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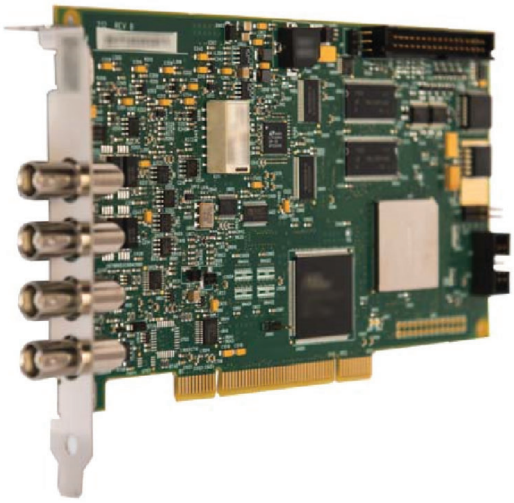
A/D Board

AL12250

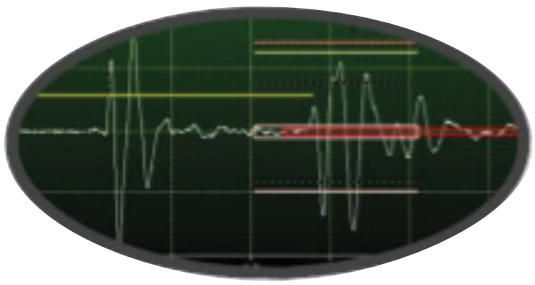
- PCI Express Bus Interface
- 8 bit Resolution · 125 mV to 2V input range ·
- Oscilloscope Software
- Configurable as 1 Channel @1 .5 GHz
- Software Development Kit C/C++, C# and VB



About AL12250

Bandwidth: DC to 100 MHz -3dB
Input Coupling: AC or DC, software selectable

- Single analog channel, two inputs switched by multiplexer (5 micro second switching time)
- AC/DC coupling, software selectable
- 50 Ohm input impedance/high input impedance software selectable
- Input ranges: 50 mVp-p - 5Vp-p
- Fine offset control
- Time profile for gain control, 20 ns resolution, 10 bit gain control DAC



The AL12250 is a single channel, non simultaneous dual input A/D board for the PCI bus. It is optimized for high-speed transient capture at sampling rates up to 250Msample/sec at very high repetition rates.

A large dual-ported onboard buffer memory allows simultaneous transient recording and readout of captured data. A post-processing section can be used to extract peak information on multiple gates while the captured data is transferred over the PCI bus into the PC's main memory.

The analog inputs can be AC- or DC-coupled under software control. High input impedance (50 kOhms) or 50 Ohms termination are also software-selectable for high signal fidelity over the entire analog bandwidth of typically 100 MHz. Input voltage range can be set from 50 mV to 5V peak to peak.

An A/D converter with 8 bits resolution samples the input signal at 250 Msample/sec. The sampled data is stored in an onboard memory buffer of 128 Msamples. The size of this buffer memory determines the maximum length of an acquisition.

The board will be ready to accept a trigger about 2 microseconds after the end of the previous acquisition, which allows for repetition rates well beyond 100 KHz for short acquisitions.

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The sampling clock is generated on the board or can be accepted from an external source in the form of a frequency reference of 5.0 or 10.0 MHz or as a direct sampling clock. Decimating the sampled data while reading it from the buffer memory creates lower sampling rates. Reading data from the buffer memory occurs simultaneously with acquisition and does not affect repetition rate.

The sampled data is transferred over the PCI bus using DMA, thus requiring no CPU intervention to achieve high transfer rates. During this data transfer, a set of peak detectors can be used to monitor the sample stream and extract peak position and threshold crossing data over selected regions (gates) of the sampled data.

A large selection of flexible triggering modes allows the user to tailor the behavior of the board to many applications. In addition to the standard software-generated trigger, the board can be triggered by a threshold crossing of the analog input signal on any channel or a signal fed to the BNC Trigger connector, a digital TTL signal on the internal trigger connector or a position-derived trigger from an encoder or motor of a scanning system.

The BNC Trigger connector can also drive a trigger signal as an output; for instance, to fire an ultrasonic pulser/receiver. This driver supports special modes that can be used to trigger multiple boards simultaneously from any of the connected boards, simply by tying the BNC Trigger connectors together.

A simple oscilloscope program is included with the board. It allows evaluation of the various configurations and triggering modes of this board. Drivers and a DLL are provided to access functionality of the board from a user application.

The internal sampling clock is generated by a PLL, multiplying a 5 MHz reference up to 400 MHz. From an external source the sampling clock can either be fed in directly from an external 400 MHz source or multiplied up by the PLL from an external 10 or 5 MHz reference input. In either case the sampling will be coherent with the external input clock. Many other reference input frequencies are possible – any multiple of 500 KHz from 5 to 50 MHz.

A/D Converter

- 250 MSamples/sec sampling rate
- 12 bits resolution, single channel

Clock

- Sampling rates: 250 MHz, 125 MHz, 62.5 MHz

Trigger Sources

- Software trigger
- Encoder trigger
- Internal trigger connector, TTL
- External trigger input, programmable threshold (BNC)
- Signal threshold trigger, programmable threshold

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Trigger Sources

- Software trigger
- Internal trigger connector, TTL, programmable polarity (3 pin header)
- External trigger input (BNC trigger connector), programmable threshold -5.0V .. +5.0V and polarity, 50 Ohm / 1 kOhm input impedance software selectable
- Signal threshold trigger, programmable threshold and polarity
- Encoder position trigger, for scanning applications

Trigger Output

TTL output, 2V into 50 or 25 Ohms

programmable polarity

pulse indicates beginning and end of acquisition

Acquisition Control

Pre-trigger and Post-trigger delay acquisition

26 bit pre/post-trigger and length counters

Auto re-arming

Interrupt after programmable number of acquisitions

Memory

MSamples on-board acquisition memory, dual-ported

Fast offload while acquiring

Optimized for maximum repetition rate in both pre- and post-trigger modes

DSP Functions

Multiple acquisitions per trigger

On-board peak detection with up to 100 gates

Customized processing functions available through firmware upload

Bus Interface

PCI interface, 32 bits, 33 MHz

PCI master mode operation

PCI burst transfer rates up to 133 MBytes/sec

DMA transfers with scatter/gather support

Interrupt on completion of DMA transfers

Connectors

2-BNC connectors for analog signal input

BNC connector for clock/reference input/output

PCI master mode operation

DMA transfers with scatter/gather support

BNC female connectors

Physical Dimensions

Full height, half length PCI board (176mm x 100mm)

