

PCIe-9814/9834

4-CH 12/16-Bit 80 MS/s PCI Express Digitizer

Features

- Up to 80 MS/s sampling
- 4 simultaneous analog inputs
- High resolution 12-bit ADC (PCIe-9814)/ 16-bit ADC (PCIe-9834)
- Up to 40 MHz bandwidth for analog input
- 1 GB onboard storage memory
- Programmable input voltage range of $\pm 0.5V$, $\pm 1V$, $\pm 5V$, or $\pm 10V$
- Scatter-Gather DMA data transfer for high speed data streaming
- Provide 10 or 20 MHz digital onboard filter (FPGA)
- Provide PLL module for precise synchronization (PCIe-9814P/PCIe-9834P only)
- Support for:
 - One external digital trigger input
 - One external clock input
 - Three SDI inputs (PCIe-9814/9814P only)
- Full auto-calibration



Introduction

The ADLINK PCIe-9814/9834 are PCI Express digitizer providing speedy, high quality data acquisition. Each of the four input channels supports up to 80MS/s sampling, with 12/16-bit resolution A/D converter. This allows simultaneous recording of signals on all channels with no interchannel phase delay. The extremely large on-board memory enables long recording times even at the highest sampling rates.

Unlike parallel PCI buses, PCI Express slots utilize serial point-to-point connection. Each connection pair (lane) can achieve burst connection speeds of 250MB/s. The PCIe-9814/9834, based on x4 lane slot PCI Express technology, provides a clear advantage in that direct connection of each slot allows full transfer bandwidth for each individual card. The ADLINK PCIe-9814/9834 PCI Express Gen1 x4 digitizers can be used in any standard PCI Express

Supported Operating System

- Windows XP/7/8/10, x64/x86, Linux

Driver and SDK

- LabVIEW, MATLAB, Visual Studio, Visual Studio.NET

Ordering Information

- **PCIe-9814**
4-CH 12-Bit 80 MS/s PCI Express Digitizer
- **PCIe-9814P**
4-CH 12-Bit 80 MS/s PCI Express Digitizer with PLL module
- **PCIe-9834**
4-CH 16-Bit 80 MS/s PCI Express Digitizer
- **PCIe-9834P**
4-CH 16-Bit 80 MS/s PCI Express Digitizer with PLL module

Specifications

Analog Input

- Number of channels: 4 single-ended
- Input impedance: 50 Ω or 1M Ω , software selectable
- Input coupling: DC
- Input signal range: $\pm 0.5V$, $\pm 1V$, $\pm 5V$, or $\pm 10V$ ($\pm 10V$ only support input impedance 1M Ω)
- Overvoltage protection: $\pm 30V@ 1M\Omega$, $\pm 10V$ and $\pm 5V$; $\pm 10V@ 1M\Omega$, $\pm 1V$ and $\pm 0.5V$; $\pm 10V$ sine wave/7 Vrms@ 50 Ω , $\pm 5V$, $\pm 1V$ and $\pm 0.5V$
- ADC resolution: 12 bits (PCIe-9814)/ 16 bits (PCIe-9834)
- Bandwidth: 40MHz
- Offset Error:

| Range | PCIe-9814 | PCIe-9834 |
|------------|--------------|--------------|
| $\pm 0.5V$ | ± 0.5 mV | ± 0.1 mV |
| $\pm 1V$ | ± 0.5 mV | ± 0.2 mV |
| $\pm 5V$ | ± 4 mV | ± 0.5 mV |
| $\pm 10V$ | ± 10 mV | ± 0.5 mV |

- Gain Error:

| Input Impedance | Range | PCIe-9814 | PCIe-9834 |
|-----------------|---|--------------------------|------------------------------|
| 50 Ω | $\pm 0.5V$, $\pm 1V$, $\pm 5V$ | $\pm 1\%$ | $\pm 0.15\%$ |
| 1M Ω | $\pm 0.5V$, $\pm 1V$, $\pm 5V$ $\pm 10V$ | $\pm 0.5\%$ $\pm 1\%$ | $\pm 0.15\%$ $\pm 0.15\%$ |

- Crosstalk: from DC to 10 MHz

| Range | PCIe-9814 | PCIe-9834 |
|---------------------------------|-----------|-----------|
| $\pm 0.5V$ | -80 dB | -80 dB |
| $\pm 1V$, $\pm 5V$, $\pm 10V$ | -90 dB | -90 dB |

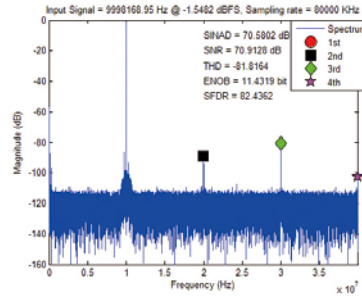
- System Noise:

| Range | PCIe-9814 (mVrms) | PCIe-9834 (mVrms) |
|------------|-------------------|-------------------|
| $\pm 0.5V$ | 0.15 | 0.1 |
| $\pm 1V$ | 0.3 | 0.15 |
| $\pm 5V$ | 1.5 | 1 |
| $\pm 10V$ | 2.5 | 1.5 |

Spectral Characteristics:

Sampling rate: 80MS/s, 10MHz -1dBFS input signal

| Range | PCIe-9814 | PCIe-9834 |
|-------|-----------|-----------|
| SNR | 64 dB | 67 dB |
| THD | -73 dB | -78 dB |
| SFDR | -74 dB | 78 dB |



Trigger

Trigger Sources

- Software
- External digital trigger
- Analog trigger from CH0 ~ CH3
- SSI

Trigger Modes

- Post-trigger
- Pre-trigger
- Middle trigger
- Delay trigger

External Digital Trigger Input

- Source: Front panel SMB connector
- Compatibility: 3.3V TTL, 5V tolerance
- Input high threshold: 2.0V
- Input low threshold: 0.8V
- Maximum input overload: -0.5 V to +5.5 V
- Trigger polarity: rising or falling edge
- Pulse width: 20 ns minimum

Timebase

- Sample clock source
 - Internal: onboard clock (oscillator)
 - External: CLK IN (front panel)
- Sample clock frequency
 - Internal: 1.22K Hz ~ 80M Hz
 - External: 20M Hz ~ 80M Hz (CLK IN)
 - Internal timebase accuracy: < ±25 ppm
- External sample clock input range : 1Vpp ~ 5Vpp
- External reference clock source
 - SDIO (Front panel, only PCIe-9814P)
 - REF_CLK (Front panel, only PCIe-9834P)
- External reference clock frequency: 10M Hz
- External reference clock input range : 3.3V ~ 5V TTL

Data Storage and Transfer

- 1 GB onboard memory, shared among four analog inputs
- Scatter-Gather DMA data transfer Onboard Reference

Onboard Reference

- +1.8V, +0.9V and +0.45V onboard reference voltage
- < 3 ppm/°C reference temperature drift
- 15 minutes recommended warm-up

General Specifications

- PCIe-9814 I/O Connector:
 - SMB x 4 for analog inputs
 - SMB x 1 for external trigger input
 - SMB x 1 for external sample clock input
 - SMB x 3 for synchronous digital input (SDIO can be shared with Ref clock input, only PCIe-9814P)
- PCIe-9834 I/O Connector:
 - SMB x 4 for analog inputs
 - SMB x 1 for external trigger input
 - SMB x 1 for external sample clock input
 - SMB x 1 for External reference clock source input (only PCIe-9834P)
- Dimensions (not including connectors):
 - 167.64 (W) x 106.68 (H) mm (6.53" x 4.16")
- Bus Interface:PCI Express gen 1 x4
- Ambient Temperature (Operational):0°C to 50°C (32°F to 122°F)
- Ambient Temperature (Storage):-20°C to 80°C (-4°F to 176°F)
- Relative Humidity:10% to 90%, non-condensing Certifications
- Power Consumption:

| | PCIe-9814 | | PCIe-9814P | |
|----------------|--------------|----------------|--------------|----------------|
| Power Rail | Standby (mA) | Full load (mA) | Standby (mA) | Full load (mA) |
| +3.3V | 20 | 20 | 20 | 20 |
| +12V | 425 | 505 | 655 | 715 |
| Total Power(W) | 5.116 | 6.126 | 7.926 | 8.646 |

| | PCIe-9834 | | PCIe-9834P | |
|----------------|--------------|----------------|--------------|----------------|
| Power Rail | Standby (mA) | Full load (mA) | Standby (mA) | Full load (mA) |
| +3.3V | 18 | 18 | 18.7 | 21.4 |
| +12V | 450 | 470 | 675 | 697 |
| Total Power(W) | 5.459 | 5.699 | 8.162 | 8.435 |

Certifications

- EMC/EMI: CE, FCC Class A

SSI Bus Cables (for multiple card synchronization)

- ACL-eSSI-2/3/4
SSI bus cable for two, three, and four devices

