

nRSP-ST

FAQs (Frequently Asked Questions)

What is the purpose on a networked RSP, as opposed to a regular RSP?

The nRSP-ST is like a traditional SDR receiver but with a fundamental new advantage which is the ability to place the unit wherever it works best and access it from wherever is most convenient. The SDRconnect client software provides a robust and flexible interface to whatever decoding apps are chosen. The addition of a web browser (and eventually an Android/iOS app) provides convenience for people who are on the move without access to a laptop.

Surely, the nRSP-ST is just an RSP and a Raspberry Pi in a box, isn't it?

SDRplay designed the nRSP-ST to have three modes by which it can deliver data: Full IQ, IQ Lite and compact. IQ-Lite is unique to the nRSP-ST. All three of these modes can be supported simultaneously using the same nRSP-ST for different users and the choice of which mode to select is dictated primarily by the network bandwidth available to the user.

To ensure the best possible user experience, we put a lot of effort into ensuring the lowest level of latency to make the software as responsive as possible. It was our objective to ensure that people find the responsiveness of the nRSP-ST to be close to that of a traditional USB connected device, even when connecting via the internet.

A very important element of the nRSP-ST offering is the customised version of the Linux operating system that we use for the device. Our intention in doing this was to ensure the highest level of OS robustness. We imagine that some of these devices will be placed in remote locations, and we consider it critical that the device should be able to operate for many months upon end without crashes or any other 'hiccups' that might necessitate a hard reboot. Considerable effort was put into developing internal 'watchdogs' to monitor the various services running on the device and ensure continuous and seamless operation. This is one of the key advantages of the nRSP-ST compared with simply connecting a RSPdx R2 to a Raspberry Pi and using the server software that we provide.

The nRSP-ST runs very cool and has been engineered to not require a noisy and potentially unreliable cooling fan

The nRSP-ST will support local IQ storage on a NAS device (coming in December 2024)

What's so different about the nRSP-ST compared with devices like the Web-888 and the Kiwi SDR?

The nRSP-ST is designed to meet the needs of a general user. If the user is really only interested in HF and digital amateur modes, then either of these devices could be an alternative. However, if people want a more general purpose receiver with the flexibility to do anything from LF NDB monitoring, DAB Dx-ing to monitoring digital PMR modes or receiving HRPT satellite weather images and to be able to access the device from anywhere in the world, then the nRSP-ST provides a more flexible solution.

We recognise and understand the attraction to many people of having a managed database of networked receivers that anyone can access from anywhere in the world. However, this is not how we see many nRSP-ST owners wanting to use their device. They might certainly want to share their unit with one or more trusted 'friends' and a good example of how we see these devices being used is as a resource of amateur radio clubs for their members. But at the moment, we have concerns about managing a global network of receivers and the potential security issues that this exposes people to.

How many simultaneous users can one nRSP-ST support?

The maximum number of simultaneous users that the device can support depends upon the connection mode, signal bandwidth and signal type (demodulation mode). The limitation in the number of users is determined by the CPU and GPU load on the host inside the nRSP-ST. A lot of work has been done to balance the signal processing that is performed on the CPU vs the GPU to maximise the use of the available processing power. By this approach, we have been able to increase the supportable number of users by perhaps 50% when compared to software that exclusively uses the CPU. The most severe load is when using 'compact mode' for SWFM. In this case if there are more than 3 connections, then there may be some audio break up as all of the processing is being performed on the host itself. For lower bandwidth signals such as AM or SSB, the limit is a lot greater. In this case, the device can support up to 8 users. In Full IQ mode, the limitation is really network bandwidth. The most useful mode in many ways is IQ Lite. For AM and SSB signals, it only uses about 2-3x the network bandwidth of compact mode, but reduces the processing load on the nRSP-ST host considerably. It has all of the advantages of full IQ with the exception that it will not allow IQ recording on the client side.

At this stage, we have not attempted to artificially limit the number of connections that can be made. However, in a future release of the firmware, we will most likely add the ability for the administrator to limit the number of simultaneous users, but we want to do that in an intelligent way that doesn't place unnecessary restrictions, so we want to take account of the modes in which the connections are made.

Was the power supply tested for noise emissions?

Yes. A lot of work was undertaken to find a power supply that was quiet, met emissions requirements and did not cause undesirable spurious interference on the nRSP-ST itself.

Any plans for built in data decoders? Or Plugins from 3rd party developers

No plans for data decoders at this stage, but that is simply not something that we have had a chance to consider yet. We don't rule it either in or out. Remember that this can be done at the client end in SDRconnect and that is likely to be our initial focus. Certainly, third party developers will be able to write modules (plugins) for SDRconnect to provide data decoders once we publish the module API. We will not be allowing third party developers to write 'plugins' to be added to the firmware of the nRSP-ST for what would hopefully be obvious reasons. Security and software stability are our key priorities here.

Any issues with powering off, killing the power? What about the device locking up or corruption?

The custom lightweight Linux OS operates almost completely in a read-only filesystem. The single exception being saving of any configuration changes. The writeable area for config is partitioned off from the main software making the OS completely immutable. The most common failure of minicomputers experiencing sudden unexpected power loss is file system corruption as a "standard" distribution would have many things running in the background making small read / writes to the filesystem at any given time. During normal operation, absolutely zero is being written to the flash on the nRSP. Only when updating the firmware or saving new configuration briefly.

There is also a built-in from the factory recovery method. There are multiple redundancies in the firmware update and boot process. This should allow recovery from a bad update in the vast majority of cases. As a final resort, tech support could provide an additional remote recovery reset method.

When a remote user connects, any other users cannot change bands, this will be permanent feature?

We want to avoid the situation where external users are 'fighting' to control the LO frequency, gain, sample rate etc. The first person on the queue will control these parameters, but the administrator can set idle time and session time limits to prevent anyone from 'hogging' access. Once a user hits either the idle or session time limit as

defined by the administrator, the next person on the queue is automatically granted control.

When is it likely we will see the admin page integrated into the web user interface, instead of using the admin tool?

We can't estimate the timing on this

If an update is made for the admin tool, does the admin tool "self update" or will there be a separate installer?

As things stand this tool is updated through the SDRconnect download on the nRSP-ST software page.

Is the current "admin tool" also multi-platform (e.g. works on Linux)?

Yes, the admin tool is multi-platform and is installed on all of them. It works on Linux, MacOS as well as Windows and for both x64 and ARM64 based systems

Why doesn't the nRSP-ST have built-in PoE (Power over Ethernet)?

We did look very hard at this, but firstly it is quite expensive to add this, and the cost would be borne by all buyers of the device whether they want it or not. The extra price the end customer would end up paying would be significantly more than if the user simply bought a cheap external PoE splitter. However, the biggest issue for us with an integrated PoE was noise and interference. The technology to integrate this contains large magnetic components and these produce a huge amount of noise and interference. Putting this inside the metal case with a sensitive radio created a range of interference problems that rendered the approach too risky in our view.

