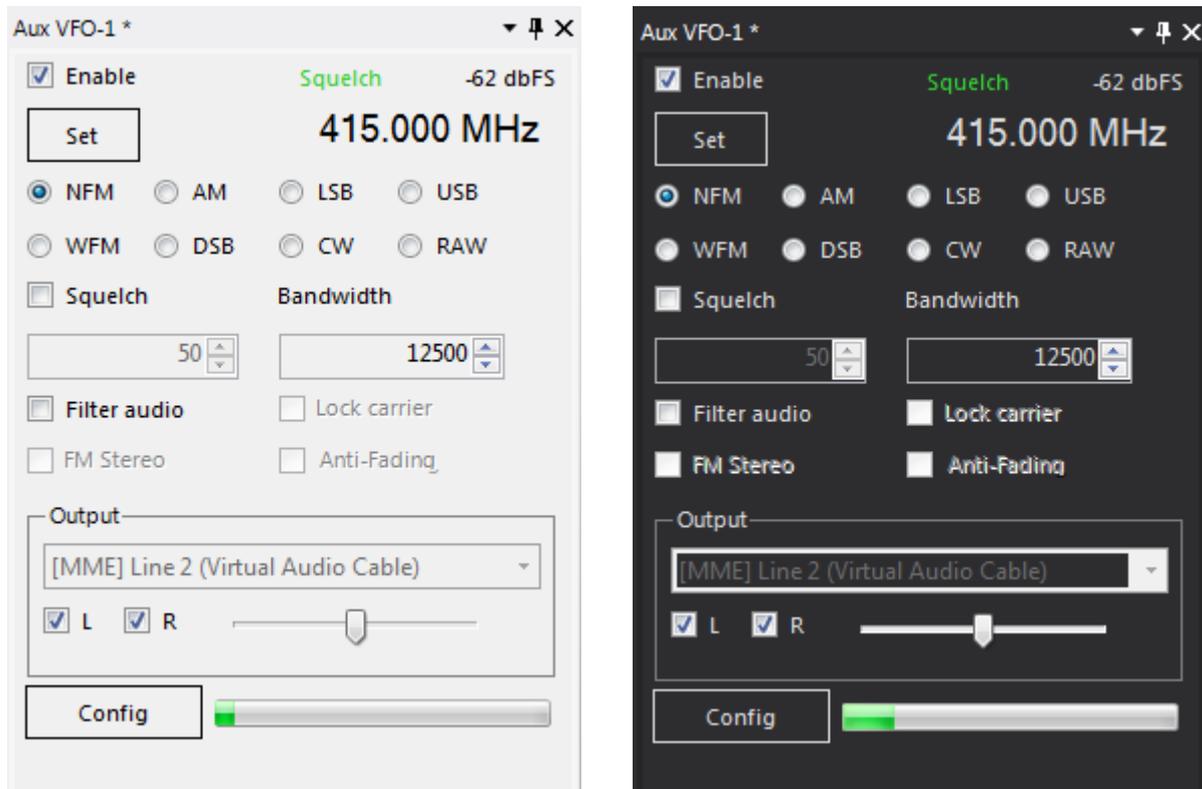


Aux VFO – A SDR# plug-in

original by Vasili (TSSDR) – Modified/Updated plug-in and documentation by [thewraith2008](#) – April 2022



SDR# side panel for Audio Recorder (light and dark theme)

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Description

The *Aux VFO* plug-in allows user to set-up multiple VFOs (in the visible bandwidth) within one instance of SDR# rather than running multiple copies of SDR# to achieve the same result.

Each AuxVFO can be separately configured from the main SDR# so each AuxVFO could be working with a different mode, bandwidth, squelch threshold, audio filtering.

The plug-in takes the SDR# IF bandwidth audio at the chosen frequency and passes it to one of the available system audio output devices like a virtual cable or it can sent to a file.

Features

- Multiple AuxVFOs in one SDR# instance.
- Pass the IF audio to a system audio device or write it to a file.
- Can record continuously or only record when squelch open.
- Simple logging of activity (Polling or events).
- Can use rules for creating path and file-names use by recordings.
- Can use rules for creating path and file-names and entries for the log files.
- Continue recording to a new file once 2 Gb file size is reached.
It used to stop writing with no indication.
- Check free HDD space and stop recording if free space is < 10 Mb.

Installation for SDR# v1700-1716

Copy the file '*SDRSharp.AuxVFO.dll*' to your SDR# folder

Update the file '*Plugins.xml*' (using notepad) with the following line (if it has not been done):

- NOTE: Repeat the entry below for the number of AuxVFOs to wish to use.
Where "X" on the line is the number to assign to the AuxVFO

```
<add key="AuxVFO-X" value="SDRSharp.AuxVFO.AuxVFOPlugin,SDRSharp.AuxVFO" />
```

If you wish to add more than 1 VFO (e.g. 2 VFOs) then add the entries as follows:

```
<add key="AuxVFO-1" value="SDRSharp.AuxVFO.AuxVFOPlugin,SDRSharp.AuxVFO" />
```

```
<add key="AuxVFO-2" value="SDRSharp.AuxVFO.AuxVFOPlugin,SDRSharp.AuxVFO" />
```

Installation for SDR# above v1800:

If you wish too use more than one AuxVFO then use the above procedure. (Note the file locations)

If you only need one AuxVFO you can use:

Copy the file '*SDRSharp.AudioRecorder.dll*' to your SDR# **Plugins** folder.

There is no need to edit the file '*Plugins.xml*'

NOTE: If you wish to use more than one AuxVFO later , then you will need to remove the DLL file from the **Plugins folder and follow the v1700-1716 procedure.**

Usage

Select plug-in options to use for AuxVFO

- Frequency
- Mode
- Filter Bandwidth
- Squelch: Enable and Threshold
- Filter audio
- FM Stereo
- Lock carrier
- Anti-Fading
- Channel usage (pass/mute) (exclude "Write to File")
- Audio gain to use for output audio device (exclude "Write to File")

Select output audio device or '*Write to File*'.

Start SDR# playing.

Click "Enable".

If output audio device is '*Write to File*', then the indicator will show a red "Record" when recording.

- May depend on if using squelch to trigger recording.

If output audio device is a audio device, then the indicator will show a green "Stream".

SDR# side panel controls

Enable (check-box)

Start the process of outputting the AuxVFO to the selected audio output device.

Stereo indicator (label)

If FM Stereo is detected, then the indicator will show red “(((Stereo)))”.

- Only in WFM.

Squelch open indicator (label)

If squelch is open, the indicator will show green “Squelch”.

- NOTE: This will always show when *Squelch* is disabled.

Signal level indicator (label)

Shows the approximate signal level of set frequency (AuxVFO).

Set (button)

Set the AuxVFO (frequency) using the current value of the SDR# VFO.

NOTE: This is disabled while using “*Write to File*” when recording is started. (see [here](#) for why)

Set frequency (label)

Shows the currently set frequency to use for the AuxVFO.

Mode selection: NFM,WFM,AM,DSB,LSB,USB,CW,RAW (radio button)

Selects the detector to use in the AuxVFO.

Squelch (check-box)

Selects if to use the squelch in the AuxVFO.

- Only for AM and NFM.

Squelch threshold (UpDownNumBox)

Sets the squelch threshold to use in the AuxVFO.

- Only for AM and NFM when *Squelch* above is enabled.

(Filter) Bandwidth (UpDownNumBox)

Set the filter bandwidth value to use in the AuxVFO.

Filter Audio (check-box)

Selects whether to use the audio filter in the AuxVFO.

Lock carrier (check-box)

Selects if to use the lock carrier in the AuxVFO.

- Only when AM or DSB.

FM Stereo (check-box)

Selects if to detect FM Stereo in the AuxVFO.

- Only when WFM.

Continued...

Anti-Fading (check-box)

Selects if to use the Anti-Fading in the AuxVFO.

- Only when AM or DSB and if *Lock carrier* is enabled.

Output Audio device selection (DropDownBox)

List the available system audio output devices

- Includes *Write to File* option.

HDD Full indicator (label) (appears top middle of output selection drop-box)

If the HDD has less than 10 Mb free space, then recording will be stopped and a red “HDD full” is shown.

Recording indicator (label) (appears top right of output selection drop-box)

If output audio device is '*Write to File*', then the indicator will show a red “Record” when recording.

- May depend on if using squelch to trigger recording.

Stream indicator (label) (appears top right of output selection drop-box)

If output audio device is a audio device, then the indicator will show a green “Stream”.

Channel pass selection (check-box)

Select channel to pass audio (with applied gain*) to the audio output device.

Deselect channel to mute/silence that channel to the audio output device.

* *Write to File* does not use the audio gain (slider) but a fixed gain value. (i.e. not adjustable)

- Selection of L/R check-boxes also has no affect.

NOTE: Selection of right channel has no affect when the *Sample format* is a mono type.

- It only uses the left channel.

Audio gain (slider)

Adjusts the audio level for the output audio devices

* *Write to File* does not use the audio gain (slider) but a fixed gain value. (i.e. not adjustable)

- Selection of L/R check-boxes also has no affect.

Debug information (label)

Shows the input and output (where applicable) samplerate and audio level.

- Double click the “Record” or “Stream” label to toggle.
- This will display under the “Config” button.
- -6 dB is good level to avoid clipping, but adjustment of the level is at your discretion and it may also depend on what you are sending the audio too. (e.g. DSD)

Buffer usage bar (bar)

The bar shows amount of buffer used while streaming/recording.

It will vary but should not get to high.

Config (button)

Opens window with plug-in options for recording and logging.

Configuration Window – Recorder options

New file after the squelch has been closed for X seconds [0 – 100] (check-box)(UpDownNumBox)

When enabled and after the file has been written to at least once, if the inactivity exceeds the set value, then the current recording (file) will be finalised and plug-in will be ready to create a new recording when activity resumes.

Don't write pause (check-box)

Enabled:

- When “Record” is pressed, plug-in only records when squelch (if enabled) is opened.
- If the “Squelch” is disabled, then this option works as if option is disabled.

Disabled:

- When “Record” is pressed, the plug-in will record all the time until stopped.

When disabled, the follow options are greyed out:

- “Continue recording after the squelch has been closed for X seconds”.

NOTE: This option will only work for NFM and AM (only modes which use squelch)

Continue recording after the squelch has been closed for X seconds [0 – 100] (UpDownNumBox)

When enabled, will continue to record for the defined value of time after the squelch has closed.

- Only when “Don't write pause” enabled (and if NFM or AM).
- Activity within the additional seconds of recording will be recorded as normal.

This may help if recordings stop to early or if you wish to create a larger gap between main activity.

(WAV) Sample format (drop-box)

Select to recording format to use - Stereo or mono and bits per sample

- 8 Bit PCM Stereo
- 16 Bit PCM Stereo
- 32 Bit IEEE Float Stereo – Direct copy of SDR# audio stream and is best (at cost of file size)
- 8 Bit PCM Mono
- 16 Bit PCM Mono

This option can affect the quality of the audio.

Samplerate (drop-box)

Only available if a **mono** *Sample format* is selected above

Selects if output audio is re-sampled to another samplerate

- no re-sampling
- 8 kHz
- 16 kHz
- 32 kHz
- 48 kHz

This option can affect the quality of the audio.

Continued...

Rules for creating file names (text-box)

Use the available keywords to to define the naming of the folder path and file name for recordings.
Will display what path and filename will look like in label.

[Set] Folder (button)

Set the folder to save recordings.

Open [folder] (button)

Opens to the selected save folder location of recordings.

Version indicator (label)

Show version of plug-in

Configuration Window – Log**Enable (check-box)**

Enable the logging feature

Log only events (check-box)

When enabled, will only log changes that meet certain conditions.

- See [here](#) more more detail about logging.

Use squelch (check-box)

When enabled, the logging will only occur if the squelch is open.

Refresh, ms [100-3600] (UpDownNumBox)

Sets the interval for the logging poll timer

- This is how often a log entry may be written.
See [here](#) more more details about logging.

Caution, using a low value with some conditions can lead to large log files.

Rules for creating log file names (text-box)

Use the available keywords to to define the naming of the folder path and file name for log files.
Will display what path and filename will look like in label.

[Set] Folder (button)

Set the folder to save log files

Open [folder] (button)

Opens to the selected save folder location of logs.

Rules for creating log entries (text-box)

Use the available keywords to to define the log entry to add to the log file.
Will display what a log entry will look like in label.

Elements separator (text-box)

Character to use for separating element in a log entry.

- Default is semi-colon = “;”

Logging – Usage

The logging has two modes of operation

- Polling
- Polling Events
- Both use rule keywords: [date](#), [time](#), [frequency](#), [level](#), [squelch](#), [record](#) for log entries.

Polling

This mode will check the state/values of the selected [keywords](#) at intervals (set by **Refresh, ms**) and enter them into the log.

Logging will occur when

- AuxVFO is enabled and frequency is in view.
- Logging is enabled.
- “Use squelch” either enabled or disabled.
When enabled, this will further reduce adding a log entry to only when squelch is open.
- “Log only events” is disabled.
When enabled, see events mode below.

NOTE: Using a low interval value (**Refresh, ms**) can quickly populate the log with a lot of entries.

Polling Events

This mode is same as polling above but uses additional conditions to detect an “event”. Using “[event keywords](#)” in a log rule, helps reduce the frequency of new log entries.

Logging will occur when:

- AuxVFO is enabled and frequency is in view.
- Logging is enabled.
- “Use squelch” either enabled or disabled.
When enabled, this will further reduce a new log entry to only when squelch is open.
- “Log only events” is enabled.
And only when event conditions are met (see below).

NOTE: A log rule must contain at least one of the [event keywords](#) to trigger an event.

NOTE: If all the [event keywords](#) are **not** present in the rule, then no event will be able to occur.

Triggering of event: (When any [event keyword](#) is used in the rule)

- If current state/value equals previous state/value then no event.
- If current state/value **not** equals previous state/value then event.

When any event is triggered, all previous ([event keywords](#)) variables are updated.

Logging Keywords

- '*date*' – Current date at time of log entry.
- '*time*' – Current time at time of log entry.
- Following keywords are also used as events:
- '*frequency*' – Current AuxVFO frequency at time of log entry.
- '*level*' – Current signal level at time of log entry.
- '*squelch*' – Current squelch state at time of log entry.
- '*record*' – Current recording state at time of log entry.

Notes, bugs, limits or other things of possible interest

NOTE:

Not all aspects of this plug-in, whether it be its usage, features, options, bugs, issues, problems or any other unforeseeable things maybe covered by this documentation.

The plug-in will save the previous state of AuxVFO for the selected mode.

- It does not save the other modes, but it will load defaults to the non saved modes and use them each time SDR# starts.
- While using the AuxVFO, the plug-in will remember the settings for each mode during the SDR session.

If you change the AuxVFO frequency after you have started recording, then the new frequency will continue to be recorded in the old frequencies recording file. An exception to this is if the option "New file after the squelch has been closed for X second" is enabled and the time has elapsed, the new recording will use the new frequency in filename.

This is a quirk rather than a bug.

The "Set" button will now be disabled while recording in "Write to File" to stop this.

2 Gb WAV file limit handling:

Normally the "Write to File" option could write a file to 2 Gb given the right conditions.

It would give no indication that writing had stopped to the file when 2 Gb was reached.

Now, once the 2 Gb limit is reached, a new file is created and will continue to record.

Plug-in now checks the free HDD space and stops recording if < 10 Mb remains.

While recording using "Write to File", don't change the following options:

- Sample Format
- Samplerate
- Folder path
- Rules for recording filename and path

While logging, don't change the following:

- Folder path
- Rules for log filename and path

Excessive dropped buffers may indicate possible CPU loading issues or HDD writing issues.

Theme matching does not 100% match all colours used by controls

This modified version and documentation by thewraith2008 started in 2021 see ***Changelog.txt*** for more details about changes and fixes.

Support forum here:

<https://forums.radioreference.com/forums/software-defined-radio.193/>

NOTE: Support is not guaranteed. Especially if the answers are contained in the documentation or on forum.

Special thanks to the creators of the following software:

SDRSharp (SDR#) by Youssef Touil

- <https://airspy.com/>
- The Aux VFO plug-in utilises code from the SDR# plug-in API.
As such, that code used by the plug-in is the property of Youssef Touil (Airspy).

Aux VFO (this original SDR# Plug-in) by Vasili (TSSDR)

- <http://rtl-sdr.ru>
- Thanks Vasili for allowing me to update this plug-in.

Necessary Disclaimer:

- This program is "as is"
- This program most probably contains errors, bugs or whatever and that it may crash itself, SDR#, the plug-ins, windows or your car. You accept that you use it at your own risk.
- I make no promises to update it or support it.
- I'm under no obligation to implement anything.
- The creator of SDR# has the right to change their code as they see fit. Because of this, this program/plugin can and probably will break.
- Not reading the read-me/set-up and usage documentation files may cause you issues.