DAQ/DAQe-2213/2214

16-CH 16-Bit 250 kS/s Low-Cost Multi-Function DAQ Cards

DAQ-2213/2214

DAQe-2213 / 2214

Introduction

ADLINK's DAQ/DAQe-2213/2214 cards can sample up to 16 AI channels with different gain settings and scan sequences, making them ideal for dealing with analog signals with various input ranges and sampling speeds. These devices also offer differential mode for 8 AI channels in order to achieve maximum noise elimination.

In addition to providing analog input functions, the DAQ/DAQe-2214 features 2-CH 12-bit analog outputs which are capable of waveform generation. The DAQ-2213/2214 and DAQe-2213/2214 also feature analog and digital triggering, 24-CH programmable digital I/O lines and 2-CH 16-bit general-purpose timer/counter.

Like all the other members in the DAQ-2000 and DAQe-2000 family, multiple DAQ/DAQe-2213/2214 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.

SSI bus cable for multiple card synchronization for DAQ/DAQe-2000 series

Terminal board DIN-68S-01 & 68-Pin SCSI-VHDCI cable ACL-10568-1

Features

- **Supports a 32-bit 3.3 V or 5 V PCI bus (DAQ-2213, DAQ-2214)**
- **x1 lane PCI Express® Interface (DAQe-2213, DAQe-2214)**
- **Onboard 1 k-sample A/D FIFO**
- **Bipolar or unipolar analog input ranges**
- **Programmable gains: x1, x2, x4, x8**
- **512-configuration channel gain queue**
- **Scatter-gather DMA**
- **2-CH 12-bit multiplying analog outputs with waveform generation (DAQ/DAQe-2214)**
- **Onboard 1 k-sample D/A FIFO (DAQ-2214, DAQe-2214)**
- **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 Vista/XP/2000/2003
- Linux

Recommended Software

- AD-Logger
- VB.NET/VC.NET/VB/VC++/BCB/Delphi
- DAQBench

Driver Support

- DAQPilot for Windows
- DAQPilot for LabVIEW™
- DAQ-MTLB for MATLAB®
- D2K-DASK for Windows
- D2K-DASK/X for Linux

Terminal Boards

DIN-68S-01

Terminal Board with One 68-pin SCSI-II Connector and DIN-Rail Mounting (cables are not included; for information on mating cables, refer to Section 14, Accessories.)

DAQ/DAQe-2214 (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

Pin Assignment

Connector CN1

AI0 (AIH0)	1	35	(AIL0) AI8
AI1 (AIH1)	2	36	(AIL1) AI9
AI2 (AIH2)	3	37	(AIL2) AI10
AI3 (AIH3)	4	38	(AIL3) AI11
AI4 (AIH4)	5	39	(AIL4) AI12
AI5 (AIH5)	6	40	(AIL5) AI13
AI6 (AIH6)	7	41	(AIL6) AI14
AI7 (AIH7)	8	42	(AIL7) AI15
NC	9	43	NC
NC	10	44	NC
NC	11	45	NC
NC	12	46	NC
NC	13	47	NC
NC	14	48	NC
NC	15	49	NC
NC	16	50	NC
AISENSE	17	51	AIGND
NC	18	52	NC
NC	19	53	NC
NC	20	54	NC
NC	21	55	NC
NC	22	56	NC
NC	23	57	NC
NC	24	58	NC
NC	25	59	NC
NC	26	60	NC
NC	27	61	NC
NC	28	62	NC
NC	29	63	NC
NC	30	64	NC
NC	31	65	NC
NC	32	66	NC
NC	33	67	NC
EXTATRIG	34	68	AIGND

Pin Assignment

Connector CN2

NC / DA0OUT*	1	35	AOGND* / NC
NC / DA1OUT*	2	36	AOGND* / NC
NC / AOEXTREF*	3	37	AOGND* / NC
NC	4	38	NC
DGND	5	39	DGND
RESERVED / EXTWFTRIG*	6	40	DGND
EXTDTRIG	7	41	DGND
SSHOUT	8	42	DGND
RESERVED	9	43	DGND
RESERVED	10	44	DGND
RESERVED / AFI1*	11	45	DGND
AFI0	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

* Note: Analog output related pins on the DAQ/DAQe-2214

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	Sampling rate	No. of channels	No. of channels
DAQ/DAQe-2213	8 DI/16 SE	16 bits	250 kS/s	±1.25 V to ±10 V	-	-	-	24-CH 8255 PIO	2-CH, 16-bit
DAQ/DAQe-2214	8 DI/16 SE	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	DAQ/DAQe-2213	DAQ/DAQe-2214
Analog Input		
Resolution	16 bits, no missing codes	
Number of channels	16 single-ended or 8 differential (software selectable per channel)	
Channel gain queue size	512	
Maximum update rate	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	±1 mV	
Gain error	±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)	83 dB	
Settling time	4 µs to 0.01% error	
-3 dB small signal bandwidth (gain = 1)	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	
Analog Output		
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
Digital I/O		
Number of channels	24-CH 8255 programmable input/output	
Compatibility	5 V/TTL	
Data transfers	Programmed I/O	
General-Purpose 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		
Onboard reference	+5 V	
Temperature drift	±2 ppm/°C	
Stability	±6 ppm/1000 Hrs	
General Specifications		
Dimensions	175 mm x 107 mm (not including connectors) (DAQ-2213/2214) 168 mm x 107 mm (not including connectors) (DAQe-2213/2214)	
Connector	68-pin VHDCI female x 2	
Operating temperature	0 to 55°C	
Storage temperature	-20 to 70°C	
Humidity	5 to 95 %, non-condensing	
Power requirements	+5 V 1.2 A typical (DAQ-2213) +3.3 V 0.84 A, +12 V 0.604 A typical (DAQe-2214)	+5 V 1.2 A typical (DAQ-2214) +3.3 V 0.77 A, +12 V 0.572 A typical (DAQe-2213)

*Gain = 1, 2, 4, 8