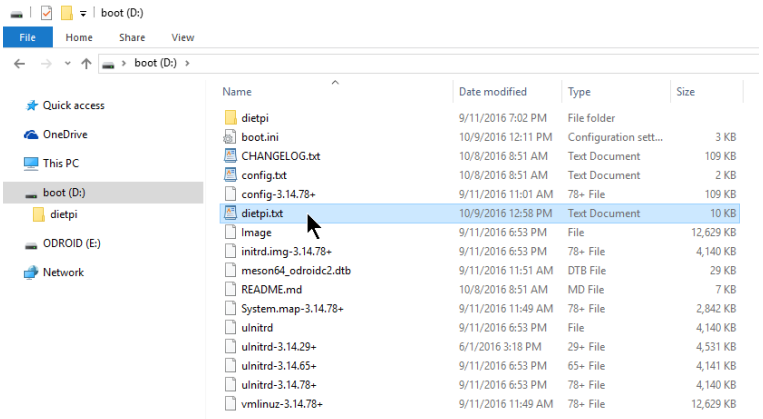
- ❑ Click on ***Write*** and confirm overwrite of your eMMC memory card by clicking ***Yes***:



- ❑ You will see a progress bar and upon completion you should see a ***Write Successful*** window, press OK to finish burning process.



- ❑ In your Windows Explorer select the eMMC Memory Card where the image was burnt to and open the file ***dietpi.txt*** and from



- ❑ Scroll down to the section ***#Enter your Wifi details below*** and enter the SSID and Key for the wireless network you will be joining for initial setup. In this example we will use settings as follows:

  #Enter your Wifi details below, if applicable (Case Sensitive).
  Wifi_SSID=**WLPC_EU-01**
  Wifi_KEY=**password**

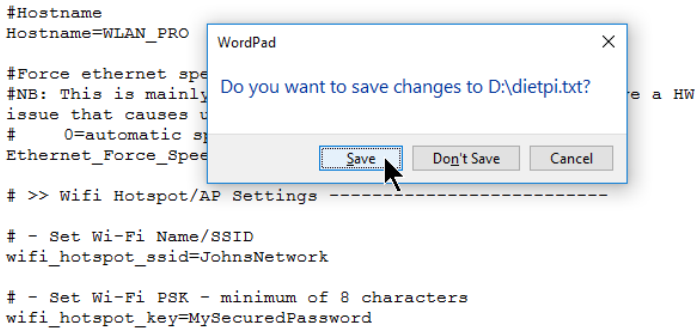
- ❑ Scroll down to the section ***# >> Wifi Hotspot/AP Settings*** and enter the WiFi hotspot SSID and password. This SSID will be the one assigned to your own personal Odroid and must be easy for you to identify, either your name, last name or something unique in the audience. In this example we will configure as follows:

  # >> Wifi Hotspot/AP Settings ----------

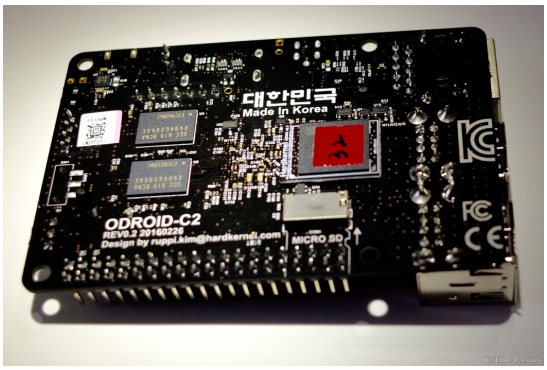
  # - Set Wi-Fi Name/SSID
  wifi_hotspot_ssid=**Firstname_Lastname**

  # - Set Wi-Fi PSK - minimum of 8 characters
  wifi_hotspot_key=**MySecuredPassword**

- ❑ Once you are done editing your deitpi.txt file, make sure you close and save the file.



- ❑ To confirm – check the 'Boot' disk and it should have your changes in place.
- ❑ Now – Unmount drive from your laptop (Eject 'boot)
- ❑ Remove the USB Adapter
- ❑ Remove the eMCC card and place it in the bottom of the Odroid device. (It should only go one way)

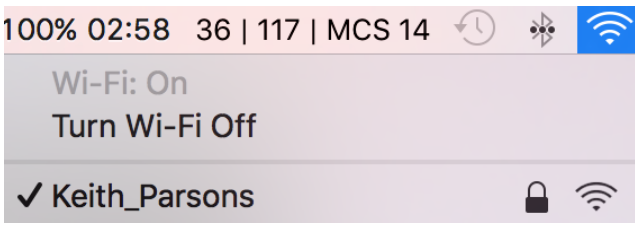


Now jump to the Prepare Odroid C2 Unit section

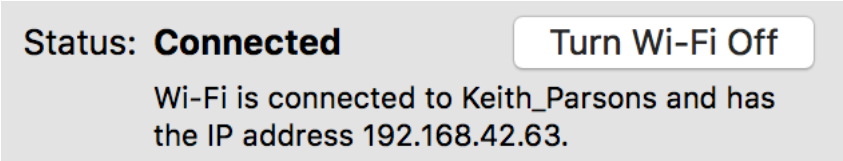
Prepare Odroid C2 Unit

- ❑ Insert USB ‘U-turn’ device top-center USB
- ❑ Insert Odroid Wi-Fi NIC into USB ‘U-turn’
- ❑ Plug USB Micro cable into your Battery
- ❑ Plug other end into Micro USB slot on Odroid C2
- ❑ Make sure the battery is on by pressing the On Button
- ❑ WAIT Patiently – This next step may take up to 10-15 minutes

- ❑ When completed – after waiting 10-15 minutes…
- ❑ Power-cycle your Odroid.
- ❑ You should see your Firstname_Lastname SSID being broadcast.

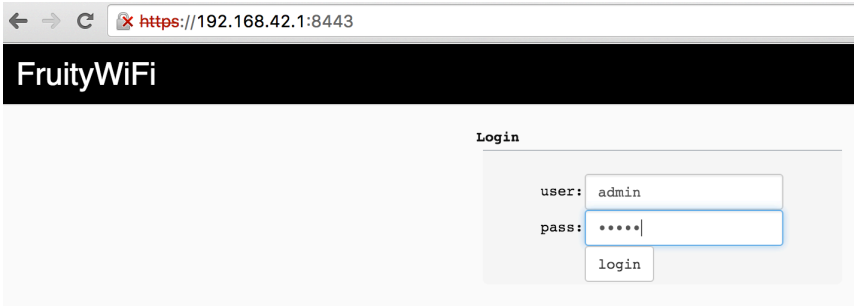


- ❑ Associate to your new SSID (the one being transmitted by your own Odroid device) with the PSK you assigned. (we recommending 'password' at this point to make it easy)

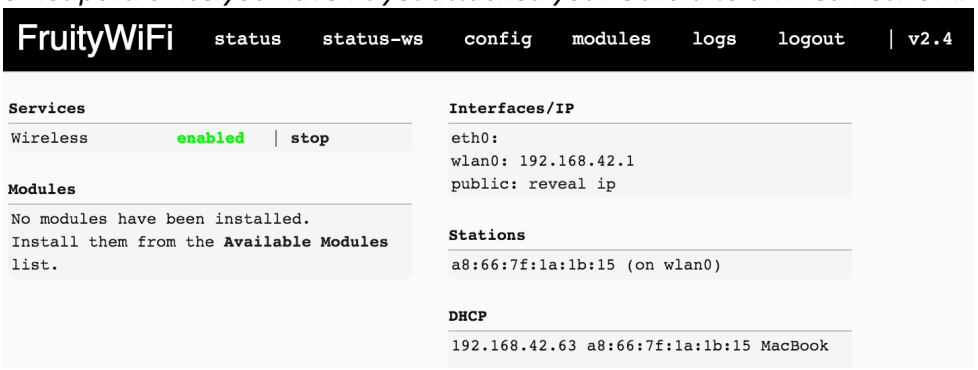


- ❑ Open a browser and go to http://192.168.42.1 - the default gateway for your SSID

- ❑ Log in as admin/admin

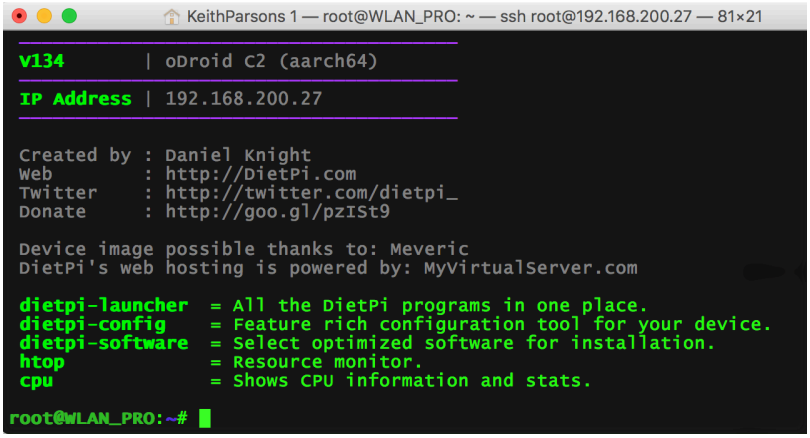


- ❑ The FruityWiFi status screen should show up. *Note: there is no IP address for the Ethernet port. Since you haven't yet attached your Odroid to a wired network.*



- ❑ At this point, use your Terminal Client of choice, Hyperterm, puTTY, etc. and SSH to your Odroid device's IP Address. (puTTY is on your WLPC_EU USB drive under "Other Wi-Fi Tools")

- ❑ Hostname `Root@192.168.42.1`
  Password "`dietpi`"

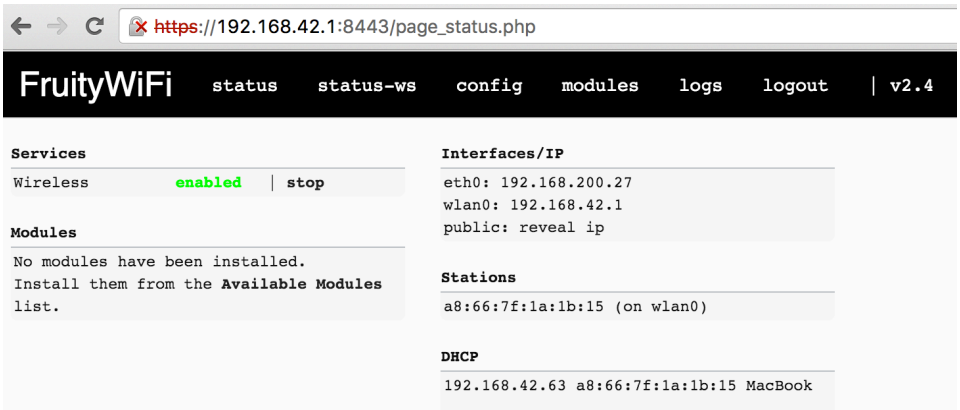


- ❑ Try the command `ifconfig` to see the current status of your device interfaces.

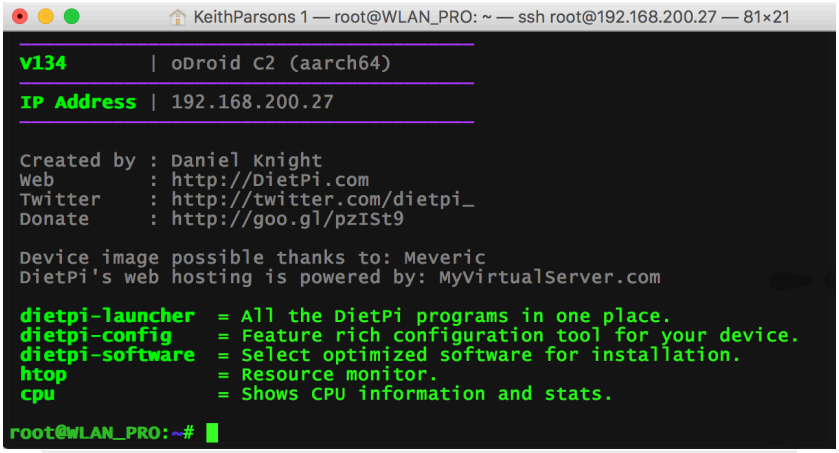
Now we are going to have you go over to the tables with the Switches and Ethernet cables.

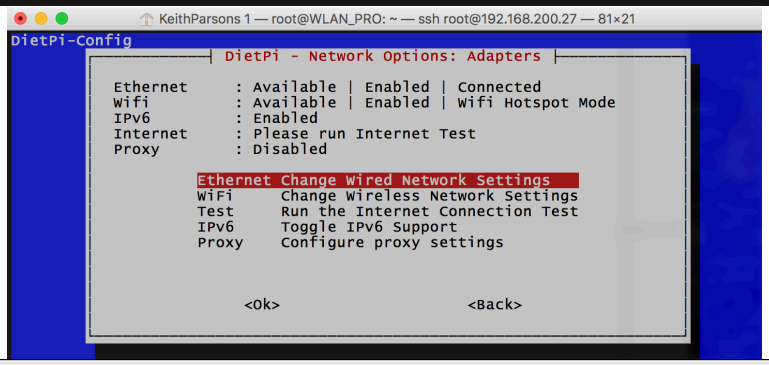
- ❑ Un-plug the battery from your Odroid device
- ❑ Plug in one of the Ethernet cables connected to a Switch
- ❑ Power on your Odroid device by plugging back in the USB Power cable

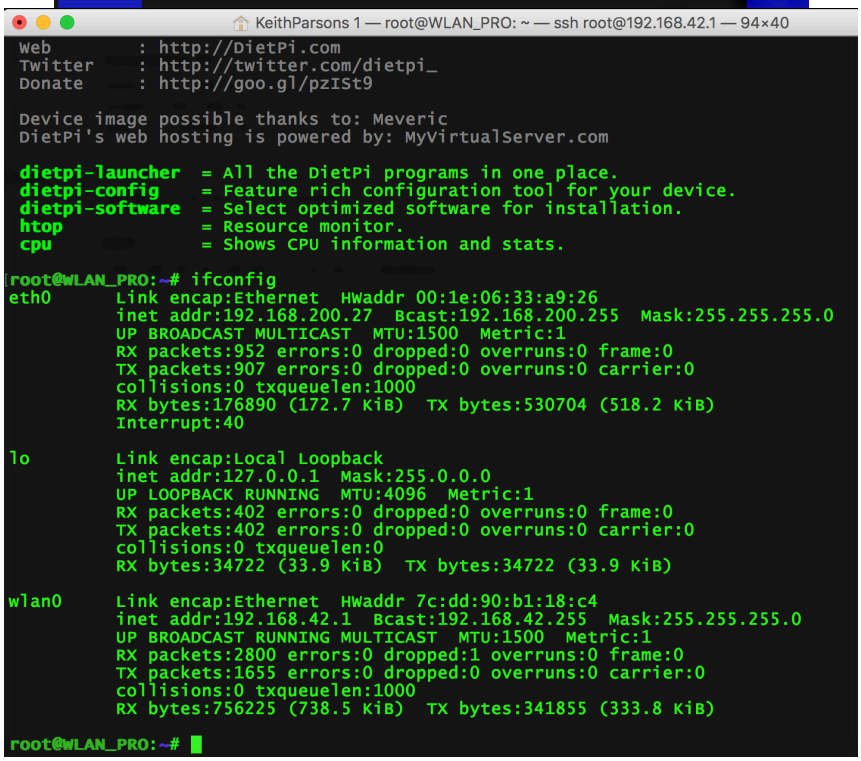
- ❑ Return to your laptop and re-connect to your SSID (with your Firstname_Lastname) you should now return to the browser (the FruityWiFi should be on 192.168.42.1) and refresh the screen to see the IP Address of the switchport you are connected to.



- ❑ Some other commands you might want to try with the SSH terminal Interface:


KeithParsons 1 — root@WLAN_PRO: ~ — ssh root@192.168.200.27 — 81×21
V134 | oDroid C2 (aarch64)
IP Address | 192.168.200.27
Created by : Daniel Knight
Web : http://DietPi.com
Twitter : http://twitter.com/dietpi_
Donate : http://goo.gl/pzISt9
Device image possible thanks to: Meveric
DietPi's web hosting is powered by: MyVirtualServer.com
dietpi-launcher = All the DietPi programs in one place.
dietpi-config = Feature rich configuration tool for your device.
dietpi-software = Select optimized software for installation.
htop = Resource monitor.
cpu = Shows CPU information and stats.
root@WLAN_PRO:~#


KeithParsons 1 — root@WLAN_PRO: ~ — ssh root@192.168.200.27 — 81×21
DietPi-Config
DietPi - Network Options: Adapters
Ethernet : Available | Enabled | Connected
Wifi : Available | Enabled | Wifi Hotspot Mode
IPv6 : Enabled
Internet : Please run Internet Test
Proxy : Disabled
Ethernet Change Wired Network Settings
WiFi Change Wireless Network Settings
Test Run the Internet Connection Test
IPv6 Toggle IPv6 Support
Proxy Configure proxy settings
<Ok>
<Back>


KeithParsons 1 — root@WLAN_PRO: ~ — ssh root@192.168.42.1 — 94×40
Web : http://DietPi.com
Twitter : http://twitter.com/dietpi_
Donate : http://goo.gl/pzISt9
Device image possible thanks to: Meveric
DietPi's web hosting is powered by: MyVirtualServer.com
dietpi-launcher = All the DietPi programs in one place.
dietpi-config = Feature rich configuration tool for your device.
dietpi-software = Select optimized software for installation.
htop = Resource monitor.
cpu = Shows CPU information and stats.
root@WLAN_PRO:~# ifconfig
eth0 Link encap:Ethernet HWaddr 00:1e:06:33:a9:26
inet addr:192.168.200.27 Bcast:192.168.200.255 Mask:255.255.255.0
UP BROADCAST MULTICAST MTU:1500 Metric:1
RX packets:952 errors:0 dropped:0 overruns:0 frame:0
TX packets:907 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:176890 (172.7 KiB) TX bytes:530704 (518.2 KiB)
Interrupt:40
lo Link encap:Local Loopback
inet addr:127.0.0.1 Mask:255.0.0.0
UP LOOPBACK RUNNING MTU:4096 Metric:1
RX packets:402 errors:0 dropped:0 overruns:0 frame:0
TX packets:402 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:34722 (33.9 KiB) TX bytes:34722 (33.9 KiB)
wlan0 Link encap:Ethernet HWaddr 7c:dd:90:b1:18:c4
inet addr:192.168.42.1 Bcast:192.168.42.255 Mask:255.255.255.0
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:2800 errors:0 dropped:1 overruns:0 frame:0
TX packets:1655 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:756225 (738.5 KiB) TX bytes:341855 (333.8 KiB)
root@WLAN_PRO:~#

At this point you now have a working Odroid device and you know it's IP Address in the air, and on the wire.

This image is currently running support for the following services:

- ePerf (for use with Ekahau ESS Throughput Surveys)
- iPerf 2
- iPerf 3
- Kismet
- End-Point for Adrian Granados' WiFi Explorer Pro

This is just a start of the things you can do. FruityWiFi has more modules you can test and play with.

At this point you can assemble the case for your Odroid device. Take apart the pieces you are currently using, mount in the provided plastic case. And Re-assemble.