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RTL-SDR (RTL2832U) and software defined radio news and projects. Also featuring Airspy, HackRF, FCD, SDRplay and more.

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## RTL-SDR Blog V.3. Dongles User Guide

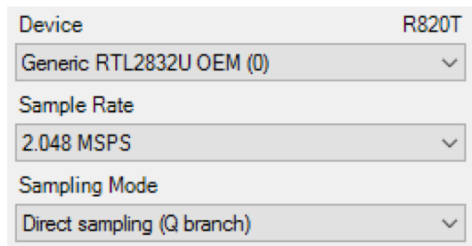
Version 3 of our customized RTL-SDR dongles brought out some new interesting features. In this guide we explain how to use those features:

### Feature 1: Direct Sampling HF Mode

This feature allows you to listen to HF signals between about 500 kHz to 28.8 MHz.

To use direct sampling mode

1. Connect an appropriate HF antenna to the SMA antenna port (this is the same port where you connect your VHF/UHF antenna).
2. In SDR# select the Q-branch in the configure menu (the cog icon next to the play button). (If it is greyed out make sure you stop the SDR first, by clicking the stop button in SDR# first)
3. Press Play and tune to 500 kHz 30 MHz.



VHF antennas like small discones or short whip antennas will probably not pick up HF signals very well, if at all. If you have no such antenna you can try extend the large telescopic antenna to its maximum length of 1.5m, or use the screw nut provided with the antenna base to clamp on a long wire antenna. Ideally you should use a 9:1 unun with the long wire antenna for optimal reception. Even more ideally you d use an antenna tuner, though this is expensive.

Other software like HSDR can also support direct sampling. It may entail setting a device string, and for the Q-branch, the value should be 2.

To go back to listening to frequencies above 28.8 MHz remember to change the sampling mode back to 'Quadrature Sampling'.

Note that this feature makes use of *direct sampling* and so aliasing will occur. The RTL-SDR samples at 28.8 MHz, thus you may see mirrors of strong signals from 0 14.4 MHz while tuning to 14.4 28.8 MHz and the other way around as well. To remove these images you need to use a low pass filter for 0 14.4 MHz, and a high pass filter for 14.4 28.8 MHz, or simply filter your band of interest.

### Feature 2: Software Selectable Bias Tee

V.1. and V.2. of our dongles included a bias tee which could manually be enabled by opening the case and soldering two pads on the PCB together. V.3. introduces a bias tee which can be enabled entirely in software.

**WARNING:** Before using the bias tee please ensure that you understand that you should not use this option when the dongle is connected to a short circuited antenna. Short circuiting the bias tee could damage it permanently. Only use it while connected to an actual powered device, like an LNA, active antenna or the Spyverter.

To enable the bias tee in Windows:

1. Download and extract all the files in [this zip file](#) to a folder on your PC. It contains two batch files that can be run.
2. Make sure all SDR software like SDR#/HSDR/SDR-Console etc is fully closed.
3. Run the biastee\_on.bat file to turn the bias tee on. It will run and open a CMD prompt that will briefly say 'Found Rafael Micro R820T Tuner'. The CMD prompt will close soon after upon success.
4. The bias tee is now on. To turn it off repeat steps 2 & 3, but instead run the biastee\_off.bat batch file. Alternatively, simply disconnect and then reconnect the SDR to turn the bias tee off.

If you get a Smart Screen message, click on More Info, and then on Run Anyway. Also note that some versions of Windows may fail to run batch files due to misconfiguration or aggressive antivirus software. If you cannot fix these problems with Windows or your antivirus, run the command manually on the CMD line.

To run it manually on the CMD line:

1. ON: `rtl_biast -b 1`
2. OFF: `rtl_biast -b 0`
3. If needed select a particular RTL-SDR device with the `-d` flag.

In Linux download the source from git, compile it the same way you do the regular RTL-SDR drivers, and then run `./rtl_biast -b 1` to turn the bias tee on and `./rtl_biast -b 0` to turn the bias tee off. The procedure is:

```
git clone https://github.com/rtlsdrblog/rtl-sdr
cd rtl-sdr
mkdir build
cd build
cmake ..
make
cd src
./rtl_biast -b 1
```

If you have trouble running the bias tee please contact us at [rtlsdrblog\\_AT\\_gmail.com](mailto:rtlsdrblog_AT_gmail.com).

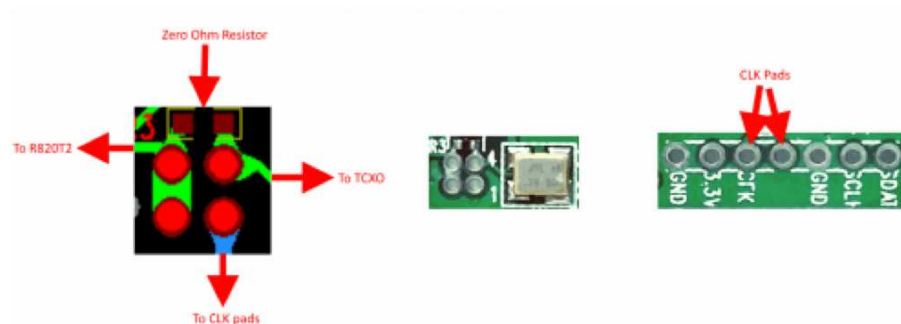
## Feature 3: Selectable Clock & Expansion Headers

This is for advanced users who need to daisy chain clocks together for coherent experiments, or need to access other ports. You can either bridge the clock selector the directly with a solder bridge, or solder on a 1.27mm 2×2 header pin jumper.

To add a jumper to the CLK selector header.

1. Carefully remove the 0 Ohm resistor.
2. Very carefully solder a 1.27mm 2×2 header onto the clock selector pads.
3. You can now select your clock input.

How to connect the CLK jumpers:



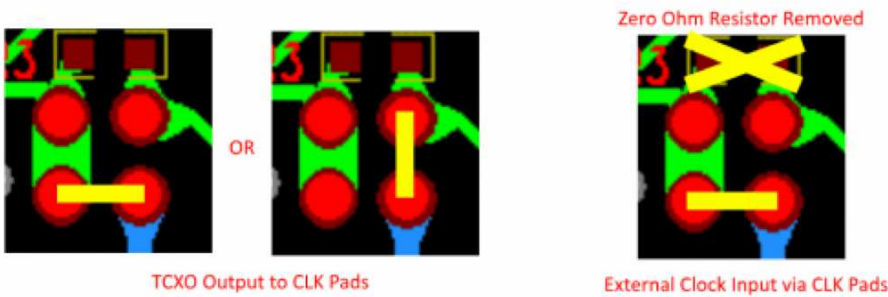


# DWDM over CWDM

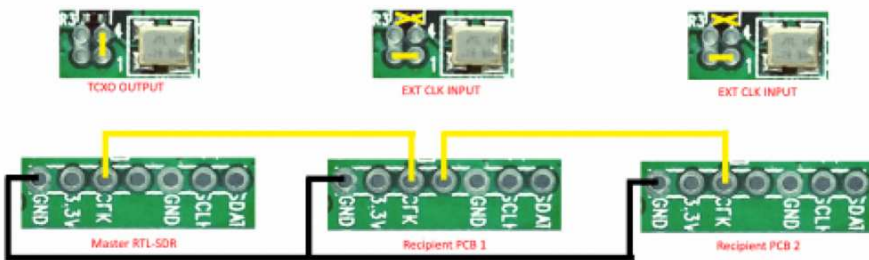
Upgrade your CWDM Network easily to DWDM



The first position allows you to output the dongles clock to the CLK pads. The second position allows you to input an external clock.



An example of CLK daisy chaining is shown below. One dongles TCXO is connected to two other dongles who have disconnected clocks.



## Current Known Issues:

We re constantly trying to improve our units and we always make note of what issues exist and how to fix them.

Please remember that these units do get hot to the touch when used in warm climates. This is not an issue. We have improved the thermal bonding and heat transfer between the chips and the metal case. This results in making the metal case hotter, but it keeps the chips much cooler, resulting in better performance.

### Known V3 Batch 1 Issues:

1. *Increased sideband noise on very strong narrowband signals.* This should not be a significant problem as it only affects very strong signals. The hardware fix is to add about 100-220uF of capacitance on the 3.3V power line. Batch 2 will reduce this noise.
2. *The bias tee when turned on adds a large spur in direct sampling HF mode.* This may be problematic only if you intend to use a bias tee powered HF LNA in direct sampling mode. This can be fixed by adding about 2.2uF of capacitance to the output of the LDO, before the inductor. Batch 2 will fix this.
3. *The bias tee can be damaged by accidentally short circuiting the output for a few seconds while it is on.* This damage only occurs on USB3.0 and USB2.0 ports that can provide up to 1A or more of current. Batch 2 will add a resettable fuse to prevent

damage.

Batch 2 (Shipping Now):

No known issues.

# Transmitters Receivers



Posted in

## 61 comments

1.



[October 21, 2016 - 1:00 am](#) *Gaston*

Hi! How can I know if my V3 dongle is batch 1 or 2? I bought it on September 12.

[Reply](#)

o



[October 26, 2016 - 8:46 am](#) *admin*

Batch 1 has small indents on the USB connector just below the latching holes, batch two does not.

[Reply](#)

▪



[October 29, 2016 - 1:59 pm](#) *Joseph*

Do you know when Amazon will be shipping Batch 2 for sure?

[Reply](#)

2.



[October 17, 2016 - 2:27 pm](#) *Daniel*

How much voltage can I expect to be put out from the bias tee?

[Reply](#)

o



[October 19, 2016 - 10:21 am](#) *admin*

4.5V

[Reply](#)

3.



[October 9, 2016 - 9:11 am Petr](#)

WARNING! If you are using TV drivers, the BIAS is permanently ON 4,5V in the connector. My dongle was still very hot! So, which component desolder?

[Reply](#)

o



[October 10, 2016 - 9:15 am admin](#)

I ll check it out. To completely disable the bias tee you could just remove component RF2 (its on the edge of the PCB), and that would break the circuit. But as long as your not using a shorted antenna the bias tee should not be drawing power, even if its on.

Remember that these dongles get naturally quite hot, because we ve improved the thermal interface between the hot components and the case. The hotter the case, the cooler the chips inside.

[Reply](#)

▪



[October 19, 2016 - 5:20 am Petr](#)

I moved the coil L13 to the input pad. And bias is away forever.

[Reply](#)

4.



[September 29, 2016 - 11:45 pm Orrin Winton](#)

As of today (Sept 29) who has the version3 in stock? Or do i need to wait a while?

I checked eBay and Amazon, but did not see it.

I believe i damaged my v3, by my own error, and want to buy another.

[Reply](#)

5.



[September 27, 2016 - 8:58 pm Pedja](#)

Just got RTL/SDR V 3. On VHF it works as expected, but I cannot use it on HF (which is why I bought it).

After i set it to Q branch and click play it just reports it cannot connect to RTL/SDR device. When I set back to quadrature sampling it again works fine on VHF.

[Reply](#)



o

[September 28, 2016 - 2:31 am admin](#)

Are you using the default drivers or modified ones? Sounds like you re using modified ones that don t support direct sampling.

[Reply](#)



▪

[October 1, 2016 - 4:30 am Pedja](#)

Thanks, that seems to be it. I already had driver installed for other SDR dongle but after I reinstalled driver and dongle now works in HF mode. I hear nothing but I guess I will have to put up some better antenna.

[Reply](#)



▪

[October 17, 2016 - 2:07 pm Daniel](#)

I haven t been able to pick up any HF signals unless I plug the rtl up to one of my ham antennas outside. About the only things I ve been able to pick up with the stock antennas are very strong nearby signals (such as me checking to see what my transmitted signals look like) and FM radio stations.

[Reply](#)



o

[October 26, 2016 - 7:10 am Errol](#)

Hi,

I have had my RTL-SRD Tuner, for the past 3 weeks works great on FM for local stations but I cannot get HF to work. Please note the tuner has a VHF and an HF SMA input on it.

For HF I use the IF output stage on my Yaesu FT1000D which I thought would work well with the tuner, but no go no joy.

I would love to hear from someone who has the same type of tuner and the FT1000D just to exchange what settings to use with SDRSHARP software please any assistance I really would love to get the unit working on 40Metres my favorite HF section to date.

Thanks and 73 from South Africa>

Errol

[Reply](#)



▪

[October 26, 2016 - 8:47 am admin](#)

If you have one of those units with two inputs, the HF input is probably direct sampling. You need to select the Q-branch in whatever software you are using.

[Reply](#)



[September 20, 2016 - 8:19 pm](#) *Scott*

I just received my V3 SDR. I assume I would have the Batch 1 model which may require the above noted Known Issues?

[Reply](#)



[September 14, 2016 - 2:10 pm](#) *Derek*

Just getting started with SDR and just got my RTL v3 yesterday. Using SDR# I cannot get direct sampling to work. SDR tries to connect but automatically stops. Not too sure if this is a SDR issue or defect with my unit.

Thoughts?

[Reply](#)



[October 10, 2016 - 9:18 am](#) *admin*

If it works on VHF mode, then it is probably a SW problem if it just stops in direct sampling mode. Check that you re using the default drivers as some of the experimental ones don t support direct sampling.

[Reply](#)



[September 12, 2016 - 7:57 am](#) *George*

Hi!  
Forgive my English. This google translate  
I received from you last third version with dongle rtl-sdr.com. To be honest, I did not expect from him such a good work on HF. On 40 meter Delta Loop needed only attenuator. One drawback the overall low-pass filter 24 MHz, and thus above 14.4 MHz the frequency of the mirror. I will make a simple preselector, I think everything will be fine.

[Reply](#)



[September 5, 2016 - 8:55 pm](#) *Max*

What is the correct wiring of the usb cable s shield considering that some modification has been done on the new V3 dongle for better filtering? According to the old school the shield should be interrupted before reaching the connector on the dongle and in case the dongle is inserted in a metal enclosure the cable s shield should touch the enclosure but not the usb connector. Is this still valid?

My impression is that in this field we are navigating between myth and legend 😊

[Reply](#)





o

[October 10, 2016 - 9:17 am](#) *admin*

Yes no one can agree on how to connect the shield anymore. We ve left it connected as it seems to give lower noise, as well as providing better grounding. Your results may vary though.

[Reply](#)

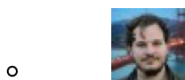
10.



[September 2, 2016 - 7:44 pm](#) *Mick Cooper*

Has anyone had any tried feed in an external clock and daisy chaining several dongles ?. Do you need any additional components to couple and match impedance etc etc ?

[Reply](#)



o

[September 2, 2016 - 9:09 pm](#) *Lucas Teske*

There is one guy that did that (I dont remember the name, but it has a post here in this blog). But you should nt need any matching. I will try this weekend in a three device daisy chain and see the results.

[Reply](#)



▪

[September 2, 2016 - 11:41 pm](#) *Mick Cooper*

Great Stuff Thanks, Where are you getting your 28.8 from ?  
and

Have you seen

<http://pe1ryy.blogspot.ie/2015/04/low-pass-filter-added.html>

<http://pe1ryy.blogspot.ie/2015/04/nt7ss-si5351a-vco-hooked-up-to-local.html>

[Reply](#)



o

[September 23, 2016 - 8:35 am](#) *Coherent Receiver*

<http://coherent-receiver.com/support>

[Reply](#)

11.



[September 2, 2016 - 1:44 pm](#) *Alan Clark*

Hi. I got my V3 this morning and set up as described with the Q Branch and 2.048mhz sampling rate with a standard long wire

HF antenna, but I am absolutely flooded with AM echoes throughout the HF band. I m unable to adjust gain when I choose the Q Branch. Anyone got any ideas about how I can fix this?

[Reply](#)

o



[September 2, 2016 - 5:20 pm admin](#)

If you have very strong BCAM in your area youll probably need an attenuator. The DSM isn t designed to handle very strong signals, and it that case an upconverter would be the better choice.

[Reply](#)

▪



[September 3, 2016 - 2:34 am Alan Clark](#)

Hi. Thanks for your response. I m just North of London in the UK and there are two major MW AM transmitters close. One is 7 miles and one is less less than 2 miles away. I guess that s the problem! I did buy an attenuator for another project and tried it out but no luck so far. I have an SDRPlay which gives me OK HF stations, but I wanted to see how the new RTLSDR worked out. Withe the SDRPlay, I don t get good HF signals from about 12-30mhz. Part of the problem is a very noisy Toshiba TV screen.

[Reply](#)

▪



[September 25, 2016 - 1:35 am Dirk](#)

I just want to let you know their is a linux distribution called skywave that is supposedly plug n play for those that know whats what give it a try so you can save me the headache of following all those steps for windows

[Reply](#)

12.



[September 2, 2016 - 1:28 pm Tomo](#)

I have problem in receiving HF and MW with the V3. VHF such as FM radio works fine. I connected the HF antenna to the V3, but the noise level does sound the same as if nothing was connected. I did the same while receiving FM radio, it made a big difference even with an HF antenna. The HF antenna works fine with my some other conventional HF receivers. I think I set the RTL-SDR controller of the SDR# as instructed on this page. Any help will be greatly appreciated.

[Reply](#)

o



[September 2, 2016 - 5:21 pm admin](#)

Can you email us some screenshots? [Rtldrblog@gmail.com](mailto:Rtldrblog@gmail.com), the HF circuit might be faulty, in which case we ll replace it.

[Reply](#)



- 

[September 3, 2016 - 1:30 am](#) *Tomo*

I just sent you email with some screen shots. I don t think V/UHF reception quality is as good as the product expected.

[Reply](#)



- 

[September 16, 2016 - 4:26 am](#) *Tomo*

I got the replacement today. It works fine. A lot of signals on V/UHF and L/HF.  
The first one unfortunately was a faulty unit.

Thanks

[Reply](#)



- 

[September 16, 2016 - 4:58 am](#) *Tomo*

FYI The first faulty unit became very hot, however the second unit only becomes warm.

[Reply](#)



- 

[September 2, 2016 - 9:52 pm](#) *Josh*

Hi, are you telling the app to use the q channel for hf? Also, a highpass filter might help, one that cuts off everything below 1700KHz. Of course you could always make or buy a preselector or transmatch to help the dongle thrive on hf.

[Reply](#)

13.



[September 1, 2016 - 9:27 am](#) *AM909*

I look forward to being able to receive WWV as a calibration source. If I need to tune to 20,000,016 Hz to get the WWV carrier centered, does that same 0.8 ppm error apply to higher frequencies (e.g. +748 Hz @ 935 MHz), or is there a difference between the direct sampling mode and the IQ mode?

[Reply](#)



- 

[September 1, 2016 - 10:16 am](#) *admin*

Yes the same PPM will apply on any frequency. As long as you use the PPM offset setting in the program you are using it

will map the correct frequency offset to different frequencies.

[Reply](#)



[September 2, 2016 - 6:11 pm](#) *AM909*

Thanks for the reply. Is there any other way of correcting an initial calibration error in the dongles (i.e. permanently)? I have a v1 that is almost exactly only\* 0.5 ppm off, which is fine for most applications. However, this produces ~470 Hz error at 935 MHz. SDR#, unfortunately, does not support fractional PPM correction, so I've no way to get it any closer (i.e. 0 ppm is too little correction, -1 ppm is too much), other than to manually calculate and enter a shift frequency all the time (and SDR# devs don't believe a decimal place is necessary, even though it does affect decoding in this narrowband environment).

\* Don't get me wrong. I'm amazed/thrilled that it's this close - it gets to that number and stays within ~0.05 ppm of it after just a few minutes' warmup.

[Reply](#)

14.



[August 31, 2016 - 3:59 am](#) *Craig*

Can I use a V3 dongle in direct sampling mode (Q branch) with rtl\_tcp?

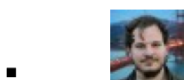
[Reply](#)



[August 31, 2016 - 5:29 am](#) *admin*

The default rtl\_tcp doesn't support it, but check out this person's modified version [https://www.reddit.com/r/RTLSDR/comments/3gth5m/starting\\_rtl\\_tcp\\_in\\_direct\\_sampling\\_mode\\_reviving/](https://www.reddit.com/r/RTLSDR/comments/3gth5m/starting_rtl_tcp_in_direct_sampling_mode_reviving/).

[Reply](#)



[August 31, 2016 - 6:32 am](#) *Lucas Teske*

I will add support to our fork using the patches from ja450n tomorrow.

[Reply](#)

15.



[August 30, 2016 - 2:39 pm](#) *Dave*

I got my V3 dongle yesterday, and started playing with it after the nightly honey do list was done ;-). Anyway, setting up SDR# I was astounded by the HF receive quality without having to use a upconverter as I have to use with my AirSpy Mini.

After about 30 minutes of listening to ham and SWL bands, I went to disconnect the V3, nearly burnt my fingers. This thing got

extremely hot. My other dongle never got as hot as the V3 did last night.

Now I hoping I didn t scorch anything on the board. Has anyone else experienced any overheating issues with the V3?

Thank  
Dave W8EIR

[Reply](#)



[August 31, 2016 - 5:26 am admin](#)

Hmm it should not be getting so hot as to be painful to touch! What s the ambient temperature in your location? The dongle actually uses less current in direct sampling mode than in quadrature mode, so this makes me think that there might a a tiny short circuit somewhere, causing excessive current draw. Please contact us [rtlsdrblog\\_AT\\_gmail.com](mailto:rtlsdrblog_AT_gmail.com) for some more troubleshooting.

[Reply](#)



[August 27, 2016 - 11:28 pm Clifford](#)

Hi,  
I do not see a way to use q branch in WebSDR software. I am putting up a WebSDR station 3000' above Los Angeles and bought 2 of the V3 to see if they would work. I cannot afford a bunch of SDRPlay units right now. Anyone have ideas? Thx  
Clifford  
KK6QMS

[Reply](#)



[August 29, 2016 - 10:49 pm admin](#)

Most software has the option to enable direct sampling, but i m not sure how WebSDR works. You might need to contact the author and ask him to implement a direct sampling option.

[Reply](#)



[August 26, 2016 - 12:39 am Bin Kenney](#)

I am pretty certain I have an HF antenna, but in case my doesn t work as expected (18 AWG stranded wire, ~20'), the 1.6m telescopic should work fine, eh? I am thinking about buying/building a 9:1 unun for the HF antenna and the v.3 dongle, and my other dongles using the mod driver. Thanks!

[Reply](#)



[October 17, 2016 - 2:22 pm Daniel](#)

Hi, I m thinking 20' is about a third of what you might want to use as a longwire antenna. I had one around 100' ran up into a tree and about a 30 degree angle and it worked great, but any shorter and I lost a lot of the receive capability. They also say you really should have a 9:1 unun, available on amazon. Also, if you haven t done this already, try running coax outside and up a far as you can before connecting the wire to the end, that might help alot.

[Reply](#)

18.



[August 24, 2016 - 3:00 pm Dex](#)

Hi guys!

When you plan release second batch (with small bug fixies)?

I own V.2 but HF capabilites are very interesting for me and of course I want support this project 😊

Thanks for your enthusiasm it is very impressive what can be finally“ done from cheap TV dongle!

Dex

[Reply](#)

o



[August 29, 2016 - 10:46 pm admin](#)

Thanks! It will probably be near the end of September.

[Reply](#)

19.



[August 24, 2016 - 12:31 pm Lucas Teske](#)

Btw admin, do you have the datasheet of the Realtek chip? Can you check what is the latency from clk in to clk out?

I m planning to make a bandwidth expander with the RTLSDR Dongles, but this can be broken if the latency is too high in daisy chain.

[Reply](#)

o



[August 29, 2016 - 10:47 pm admin](#)

Sorry no I don t have it. It s tightly controlled by NDAs, only the factory engineers have it.

[Reply](#)

o



[September 17, 2016 - 3:23 am Bryan](#)

I d love to hear more about the bandwidth expander as it progresses. I may be able to help with the coding if I have some time.

[Reply](#)

20.



[August 24, 2016 - 12:41 am John AE5X](#)

I received my V3 RTL dongle yesterday and had no problem getting it going and receiving VHF and up by following the quick start guide. Then I tried to configure it for HF via the instructions here. Device and Sample Rate can be set to indicated options but the Sampling Mode menu option is grayed out. Any ideas why this might be the case? I m using Windows 8.1.

Thanks,

John AE5X

[Reply](#)

o



[August 24, 2016 - 12:43 am admin](#)

You ll need to press stop in SDR# first, otherwise this option will be greyed out.

[Reply](#)

21.



[August 23, 2016 - 5:54 pm Craig](#)

Can you elaborate? How strong is very strong?

[Reply](#)

o



[August 23, 2016 - 5:58 pm Craig](#)

I screwed up the block quote.

On the issue of increased sideband noise on very strong narrowband signals, how strong are we talking about?

[Reply](#)

▪



[August 24, 2016 - 12:00 am admin](#)

Near the edge of the strength of what is receivable by the RTL-SDR before overload, about 50dBFS SNR and higher.

[Reply](#)

▪ [August 24, 2016 - 3:41 am](#) *Craig*

I have a v3 on order. I do a lot of decoding of local nxdn and p25 signals some of which are very very strong. Can you provide any more info on the hardware fix? I m hoping that I won t need it but just in case.

[Reply](#)

▪ [August 24, 2016 - 3:56 am](#) *admin*

Have a look at the image on feature 3 of the clock daisy chaining on this page. Solder a 220uF cap on the left most 3.3v and GND pins. If all the signals are strong there shouldn t be a problem for you anyway. A problem might occur if there are very strong and very weak signals right next to each other.

[Reply](#)

22.

[August 18, 2016 - 1:36 am](#) *Seasalt*

If you want to run Q Branch direct sampling in Linux GQRX here is a reply I got from the GQRX forum written by Alexandru Csete.

Gqrx supports the direct sampling mode by adding `direct_samp=...` to the device string:

```
direct_samp=0|1|2
```

Enable direct sampling mode on the RTL chip. 0: Disable, 1: use I channel, 2: use Q channel

So, for using the Q channel the device string would be something like:

```
rtl=0,direct_samp=2
```

You may have to check "No limits" to allow tuning below 24 MHz, I don t remember.

Alex"

This works great on my Soft66Q HF RTL from Japan in Q mode.

[Reply](#)

23.

[August 17, 2016 - 1:55 pm](#) *Lucas Teske*

I m adding the support for the Bias T of the V3 Dongle at librtlsdr repository (we made a fork in github because the main one is some patches behind). I did not received (yet) my V3 dongles, but I will test it as soon as it arrives.



Anyways, good work! 😊

<https://github.com/librtlsdr/librtlsdr/pull/14>

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ANTISPAM: What does the 'D' in SDR stand for? (Required)

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**Lao** { Are there still ink rubbing off issues? } [Nov 02, 11:47 AM](#)

**Juanro** { Edit the original file tetra.xml (to do cleaning), and leave only the parameters of your country and your networks. It has to be on this ... } [Nov 02, 10:58 AM](#)

**Juanro** { Lucas congratulations , good job. I hope it works well for Meteosat. } [Nov 02, 10:45 AM](#)

**Doug Haber** { I am the author of that tool. One correction, I wouldn't describe myself as a ghost hunter. I stumbled across ghost boxes online and saw ... } [Nov 02, 12:00 AM](#)

**Mike** { Jon, The radio was completely DOA to begin with. It was purchased broken and re purposed for this project. Berie, Actually I didn't use any ... } [Nov 01, 9:09 PM](#)

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## Polls

**What do you mainly use your RTL-SDR / SDR for?**

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- AIS
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- Weather Satellites
- HF Reception
- Filter & VSWR Meter
- L-Band Satellites
- Radio Astronomy
- Air Traffic Control
- ACARS
- Weather Balloons
- Reverse Engineering
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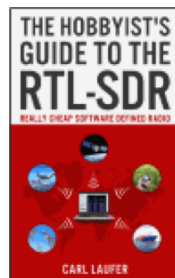
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## What is RTL-SDR

The RTL-SDR is an ultra cheap software defined radio based on DVB-T TV tuners with RTL2832U chips. The RTL-SDR can be used as a wide band radio scanner. It may interest ham radio enthusiasts, hardware hackers, tinkerers and anyone interested in RF.

