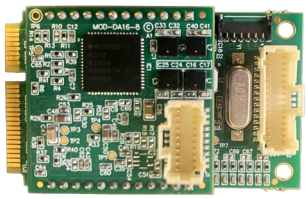
Multifunction Analog I/O
PCI Express Mini Card Datasheet

Features

Model mPCIe-DAAI16-8F

- PCI Express Mini Card (mPCIe) type F1, with latching I/O connector (double stack)
- 8× 16-bit DACs capable of Current or Voltage, Waveform streaming at up to 125 kSPS, each
  - Software selectable as Voltage or Current output, per channel
  - 0 to 20, 0 to 24, and 4-20mA current output ranges
  - 5V, 10V, ±5V and ±10V voltage output ranges (with optional 20% overrange)
  - Per-Channel offset/scale calibration
- 16-bit, Bipolar, Differential, A/D sampling at up to 1MHz
  - Software selectable as 8 Single Ended or 4 Differential channels
  - 7 channel-by-channel programmable differential input ranges from ±0.3125V up to ±12V
  - High impedance input: 500 MΩ
  - FIFO plus DMA for efficient, robust data streaming
- 8× Digital I/O pins (4 inputs and 4 outputs)
- RoHS compliant standard



FACTORY OPTIONS INCLUDE

- One HART channel
- ADC current input (4-20mA, 10-50mA)
- Voltage dividers per input
- Extended temp operation

Functional Description

The mPCIe-DAAI16-8F is an ideal solution for adding high-speed analog I/O capabilities to any computer with an mPCIe slot.

The mPCIe-DAAI16-8F is a 16-bit resolution D/A & A/D card with 8 DACs, 8 ADC channels, and 8 DIO. Four DAC voltage ranges (with optional 20% overrange) and 3 current ranges, with both current and voltage outputs, are software selectable.

Each ADC channel can be independently software configured to accept any of 7 input ranges.

This tiny analog I/O card provides the user with everything needed to start acquiring and controlling signals in a variety of applications. The mPCIe-DAAI16-8F 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 double sided "F1" sized PCI Express Mini Card with a custom daughter-card stacked on top.

A HART (Highway Addressable Remote Transducer) modem option makes this device suitable for a wide array of large-scale infrastructure projects.

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.

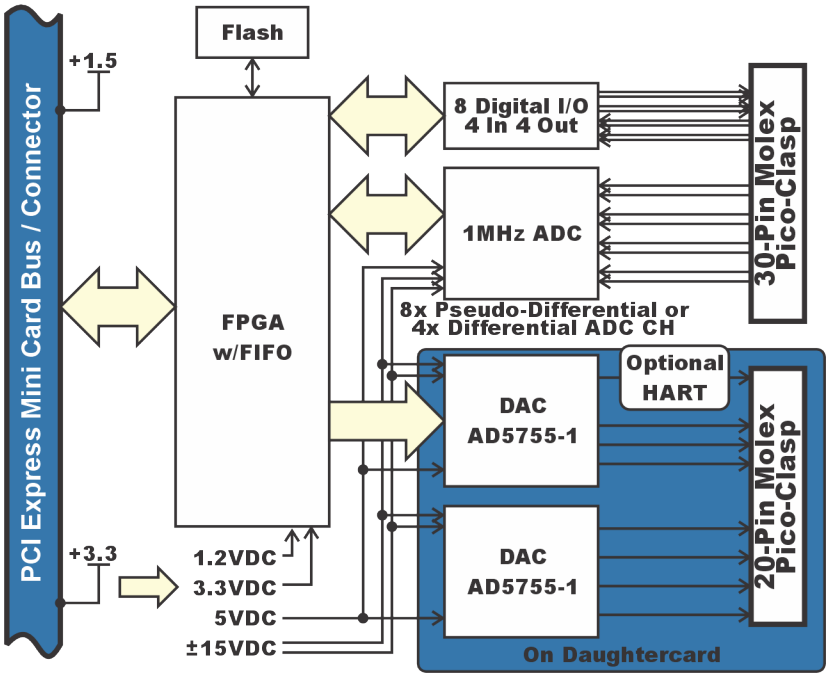
Special Order

Please contact ACCES with your precise requirement. Examples of special orders would be conformal coating, custom software, custom product labeling, 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

mPCIe-HDW-KIT2	Mounting hardware for 2mm
mPCIe-HDW-KIT2.5	Mounting hardware for 2.5mm

MULTICHANNEL ANALOG I/O
PCI EXPRESS MINI CARD DATASHEET



PC Interface

PCI Express Mini Card	Type F1 "Full Length", double-stack

Analog Outputs

Number	8
Type:	Single-ended Voltage, Current
Resolution:	16-bit
Voltage Ranges:	0-5V, 0-10V, ±5V, ±10V (with software enabled 20% overrange)
Current Ranges:	4-20mA, 0-20mA, 0-24ma
Settling Time	20us typical, +/-10V (+/-1LSB at 16 bits)
Output Current	max ±10mA per channel

Analog Inputs

ADC Type	Successive approximation
Resolution	16-bit differential bipolar ADC
Sampling rate	1 MSPS aggregate
Number of channels	8 SINGLE-ENDED or 4 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
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

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	50.95mm (2.006")
	Width	30.00mm (1.181")
	Height	0.5 " (2 card stack plus connector)
Weight	12g	

Digital Input / Output Interface

Digital Bits		4 inputs and 4 outputs
Performance		1 µs per transaction max (~3.5µs in non-kernel Windows, typ.)
Digital Inputs	Logic High Logic Low	2.0V to 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 (from mPCIe Bus)	+3.3VDC @ 150mA (idle) +1.5VDC @ 200mA (idle)

I/O Interface Connectors

DAC	On card	Molex 5011902017 20-pin latching
	Mating	Molex 5011892010 20-pin latching
ADC + DIO	On card	Molex 5011903017 30-pin latching
	Mating	Molex 5011893010 30-pin latching

Model Options

-T	Extended Temperature Operation (-40° to +85°C)
-I or -ID	4-20mA inputs (single-ended or differential)
-Sxx	Special configurations (10-50mA inputs, input voltage dividers, conformal coating, etc.)
-H	HART modem on DAC #0

Ordering Guide

mPCIe-DAAI16-8F	mPCIe, 8 16-bit D/A with 8 A/D at up to 1 msps
mPCIe-DAAI16-8A	mPCIe, 8 16-bit D/A with 8 A/D at up to 500 ksps
mPCIe-DAAI16-8E	mPCIe, 8 16-bit D/A with 8 A/D at up to 250 ksps
mPCIe-DAAI12-8A	mPCIe, 8 16-bit D/A with 8 12-bit A/D at up to 500 ksps
mPCIe-DAAI12-8	mPCIe, 8 16-bit D/A with 8 12-bit A/D at up to 250 ksps
mPCIe-DAAI12-8E	mPCIe, 8 16-bit D/A with 8 12-bit A/D at up to 100 ksps