DAQ-2500 Series
4/8-CH 12-Bit 1 MS/s Analog Output Multi-Function DAQ Cards

Features
- Supports a 32-bit 3.3 V or 5 V PCI bus
- 12-bit multiplying D/A resolution
- Up to 1 MS/s simultaneous-update rate
- 4-CH multiplying analog outputs (DAQ-2501)
- 8-CH multiplying analog outputs (DAQ-2502)
- Hardware-based arbitrary waveform generation
- On-board 8 k-sample D/A FIFO (DAQ-2501)
- On-board 16 k-sample D/A FIFO (DAQ-2502)
- Programmable bipolar or unipolar analog output ranges on per channel basis
- Programmable internal or external reference sources on per channel basis
- 8-CH 400 kS/s 14-bit single-ended analog inputs (DAQ-2501)
- 4-CH 400 kS/s 14-bit single-ended analog inputs (DAQ-2502)
- On-board 2k-sample A/D FIFO
- Bipolar or unipolar analog input ranges
- Scatter-gather DMA for both analog inputs and outputs
- 24-CH TTL digital input/output
- 2-CH 16-bit general purpose timer/counters
- Analog & 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-2501 and DAQ-2502 are high-speed and high-performance analog output multifunction DAQ cards. The devices are able to update up to 8-CH, 12-bit analog outputs simultaneously at sustaining 1 MS/s. The reference sources and the output polarities are programmable on per channel basis, combining with the multiplying DAC architecture, ADLINK DAQ-2500 series DAQ cards can generate complex modulated analog signals. The hardware-based arbitrary waveform generation frees the CPU intervention even when all analog outputs are updating at full speed, and the lengths of waveforms are only limited by the system memory.

The DAQ-2500 series integrate up to 8-CH, 400 kS/s, 14-bit single-ended analog inputs with programmable polarity, 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-2500 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 boards.
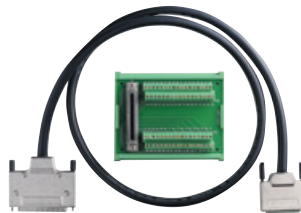
Termination Boards
- **DIN-68S/1M**
  Termination Board with a 68-pin SCSI-II Connector and DIN-Rail Mounting (Including One 1-meter ACL-10568 Cable)

SSI bus cable for multiple cards synchronization

Ordering Information

- **DAQ-2501**
  4-CH 12-Bit 1 MS/s Analog Output Multi-Function DAQ Card
- **DAQ-2502**
  8-CH 12-Bit 1 MS/s Analog Output Multi-Function DAQ Card

Termination board DIN-68S/1M

Pin Assignment
Connector CN1 Pin Assignment

Signal	Pin	Pin	Signal
AO_0	1	35	AGND
AO_1	2	36	AGND
AO_2	3	37	AGND
AO_3	4	38	AGND
AOEXTREF_A/AI_0	5	39	AGND
AI_1	6	40	AGND
EXTTRIG/AI_2	7	41	AGND
AOEXTREF_B/AI_3	8	42	AGND
AO_4/AI_4	9	43	AGND
AO_5/AI_5	10	44	AGND
AO_6/AI_6	11	45	AGND
AO_7/AI_7	12	46	AGND
AO_TRIG_OUT_A	13	47	EXTWFTRG_A
AO_TRIG_OUT_B	14	48	EXTWFTRG_B
GPTC1_SRC	15	49	VCC
GPTC0_SRC	16	50	DGND
GPTC0_GATE	17	51	GPTC1_GATE
GPTC0_OUT	18	52	GPTC1_OUT
GPTC0_UPDOWN	19	53	GPTC1_UPDOWN
RESERVED	20	54	DGND
AFI1	21	55	AFI0
PB7	22	56	PB6
PB5	23	57	PB4
PB3	24	58	PB2
PB1	25	59	PB0
PC7	26	60	PC6
PC5	27	61	PC4
DNGD	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 are AI<4..7> for DAQ-2501 ; AO<4..7> for DAQ-2502
* The external references inputs and the external analog trigger share the analog input pins 5, 7, and 8

Quick Selection Guide

Model number	Analog Output				Analog Input				DIO	Timer/Counter
	No. of channels	Resolution	Update rate	Output range	No. of channels	Resolution	Sampling rate	Input range	No. of channels	No. of channels
DAQ-2501	4	12 bits	1 MS/s	±10 V, 0 to 10 V	8	14 bits	400 kS/s	±10 V or 0 to 10 V	24-CH 8255 PIO	2-CH, 16-bit
DAQ-2502	8	12 bits	1 MS/s	±10 V, 0 to 10 V	4	14 bits	400 kS/s	±10 V or 0 to 10 V	24-CH 8255 PIO	2-CH, 16-bit

Specifications

Model Number	DAQ-2501	DAQ-2502
Analog Output		
Number of channels	4 voltage outputs	8 voltage outputs
Resolution	12 bits	
Output ranges	0-10 V, ±10 V, 0-AOEXTREF, ±AOEXTREF	
Maximum update rate	1 MS/s	
Slew rate	20 V/µs	
Settling time	3 µs to ±0.5 LSB accuracy	
Offset error	±2 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	8 k samples	16 k samples
Data transfers	Programmed I/O, scatter-gather DMA	
Analog Input		
Resolution	14 bits, no missing codes	
Number of channels	8 single-ended	4 single-ended
Maximum sampling rate	400 kS/s	
Gain	1	
Bipolar input ranges	±10 V	
Unipolar input ranges	0-10 V	
Offset error	±1 mV	
Gain error	±0.03% of FSR	
Input coupling	DC	
Overvoltage protection	Power on: Continuous ±30 V, Power off: Continuous ±15 V	
Input impedance	1 GΩ/6 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	Polling, scatter-gather DMA	
Digital I/O		
Number of channels	24-CH 8255 programmable input/output	
Compatibility	5 V/TTL	
Data transfers	Programmed I/O	
Timer/Counter		
Number of channels	2	
Resolution	16 bits	
Compatibility	5 V/TTL	
Base clock available	40 MHz, external clock up to 10 MHz	
Auto Calibration		
On-board reference	+5 V	
Temperature drift	±2 ppm/˚C	
Stability	±6 ppm/1000 Hrs	
General Specifications		
Dimensions	175 mm x 107 mm (not including connectors)	
Connector	68-pin VHDCI female	
Operating temperature	0 to 55˚C	
Storage temperature	-20 to 70˚C	
Humidity	5 to 95 %, noncondensing	
Power requirements	+5 V 1.6 A typical	+5 V 2.12 A typical

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