

Instructions for Use

To execute the tool, navigate to the folder where the project was downloaded (the folder contains two files: menu.py and PCPS.py) and run the menu.py file. To execute it simply with the command `./menu.py`, you must grant the operating system the necessary permissions using the command `chmod +x menu.py`.

Once the tool has been executed, you will see the main menu shown in **Figure A.1**, where there are two options to proceed:

1. Analyze a recorded file
2. Record a file

```
----- PyGNSS-SDR -----  
  
Bloque de Adquisicion para señales GPS L1/CA  
Laboratorio de Telecomunicaciones - FACET - UNT  
CASTILLO DELACROIX LUCAS - 8/2021  
  
-----  
  
Menu Principal  
  
    1 - Analizar un archivo grabado  
    2 - Grabar un archivo  
    3 - Salir  
  
-----  
  
Ingrese una opcion: 
```

Figure A.1. Tool Main Menu

- **Analyzing a Recorded File**

To analyze a previously recorded file, select option **1** (after choosing an option, press Enter), and you will see the menu shown in **Figure A.2**.

You can execute the acquisition algorithm through two approaches:

1. Run with default parameters
2. Configure parameters

```
Selecciona una opción

    1 - Correr Parametros por Default
    2 - Setear Parametros
    3 - Volver al menu anterior
    4 - Salir

Ingrese una opcion: 
```

Figure A. 2. File Analysis Submenu

If option **1** is chosen, the tool uses a set of pre-loaded generic options to simplify execution, assisting users unfamiliar with the details of each option. However, certain parameters (e.g., file path, file format, sampling frequency, number of satellites to search, save results, analysis time) must still be entered one by one.

The tool then displays all parameters, both the pre-loaded and user-provided ones, and requests confirmation, as illustrated in **Figure A.3**.

```
Los parametros ingresados son:
-----
Ruta del archivo: /home/lucas/Tesis/gnss-sdr/prueba1/signal_source.dat
Formato del archivo: GNSS-SDR
Buscar todos los satelites
Frecuencia de Muestreo: 2000000.0 Hz
Tiempo total de analisis: 2 s
Tiempo de integracion coherente: 0.002 s
Numero de integraciones por cada ventana no coherente: 1
Tiempo total de la ventana de integracion no coherente: 0.002 s
Numero de adquisiciones positivas por cada ventana no coherente para lograr adquisicion: 1
Rango de busqueda Frecuencial: ± 5000 Hz
Resolucion del bin frecuencial: 500 Hz
Resolucion del bin chip: 1.0
Umbral de deteccion: 0.005
Volcar resultados en archivo: False
-----
Confirmar parametros(y/n): 
```

Figure A.3. Default parameter visualization

If the entered parameters are confirmed, the algorithm is executed. Otherwise, the parameters can be reset, or the user can return to the main menu (see **Figure A.4**).

```
Selecciona una opción

    1 - Volver a setear parametros
    2 - Volver al menu principal

Ingrese una opcion: 
```

Figure A.4. Parameter cancellation submenu

- **Recording a Sample File**

To record a file, select option **2** in the main menu (**Figure A.1**) and proceed to the submenu shown in **Figure A.5**, where you must choose option **1** to configure recording parameters.

```
Selecciona una opción

    1 - Setear Parametros de grabacion y Grabar
    2 - Volver al menu anterior
    3 - Salir

Ingrese una opcion: 
```

Figure A.5. File recording submenu

The required parameters (e.g., file name, sampling frequency, front-end gain, duration of recording in seconds) must be entered one by one (see **Figure A.6**).

```
Selecciona una opción

    1 - Setear Parametros de grabacion y Grabar
    2 - Volver al menu anterior
    3 - Salir

Ingrese una opcion: 1

Ingrese el nombre del archivo que se grabara (sin extension): signal_test_3_11_21

Ingrese la frecuencia de muestro del archivo: 2e6

Ingrese la ganancia del front-end RF: 40

Ingrese la cantidad de segundos a grabar: 5
```

Figure A.6. Recording parameter configuration submenu

If the parameters are correct, and the device is connected and ready, the tool begins recording and displays a screen, as shown in **Figure A.7**, indicating the recording process.

```
Found 1 device(s):
  0: Realtek, RTL2838UHIDIR, SN: 00000001

Using device 0: Generic RTL2832U OEM
Detached kernel driver
Found Rafael Micro R820T tuner
Reattached kernel driver
Found 1 device(s):
  0: Realtek, RTL2838UHIDIR, SN: 00000001

Using device 0: Generic RTL2832U OEM
Detached kernel driver
Found Rafael Micro R820T tuner
Exact sample rate is: 2000000.052982 Hz
[R82XX] PLL not locked!
Sampling at 2000000 S/s.
Tuned to 1575420000 Hz.
Tuner gain set to 40.20 dB.
Reading samples in async mode...
Allocating 15 zero-copy buffers

User cancel, exiting...
Reattached kernel driver

Pulse una tecla para volver al menu principal
```

Figure A.7. File recording screen

If the device is not connected or not recognized, the tool shows the error screen in **Figure A.8**

```
No supported devices found.

Pulse una tecla para volver al menu principal
```

Figure A.8. Error screen during recording