

# DAQ-2200 Series

## 64-CH 12/16-Bit Up to 3 MS/s Multi-Function DAQ Cards

### Features

- Supports a 32-bit 3.3 V or 5 V PCI bus
- 64-CH single-ended or 32-CH differential analog inputs
- Up to 3 MS/s sampling rate (DAQ-2204)
- 12-bit A/D resolution (DAQ-2204)
- 16-bit A/D resolution (DAQ-2205 & DAQ-2206)
- On-board 1 K-sample A/D FIFO
- Bipolar or unipolar analog input ranges
- Programmable gains:
  - x1, x2, x4, x5, x8, x10, x20, x40, x50, x200 (DAQ-2204)
  - x1, x2, x4, x8 (DAQ-2205 & DAQ-2206)
- 512-configuration channel-gain queue
- Scatter-gather DMA for both analog inputs and outputs
- 2-CH 12-bit multiplying analog outputs with waveform generation
- On-board 1k-sample D/A FIFO
- 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

### Operating Systems

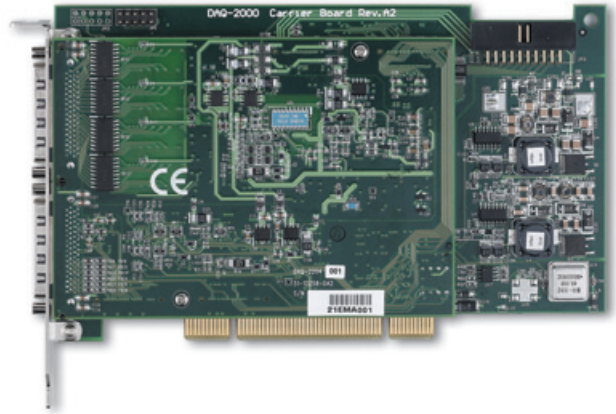
- Windows 98/NT/2000/XP/2003
- Linux

### Recommended Software

- VB/VC++/BCB/Delphi
- DAQBench

### Driver Support

- DAQ-LVIEW PnP for LabVIEW
- DAQ-MTLB for MATLAB
- DAQBOY for Windows
- D2K-DASK for Windows
- D2K-DASK/X for Linux



### Introduction

ADLINK DAQ-2204, DAQ-2205, and DAQ-2206 are high-density and high-performance multifunction DAQ cards. The devices can sample up to 64 AI channels with different gain settings and scan sequences. It makes them ideal for dealing with high-density analog signals with various input ranges and sampling speeds. These devices also offer differential mode for 32 AI channels in order to achieve maximum noise elimination.

The DAQ-2200 series also feature analog and digital triggering, 2-CH 12-bit analog outputs with waveform generation capability, 24-CH programmable digital I/O lines, and 2-CH 16-bit general-purpose timer/counters.

Like all the other members in DAQ-2000 family, the DAQ-2200 series are able to perform the analog input and output functions at full speed simultaneously and multiple cards can be synchronized through the SSI (system synchronization interface) bus. 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.

### Termination Boards

#### ■ DIN-68S/1M

Termination Board with a 68-pin SCSI-II Connector and DIN-Rail Mounting (Including One 1-meter ACL-10568 Cable)

### SSI Bus Cables (for multiple cards synchronization)

#### ■ ACL-SSI-2

SSI Bus cable for 2 devices

#### ■ ACL-SSI-3

SSI Bus cable for 3 devices

#### ■ ACL-SSI-4

SSI Bus cable for 4 devices

### Ordering Information

- DAQ-2204  
64-CH 12-Bit 3 MS/s Multi-Function DAQ Card
- DAQ-2205  
64-CH 16-Bit 500 kS/s Multi-Function DAQ Card
- DAQ-2206  
64-CH 16-Bit 250 kS/s Multi-Function DAQ Card

### Pin Assignment

#### Connector CN1 Pin Assignment

|              |    |    |         |      |
|--------------|----|----|---------|------|
| AI0 (AIH0)   | 1  | 35 | (AIL0)  | AI32 |
| AI1 (AIH1)   | 2  | 36 | (AIL1)  | AI33 |
| AI2 (AIH2)   | 3  | 37 | (AIL2)  | AI34 |
| AI3 (AIH3)   | 4  | 38 | (AIL3)  | AI35 |
| AI4 (AIH4)   | 5  | 39 | (AIL4)  | AI36 |
| AI5 (AIH5)   | 6  | 40 | (AIL5)  | AI37 |
| AI6 (AIH6)   | 7  | 41 | (AIL6)  | AI38 |
| AI7 (AIH7)   | 8  | 42 | (AIL7)  | AI39 |
| AI8 (AIH8)   | 9  | 43 | (AIL8)  | AI40 |
| AI9 (AIH9)   | 10 | 44 | (AIL9)  | AI41 |
| AI10 (AIH10) | 11 | 45 | (AIL10) | AI42 |
| AI11 (AIH11) | 12 | 46 | (AIL11) | AI43 |
| AI12 (AIH12) | 13 | 47 | (AIL12) | AI44 |
| AI13 (AIH13) | 14 | 48 | (AIL13) | AI45 |
| AI14 (AIH14) | 15 | 49 | (AIL14) | AI46 |
| AI15 (AIH15) | 16 | 50 | (AIL15) | AI47 |
| AISENSE      |    | 17 | 51      | AI48 |
| AI16 (AIH16) | 18 | 52 | (AIL16) | AI49 |
| AI17 (AIH17) | 19 | 53 | (AIL17) | AI50 |
| AI18 (AIH18) | 20 | 54 | (AIL18) | AI51 |
| AI19 (AIH19) | 21 | 55 | (AIL19) | AI52 |
| AI20 (AIH20) | 22 | 56 | (AIL20) | AI53 |
| AI21 (AIH21) | 23 | 57 | (AIL21) | AI54 |
| AI22 (AIH22) | 24 | 58 | (AIL22) | AI55 |
| AI23 (AIH23) | 25 | 59 | (AIL23) | AI56 |
| AI24 (AIH24) | 26 | 60 | (AIL24) | AI57 |
| AI25 (AIH25) | 27 | 61 | (AIL25) | AI58 |
| AI26 (AIH26) | 28 | 62 | (AIL26) | AI59 |
| AI27 (AIH27) | 29 | 63 | (AIL27) | AI60 |
| AI28 (AIH28) | 30 | 64 | (AIL28) | AI61 |
| AI29 (AIH29) | 31 | 65 | (AIL29) | AI62 |
| AI30 (AIH30) | 32 | 66 | (AIL30) | AI63 |
| AI31 (AIH31) | 33 | 67 | (AIL31) | AI64 |
| EXTATRIG     |    | 34 | 68      | AI48 |

### Pin Assignment

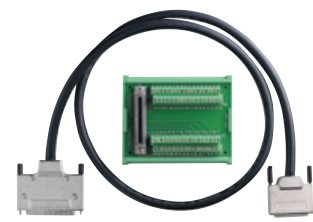
#### Connector CN2 Pin Assignment

|              |    |    |              |      |
|--------------|----|----|--------------|------|
| DA0OUT       | 1  | 35 | AOGND        |      |
| DA1OUT       | 2  | 36 | AOGND        |      |
| AOEXTREF     | 3  | 37 | AOGND        |      |
| N/C          |    | 4  | 38           | N/C  |
| DGND         |    | 5  | 39           | DGND |
| EXTWTRIG     | 6  | 40 | DGND         |      |
| EXTDTRIG     | 7  | 41 | DGND         |      |
| SSHOUT       | 8  | 42 | SDI0 / DGND* |      |
| RESERVED     | 9  | 43 | SDI1 / DGND* |      |
| RESERVED     | 10 | 44 | SDI2 / DGND* |      |
| AF11         | 11 | 45 | SDI3 / DGND* |      |
| AF10         | 12 | 46 | DGND         |      |
| GPTC0_SRC    | 13 | 47 | DGND         |      |
| GPTC0_GATE   | 14 | 48 | DGND         |      |
| GPTC0_UPDOWN | 15 | 49 | DGND         |      |
| GPTC0_OUT    | 16 | 50 | DGND         |      |
| GPTC1_SRC    | 17 | 51 | DGND         |      |
| GPTC1_GATE   | 18 | 52 | DGND         |      |
| GPTC1_UPDOWN | 19 | 53 | DGND         |      |
| GPTC1_OUT    | 20 | 54 | DGND         |      |
| EXTTIMEBASE  | 21 | 55 | DGND         |      |
| 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 42-45 are SDI<0..3> for DAQ-2204 ; DGND for DAQ-2205 and DAQ-2206



SSI bus cable for multiple cards synchronization



Termination board DIN-68S/1M

Quick Selection Guide

| Model number | 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 |
| DAQ-2204     | 32DI/64SE       | 12 bits    | 3 MS/s        | ±0.05 V to ±10 V | 2               | 12 bits    | 1 MS/s      | 24-CH 8255 PIO  | 2-CH, 16-bit    |
| DAQ-2205     | 32DI/64SE       | 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    |
| DAQ-2206     | 32DI/64SE       | 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 Number                           | DAQ-2204   | DAQ-2205                         | DAQ-2206                         |
|--|--|----------------------------------|----------------------------------|
| <b>Analog Input</b>                    |  |                                  |                                  |
| Resolution                             | 12 bits, no missing codes  | 16 bits, no missing codes        | 16 bits, no missing codes        |
| Number of channels                     | 64 single-ended or 32 differential (software selectable per channel)           |                                  |                                  |
| Channel gain queue size                | 512  |                                  |                                  |
| Maximum sampling rate                  | 3 MS/s   | 500 kS/s                         | 250 kS/s                         |
| Programmable gain                      | 1, 2, 4, 5, 8, 10, 20, 40, 50, 200   | 1, 2, 4, 8                       | 1, 2, 4, 8                       |
| Bipolar input ranges                   | Max. : ±10 V, Min. : ±0.05 V   | ±10 V, ±5 V, ±2.5 V, ±1.25 V     | ±10 V, ±5 V, ±2.5 V, ±1.25 V     |
| Unipolar input ranges                  | Max. : 0-10 V, Min. : 0-0.1 V  | 0-10 V, 0-5 V, 0-2.5 V, 0-1.25 V | 0-10 V, 0-5 V, 0-2.5 V, 0-1.25 V |
| Offset error                           | ±1 mV  | ±1 mV                            | ±1 mV                            |
| Gain error                             | ±0.03% of FSR  | ±0.01% of FSR                    | ±0.01% of FSR                    |
| Input coupling                         | DC   |                                  |                                  |
| Overvoltage protection                 | Power on: Continuous ±30 V, Power off: Continuous ±15 V                        |                                  |                                  |
| Input impedance                        | 1 GΩ/100 pF  |                                  |                                  |
| CMRR (gain = 1)                        | 90 dB  | 83 dB                            | 83 dB                            |
| Settling time                          | 1 μs to 0.1% error *   | 2 μs to 0.1% error               | 4 μs to 0.01% error              |
| -3dB small signal bandwidth (gain = 1) | 2 MHz  | 1.6 MHz                          | 760 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                       | 1 k 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                           | ±1 mV  |                                  |                                  |
| Gain error                             | ±0.02 % 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                       | 1 k samples  |                                  |                                  |
| Data transfers                         | Programmed I/O, scatter-gather DMA   |                                  |                                  |
| <b>Digital I/O</b>                     |  |                                  |                                  |
| Number of channels                     | 24-CH 8255 programmable input/output   |                                  |                                  |
| Compatibility                          | 5 V/TTL  |                                  |                                  |
| Data transfers                         | Programmed I/O   |                                  |                                  |
| <b>General-Purpose Timer/Counter</b>   |  |                                  |                                  |
| Number of channels                     | 2  |                                  |                                  |
| Resolution                             | 16 bit   |                                  |                                  |
| Compatibility                          | 5 V/TTL  |                                  |                                  |
| Base clock available                   | 40 MHz, external clock up to 10 MHz  |                                  |                                  |
| <b>Auto Calibration</b>                |  |                                  |                                  |
| On-board reference                     | +5 V   |                                  |                                  |
| Temperature drift                      | ±2 ppm/°C  |                                  |                                  |
| Stability                              | ±6 ppm/1000 Hrs  |                                  |                                  |
| <b>General Specifications</b>          |  |                                  |                                  |
| Dimensions                             | 175 mm x 107 mm (not including connectors)                                     |                                  |                                  |
| Connector                              | 68-pin VHDCI female x 2  |                                  |                                  |
| Operating temperature                  | 0 to 55°C  |                                  |                                  |
| Storage temperature                    | -20 to 70°C  |                                  |                                  |
| Humidity                               | 5 to 95 %, noncondensing   |                                  |                                  |
| Power requirements                     | +5V 1.3 A typical  | +5 V 1.2 A typical               | +5 V 1.2 A typical               |

\*Gain = 1, 2, 4, 8

- 1 Software Solutions
- 2 PXI/ CompactPCI Platforms
- 3 PXI-Based Instruments
- 4 PXI/ CompactPCI Modules
- 5 PCI DAQ Cards
- 6 PCI DIO Cards
- 7 PC/104-Plus Products
- 8 ISA DAS/ DIO Cards
- 9 Wiring Termination Boards
- 10 Motion Vision & COM
- 11 Remote I/O Modules
- 12 Industrial Computers