NEW

PCI-9222/9223

16/32-CH 16-Bit 250/500 kS/s Multi-Function DAQ Cards with Encoder Input

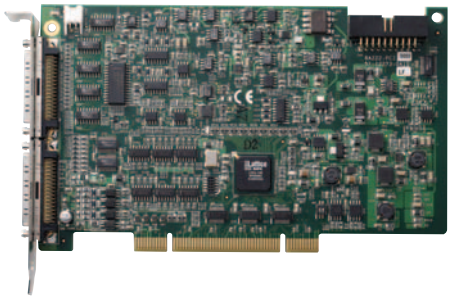
Features

- Supports a 32-bit 5 V PCI bus
- Programmable gains for analog input: 1, 2, 4, 5, 8, 10, 20, and 40
- 2-CH 16-bit simultaneous analog outputs, supporting up to 1 MS/s update rate
- Programmable function I/O, supporting modes:
  - 16-CH TTL DI and 16-CH TTL DO
  - 2 MHz 32-CH high-speed DIO
  - 4-CH 32-bit 80 MHz general-purpose timer/counter
  - 4-CH PWM outputs
- 2-CH 4 MHz encoder inputs, supporting AB phase, and CW/CCW
- Dedicated DMA channels for A/D, D/A, and high-speed DIO
- External digital trigger for A/D, D/A, and high-speed DIO
- Multiple card synchronization through SSI (System Synchronization Interface) bus
- Auto-calibration

Operating Systems
- Windows Vista/XP/2000/2003
- Linux

Recommended Software
- VB.NET/VC.NET/VB/VC++/BCB/Delphi
- DAQBench

Driver Support
- DAQPilot for Windows
- DAQ-LVIEW PnP for LabVIEW™
- DAQ-MTLB for MATLAB®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux



Introduction

The ADLINK PCI-9222/9223 is a 16-bit, 16/32-CH, 250/500 kS/s high performance DAQ card with 8 different input ranges. It also features 2-CH 16-bit analog outputs capable of a 1 MS/s update rate, 2-CH encoder inputs, and programmable function I/O. The software-programmable function I/O supports a variety of applications, including TTL digital I/O, high-speed DIO, general-purpose timer/counter, pulse generation, and PWM output. Analog input, analog output, and function I/O can function at full speed simultaneously, and multiple cards can be synchronized through the SSI (System Synchronization Interface) bus if users need more channels than a single board can provide. Ideal for mixed-signal tests, laboratory research, and factory automation, PCI-9222/9223 is the best single-board solution on the market providing the best integration capability of multiple tasks with high performance and an affordable price.

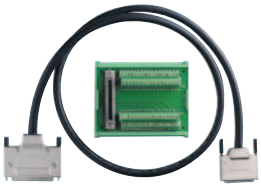
Termination Board

- **DIN-68S-01**
  Termination board with one 68-pin SCSI-II connector and DIN-Rail Mounting (Cables are not included. For more information on mating cables, refer to section 12.)

SSI Bus Cables (for multiple cards synchronization)

- ACL-SSI-2
  SSI Bus cable for two devices
- ACL-SSI-3
  SSI Bus cable for three devices
- ACL-SSI-4
  SSI Bus cable for four devices

SSI bus cable for multiple cards synchronization



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

Ordering Information

- **PCI-9222**
  16-CH 16-bit 250 kS/s Multi-Function DAQ Card with Encoder Input
- **PCI-9223**
  32-CH 16-bit 500 kS/s Multi-Function DAQ Card with Encoder Input

Pin Assignment

CN1 pin assignment for PCI-9223

AI0(AIH0)	34	68	AI16(AIL0)
AI1(AIH1)	33	67	AI17(AIL1)
AI2(AIH2)	32	66	AI18(AIL2)
AI3(AIH3)	31	65	AI19(AIL3)
AI4(AIH4)	30	64	AI20(AIL4)
AI5(AIH5)	29	63	AI21(AIL5)
AI6(AIH6)	28	62	AI22(AIL6)
AI7(AIH7)	27	61	AI23(AIL7)
AGND	26	60	AISENSE
AI8(AIH8)	25	59	AI24(AIL8)
AI9(AIH9)	24	58	AI25(AIL9)
AI10(AIH10)	23	57	AI26(AIL10)
AI11(AIH11)	22	56	AI27(AIL11)
AI12(AIH12)	21	55	AI28(AIL12)
AI13(AIH13)	20	54	AI29AIL13)
AI14(AIH14)	19	53	AI30(AIL14)
AI15(AIH15)	18	52	AI31(AIL15)
AGND	17	51	AGND
AO0	16	50	AGND
AO1	15	49	AGND
NC	14	48	NC
NC	13	47	NC
NC	12	46	NC
NC	11	45	NC
NC	10	44	NC
NC	9	43	NC
NC	8	42	NC
NC	7	41	NC
NC	6	40	NC
NC	5	39	NC
NC	4	38	NC
NC	3	37	NC
NC	2	36	NC
NC	1	35	NC

CN1 pin assignment for PCI-9222

AI0(AIH0)	34	68	AI8(AIL0)
AI1(AIH1)	33	67	AI9(AIL1)
AI2(AIH2)	32	66	AI10(AIL2)
AI3(AIH3)	31	65	AI11(AIL3)
AI4(AIH4)	30	64	AI12(AIL4)
AI5(AIH5)	29	63	AI13(AIL5)
AI6(AIH6)	28	62	AI14(AIL6)
AI7(AIH7)	27	61	AI15(AIL7)
AGND	26	60	AISENSE
NC	25	59	NC
NC	24	58	NC
NC	23	57	NC
NC	22	56	NC
NC	21	55	NC
NC	20	54	NC
NC	19	53	NC
NC	18	52	NC
AGND	17	51	AGND
AO0	16	50	AGND
AO1	15	49	AGND
NC	14	48	NC
NC	13	47	NC
NC	12	46	NC
NC	11	45	NC
NC	10	44	NC
NC	9	43	NC
NC	8	42	NC
NC	7	41	NC
NC	6	40	NC
NC	5	39	NC
NC	4	38	NC
NC	3	37	NC
NC	2	36	NC
NC	1	35	NC

CN2 pin assignment for PCI-9222/9223

GPI0/GPTC_CLK0	34	68	GPI8/GPTC_CLK2
GPI1/GPTC_UD0	33	67	GPI9/GPTC_UD2
GPI2/GPTC_GATE0	32	66	GPI10/GPTC_GATE2
GPI3/GPTC_AUX0	31	65	GPI11/GPTC_AUX2
GPI4/GPTC_CLK1	30	64	GPI12/GPTC_CLK3
GPI5/GPTC_UD1	29	63	GPI13/GPTC_UD3
GPI6/GPTC_GATE1	28	62	GPI14/GPTC_GATE3
GPI7/GPTC_AUX1	27	61	GPI15/GPTC_AUX3
DGND	26	60	DGND
GPO0/GPTC_OUT0	25	59	GPO8
GPO1/GPTC_OUT1	24	58	GPO9
GPO2/GPTC_OUT2	23	57	GPO10
GPO3/GPTC_OUT3	22	56	GPO11
GPO4	21	55	GPO12
GPO5	20	54	GPO13
GPO6	19	53	GPO14
GPO7	18	52	GPO15
DGND	17	51	DGND
DGND	16	50	DGND
DGND	15	49	DGND
+5Vout	14	48	DGND
NC	13	47	NC
NC	12	46	NC
NC	11	45	NC
NC	10	44	NC
E24V	9	43	NC
EGND	8	42	NC
IEA0+	7	41	IEA1+
IEA0-	6	40	IEA1-
IEB0+	5	39	IEB1+
IEB0-	4	38	IEB1-
IEZ0+	3	37	IEZ1+
IEZ0-	2	36	IEZ1-
IORG0	1	35	IORG1

Specifications

Model Number	PCI-9222 NEW	PCI-9223 NEW
Analog Input		
Resolution	16 bits	
Number of channels	16 SE/ 8 DIFF	32 SE/ 16 DIFF
Maximum Sampling rate (single channel)	250 kS/s	500 kS/s
Programmable gain	1, 2, 4, 5, 8, 10, 20, 40	
Input range	±10 V, ±5 V, ±2.5 V, ±2 V, ±1.25 V, ±1 V, ±500 mV, ±250 mV	
Offset error	±2.6 mV typical, before calibration, ±0.5 mV typical, after calibration	
Gain error	±0.2% of FSR, before calibration, ±0.015% of FSR, after calibration	
-3 dB small signal bandwidth (gain=1)	1.5 MHz	
System noise (gain=1)	0.5 mVRMS	
CMRR (gain=1)	93.5 dB	
SFDR (Spurious-free dynamic range, gain=1)	95 dB	88 dB
SINAD (Signal-to-noise and distortion ratio, gain=1)	86 dB	84 dB
THD (Total harmonic distortion, gain=1)	-94 dB	-90 dB
SNR (Signal-to-noise ratio, gain=1)	87 dB	86 dB
ENOB (gain=1)	13.9 bits	13.5 bits
FIFO buffer size	1 k samples	
Trigger sources	Software, external digital, SSI	
Trigger mode	Post trigger, retrigger, gate trigger	
External conversion source	Yes (up to 250 kS/s)	Yes (up to 500 kS/s)
Input coupling	DC	
Overvoltage protection	Continuous ±30 V	
Input impedance	High impedance > 1 GΩ	
Data Transfer	Programmed I/O, Interrupt, Bus Mastering DMA	
Analog Output		
Number of channels	2 voltage outputs	
Resolution	16-bit	
Maximum update rate	1 MHz (simultaneous update)	
FIFO	512	
Output Range	±10 V	
Output driving capacity	±5 mA	
Slew rate	20 V/μs	
Setting time (Full scale)	3 μs to ±0.5 LSB accuracy	
Offset error	±0.1 mV	
Gain error	±0.1 mV	
Rising time	0.67 μs	
Falling time	0.705 μs	
Function I/O		
Mode	Digital I/O, General Timer/Counter, Pulse Generation	
Digital I/O	16 DO (3.3 V TTL Level) / 16 DI (3.3 V or 5 V TTL Level)	
General Timer/Counter	Four 32-bit, Base clock: 80 MHz, external to 10 MHz	
Pulse Generation	Four PWM outputs (supporting single pulse generation and pulse train generation)	
Encoder Input		
Number of channels	2	
Encoder type	CW/CCW encoder, x 1 AB phase encoder, x 2 AB phase encoder, x 4 AB phase encoder	
General specs.		
PCI Bus	5 V & 3.3 V universal PCI bus	
Auto-calibration	Yes	
I/O Connector	Two 68-pin SCSI-VHDCI female	
Operation temperature	0 to 55˚C	
Storage temperature	-20 to 70˚C	
Relative humidity	5 to 95% non-condensing	
Power requirements	+5 V 1.2 A typical +12 V 760 mA typical -12 V 50 mA typical	
Dimensions	175 mm x 107 mm (not including connectors)	