Multichannel Analog I/O PCI Express Card Datasheet

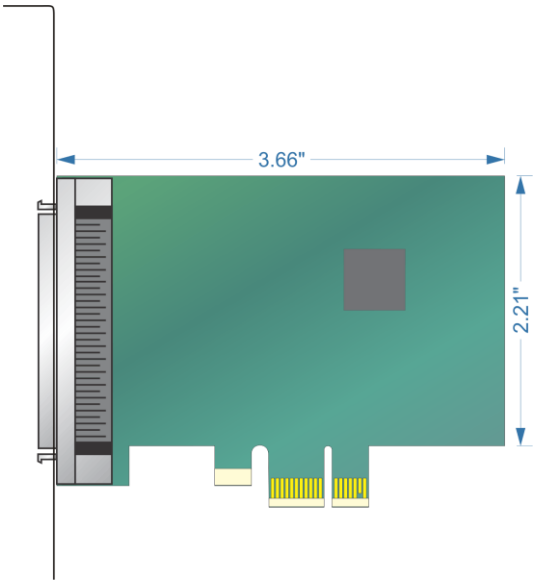
Features

Model PCIe-ADIO16-16F

- PCI Express half-height/length with latching I/O connector
- 2× 16-bit, Bipolar, Differential, A/D converters sampling at up to 1MHz, simultaneously
  - Software selectable as 16+0, 8+4, or 0+8 (Single-Ended + Differential Inputs)
  - 7 channel-by-channel programmable differential input ranges from ±0.3125V up to ±12V (48Vp-p)
  - A/D starts via software, external input, or periodic timer
  - A/D "Scan Start" mode optimizes inter-channel timing
  - High impedance, 8-channel input: 1 MΩ
  - 32k FIFO plus DMA for efficient, robust data streaming
- 16× Digital I/O pins with flexible secondary functions
- Four 16-bit analog outputs
  - 5 per-channel programmable ranges: 0V to 5V, 0V to 10V, ±2.5V, ±5V, ±10V,
  - optional 4-20mA output range
  - Outputs Drive ±10mA Guaranteed
- Onboard Watchdog with status output
- RoHS compliant standard

FACTORY OPTIONS INCLUDE

- Single-ended current input (4-20mA, 10-50mA)
- Voltage dividers per input
- extended temp operation



Functional Description

The PCIe-ADIO16-16F is an ideal solution for adding high-speed analog I/O capabilities to any computer with a PCI Express slot.

The PCIe-ADIO16-16F is a 16-bit resolution A/D & D/A card with two simultaneous 1MHz A/D converters, having a total of either 16 single ended, 8 differential, or 8 single ended *and* 4 differential inputs. Each channel can be independently software configured to accept any of 7 input ranges. Four analog outputs with 5, 10, ±5, ±10, and ±2.5V ranges are provided. Sixteen Digital I/O bits feature advanced functionality including IRQ generation, External DAC Load, ADC Trigger, and ADC Start, as well as a dedicated Watchdog Status output pin.

This analog I/O card provides the user with everything needed to start acquiring and controlling signals in a variety of applications. The PCIe-ADIO16-16F data acquisition board can be used in many current real-world applications such as embedded equipment monitoring, precision PC-based and portable environmental measurements, and mobile data acquisition. The card is designed to be used in rugged industrial environments and is a half—height/length PCI Express Gen2 1×lane card.

Applications: Optical Networking, Instrumentation, Multichannel Data Acquisition and system monitoring, Automatic Test Equipment, Process Control and Industrial Automation, Power line monitoring.

SOFTWARE

The card is supported for use in most operating systems and includes a free Linux and Windows compatible software package. This package contains sample programs and source code in C# and Delphi for Windows. Also provided is a graphical setup program in Windows. Linux support includes installation files and basic samples for programming from user level via an open source kernel driver. Third party support includes a Windows standard DLL interface usable from the most popular application programs. Embedded OS support includes the family of Windows Operating Systems including IoT. ACCES is also now offering a VxWorks driver/library for the ultimate real-time process monitoring and control solution.

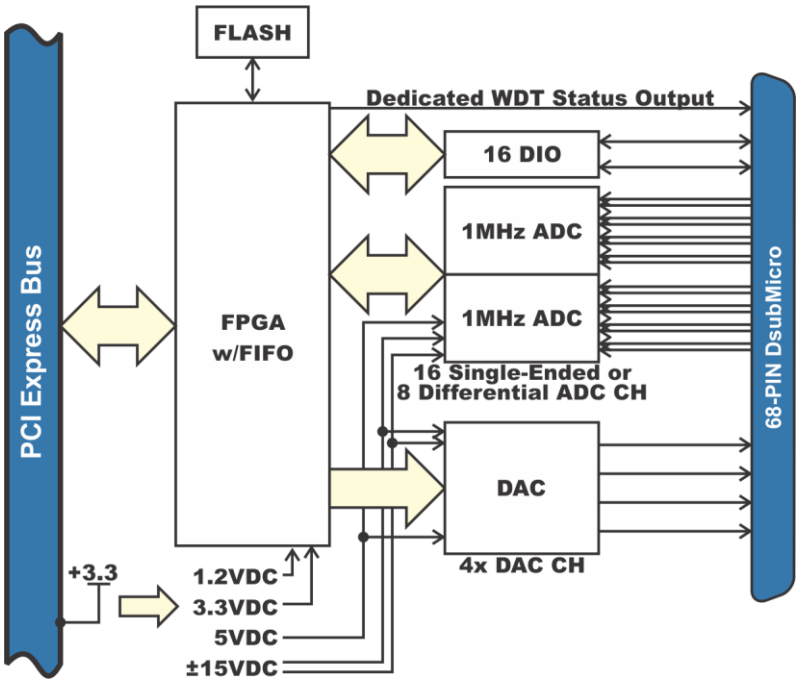
Special Order

Please contact ACCES with your precise requirement. Examples of special orders would be conformal coating, custom software, custom product labeling, 4-20mA or 5-100mA input support, per-channel input-voltage dividers, and more. We will work with you to provide *exactly* what is required.

Available Accessories Include

C68PS18L	68-Pin SCSI 18" shielded cable with one-touch latches
STB-68	Screw Terminal Board (mounted on standoffs)

MULTICHANNEL ANALOG I/O PCI EXPRESS CARD DATASHEET



PC Interface

PCI Express Card	Half-height, half-length, Gen2 1×Lane PCIe interface

Analog Inputs

ADC Type	Successive approximation
Resolution	16-bit differential bipolar ADC
Sampling rate	2 Msps aggregate (1MHz ADC ×2 simultaneous)
Number of channels	16+0, 8+4, or 0+8 (SINGLE-ENDED + DIFFERENTIAL) (software selectable)
Differential Bipolar Ranges (V)	±12, ±10, ±5, ±2.5, ±1.25, ±0.625, ±0.3125V with 0, 0, ±5.12, ±7.68, ±8.96, ±9.60, ±9.92V common mode rejection, respectively
Single Ended Bipolar Ranges (V)	½ each differential range at 15 ENOB
4-20mA or 10-50mA	Factory options
Int Nonlinearity Error	±0.6 LSB to ±1.5 LSB depending on gain
No Missing Codes	16 bits
Input Impedance	>500MΩ
A/D Start Sources	Software Start, Timer Start, External Start, Externally Triggered Timer Start
A/D Start Types	Single Channel or Scan
Overvoltage Protection	Current limiting through 2 KΩ
Crosstalk	-120dB @ 10kHz

Analog Outputs

Number	4
Type:	Single-ended
Resolution:	16-bit
Bipolar Ranges:	±2.5V, ±5V, ±10V
Unipolar Ranges:	0-5V, 0-10V
Settling Time	20us typical, +/-10V (+/-1LSB at 16 bits)
Output Current	max ±10mA per channel

Environmental

Temperature	Operating	0°C to +70°C -40°C to +85°C (-T option)
	Storage	-40°C to +105°C
Humidity		5% to 95% RH, non-condensing
Dimensions	Length	92.96mm (3.66“)
	Height	56.134mm (2.21”)

Weight	53.0 grams

Digital Input / Output Interface

Digital Bits	16, in two 8-bit direction controllable I/O Groups	
Performance	1 µs per transaction max (~3.5µs in non-kernel Windows)	
Digital Inputs	Logic High Logic Low	2.0V to VCCIO (3.3VDC, 5VDC tolerant) 0V to 0.8V
Digital Outputs	Logic High Logic Low	2.0V (min) 24mA source 0.55V (max) 24mA sink

Power

Power required	+3.3VDC @ 400mA (idle) 495mA (full load)

I/O Interface Connectors

On card	68-Pin SCSI Female, with latches

Model Options

-T	Extended Temperature Operation (-40° to +85°C)
-I	4-20mA inputs
-Sxx	Special configurations (10-50mA inputs, input voltage dividers, conformal coating, etc.)

Ordering Guide

PCIe-ADIO16-16F	A/D 16-bit, 2Msps, 4 D/A
PCIe-ADIO16-16A	A/D 16-bit, 1Msps, 4 D/A
PCIe-ADIO16-16E	A/D 16-bit, 500Ksps, 4 D/A
PCIe-ADI16-16F	A/D 16-bit, 2Msps
PCIe-ADI16-16A	A/D 16-bit, 1Msps
PCIe-ADI16-16E	A/D 16-bit, 500Ksps
PCIe-ADIO12-16A	A/D 12-bit, 1Msps, 4 D/A
PCIe-ADIO12-16	A/D 12-bit, 500Ksps, 4 D/A
PCIe-ADIO12-16E	A/D 12-bit, 200Ksps, 4 D/A
PCIe-ADI12-16A	A/D 12-bit, 1Msps
PCIe-ADI12-16	A/D 12-bit, 500Ksps
PCIe-ADI12-16E	A/D 12-bit, 200Ksps
C68PS18L	68-Pin SCSI 18” shielded cable with one-touch latches
STB-68	Screw Terminal Board (mounted on standoffs)