SDRPlay RSPdx

US$200   £190   €210

OVERVIEW

The SDRplay RSPdx is a 14-bit single tuner SDR capable of receiving the entire RF spectrum from 1kHz to 2GHz. With its accompanying software, SDRuno, it can display and record a spectrum of up to 10MHz anywhere within that range. Power-ed from the USB port of a host computer it now replaces the well established RSP2 & Pro models, promising better strong signal handling capabilities and a more flexible antenna connection.

From the beginning SDRplay has opened the door to reasonably priced and high quality SDR reception while the team behind it have continually supported and upgraded both the hardware and accompanying software.

Naturally we were keen to try out the new model and compare it, side by side, with the RSP2 it has superseded. Our review unit was kindly loaned to us by Jon Hudson at SDRPlay.

FEATURES

A number of improvements have been incorporated into this redesigned model. Overall, performance has been enhanced by an increase from 12 to 14-bit architecture and the refinement of the Pre-Selection filters. The low pass filters are now operational on all three aerial ports, and a new 500kHz low pass filter has been added, improving reception below 500kHz. There are two software selectable hardware notches for AM/FM and DAB filters, which also work on all input ports.

When using SDRuno, the software for use with the entire SDRPlay range, the RSPdx is supported by a new High Dynamic Range (HDR) mode for framed bands below 2MHz. This feature increases dynamic range, improves intermodulation and reduces spurious responses.

The RSPdx has two 50 ohm SMA aerial inputs, Ant A & B, but whereas these operated from 1.5-2GHz on the RSP2, they now cover the entire spectrum of 1kHz to 2GHz.

The three-pin 900 ohm Hi Z input port fitted on the RSP2 which operated from 1kHz to 30MHz has been replaced by a 50 ohm BNC connector, and now operates from 1kHz to 200MHz. Better isolation between aerial ports has been achieved and all inputs are software selectable.

The RSPdx still has the capability to accept an external 24MHz reference input via a female MCX connector to an external frequency standard such as a GPSDO. The reference output has been deleted. Bias-T output is still available on Ant B.

Supplied in a 95x90x30mm metal case, from the outside the RSPdx looks little different from the RPS2 Pro – the BNC socket being the only real give away from a distance – and the same could be said of SDRuno. However, a closer look at the Main panel in SDRuno now displays a DAB Notch Filter selection box and the Hi Z input selection box now reads 'ANT C'. By selecting the Bands button in the RX control panel the new HDR modes can be selected and it is here that the improvements become noticeable. The 'Framed' frequency ranges in HDR mode are, approximately: LW 150-290kHz, MW 550-1700kHz, NDB-H 486-546kHz, NDB-L 180-500kHz, LFER 144-205kHz, FULL 50-1700kHz and Low 0-520kHz. Each can be selected or de-selected by a click on the appropriate button.

Incidentally existing users of SDRplay devices using SDRuno will be pleased to know that upgrading to the RSPdx merely requires pluging the new device into a USB port. SDRuno (v.1.33 and above) will recognise the device and set itself up, there being no further setting up required, and all previous settings are retained. Indeed two

instances of SDRuno can be run if owners decide to keep their previous RSP unit. For new users the installation of SDRuno is straightforward and should present no problems.

EVALUATION

We used SDRuno v. 1.33 running under Windows 10 on an elderly Dell Inspiron Athlon IIx 4 630 with 16gb RAM and with the operating system and SDRuno software installed on a solid state drive. Other third party software is available.

Aerials used for HF were a 66ft inverted L end fed at 30ft with a 20:1 transformer providing a DC path to ground and a home made Active Magnetic Loop of 1m diameter. No ATU was used for the evaluation. At VHF and above a diamond V2000 and simple discone at 20ft were used.

FM implementation works very well. WFM or WFM Stereo may be selected by software and there are four pre-set IF filter bandwidths which can all be varied. 50µs and 75µs de-emphasis may be selected or set to Off. There is also an effective variable noise reduction filter that works on stereo FM to reduce 'hiss' on marginal signals. Station RDS info may also be displayed.

Turning to the lower frequencies we found that this is where the improvements are more immediately noticeable. As an example, for good reception below 500kHz using the RSP2, an external 500kHz Low Pass Filter was helpful in rejecting out-of-band signals. On the RSPdx with its internal filter this is no longer needed, demonstrating a marked improvement with no spurious signals present. We found the same on the LW and MW broadcast bands where some spurious signals on the RSP2 were not present on the RSPdx.

The individual HDR band frames for MW and LW work really well. The RSPdx's ability to pick out weak signals, sandwiched between much stronger ones on MW, was impressive and narrowing the IF filters efficiently removed any splatter. The HDR band frame Full which covers the spectrum up to 1700kHz will appeal to those keen to explore this part of the spectrum in one chunk. Outside the HDR modes, on HF the RSPdx produces very good results and is a great performer on the broadcast bands. It is even possible to try out a form of diversity reception when simultaneous transmissions can be received on different bands that are within the selected spectrum bandwidth of the RSPdx. A brief check of the new DAB Notch filter demonstrated that it effectively prevented DAB breakthrough on the receiver above 230MHz.

Naturally all of the versatile facilities provided by the SDRuno software are available with the RSPdx. Synchronous AM with selectable sidebands is effective when noise or interference affects a weak broadcast station. In this mode it is also possible to make accurate frequency measurements of a station; the frequency offset being displayed in the RX Control panel.

IF filters have sharp skirts and bandwidths may be fully varied by dragging the vertical bars on the Aux SP Panel, IF shift can also be implemented to avoid interference. SDRuno also provides good noise reduction facilities and fully variable wide and narrow noise blanking which, when used carefully, helps to reduce a surprising amount of noise found on the bands. A click of the mouse will access four variable notch filters.

Audio playback quality will depend on the host computer system. When using a pair of reasonable quality outboard Yamaha PC speakers, we found the dx capable of good audio reproduction.

There are no limits on memories or memory banks and memory channel scanning is possible. A calibrated RSSI allows accurate signal measurements to be made.

The RDS feature on broadcast FM is a nice touch for quick station identification and, with the introduction of software version 1.4, it should be possible to obtain a plug-in for DAB reception, and a very useful FRAN (Frequency Annotation) plug-in which can read SWSKEDS or users own .s1b files to display stations relative to frequency on the main spectrum window. Also noted was that the RF gain control has more refined steps. Another excellent feature of SDRuno is the ability to run multiple virtual receivers anywhere within the selected bandwidth. We also found that the recording and playback feature makes instant or unattended recording a very simple matter.

SDRuno certainly makes the RSPdx a very versatile receiver and it is worth investing time to learn its many features and 'quirks'.

Another great plus for any SDRplay user is the free Spectrum Analyser software available from the SDRplay website. Owners of the RSPdx can have an accurate 1kHz to 2GHz spectrum analyser for just the cost of the SDRplay device.

CONCLUSION

The SDRplay RSPdx certainly offers improved performance over the RSP2. This is not overly obvious on the higher bands but where the upgrades have really made a difference is on the lower bands. There were no spurious signals found on the MW band and there is no longer a need for an external low pass filter for work below 500kHz. HDR works effectively, improving the strong signal handling capability of the RSPdx and the DAB notch filter stops the DAB multiplex breakthrough. The aerial input arrangements are a great improvement, being a lot more flexible.

This receiver excels at all types of monitoring whether it be broadcast, amateur, utility, L-Band and more. With decent aerials there is not much out there than can escape the SDRplay RSPdx. It impresses with its good overall performance, wide band coverage, small footprint, all mode reception, and powerful free software; it is also so reasonably priced that it's hard to think what's not to like about this great little receiver.