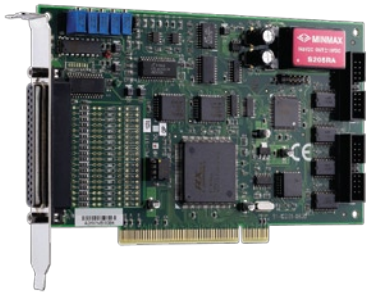
# PCI-9111 Series

## 16-CH 12/16-Bit 100 kS/s Low-Cost Multi-Function DAQ Cards



## Introduction

ADLINK's PCI-9111 series are 16-CH, 100 kS/s low-cost multi-function DAQ cards that feature flexible analog input configurations. An RC filter is implemented on each A/D input channel to allow attenuation or filtering of the input signals. The PCI-9111 series provide analog inputs with 5 programmable input ranges for bipolar inputs. The PCI-9111 series also support automatic analog input scanning. The PCI-9111DG provides 12-bit A/D resolution while the PCI-9111HR provides 16-bit A/D resolution.

The PCI-9111 series also feature 1-CH 12-bit analog output, 16-CH TTL digital inputs and 16-CH TTL digital outputs. ADLINK's PCI-9111 series delivers cost-effective and reliable data acquisition capabilities, and is ideal for a broad variety of applications.

## Features

- **Supports a 32-bit 5 V PCI bus**
- **12-bit A/D resolution (PCI-9111DG)**
- **16-bit A/D resolution (PCI-9111HR)**
- **16-CH single-ended analog inputs**
- **Up to 100 kS/s sampling rate**
- **Onboard 1 k-sample A/D FIFO**
- **Programmable gains of x1, x2, x4, x8, x16**
- **Bipolar analog input ranges**
- **Onboard low-pass filtering capability for analog inputs**
- **Automatic analog inputs scanning**
- **One 12-bit multiplying analog outputs**
- **16-CH TTL digital inputs and 16-CH TTL digital outputs**
- **4-CH TTL extended digital inputs and 4-CH TTL extended digital outputs**
- **Compact, half-size PCB**

Operating Systems
- Windows 7/Vista/XP/2000/2003 Server
- Linux

Recommended Software
- AD-Logger
- VB.NET/VC.NET/VB/VC++/BCB/Delphi
- DAQBench

Driver Support
- DAQPilot for LabVIEW™
- DAQ-MTLB for MATLAB®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

## Specifications

### Analog Input

- Number of channels: 16 single-ended
- Resolution
  - 12 bits (PCI-9111DG)
  - 16 bits (PCI-9111HR)
- Conversion time: 8 μs
- Maximum sampling rate: 100 kS/s
- Input signal ranges (software programmable)

| Gain | Input Range |
|---|---|
| | Bipolar |
| 1 | ±10 V |
| 2 | ±5 V |
| 4 | ±2.5 V |
| 8 | ±1.25 V |
| 16 | ±0.625 V |

- Accuracy

| Gain | Accuracy |
|---|---|
| 1, 2 | 0.01% of FSR ± 1 LSB |
| 4, 8 | 0.02% of FSR ± 1 LSB |
| 16 | 0.04% of FSR ± 1 LSB |

- Input coupling: DC
- Overvoltage protection: continuous ±35 V
- Input impedance: 10 MΩ
- Trigger modes: software, pacer, and external trigger (5 V/TTL compatible)
- FIFO buffer size: 1 k samples
- Data transfers: polling, interrupt

### Analog Output

- Number of channels: 1 voltage output (NO s)
- Resolution: 12 bits
- Output ranges (jumper selectable)

| Output Range | |
|---|---|
| Bipolar | ±10 V |
| Unipolar | 0 to 10 V |

- Output driving capacity: ±5 mA max
- Settling time: 30 μs
- Data transfers: programmed I/O

### Digital I/O

- Number of channels: 16 inputs and 16 outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

### General Specifications

- I/O connector
  - 37-pin D-sub female
  - 20-pin ribbon male x 2
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

| Device | +5 V |
|---|---|
| PCI-9111DG | 570 mA typical |
| PCI-9111HR | 570 mA typical |

- Dimensions (not including connectors)
  175 mm x 107 mm

## Terminal Boards & Cables

- DIN-37D-01*
  Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting
- DIN-20P-01*
  Terminal Board with One 20-pin Ribbon Connector and DIN-Rail Mounting
- ACLD-9137-01
  General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- ACLD-9188-01*
  General-Purpose Terminal Board with Two 20-pin Ribbon Connectors and One 37-pin D-sub Connector
- ACLD-9182A-01*
  Terminal Board with 16-CH Isolated Digital Inputs
- ACLD-9185-01*
  Terminal Board with 16-CH Relay Outputs

*** Cables are not included. For information on mating cables, refer to P2-61/62**

## Ordering Information

- **PCI-9111DG**
  16-CH 12-Bit 100 kS/s Low-Cost Multi-Function DAQ Card
- **PCI-9111HR**
  16-CH 16-Bit 100 kS/s Low-Cost Multi-Function DAQ Card

## Pin Assignment

*CN3*

| | | | |
|---|---|---|---|
| AI0 | 1 | 20 | AI8 |
| AI1 | 2 | 21 | AI9 |
| AI2 | 3 | 22 | AI10 |
| AI3 | 4 | 23 | AI11 |
| AI4 | 5 | 24 | AI12 |
| AI5 | 6 | 25 | AI13 |
| AI6 | 7 | 26 | AI14 |
| AI7 | 8 | 27 | AI15 |
| A.GND | 9 | 28 | A.GND |
| A.GND | 10 | 29 | A.GND |
| N/C | 11 | 30 | DA Out |
| PreTrg | 12 | 31 | EDI0 |
| +12Vout | 13 | 32 | EDI1 |
| D.GND | 14 | 33 | EDI2 |
| D.GND | 15 | 34 | EDI3 |
| ExtTrg | 16 | 35 | EDO0 |
| EDO1 | 17 | 36 | EDO2 |
| EDO3 | 18 | 37 | N/C |
| +5Vout | 19 | | |

*CN1*

| | | | |
|---|---|---|---|
| DI0 | 1 | 2 | DI1 |
| DI2 | 3 | 4 | DI3 |
| DI4 | 5 | 6 | DI5 |
| DI6 | 7 | 8 | DI7 |
| DI8 | 9 | 10 | DI9 |
| DI10 | 11 | 12 | DI11 |
| DI12 | 13 | 14 | DI13 |
| DI14 | 15 | 16 | DI15 |
| GND | 17 | 18 | GND |
| +5Vout | 19 | 20 | +12Vout |

*CN2*

| | | | |
|---|---|---|---|
| DO0 | 1 | 2 | DO1 |
| DO2 | 3 | 4 | DO3 |
| DO4 | 5 | 6 | DO5 |
| DO6 | 7 | 8 | DO7 |
| DO8 | 9 | 10 | DO9 |
| DO10 | 11 | 12 | DO11 |
| DO12 | 13 | 14 | DO13 |
| DO14 | 15 | 16 | DO15 |
| GND | 17 | 18 | GND |
| +5Vout | 19 | 20 | +12Vout |