OpenLTE Manual

Introduction

USRP Hardware Driver

Linux:

```
sudo apt-get install libuhd-dev libuhd003 uhd-host
```

Mac:

```
sudo port install uhd
```

Windows Installers:

http://files.ettus.com/binaries/uhd/latest_release/

USB UHD driver:

http://files.ettus.com/binaries/misc/erllc_uhd_winusb_driver.zip

Command to find connected devices:

```
uhd_find_devices
```

Properties of attached device:

```
uhd_usrp_probe
```

USRP Technical Specifications:

http://www.ni.com/pdf/manuals/374925c.pdf

OpenLTE Installation

Source:

https://sourceforge.net/projects/openlte/

Dependencies:

```
sudo apt-get install libpolarssl-dev
```

Linux:

```
mkdir build
```

```
cd build && cmake ..
```

```
make
```

Optional:

```
make install
```

Running OpenLTE eNodeB

First terminal:

Do not close this windows during operation!

```
LTE_fdd_enodeb
```

Output:

```
linux; GNU C++ version 4.8.2; Boost_105400; UHD_003.008.001-42-
g8c87a524

*** LTE FDD ENB ***
Please connect to control port 30000
```

Second terminal:

This is the control interface of the eNodeB.

```
telnet 127.0.0.1 30000
```

Output:

```
Trying 127.0.0.1...
Connected to 127.0.0.1.
Escape character is '^]'.
*** LTE FDD ENB ***
Type help to see a list of commands
```

Third terminal (Optional):

This command will provide debug log messages.

```
telnet 127.0.0.1 30001
```

OpenLTE Tx Configuration

LTE frequencies band and frequencies (Spain):

Band LTE	Uplink frequency (MHz)	Downlink frequency (MHz)
20	832-862	791-821
3	1710-1785	1805-1880
7	2500-2570	2620-2690

[1]

EARFCN:

$$F_{DL} = F_{DL\_low} + 0.1(N_{DL} - N_{Offs-DL})$$ [2]

Using band 20, means using a $F_{DL\_low} = 791MHz$ and $N_{Offs-DL} = 6150$.

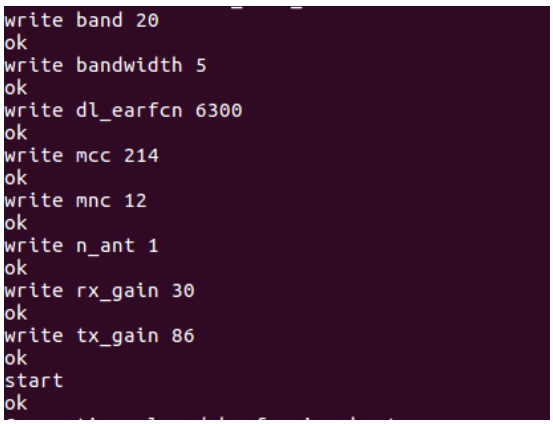
$$F_{DL} = 791 + 0.1(6300 - 6150) = 806MHz$$

Tx configuration:

```
write band 20
write bandwidth 5
write dl_earfcn 6300
write mcc 214
write mnc 12
write n_ant 1
write rx_gain 30
write tx_gain 86
```

[1] LTE Frequencies (Spain) [1]

[2] Downlink frequency [2]



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[3] eNodeB Configuration

Wireshark Configuration

Edit → Preferences → Protocols → DLT_USER → Edit…
Click ‘+’ → DLT = User 0 and Payload protocol = mac-lte-framed

[3]

References

[1] LTE Frequencies (Spain) - https://wiki.bandaancha.st/Frecuencias_y_bandas_LTE_en_Espa%C3%B1a

[2] EARFCN - 3GPP TS 36.106 Pág. 12

[3] Wireshark Configuration - https://sourceforge.net/p/openlte/discussion/general/thread/8c05b60e/?limit=25