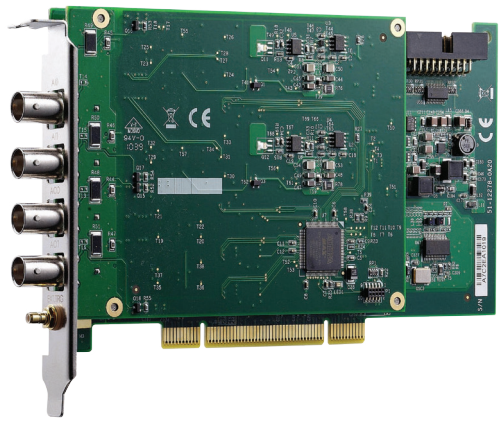
PCI-9527L

24-bit High-Resolution Dynamic Signal Acquisition and Generation Modules

Features

- 24-bit Sigma-Delta ADC and DAC
- 2-ch simultaneous sampling analog input
- 2-ch simultaneous updated analog output
- 216 kS/s maximum sampling rate with software programmable rate
- Programmable input range: ±40 V, ±10 V, ±3.16 V, ±1 V, ±0.316 V
- Programmable output range: ±10 V, ±1 V, ±0.1 V
- AC or DC input coupling, software selectable
- Trigger I/O connector for external digital trigger signal
- Supports IEPE output on each analog input, software-configurable



Introduction

The PCI-9527L is a high-performance, 2-ch analog input and 2-ch analog output dynamic signal acquisition module. This module is specifically designed for audio testing, acoustic measurement, and vibration analysis applications.

The ADLINK PCI-9527L features two 24-bit simultaneous sampling analog input channels. The 24-bit sigma-delta ADC provides a sampling rate up to 216 kS/s at high resolutions, making it ideal for higher bandwidth dynamic signal measurements. The sampling rate can be adjusted by setting the module DDS clock source to an appropriate frequency. All channels are sampled simultaneously and accept an input range from ±40 V to ±0.316 V. The PCI-9527L analog input supports software selectable AC or DC coupling and 4 mA bias current for integrated electronic piezoelectric (IEPE) sensors.

The ADLINK PCI-9527L also has two channels of 24-bit resolution, high fidelity analog output. The outputs occur simultaneously at software programmable rates up to 216 kS/s. A software programmable output range of ±0.1 V, ±1 V, and ±10 V is available on the output channels.

Supported Operating System

- Windows 7/10, Linux

Driver and SDK

- LabVIEW, C/C++, Visual Studio.NET

Specifications

Analog Input

- Number of simultaneously sampled channels: 2
- Input configuration: Differential or pseudo-differential, each channel independently software-selectable
- Input impedance:

Input Impedance	Differential Configuration	Pseudodifferential Configuration
Between positive input and system ground	1 MΩ	1 MΩ
Between negative input and system ground	1 MΩ	50 Ω

Specifications

- Input coupling: AC or DC, software-selectable on each channel
- ADC resolution: 24-bit
- ADC type: Sigma-Delta
- Sampling rate: Up to 216 kS/s maximum, 2 kS/s to 216 kS/s in 454.7 µS/s increments
- Input signal range: ±0.316 V, ±1.00 V, ±3.16 V, ±10.0 V, ±40.0 V
- Integrated Electronic Piezoelectric (IEPE)
  - Current: 4 mA each channel independently software-selectable
  - IEPE compliance: 24 V
- Data transfer: DMA
- FIFO buffer size: 4096 samples shared for AI channels
- Input Common Mode Range: ±10 V for both differential and pseudo-differential configuration
- Overvoltage protection
  - Differential input: ± 40 Vpk
  - Pseudo-differential:
  – Positive terminal: ± 40 Vpk
  – Negative terminal: ± 10 Vpk
- AC couple bandwidth
  - -3dB cutoff frequency: 4 Hz
  - -0.1dB cutoff frequency: 24 Hz

AI Offset Error	Input Range	Offset
	±40 V	±0.3 mV
	±10 V	±0.2 mV
	±3.16 V	±0.1 mV
	±1 V	±0.04 mV
	±0.316 V	±0.04mv

AI Gain Error	Input Range	
	±40V	±0.3%
	±10 V, ±3.16 V, ±1 V, ±0.316 V	±0.2%

Crosstalk	
	Crosstalk
Adjacent channel	<-110 dB

Measured with +/-10V
Input 1 kHz input tone and -1 dBFS input amplitude

Index	Fs =54 kS/s	Fs =108 kS/s	Fs =216 kS/s
SNR	103 dB	99 dB	93 dB
THD	-114 dB	-112 dB	-106 dB
THD+N	-103 dB	-99 dB	-93 dB

Measure with ±10V input range
20 Hz~20 kHz input tone and -1 dBFS input amplitude

Index	Fs =54 kS/s	Fs =108 kS/s	Fs =216 kS/s
Dynamic Range	105 dB	101 dB	101 dB
SFDR	116 dB	113 dB	108 dB

Measure with ±10V input range
20 Hz~20 kHz input tone and -60 dBFS input amplitude

Analog Output

- Number of output channels: 2
- Output configuration:
  Differential or pseudo-differential, each channel independently software-selectable
- DAC resolution: 24-bit
- DAC type: Sigma-Delta
- Update rate:
  1 kS/s to 216 kS/s in 227.3 µS/s increments
- FIFO buffer size: 2048 samples for each analog output channel
- Output signal range: ±0.1 V, ±1 V, ±10 V
- Voltage output coupling: DC
- Minimum working load: 600 Ω
- AO Offset error and gain error:

Output Range	AO Offset Error	AO Gain Error
±0.1 V	±0.05 mV	±0.4%
±1 V	±0.25 mV	±0.4%
±10 V	±1 mV	±0.4%

- Output impedance:

Output Range	Differential Configuration	Pseudodifferential Configuration
Between positive and negative outputs	66 Ω	66 Ω

- Analog output, -3dB bandwidth: 110 kHz
- AO THD+N

Output Range	20 Hz to 20 kHz, 102.4 kS/s
±0.1 V	-85 dB
±1 V	-100 dB
±10 V	-101 dB

Triggers

- Trigger sources:
  - Software trigger
  - Analog trigger
  - External digital trigger
- Trigger mode:
  - Post-trigger
  - Delay-trigger
  - Re-trigger

PCI-9527L

Specifications

- Analog trigger
  - Source: AI0, AI1
  - Trigger level: full scale input range
  - Trigger conditions: positive or negative trigger, software selectable
  - Trigger resolution: 24-bit
- External digital trigger
  - Source: front panel SMB connector
  - Compatibility: 5 V TTL
  - Trigger polarity: rising or falling edge
  - Pulse width: 25 ns minimum

Timebase source

- Internal (on board): 125 MHz

General Specifications

- I/O connector
  - BNC x 4 for analog inputs/outputs
  - SMB x 1 for external trigger
- PCI Bus Signaling: Universal PCI, support 3.3 V and 5 V PCI signals
- Dimensions (not including connectors)
  - PCI-9527L: 175 mm (W) x 107 mm (H) (6.82" x 4.17")
- Ambient temperature (Operational):
  - 0˚C to 50˚C (32˚F to 122˚F) (PCI version)
- Ambient temperature (Storage):
  - -20˚C to 80˚C (-4˚F to 176˚F)
- Relative humidity:
  - 10% to 90% non-condensing

Calibration

- Onboard reference: +5 V
- Temperature coefficient: ≦ ±5 ppm/°C
- Recommend Warm-up time: 15 minute
- Power Requirement

Power Rail	Standby Current (mA)	Full Load (mA)
+5 V	930	2330
+12 V	310	350

Certifications

- EMC/EMI: CE, FCC Class AV

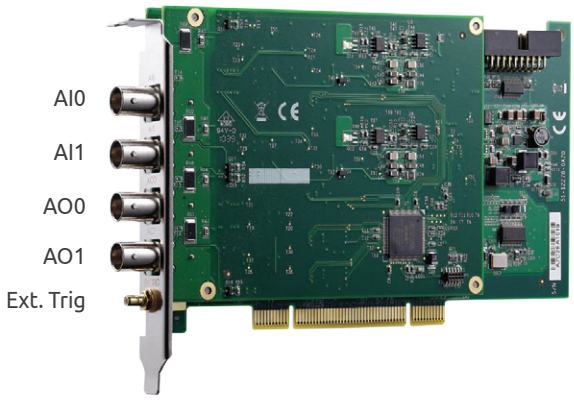
Cable Accessories

Cable	Description
SMB-SMB-1M	1 meter SMB to SMB cable
SMB-BNC-1M	1 meter SMB to BNC cable

Ordering Information

- **PCI-9527L**
  2-ch 24-bit 216 kS/s High-Resolution Dynamic Signal Acquisition and Generation module for PCI bus

IO connector definition



PCI-9527L

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