

SRXL2

Signal receiver and processor for L-band and IF – v. 2



Description

The SRXL2 is a mezzanine board that pairs with an EDT main board (for PCI or PCI Express) to receive and process simultaneous L-band inputs (900 to 2250 MHz), IF inputs (160, 140, 70, or 21.4 MHz), or both. It also accepts any IF input below 90 MHz with a direct sampling path.

Except for the direct path, each input is processed with an analog mixer. Mixer outputs are bandpass-filtered and digitized with 12-bit precision at a fixed sample rate of 250 MHz. The sample rate can be set to lower frequencies, but external filtering is required.

The resulting two channels of digital sample data are available as inputs to the programmable Xilinx Virtex 4 FPGA. The FPGA can perform signal processing or serve as a configurable switch matrix to route data to the main board and four digital down-converter Graychips (GC4016).

The board also has a TCXO 10 MHz reference clock, which can be set for either internal or external use.

The main board supplies high-speed DMA, plus additional memory and programmable FPGA resources.

Features

Mezzanine board – pairs with an EDT main board (in a PCI, PCI-X, or PCIe slot), which adds high-speed DMA, programmable FPGA resources, and memory

Simultaneous L-band and IF analog-to-digital conversion (12-bit)

L-band: 900 to 2250 MHz (115 MHz bandwidth) with 500 kHz tuning resolution

IF: 160 or 140 MHz (70 MHz bandwidth), 70 MHz (40 MHz bandwidth), or any other frequency below 90 MHz with a direct sampling path

Time code: 1 pps, IRIG-B, or other input, with user-configurable output

FPGA: One programmable Xilinx Virtex 4 SX XC4VSX55

Graychips: Four optional (TI GC4016) for 16-channel digital down-conversion

Sample clock: Programmable to any frequency from 10 to 250 MHz

Reference clock: Onboard 10 MHz TCXO or optional external reference input

Applications

Satellite receiver

Software-defined radio

Surveillance / spectrum monitoring

Digital tuning

Test and measurement equipment

Specifications

Product Type	SRXL2 is a signal receiver mezzanine board (v. 2) for L-band and IF; it requires a main board.				
FPGAs and Memory	One programmable FPGA (Xilinx Virtex 4 SX XC4V5X55), plus FPGA and memory resources on main board				
Graychips	4 or optional 0 (TI GC4016) for digital down-conversion				
Sample Clock and Converter (A/D)	Sample clock tuning range	10-250 MHz, programmed through FPGA and phase-locked to 10-MHz reference			
	Converter maximum sample rate	250 MHz			
	Converter resolution	12 bits			
Data Rates	Data rates are dependent on data format and main board.				
Data Format (I/O)	Time code (from external receiver):		1 pps, IRIG-B, or other input, with user-configurable output		
	RFs:	Reference - External (10 MHz)	L-band (900-2250 MHz, mixed down and filtered)	IF (160 or 140 MHz, mixed down and filtered)	IF (1-90 MHz, sampled directly)
	General				
	Nominal input impedance	50 Ω	75 Ω	75 or optional 50 Ω	75 or optional 50 Ω
	Minimum return loss	12 dB	TBD	TBD	TBD
	Variable gain control range	n/a	45 dB	45 dB	45 dB
	Signal level				
	Usable	-10 to 10 dBm	-65 to -20 dBm	-65 to -20 dBm	-65 to -20 dBm
	Maximum (absolute)	16 dBm	0 dBm	0 dBm	0 dBm
	Sampled data				
	Center frequency	n/a	187.5 MHz	55 MHz	Input frequency
	-3 dB bandwidth	n/a	116 MHz	70 MHz	40 MHz minimum
	Typical performance				
	SNR	n/a	70 dB	70 dB	70 dB
	SFDR	n/a	50 dB	45 dB	45 dB
Local Oscillators	L-band and IF:	L-band (oscillator 1)	L-band (oscillator 2)	IF (160 or 140 MHz)	IF (1-90 MHz)
	Tuning range	1700-2950 MHz	562.5 MHz (fixed)	215 or 195 MHz (fixed)	n/a
	Tuning step size	500 kHz	n/a	n/a	n/a
10 MHz Reference (Internal)	Nominal frequency tolerance	+/- 0.5 ppm at 25° C			
	Frequency over temperature	+/- 2.5 ppm at 0° to 75° C			
	Adjustment range	+/- 3 ppm			
Connectors		Reference - External	L-band	IF	Time code
	Connector type	SMB 50 Ω	F-type 75 Ω	SMB 50 or 75 Ω	7-pin Lemo
Cabling	Consult EDT for purchase options: To 7-pin Lemo on board, from time code source		Via one DB9 (for 1 pps or IRIG-B) or BNC (for IRIG-B only)		
Physical	Weight	4.9 oz. typical			
	Dimensions	6.6 x 4.2 x 0.5 in. (with a main board)			
Environmental	Temperature	Operating 0° to 40° C Non-operating -40° to 70° C			
	Humidity	Operating 1% to 90% (non-condensing at 40° C) Non-operating 95% (non-condensing at 45° C)			
System and Software	System requirements and EDT-provided software driver packages are discussed in the specifications for your EDT main board.				

Support

EDT offers engineer-to-engineer customer support, from phone consultation to custom design of hardware, firmware, and software. Contact us for options and details.

Contact

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Ordering Options

- Main board: PCI SS / PCI GS / PCIe8 LX
- Graychips: 0 / 4
- Connectors: 50 / 75 Ω (IF)
- Cabling (for time code input): DB9 / BNC

Bold is default.
For more options, see main board datasheet.