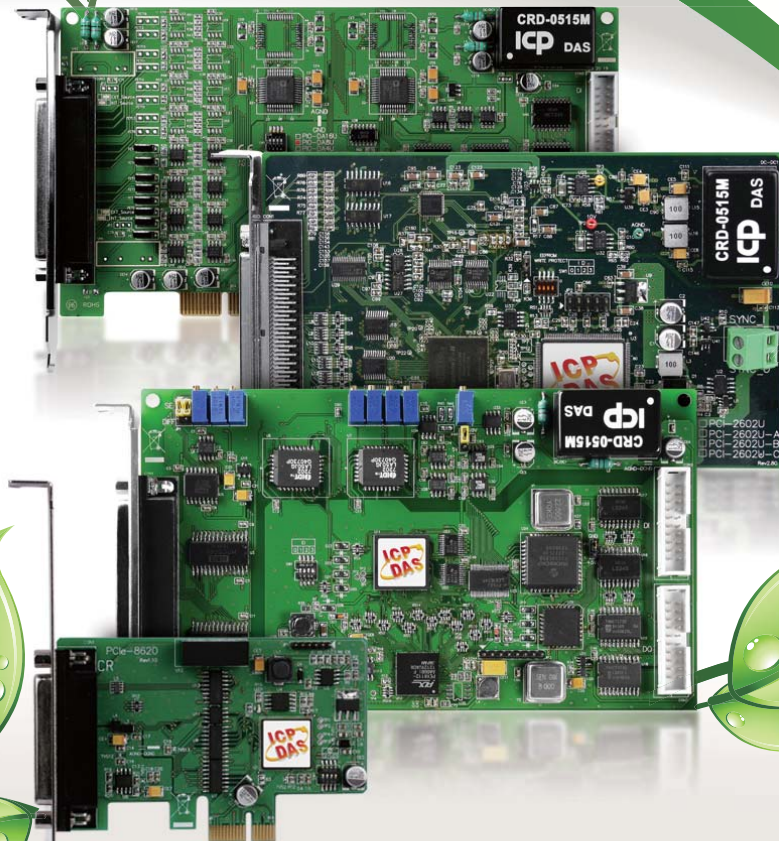




# High-quality, Industrial Data Acquisition and Control I/O Products for PC-based Systems



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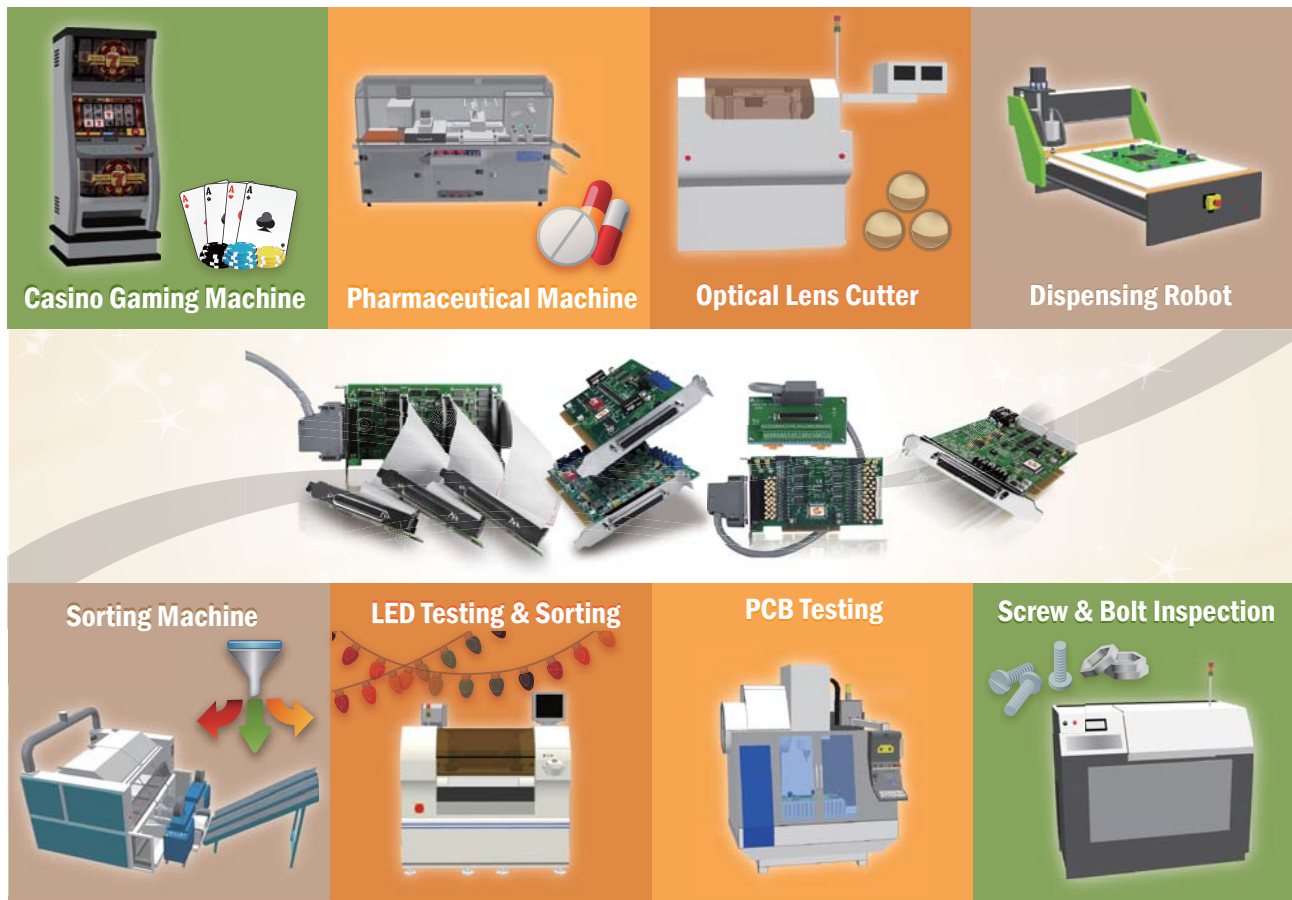


## • Introduction

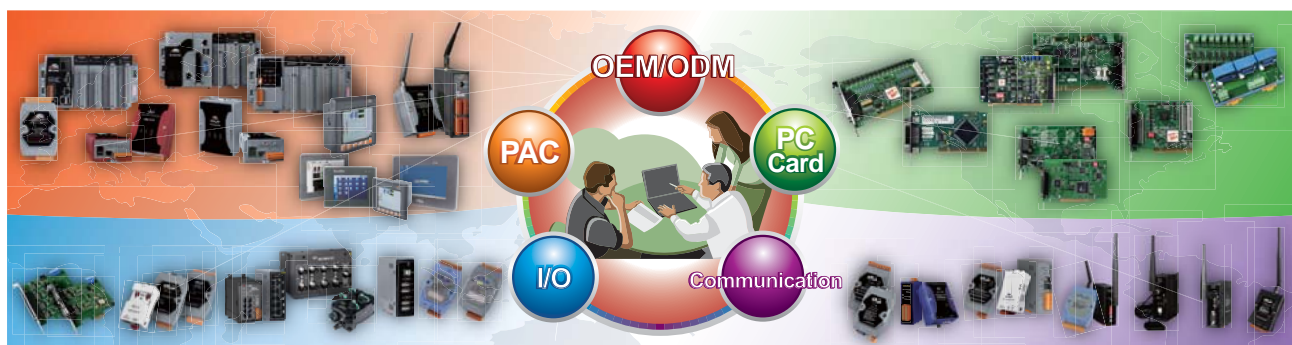
ICP DAS is the one-stop shopping location for a range of more than 170 high-quality industrial data acquisition and control products that can satisfy virtually any requirement. The ICP DAS range not only includes boards that support both the ISA and the PCI bus, but now also offers products that are compatible with the PCI Express (PCIe) standard. For each bus, a wide choice of Digital and/or Analog Input/Output boards is available.

Digital I/O boards can be used in applications where logic signals need to be monitored and/or controlled, such as buttons, ON/OFF switches, relays, or situations where high/low or open/close conditions exist, whereas Analog I/O boards can be used for the control and acquisition of real-world analog signals, such as current, voltage, temperature, sound, etc. Timer, counter and frequency boards are for used to measure pulse signals.

ICP DAS I/O boards are renowned for their reliability, durability, usefulness and for the variety of features and support. In addition, using any Data Acquisition board becomes easier with the aid of the range of ICP DAS Daughterboards that make any system highly expandable.



ICP DAS is a fast-growing provider of high-quality Industrial Data Acquisition Systems and Control Products. In addition to data acquisition and control boards, ICP DAS also provides a wide variety of products, such as Motion Control devices, Industrial Communication and Networking modules, and CAN Bus and FRnet Communication solutions, etc. ICP DAS is also focused on ODM/OEM services in the design, production and maintenance fields. ICP DAS works closely with all our customers, meaning that you can rely on us to satisfy your requirements for cost, quality and manufacturability.



## • Software

ICP DAS provides a full-featured Software Development Kit (SDK) together with reliable drivers for all I/O boards (AD, DA, DI, DO and Timer/Counter series), with support for a variety of operating systems, such as Linux, DOS, Windows 98/NT/2000, and 32 and 64-bit versions of Windows XP/Server 2003/Server 2008/7/Server 2012, as well as supporting Microsoft's latest 32 and 64-bit versions of Windows 8. The Windows SDK for the I/O boards contains DLL (Dynamic Link Library) files, ActiveX (OCX) control components, and a large number of sample programs with source code written in Microsoft Visual C++, Visual Basic, Borland C++ Builder, Delphi, VB.NET, C#.NET and MATLAB. By using a combination of the SDK and the sample programs, complex hardware-register-based operations are no longer required, meaning that custom applications can be quickly and easily developed.



### ActiveX Control (OCX)

ActiveX Control (OCX) is a software component standard introduced by Microsoft to allow easy and user-friendly program development. Any OCX control can be inserted into an application so that the properties, methods and events provided by the object can be used to develop custom applications without needing to understand how it actually works. The ICP DAS OCX supports Windows 98/NT/2000 and 32-bit Windows XP/Server 2003/Server 2008/7/Server 2012/8, and sample programs with source code are also provided for development environments such as VB, VC, Delphi, and BCB, etc. By integrating the ICP DAS OCX, developers from a variety of backgrounds or with different levels of expertise can add their individual creativity to a wide range of applications.



### DOS Lib

DOS includes many valuable features for industrial control and measurement applications, such as high performance, stability, easy installation and deployment, etc. ICP DAS continues to support DOS-based systems by providing useful function libraries and a wide variety of C sample programs, including the source code, which can be freely modified and used as required.



### Driver & SDK for Linux

The Linux operating system has been widely adopted in numerous industrial applications because of its stability, as well as the fact that it is open source and is free. The ICP DAS I/O Board driver for Linux supports x86 32-bit and 64-bit distributions for Linux Kernel 2.6.x to 3.x.x (for example, Fedora Core, Ubuntu and OpenSUSE etc.), and the SDK includes libraries and sample programs with source code. I/O control applications can easily be developed for Linux systems using the SDK and the GNU C Language.



### Java I/O Driver

(JIOD) package.

Java technology is a write-once, run everywhere solution that features complete network support, making it an ideal solution for industry control projects. Java reduces the cost of development and maintenance, while satisfying the demands of time-to-market requirements. However, low-level I/O access is not a standard implementation in Java. So in order to ensure our customers obtain the benefits of integrating Java technology into their solutions, ICP DAS has developed the Java I/O Driver



### DASyLab

DASyLab is a popular and easy-to-use software package for data acquisition systems that is compatible with a wide range of interface options, providing connections to hardware such as RS-232, IEEE, USB, and Parallel ports, as well as the ISA and PCI bus interfaces, etc. A large variety of functional modules for measurement and control are also supplied with DASyLab, meaning that it only takes a few minutes to create customized acquisition and analysis applications. Consequently, the most sophisticated data acquisition and control tasks can quickly be solved using DASyLab without the need for additional complex programming tools. To take advantage of this state-of-the-art software, ICP DAS has developed a series of drivers for PCI, ISA and DCON series products, allowing the easy integration of hardware and software into data acquisition, measurement and control systems.



### LabVIEW

LabVIEW delivers a graphical development environment that enables data acquisition, instrumentation and control systems to be quickly created, boosting productivity and reducing development time. An added advantage is that LabVIEW is scalable across multiple operating systems and includes hundreds of built-in libraries.

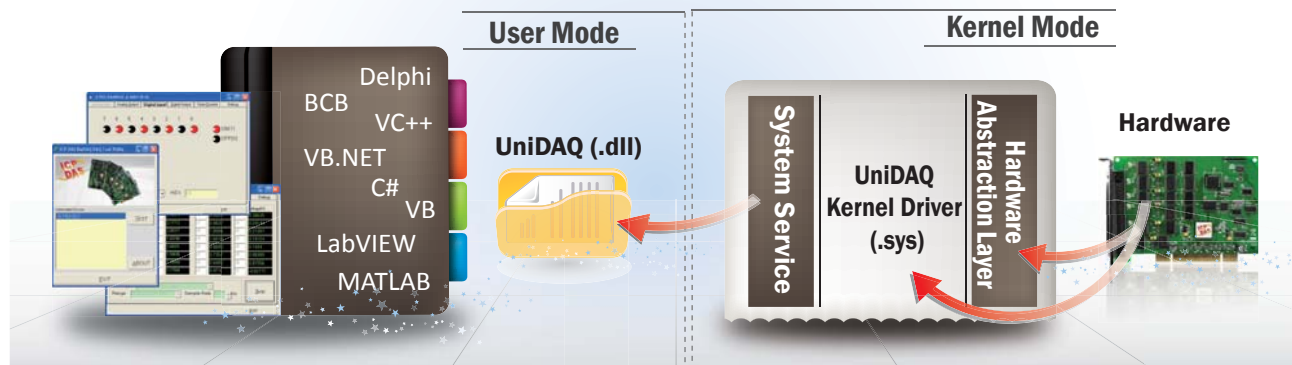
The LabVIEW toolkit can be used in conjunction with ICP DAS I/O series boards operating in a Windows 98/NT/2000 and 32/64-bit Windows XP/Server 2003/Server 2008/7/Server 2012/8 environment. ICP DAS also provides an LLB Library together with sample programs, including the source code, meaning that hardware and software can easily be integrated in the LabVIEW graphical development environment to provide effective data acquisition, measurement and control solutions.



### UniDAQ Driver & SDK for Windows

UniDAQ is a uniform SDK interface that operates within the Windows Operating System environment, and is used to implement common data access functionality on ICP DAS I/O boards. UniDAQ supports the majority of I/O cards based on either the PCI or the Universal PCI bus as well as the PCI Express bus. The UniDAQ SDK makes it easy to integrate different kinds of I/O boards within the same system, upgrade to new hardware, expand the number of channels in an existing system, or develop numerous applications based on the various I/O boards.

The UniDAQ SDK includes functions related to the Driver, Digital I/O, Interrupts, Analog I/O, Timer/Counter processes and Memory I/O, and supports both 32- and 64-bit Windows systems. Sample programs, including the source code, are also provided for a range of common programming languages, such as Microsoft Visual C++ 6.0, Microsoft Visual Basic 6.0, Borland Delphi 6.0, Borland C Builder++ 6.0, Microsoft Visual Basic.NET, Microsoft Visual C#.NET, LabVIEW and MATLAB.



Suitable User

User situation	UniDAQ Driver & SDK	Classic Driver & SDK
Using an ICP DAS I/O board for the first time	✓	
64-bit Operating System Environment	✓	
Currently using several types of ICP DAS PCI boards	✓	
Currently using the Classic Driver & SDK and not wishing to amend the software		✓
Windows 95/98/NT Environment		✓

## High Speed Multifunction & Multifunction Boards



Model	Available soon PCIe-813	NEW PCIe-8620	NEW PCIe-8622	PEX-1202L	PEX-1202H
<b>Analog Input</b>					
Isolation Voltage	3750 Vrms (Bus-type)	2500 VDC (Bus-type)		-	
Resolution	16-bit			12-bit	
Channels	SE	32	8	16	32
	Diff.	-	-	-	16
Sampling Rate	1 MS/s	200 kS/s (Per Channel)		110 kS/s	44 kS/s
FIFO Size	8 K	2 K	2 K	1 K	
<b>Analog Output</b>					
Resolution	-		16-bit	12-bit	
Channels	-		2	2	
<b>Non-isolated Digital Input/Output</b>					
DI Channels	-		16 (5 V/TTL)		
DO Channels	-		16 (5 V/TTL)		
<b>Isolated Digital Input/Output</b>					
DI Channels	-	4	12	-	
DO Channels	-	4	12	-	
Isolation Voltage	-	2500 VDC	2500 VDC	-	
<b>Timer/Counter</b>					
Channels	-	-	2	1	
Page	7	8	9	10	

## Analog Input/Output Boards



Model	PEX-1002L	PEX-1002H	PEX-DA4	PEX-DA8	PEX-DA16
<b>Analog Input</b>					
Resolution	12-bit		-		
Channels	SE	32	-		
	Diff.	16	-		
Sampling Rate	110 kS/s	44 kS/s	-		
<b>Analog Output</b>					
Resolution	-		14-bit	14-bit	14-bit
Channels	-		4	8	16
<b>Digital Input</b>					
Channels	16		16	16	16
Compatibility	5 V/TTL		5 V/TTL	5 V/TTL	5 V/TTL
<b>Digital Output</b>					
Channels	16		16	16	16
Compatibility	5 V/TTL		5 V/TTL	5 V/TTL	5 V/TTL
<b>Timer/Counter</b>					
Channels	-		3	3	3
Page	11		12		



## Non-isolated Digital Input/Output Boards



Model	<b>NEW</b> PEX-D144S	<b>NEW</b> PEX-D96S	PEX-D56	PEX-D48	PEX-D24
<b>Programmable DIO</b>					
Channels	144	96	24	48	24
<b>Digital Input</b>					
Channels	-	-	16	-	-
Compatibility	5 V/CMOS	5 V/CMOS	5 V/TTL	5 V/TTL	5 V/TTL
<b>Digital Output</b>					
Channels	-	-	16	-	-
Compatibility	5 V/CMOS	5 V/CMOS	5 V/TTL	5 V/TTL	5 V/TTL
<b>Timer/Counter</b>					
Channels		-		2	-
<b>Connector</b>					
100-pin SCSI II	1	1	-	-	-
50-pin Header	1	-	-	1	-
37-pin D-Sub	-	-	1	1	1
20-pin Header	-	-	2	-	-
<b>Page</b>	<b>13</b>	<b>14</b>	<b>16</b>	<b>15</b>	<b>16</b>



## Isolated Digital Input/Output Boards



Model	PEX-P8R8i PEX-P16R16i	PEX-P8POR8i PEX-P16POR16i	PEX- P32C32	PEX- P32A32	PEX-730	<b>NEW</b> PEX-730A	PEX-P64		PEX-C64
							-	-24V	
<b>Digital Input</b>									
Channels	8/16	8/16	32	32	16	16	64		-
Isolation Voltage	3750 Vrms	2000 VDC	3750 Vrms	3750 Vrms	3750 Vrms	3750 Vrms	3750 Vrms		-
Compatibility	Photocoupler	Photocoupler	Photocoupler	Photocoupler	Optical	Optical	Photocoupler		-
Input Voltage	Logic 0	AC/DC 0 ~ +1 V		0 ~ +1 V	0 ~ +1 V	0 ~ +1 V	0 ~ +1 V		-
	Logic 1	AC/DC +5 ~ +24 V		+9 ~ +24 V	+9 ~ +24 V	+9 ~ +24 V	+5 ~ +15 V	+20 ~ +28 V	-
<b>Relay Output</b>									
Channels	8/16	8/16							-
Relay Type	4 SPDT, 4 SPST/ 8 SPDT, 8 SPST	PhotoMOS Relay (Form A)							-
<b>Digital Output</b>									
Channels			32	32	16	16			64
Isolation Voltage			3750 Vrms	3750 Vrms	3750 Vrms	3750 Vrms			3750 Vrms
Compatibility			Sink, Open Collector	Source, Open Collector	Sink, Open Collector	Source, Open Collector			Sink, Open Collector
<b>Non-isolation Digital Input/Output</b>									
DI Channels					16 (5 V/TTL)	16 (5 V/TTL)			-
DO Channels					16 (5 V/TTL)	16 (5 V/TTL)			-
<b>Page</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>19</b>	<b>20</b>	<b>20</b>	<b>21</b>		<b>22</b>

# PCIe-813 *Available soon*

PCI Express, 1 MS/s High-speed, 16-bit, 32-channel Bus-isolated Analog Input Board



## Features ▶▶▶

- PCI Express x1 Interface
- 32-channel Single-ended Isolated Analog Input
- 16-bit, ADC with Max. 1 MS/s Sampling Rate
- 8192 Sample Hardware FIFO for Analog Input
- Programmable Gain Control: 0.4, 0.8, 1.6
- Bipolar Input: ±10.24 V, ±5.12 V, ±2.56 V
- Built-in MagicScan Controller
- Built-in DC/DC Converter with 3000 Vdc Protection
- 3750 Vrms Bus Isolation Protection
- AD Trigger: Software, Pacer, External
- High Performance DMA Data Transfer
- Supports Card ID (SMD Switch)

## Introduction

The PCIe-813 is a bus-type isolated 16-bit AD board that supports the PCI Express bus and provides 32 single-ended 16-bit Analog Input channels with an 8 k Sample hardware FIFO. Analog Input sampling rates of up to 1 MS/s can be achieved, and the board also includes DMA channels that allow the streaming of Analog Input data without significantly impacting processor resources. The isolation range of the board has been increased to 3750 Vrms, making it the most cost-effective solutions when considering isolated AD boards.

The PCIe-813 board provides a variety of programmable trigger methods, including software and pacer, as well as external triggers that include Post, Pre, Middle, Delay and Analog triggers. Even in channel scan mode, a different gain code can be used for each channel, and a total sampling rate of 1 MS/s can still be achieved, making the PCIe-813 board well-suited to the demands of high-end applications. Synchronization of the data acquisition process relative to an external event is an important criterion in many applications.

## Hardware Specifications

Analog Input	
Isolation Voltage	3750 Vrms (Bus-type)
Channels	32 Single-ended
AD Converter	16-bit, 1 μs conversion time
Sampling Rate	1 MS/s
FIFO Size	8192 Samples
Over voltage Protection	Continuous +/-35 Vp-p
Input Impedance	10,000 MΩ/6 pF
Trigger Modes	Software, Pacer, External
Data Transfer	Polling, Interrupt, DMA
Accuracy	0.05% of FSR ±1 LSB @ 25°C, ± 10.24 V
Input Range	Gain: 0.4, 0.8, 1.6, Bipolar Range: ±10.24 V, ±5.12 V, ±2.56 V
General	
Bus Type	PCI Express x1
Card ID	Yes (4-bit)
Connectors	Female DB37 x 1
Power Consumption	1 A @ +5 V (Max.)
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

## Ordering Information

PCIe-813 CR	PCI Express, 1 MS/s High-speed, 16-bit, 32-ch Bus-isolated Analog Input Board (RoHS). Includes one CA-4002 D-sub Connector.
PCIe-813/S CR	PCIe-813 CR with DN-37 Daughterboard. Includes one CA-4002 D-sub Connector.

## Accessories

CA-3710DM	DB-37 Male-Male Cable, 1.0 m, 180° (RoHS)	DB-37	Screw Terminal for I/O Boards that use a 37-pin D-sub Connector
CA-4002	37-pin Male D-sub Connector with Plastic Cover	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board

## Software

### Drivers

- 32-bit Windows XP/2003/2008/7/8/10
- 64-bit Windows XP/2003/2008/7/8/10

### Sample Programs

- LabVIEW Toolkit
- VB/VC/Delphi/BCB/MATLAB Demo
- VB.NET/C#.NET/VC.NET Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
AI 0	01	
AI 2	02	20 AI 1
AI 4	03	21 AI 3
AI 6	04	22 AI 5
AI 8	05	23 AI 7
AI 10	06	24 AI 9
AI 12	07	25 AI 11
AI 14	08	26 AI 13
A_GND	09	27 AI 15
A_GND	10	28 A_GND
AI 16	11	29 Ext_Trng
AI 18	12	30 AI 17
AI 20	13	31 AI 19
AI 22	14	32 AI 21
AI 24	15	33 AI 23
AI 26	16	34 AI 25
AI 28	17	35 AI 27
AI 30	18	36 AI 29
A_GND	19	37 AI 31

CON1





# PCIe-8620 **NEW**

PCI Express, 200 kS/s High-speed, 16-bit, 8-channel Simultaneously Sampled Analog Input Board with 4-channel Isolated DI/O

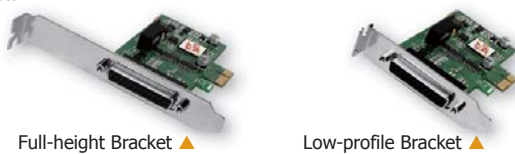


## Introduction

The PCIe-8620 is a bus-type, isolated high-speed Analog Input board with isolated DI/O. The simultaneously sampled AD offers a mix of up to 8 single-ended 16-bit Analog Input channels with a 2 k Sample hardware FIFO. All channels feature a programmable input range of  $\pm 10$  V or  $\pm 5$  V with a sampling rate up to 200 kS/s per channel. The PCIe-8620 provides 4 isolated Digital Input channels and 4 isolated Digital Output channels. The isolation range of the board has been increased to 2500 Vdc, making it one of the most cost-effective solutions when considering isolated AD with DI/O boards.

PCIe-8620 also includes a second-order anti-alias analog filter where the -3 dB frequency for the  $\pm 5$  V input range is typically 15 kHz, and is typically 23 kHz for the  $\pm 10$  V input range.

The PCIe-8620 is a low-profile PCI Express board that is suitable for computers with limited space, and is also suitable for standard-size computers since the board is shipped with both full-height and low-profile brackets.

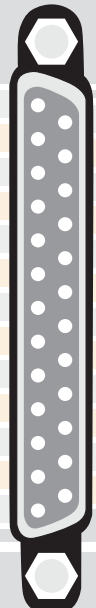


Full-height Bracket ▲

Low-profile Bracket ▲

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
AI 0	01	
AI 1	02	14 A_GND
AI 2	03	15 A_GND
AI 3	04	16 A_GND
AI 4	05	17 A_GND
AI 5	06	18 A_GND
AI 6	07	19 A_GND
AI 7	08	20 A_GND
D_GND	09	21 D_GND
DI 1	10	22 DI 0
DI 3	11	23 DI 2
DO 1	12	24 DO 0
DO 3	13	25 DO 2



CON1

## Ordering Information

PCIe-8620 CR	PCI Express, 200 kS/s, 16-bit, 8-ch Simultaneously Sampled Analog Input Board and 4-ch Isolated DI/O (RoHS). Includes one CA-PC25M D-sub Connector and one Low-profile Bracket.
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## Features

- PCI Express x1 Interface, Full-profile or Low-profile
- 4-channel Isolated Digital Input
- 4-channel Isolated Digital Output
- 8 Single-ended Analog Input Channels
  - Synchronous Sample and Hold
  - Analog Input Range:  $\pm 10$  V,  $\pm 5$  V
  - 16-bit, 200 kS/s Sampling Rate for each channel
  - Hardware FIFO for Analog Input with a total of 2048 Samples
  - Built-in MagicScan Controller

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10



### Sample Programs

- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Hardware Specifications

Analog Input	
Isolation Voltage	2500 VDC (Bus-type)
Channels	8 Single-ended
Resolution	16-bit
Sampling Rate	200 kS/s (Each Channel)
Bipolar Input	$\pm 10$ V, $\pm 5$ V
FIFO Size	2 k Samples (Total)
Accuracy	0.05% of FSR $\pm 1$ LSB @ 25°C, $\pm 10$ V
Digital Input	
Channels	4
Isolation Voltage	2500 VDC
Digital Output	
Channels	4
Isolation Voltage	2500 VDC
General	
Bus Type	PCI Express x1
Card ID	Yes (4-bit)
Connectors	Female DB25 x 1
Dimensions (L x W x D)	Full-profile: 107 mm x 120 mm x 22 mm Low-profile: 107 mm x 80 mm x 22 mm
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

## Accessories

 CA-2520	25-pin D-sub Cable, 2.0 m
 DN-25 CR	DIN-Rail Mountable I/O Connector Block with 25/9-pin D-sub Connector (RoHS) Include: CA-0920 Cable x 1 and CA-2520 Cable x 1

# PCIe-8622 **NEW**

PCI Express, 200 kS/s High-speed, 16-bit, 16-channel Simultaneously Sampled Analog Input Board with 12-channel Isolated DI/O



## Introduction

The PCIe-8622 is a bus-type, isolated high-speed AD multifunction board with 16-bit DA and isolated DI/O. The simultaneously sampled AD offers a mix of up to 16 single-ended, 16-bit Analog Input channels with a 2 k Sample hardware FIFO and 2500 V<sub>DC</sub> bus-typed isolation protection. All channels feature a programmable input range of ±10 V or ±5 V with a sampling rate up to 200 kS/s per channel.

The PCIe-8622 supports the PCI Express bus and provides 12 isolated Digital Input channels, 12 isolated Digital Output channels and 2 Analog Output channels at 16-bit resolution. The board has a single high-density connector that reduces the amount of space required for installation.

## Pin Assignments

Pin Assignment	Terminal No.	Terminal No.	Pin Assignment
Output +5 V	01	35	Output +15 V
CNT1_GATE	02	36	CNT0_GATE
CNT1_OUT	03	37	CNT0_OUT
CNT1_CLK	04	38	CNT0_CLK
D_GND	05	39	D_GND
DO 11	06	40	DO 10
DO 9	07	41	DO 8
DO 7	08	42	DO 6
DO 5	09	43	DO 4
DO 3	10	44	DO 2
DO 1	11	45	DO 0
DI 11	12	46	DI 10
DI 9	13	47	DI 8
D_GND	14	48	D_GND
DI 7	15	49	DI 6
DI 5	16	50	DI 4
DI 3	17	51	DI 2
DI 1	18	52	DI 0
N.C.	19	53	N.C.
AI_CONV	20	54	N.C.
DTRG1	21	55	DTRG0
A_GND	22	56	A_GND
A_GND	23	57	A_GND
AO 1	24	58	AO 0
A_GND	25	59	A_GND
A_GND	26	60	A_GND
AI 15	27	61	AI 14
AI 13	28	62	AI 12
AI 11	29	63	AI 10
AI 9	30	64	AI 8
AI 7	31	65	AI 6
AI 5	32	66	AI 4
AI 3	33	67	AI 2
AI 1	34	68	AI 0

## Features

- PCI Express x1 Interface, Full-profile
- 12-channel Isolated Digital Input
- 12-channel Isolated Digital Output
- 2-channel 16-bit Analog Output
- 16 Single-ended Analog Input Channels
  - Synchronous Sample and Hold
  - Analog Input Range: ±10 V, ±5 V
  - 16-bit, 200 kS/s Sampling Rate for each Channel
  - Hardware FIFO for Analog Input with a total of 2048 Samples
  - Built-in MagicScan Controller

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10

### Sample Programs

- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Hardware Specifications

Analog Input	
Isolation Voltage	2500 V <sub>DC</sub> (Bus-type)
Channels	16 Single-ended
Resolution	16-bit
Sampling Rate	200 kS/s (Each Channel)
Bipolar Input	±10 V, ±5 V
FIFO Size	2 k Samples (Total)
Accuracy	0.05% of FSR ±1 LSB @ 25°C, ±10 V
Analog Output	
Channels	2
Resolution	16-bit
Output Range	±5 V, ±10 V
Digital Input	
Channels	12
Isolation Voltage	2500 V <sub>DC</sub>
Digital Output	
Channels	12
Isolation Voltage	2500 V <sub>DC</sub>
Timer/Counter	
Channels	2
General	
Bus Type	PCI Express x1
Card ID	Yes (4-bit)
Connectors	68-pin Female SCSI II x 1
Dimensions (L x W x D)	125 mm x 120 mm x 22 mm
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

## Accessories

	CA-SCSI15-H	68-pin SCSI-II Connector Cable, 1.5 m
	DN-68A CR	DIN-Rail Mountable I/O Connector Block with 68-pin Female SCSI II Connector (RoHS).

## Ordering Information

PCIe-8622 CR	PCI Express, 200 kS/s, 16-bit, 16-ch Simultaneously Sampled Analog Input Board, with 2-ch 16-bit Analog Output and 12-ch Isolated DI/O (RoHS).
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# PEX-1202H/PEX-1202L

PCI Express, 32-channel, 12-bit, 44 kS/s or 110 kS/s Multifunction (1 K word FIFO) Board



## Introduction

The PEX-1202L/H series utilizes the PCI Express bus and is designed as an easy replacement for the PCI-1202 series without requiring any modification to either the software or the driver.

The PEX-1202L/H provides 32 single-ended or 16 differential Analog Input channels at 12-bit resolution, together with 16 TTL Digital Input and 16 TTL Digital Output channels. Data acquisition under DOS is gap-free and continuous, at 110 kHz for low gain and 44 kHz for high gain. The PEX-1202L/H also features "Magic Scan" and Continuous Capture functions.

The PEX-1202L/H includes a Card ID switch that enables the board to be easily recognized via software if two or more cards are installed in the same computer. The pull-high/low jumpers allow the DI status to be predefined instead of remaining floating if the DI channels are disconnected or line broken.

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
AI 0	01	20 AI 16
AI 1	02	21 AI 17
AI 2	03	22 AI 18
AI 3	04	23 AI 19
AI 4	05	24 AI 20
AI 5	06	25 AI 21
AI 6	07	26 AI 22
AI 7	08	27 AI 23
AI 8	09	28 AI 24
AI 9	10	29 AI 25
AI 10	11	30 AI 26
AI 11	12	31 AI 27
AI 12	13	32 AI 28
AI 13	14	33 AI 29
AI 14	15	34 AI 30
AI 15	16	35 AI 31
A_GND	17	36 Da2 out
Da1 out	18	37 D_GND
Ext_Trg	19	

Pin Assignment	Terminal No.	Pin Assignment
DO 0	01	02 DO 1
DO 2	03	04 DO 3
DO 4	05	06 DO 5
DO 6	07	08 DO 7
DO 8	09	10 DO 9
DO 10	10	12 DO 11
DO 12	12	14 DO 13
DO 14	14	16 DO 15
GND	16	18 GND
+5 V	18	20 +12 V

Pin Assignment	Terminal No.	Pin Assignment
DI 0	01	02 DI 1
DI 2	03	04 DI 3
DI 4	05	06 DI 5
DI 6	07	08 DI 7
DI 8	09	10 DI 9
DI 10	11	12 DI 11
DI 12	13	14 DI 13
DI 14	15	16 DI 15
GND	17	18 GND
+5 V	19	20 +12 V

## Ordering Information

PEX-1202L CR	PCI Express, 32-ch, 12-bit, 110 kS/s. Low Gain Multifunction Board (RoHS). Includes one CA-4002 D-sub Connector.
PEX-1202H CR	PCI Express, 32-ch, 12-bit, 44 kS/s. High Gain Multifunction Board (RoHS). Includes one CA-4002 D-sub Connector.



## Features

- PCI Express x1 Interface
- 16-channel 5 V/TTL Digital Input
- 16-channel 5 V/TTL Digital Output
- Pull-high/Pull-low Jumpers for DI Channels
- 12-bit, 32 Single-ended/16 Differential Analog Input channels
- Three External Triggers: Pre-trigger, Middle-trigger, Post-trigger
- 110 kS/s or 44 kS/s AD Sampling Rate
- Supports Card ID (SMD Switch)

## Hardware Specifications

Model	PEX-1202L	PEX-1202H
<b>Analog Input</b>		
Channels	32 Single-ended/16 Differential	
Resolution	12-bit, 8.5 μs Conversion Time	
FIFO Size	1024 Samples	
Accuracy	0.1% of FSR ±1 LSB @ 25°C, ±10 V	
Sampling Rate	110 kS/s (Low-Gain)	44 kS/s (High-Gain)
<b>Analog Output</b>		
Channels	2	
Resolution	12-bit	
Accuracy	0.06% of FSR ±1 LSB @ 25°C, ±10 V	
Output Range	±5 V, ±10 V	
<b>Digital Input</b>		
Channels	16	
Compatibility	5 V/TTL	
Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.	
Response Speed	500 kHz (Typical)	
<b>Digital Output</b>		
Channels	16	
Compatibility	5 V/CMOS	
Output Voltage	Logic 0: 0.1 V Max., Logic 1: 4.4 V Min.	
Output Capability	Sink: 6 mA @ 0.33 V, Source: 6 mA @ 4.77 V	
Response Speed	500 kHz (Typical)	
<b>Timer/Counter</b>		
Channels	1	
Resolution	16-bit	
<b>General</b>		
Bus Type	PCI Express x1	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1, 20-pin Box Header x 2	
Power Consumption	300 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

## Accessories

	CA-2010	20-pin Flat Cable, 1 m
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	DB-1825	Analog Input Screw Terminal Board
	DN-20	DIN-Rail Mountable 20-pin D-sub Connector Board
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board

# PEX-1002H/PEX-1002L

PCI Express, 32-channel, 12-bit, 44 kS/s or 110 kS/s Analog Input Board



## Features

- PCI Express x1 Interface
- 16-channel 5 V/TTL Digital Input
- 16-channel 5 V/TTL Digital Output
- Pull-high/Pull-low Jumpers for DI Channels
- 12-bit, 32 Single-ended/16 Differential Analog Input Channels
- Internal/External Trigger
- 110 or 44 kS/s AD Sampling Rate
- Supports Card ID (SMD Switch)

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10  Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo  LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
AI 0	01	20 AI 16
AI 1	02	21 AI 17
AI 2	03	22 AI 18
AI 3	04	23 AI 19
AI 4	05	24 AI 20
AI 5	06	25 AI 21
AI 6	07	26 AI 22
AI 7	08	27 AI 23
AI 8	09	28 AI 24
AI 9	10	29 AI 25
AI 10	11	30 AI 26
AI 11	12	31 AI 27
AI 12	13	32 AI 28
AI 13	14	33 AI 29
AI 14	15	34 AI 30
AI 15	16	35 AI 31
A_GND	17	36 N.C.
N.C.	18	37 D_GND
Ext_Trg	19	

Pin Assignment	Terminal No.	Pin Assignment
DO 0	01	02 DO 1
DO 2	03	04 DO 3
DO 4	05	06 DO 5
DO 6	07	08 DO 7
DO 8	09	10 DO 9
DO 10	10	12 DO 11
DO 12	12	14 DO 13
DO 14	14	16 DO 15
GND	16	18 GND
+5 V	18	20 +12 V

Pin Assignment	Terminal No.	Pin Assignment
DI 0	01	02 DI 1
DI 2	03	04 DI 3
DI 4	05	06 DI 5
DI 6	07	08 DI 7
DI 8	09	10 DI 9
DI 10	11	12 DI 11
DI 12	13	14 DI 13
DI 14	15	16 DI 15
GND	17	18 GND
+5 V	19	20 +12 V

## Introduction

The PEX-1002L/H series utilizes the PCI Express bus and is designed as an easy replacement for the PCI-1002 series without requiring any modification to either the software or the driver.

The PEX-1002L/H provides 32 single-ended or 16 differential Analog Input channels at 12-bit resolution, together with 16 TTL Digital Input and 16 TTL Digital Output channels.

The PEX-1002L/H includes a Card ID switch that enables the board to be easily recognized via software if two or more cards are installed in the same computer. The pull-high/low jumpers allow the DI status to be predefined instead of remaining floating if the DI channels are disconnected or line broken.

## Hardware Specifications

Model	PEX-1002L	PEX-1002H
<b>Analog Input</b>		
Channels	32 Single-ended/16 Differential	
Resolution	12-bit, 8 $\mu$ s Conversion Time	
Accuracy	0.01% of FSR $\pm$ 2 LSB @ 25°C, $\pm$ 10 V	
Sampling Rate	110 kS/s (Low-Gain)	44 kS/s (High-Gain)
<b>Digital Input</b>		
Channels	16	
Compatibility	5 V/TTL	
Input Voltage	Logic 0: 0.8 V Max. Logic 1: 2.0 V Min.	
Response Speed	500 kHz (Typical)	
<b>Digital Output</b>		
Channels	16	
Compatibility	5 V/TTL	
Output Voltage	Logic 0: 0.4 V Max. Logic 1: 2.4 V Min.	
Output Capability	Sink: 2.4 mA @ 0.8 V Source: 0.8 mA @ 2.0 V	
Response Speed	500 kHz (Typical)	
<b>General</b>		
Bus Type	PCI Express x1	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1, 20-pin Box Header x 2	
Power Consumption	800 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

## Accessories

	CA-2010	20-pin Flat Cable, 1 m
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	DB-1825	Analog Input Screw Terminal Board
	DN-20	DIN-Rail Mountable 20-pin D-sub Connector Board
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board

## Ordering Information

PEX-1002L CR	PCI Express, 32-ch, 12-bit, 110 kS/s. Low Gain Analog Input Board (RoHS). Includes one CA-4002 D-sub Connector.
PEX-1002H CR	PCI Express, 32-ch, 12-bit, 44 kS/s. High Gain Analog Input Board (RoHS). Includes one CA-4002 D-sub Connector.



# PEX-DA4/PEX-DA8/PEX-DA16

PCI Express, 14-bit, 4/8/16-channel Analog Output Board



## Introduction

The PEX-DA4/DA8/DA16 series Analog Output boards utilize the PCI Express interface, and are equipped with 4, 8, or 16 Analog Output channels at 14-bit resolution with each DA channel featuring a double-buffered latch.

The voltage output for the PEX-DA series can range from -10 V to +10 V, and the current output range can be from 0 to 20 mA. In addition, the PEX-DA series also provides the following advantages:

- 1. Accurate and easy-to-use calibration:** ICP DAS provides a software calibration function, meaning that jumpers and trimpots are no longer required. The calibration data is saved in EEPROM for long-term use.
- 2. Individual channel configuration:** Each channel can be individually configured as either voltage or current output.
- 3. Card ID:** The PEX-DA series includes a Card ID switch that enables the board to be easily recognized via software if two or more cards are installed in the same computer.

The PEX-DA series is designed as an easy replacement for the PIO-DA series without requiring any modification to either the software or the driver.

## Hardware Specifications

Model	PEX-DA4	PEX-DA8	PEX-DA16
<b>Analog Output</b>			
Channels	4	8	16
Resolution	14-bit		
Accuracy	0.01% of FSR $\pm 2$ LSB @ 25°C, $\pm 10$ V		
Output Range	$\pm 10$ V, 0 ~ +20 mA		
Output Driving	$\pm 5$ mA		
<b>Digital Input</b>			
Channels	16		
Compatibility	5 V/TTL		
Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.		
Response Speed	200 kHz (Typical)		
<b>Digital Output</b>			
Channels	16		
Compatibility	5 V/CMOS		
Output Voltage	Logic 0: 0.1 V Max., Logic 1: 4.4 V Min.		
Output Capability	Sink: 6 mA @ 0.33 V, Source: 6 mA @ 4.77 V		
Response Speed	200 kHz (Typical)		
<b>Timer/Counter</b>			
Channels	3		
Resolution	16-bit		
<b>General</b>			
Bus Type	PCI Express x1		
Card ID	Yes (4-bit)		
Connectors	Female DB37 x 1, 20-pin Box Header x 2		
Power Consumption	600 mA @ +5 V	800 mA @ +5 V	1400 mA @ +5 V
Operating Temperature	0°C to +60°C		
Humidity	5 to 85% RH, Non-condensing		

## Ordering Information

PEX-DA4 CR	PCI Express, 4-ch Analog Output Board (RoHS). Includes one CA-4002 D-sub Connector.
PEX-DA8 CR	PCI Express, 8-ch Analog Output Board (RoHS). Includes one CA-4002 D-sub Connector.
PEX-DA16 CR	PCI Express, 16-ch Analog Output board (RoHS). Includes one CA-4002 D-sub Connector.



## Features

- PCI Express x1 Interface
- Supports Card ID (SMD Switch)
- 16-channel 5 V/TTL Digital Input
- 16-channel 5 V/CMOS Digital Output
- Pull-high/Pull-low Jumpers for DI Channels
- 4, 8 or 16-channel 14-bit Analog Output
- Voltage Output:  $\pm 10$  V
- Current Output: 0 ~ +20 mA (sink)
- Double-buffered DA Latch

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
VO 0	01	20 IO 0
VO 1	02	21 IO 1
VO 2	03	22 IO 2
VO 3	04	23 IO 3
A_GND	05	24 N.C.
VO 4	06	25 IO 4
VO 5	07	26 IO 5
VO 6	08	27 IO 6
VO 7	09	28 IO 7
A_GND	10	29 N.C.
VO 8	11	30 IO 8
VO 9	12	31 IO 9
VO 10	13	32 IO 10
VO 11	14	33 IO 11
A_GND	15	34 IO 12
VO 12	16	35 IO 13
VO 13	17	36 IO 14
VO 14	18	37 IO 15
VO 15	19	

CON3

Pin Assignment	Terminal No.	Pin Assignment
DO 0	01	02 DO 1
DO 2	03	04 DO 3
DO 4	05	06 DO 5
DO 6	07	08 DO 7
DO 8	09	10 DO 9
DO 10	11	12 DO 11
DO 12	13	14 DO 13
DO 14	15	16 DO 15
GND	17	18 GND
+5 V	19	20 +12 V

CON1

Pin Assignment	Terminal No.	Pin Assignment
DI 0	01	02 DI 1
DI 2	03	04 DI 3
DI 4	05	06 DI 5
DI 6	07	08 DI 7
DI 8	09	10 DI 9
DI 10	10	12 DI 11
DI 12	12	14 DI 13
DI 14	14	16 DI 15
GND	16	18 GND
+5 V	18	20 +12 V

CON2

## Accessories

	CA-2010	20-pin Flat Cable, 1 m
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board

# PEX-D144LS

PCI Express, 144-channel Digital I/O Board with SCSI-II Connector



## Introduction

The PEX-D144LS board utilizes the PCI Express bus and is designed as an easy replacement for the PIO-D144U/D144LU series without requiring any modification to either the software or the driver.

The PEX-D144LS provides a high-density connector and a 50-pin box header that dramatically reduces the amount of installation space required for the card in the computer. It supports 144 low-heating CMOS Digital I/O lines that consist of eighteen 8-bit bi-directional ports: port A (PA), port B (PB) and port C (PC). All ports are configured as input mode during power-on or after a reset.

The PEX-D144LS also includes an onboard Card ID that enables the board to be easily recognized via software if two or more cards are installed in the same computer.

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Hardware Specifications

Programmable DIO	
Channels	144
Digital Input	
Compatibility	5 V/CMOS
Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.
Response Speed	500 kHz
Digital Output	
Compatibility	5 V/CMOS
Output Voltage	Logic 0: 0.1 V Max., Logic 1: 4.4 V Min.
Output Capability	Sink: 6 mA @ 0.33 V, Source: 6 mA @ 4.77 V
Response Speed	500 kHz
General	
Bus Type	PCI Express x1
Card ID	Yes (4-bit)
Connectors	100-pin Female SCSI II x 1, 50-pin Box Header x 1
Power Consumption	600 mA @ +5 V
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

## Accessories

	DN-100 CR	DIN-Rail Mountable I/O Connector Block with 100-pin Female SCSI II Connector (RoHS)
	CA-SCSI100-15	100-pin SCSI II and 100-pin Male Connector Cable, 1.5 m
	DN-100-CA CR	DN-100 CR Daughterboard. Include one CA-SCSI100-15 Cable

## Features

- PCI Express x1 Interface
- Supports Card ID (SMD Switch)
- Pull-high/Pull-low Jumpers for DI Channels
- Four Interrupt Sources
- 144 Buffered CMOS Digital Input/Output Lines
- Eighteen 8-bit Bi-directional I/O Ports
- Supports DO Status Readback (Register Level)
- DI/O Response Time approximately 2 μs (500 kHz Max.)

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment	Pin Assignment	Terminal No.	Pin Assignment
PA 0	01	51	PA 10	02	+5 V
PA 1	02	52	PA 11	04	PA 50
PA 2	03	53	PA 12	06	PA 51
PA 3	04	54	PA 13	08	PA 52
PA 4	05	55	PA 14	10	PA 53
PA 5	06	56	PA 15	12	PA 54
PA 6	07	57	PA 16	14	PA 55
PA 7	08	58	PA 17	16	PA 56
PB 0	09	59	PB 10	18	PA 57
PB 1	10	60	PB 11	20	PB 50
PB 2	11	61	PB 12	22	PB 51
PB 3	12	62	PB 13	24	PB 52
PB 4	13	63	PB 14	26	PB 53
PB 5	14	64	PB 15	28	PB 54
PB 6	15	65	PB 16	30	PB 55
PB 7	16	66	PB 17	32	PB 56
PC 0	17	67	PC 10	34	PB 57
PC 1	18	68	PC 11	36	PC 50
PC 2	19	69	PC 12	38	PC 51
PC 3	20	70	PC 13	40	PC 52
PC 4	21	71	PC 14	42	PC 53
PC 5	22	72	PC 15	44	PC 54
PC 6	23	73	PC 16	46	PC 55
PC 7	24	74	PC 17	48	PC 56
GND	25	75	GND	50	PC 57
PA 20	26	76	PA 30		
PA 21	27	77	PA 31		
PA 22	28	78	PA 32		
PA 23	29	79	PA 33		
PA 24	30	80	PA 34		
PA 25	31	81	PA 35		
PA 26	32	82	PA 36		
PA 27	33	83	PA 37		
PB 20	34	84	PB 30		
PB 21	35	85	PB 31		
PB 22	36	86	PB 32		
PB 23	37	87	PB 33		
PB 24	38	88	PB 34		
PB 25	39	89	PB 35		
PB 26	40	90	PB 36		
PB 27	41	91	PB 37		
PC 20	42	92	PC 30		
PC 21	43	93	PC 31		
PC 22	44	94	PC 32		
PC 23	45	95	PC 33		
PC 24	46	96	PC 34		
PC 25	47	97	PC 35		
PC 26	48	98	PC 36		
PC 27	49	99	PC 37		
+5 V	50	100	+5 V		

## Ordering Information

PEX-D144LS CR	PCI Express, 144-ch Digital I/O Board with SCSI-II Connector (RoHS).
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# PEX-D96S

PCI Express, 96-channel Digital I/O Board with SCSI-II Connector



## Features >>>

- PCI Express x1 Interface
- Supports Card ID (SMD Switch)
- Four Interrupt Sources
- Pull-high/Pull-low Jumpers for DI Channels
- 96 Buffered CMOS Digital Input/Output Lines
- Twelve 8-bit Bi-directional I/O Ports
- Supports DO Status Readback (Register Level)
- DI/O Response Time approximately 2 μs (500 kHz Max.)

## Introduction

The PEX-D96S board utilizes the PCI Express bus and is designed as an easy replacement for the PIO-D96U/D96SU series without requiring any modification to either the software or the driver.

The PEX-D96S provides a single high-density connector that dramatically reduces the amount of installation space required for the card in the computer. It supports 96 low-heating CMOS Digital I/O lines that consist of twelve 8-bit bi-directional ports: port A (PA), port B (PB) and port C (PC). All ports are configured as input mode during power-on or after a reset.

The PEX-D96S also includes an onboard Card ID that enables the board to be easily recognized via software if two or more cards are installed in the same computer.

### SCSI-II Cabling



## Hardware Specifications

Programmable DIO	
Channels	96
Digital Input	
Compatibility	5 V/CMOS
Input Voltage	Logic 0: 0.8 V Max. Logic 1: 2.0 V Min.
Response Speed	500 kHz
Digital Output	
Compatibility	5 V/CMOS
Output Voltage	Logic 0: 0.1 V Max. Logic 1: 4.4 V Min.
Output Capability	Sink: 6 mA @ 0.33 V Source: 6 mA @ 4.77 V
Response Speed	500 kHz
General	
Bus Type	PCI Express x1
Card ID	Yes (4-bit)
Connectors	100-pin Female SCSI II x 1
Power Consumption	600 mA @ +5 V
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing



## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
PA 0	01	PA 10
PA 1	02	PA 11
PA 2	03	PA 12
PA 3	04	PA 13
PA 4	05	PA 14
PA 5	06	PA 15
PA 6	07	PA 16
PA 7	08	PA 17
PB 0	09	PB 10
PB 1	10	PB 11
PB 2	11	PB 12
PB 3	12	PB 13
PB 4	13	PB 14
PB 5	14	PB 15
PB 6	15	PB 16
PB 7	16	PB 17
PC 0	17	PC 10
PC 1	18	PC 11
PC 2	19	PC 12
PC 3	20	PC 13
PC 4	21	PC 14
PC 5	22	PC 15
PC 6	23	PC 16
PC 7	24	PC 17
GND	25	GND
PA 20	26	PA 30
PA 21	27	PA 31
PA 22	28	PA 32
PA 23	29	PA 33
PA 24	30	PA 34
PA 25	31	PA 35
PA 26	32	PA 36
PA 27	33	PA 37
PB 20	34	PB 30
PB 21	35	PB 31
PB 22	36	PB 32
PB 23	37	PB 33
PB 24	38	PB 34
PB 25	39	PB 35
PB 26	40	PB 36
PB 27	41	PB 37
PC 20	42	PC 30
PC 21	43	PC 31
PC 22	44	PC 32
PC 23	45	PC 33
PC 24	46	PC 34
PC 25	47	PC 35
PC 26	48	PC 36
PC 27	49	PC 37
+5 V	50	+5 V

## Software

### Drivers

- 32-bit Windows XP/2003/2008/7/8/10
- 64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- LabVIEW Toolkit
- DOS Lib and TC/BC/MSC Demo
- VB/VC/Delphi/BCB Demo
- VB.NET/C#.NET/VC.NET/MATLAB Demo

## Ordering Information

PEX-D96S CR	PCI Express, 96-ch Digital I/O Board with SCSI-II Connector. (RoHS)
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## Accessories

DN-100 CR	DIN-Rail Mountable I/O Connector Block with 100-pin Female SCSI II Connector (RoHS)
CA-SCSI100-15	100-pin SCSI II and 100-pin Male Connector Cable, 1.5 m
DN-100-CA CR	DN-100 CR Daughterboard. Include one CA-SCSI100-15 Cable

# PEX-D48

PCI Express, 48-channel Digital I/O Board



## Features ▶▶▶

- PCI Express x1 Interface
- Supports Card ID (SMD Switch)
- Four Interrupt Sources
- Emulates two Industrial-standard 8255 PPI Ports (Mode 0)
- DO Provides Higher Driving Capability
- One 16-bit Event Counter
- 48 Buffered TTL Digital Input/Output Lines
- Six 8-bit Bi-directional Input/Output Ports
- One 32-bit Programmable Internal Timer
- Pull-high/Pull-low Jumpers for DI Channels
- DI/O Response Time approximately 2 μs (500 kHz Max.)

## Introduction

The PEX-D48 board utilizes the PCI Express bus and is designed as an easy replacement for the PIO-D48/PIO-D48U/PIO-D48SU series without requiring any modification to either the software or the driver.

The PEX-D48 provides 48 buffered TTL Digital Input/Output lines, which are grouped into six 8-bit bi-directional ports: Port A (PA), Port B (PB) and Port C (PC). Port C can also be split into two nibble-wide (4-bit) segments. All ports are configured as input mode during power-on or after a reset.

The PEX-D48 also includes an onboard Card ID that enables the board to be easily recognized via software if two or more cards are installed in the same computer. The pull-high/low jumpers allow the DI status to be predefined instead of remaining floating if the DI channels are disconnected or line broken.

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Hardware Specifications

### Programmable DIO

Channels	48
Compatibility	5 V/TTL

### Digital Input

Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.
Response Speed	500 kHz

### Digital Output

Output Voltage	Logic 0: 0.4 V Max., Logic 1: 2.4 V Min.
Output Capability	Sink: 64 mA @ 0.8 V, Source: 32 mA @ 2.0 V
Response Speed	500 kHz

### Timer/Counter

Channels	2 (Event Timer x 1/32-bit Timer x 1)
Resolution	16-bit
Reference Clock	Internal: 4 MHz

### General

Bus Type	PCI Express x1
Card ID	Yes (4-bit)
Connectors	Female DB37 x 1, 50-pin Box Header x 1
Power Consumption	900 mA @ +5 V
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment	Terminal No.	Pin Assignment
N.C.	01	20	+5 V	
N.C.	02	21	GND	
PB 7	03	22	PC 7	
PB 6	04	23	PC 6	
PB 5	05	24	PC 5	
PB 4	06	25	PC 4	
PB 3	07	26	PC 3	
PB 2	08	27	PC 2	
PB 1	09	28	PC 1	
PB 0	10	29	PC 0	
GND	11	30	PA 7	
N.C.	12	31	PA 6	
GND	13	32	PA 5	
N.C.	14	33	PA 4	
GND	15	34	PA 3	
N.C.	16	35	PA 2	
GND	17	36	PA 1	
+5 V	18	37	PA 0	
GND	19			

## Ordering Information

PEX-D48 CR	PCI Express, 48-ch Digital I/O Board (RoHS).
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## Accessories

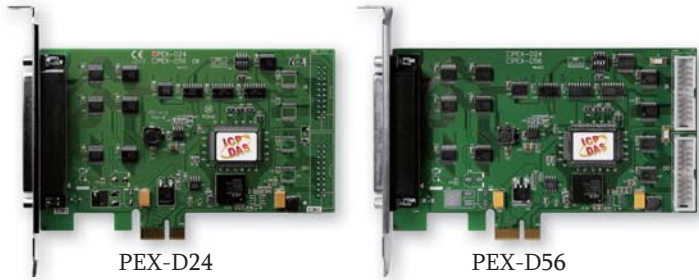
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-5002	50-pin Flat Cable, 20 cm
	ADP-37/PCI	50-pin Connector Extender to 37-pin Connector
	DB-24P	24-channel Isolated DI Board
	DB-24R	24-channel Relay Output Board
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board





# PEX-D24/PEX-D56

PCI Express, 24/56-channel Digital I/O Board



PEX-D24

PEX-D56

## Features ▶▶▶

- PCI Express x1 Interface
- Supports Card ID (SMD Switch)
- Four Interrupt Sources
- Emulates two Industrial-standard 8255 PPI Ports (Mode 0)

- 24/56 Buffered TTL Digital Input/Output Lines
- Three 8-bit Bi-directional I/O Ports
- DO Provides Higher Driving Capability
- DI/O Response Time approximately 2 μs (500 kHz Max.)

## Introduction

The PEX-D24/D56 series utilizes the PCI Express bus and is designed as an easy replacement for the PIO-D24/PIO-D24U/PIO-D56/PIO-D56U series without requiring any modification to either the software or the driver.

The PEX-D24/D56 provides 24/56 buffered TTL Digital Input/Output lines, which are grouped into three 8-bit bi-directional ports: Port A (PA), Port B (PB) and Port C (PC), and are configured as input mode during power-on or after a reset.

The PEX-D24/D56 also includes an onboard Card ID that enables the board to be easily recognized via software if two or more cards are installed in the same computer.

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Hardware Specifications

Model	PEX-D24	PEX-D56
<b>Programmable DIO</b>		
Channels	24	
<b>Digital Input</b>		
Channels	-	16
Compatibility	5 V/TTL	
Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.	
Response Speed	500 kHz	
<b>Digital Output</b>		
Channels	-	16
Compatibility	5 V/TTL	
Output Voltage	Logic 0: 0.4 V Max., Logic 1: 2.4 V Min.	
Output Capability	Sink: 64 mA @ 0.8 V Source: 32 mA @ 2.0 V	CN1 Sink: 2.4 mA @ 0.8 V Source: 0.8 mA @ 2.0 V
		CN3 Sink: 64 mA @ 0.8 V Source: 32 mA @ 2.0 V
Response Speed	500 kHz	
<b>General</b>		
Bus Type	PCI Express x1	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1	Female DB37 x 1, 20-pin Male Box Header x 2
Power Consumption	420 mA @ +5 V	580 mA @ +5 V
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

## Ordering Information

PEX-D24 CR	PCI Express, 24-ch Digital I/O Board (RoHS).
PEX-D56 CR	PCI Express, 56-ch Digital I/O Board (RoHS).

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
N.C.	01	20 +5 V
N.C.	02	21 GND
PB 7	03	22 PC 7
PB 6	04	23 PC 6
PB 5	05	24 PC 5
PB 4	06	25 PC 4
PB 3	07	26 PC 3
PB 2	08	27 PC 2
PB 1	09	28 PC 1
PB 0	10	29 PC 0
GND	11	30 PA 7
N.C.	12	31 PA 6
GND	13	32 PA 5
N.C.	14	33 PA 4
GND	15	34 PA 3
N.C.	16	35 PA 2
GND	17	36 PA 1
+5 V	18	37 PA 0
GND	19	

Pin Assignment	Terminal No.	Pin Assignment
DI 0	01	02 DI 1
DI 2	03	04 DI 3
DI 4	05	06 DI 5
DI 6	07	08 DI 7
DI 8	09	10 DI 9
DI 10	11	12 DI 11
DI 12	13	14 DI 13
DI 14	15	16 DI 15
GND	17	18 GND
+5 V	19	20 +12 V

CON2 (PEX-D56 only)

Pin Assignment	Terminal No.	Pin Assignment
DO 0	01	02 DO 1
DO 2	03	04 DO 3
DO 4	05	06 DO 5
DO 6	07	08 DO 7
DO 8	09	10 DO 9
DO 10	10	12 DO 11
DO 12	12	14 DO 13
DO 14	14	16 DO 15
GND	16	18 GND
+5 V	18	20 +12 V

CON1 (PEX-D56 only)

## Accessories

	CA-2010	20-pin Flat Cable, 1 m
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	DB-24PD	24-channel of Isolated DI Board
	DB-24RD	24-channel of Relay Output Board
	DB-24C	24-channel of Open-collector Output Board
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board

# PEX-P8R8i/PEX-P16R16i

PCI Express, 8/16-channel Isolated Digital Input and 8/16-channel Relay Output Board



## Features

- PCI Express x1 Interface
- Supports Card ID (SMD Switch)
- 8/16-channel Relay Output
  - 7 ms Relay Release Time

## Introduction

The PEX-P8R8i/PEX-P16R16i series utilizes the PCI Express bus and is designed as an easy replacement for the PISO-P16R16U board without requiring any modification to either the software or the driver.

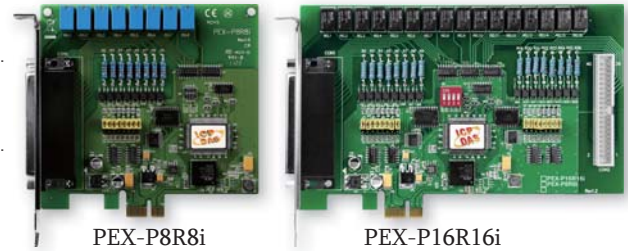
The PEX-P8R8i/PEX-P16R16i provides 8/16 photocoupler Digital Input channels with 3750 V<sub>rms</sub> isolation protection, and allows the input signals to be completely floated to prevent ground loops. The boards are also equipped with 8/16 Relay Output channels that can be used for controlling the ON/OFF state of external devices, for driving external relays or small power switches, or for activating alarms, etc.

## Hardware Specifications

Model	PEX-P8R8i	PEX-P16R16i
<b>Digital Input</b>		
Isolation Voltage	3750 V <sub>rms</sub> (Photocoupler)	
Channels	8	16
Input Voltage	Logic 1: AC/DC +5 ~ +24 V (AC 50 ~ 1 kHz) Logic 0: AC/DC 0 ~ +1 V	
Response Speed	Without Filter: 50 kHz (Typical) With Filter: 0.455 kHz (Typical)	
<b>Relay Output</b>		
Channels	8	16
Relay Type	4 SPDT, 4 SPST	
Contact Rating	Voltage	120 V <sub>Ac</sub> /24 V <sub>Dc</sub>
	Current	1 A
Operate Time	1 ms (Typical)	
Release Time	7 ms (Typical)	
Lifetime	Mechanical: 5,000,000 ops. Electrical: 100,000 ops.	
Insulation Resistance	1000 MΩ @ 500 V <sub>Dc</sub>	
<b>General</b>		
Bus Type	PCI Express x1	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1	Female DB37 x 1, 40-pin Box Header x 1
Power Consumption	800 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

## Ordering Information

PEX-P8R8i CR	PCI Express, 8-ch Isolated Digital Input and 8-ch Relay Output Board (RoHS). Includes one CA-4002 D-sub Connector.
PEX-P16R16i CR	PCI Express, 16-ch Isolated Digital Input and 16-ch Relay Output Board (RoHS). Includes one CA-4037W Cable and two CA-4002 D-sub Connectors.



- 8/16-channel Isolated Digital Input
  - Selectable DC Signal Input Filter
  - AC Signal Input with Filter
  - 3750 V<sub>rms</sub> Photo-isolation Protection

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment	Terminal No.	Pin Assignment			
NO 0	01	NO 3	20	NO 8	01	NO 11	02
COM 0	02	COM 3	21	COM 8	03	COM 11	04
NC 0	03	NC 3	22	NC 8	05	NC 11	06
NO 1	04	NO 4	23	NO 9	07	NO 12	08
COM 1	05	COM 4	24	COM 9	09	COM 12	10
NC 1	06	NC 4	25	NC 9	11	NC 12	12
NO 2	07	NO 5	26	NO 10	13	NO 13	14
COM 2	08	COM 5	27	COM 10	15	COM 13	16
NC 2	09	NC 5	28	NC 10	17	NC 14	18
NO 7	10	NO 6	29	NO 15	19	NO 14	20
COM 7	11	COM 6	30	COM 15	21	COM 14	22
DIA 0	12	DIB 0	31	DIA 8	23	DIB 8	24
DIA 1	13	DIB 1	32	DIA 9	25	DIB 9	26
DIA 2	14	DIB 2	33	DIA 10	27	DIB 10	28
DIA 3	15	DIB 3	34	DIA 11	29	DIB 11	30
DIA 4	16	DIB 4	35	DIA 12	31	DIB 12	32
DIA 5	17	DIB 5	36	DIA 13	33	DIB 13	34
DIA 6	18	DIB 6	37	DIA 14	35	DIB 14	36
DIA 7	19	DIB 7		DIA 15	37	DIB 15	38
				N.C.	39	N.C.	40

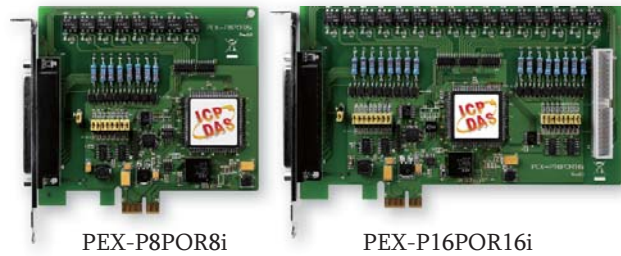
CON2 (PEX-P16R16i only)

## Accessories

CA-4037W	40-pin Flat and 37-pin Female D-sub Cable, 24 cm
CA-4002	37-pin Male D-sub Connector with Plastic Cover
CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
DB-37	Screw Terminal for I/O Boards that use a 37-pin D-sub Connector
DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board

# PEX-P8POR8i/PEX-P16POR16i

PCI Express, 8/16-channel Isolated Digital Input and 8/16-channel PhotoMOS Relay Output Board



## Features

- PCI Express x1 Interface
- Supports Card ID (SMD Switch)
- LED Power Indicator
- 8/16-channel Isolated Digital Input
  - Selectable DC Signal Input Filter
  - AC Signal Input with Filter
  - 2000 Vdc Photo-isolation Protection
- 8/16-channel PhotoMOS Relay Output
  - Supports DO Status Readback (Register Level)
  - 0.05 ms Release Time
  - Durable and highly reliable PhotoMOS Relay
  - Low Leakage Current when PhotoMos Relay is OFF
  - No Contact Bounce, No Sparking, No Acoustical Noise

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
NO 0	01	20 CM 0
NO 1	02	21 CM 1
NO 2	03	22 CM 2
NO 3	04	23 CM 3
NO 4	05	24 CM 4
NO 5	06	25 CM 5
NO 6	07	26 CM 6
NO 7	08	27 CM 7
N.C.	09	28 N.C.
N.C.	10	29 N.C./GND
N.C.	11	30 DIB 0
DIA 0	12	31 DIB 1
DIA 1	13	32 DIB 2
DIA 2	14	33 DIB 3
DIA 3	15	34 DIB 4
DIA 4	16	35 DIB 5
DIA 5	17	36 DIB 6
DIA 6	18	37 DIB 7
DIA 7	19	

Pin Assignment	Terminal No.	Pin Assignment
NO 8	01	02 CM 8
NO 9	03	04 CM 9
NO 10	05	06 CM 10
NO 11	07	08 CM 11
NO 12	09	10 CM 12
NO 13	11	12 CM 13
NO 14	13	14 CM 14
NO 15	15	16 CM 15
N.C.	17	18 N.C.
N.C.	19	20 N.C./GND
N.C.	21	22 DIB 8
DIA 8	23	24 DIB 9
DIA 9	25	26 DIB 10
DIA 10	27	28 DIB 11
DIA 11	29	30 DIB 12
DIA 12	31	32 DIB 13
DIA 13	33	34 DIB 14
DIA 14	35	36 DIB 15
DIA 15	37	38 N.C.
N.C.	39	40 N.C.

CON2 (PEX-P16POR16i only)

## Accessories

	CA-4037W	40-pin Flat and 37-pin Female D-sub Cable, 24 cm
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	DB-37	Screw Terminal for I/O Boards that use a 37-pin D-sub Connector
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board

## Introduction

The PEX-P8POR8i/PEX-P16POR16i series utilizes the PCI Express bus and designed as an easy replacement for the PCI-P8POR8/P16POR16 series without requiring any modification to either the software or the driver.

The PEX-P8POR8i/PEX-P16POR16i provides 8/16 photocoupler Digital Input channels with 2000 Vdc isolation protection, and allows the input signals to be completely floated to prevent ground loops. It is also equipped with 8/16 PhotoMOS Relay Outputs channels that can be used for controlling the ON/OFF state of external devices, for driving external relays or small power switches, or for activating alarms, etc.

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Hardware Specifications

Model	PEX-P8POR8i	PEX-P16POR16i
<b>Digital Input</b>		
Isolation Voltage	2000 Vdc (Photocoupler)	
Channels	8	16
Input Voltage	Logic 1: AC/DC +5 ~ +24 V (AC 50 ~ 1 kHz) Logic 0: AC/DC 0 ~ +1 V	
Response Speed	Without Filter: 50 kHz (Typical) With Filter: 0.455 kHz (Typical)	
<b>Relay Output</b>		
Channels	8	16
Relay Type	PhotoMOS, Form A	
Contact Voltage	300 V (AC peak or DC)	
Rating Current	130 mA	
Operate Time	0.7 ms (Typical)	
Release Time	0.05 ms (Typical)	
Insulation Resistance	1000 MΩ @ 500 Vdc	
Electrical Endurance	Long Life and No Spike	
<b>General</b>		
Bus Type	PCI Express x1	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1	Female DB37 x 1, 40-pin Box Header x 1
Power Consumption	800 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

## Ordering Information

PEX-P8POR8i CR	PCI Express, 8-ch Isolated Digital Input and 8-ch PhotoMOS Relay Output Board (RoHS). Includes one CA-4002 D-sub Connector.
PEX-P16POR16i CR	PCI Express, 16-ch Isolated Digital Input and 16-ch PhotoMOS Relay Output Board (RoHS). Includes one CA-4037W Cable and two CA-4002 D-sub Connectors.

# PEX-P32C32/PEX-P32A32

PCI Express, 32-channel Optically-isolated Digital Input and 32-channel Optically-isolated Open-collector Digital Output (Sink/Source) Board



## Features

- PCI Express x1 Interface
- 32-channel Optically-isolated Digital Input
  - Internal Power (3000 Vdc Isolation) for Dry-contact Input
- 3750 V<sub>rms</sub> Photo-isolation Protection
- Supports Card ID (SMD Switch)
- 32-channel Optically-isolated Digital Output
  - PEX-P32C32: Current Sinking (NPN)
  - PEX-P32A32: Current Sourcing (PNP)
  - Supports Output Status Readback (Register Level)

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

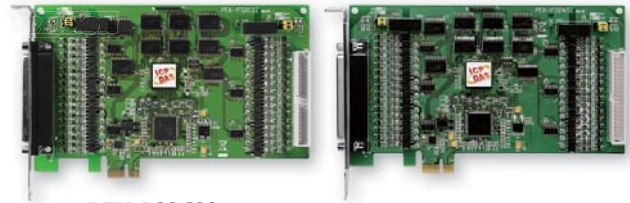
- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment	Pin Assignment	Terminal No.	Pin Assignment
Ext. GND0	01	20	Ext. GND1	01	02
DI 0	02	21	DO 0	03	04
DI 1	03	22	DO 1	05	06
DI 2	04	23	DO 2	07	08
DI 3	05	24	DO 3	09	10
DI 4	06	25	DO 4	11	12
DI 5	07	26	DO 5	13	14
DI 6	08	27	DO 6	15	16
DI 7	09	28	DO 7	17	18
DI 8	10	29	DO 8	19	20
DI 9	11	30	DO 9	21	22
DI 10	12	31	DO 10	23	24
DI 11	13	32	DO 11	25	25
DI 12	14	33	DO 12	26	26
DI 13	15	34	DO 13	27	27
DI 14	16	35	DO 14	28	28
DI 15	17	36	DO 15	29	29
ECOM0	18	37	Ext. PWRO	30	30
IGNDD	19			31	31
				33	32
				35	33
				37	34
				39	35
					36
					37
					38
					39
					40
					N.C.

## Ordering Information

PEX-P32C32 CR	PCI Express, 32-ch Optically-isolated Digital Input and 32-ch Optically-isolated Open-collector Digital Output Board (Sink, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.
PEX-P32A32 CR	PCI Express, 32-ch Optically-isolated Digital Input and 32-ch Optically-isolated Open-collector Digital Output Board. (Source, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.



PEX-P32C32

PEX-P32A32

## Introduction

The PEX-P32C32/P32A32 series provides 32 optically-isolated Digital Input channels and 32 optically-isolated Digital Output channels, arranged into four isolated banks. Each input channel uses a photocoupler input that allows either an internal isolated power supply or an external power supply to be connected, and can be selected via a jumper.

Each Digital Output channel includes either a Darlington (PEX-P32C32) or a PNP (PEX-P32A32) transistor and an integrated suppression diode for the inductive load. The input port may use either an external power source or can be powered from the Host PC via a DC/DC converter. The output port should use an external power source. The board helps eliminate ground loop problems and isolates the host computer from potentially damaging voltage spikes.

The PEX-P32C32/P32A32 series also includes an onboard Card ID switch that enables the board to be easily recognized via software if two or more cards are installed in the same computer. The PEX-P32C32/P32A32 series is designed as an easy replacement for the PISO-P32C32U/P32A32U series without requiring any modification to either the software or the driver.

## Hardware Specifications

Model	PEX-P32C32	PEX-P32A32
<b>Digital Input</b>		
Isolation Voltage	3750 V <sub>rms</sub>	
Channels	32	
Compatibility	Sink or Source, Photocoupler isolated channel with common power or ground	
Input Voltage	Logic 0: 0 ~ +1 V, Logic 1: +9 ~ +24 V	
Impedance	3 K $\Omega$ , 0.25 W	
<b>Digital Output</b>		
Isolation Voltage	3750 V <sub>rms</sub>	
Channels	32	
Compatibility	Sink, Open-collector	Source, Open-collector
Output Capability	100 mA/+30 V for each channel @ 100% duty	
<b>General</b>		
Bus Type	PCI Express x1	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1, 40-pin Box Header x 1	
Power Consumption	600 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

## Accessories

	CA-4037W	40-pin Flat and 37-pin Female D-sub Cable, 24 cm
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	DB-37	Screw Terminal for I/O Boards that use a 37-pin D-sub Connector
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board



# PEX-730/PEX-730A **NEW**

PCI Express, 32-channel TTL Digital Input/Output and 32-channel Isolated Digital Input/Output (Sink/Source) Board



## Introduction

PEX-730/730A cards provide 32 isolated digital I/O channels (16 x DI and 16 x DO) and 32 TTL-level digital I/O channels (16 x DI and 16 x DO). Both the isolated DI and DO channels use a short optical transmission path to transfer an electronic signal between the elements of a circuit and keep them electrically isolated. With 3750 Vrms isolation protection, these DI/O channels allow the input signals to be completely floated so as to prevent ground loops and isolate the host computer from damaging voltages. Each digital output offers a Darlington (PEX-730) or a PNP (PEX-730A) transistor and integrated suppression diode for the inductive load. The open collector outputs (DO channels) are typically used for alarm and warning notification, signal output control, control for external circuits that require a higher voltage level, and signal transmission applications, etc.

The PEX-730/730A also adds a Card ID switch. Users can set Card ID on a board and recognize the board by the ID via software when using two or more cards in one computer. The PEX-730/730A is designed as easy replacement for the PISO-730U/730A without any software/driver modification.

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
IDI 0	01	20 IDI 1
IDI 2	02	21 IDI 3
IDI 4	03	22 IDI 5
IDI 6	04	23 IDI 7
IDI 8	05	24 IDI 9
IDI 10	06	25 IDI 11
IDI 12	07	26 IDI 13
IDI 14	08	27 IDI 15
EI_COM1	09	28 EI.COM2
EO_COM1	10	29 I_GND
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
EO_COM2	19	

Pin Assignment	Terminal No.	Pin Assignment
DI 0	01	02 DI 1
DI 2	03	04 DI 3
DI 4	05	06 DI 5
DI 6	07	08 DI 7
DI 8	09	10 DI 9
DI 10	11	12 DI 11
DI 12	13	14 DI 13
DI 14	15	16 DI 15
GND	17	18 GND
+5 V	19	20 +12 V

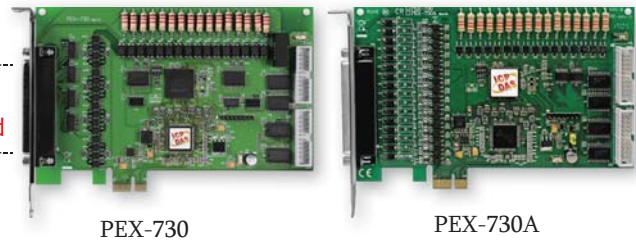
CON2

Pin Assignment	Terminal No.	Pin Assignment
DO 0	01	02 DO 1
DO 2	03	04 DO 3
DO 4	05	06 DO 5
DO 6	07	08 DO 7
DO 8	09	10 DO 9
DO 10	10	12 DO 11
DO 12	12	14 DO 13
DO 14	14	16 DO 15
GND	16	18 GND
+5 V	18	20 +12 V

CON3

## Ordering Information

PEX-730 CR	PCI Express, 32-ch TTL Digital Input/Output and 32-ch Isolated Digital Input/Output (Sink) Board (RoHS). Includes one CA-4002 D-sub Connector.
PEX-730A CR	PCI Express, 32-ch TTL Digital Input/Output and 32-ch Isolated Digital Input/Output (Source) Board (RoHS). Includes one CA-4002 D-sub Connector.



## Features

- PCI Express x1 Interface
- 16-channel Optically-isolated Digital Input
- 16-channel Optically-isolated Digital Output (Sink, NPN)
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
- 3750 Vrms Photo-isolation Protection
- Internal Power (3000 Vdc isolation) for Dry-contact Input
- Supports Output Status Readback
- Supports Card ID (SMD Switch)
- Two Interrupt Sources

## Hardware Specifications

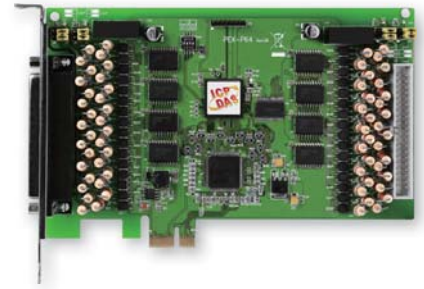
Model	PEX-730	PEX-730A
<b>Isolated Digital Input</b>		
Channels	16	
Compatibility	Optical	
Isolation Voltage	3750 Vrms	
Input Voltage	Logic 0: 0 ~ +1 V, Logic 1: +9 ~ +24 V	
Input Impedance	1.2 KΩ, 1 W	
Response Speed	4 kHz (Typical)	
<b>Isolated Digital Output</b>		
Channels	16	
Compatibility	Sink (NPN)	Source (PNP)
Isolation Voltage	3750 Vrms	
Output Capability	100 mA/+30 V for each channel @ 100% duty	
Response Speed	4 kHz (Typical)	
<b>Non-isolated Digital Input</b>		
Channels	16	
Compatibility	5 V/TTL	
Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.	
Response Speed	500 kHz	
<b>Non-isolated Digital Output</b>		
Channels	16	
Compatibility	5 V/TTL	
Output Voltage	Logic 0: 0.4 V Max., Logic 1: 2.4 V Min.	
Output Capability	Sink: 2.4 mA @ 0.8 V, Source: 0.8 mA @ 2.0 V	
Response Speed	500 kHz	
<b>General</b>		
Bus Type	PCI Express x1	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1, 20-pin Box Header x 2	
Power Consumption	600 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

## Accessories

	CA-2010	20-pin Flat Cable, 1 m
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	DN-20	DIN-Rail Mountable 20-pin D-sub Connector Board
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board
	ADP-20/PCI	20-pin Extender Board

# PEX-P64/PEX-P64-24V

PCI Express, 64-channel Optically-isolated Digital Input Board



## Features

- PCI Express x1 Interface
- 64-channel Optically-isolated Digital Input
  - Internal Power (3000 V<sub>DC</sub> Isolation) for Dry-Contact Input
- Supports Card ID (SMD Switch)

- 3750 V<sub>rms</sub> Photo-isolation Protection
- Digital Input Channels arranged into Four Isolated Banks when using Four Isolated External Power Supplies
- Selectable Internal or External Power for Digital Input

## Introduction

The PEX-P64/P64-24V series utilizes the PCI Express bus and provides 64 optically-isolated Digital Input channels that use either an internal or external power supply that can be selected via a jumper. The internal power is provided by an onboard isolated DC/DC converter that provides 3000 V<sub>DC</sub> isolation and is used for connecting dry-contact input devices. The DI channels are arranged into four isolated banks when using four isolated external power supplies, where DI channels 0 to 15 are allocated to bank A, DI channels 16 to 31 are allocated to bank B, DI channels 32 to 47 are allocated to bank C, and DI channels 48 to 63 are allocated to bank D. The onboard photocouplers provide 3750 V<sub>rms</sub> isolation, and act as an interface between field logic signals, eliminating ground loop problems and isolating the host computer from potentially damaging voltage spikes.

The PEX-P64/P64-24V series also include an onboard Card ID switch that enables the board to be easily recognized via software if two or more cards are installed in the same computer. The PEX-P64/P64-24V series is designed as an easy replacement for the PISO-P64U board without requiring any modification to either the software or the driver.

## Hardware Specifications

Model	PEX-P64	PEX-P64-24V
<b>Digital Input</b>		
Isolation Voltage	3750 V <sub>rms</sub>	
Channels	64	
Compatibility	Photocoupler Isolated	
Input Logic Low	0 ~ +1 V	0 ~ +1 V
Input Logic High	+5 ~ +15 V (+24 V Max.)	+20 ~ +28 V (+30 V Max.)
Impedance	1.2 KΩ, 1 W	3 KΩ, 1 W
Response Speed	4 kHz (Typical)	
<b>General</b>		
Bus Type	PCI Express x1	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1 40-pin Box Header x 1	
Power Consumption	400 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

## Ordering Information

PEX-P64 CR	PCI Express, 64-ch Optically-isolated Digital Input Board (High: +5 ~ +15 V, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.
PEX-P64-24V CR	PCI Express, 64-ch Optically-isolated Digital Input Board (High: +20 ~ +28 V, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment	Pin Assignment	Terminal No.	Pin Assignment
IGND0	01	20	IGND1	02	IGND3
DI 0	02	21	DI 16	03	DI 48
DI 1	03	22	DI 17	04	DI 49
DI 2	04	23	DI 18	05	DI 50
DI 3	05	24	DI 19	06	DI 51
DI 4	06	25	DI 20	07	DI 52
DI 5	07	26	DI 21	08	DI 53
DI 6	08	27	DI 22	09	DI 54
DI 7	09	28	DI 23	10	DI 55
DI 8	10	29	DI 24	11	DI 56
DI 9	11	30	DI 25	12	DI 57
DI 10	12	31	DI 26	13	DI 58
DI 11	13	32	DI 27	14	DI 59
DI 12	14	33	DI 28	15	DI 60
DI 13	15	34	DI 29	16	DI 61
DI 14	16	35	DI 30	17	DI 62
DI 15	17	36	DI 31	18	DI 63
ECOM0	18	37	ECOM1	19	DI 64
N.C.	19				N.C.

## Accessories

	CA-4037B	40-pin Flat and 37-pin Female D-sub Cable, 24 cm
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	CA-3750DM	DB-37 Male-Male Cable, 5 m, 180° (RoHS)
	DB-37	Screw Terminal for I/O Boards that use a 37-pin D-sub Connector
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board



# PEX-C64 NEW

PCI Express, 64-channel Open-collector Digital Output (Sink) Board



## Features >>>

- PCI Express x1 Interface
- 64-channel Optically-isolated Digital Output (Sink, NPN)
  - Supports Output Status Readback
- Supports Card ID (SMD Switch)
- 3750 Vrms Photo-isolation Protection
- Digital Output Channels arranged into Four Isolated Banks when using Four Isolated External Power Supplies

## Introduction

The PEX-C64 board utilizes the PCI Express bus and provides 64 optically-isolated Digital Output channels, each of which includes a Darlington transistor that provides 3750 Vrms isolation, and an integrated suppression diode for the inductive load. The DO channels are allocated into four isolated banks when using four isolated external power supplies, and act as an interface between field logic signals, eliminating ground loop problems and isolating the host computer from potentially damaging voltage spikes.

The PEX-C64 board also includes an onboard Card ID switch that enables the board to be easily recognized via software if two or more cards are installed in the same computer. The PEX-C64 board is designed as an easy replacement for the PISO-C64U board without requiring any modification to either the software or the driver.

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Hardware Specifications

Digital Output	
Isolation Voltage	3750 Vrms
Channels	64
Compatibility	Sink, Open Collector
Output Capability	100 mA/+30 V for each channel @ 100% duty
Response Speed	4 kHz (Typical)
General	
Bus Type	PCI Express x1
Card ID	Yes (4-bit)
Connectors	Female DB37 x 1 40-pin Box Header x 1
Power Consumption	800 mA @ +5 V
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

## Ordering Information

PEX-C64 CR	PCI Express, 64-ch Optically-isolated Digital Output Board (Sink, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.
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## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
Ext. GND0	01	20 Ext. GND1
DO 0	02	21 DO 16
DO 1	03	22 DO 17
DO 2	04	23 DO 18
DO 3	05	24 DO 19
DO 4	06	25 DO 20
DO 5	07	26 DO 21
DO 6	08	27 DO 22
DO 7	09	28 DO 23
DO 8	10	29 DO 24
DO 9	11	30 DO 25
DO 10	12	31 DO 26
DO 11	13	32 DO 27
DO 12	14	33 DO 28
DO 13	15	34 DO 29
DO 14	16	35 DO 30
DO 15	17	36 DO 31
Ext. PWR0	18	37 Ext. PWR1
N.C.	19	

Pin Assignment	Terminal No.	Pin Assignment
Ext. GND2	01	02 Ext. GND3
DO 32	03	04 DO 48
DO 33	05	06 DO 49
DO 34	07	08 DO 50
DO 35	09	10 DO 51
DO 36	11	12 DO 52
DO 37	13	14 DO 53
DO 38	15	16 DO 54
DO 39	17	18 DO 55
DO 40	19	20 DO 56
DO 41	21	22 DO 57
DO 42	23	24 DO 58
DO 43	25	26 DO 59
DO 44	27	28 DO 60
DO 45	29	30 DO 61
DO 46	31	32 DO 62
DO 47	33	34 DO 63
Ext. PWR2	35	36 Ext. PWR3
N.C.	37	38 N.C.
N.C.	39	40 N.C.

CON2

## Accessories

	CA-4037B	40-pin Flat and 37-pin Female D-sub Cable, 24 cm
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	DB-37	Screw Terminal for I/O Boards that use a 37-pin D-sub Connector
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board
	DB-32R	32-ch Relay Output Board. Include one CA-3710D Male-Male D-sub Cable, 1.0 m

PCI Express  
Isolated Digital I/O Boards > PEX-C64

## High Speed Multifunction & Multifunction Boards



Model	NEW PCI-2602U	PCI-826		PCI-822		PCI-1802		PCI-1800		PCI-1602		PCI-1202		PIO-821	
		LU	LU	LU	HU	LU	HU	U	FU	LU	HU	LU	HU		
<b>Analog Input</b>															
Resolution	16-bit	16-bit	12-bit	12-bit		12-bit		16-bit		12-bit		12-bit		12-bit	
Channels	SE	16	32		32		16		32		32		16		
	Diff.	8	16		16		8		16		16		8		
Sampling Rate	1 MS/s	250 KS/s		330 KS/s	44 KS/s	330 KS/s	44 KS/s	100 KS/s	200 KS/s	110 KS/s	44 KS/s	45 KS/s			
Gain	-	Low Gain		Low Gain	High Gain	Low Gain	High Gain	Low Gain		Low Gain	High Gain	Low Gain	High Gain		
FIFO Size	8 K	8 K		8 K		1 K		8 K		1 K		-			
<b>Analog Output</b>															
Resolution	16-bit	16-bit		12-bit		12-bit		12-bit		12-bit		12-bit		12-bit	
Channels	2	2		2		2		2		2		1		1	
<b>Digital Input/Output</b>															
DI Channels	Programmable 32 (DI: 5 V/TTL) (DO: 5 V/CMOS)	Programmable 32 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)	
DO Channels				16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)	
<b>Timer/Counter</b>															
Channels	-	-		1		1		1		1		3		3	
Page	25	26						29							

## Analog Input/Output Boards



Model	PCI-1002		PISO-813U	PISO-DA2U	PISO-DA4U	PISO-DA8U	PISO-DA16U	PIO-DA4U	PIO-DA8U	PIO-DA16U
	LU	HU								
<b>Analog Input</b>										
Resolution	12-bit		12-bit	-						
Channels	SE	32	32	-						
	Diff.	16	-	-						
Sampling Rate	110 KS/s	44 KS/s	10 KS/s	-						
Gain	Low Gain	High Gain	Low Gain	-						
<b>Analog Output</b>										
Channels	-		2	4	8	16	4	8	16	
Resolution	-		12-bit	14-bit			14-bit			
Isolation Voltage	-		3750 Vdc	2500 Vdc			-			
<b>Digital Input/Output</b>										
DI Channels	16 (5 V/TTL)		-	-	16 (5 V/TTL)					
DO Channels	16 (5 V/TTL)		-	-	16 (5 V/TTL)					
<b>Timer/Counter</b>										
Channels	-		-	-	3					
Page	29		30							

## Memory Boards



Model	PCI-M512U
<b>Digital Input/Output</b>	
DI Channels	16 (5 V/TTL)
DO Channels	16 (5 V/TTL)
<b>Memory</b>	
Size	512 KB
Li-ion Battery	BT1 and BT2
Page	30

## Counter/Frequency Boards

Model	PCI-FC16U
<b>Programmable DIO</b>	
Channels	32 (5 V/TTL)
<b>Counter/Frequency</b>	
Channels	16-channel Up Counter/16-channel Frequency
Resolution	32-bit
Isolation Voltage	1000 V <sub>rms</sub>
Page	28



## Non-isolated Digital Input/Output Boards



Model	PCI-D64HU	PIO-D24U	PIO-D48U	PIO-D48SU	PIO-D56U	PIO-D64U	PIO-D96U	PIO-D96SU	PIO-D144U	PIO-D144LU	PIO-D168U	PCI-TMC12A
<b>Programmable DIO</b>												
Channels	-	24	48	24	-	96	144	168	-	-	-	-
<b>Digital Input/Output</b>												
DI Channels	32	-	-	16	32	-	-	-	-	-	-	16
DO Channels	32	-	-	16	32	-	-	-	-	-	-	16
Compatibility	5 V/TTL	5 V/TTL	5 V/TTL	5 V/TTL	5 V/TTL	5 V/TTL	5 V/CMOS	5 V/CMOS	5 V/TTL	5 V/CMOS	5 V/TTL	5 V/TTL
Response Speed	10.0 MHz	1 MHz	1 MHz	1 MHz	1 MHz	1 MHz	1 MHz	1 MHz	1 MHz	1 MHz	1 MHz	1 MHz
<b>Timer/Counter</b>												
Channels	3	-	2	-	5	-	-	-	-	-	-	12
Page	27 30											

## Isolated Digital Input/Output Boards



Model	PISO-1730U	PISO-P32C32U		PISO-P32A32U		PISO-P32S32WU	PISO-P64U		PISO-C64U	PISO-A64	PISO-730		PISO-730A	
		-	-5V	-	-5V		-	-24V			U	-5V	-	-5V
<b>Isolated Digital Input</b>														
Channels	32	32	32	32	32	64	-	-	16	16	16	16	16	16
Isolation Voltage	3750 Vrms								-	-	3750 Vrms			
Type	Optical-isolated								-	-	Optical-isolated			
Input Voltage	Logic 0	0 ~ +1 V												
	Logic 1	+9 ~ +24 V	+5 ~ +12 V	+9 ~ +24 V	+5 ~ +12 V	+9 ~ +24 V	+5 ~ +15 V	+20 ~ +28 V	-	-	+9 ~ +24 V	+5 ~ +12 V	+9 ~ +24 V	+5 ~ +12 V
<b>Isolated Digital Output</b>														
Channels	32	32	32	32	32	-	64	64	16	16	16	16	16	16
Type	Sink (NPN)		Source (PNP)		Sink (NPN)	-	Sink (NPN)	Source (PNP)	Sink (NPN)	Source (PNP)	Sink (NPN)	Source (PNP)	Sink (NPN)	Source (PNP)
Isolated Voltage	3750 Vrms						-	3750 Vrms						
<b>Non-isolated Digital I/O</b>														
DI Channels										16 (5 V/TTL)	16 (5 V/TTL)	16 (5 V/TTL)	16 (5 V/TTL)	
DO Channels										16 (5 V/TTL)	16 (5 V/TTL)	16 (5 V/TTL)	16 (5 V/TTL)	
Page	31												32	

Model	PCI-P8R8U	PCI-16R16U	PCI-P16C16	PCI-P16POR16U	PISO-P8R8U	PISO-P8SSR8AC	PISO-P8SSR8DC	PISO-P16R16U	PISO-725
<b>Isolated Digital Input</b>									
Channels	8	16	16	16	8	8	8	16	8
Type	Optical-isolated								
Isolation Voltage	5000 Vrms						3750 Vrms		
<b>Isolated Digital Output</b>									
Channels	4 x Form C 4 x Form A	8 x Form C 8 x Form A	16 (Sink, NPN)	16 x Form A	8 x Form A	8 x Form A	8 x Form A	8 x Form C 8 x Form A	8 x Form C
Type	Relay	Relay	Open-collector	PhotoMOS Relay	Relay	AC Type Solid-state Relay	DC Type Solid-state Relay	Relay	Relay
Isolated Voltage	-		5000 Vrms	-					
Page	32								

# PCI-2602U **NEW**

Universal PCI, 1 MS/s High-speed, 16-channel Analog Input, 2-channel Analog Output and 32-channel DI/O Multifunction Board



## Features ▶▶

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 2-channel 16-bit Voltage Output
  - 512-sample Hardware FIFO for the Analog Pattern Generator
- 32 Programmable DI/O Channels
  - Supports DO Status Readback (Register Level)
  - 512-sample Hardware FIFO for the Digital Pattern Generator
  - Digital Input Filter Function
- 16 Single-ended/8 Differential Analog Input Channels
  - 16-bit ADC with Max. 1 MS/s Sampling Rate
  - 8192-sample Hardware FIFO for Analog Input
  - Supports Variety of Programmable AD Trigger Mode
  - AD R/L Filter Function
  - AD Data Transfer: Polling, Interrupt, DMA
  - AD Continuous Capture
  - AD Auto-calibration Function

## Introduction

The PCI-2602U board delivers exceptional performance and value by providing 16 single-ended or 8 differential 16-bit Analog Input channels with an 8 k sample hardware FIFO, two 16-bit Analog Output channels with a 512-sample hardware FIFO, and 32 Digital Input/Output lines with a 512 sample Digital Output hardware FIFO on a single board. 16-bit Analog Input sampling rates of up to 1 MS/s can be achieved, and the board also includes DMA channels that allow the streaming of Analog Input data to be performed without significantly impacting processor resources.

The PCI-2602U board provides a wide range of features, including Card ID functionality, programmable Digital Input filters, MagicScan, Analog/Digital pattern generation, External AD triggers, analog triggers, and pulse width modulation (PWM).

The PCI-2602U board includes a software calibration function that removes the necessity for complicated manual calibration, meaning that jumpers and trimpots are no longer required, and the calibration data can be saved in the EEPROM for long-term use.

The board also includes an onboard Card ID switch that enables the board to be easily recognized via software if two or more boards are installed in the same computer.

## Hardware Specifications

Analog Input	
Channels	16 Single-ended/8 Differential
AD Converter	16-bit, 1 $\mu$ s conversion time
Sampling Rate	1 MS/s (Max.)
FIFO Size	8192 Samples
Bipolar Range	$\pm 10.24$ V, $\pm 5.12$ V, $\pm 2.56$ V
Analog Output	
Channels	2
Resolution	16-bit
FIFO Size	512 Samples
Output Rate	20 MS/s (Max.)
Output Range	$\pm 10$ V, $\pm 5$ V, $\pm$ EXT_REF, 0 ~ +10 V, 0 ~ +5 V, 0 ~ EXT_REF
Programmable DIO	
Channels	32 (4-port Programmable)
Digital Input	
Compatibility	5 V/TTL
FIFO Size	512 Samples
Input Voltage	Low: 0.8 V Max. High: 2.0 V Min.
Digital Output	
Compatibility	5 V/CMOS
DO FIFO Size	512 Samples
Output Voltage	Logic 0: 0.4 V Max. Logic 1: 2.4 V Min.
Output Capability	Sink: 6 mA @ 0.33 V Source: 6 mA @ 4.77 V
General	
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz
Card ID	Yes (4-bit)
Connectors	68-pin Female SCSI II x 1
Power Consumption	1 A @ +5 V (Max.)
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

## Software

### Drivers

- 32-bit Windows XP/2003/2008
- 32-bit Windows 7/8/10
- 64-bit Windows XP/2003/2008
- 64-bit Windows 7/8/10

### Sample Programs

- LabVIEW Toolkit
- VB/VC/Delphi/BCB/MATLAB Demo
- VB.NET/C#.NET/VC.NET Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
+5 V (Output)	01	35 +12 V (Output)
Ext_TRG	02	36 Cnt0_GATE
Trg_GATE	03	37 Cnt0_OUT
Pacer_OUT	04	38 Cnt0_CLK
D_GND	05	39 D_GND
PD 7	06	40 PD 6
PD 5	07	41 PD 4
PD 3	08	42 PD 2
PD 1	09	43 PD 0
PC 7	10	44 PC 6
PC 5	11	45 PC 4
PC 3	12	46 PC 2
PC 1	13	47 PC 0
D_GND	14	48 D_GND
PB 7	15	49 PB 6
PB 5	16	50 PB 4
PB 3	17	51 PB 2
PB 1	18	52 PB 0
PA 7	19	53 PA 6
PA 5	20	54 PA 4
PA 3	21	55 PA 2
PA 1	22	56 PA 0
AO_GND	23	57 AO_GND
AO1_OUT	24	58 AOO_OUT
AO1_REF	25	59 AOO_REF
AI_GND	26	60 AI_GND
AI 15	27	61 AI 14
AI 13	28	62 AI 12
AI 11	29	63 AI 10
AI 9	30	64 AI 8
AI 7	31	65 AI 6
AI 5	32	66 AI 4
AI 3	33	67 AI 2
AI 1	34	68 AI 0

## Ordering Information

PCI-2602U CR	Universal PCI, 1 MS/s High-speed, 16-ch Analog Input, 2-ch Analog Output and 32-ch DI/O Multifunction Board (RoHS).
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## Accessories

	DN-68A CR	DIN-Rail Mountable I/O Connector Block with 68-pin Female SCSI II Connector. (RoHS)
	CA-SCSI15-H	68-pin SCSI-II Connector Cable, 1.5 m



# PCI-822LU/PCI-826LU

Universal PCI, 250 kS/s, 32-channel, 12-/16-bit AD, 2-channel, 16-bit DA and 32-channel Programmable DI/O Multifunction Board



## Introduction

The PCI-822LU/826LU is a series of multifunction boards that provides high-speed Analog and Digital I/O functions, and features a continuous 250 kS/s, 12- or 16-bit resolution AD converter, an 8-kSample hardware FIFO, a 2-channel, 16-bit DA converter, and 32 programmable Digital I/O channels with DO readback. The PCI-822LU/826LU series provides either 32 single-ended or 16 differential Analog Input channels that are jumper selectable, and is equipped with a high-speed PGA featuring programmable gain (1, 2, 4 or 8).

The PCI-822LU/826LU series also includes an onboard Card ID switch that enables the board to be easily recognized via software if two or more boards are installed in the same computer. The pull-high/low jumpers allow the DI status to be predefined instead of remaining floating if the DI channels are disconnected or interrupted.

The PCI-822LU/826LU series includes an AD channel scan function called MagicScan, which eliminates the majority of the effort required to acquire AD values, such as selecting the channel, setting the gain values and the settling time, triggering the ADC, and acquiring the data. Using the built-in MagicScan and the interrupt features, these complex tasks are effectively offloaded from the CPU. Even in MagicScan mode, a different gain code can be used for each channel, and the sampling rate can still reach a total of 250 kS/s, making the PCI-822LU/826LU series especially suitable for high-end applications.

## Hardware Specifications

Model	PCI-822LU	PCI-826LU
<b>Analog Input</b>		
Channels	32 Single-ended/16 Differential	
Resolution	12-bit	16-bit
Sampling Rate	250 kS/s Max.	
FIFO Size	8192 Samples	
Accuracy	0.1% of FSR $\pm 1$ LSB @ 25°C, $\pm 10$ V	
<b>Analog Output</b>		
Channels	2	
Resolution	16-bit	
Accuracy	$\pm 6$ LSB	
Output Driving	$\pm 5$ mA	
Output Range	$\pm 5$ V, $\pm 10$ V, 0 ~ +10 V, 0 ~ +5 V	
Slew Rate	8.33 V/ $\mu$ s	
<b>Programmable DIO</b>		
Channels	32	
Compatibility	5 V/TTL	
Output Capability	Sink: 2.4 mA @ 0.8 V; Source: 0.8 mA @ 2.0 V	
<b>General</b>		
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1, 20-pin Box Header x 2	
Power Consumption	800 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

## Accessories

	CA-2010	20-pin Flat Cable, 1 m
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	DN-20	DIN-Rail Mountable 20-pin D-sub Connector Board
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board



PCI-822LU



PCI-826LU

## Features

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 32 programmable DI/O Channels
  - Pull-high and Pull-low Resistors for DI Channels
  - Supports Digital Output Status Readback (Register Level)
- 2-channel, 16-bit Analog Output
- 32 Single-ended/16 Differential Analog Input Channels
  - 12-bit 250 kS/s High-speed AD for PCI-822LU
  - 16-bit 250 kS/s High-speed AD for PCI-826LU
  - Built-in MagicScan Controller
  - 8 k sample Hardware FIFO
  - Supports Software and Pacer Triggers

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10

### Sample Programs

- DOS Lib and TC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
AI 0	01	20 AI 16
AI 1	02	21 AI 17
AI 2	03	22 AI 18
AI 3	04	23 AI 19
AI 4	05	24 AI 20
AI 5	06	25 AI 21
AI 6	07	26 AI 22
AI 7	08	27 AI 23
AI 8	09	28 AI 24
AI 9	10	29 AI 25
AI 10	11	30 AI 26
AI 11	12	31 AI 27
AI 12	13	32 AI 28
AI 13	14	33 AI 29
AI 14	15	34 AI 30
AI 15	16	35 AI 31
A_GND	17	36 Da2 out
Da1 out	18	37 D_GND
Ext_Trgr	19	

CON3

Pin Assignment	Terminal No.	Pin Assignment
PB 0	01	02 PB 1
PB 2	03	04 PB 3
PB 4	05	06 PB 5
PB 6	07	08 PB 7
PB 8	09	10 PB 9
PB 10	11	12 PB 11
PB 12	13	14 PB 13
PB 14	15	16 PB 15
GND	17	18 GND
+5 V	19	20 +12 V

CON1

Pin Assignment	Terminal No.	Pin Assignment
PA 0	01	02 PA 1
PA 2	03	04 PA 3
PA 4	05	06 PA 5
PA 6	07	08 PA 7
PA 8	09	10 PA 9
PA 10	10	12 PA 11
PA 12	12	14 PA 13
PA 14	14	16 PA 15
GND	16	18 GND
+5 V	18	20 +12 V

CON2

## Ordering Information

PCI-822LU CR	Universal PCI, 250 kS/s, 32-ch 12-bit AD, 2-ch 16-bit DA and 32-ch Programmable DI/O Multifunction Board (RoHS). Includes one CA-4002 D-sub connector.
PCI-826LU CR	Universal PCI, 250 kS/s, 32-ch 16-bit AD, 2-ch 16-bit DA and 32-ch Programmable DI/O Multifunction Board (RoHS). Includes one CA-4002 D-sub connector.

# PCI-D64HU

Universal PCI, 40 MB/s, High-speed 32-channel Digital Input and 32-channel Digital Output Board



## Introduction

The PCI-D64HU is a high-speed Digital I/O board that provides 32 Digital Input channels and 32 Digital Output channels. The high-performance design makes this card perfect for high-speed data transfer and pattern generation applications.

The PCI-D64HU board performs high-speed data transfer using a bus-mastering DMA via the 32-bit PCI bus, with a maximum data transfer rate of up to 40 MB per second. A variety of Digital I/O transfer modes are supported, including directly programmable I/O control, timer pacer control, external clock mode and handshaking mode.

The PCI-D64HU board also features a programmable digital filter for all input signals, including handshaking and trigger signals. The PCI-D64HU board is a reliable and cost-effective interface that can be used to control any high-speed peripherals connected to the host computer system.

## Software

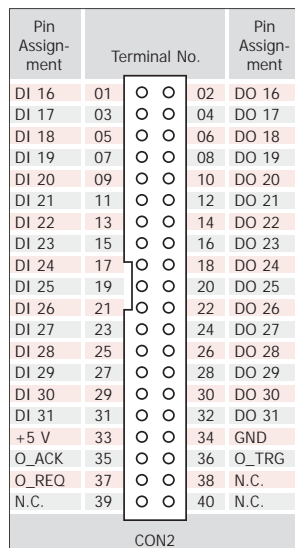
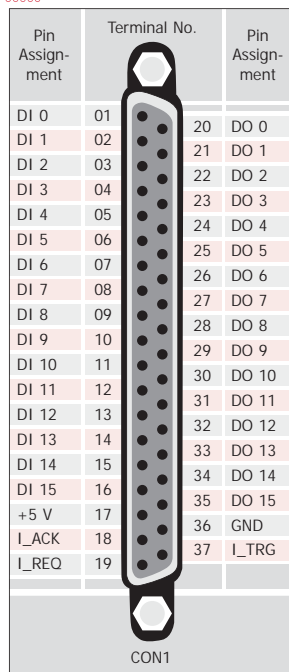
### Drivers

32-bit Windows XP/2003/2008/7/8/10

### Sample Programs

VB/VC/BCB Demo

## Pin Assignments



## Ordering Information

PCI-D64HU CR	Universal PCI, 40 MB/s High-speed 32-ch Digital Input and 32-ch Digital Output Board (RoHS). Includes one CA-4037W cable and two CA-4002 D-sub connectors.
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## Features

- Universal PCI (3.3 V/5 V) Interface
- 32-channel, 5 V/TTL Digital Output
- Data Transfer Rate up to 40 MB/s for each DMA Channel
- Onboard 1 k/2 k DWORD FIFO for DI/DO, respectively
- DO FIFO Supports Ring Buffer Mode
- No Bus Loading in Repetitive Pattern Generation Applications
- 32-channel, 5 V/TTL Digital Input
- 2-channel Bus Mastering Scatter/Gather
- Data Transfer Modes:
  - Direct Program Control, Internal Timer Pacer
  - External Clock (DI only), Handshaking

## Hardware Specifications

Digital Input	
Channels	32
Compatibility	5 V/TTL
Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.
Handshaking Signals	I_REQ Input, I_ACK Output, I_TRG Input
Digital Output	
Channels	32
Compatibility	5 V/TTL
Output Voltage	Logic 0: 0.55 V Max., Logic 1: 2.0 V Min.
Output Capability	Sink: 64 mA @ 0.55 V, Source: 32 mA @ 2.0 V
Handshaking Signals	O_REQ Output, O_ACK Input, O_TRG Output
Transfer Speed	40 MB/s (Max.) for DI and DO simultaneously
Timer/Counter	
Channels	3
Resolution	16-bit
Input Frequency	2.5 ~ 20 MHz
Timer 0	DI Clock Source
Timer 1	DO Clock Source
Timer 2	Base Clock for Timer 0 and Timer 1
Interrupts	
Sources	O_ACK, I_REQ, Timer 0, Timer 1 and Timer 2
Onboard FIFO	
Size	1 K DWORD (32-bit) for DI 2 K DWORD (32-bit) for DO
Size in Ring Buffer Mode	2 ~ 2 k DWORD (32-bit), DO only
General	
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz
Connectors	Female DB37 x 1, 40-pin Box Header x 1
Power Consumption	200 mA @ +5 V Typical (no output load)
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

## Accessories

	CA-4037W	40-pin Flat and 37-pin Female D-sub Cable, 24 cm
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	CA-3730DM	DB-37 Male-Male Cable, 3 m, 180° (RoHS)
	DB-37	Screw Terminal for I/O Boards that use a 37-pin D-sub Connector
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board



# PCI-FC16U

Universal PCI, 16-channel Counter/Frequency Board with 32 Programmable Digital I/O Channels



## Features

- Universal PCI (3.3 V/5 V) Interface
- 32 Programmable Digital I/O Channels
- 16-channel Up Counter or Frequency Measurement (Pulse Width = 2 μs Min.)
- Supports Card ID (SMD Switch)
- Digital Filter: 1 to 32767 (μs)
- Pull-high and Pull-low Resistors for DI Channels

## Introduction

The PCI-FC16U is a 32-bit hardware-type high-speed Counter/Frequency board that supports both the 3.3 V and the 5 V Universal PCI bus. The card provides 16 channels that can be individually configured for either frequency measurement or up-counter applications, and can support high-frequency signals up to 250 kHz. The PCI-FC16U board also includes 32 programmable Digital I/O channels.

The PCI-FC16U board includes an onboard Card ID switch that enables the board to be easily recognized via software if two or more boards are installed in the same computer. The pull-high/pull-low resistors allow the DI status to be predefined as either high or low instead of remaining floating if the DI channels are disconnected or interrupted.

## Software

### Drivers

- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux

### Sample Programs

- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

## Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
C0+	01	20 C0-
C1+	02	21 C1-
C2+	03	22 C2-
C3+	04	23 C3-
C4+	05	24 C4-
C5+	06	25 C5-
C6+	07	26 C6-
C7+	08	27 C7-
N.C.	09	28 N.C.
C8+	10	29 C8-
C9+	11	30 C9-
C10+	12	31 C10-
C11+	13	32 C11-
C12+	14	33 C12-
C13+	15	34 C13-
C14+	16	35 C14-
C15+	17	36 C15-
N.C.	18	37 N.C.
N.C.	19	

CON3

Pin Assignment	Terminal No.	Pin Assignment
PB 0	01	02 PB 1
PB 2	03	04 PB 3
PB 4	05	06 PB 5
PB 6	07	08 PB 7
PB 8	09	10 PB 9
PB 10	10	12 PB 11
PB 12	12	14 PB 13
PB 14	14	16 PB 15
GND	16	18 GND
+5 V	18	20 +12 V

CON1

Pin Assignment	Terminal No.	Pin Assignment
PA 0	01	02 PA 1
PA 2	03	04 PA 3
PA 4	05	06 PA 5
PA 6	07	08 PA 7
PA 8	09	10 PA 9
PA 10	11	12 PA 11
PA 12	13	14 PA 13
PA 14	15	16 PA 15
GND	17	18 GND
+5 V	19	20 +12 V

CON2

## Ordering Information

PCI-FC16U CR	Universal PCI, 16-channel Counter/Frequency Board with 32 Programmable DI/O Channels (RoHS). Includes one CA-4002 D-sub Connector.
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## Hardware Specifications

Counter/Frequency		
Counter/Frequency	16-channel Up Counter 16-channel Frequency	
Resolution	32-bit	
Digital Noise Filter	1 ~ 32767 μs	
Min. Pulse Width	2 μs (250 kHz Max.)	
Isolated Input Level	ON Voltage	+4.5 ~ +30 VDC
	OFF Voltage	+1 VDC Max.
Isolation Voltage	+250 Vdc	
ESD Protection	2 kV (Contact for each Channel)	
Programmable DIO		
Channels	32	
Digital I/O		
Input Voltage	Logic 0	0.8 V (Max.)
	Logic 1	2.0 V (Min.)
Output Voltage	Logic 0	0.4 V (Max.)
	Logic 1	2.4 V (Min.)
Output Capability	Sink	2.4 mA @ 0.8 V
	Source	0.8 mA @ 2.0 V
General		
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1, 20-pin Box Header x 2	
Power Consumption	700 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

## Accessories

	CA-2010	20-pin Flat Cable, 1 m
	CA-4002	37-pin Male D-sub Connector with Plastic Cover
	CA-3710DM	DB-37 Male-Male Cable, 1 m, 180° (RoHS)
	DN-20	DIN-Rail Mountable 20-pin D-sub Connector Board
	DN-37	DIN-Rail Mountable 37-pin D-sub Connector Board

## Multifunction Boards

### PCI-1800LU/1800HU/1802LU/PCI-1802HU

#### Universal PCI, 16/32-channel, 12-bit, 44 or 330 kS/s Multifunction Board

- Universal PCI (3.3 V/5 V) Interface
- Analog Input Channels
  - PCI-1802LU/HU: 32 SE/16 Diff.
  - PCI-1800LU/HU: 16 SE/8 Diff.
- Hardware FIFO
  - PCI-1802LU/HU: 8 k sample
  - PCI-1800LU/HU: 1 k sample
- 2-channel, 12-bit Analog Output
- Supports Card ID (SMD Switch)
- 12-bit, 44 kS/s or 330 kS/s AD Converter
- Built-in MagicScan Controller
- Internal Trigger: Software, Pacer
- External Trigger: Post, Pre, Middle
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
- Pull-high and Pull-low Resistors for DI Channels
- High-speed data transfer rate up to 2.7 M words/sec.

PCI-1800LU/HU



PCI-1802LU/HU



### PCI-1602U/PCI-1602FU

#### Universal PCI, 32-channel, 16-bit, 100 or 200 kS/s Multifunction Board

- Universal PCI (3.3 V/5 V) Interface
- 32 SE/16 Diff. Analog Input Channels
- 16-bit, 100 kS/s or 200 kS/s AD Converter
- 8 k sample Hardware FIFO
- Built-in MagicScan Controller
- Internal Trigger: Software, Pacer
- External Trigger: Post, Pre, Middle
- 2-channel, 12-bit Analog Output
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
- Pull-high and Pull-low Resistors for DI Channels
- Supports Card ID (SMD Switch)
- High-speed data transfer rate up to 2.1 M words/sec.



### PCI-1202LU/PCI-1202HU

#### Universal PCI, 32-channel, 12-bit, 44 or 110 kS/s Multifunction Board

- Universal PCI (3.3 V/5 V) Interface
- 32 SE/16 Diff. Analog Input Channels
- 12-bit, 110 kS/s or 44 kS/s AD Converter
- 1 k sample Hardware FIFO
- Built-in MagicScan Controller
- Internal: Software-trigger, Pacer-trigger
- External: Post-trigger, Pre-trigger, Middle-trigger
- 2-channel, 16-bit Analog Output
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
- Pull-high and Pull-low Resistors for DI Channels
- Supports Card ID (SMD Switch)
- High-speed data transfer rate up to 2.1 M words/sec.



### PIO-821LU/PIO-821HU

#### Universal PCI, 16-channel, 12-bit, 45 kS/s Multifunction Board

- Universal PCI (3.3 V/5 V) Interface
- 16 SE/8 Diff. Analog Input Channels
- 12-bit, 45 kS/s AD Converter
- AD Trigger: Software, Pacer, External Triggers
- 1-channel, 12-bit Analog Output
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
- Pull-high and Pull-low Resistors for DI Channels
- Supports Card ID (SMD Switch)
- Interrupt Handling



## Analog Input Boards

### PCI-1002LU/PCI-1002HU

#### Universal PCI, 32-channel, 12-bit, 110 or 44 kS/s AD Board

- Universal PCI (3.3 V/5 V) Interface
- 32 SE/16 Diff. Analog Input Channels
- 12-bit, 110 kS/s or 44 kS/s AD Converter
- Internal Trigger: Pacer-trigger
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
- Pull-high and Pull-low Resistors for DI Channels
- Supports Card ID (SMD Switch)



### PISO-813U

#### Universal PCI, 32-channel, 12-bit, 10 kS/s Isolated AD Board

- Universal PCI (3.3 V/5 V) Interface
- 32 SE Analog Input Channels
- 12-bit, 10 kS/s AD Converter
- AD Trigger: Software-trigger
- Built-in DC/DC Converter with 3000 V<sub>DC</sub> Protection
- 3750 V<sub>rms</sub> Bus Isolation Protection
- Supports Card ID (SMD Switch)





## Analog Output Boards

### PISO-DA2U

#### Universal PCI, 12-bit, 2-channel Isolated Analog Output Board

- Universal PCI (3.3 V/5 V) Interface
- 12-bit, 2-channel Analog Output
- 3750 Vdc Bus and Channel Isolation Protection
- 3000 Vdc Power Isolation Protection
- Voltage Output:  $\pm 10$  V,  $\pm 5$  V,  $0 \sim +10$  V,  $0 \sim +5$  V
- Current Output:  $0 \sim +20$  mA,  $+4 \sim +20$  mA
- Two Timer-triggered Interrupt Sources
- Calibration data stored in EEPROM
- Double-buffered DA Latch
- Software Calibration
- Supports Card ID (SMD Switch)



### PIO-DA4U/PIO-DA8U/PIO-DA16U

#### Universal PCI, 14-bit, 4/8/16-channel Analog Output Board

- Universal PCI (3.3 V/5 V) Interface
- 14-bit, 4/8/16-channel Analog Output
- Voltage Output:  $\pm 10$  V
- Current Output:  $0 \sim +20$  mA
- Two Timer-triggered Interrupt Sources
- Software Calibration
- Double-buffered DA Latch
- 16-channel 5 V/TTL DO, 16-channel 5 V/TTL DI
- Pull-high and Pull-low Resistors for DI Channels
- Supports Card ID (SMD Switch)



### PISO-DA4U/PISO-DA8U/PISO-DA16U

#### Universal PCI, 14-bit, 4/8/16-channel Isolated Analog Output Board

- Universal PCI (3.3 V/5 V) Interface
- 14-bit, 4/8/16-channel Analog Output
- 2500 Vdc Bus and Power Isolation Protection
- Built-in DC/DC Converter with 3000 Vdc Protection
- Voltage Output:  $\pm 10$  V
- Current Output:  $0 \sim +20$  mA
- Software Calibration
- Two Timer-triggered Interrupt Sources
- Double-buffered DA Latch
- 16-channel 5 V/TTL DO, 16-channel 5 V/TTL DI
- Pull-high and Pull-low Resistors for DI Channels
- Supports Card ID (SMD Switch)



## Non-isolated Digital I/O Boards

### PIO-D24U/D56U/D48U/D64U/D96U/D144U/D144LU/D168U

#### Universal PCI, 24/56/48/64/96/144/168-channel Digital I/O Board

- Universal PCI (3.3 V/5 V) Interface
- Emulates Industrial-standard 8255 PPI Ports (Mode 0) (PIO-D24U/D56U/D48U/D96U/D144(L)U/D168U)
- High-driving Output Capability (PIO-D24U/D56U/D48U/D96U/D144(L)U/D168U)
- 24/48/56/64/96/144/168-channel DI/O
- Interrupt Handling Capability
- Supports Card ID (SMD Switch)
- DI/O Response Time approximately 1  $\mu$ s (1 MHz)



### PIO-D96SU/D48SU

#### Universal PCI, 48/96-channel Digital I/O Board with SCSI-II Connector

- Universal PCI (3.3 V/5 V) Interface
- 48/96-channel DIO
- Emulates Industrial-standard 8255 PPI Ports (Mode 0)
- 4-channel Interrupt Source
- Pull-high and Pull-low Function for DI Channels
- Supports DO Status Readback (Register Level)
- Supports Card ID (SMD Switch)
- DI/O Response Time approximately 1  $\mu$ s (1 MHz)
- Includes one SCSI-II 100-pin Connector



### PCI-TMC12AU

#### Universal PCI, 12-channel Timer/Counter Board with Digital I/O

- Universal PCI (3.3 V/5 V) Interface
- 16-bit Timers/Counters can be cascaded to create a 32/48-bit Timer/Counter
- 16-channel 5 V/TTL DO, 16-channel 5 V/TTL DI
- Gate Input can be sourced from either External or Previous Timer/Counter Output
- More Flexible Interrupt Mechanism
- 4 Onboard 8254 Timer/Counter Chips
- 12 Independent 16-bit Timers/Counters
- 12 External Clock Input Channels
- 12 Timer/Counter Output Channels
- 2 Internal Clock Sources, 4 Interrupt Sources
- Hardware Mechanism to generate two Starting Clocks



## Memory Boards

### PCI-M512U

#### Universal PCI, 512 KB Memory Board with Digital I/O

- Universal PCI (3.3 V/5 V) Interface
- Two Li-ion Batteries to prevent loss of SRAM Data
- 512 KB Onboard SRAM
- LED Indicators to monitor Battery Status
- 16-channel 5 V/TTL DO, 12-channel 5 V/TTL DI
- 4-bit Battery Status Readback (DIO~3)



**PISO-1730U/PISO-P32C32U/PISO-P32C32U-5V**

Universal PCI, 32-channel Optically-isolated Digital Input and 32-channel Optically-isolated Open-collector Digital Output Board (Sink, NPN)

- Universal PCI (3.3 V/5 V) Interface
- 32-channel Optically-isolated Digital Input
  - PISO-1730U/PISO-P32C32U: Logic High +9 ~ +24 V
  - PISO-P32C32U-5V: Logic High +5 ~ +12 V
- Built-in DC/DC Converter with 3000 V<sub>DC</sub> Isolation
- 3750 V<sub>rms</sub> Photo-isolation Protection
- 32-channel Optically-isolated Digital Output
  - Current Sinking (NPN)
- Supports Card ID (SMD Switch)
- Supports DO Status Readback (Register Level)
- DIO Response Time approximately 250 μs (4 kHz)

PISO-1730U


 PISO-P32C32U  
PISO-P32C32U-5V

**PISO-P32A32U/PISO-P32A32U-5V**

Universal PCI, 32-channel Optically-isolated Digital Input and 32-channel Optically-isolated Open-collector Digital Output Board (Source, PNP)

- Universal PCI (3.3 V/5 V) Interface
- 32-channel Optically-isolated Digital Input
  - PISO-P32A32U-5V: Logic High +5 ~ +12 V
  - PISO-P32A32U: Logic High +9 ~ +24 V
- 32-channel Optically-isolated Digital Output
  - Current Sourcing (PNP)
- Built-in DC/DC Converter with 3000 V<sub>DC</sub> Isolation
- 3750 V<sub>rms</sub> Photo-isolation Protection
- Supports DO Status Readback (Register Level)
- Supports Card ID (SMD Switch)
- DI/O Response Time approximately 250 μs (4 kHz)


**PISO-P32S32WU**

Universal PCI, 32-channel Optically-isolated Digital Input and 32-channel Optically-isolated Open-collector Digital Output Board (Sink, NPN, 8-channel High-driving)

- Universal PCI (3.3 V/5 V) Interface
- 32-channel Optically-isolated Digital Input
- Maximum Input Range 30 V<sub>DC</sub>
- 3750 V<sub>rms</sub> Photo-isolation Protection
- Supports Card ID (SMD Switch)
- 32-channel Optically-isolated Digital Output
  - Current Sinking (NPN)
  - 500 mA (8-channel) High-driving
  - 100 mA (24-channel) Driving
- DIO Response Time approximately 250 μs (4 kHz)


**PISO-P64U/PISO-P64U-24V**

Universal PCI, 64-channel Optically-isolated Digital Input Board

- Universal PCI (3.3 V/5 V) Interface
- 64-channel Optically-isolated Digital Input
  - PISO-P64U: Logic High +5 ~ +15 V
  - PISO-P64U-24V: Logic High +20 ~ +28 V
- 4 Isolated Banks when using 4 Isolated External Power Supplies
- Jumper-selectable Internal or External Power Source for DI
- Built-in DC/DC Converter with 3000 V<sub>DC</sub> Isolation
- 3750 V<sub>rms</sub> Photo-isolation Protection
- Supports Card ID (SMD Switch)
- DI Response Time approximately 250 μs (4 kHz)


**PISO-C64U/PISO-A64**

Universal PCI/PCI, 64-channel Optically-isolated Digital Output Board (Sink/Source)

- PISO-C64U: Universal PCI (3.3 V/5 V) Interface
  - 64-channel Optically-isolated Open-collector Digital Output (Sink, NPN)
  - Supports Card ID (SMD Switch)
  - Supports DO Status Readback (Register Level)
- DO Response Time approximately 250 μs (4 kHz Max.)
- PISO-A64: PCI (5 V) Interface
  - 64-channel Optically-isolated Open-collector Digital Output (Source, PNP)
- 3750 V<sub>rms</sub> Photo-isolation Protection
- 4 Isolated Banks when using 4 Isolated External Power Supplies

PISO-C64U



PISO-A64


**PISO-730U/PISO-730U-5V**

Universal PCI, 32-channel Isolated Digital I/O and 32-channel TTL Digital I/O Board (Sink, NPN)

- Universal PCI (3.3 V/5 V) Interface
- 16-channel Optically-isolated Digital Input
  - PISO-730U: Logic High +9 ~ +24 V
  - PISO-730U-5V: Logic High +5 ~ +12 V
- 16-channel Optically-isolated Digital Output
  - Current Sinking (NPN)
- 2 Interrupt Sources
- Built-in DC/DC Converter with 3000 V<sub>DC</sub> Isolation
- 3750 V<sub>rms</sub> Photo-isolation Protection
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
- Supports DO Status Readback (Register Level)
- Supports Card ID (SMD Switch)







### PISO-730A/PISO-730A-5V

PCI Bus, 32-channel Isolated Digital I/O and 32-channel TTL Digital I/O Board (Source, PNP)

- PCI (5 V) Interface
- 16-channel Optically-isolated Digital Input
  - PISO-730A: Logic High +9 ~ +24 V
  - PISO-730A-5V: Logic High +5 ~ +12 V
- 16-channel Optically-isolated Digital Output
  - Current Sourcing (PNP)
- 3750 V<sub>rms</sub> Photo-isolation Protection
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
- 2 Interrupt Sources



### PCI-P16C16U

Universal PCI, 16-channel Isolated Digital Input and 16-channel Open-collector Digital Output Board (Sink, NPN)

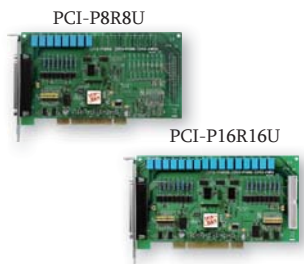
- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 16-channel Optically-isolated Digital Input
  - AC Signal Input with Filter
  - Selectable DC Signal Input Filter
- 16-channel Open-collector Digital Output
  - Current Sinking (NPN)
- 5000 V<sub>rms</sub> Photo-isolation Protection
- External Power Status LED Indicator



### PCI-P8R8U/PCI-P16R16U

Universal PCI, 8/16-channel Isolated Digital Input and 8/16-channel Relay Output Board

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- Relay Output
  - PCI-P8R8U: 8 Channels (4 x Form C, 4 x Form A)
  - PCI-P16R16U: 16 channels (8 x Form C, 8 x Form A)
- Optically-isolated Digital Input
  - PCI-P8R8U: 8 Channels
  - PCI-P16R16U: 16 Channels
  - 5000 V<sub>rms</sub> Photo-isolation Protection
  - Selectable DC Signal Input Filter
  - AC Signal Input with Filter



### PCI-P16POR16U

Universal PCI, 16-channel Isolated Digital Input and 16-channel PhotoMOS Relay Output Board

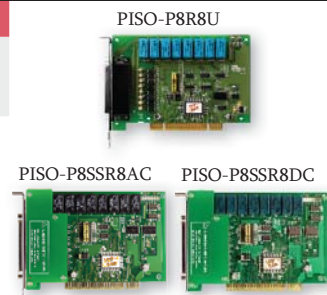
- Universal PCI (3.3 V/5 V) Interface
- LED Power Indicator
- Supports Card ID (SMD Switch)
- 16-channel Optically-isolated Digital Input
  - 5000 V<sub>rms</sub> Photo-isolation Protection
  - Selectable DC Signal Input Filter
  - AC Signal Input with Filter
- High-speed DIO Operation
- 16-channel PhotoMOS Relay Output
  - Long-life, High-reliability PhotoMOS Relay
  - Low leakage current when PhotoMOS Relay is OFF
  - No Acoustical Noise
  - No Contact Bounce and Sparking



### PISO-P8R8U/PISO-P8SSR8AC/PISO-P8SSR8DC

Universal PCI/PCI, 8-channel Isolated Digital Input and 8-channel Electromechanical/Solid-state Relay Output Board

- PISO-P8R8U: Universal PCI (3.3 V/5 V) Interface
  - Supports Card ID (SMD Switch)
  - 8-channel Electromechanical Relay Output
- 8-channel Optically-isolated Digital Input
  - 5000 V<sub>rms</sub> Photo-isolation Protection
  - Selectable DC Signal Input Filter
  - AC Signal Input with Filter
- PISO-P8SSR8AC/P8SSR8DC: PCI (5 V) Interface
  - 8-channel Solid-state Relays (SSR) Output
  - Decreased Electrical Noise During Relay Switching
- 3750 V<sub>rms</sub> Photo-isolation Protection
- Onboard Relay Output Status LED Indicators



### PISO-P16R16U

Universal PCI, 16-channel Isolated Digital Input and 16-channel Relay Output Board

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 16-channel Relay Output
- 16-channel Optically-isolated Digital Input
  - 3750 V<sub>rms</sub> Photo-isolation Protection
  - Selectable DC Signal Input Filter
  - AC Signal Input with Filter



### PISO-725

PCI Bus, 8-channel Isolated Digital Input and 8-channel Relay Output Board

- PCI (5 V) Interface
- 8-channel Electromechanical Relay Output
  - Supports Relay Output Status Readback
  - Onboard Relay Output Status LED Indicators
- 8-channel Optically-isolated Digital Input
  - 3750 V<sub>rms</sub> Photo-isolation Protection
  - State-changed Interrupt for all Digital Inputs
  - Jumper-selectable Isolated or Non-isolated Digital Input



## Multifunction Boards



Model	A-826PG	A-823PG		A-822PG		A-821PG		A-812PG	A-8111
		L	H	L	H	L	H		
Interface	ISA Bus								
<b>Analog Input</b>									
Resolution	16-bit	12-bit		12-bit		12-bit		12-bit	12-bit
Channels	SE	16	16	16		16		16	8
	Diff.	8	8	8		8		-	-
Sampling Rate	100 kS/s	125 kS/s		125 kS/s		45 kS/s		62.5 kS/s	35 kS/s
Input Range	Bipolar	Bipolar/Unipolar		Bipolar/Unipolar		Bipolar		Bipolar	Bipolar
<b>Analog Output</b>									
Resolution	12-bit	12-bit		12-bit		12-bit		12-bit	12-bit
Channels	2	2		2		1		2	2
Voltage Output Range (V)	0 ~ +10, 0 ~ +5	±10, ±5, 0 ~ +10, 0 ~ +5		0 ~ +10, 0 ~ +5		0 ~ +10, 0 ~ +5		0 ~ +10, 0 ~ +5	0 ~ +10, 0 ~ +5
<b>Digital Input/Output</b>									
DI Channels	16 (5 V/TTL)	16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)	16 (5 V/TTL)
DO Channels	16 (5 V/TTL)	16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)		16 (5 V/TTL)	16 (5 V/TTL)
<b>Timer/Counter</b>									
Channels	3	3		3		3		3	3
Resolution	16-bit	16-bit		16-bit		16-bit		16-bit	16-bit

## Analog Input/Output Boards



Model	ISO-AD32		ISO-813	ISO-DA		A-726	A-626	A-628
	L	H		8	16			
Interface	ISA Bus							
<b>Analog Input</b>								
Resolution	12-bit		12-bit	-				
Channels	SE	32		32		-		
	Diff.	16		-		-		
Sampling Rate	200 kS/s	125 kS/s	10 kS/s	-				
FIFO Size	1 k		-		-			
Input Range	Bipolar/Unipolar		Bipolar/Unipolar		-			
Bus Isolation	500 V <sub>rms</sub>		3000 V <sub>DC</sub>		-			
<b>Analog Output</b>								
Resolution	-		14-bit		12-bit	12-bit	12-bit	
Channels	-		8	16	6	6	8	
Isolation Voltage	-		2500 V <sub>DC</sub>		-	-	-	
Voltage Output Range (V)	-		± 10		±10, ±5, 0 ~ +10, 0 ~ +5			
Current Output Range (mA)	-		0 ~ +20		+4 ~ +20			
<b>Digital Input/Output</b>								
DI Channels	-		16 (5 V/TTL)		16 (5 V/TTL)	16 (5 V/TTL)	16 (5 V/TTL)	
DO Channels	-		16 (5 V/TTL)		16 (5 V/TTL)	16 (5 V/TTL)	16 (5 V/TTL)	
<b>I/O Connector</b>								
20-pin Header	-		-	2	4	2	2	
37-pin D-sub	1		1	1	-	1	1	



## Isolated Digital Input/Output Boards



Model	P16R16DIO	P8R8DIO	ISO-P32C32	ISO-P32S32W	ISO-P64	ISO-C64	ISO-730
Interface	ISA Bus						
<b>Digital Input</b>							
Isolation Voltage	5000 Vrms		3750 Vrms	3750 Vrms	3750 Vrms	-	3750 Vrms
Channels	16	8	32	32	64	-	16
Compatibility	Optical		Photocoupler			-	Optical
Input Voltage	Logic 0	0 ~ 1 V	0 ~ 1 V	0 ~ 1 V	0 ~ 1 V	-	0 ~ 1 V
	Logic 1	5 ~ 24 V	9 ~ 24 V	5 ~ 24 V	9 ~ 24 V	-	9 ~ 24 V
<b>Digital Output</b>							
Isolation Voltage	-	3750 Vrms	3750 Vrms	-	3750 Vrms	3750 Vrms	
Channels	-	32	32	-	64	16	
Compatibility	-	Sink (NPN)	Sink (NPN)	-	Sink (NPN)	Sink (NPN)	
Output Capability	-	100 mA/30 V	500 mA (Max.)	-	100 mA/30 V	100 mA/30 V	
<b>Relay Output</b>							
Channels	8 x Form C 8 x Form A	4 x Form C 4 x Form A	-	-	-	-	
Contact Rating	AC:120 V @ 0.5 A DC: 24 V @ 1 A		-	-	-	-	
<b>Non-isolated Digital Input/Output</b>							
DI Channels	-						16 (5 V/TTL)
DO Channels	-						16 (5 V/TTL)

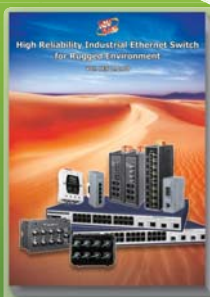


## Non-isolated Digital Input/Output Boards



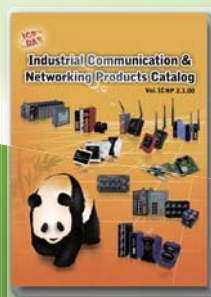
Model	DIO-24	DIO-48	DIO-64/3	DIO-64/6	DIO-96	DIO-144	TMC-10
Interface	ISA Bus						
<b>Programmable Digital Input/Output</b>							
Channels	24 (5 V/TTL)	48 (5 V/TTL)	-	-	96 (5 V/TTL)	144 (5 V/TTL)	-
<b>Digital Input</b>							
Channels	-	-	32 (5 V/TTL)	32 (5 V/TTL)	-	-	-
Input Voltage	Logic 0: 0.8 V Max. Logic 1: 2.0 V Min.						
<b>Digital Output</b>							
Channels	-	-	32 (5 V/TTL)	32 (5 V/TTL)	-	-	8 (5 V/TTL)
Output Voltage	Logic 0: 0.4 V Max. Logic 1: 2.4 V Min.						
Output Capability	Sink: 0.8 mA @ 0.8 V Source: -2.4 mA @ 2.0 V						
<b>Timer/Counter</b>							
16-bit Channels	-	1	3	6	-	-	8
32-bit Channels	-	1	-	-	-	-	2
Input Frequency	-	10 MHz	10 MHz	10 MHz	-	-	10 MHz
<b>I/O Connector</b>							
20-pin Header	2	-	5	5	-	-	-
37-pin D-sub	-	-	-	-	-	-	1
40-pin Header	-	-	-	-	-	-	-
50-pin Header	1	2	-	-	4	6	-

# ICP DAS Catalogs & Brochures



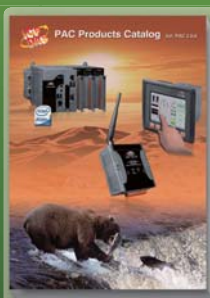
## High Reliability Industrial Ethernet Switch Catalog

- Managed Ethernet Switches
- Unmanaged Ethernet Switches
- PoE Ethernet Switches
- Media Converters
- Real-time Redundant Ring Ethernet Switches
- IP67 Waterproof Switches
- Cyber-Ring Ethernet Self-healing Technology



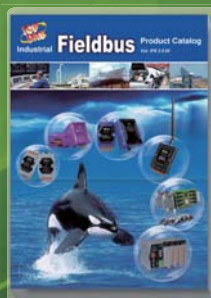
## Industrial Communication & Networking Products Catalog

- Multi-port Serial Cards
- Programmable Device Servers (Serial-to-Ethernet)
- Converters, Repeaters and Hubs
- Fieldbus Solutions
- Ethernet Switches



## PAC Products Catalog

- XP-8000-Atom Series
- XP-8000 Series
- WP-8000 Series
- LP-8000 Series
- iP-8000 Series
- ViewPAC Series
- MotionPAC Series
- I/O Expansion Units
- I/O Modules
- 5000 Series
- 7188/7186 Series



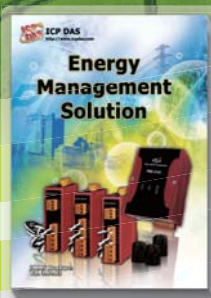
## Industrial Fieldbus

- RS-485
- Industrial Ethernet
- Profinet
- CAN Bus
- CANopen
- DeviceNet
- J1939
- PROFIBUS
- HART
- Ethernet/IP
- BACnet



## Remote I/O Modules and I/O Expansion Units Products Catalog

- RS-485 Products
- Ethernet Remote I/O Modules
- FRnet I/O Modules
- CAN Bus Products
- PROFIBUS Remote I/O Modules
- HART Products
- Smart Power Meters
- WISE I/O Modules



## Energy Management Solution - PMMS Brochure

- Smart Power Meter Concentrator
- Smart Power Meter
- True RMS Input Module
- TouchPAD Devices - VPD Series
- GPS Solutions



## A Web-based Intelligent PAC Controller - WISE Brochure

- Intelligent Multifunction IoT Controller
- Intelligent Data Logger I/O Controller
- Intelligent I/O Module



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