Radio Spectrum Processor 1A
14-bit SDR

SDRplay

The SDRplay RSP1A is a powerful wideband full featured 14-bit SDR which covers the RF spectrum from 1kHz to 2GHz. All it needs is a computer and an antenna to provide excellent communications receiver functionality. Combined with the power of readily available SDR receiver software (including Windows-based 'SDRuno' supplied free of charge by SDRplay), you can monitor up to 10MHz of spectrum at a time. A documented API allows developers to create new demodulators or applications around the platform.

KEY BENEFITS

- Covers all frequencies from 1kHz through VLF, LF, MW, HF, VHF, UHF and L-band to 2GHz, with no gaps
- Receive, monitor and record up to 10MHz of spectrum at a time
- Free use of windows-based SDRuno software which provides an ever-increasing feature-set
- Strong and growing software support network
- Calibrated S meter/ RF power and SNR measurement with SDRuno (including datalogging to .CSV file capability)
- Documented API provided to allow demodulator or application development on multiple platforms
- Excellent dynamic range for challenging reception conditions
- Works with popular 3rd party SDR software (including HDSDR, SDR Console and Cubic SDR)
- ExtIO based plugin available
- Software upgradeable for future standards
- Strong and growing software support network
- API provided to allow demodulator or application development
- Multiplatform driver and API support including Windows, Linux, Mac, Android and Raspberry Pi 3/4
- Up to 16 individual receivers in any 10MHz slice of spectrum using SDRuno
- Calibrated S meter and power measurements with SDRuno
- Stand-alone windows-based spectrum analyser software available (with sweep, sample and hold features)
- Ideal for monitoring of ISM/ IoT/ Telemetry bands <2GHz
- Ideal for portable operation

RSP COMPARISON TABLE

| Key specifications and highlights	RSP1A	RSPdx	RSPduo
Continuous coverage from 1kHz to 2GHz	✓	✓	✓
Up to 10MHz visible bandwidth	✓	✓	✓
14-bit ADC silicon technology plus multiple high-performance input filters	✓	✓	✓
Software selectable AM/FM & DAB broadcast band notch filters	✓	✓	✓
4.7V Bias-T for powering external remote antenna amplifier	✓	✓	✓
Powers over the USB cable with a simple type B socket	✓	✓	✓
50Ω SMA antenna input(s) for 1kHz to 2GHz operation (software selectable)	1	2	2
Additional software selectable Hi-Z input for up to 30MHz operation			✓
Additional software selectable 50Ω BNC input for up to 200MHz operation		✓	
Additional LF/VLF filter for below 500kHz		✓	
24MHz Reference clock input (+ output on RSPduo)		✓	✓
Dual tuners enabling reception on 2 totally independent 2MHz ranges			✓
Dual tuners enabling diversity reception using SDRuno			✓
Robust and strong plastic case (with internal RF shielding layer)	✓		
Rugged black painted steel case		✓	✓
Overall performance below 2MHz for MW and LF	Good	Best	Good
Multiple simultaneous applications	Good	Good	Best
Performance in challenging fading conditions (*using diversity tuning)	Good	Good	Best*

SPECIFICATIONS

General
- Weight 110g
- Size: 98mm x 88mm x 34mm (case only)
- Low Current: 185 mA (excl bias T)

Connectivity
- Single 50Ω RF connector (SMA socket)*
- USB 2.0 (high speed) type B socket

Frequency Range
- Continuous coverage 1kHz – 2GHz

ADC Characteristics
- Sample frequency 2 – 10.66MSPS
- 14 bit native ADC (2 – 6.048MSPS)
  - 12-bit (6.048- 8.064 MSPS)
  - 10-bit (8.064- 9.216MSPS)
  - 8-bit (> 9.216 MSPS)

Bias T
- Software Selectable 4.7V @ 100mA

Reference
- High Temperature Stability (0.5ppm) TCXO
- In-field trimmable to 0.01ppm.

Maximum recommended input power
- 0dBm continuous, 10dBm for short periods

Typical Noise Figures
- 18dB @ 2MHz
- 15dB @ 12MHz
- 15dB @ 25MHz
- 15dB @ 40MHz
- 3.3dB @ 100MHz
- 3.3dB @ 200MHz
- 7.7dB @ 386MHz
- 3.6dB @ 660MHz
- 5.0dB @ 1500MHz
- 6.3dB @ 1800MHz

IF Modes
- Zero IF, All IF bandwidths
- Low IF, IF bandwidths ≤ 1.536MHz

IF Bandwidths (3dB)
- 200kHz
- 300kHz
- 600kHz
- 1.536MHz
- 5.0MHz
- 6.0MHz
- 7.0MHz
- 8.0MHz

Front End Filtering
Automatically configured front end filtering:

Low Pass
- 2MHz

Band Pass
- 2-12MHz
- 12-30MHz
- 30-60MHz
- 60-120MHz
- 120-250MHz
- 250-300MHz
- 300-380MHz
- 380-420MHz
- 420-1000MHz

High Pass
- 1000MHz

Notch Filters
- FM Filter:
>50dB 85 – 100MHz
- MW Filter:
>30dB 660 – 1550kHz
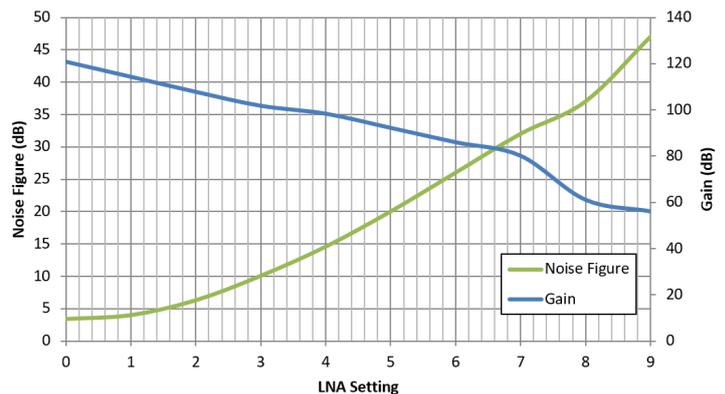- DAB Filter:
>30dB 165 – 230MHz

*we recommend the use of an SMA (male) plug on a cable or "pigtail" - avoid large adapters like SMA to SO239 which may place too much strain on the SMA socket. Make sure the plug has a centre pin

Gain and IIP3 Vs LNA Setting @ 100MHz
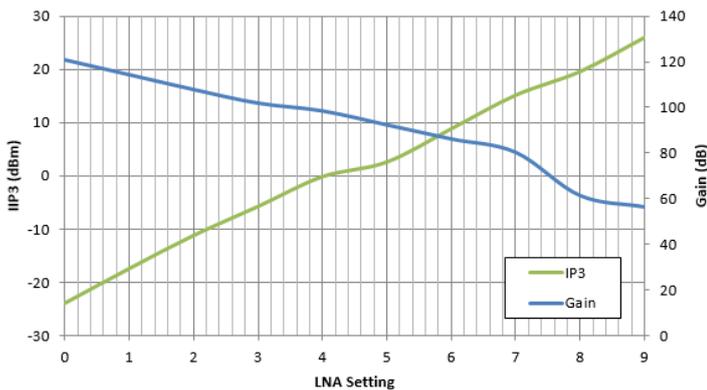
Gain and Noise Figure Vs LNA Setting @ 100MHz

SDRuno FEATURES

- Multiple 'Virtual Receivers' which allow for simultaneous reception and demodulation of different types of signals within the same receiver bandwidth.
- A selectivity filter with an ultimate rejection greater than 140dB.
- A unique distortion-free double stage AGC with fully adjustable parameters.
- Multiple notch filters with BW adjustable down to 1Hz, Notch Lock feature.
- A unique synchronous AM mode with selectable/adjustable sidebands, dedicated PLL input filter, and selectable PLL time constants.
- SNR (stereo noise reduction), featuring a proprietary noise reduction algorithm for stereo broadcast.

- AFC for FM signals.
- Calibration for receiver frequency errors.
- Class leading audio quality
- Calibrated S meter and power measurements
- RDS support with "DX Mode" for low signal environment
- Active Noise cancelling
- CAT and Omnirig control
- SSB/AM and Synchronous AM modes
- WBFM and NFM with AFC