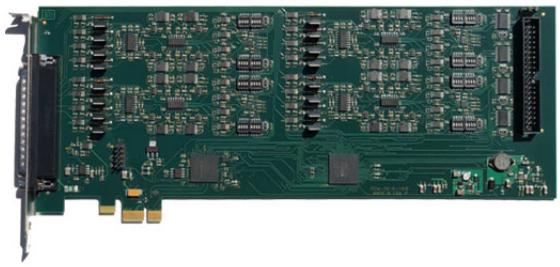
PCIe-DA16 Family

High Density Analog Output Cards

FEATURES

- 16-channel, 16-bit digital-to-analog PCI Express card
- Software / Hardware compatible with PCI-DA12-16, >125k conversions per channel
- Dip-switch selectable analog output ranges of 2.5V, 5V, 10V, ±2.5V, ±5V, ±10V, 4-20mA
- Individual or simultaneous update of the DACs
- DACs restricted at power-on to prevent spurious outputs
- 24-bits of digital I/O
- Three 16-bit down counters (emulated 82C54)
- Can use the counter-timer to generate DAC updates, and/or IRQs
- VCCIO voltage available to the user via 0.5A resettable fuse
- RoHS Available
- Wind River VxWorks support available



FUNCTIONAL DESCRIPTION

The PCIe-DA16-16 series are x1 10.5” cards that can be installed in long PCIe slots. They contain sixteen or eight digital-to-analog converters (DACs), 24 bits of digital I/O, and three 16-bit counter/timers.

The DACs can be updated individually or simultaneously. The board features a variety of unipolar and bipolar voltage ranges or a 4-20 mA current range (sink) for each DAC giving the user a variety of options. To ensure that there will not be excessive outputs to external circuits when the board is powered on, automatic circuits limit analog outputs to zero volts until initialized via software command.

Analog output ranges available are:

0 to +2.5V	-2.5 to +2.5V
0 to +5V	-5 to +5V
0 to +10V	-10V to +10V
4 mA to 20 mA (sink)	

Each DIO line is buffered and capable of up to 32mA source/sink. The VCCIO logic level is globally configured via jumper selection as 5V or 3.3V. Also, ports A, B, Chi, and CLo nybble are factory-configured as pull-up (to the selected VCCIO) through 10kΩ resistor networks. These groups can be configured for pull-down as a factory option.

The card includes an emulated 82C54 counter/timer which has three 16-bit programmable down counters. These are configured as Event counters (See Block Diagram) and can also be used as a frequency source derived from an on-board 1 MHz clock. These counters can generate IRQs at a programmed frequency, and/or initiate DAC updates. This allows for very precise timing of waveform generation.

I/O connections for the DACs are made at a 37-pin D-subminiature Male connector on the card mounting bracket. I/O connections for the digital I/O and counter/timer signals are made through a 40-pin 0.1” IDC header and a ribbon cable to a second bracket that can install alongside the first.

Calibration is supported with oncard non-volatile memory to hold per-channel per-range mX+B constants.

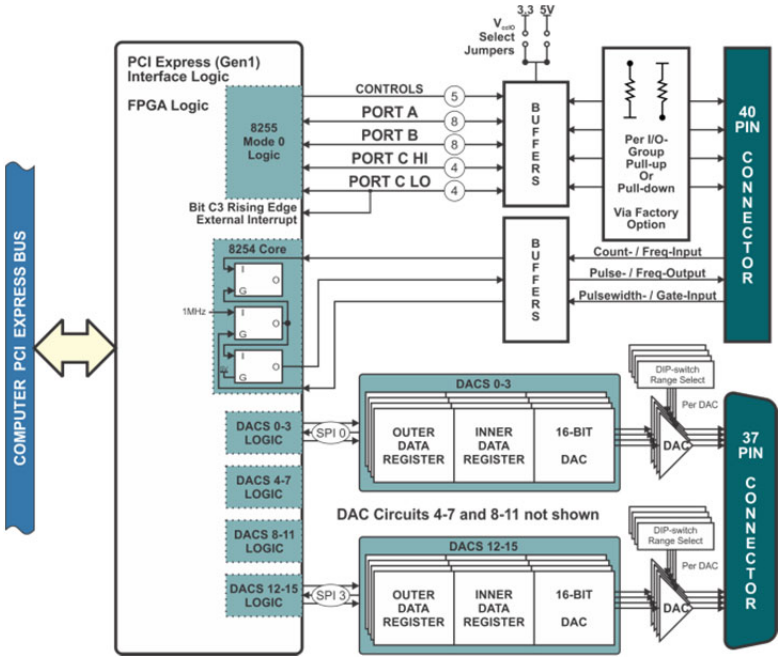
SOFTWARE

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#, Delphi, and Visual C++ 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.

10623 Roselle Street, San Diego, CA 92121 • (858) 550-9559 • Fax (858) 550-7322 • contactus@accesio.com • www.accesio.com
3/12/2020

PCIe-DA16 Family

High Density Analog Output Cards



BLOCK DIAGRAM

SPECIFICATIONS

Analog Outputs

- Channels: 16, 8
- Resolution: 16 bits, 12 bits
- Unipolar Ranges: 0-2.5V, 0-5V, 0-10V
- Bipolar Ranges: ±2.5V, ±5.0V, ±10.0V
- Current Range: 4 to 20 mA (external excitation of 8-36VDC)
- Output Drive: 5 mA maximum
- Output Resistance: Less than 0.1 ohm
- Relative Accuracy: ± 1 LSB max, ± ½ LSB typical
- Diff. Linearity: ± ½ LSB integral non-linearity over rated temperature range
- Monotonicity: 16 bits over operating temp
- Settle time: 5 µsec ¼ to ¾ scale and ¾ to ¼ scale settling time, to ±2 LSB

Counter/Timers

- Type: Emulated 82C54 programmable counters
- Counter size: 16-bit
- Logic level: VCCIO
- On-board clock 1MHz
- Clock Pulse Width: See 82C54A datasheet

Digital I/O

- Lines 24; Ports A, B, and C
- Type 8255 compatible
- Logic Level VCCIO jumper selectable
- Pull-up/down 10k ohm (pulled up by default)

Logic Levels	VCCIO = 5V	
Low Inputs	≤ 1.5V	≤ 2uA
High Inputs	≥ 3.5V	≤ 2uA
Low Outputs	≤ 0.55V	32mA
High Outputs	≥ 3.8V	32mA
Logic Levels	**VCCIO = 3.3V**	
Low Inputs	≤ 0.8V	≤ 2uA
High Inputs	≥ 2.0V	≤ 2uA
Low Outputs	≤ 0.55V	24mA
High Outputs	≥ 2.4V	24mA

Environmental

- Operating Temp: 0 to +70°C
- Storage Temp: -55 to +150°C
- Humidity: 5% to 95% w/o condensation
- PCIe-DA16-8/16: 10.5" (267 mm) long

ORDERING GUIDE

- PCIe-DA16-16 Sixteen 16-Bit Analog Outputs
- PCIe-DA16-8 Eight 16-Bit Analog Outputs
- PCIe-DA12-16 Sixteen 12-Bit Analog Outputs
- PCIe-DA12-8 Eight 12-Bit Analog Outputs

10623 Roselle Street, San Diego, CA 92121 • (858) 550-9559 • Fax (858) 550-7322 • contactus@accesio.com • www.accesio.com
3/12/2020