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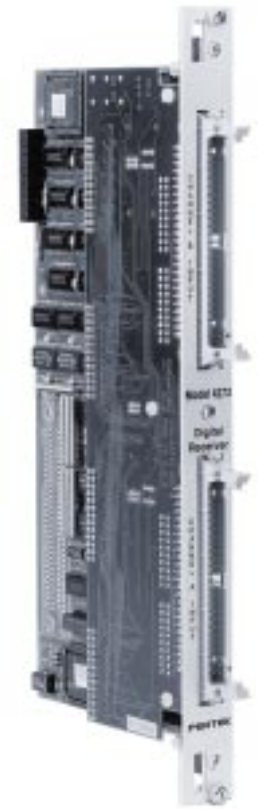
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Find the *Pentek 4283* at our website: ***Click HERE***

Model 4272

Multiband Digital Receiver MIX Module



Features

- Sampling rates to 70 MHz
- One wideband and two narrowband receivers
- 70 dB dynamic range
- 0.008 Hz tuning resolution
- Compatible A/D's available, Series 64xx

Ordering Information

Model	Description
4272	Multiband Digital Receiver MIX module

Options:

-012	12-bit ECL diff. inputs (full-depth module, see p. 118)
-019	16-bit TTL inputs
-020	8 ksample FIFO
-022	16 ksample FIFO

General Information

Model 4272 is a general purpose multiband digital receiver MIX module which accepts digitized data at sampling rates up to 70 MHz. It contains one wideband and two narrowband receivers, which perform frequency down conversion, lowpass filtering, and decimation of the sampled output. The receiver output signals can be delivered through the MIX bus to one of Pentek's VMEbus MIX baseboards, thereby providing DSP functions and/or DMA transfers to the VMEbus. A front panel digital output of the wideband receiver allows data to be sent to a DSP subsystem over a dedicated parallel cable.

Operating Principle

The module uses highly integrated digital receiver chips containing a tunable local oscillator, a mixer and a tunable low pass output filter. The local oscillator frequency and the output filter cutoff frequency in each section is independently programmable over the MIX interface providing extremely flexible and agile operation.

Flexible Input Connections

All input data is accepted on front panel parallel digital connectors with TTL or ECL level compliance. An input multiplexer at the narrowband receivers allows data to be taken either from independent input connectors, or from the wideband receiver input connector, so that all receivers process the same input signal.

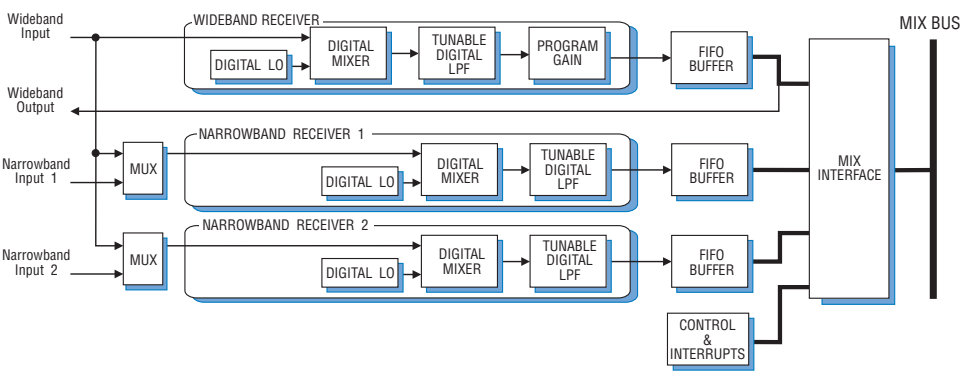
Operating modes and receiver frequencies are programmable over the MIX bus.

Specifications

Narrowband Receivers (2)
Receiver type: Harris HSP50016
Digital input format: 16-bit words, 2's complement; one sample clock line
Input level: TTL single-ended; optionally ECL differential
Sampling rate: DC to 70 MHz max.
Local oscillator: direct digital synthesizer; single frequency CW and sweep (chirp) up/down modes; CW frequency is equal to $F*f_s/2^{33}$, where F is a 32-bit binary integer and f_s is the input sample rate
Tuning range: DC to $f_s/2$ (35 MHz for f_s = 70 MHz)
Tuning resolution: $f_s/2^{33}$ (~0.008 Hz for f_s = 70 MHz)
Low pass filter: decimating 121-tap FIR, programmed by 15-bit integer R, from 16 to 32,768; nominal output Nyquist bandwidth $f_N = f_s/4R$; output sampling rate is $f_s/4R$ for complex outputs and $f_s/2R$ for real outputs
Filter response: ±0.04 dB passband ripple; –3 dB bandwidth = $0.56f_N$; –100 dB stop bandwidth = $0.8f_N$
Real mode: 16-bit real output samples at sampling rate $f_s/2R$
Complex mode: 16-bit complex (interleaved I and Q) output samples at sampling rate $f_s/4R$ per complex pair
FIFO buffer: 1k x 16 per channel, MIX interrupts for full, half-full and empty

[Continued on next page]

Block Diagram, Model 4272



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4-Channel Wideband Digital Receiver VME Board

Specifications, continued

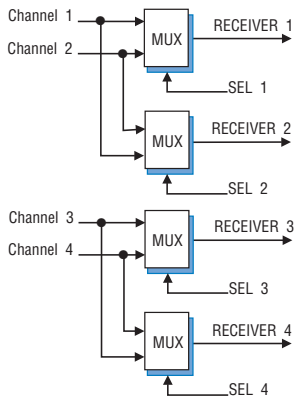
Wideband Receiver (1)
Receiver type: Graychip GC1012
Digital input format: 12-bit words, 2's complement; one sample clock line
Input level: same as narrowband receivers
Sampling rate: DC to 50 MHz max
Local oscillator: direct digital synthesizer; frequency = F*$f_s/2^{28}$, where F is a 28-bit binary integer and f_s is the input sample rate
Tuning range: DC to $f_s/2$ (25 MHz for f_s = 50 MHz)
Tuning resolution: $f_s/2^{28}$ (~0.2 Hz for f_s = 50 MHz)
Low pass filter: decimating FIR with a decimation range M of 4, 8, 16, 32 or 64; nominal output Nyquist bandwidth $f_N = f_s/M$; output sampling rate is f_s/M for complex outputs and $2f_s/M$ for real outputs
Filter response: in band ripple = $\pm$0.1 dB; -2 dB bandwidth = $0.8f_N$; out of band rejection >75 dB
Real mode: 16-bit real output samples at sampling rate $2f_s/M$
Complex mode: 16-bit complex (interleaved I and Q) output samples at sampling rate f_s/M per complex pair
Output signal: gain may be adjusted from 0.0 dB to 90.0 dB with 0.03 dB resolution
FIFO: 16k x 16 bits, 25 MHz max. input rate; consecutive real samples in real mode, interleaved I and Q in complex mode; interrupts at full, half-empty and empty; 16-bit parallel word output to the MIX bus
Power: 3.0 A at +5 V from the MIX bus

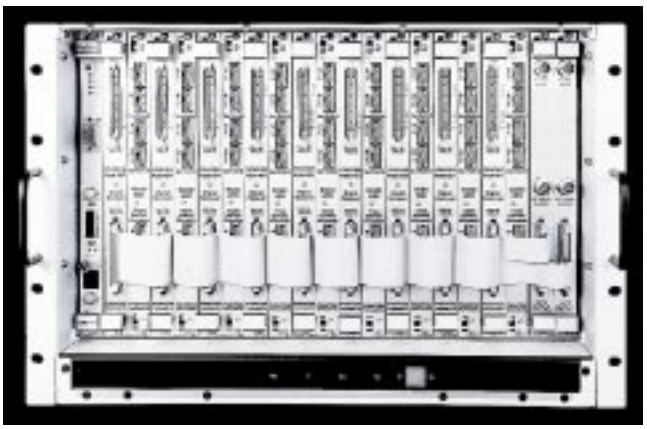
Notes on Models 4271 and 4272 Digital Receivers

1. When either model is equipped with Option -012, ECL differential inputs, additional circuitry and power are needed. These requirements were met by utilizing a full-depth MIX module in the design of this option. A full-depth MIX module extends all the way to the VMEbus backplane and engages the P1 and P2 connectors to provide additional power.

As a result, unlike the TTL versions, these modules will not "nest" as the first MIX module in the same slot with the Model 420x MIX Baseboards. However, since most MIX subsystems have at least one standard MIX module which can be used in the nested position, the ECL receiver can occupy the second or third MIX position. Such a system has the same number of slots as the TTL receiver system.

2. With option -012, the input MUX of Model 4271 is arranged as shown below:





Multichannel Digital Receiver System, as put together by a Pentek customer.

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