RSPduo
Dual Tuner 14-bit SDR

The SDRplay RSPduo is a dual-tuner wideband full featured 14-bit SDR which covers the entire RF spectrum from 1kHz to 2GHz giving 10MHz of spectrum visibility. Combined with the power of readily available SDR receiver software (including 'SDRuno' supplied by SDRplay) you can simultaneously monitor two completely separate 2MHz bands of spectrum anywhere between 1kHz and 2GHz. The RSPduo provides three software selectable antenna inputs, and clocking features ideally suited to industrial, scientific and educational applications. All it needs is a PC and an antenna to provide excellent communications receiver functionality. A documented API allows developers to create new demodulators or applications around the platform.

KEY BENEFITS

- Simultaneously receive on two totally independent 2MHz spectrum windows anywhere between 1kHz and 2GHz
- Simultaneous processing from 2 antennas enables direction-finding, diversity and noise reduction applications
- Ideal for cross band full-duplex reception, e.g. HF + VHF or VHF + UHF
- Simultaneous Dump1090 and VHF ATC reception
- Simultaneous monitoring and recording of 2 ISM bands
- 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 (single tuner mode)
- External clock input and output for synchronisation purposes, or connection to GPS reference clock
- Excellent dynamic range for challenging reception conditions
- Works with popular EXTIO-based SDR software
- Software upgradeable for future standards
- Strong and growing software support network
- API provided to allow demodulator or application development
- Calibrated S meter/ RF power and SNR measurement with SDRuno (including datalogging to .CSV file capability)
- Ideal for portable monitoring of ISM/ IoT/ Telemetry bands <2GHz
- World-class technical support via www.sdrplay.com

KEY FEATURES

- Dual tuner provides independent coverage from 1kHz to 2GHz using 2 antenna ports simultaneously
- 14-bit ADC silicon technology (not another 8 bit dongle!)
- Up to 10MHz visible bandwidth (single tuner mode) or 2 slices of 2MHz spectrum (dual tuner mode)
- 3 software-selectable antenna ports (2 x 50Ω and 1 x 1kΩ high impedance balanced/unbalanced input)
- High impedance antenna port (1kHz to 30MHz) with selectable MW notch filter and choice of 2 pre-selection filters
- Software selectable AM/FM and DAB broadcast band notch filters for the 2 SMA antenna (1kHz to 2GHz) antenna ports
- External clock input and output enables easy synchronisation to multiple RSPs or external reference clock
- Powers over the USB cable with a simple type B socket
- 11 high-selectivity, built in front-end preselection filters on both the 2 SMA antenna ports
- Software selectable multi-level Low Noise Preamplifier
- Bias -T power supply for powering antenna-mounted LNA
- Enclosed in a rugged black painted steel case.
- SDRuno—World Class SDR software for Windows
- Documented API for new apps development

CONNECTIONS
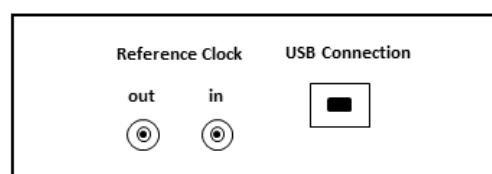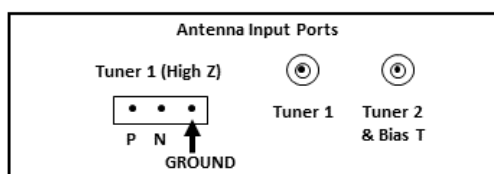
SPECIFICATIONS

General
- Weight 315g
- Size: 95mm x 80mm x 30mm
- Low Current:
  - Single tuner:180 mA (excl Bias T)
  - Both tuners: 280 mA (excl Bias T)

Frequency Range
- Continuous coverage 1kHz – 2GHz

Connectivity
- USB 2.0 (high speed) type B socket

Tuner 1 Antenna Coax Port Characteristics
- 1kHz – 2GHz operation
- 50Ω input impedance
- SMA female connector

Tuner 1 High-Z Port Characteristics
- 1kHz – 30MHz operation
- 1kΩ input impedance (balanced)
- Pluggable screw connector (CTB9208/3 plug supplied)

Tuner 2 Antenna Port Characteristics
- 1kHz – 2GHz operation
- 50Ω input impedance
- SMA female connector
- Selectable 4.7V DC out (see Bias T)

Reference Clock Input and Output
- MCX female connector

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 (Tuner 2 Port only)
- Software selectable 4.7V @ 100mA

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

Typical Noise Figures (50 ohm)
- 18dB @ 2MHz
- 15dB @ 12MHz
- 15dB @ 25MHz
- 15dB @ 40MHz
- 3.3dB @ 100MHz
- 3.3dB @ 200MHz
- 5.8dB @ 340MHz
- 3.6dB @ 660MHz
- 4.3dB @ 1500MHz
- 5.0dB @ 1800MHz

Typical Noise Figures (High-Z)
- 14dB @ 2MHz
- 18dB @ 15MHz

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

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

Reference
- High temp stability 0.5PPM TCXO
- In-field trimmable to 0.01ppm.

External Reference Clock
- When an external clock is applied, auto-detect will switch to the external reference. Ideally the external clock source should be connected to the RSPduo before power up

Front End Filtering (Coax Antenna Ports)
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 (Coax Antenna Ports)
- FM Notch Filter:

>30dB 77 – 115MHz
>50dB 85 – 107MHz
>3dB 144 – 148MHz

- MW Notch Filter:

>15dB 400 – 1650kHz
>30dB 500 – 1530kHz
>40dB 540 – 1490kHz

- DAB Notch Filter:

>20dB 155 – 235MHz
>30dB 160 – 230MHz

Front End Filtering (High Z Tuner 1 Port)
- Choice of 0-2MHz and 0-30MHz low pass

Notch Filters (High Z Tuner 1Port)
- MW Notch Filter:

>15dB 490 – 1640kHz
>30dB 560 – 1470kHz

Note: The notch filters above are software selectable and remove specific broadcast bands. Each port carries its own filters which can be independently selected.

Operating Modes
- One receive stream, any IF mode or bandwidth, software selectable from either tuner, or….
- Two simultaneous receive streams from both tuners using low IF mode and bandwidth limited to 1.536MHz maximum
- These modes are summarised in the table below.

Operating Mode	Tuner 1 Available RF ports	Tuner 2 Available RF ports	Master Sample Rate	Slave Sample Rate	Tuner 1 IF Bandwidth	Tuner 2 IF Bandwidth	Tuner 1 Frequency Range	Tuner 2 Frequency Range
Single Receiver (Tuner 1)	50Ω/Hi-Z	Not available	2-10 MHz	N/A	200 kHz – 8 MHz	N/A	1 kHz – 2 GHz	N/A
Single Receiver (Tuner 2)	Not available	50 Ω with Bias T	2-10 MHz	N/A	N/A	200 kHz – 8 MHz	N/A	1 kHz – 2 GHz
Dual Tuner (Tuner 1 master)	50Ω/Hi-Z	50 Ω with Bias T	6/8 MHz	Determined by Tuner 1	200 kHz – 1.536 MHz	200 kHz – 1.536 MHz	1 kHz – 2 GHz	1 kHz – 2 GHz
Dual Tuner (Tuner 2 master)	50Ω/Hi-Z	50 Ω with Bias T	6/8 MHz	Determined by Tuner 2	200 kHz – 1.536 MHz	200 kHz – 1.536 MHz	1 kHz – 2 GHz	1 kHz – 2 GHz