Selection Guide

Selecting the right hardware, software, and accessories

This section provides a guideline to assist you in selecting:
(1) Hardware: platforms/systems and modules
(2) Software: drivers, componentware, third-party software support, and applications
(3) Accessories: terminal boards and cables for ADLINK test and measurement products

Hardware Selection

Accessory Selection

Software Selection

Analog Input/Output Cards

Interface	Analog Input				Analog Output				Digital I/O	Green Product	Model Number	Page
	No. of Channels	Sampling Rate (Max.)	Resolution		No. of Channels	Update Rate (Max.)	Resolution	Waveform Generator	No. of Channels			
PCI/PCI Express®	2-CH	65 MS/s	14-Bit	Simultaneous Sampling							PCI-9820	4-5
	4-CH	20 MS/s	12-Bit						3 DI		PCI-9812	4-7
			10-Bit								PCI-9810	4-7
		2 MS/s	14-Bit		2-CH	1 MS/s	12-Bit	YES			DAQ/DAQe-2010	2-7
		800 kS/s	16-Bit								DAQ/DAQe-2016	2-7
		500 kS/s									DAQ/DAQe-2005	2-7
		250 kS/s							24 DI/24 DO		DAQ/DAQe-2006	2-7
	96-CH	3 MS/s	12-Bit								DAQ/DAQe-2208	2-9
	64-CH	500 kS/s	16-Bit		2-CH	1 MS/s	12-Bit	YES			DAQ/DAQe-2204	2-11
		250 kS/s									DAQ/DAQe-2205	2-11
											DAQ/DAQe-2206	2-11
	16-CH	250 kS/s	16-Bit	Encoder Inputs		Static	16-Bit	YES	8 DI/4 DO		PCI-9221	2-5
						1 MS/s			16 DI/16 DO		PCI-9222	2-5
	32-CH	500 kS/s									PCI-9223	2-5
		250 kS/s							16 DI/16 DO Isolated		PCI-9114A-DG(1)	2-17
											PCI-9114A-HG(1)	2-17
		100 kS/s									PCI-9114DG(1)	2-17
											PCI-9114HG(1)	2-17

Analog Input/Output Cards

Interface	Analog Input			Analog Output				Digital I/O	Green Product	Model Number	Page
	No. of Channels	Sampling Rate (Max.)	Resolution	No. of Channels	Update Rate (Max.)	Resolution	Waveform Generator	No. of Channels			
PCI/PCI Express®	16-CH	100 kS/s	12-Bit							PCI-9113A(3)	2-22
		333 kS/s	12-Bit					4 DI/4 DO		PCI-9118DG/L(1)	2-21
										PCI-9118HG/L(1)	2-21
		250 kS/s	16-Bit					24 DI/24 DO		DAQ/DAQe-2213	2-15
				2-CH	1 MS/s	12-Bit	YES			DAQ/DAQe-2214	2-15
		100 kS/s	12-Bit	1-CH	Static	12-Bit		16 DI/16 DO		PCI-9111HR	2-18
										PCI-9111DG(1)	2-18
				2-CH						PCI/LPCI-9112	2-19
	8-CH	400 kS/s	14-Bit	4-CH	1 MS/s		YES	24 DI/24 DO		DAQ/DAQe-2501	2-13
	4-CH			8-CH						DAQ/DAQe-2502	2-13
				4-CH		16-Bit		16 DI/16 DO Isolated		PCI-6202	2-25
				8-CH	Static	12-Bit		4 DI/4 DO Isolated		PCI-6308V	2-24
										PCI-6308A(2)	2-24
						16-Bit		4 DI/4 DO		PCI/PCIe-6208V	2-27
										PCI-6208A(2)	2-27
				16-CH						PCI/PCIe-6216V	2-27
PXI	4-CH	2 MS/s	14-Bit	2-CH	1 MS/s	12-Bit	YES	24 DI/24 DO		PXI-2010	2-7
		800 kS/s	16-Bit							PXI-2016	2-7
		500 kS/s								PXI-2005	2-7
		250 kS/s								PXI-2006	2-7
	96-CH	3 MS/s	12-Bit							PXI-2208	2-9
	64-CH	500 kS/s	16-Bit	2-CH	1 MS/s	12-Bit	YES			PXI-2204	2-11
		250 kS/s								PXI-2205	2-11
	8-CH	400 kS/s	14-Bit	4-CH						PXI-2206	2-11
	4-CH			8-CH						PXI-2501	2-13
										PXI-2502	2-13
CompactPCI®	64-CH	250 kS/s	16-Bit	2-CH				8 DI/8 DO		cPCI-9116(6)	2-23
	16-CH	100 kS/s	12-Bit	2-Bit	Static	12-Bit		16 DI/16 DO		cPCI-9112(6)	2-19
				16CH		16-Bit		4 DI/4 DO		cPCI-6216V(6)	2-27
				8-CH						cPCI-6208A(6)(7)	2-27
										cPCI-6208V(6)	2-27

Simultaneous Sampling

Note:

(1) DG: Normal gain; HG: High gain

(2) PCI-6X08A: Current Output available

(3) Isolated analog input card

(4) Rear I/O version available

(5) Current output available

Low-Profile PCI Available

PCI Express® Version Available

Smart DAQ Solutions

PXI/DAQ/DAQe-2000 series

Simultaneous Sampling DAQ Cards

Analog Output Cards






Model Name	PXI/DAQ/DAQe-2010	PXI/DAQ/DAQe-2016	PXI/DAQ/DAQe-2005	PXI/DAQ/DAQe-2006	PXI/DAQ/DAQe-2501	PXI/DAQ/DAQe-2502
Form Factor	PXI/PCI[1]/PCI Express®	PXI/PCI[1]/PCI Express®	PXI/PCI[1]/PCI Express®	PXI/PCI[1]/PCI Express®	PXI/PCI[1]/PCI Express®	PXI/PCI[1]/PCI Express®
Bus-mastering DMA	Scatter-gather	Scatter-gather	Scatter-gather	Scatter-gather	Scatter-gather	Scatter-gather
Auto Calibration	√	√	√	√	√	√
Analog Input						
Analog Inputs	4 DI	4 DI	4 DI	4 DI	8 DI	4 DI
Max. Smapling Rates (S/s)	2 M	800 k	500 k	250 k	400 k	400 k
Simultaneous Sampling	√	√	√	√	√	√
AD Resolution (bits)	14	16	16	16	14	14
FIFO Size (samples)	8 k	512	512	512	1 k	1 k
Channel Gain Queue	-	-	-	-	-	-
Bipolar Input Ranges (V)	±10 V to ±1.25 V	±10 V to ±1.25 V	±10 V to ±1.25 V	±10 V to ±1.25 V	±10 V	±10 V
Unipolar Input Ranges (V)	0-10 V to 0-1.25 V	0-10 V to 0-1.25 V	0-10 V to 0-1.25 V	0-10 V to 0-1.25 V	0-10 V	0-10 V
Analog Output						
Voltage Outputs	2 + AWG [2]	2 + AWG [2]	2 + AWG [2]	2 + AWG [2]	4 + AWG [2]	8 + AWG [2]
Update Rate (S/s)	1 M	1 M	1 M	1 M	1 M	1 M
Simultaneous Update	√	√	√	√	√	√
DA Resolution (bits)	12	12	12	12	12	12
FIFO Size (samples)	2 k	2 k	2 k	2 k	2 k	2 k
Settling Time	3 µs	3 µs	3 µs	3 µs	3 µs	3 µs
Analog Output Ranges	±10 V, ±EXTREF, 0-10 V, 0-EXTREF	±10 V, ±EXTREF, 0-10 V, 0-EXTREF	±10 V, ±EXTREF, 0-10 V, 0-EXTREF	±10 V, ±EXTREF, 0-10 V, 0-EXTREF	±10 V, ±EXTREF, 0-10 V, 0-EXTREF	±10 V, ±EXTREF, 0-10 V, 0-EXTREF
Digital I/O, Timer/Counter, and External Trigger						
Digital I/O	24-bit 8255 PIO	24-bit 8255 PIO	24-bit 8255 PIO	24-bit 8255 PIO	24-bit 8255 PIO	24-bit 8255 PIO
Timer/Counter	16-bit x2	16-bit x2	16-bit x2	16-bit x2	16-bit x2	16-bit x2
Analog Trigger	√	√	√	√	√	√
Digital Trigger	√	√	√	√	√	√
Page Number	2-6	2-6	2-6	2-6	2-13	2-13

Multi-Function DAQ Cards






Model Name	PXI/DAQ/DAQe-2204	PXI/DAQ/DAQe-2205	PXI/DAQ/DAQe-2206	DAQ/DAQe-2213	DAQ/DAQe-2214	PXI/DAQ/DAQe-2208
Form Factor	PXI/PCI[1]/PCI Express®	PXI/PCI[1]/PCI Express®	PXI/PCI[1]/PCI Express®	PXI/PCI[1]/PCI Express®	PXI/PCI[1]/PCI Express®	PXI/PCI[1]/PCI Express®
Bus-mastering DMA	Scatter-gather	Scatter-gather	Scatter-gather	Scatter-gather	Scatter-gather	Scatter-gather
Auto Calibration	√	√	√	√	√	√
Analog Input						
Analog Inputs	64 SE/32 DI	64 SE/32 DI	64 SE/32 DI	16 SE/8 DI	16 SE/8 DI	96 SE/48 DI
Max. Smapling Rates (S/s)	3 M	500 k	250 k	250 k	250 k	3 M
Simultaneous Sampling	-	-	-	-	-	-
AD Resolution (bits)	12	16	16	16	16	12
FIFO Size (samples)	1 k	1 k	1 k	1 k	1 k	1 k
Channel Gain Queue	512	512	512	512	512	1024
Bipolar Input Ranges (V)	±10 V to ±0.05 V	±10 V to ±1.25 V	±10 V to ±1.25 V	±10 V to ±1.25 V	±10 V to ±1.25 V	±10 V to ±0.05 V
Unipolar Input Ranges (V)	0-10 V to 0-0.1 V	0-10 V to 0-1.25 V	0-10 V to 0-1.25 V	0-10 V to 0-1.25 V	0-10 V to 0-1.25 V	0-10 V to 0-0.1 V
Analog Output						
Voltage Outputs	2 + AWG[2]	2 + AWG[2]	2 + AWG[2]	-	2 + AWG[2]	-
Update Rate (S/s)	1 M	1 M	1 M	-	1 M	-
Simultaneous Update	√	√	√	-	√	-
DA Resolution (bits)	12	12	12	-	12	-
FIFO Size (samples)	1 k	1 k	1 k	-	1 k	-
Settling Time	3 µs	3 µs	3 µs	-	3 µs	-
Analog Output Ranges	±10 V, ±EXTREF, 0-10 V, 0-EXTREF	±10 V, ±EXTREF, 0-10 V, 0-EXTREF	±10 V, ±EXTREF, 0-10 V, 0-EXTREF	-	±10 V, ±EXTREF, 0-10 V, 0-EXTREF	-
Digital I/O, Timer/Counter, and External Trigger						
Digital I/O	24-bit 8255 PIO	24-bit 8255 PIO	24-bit 8255 PIO	24-bit 8255 PIO	24-bit 8255 PIO	24-bit 8255 PIO
Timer/Counter	16-bit x2	16-bit x2	16-bit x2	16-bit x2	16-bit x2	-
Analog Trigger	√	√	√	√	√	√
Digital Trigger	√	√	√	√	√	√
Page Number	2-11	2-11	2-11	2-15	2-15	2-9

Legend: √ Supported - Not available

Notes: (1) Supports 3.3 V/5 V PCI

(2) Analog outputs with hardware-based arbitrary waveform generation.

Multi-Function DAQ Cards

Multi-Function DAQ Cards






Model Name	PCI-9222/9223	PCI-9221	PCI-9114(A)-DG/-HG	PCI/LPCI/cPCI-9112	PCI-9111DG/HR	cPCI-9116
Form Factor	PCI [3]	PCI [3]	PCI [4]	PCI [3] /CompactPCI®	PCI [4]	CompactPCI®
Bus-mastering DMA	√	√	-	√	-	√
Auto Calibration	√	√	-	-	-	-
Analog Input						
Analog Inputs	32 SE/16 DI (PCI-9223) 16 SE/8 DI (PCI-9222)	16 SE/8 DI	32 SE/16 DI	16 SE/8 DI	16 SE	64 SE/ 32 DI
Max. Smapling Rates (S/s)	500 k (PCI-9223) 250 k (PCI-9222)	250 k	250 k (PCI-9114A-DG/-HG) 100 k (PCI-9114DG/HG)	110 k	100 k	250 k
AD Resolution (bits)	16	16	16	12	12 (PCI-9111DG) 16 (PCI-9111HR)	12
FIFO Size (samples)	1 k	1 k	1 k	8	1 k	1 k
Channel Gain Queue	√	√	-	–	–	-
Bipolar Input Ranges (V)	±10 V to ±0.25 V	±5 V to ±0.2 V	±10 V to ±1.25 V (PCI-9114(A)-DG)/ ±10 V to ±0.1 V (PCI-9114(A)-HG)	±10 V to ±0.625 V	±10 V to ±0.625 V	±5 V, ±2.5 V, ±1.25 V, ±0.625 V
Unipolar Input Ranges (V)	-	-	-	0-10 V to 0-1.25 V	–	0-10 V, 0-5 V, 0-2.5 V, 0-1.25 V
Analog Output						
Voltage Outputs	2	2	-	2	1	-
Update Rate (S/s)	1 M	Static	-	33 k [1]	33 k [1]	-
DA Resolution (bits)	16	16	-	12	12	-
Settling Time	3 µs	Static	-	30 µs	30 µs	-
Analog Output Ranges	±10 V	±5 V	-	0-5 V, 0-10 V, 0-EXTREF	±10 V, 0-10 V	-
Digital I/O, Timer/Counter, and External Trigger						
Digital I/O	16 DI, 16 DO [2]	8 DI, 4 DO [2]	16 DI, 16 DO (Isolated)	16 DI, 16 DO	16 DI, 16 DO	8 DI, 8 DO
Timer/Counter	32-bit x 4	32-bit x 2	16-bit	16-bit	-	1-CH 16-bit
Analog Trigger	-	-	-	-	-	-
Digital Trigger	√	√	√	√	√	√
Page Number	2-5	2-6	2-17	2-19	2-18	2-23

Legend: √ Supported – Not available Note: (1) Actual maximum update rate is dependent on system performance. (2) Programmable Function I/O (3) 3.3 V or 5 V universal PCI bus (4) 5 V PCI bus

PCI AI Cards


Model Name	PCI-9118 DG/L PCI-9118 HG/L	PCI-9113A
Form Factor	PCI [3]	PCI [3]
Bus-mastering DMA	√	-
Analog Input		
Analog Inputs	16 SE/8 DI	32 SE/ 16 DI
Max. Sampling Rate (S/s)	333 k	100 k (Isolated)
AD Resolution (bits)	12	12
FIFO Size (samples)	1 k	1 k
Channel gain Queue	256	-
Bipolar Input Ranges	±5 V to ±0.05 V	±10 V to ±0.05 V
Unipolar Input Ranges	0-10 V to 0-0.1 V	0-10 V to 0-0.1 V
Digital I/O, Timer/Counter, and External Trigger		
Digital I/O	4 DI, 4 DO	-
Timer/Counter	-	-
Analog Trigger	-	-
Digital Trigger	√	-
Page Number	2-21	2-22

Legend: √ Supported – Not available

Notes: (1) Actual maximum update rate is dependent on system performance.
(2) 3.3 V or 5 V universal PCI bus
(3) 5 V PCI bus

PCI AO Cards

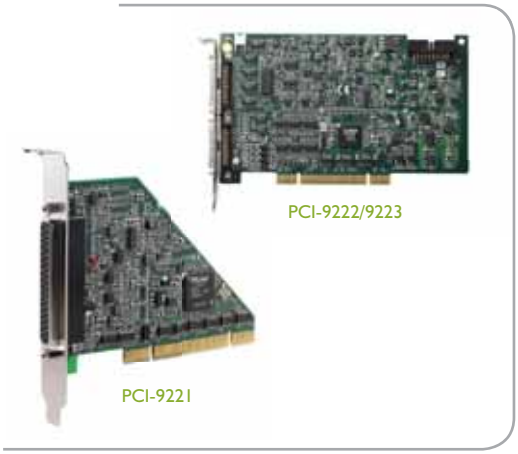




Model Name	PCI-6202	cPCI/PCI-6216V-GL cPCI/PCI-6208V-GL	cPCI/PCI-6208A	PCI-6308V	PCI-6308A
Form Factor	PCI [2]	PCI [2] / CompactPCI®	PCI [3] / CompactPCI®	PCI [2]	PCI [2]
Bus-mastering DMA	√	-	-	-	-
Analog Output					
Voltage Outputs	4	16 (cPCI/PCI-6216) 8 (cPCI/PCI-6208)	8	8	8
Current Outputs	-	-	8	-	8
Update Rate (S/s)	1 M	454 k [1]	454 k [1]	250 k (Isolated) [1]	250 k (Isolated) [1]
Simultaneous Update	√	-	-	√	√
DA Resolution (bits)	16	16	16	12	12
FIFO Size (samples)	512	-	-	-	–
Settling Time	3 µs	2 µs	17 µs	16 µs	17 µs
Voltage Output Ranges	±10 V	±10 V	±10 V	±10 V, 0-10 V, 0-EXTREF0	±10 V, 0-10 V, 0-EXTREF
Current Output Ranges	-	-	0-20 mA, 4-20 mA, 5-25 mA	-	0-20 mA, 4-20 mA, 5-25 mA
Digital I/O, Timer/Counter, and External Trigger					
Digital I/O	16 DI, 16 DO (Isolated)	4 DI, 4 DO	4 DI, 4 DO	4 DI, 4 DO (Isolated)	4 DI, 4 DO (Isolated)
Timer/Counter	32-bit x 4	-	-	-	-
Analog Trigger	-	-	-	-	-
Digital Trigger	√	-	-	-	-
Page Number	2-25	2-27	2-27	2-24	2-24

PCI-9221/9222/9223

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



Introduction

The PCI-9221/9222/9223 are ADLINK's next-generation high performance DAQ cards. PCI-9221/9222/9223 are 16-bit, 16/32-CH, 250/500 kS/s multi-function DAQ cards with 4/8 different input ranges. They also feature 2-CH 16-bit simultaneous analog outputs and programmable function I/O. The software-programmable function I/O supports a variety of applications, including TTL digital I/O, high-speed DIO (PCI-9222/9223 only), general-purpose timer/counter, pulse generation, encoder input, and PWM output. Analog input, analog output, and function I/O can operate at full speed simultaneously. For the PCI-9222/9223, multiple cards can be synchronized through the SSI (System Synchronization Interface) bus if more channels are needed. Ideal for mixed-signal tests, laboratory research, and factory automation, the PCI-9221/9222/9223 are the best single-board solutions on the market providing the best integration capability of multiple tasks with high performance and an affordable price.

Features

- **Supports a 32-bit 3.3 V or 5 V PCI bus**
- **Programmable gains for analog input: 1, 2, 4, 5, 8, 10, 20, 40 (PCI-9222/9223) 1, 5, 10, 25 (PCI-9221)**
- **2-CH 16-bit simultaneous analog outputs, up to 1 MS/s analog output update rate (PCI-9222/9223)**
- **Programmable function I/O, supporting modes:**
  - **TTL DI and TTL DO**
  - **2 MHz High-Speed DIO (PCI-9222/9223 only)**
  - **General-purpose timer/counter**
  - **PWM outputs**
  - **Encoder inputs**
- **Dedicated 2-CH 4 MHz encoder inputs, supporting AB phase, and CW/CCW (PCI-9222/9223)**
- **Dedicated DMA channels for A/D, D/A, and high-speed DIO (PCI-9222/9223)**
- **External digital trigger for A/D, D/A, and high-speed DIO (PCI-9222/9223)**
- **Multiple card synchronization through SSI (System Synchronization Interface) bus (PCI-9222/9223)**
- **Auto-calibration**

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 (for PCI-9222/9223)

Terminal 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 14, Accessories.)

TB-9221-01 (for PCI-9221)

General-purpose Terminal Board with One 37-pin D-Sub Connector. Supports Differential to Single-ended Encoder Signal Conversion of PCI-9221's Function I/O Through Jumper Switching. (Cables are not included.)

DIN-37D-01 (for PCI-9221)

Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included.)

SSI Bus Cables (for PCI-9222/9223) (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

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

PCI-9221
16-Bit Multi-Function DAQ Card with 2-CH Encoder Input

SSI bus cable for multiple cards synchronization

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

TB-9221-01

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

CN1 pin assignment For PCI-9221

GPO2	1	20	GPO3
DGND	2	21	GPO1/GPTC_OUT1
GPO0/GPTC_OUT0	3	22	GPI1/ORG1/GPTC_AUX1
GPI6/EZ1/GPTC_GATE1	4	23	DGND
GPI5/EB1/GPTC_UD1	5	24	GPI4/EA1/GPTC_CLK1
GPI3/ORG0/GPTC_AUX0	6	25	GPI2/EZ0/GPTC_GATE0
DGND	7	26	GPI1/EB0/GPTC_UD0
GPI0/EA0/GPTC_CLK0	8	27	AO1
AGND	9	28	AO0
AGND	10	29	AI15(AIL7)
AI7(AIH7)	11	30	AI14(AIL6)
AI6(AIH6)	12	31	AI13(AIL5)
AI5(AIH5)	13	32	AI12(AIL4)
AI4(AIH4)	14	33	AISENSE
AGND	15	34	AI11(AIL3)
AI3(AIH3)	16	35	AI10(AIL2)
AI2(AIH2)	17	36	AI9(AIL1)
AI1(AIH1)	18	37	AI8(AIL0)
AI0(AIH0)	19		

Specifications

Model Name	PCI-9221	PCI-9222	PCI-9223
Analog Input			
Resolution	16 bits		
Number of channels	16 SE/ 8 DIFF	16 SE/ 8 DIFF	32 SE/ 16 DIFF
Maximum sampling rate (single channel)	250 kS/s	250 kS/s	500 kS/s
Programmable gain	1, 5,10, 25	1, 2, 4, 5, 8, 10, 20, 40	1, 2, 4, 5, 8, 10, 20, 40
Input range	±5 V, ±1 V, ±500 mV, ±200 mV	±10 V, ±5 V, ±2.5 V, ±2 V, ±1.25 V, ±1 V, ±500 mV, ±250 mV	±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)	1.8 MHz	1.5 MHz	1.5 MHz
System noise (gain=1)	0.1 mV_{RMS}	0.5 mV_{RMS}	0.5 mV_{RMS}
CMRR (gain=1)	71 dB	93.5 dB	93.5 dB
SFDR (Spurious-free dynamic range, gain=1)	95 dB	95 dB	88 dB
SINAD (Signal-to-noise and distortion ratio, gain=1)	85 dB	86 dB	84 dB
THD (Total harmonic distortion, gain=1)	-93 dB	-94 dB	-90 dB
SNR (Signal-to-noise ratio, gain=1)	86 dB	87 dB	86 dB
ENOB (gain=1)	13.5 bits	13.9 bits	13.5 bits
FIFO buffer size	1 k samples		
Trigger sources	Software, external digital	Software, external digital, SSI	Software, external digital, SSI
Trigger mode	Post trigger	Post trigger, retrigger, gate trigger	Post trigger, retrigger, gate trigger
External conversion source	Yes (up to 250 kS/s)	Yes (up to 250 kS/s)	Yes (up to 500 kS/s)
Input coupling	DC		
Overvoltage protection	±10 V	Continuous ±30 V	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	1.25 kS/s (static)	1 MHz (simultaneous update)	1 MHz (simultaneous update)
FIFO	-	512	512
Output range	±5 V	±10 V	±10 V
Output driving capacity	±5 mA		
Slew rate	0.014 V/µs	20 V/µs	20 V/µs
Setting time (0.1% of full scale)	1396 µs	2.6 µs	2.6 µs
Offset error	±1 mV	±0.1 mV	±0.1 mV
Gain error	±2 mV	±0.1 mV	±0.1 mV
Rising time	390 µs	0.67 µs	0.67 µs
Falling time	395 µs	0.705 µs	0.705 µs
Function I/O			
Mode	Digital I/O(1) , General Timer/Counter(1), Pulse Generation(1)	Digital I/O, General Timer/Counter, Pulse Generation	Digital I/O, General Timer/Counter, Pulse Generation
Digital I/O	8DI/4DI (5 V TTL level)	16 DO (3.3 V TTL Level) / 16 DI (3.3 V or 5 V TTL Level)	16 DO (3.3 V TTL Level) 16 DI (3.3 V or 5 V TTL Level)
General Timer/Counter	Two 32-bit, Base clock: 40 MHz, external to 10 MHz	Four 32-bit, Base clock: 80 MHz, external to 10 MHz	Four 32-bit, Base clock: 80 MHz, external to 10 MHz
Pulse generation	Two PWM outputs (Modulation frequency: 0.005 Hz to 5 MHz; Duty cycle: 1%-99%)	Four PWM outputs (Modulation frequency: 0.01 Hz to 5 MHz; Duty cycle: 1%-99%)	Four PWM outputs (Modulation frequency: 0.01 Hz to 5 MHz; Duty cycle: 1%-99%)
Encoder Input			
Number of channels	2(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 and 3.3 V universal PCI bus		
Auto-calibration	Yes		
I/O Connector	One 37-pin D-Sub connector	Two 68-pin SCSI-VHDCI female	Two 68-pin SCSI-VHDCI female
Operation temperature	0 to 45˚C	0 to 55˚C	0 to 55˚C
Storage temperature	-20 to 80˚C	-20 to 70˚C	-20 to 70˚C
Humidity	5 to 95% non-condensing		
Power requirements	+5 V 1A typical, +12 V 100mA typical, -12 V 100mA typical	+5 V 1.2 A typical +12 V 760 mA typical -12 V 50 mA typical	+5 V 1.2 A typical +12 V 760 mA typical -12 V 50 mA typical
Dimensions	120 mm x 87 mm	175 mm x 107 mm (not including connectors)	175 mm x 107 mm (not including connectors)

Note:

(1) The function I/O and encoder inputs share the same I/O pins of the PCI-9221. Only one of these modes can be selected.

(2) Dedicated

PXI/DAQ/DAQe-2000 Series

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

DAQ-2010

DAQe-2010

PXI-2010

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 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.)

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

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

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

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
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
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 2016, 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-2016	4-CH DI	16 bits	800 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-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-2016	PXI/DAQ/DAQe-2005	PXI/DAQ/DAQe-2006
Analog Input				
Resolution	14 bits	16 bits, no missing codes	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	800 kS/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	±1 mV	±1 mV	±1 mV
Gain error	±0.03% of FSR	±0.01% of FSR	±0.01% of FSR	±0.01% 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	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	512 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	2 k samples			
Data transfers	Programmed I/O, scatter-gather DMA			
Digital I/O				
Number of channels	8255 24-bit 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				
Onboard reference	+5 V			
Temperature drift	±2 ppm/˚C			
Stability	6 ppm/1000 Hrs			
General				
Dimensions	160 mm x 100 mm (not including connectors) (PXI-2000 series) 175 mm x 107 mm (not including connectors) (DAQ-2000 series) 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) +3.3 V 1.246 A, +12 V 0.448 A typical (DAQe-2010)	+5 V 2.26 A typical (PXI/DAQ-2016) +3.3 V 0.569 A, +12 V 1.097 A typical (DAQe-2016)	+5 V 2.04 A typical (PXI/DAQ-2005) +3.3 V 1.03 A, +12 V 0.75 A typical (DAQe-2005)	+5 V 1.82 A typical (DAQ-2006) +3.3 V 1.02 A, +12 V 0.67 A typical (DAQe-2006)

PXI/DAQ/DAQe-2208

96-CH 12-Bit 3 MS/s Ultra High-Density Analog Input Cards

DAQ-2208

DAQe-2208

PXI-2208

Introduction

ADLINK's PXI/DAQ/DAQe-2208 are ultra-highdensity and high-performance analog input cards. These decvices can sample up to 96 AI channels with different gain settings and scan sequences, making them ideal for dealing with ultra-high-density analog signals with various input ranges and sampling speeds. These devices also offer differential mode for 48 AI channels in order to achieve maximum noise elimination.

The PXI/DAQ/DAQe-2208 also features analog and digital triggering and 24-CH programmable digital I/O lines. Like all the other members in the PXI/DAQ/DAQe-2000 family, the PXI/DAQ/DAQe-2208 are able to perform analog input at full speed while 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 so 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-2208)**
- **x1 lane PCI Express® Interface (DAQe-2208)**
- **PXI Specification Rev. 2.2 compliant (PXI-2208)**
- **96-CH single-ended or 48-CH differential analog inputs**
- **Onboard 1 k-sample A/D FIFO**
- **Bipolar or unipolar analog input ranges**
- **Programmable gains of x1, x2, x4, x5, x8, x10, x20, x40, x50, x200**
- **1024-configuration channel gain queue**
- **Scatter-gather DMA for analog inputs**
- **24-CH TTL digital input/output**
- **Analog and digital triggering**
- **Fully auto calibration**
- **Multiple cards synchronization through SSI (System Synchronization Interface) bus or PXI trigger 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

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

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.)

Pin Assignment

Connector CN1 Pin Assignment

AI0 (AIH0)	1	35	(AIL0) AI48
AI1 (AIH1)	2	36	(AIL1) AI49
AI2 (AIH2)	3	37	(AIL2) AI50
AI3 (AIH3)	4	38	(AIL3) AI51
AI4 (AIH4)	5	39	(AIL4) AI52
AI5 (AIH5)	6	40	(AIL5) AI53
AI6 (AIH6)	7	41	(AIL6) AI54
AI7 (AIH7)	8	42	(AIL7) AI55
AISENSE	9	43	AIGND
AI8 (AIH8)	10	44	(AIL8) AI56
AI9 (AIH9)	11	45	(AIL9) AI57
AI10 (AIH10)	12	46	(AIL10) AI58
AI11 (AIH11)	13	47	(AIL11) AI59
AI12 (AIH12)	14	48	(AIL12) AI60
AI13 (AIH13)	15	49	(AIL13) AI61
AI14 (AIH14)	16	50	(AIL14) AI62
AI15 (AIH15)	17	51	(AIL15) AI63
AI16 (AIH16)	18	52	(AIL16) AI64
AI17 (AIH17)	19	53	(AIL17) AI65
AI18 (AIH18)	20	54	(AIL18) AI66
AI19 (AIH19)	21	55	(AIL19) AI67
AI20 (AIH20)	22	56	(AIL20) AI68
AI21 (AIH21)	23	57	(AIL21) AI69
AI22 (AIH22)	24	58	(AIL22) AI70
AI23 (AIH23)	25	59	(AIL23) AI71
AIGND	26	60	AIGND
AI24 (AIH24)	27	61	(AIL24) AI72
AI25 (AIH25)	28	62	(AIL25) AI73
AI26 (AIH26)	29	63	(AIL26) AI74
AI27 (AIH27)	30	64	(AIL27) AI75
AI28 (AIH28)	31	65	(AIL28) AI76
AI29 (AIH29)	32	66	(AIL29) AI77
AI30 (AIH30)	33	67	(AIL30) AI78
AI31 (AIH31)	34	68	(AIL31) AI79

Pin Assignment

Connector CN2 Pin Assignment

AI32 (AIH32)	1	35	(AIL32) AI80
AI33 (AIH33)	2	36	(AIL33) AI81
AI34 (AIH34)	3	37	(AIL34) AI82
AI35 (AIH35)	4	38	(AIL35) AI83
AI36 (AIH36)	5	39	(AIL36) AI84
AI37 (AIH37)	6	40	(AIL37) AI85
AI38 (AIH38)	7	41	(AIL38) AI86
AI39 (AIH39)	8	42	(AIL39) AI87
EXTATRIG	9	43	AIGND
AI40 (AIH40)	10	44	(AIL40) AI88
AI41 (AIH41)	11	45	(AIL41) AI89
AI42 (AIH42)	12	46	(AIL42) AI90
AI43 (AIH43)	13	47	(AIL43) AI91
AI44 (AIH44)	14	48	(AIL44) AI92
AI45 (AIH45)	15	49	(AIL45) AI93
AI46 (AIH46)	16	50	(AIL46) AI94
AI47 (AIH47)	17	51	(AIL47) AI95
AIGND	18	52	AIGND
N/C	19	53	N/C
EXTDTRIG	20	54	AFI0
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

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

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-2208	48 DI/96 SE	12 bits	3 MS/s	±0.05V to ±10 V	-	-	-	24-bit 8255 PIO	-

Specifications

Model Name	PXI/DAQ/DAQe-2208
Analog Input	
Resolution	12 bits, no missing codes
Number of channels	96 single-ended or 48 differential
Channel gain queue size	1024
Maximum sampling rate	3 MS/s
Programmable gain	1, 2, 4, 5, 8, 10, 20, 40, 50, 200
Bipolar input ranges	±10 V, ±5 V, ±2.5 V, ±2 V, ±1.25 V, ±1 V, ±0.5 V, ±0.25 V, ±0.2 V, ±0.05 V
Unipolar input ranges	0-10 V, 0-5 V, 0-4 V, 0-2.5 V, 0-1 V, 0-0.5 V, 0-0.4 V, 0-0.1 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/100 pF
CMRR (gain = 1)	90 dB
Settling time	1 µs to 0.1 % error *
-3 dB small signal bandwidth (gain = 1)	2 MHz
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
Digital I/O	
Number of channels	24-CH 8255 programmable input/output
Compatibility	5 V/TTL
Data transfers	Programmed I/O
Auto Calibration	
Onboard reference	+5 V
Temperature drift	±2 ppm/°C
Stability	±6 ppm/1000 Hrs
General Specifications	
Dimensions	160 mm x 100 mm (not including connectors) (PXI-2208) 175 mm x 107 mm (not including connectors) (DAQ-2208) 168 mm x 107 mm (not including connectors) (DAQe-2208)
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 0.95 A typical (PXI/DAQ-2208) +3.3 V 0.81 A, +12 V 0.568 A typical (DAQe-2208)

*Gain = 1, 2, 4, 8

PXI/DAQ/DAQe-2200 Series

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

DAQ-2204

DAQe-2204

PXI-2204

Introduction

ADLINK's PXI/DAQ/DAQe-2200 series are high-density and high-performance multi-function DAQ cards. These devices can sample up to 64 AI channels with different gain settings and scan sequences, making 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 PXI/DAQ/DAQe-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/counter. Like all the other members in the PXI/DAQ/DAQe-2200 family, the PXI/DAQ/DAQe-2200 is 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.

Features

- **Supports a 32-bit 3.3 V or 5 V PCI bus (DAQ-2200 series)**
- **x1 lane PCI Express® Interface (DAQe-2200 series)**
- **PXI specification Rev 2.2 compliant (PXI-2200 series)**
- **64-CH single-ended or 32-CH differential analog inputs**
- **Onboard 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/DAQe-2204)**
  - **x1, x2, x4, x8 (DAQ/DAQe-2205 & DAQ/DAQe-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**
- **Onboard 1 k-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 or PXI trigger 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.)

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

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

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	AIGND
AI16 (AIH16)	18	52	(AIL16) AI48
AI17 (AIH17)	19	53	(AIL17) AI49
AI18 (AIH18)	20	54	(AIL18) AI50
AI19 (AIH19)	21	55	(AIL19) AI51
AI20 (AIH20)	22	56	(AIL20) AI52
AI21 (AIH21)	23	57	(AIL21) AI53
AI22 (AIH22)	24	58	(AIL22) AI54
AI23 (AIH23)	25	59	(AIL23) AI55
AI24 (AIH24)	26	60	(AIL24) AI56
AI25 (AIH25)	27	61	(AIL25) AI57
AI26 (AIH26)	28	62	(AIL26) AI58
AI27 (AIH27)	29	63	(AIL27) AI59
AI28 (AIH28)	30	64	(AIL28) AI60
AI29 (AIH29)	31	65	(AIL29) AI61
AI30 (AIH30)	32	66	(AIL30) AI62
AI31 (AIH31)	33	67	(AIL31) AI63
EXTATRIG	34	68	AIGND

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
EXTWFTRIG	6	40	DGND
EXTDTRIG	7	41	DGND
SSHOUT	8	42	SDI0 / DGND*
RESERVED	9	43	SDI1 / DGND*
RESERVED	10	44	SDI2 / DGND*
AFI1	11	45	SDI3 / 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

*Pin 42-45 are SDI<0..3> for 2204; DGND for 2205 and 2206

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-2204	32 DI/64 SE	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
PXI/DAQ/DAQe-2205	32 DI/64 SE	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-2206	32 DI/64 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

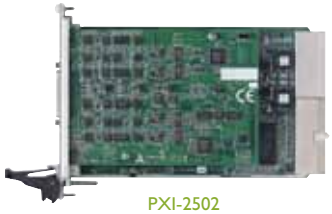
Model Name	PXI/DAQ/DAQe-2204	PXI/DAQ/DAQe-2205	PXI/DAQ/DAQe-2206
Analog Input			
Resolution	12 bits, no missing codes	16 bits, no missing codes	16 bits, no missing codes
Number of channels	64 single-ended or 32 differential (software selectable per channel)		
Channel gain queue size	512		
Maximum sampling 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 V0-10 V, 0-5 V, 0-2.5 V, 0-1.25 V0-10 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
-3 dB 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		
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 bit		
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	160 mm x 100 mm (not including connectors) (PXI-2200 series) 175 mm x 107 mm (not including connectors) (DAQ-2200 series) 168 mm x 107 mm (not including connectors) (DAQe-2200 series)		
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 1.3 A typical (PXI/DAQ-2204) +3.3 V 0.9 A, +12 V 0.564 A typical (DAQe-2204)	+5 V 1.2 A typical (PXI/DAQ-2205) +3.3 V 0.81 A, +12 V 0.568 A typical (DAQe-2205)	+5 V 1.2 A typical (PXI/DAQ-2206) +3.3 V 0.756 A, +12 V 0.584 A typical (DAQe-2206)

PXI/DAQ/DAQe-2500 Series

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


DAQ-2502


DAQe-2502


PXI-2502

Introduction

ADLINK's PXI/DAQ/DAQe-2500 series are high-speed and high-performance analog output multi-function DAQ cards able to update up to 8-CH, 12-bit analog outputs simultaneously while sustaining a 1 MS/s rate. The reference sources and the output polarities are programmable on a per channel basis. Combined with a multiplying DAC architecture, the ADLINK PXI/DAQ/DAQe-2500 series of DAQ cards can generate complex modulated analog signals.

The hardware-based arbitrary waveform generation reduces CPU loading even when all analog outputs are updating at full speed, and the lengths of waveforms are only limited by the system memory.

The PXI/DAQ/DAQe-2500 series integrates up to 8-CH, 400 kS/s, 14-bit single-ended analog inputs with programmable polarity, 24-CH programmable digital I/O lines, and a 2-CH 16-bit general-purpose timer/counter.

The PXI/DAQ/DAQe-2500 series is able to perform analog input and output functions at full speed simultaneously and multiple cards can be synchronized through the SSI (System Synchronization Interface) bus or PXI trigger 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.

Features

- **Supports a 32-bit 3.3 V or 5 V PCI bus (DAQ-2500 series)**
- **PXI specification Rev 2.2 compliant (PXI-2500 series)**
- **x1 lane PCI Express® Interface (DAQe-2500 series)**
- **Hardware-based arbitrary waveform generation**
- **Onboard 8 k-sample D/A FIFO (PXI/DAQ/DAQe-2501)**
- **Onboard 16 k-sample D/A FIFO (PXI/DAQ/DAQe-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 (PXI/DAQ/DAQe-2501)**
- **4-CH 400 kS/s 14-bit single-ended analog inputs (PXI/DAQ/DAQe-2502)**
- **Onboard 2 k-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/counter**
- **Analog & digital triggering**
- **Fully auto-calibration**
- **Multiple cards synchronization through SSI (System Synchronization Interface) bus or PXI trigger 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


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

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.)

Pin Assignment

Connector CN1 Pin Assignment

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 2501; AO<4..7> for 2502
* The external references inputs and the external analog trigger share the analog input pins 5, 7, and 8

Ordering Information / Quick Selection Guide

Model Name	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
PXI/DAQ/DAQe-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
PXI/DAQ/DAQe-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 Name	PXI/DAQ/DAQe-2501	PXI/DAQ/DAQe-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		
Onboard reference	+5 V	
Temperature drift	±2 ppm/°C	
Stability	±6 ppm/1000 Hrs	
General Specifications		
Dimensions	160 mm x 100 mm (not including connectors) (PXI-2500 series) 175 mm x 107 mm (not including connectors) (DAQ-2500 series) 168 mm x 107 mm (not including connectors) (DAQe-2500 series)	
Connector	68-pin VHDCI female	
Operating temperature	0 to 55°C	
Storage temperature	-20 to 70°C	
Humidity	5 to 95 %, non-condensing	
Power requirements	+5 V 1.6 A typical (PXI/DAQ-2501) +3.3 V 0.78 A, +12 V 0.66 A typical (DAQe-2501)	+5 V 2.12 A typical (PXI/DAQ-2502) +3.3 V 0.89 A, +12 V 0.76 A typical (DAQe-2502)

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

PCI-9114 Series

32-CH 16-Bit Up to 250 kS/s Multi-Function DAQ Cards

Introduction

ADLINK's PCI-9114 series are 32-CH, 16-bit, high-resolution multi-function DAQ Cards. The PCI-9114 device features flexible configurations on analog input. The devices are divided into 2 kinds: normal gain version and high gain version. Both versions provide 4 programmable input ranges for bipolar and unipolar inputs. The A/D on the PCI-9114DG/HG device features a sampling rate of 100 kS/s with resolution at 16 bits, while PCI-9114A-DG/HG device features a sampling rate of up to 250 kS/s with resolution at 16 bits. The device supports automatic analog input scanning, and offers a differential mode for 8-CH analog inputs and maximum noise elimination, as well as single-ended modes for16-CH analog inputs.

The PCI-9114 also features 1-CH 16-bit general-purpose timer/counter, 16-CH TTL isolated digital inputs and 16-CH TTL isolated digital outputs. ADLINK PCI-9114 delivers cost-effective and reliable data acquisition capabilities and is ideal for a broad variety of applications.

Features

- **Supports a 32-bit 5 V PCI bus**
- **16-bit A/D resolution**
- **Up to 100 kS/s sampling rate (PCI-9114DG and PCI-9114HG)**
- **Up to 250 kS/s sampling rate (PCI-9114A-DG and PCI-9114A-HG)**
- **32-CH single-ended or 16-CH differential analog inputs**
- **Bipolar or unipolar analog input ranges**
- **Onboard 1 k-sample A/D FIFO**
- **Programmable gains:**
  - **x1, x2, x4, x8 (PCI-9114DG and PCI-9114A-DG)**
  - **x1, x10, x100 (PCI-9114HG and PCI-9114A-HG)**
- **Automatic analog inputs scanning**
- **16-CH isolated digital inputs and 16-CH isolated digital outputs**
- **2500 VRMS optical isolation for digital inputs and outputs**
- **1-CH 16-bit general-purpose timer/counter**
- **+12 V and -12 V power available on the 37-pin D-sub connector**
- **Onboard resettable fuses for power output protection**
- **Compact, half-size PCB**
- Operating Systems
  - Windows Vista/XP/2000/2003
  - Linux
- Recommended Software
  - AD-Logger
  - VB.NET/VC.NET/VB/VC++/BCB/Delphi
  - DAQBench
- Drivers Support
  - DAQPilot for Windows
  - DAQPilot for LabVIEW™
  - DAQ-MTLB for MATLABR
  - PCIS-DASK for Windows
  - PCIS-DASK/X for Linux

Specifications

Analog Input

- Number of channels: 32 single-ended or 16 differential
- Resolution: 16 bits
- Conversion time:
  - 10 μs (PCI-9114DG & PCI-9114HG)
  - 4 μs (PCI-9114A-DG & PCI-9114A-HG)
- Maximum sampling rate

Device	Sampling rate
PCI-9114DG PCI-9114HG	100 kS/s
PCI-9114A-DG PCI-9114A-HG	250 kS/s

- Input ranges (software programmable)

Device	Gain	Input Range
PCI-9114DG PCI-9114A-DG	1	±10 V
	2	±5 V
	4	±2.5 V
	8	±1.25 V
PCI-9114HG PCI-9114A-HG	1	±10 V
	10	±1 V
	100	±0.1 V

- Accuracy

Device	Gain	Input Range
PCI-9114DG PCI-9114A-DG	1	0.01 % of FSR ± 1 LSB
	2,4	0.02 % of FSR ± 1 LSB
	8	0.04 % of FSR ± 1 LSB
PCI-9114HG	1, 10	0.01 % of FSR ± 1 LSB
PCI-9114A-HG	100	0.02 % of FSR ± 1 LSB

- Input coupling: DC
- Overvoltage protection: continuous ±35 V
- Input impedance: 1 GΩ
- Trigger modes: software, pacer, and external trigger (5 V/TTL compatible)
- FIFO buffer size: 1 k samples
- Data transfers: polling, interrupt

Isolated Digital Input

- Number of channels: 16
- Maximum input range: 24 V, non-polarity
- Digital logic levels
  - 0 - 24 V, non-polarity
    - Input high voltage: 5 - 24 V
    - Input low voltage: 0 - 1.5 V
- Input resistance: 2.4 KΩ @ 0.5 W
- Isolation voltage: 2500 VRMS
- Data transfers: programmed I/O

Isolated Digital Output

- Number of channels: 16
- Output type: open emitter Darlington transistors
- Sink current
  - 350 mA for one channel @ 100% duty
  - 260 mA for all channels @ 10% duty
- Power dissipation: Max. 1.47 W per chip (8 DO channels)
- Supply voltage: 5-35 V
- Isolation voltage: 2500 VRMS
- Data transfers: programmed I/O

Power Output

- Output voltage: +12 V and -12 V
- Resettable fuse protection: 500 mA

General-Purpose Timer/Counter

- Number of channels: 1
- Resolution: 16 bits
- Compatibility: 5 V/TTL
- Base clock available: 2 MHz, external clock to 2MHz

General Specifications

- I/O connector
  - 37-pin D-sub female
  - 20-pin ribbon male x 2
- Operating temperature: 0°C to 55°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95 %, non-condensing
- Power requirements

+5 V	+12 V
600 mA typical	100 mA typical

- Dimensions (not including connectors)
  175 mm x 107 mm

Terminal Boards

- DIN-37D-01*

  Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting

- DIN-20P-01*

  Terminal Board with One 20-pin Ribbon Connector and DIN-Rail Mounting

- ACLD-9137-01

  General-Purpose Terminal Board with One 37-pin D-sub Male Connector

- ACLD-9188-01*

  General-Purpose Terminal Board with Two 20-pin Ribbon Connectors and One 37-pin D-sub Connector

*** Cables are not included. For information on mating cables, refer to Section 14, Accessories.**

Ordering Information

- **PCI-9114DG**
  32-CH 16-bit 100 kS/s Normal-Gain Multi-Func tion DAQ Card
- **PCI-9114HG**
  32-CH 16-bit 100 kS/s High-Gain Multi-Function DAQ Card
- **PCI-9114A-DG**
  32-CH 16-bit 250 kS/s Normal-Gain Multi-Function DAQ Card
- **PCI-9114A-HG**
  32-CH 16-bit 250 kS/s High-Gain Multi-Function DAQ Card

Pin Assignment

CN1

+12Vout	1	20	GND
-12Vout	2	21	(AIL15) AI31
AI15 (AIH15)	3	22	(AIL14) AI30
AI14 (AIH14)	4	23	(AIL13) AI29
AI13 (AIH13)	5	24	(AIL12) AI28
AI12 (AIH12)	6	25	(AIL11) AI27
AI11 (AIH11)	7	26	(AIL10) AI26
AI10 (AIH10)	8	27	(AIL9) AI25
AI9 (AIH9)	9	28	(AIL8) AI24
AI8 (AIH8)	10	29	AGND
AGND	11	30	(AIL7) AI23
AI7 (AIH7)	12	31	(AIL6) AI22
AI6 (AIH6)	13	32	(AIL5) AI21
AI5 (AIH5)	14	33	(AIL4) AI20
AI4 (AIH4)	15	34	(AIL3) AI19
AI3 (AIH3)	16	35	(AIL2) AI18
AI2 (AIH2)	17	36	(AIL1) AI17
AI1 (AIH1)	18	37	(AIL0) AI16
AI0 (AIH0)	19		

CN2

DI_0	1	2	DI_8
DI_1	3	4	DI_9
DI_2	5	6	DI_10
DI_3	7	8	DI_11
DI_4	9	10	DI_12
DI_5	11	12	DI_13
DI_6	13	14	DI_14
DI_7	15	16	DI_15
EICOM1	17	18	EICOM3
EICOM2	19	20	EICOM4

CN3

DO_0	1	2	DO_8
DO_1	3	4	DO_9
DO_2	5	6	DO_10
DO_3	7	8	DO_11
DO_4	9	10	DO_12
DO_5	11	12	DO_13
DO_6	13	14	DO_14
DO_7	15	16	DO_15
EOGND	17	18	EOGND
VDD	19	20	VDD

PCI-9111 Series

16-CH 12/16-Bit 100 kS/s Low-Cost Multi-Function DAQ Cards

PCI CONVENTIONAL

Introduction

ADLINK's PCI-9111 series are 16-CH, 100 kS/s low-cost multi-function DAQ cards that feature flexible analog input configurations. An RC filter is implemented on each A/D input channel to allow attenuation or filtering of the input signals. The PCI-9111 series provide analog inputs with 5 programmable input ranges for bipolar inputs. The PCI-9111 series also support automatic analog input scanning. The PCI-9111DG provides 12-bit A/D resolution while the PCI-9111HR provides 16-bit A/D resolution.

The PCI-9111 series also feature 1-CH 12-bit analog output, 16-CH TTL digital inputs and 16-CH TTL digital outputs. ADLINK's PCI-9111 series delivers cost-effective and reliable data acquisition capabilities, and is ideal for a broad variety of applications.

Features

- **Supports a 32-bit 5 V PCI bus**
- **12-bit A/D resolution (PCI-9111DG)**
- **16-bit A/D resolution (PCI-9111HR)**
- **16-CH single-ended analog inputs**
- **Up to 100 kS/s sampling rate**
- **Onboard 1 k-sample A/D FIFO**
- **Programmable gains of x1, x2, x4, x8, x16**
- **Bipolar analog input ranges**
- **Onboard low-pass filtering capability for analog inputs**
- **Automatic analog inputs scanning**
- **One 12-bit multiplying analog outputs**
- **16-CH TTL digital inputs and 16-CH TTL digital outputs**
- **4-CH TTL extended digital inputs and 4-CH TTL extended digital outputs**
- **Compact, half-size PCB**

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Analog Input

- Number of channels: 16 single-ended
- Resolution
  - 12 bits (PCI-9111DG)
  - 16 bits (PCI-9111HR)
- Conversion time: 8 μs
- Maximum sampling rate: 100 kS/s
- Input signal ranges (software programmable)

Gain	Input Range
	Bipolar
1	±10 V
2	±5 V
4	±2.5 V
8	±1.25 V
16	±0.625 V

- Accuracy

Gain	Accuracy
1, 2	0.01 % of FSR ± 1 LSB
4, 8	0.02 % of FSR ± 1 LSB
16	0.04 % of FSR ± 1 LSB

- Input coupling: DC
- Overvoltage protection: continuous ±35 V
- Input impedance: 10 MΩ
- Trigger modes: software, pacer, and external trigger (5 V/TTL compatible)
- FIFO buffer size: 1 k samples
- Data transfers: polling, interrupt

Analog Output

- Number of channels: 1 voltage output (NO s)
- Resolution: 12 bits
- Output ranges (jumper selectable)

Output Range	
Bipolar	±10 V
Unipolar	0 to 10 V

- Output driving capacity: ±5 mA max
- Settling time: 30 μs
- Data transfers: programmed I/O

Digital I/O

- Number of channels: 16 inputs and 16 outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

General Specifications

- I/O connector
  - 37-pin D-sub female
  - 20-pin ribbon male x 2
- Operating temperature: 0°C to 60 °C
- Storage temperature: -20°C to 80 °C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	+5 V
PCI-9111DG	570 mA typical
PCI-9111HR	570 mA typical

- Dimensions (not including connectors)
  175 mm x 107 mm

Terminal Boards

- **DIN-37D-01***
  Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting
- **DIN-20P-01***
  Terminal Board with One 20-pin Ribbon Connector and DIN-Rail Mounting
- **ACLD-9137-01**
  General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- **ACLD-9188-01***
  General-Purpose Terminal Board with Two 20-pin Ribbon Connectors and One 37-pin D-sub Connector
- **ACLD-9182A-01***
  Terminal Board with 16-CH Isolated Digital Inputs
- **ACLD-9185-01***
  Terminal Board with 16-CH Relay Outputs

*** Cables are not included. For information on mating cables, refer to Section 14, Accessories.**

Ordering Information

- **PCI-9111DG**
  16-CH 12-Bit 100 kS/s Low-Cost Multi-Function DAQ Card
- **PCI-9111HR**
  16-CH 16-Bit 100 kS/s Low-Cost Multi-Function DAQ Card

Pin Assignment

CN3

AI0	1	20	AI8	AI0	1	2	DI1
AI1	2	21	AI9	DI2	3	4	DI3
AI2	3	22	AI10	DI4	5	6	DI5
AI3	4	23	AI11	DI6	7	8	DI7
AI4	5	24	AI12	DI8	9	10	DI9
AI5	6	25	AI13	DI10	11	12	DI11
AI6	7	26	AI14	DI12	13	14	DI13
AI7	8	27	AI15	DI14	15	16	DI15
A.GND	9	28	A.GND	GND	17	18	GND
A.GND	10	29	A.GND	+5Vout	19	20	+12Vout
N/C	11	30	DA Out				
PreTrg	12	31	EDI0				
+12Vout	13	32	EDI1				
D.GND	14	33	EDI2				
D.GND	15	34	EDI3				
ExtTrg	16	35	EDO0				
EDO1	17	36	EDO2				
EDO3	18	37	N/C				
+5Vout	19						

CN1

DI0	1	2	DI1
DI2	3	4	DI3
DI4	5	6	DI5
DI6	7	8	DI7
DI8	9	10	DI9
DI10	11	12	DI11
DI12	13	14	DI13
DI14	15	16	DI15
GND	17	18	GND
+5Vout	19	20	+12Vout

CN2

DO0	1	2	DO1
DO2	3	4	DO3
DO4	5	6	DO5
DO6	7	8	DO7
DO8	9	10	DO9
DO10	11	12	DO11
DO12	13	14	DO13
DO14	15	16	DO15
GND	17	18	GND
+5Vout	19	20	+12Vout

cPCI/PCI/LPCI-9112

16-CH 12-Bit 110 kS/s Multi-Function DAQ Card / Low-Profile DAQ Card

PCI CONVENTIONAL CompactPCI


cPCI-9112


PCI-9112


LPCI-9112

Features

- **Supports a 3.3 V or 5 V PCI bus (PCI/LPCI-9112)**
- **3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1) (cPCI-9112)**
- **12-bit A/D resolution**
- **Up to 110 kS/s sampling rate**
- **16-CH single-ended or 8-CH differential inputs**
- **Bipolar or unipolar analog input ranges**
- **Programmable gains of x0.5, x1, x2, x4, x8**
- **Automatic analog inputs scanning**
- **Bus-mastering DMA for analog inputs**
- **2-CH 12-bit multiplying analog outputs**
- **16-CH TTL digital inputs and 16-CH TTL digital outputs**
- **1-CH 16-bit general-purpose timer/counter**
- **Compact, half-size PCB (PCI-9112)**
- **Compact, low-profile PCI size PCB (LPCI-9112)**
- **Rear I/O available on cPCI-9112R**

Operating Systems

- Windows Vista/XP/2000/2003
- Linux
- Windows CE (call for availability)

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Introduction

ADLINK's cPCI/PCI/LPCI-9112 are 16-CH, 12-bit, 110 kS/s multi-function DAQ cards. The cPCI/PCI/LPCI-9112 devices features flexible configurations on analog inputs. They provides analog inputs with 4 programmable input ranges for both bipolar and unipolar inputs. The A/D on the cPCI/PCI/LPCI-9112 features a sampling rate up to 110 kS/s with resolution at 12 bits. These devices support automatic analog input scanning, and offers a differential mode for 8-CH analog inputs and maximum noise elimination, as well as single-ended modes for 16-CH analog inputs.

The cPCI/PCI/LPCI-9112 also feature 2-CH 12-bit analog outputs, 1-CH 16-bit general-purpose timer/counter, 16-CH TTL digital inputs, and 16-CH TTL digital outputs. The LPCI-9112 is the MD1 size, low-profile version of PCI-9112. The low-profile PCI card is especially suitable for the applications which have a space restriction on the size of peripheral cards.

The cPCI-9112R allows I/O connectivity to be routed through the backplane via J2/P2 allowing a rear I/O transition module to be inserted, which is capable of efficient trouble-shooting and maintenance.

Specifications

Analog Input

- Number of channels: 16 single-ended or 8 differential
- Resolution: 12 bits
- Conversion time: 8 μs
- Maximum sampling rate: 110 kS/s
- Input signal ranges

Gain	Input Range	
	Bipolar	Unipolar
0.5	±10 V	-
1	±5 V	0 to 10 V
2	±2.5 V	0 to 5 V
4	±1.25 V	0 to 2.5 V
8	±0.625 V	0 to 1.25 V

- Accuracy

Gain	Accuracy
0.5, 1	0.01 % of FSR ± 1 LSB
2, 4	0.02 % of FSR ± 1 LSB
8	0.04 % of FSR ± 1 LSB

- Input coupling: DC
- Overvoltage protection: continuous ±35 V
- Input impedance: 1 GΩ
- Trigger modes: software
- Data transfers: programmed I/O, interrupt, bus-mastering DMA

Analog Output

- Number of channels: 2 voltage outputs
- Resolution: 12 bits
- Output ranges (software programmable)

Output Range	
Unipolar	0 to 10 V, 0 to 5 V, 0 to EXTREF

- Output driving capacity: ±5 mA max
- Settling time: 30 μs to 0.5 LSB
- Data transfers: programmed I/O

Digital I/O

- Number of channels: 16 inputs and 16 outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

General-Purpose Timer/Counter

- Number of channels: 1
- Resolution: 16 bits
- Compatibility: 5 V/TTL
- Base clock available: 2 MHz, external clock to 10 MHz

General Specifications

- I/O connector: 37-pin D-sub female
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95 %, non-condensing
- Power requirements

	+5 V	+12 V
cPCI-9112(R)	600 mA typical	20 mA typical
PCI-9112	460 mA typical	110 mA typical
LPCI-9112	500 mA typical	110 mA typical

- Dimensions (not including connectors)
  - 160 mm x 100 mm (cPCI-9112/9112R)
  - 175 mm x 107 mm (PCI-9112)
  - 120 mm x 65 mm (LPCI-9112)

Terminal Boards

For PCI-9112:

- DIN-37D-01*
  Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting Section 12.)
- DIN-20P-01*
  Terminal Board with One 20-pin Ribbon Connector and DIN-Rail Mounting
- ACLD-9137-01
  General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- ACLD-9138-01*
  General-Purpose Terminal Board with One 37-pin D-sub Connector
- ACLD-9188-01*
  General-Purpose Terminal Board with Two 20-pin Ribbon Connectors and One 37-pin D-sub Connector
- ACLD-9182A-01*
  Terminal Board with 16-CH Isolated Digital Inputs
- ACLD-9185-01*
  Terminal Board with 16-CH Isolated Digital Inputs

For LPCI-9112:

- DIN-68S-01*
  Terminal Board with One 68-pin SCSI-II Connector and DIN-Rail Mounting

For cPCI-9112:

- DIN-100S-01
  Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting

*** Cables are not included. For information on mating cables, refer to Section 14, Accessories.**

Ordering Information

- **PCI-9112**
  16-CH 12-Bit 110 kS/s Multi-Function DAQ Card
- **LPCI-9112**
  16-CH 12-Bit 110 kS/s Multi-Function Low-Profile DAQ Card
- **cPCI-9112**
  16-CH 12-Bit 110 kS/s Multi-Function DAQ Module
- **cPCI-9112R**
  16-CH 12-Bit 110 kS/s Multi-Function DAQ Module with rear I/O

Pin Assignment

LPCI-9112

DOUT0	1	35	DIN0
DOUT1	2	36	DIN1
DOUT2	3	37	DIN2
DOUT3	4	38	DIN3
DOUT4	5	39	DIN4
DOUT5	6	40	DIN5
DOUT6	7	41	DIN6
DOUT7	8	42	DIN7
DOUT8	9	43	DIN8
DOUT9	10	44	DIN9
DOUT10	11	45	DIN10
DOUT11	12	46	DIN11
DOUT12	13	47	DIN12
DOUT13	14	48	DIN13
DOUT14	15	49	DIN14
DOUT15	16	50	DIN15
FCOUT0	17	51	EXTCLK
EXTTRG	18	52	GATE0
FCOUT1	19	53	GATE
+12V	20	54	SGND
VCC	21	55	SGND
AGND	22	56	AGND
VREF	23	57	EXTVREF1
EXTVREF2	24	58	DAOUT0
AGND	25	59	DAOUT1
AGND	26	60	AGND
AIN0	27	61	AIN8
AIN1	28	62	AIN9
AIN2	29	63	AIN10
AIN3	30	64	AIN11
AIN4	31	65	AIN12
AIN5	32	66	AIN13
AIN6	33	67	AIN14
AIN7	34	68	AIN15

PCI-9112

CN3: Analog Input /Output & Counter/Timer

AI0 (AIH0)	1	20	(AIL0) AI8
AI1 (AIH1)	2	21	(AIL1) AI9
AI2 (AIH2)	3	22	(AIL2) AI10
AI3 (AIH3)	4	23	(AIL3) AI11
AI4 (AIH4)	5	24	(AIL4) AI12
AI5 (AIH5)	6	25	(AIL5) AI13
AI6 (AIH6)	7	26	(AIL6) AI14
AI7 (AIH7)	8	27	(AIL7) AI15
AGND	9	28	AGND
AGND	10	29	AGND
V.REF	11	30	AO1
ExtVref2	12	31	ExtVref1
+12Vout	13	32	AO2
AGND	14	33	GATE0
D.GND	15	34	GATE
Cout0	16	35	Cout1
ExtTrg	17	36	N/C
N/C	18	37	EXTCLK
+5Vout	19		

CN1: Digital Input

DI0	1	2	DI1
DI2	3	4	DI3
DI4	5	6	DI5
DI6	7	8	DI7
DI8	9	10	DI9
DI10	11	12	DI11
DI12	13	14	DI13
DI14	15	16	DI15
GND	17	18	GND
+5Vout	19	20	+12Vout

CN2: Digital Output

DO0	1	2	DO1
DO2	3	4	DO3
DO4	5	6	DO5
DO6	7	8	DO7
DO8	9	10	DO9
DO10	11	12	DO11
DO12	13	14	DO13
DO14	15	16	DO15
GND	17	18	GND
+5Vout	19	20	+12Vout

cPCI-9112, cPCI-9112R

DOUT_0	1	51	GND
DOUT_1	2	52	GND
DOUT_2	3	53	GND
DOUT_3	4	54	GND
DOUT_4	5	55	GND
DOUT_5	6	56	GND
DOUT_6	7	57	GND
DOUT_7	8	58	GND
DOUT_8	9	59	GND
DOUT_9	10	60	GND
DOUT_10	11	61	GND
DOUT_11	12	62	GND
DOUT_12	13	63	GND
DOUT_13	14	64	GND
DOUT_14	15	65	+5Vout
DOUT_15	16	66	+5Vout
DIN_0	17	67	GND
DIN_1	18	68	GND
DIN_2	19	69	GND
DIN_3	20	70	GND
DIN_4	21	71	GND
DIN_5	22	72	GND
DIN_6	23	73	GND
DIN_7	24	74	GND
DIN_8	25	75	GND
DIN_9	26	76	GND
DIN_10	27	77	GND
DIN_11	28	78	GND
DIN_12	29	79	GND
DIN_13	30	80	GND
DIN_14	31	81	+5Vout
DIN_15	32	82	+5Vout
EXTCLK	33	83	GND
EXTTRG	34	84	GND
COUT0	35	85	COUT1
GATE0	36	86	GATE
+12Vout	37	87	AGND
ExtVref2	38	88	AGND
ExtVref1	39	89	AGND
REFout	40	90	AGND
DA2	41	91	AGND
DA1	42	92	AGND
AI7 (AIH7)	43	93	AI15 (AIL7)
AI6 (AIH6)	44	94	AI14 (AIL6)
AI5 (AIH5)	45	95	AI13 (AIL5)
AI4 (AIH4)	46	96	AI12 (AIL4)
AI3 (AIH3)	47	97	AI11 (AIL3)
AI2 (AIH2)	48	98	AI10 (AIL2)
AI1 (AIH1)	49	99	AI9 (AIL1)
AI0 (AIH0)	50	100	AI8 (AIL0)

PCI-9118/L Series

16-CH 12 Bit Up to 333 kS/s Analog Input Cards

PCI-9118HG/L

PCI-9118DG/L

Introduction

ADLINK's PCI-9118/L series are high-performance data acquisition cards that are simplified versions of the phased-out PCI-9118. The PCI-9118/L series provides full compatible functionality with the PCI-9118 series except for the analog output functions. The PCI-9118DG/L and PCI-9118HG/L feature 12-bit resolution, with sampling rate up to 333 kS/s.

The 256-location channel gain queues on PCI-9118/L series cards allow high-speed data acquisition with different gains on each channel and non-sequential order of automatic analog input scanning capability. The onboard 1 k-sample A/D FIFO ensures reliable high-speed data acquisition under Windows operating systems. The data can be transferred through bus-mastering DMA with gap-free, continuous high throughput; even for a large amount of data.

ADLINK PCI-9118/L series analog input cards deliver cost-effective and reliable data acquisition capabilities, and are ideal for a broad variety of applications.

Features

- **Supports a 32-bit 5 V PCI bus**
- **12-bit A/D resolution**
- **Up to 333 kS/s sampling rate**
- **16 single-ended or 8 differential inputs**
- **256-configuration channel gain queue**
- **Onboard 1 k-sample A/D FIFO**
- **Bipolar or Unipolar analog input ranges**
- **Programmable gains:**
  - **x1, x2, x4, x8 (PCI-9118DG/L)**
  - **x1, x10, x100 (PCI-9118HG/L)**
- **Bus-mastering DMA for analog inputs**
- **4-CH TTL digital inputs and 4-CH TTL digital outputs**
- **Compact, half-size PCB**

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Analog Input

- Number of channels
  - 16 single-ended or 8 differential
- Channel gain queue size: 256 configurations
- Resolution
  - 12 bits
- Conversion time
  - 3 μs
- Maximum sampling rate
  - 333 kS/s
- Input signal ranges: (software programmable)

Device	Input Range		
	Gain	Bipolar	Unipolar
PCI-9118DG/L	1	±5 V	0 to 10 V
	2	±2.5 V	0 to 5 V
	4	±1.25 V	0 to 2.5 V
	8	±0.625 V	0 to 1.25 V
PCI-9118HG/L	1	±5 V	0 to 10 V
	10	±0.5 V	0 to 1 V
	100	±0.05 V	0 to 0.1 V

- Accuracy

Device	Gain	Accuracy
PCI-9118DG/L	1	0.008 % of FSR ± 1 LSB
	2	0.01 % of FSR ± 1 LSB
	4	0.02 % of FSR ± 1 LSB
	8	0.04 % of FSR ± 1 LSB
PCI-9118HG/L	1	0.008 % of FSR ± 1 LSB
	10	0.01 % of FSR ± 1 LSB
	100	0.02 % of FSR ± 1 LSB

- Input coupling: DC
- Overvoltage protection: continuous ±35 V
- Input impedance: 1 GΩ
- Trigger modes software, pacer, and external trigger (5 V/TTL compatible)
- FIFO buffer size: 1 k samples
- Data transfers:
  polling, interrupt, bus-mastering DMA

Digital I/O

- Number of channels: 4 inputs and 4 outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

General Specifications

- I/O connector: 50-pin SCSI-II female
- Operating temperature: 0°C to 55°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	+5 V
PCI-9118DG/L, PCI-9118HG/L	450 mA typical

- Dimensions (not including connectors)
  173 mm x 107 mm

Ordering Information

- **PCI-9118DG/L**
  16-CH 12-Bit 333 kS/s Normal-GainAnalog Input Card
- **PCI-9118HG/L**
  16-CH 12-Bit 333 kS/s High-Gain Analog Input Card

Terminal Boards

DIN-50S-01

Terminal Board with One 50-pin SCSI-II Connector and DIN-Rail Mounting (cables are not included; for information on mating cables, refer to Section 14, Accessories.

Pin Assignment

U_CMMD	1	26	(AIH0) AI0
AI8 (AIL0)	2	27	(AIH1) AI1
AI9 (AIL1)	3	28	(AIH2) AI2
AI10 (AIL2)	4	29	(AIH3) AI3
AI11 (AIL3)	5	30	(AIH4) AI4
AI12 (AIL4)	6	31	(AIH5) AI5
AI13 (AIL5)	7	32	(AIH6) AI6
AI14 (AIL6)	8	33	(AIH7) AI7
AI15 (AIL7)	9	34	AGND
N/C	10	35	N/C
N/C	11	36	N/C
N/C	12	37	N/C
+15Vout	13	38	-15Vout
DGND	14	39	ADGAIN2
DI1	15	40	DI0
DI3	16	41	DI2
DO1	17	42	DO0
DO3	18	43	DO2
DOSTB	19	44	EXTTRG
TGOUT	20	45	SSHO
ADCHN3	21	46	TGIN
ADCHN5	22	47	ADCHN4
ADCHN7	23	48	ADCHN6
Vcc	24	49	Vcc
DGND	25	50	DGND

PCI-9113A

32-CH 12-Bit 100 kS/s Isolated Analog Input Card

Introduction

ADLINK's PCI-9113A is a 32-CH, 12-bit, 100 kS/s isolated analog input card. The PCI-9113A provides analog inputs with 3 programmable input ranges for both bipolar and unipolar inputs. The 32-CH single-ended analog inputs can be converted to 16-CH differential analog inputs, which improves the noise rejection in harsh industrial environments.
The analog inputs are isolated from the PC's system ground. This feature not only protects the PC from being damaged from surges on the signal lines, but also eliminates ground loops and common-mode problems commonly seen in industrial measurement applications.

The PCI-9113A provides custom circuit area for input signal conditioning. Either signal attenuation or filtering can be applied on per channel basis. With all the features, ADLINK PCI-9113A delivers cost-effective and reliable data acquisition capabilities for ATE, sensor monitoring, data logging, power transmission, and a broad variety of industrial measurement applications.

Features

- **Supports a 32-bit 5 V PCI bus**
- **12-bit A/D resolution**
- **Up to 100 kS/s sampling rate**
- **32-CH single-ended or 16-CH differential inputs**
- **Onboard 1 k-sample A/D FIFO**
- **Bipolar or unipolar analog input ranges**
- **Programmable gains of x1, x10, x100**
- **Automatic analog inputs scanning**
- **Onboard low-pass filtering capability for analog inputs**
- **2500 VRMS optical isolation**
- **Compact, half-size PCB**

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Analog Input

- Number of channels: 32 single-ended or 16 differential
- Resolution: 12 bits
- Conversion time: 8 μs
- Maximum sampling rate: 100 kS/s
- Input signal ranges

Gain	Input Range		
	Bipolar		Unipolar
1	±10 V	±5 V	0 to 10 V
10	±1 V	±0.5 V	0 to 1 V
100	±0.1 V	±0.05 V	0 to 0.1 V

- Accuracy: 0.01 % of FSR ± 1 LSB
- Input coupling: DC
- Overvoltage protection: continuous ±35 V
- Input impedance: 1 GΩ
- Trigger modes: software, pacer
- FIFO buffer size: 1 k samples
- Data transfers: polling, interrupt
- Isolation Voltage: 2500 VRMS

General Specifications

- I/O connector: 37-pin D-sub female
- Operating temperature: 0°C to 55°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

+5 V
960 mA typical

- Dimensions (not including connectors)
  173 mm x 107 mm

Terminal Boards

- DIN-37D-01
  Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (cables are not included; for information on mating cables, refer to Section 14 (Accessory) on page 14-7)
- ACLD-9137-01
  General-Purpose Terminal Board with One 37-pin D-sub Male Connector

Ordering Information

- **PCI-9113A**
  32-CH 12-Bit 100 kS/s Isolated Analog Input Card

Pin Assignment

AI0 (AIH0)	1	20	(AIH1) AI1
AI2 (AIH2)	2	21	(AIH3) AI3
AI4 (AIH4)	3	22	(AIH5) AI5
AI6 (AIH6)	4	23	(AIH7) AI7
AI8 (AIH8)	5	24	(AIH9) AI9
AI10 (AIH10)	6	25	(AIH11) AI11
AI12 (AIH12)	7	26	(AIH13) AI13
AI14 (AIH14)	8	27	(AIH15) AI15
IGND	9	28	IGND
IGND	10	29	IGND
AI16 (AIL0)	11	30	(AIL1) AI17
AI18 (AIL2)	12	31	(AIL3) AI19
AI20 (AIL4)	13	32	(AIL5) AI21
AI22 (AIL6)	14	33	(AIL7) AI23
AI24 (AIL8)	15	34	(AIL9) AI25
AI26 (AIL10)	16	35	(AIL11) AI27
AI28 (AIL12)	17	36	(AIL13) AI29
AI30 (AIL14)	18	37	(AIL15) AI31
IGND	19		

cPCI-9116 Series

64-CH 16-Bit 250 kS/s Multi-Function DAQ Modules

CompactPCI

Introduction

ADLINK's cPCI-9116 series are high-density and high-resolution multi-function DAQ modules for PXI/CompactPCI form factors. The devices can sample up to 64 AI channels with different gain settings and scan sequences, making them ideal for dealing with high-density analog signals with various input ranges and sampling speeds. The cPCI-9116 devices feature flexible configurations on analog inputs. They provide analog inputs with 4 programmable input ranges for both bipolar and unipolar inputs. The A/D on the cPCI-9116 devices features a sampling rate of up to 250 kS/s with resolution at 16 bits. These devices also offer differential mode for 32 AI channels in order to achieve maximum noise elimination.

The cPCI-9116 series also feature 1-CH 16-bit general purpose timer/counter, 8-CH TTL digital inputs, and 8-CH TTL digital outputs. The cPCI-9116R allows I/O connectivity to be routed through the backplane via J2/P2 allowing a rear I/O transition module to be inserted, which is capable of efficient trouble-shooting and maintenance. ADLINK cPCI-9116 devices deliver cost-effective and reliable data acquisition capabilities, and are ideal for a broad variety of applications.

Features

- **3U/6U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1)**
- **16-bit A/D resolution, up to 250 kS/s sampling rate**
- **Up to 250 kS/s sampling rate**
- **64-CH single-ended or 32-CH differential inputs**
- **Onboard 1 k-sample A/D FIFO**
- **Bipolar or unipolar analog input ranges**
- **Programmable gains of x1, x2, x4, x8**
- **512-configuration channel-gain queue**
- **Bus-mastering DMA for analog inputs**
- **8-CH TTL digital inputs and 8-CH TTL digital outputs**
- **1-CH 16-bit general purpose timer/counter**
- **Rear I/O available on cPCI-9116R**

Operating Systems

- Windows Vista/XP/2000/2003
- Linux
- Windows CE (call for availability)

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Analog Input

- Number of channels: 64 single-ended or 32 differential (software selectable per channel)
- Resolution: 16 bits
- Maximum sampling rate: 250 kS/s
- Input signal ranges (software programmable)

Gain	Input Range	
	Bipolar	Unipolar
1	±5 V	0 to 10 V
2	±2.5 V	0 to 5 V
4	±1.25 V	0 to 2.5 V
8	±0.625 V	0 to 1.25 V

- Accuracy

Gain	Accuracy
1	0.01 % of FSR ± 1 LSB
2, 4	0.02 % of FSR ± 1 LSB
8	0.04 % of FSR ± 1 LSB

- Input coupling: DC
- Overvoltage protection: Continuous ±35 V
- Input impedance: 1 GΩ
- Trigger modes: Software, pre-trigger, post-trigger, middle trigger, delay trigger, and repeated trigger
- Channel-gain queue size: 512 configurations
- FIFO buffer size: 1 k samples
- Data transfers: polling, interrupt, bus-mastering DMA

Digital I/O

- Number of channels: 8 inputs and 8 outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

General-Purpose timer/counter

- Number of channels: 1
- Resolution: 16 bits
- Compatibility: 5 V/TTL
- Base clock available: 24 MHz, external clock up to 24 MHz

General Specifications

- I/O connector: 100-pin SCSI-II female
- Operating temperature: 0°C to 55°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

+5 V	+12 V
560 mA typical	100 mA typical

- Dimensions (not including connectors)
  - 160 mm x 100 mm (3U)

Terminal Boards

DIN-100S-01

Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (cables are not included; for information on mating cables, refer to Section 14, Accessories.)

Ordering Information

- **cPCI-9116**
  64-CH 16-Bit 250 kS/s Multi-Function DAQ Module
- **cPCI-9116R**
  64-CH 16-Bit 250 kS/s Multi-Function DAQ Module with Rear I/O

Pin Assignment

U_CMMD	1	51	AGND
AI0 (AIH0)	2	52	(AIL0) AI32
AI1 (AIH1)	3	53	(AIL1) AI33
AI2 (AIH2)	4	54	(AIL2) AI34
AI3 (AIH3)	5	55	(AIL3) AI35
AI4 (AIH4)	6	56	(AIL4) AI36
AI5 (AIH5)	7	57	(AIL5) AI37
AI6 (AIH6)	8	58	(AIL6) AI38
AI7 (AIH7)	9	59	(AIL7) AI39
AI8 (AIH8)	10	60	(AIL8) AI40
AI9 (AIH9)	11	61	(AIL9) AI41
AI10 (AIH10)	12	62	(AIL10) AI42
AI11 (AIH11)	13	63	(AIL11) AI43
AI12 (AIH12)	14	64	(AIL12) AI44
AI13 (AIH13)	15	65	(AIL13) AI45
AI14 (AIH14)	16	66	(AIL14) AI46
AI15 (AIH15)	17	67	(AIL15) AI47
AI16 (AIH16)	18	68	(AIL16) AI48
AI17 (AIH17)	19	69	(AIL17) AI49
AI18 (AIH18)	20	70	(AIL18) AI50
AI19 (AIH19)	21	71	(AIL19) AI51
AI20 (AIH20)	22	72	(AIL20) AI52
AI21 (AIH21)	23	73	(AIL21) AI53
AI22 (AIH22)	24	74	(AIL22) AI54
AI23 (AIH23)	25	75	(AIL23) AI55
AI24 (AIH24)	26	76	(AIL24) AI56
AI25 (AIH25)	27	77	(AIL25) AI57
AI26 (AIH26)	28	78	(AIL26) AI58
AI27 (AIH27)	29	79	(AIL27) AI59
AI28 (AIH28)	30	80	(AIL28) AI60
AI29 (AIH29)	31	81	(AIL29) AI61
AI30 (AIH30)	32	82	(AIL30) AI62
AI31 (AIH31)	33	83	(AIL31) AI63
AGND	34	84	AGND
+15Vout	35	85	-15Vout
N/C	36	86	N/C
DI0	37	87	DO0
DI1	38	88	DO1
DI2	39	89	DO2
DI3	40	90	DO3
DI4	41	91	DO4
DI5	42	92	DO5
DI6	43	93	DO6
DI7	44	94	DO7
ExtTimeBase	45	95	N/C
ExtTrg	46	96	GP_TC_CLK
SSH_OUT	47	97	GP_TC_GATE
GP_TC_GATE	48	98	GP_TC_UPDN
+5Vout	49	99	+5Vout
DGND	50	100	DGND

PCI-6308V/6308A

8-CH 12-Bit Isolated Analog Output Cards

Introduction

The PCI-6308V is a high-performance 12-bit analog output board with PCI interface. It provides 8 identical voltage output channels, with each channel capable of bipolar voltage outputs, unipolar voltage output and unipolar 0 to user defined voltage output. The PCI-6308V provides good monotonicity, low distortion, and low differential linearity error over long periods of time. The output ranges of the PCI-6308V are bipolar -10 to +10 V, unipolar 0 to 10 V and as well as user-defined ranges with external reference input, which are jumper selectable. The PCI-6308A device is the combination of the PCI-6308V with an 8-CH current output extended board, EXP-8A. The EXP-8A board includes 8 precision voltage-to-current converters.

ADLINK PCI-6308 series devices provide flexible and isolated analog output functionalities and are suitable for ATE, signal generation, industrial process control, servo control and other industrial control applications.

Features

- **Supports a 32-bit 5 V PCI bus**
- **12-bit D/A resolution (PCI-6308V & PCI-6308A)**
- **Isolated 8-CH 12-bit voltage output (PCI-6308V & PCI-6308A)**
- **Isolated 8-CH 12-bit current output (PCI-6308A)**
- **Bipolar or unipolar output ranges**
- **External reference input for user-defined ranges**
- **4-CH isolated digital outputs and 4-CH isolated digital inputs**
- **2500 VRMS optical isolation**
- **Compact, half-size PCB**

Operating Systems

- Windows Vista/XP/2000/2003
- Linux
- Windows CE (call for availability)

Recommended Software

- AD-Logger
- 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

Specifications

Isolated Analog Output

- Number of channels: 8 voltage outputs (PCI-6308V & PCI-6308A)
- Resolution: 12 bits
- Output ranges (jumper selectable)

	Input Range
Bipolar	±10 V
Unipolar	0 to 10 V, 0 to EXTREF

- Settling time: 16 μs (20 V step)
- Maximum update interval: 90 μs for four channels simultaneously
- Gain error: ±0.2 % max.
- DNL: ±1 LSB
- Output driving capacity: ±5 mA
- Isolation voltage: 2500 VRMS
- Output initial status: 0 V (after RESET or POWER-ON)
- Data transfers: programmed I/O

Current Output (PCI-6308A)

- Number of channels: 8
- Resolution: 12 bits
- Output ranges (software programmable): 0-20 mA, 4-20 mA, and 5-25 mA
- Gain error: 0.3 %
- Settling time: 17 μs (0-20 mA)
- Slew rate: 1.3 mA/μs
- DNL: ±1 LSB maximum
- Output resistance: 10 GΩ typical
- Current load resistance: 0 - 500 Ω
- Output initial status: 4 mA (after RESET or POWER-ON)
- Data transfer: programmed I/O

Isolated Digital Input

- Number of channels: 4
- Maximum input range: 24 V, non-polarity
- Digital logic levels
  - Input high voltage: 5 - 24 V
  - Input low voltage: 0 - 1.5 V
- Input resistance: 2.4 kΩ @ 0.5 W
- Isolation voltage: 2,500 VRMS
- Data transfers: programmed I/O

Isolated Digital Output

- Number of channels: 4 (PCI-6308V & PCI-6308A)
- Output type: photo-coupler transistors
- Supply voltage: 5 to 35 V
- Isolation voltage: 2,500 VRMS
- Data transfers: programmed I/O

General Specifications

- I/O connector: 37-pin D-sub female
- Operating temperature: 0°C to 55°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95 %, non-condensing
- Power requirements

Device	+5 V	+12 V
PCI-6308V	220 mA typical	175 mA typical
PCI-6308A	220 mA typical	250 mA typical 530 mA maximum

- Dimensions (not including connectors) 175 mm x 107 mm

Terminal Boards

- **DIN-37D-01**
  Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)
- **ACLD-9137-01**
  General-Purpose Terminal Board with One 37-pin D-sub Male Connector

Ordering Information

- **PCI-6308V**
  8-CH 12-Bit Isolated Voltage Output Card
- **PCI-6308A**
  8-CH 12-Bit Isolated Voltage & Current Output Card

Pin Assignment

DI3	1	20	DO3
DI2	2	21	DO2
DI1	3	22	DO1
DI0	4	23	DO0
DIGND	5	24	DOGND
ExtVref	6	25	-15Vout
+15Vout	7	26	AGND
AGND	8	27	A7
A6	9	28	V7
V6	10	29	AGND
AGND	11	30	A5
A4	12	31	V5
V4	13	32	A.GND
AGND	14	33	A3
A2	15	34	V3
V2	16	35	AGND
AGND	17	36	A1
A0	18	37	V1
V0	19		

PCI-6202

4-CH 16-Bit 1 MS/s Analog Output & 32-CH Isolation DIO Card

Introduction

The ADLINK PCI-6202 is a 4-CH, 16-bit high resolution voltage output card with hardware timed waveform generation. Four analog output channels can update simultaneously and support up to 1 MS/s update rate per channel. PCI-6202 features excellent linearity (DNL < 1 LSB), which is suitable for dynamic signal simulation and control applications requiring high accuracy through voltage output. Furthermore, the PCI-6202 provides additional I/O control lines for system integration, such as 16-CH isolated digital input and 16-CH isolated output, 8-CH TTL DI and 8-CH TTL DO, 3-CH encoder inputs, and 4-CH PWM outputs. Combined, these I/O functionalities, solid voltage output linearity, and high accuracy, make PCI-6202 the best single-board solution for both equipment manufacturers and laboratory research applications.

Features

- **Supports a 32-bit 3.3 V or 5 V PCI bus**
- **Hardware-based waveform generation**
- **DNL Linearity less than 1 LSB**
- **Digital triggering for waveform generation**
- **16-CH isolation digital inputs & 16-CH isolation digital outputs**
- **8-CH TTL DI and 8-CH TTL DO**
- **2-CH timer/counter, base clock: 40 MHz**
- **4-CH PWM output**
- **3-CH encoder inputs, supporting AB phase and CW/CCW**
- **Multiple card synchronization through SSI (System Synchronization Interface) bus**

Operating Systems

- Windows Vista/XP/2000/2003
- Linux
- Windows CE (call for availability)

Recommended Software

- AD-Logger
- 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

Specifications

Analog Output

- Resolution: 16 bits
- Number of channels: Four (simultaneous update)
- Maximum update rate: 1 MS/s
- FIFO buffer size: 8k Samples (4-CH Sharing)
- Output range: ±10 V
- DNL: Less than ±1 LSB
- Offset Error: 0.3 mV
- Positive Gain Error: 0.3 mV
- Negative Gain Error: 0.3 mV
- Settling Time: 3 μs
- Slew Rate: 20 V/μs
- Rise Time: 0.67 μs
- Falling Time: 0.705 μs
- Output Current Capacity: 5 mA
- Trigger source: Software, External digital, SSI bus
- Data Transfer: Software polling, DMA

Isolated Digital Input

- Number of channels: 16
- Maximum input range: 24 V, non-polarity
- Digital logic level
  - Input high voltage: 10-24 V
  - Input low voltage: 0-1.5 V
- Isolation voltage: 2500 VRMS

Isolated Digital Output

- Number of channels: 16
- Sink current limitation: 250 mA for one channel @ 100% duty
- Supply voltage: 5-35 VDC
- Isolation voltage: 2500 VRMS

Encoder Input

- Number of channels: Three Encoder type
  - CW/CCW encoder
  - x1 AB phase encoder
  - x2 AB phase encoder
  - x4 AB phase encoder

Function I/O

- Digital I/O: Eight DO (3.3 V TTL Level)/Eight DI (3.3 V or 5 V TTL Level)
- General Timer/Counter: Two 32-bit, Base clock: 80 MHz, external to 10 MHz
- Pulse Generation: Four PWM Outputs
  - Single pulse generation
  - Pulse train generation
- AFI0/AFI1: D/A Convert Clock or Start Trigger

General Specifications

- PCI Bus: 5 V and 3.3 V universal PCI bus
- I/O Connector: Two 68-pin SCSI-VHDCI female
- Operation temperature: 0°C to 55°C
- Storage temperature: -20°C to 70°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements:

+5 V	+12 V
500 mA typical	110 mA typical

- Dimensions: 175 mm x 107 mm (not including connectors)

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

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.)

Ordering Information

- **PCI-6202**
  4-CH 16-Bit 1 MS/s Analog Output & 32-CH Isolation DIO Card

Pin Assignment

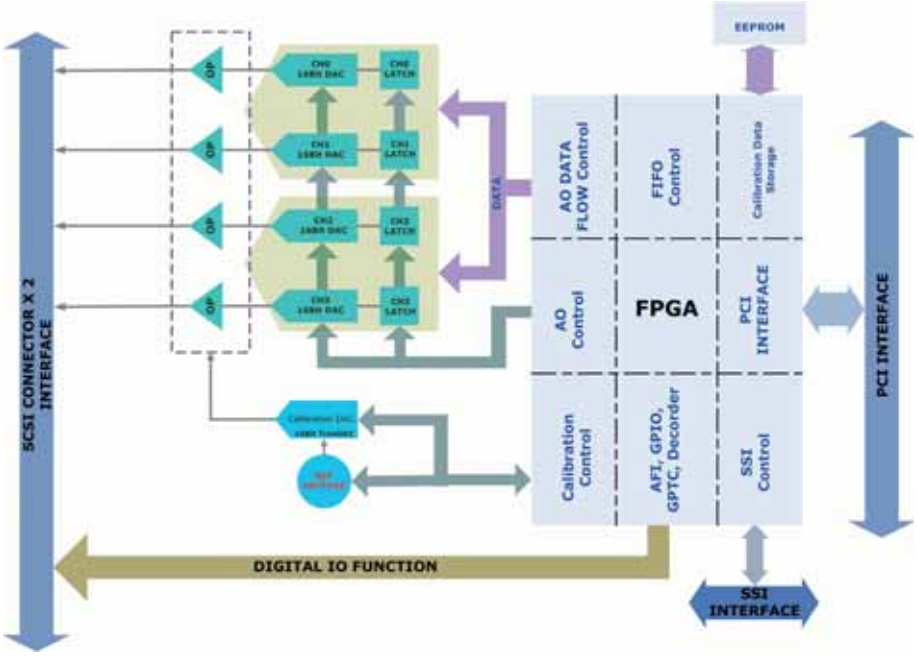
CN1

DO_0	1	35	GPTC_OUT0
DO_1	2	36	GPTC_GATE0
DO_2	3	37	GPTC_UD0
DO_3	4	38	GPTC_AUX0
DO_4	5	39	GPTC_CLK0
DO_5	6	40	GPTC_OUT1
DO_6	7	41	GPTC_GATE1
DO_7	8	42	GPTC_UD1
DGND	9	43	GPTC_AUX1
DGND	10	44	GPTC_CLK1
DI_0	11	45	DGND
DI_1	12	46	DGND
DI_2	13	47	DGND
DI_3	14	48	DGND
DI_4	15	49	DGND
DI_5	16	50	DGND
DI_6	17	51	DGND
DI_7	18	52	DGND
DGND	19	53	PWM_0
DGND	20	54	PWM_1
DGND	21	55	PWM_2
DGND	22	56	PWM_3
DGND	23	57	AFI0
AGND	24	58	AFI1
AGND	25	59	NC
AGND	26	60	AGND
AGND	27	61	AGND
AGND	28	62	AGND
AGND	29	63	AGND
AGND	30	64	AGND
AO_CH0	31	65	AGND
AO_CH1	32	66	AGND
AO_CH2	33	67	AGND
AO_CH3	34	68	AGND

CN2

IDI_0	1	35	IDI_8
IDI_1	2	36	IDI_9
IDI_2	3	37	IDI_10
IDI_3	4	38	IDI_11
IDI_4	5	39	IDI_12
IDI_5	6	40	IDI_13
IDI_6	7	41	IDI_14
IDI_7	8	42	IDI_15
COM	9	43	COM
COM	10	44	COM
EA0+	11	45	EA1+
EA0-	12	46	EA1-
EB0+	13	47	EB1+
EB0-	14	48	EB1-
EZ0+	15	49	EZ1+
EZ0-	16	50	EZ1-
EORG0	17	51	EORG1
EA2+	18	52	EZ2+
EA2-	19	53	EZ2-
EB2+	20	54	EORG2
EB2-	21	55	Ext. 24V
Ext. GND	22	56	Ext. 24V
IGND	23	57	Ext. GND
IGND	24	58	IGND
VDD	25	59	IGND
VDD	26	60	ISO5V
IDO_0	27	61	IDO_8
IDO_1	28	62	IDO_9
IDO_2	29	63	IDO_10
IDO_3	30	64	IDO_11
IDO_4	31	65	IDO_12
IDO_5	32	66	IDO_13
IDO_6	33	67	IDO_14
IDO_7	34	68	IDO_15

PCI-6202 Block Diagram



PCI/PCIe/cPCI-6208/6216 Series

8/16-CH 16-Bit Analog Output Cards

PCI-6208V/6216V-GL

PCI-6208A

PCIe-6208V-GL

Features

- **Supports a 32-bit 3.3 V or 5 V PCI bus (PCI-6208/6216-GL)**
- **x1 lane PCI Express® Interface (PCIe-6208/6216-GL)**
- **3U Eurocard form factor, CompactPCI compliant PICMG 2.0 R2.1 (cPCI-6208/6216 series)**
- **16-bit D/A resolution**
- **Effective 15-bit resolution current transducers (PCI-6208A/cPCI-6208A)**
- **8-CH voltage outputs (PCI/PCIe/cPCI-6208V-GL)**
- **16-CH voltage outputs (PCI/PCIe/cPCI-6216V-GL)**
- **8-CH current outputs (PCI/cPCI-6208A)**
- **Bipolar analog output range**
- **4-CH TTL digital inputs and 4-CH TTL digital outputs**
- **Rear I/O available on the cPCI-6208V/R-GL, cPCI-6216V/R-GL & cPCI-6208A/R.**

Operating Systems

- Windows Vista/XP/2000/2003
- Linux
- Windows CE (call for availability)

Recommended Software

- AD-Logger
- 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

ADLINK's PCI/PCIe/cPCI-6208 series are 8 or 16-CH, 16-bit, analog output cards. The PCI/PCIe/cPCI-6208-GL series offers 8 voltage outputs with ±10 V range, featuring 15-bit monotonicity and 10 V/μs slew rate. The onboard analog switches minimize the power-on glitches. The PCI/PCIe/cPCI-6216V-GL series expands the voltage output channels to a total of 16 for higher analog output density requirements. In addition to the voltage output functions, the PCI/cPCI-6208A features 8 current outputs with ranges of 0-20 mA, 4-20 mA, and 5-25 mA. The daughter board EXP-8A provides high-quality voltage to current transducers. The PCI/cPCI-6208A device is capable of delivering 14-bit monotonicity with 1.3 mA/μs slew rate.

ADLINK PCI/PCIe/cPCI-6208 series devices provide high-resolution, high-density analog output functionalities and are suitable for ATE, signal generation, industrial process control, servo control and other industrial control applications.

Specifications

Voltage Output

- Number of channels
  - 8 voltage outputs (PCI/PCIe/cPCI-6208V-GL & PCI/cPCI-6208A)
  - 16 voltage outputs (PCI/PCIe/cPCI-6216V-GL)
- Resolution: 16 bits
- Monotonicity: 15 bits typical
- Output ranges: ±10 V
- Slew rate:10 V/μs typical
- Settling time: 130 μs typical (20 V step)
- Gain Error: ±0.2% maximum
- DNL: ±0.65 LSB typical
- Output driving capacity: ±5 mA maximum
- Output initial status: 0 V
- Data transfer: programmed I/O

Current Output

- Number of channels: 8 current outputs (PCI/cPCI-6208A)
- Resolution: 15 bits typical
- Monotonicity: 14 bits typical
- Output ranges: (Software programmable) 0-20 mA, 4-20 mA, 5-25 mA
- Slew rate: 1.3 mA/μs typical
- Settling time: 17 μs typical (20 mA step)
- Span Error: ±0.3% typical
- Output Initial Status: 4 mA (after RESET or POWER-ON)
- Data transfer: programmed I/O

Digital I/O

- Number of channels: 4 inputs and 4 outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

General Specifications

- I/O connector: One 37-pin D-sub female
- Operating temperature: 0°C to 50°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	+5 V	+12 V
PCI-6208V-GL	650 mA typical	170 mA typical
PCI-6216V-GL	1.2 A typical	280 mA typical
PCI-6208A	670 mA typical	380 mA typical
cPCI-6208V/R-GL	500 mA typical	200 mA typical
cPCI-6216V/R-GL	1 A typical	300 mA typical
cPCI-6208A/R	600 mA typical	380 mA typical

Device	+3.3 V	+12 V
PCIe-6208V-GL	310 mA typical	380 mA typical
PCIe-6216V-GL	315 mA typical	660 mA typical

- Dimensions (not including connectors)
  175 mm x 107 mm (PCI-6208/6216)
  168 mm x 112 mm (PCIe-6208/6216)
  160 mm x 100 mm (cPCI-6208/6216)

Cables

- ACL-10137-1MM

  37-Pin D-Sub male-male cable, length in 1M.

Note: Please note that cables and terminal boards are not included in product.

Terminal Boards

- DIN-37D-01

  Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

- ACLD-9137-01

  General-Purpose Terminal Board with One 37-pin D-sub Male Connector

- ACLD-9137F-01

  General-Purpose Terminal Board with One 37-pin D-sub female Connector.

Note: A rear I/O terminal board (cPCI-R6216DB) has been included with the cPCI-6208V/R-GL cPCI-6216V/R-GL and cPCI- 6208A/R. This cPCI-R6216DB rear I/O board is responsible for conducting I/O signals from the CompactPCI J2 connector to a 37-pin D-sub connector.

Ordering Information

- **PCI-6208V-GL**
  8-CH 16-Bit Voltage Output Card
- **PCI-6216V-GL**
  16-CH 16-Bit Voltage Output Card
- **PCI-6208A**
  8-CH 16-Bit Voltage and Current Output Card
- **cPCI-6208V-GL**
  8-CH 16-Bit Voltage Output Module
- **cPCI-6208V/R-GL**
  8-CH 16-Bit Voltage Output Module with Rear I/O
- **cPCI-6208A**
  8-CH 16-Bit Voltage and Current Output Module
- **cPCI-6208AR**
  8-CH 16-Bit Voltage and Current Output Module with Rear I/O
- **cPCI-6216V-GL**
  16-CH 16-Bit Voltage Output Module
- **cPCI-6216V/R-GL**
  16-CH 16-Bit Voltage Output Module with Rear I/O
- **PCIe-6208V-GL**
  8-CH 16-Bit Voltage Output PCI Express® Card
- **PCIe-6216V-GL**
  16-CH 16-Bit Voltage Output PCI Express® Card

Note: Rear I/O versions can not be used in PXI chassis due to signals conflict with PXI bus.

Pin Assignment

PCI/PCIe/cPCI-6208V-GL and PCI/PCIe/cPCI-6216V-GL

DI3	1	20	DO3
DI2	2	21	DO2
DI1	3	22	DO1
DI0	4	23	DO0
GND	5	24	GND
+5Vout	6	25	-15Vout
+15Vout	7	26	AGND
AGND	8	27	NC/V15
NC/V14	9	28	V7
V6	10	29	AGND
AGND	11	30	NC/V13
NC/V12	12	31	V5
V4	13	32	AGND
AGND	14	33	NC/V11
NC/V10	15	34	V3
V2	16	35	AGND
AGND	17	36	NC/V9
NC/V8	18	37	V1
V0	19		

(PCI/cPCI-6208A)

DI3	1	20	DO3
DI2	2	21	DO2
DI1	3	22	DO1
DI0	4	23	DO0
GND	5	24	GND
+5Vout	6	25	-15Vout
+15Vout	7	26	AGND
AGND	8	27	A7
A6	9	28	V7
V6	10	29	AGND
AGND	11	30	A5
A4	12	31	V5
V4	13	32	AGND
AGND	14	33	A3
A2	15	34	V3
V2	16	35	AGND
AGND	17	36	A1
A0	18	37	V1
V0	19		

Selection Guide

Digital Input/Output Cards

Interface	Type	Digital Input		Digital Output			DIO Update	Tiemr/ Counter	Green Products	Model Number	Page
		Range	No. of Channels	No. of Channels	Range	Driver Type	Update Rate(Max.)				
PCI/PCI Express®	High-Density Isolated DIO	0-28 V Isolated	128-CH							PCI-7443	2-41
			64-CH	64-CH	5-40 V	Power MOSFET				PCI-7442	2-41
				128-CH						PCI-7444	2-41
	Isolated DIO	0-24 V Isolated	64-CH							PCI-7433	2-43
			32-CH							PCI-7233	2-45
				32-CH	5-35 V	Darlington				PCI-7432	2-43
			16-CH	16-CH						PCI/LPCI/LPCIe-7230	2-45
		0-50 V Isolated	64-CH							PCI-7433HIR	2-43
			32-CH	32-CH	5-35 V	Darlington				PCI-7432HIR	2-43
				64-CH						PCI-7434	2-43
				32CH						PCI-7234	2-45
	Relay DO	0-24 V Isolated	2-CH		350 V, 0.12 A	PhotoMos Relay				PCI-7258	2-40
			16-CH	16-CH	125 VAC, 0.5 A 30 VDC, 1 A	Latching Relay				PCI-7256	2-39
			8-CH	8-CH	250 VAC, 5 A 30 VDC, 5 A	High-Power Relay				PCI-7260	2-36
					120 VAC, 5 A 24 VDC, 5 A	Relay				PCI/LPCI/ LPCIe-7250	2-37
	High-Speed DIO	1.8V/2.5V/3.3V SW Selectable	32-CH S/W Programmable		1.8V/2.5V/3.3V SW Selectable		200 MB/s			PCIe-7350	2-31
		5 V TTL			5 V TTL		80 MS/s			PCI/PCIe-7300A	2-33
			32-CH	32-CH			12 MS/s			PCI/PCIe-7200	2-35
	TTL DIO		96-CH S/W Programmable							PCI-7396	2-51
										PCI-7296(1)	2-47
			48-CH S/W Programmable							PCI-7348	2-51
										PCI-7248(1)	2-47
			24-CH S/W Programmable							PCI-7224(1)	2-47
	Timer/ Counter		8-CH	8-CH				10-CH/ 16-Bit		PCI-8554	2-52
CompactPCI®	Isolated DIO	0-24 V Isolated	64-CH							cPCI-7433/R(2)	2-43
			128-CH	128-CH						cPCI-7452(3)	2-49
			32-CH	32-CH	5-35 V	Darlington				cPCI-7432/R(2)	2-43
				64-CH						cPCI-7434/R(2)	2-43
	Relay DO	0-24 V Isolated	16-CH	8-CH	120 VAC, 0.5 A 24 VDC, 1 A	Relay				cPCI-7252	2-37
	High-Speed DIO	5 V TTL	32-CH S/W Programmable		5 V TTL		80 MB/s			cPCI-7300	2-33
			32-CH	32-CH			12 MB/s			cPCI-7200	2-35
	TTL DIO		48-CH S/W Programmable					1-CH/32-Bit(4)		cPCI-7248	2-48
								1-CH/16-Bit(5)		cPCI-7249/R(2)	2-48
	Timer/Counter		8-CH	8-CH				10-CH/16-Bit		cPCI-8554/R(2)	2-52

Note: (1) Opto-22 compatible (2) Rear I/O version available (3) with 6U Eurocard from factor (4) Timer (5) Counter

Low-Profile PCI Available

PCI Express® Version Available

Digital I/O

Digital I/O Modules

Model Name	PCI-7250 / PCI-7251	LPCI/LPCIe-7250	cPCI-7252	PCI-7260 / PCI-7256	PCI-7258	PCI/cPCI-8554	PCI-7442 / 7443 / 7444	PCI/cPCI-7432 / 7433 / 7434	cPCI-7452
Form Factor	PCI	Low-Profile PCI/ Low-Profile PCI Express®	CompactPCI®	PCI	PCI	PCI/CompactPCI®	PCI	PCI/CompactPCI®	CompactPCI®
Bus-mastering DMA	-	-	-	-	-	-	-	-	-
Isolation	√	√	√	√	√	-	√	√	√
Dedicated Inputs									
No. of Channels	8	8	16	8/16 + COS(2)	2	8	64 + COS(2)/128 + COS(2)/-	32 / 64 / -	128+COS(2)
Max. Sampling Rate (Hz)(1)	10 k	10 k	-	10 k	10 k	500 k	10 k/ 10 k /-	10 k / 10 k / -	10 k
Logic Standard	V_{IH}=5-24 V V_{IL}=0-1.5 V	V_{IH}=5-24 V V_{IL}=0-1.5 V	V_{IH} = 3-24 V V_{IL} = 0-1 V	V_{IH}=10-24 V V_{IL}=0-2 V	V_{IH}=5-24 V V_{IL}=0-1.5 V	5 V/TTL	V_{IH}=5-28 V;V_{IL}=0-1.5 V V_{IH}=5-28 V;V_{IL}=0-1.5 V -	V_{IH}=5-24 V; V_{IL}=0-1.5 V V_{IH}=5-24 V; V_{IL}=0-1.5 V -	V_{IH}=5-28 V V_{IL}=0-1.5 V
Dedicated Outputs									
No. of Channels	8	8	8	8/16	32	8	64/ - /128	32 / - / 64	128
Max. Update Rate (Hz)(1)	-	-	-	-	-	500 k	10 k/ - /10 k	10 k / - / 10 k	10 k
Relay Operate/ Release Time	8 ms/8 ms	8 ms/8 ms	8 ms/ 8 ms	10 ms/10 ms 3 ms/3 ms	0.23 ms/0.04 ms	-	- / - / -	- / - / -	-
Output Type	Relay	Relay	Relay	Relay	PhotoMos Relay	5 V/TTL	Power MOSFET / - / Power MOSFET	Darlington - Darlington	Darlington
Timer/Counter									
Timer/Counter	-	-	-	-	-	10, 16-bit	- / - / -	-	-
Page Number	2-37	2-37	2-37	2-36/2-39	2-40	2-52	2-41	2-43	2-49

Digital I/O Modules

Model Name	PCIe-7350	PCI-7300A PCIe-7300A cPCI-7300	PCI-7200 PCIe-7200 cPCI-7200	PCI-7230/ cPCI-7230	LPCI-7230 LPCIe-7230	PCI-7233 PCI-7234P PCI-7234	PCI-7296 PCI-7248 PCI-7224	PCI-7396 PCI-7348	cPCI-7248/7249R
Form Factor	PCI Express®	PCI/PCI Express®/ CompactPCI	PCI/PCI Express®/ CompactPCI	PCI/CompactPCI®	Low-Profile PCI/ Low-Profile PCI Express®	PCI	PCI	PCI	CompactPCI®
Bus-mastering DMA	√	√	√	-	-	-	-	-	-
Isolation	-	-	-	√	√	√	-	-	-
High-Speed Digital I/O									
No. of Channels	32-bit DIO	2 x 16-bit DIO	32 DI, 32 DO	-	-	-	4/2/1 x 24-bit 8255 PIO	96/48 DIO + COS(2)	2 x 24-bit / 8255 PIO
Transfer Rate (Byte/s)	200 M	80 M	12 M	-	-	-	500 k(1)	500 k(1)	500 k(1)
FIFO size (words)	8 k	32 k	-	-	-	-	-	-	-
Logic Standard	1.8/2.5/3.3	5 V/TTL	5 V/TTL	-	-	-	5 V/TTL	5 V/TTL	5 V/TTL
Handshaking Transfer	√	√	√	-	-	-	-	-	-
Dedicated Inputs									
No. of Channels	8(4)	4	-	16	16	32 + COS(2)/-	-	-	-
Max. Sampling Rate (Hz)(1)	500 k	500 k	-	10 k	10 k	10 k/-	-	-	-
Logic Standard	1.8/2.5/3.3	5 V/TTL	-	V_{IH}=5-24 V V_{IL}=0-1.5 V	V_{IH}=5-24 V V_{IL}=0-1.5 V	V_{IH}=5-24 V/- V_{IL}=0-1.5 V/-	-	-	-
Dedicated Outputs									
No. of Channels	-	4	-	16	16	-/32	-	-	-
Max. Update Rate (Hz)(1)	-	500 k	-	10 k	10 k	-/10 k	-	-	-
Output Type	-	5 V/TTL	-	Darlington	Darlington	-/Darlington(3)	-	-	-
Timer/Counter									
Timer/Counter	-	-	-	-	-	-	-	-	1-CH 16-bit counter ; 1-CH 32-bit timer
Page Number	2-31	2-33	2-35	2-45	2-45	2-45	2-47	2-51	2-48

Legend: √ Supported – Not available

Notes: (1) Actual maximum update rate is dependent on system performance.
(2) Change-Of-State detection
(3) The PCI-7234P's outputs provide Darlington source drivers.
(4) For Application Function I/O, please refer to page 2-31.

PCIe-7350

50 MHz 32-CH High-Speed Digital I/O Card

Features

- **x1 lane PCI Express® Interface**
- **Maximum 50 MHz clock rate from internal timer or 100 MHz from external clock**
- **200 MB/s maximum throughput**
- **Software selectable voltage level of 1.8 V, 2.5 V, and 3.3 V**
- **16-steps phase shift in external clock mode**
- **Per group (8-bit) input/output direction selectable**
- **Supports I²C and SPI programmable serial interfaces for external device communication**
- **Scatter-gather DMA support**
- **Flexible handshaking and external digital trigger modes**
- **8-channel auxiliary programmable I/O**

Operating Systems

- Windows Vista/XP/2000/2003

Recommended Software

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

Driver Support

- PCIS-DASK for Windows

Introduction

ADLINK's PCIe-7350 is a high-speed digital I/O board with 32-channel bi-direction parallel I/O lines. The data rate can achieve up to 200 MB/s through the x1 PCI Express® interface. The clock rate can support up to 50 MHz internal clock or 100 MHz external clock, which is ideal for the applications of high-speed and large-scale digital data acquisition or exchange, such as digital image capture, video playback and IC testing.

I/O Port Configuration & Level Shifting

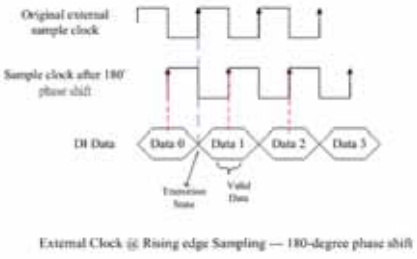
The PCIe-7350's initial status (power-up status) of the on-board 32-channel I/O lines is preset as input lines. The 32-channel I/O lines are bi-direction and can be divided into four groups. Each group contains 8 channels and can be individually configured as an input or output port. The PCIe-7350 also supports software selectable logic level of 1.8 V, 2.5 V, and 3.3 V. When you select one of the logic levels, all the four groups will be at the same logic level you choose. In digital output mode, the outputs are tri-stated when the digital output lines are disabled. The programmable I/O direction and logic levels provide a flexible interface to the device under test (DUT).

Maximum Data Transfer Rate

The PCIe-7350 can support a maximum of 200 MB/s throughput along with a 32-bit data width at a maximum 50 MHz internal clock rate or 8/16-bit data width at a maximum 100 MHz external clock rate. The combination scatter-gather bus-mastering DMA, deep on-board 8 k-sample FIFO size, and x1 PCI Express® interface guarantee no data loss during sustained high-speed data processing.

Phase Delay

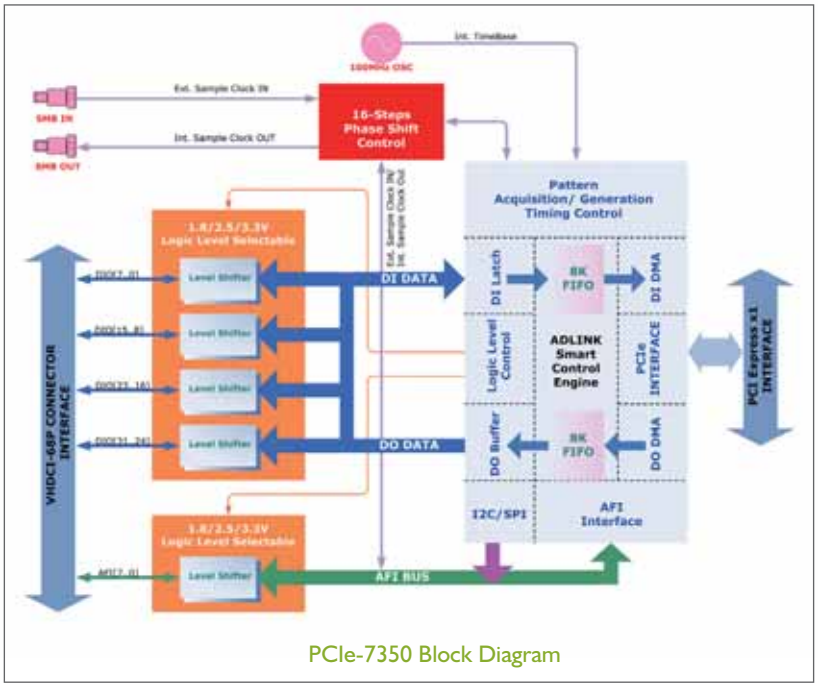
The PCIe-7350 features phase shifting of external sample clock or internal sample clock exporting, which allow you to optimize the acquisition/generation timing in high-speed data transfer applications. The phase shifting of sample clock is capable of up to 16-steps adjustment– that is, the phase shifting can be adjusted from 22.5 degrees to 337.5 degrees. This feature thus prevents sampling at the transition state of the acquired data to ensure sample timing is valid and in stable condition. The left timing diagram is the examples of 180-degree phase shift for digital data acquisition and generation.



External Clock @ Rising edge Sampling — 180-degree phase shift

I²C & SPI Serial Interfaces

PCIe-7350's application function I/O (AFI) can be configured as a I²C or SPI master node. The I²C interface supports fast mode and uses two bi-direction lines called SCL (serial clock) and SDA (serial data). The SPI interface uses three-wire signaling called SCK (serial clock), SI (serial data input), and SO (serial data output). Communication with peripheral devices can be directly performed through the PCIe-7350's built-in I²C or SPI protocols along with provided APIs.



PCIe-7350 Block Diagram

Specifications

Digital I/O

- Number of channels:
  32, per group (8-channel) input/output direction selectable logic levels: 1.8 V, 2.5 V, 3.3 V (software selectable)
- Power-up status: All digital inputs
- Impedance:
  - Input: 10 kΩ
  - Output: 50 Ω
- Input protection: -1 to 6 V
- Data transfer: Programmable I/O, bus-mastering DMA with scatter-gather
- Maximum data transfer rate: 200 MB/s
- Digital logic levels:

Logic Levels		1.8 V	2.5 V	3.3 V
Digital Input	Min. input high voltage	1.2 V	1.6 V	2 V
	Max. input low voltage	0.63 V	0.7 V	0.8 V
Digital Output	Min. output high voltage	1.6 V	2.3 V	3.1 V
	Max. output low voltage	0.2 V	0.2 V	0.2 V
	Max. output driving current	8 mA	16 mA	32 mA

Clocking mode

- Internal clock: Max. 50 MHz (100 MHz / N; 2<N<65535)
- External clock: Max. 100 MHz (support 8/16-bit data width only, data throughput must be less than 200 MB/s)
- Handshaking
- Burst handshaking

Trigger sources

- Software trigger
- External digital trigger: AFI[0…7]

Trigger modes

- Post trigger, Retrigger, Pattern match, Handshaking

Change of State Interrupt

- Interrupt sources: Any of 32 channels or a pre-define channel Change-of-State

Application Function I/O

- Number of channels: 8
- Supporting modes: static I/O, I^2C or SPI master node, external clock input/output, external digital trigger input, handshaking

Cable & Terminal Boards

- DIN-68H-01
  Terminal Board with One 68-pin SCSI-VHDCI Connector and 0 or 50 Ω Jumper Selectable Impedance (cables not included)
- ACL-10279
  - 68-pin SCSI-VHDCI Cable with 50 Ω Impedance
- SMB-SMB-1M
  - SMB to SMB Cable, 1M

Ordering Information

PCIe-7350
50 MHz 32-CH High-Speed Digital I/O PCI Express® Card

DIN-68H-01
Terminal Board with One 68-pin SCSI-VHDCI Connector and 0 or 50 Ω Selectable Impedance


ACL-10279


SMB-SMB-1M


DIN-68H

Pin Assignment

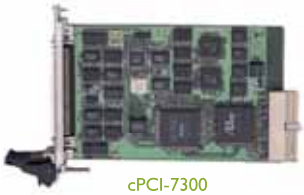
GND	68	34	GND
AFI7(DI CLK)	67	33	AFI6 (DO CLK)
GND	66	32	GND
D0	65	31	D1
AFI5	64	30	AFI4
D2	63	29	D3
GND	62	28	GND
D4	61	27	D5
AFI3	60	26	AFI2
D6	59	25	D7
GND	58	24	GND
D8	57	23	D9
GND	56	22	GND
D10	55	21	D11
GND	54	20	GND
D12	53	19	D13
AFI1	52	18	GND
D14	51	17	D15
GND	50	16	GND
D16	49	15	D17
GND	48	14	GND
D18	47	13	D19
GND	46	12	GND
D20	45	11	D21
GND	44	10	GND
D22	43	9	D23
GND	42	8	AFI0
D24	41	7	D25
GND	40	6	GND
D26	39	5	D27
GND	38	4	GND
D28	37	3	D29
GND	36	2	GND
D30	35	1	D31

PCI/PCIe-7300A, cPCI-7300

80 MB/s High-Speed 32-CH Digital I/O Cards

PCI-7300A

PCIe-7300A



cPCI-7300

Features

- **x1 lane PCI Express® Interface (PCIe-7300A)**
- **Supports a 32-bit 5 V PCI bus (PCI-7300A)**
- **3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1) (cPCI-7300)**
- **32-CH 5 V/TTL digital inputs/outputs**
- **20 MHz (80 MB/s) maximum transfer rate**
- **8, 16, or 32-bit transfers**
- **4 auxiliary DI & 4 auxiliary DO**
- **Onboard 64 kB FIFO**
- **Onboard programmable timer pacer clock**
- **Timed digital input sampling controlled by internal timer or external clock**
- **Independent trigger signals to start data acquisition and pattern generation**
- **Scatter-gather DMA**
- **Supports handshaking digital I/O transfer mode**
- **Repeated digital pattern generation from FIFO**
- **Active terminators for high-speed and longdistance data transfer**

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™
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Introduction

ADLINK's PCI/PCIe-7300A and cPCI-7300 are ultra-highspeed digital I/O card consisting of 32 digital input/output channels. High performance designs and state-of-the-art technology make these cards ideal for a wide range of applications, such as high-speed data transfer, digital pattern generation and digital pattern capture applications, and logic analyzer applications. Trigger signals are available to start the data acquisition of pattern generation.

Maximum Data Acquisition Rate

For sustained data transfer directly from or to host memory, the maximum data acquisition rate can be 80 MB/s. The maximum data transfer rates between external device and onboard FIFO can be up to 80 MB/s for DO and 160 MB/s for DI. 80MB/s is achieved by 32-bit data width multiplied by an internal 20 MHz clock. 160 MB/s is achieved by 32-bit data width with an external 40 MHz clock for digital input channels only. The PCI/PCIe-7300A, cPCI-7300 can reach 160 MB/s throughput only when the acquired data length is less than FIFO size (16 k samples).

Bus Mastering DMA

The PCI/PCIe-7300A, cPCI-7300 performs high-speed data transfers between onboard FIFO and host memory using bus mastering DMA and scatter gather. When the PCI/PCIe-7300A, cPCI-7300 becomes the bus master, it takes control of the PCI/PCIe/cPCI bus, transfers data at burst speed, and then releases the bus. The host memory can be utilized as much as possible to store data when the data acquisition throughput is less than the sustained PCI bus bandwidth.

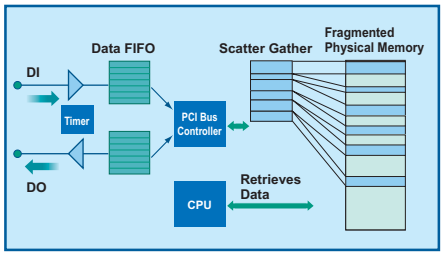
Scatter Gather Support

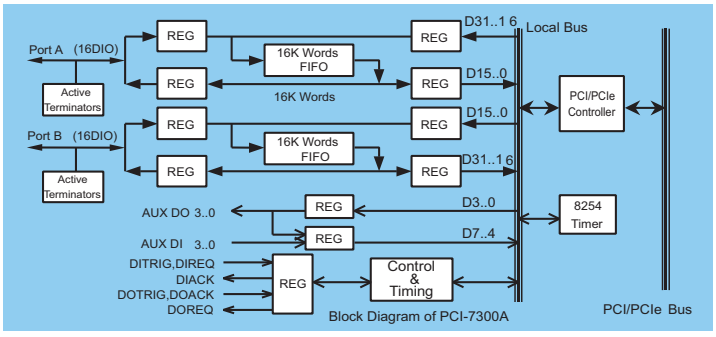
For bus master devices, the hardware has the special-design built-in support for transferring data to and from non-contiguous ranges of physical memory. The PCI/PCIe-7300A, cPCI-7300 contains multiple pairs of address and length registers, each one describing a single contiguous buffer segment. This allows the PCI/PCIe-7300A, cPCI-7300 to perform I/O using buffers that are scattered throughout DMA address space. These multiple address and count registers are often referred to as a scatter/gather list, and you can also think of these bus masters as having their own built-in mapping registers. With scatter gather support, the data transfer size is no longer a limitation, and moreover, ring buffer is easily achieved with the link list of the scattered memory.

I/O Port Configurations

The PCI/PCIe-7300A, cPCI-7300 is initially configured as two ports: PORT A and PORT B. Each port controls 16 digital I/O lines. The I/O ports can be configured as either input or output. According to outside device environment, the PCI/PCIe-7300A, cPCI-7300 can be configured to meet all high-speed digital I/O data transferring. PCI/PCIe-7300A, cPCI-7300 can support many different digital I/O operation modes:

- Internal clock: The digital input and output operations are handled by internal clock and data is transferred by busmastering DMA.
- External clock: The digital input and output operations are handled by external In/Out strobe signals (DI_REQ or DO_ACK) and data is transferred by busmastering DMA.
- Handshaking: Through REQ and ACK signals, the digital I/O data can have simple handshaking data transfer to guarantee no data loss.
- Pattern generation: The PCI/PCIe-7300A, cPCI-7300 reads or writes digital data at a prede termined rate. Users can control the rate internally via by onboard counters with 50 ns timing resolution.





Block Diagram of PCI-7300A

Specifications

Digital I/O

- Numbers of channel (Software configurable)
  - 16 DI & 16 DO
  - 32 DI
  - 32 DO
- Compatibility: 5 V/TTL
- Digital logic levels
  - Input high voltage: 2-5.25 V
  - Input low voltage: 0-0.8 V
  - Output high voltage: 2.7 V minimum
  - Output low voltage: 0.5 V maximum
- Input load
  - Terminator OFF
    - Input high current: 1 mA
    - Input low current: 20 mA
  - Terminator ON
    - Termination resistor: 111 Ω
    - Termination voltage: 2.9 V
    - Input high current: 1 mA
    - Input low current: 22.4 mA
- Output driving capacity
  - Source current: 8 mA
  - Sink current: 48 mA

Transfer characteristics

- Data transfers:
  Bus-mastering DMA with Scatter/Gather
- Data width: 32/16/8 bits (programmable)

Data transfer count

- 2 M double words (8 MB) for non-chaining mode DMA
- No limitation for chaining mode (scatter/gather) DMA

Max transfer rate

- DO: 80 MBytes/s, 32-bit output @ 20 MHz
  DI: 80 MBytes/s, 32-bit input @ 20 MHz

Trigger

- DI_TRG for digital inputs,
  DO_TRG for digital outputs
- Compatibility: 5 V/TTL
- Trigger types: rising or falling edges
- Minimum pulse width: 32 ns

Clocking mode

- Internal clock
  - Internal clock sources: 20 MHz, 10 MHz, Timer#0 output (digital input pacer) and Timer #1 output (digital output pacer)
- External clock up to 40 MHz
- Handshaking
- Burst handshaking

Programmable counter

- Base clock: 10 MHz
- Timer #0 as digital input pacer
- Timer #1 as digital output pacer
- Timer #2: as interrupt source

Auxiliary digital I/O

- Number of channels
  - 4-CH digital inputs
  - 4-CH digital outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

Auxiliary digital I/O

- I/O connector: One 100-pin SCSI-II female
- Operating temperature: 0 °Cto 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	Power	Onboard terminator off	Onboard terminator on
PCI-7300A	+5 V	830 mA typical	1.0 A typicall
PCIe-7300A	+12 V	119 mA typical	287 mA typical
	+3.3 V	499 mA typical	543 mA typical
cPCI-7300	+5 V	830 mA typical	1.0 A typical

- Dimensions (not including connectors)
  - 179 mm x 106 mm (PCI-7300A)
  - 168 mm x 112 mm (PCIe-7300A)
  - 160 mm x 100 mm (cPCI-7300)

Terminal Boards

- DIN-100S-01

  Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

  Note:
  Legacy DIN-502S can be replaced by two DIN-50S-01 and ACL-10252-1 (100-Pin to two 50-Pin Cable, 1 M)

Ordering Information

- **PCI-7300A**
  80 MB/S High-Speed 32-CH Digital I/O Card
- **PCIe-7300A**
  80 MB/S High-Speed 32-CH Digital I/O PCIe Card
- **cPCI-7300**
  80 MB/s High-Speed 32-CH Digital I/O Module

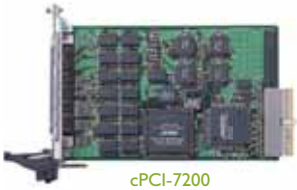
Pin Assignment

GND	1	51	PB15
GND	2	52	PB14
GND	3	53	PB13
GND	4	54	PB12
GND	5	55	PB11
GND	6	56	PB10
GND	7	57	PB9
GND	8	58	PB8
GND	9	59	PB7
GND	10	60	PB6
GND	11	61	PB5
GND	12	62	PB4
GND	13	63	PB3
GND	14	64	PB2
GND	15	65	PB1
GND	16	66	PB0
GND	17	67	DO_ACK
GND	18	68	DO_REQ
GND	19	69	DO_TRG
GND	20	70	AUXO3
GND	21	71	AUXO2
GND	22	72	AUXO1
GND	23	73	AUXO0
GND	24	74	TERMPWR
GND	25	75	TERMPWR
GND	26	76	TERMPWR
GND	27	77	TERMPWR
GND	28	78	AUXI3
GND	29	79	AUXI2
GND	30	80	AUXI1
GND	31	81	AUXI0
GND	32	82	DI_ACK
GND	33	83	DI_REQ
GND	34	84	DI_TRG
GND	35	85	PA15
GND	36	86	PA14
GND	37	87	PA13
GND	38	88	PA12
GND	39	89	PA11
GND	40	90	PA10
GND	41	91	PA9
GND	42	92	PA8
GND	43	93	PA7
GND	44	94	PA6
GND	45	95	PA5
GND	46	96	PA4
GND	47	97	PA3
GND	48	98	PA2
GND	49	99	PA1
GND	50	100	PA0

PCI/PCIe/cPCI-7200

12 MB/s High-Speed 32-CH DI & 32-CH DO Cards


PCI-7200


cPCI-7200


PCIe-7200

NEW

PCI EXPRESS® PCI CompactPCI

Introduction

ADLINK's PCI/PCIe/cPCI-7200 are high-speed digital I/O cards consisting of 32 digital input channels, and 32 digital output channels. High-performance designs and the state-of-the-art technology make these cards suitable for high-speed data transfer and pattern generation applications.

The PCI/PCIe/cPCI-7200 performs high-speed data transfers using bus-mastering DMA via 32-bit PCI bus architecture. The maximum data transfer rates can be up to 12 MB per second. Several digital I/O transfer modes are supported, such as direct programmed I/O control, timer pacer control, external clock mode and handshaking mode. They are very suitable for interfacing high-speed peripherals with your computer system.

Features

- **Support a 32-bit 5 V PCI bus (PCI-7200)**
- **x1 lane PCI Express® interface (PCIe-7200)**
- **3U EuroCard form factor, CompactPCI compliant (PICMG 2.0 R2.1) (cPCI-7200)**
- **32-CH TTL digital inputs and 32-CH TTL digital outputs**
- **Up to 12 MB/s transfer rate**
- **Bus-mastering DMA for both digital inputs and outputs**
- **Onboard programmable timer pacer clock**
- **Supports handshaking digital I/O transfer mode**
- **Multiple programmable interrupt sources**
- **5 V power available on connectors**
- **Compact, half-size PCB (PCI-7200/PCIe-7200)**

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Digital I/O

- Number of channels:
  - 32-CH digital inputs
  - 32-CH digital outputs
- Compatibility: 5 V/TTL
- Data transfer rate
  - 12 MB/s with external 3 MHz clock, handshaking or external strobe
  - 8 MB/s with internal 2 MHz timer pacer
- Digital logic levels
  - Input high voltage: 2-5.25 V
  - Input low voltage: 0-0.8 V
  - Output high voltage: 2.7 V minimum
  - Output low voltage: 0.5 V maximum
- Output driving capacity
  - Source current: 3.0 mA
  - Sink current: 24 mA
- Data transfers:
  - programmed I/O, interrupt, bus-mastering DMA

Programmable Counter

- Base clock: 4 MHz
- Timer 0: DI clock source
- Timer 1: DO clock source
- Timer 2: Base clock source of timer 0 & 1

Interrupt

- Sources:
  EO_ACK, EI_REQ, Timer 0, Timer 1 or Timer 2

General Specifications

- I/O connector
  - PCI/PCIe-7200
    - 37-pin D-sub female
    - 40-pin Header
  - cPCI-7200
    - One 100-pin SCSI-II female
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	Power Consumption
PCI-7200	5V @ 720 mA typical
cPCI-7200	5V @ 800 mA typical
PCIe-7200	12V @ 200 mA 3.3V @ 500 mA

- Dimensions (not including connectors)
  - 148 mm x 102 mm (PCI/PCIe-7200)
  - 160 mm x 100 mm (cPCI-7200)

Terminal Boards

PCI/PCIe-7200:

- DIN-37D-01
  Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)
- ACLD-9137-01
  General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- ACLD-9137F-01
  General-Purpose Terminal Board with One 37-pin D-sub Female Connector

cPCI-7200:

- DIN-100S-01
  Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

Ordering Information

- **PCI-7200**
  12 MB/s High-Speed 32-CH DI & 32-CH DO Card
- **PCIe-7200**
  12 MB/s High-Speed 32-CH DI & 32-CH DO PCI Express® card
- **cPCI-7200**
  12 MB/s High-Speed 32-CH DI & 32 CH DO Module Card for Low-Profile PCI

Pin Assignment

PCI/PCIe-7200

CN1

DI16	1	2	DO16
DI17	3	4	DO17
DI18	5	6	DO18
DI19	7	8	DO19
DI20	9	10	DO20
DI21	11	12	DO21
DI22	13	14	DO22
DI23	15	16	DO23
DI24	17	18	DO24
DI25	19	20	DO25
DI26	21	22	DO26
DI27	23	24	DO27
DI28	25	26	DO28
DI29	27	28	DO29
DI30	29	30	DO30
DI31	31	32	DO31
+5Vout	33	34	GND
O-ACK	35	36	O-TRG
O-REQ	37	38	N/C
N/C	39	40	N/C

CN2

DI0	1	20	DO0
DI1	2	21	DO1
DI2	3	22	DO2
DI3	4	23	DO3
DI4	5	24	DO4
DI5	6	25	DO5
DI6	7	26	DO6
DI7	8	27	DO8
DI8	9	28	DO7
DI9	10	29	DO9
DI10	11	30	DO10
DI11	12	31	DO11
DI12	13	32	DO12
DI13	14	33	DO13
DI14	15	34	DO14
DI15	16	35	DO15
+5Vout	17	36	GND
I-ACK	18	37	I-TRG
I-REQ	19		

cPCI-7200

CN1

DO0	1	51	DO1
DO2	2	52	DO3
DO4	3	53	DO5
DO6	4	54	DO7
DO8	5	55	DO9
DO10	6	56	DO11
DO12	7	57	DO13
DO14	8	58	DO15
GND	9	59	GND
DO16	10	60	DO17
DO18	11	61	DO19
DO20	12	62	DO21
DO22	13	63	DO23
DO24	14	64	DO25
DO26	15	65	DO27
DO28	16	66	DO29
DO30	17	67	DO31
GND	18	68	GND
+5Vout	19	69	GND
+5Vout	20	70	GND
AUXIN0	21	71	AUXOUT0
AUXIN1	22	72	AUXOUT1
I_TRG	23	73	GND
I_REQ	24	74	GND
I_ACK	25	75	GND
O_TRG	26	76	GND
O_REQ	27	77	GND
O_ACK	28	78	GND
AUXIN2	29	79	AUXOUT2
AUXIN3	30	80	AUXOUT3
+5Vout	31	81	GND
+5Vout	32	82	GND
GND	33	83	GND
DIN0	34	84	DIN1
DIN2	35	85	DIN3
DIN4	36	86	DIN5
DIN6	37	87	DIN7
DIN8	38	88	DIN9
DIN10	39	89	DIN11
DIN12	40	90	DIN13
DIN14	41	91	DIN15
GND	42	92	GND
DIN16	43	93	DIN17
DIN18	44	94	DIN19
DIN20	45	95	DIN21
DIN22	46	96	DIN23
DIN24	47	97	DIN25
DIN26	48	98	DIN27
DIN28	49	99	DIN29
DIN30	50	100	DIN31

PCI-7260

8-CH High-Power Relay Outputs & 8-CH Isolated Digital Inputs Card

Introduction

ADLINK's PCI-7260 is the world's first PCI-bus, high-power relay output card for industrial automation and machine control. The design of PCI-7260 conforms to EN61010-1 safety standards. All eight channels are capable to switch 5 A current at 250 VAC or 5 A current at 30 VDC. Its pluggable front-panel connector gives consideration to both carrying high current and easy wiring. The PCI-7260 also provides eight isolated digital input channels with debouncer capability. Users may monitor the digital inputs by handling the hardware interrupt generated when DI status changes or DI CH0/CH1 transitions from low to high.

PCI-7260 also provides advanced features to make it feasible for industrial applications. The emergency shutdown input on the front panel lets users get back to a safety state set by a DIP switch regardless the system condition. A DIP switch sets the initial output status upon powering on, while a built-in watchdog timer guarantees that all the relays return to the safety state when the compute halts.

Features

- **Supports a 32-bit 3.3 V or 5 V PCI bus**
- **8-CH high power relay outputs**
- **5 A at 250 VAC**
- **5 A at 30 VDC**
- **8-CH isolated digital inputs**
- **8-CH relay status outputs**
- **1-CH emergency shutdown input**
- **Pluggable connector for high current input**
- **Onboard LED indicators for relay status**
- **Initial and safety state setting by DIP switches**
- **Interrupt generated from**
  - **COS (Change-of-State) of DI**
  - **CH0/CH1 rising edge**
- **Built-in watchdog timer**

Operating Systems

- Windows Vista/XP/2000/2003
- Linux
- Windows CE (call for availability)

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Relay Output

- Number of channels: 8
- Relay type: Non-latching SPST-NO + SPST-NC (for output indicator)
- Contact rating
  - AC: 250 V @ 5 A
  - DC: 30 V @ 5 A
- Insulation resistance: 1000 MΩ min. (at 500 VDC)
- Breakdown voltage: 2000 VAC, 50/60 Hz for 1 minute
- Contact resistance: 30 mΩ max
- Operate time: 10 ms max.
- Release time: 10 ms max.
- LED indicators: onboard LEDs for relay status
- Expected relay life
  > 10^5 operations @ 5 A, 250 VAC/30 VDC
- Data transfer: programmed I/O

Isolated Digital Input

- Number of channels: 8
- Input current
  - Rated current: 10 mA
  - Max current: 50 mA, for isolated input.
- Input voltage: Up to 24 VDC
  - Input high voltage: 10-24 V
  - Input low voltage: 0-2 V
- Input resistance: 4.7 KΩ @ 0.5 W
- Input mode: AC-filter/ Non-AC-filter
- Isolation voltage: 2,500 VRMS channel-to-system
- Interrupt sources
  - Change-of-state (COS)
  - CH0/CH1 rising edge
- Data transfer: programmed I/O

Isolation +5 V Power Supply

- Output Voltage: +5 V
- Output Current: 170 mA max. (@ 40°C)

Relay Status Output

- Number of channels: 8
- Driving capacity: 15 mA

General Specifications

- I/O connector
  - 18-pin pluggable terminal block connector
  - 20-pin ribbon male x2
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 70°C
- Relative humidity: 35% to 85%, non-condensing
- Power requirements

+5 V
510 mA typical
990 mA typical (when all relays are activated simultaneously)

- Dimensions (not including connectors)
  175 mm x 107 mm

Certificate

- EMC/EMI: CE, FCC Class A
- Safety: EN61010: 2001

Ordering Information

- **PCI-7260**
  8-CH High-Power Relay Outputs & 8-CH Isolated Digital Inputs Card
- **ACL-10337 (for JP2/JP3)**
  Two 20-Pin Header to 37-Pin D-Sub PC Back Panel

Pin Assignment

CN1: Relay Output/ Emergency Shutdown Input

1	NO0
2	COM0
3	NO1
4	COM1
5	NO2
6	COM2
7	NO3
8	COM3
9	NO4
10	COM4
11	NO5
12	COM5
13	NO6
14	COM6
15	NO7
16	COM7
17	ESDN_SHDN+
18	ESDN_SHDN-

JP2: Digital Input

DI 0+	1	1	DI 0-
DI 1+	2	2	DI 1-
DI 2+	3	3	DI 2-
DI 3+	4	4	DI 3-
DI 4+	5	5	DI 4-
DI 5+	6	6	DI 5-
DI 6+	7	7	DI 6-
DI 7+	8	8	DI 7-
ISOGND	9	9	ISOGND
ISO5V	10	10	ISO5V

JP3: External LED

LED0-	1	1	LED0+
LED1-	2	2	LED1+
LED2-	3	3	LED2+
LED3-	4	4	LED3+
LED4-	5	5	LED4+
LED5-	6	6	LED5+
LED6-	7	7	LED6+
LED7-	8	8	LED7+
X	9	9	X
X	10	10	X

PCI-7250/7251, LPCI-7250, LPCIe-7250, cPCI-7252

8-CH Relay Outputs & 8-CH Isolated DI Cards


PCI-7250


PCI-7250+PCI-7251


cPCI-7252


LPCI-7250


LPCIe-7250

Features

- **Support a 32-bit 5 V PCI bus (PCI-7250/7251)**
- **Support a 32-bit 3.3 V or 5 V PCI bus (LPCI-7250)**
- **x1 lane PCI Express Interface (LPCIe-7250)**
- **3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1) (cPCI-7252)**
- **4-CH SPDT & 4-CH SPST relays (PCI-7250)**
- **8-CH SPDT & 8-CH SPST relays (PCI-7250 + 1 x PCI-7251)**
- **12-CH SPDT & 12-CH SPST relays (PCI-7250 + 2 x PCI-7251)**
- **16-CH SPDT & 16-CH SPST relays (PCI-7250 + 3 x PCI-7251)**
- **8-CH SPDT (LPCI-7250/LPCIe-7250/cPCI-7252)**
- **Non-latching relays**
- **Onboard LED indicators for relay status**
- **Onboard relay driving circuits**
- **Relay output status read back**
- **8-CH isolated digital inputs (cPCI-7252/PCI-7250/LPCI-7250/LPCIe-7250)**
- **16-CH isolated digital inputs (PCI-7250 + 1 x PCI-7251)**
- **24-CH isolated digital inputs (PCI-7250 + 2 x PCI-7251)**
- **32-CH isolated digital inputs (PCI-7250 + 3 x PCI-7251)**
- **Onboard low-pass filtering for digital inputs**
- **Compact, low-profile size PCB (LPCI-7250/LPCIe-7250)**

Introduction

ADLINK's PCI-7250/7251 provide 4-CH SPDT (Form C) & 4-CH SPST (Form A) relay outputs and 8-CH isolated digital inputs. The LPCI/LPCIe-7250 and cPCI-7252 provide 8-CH SPDT (Form C) relay outputs and 8/16-CH isolated digital inputs. The status of each relay output is represented by an onboard LED. When the relay is in SET condition, its corresponding LED will turn ON, and on the contrary, it is OFF. All digital input channels are nonpolarity, optically isolated, and may be set to use RC filter or not. The devices are suitable for collecting digital inputs in noisy environments.

The PCI-7251 is an 8-CH relay outputs and 8-CH isolated DI extension card of the PCI-7250. All the I/O functions of PCI-7251 are the same as those of the PCI-7250. The PCI-7251 has to be connected with PCI-7250 and the bus interface is controlled by the PCI-7250. Up to three PCI-7251 cards can be connected to one PCI-7250, therefore, expanding the PCI-7250's DIO from 8 DIO to maximum 32 DIO.

Operating Systems

- Windows Vista/XP/2000/2003
- Linux
- Windows CE (call for availability)

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Relay Output

- Number of channels: 8
- Relay types
  - PCI-7250/7251:
    - Channel 0-3: SPDT (normal open)
    - Channel 4-7: SPST (normal open)
  - LPCI-7250/LPCIe-7250/cPCI-7252
    - Channel 0-7: SPDT (normal open)
- Contact rating
  - PCI-7250/7251 & cPCI-7252
    - AC: 120 V @ 0.5 A
    - DC: 24 V @ 1 A
  - LPCI-7250/LPCIe-7250
    - DC: 30 V @ 2 A
- Breakdown voltage: 1000 V_{RMS}
- Contact resistance: 100 m
- Relay ON/OFF time
  - Operate time: 8 ms
  - Release time: 8 ms
- LED indicators: onboard LEDs for relay status
- Expected life
  - PCI-7250/7251 & cPCI-7252
    - $>5x10^5$ operations @ 1 A, 24 V_{DC}
    - $>2x10^5$ operations @ 0.5 A, 120 V_{AC}

- LPCI-7250/LPCIe-7250:
  - $>10^5$ operations @ 2 A, 30 VDC
  - $>5x10^5$ operations @ 1 A, 30 VDC
- Data transfers: programmed I/O

Isolated Digital Input

- Number of channels: 8
- Maximum input range: 24 V, non-polarity
- Digital logic levels
  - 0-24 V, non-polarity
  - Input high voltage:
    5-24 V (PCI/LPCI/LPCIe-7250, PCI-7251)
    3-24 V (cPCI-7252)
  - Input low voltage:
    0-1.5 V (PCI/LPCI/LPCIe-7250, PCI-7251)
    0-1 V (cPCI-7252)
- Input resistance: 2.2 kΩ @ 0.33 W (PCI/LPCI/LPCIe-7250, PCI-7251) 1.2 kΩ @ 0.5 W (cPCI-7252)
- Isolation voltage: 5000 VRMS
- Data transfers: programmed I/O

General Specifications

- I/O connector
  - PCI-7250/7251
    - 37-pin D-sub female
  - LPCI-7250/LPCIe-7250/cPCI-7252
    - 50-pin SCSI-II female
- Operating temperature: 0 °C to 60 °C
- Storage temperature: -20 °C to 80 °C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	Power Consumption
PCI-7250	+5 V @ 140 mA typical
PCI-7251	+5 V @ 125 mA typical
LPCI-7250	+5 V @ 200 mA typical
LPCIe-7250	+3.3 V @ 280 mA +12 V @ 180 mA

- Dimensions (not including connectors)
  - 162 mm x 107 mm (PCI-7250)
  - 141 mm x 102 mm (PCI-7251)
  - 120 mm x 65 mm (LPCI-7250)
  - 120 mm x 69 mm (LPCIe-7250)
  - 160 mm x 100 mm (cPCI-7252)

Terminal Boards

PCI-7250/7251:

■ DIN-37D-01

Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

■ ACLD-9137-01

General-Purpose Terminal Board with One 37-pin D-sub Male Connector

LPCI-7250/LPCIe-7250/cPCI-7252:

■ DIN-50S-01

Terminal Board with One 50-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

Ordering Information

■ **PCI-7250**
8-CH Relay Outputs & 8-CH Isolated DI Card

■ **PCI-7251**
8-CH Relay Outputs & 8-CH Isolated DI Extension Card for PCI-7250

■ **LPCI-7250**
8-CH Relay Outputs & 8-CH Isolated DI Low-Profile PCI Card

■ **LPCIe-7250**
8-CH Relay Outputs & 8-CH Isolated DI Low-Profile PCI Express Card

■ **cPCI-7252**
8-CH Relay Output & 16-CH Isolated DI Module

Note: Rear I/O version can not be used in PXI chassis due to signals conflict with PXI bus.

Pin Assignment

PCI-7250

NO0	1	20	NO3
COM0	2	21	COM3
NC0	3	22	NC3
NO1	4	23	NO4
COM1	5	24	COM4
NC1	6	25	NO5
NO2	7	26	COM5
COM2	8	27	NO6
NC2	9	28	COM6
NO7	10	29	N/C
COM7	11	30	DI0_L
DI0_H	12	31	DI1_L
DI1_H	13	32	DI2_L
DI2_H	14	33	DI3_L
DI3_H	15	34	DI4_L
DI4_H	16	35	DI5_L
DI5_H	17	36	DI6_L
DI6_H	18	37	DI7_L
DI7_H	19		

LPCI-7250/LPCIe-7250

NO0	1	26	NO4
COM0	2	27	COM4
NC0	3	28	NC4
NO1	4	29	NO5
COM1	5	30	COM5
NC1	6	31	NC5
NO2	7	32	NO6
COM2	8	33	COM6
NC2	9	34	NC6
NO3	10	35	NO7
COM3	11	36	COM7
NC3	12	37	NC7
N/C	13	38	N/C
N/C	14	39	N/C
N/C	15	40	N/C
N/C	16	41	N/C
N/C	17	42	N/C
IDI_0H	18	43	IDI_0L
IDI_1H	19	44	IDI_1L
IDI_2H	20	45	IDI_2L
IDI_3H	21	46	IDI_3L
IDI_4H	22	47	IDI_4L
IDI_5H	23	48	IDI_5L
IDI_6H	24	49	IDI_6L
IDI_7H	25	50	IDI_7L

cPCI-7252

IGND	1	26	IGND
DI8	2	27	DI12
DI9	3	28	DI13
DI10	4	29	DI14
DI11	5	30	DI15
DI0L	6	31	DI4H
DI0H	7	32	DI4L
DI1L	8	33	DI5H
DI1H	9	34	DI5L
DI2L	10	35	DI6H
DI2H	11	36	DI6L
DI3L	12	37	DI7H
DI3H	13	38	DI7L
NO0	14	39	NO5
NO1	15	40	NO4
COM0	16	41	COM5
COM1	17	42	COM4
NC0	18	43	NC5
NC1	19	44	NC4
NO2	20	45	NO7
NO3	21	46	NO6
COM2	22	47	COM7
COM3	23	48	COM6
NC2	24	49	NC7
NC3	25	50	NC6

PCI-7256

16-CH Latching Relay Outputs & 16-CH Isolated DI Card

Introduction

ADLINK's PCI-7256 is a 16-CH latching relay outputs and 16-CH isolated DI card. All relays are Form C type, which are suitable for device connection with ON/OFF control. With latching relays, the PCI-7256 has the advantage of power saving. The status of each latching relay output is represented by an onboard LED. When the relay is in SET condition, its corresponding LED will turn ON, and on the contrary, it is OFF. Latching relays also features unchanged status even when the system power is turned off, so that the PCI-7256 is suitable for critical applications which need to keep output status when fault conditions happen.

All digital input channels are non-polarity, optically isolated, and may be set to use RC filter or not. The PCI-7256 also features a change-of-state (COS) function that generates an interrupt when any digital input changes its state.

Features

- **Supports a 32-bit 3.3 V or 5 V PCI bus**
- **16-CH latching SPDT relays**
- **Latching relays**
- **Power saving on relay actuation**
- **Output status unchanged when power-off**
- **Onboard LED indicators for relay status**
- **Relay output status read back**
- **Onboard relay driving circuits**
- **Onboard connectors for external LED connection**
- **16-CH isolated digital inputs**
- **2500 VRMS optical isolation for digital inputs**
- **Change-of-state (COS) interrupt**
- **Onboard low-pass filtering for digital inputs**
- **Two external interrupt sources**
- **Onboard isolated +5 V power for dry contact inputs**
- **Compact, half-size PCB**
- **Board ID**

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Relay Output

- Number of channels: 16
- Relay type: Latching SPDT (Form C), latching
- The output status will keep unchanged when power-off
- Isolation voltage: 1500 VRMS
- Contact rating
  - AC: 125 V @ 0.5 A
  - DC: 30 V @ 1 A
- Breakdown voltage: 1000 VRMS
- Contact resistance: 60 mΩ
- Relay ON/OFF time
  - Operate time: 3 ms
  - Release time: 3 ms
- LED indicators
  - Onboard LEDs for relay status
  - Onboard connectors for external LED connection
- Expected relay life:
  - $>2x10^5$ operations @ 1 A, 30 VDC
  - $>10^5$ operations @ 0.5 A, 125 VAC
- Data transfer: programmed I/O

Isolated Digital Input

- Number of channels: 16
- Maximum input range: 24 V, non-polarity
- Digital logic levels
  - 0-24 V, non-polarity
    - Input high voltage: 10-24 V
    - Input low voltage: 0-2 V
- Input resistance: 4.7 kΩ @ 0.5 W
- Isolation voltage: 2500 VRMS channel-to-system
- Interrupt sources: Change-of-state interrupt, digital input channel 0 and 1
- Data transfer: programmed I/O

Isolated Power Supply

- Output voltage: +5 V
- Output current: 170 mA max @ 40°C

General Specifications

- I/O connector: 68-pin SCSI-II female
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

+5 V
340 mA typical 980 mA max. (when all relays are activated simultaneously)

- Dimensions (not including connectors)
  175 mm x 107 mm

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.)

Ordering Information

- **PCI-7256**
  16-CH Latching Relay Outputs & 16-CH Isolated DI Card

Pin Assignment

PCI-7256

ISO5V	1	35	ISOGND
DI0	2	36	DI1
DI2	3	37	DI3
DI4	4	38	DI5
DI6	5	39	DI7
DICOM2	6	40	DICOM1
DI8	7	41	DI9
DI10	8	42	DI11
DI12	9	43	DI13
DI14	10	44	DI15
NC0	11	45	NC8
COM0	12	46	COM8
NO0	13	47	NO8
NC1	14	48	NC9
COM1	15	49	COM9
NO1	16	50	NO9
NC2	17	51	NC10
COM2	18	52	COM10
NO2	19	53	NO10
NC3	20	54	NC11
COM3	21	55	COM11
NO3	22	56	NO11
NC4	23	57	NC12
COM4	24	58	COM12
NO4	25	59	NO12
NC5	26	60	NC13
COM5	27	61	COM13
NO5	28	62	NO13
NC6	29	63	NC14
COM6	30	64	COM14
NO6	31	65	NO14
NC7	32	66	NC15
COM7	33	67	COM15
NO7	34	68	NO15

PCI-7258

32-CH PhotoMos Relay Outputs & 2-CH Isolated DI Card

Introduction

ADLINK's PCI-7258 is a 32-CH PhotoMos relay and 2-CH isolated digital input card. The 32 PhotoMos relay outputs on the PCI-7258 can switch external devices, including those requiring high input voltage or AC/DC signal at different levels. PhotoMos relays feature long mean-time-between-failure (MTBF) coming from the solid-state process. This makes the PCI-7258 ideal in various applications, such as semiconductor applications, telecommunications, instrumentations, medical equipments and machine automation.

The 2-CH isolated digital inputs on the PCI-7258 can sense the status of external inputs. The PCI-7258 can generate an interrupt when one or both inputs change from low to high. Using these interrupts well can release your computer from a heavy burden in dealing with digital input data.

Features

- **Supports a 32-bit 3.3 V or 5 V PCI bus**
- **32-CH long-life PhotoMos relay outputs**
- **Relay output status read back**
- **1500 VRMS optical isolation for relay outputs**
- **Onboard LED indicators for relay status**
- **Onboard connectors for external LED connection**
- **Onboard relay driving circuits**
- **2-CH isolated digital inputs**
- **Two external interrupt sources**
- **2500 VRMS optical isolation for digital inputs**
- **Compact, half-size PCB**
- **Board ID**

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Relay Output

- Number of channels: 32
- Relay type: PhotoMos SPST (Form A)
- Load voltage (peak AC): 350 V
- Continuous load current: 0.12 A
- Peak load current: 0.3 A
- Maximum switching power: 300 mW
- Isolation voltage: 1500 VRMS
- Output turn-on resistance: 17 Ω typical
- Output off-state leakage current: 1 μA maximum
- Turn-on time: 0.23 ms typical
- Turn-off time: 0.04 ms typical
- Data transfers: programmed I/O

Isolated Digital Input

- Number of channels: 2
- Maximum input range: 24 V, non-polarity
- Digital logic levels
  - 0-24 V, non-polarity
  - Input high voltage: 5-24 V
  - Input low voltage: 0-1.5 V
- Input resistance: 2.4 kΩ @ 0.5 W
- Isolation voltage: 2500 VRMS
- Interrupt sources: digital input channel 0 and 1
- Data transfers: programmed I/O

General Specifications

- I/O connector: 68-pin SCSI-II female
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

+5 V
380 mA max.

- Dimensions (not including connectors)
  175 mm x 107 mm

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.)

Ordering Information

- **PCI-7258**
  32-CH PhotoMos Relay Outputs & 2-CH Isolated DI Card

Pin Assignment

PCI-7258

NO1	1	35	NO18
COM1	2	36	COM18
NO2	3	37	NO19
COM2	4	38	COM19
NO3	5	39	NO20
COM3	6	40	COM20
NO4	7	41	NO21
COM4	8	42	COM21
NO5	9	43	NO22
COM5	10	44	COM22
NO6	11	45	NO23
COM6	12	46	COM23
NO7	13	47	NO24
COM7	14	48	COM24
NO8	15	49	NO25
COM8	16	50	COM25
NO9	17	51	NO26
COM9	18	52	COM26
NO10	19	53	NO27
COM10	20	54	COM27
NO11	21	55	NO28
COM11	22	56	COM28
NO12	23	57	NO29
COM12	24	58	COM29
NO13	25	59	NO30
COM13	26	60	COM30
NO14	27	61	NO31
COM14	28	62	COM31
NO15	29	63	NO32
COM15	30	64	COM32
NO16	31	65	DI0
COM16	32	66	DI1
NO17	33	67	DIGND0
COM17	34	68	DIGND1

PCI-7442/7443/7444

High-density 128-CH Isolated DIO/DI/DO Cards

PCI-7442

PCI-7443

PCI-7444

Introduction

Responding to the industry's need for high-density digital input/output modules, the ADLINK PCI-744X DIO card series delivers up to 128 opto-isolated channels for a wide range of demanding PCI-based applications.

The PCI-744X card series comes with 64 (PCI-7442) or 128 (PCI-7443) opto-isolated digital inputs and 64 (PCI-7442) or 128 (PCI-7444) opto-isolated digital outputs. With a 1250 Vrms (excluding cables) channel-tosystem isolation protection, these cards are shielded from damage caused by accidental contact with external voltage while promoting simple ground connections. All input channels are identical non-polarity with each line isolated and suited to collect digital inputs even at high-noise environments. Featuring a Change-of-State (COS) interrupt function, the PCI-7442/PCI-7443 instantly generates an interrupt request to the PCI controller when it detects a sharp change in the logical state of any of its digital inputs.

For easy identification in systems with multiple DIO cards installed, the cards are also equipped with a board ID design that enables fast and convenient card detection and troubleshooting.

Features

- **Supports universal 32-bit 3.3 V and 5 V PCI bus, Plug-and-Play**
- **High-density, opto-isolated digital input and/or digital output**
  - **PCI-7442: 64-CH digital input and 64-CH digital output**
  - **PCI-7443: 128-CH digital input**
  - **PCI-7444: 128-CH digital output**
- **1250 Vrms isolation voltage**
- **Programmable Change-of-State (COS) detection for all digital input channels**
- **Voltage protection of up to 28 V for isolated input**
- **Dry contact input (PCI-7442 only)**
- **Up to 300 mA high-output driving capability for all output channels**
- **250 mA sink current on isolated output channels**
- **Digital output status read back function**
- **Digital output value retained after hot system reset**
- **Programmable power-up DO initial status**
- **Programmable safety DO status functions when WDT interruption occurs**
- **Watchdog timer counter prevents system crashes (PCI-7442/PCI-7444 only)**
- **32-CH programmable TTL I/O function**
- **Board ID feature**

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Isolated Digital Input

- Number of channels
  - 64 (PCI-7442)
  - 128 (PCI-7443)
- Maximum input range: 28 V, non-polarity
- Digital logic levels: 0 V to 28 V, non-polarity
  - Input high voltage: 5 V to 28 V
  - Input low voltage: 0 V to 1.5 V
- Input resistance: 4.7 kΩ @ 0.5 W
- ESD protection CKT switch (forward)
- Isolation voltage: 1250 Vrms channel-to-system
- Interrupt sources: 64/128-channel Change-of-State (COS)
- Data transfer: programmed I/O

Isolated Digital Output

- Number of channels:
  - 64 (PCI-7442)
  - 128 (PCI-7444)
- Output type: open drain Power MOSFET driver
- Output range: 5 V to 40 V
- Sink current: 250 mA for all channel @ 100% duty (300 mA max.)
- Isolation voltage: 1250 Vrms channel-to-system
- Data transfer: programmed I/O

Isolation +5 V Power Supply (PCI-7442/7444 only)

- Output Voltage: +5 V
- Output Current: 100 mA max. (@ 40°C)

Safety Functions (PCI-7442/7444 only)

- Programmable power-up DO status
- Watchdog timer
  - Base clock available: 10 MHz, fixed
  - Counter width: 32-bit

General Specifications

- I/O connector: 68-pin Dual port VHDCI female
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	+5 V
PCI-7442	800 mA typical
PCI-7443	550 mA typical
PCI-7444	800 mA typical

- Dimension: 175 mm x 107 mm

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.)

Cable

ACL-10568D

Dual-68-Pin Head to Two 68-Pin SCSI-VHDCI Cable

ACL-10568F

68-Pin SCSI-VHDCI Flat Cable

Ordering Information

PCI-7442
64-CH Isolated DI and 64-CH Isolated DO card

PCI-7443
128-CH Isolated DI card

PCI-7444
128-CH Isolated DO card

Pin Assignment

PCI-7442

CN2B

V5V	B68	B34	V5V
IGND	B67	B33	IGND
IGND	B66	B32	IGND
IGND	B65	B31	IGND
IGND	B64	B30	IGND
IGND	B63	B29	IGND
IGND	B62	B28	IGND
IGND	B61	B27	IGND
VDD8	B60	B26	VDD7
IDO_63	B59	B25	IDO_55
IDO_62	B58	B24	IDO_54
IDO_61	B57	B23	IDO_53
IDO_60	B56	B22	IDO_52
IDO_59	B55	B21	IDO_51
IDO_58	B54	B20	IDO_50
IDO_57	B53	B19	IDO_49
IDO_56	B52	B18	IDO_48
N/C	B51	B17	N/C
IGND	B50	B16	IGND
IGND	B49	B15	IGND
IGND	B48	B14	IGND
IGND	B47	B13	IGND
IGND	B46	B12	IGND
IGND	B45	B11	IGND
IGND	B44	B10	IGND
VDD6	B43	B9	VDD5
IDO_47	B42	B8	IDO_39
IDO_46	B41	B7	IDO_38
IDO_45	B40	B6	IDO_37
IDO_44	B39	B5	IDO_36
IDO_43	B38	B4	IDO_35
IDO_42	B37	B3	IDO_34
IDO_41	B36	B2	IDO_33
IDO_40	B35	B1	IDO_32

CN2A

IDO_0	A1	A35	IDO_8
IDO_1	A2	A36	IDO_9
IDO_2	A3	A37	IDO_10
IDO_3	A4	A38	IDO_11
IDO_4	A5	A39	IDO_12
IDO_5	A6	A40	IDO_13
IDO_6	A7	A41	IDO_14
IDO_7	A8	A42	IDO_15
VDD1	A9	A43	VDD2
IGND	A10	A44	IGND
IGND	A11	A45	IGND
IGND	A12	A46	IGND
IGND	A13	A47	IGND
IGND	A14	A48	IGND
IGND	A15	A49	IGND
IGND	A16	A50	IGND
N/C	A17	A51	N/C
IDO_16	A18	A52	IDO_24
IDO_17	A19	A53	IDO_25
IDO_18	A20	A54	IDO_26
IDO_19	A21	A55	IDO_27
IDO_20	A22	A56	IDO_28
IDO_21	A23	A57	IDO_29
IDO_22	A24	A58	IDO_30
IDO_23	A25	A59	IDO_31
VDD3	A26	A60	VDD4
IGND	A27	A61	IGND
IGND	A28	A62	IGND
IGND	A29	A63	IGND
IGND	A30	A64	IGND
IGND	A31	A65	IGND
IGND	A32	A66	IGND
IGND	A33	A67	IGND
N/C	A34	A68	N/C

CN1B

N/C	B68	B34	N/C
COM8	B67	B33	COM7
COM8	B66	B32	COM7
COM8	B65	B31	COM7
COM8	B64	B30	COM7
COM8	B63	B29	COM7
COM8	B62	B28	COM7
COM8	B61	B27	COM7
COM8	B60	B26	COM7
IDI_63	B59	B25	IDI_55
IDI_62	B58	B24	IDI_54
IDI_61	B57	B23	IDI_53
IDI_60	B56	B22	IDI_52
IDI_59	B55	B21	IDI_51
IDI_58	B54	B20	IDI_50
IDI_57	B53	B19	IDI_49
IDI_56	B52	B18	IDI_48
N/C	B51	B17	N/C
COM6	B50	B16	COM5
COM6	B49	B15	COM5
COM6	B48	B14	COM5
COM6	B47	B13	COM5
COM6	B46	B12	COM5
COM6	B45	B11	COM5
COM6	B44	B10	COM5
COM6	B43	B9	COM5
IDI_47	B42	B8	IDI_39
IDI_46	B41	B7	IDI_38
IDI_45	B40	B6	IDI_37
IDI_44	B39	B5	IDI_36
IDI_43	B38	B4	IDI_35
IDI_42	B37	B3	IDI_34
IDI_41	B36	B2	IDI_33
IDI_40	B35	B1	IDI_32

CN1A

IDI_0	A1	A35	IDI_8
IDI_1	A2	A36	IDI_9
IDI_2	A3	A37	IDI_10
IDI_3	A4	A38	IDI_11
IDI_4	A5	A39	IDI_12
IDI_5	A6	A40	IDI_13
IDI_6	A7	A41	IDI_14
IDI_7	A8	A42	IDI_15
COM1	A9	A43	COM2
COM1	A10	A44	COM2
COM1	A11	A45	COM2
COM1	A12	A46	COM2
COM1	A13	A47	COM2
COM1	A14	A48	COM2
COM1	A15	A49	COM2
COM1	A16	A50	COM2
N/C	A17	A51	N/C
IDI_16	A18	A52	IDI_24
IDI_17	A19	A53	IDI_25
IDI_18	A20	A54	IDI_26
IDI_19	A21	A55	IDI_27
IDI_20	A22	A56	IDI_28
IDI_21	A23	A57	IDI_29
IDI_22	A24	A58	IDI_30
IDI_23	A25	A59	IDI_31
COM3	A26	A60	COM4
COM3	A27	A61	COM4
COM3	A28	A62	COM4
COM3	A29	A63	COM4
COM3	A30	A64	COM4
COM3	A31	A65	COM4
COM3	A32	A66	COM4
COM3	A33	A67	COM4
N/C	A34	A68	N/C

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CN2B

N/C	B68	B34	N/C
COM16	B67	B33	COM15
COM16	B66	B32	COM15
COM16	B65	B31	COM15
COM16	B64	B30	COM15
COM16	B63	B29	COM15
COM16	B62	B28	COM15
COM16	B61	B27	COM15
COM16	B60	B26	COM15
IDI_127	B59	B25	IDI_119
IDI_126	B58	B24	IDI_118
IDI_125	B57	B23	IDI_117
IDI_124	B56	B22	IDI_116
IDI_123	B55	B21	IDI_115
IDI_122	B54	B20	IDI_114
IDI_121	B53	B19	IDI_113
IDI_120	B52	B18	IDI_112
N/C	B51	B17	N/C
COM14	B50	B16	COM13
COM14	B49	B15	COM13
COM14	B48	B14	COM13
COM14	B47	B13	COM13
COM14	B46	B12	COM13
COM14	B45	B11	COM13
COM14	B44	B10	COM13
COM14	B43	B9	COM13
IDI_111	B42	B8	IDI_103
IDI_110	B41	B7	IDI_102
IDI_109	B40	B6	IDI_101
IDI_108	B39	B5	IDI_100
IDI_107	B38	B4	IDI_99
IDI_106	B37	B3	IDI_98
IDI_105	B36	B2	IDI_97
IDI_104	B35	B1	IDI_96

CN2A

IDI_64	A1	A35	IDI_72
IDI_65	A2	A36	IDI_73
IDI_66	A3	A37	IDI_74
IDI_67	A4	A38	IDI_75
IDI_68	A5	A39	IDI_76
IDI_69	A6	A40	IDI_77
IDI_70	A7	A41	IDI_78
IDI_71	A8	A42	IDI_79
COM9	A9	A43	COM10
COM9	A10	A44	COM10
COM9	A11	A45	COM10
COM9	A12	A46	COM10
COM9	A13	A47	COM10
COM9	A14	A48	COM10
COM9	A15	A49	COM10
COM9	A16	A50	COM10
N/C	A17	A51	N/C
IDI_80	A18	A52	IDI_88
IDI_81	A19	A53	IDI_89
IDI_82	A20	A54	IDI_90
IDI_83	A21	A55	IDI_91
IDI_84	A22	A56	IDI_92
IDI_85	A23	A57	IDI_93
IDI_86	A24	A58	IDI_94
IDI_87	A25	A59	IDI_95
COM11	A26	A60	COM12
COM11	A27	A61	COM12
COM11	A28	A62	COM12
COM11	A29	A63	COM12
COM11	A30	A64	COM12
COM11	A31	A65	COM12
COM11	A32	A66	COM12
COM11	A33	A67	COM12
N/C	A34	A68	N/C

CN1B

N/C	B68	B34	N/C
COM8	B67	B33	COM7
COM8	B66	B32	COM7
COM8	B65	B31	COM7
COM8	B64	B30	COM7
COM8	B63	B29	COM7
COM8	B62	B28	COM7
COM8	B61	B27	COM7
COM8	B60	B26	COM7
IDI_63	B59	B25	IDI_55
IDI_62	B58	B24	IDI_54
IDI_61	B57	B23	IDI_53
IDI_60	B56	B22	IDI_52
IDI_59	B55	B21	IDI_51
IDI_58	B54	B20	IDI_50
IDI_57	B53	B19	IDI_49
IDI_56	B52	B18	IDI_48
N/C	B51	B17	N/C
COM6	B50	B16	COM5
COM6	B49	B15	COM5
COM6	B48	B14	COM5
COM6	B47	B13	COM5
COM6	B46	B12	COM5
COM6	B45	B11	COM5
COM6	B44	B10	COM5
COM6	B43	B9	COM5
IDI_47	B42	B8	IDI_39
IDI_46	B41	B7	IDI_38
IDI_45	B40	B6	IDI_37
IDI_44	B39	B5	IDI_36
IDI_43	B38	B4	IDI_35
IDI_42	B37	B3	IDI_34
IDI_41	B36	B2	IDI_33
IDI_40	B35	B1	IDI_32

CN1A

IDI_0	A1	A35	IDI_8
IDI_1	A2	A36	IDI_9
IDI_2	A3	A37	IDI_10
IDI_3	A4	A38	IDI_11
IDI_4	A5	A39	IDI_12
IDI_5	A6	A40	IDI_13
IDI_6	A7	A41	IDI_14
IDI_7	A8	A42	IDI_15
COM1	A9	A43	COM2
COM1	A10	A44	COM2
COM1	A11	A45	COM2
COM1	A12	A46	COM2
COM1	A13	A47	COM2
COM1	A14	A48	COM2
COM1	A15	A49	COM2
COM1	A16	A50	COM2
N/C	A17	A51	N/C
IDI_16	A18	A52	IDI_24
IDI_17	A19	A53	IDI_25
IDI_18	A20	A54	IDI_26
IDI_19	A21	A55	IDI_27
IDI_20	A22	A56	IDI_28
IDI_21	A23	A57	IDI_29
IDI_22	A24	A58	IDI_30
IDI_23	A25	A59	IDI_31
COM3	A26	A60	COM4
COM3	A27	A61	COM4
COM3	A28	A62	COM4
COM3	A29	A63	COM4
COM3	A30	A64	COM4
COM3	A31	A65	COM4
COM3	A32	A66	COM4
COM3	A33	A67	COM4
N/C	A34	A68	N/C

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CN2B

V5V	B68	B34	V5V
IGND	B67	B33	IGND
IGND	B66	B32	IGND
IGND	B65	B31	IGND
IGND	B64	B30	IGND
IGND	B63	B29	IGND
IGND	B62	B28	IGND
IGND	B61	B27	IGND
VDD16	B60	B26	VDD15
IDO_127	B59	B25	IDO_119
IDO_126	B58	B24	IDO_118
IDO_125	B57	B23	IDO_117
IDO_124	B56	B22	IDO_116
IDO_123	B55	B21	IDO_115
IDO_122	B54	B20	IDO_114
IDO_121	B53	B19	IDO_113
IDO_120	B52	B18	IDO_112
N/C	B51	B17	N/C
IGND	B50	B16	IGND
IGND	B49	B15	IGND
IGND	B48	B14	IGND
IGND	B47	B13	IGND
IGND	B46	B12	IGND
IGND	B45	B11	IGND
IGND	B44	B10	IGND
VDD14	B43	B9	VDD13
IDO_111	B42	B8	IDO_103
IDO_110	B41	B7	IDO_102
IDO_109	B40	B6	IDO_101
IDO_108	B39	B5	IDO_100
IDO_107	B38	B4	IDO_99
IDO_106	B37	B3	IDO_98
IDO_105	B36	B2	IDO_97
IDO_104	B35	B1	IDO_96

CN2A

IDO_64	A1	A35	IDO_72
IDO_65	A2	A36	IDO_73
IDO_66	A3	A37	IDO_74
IDO_67	A4	A38	IDO_75
IDO_68	A5	A39	IDO_76
IDO_69	A6	A40	IDO_77
IDO_70	A7	A41	IDO_78
IDO_71	A8	A42	IDO_79
VDD9	A9	A43	VDD10
IGND	A10	A44	IGND
IGND	A11	A45	IGND
IGND	A12	A46	IGND
IGND	A13	A47	IGND
IGND	A14	A48	IGND
IGND	A15	A49	IGND
IGND	A16	A50	IGND
N/C	A17	A51	N/C
IDO_80	A18	A52	IDO_88
IDO_81	A19	A53	IDO_89
IDO_82	A20	A54	IDO_90
IDO_83	A21	A55	IDO_91
IDO_84	A22	A56	IDO_92
IDO_85	A23	A57	IDO_93
IDO_86	A24	A58	IDO_94
IDO_87	A25	A59	IDO_95
VDD11	A26	A60	VDD12
IGND	A27	A61	IGND
IGND	A28	A62	IGND
IGND	A29	A63	IGND
IGND	A30	A64	IGND
IGND	A31	A65	IGND
IGND	A32	A66	IGND
IGND	A33	A67	IGND
N/C	A34	A68	N/C

CN1B

N/C	B68	B34	N/C
IGND	B67	B33	IGND
IGND	B66	B32	IGND
IGND	B65	B31	IGND
IGND	B64	B30	IGND
IGND	B63	B29	IGND
IGND	B62	B28	IGND
IGND	B61	B27	IGND
VDD8	B60	B26	VDD7
IDO_63	B59	B25	IDO_55
IDO_62	B58	B24	IDO_54
IDO_61	B57	B23	IDO_53
IDO_60	B56	B22	IDO_52
IDO_59	B55	B21	IDO_51
IDO_58	B54	B20	IDO_50
IDO_57	B53	B19	IDO_49
IDO_56	B52	B18	IDO_48
N/C	B51	B17	N/C
IGND	B50	B16	IGND
IGND	B49	B15	IGND
IGND	B48	B14	IGND
IGND	B47	B13	IGND
IGND	B46	B12	IGND
IGND	B45	B11	IGND
IGND	B44	B10	IGND
VDD6	B43	B9	VDD5
IDO_47	B42	B8	IDO_39
IDO_46	B41	B7	IDO_38
IDO_45	B40	B6	IDO_37
IDO_44	B39	B5	IDO_36
IDO_43	B38	B4	IDO_35
IDO_42	B37	B3	IDO_34
IDO_41	B36	B2	IDO_33
IDO_40	B35	B1	IDO_32

CN1A

IDO_0	A1	A35	IDO_8
IDO_1	A2	A36	IDO_9
IDO_2	A3	A37	IDO_10
IDO_3	A4	A38	IDO_11
IDO_4	A5	A39	IDO_12
IDO_5	A6	A40	IDO_13
IDO_6	A7	A41	IDO_14
IDO_7	A8	A42	IDO_15
VDD1	A9	A43	VDD2
IGND	A10	A44	IGND
IGND	A11	A45	IGND
IGND	A12	A46	IGND
IGND	A13	A47	IGND
IGND	A14	A48	IGND
IGND	A15	A49	IGND
IGND	A16	A50	IGND
N/C	A17	A51	N/C
IDO_16	A18	A52	IDO_24
IDO_17	A19	A53	IDO_25
IDO_18	A20	A54	IDO_26
IDO_19	A21	A55	IDO_27
IDO_20	A22	A56	IDO_28
IDO_21	A23	A57	IDO_29
IDO_22	A24	A58	IDO_30
IDO_23	A25	A59	IDO_31
VDD3	A26	A60	VDD4
IGND	A27	A61	IGND
IGND	A28	A62	IGND
IGND	A29	A63	IGND
IGND	A30	A64	IGND
IGND	A31	A65	IGND
IGND	A32	A66	IGND
IGND	A33	A67	IGND
N/C	A34	A68	N/C

PCI-7432/7433/7434, cPCI-7432/7433/7434

64-CH Isolated Digital I/O Cards

cPCI-7432

cPCI-7433

cPCI-7434

PCI CONVENTIONAL CompactPCI

Introduction

ADLINK's cPCI/PCI-743X series cards are 64-CH highdensity digital input and/or output cards that provide a robust 2,500 V isolation protection is suitable for most industrial applications. The wide input range of the cPCI/PCI-7432 and cPCI/PCI-7433 makes it easy to sense the status of external devices. There are several options for PCI-743X series, such as normal version with input range from 0 to 24 V, as well as HIR version with high input range from 0 to 50 V. The PCI- 7433ALC is specifically designed for AC power test system.

The cPCI/PCI-7432 and cPCI/PCI-7434 feature a wide output range from 5 to 35 V, suitable for relay driving and industrial automation applications. The cPCI/PCI-7432 and cPCI/PCI-7433 also provide two interrupt sources on digital input channels, which are easily configurable.

Features

- **Supports a 32-bit 5 V PCI bus (PCI-7432/7433/7434)**
- **3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1) (cPCI-7432/7433/7434)**
- **32-CH isolated digital inputs & 32-CH isolated digital outputs (PCI-7432/7432HIR, cPCI-7432/7432R/7432RP)**
- **64-CH isolated digital inputs (PCI-7433/7433HIR, cPCI-7433/7433R)**
- **64-CH isolated digital outputs (PCI-7434, cPCI-7434/7434R/7434P/7434RP)**
- **Isolation Voltage:**
  - **2500 V_{RMS}: PCI-7432/7433/7434, cPCI-7432R/7432RP/7433R**
  - **5000 V_{RMS}: cPCI-7432/7433/7434/7434R/7434P/7434RP**
- **Sink current up to 500 mA on single isolated output**
- **Isolated input voltage up to 24 V (PCI-7432/7433, cPCI-7432/7432R/7432RP/7433/7433R)**
- **Isolated input voltage up to 50 V (PCI-7432HIR/7433HIR)**
- **Two external interrupt sources (PCI-7432/7432HIR/7433/7433HIR, cPCI-7432/7432R/7432RP/7433/7433R)**

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Isolated Digital Input

- Number of channels
  - 32 (PCI-7432/7432HIR, cPCI-7432/7432R/7432RP)
  - 64 (PCI-7433/7433HIR, cPCI-7433/7433R)
- Maximum input range (Non-polarity)
  - 24 V, non-polarity (PCI-7432/7433, cPCI-7432/7432R/7432RP/7433/7433R)
- Digital logic levels: 0 V to 24 V, non-polarity
  - Input high voltage: 5 V to 24 V
  - Input low voltage: 0 V to 1.5 V
- Input resistance
  - 2.4 kΩ @ 0.5 W (PCI-7432 & PCI-7433, cPCI-7432/7432R/7432RP)
  - 2.4 kΩ @ 1 W (PCI-7433, cPCI-7433/7433R)
  - 4.7 kΩ @ 0.5 W (PCI-7432HIR)
  - 4.7 kΩ @ 1 W (PCI-7433HIR)
- Isolation voltage: 2500 V_{RMS}: PCI-7432/7432HIR/7433/7433HIR, cPCI-7432R/7432RP/7433R
  5000 V_{RMS}: cPCI-7432/7433
- Interrupt sources: digital input channel 0 & 1
- Data transfers: programmed I/O

Isolated Digital Output

- Number of channels
  - 32 (PCI-7432/7432HIR, cPCI-7432/7432R/7432RP)
  - 64 (PCI-7434, cPCI-7434/7434R/7434P/7434RP)
- Output type: open collector Darlington transistor
- Sink current (PCI-7432/7432HIR/7434, cPCI-7432/7432R/7434/7434R)
  - 500 mA for single channel @ 100% duty cycle
  - 500 mA for all channels @ 20% duty cycle
- Source current (cPCI-7432RP/7434P/7434RP)
  - 500 mA for single channel @ 100% duty cycle
  - 260 mA for all channels @ 10% duty
- Power dissipation: Max. 2.25 W per chip (8 DO channels) (PCI-7432/7432HIR/7434, cPCI-7432/7432R/7434/7434R)
  Max. 1.47 W per chip (8 DO channels) (cPCI-7432RP/7434P/7434RP)
- Supply voltage: 5-35 V
- Isolation voltage: 2500 V_{RMS}
- Data transfers: programmed I/O

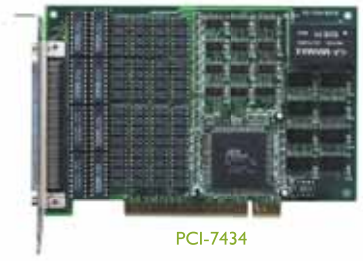
General Specifications

- I/O connector: 100-pin SCSI-II female
- Operating temperature: 0°C to 60 °C
- Storage temperature: -20°C to 80 °C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

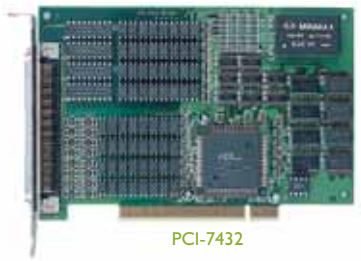
Device	+5 V
PCI-7432/7432HIR, cPCI-7432/7432R/7432RP	530 mA typical
PCI-7433/7433HIR, cPCI-7433/7433R	500 mA typical
PCI-7434, cPCI-7434/7434R/7434P/7434RP	560 mA typical

- Dimensions (not including connectors)
  - 156 mm x 106 mm (PCI-7432 & PCI-7432HIR)
  - 175 mm x 107 mm (PCI-7433, PCI-7433HIR)
  - 156 mm x 106 mm (PCI-7434)
  - 156 mm x 106 mm (PCI-7434)
  - 160 mm x 100 mm (cPCI-7432/7433/7434)

PCI-7433



PCI-7434



PCI-7432

Terminal Boards

■ DIN-100S-01

Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables,refer to Section 14, Accessories.)

Note:

Legacy DIN-502S can be replaced by two DIN-50S-01 and ACL-10252-1 (100-Pin to two 50-Pin Cable, 1 M)

Ordering Information

- **PCI-7432**
  32-CH Isolated DI & 32-CH Isolated DO Card
- **PCI-7432HIR**
  32-CH Isolated DI & 32-CH Isolated DO Card with High Input Range
- **PCI-7433**
  64-CH Isolated DI Card
- **PCI-7433HIR**
  64-CH Isolated DI Card with High Input Range
- **PCI-7434**
  64-CH Isolated DO Card
- **cPCI-7432R**
  32-CH Isolated DI & 32-CH Isolated DO Card with Rear I/O
- **cPCI-7432RP**
  cPCI-7432 with Rear I/O & Source Current Transistor
- **cPCI-7433**
  64-CH Isolated DI Card
- **cPCI-7433R**
  64-CH Isolated DI Card with Rear I/O
- **cPCI-7434**
  64-CH Isolated DO Card
- **cPCI-7434R**
  64-CH Isolated DO Card with Rear I/O
- **cPCI-7434P**
  64-CH Isolated DO Card with Source Current Transistor
- **cPCI-7434RP**
  cPCI-7434 with Rear I/O & Source Current Transistor

Pin Assignment

PCI-7432/7432HIR, cPCI-7432/7432R

IDI_0	1	51	IDI_8
IDI_1	2	52	IDI_9
IDI_2	3	53	IDI_10
IDI_3	4	54	IDI_11
IDI_4	5	55	IDI_12
IDI_5	6	56	IDI_13
IDI_6	7	57	IDI_14
IDI_7	8	58	IDI_15
COM1	9	59	COM2
COM1	10	60	COM2
COM1	11	61	COM2
COM1	12	62	COM2
IDI_16	13	63	IDI_24
IDI_17	14	64	IDI_25
IDI_18	15	65	IDI_26
IDI_19	16	66	IDI_27
IDI_20	17	67	IDI_28
IDI_21	18	68	IDI_29
IDI_22	19	69	IDI_30
IDI_23	20	70	IDI_31
COM3	21	71	COM4
COM3	22	72	COM4
COM3	23	73	COM4
COM3	24	74	COM4
N/C	25	75	N/C
IDO_0	26	76	IDO_8
IDO_1	27	77	IDO_9
IDO_2	28	78	IDO_10
IDO_3	29	79	IDO_11
IDO_4	30	80	IDO_12
IDO_5	31	81	IDO_13
IDO_6	32	82	IDO_14
IDO_7	33	83	IDO_15
VDD1	34	84	VDD2
IGND	35	85	IGND
IGND	36	86	IGND
IGND	37	87	IGND
IDO_16	38	88	IDO_24
IDO_17	39	89	IDO_25
IDO_18	40	90	IDO_26
IDO_19	41	91	IDO_27
IDO_20	42	92	IDO_28
IDO_21	43	93	IDO_29
IDO_22	44	94	IDO_30
IDO_23	45	95	IDO_31
VDD3	46	96	VDD4
IGND	47	97	IGND
IGND	48	98	IGND
IGND	49	99	IGND
+5Vout	50	100	+5Vout

PCI-7433/7433HIR, cPCI-7433/7433R

IDI_0	1	51	IDI_8
IDI_1	2	52	IDI_9
IDI_2	3	53	IDI_10
IDI_3	4	54	IDI_11
IDI_4	5	55	IDI_12
IDI_5	6	56	IDI_13
IDI_6	7	57	IDI_14
IDI_7	8	58	IDI_15
COM1	9	59	COM2
COM1	10	60	COM2
COM1	11	61	COM2
COM1	12	62	COM2
IDI_16	13	63	IDI_24
IDI_17	14	64	IDI_25
IDI_18	15	65	IDI_26
IDI_19	16	66	IDI_27
IDI_20	17	67	IDI_28
IDI_21	18	68	IDI_29
IDI_22	19	69	IDI_30
IDI_23	20	70	IDI_31
COM3	21	71	COM4
COM3	22	72	COM4
COM3	23	73	COM4
COM3	24	74	COM4
N/C	25	75	N/C
IDI_32	26	76	IDI_40
IDI_33	27	77	IDI_41
IDI_34	28	78	IDI_42
IDI_35	29	79	IDI_43
IDI_36	30	80	IDI_44
IDI_37	31	81	IDI_45
IDI_38	32	82	IDI_46
IDI_39	33	83	IDI_47
COM5	34	84	COM6
COM5	35	85	COM6
COM5	36	86	COM6
COM5	37	87	COM6
IDI_48	38	88	IDI_56
IDI_49	39	89	IDI_57
IDI_50	40	90	IDI_58
IDI_51	41	91	IDI_59
IDI_52	42	92	IDI_60
IDI_53	43	93	IDI_61
IDI_54	44	94	IDI_62
IDI_55	45	95	IDI_63
COM7	46	96	COM8
COM7	47	97	COM8
COM7	48	98	COM8
COM7	49	99	COM8
N/C	50	100	N/C

PCI-7434, cPCI-7434/7434R

IDO_0	1	51	IDO_8
IDO_1	2	52	IDO_9
IDO_2	3	53	IDO_10
IDO_3	4	54	IDO_11
IDO_4	5	55	IDO_12
IDO_5	6	56	IDO_13
IDO_6	7	57	IDO_14
IDO_7	8	58	IDO_15
VDD1	9	59	VDD2
IGND	10	60	IGND
IGND	11	61	IGND
IGND	12	62	IGND
IDO_16	13	63	IDO_24
IDO_17	14	64	IDO_25
IDO_18	15	65	IDO_26
IDO_19	16	66	IDO_27
IDO_20	17	67	IDO_28
IDO_21	18	68	IDO_29
IDO_22	19	69	IDO_30
IDO_23	20	70	IDO_31
VDD3	21	71	VDD4
IGND	22	72	IGND
IGND	23	73	IGND
IGND	24	74	IGND
N/C	25	75	N/C
IDO_32	26	76	IDO_40
IDO_33	27	77	IDO_41
IDO_34	28	78	IDO_42
IDO_35	29	79	IDO_43
IDO_36	30	80	IDO_44
IDO_37	31	81	IDO_45
IDO_38	32	82	IDO_46
IDO_39	33	83	IDO_47
VDD5	34	84	VDD6
IGND	35	85	IGND
IGND	36	86	IGND
IGND	37	87	IGND
IDO_48	38	88	IDO_56
IDO_49	39	89	IDO_57
IDO_50	40	90	IDO_58
IDO_51	41	91	IDO_59
IDO_52	42	92	IDO_60
IDO_53	43	93	IDO_61
IDO_54	44	94	IDO_62
IDO_55	45	95	IDO_63
VDD7	46	96	VDD8
IGND	47	97	IGND
IGND	48	98	IGND
IGND	49	99	IGND
+5Vout	50	100	+5Vout

PCI-7230/7233/7234, LPCI/LPCIe/cPCI-7230

32-CH Isolated DIO Cards


PCI-7230


PCI-7234/7234P


PCI-7233


LPCI-7230


LPCIe-7230


cPCI-7230

Features

- **Support a 32-bit 5 V PCI bus (PCI-7230/7233/7234/7234P)**
- **Support a 32-bit 3.3 V or 5 V PCI bus (LPCI-7230)**
- **x1 lane PCI Express Interface (LPCIe-7230)**
- **3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1) (cPCI-7230)**
- **16-CH isolated digital inputs & 16-CH isolated digital outputs (PCI-7230/LPCI-7230/LPCIe-7230/cPCI-7230)**
- **32-CH isolated digital inputs (PCI-7233)**
- **32-CH isolated digital outputs (PCI-7234/7234P)**
- **5000 V_{RMS} optical isolation (PCI-7230 & PCI-7233/cPCI-7230)**
- **2500 V_{RMS} optical isolation (PCI-7234/7234P/LPCI-7230/LPCIe-7230)**
- **Sink current up to 500 mA on single isolated output**
- **Two external interrupt sources (PCI-7230/LPCI-7230/LPCIe-7230/cPCI-7230)**
- **Change-of-state interrupt sources (PCI-7233)**
- **Compact, low-profile PCI/PCI Express® size PCB (LPCI-7230/LPCIe-7230)**

Operating Systems

- Windows Vista/XP/2000/2003
- Linux
- Windows CE (call for availability)

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Introduction

ADLINK's PCI/LPCI/LPCIe/cPCI-723X series are 32-CH isolated input and/or output cards which provide a 2,500 V optical isolation protection. The wide input range of the PCI/cPCI/LPCI/LPCIe-7230 and PCI-7233 makes it easy to sense the status of external devices. The non-polarity characteristic is suitable for a wide variety of industry applications. The PCI/cPCI/LPCI/LPCIe-7230 and PCI-7234 devices also feature a wide output range from 5 to 35 V, which is suitable for relay driving and industrial automation applications. The PCI-7234P provides current-source output capability. The PCI/cPCI/LPCI/LPCIe-7230 and PCI-7233 also provide two interrupt sources on digital input channels. The PCI-7233 also features a change-of-state (COS) function that generates an interrupt when any digital input changes its state.

Specifications

Isolated Digital Input

- Number of channels
  - 16 (PCI-7230/LPCI-7230/LPCIe-7230/cPCI-7230)
  - 32 (PCI-7233)
- Maximum input range
  - 24 V, non-polarity
  - PCI-7230/PCI-7233/LPCI-7230/LPCIe-7230
- Digital logic levels
  - 0-24 V, non-polarity
    - Input high voltage: 5-24 V
    - Input low voltage: 0-1.5 V
- Input resistance: 1.2 k @ 0.5 W
- Isolation voltage
  - 2500 V_{RMS} (LPCI-7230/LPCIe-7230)
  - 5000 V_{RMS} (PCI-7230/PCI-7233/cPCI-7230)
- Interrupt sources
  - Digital input channel 0 and 1 (PCI-7230/LPCI-7230/LPCI-7230/cPCI-7230)
  - Change-of-state (PCI-7233)
- Data transfers: programmed I/O

Isolated Digital Output

- Number of channels
  - 16 (PCI-7230/LPCI-7230/LPCIe-7230/cPCI-7230)
  - 32 (PCI-7234)
- Output type: Darlington transistor
- Sink current
  - 500 mA for one channel @ 100% duty (PCI-7230/LPCI-7230/LPCIe-7230)
  - 370 mA for all channels @ 10% duty (PCI-7230/LPCI-7230/LPCIe-7230)
  - 130 mA for all channels @ 50% duty (PCI-7230/LPCI-7230/LPCIe-7230)
  - 500 mA for single channel @ 100% duty (PCI-7234)
  - 500 mA for all channels @ 20% duty (PCI-7234)
- Source current
  - 500 mA for one channel @100% duty cycle (PCI-7234P)
  - 260 mA for all channels @10% duty cycle (PCI-7234P)
- Power dissipation
  - Max. 1.47 W per chip (8 DO channels) (PCI-7230/PCI-7234P/LPCI-7230/LPCIe-7230)
  - Max. 2.25 W per chip (8 DO channels) (PCI-7234)
- Supply voltage: 5-35 V_{DC}
- Isolation voltage: 2500 V_{RMS}
- Data transfers: programmed I/O

General Specifications

- I/O connector
  - PCI-7230/7233/7234/7234P
    - 37-pin D-sub female
  - PCI-7230/LPCI-7230/cPCI-7230
    - One 50-pin SCSI-II female

- Operating temperature: 0°C to 60 °C
- Storage temperature: -20°C to 80 °C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	Power Consumption
PCI-7230	+5 V @ 150 mA typical (needs external DC power)
PCI-7233	+5 V @ 300 mA typical
PCI-7234	+5 V @ 180 mA typical (with internal DC-DC power)
PCI-7234P	+5 V @ 150 mA typical
LPCI-7230	+3.3 V @ 279 mA
LPCIe-7230	+12 V @ 133 mA
cPCI-7230	+5V@ 270 mA typical

- Dimensions (not including connectors)
  - 153 mm X 107 mm (PCI-7230)
  - 158 mm X 107 mm (PCI-7233)
  - 175 mm X 107 mm (PCI-7234 & PCI-7234P)
  - 120 mm X 65 mm (LPCI-7230)
  - 119.9 mm(L) x 68.9 mm(H) (LPCIe-7230)
  - 160 mm x 100 mm (cPCI-7230)

Terminal Boards

PCI-7230/7233/7234/7234P:

- DIN-37D-01

  Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

- ACLD-9137-01

  General-Purpose Terminal Board with One 37-pin D-sub Male Connector

LPCI-7230/LPCIe-7230/cPCI-7230:

- DIN-50S-01

  Terminal Board with One 50-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

Ordering Information

- **PCI-7230**
  16-CH Isolated DI & 16-CH Isolated DO Card
- **PCI-7233**
  32-CH Isolated DI Card with inversed input logic
- **PCI-7234**
  32-CH Isolated DO Card
- **PCI-7234P**
  32-CH Isolated DO Card with Source Current Transistor
- **LPCI-7230**
  16-CH Isolated DI & 16-CH Isolated DO Low-Profile PCI Card
- **LPCIe-7230**
  16-CH Isolated DI & 16-CH Isolated DO Low-Profile PCI Express® Card
- **cPCI-7230**
  16-CH Isolated DI & 16-CH Isolated DO Module

Pin Assignment

PCI-7230

IDI_0	1	20	IDI_1
IDI_2	2	21	IDI_3
IDI_4	3	22	IDI_5
IDI_6	4	23	IDI_7
IDI_8	5	24	IDI_9
IDI_10	6	25	IDI_11
IDI_12	7	26	IDI_13
IDI_14	8	27	IDI_15
EICOM	9	28	EOGND
EOGND	10	29	EOGND
IDO_0	11	30	IDO_1
IDO_2	12	31	IDO_3
IDO_4	13	32	IDO_5
IDO_6	14	33	IDO_7
IDO_8	15	34	IDO_9
IDO_10	16	35	IDO_11
IDO_12	17	36	IDO_13
IDO_14	18	37	IDO_15
VDD	19		

PCI-7233

IDI_0	1	20	IDI_1
IDI_2	2	21	IDI_3
IDI_4	3	22	IDI_5
IDI_6	4	23	IDI_7
IGND	5	24	IDI_8
IDI_9	6	25	IDI_10
IDI_11	7	26	IDI_12
IDI_13	8	27	IDI_14
IDI_15	9	28	IGND
IDI_16	10	29	IDI_17
IDI_18	11	30	IDI_19
IDI_20	12	31	IDI_21
IDI_22	13	32	IDI_23
IGND	14	33	IDI_24
IDI_25	15	34	IDI_26
IDI_27	16	35	IDI_28
IDI_29	17	36	IDI_30
IDI_31	18	37	IGND
IGND	19		

LPCI-7230/LPCIe-7230

VDD	1	26	VDD
EICOM	2	27	+5V
EICOM	3	28	EICOM
EICOM	4	29	EICOM
IDO_7	5	30	IDO_14
IDO_6	6	31	IDO_15
IDO_5	7	32	IDO_12
IDO_4	8	33	IDO_13
IDO_3	9	34	IDO_10
IDO_2	10	35	IDO_11
IDO_1	11	36	IDO_8
IDO_0	12	37	IDO_9
IDI_3H	13	38	IDI_7L
IDI_3L	14	39	IDI_7H
IDI_2H	15	40	IDI_6L
IDI_2L	16	41	IDI_6H
IDI_1H	17	42	IDI_5L
IDI_1L	18	43	IDI_5H
IDI_0H	19	44	IDI_4L
IDI_0L	20	45	IDI_4H
IDI_11	21	46	IDI_15
IDI_10	22	47	IDI_14
IDI_9	23	48	IDI_13
IDI_8	24	49	IDI_12
EOGND	25	50	EOGND

PCI-7234

IDO_0	1	20	IDO_1
IDO_2	2	21	IDO_3
IDO_4	3	22	IDO_5
IDO_6	4	23	IDO_7
IGND	5	24	IDO_8
IDO_9	6	25	IDO_10
IDO_11	7	26	IDO_12
IDO_13	8	27	IDO_14
IDO_15	9	28	IGND
IDO_16	10	29	IDO_17
IDO_18	11	30	IDO_19
IDO_20	12	31	IDO_21
IDO_22	13	32	IDO_23
IGND	14	33	IDO_24
IDO_25	15	34	IDO_26
IDO_27	16	35	IDO_28
IDO_29	17	36	IDO_30
IDO_31	18	37	IGND
VDD	19		

PCI-7234P

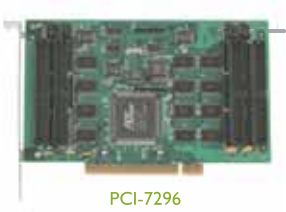
IDO_0	1	20	IDO_1
IDO_2	2	21	IDO_3
IDO_4	3	22	IDO_5
IDO_6	4	23	IDO_7
VDD	5	24	IDO_8
IDO_9	6	25	IDO_10
IDO_11	7	26	IDO_12
IDO_13	8	27	IDO_14
IDO_15	9	28	VDD
IDO_16	10	29	IDO_17
IDO_18	11	30	IDO_19
IDO_20	12	31	IDO_21
IDO_22	13	32	IDO_23
VDD	14	33	IDO_24
IDO_25	15	34	IDO_26
IDO_27	16	35	IDO_28
IDO_29	17	36	IDO_30
IDO_31	18	37	VDD
IGND	19		

cPCI-7230

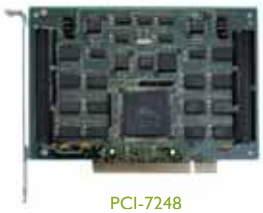
VDD	1	26	VDD
EOGND	2	27	EOGND
EOGND	3	28	EOGND
EOGND	4	29	EOGND
IDO_7	5	30	IDO_14
IDO_6	6	31	IDO_15
IDO_5	7	32	IDO_12
IDO_4	8	33	IDO_13
IDO_3	9	34	IDO_10
IDO_2	10	35	IDO_11
IDO_1	11	36	IDO_8
IDO_0	12	37	IDO_9
IDI_3H	13	38	IDI_7L
IDI_3L	14	39	IDI_7H
IDI_2H	15	40	IDI_6L
IDI_2L	16	41	IDI_6H
IDI_1H	17	42	IDI_5L
IDI_1L	18	43	IDI_5H
IDI_0H	19	44	IDI_4L
IDI_0L	20	45	IDI_4H
IDI_11	21	46	IDI_15
IDI_10	22	47	IDI_14
IDI_9	23	48	IDI_13
IDI_8	24	49	IDI_12
EICOM	25	50	EICOM

PCI-7296/7248/7224

96/48/24-CH Opto-22 Compatible DIO Cards



PCI-7296



PCI-7248

Introduction

ADLINK's PCI-7296/7248/7224 are high-density parallel digital I/O boards with 96/48/24 I/O channels. The header connectors are fully compatible with industry Opto-22 standard. Thus, PCI-7296/48/24 can utilize the Opto-22 external devices. The PCI-7296/7248/7224 devices emulate mode 0 of the industry standard 8255 programmable peripheral interface (PPI) chips. The PCI-7296/7248/7224 provides 4/2/1 PPI chips respectively. Each PPI offers three 8-bit ports: Port A, Port B and Port C. The Port C is divided into 2 nibble-wide (4-bit) ports. The PCI-7296/7248/7224 devices have programmable timer/counters. One 16-bit counter is available for event counting, while the other 32-bit timer is available for timed interrupt generation.

The PCI-7296/7248/7224 devices provide multiple programmable interrupt sources from DIO channels, as well as the output of the timer.

Features

- **Supports a 32-bit 5 V PCI bus**
- **96-CH digital TTL/DTL inputs/outputs (PCI-7296)**
- **48-CH digital TTL/DTL inputs/outputs (PCI-7248)**
- **24-CH digital TTL/DTL inputs/outputs (PCI-7224)**
- **Emulates 4/2/1 industry standard 8255 PPI (mode 0)**
- **Direct interface with OPTO-22 compatible I/O modules**
- **Output status read back**
- **Onboard 8254 timer/counter chip**
- **One 32-bit timer for timed interrupt generation**
- **One 16-bit event counter to generate event interrupt**
- **Programmable interrupt sources**
- **+12 V and +5 V power available on OPTO-22 connectors**
- **Onboard resettable fuses for power output protection**
- **Compact, half-size PCB**

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Digital I/O
- Number of channels
  - 96 inputs/outputs (PCI-7296)
  - 48 inputs/outputs (PCI-7248)
  - 24 inputs/outputs (PCI-7224)
- Compatibility: 5 V/TTL
- Digital logic levels
  - Input high voltage: 2-5.25 V
  - Input low voltage: 0-0.8 V
  - Output high voltage: 2.4 V minimum
  - Output low voltage: 0.5 V maximum
- Output driving capacity
  - Source current: 2.6 mA for port A & B, and 15 mA for port C.
  - Sink current: 24 mA
- Data transfers: programmed I/O

General Specifications
- I/O connector
  - 50-pin ribbon male x 1 (PCI-7224)
  - 50-pin ribbon male x 2 (PCI-7248)
  - 50-pin ribbon male x 4 (PCI-7296)
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	+5 V
PCI-7296	860 mA typical
PCI-7248	500 mA typical
PCI-7224	330 mA typical

- Dimensions (not including connectors)
  - 148 mm x 102 mm (PCI-7248 and PCI-7224)
  - 166 mm x 102 mm (PCI-7296)

Terminal Boards

- TB-24R-01*
  Terminal Board with 24-CH Relay Outputs
- TB-24P-01*
  Terminal Board with 24-CH Isolated Digital Inputs
- TB-16P8R-01*
  Terminal Board with 16-CH Isolated DI & 8-CH Relay Outputs
- DIN-24R-01*
  Terminal Board with 24-CH Relay Outputs
- DIN-24P-01*
  Terminal Board with 24-CH Isolated Digital Inputs and DIN-Rail Mounting

*** Cables are not included. For information on mating cables, refer to Section 14 (Accessory) on page 14-5 and 14-6)**

Ordering Information

- **PCI-7296**
  96-CH Opto-22 Compatible DIO Card
- **PCI-7248**
  48-CH Opto-22 Compatible DIO Card
- **PCI-7224**
  24-CH Opto-22 Compatible DIO Card

Note:
The PCI-7224 is the 24-CH version of the PCI-7248. The software drivers of the PCI-7224 are exactly the same as those of the PCI-7248

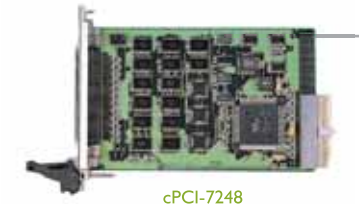
Pin Assignment

PCI-7224/7248/7296

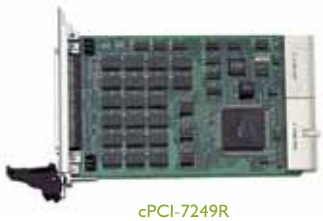
PnC7	1	2	+12Vout/GND (User Selection)
PnC6	3	4	+12Vout/GND (User Selection)
PnC5	5	6	GND
PnC4	7	8	GND
PnC3	9	10	GND
PnC2	11	12	GND
PnC1	13	14	GND
PnC0	15	16	GND
PnB7	17	18	GND
PnB6	19	20	GND
PnB5	21	22	GND
PnB4	23	24	GND
PnB3	25	26	GND
PnB2	27	28	GND
PnB1	29	30	GND
PnB0	31	32	GND
PnA7	33	34	GND
PnA6	35	36	GND
PnA5	37	38	GND
PnA4	39	40	GND
PnA3	41	42	GND
PnA2	43	44	GND
PnA1	45	46	GND
PnA0	47	48	GND
+5Vout	49	50	GND

cPCI-7248/7249R

48-CH DIO & Timer/Counter Modules



cPCI-7248



cPCI-7249R

CompactPCI

Introduction

The ADLINK cPCI-7248 and cPCI-7249R are 48-channel parallel digital input/output (DIO) modules for the PXI/CompactPCI form factor. The cPCI-7248 and cPCI-7249R devices emulate mode 0 of the industry standard 8255 Programmable Peripheral Interface (PPI) chips. Each PPI offers three 8-bit ports: Port A, Port B and Port C. The Port C is divided into 2 nibble-wide (4-bit) ports.

The cPCI-7248 and cPCI-7249R devices have programmable timer/counters. One 16-bit counter is available for event counting, while the other 32-bit timer is available for timed interrupt generation. The cPCI-7248 and cPCI-7249R devices provide multiple programmable interrupt sources from DIO channels, as well as the output of the timer. The cPCI-7249R is the extended version of the cPCI-7248, which features one more latch register and rear I/O connectivity.

Features

- **3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1)**
- **48-CH digital TTL inputs/outputs**
- **Emulates 4/2/1 industry standard 8255 PPI (mode 0)**
- **Buffered circuits for higher driving capability**
- **Ports are independently configurable as input or output**
- **External latch signal available for digital inputs**
- **Output status read back**
- **Known power-up states**
- **Onboard 8254 timer/counter chip**
- **1-CH 16-bit event counter to generate event interrupt**
- **1-CH 32-bit timer to generate watchdog timer interrupt**
- **Multiple programmable interrupt sources**
- **+12 V and +5 V power available on the connector**
- **Onboard resettable fuses for power output protection**
- **Rear I/O available on cPCI-7249R**

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Digital I/O

- Number of channels: 48 inputs/outputs
- Compatibility: 5 V/TTL
- Power-on states:
  pull-high, pull-low, floating (programmable)
- Digital logic levels
  - Input high voltage: 2-5.25 V
  - Input low voltage: 0-0.8 V
  - Output high voltage: 2.4 V minimum
  - Output low voltage: 0.5 V maximum
- Output driving capacity
  - Source current: 15 mA
  - Sink current: 24 mA
- External digital input latch available on cPCI-7249R
- Data transfers: programmed I/O

Interrupt

- Interrupt #0 sources
  - P1C0
  - P1C3
  - 16-bit event counter
- Interrupt #1 sources
  - P2C0
  - P2C3
  - 32-bit timer (based on 2 MHz internal clock)

General Specifications

- I/O connector : One 100-pin SCSI-II female
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	+5 V
cPCI-7248	470 mA typical
cPCI-7249R	700 mA typical

- Dimensions (not including connectors)
  160 mm x 100 mm

Terminal Boards

DIN-100S-01

Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

Ordering Information

cPCI-7248
48-CH DIO & Timer/Counter Module

cPCI-7249R
48-CH DIO & Timer/Counter Module with Rear I/O

Note:
Rear I/O version can not be used in PXI chassis due to signals conflict with PXI bus

Pin Assignment

cPCI-7248				cPCI-7249R			
P1A0	1	51	EVENT	P1A0	1	51	EVENT
P1A1	2	52	GND	P1A1	2	52	GND
P1A2	3	53	GND	PA12	3	53	GND
P1A3	4	54	GND	P1A3	4	54	GND
P1A4	5	55	GND	P1A4	5	55	GND
P1A5	6	56	GND	P1A5	6	56	GND
P1A6	7	57	GND	P1A6	7	57	GND
P1A7	8	58	GND	P1A7	8	58	GND
P1B0	9	59	GND	P1B0	9	59	GND
P1B1	10	60	GND	P1B1	10	60	GND
P1B2	11	61	GND	P1B2	11	61	GND
P1B3	12	62	GND	P1B3	12	62	GND
P1B4	13	63	GND	P1B4	13	63	GND
P1B5	14	64	GND	P1B5	14	64	GND
P1B6	15	65	GND	P1B6	15	65	GND
P1B7	16	66	GND	P1B7	16	66	GND
P1C0	17	67	GND	P1C0	17	67	GND
P1C1	18	68	GND	P1C1	18	68	GND
P1C2	19	69	GND	P1C2	19	69	GND
P1C3	20	70	GND	P1C3	20	70	GND
P1C4	21	71	GND	P1C4	21	71	GND
P1C5	22	72	GND	P1C5	22	72	GND
P1C6	23	73	GND	P1C6	23	73	GND
P1C7	24	74	GND	P1C7	24	74	GND
+5Vout	25	75	+5Vout	+5Vout	25	75	+5Vout
P2A0	26	76	GND	P2A0	26	76	GND
P2A1	27	77	GND	P2A1	27	77	GND
P2A2	28	78	GND	P2A2	28	78	GND
P2A3	29	79	GND	P2A3	29	79	GND
P2A4	30	80	GND	P2A4	30	80	GND
P2A5	31	81	GND	P2A5	31	81	GND
P2A6	32	82	GND	P2A6	32	82	GND
P2A7	33	83	GND	P2A7	33	83	GND
P2B0	34	84	GND	P2B0	34	84	GND
P2B1	35	85	GND	P2B1	35	85	GND
P2B2	36	86	GND	P2B2	36	86	GND
P2B3	37	87	GND	P2B3	37	87	GND
P2B4	38	88	GND	P2B4	38	88	GND
P2B5	39	89	GND	P2B5	39	89	GND
P2B6	40	90	GND	P2B6	40	90	GND
P2B7	41	91	GND	P2B7	41	91	GND
P2C0	42	92	GND	P2C0	42	92	GND
P2C1	43	93	GND	P2C1	43	93	GND
P2C2	44	94	GND	P2C2	44	94	GND
P2C3	45	95	GND	P2C3	45	95	GND
P2C4	46	96	GND	P2C4	46	96	GND
P2C5	47	97	GND	P2C5	47	97	GND
P2C6	48	98	GND	P2C6	48	98	GND
P2C7	49	99	GND	P2C7	49	99	EXTCLK
+12Vout	50	100	+12Vout	+12Vout	50	100	+12Vout

cPCI-7452

128-CH Isolated DI & 128-CH Isolated DO Module

CompactPCI

Introduction

The ADLINK cPCI-7452 is a 256-CH extra-high-density opto-isolated digital input and output card. It provides a robust 2500 V_{RMS} isolation protection, suitable for most industrial applications. The wide input range of the cPCI-7452 makes it easy to sense the status of external devices. The cPCI-7452 also features a wide output range from 5 to 35 V, suitable for driving relays and use in industrial automation applications. The cPCI-7452 provides sink drive outputs. The cPCI-7452 provides Change-of-State interrupt on all digital input channels, simplifying configuration and management.

Features

- **6U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R3.0)**
- **128-CH isolated digital inputs and 128-CH isolated digital outputs**
- **Non-polarity digital input range**
- **Isolated input voltage up to 28 V_{DC}**
- **Isolation voltage up to 2500 V_{RMS}**
- **Sink current up to 300 mA on each isolated output**
- **Interrupt sources: 128-CH DI Change-of- State**
- **Output status read back**

Operating Systems

- Windows Vista/XP/2000/2003
- Linux
- Windows CE (call for availability)

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Isolated Digital Input

- Number of channels: 128
- Maximum input range: 28 V, non-polarity
- Digital logic levels: 0-28 V, non-polarity
  - Input high voltage: 5-28 V
  - Input low voltage: 0-1.5 V
- Input resistance: 2.4 kΩ @ 1/2 W
- ESD protection CKT switch (Forward)
- Isolation voltage: 2500 Vrms channel-to-system
- Interrupt sources: 128 channel Change-of-state (COS)
- Data transfer: programmed I/O

Isolated Digital Output

- Number of channels: 128
- Supply voltage: 5-35 V
- Output type: open collector Darlington transistor
- Sink current: 300 mA for one channel @ 100% duty
- Isolation voltage: 2500 Vrms channel-to-system
- Data transfer: programmed I/O

Isolation +5 V Power Supply

- Output Voltage: +5 V
- Output Current: 100 mA max. (@ 40°C)

General Specifications

- I/O connector
  Two 200-pin dual port VHDCI female
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

3.3 V	+5 V
300 mA typical	1.26 A typical

- Dimensions (not including connectors)
  233.35 mm (L) x 160 mm (W)

Terminal Boards

DIN-100S-01

Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

Cable

ACL-102150

SCSI-100 to MINI SCSI-100 connector, 1 M (cPCI-7452 only)

Ordering Information

cPCI-7452
128-CH Isolated DI & 128-CH Isolated DO Module

Pin Assignment

DO Connector

CN1B

N/C	100	50	N/C
IGND	99	49	IGND
IGND	98	48	IGND
IGND	97	47	IGND
VDD2	96	46	VDD2
IDO_127	95	45	IDO_119
IDO_126	94	44	IDO_118
IDO_125	93	43	IDO_117
IDO_124	92	42	IDO_116
IDO_123	91	41	IDO_115
IDO_122	90	40	IDO_114
IDO_121	89	39	IDO_113
IDO_120	88	38	IDO_112
IGND	87	37	IGND
IGND	86	36	IGND
IGND	85	35	IGND
VDD2	84	34	VDD2
IDO_111	83	33	IDO_103
IDO_110	82	32	IDO_102
IDO_109	81	31	IDO_101
IDO_108	80	30	IDO_100
IDO_107	79	29	IDO_99
IDO_106	78	28	IDO_98
IDO_105	77	27	IDO_97
IDO_104	76	26	IDO_96
N/C	75	25	N/C
IGND	74	24	IGND
IGND	73	23	IGND
IGND	72	22	IGND
VDD2	71	21	VDD2
IDO_95	70	20	IDO_87
IDO_94	69	19	IDO_86
IDO_93	68	18	IDO_85
IDO_92	67	17	IDO_84
IDO_91	66	16	IDO_83
IDO_90	65	15	IDO_82
IDO_89	64	14	IDO_81
IDO_88	63	13	IDO_80
IGND	62	12	IGND
IGND	61	11	IGND
IGND	60	10	IGND
VDD2	59	9	VDD2
IDO_79	58	8	IDO_71
IDO_78	57	7	IDO_70
IDO_77	56	6	IDO_69
IDO_76	55	5	IDO_68
IDO_75	54	4	IDO_67
IDO_74	53	3	IDO_66
IDO_73	52	2	IDO_65
IDO_72	51	1	IDO_64

CN1A

IDO_0	1	51	IDO_8
IDO_1	2	52	IDO_9
IDO_2	3	53	IDO_10
IDO_3	4	54	IDO_11
IDO_4	5	55	IDO_12
IDO_5	6	56	IDO_13
IDO_6	7	57	IDO_14
IDO_7	8	58	IDO_15
VDD1	9	59	VDD1
IGND	10	60	IGND
IGND	11	61	IGND
IGND	12	62	IGND
IDO_16	13	63	IDO_24
IDO_17	14	64	IDO_25
IDO_18	15	65	IDO_26
IDO_19	16	66	IDO_27
IDO_20	17	67	IDO_28
IDO_21	18	68	IDO_29
IDO_22	19	69	IDO_30
IDO_23	20	70	IDO_31
VDD1	21	71	VDD1
IGND	22	72	IGND
IGND	23	73	IGND
IGND	24	74	IGND
N/C	25	75	N/C
IDO_32	26	76	IDO_40
IDO_33	27	77	IDO_41
IDO_34	28	78	IDO_42
IDO_35	29	79	IDO_43
IDO_36	30	80	IDO_44
IDO_37	31	81	IDO_45
IDO_38	32	82	IDO_46
IDO_39	33	83	IDO_47
VDD1	34	84	VDD1
IGND	35	85	IGND
IGND	36	86	IGND
IGND	37	87	IGND
IDO_48	38	88	IDO_56
IDO_49	39	89	IDO_57
IDO_50	40	90	IDO_58
IDO_51	41	91	IDO_59
IDO_52	42	92	IDO_60
IDO_53	43	93	IDO_61
IDO_54	44	94	IDO_62
IDO_55	45	95	IDO_63
VDD1	46	96	VDD1
IGND	47	97	IGND
IGND	48	98	IGND
IGND	49	99	IGND
V5V	50	100	V5V

DI Connector

CN2B

N/C	100	50	N/C
COM16	99	49	COM15
COM16	98	48	COM15
COM16	97	47	COM15
COM16	96	46	COM15
IDI_127	95	45	IDI_119
IDI_126	94	44	IDI_118
IDI_125	93	43	IDI_117
IDI_124	92	42	IDI_116
IDI_123	91	41	IDI_115
IDI_122	90	40	IDI_114
IDI_121	89	39	IDI_113
IDI_120	88	38	IDI_112
COM14	87	37	COM13
COM14	86	36	COM13
COM14	85	35	COM13
COM14	84	34	COM13
IDI_111	83	33	IDI_103
IDI_110	82	32	IDI_102
IDI_109	81	31	IDI_101
IDI_108	80	30	IDI_100
IDI_107	79	29	IDI_99
IDI_106	78	28	IDI_98
IDI_105	77	27	IDI_97
IDI_104	76	26	IDI_96
N/C	75	25	N/C
COM12	74	24	COM11
COM12	73	23	COM11
COM12	72	22	COM11
COM12	71	21	COM11
IDI_95	70	20	IDI_87
IDI_94	69	19	IDI_86
IDI_93	68	18	IDI_85
IDI_92	67	17	IDI_84
IDI_91	66	16	IDI_83
IDI_90	65	15	IDI_82
IDI_89	64	14	IDI_81
IDI_88	63	13	IDI_80
COM10	62	12	COM9
COM10	61	11	COM9
COM10	60	10	COM9
COM10	59	9	COM9
IDI_79	58	8	IDI_71
IDI_78	57	7	IDI_70
IDI_77	56	6	IDI_69
IDI_76	55	5	IDI_68
IDI_75	54	4	IDI_67
IDI_74	53	3	IDI_66
IDI_73	52	2	IDI_65
IDI_72	51	1	IDI_64

CN2A

IDI_0	1	51	IDI_8
IDI_1	2	52	IDI_9
IDI_2	3	53	IDI_10
IDI_3	4	54	IDI_11
IDI_4	5	55	IDI_12
IDI_5	6	56	IDI_13
IDI_6	7	57	IDI_14
IDI_7	8	58	IDI_15
COM1	9	59	COM2
COM1	10	60	COM2
COM1	11	61	COM2
COM1	12	62	COM2
IDI_16	13	63	IDI_24
IDI_17	14	64	IDI_25
IDI_18	15	65	IDI_26
IDI_19	16	66	IDI_27
IDI_20	17	67	IDI_28
IDI_21	18	68	IDI_29
IDI_22	19	69	IDI_30
IDI_23	20	70	IDI_31
COM3	21	71	COM4
COM3	22	72	COM4
COM3	23	73	COM4
COM3	24	74	COM4
N/C	25	75	N/C
IDI_32	26	76	IDI_40
IDI_33	27	77	IDI_41
IDI_34	28	78	IDI_42
IDI_35	29	79	IDI_43
IDI_36	30	80	IDI_44
IDI_37	31	81	IDI_45
IDI_38	32	82	IDI_46
IDI_39	33	83	IDI_47
COM5	34	84	COM6
COM5	35	85	COM6
COM5	36	86	COM6
COM5	37	87	COM6
IDI_48	38	88	IDI_56
IDI_49	39	89	IDI_57
IDI_50	40	90	IDI_58
IDI_51	41	91	IDI_59
IDI_52	42	92	IDI_60
IDI_53	43	93	IDI_61
IDI_54	44	94	IDI_62
IDI_55	45	95	IDI_63
COM7	46	96	COM8
COM7	47	97	COM8
COM7	48	98	COM8
COM7	49	99	COM8
N/C	50	100	N/C

PCI-7396/7348

96/48-CH High-Driving DIO Cards

Introduction

The PCI-7396 and PCI-7348 are 96/48-bit parallel digital input/output (DIO) cards designed for industrial applications. The PCI-7396 and PCI-7248 emulate four/two 8255 Programmable Peripheral Interface (PPI) chips. Each PPI offers three 8-bit DIO ports which can be accessed simultaneously. The total 12/6 ports can be configured as input or output independently.

The PCI-7396 and PCI-7348 devices feature external trigger to latch the digital input data, and also provides "Change-of-State" (COS) interrupt, which means when any of the digital inputs changes its state, an interrupt will be generated. Users can power up the PCI-7396 and PCI-7348 digital I/O lines in a user-defined state - either high or low, by simply setting the pull-high/pull-low resistors with a jumper.

Features

- **Supports a 32-bit 5 V PCI bus**
- **96-CH digital TTL inputs/outputs (PCI-7396)**
- **48-CH digital TTL inputs/outputs (PCI-7438)**
- **High driving up to 48 mA (sink) and 15 mA (source)**
- **Emulates 4/2 industry standard 8255 PPI (mode 0)**
- **Ports are independently configurable as input or output**
- **External latch signal available for digital inputs**
- **Output status read back**
- **Known power-up states**
- **Onboard 8254 timer/counter chip**
- **1-CH 16-bit event counter for external signal**
- **1-CH 32-bit timer for timed interrupt generation**
- **Change-of-state (COS) interrupt**
- **Multiple programmable interrupt sources**
- **Compact, half-size PCB**

Operating Systems

- Windows Vista/XP/2000/2003
- Linux
- Windows CE (call for availability)

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®
- PCIS-DASK for Windows
- PCIS-DASK/X for Linux

Specifications

Digital I/O

- Number of channels
  - 96 input/output (PCI-7396)
  - 48 input/output (PCI-7348)
- Compatibility: 5 V/TTL
- Power-on state: input
- Digital logic levels
  - Input high voltage: 2-5.25 V
  - Input low voltage: 0-0.8 V
  - Output high voltage: 2.4 V minimum
  - Output low voltage: 0.5 V maximum
- Output driving capacity
  - Source current: 15 mA
  - Sink current: 48 mA
- Data transfers: programmed I/O

Interrupt

- Interrupt #0 sources
  - P1C0
  - P1C3
  - 16-bit event counter
  - Change-of-state detection on any bit of PPI 1 & PPI 2
- Interrupt #1 sources
  - P2C0
  - P2C3
  - 32-bit timer (based on 2 MHz internal clock),
  - Change-of-state detection on any bit of PPI 3 & PPI 4

General Specifications

- I/O connector : One 100-pin SCSI-II female
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	+5 V
PCI-7396	450 mA typical
PCI-7348	350 mA typical

- Dimensions (not including connectors)
  158 mm x 107 mm

Terminal Boards

DIN-100S-01

Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

DIN-96DI-01

96-CH Isolated DI Terminal Board with DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

DIN-96DO-01

96-CH Isolated DO Terminal Board with DINRail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

Ordering Information

PCI-7396
96-CH High-Driving DIO Card

PCI-7348
48-CH High-Driving DIO Card

Pin Assignment

P1A0	1	51	P3A0/EVENT
P1A1	2	52	P3A1
P1A2	3	53	P3A2
P1A3	4	54	P3A3
P1A4	5	55	P3A4
P1A5	6	56	P3A5
P1A6	7	57	P3A6
P1A7	8	58	P3A7
P1B0	9	59	P3B0
P1B1	10	60	P3B1
P1B2	11	61	P3B2
P1B3	12	62	P3B3
P1B4	13	63	P3B4
P1B5	14	64	P3B5
P1B6	15	65	P3B6
P1B7	16	66	P3B7
P1C0	17	67	P3C0
P1C1	18	68	P3C1
P1C2	19	69	P3C2
P1C3	20	70	P3C3
P1C4	21	71	P3C4
P1C5	22	72	P3C5
P1C6	23	73	P3C6
P1C7	24	74	P3C7
GND	25	75	GND
P2A0	26	76	P4A0
P2A1	27	77	P4A1
P2A2	28	78	P4A2
P2A3	29	79	P4A3
P2A4	30	80	P4A4
P2A5	31	81	P4A5
P2A5	32	82	P4A6
P2A7	33	83	P4A7
P2B0	34	84	P4B0
P2B1	35	85	P4B1
P2B2	36	86	P4B2
P2B3	37	87	P4B3
P2B4	38	88	P4B4
P2B5	39	89	P4B5
P2B6	40	90	P4B6
P2B7	41	91	P4B7
P2C0	42	92	P4C0
P2C1	43	93	P4C1
P2C2	44	94	P4C2
P2C3	45	95	P4C3
P2C4	46	96	P4C4
P2C5	47	97	P4C5
P2C6	48	98	P4C6
P2C7	49	99	P4C7/EXTTRG
GND	50	100	GND

PCI/cPCI-8554

10-CH General Purpose Timers/Counters & 8-CH DIO Card

PCI-8554

cPCI-8554

Introduction

ADLINK's PCI/cPCI-8554 are 10-CH 16-bit timer/counter and digital I/O cards which provides ten independent timer/counters and one cascaded 32-bit timer. The clock source for each timer/counter can be software selected from the cascaded 32-bit timer, external clock source, timer/counter output of the last channel, and the onboard 8 MHz clock. The flexible architecture makes it easy to re-configure the hardware; for example, up to ten timer/counters can be cascaded to form a 160-bit timer/counter. The hardware can also generate interrupts from either the external interrupt sources or the output of the cascaded 32-bit timer.

The programmable de-bounce filters provide eleven channels of glitch-filtered external clock inputs for timer/counters and the external interrupt input. This feature further improves the reliability for counting applications.

The PCI/cPCI-8554 also provides 8-CH TTL digital inputs and 8-CH TTL digital outputs. ADLINK PCI/cPCI-8554 delivers cost-effective and reliable solutions for event counting, frequency measurement, baud-rate generation, watchdog timer, and other industrial applications.

Features

- **Supports a 32-bit 5 V PCI bus (PCI-8554)**
- **3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R3.0) (cPCI-8554)**
- **Onboard four 8254 programmable timer/counter chips**
- **10-CH independent 16-bit down counters**
- **1-CH 32-bit cascaded timer**
- **Onboard 8 MHz clock source**
- **Four programmable clock sources for each timer/counter**
- **Programmable de-bounce filters for external clock & external interrupt inputs**
- **Programmable interrupt sources**
- **8-CH TTL digital inputs & 8-CH TTL digital outputs**
- **+12 V and +5 V power available on the connector**
- **Onboard resettable fuses for power output protection**
- Operating Systems
  - Windows Vista/XP/2000/2003
  - Linux
  - Windows CE (call for availability)
- 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®
  - PCIS-DASK for Windows
  - PCIS-DASK/X for Linux

Specifications

General-Purpose Timer/Counters

- Number of channels: 10
- Counter width: 16 bits
- Compatibility: 5 V/TTL
- Base clock available: 8 MHz or external clock up to 10 MHz
- Programmable clock sources
  - cascaded 32-bit timer output
  - external clock
  - timer/counter output of the last channel
  - Onboard 8 MHz clock

Cascaded Timer

- Number of channels: 1
- Counter width: 32 bits
- Compatibility: 5 V/TTL
- Base clock available: 8 MHz, fixed

Programmable De-bounce Filters for External Clocks

- Number of channels: 11
- Filtered inputs: external clock, external interrupt
- Glitch rejection pulse width: 4 periods of the debounce clock
- De-bounce clock: up to 2 MHz, programmable

Interrupt

- Number of interrupt sources: 2
- Sources: external interrupt input and output of counter #12

Digital I/O

- Number of channels: 8 inputs and 8 outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

General Specifications

- I/O connector: One 100-pin SCSI-II female
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 80°C
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Device	+5 V
PCI-8554/cPCI-8554/cPCI-8554R	350 mA typical

- Dimensions (not including connectors)
  134 mm x 107 mm (PCI-8554)
  160 mm x 100 mm (cPCI-8554/8554R)

Terminal Boards

- DIN-100S-01

  Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included. For information on mating cables, refer to Section 14, Accessories.)

Note:
Legacy DIN-502S can be replaced by two DIN-50S-01 and ACL-10252-1 (100-Pin to two 50-Pin Cable, 1 M)

Ordering Information

- **PCI-8554**
  10-CH General Purpose Timer/Counter & 8-CH DIO Card
- **cPCI-8554**
  12-CH 16-Bit Timer/Counter & Digital I/O Module
- **cPCI-8554R**
  12-CH 16-Bit Timer/Counter & Digital I/O Module with Rear I/O

Note:
Rear I/O version can not be used in PXI chassis due to signals conflict with PXI bus

Pin Assignment

PCI/cPCI-8554

+12Vout	1	51	GND
+12Vout	2	52	GOUT2
+12Vout	3	53	GIN2
+5Vout	4	54	GND
+5Vout	5	55	GOUT1
+5Vout	6	56	GIN1
GATE12 / N/A*	7	57	E_INT
DI_6	8	58	DI_7
DI_4	9	59	DI_5
DI_2	10	60	DI_3
DI_0	11	61	DI_1
DO_6	12	62	DO_7
DO_4	13	63	DO_5
DO_2	14	64	DO_3
DO_0	15	65	DO_1
GATE12 / N/A*	16	66	ECLK12
GND	17	67	COUT12
GND	18	68	ECLK11
GND	19	69	COUT11
GND	20	70	GND
GND	21	71	COUT10
GND	22	72	GATE10
GND	23	73	ECLK10
GND	24	74	COUT9
GND	25	75	GATE9
GND	26	76	ECLK9
GND	27	77	COUT8
GND	28	78	GATE8
GND	29	79	ECLK8
GND	30	80	COUT7
GND	31	81	GATE7
GND	32	82	ECLK7
GND	33	83	COUT6
GND	34	84	GATE6
GND	35	85	ECLK6
GND	36	86	COUT5
GND	37	87	GATE5
GND	38	88	ECLK5
GND	39	89	COUT4
GND	40	90	GATE4
GND	41	91	ECLK4
GND	42	92	COUT3
GND	43	93	GATE3
GND	44	94	ECLK3
GND	45	95	COUT2
GND	46	96	GATE2
GND	47	97	ECLK2
GND	48	98	COUT1
GND	49	99	GATE1
GND	50	100	ECLK1

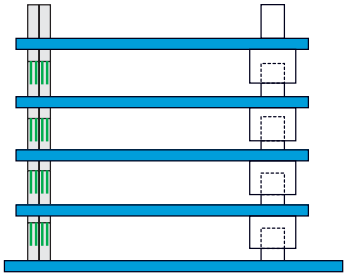
* **GATE11 & GATE 12 for cPCI-8554 N/A for PCI-8554**

PC/104-Plus Overview and Selection Guide

Overview

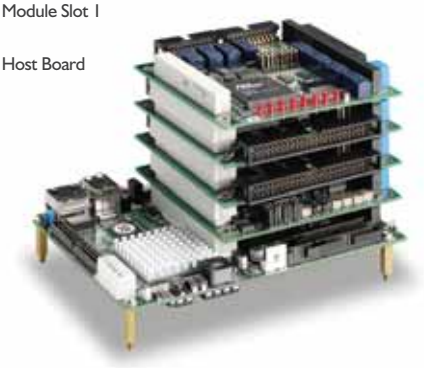
The original PC/104 bus has done a great job of supporting the 16-bit ISA standard. However, certain applications require greater throughput. Therefore, PC/104-Plus was defined and standardized. It is the 32-bit standard migrated from the desktop to the embedded world while still offering the same functionalities.

PC/104-Plus is a PCI implementation on a stackable board while maintaining the 3.6" x 3.8" form factor. PC/104-Plus modules can also include original PC/104 connectors to allow the most system configuration flexibility. A third connector opposite the PC/104 connectors supports the PCI bus. Basically the electrical specifications of the PC/104-Plus bus are compliant with the PCI signals, except 64-bit extensions, JTAG, PRSNT or CLKRUN signals. According to the specifications of PC/104-Plus, PC/104-Plus modules are installed and configured by switching CLK, IDSEL, INT, REQ and GNT signals through multiplexers to the appropriate connections. Rotary switch on ADLINK PCM-xxxx+ is used for these signals switching.



■ PC/104-Plus module stack

ADLINK provides typical DAQ and DIO modules for PC/104-Plus computers, as well as a choice of PC/104-Plus motherboard.



	Multi-Function DAQ Module	Analog Output Module
		
Model Name	**PCM-9112+**	**PCM-6308V+**
3.3 V or 5 V PCI	5 V	5 V
Bus-mastering DMA	√	-
Auto Calibration	–	–
Analog Input		
Analog Inputs	16 SE/ 8 DI	-
Max. Sampling Rate (S/s)	110 k	-
AD Resolution (bits)	12	-
FIFO Size (samples)	8	-
Bipolar Input Ranges	±10 V ±5 V ±2.5 V ±1.25 V ±0.625 V	-
Unipolar Inpu t Ranges	0-10 V 0-5 V 0-2.5 V 0-1.25 V	-
Analog Output		
Voltage Outputs	2	8
Update Rate (S/s)(1)	33 k	11 k (Isolated)
Simultaneous Update	–	√
DA Resolution (bits)	12	12
FIFO Size (samples)	–	–
Settling Time	30 µs	16 µs
Analog Output Ranges	0-5 V 0-10 V 0-EXTREF	±10 V 0-10 V 0-EXTREF
Digital I/O, Timer/Counter, and External Trigger		
Digital I/O	–	4 DI, 4 DO (Isolated)
Timer/Counter	16-bit	–
Analog Trigger	–	–
Digital Trigge	√	–

	Digital I/O Modules		
			
Model Name	**PCM-7250+**	**PCM-7230+**	**PCM-7248+**
3.3 V or 5 V PCI	5 V	5 V	5 V
Bus-mastering DMA	–	–	–
Isolation	√	√	–
High Speed Digital I/O			
No. of Channels	–	–	2 x 24-bit 8255 PIO
Transfer Rate (Byte/s)	–	–	500 k(1)
FIFO Size (words)	–	–	–
Logic Standard	–	–	5 V/TTL
Handshaking Transfer	–	–	–
Dedicated Inputs			
No. of Channels	8	16	–
Max. Sampling Rate (Hz)(1)	10 k	10 k	–
Logic Standard	VIH = 3-24 V VIL = 0-1 V	VIH = 3-24 V VIL = 0-1 V	–
Dedicated Outputs			
No. of Channels	8	16	–
Max. Update Rate (Hz)(1)	125	10 k	–
Output Type	Relay	Darlington	–
Timer/Counter			
No. of Channels	–	–	WDT

Legend: √ Supported – Not available

Note: (1) Actual maximum update rate is dependent on system performance.

PCM-9112+

PC/104-Plus 16-CH 12-Bit 110 kS/s Multi-Function DAQ Module

- PC/104-Plus specifications Rev. 1.2 compliant
- 12-bit A/D resolution
- Up to 110 kS/s sampling rate
- 16-CH single-ended or 8-CH differential inputs
- Onboard A/D FIFO
- Bipolar or unipolar analog input ranges
- Programmable gains of x0.5, x1, x2, x4, x8
- Automatic analog inputs scanning

PCM-6308V+

PC/104-Plus 8-CH 12-Bit Isolated Analog Output Module

- PC/104-Plus specifications Rev. 1.2 compliant
- 12-bit D/A resolution
- Bipolar or unipolar output ranges
- Isolated 8-CH 12-bit voltage outputs
- External reference input for user-defined ranges
- 4-CH isolated digital outputs and 4-CH isolated digital inputs
- 2500 V_{RMS} optical isolation voltage

PCM-7250+

PC/104-Plus 8-CH Relay Outputs & 8-CH Isolated DI Module

- PC/104-Plus specifications Rev. 1.2 compliant
- 4-CH SPDT and 4-CH SPST relays
- Non-latching relays
- Onboard LED indicators for relay status
- Onboard relay driving circuits
- Relay output status read back
- 8-CH isolated digital inputs
- Onboard low-pass filtering for digital inputs

PCM-7230+

PC/104-Plus 16-CH Isolated DI & 16-CH Isolated DO Module

- PC/104-Plus specifications Rev. 1.2 compliant
- 16-CH isolated digital inputs and 16-CH isolated digital outputs
- Non-polarity digital input range
- Isolated input voltage up to 24 V
- 2500 V_{RMS} optical isolation
- Sink current up to 500 mA on each isolated output
- Two external interrupt sources

PCM-7248+

PC/104-Plus 48-CH Opto-22 Compatible DIO Module

- PC/104-Plus specifications Rev. 1.2 compliant
- 48-CH TTL/DTL digital inputs/outputs
- Emulates 2 industry standard 8255 PPI (mode 0)
- Buffered circuits for higher driving capacity
- Direct interface with OPTO-22 compatible I/O modules
- Known power-up states
- Output port status read back
- 1-CH 32-bit timer for timed interrupt generation

ISA Multi-Function DAQ/Analog Ouput Cards

	Multi-Function DAQ Cards					Analog Output Cards	
							
Model Name	**ACL-8316/L, ACL-8312/L**	**ACL-8216**	**ACL-8112DG/HG/PG**	**ACL-8111**	**ACL-8113A**	**ACL-6126**	**ACL-6128A**
Analog Input							
Analog Inputs	16 SE/8 DI	16 SE/8 DI	16 SE/8 DI or 16 SE[1]	8 SE	32 SE	–	–
Isolation	–	–	–	–	√	–	–
DMA Transfer	√	√	√	–	–	–	–
Max. Sampling Rate (S/s)	100 k	100 k	100 k	50 k	30 k	–	–
AD Resolution (bits)	16/12	16	12	12	12	–	–
FIFO Size (samples)	1 k	–	–	–	–	–	–
Bipolar Input Ranges	±10 V ±5 V ±2.5 V ±1.25 V	±10 V ±5 V ±2.5 V ±1.25 V	ACL-8112DG[2] ACL-8112HG[3] ACL-8112PG[4]	±5 V ±2.5 V ±1.25 V ±0.625 V ±0.3125 V	±10 V ±5 V ±2.5 V ±1.25 V ±0.625 V	–	–
Unipolar Input Ranges	–	–	ACL-8112DG[5] ACL-8112HG[6]	–	0-10 V, 0-5 V, 0-2.5 V, 0-1.25 V, 0-0.625 V	–	–
Analog Output							
Voltage Outputs	–	2	2	1	–	6	2
Current Outputs	–	–	–	–	–	6	2
Isolation	–	–	–	–	–	–	√
DA Resolution (bits)	–	12	12	12	–	12	12
Settling Time	–	30 µs	30 µs	30 µs	–	70 µs	30 µs
Bipolar Output Ranges	–	-	-	–	–	±10 V, ±5 V	±10 V, ±5 V
Unipolar Output Ranges	–	0-10 V 0-5 V	0-10 V 0-5 V	0-10 V 0-5 V	–	0-10 V 0-5 V	0-10 V 0-5 V
Current Output Ranges	–	–	–	–	–	4-20 mA	0-20 mA, 4-20 mA
Digital I/O, Timer/Counter, and Externel Trigger							
Digital I/O	16 DI, 16 DO	16 DI, 16 DO	16 DI, 16 DO	16 DI, 16 DO	–	16 DI, 16 DO	–
Timer/Counter	1, 16-bit	1, 16-bit	1, 16-bit	–	–	–	–
Pacer Trigger	√	√	√	√	–	–	–

Legend: √ Supported - Not available

Notes: (1) 16 SE/8 DI for ACL-8112DG/HG, 16 SE for ACL-8112PG
(2) ±10 V, ±5 V, ±2.5 V, ±1.25 V, ±0.625 V
(3) ±10 V, ±5 V, ±1 V, ±500 mV, ±100 mV, ±50 mV, ±10 mV, ±5 mV
(4) ±10 V, ±5 V, ±2.5 V, ±1.25 V, ±0.625 V
(5) 0-10 V, 0-5 V, 0-2.5 V, 0-1.25 V
(6) 0-10 V, 0-1 V, 0-0.1 V, 0-10 mV

ISA DIO Cards

	Digital I/O Cards						
							
Model Name	**ACL-7130**	**ACL-7125**	**ACL-7225**	**ACL-7122**	**PET-48DIO**	**ACL-7120A/6**	**ACL-8454/12**
Digital I/O							
Digital Input	16 Isolated DI 16 TTL DI	8 Isolated DI	16 Isolated DI	144 TTL DIO	48 TTL DIO	32 TTL DI	16 TTL DI
Digital Output	16 Isolated DO 16 TTL DO	8 Relay DO	16 Relay DO			32 TTL DO	8 TTL DO
Max. Transfer Rate (Hz)	10 k	10 k	10 k	500 k	500 k	500 k	500 k
Timer/Counter							
Timer	1, 32-bit	–	–	–	1, 32-bit	2, 16-bit	2, 32-bit
Counter	1, 16-bit	–	–	–	1, 16-bit	4, 16-bit	8, 16-bit
Accessory							
Termination Board (Cables are not included. For information on mating cables, refer to Section 14.)	ACLD-9188 ACLD-9137 DIN-37D	ACLD-9137 ACLD-9138 DIN-37D	ACLD-9137 ACLD-9138 DIN-37D	TB-24P/24 TB-24R/24 TB-24R/12 TB-16P8R DIN-50P DIN-24P/24 DIN-24R/24 DIN-24R/12	TB-24P/24 TB-24R/24 TB-24R/12 TB-16P8R DIN-50P DIN-24P/24 DIN-24R/24 DIN-24R/12	ACLD-9188 ACLD-9185 ACLD-9182A	ACLD-9137 ACLD-9138 DIN-37D

ACL-8316L/8312L

16-CH 16/12-Bit 100 kS/s Multi-Function DAQ Cards

- Up to 16-bit A/D resolution
- Up to 100 kS/s sampling rate
- 16-CH single-ended or 8-CH differential inputs
- DMA transfer for analog inputs
- Programmable gains

ACL-8216

16-CH 16-Bit 100 kS/s Multi-Function DAQ Card

- 16-bit A/D resolution
- Up to 100 kS/s sampling rate
- 16-CH single-ended or 8-CH differential inputs
- DMA for analog inputs
- Programmable gains

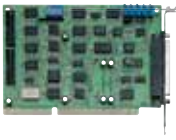
ACL-8112 Series

16-CH 12-Bit 100 kS/s Multi-Function DAQ Cards

- 12-bit A/D resolution
- Up to 100 kS/s sampling rate
- 16-CH single-ended or 8-CH differential inputs
- DMA for analog inputs
- Programmable gains

ACL-8111

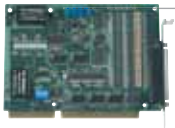
8-CH 12-Bit 50 kS/s Low-Cost Multi-Function DAQ Card



- 12-bit A/D resolution
- Up to 50 kS/s sampling rate
- 8-CH single-ended inputs
- Programmable IRQ level for A/D data transfer
- Programmable gains

ACL-8113A

32-CH 12-Bit 30 kS/s Isolated Analog Input Card



- 12-bit A/D resolution
- Up to 30 kS/s sampling rate
- 32-CH single-ended inputs
- Programmable gains
- 2500 Vrms optical isolation

ACL-6126

6-CH 12-Bit Analog Output Card

- 12-bit D/A resolution
- 6-CH voltage outputs
- 6-CH current outputs
- Bipolar or unipolar analog output ranges
- 16-CH TTL digital inputs & 16-CH TTL digital outputs

ACL-6128A

2-CH 12-Bit Isolated Analog Output Card

- 2-CH 12-bit multiplying analog outputs
- Bipolar or unipolar voltage output ranges
- Unipolar current output ranges
- 2500 Vrms optical isolation
- Compact, half-size PCB Programmable gains

ACL-7130

16-CH Isolated DI &16-CH Isolated DO Card

- 16-CH isolated digital inputs and 16-CH isolated digital outputs
- 2500 Vrms optical isolation
- Sink current up to 500 mA on each isolated output
- 16-CH TTL digital inputs and 16-CH TTL digital outputs
- Two external interrupt sources

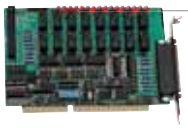
ACL-7125

8-CH Relay Outputs & 8-CH Isolated DI Card

- 4-CH SPDT (Form C) and 4-CH SPST (Form A) relays
- Non-latching relays
- Onboard relay driving circuits
- Onboard LED indicators for relay status
- 8-CH isolated digital inputs

ACL-7225

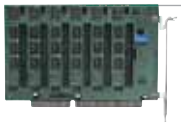
16-CH Relay Outputs & 16-CH Isolated DI Card



- 8-CH SPDT (Form C) & 8-CH SPST(Form A) relays
- Non-latching relays
- Onboard LED indicators for relay status
- Onboard relay driving circuits
- 16-CH isolated digital inputs

ACL-7122

Opto-22 Compatible 144-CH Card



- High-density 144-CH digital inputs/outputs
- TTL/DTL compatible digital I/O channels
- Direct interface with OPTO-22 compatible I/Omodules
- Buffered circuits for high driving capacity
- Programmable interrupt handling

PET-48DIO

Opto-22 Compatible 48-CH Card

- High-density 48-CH digital inputs/outputs
- TTL/DTL compatible digital I/O channels
- Direct interface with OPTO-22 compatible I/O modules
- Buffered circuits for high driving capacity
- Programmable interrupt handling

ACL-7120A/6

32-CH DIO & Timer/Counter Card

- 32-CH TTL digital inputs and 32-CH TTL digital outputs
- High output driving capacity
- 3 independent programmable 16-bit down counters
- One 16-bit event counter for interrupt generation
- One cascaded 32-bit timer with a 4 MHz timebase

ACL-8454/12

8-CH 16-Bit Counters, 2-CH 32-Bit Timer & Digital I/O Card

- 8-CH timers/counters
- 2-CH cascaded 32-bit timer with 1 MHz base clock
- Onboard multiple base clocks ranging from 100 kHz to 2 MHz
- External gate control and clock inputs for each counter
- 8-CH TTL digital outputs and up to 16-CH TTL digital inputs