

# PXI/DAQ/DAQe-2000 Series

4-CH 14/16-Bit Up to 2 MS/s Simultaneous-Sampling Multi-Function DAQ Cards



## Introduction

ADLINK's PXI/DAQ/DAQe-2000 series of products are simultaneous-sampling multi-function DAQ cards to meet a wide range of application requirements. The devices can simultaneously sample 4 AI channels with differential input configurations in order to achieve maximum noise elimination. They also provide 2-CH 12-bit analog outputs with waveform generation capability, which can be performed together with analog input functions. If more analog input or output channels are required, multiple cards can be synchronized through the SSI (System Synchronization Interface) bus. This makes the PXI/DAQ/DAQe-2000 series ideal for stimulus/response testing.

The PXI/DAQ/DAQe-2000 series also features analog and digital triggering, 24-CH programmable digital I/O lines, and 2-CH 16-bit general-purpose timer/counter. The auto-calibration functions adjust the gain and offset to within specified accuracies such that you do not have to adjust trimpots to calibrate the cards.

## Features

- Supports a 32-bit 3.3 V or 5 V PCI bus (DAQ-2000 series)
- x1 lane PCI Express® Interface (DAQe-2000 series)
- PXI specification Rev. 2.2 compliant (PXI-2000 series)
- 4-CH differential analog inputs
- Bipolar or unipolar analog input ranges
- Programmable gains of x1, x2, x4, x8
- Scatter-gather DMA for both analog inputs and outputs
- 2-CH 12-bit multiplying analog outputs with waveform generation
- 24-CH TTL digital input/output
- 2-CH 16-bit general-purpose timer/counter
- Analog and digital triggering
- Fully auto calibration
- Multiple cards synchronization through SSI (System Synchronization Interface) bus or PXI trigger bus

### 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®
- D2K-DASK for Windows
- D2K-DASK/X for Linux

## Terminal Boards & Cables

### DIN-68S-01

Terminal Board with One 68-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included.)

### ACL-10568-1

68-pin SCSI-VHDCI cable (mating with AMP-787082-7), 1 M

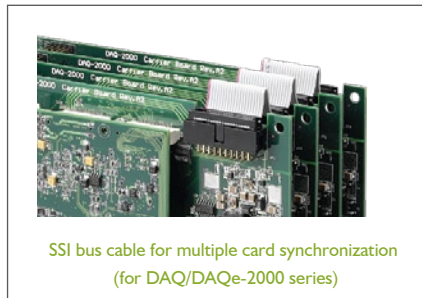
\* For more information on mating cables, please refer to P2-61/62.



## SSI Bus Cables (for multiple cards synchronization)

### ACL-SSI-2/3/4

SSI Bus cable for two, three, and four devices



## Pin Assignment

### Connector Pin Assignment

|              |    |    |              |
|--------------|----|----|--------------|
| CH0+         | 1  | 35 | CH0-         |
| CH1+         | 2  | 36 | CH1-         |
| CH2+         | 3  | 37 | CH2-         |
| CH3+         | 4  | 38 | CH3-         |
| EXTATRIG     | 5  | 39 | AIGND        |
| DA1OUT       | 6  | 40 | AOGND        |
| DA0OUT       | 7  | 41 | AOGND        |
| AOEXTREF     | 8  | 42 | AOGND        |
| SDI3_1 / NC* | 9  | 43 | SDI3_0 / NC* |
| SDI2_1 / NC* | 10 | 44 | SDI2_0 / NC* |
| SDI1_1 / NC* | 11 | 45 | SDI1_0 / NC* |
| SDI0_1 / NC* | 12 | 46 | SDI0_0 / NC* |
| AO_TRIG_OUT  | 13 | 47 | EXTWFTRG     |
| AI_TRIG_OUT  | 14 | 48 | EXTDTRIG     |
| GPTC1_SRC    | 15 | 49 | DGND         |
| GPTC0_SRC    | 16 | 50 | DGND         |
| GPTC0_GATE   | 17 | 51 | GPTC1_GATE   |
| GPTC0_OUT    | 18 | 52 | GPTC1_OUT    |
| GPTC0_UPDOWN | 19 | 53 | GPTC1_UPDOWN |
| EXTTIMEBASE  | 20 | 54 | DGND         |
| AF11         | 21 | 55 | AF10         |
| PB7          | 22 | 56 | PB6          |
| PB5          | 23 | 57 | PB4          |
| PB3          | 24 | 58 | PB2          |
| PB1          | 25 | 59 | PB0          |
| PC7          | 26 | 60 | PC6          |
| PC5          | 27 | 61 | PC4          |
| DGND         | 28 | 62 | DGND         |
| PC3          | 29 | 63 | PC2          |
| PC1          | 30 | 64 | PC0          |
| PA7          | 31 | 65 | PA6          |
| PA5          | 32 | 66 | PA4          |
| PA3          | 33 | 67 | PA2          |
| PA1          | 34 | 68 | PA0          |

\*Pin 9-12 and pin 43-46 are SDI<0..3>\_n for 2010; NC for 2005, and 2006

## Ordering Information / Quick Selection Guide

| Model Name        | Analog Input    |            |               |                  | Analog Output   |            |             | DIO             | Timer/Counter   |
|-------------------|-----------------|------------|---------------|------------------|-----------------|------------|-------------|-----------------|-----------------|
|                   | No. of channels | Resolution | Sampling rate | Input range      | No. of channels | Resolution | Update rate | No. of channels | No. of channels |
| PXI/DAQ/DAQe-2010 | 4-CH DI         | 14 bits    | 2 MS/s        | ±1.25 V to ±10 V | 2               | 12 bits    | 1 MS/s      | 24-CH 8255 PIO  | 2-CH, 16-bit    |
| PXI/DAQ/DAQe-2005 | 4-CH DI         | 16 bits    | 500 kS/s      | ±1.25 V to ±10 V | 2               | 12 bits    | 1 MS/s      | 24-CH 8255 PIO  | 2-CH, 16-bit    |
| PXI/DAQ/DAQe-2006 | 4-CH DI         | 16 bits    | 250 kS/s      | ±1.25 V to ±10 V | 2               | 12 bits    | 1 MS/s      | 24-CH 8255 PIO  | 2-CH, 16-bit    |

## Specifications

| Model Name                              | PXI/DAQ/DAQe-2010   | PXI/DAQ/DAQe-2005   | PXI/DAQ/DAQe-2006   |
|---|---|---|---|
| <b>Analog Input</b>                     |   |   |   |
| Resolution                              | 14 bits   | 16 bits, no missing codes   | 16 bits, no missing codes   |
| Number of channels                      | 4 simultaneous-sampling channels with differential input  |   |   |
| Maximum sampling rate                   | 2 MS/s  | 500 kS/s  | 250 kS/s  |
| Programmable gain                       | 1, 2, 4, 8  |   |   |
| Bipolar input ranges                    | ±10 V, ±5 V, ±2.5 V, ±1.25 V  |   |   |
| Unipolar input ranges                   | 0-10 V, 0-5 V, 0-2.5 V, 0-1.25 V  |   |   |
| Offset error                            | ±3 mV   | 2 mV  | ±1 mV   |
| Gain error                              | ±0.1% of FSR  | ±0.04% of FSR   | ±0.03% of FSR   |
| Input Coupling                          | DC  |   |   |
| Overvoltage protection                  | Power on: Continuous ±35 V, Power off: Continuous ±15 V   |   |   |
| Input Impedance                         | 1 GΩ/100 pF   |   |   |
| CMRR (gain = 1)                         | 85 dB   |   |   |
| -3 dB small signal bandwidth (gain = 1) | 1 MHz   | 1 MHz   | 600 kHz   |
| Trigger sources                         | Software, external digital/analog trigger, SSI bus  |   |   |
| Trigger modes                           | Pre-trigger, post-trigger, middle-trigger, delay-trigger, and repeated trigger  |   |   |
| FIFO buffer size                        | 8 k samples   | 512 samples   | 512 samples   |
| Data transfers                          | Polling, scatter-gather DMA   |   |   |
| <b>Analog Output</b>                    |   |   |   |
| Number of channels                      | 2 voltage outputs   |   |   |
| Resolution                              | 12 bits   |   |   |
| Output ranges                           | 0-10 V, ±10 V, 0-AOEXTREF, ±AOEXTREF  |   |   |
| Maximum update rate                     | 1 μs  |   |   |
| Slew rate                               | 20 V/μs   |   |   |
| Settling time                           | 3 μs to ±0.5 LSB accuracy   |   |   |
| Offset error                            | ±3mV  | ±1mV  | ±1mV  |
| Gain error                              | ±0.05% of max. output   | ±0.04% of max. output   | ±0.04% of max. output   |
| Driving capacity                        | 5 mA  |   |   |
| Stability                               | Any passive load, up to 1500 pF   |   |   |
| Trigger sources                         | Software, external digital/analog trigger, SSI bus  |   |   |
| Trigger modes                           | Post-trigger, delay-trigger, and repeated trigger   |   |   |
| FIFO buffer size                        | 2 k samples   |   |   |
| Data transfers                          | Programmed I/O, scatter-gather DMA  |   |   |
| <b>Digital I/O</b>                      |   |   |   |
| Number of channels                      | 8255 24-bit programmable input/output   |   |   |
| Compatibility                           | 5 V/TTL   |   |   |
| Data transfers                          | Programmed I/O  |   |   |
| <b>Timer/Counter</b>                    |   |   |   |
| Number of channels                      | 2   |   |   |
| Resolution                              | 16 bits   |   |   |
| Compatibility                           | 5 V/TTL   |   |   |
| Base clock available                    | 40 MHz, external clock up to 10 MHz   |   |   |
| <b>Auto Calibration</b>                 |   |   |   |
| Onboard reference                       | +5 V  |   |   |
| Temperature drift                       | ±2 ppm/°C   |   |   |
| Stability                               | 6 ppm/1000 Hrs  |   |   |
| <b>General Specifications</b>           |   |   |   |
| Dimensions                              | 160 mm x 100 mm (not including connectors) (PXI-2000 series)<br>175 mm x 107 mm (not including connectors) (DAQ-2000 series)<br>168 mm x 107 mm (not including connectors) (DAQe-2000 series) |   |   |
| Connector                               | 68-pin VHDCI-type female  |   |   |
| Operating temperature                   | 0 to 55°C   |   |   |
| Storage temperature                     | -20 to 70°C   |   |   |
| Humidity                                | 5 to 95%, non-condensing  |   |   |
| Power requirements                      | +5 V 1.82 A typical (PXI/DAQ-2010)<br>+3.3 V 1.246 A, +12 V 0.448 A typical (DAQe-2010)   | +5 V 2.04 A typical (PXI/DAQ-2005)<br>+3.3 V 1.03 A, +12 V 0.75 A typical (DAQe-2005) | +5 V 1.82 A typical (DAQ-2006)<br>+3.3 V 1.02 A, +12 V 0.67 A typical (DAQe-2006) |