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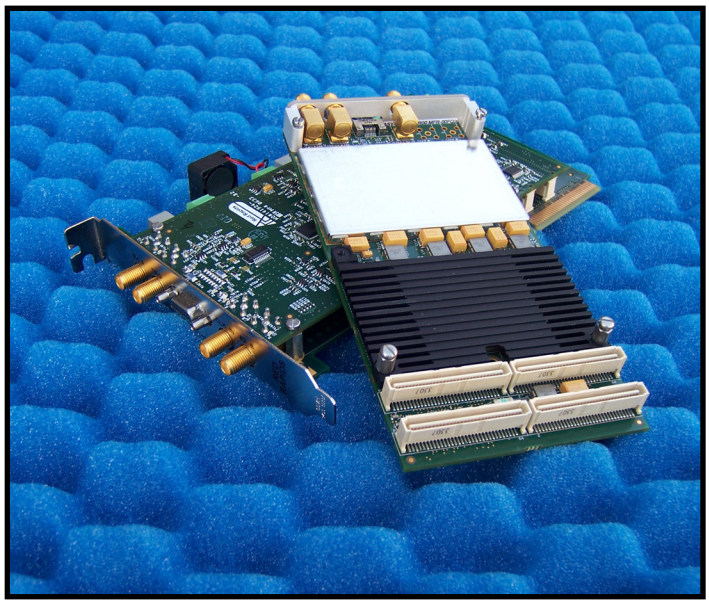
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Red Rapids

Softband Radio

Model 130/131



- **Available in PMC/PCI/cPCI form factors**
- **Multiple ADC/DAC configurations**
- **30 to 213 MHz sample clock frequency**
- **AC and DC coupled analog interfaces**
- **Continuous, snapshot, periodic modes**
- **Programmable FIR filter coefficients**
- **Optional SRAM snapshot buffers**
- **On-board fixed frequency synthesizer**
- **Time tagged signal acquisition data**
- **PCI-X (133 MHz) and legacy PCI support**
- **Bus master with scatter-gather DMA**
- **Windows, Linux, VxWorks drivers & API**

IF Digital Downconverter

The *Softband Radio* product family performs frequency conversion and filtering of digitized signal data. The hardware incorporates a rich set of software programmable features that include selectable operating modes (continuous, snapshot, or periodic), programmable filter coefficients, cascaded decimation stages, external or timed event triggers, and time tagged data samples.

The continuous mode of operation is used to stream data samples from the ADC to host memory, or from host memory to the DAC. In this case, the PCI bus must be able to sustain data transfers at the composite rate of all active channels.

Snapshot mode is a special case of the continuous operating mode. The key difference is that the signal acquisition or generation will automatically halt after a specified number of samples.

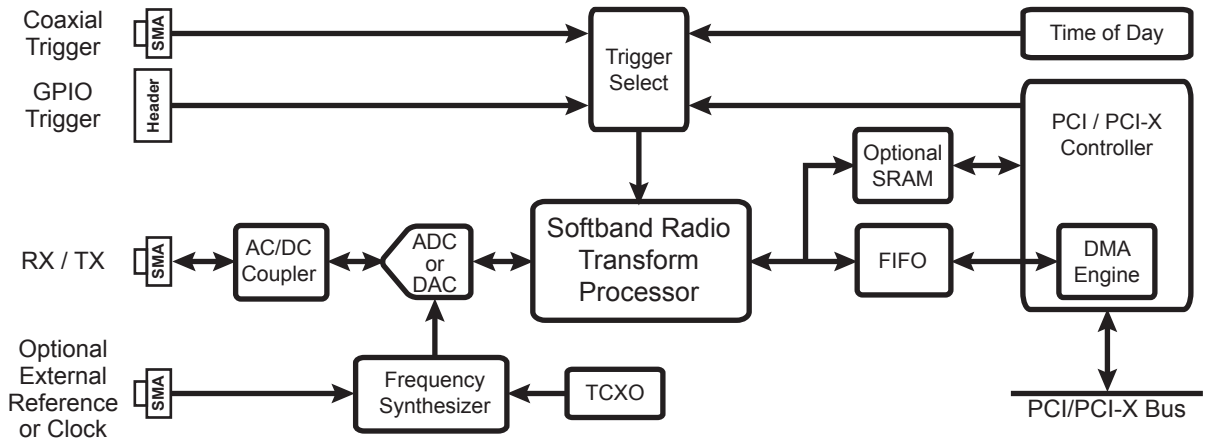
Periodic mode is a special case of the snapshot operating mode. The snapshot is simply repeated on a periodic interval defined by an external trigger or the on-board clock.

The *Softband Radio* datapath is configured as a down converter for ADC channels and an up converter for DAC channels. The frequency conversion and filter operations are performed in the transform processor.

The datapath includes a FIFO that can store 64 ksamples per channel. Capacity can be increased with optional SRAM to create snapshot buffers for additional high-speed data storage that is independent of PCI bus traffic.

The *Softband Radio* products are available in several different ADC/DAC configurations as listed on the back of this datasheet. Most offer the option for either AC or DC coupled analog interfaces.

The ADC/DAC sample clock is supplied by either an on-board frequency synthesizer or an external source. The frequency synthesizer can be phase locked to the local 10 MHz TCXO



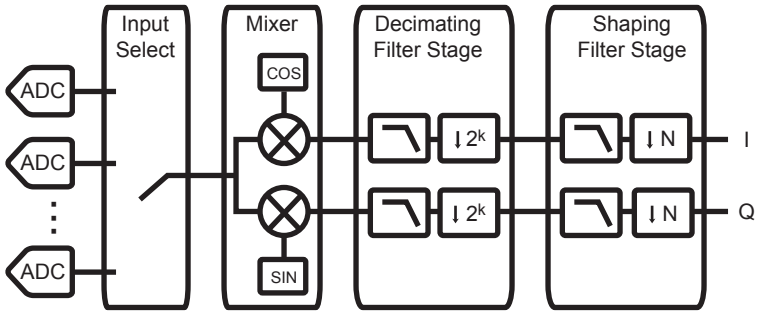
Softband Radio Down Converter (ADC) or Up Converter (DAC) Channel

or an external reference can be used to achieve system-wide phase coherence.

A coaxial trigger input is provided to synchronize data collection to an external timing strobe. This input can also be used to provide a 1 PPS signal to the on-board time of day clock. An additional header provides separate triggers for each channel. The trigger source used by the transform processor is software selectable.

The wideband digital down converter datapath consists of a quadrature mixer, decimating FIR filter, and a shaping FIR filter. The down converter can preserve the full input signal bandwidth through the entire channel, producing a complex output at half the input sample rate.

The down converter settings, including filter coefficients, are fully programmable and can be customized for a specific application. A set of configuration files are supplied with the product to produce a fixed set of output bandwidths



Softband Radio Down Converter Transform Datapath

The PCI controller implements either conventional PCI or high speed PCI-X protocol for host communication. A DMA engine manages data transfers between the PCI controller and host memory. The DMA engine allows the transceiver to automatically initiate a PCI burst transaction when data needs to be transferred. An interrupt is generated when the specified number of data blocks have been exchanged.

There are also more sophisticated DMA features built into the PCI controller. DMA chaining and scatter-gather techniques are supported by both the hardware and software to optimize data transfer efficiency.

Software templates are provided with the hardware to quickly establish a link with end-user application code. The API is supported with drivers for Windows™, Linux, or VxWorks operating systems.

Typical Applications

- **Multi-channel voice/data communications**
- **Multi-channel radar receiver**
- **Signal collection and geolocation**
- **Software defined radio**
- **Beamforming**
- **Signal recorder and playback**

Model 130 (RX2 12/213)

Dual 12-bit (213 MHz) ADC
Dual Wideband Downconverter

Model 131 (RX2 16/130)

Dual 16-bit (130 MHz) ADC
Dual Wideband Downconverter

Hardware

Form factor: PMC, PCI, or cPCI
PCI/PCI-X bus: 3.3 V (133 MHz max)
Optional external reference or sample clock
Global trigger input (50 ohms)
Individual trigger inputs: LVTTL

Software

Fedora Linux kernel 2.4 or 2.6
Windows 2000, XP, or Server
VxWorks 6.5 (CHAMP IV default target)

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