

PCIe-9814

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

NEW



Introduction

The ADLINK PCIe-9814 is a PCI Express digitizer providing speedy, high quality data acquisition. Each of the four input channels supports up to 80MS/s sampling, with 12-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, 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 x4 digitizer can be used in any standard PCI Express slot, x4, x8, or x16.

Features

- Up to 80 MS/s sampling
- 4 simultaneous analog inputs
- High resolution 12-bit ADC
- 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 only)
- Support for:
 - One external digital trigger input
 - One external clock input
 - Three SDI inputs
- Full auto-calibration
- Supported Operating Systems
 - Windows 7/8 x64/x86, Linux
- Driver and SDK
 - LabVIEW, MATLAB, C/C++, Visual Basic, Visual Studio.NET

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 $\pm 10V$
- 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 , all ranges

- ADC resolution: 12 bits
- Bandwidth: 40MHz
- Offset Error:

Range	Offset Error
$\pm 0.5V$, $\pm 1V$	± 0.5 mV
$\pm 5V$	± 4 mV
$\pm 10V$	± 10 mV

- Gain Error:

Input Impedance	Range	Gain Error
50 Ω	All Range	$\pm 1\%$
1M Ω	$\pm 0.5V$, $\pm 1V$, $\pm 5V$	$\pm 0.5\%$
	$\pm 10V$	$\pm 1\%$

- Crosstalk: from DC to 10 MHz

Range	Crosstalk
$\pm 0.5V$	-80 dB
$\pm 1V$, $\pm 5V$, $\pm 10V$	-90 dB

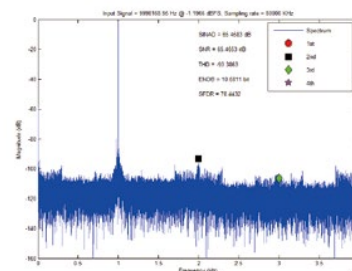
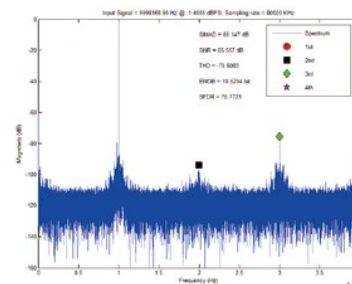
- System Noise:

Range	System Noise (RMS)
$\pm 0.5V$	150 μV
$\pm 1V$	300 μV
$\pm 5V$	1.5 mV
$\pm 10V$	2.5 mV

- Spectral Characteristics:

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

Input Range	SNR	THD	SFDR
50 Ω with digital filter OFF			
$\pm 0.5V$, $\pm 1V$, $\pm 5V$	64 dB	-74 dB	76 dB
50 Ω with digital filter ON			
$\pm 0.5V$, $\pm 1V$, $\pm 5V$	65 dB	-93 dB	78 dB
1M Ω with digital filter OFF			
$\pm 0.5V$, $\pm 1V$	64 dB	-71 dB	72 dB
$\pm 5V$	64 dB	-73 dB	74 dB
$\pm 10V$	64 dB	-75 dB	76 dB
1M Ω with digital filter On			
All Range	65 dB	-93 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)
- 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

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

General Specifications

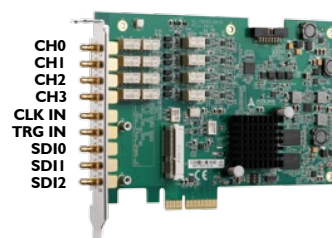
- I/O Connector:
 - SMB x 4 for analog inputs
 - SMB x 1 for external trigger input
 - SMB x 1 for external sample clock input
 - SMB x 3 for synchronous digital input
(SDIO can be shared with Ref clock input, only PCIe-9814P)
- Dimensions (not including connectors):
 - 167.64 (W) x 106.68 (H) mm (6.53" 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

Certifications

- EMC/EMI: CE, FCC Class A

IO connector definition



SSI Bus Cables (for multiple card synchronization)

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

