

# nRSP-ST Review

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Radio Society of Great Britain - first published in  
February 2025 RadCom magazine



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SDR receiver review**

# SDRplay nRSP-ST

## networked SDR receiver

**The nRSP-ST networked 1kHz-2GHz SDR receiver is the latest product from SDRplay. It marries a high-performance SDR receiver with a built-in computer to give fully-networked access to the receiver.**

### Introduction

The nRSP-ST comes in a smart black metal case, measures 200mm x 105mm x 40mm, and weighs 800g (see **Figure 1**). It covers all frequencies from 1kHz to 2GHz, and is powered by an included 5.1V DC supply at 3A max. This plugs into the back of the device via a USB-C connector. You can operate the receiver from any suitable device on your network, such as a tablet or mobile phone. If you wish it can even be configured to give you remote access when out and about.

There are no controls on the box as everything is handled in software, but there are two LEDs on the front denoting status and power, and a number of connectors on the rear (see **Figure 2**). These comprise a socket for the supplied WiFi antenna, the aforementioned USB power socket, an RJ45 gigabit Ethernet socket, a USB A socket, a socket marked 'FLASH' (which is not used normally), an MCX socket marked 'REF IN' for an external 24MHz signal, and a ground stud on the far right which enables you to ground the case to reduce interference if needed. The WiFi supports both the 2.4GHz and 5GHz bands and is compatible with the IEEE 802.11b/g/n/ac wireless standards.

Also on the back are three 50Ω antenna sockets marked 'ANT A', 'ANT B' and 'ANT C'. Antenna connections A and B are SMA types, while antenna B also has a switchable Bias-T power supply for an externally-powered antenna. The ANT C connector is a BNC type. Antennas A and B cover 1kHz to 2GHz, while ANT C covers 1kHz to 200MHz in continuous coverage.

This configuration and coverage is the same as the SDRplay's latest RSP1B and RSPdx-R2 receivers, which all feature 14-bit SDR with RF spectrum coverage from 1kHz to 2GHz. Just think about that for a minute. This means that the nRSP-ST covers everything from VLF to microwaves, with no gaps, so you can tune in to SAQ's CW transmissions on 17.2kHz, listen to long- and medium-wave broadcasts, cover all the amateur bands from 136kHz to 1325MHz (23cm), and everything else up to 2GHz. That makes it an incredibly powerful tool and very versatile. The computer behind all this is a 64-bit quad core running at 1.5GHz with 2GB of RAM and 8GB of eMMC storage.

The nRSP-ST is a 'plug and play' networked receiver that is designed to be connected to a computer network, either via its Ethernet port or a WiFi connection. You can also use it via the USB port just as you can with SDRPlay's RSP1B, RSPdx-R2 and RSPduo, but when used in that way you won't get the network capabilities. Access is via the multi-platform SDRconnect software, available for Windows 10 and 11, Apple MacOS (x64 and ARM64), and Linux (Raspberry Pi x64 and ARM 64). Please note this won't run on versions of Windows before Windows 10.

### Getting going

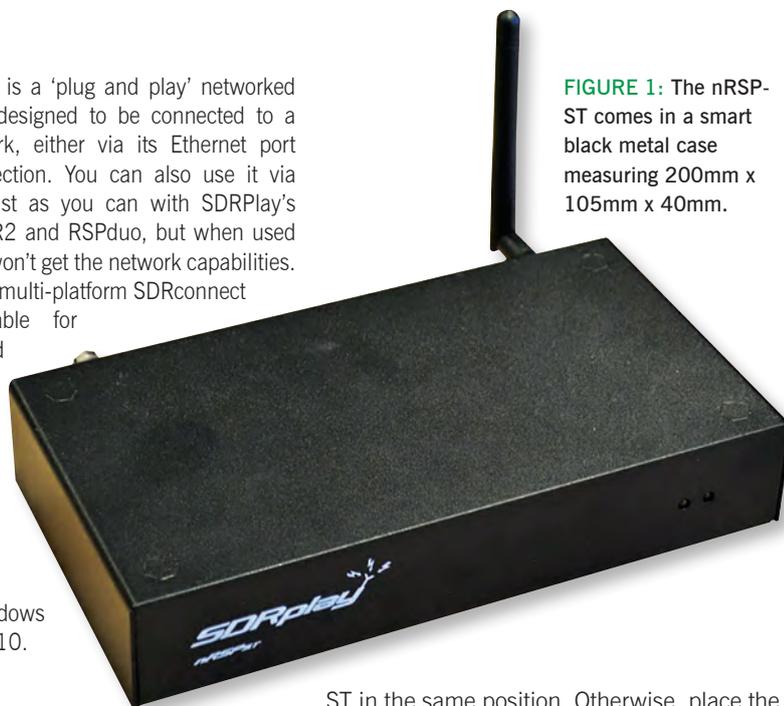
So how do we get it to work? Please note that the detailed instructions are not included with the device, so you will need to follow the specific links to the latest information on the SDRplay website [1] and follow the instructions carefully.

First, you will need to download the SDRconnect software. Make sure it is the latest version. The installer will install three pieces of software on your computer, the SDRconnect v1.0 (the latest version), a firmware update tool for the nRSP-ST, and an administrator tool for the nRSP-ST. On Linux the updater will be called 'NRSPUpdater' and is installed in your SDRconnect installation folder. On a Macintosh the updater will have been installed in your 'Applications' folder. On Windows the updater is automatically started by the installation process; however, should you need to run the updater again you can find it in the Windows start menu.

Install SDRconnect on your computer and then connect the nRSP-ST to your broadband router with an RJ45-RJ45 Ethernet cable. This is an essential step to configure the device; download the latest firmware, and enable the nRSP-ST's WiFi connection.

First, run the firmware updating tool, locate your device on the network, and run the update utility. Once that is complete you can run the nRSP-ST administrator tool and set up the WiFi; for this you will need your router's password. Once that is complete you can disconnect the Ethernet cable from your router, unless you intend to use your nRSP-

**FIGURE 1:** The nRSP-ST comes in a smart black metal case measuring 200mm x 105mm x 40mm.



ST in the same position. Otherwise, place the device where you intend to use it, connect it to your LAN with an Ethernet cable (unless you are using WiFi), plug it in, and wait until the status light extinguishes.

You can now run the SDRconnect administrator software which uses the device's serial number as the password. This can be found on the underside of the device or on the box that the device arrived in. The admin software gives you control over the method of accessing the device and also its IP address (useful if using a web page to access it). Now run the SDRconnect software. Once it is running you can locate the device at the top of the screen and select the mode you require. You can choose from three different modes: 'IQ Lite', 'Compact', or 'Full IQ'. If you are accessing someone else's unit, you can add it as a remote device and enter their hostname and port number. You can give it a unique name and thereafter it will appear in the device dropdown list with those same three mode options. For example, at the time of writing SDRplay had a test unit, which is named 'Bedford'.

'IQ Lite' is ideal for remote access to lower-bandwidth networks, giving up to 10MHz spectrum visibility at <192kHz demodulated signal. 'Compact' enables full demodulation of AM/FM/CW and SSB audio, while still giving up to 10MHz spectrum visibility. Finally, 'Full IQ' is for high-bandwidth networks and full functionality. To be honest, it may be worth playing with all three to see which gives the best results; it will largely depend on your available network bandwidth.



FIGURE 2: A rear view showing the connectors.

Testing

I tested the device via my 2.4GHz WiFi and was able to use all three of the modes locally with no problems. I won't go into all the capabilities of SDRconnect as I looked more closely at the software when I reviewed the RSPdx-R2 a couple of issues ago. Instead, I'll focus on the network-capable characteristics of the nRSP-ST. Note that it is now possible to record IQ data on a hard drive connected to your network.

I used my iPhone and also an Android-powered Motorola G14 mobile phone. Both worked (see Figure 3) by using the IP address of `http://192.168.1.13:9001`. You can also use the serial number of the device to access a webpage, such as `http://nRSP(serial number):9001`. A phone's small screen makes it fiddly, but it works. I also tried a couple of Android-powered tablet computers and an iPad, but couldn't get the software to work with them.

The web page version of SDRconnect is a simplified version of the main SDRconnect application. If you have a Windows, Mac OS, or Linux laptop, you can still use the main version of SDRconnect to connect remotely to your unit – this is probably the best way

to do it. To make your device accessible outside your own local network you will need to consult your router's port-forwarding instructions [2]. I used the nRSP-ST with an HP Windows 10 laptop running SDRconnect. This is not the fastest PC in the world, but it worked well. I listened to 40m, 20m and 10m via a 132ft EFHW for 80-10m. I also listened to short-wave AM broadcasts and VOLMET transmissions. The nRSP-ST worked flawlessly and at no time did it fail to work. Yes, if you used the internet browser at the same time as listening it stuttered, but that was probably because my Celeron-powered laptop is not that powerful. I then tried an Acer Chromebook running the Chrome browser and again it worked. I used it for monitoring 10m beacons, which it did very well.

Summary

So in conclusion, the nRSP-ST is a novel device that has all sorts of applications. It enables you to monitor the bands while sitting in the lounge as well as from anywhere else. I could imagine lots of uses for it, once you get it set up correctly. The device currently costs £471.07 including VAT and delivery,

direct from SDRplay. It is also available from its authorised UK distributors, including Martin Lynch and Sons, Nevada, Moonraker, Radioworld and SDR Kits. My thanks to SDRplay for the loan of the nRSP-ST.

SDRplay comments...

"We see the web-browser version being ideal for more casual listening, either around the home or when out and about, using tablets or phones. When you have access to a computer with a keyboard, then using the SDRconnect client software will allow easier access to the full feature set. The companion 'admin' software makes it easy to enable trusted friends to have controlled access (with or without timeout limits) which is ideal for sharing with a radio club.

"Some people have asked why we don't have more-comprehensive instructions included in the printed 'Operating Instructions' booklet. The reason is that new features and improvements are being added regularly, and the necessity of a firmware update is something that changes depending on which production unit you have.

"We also note that while Steve saw no problems using Wi-Fi for 'Full IQ' mode, this may not be true for more typical Wi-Fi set-ups, particularly when doing IQ recording or using 192kHz WFM mode. We therefore recommend use of gigabit Ethernet when using 'Full IQ'. When using the web browser on a phone, as Steve says this can be rather fiddly, but this is an area we are working on, and you can expect significant improvement software updates very soon. Please note, readers are welcome to try accessing the 'Bedford' test set-up: hostname 'nrsp.ddns.net' and port 50002. The username and password are both 'Test'. Antenna A is connected to a G5RV antenna which works well from medium wave through to VHF. It does get very busy and has a 15-minute timeout. The product webpage has a link to more information about it [3]. Finally, our small UK technical team appreciates all the positive feedback we're already getting on this latest SDRplay product, which we build in Peterborough."



FIGURE 3: Accessing the nRSP-ST using an Android-powered Motorola G14 mobile phone.

References

- [1] <https://www.sdrplay.com/nRSPstart/>
- [2] <https://www.wikihow.com/Set-Up-Port-Forwarding-on-a-Router>
- [3] <https://www.sdrplay.com/nrspst/>

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