# SDRuno

# The SDRuno Cookbook
# by
# Paul NN4F & Mike KD2KOG

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# Introduction

Welcome to the SDRuno Cookbook,

I'm Paul Jones, Amateur Radio Operator NN4F and general SDR Junkie, I'm a Beta tester for all the SDRPlay products, and also a member of Simon Browns SDR-Console Test Team.

Mike Ladd is a SDR Techno Junkie and Licensed Amateur Operator, callsign KD2KOG, and has been a SDRPlay Beta tester, as well as a tester/reviewer for many SDR's

In this document I'll try and cover all the facets of the SDRUno software, and its various settings using screen shots were applicable. The aim is to make the use as simple as possible, allowing you to get the maximum from the software.

I'd like to thank the SDRPlay team for all the great work they do, and for allowing me to take part in the testing, along with Mike Ladd and Preben Lohse Rasmussen.

And also to thank Mike Ladd again KD2KOG for his input and help with this guide.

Use this guide along with the manual supplied in the install, this is just a guide to try and make a few things easier to understand, we hope it helps you.

I'm also not going to cover the install, as this is very simple, download the software from SDRPlay.com and click on run and the software will install itself and the API driver, and we will start once you double click on the SDRuno icon.

Paul Jones – NN4F – http://www.nn4f.com

Mike Ladd – KD2KOG – http://www.kd2kog.com

SDRPlay – http://www.sdrplay.com

SDRUno – http://www.SDRuno.com

## The Main Tab

The **MAIN** tab is the first box you will see when you click on the SDRuno icon. This is the basic control panel for the radio.

So when you first start, this is what you will see.

You have access here to the main controls, LNA, AGC, etc. so we'll step through what they all do and how to get the best from them.

This is also the screen for profiles and additional VRX or Virtual Receivers. And then the status of SDRUno processor usage and system usage.

**SETT –** Opens the settings window

**MA –** Maximize/Minimize all, this keeps all the windows in sync when minimizing the windows

**OPT** – Options for the input, I/Q swap

**SR** – Sample Rate for Sound Card Input when not using RSP or ExtIO radio

**REC PANEL** -  This brings up the record panel to allow for I/Q recordings

**IN SR:** - The selected bandwidth.

**SP1** – Main Spectrum Panel

**SP2** – Auxiliary Spectrum Panel, the Audio Spectrum

**RX** – The Receiver Panel

**ADD VRX** – This allows you to add an additional VRX, this can only be added if the radio is stopped. The additional VRX has to be in the selected bandwidth you have selected.

**DEL VRX** – Delete the last VRX on the list. (stopped radio only)

**LO LOCK** – Locks the LO frequency when tuning

**LNA** – The RSP LNA On or Off

**AGC** – Turns the RSP AGC On or Off

**PERF** – High Performance Mode, uses more CPU

**ADV** – Brings up the RSP advanced settings, for DC/Bandwidth etc. see later screen shot

**GR** – Gain Reduction, click to move, if AGC is on, this will move automatically to compensate

**BW** – You can click here to fast change the RSP bandwidth on the fly

**PLAY** – Starts the radio

**MEM PAN** -  Opens up the Memory Panel

The rest are self-explanatory, Date and Time, Gain figures IF Gain Reduction, Total Gain Reduction.

The bottom SDRPlay Home is text I typed in, this is where the profile is stored, it starts as Default Workspace, when you left click a pop up menu will appear, change this to Workspace 1, then right click and you can rename this to your selected profile name, I have profiles for different screen settings, when running on a laptop or additional monitor.

Now you can click on SP1/SP2/RX to open up the basic windows you need, once you have them open and sized/positioned as you like, you can **ctrl+left click** on the profile and that will save your window layout.

## The ADV window

This is the **ADV** pop up window that controls certain RSP settings.

The **IF BW** is the main bandwidth, click on this and you will see a selection of the bandwidths available from 0.3Mhz to 8Mhz.

The **ADC SP** is used in conjunction with the AGC setting, if the AGC is on, this will apply the reduction, I run at -30 if I have the AGC on.

**DC/IQ** is used when in ZeroIF mode, and removes the DC spike.

**ZeroIF** is either on or off, If you click on **LowIF** the ZeroIF will un highlight.

**LO Plan**, selects the method that removes the old GAP, I run on Auto, but it can be changed bly clicking on it, this helps in removing images, if you see an image on the display, try changing the LO Plan to a different setting.

**DC Mode** can also be changed, but Periodic is the one I use the most, and works well

**DEC** is the Decimation setting, this is selected by the software depending on the BW, but you can change it if on a higher bandwidth.

# The SP1 Window

This is the main spectrum window
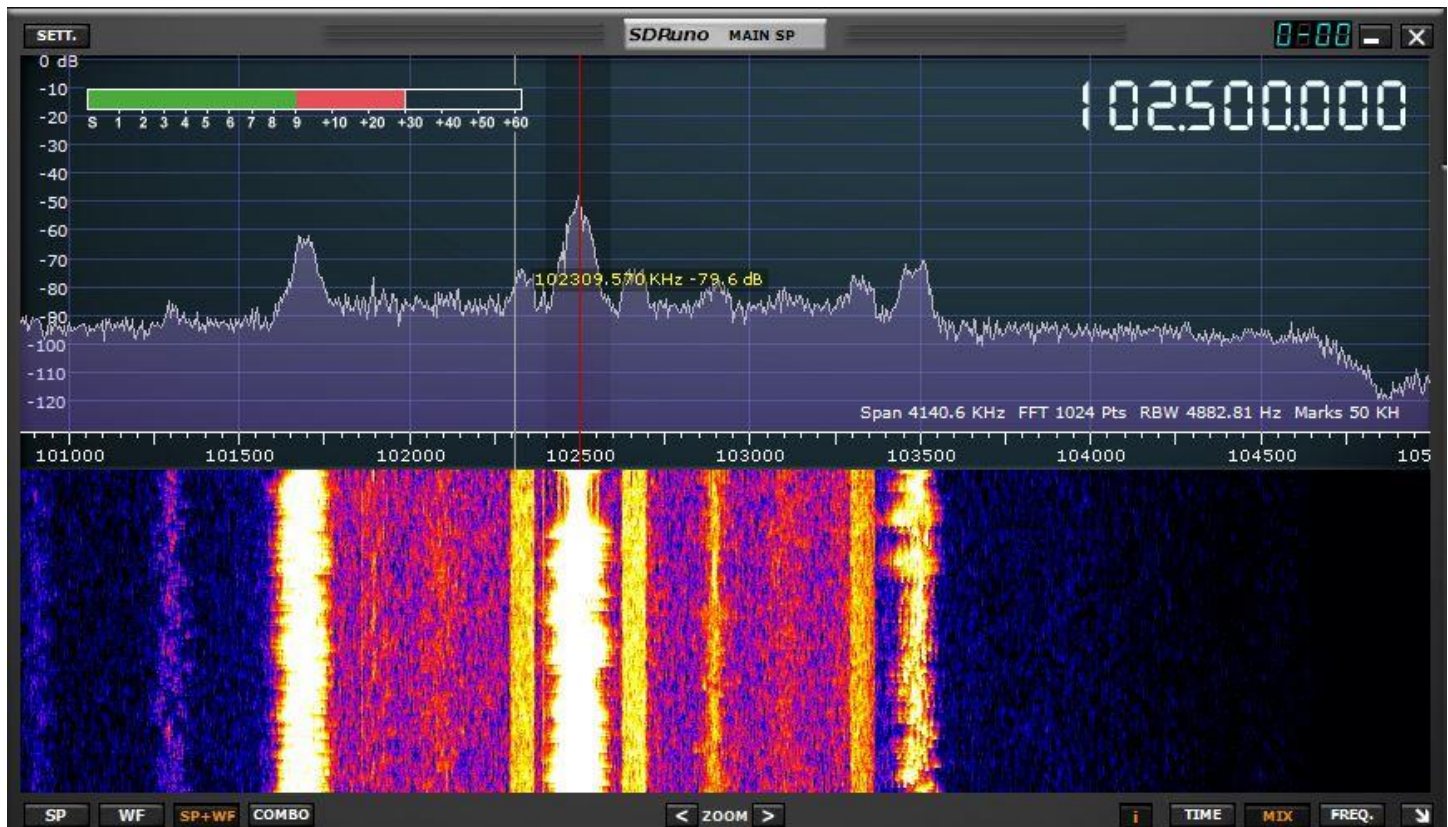


**SETT** will allow you to bring up the settings for waterfall gain, contrast, speed and additional settings. **SP** is spectrum only, **WF** is Waterfall only, **SP+WF** is shown above and **COMBO** is an overlay mix, which is a very nice display, **Zoom** is zoom, I is the info just above the center scale, and **Time/Mix/Freq**  I keep on **MIX** for best results. You can slide up and down by **left clicking** on the scale, if you want to move by a larger amount, you can **SHFT+Left click** on the scale and GREEN bar will appear, then scroll is much faster.
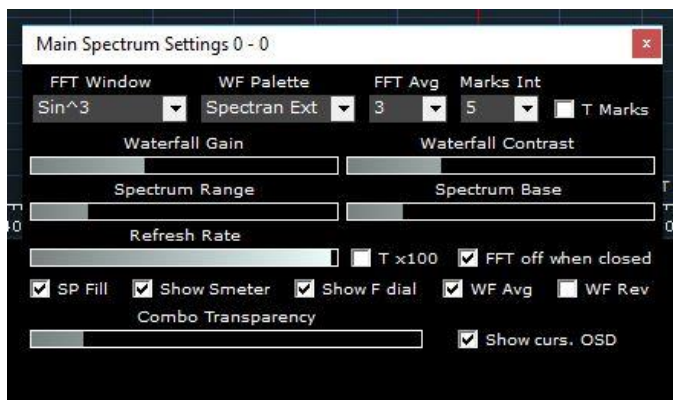


This is the **SETT** window for the SP1, has you can see it has various settings, for the FFT, Palette FFT AVG, Marks is the Time Marks, Range and Base allow you to alter the top and bottom ranges, Refresh rate is the speed of the waterfall

Each SP1 window you open on additional VRX's has its own settings window.

# The SP2 Window

This is the auxiliary window for the Audio Spectrum.
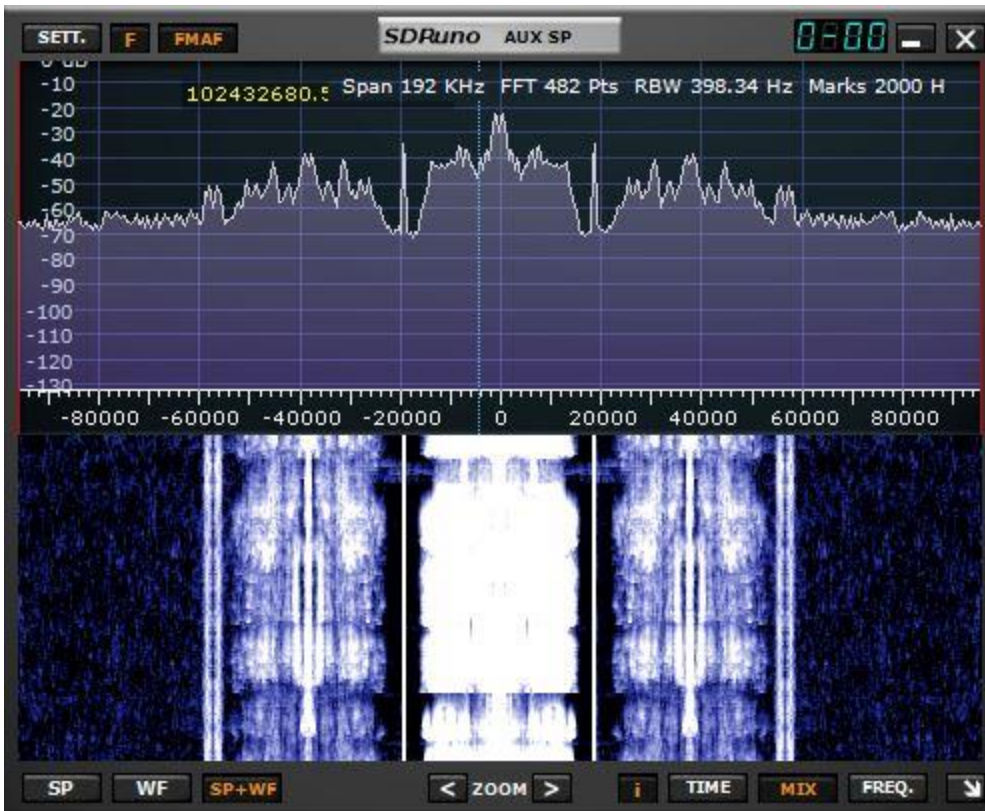


This is very similar to the SP1 window, but for your Audio selection, you can zoom in and out on the audio. Clicking on the spectrum or waterfall has no effect unless you are in CW mode, where you can move signals.

The SETT is the same, it will bring up the settings window for the SP2, F will show just the filtered audio, and FMAF is used on FM signals. Bottom controls are the same as SP1, minus the COMBO screen.

This is the SP2 Settings Screen, again similar to the main SP1 Settings, minus the option for the combo transparency.



Same controls, FFT, Palette, Contrast, Gain, Range & Base, Refresh Rate, SP Fill, the time marks can also be turned on and off for the SP2 screen, Marks Int is the time interval in seconds, then check the T Marks box for the time lines to appear.

## The Receiver Panel (RX)

This is the RX Panel, each VRX will have its own RX Panel. Also LOTS of Clicky bits....



It may look complicated, but it is rather simple, Standard Controls for VFO A/B, Modes, Filters, S-Meter, Band Buttons, AGC, Squelch, Volume, Notch.

So let's explore deeper, **Tuning**, obviously it shows the main frequency display of the VRX, this can be changed several ways.

**First,** mouse control, move over the digits, and a yellow cursor will appear above each digit, you can then use the mouse wheel to move that digit up and down.

**Second**, Keyboard Entry, click on the space bar, the white line around will change to yellow, then enter your frequency in KHz, so 14200 and enter will put you on 14.2Mhz.

**Third** for Amateur Bands, you can click on the band buttons down the right side.

**Fourth,** to use the 0-9 digits on the band buttons, hit space then the keys will give you 0-9 rather than the bands.

**Modes** are straight forward, AM/SAM/FM/CW/DSB/LSB/USB/USER, you can change mode by clicking on the button, or see the keyboard shortcuts at the end of this document.

**SAM** has the option to use DSB/LSB/USB to eliminate qrm above or below the carrier. **FM** has several modes, NFM/MFM/WFM/SFM each with its own filter settings/widths

**NB** has two modes, Wide and Narrow

**NCH** you have 4 notches available, NCH1 & 2 can be moved, 3&4 are fixed, to move 1, hold down the shift and left click, to move NCH2 shift and right click all in the SP2 window

The volume is controlled by clicking on the bottom slider, and the squelch level is controlled by the top slider, to enable **SQLC** click on the button, and below is the **MUTE** button

## The Extra Control

This is another pop up panel for the Receiver that contains less used controls, accessed by hitting the **EXW** on the title bar of the RX Control



This panel contains several user controls that you may want to access, but not always have on screen, personally I keep this window open, but depends on your screen area if you have enough room.

The most used on this are the sliders for **AGC, NB** and **NR**, the **AGC/NB** are OK left on the default settings, the **NR** (Noise Reduction) I vary depending on the signal being received. The higher the value, the more **NR** is applied to the signal.

**DEEM** is de-emphasis and can be turned on or off and set for 50us or 75us, normally 50us is for the USA and 75us for the rest of the world.
**AFC** is Automatic Frequency Control, can be on or off.
**MONO** turns off Stereo reception when in SFM mode,
**FMSNR** is the FM Signal to Noise Ratio.
**AM SOFT FILTER**, applies filters to AM to give that old AM tube type AM signal.

# Keyboard Shortcuts

These are the keyboard shortcuts…

| Key: | Function: Scope: |
|------|------------------|
| **A - a** | Select AM rx mode VRX |
| **S - s** | Select SAM rx mode VRX |
| **F - f** | Select FM rx mode VRX |
| **C - c** | Select CW rx mode VRX |
| **D - d** | Select DSB rx mode VRX |
| **L - l** | Select LSB rx mode VRX |
| **U - u** | Select USB rx mode VRX |
| **E - e** | Select User rx mode VRX |
| **N - n** | Select NFM rx FM sub-mode VRX |
| **M – m** | Select MFM rx FM sub-mode VRX |
| **W - w** | Select WFM rx FM sub-mode VRX |
| **O - o** | Select SWFM rx FM sub-mode VRX |
| **T - t** | Toggle Rx/Tx mode(4) VRX |
| **SPACE** | Starts direct frequency input seq. VRX |
| **Enter** | Closes direct frequency input seq. VRX |
| **ESC** | Aborts direct frequency input seq. VRX |
| **CTRL+F** | Show/hide the files pane Memory Panel |
| **CTRL+S** | Store enabled VRX to memory location (same as STORE button)Memory Panel |
| **Ins** | Inserts a new row after the current Memory Panel |
| **Del** | Deletes the current row Memory Panel |
| **F2** | Starts editing the current cell Memory Panel |
| **CTRL+S** | Store specific VRX to memory location VRX |
| **\*** | Starts IQ file recording Instance(1) |
| **H - h** | Shows the ExtIO panel (if loaded) Instance(1) |
| **B - b** | Shows the Memory Panel window Instance |
| **Up/Down Arrows** | Change frequency by step size VRX |

Note 1: Controls not available when the memory panel has focus.

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## The Memory Panel

You can have unlimited memory banks available for your use.



It is possible to have many memory banks available, firstly lets import the EiBi HF Database, go to http://www.eibispace.de and click on the CSV download link and save to your documents folder. Then right click on the Mem Panel above and you can go to IMPORT and select import eibi csv, browse to the file location and load the file. It will appear as above. Once that is complete, right click and save bank.

You can right click and new bank it will open up a blank table and you can click on and type in a frequency, mode etc...

Better still, if you are using the radio, refer to the RX image on page 9, at the top you will see a **MCTR** on the title bar, click that and it will make this RX the active RX for the memory bank. Now if you are tuning around and find something you wish to keep, then you can just hit store on the **Mem Panel** window, and it will save the Frequency and Mode, then you can just click double click on the description and enter the new description you want.

Cont...
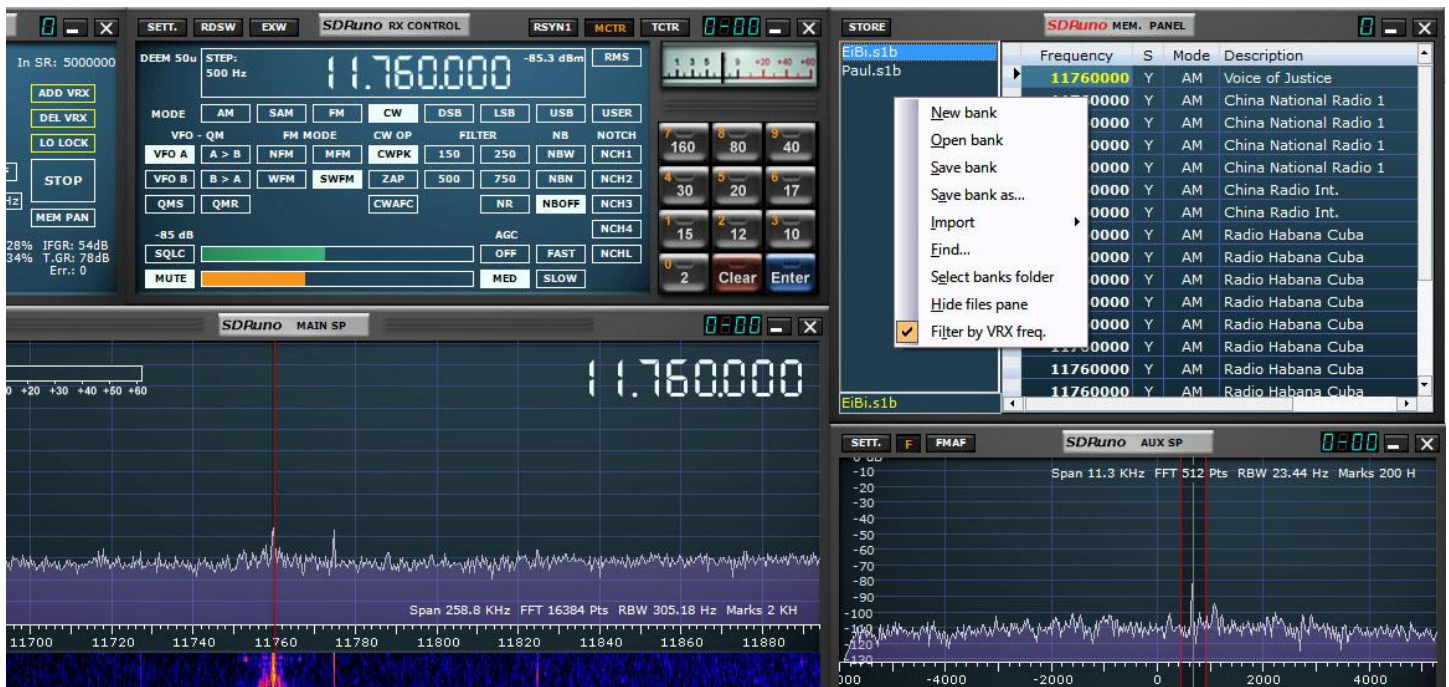
If you click on MCTR then right click on the MEM Panel when its open you will get the menu, click on Filter b VRX freq. this will show just the stations on the current frequency

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## RDS Decoding

SDRUno includes a great RDS decoder, it is accessed from the RDSW button on top of the RX panel



Clicking on the RDSW button will bring up the RDS Decode Window

Each active VRX can have it's own RDS decode available.



This is the RDS decode window, it will display the PI Code, but currently does not decode the PI and t will give you the text.

In the USA you can go to
http://db.wtfda.org/

Enter the PI code into the PI Code area, Must use CAPS and it will give you the station info.

UK go to http://www.dxradio.co.uk/ukrdscom.php

Other areas, please just google RDS PI Code Decodes in your area.

Scanning is a future option that will be worked on.

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## SDRuno Reset

This is an easy way to reset SDRuno

reg delete "HKEY_CURRENT_USER\Software\SDRplay\SDRuno" /f

you can add the above text line to a notepad file and save as sdrunoreset.bat

then when you double click on it, it will delete the registry entries, or you can just paste it into a dos command prompt window.

## EXTIO Radios

Although SDRUno is designed for use with the SDRPlay RSP, it will work with any radio that uses the extio standard.

Place a copy of your extio.dll in the c:\program files(x86)\SDRPlay\SDRuno

To make the extio available, you must disconnect your SDRPlay RSP otherwise this will always be the default radio. So disconnect your RSP, and plug in your other radio, like the RTL or ELAD or such.

Restart SDRuno and click on the OPT in the main panel, and then select input, you should see your other radio listed and the extio will be available and you can start using, the bandwidth is limited to **1MHz** on any radio other than the RSP.

### RTL EXtio
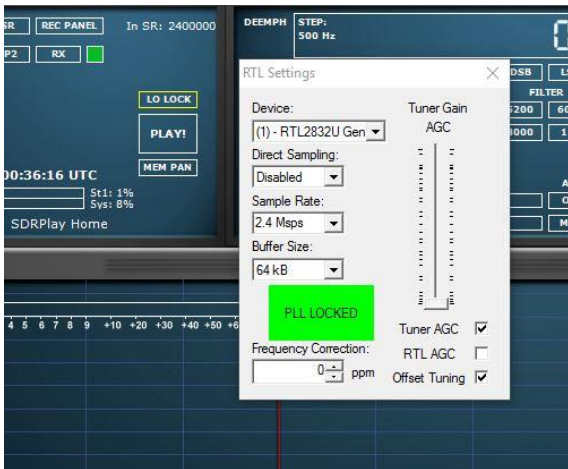


There is a known issue with the RTL extio's at the moment, the drop down menus do not work, but if you click on the sample rate, you can use the up/down keys to change the settings, the AGC slider does work OK

### Elad Extio

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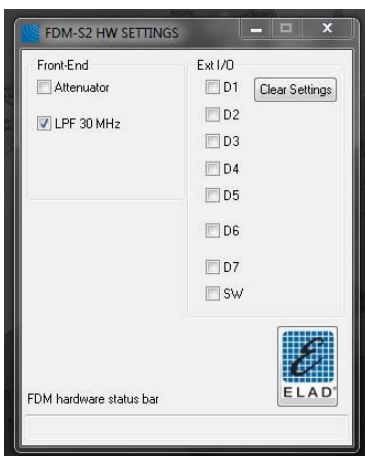
## Step By Step Start UP

So this is your step by step guide now that you know what all your windows are.

Your RSP must be plugged in before you run SDRuno.

First click on the SDRuno icon, and the Main Panel will come up, it the top left of your screen



by default, so we will set some settings and get you on the air.

1. First let's set a bandwidth, click in the **BW window** where this image left says **BW 5.0 Mhz**, once you click you can enter a number, so let's start at 5.0 and enter, click the **LNA** so that is not highlighted and same with the **AGC**, when they are white blocks it means they are ON, the grey bar next to **GR** is the **GAIN**, set this to Midway as in the image. So now that we have the settings to run, we can open up some of the important windows,
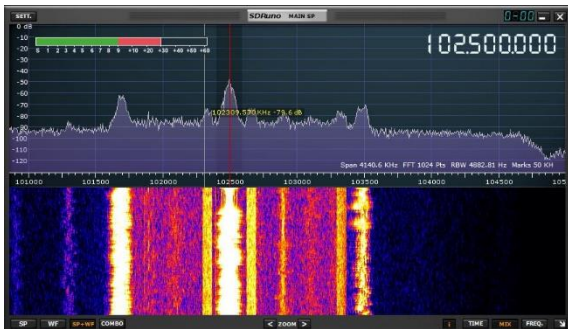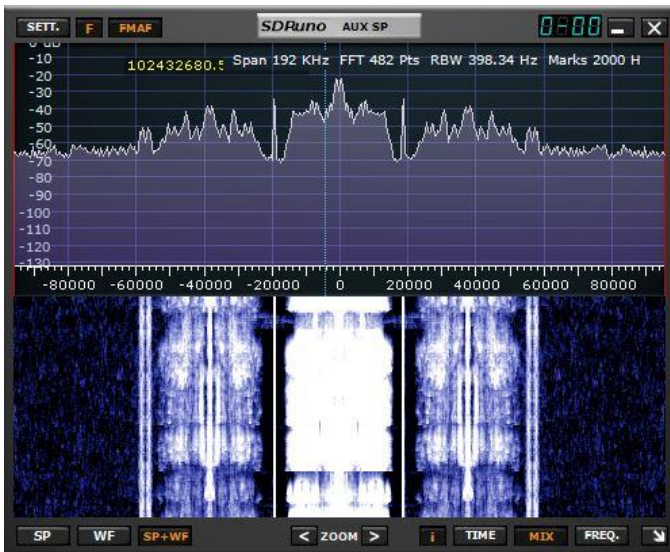


2. Click on the **SP1** box and the main spectrum window will appear you can move this around and resize to your requirements.



3. Click on the **RX** box, this will open up the RX Window, where we set the frequency and modes and a few more items like filter bandwidth.

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4. Click on the **SP2** Box this is the auxiliary spectrum, where you can look close in at the signal you are on and also vary the filter bandwidth by dragging the filter edges.

5. So now we have all the windows open we need for basic operation. So let's set a frequency for us to start on. I'm going to start us in the Broadcast FM band, on 102.5 FM (Choose a station close to you) Look, on the RX panel and click on the frequency area, or press the space bar, this will then turn to 0 and you can use the keyboard to enter a frequency.

So for 102.5 Mhz, I have to enter that in KHz, so on the keyboard enter 102500 and the display will read 102.500.000 so now our frequency is set.

6. Let's set the mode, we need FM and SWFM for FM broadcast, so click on FM and below it SWFM.

7. So now we are set and ready to go to receive our local FM Station. Press PLAY on the main panel and the RSP should spring to life. You will see the signal on the SP1 window and also on the sp2 window.

8. We need to save these setting so that when you start up you can come right back to where you left off, we do this with workspaces on the main window, you will see yours's says Default Workspace, Right click on the words Default workspace and you will notice it changes, you can now enter a name, I called mine SDRPlay Home, once you have entered a name, press ENTER, this will update the name, now we need to save the current workspace, while holding the CTRL (Control Key) down, left click on the new name and the menu will pop up, move over the menu, don't let go of the CRTL key until you move over the new name, and let go. This will store the profile and window settings.

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This Guide is a work in progress and to be used in conjunction with the official guide, we will be bringing you user tips and things, we have been testing the software for the past 3 weeks, so as we add more this document will be updated. And we will post in the facebook groups when we update the document.

Thanks,

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