PC-based I/O Boards Catalog

High-quality Industrial Data Acquisition and Control Products

Vol. IOC-1.06.06

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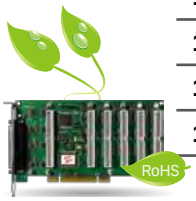

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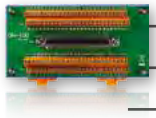

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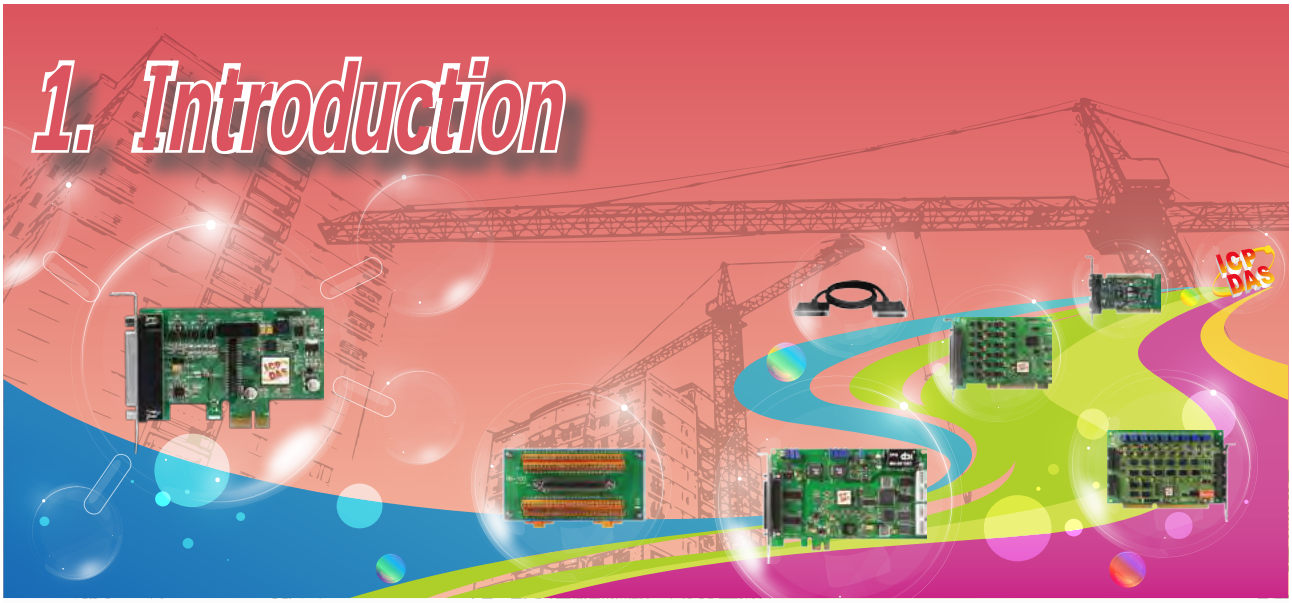
1. Introduction



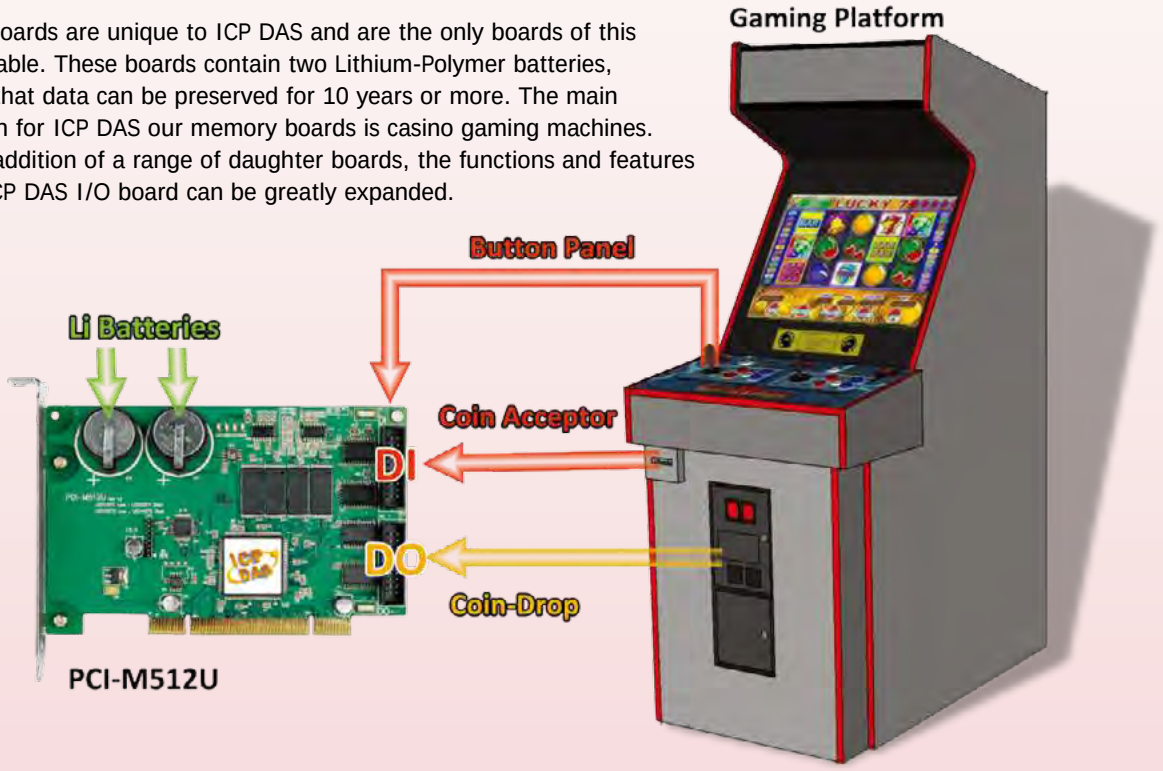
1-1 Presentation

ICP DAS is your 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 the ISA and PCI bus, but now offers products that are compatible with the PCI Express (PCIe) standard.

By way of example, PCI boards are categorized into three different varieties: the PCI series, the PISO series and the PIO series. PCI series boards are the top-of-the-line products that can achieve remarkably high performance levels and provide multiple I/O functions and allow high data resolutions. The emphasis of the PISO series is focused on its ability to provide protection to the Host PC against the direct impact of external noise. Finally, the PIO series offers a cost-effective solution for general use and are well-suited for high-speed transmission applications.

ICP DAS I/O boards can be integrated into a wide variety of automation systems. For example, digital I/O boards can be used for monitoring and controlling logic signals such as buttons, switches, and relays, and for on/off, high/low or open/close situations. Analog I/O boards are primarily used for applications requiring the acquisition or transmission of analog signals, while timer, counter and frequency boards are used for measuring pulse signals.

Memory boards are unique to ICP DAS and are the only boards of this type available. These boards contain two Lithium-Polymer batteries, ensuring that data can be preserved for 10 years or more. The main application for ICP DAS our memory boards is casino gaming machines. With the addition of a range of daughter boards, the functions and features of each ICP DAS I/O board can be greatly expanded.



1-2 Features

Digital Input/Output

A wide variety of digital input/output signals, such as switch closures, relay contacts, or TTL-compatible interfaces, can be directly read using digital I/O cards.

Analog Input/Output

For industrial applications, voltage, temperature, strain, current or resistance can be used as the source for the analog input (AI or AD) signals, while analog output (AO or DA) signals can be either voltage or current.

Timer/Counter

Timer/counter boards can be used for applications such as counting external pulse signals, accurate time measurement, or as the pacer trigger source for the analog input. Frequency measurement is also possible by simply computing the number of pulses and the value of the time measured.

Isolation Protection

Isolated input/output boards help to eliminate ground loop problems, and isolate the Host PC from potentially damaging voltages.

Relay

Relay boards can be used to control circuits that use low-power signals requiring complete electrical isolation between the control and the controlled circuits.

Pull-High/Pull-Low

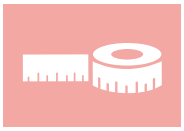
If the digital input channels become disconnected from the signals, the value of the reading can be held at a predefined state based on the value set for the pull-high/low jumpers, rather than letting the reading float.

Card ID Function

The Card ID feature is useful for distinguishing individual boards if multiple I/O boards are installed in a single Host PC.

Accessories

A wide range of optional accessories are available for ICP DAS I/O cards, including as cable, connectors and daughter boards, making wiring and installation very easy.



Half-size Design

The half-size design of ICP DAS I/O boards is particularly suitable for compact computers, especially for those based on Industrial Personal Computer (IPC) specifications.

Universal PCI (3.3 V/5 V)

ICP DAS Universal PCI boards work with both the new 3.3 V PCI bus as well as the traditional 5 V bus.

PCI Express

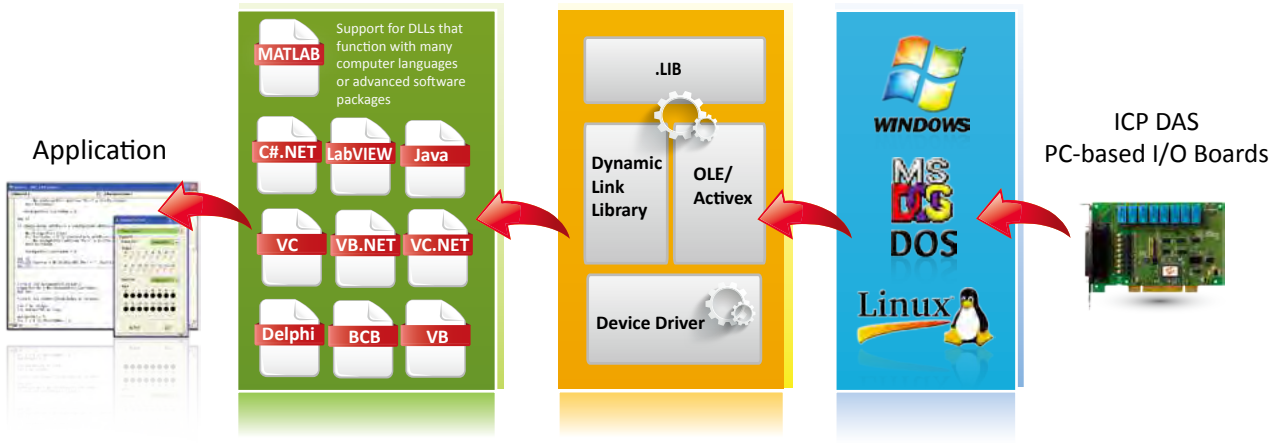
PCI Express (PCIe) is a computer expansion bus standard that is available on more recent computers, and is the replacement for the older PCI/PCI-X bus.

Temperature Range

ICP DAS I/O boards can operate in temperatures ranging from 0 to 60°C, ensuring reliable performance in the harshest of environments.

1-3 Software

ICP DAS provides a full-featured Software Development Kit (SDK) and reliable drivers for all our 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-/64-bit Windows XP/2003/2008/Vista/7, as well as supporting Microsoft's latest 32-/64-bit Windows 8. The Windows SDK for the I/O boards contain 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 the SDK and the sample programs, complex hardware-register-based operations are not required, meaning that custom applications can be developed quickly and easily.

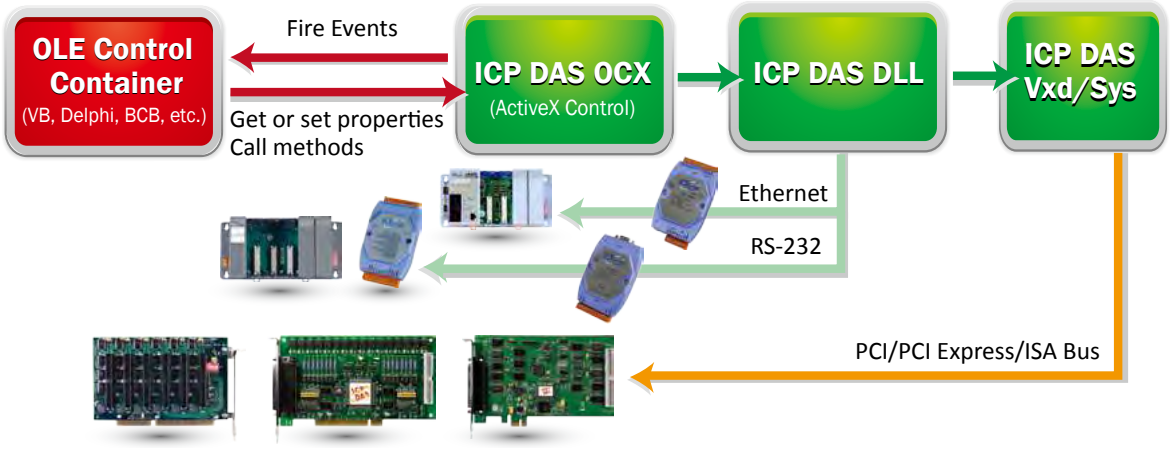


These software packages are designed so that it is easy for users to learn and use. Most contain a variety of sample programs, including the source code, that can be freely modified and used. The included shared libraries developed by ICP DAS can be distributed with no licensing fees, providing a cost-effective method for deploying custom run-time applications.

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/2003/2008/Vista/7/8, and sample programs with source code are also provided for VB, VC, Delphi, and BCB, etc. With this OCX, users from a variety of backgrounds and expertise can bring their creativity to any kind of application.

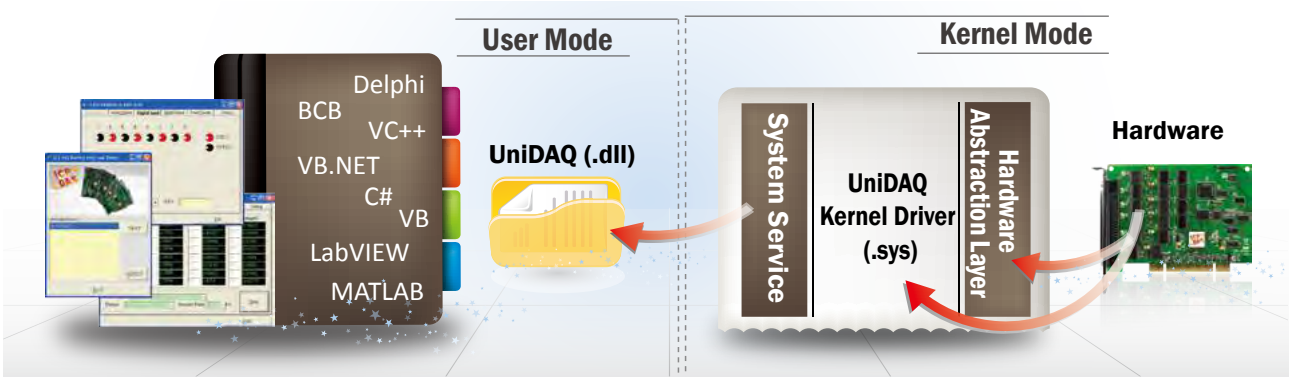
The ICP DAS OCX communicates with PCI, ISA, PCI Express cards and DCON series modules to perform digital, analog and timer/counter operations, and is designed to minimize the need to manipulate the hardware details, meaning that data acquisition operations can be achieved using only a few lines of code. The following figure illustrates the programming system architecture for the ActiveX Control (OCX) component.



UniDAQ Driver & SDK for Windows

UniDAQ is a uniform SDK interface that operates on the Windows OS 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 Universal PCI bus in addition to future products based on the PCI Express bus. The UniDAQ SDK makes it easy to integrate different kinds of I/O boards in the same system, upgrade to new hardware, expand the number of channels in your system, and 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.

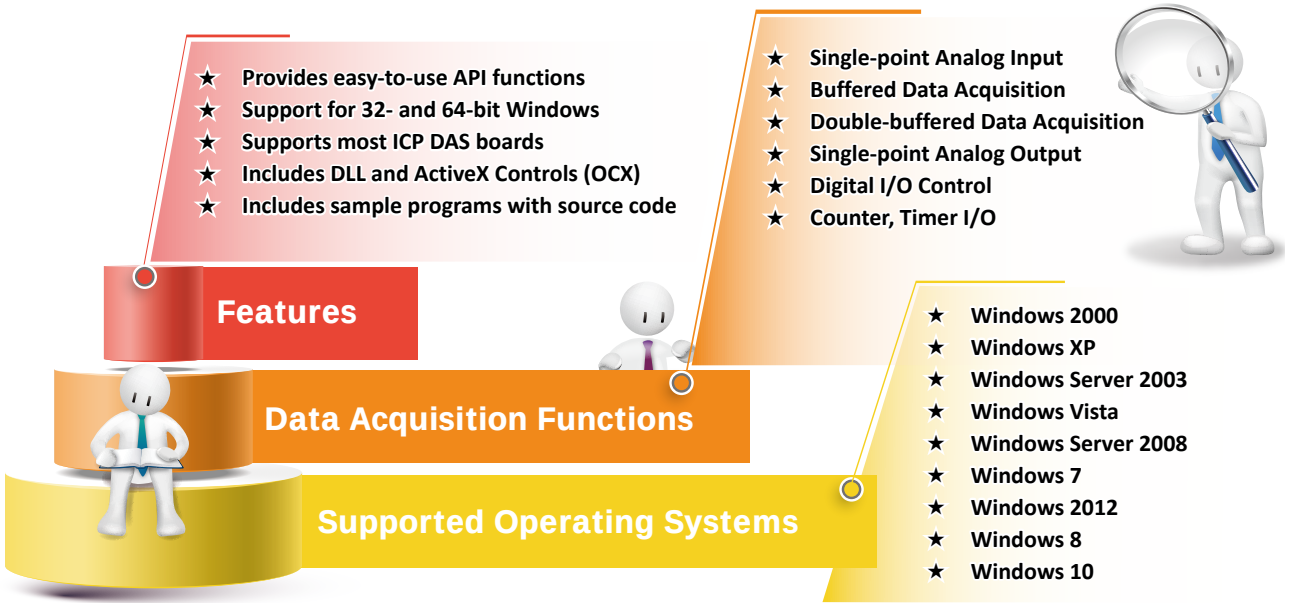


Get Ready for Windows 8 ▸▸▸

Windows 8 is the latest operating system from Microsoft and ICP DAS provides both 32-bit and 64-bit versions of the kernel drivers for most of its DAQ cards, meaning that you can take advantage of the new Windows 10 functionality. UniDAQ also supports 64-bit extended versions of Windows XP and Windows Server 2003 systems, including both AMD64 and Intel x86-64 system architecture.

.NET Support ▸▸▸

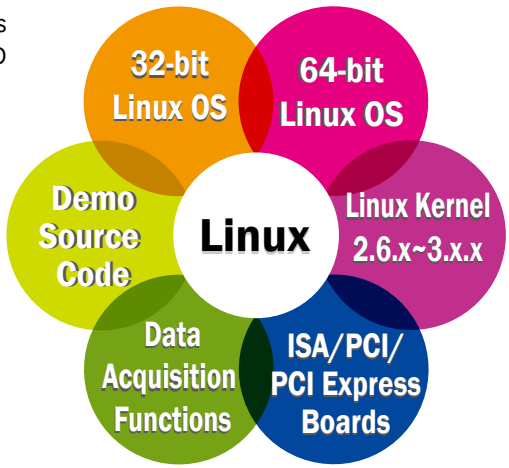
For .NET programmers who require direct calling of UniDAQ DLL libraries, ICP DAS provides sample programs for C# and Visual Basic .NET that can help to speed up the development of custom applications in Microsoft Visual Studio .NET 2003/2005/2008/2010.



Driver & SDK for Linux

One of the major benefits of using the Linux operating system is the huge level of support provided by the open source development community. Linux has a well-deserved reputation for stability and flexibility, together with no licensing fees or use-restrictions to speak of, meaning that Linux is an ideal operating environment. As Linux has continued to gain ground in industry and enterprise applications, ICP DAS provides drivers and libraries to enable users to take advantage of Linux for their industry control projects.

The Linux operating system has been widely adopted by many users in numerous industrial applications because of its stability, and the fact that it is open source and is free. The I/O Boards driver for Linux supports x86 32-bit and 64-bit Linux distributions with Linux Kernel 2.6.x to 3.x.x (for examples, Fedora Core, Ubuntu, OpenSUSE, etc.) and the SDK includes libraries and sample programs with source code. Users can develop I/O control applications on Linux easily by the SDK and GNU C Language.



Features

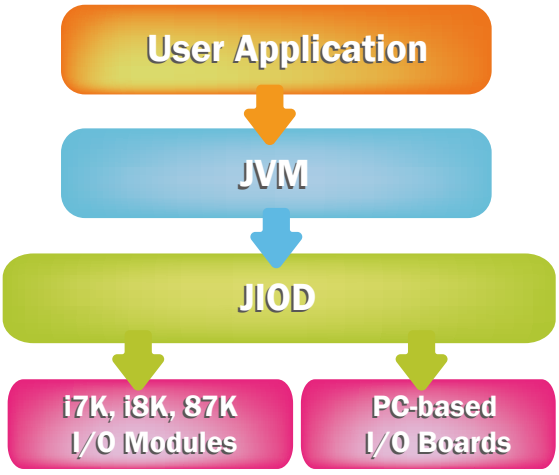
- ☑ Supports x86 32/64-bit Linux OS with Linux Kernel 2.6.x to 3.x.x
- ☑ Supports most ICP DAS ISA/PCI/PCI Express I/O series cards
- ☑ Includes Linux drivers and sample programs with source code
- ☑ Provides data acquisition functions: single-point Analog I/O, buffered data acquisition, double-buffered data acquisition, Digital I/O control and counter/timer I/O

Java I/O Driver

The Java technology features a complete network support and write-once, run everywhere solution, which makes it the ideal solution for industry control project. It reduces the developing and maintaining cost, satisfies the time-to-market requirement. However the Java technology does not implement the low level I/O access in nature. To help user to involve the Java technology and obtain the benefit from it, ICP DAS develops the Java I/O Driver (JIOD) package.

Features

The JIOD is a Java platform technology chosen for JVM extension and makes many industry control applications. The JIOD includes packages for i7K, i8K and 87K I/O modules and ICP DAS I/O cards working on PCI bus. It provides developers a simple and easy mechanism to extend the JVM functionality to access the ICP DAS products. JIOD is now available and distributed for Linux and Windows operation systems.



JIOD

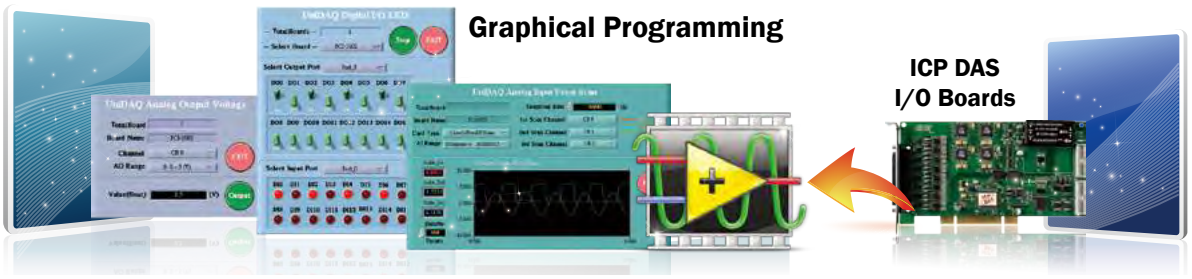
The JIOD contains three packages - com.icpdas.IxPIO, com.icpdas.IxPCI and com.icpdas.comm. The IxPIO and IxPCI projects support PC-based I/O Boards. The comm packages support the i7K, i8K and 87K I/O modules. They provide powerful, easy-to-use facilities for developing the data acquisition applications. They could also be used in application, applet and servlet easily.

LabVIEW

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

LabVIEW provides a single development environment that allows easy access and integration with a variety of measurement and control hardware, including data acquisition devices, bench top systems and modular instruments. Hundreds of drag-and-drop control and graph options can be used to quickly create a custom GUI. In addition, custom imagery and logos can be incorporated, or the default controls can be modified, to provide a customized appearance, meaning that dynamic user interfaces can be quickly created to provide interactive control of your software system.

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



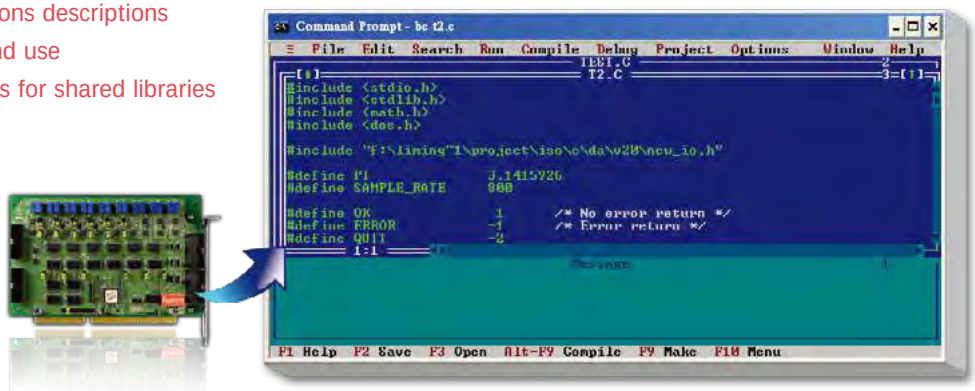
DOS Lib

DOS includes many valuable features, such as high performance, stability, easy installation and deployment, etc., for industrial control and measurement applications.

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.

Features

- ☑ Useful function libraries for TC/BC/MSC with a large range of modes
- ☑ Wide variety of sample programs for TC/BC/MSC, including source code
- ☑ Integrated diagnostics application
- ☑ Complete functions descriptions
- ☑ Easy to learn and use
- ☑ No licensing fees for shared libraries

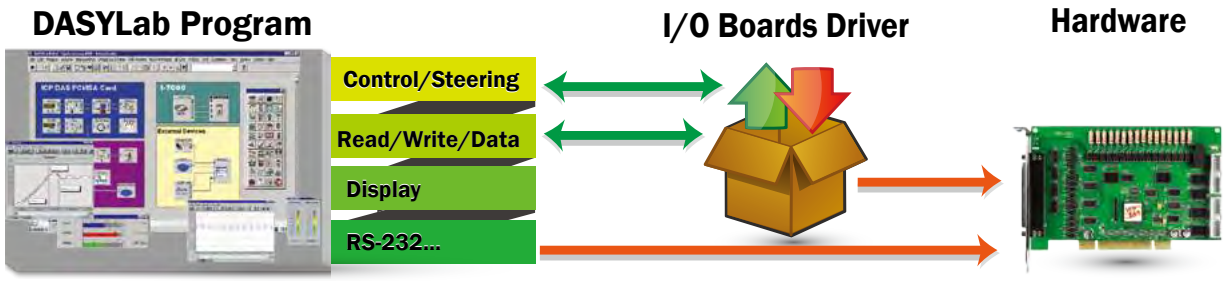


DASYLab

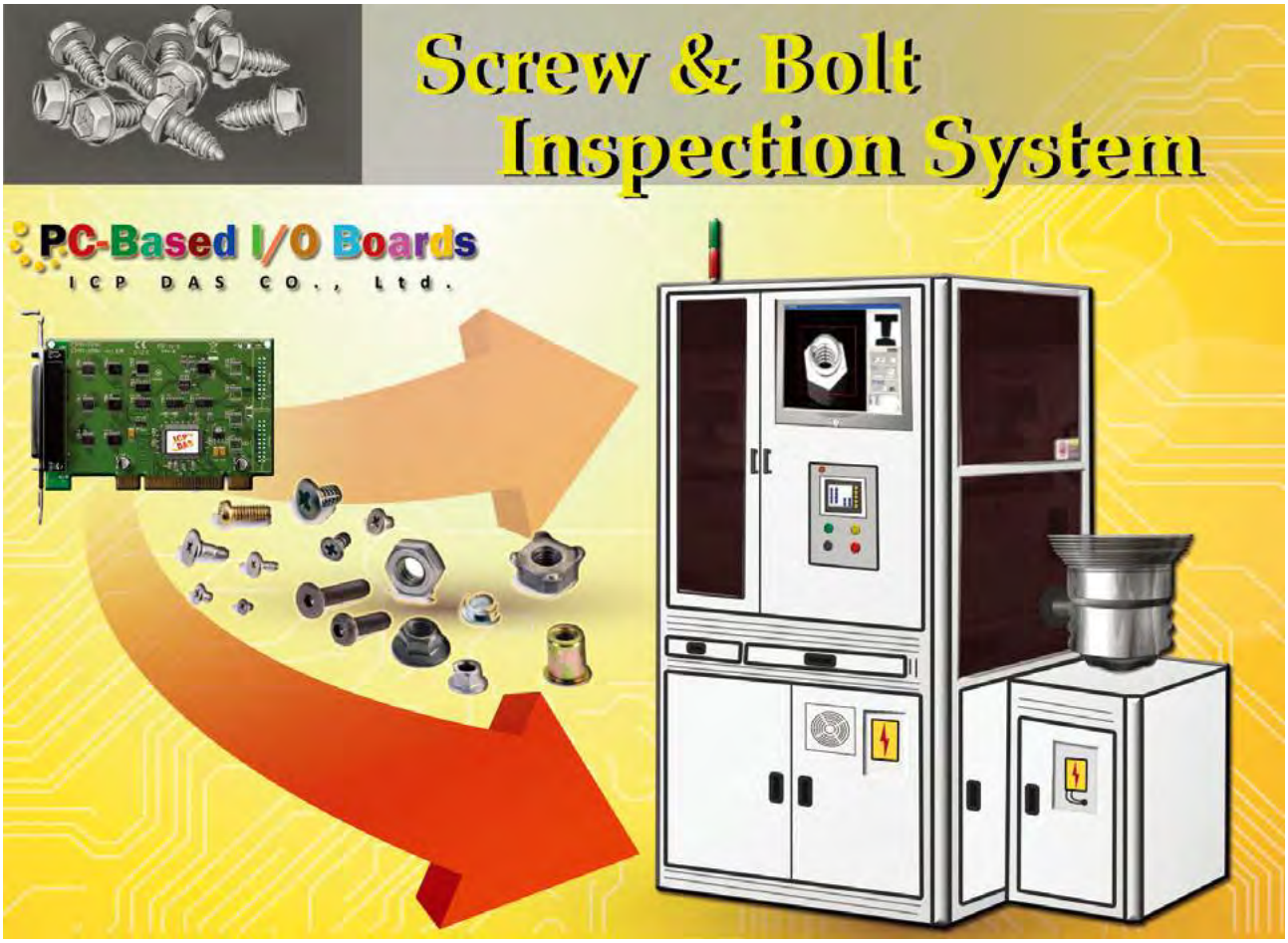
DASYLab is a popular and easy-to-use software package for data acquisition systems that is compatible with a wide range of interface options, providing connections to hardware such as RS-232, IEEE, USB, and Parallel ports, and ISA and PCI bus, etc. A large variety of functional modules for measurement 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 easy integration of hardware and software in the data acquisition, measurement and control system loop.

Features

- ☑ Easy-to-use graphical programming environment
- ☑ Fast data acquisition and display
- ☑ Supports more then 40 DAQ drivers
- ☑ Support for a wide range of functions and modules, including Input/Output modules, control modules, signal processing modules, and display modules, etc.



1-4 Applications


Screw & Bolt
Inspection System
PC-Based I/O Boards
ICP DAS CO., Ltd.


LED Testing & Sorting
PC-Based I/O Boards
ICP DAS CO., Ltd.


Dispensing Robot
PC-Based I/O Boards
ICP DAS CO., Ltd.
START


Pharmaceutical Machine
PC-Based I/O Boards
ICP DAS CO., Ltd.


Optical Lens Cutter
PC-Based I/O Boards
ICP DAS CO., Ltd.


Sorting Machine
PC-Based I/O Boards
ICP DAS CO., Ltd.
(Small)
(Medium)
(Large)

2. PCI Express Data Acquisition Boards

Multifunction and Analog Output Board Selection Guide

2-1 High Speed Multifunction Board | 2-2 Multifunction Board | 2-3 Analog Input/Output Board

Model	PCIe-813 (Available soon)	PCIe-8620 (NEW)	PCIe-8622 (NEW)	PEX-1202L	PEX-1202H	PEX-1002L	PEX-1002H	PEX-DA4/DA8/DA16
Interface	PCI Express							
Analog Input								
Isolation Voltage	3750 V_{rms}	2500 VDC		-		-		-
Resolution	16-bit			12-bit		12-bit		-
Channels	32 SE	8 SE	16 SE	32 SE/16 Diff.		32 SE/16 Diff.		-
Sampling Rate	1 MS/s	200 kS/s (Per Channel)		110 kS/s	44 kS/s	110 kS/s	44 kS/s	-
Bipolar Input	±2.56 V, ±5.12 V, ±10.24 V,	±5 V, ±10 V	±5 V, ±10 V	±0.625 V, ±1.25 V, ±2.5 V, ±5 V, ±10 V	±0.005 V, ±0.01 V, ±0.05 V, ±0.1 V, ±1 V, ±5 V, ±10 V	±1.25 V, ±2.5 V, ±5 V, ±10 V	±0.01 V, ±0.1 V, ±1 V, ±10 V	-
Unipolar Input	-	-	-	0 ~ +10 V, 0 ~ +5 V, 0 ~ +2.5 V, 0 ~ +1.25 V	0 ~ +10 V, 0 ~ +0.1 V, 0 ~ +0.01 V	-	-	-
FIFO Size	8 K	2 K	2 K	1 K		-		-
Accuracy	0.05% of FSR ±1 LSB @ 25°C, ±10.24 V	0.05% of FSR ±1 LSB @ 25°C, ±10 V		0.01% of FSR ±1 LSB @ 25°C, ±10 V		0.01% of FSR ±1 LSB @ 25°C, ±10 V		-
Analog Output								
Resolution	-	-	16-bit	12-bit		-		14-bit
Channels	-	-	2	2		-		4/8/16
Accuracy	-	-	-	0.06% of FSR ± 1 LSB @ 25°C, ±10 V		-		0.04% of FSR ±2 LSB @ 25°C, ±10 V
Output Range	-	-	±5 V, ±10 V	±5 V, ±10 V		-		Voltage: ±10 V Current: 0 ~ +20 mA
Slew Rate	-	-	-	8.33 V/μs		-		0.71 V/μs
Non-isolated Digital Input/Output								
DI Channels	-	-	-	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)
Isolated Digital Input/Output								
DI Channels	-	4	12	-		-		-
DO Channels	-	4	12	-		-		-
Isolation Voltage	-	2500 VDC	2500 VDC	-		-		-
Timer/Counter								
Channels	-	-	-	3		3		3
Resolution	-	-	-	16-bit		16-bit		16-bit
Clock Source	-	-	-	8 MHz		4 MHz (Internal)		4 MHz (Internal)
Page	**2-2**	**2-3**	**2-4**	**2-5**		**2-6**		**2-7**

2-1 High Speed Multifunction Board

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 Single-ended Isolated Analog Input Channels
- 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 V_{DC} Protection
- 3750 V_{rms} Bus Isolation Protection
- AD Trigger: Software, Pacer, External Triggers
- 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.

Software

Drivers

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

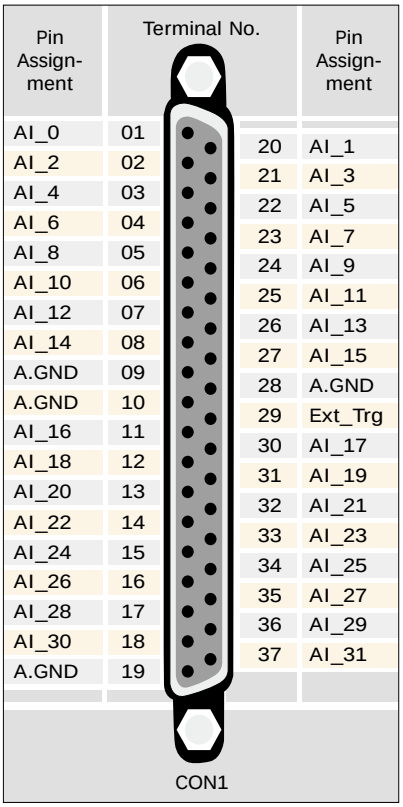
Sample Programs

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

Hardware Specifications

Analog Input	
Isolation Voltage	3750 V_{rms} (Bus-type)
Channels	32 Single-ended
A/D 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

Pin Assignments



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.

PCIe-8620 NEW

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

Features

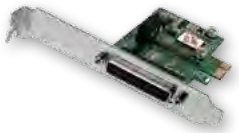
- PCI Express x1 Interface, Full-profile or Low-profile
- 4-channel Isolated Digital Input
- 4-channel Isolated Digital Output
- 8 Single-ended Analog Input channels
  - Synchronous Sample and Hold
  - Analog Input Range: ±10 V, ±5 V
  - 16-bit, 200 kS/s Sampling Rate for each channel
  - Hardware FIFO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

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 ±10 V or ±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 ±5 V input range is typically 15 kHz, and is typically 23 kHz for the ±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.

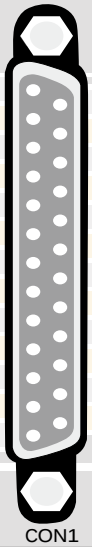


Full-height Bracket ▲

Low-profile Bracket ▲

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
AD0	01	14	AGND
AD1	02	15	AGND
AD2	03	16	AGND
AD3	04	17	AGND
AD4	05	18	AGND
AD5	06	19	AGND
AD6	07	20	AGND
AD7	08	21	DGND
DGND	09	22	DIN0
DIN1	10	23	DIN2
DIN3	11	24	DOUT0
DOUT1	12	25	DOUT2
DOUT3	13		



CON1

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	±10 V, ±5 V
FIFO Size	2 K Samples (Total)
Accuracy	0.05% of FSR ±1 LSB @ 25°C, ±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

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.

PCIe-8622 NEW

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

Features

- PCI Express x1 Interface, Full-profile
- 12-channel Isolated Digital Input
- 12-channel Isolated Digital Output
- 2-channel 16-bit Analog Output
- 8 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

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 VDC 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
DGND	05		39	DGND
DOUT11	06		40	DOUT10
DOUT9	07		41	DOUT8
DOUT7	08		42	DOUT6
DOUT5	09		43	DOUT4
DOUT3	10		44	DOUT2
DOUT1	11		45	DOUT0
DIN11	12		46	DIN10
DIN9	13		47	DIN8
DGND	14		48	DGND
DIN7	15		49	DIN6
DIN5	16		50	DIN4
DIN3	17		51	DIN2
DIN1	18		52	DIN0
N/A	19		53	N/A
AI_CONV	20		54	N/A
DTRG1	21		55	DTRG0
AGND	22		56	AGND
AGND	23		57	AGND
AO1	24		58	AO0
AGND	25		59	AGND
AGND	26		60	AGND
AI15	27		61	AI14
AI13	28		62	AI12
AI11	29		63	AI10
AI9	30		64	AI8
AI7	31		65	AI6
AI5	32		66	AI4
AI3	33		67	AI2
AI1	34		68	AI0

CON1

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	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 VDC
Digital Output	
Channels	12
Isolation Voltage	2500 VDC
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

Ordering Information

PCIe-8622 CR	PCI Express, 200 KS/s , 16-bit, 16-ch Simultaneously Sampled Analog Input, 2-channel 16-bit Analog Output and 12-ch Isolated DI/O Board (RoHS).

2-2 Multifunction Boards

PEX-1202L/PEX-1202H

PCI Express, 32-channel, 12-bit, 110 kS/s or 44 kS/s
Multi-function (1 K word FIFO) 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
- Three External Triggers: Pre-trigger, Middle-trigger, Post-trigger
- 110 or 44 kS/s AD Sampling Rate
- Supports Card ID (SMD Switch)

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

CON3

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		

CON1

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

CON2

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

Hardware Specifications

Model	PEX-1202L	PEX-1202H
Analog Input		
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	44 kS/s
Analog Output		
Channels	2	
Resolution	12-bit	
Accuracy	0.06% of FSR ±1 LSB @ 25°C, ±10 V	
Output Range	±5 V, ±10 V	
Digital Input		
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)	
Digital Output		
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)	
Timer/Counter		
Channels	3	
Resolution	16-bit	
Reference Clock	Internal: 8 MHz	
General		
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	

Ordering Information

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

2-3 Analog Input/Output Boards

PEX-1002L/PEX-1002H

PCI Express, 32-channel, 12-bit, 110 kS/s or 44 kS/s Multi-function 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)

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.

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
AI_0	01		
AI_1	02	20	AI_16
AI_2	03	21	AI_17
AI_3	04	22	AI_18
AI_4	05	23	AI_19
AI_5	06	24	AI_20
AI_6	07	25	AI_21
AI_7	08	26	AI_22
AI_8	09	27	AI_23
AI_9	10	28	AI_24
AI_10	11	29	AI_25
AI_11	12	30	AI_26
AI_12	13	31	AI_27
AI_13	14	32	AI_28
AI_14	15	33	AI_29
AI_15	16	34	AI_30
A.GND	17	35	AI_31
N.C.	18	36	N.C.
Ext_Trg	19	37	D.GND

CON3

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

CON1

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-1002L	PEX-1002H
Analog Input		
Channels	32 Single-ended/16 Differential	
Resolution	12-bit, 8 µs Conversion Time	
Accuracy	0.01% of FSR ±2 LSB @ 25°C, ±10 V	
Sampling Rate	110 kS/s	44 kS/s
Digital Input		
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)	
Digital Output		
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)	
Timer/Counter		
Channels	3	
Resolution	16-bit	
Reference Clock	Internal: 4 MHz	
General		
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	

Ordering Information

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

Features

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

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.

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/A
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/A
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

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

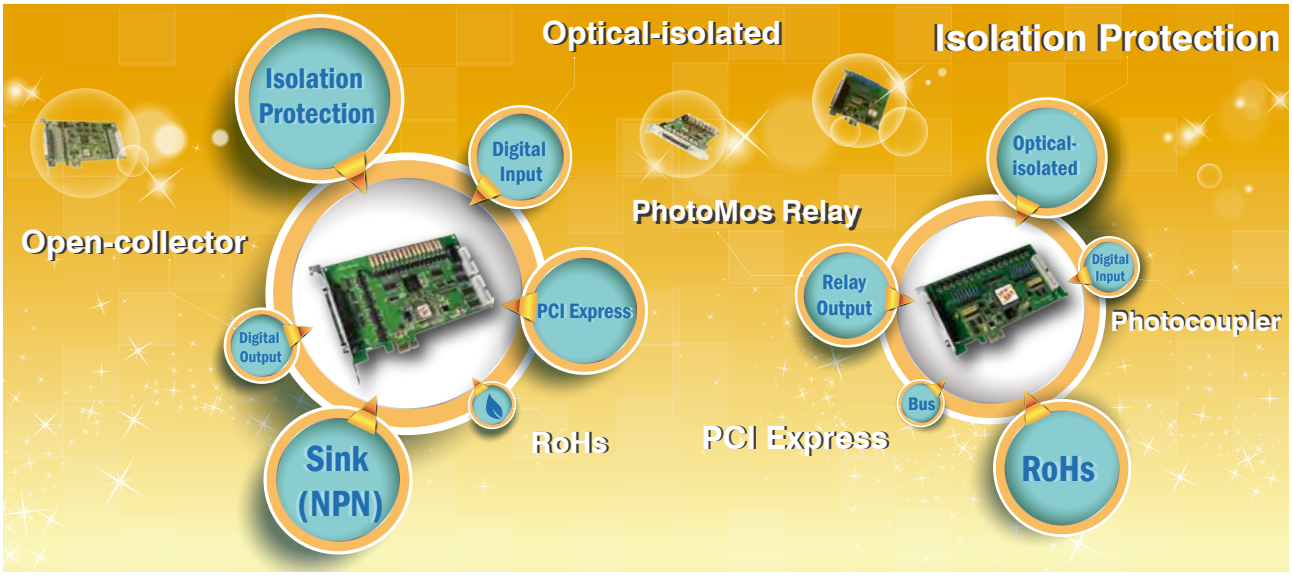
Hardware Specifications

Model	PEX-DA4	PEX-DA8	PEX-DA16
Analog Outputs			
Channels	4	8	16
Resolution	14-bit		
Accuracy	0.01% of FSR ±2 LSB @ 25°C, ±10 V		
Output Range	±10 V, 0 ~ +20 mA		
Output Driving	±5 mA		
Slew Rate	0.71 V/μs		
Digital Inputs			
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)		
Digital Outputs			
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)		
General			
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-channel Analog Output Board (RoHS). Includes one CA-4002 D-sub Connector.
PEX-DA8 CR	PCI Express, 8-channel Analog Output Board (RoHS). Includes one CA-4002 D-sub Connector.
PEX-DA16 CR	PCI Express, 16-channel Analog Output board (RoHS). Includes one CA-4002 D-sub Connector.

2-4 Isolated Digital I/O Boards



Selection Guide

Model	PEX-P8R8i PEX-P16R16i	PEX-P8POR8i PEX-P16POR16i	PEX-P64 -	PEX-P64 -24V	PEX-C64	PEX-P32C32	PEX-P32A32	PEX-730 Isolated	PEX-730 Non-isolated	NEW PEX-730A Isolated	PEX-730A Non-isolated
Interface	PCI Express										
Digital Input											
Channels	8/16	8/16	64		-	32		16	16	16	16
Isolation Voltage	3750 V_{rms}	2000 V_{DC}	3750 V_{rms}		-	3750 V_{rms}		3750 V_{rms}		3750 V_{rms}	
Compatibility	Photocoupler	Photocoupler	Photocoupler		-	Photocoupler		Optical	TTL	Optical	TTL
Input Voltage Logic 0	AC/DC 0 ~ +1 V		0 ~ +1 V		-	0 ~ +1 V		0 ~ +1 V	0.8 V Max.	0 ~ +1 V	0.8 V Max.
Input Voltage Logic 1	AC/DC +5 ~ +24 V		+5 ~ +15 V	+20 ~ +28 V	-	+9 ~ +24 V		+9 ~ +24 V	2.0 V Min.	+9 ~ +24 V	2.0 V Min
Input Impedance	1.2 KΩ, 0.5 W	1.2 KΩ, 0.5 W	1.2 KΩ, 1 W	3 KΩ, 1 W	-	3 KΩ, 0.25 W		1.2 KΩ, 1 W		1.2 KΩ, 1 W	
Relay Output											
Channels	8/16	8/16	-		-	-		-		-	
Relay Type	4 SPDT, 4 SPST/ 8 SPDT, 8 SPST	PhotoMos Relay (Form A)	-		-	-		-		-	
Contact Rating	AC: 120 V @ 0.5 A DC: 24 V @ 1 A	Load Voltage: 300 V (AC Peak or DC) Load Current: 130 mA	-		-	-		-		-	
Insulation Resistance	1000 MΩ @ 500 V_{DC}		-		-	-		-		-	
Digital Output											
Channels	-	-	-		64	32		16	16	16	16
Isolation Voltage	-	-	-		3750 V_{rms}	3750 V_{rms}		3750 V_{rms}		3750 V_{rms}	
Compatibility	-	-	-		Sink	Sink	Source	Sink	5 V/TLL	Source	5 V/TLL
Output Capability	-	-	-		100 mA/+30 V for each channel @ 60% duty	100 mA/+30 V for each channel @ 100% duty		100 mA/+30 V for each channel @ 100% duty	Sink: 2.4 mA @ 0.8 V Source: 0.8 mA @ 2.0 V	100 mA/+30 V for each channel @ 100% duty	Sink: 2.4 mA @ 0.8 V Source: 0.8 mA @ 2.0 V
Page	**2-9**	**2-10**	**2-11**		**2-12**	**2-13**		**2-14**		**2-14**	

PEX-P8R8i/PEX-P16R16i

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

PEX-P8R8i PEX-P16R16i

Features

- PCI Express x1 Interface
- Supports Card ID (SMD Switch)
- 8/16-channel Relay Output
  - 7 ms Relay Release Time
- 8/16-channel Isolated Digital Input
  - Selectable DC Signal Input Filter
  - AC Signal Input with Filter
  - 2000 V_{DC} Photo-isolation Protection

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_{rms} 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.

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-P8R8i	PEX-P16R16i
Digital Input			
Isolation Voltage		2000 V_{DC} (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)	
Relay Output			
Channels		8	16
Relay Type		4 SPDT, 4 SPST	8 SPDT, 8 SPST
Contact Rating	Voltage	120 V_{AC}/24 V_{DC}	
	Current	1 A	
Operating Time		1 ms (Typical)	
Lifetime		Mechanical: 5,000,000 ops. Electrical: 100,000 ops.	
Insulation Resistance		1000 MΩ @ 500 V_{DC}	
General			
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	

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
NO_0	01	20	NO_3
COM_0	02	21	COM_3
NC_0	03	22	NC_3
NO_1	04	23	NO_4
COM_1	05	24	COM_4
NC_1	06	25	NO_5
NO_2	07	26	COM_5
COM_2	08	27	NO_6
NC_2	09	28	COM_6
NO_7	10	29	GND
COM_7	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		

CON1

Pin Assignment	Terminal No.		Pin Assignment
NO_8	01	02	NO_11
COM_8	03	04	COM_11
NC_8	05	06	NC_11
NO_9	07	08	NO_12
COM_9	09	10	COM_12
NC_9	11	12	NO_13
NO_10	13	14	COM_13
COM_10	15	16	NO_14
NC_10	17	18	COM_14
NO_15	19	20	GND
COM_15	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/A
N/A	39	40	N/A

CON2 (PEX-P16R16i only)

Ordering Information

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

PEX-P8POR8i/PEX-P16POR16i

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

PEX-P8POR8i PEX-P16POR16i

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 V_{DC} Photo-isolation Protection
- 8/16-channel PhotoMOS Relay Output
  - Supports DO Status Readback (Register Level)
  - 0.05 ms Release Time
  - Long Life and High Reliability PhotoMos Relay
  - Low Leakage Current when PhotoMos Relay is OFF
  - No Contact Bounce, No Sparking

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 V_{DC} 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
Digital Input			
Isolation Voltage		2000 V_{DC} (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)	
Relay Output			
Channels		8	16
Relay Type		PhotoMos, Form A	
Contact Rating	Voltage	300 V (AC peak or DC)	
	Current	130 mA	
Operating Time		0.7 ms (Typical)	
Insulation Resistance		1000 MΩ @ 500 V_{DC}	
Electrical Endurance		Long Life and No Spike	
General			
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	

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/A	09	28	N/A
N/A	10	29	N/A / GND
N/A	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		

CON1

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/A	17	18	N/A
N/A	19	20	N/A / GND
N/A	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/A
N/A	39	40	N/A

CON2 (PEX-P16POR16i only)

Ordering Information

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

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_{DC} Isolation) for Dry-Contact Input
- Supports Card ID (SMD Switch)
- 3750 V_{rms} Photo-isolation Protection
- Digital Input 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_{DC} 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 Vrms 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.

Software

Drivers

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

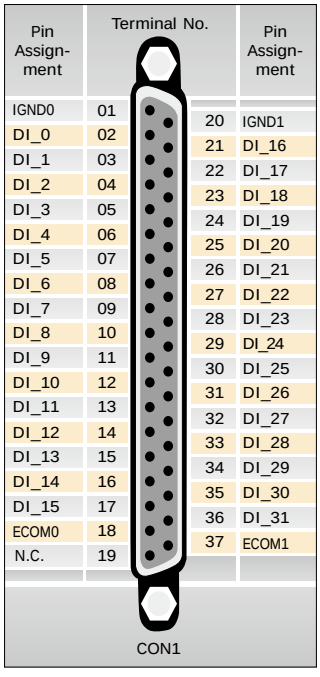
Sample Programs

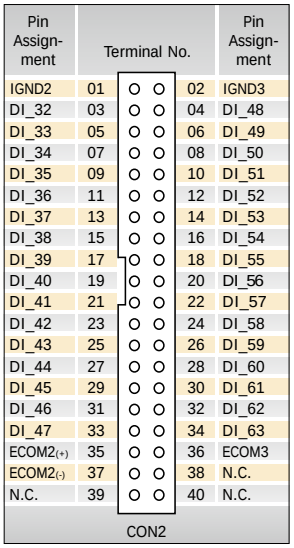
- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

Hardware Specifications

Model	PEX-P64	PEX-P64-24V
Digital Input		
Isolation Voltage	3750 V_{rms}	
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)	
General		
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	

Pin Assignments





Ordering Information

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

PEX-C64

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

Features

- PCI Express x1 Interface
- 64-channel Optically-isolated Digital Output (Sink, NPN)
  - Supports Output Status Readback
- Supports Card ID (SMD Switch)
- 3750 V_{rms} Photo-isolation Protection
- Digital Input 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 V_{rms} 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

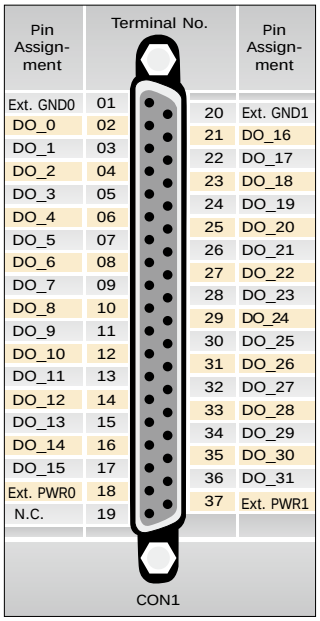
Sample Programs

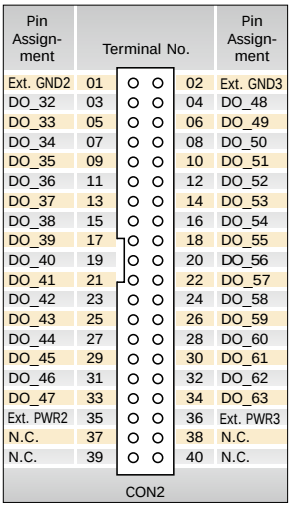
- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

Hardware Specifications

Digital Output	
Isolation Voltage	3750 V_{rms}
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

Pin Assignments





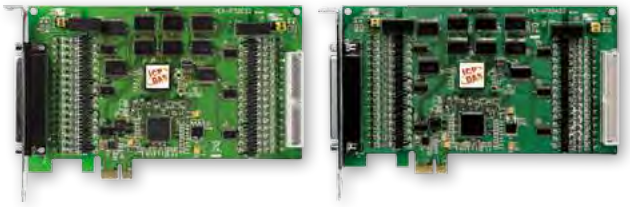
Ordering Information

PEX-C64 CR	PCI Express, 64-channel Optically-isolated Digital Output Board (Sink, NPN, RoHS). Includes one CA-4037B 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

PEX-P32C32 PEX-P32A32



Features

- PCI Express x1 Interface
- 32-channel Optically-isolated Digital Input
  - Internal Power (3000 V_{DC} Isolation) for Dry-Contact Input
- 3750 V_{rms} 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)

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.

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
Ext. GND0	01	20	Ext. GND0
DI_0	02	21	DO_0
DI_1	03	22	DO_1
DI_2	04	23	DO_2
DI_3	05	24	DO_3
DI_4	06	25	DO_4
DI_5	07	26	DO_5
DI_6	08	27	DO_6
DI_7	09	28	DO_7
DI_8	10	29	DO_8
DI_9	11	30	DO_9
DI_10	12	31	DO_10
DI_11	13	32	DO_11
DI_12	14	33	DO_12
DI_13	15	34	DO_13
DI_14	16	35	DO_14
DI_15	17	36	DO_15
ECOM0	18	37	Ext. PWR0
IGND0	19		

CON1

Pin Assignment	Terminal No.		Pin Assignment
Ext. GND1	01	02	Ext. GND1
DI_16	03	04	DO_16
DI_17	05	06	DO_17
DI_18	07	08	DO_18
DI_19	09	10	DO_19
DI_20	11	12	DO_20
DI_21	13	14	DO_21
DI_22	15	16	DO_22
DI_23	17	18	DO_23
DI_24	19	20	DO_24
DI_25	21	22	DO_25
DI_26	23	24	DO_26
DI_27	25	26	DO_27
DI_28	27	28	DO_28
DI_29	29	30	DO_29
DI_30	31	32	DO_30
DI_31	33	34	DO_31
ECOM1	35	36	Ext. PWR1
IGND1	37	38	N/A
N/A	39	40	N/A

CON2

Hardware Specifications

Model	PEX-P32C32	PEX-P32A32
Digital Input		
Isolation Voltage	3750 Vrms	
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 KΩ, 0.25 W	
Digital Output		
Isolation Voltage	3750 Vrms	
Channels	32	
Compatibility	Sink, Open-collector	Source, Open-collector
Output Capability	100 mA/+30 V for each channel @ 100% duty	
General		
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	

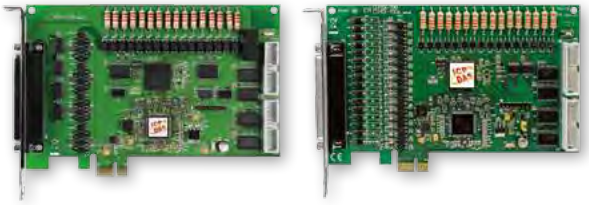
Ordering Information

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-730/PEX-730A NEW

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

PEX-730 PEX-730A



Features

- PCI Express x1 Interface
- 16-channel Optically-isolated Digital Input
- 16-channel Optically-isolated Digital Output
  - PEX-730: Current Sinking (NPN)
  - PEX-730A: Current Sourcing (PNP)
- Supports Output Status Readback
- Supports Card ID (SMD Switch)
- 3750 V_{rms} Photo-isolation Protection
- Internal Power (3000 V_{DC} isolation) for Dry-contact Input
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
- Two Interrupt Sources

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 V_{rms} 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 NPN (Current Sinking for PEX-730) or PNP (Current Sourcing for 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.

These cards 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/PISO-730A without any software/driver modification.

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
IDI_0	01		
IDI_2	02	20	IDI_1
IDI_4	03	21	IDI_3
IDI_6	04	22	IDI_5
IDI_8	05	23	IDI_7
IDI_10	06	24	IDI_9
IDI_12	07	25	IDI_11
IDI_14	08	26	IDI_13
EI.COM1	09	27	IDI_15
EO.COM1	10	28	EI.COM2
IDO_0	11	29	IGND
IDO_2	12	30	IDO1
IDO_4	13	31	IDO3
IDO_6	14	32	IDO5
IDO_8	15	33	IDO7
IDO_10	16	34	IDO9
IDO_12	17	35	IDO11
IDO_14	18	36	IDO13
EO.COM2	19	37	IDO15

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

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-730	PEX-730A
Isolated Digital Input		
Channels	16	
Compatibility	Optical	
Isolation Voltage	3750 V_{rms}	
Input Voltage	Logic 0: 0 ~ +1 V, Logic 1: +9 ~ +24 V	
Input Impedance	1.2 KΩ, 1 W	
Response Speed	4 kHz (Typical)	
Isolated Digital Output		
Channels	16	
Compatibility	Sink (NPN), Open Collector	Source (PNP), Open Collector
Isolation Voltage	3750 V_{rms}	
Output Capability	100 mA/+30 V for each channel @ 100% duty	
Response Speed	4 kHz (Typical)	
Non-isolated Digital Input		
Channels	16	
Compatibility	5 V/TTL	
Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.	
Response Speed	500 kHz	
Non-isolated Digital Output		
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	
General		
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	

2-5 Non-isolated Digital I/O Boards

Selection Guide

Model	PEX-D24	PEX-D48	PEX-D56	PEX-D96S	PEX-D144S
Interface	PCI Express				
Programmable DI/O					
Channels	24	48	24	96	144
Digital Input					
Channels	-	-	16	-	-
Compatibility	5 V/TTL	5 V/TTL	5 V/TTL	5 V/CMOS	5 V/CMOS
Input Voltage	Logic 0: 0.8 Max. Logic 1: 2.0 Min.	Logic 0: 0.8 Max. Logic 1: 2.0 Min.	Logic 0: 0.8 Max. Logic 1: 2.0 Min.	Logic 0: 0.8 Max. Logic 1: 2.0 Min.	Logic 0: 0.8 Max. Logic 1: 2.0 Min.
Digital Output					
Channels	-	-	16	-	-
Compatibility	5 V/TTL	5 V/TTL	5 V/TTL	5 V/CMOS	5 V/CMOS
Output Voltage	Logic 0: 0.4 V Max. Logic 1: 2.4 V Min.	Logic 0: 0.4 V Max. Logic 1: 2.4 V Min.	Logic 0: 0.4 V Max. Logic 1: 2.4 V Min.	Logic 0: 0.1 V Max. Logic 1: 4.4 V Min.	Logic 0: 0.1 V Max. Logic 1: 4.4 V Min.
Timer/Counter					
Channels	-	2	-	-	-
Connector					
100-pin SCSI II	-	-	-	1	1
50-pin Header	-	1	-	-	1
37-pin D-Sub	1	1	1	-	-
20-pin Header	-	-	2	-	-
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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)
- Emulates two Industrial-standard 8255 PPI Ports (Mode 0)
- DI/O Response Time approximately 2 μs (500 kHz Max.)
- 24/56 Buffered TTL Digital Input/Output Lines
- Three 8-bit Bi-directional I/O Ports
- DO Provides Higher Driving Capability
- Four Interrupt Sources

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

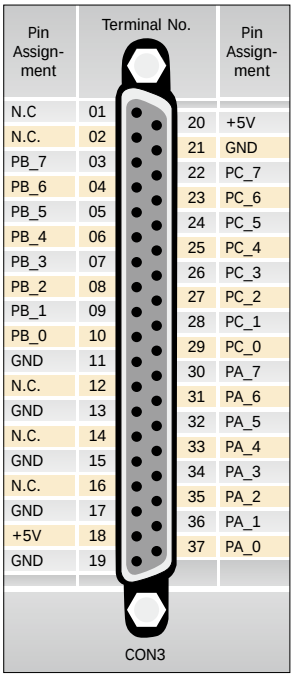
Sample Programs

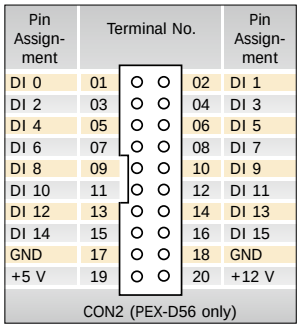
- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

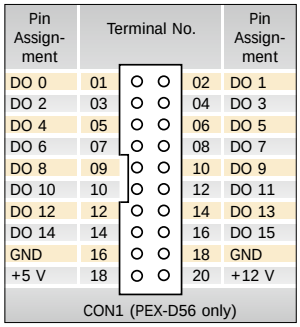
Hardware Specifications

Model	PEX-D24	PEX-D56	
Programmable DI/O			
Channels	24		
Digital Input			
Channels	-	16	
Compatibility	5 V/TTL		
Input Voltage	Logic 0: 0.8 V Max. Logic 1: 2.0 V Min.		
Response Speed	500 kHz		
Digital Output			
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		
General			
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		

Pin Assignments







Ordering Information

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

PEX-D48

PCI Express, 48-channel Digital I/O Board

Features

- PCI Express x1 Interface
- Supports Card ID (SMD Switch)
- Emulates two Industrial-standard 8255 PPI Ports (Mode 0)
- DI/O Response Time approximately 2 µs (500 kHz Max.)
- 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
- Four Interrupt Sources

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

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		

CN1

Pin Assignment	Terminal No.		Pin Assignment
PC_7	01	02	GND
PC_6	03	04	GND
PC_5	05	06	GND
PC_4	07	08	GND
PC_3	09	10	GND
PC_2	11	12	GND
PC_1	13	14	GND
PC_0	15	16	GND
PB_7	17	18	GND
PB_6	19	20	GND
PB_5	21	22	GND
PB_4	23	24	GND
PB_3	25	26	GND
PB_2	27	28	GND
PB_1	29	30	GND
PB_0	31	32	GND
PA_7	33	34	GND
PA_6	35	36	GND
PA_5	37	38	GND
PA_4	39	40	GND
PA_3	41	42	GND
PA_2	43	44	GND
PA_1	45	46	GND
PA_0	47	48	GND
+5 V	49	50	GND

CN2

Hardware Specifications

Programmable DI/O	
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

Ordering Information

PEX-D48 CR	PCI Express, 48-channel Digital I/O Board (RoHS)

PEX-D96S/PEX-D144LS

PCI Express, 96/144-channel Digital I/O Board

PEX-D96S

PEX-D144LS

Features

- PCI Express x1 Interface
- Supports Card ID (SMD Switch)
- DI/O Response Time approximately 2 μs (500 kHz Max.)
- DO Provides Higher Driving Capability
- 96/144 Buffered CMOS Digital Input/Output Lines
- Twelve/Eighteen 8-bit Bi-directional I/O Ports
- Four Interrupt Sources
- Pull-high/Pull-low Jumpers for DI Channels

Introduction

The PEX-D96S/D144LS utilizes the PCI Express bus and designed as an easy replacement for the PIO-D96U/D96SU/D144U/D144LU without requiring any modification to the software or the driver.

The PEX-D96S/D144LS provides a high-density connector that reduces the amount of installation space required for the card in the computer.

The PEX-D96S/D144LS supports the 96/144 CMOS digital I/O lines that consist of twelve/eighteen 8-bit bi-direction ports: port A (PA), port B (PB) and port C (PC) in a connector. All ports are configured as input ports during power-on or after a reset.

The PEX-D96S/D144LS also includes an onboard Card ID that enables the board to be recognized via software if two or more cards are installed in the same computer.

Hardware Specifications

Model	PEX-D96S	PEX-D144LS
Programmable DI/O		
Channels	96	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	Female SCSI II 100-pin x 1	Female SCSI II 100-pin 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	

Ordering Information

PEX-D96S CR	PCI Express, 96-channel Digital I/O Board (RoHS)
PEX-D144LS CR	PCI Express, 144-channel Digital I/O Board (RoHS)

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
PA_00	01	51	PA_10
PA_01	02	52	PA_11
PA_02	03	53	PA_12
PA_03	04	54	PA_13
PA_04	05	55	PA_14
PA_05	06	56	PA_15
PA_06	07	57	PA_16
PA_07	08	58	PA_17
PB_00	09	59	PB_10
PB_01	10	60	PB_11
PB_02	11	61	PB_12
PB_03	12	62	PB_13
PB_04	13	63	PB_14
PB_05	14	64	PB_15
PB_06	15	65	PB_16
PB_07	16	66	PB_17
PC_00	17	67	PC_10
PC_01	18	68	PC_11
PC_02	19	69	PC_12
PC_03	20	70	PC_13
PC_04	21	71	PC_14
PC_05	22	72	PC_15
PC_06	23	73	PC_16
PC_07	24	74	PC_17
GND	25	75	GND
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

CON1

Pin Assignment	Terminal No.		Pin Assignment
GND	01	02	+5 V
PA_40	03	04	PA_50
PA_41	05	06	PA_51
PA_42	07	08	PA_52
PA_43	09	10	PA_53
PA_44	11	12	PA_54
PA_45	13	14	PA_55
PA_46	15	16	PA_56
PA_47	17	18	PA_57
PB_40	19	20	PB_50
PB_41	21	22	PB_51
PB_42	23	24	PB_52
PB_43	25	26	PB_53
PB_44	27	28	PB_54
PB_45	29	30	PB_55
PB_46	31	32	PB_56
PB_47	33	34	PB_57
PC_40	35	36	PC_50
PC_41	37	38	PC_51
PC_42	39	40	PC_52
PC_43	41	42	PC_53
PC_44	43	44	PC_54
PC_45	45	46	PC_55
PC_46	47	48	PC_56
PC_47	49	50	PC_57

CON2 (PEX-D144LS only)

3. PCI Bus Data Acquisition Boards

Selection Guide

3-1 High Speed Multifunction Board

3-2 Multifunction Board

Model		PCI-2602U	PCI-826	PCI-822	PCI-1802		PCI-1800		PCI-1602		PCI-1202		PCI-1002		PIO-821		PISO-813U
			LU	LU	LU	HU	LU	HU	U	FU	LU	HU	LU	HU	LU	HU	
Interface		Universal PCI															
Analog Input																	
Resolution		16-bit	16-bit	12-bit	12-bit		12-bit		16-bit		12-bit		12-bit		12-bit		12-bit
Channels	SE	16	32		32		16		32		32		32		16		32
	Diif.	8	16		16		8		16		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	40 KS/s	110 KS/s	44 KS/s	45 KS/s		10 KS/s
FIFO Size		8 k	8 k		8 k		1 k		8 k		1 k		-		-		-
Unipolar Input		-	-		✓		✓		-		✓		-		-		✓
Bipolar Input		✓	✓		✓		✓		✓		✓		✓		✓		✓
Analog Output																	
Resolution		16-bit	16-bit		12-bit		12-bit		12-bit		12-bit		-		12-bit		-
Channels		2	2		2		2		2		2		-		1		-
Output Voltage		±10 V, ±5 V, ±EXT_REF, 0 ~ +10 V, 0 ~ +5 V, 0~EXT_REF	±5 V, ±10 V 0 ~ +5 V, 0 ~ +10 V		±5, ±10		±5 V, ±10 V		±5 V, ±10 V		±5 V, ±10 V		-		0 ~ +10 V, 0 ~ +5 V, 0 ~ EXT_REF		-
Digital I/O																	
DI Channels		-	-		16		16		16		16		16		16		-
DO Channels		-	-		16		16		16		16		16		16		-
Programmable DIO Channels		32	32		-		-		-		-		-		-		-
Compatibility		DI: 5 V/TTL DO: 5 V/CMOS	5 V/TTL		5 V/TTL		5 V/TTL		5 V/TTL		5 V/TTL		5 V/TTL		5 V/TTL		-
Timer/Counter																	
Channels		-	-		1		1		1		1		1		3		-
Resolution		-	-		16-bit		16-bit		16-bit		16-bit		16-bit		16-bit		-
Clock Source		-	-		8 MHz		8 MHz		8 MHz		8 MHz		4 MHz		2 MHz		-
Page		**3-2**	**3-6**		**3-7**		**3-8**		**3-9**		**3-10**		**3-11**		**3-12**		**3-13**

3-1 High Speed Multifunction Board

PCI-2602U

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 Analog Pattern Generator
- 32-channel Programmable DI/O
  - Supports DO Status Readback (Register Level)
  - 512-sample Hardware FIFO for 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 Data Transfer: Polling, Interrupt, DMA
  - AD R/L Filter Function
  - AD Continuous Capture
  - AD Auto-calibration Function

Introduction

The PCI-2602U is a high-performance multifunction card that provides Analog and Digital I/O functions for high-speed data transfer, analog signal measurement, I/O control and pattern generation applications, etc. The card features a continuous, 1 MS/s 16-bit resolution AD converter, an 8 K-sample hardware FIFO, a 2-channel 16-bit DA converter, and 32-channel programmable Digital I/O with Digital Output readback. The PCI-2602U provides either 16-channel single-ended or 8-channel differential Analog Input, which is selectable via software, and is equipped with a high speed PGA featuring programmable gain.

In addition, the PCI-2602U card also provides the following advantages:

❶ Card ID

The PCI-2602U also includes an onboard Card ID that enables the board to be recognized via software if two or more PCI-2602U cards are installed in the same computer.

❷ Programmable Digital Input Filters (DI)

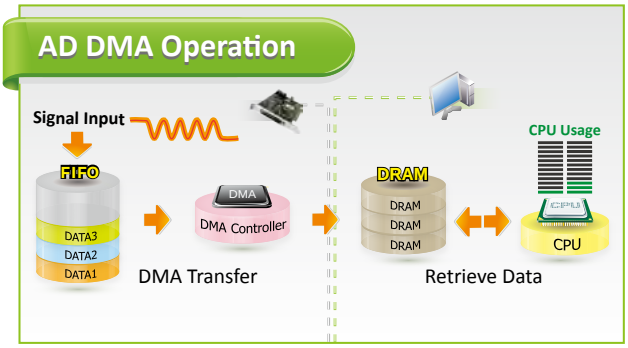
Programmable Digital Input filters can be employed to remove noise, glitches, and spikes on Digital Input ports, as well as to denounce the signal from the switch and relays in noisy industrial environments to prevent false readings caused by noise. The filter for the Digital Input channel can be configured by setting the filter time in seconds, preventing invalid readings and false triggers related to status change detection events.

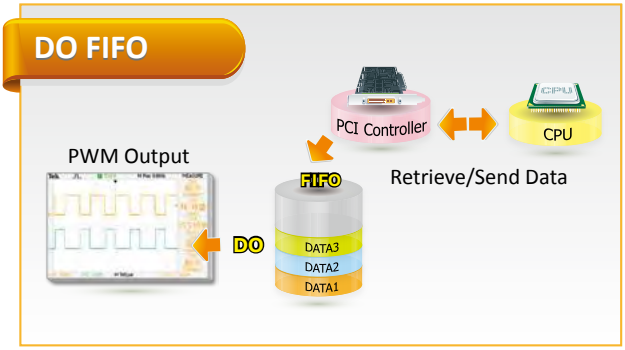
❸ Analog Pattern Generator (DA)

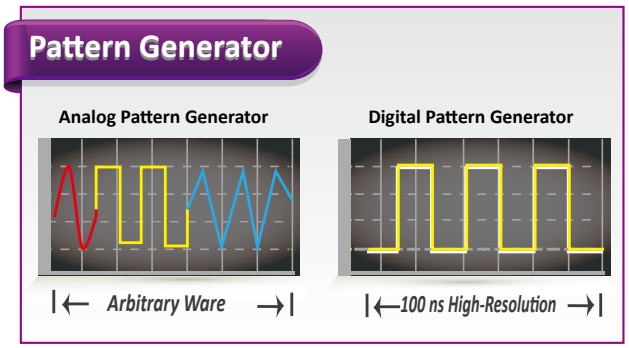
The PCI-2602 can be used to generate arbitrary wave shapes on a single Analog Output port based on user-defined waveform patterns. The Analog Pattern Generator operates at a full 20 MHz rate and is suitable for control systems or radar simulation, etc. The user-defined waveform pattern is stored in the onboard memory with a length of 512 samples of 16-bit data for simple- or complex-pattern applications.

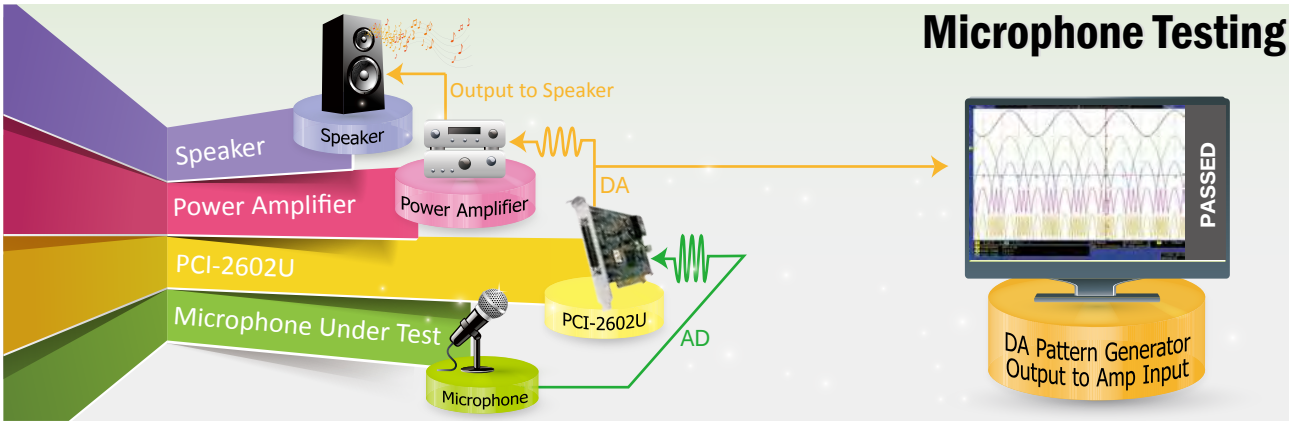
❹ Digital Pattern Generator (DO)

The PCI-2602U can be used to continuously output a digital pattern on the Digital Output port by utilizing a user-defined data pattern and rate that is based on 100 ns high-resolution timing (10 MHz).







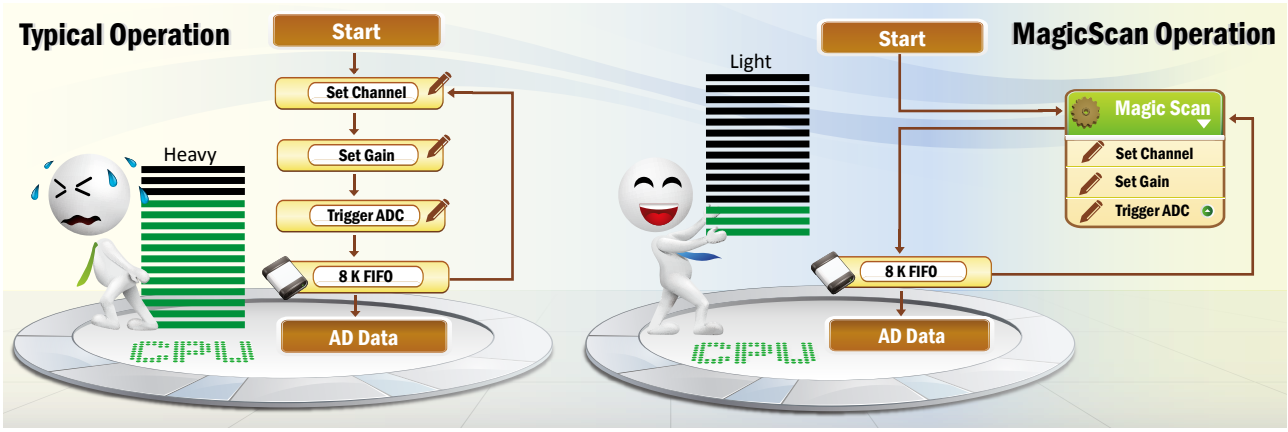


❺ AD Continuous Capture

PCI-2602U provides the AD continuous capture function. The continuous capture refers to the acquisition of an unspecified number of samples. Instead of acquiring a set number of data samples and stopping, a continuous acquisition continues until you stop the operation.

❻ MagicScan (AD)

The AD channel scan function, called MagicScan, eliminates the majority of the effort required to acquire the AD value, 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 channel scan mode, a different gain code can be used for each channel, and the sampling rate can still achieve a total of 1 MS/s.

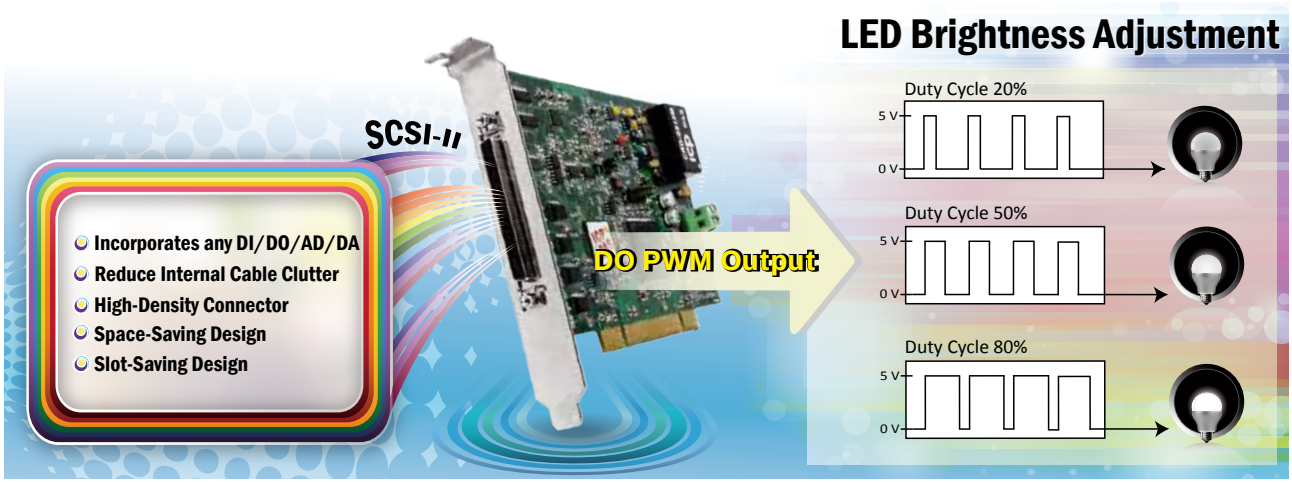


❼ Pulse Width Modulation (PWM, DO)

PCI-2602U is capable of producing PWM signals. PWM signals can be generated as a digital signal, using digital output line(s) from PA. PWM signals are most commonly used to control from controlling valves or pumps to adjusting the brightness of an LED.

❽ SCSI II Connector

PCI-2602U provides a single SCSI II 68-pin high-density connector that reduces the required installation space and slot of the card in the computer and incorporates 32 programmable Digital I/O channels, 16 analog input channels and 2 analog output channels.

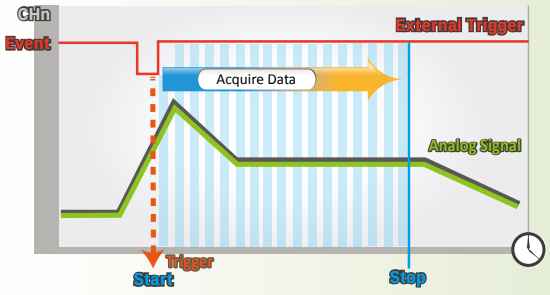


❾ AD External Trigger

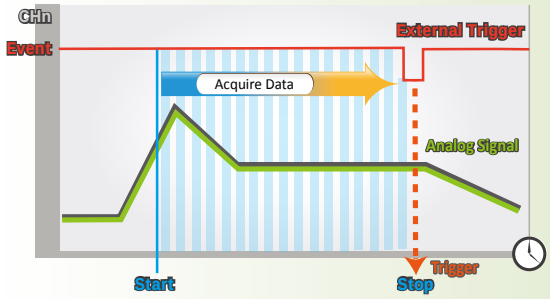
Synchronization of the data acquisition process relative to an external event is an important criterion in many applications. For example, user may want to collect data after receiving a pulse signal from an encoder or when the temperature of a chamber exceeds a critical value. In such instances, the PCI-2602U must be set up to start the ADC as soon as the external event, or trigger, occurs. PCI-2602U supports both analog and digital triggers.

■ **Digital Trigger: Post-trigger, Middle-trigger, Pre-trigger and Delay-trigger**

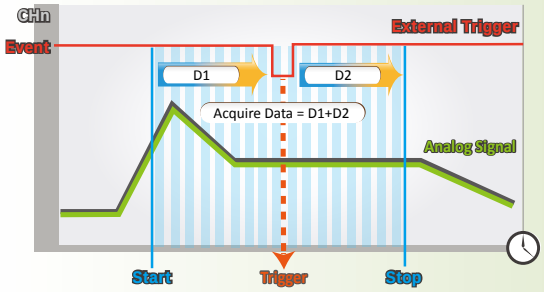
○ **Post-trigger Mode:** In post-trigger mode, the signals are digitized after a trigger condition occurs.



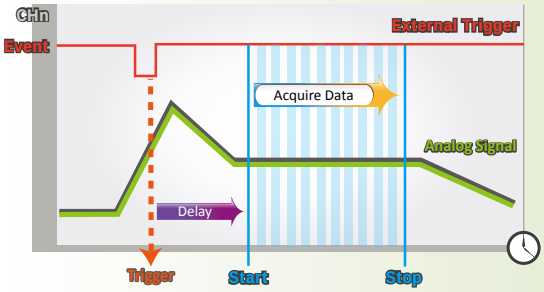
○ **Pre-trigger Mode:** In pre-trigger mode, the signals are digitized before a trigger condition occurs.



○ **Middle-trigger Mode:** In middle-trigger mode, the signals are digitized both before and after a trigger condition occurs.

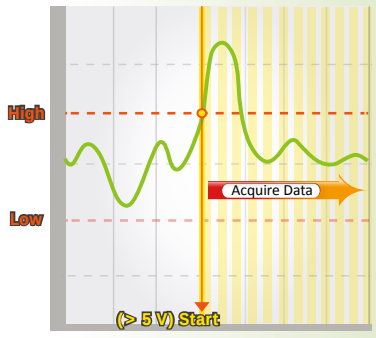


○ **Delay-trigger Mode:** In delay-trigger mode, signal capture begins once the programmed delay period from the trigger has elapsed.

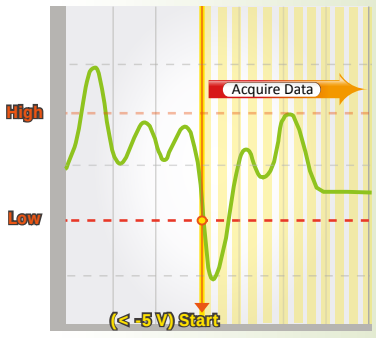


■ **Analog Trigger:** There are six different types of analog trigger, as illustrated below:

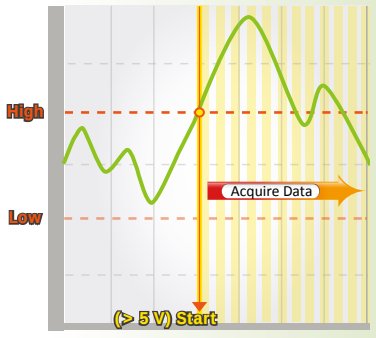
○ Type 1: Above High



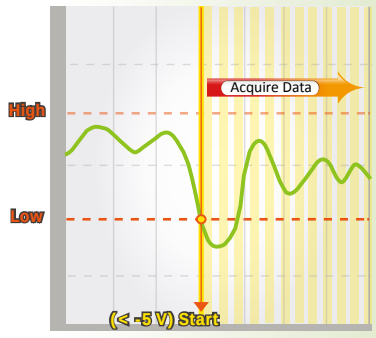
○ Type 2: Below Low



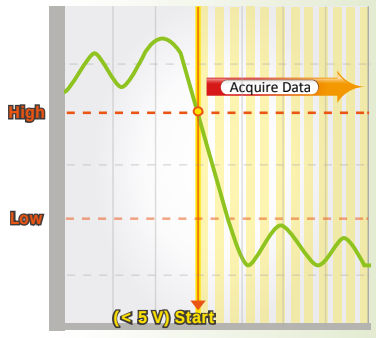
○ Type 3A: Leave-region



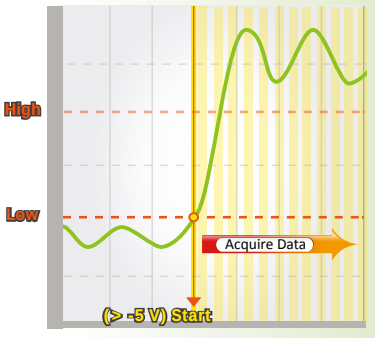
○ Type 3B: Leave-region



○ Type 4A: Entry-region



○ Type 4B: Entry-region



Software

Drivers

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

Sample Programs

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

Pin Assignments

Pin Assignment	Terminal No.		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
PD7	06		40	PD6
PD5	07		41	PD4
PD3	08		42	PD2
PD1	09		43	PD0
PC7	10		44	PC6
PC5	11		45	PC4
PC3	12		46	PC2
PC1	13		47	PC0
D_GND	14		48	D_GND
PB7	15		49	PB6
PB5	16		50	PB4
PB3	17		51	PB2
PB1	18		52	PB0
PA7	19		53	PA6
PA5	20		54	PA4
PA3	21		55	PA2
PA1	22		56	PA0
AO_GND	23		57	AO_GND
AO1_OUT	24		58	AO0_OUT
AO1_REF	25		59	AO0_REF
AI_GND	26		60	AI_GND
AI15	27		61	AI14
AI13	28		62	AI12
AI11	29		63	AI10
AI9	30		64	AI8
AI7	31		65	AI6
AI5	32		66	AI4
AI3	33		67	AI2
AI1	34		68	AI0

Female SCSI 68-pin (CON1)

Hardware Specifications

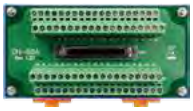
Analog Input	
Channels	16 Single-ended/8 Differential
AD Converter	16-bit, 1 μs conversion time
Sampling Rate	1 MS/s (Max.)
FIFO Size	8192 Samples
Bipolar Range	±10.24 V, ±5.12 V, ±2.56 V
Analog Output	
Channels	2
Resolution	16-bit
FIFO Size	512 Samples
Output Rate	20 MS/s (Max.)
Output Range	±10 V, ±5 V, ±EXT_REF, 0 ~ +10 V, 0 ~ +5 V, 0 ~ EXT_REF
Programmable Digital I/O	
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 Voltage	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	Female SCSI II 68-pin 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

PCI-2602U CR	Universal PCI, 1 MS/s High-Speed, 16-channel Analog Input, 2-channel Analog Output and 32-channel DI/O (RoHS)

Accessories

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


DN-68A


CA-SCSI15-H

3-2 Multifunction Boards

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

PCI-822LU

PCI-826LU

Features

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 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
  - Supports Software-trigger and Pacer-trigger
  - 8 K-sample Hardware FIFO
- 2-channel, 16-bit Analog Output
- 32-channel programmable DI/O
  - Pull-high and Pull-low Resistors for DI Channels
  - Supports Digital Output Status Readback (Register Level)

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.

Software

Drivers

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

Sample Programs

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

Hardware Specifications

Model	PCI-822LU	PCI-826LU
Analog Input		
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 ±1 LSB @ 25°C, ±10 V	
Analog Output		
Channels	2	
Resolution	16-bit	
Accuracy	±6 LSB	
Output Driving	±5 mA	
Output Range	±5 V, ±10 V, 0 ~ +10 V, 0 ~ +5 V	
Slew Rate	8.33 V/μs	
Programmable Digital I/O		
Channels	32	
Compatibility	5 V/TTL	
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	800 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

Pin Assignments

CON3

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		

CON1

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

CON2

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

Ordering Information

PCI-822LU CR	Universal PCI, 250 kS/s, 32-channel 12-bit Analog Input, 2-channel 16-bit Analog Output and 32-channel Programmable DI/O (RoHS). Includes one CA-4002 D-sub connector.
PCI-826LU CR	Universal PCI, 250 kS/s, 32-channel 16-bit Analog Input, 2-channel 16-bit Analog Output and 32-channel Programmable DI/O (RoHS). Includes one CA-4002 D-sub connector.

PCI-1802LU/PCI-1802HU

Universal PCI, 32-channel, 12-bit, 330 or 44 kS/s
Multifunction Board (8 K word FIFO)

Features

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 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
- 32 Single-ended/16 Differential Analog Input Channels
  - 12-bit, 330 kS/s or 44 kS/s AD Converter
  - Built-in MagicScan Controller
  - Internal Trigger: Software-trigger, Pacer-trigger
  - External Trigger: Post-trigger, Pre-trigger, Middle-trigger
- High-speed data transfer rate up to 2.7 M words/sec.

Introduction

The PCI-1802LU/HU card is designed as an easy replacement for the PCI-1802L/H without requiring any modification to the software or the driver.

The PCI-1802LU/HU is a high-performance multifunction card that provides high-speed Analog and Digital I/O functions. The PCI-1802LU/HU is based on the Universal PCI interface, supporting both the 3.3 V and the 5 V PCI bus, and features a continuous 330 kS/s or 44 kS/s 12-bit resolution AD converter, an 8 K-sample hardware FIFO, a MagicScan controller (for multi-channel scanning), a 2-channel 12-bit DA converter, and 16-channel Digital Input and 16-channel Digital Output.

The PCI-1802LU/HU provides either 32-channel single-ended or 16-channel differential Analog Inputs that are jumper selectable, and a programmable high-speed PGA that is equipped for gain controls (0.5/1/2/4/8 for Low Gain, and 0.5/1/5/10/50/100/500/1000 for High Gain).

The PCI-1802LU/HU also includes an onboard Card ID switch and pull-high/low DI resistors. The Card ID enables the board to be recognized via software if two or more PCI-1802LU/HU cards are installed in the same computer. The pull-high/pull-low resistors allow the DI status to be predefined instead of remaining floating if the DI channels are disconnected or interrupted.

Pin Assignments

Pin Assignment		Pin Assignment
AI_0	01	
AI_1	02	
AI_2	03	
AI_3	04	
AI_4	05	
AI_5	06	
AI_6	07	
AI_7	08	
AI_8	09	
AI_9	10	
AI_10	11	
AI_11	12	
AI_12	13	
AI_13	14	
AI_14	15	
AI_15	16	
A.GND	17	
Da1 out	18	
Ext_Trg	19	
	20	AI_16
	21	AI_17
	22	AI_18
	23	AI_19
	24	AI_20
	25	AI_21
	26	AI_22
	27	AI_23
	28	AI_24
	29	AI_25
	30	AI_26
	31	AI_27
	32	AI_28
	33	AI_29
	34	AI_30
	35	AI_31
	36	Da2 out
	37	D.GND

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	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

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

Software

Drivers

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

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	PCI-1802LU	PCI-1802HU
Analog Input		
Channels	32 Single-ended/16 Differential	
AD Conversion	12-bit, 3 µs Conversion Time	
Accuracy	0.01% of FSR ±1 LSB @ 25 °C, ±10 V	
FIFO Size	8192 Samples	
Sampling Rate	330 kS/s	44 kS/s
Analog Output		
Channels	2	
Resolution	12-bit	
Accuracy	0.06% of FSR ±1 LSB @ 25°C, ±10 V	
Output Driving	±5 mA	
Output Range	±5 V, ±10 V	
Digital I/O		
Channels DI	16, 5 V/TTL	
Channels DO	16, 5 V/TTL	
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	
Timer/Counter		
Channels	3	
Resolution	16-bit	
Input Frequency	10 MHz Max.	
Reference Clock	Internal: 8 MHz	
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	300 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

Ordering Information

PCI-1802LU CR	Universal PCI, 32-channel, 12-bit, 330 kS/s Low Gain Multifunction DAQ Board (RoHS). Includes one CA-4002 D-sub Connector.
PCI-1802HU CR	Universal PCI, 32-channel, 12-bit, 44 kS/s High Gain Multifunction DAQ Board (RoHS). Includes one CA-4002 D-sub Connector.

PCI-1800LU/PCI-1800HU

Universal PCI, 16-channel, 12-bit, 330 or 44 kS/s
Multifunction Board (1 K word FIFO)

Features

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 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
- 16 Single-ended/8 Differential Analog Input Channels
  - 12-bit, 330 kS/s or 44 kS/s AD Converter
  - Built-in MagicScan Controller
  - Internal Trigger: Software-trigger, Pacer-trigger
  - External Trigger: Post-trigger, Pre-trigger, Middle-trigger
- High-speed data transfer rate up to 2.7 M words/sec.

Introduction

The PCI-1800LU/HU card is designed as an easy replacement for the PCI-1800L/H without requiring any modification to the software or the driver.

The PCI-1800LU/HU is a high-performance multifunction card that provides high-speed Analog and Digital I/O functions. The PCI-1800LU/HU is based on the Universal PCI interface, supporting both the 3.3 V and the 5 V PCI bus, and features a continuous 330 kS/s or 44 kS/s 12-bit resolution AD converter, a 1 K-sample hardware FIFO, a MagicScan controller (for multi-channel scanning), a 2-channel 12-bit D/A converter, and 16-channel Digital Input and 16-channel Digital Output.

The PCI-1800LU/HU provides either 16-channel single-ended or 8-channel differential Analog Inputs that are jumper selectable, and a programmable high-speed PGA that is equipped for gain controls (0.5/1/2/4/8 for Low Gain, and 0.5/1/5/10/50/100/500/1000 for High Gain).

The PCI-1800LU/HU also includes an onboard Card ID switch and pull-high/low DI resistors. The Card ID enables the board to be recognized via software if two or more PCI-1800LU/HU cards are installed in the same computer. The pull-high/pull-low resistors allow the DI status to be predefined instead of remaining floating if the DI channels are disconnected or interrupted.

Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
AI_0	01	
AI_1	02	
AI_2	03	
AI_3	04	
AI_4	05	
AI_5	06	
AI_6	07	
AI_7	08	
A.GND	09	
A.GND	10	
N.C.	11	
N.C.	12	
+12 V out	13	
A.GND	14	
D.GND	15	
N.C.	16	
Ext_Trig	17	
Da1 out	18	
+5 V out	19	
	20	AI_8
	21	AI_9
	22	AI_10
	23	AI_11
	24	AI_12
	25	AI_13
	26	AI_14
	27	AI_15
	28	A.GND
	29	A.GND
	30	DA out0
	31	N.C.
	32	DA out1
	33	N.C.
	34	N.C.
	35	N.C.
	36	N.C.
	37	N.C.

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	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

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

Software

Drivers

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

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		PCI-1800LU	PCI-1800HU
Analog Input			
Channels		16 Single-ended/8 Differential	
AD Conversion		12-bit, 3 µs Conversion Time	
Accuracy		0.01% of FSR ±1 LSB @ 25 °C, ±10 V	
FIFO Size		1024 Samples	
Sampling Rate		330 kS/s	44 kS/s
Analog Output			
Channels		2	
Resolution		12-bit	
Accuracy		0.06% of FSR ±1 LSB @ 25°C, ±10 V	
Output Driving		±5 mA	
Output Range		±5 V, ±10 V	
Digital I/O			
Channels	DI	16, 5 V/TTL	
	DO	16, 5 V/TTL	
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	
Timer/Counter			
Channels		3	
Resolution		16-bit	
Input Frequency		10 MHz Max.	
Reference Clock		Internal: 8 MHz	
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		300 mA @ +5 V	
Operating Temperature		0°C to +60°C	
Humidity		5 to 85% RH, Non-condensing	

Ordering Information

PCI-1800LU CR	Universal PCI, 16-channel, 12-bit, 330 kS/s Low Gain Multifunction DAQ Board (RoHS). Includes one CA-4002 D-sub Connector
PCI-1800HU CR	Universal PCI, 16-channel, 12-bit, 44 kS/s High Gain Multifunction DAQ Board (RoHS). Includes one CA-4002 D-sub Connector.

PCI-1602U/PCI-1602FU

Universal PCI, 32-channel, 16-bit, 100 or 200 kS/s
Multifunction Board (8 K word FIFO)

Features

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 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
- 32 Single-ended/16 Differential Analog Input Channels
  - 12-bit, 100 kS/s or 200 kS/s AD Converter
  - Built-in MagicScan Controller
  - Internal Trigger: Software-trigger, Pacer-trigger
  - External Trigger: Post-trigger, Pre-trigger, Middle-trigger
- High-speed data transfer rate up to 2.1 M words/sec.

Introduction

The PCI-1602U/FU is a high-performance multifunction card providing high-speed Analog and Digital I/O functions. The PCI-1602U/FU is based on the Universal PCI interface, supporting both the 3.3 V and the 5 V PCI bus, and features a continuous 100 kS/s (200 kS/s for the F version) 16-bit resolution AD converter, an 8 K-sample hardware FIFO, a MagicScan controller (for multi-channel scanning), a 2-channel 16-bit DA converter, and 16-channel Digital Input and 16-channel Digital Output.

The PCI-1602U/FU provides either 32-channel single-ended or 16-channel differential Analog Inputs that are jumper selectable, and a programmable high-speed PGA that is equipped for gain controls (1, 2, 4 and 8). The PCI-1602U/FU is fully compatible with the PCI-1602/F, and is designed as a direct replacement without requiring any modification to the software or the driver.

The PCI-1602U/FU also includes an onboard Card ID switch that enables the board to be recognized via software if two or more PCI-1602U/FU cards are installed in the same computer. The pull-high/low resistors allow the DI status to be predefined instead of remaining floating if the DI channels are disconnected or interrupted.

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		

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	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

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

Software

Drivers

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

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	PCI-1602U	PCI-1602FU
Analog Input		
Channels	32 Single-ended/16 Differential	
AD Conversion	16-bit, 2 µs Conversion Time	
Accuracy	0.01% of FSR ±1 LSB @ 25 °C, ±10 V	
FIFO Size	8192 Samples	
Sampling Rate	100 kS/s	200 kS/s
Analog Output		
Channels	2	
Resolution	12-bit	
Accuracy	0.06% of FSR ±1 LSB @ 25°C, ±10 V	
Output Driving	±5 mA	
Output Range	Bipolar: ±5 V, ±10 V	
Digital I/O		
Channels	DI: 16, 5 V/TTL	
	DO: 16, 5 V/TTL	
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	
Timer/Counter		
Channels	3	
Resolution	16-bit	
Input Frequency	10 MHz Max.	
Reference Clock	Internal: 8 MHz	
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	300 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

Ordering Information

PCI-1602U CR	Universal PCI, 32-channel 16-bit, 100 kS/s Low Gain, Multifunction DAQ Board (RoHS). Includes one CA-4002 D-sub connector
PCI-1602FU CR	Universal PCI, 32-channel 16-bit, 200 kS/s Low Gain, Multifunction DAQ Board (RoHS). Includes one CA-4002 D-sub connector

PCI-1202LU/PCI-1202HU

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

Features

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 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
- 32 Single-ended/16 Differential Analog Input Channels
  - 12-bit, 110 kS/s or 44 kS/s AD Converter
  - Built-in MagicScan Controller
  - Internal Trigger: Software-trigger, Pacer-trigger
  - External Trigger: Post-trigger, Pre-trigger, Middle-trigger
- High-speed data transfer rate up to 2.1 M words/sec.

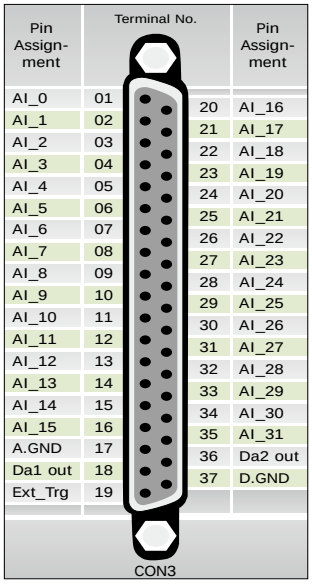
Introduction

The PCI-1202 series is a family of high performance data acquisition boards that feature continuous gap-free data acquisition in DOS at 110 kHz for low gain or 44 kHz for high gain. The PCI-1202 family has the same hardware architecture as the PCI-1802, and provides 32-channel single-ended or 16-channel differential Analog Inputs. As with the PCI-1802 family, the PCI-1202 series features both the Magic Scan and Continuous Capture functions.

The PCI-1202LU/HU Universal PCI card supports both the 3.3 V and the 5 V PCI bus. The PCI-1202LU/HU cards are fully compatible with PCI-1202L/H cards and are designed as direct replacements without requiring any modification to the software or the driver, with the main difference being the addition of DI pull-high/low resistors and a Card ID switch on the PCI-1202LU/HU.

The PCI-1202LU/8K and PCI-1202HU/8K cards are equipped with an 8K-sample hardware FIFO that reduces data overflow issues in multi-tasking environments such as Windows and Linux.

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		

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	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

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

Software

Drivers

- 32/64-bit Windows XP/2003/20087/8/10
- Linux
- DASYLab

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		PCI-1202LU	PCI-1202HU
Analog Input			
Channels		32 Single-ended/16 Differential	
AD Conversion		12-bit, 8.5 µs Conversion Time	
Accuracy		0.1% of FSR ±1 LSB @ 25 °C, ±10 V	
FIFO Size		1024 Samples	
Sampling Rate		110 kS/s	44 kS/s
Analog Output			
Channels		2	
Resolution		12-bit	
Accuracy		0.06% of FSR ±1 LSB @ 25°C, ±10 V	
Output Driving		±5 mA	
Output Range		±5 V, ±10 V	
Digital I/O			
Channels	DI	16, 5 V/TTL	
	DO	16, 5 V/TTL	
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	
Timer/Counter			
Channels		3	
Resolution		16-bit	
Input Frequency		10 MHz Max.	
Reference Clock		Internal: 8 MHz	
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		300 mA @ +5 V	
Operating Temperature		0°C to +60°C	
Humidity		5 to 85% RH, Non-condensing	

Ordering Information

PCI-1202LU CR	Universal PCI, 32-channel 12-bit, 110 kS/s Low Gain, Multifunction DAQ Board (1 K word FIFO) (RoHS). Includes one CA-4002 D-sub connector.
PCI-1202HU CR	Universal PCI, 32-channel 12-bit, 44 kS/s High Gain, Multifunction DAQ Board (1 K word FIFO) (RoHS). Includes one CA-4002 D-sub connector.
PCI-1202LU/8K CR	Universal PCI, 32-channel 12-bit, 110 kS/s Low Gain, Multifunction DAQ Board (8 K word FIFO) (RoHS). Includes one CA-4002 D-sub connector.
PCI-1202HU/8K CR	Universal PCI, 32-channel 12-bit, 44 kS/s High Gain, Multifunction DAQ Board (8 K word FIFO) (RoHS). Includes one CA-4002 D-sub connector.

PCI-1002LU/PCI-1002HU

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

Features

- Universal PCI (3.3 V/5 V) Interface
- 32 Single-ended/16 Differential Analog Input Channels
  - 12-bit, 110 kS/s or 44 kS/s AD Converter
  - Internal 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)

Introduction

The PCI-1002LU/HU card is designed as an easy replacement for the PCI-1002L/H without requiring any modification to the software or the driver.

The PCI-1002LU/PCI-1002HU is an AD board that supports both the 3.3 V and the 5 V PCI bus and features low gain Analog Input at 110 kS/s or high gain at 44 kS/s. The PCI-1002LU/PCI-1002HU provides 32 single-ended or 16 differential 12-bit Analog Input channels, 16 Digital Input channels, and 16 Digital Output channels. The pull-high/low resistors allow the DI status to be predefined 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
- DASYLab

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	PCI-1002LU	PCI-1002HU
Analog Input		
Channels	32 Single-ended/16 Differential	
A/D Converter	12-bit, 8 µs Conversion Time	
Accuracy	0.01% of FSR ±2 LSB @ 25 °C, ±10 V	
Sampling Rate	110 kS/s	44 kS/s
Digital Inputs		
Channels	16	
Compatibility	5 V/TTL	
Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.	
Response Speed	1.0 MHz (Typical)	
Digital Outputs		
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	1.0 MHz (Typical)	
Timer/Counter		
Channels	3	
Resolution	16-bit	
Input Frequency	10 MHz Max.	
Reference Clock	Internal: 4 MHz	
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	800 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

Pin Assignments

CON3

Pin Assignment	Terminal No.		Pin Assignment
AI_0	01		
AI_1	02		
AI_2	03		
AI_3	04		
AI_4	05		
AI_5	06		
AI_6	07		
AI_7	08		
AI_8	09		
AI_9	10		
AI_10	11		
AI_11	12		
AI_12	13		
AI_13	14		
AI_14	15		
AI_15	16		
A.GND	17		
N.C.	18		
Ext_Trg	19		
		20	AI_16
		21	AI_17
		22	AI_18
		23	AI_19
		24	AI_20
		25	AI_21
		26	AI_22
		27	AI_23
		28	AI_24
		29	AI_25
		30	AI_26
		31	AI_27
		32	AI_28
		33	AI_29
		34	AI_30
		35	AI_31
		36	N.C.
		37	D.GND

CON2

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

CON1

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

Ordering Information

PCI-1002LU CR	Universal PCI, 32-channel 12-bit, 110 kS/s Low Gain, Multifunction DAQ Board (RoHS). Includes one CA-4002 D-sub Connector.
PCI-1002UH CR	Universal PCI, 32-channel, 12-bit, 44 kS/s High Gain, Multifunction DAQ Board (RoHS). Includes one CA-4002 D-sub Connector.
PCI-1002LU/S CR	PCI-1002LU with DB-1825 Daughterboard and Cable (RoHS). Includes one CA-3710 D-sub Cable.
PCI-1002UH/S CR	PCI-1002HU with DB-1825 Daughterboard and Cable (RoHS). Includes one CA-3710 D-sub Cable.

PIO-821LU/PIO-821HU

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

Features

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

Introduction

The PIO-821LU/HU card is designed as an easy replacement for the PIO-821L/H without requiring any modification to the software or the driver.

The PIO-821LU/HU is a multifunction board for PC/AT compatible computers. The PIO-821LU provides for low gain (1, 2, 4, 8), and the PIO-821HU supports high gain (1, 10, 100, 1000). The PIO-821L/H contains a 12-bit ADC with up to 16 single-ended or 8 differential Analog Input channels. The cards also have a 12-bit DAC voltage output and 16 TTL-compatible Digital Input and Digital Output channels, respectively. The maximum sampling rate for the AD converter is around 45 kS/s.

The PIO-821LU/HU also includes an onboard Card ID switch and pull-high/low DI resistors. The Card ID enables the board to be recognized via software if two or more PIO-821LU/HU cards are installed in the same computer. The pull-high/pull-low resistors allow the DI status to be predefined 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

- ☑ 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_8
AI_1	02	21	AI_9
AI_2	03	22	AI_10
AI_3	04	23	AI_11
AI_4	05	24	AI_12
AI_5	06	25	AI_13
AI_6	07	26	AI_14
AI_7	08	27	AI_15
A.GND	09	28	A.GND
A.GND	10	29	A.GND
N.C.	11	30	DAOUT
N.C.	12	31	N.C.
+12V	13	32	GATE0
A.GND	14	33	N.C.
D.GND	15	34	GATE2
COUT0	16	35	COUT2
N.C.	17	36	EXT_INT
COUT1	18	37	EXT_CLK
VCC	19		

CON3

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

CON1

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

CON2

Hardware Specifications

Model		PIO-821LU	PIO-821HU
Analog Input			
Channels		16 Single-ended/8 Differential	
AD Conversion		12-bit, 8 µs Conversion Time	
Accuracy		0.01% of FSR ±1 LSB @ 25 °C, ±10 V	
Sampling Rate		45 kS/s	
Analog Output			
Channels		2	
Resolution		12-bit	
Accuracy		0.01% of FSR ±1/2 LSB @ 25°C, ±10 V	
Output Driving		±5 mA	
Output Range		Unipolar: 0 ~ +5 V, 0 ~ +10 V, 0 ~ Ext Ref	
Digital I/O			
Channels	DI	16, 5 V/TTL	
	DO	16, 5 V/TTL	
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	
Response Speed		1.2 MHz (Typical)	
Timer/Counter			
Channels		3	
Resolution		16-bit	
Input Frequency		10 MHz Max.	
Reference Clock		Internal: 2 MHz	
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		960 mA @ +5 V	
Operating Temperature		0°C to +60°C	
Humidity		5 to 85% RH, Non-condensing	

Ordering Information

PIO-821LU CR	Universal PCI, 16-channel, 12-bit, 45 kS/s Low Gain, Multifunction DAQ Board.
PIO-821HU CR	Universal PCI, 16-channel, 12-bit, 45 kS/s High Gain, Multifunction DAQ Board.

PISO-813U

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

Features

- Universal PCI (3.3 V/5 V) Interface
- 32 Single-ended Analog Input Channels
  - Bipolar Input: ±0.625 V, ±1.25 V, ±2.5 V, ±5 V, ±10 V
  - Unipolar Input: 0 ~ +0.625 V, 0 ~ +1.25 V, 0 ~ +2.5 V, 0 ~ +5 V, 0 ~ +10 V
  - Programmable Gain Control: 1, 2, 4, 8, 16
  - AD Trigger: Software-trigger
  - 12-bit, 10 kS/s AD Converter
  - 3750 V_{rms} Bus Isolation Protection
  - Built-in DC/DC Converter with 3000 V_{DC} Protection
- Supports Card ID (SMD Switch)

Introduction

The PISO-813U card is designed as an easy replacement for the PISO-813 without requiring any modification to the software or the driver.

The PISO-813U is a bus-type isolated 12-bit AD board that supports both the 3.3 V and the 5 V PCI bus and features 10 kHz data acquisitions under both DOS and Windows, and provides 32 single-ended Analog Input channels. The isolation range of the board has been increased to 3000 V, making it the most cost effective solution when considering isolated AD boards for the PCI bus.

The PISO-813U also includes an onboard Card ID that enables the board to be recognized via software if two or more PISO-813U cards are installed in the same computer.

Software

Drivers

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

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

Analog Input	
Isolation Voltage	3750 V_{rms} (Bus Type)
Channels	32 Single-ended
A/D Converter	12-bit, 8 µs Conversion Time
Accuracy	0.01% of FSR ±1 LSB @ 25°C, ±10 V
Sampling Rate	10 kS/s
Input Impedance	10 MΩ/6 pF
Trigger Modes	Software
Data Transfer	Polling
General	
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz
Card ID	Yes (4-bit)
Connectors	Female DB37 x 1
Power Consumption	850 mA @ +5 V
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

Pin Assignments

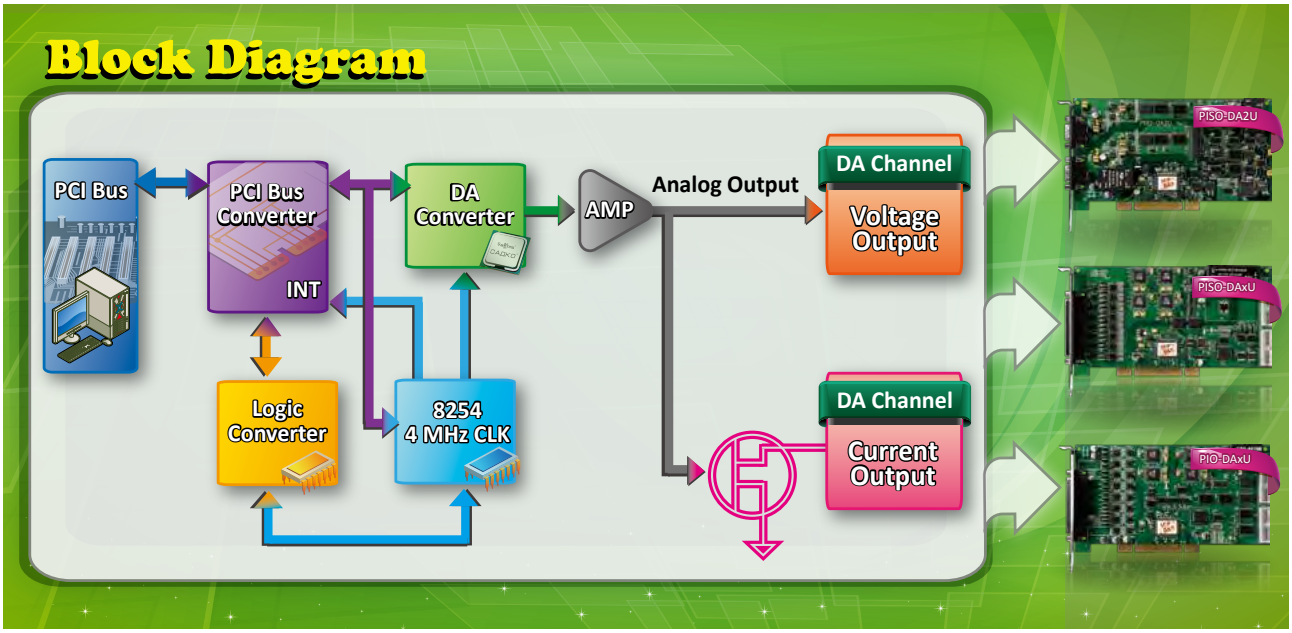
Pin Assignment	Terminal No.		Pin Assignment
AI_0	01	20	AI_1
AI_2	02	21	AI_3
AI_4	03	22	AI_5
AI_6	04	23	AI_7
AI_8	05	24	AI_9
AI_10	06	25	AI_11
AI_12	07	26	AI_13
AI_14	08	27	AI_15
A.GND	09	28	A.GND
A.GND	10	29	A.GND
AI_16	11	30	AI_17
AI_18	12	31	AI_19
AI_20	13	32	AI_21
AI_22	14	33	AI_23
AI_24	15	34	AI_25
AI_26	16	35	AI_27
AI_28	17	36	AI_29
AI_30	18	37	AI_31
A.GND	19		

CON1

Ordering Information

PISO-813U CR	Universal PCI, 12-bit, 10 kS/s, 32-channel Isolated Analog Input Board (RoHS). Includes one CA-4002 D-sub connector.
PISO-813U/S CR	PISO-813U CR with DB-8325 daughterboard. Includes one CA-4002 D-sub connector.

3-3 Analog Output Boards



Selection Guide

Model	PISO-DA2U	PISO-DA4U	PISO-DA8U	PISO-DA16U	PIO-DA4U	PIO-DA8U	PIO-DA16U
Interface	Universal PCI						
Analog Output							
Channels	2	4	8	16	4	8	16
Resolution	12-bit	14-bit	14-bit	14-bit	14-bit	14-bit	14-bit
Isolation Voltage	3750 V_{DC}	2500 V_{DC}	2500 V_{DC}	2500 V_{DC}	-	-	-
Isolation Type	Bus Type, cH-to-cH	Bus Type	Bus Type	Bus Type	-	-	-
Built-in DC/DC Converter	3000 V_{DC}	3000 V_{DC}	3000 V_{DC}	3000 V_{DC}	-	-	-
Output Voltage	±5 V ±10 V 0 ~ +5 V 0 ~ +10 V	±10 V	±10 V	±10 V	±10 V	±10 V	±10 V
Output Current	0 ~ +20 mA +4 ~ +20 mA	0 ~ +20 mA	0 ~ +20 mA	0 ~ +20 mA	0 ~ +20 mA	0 ~ +20 mA	0 ~ +20 mA
Output Driving	±5 mA	±5 mA	±5 mA	±5 mA	±5 mA	±5 mA	±5 mA
Digital I/O							
DI Channels	-	16	16	16	16	16	16
DO Channels	-	16	16	16	16	16	16
Compatibility	-	5 V/TTL	5 V/TTL	5 V/TTL	5 V/TTL	5 V/TTL	5 V/TTL
Timer/Counter							
Channels	-	3	3	3	3	3	3
Resolution	-	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit
Clock Source	-	4 MHz	4 MHz	4 MHz	4 MHz	4 MHz	4 MHz
Page	**3-15**	**3-16**			**3-17**		

PISO-DA2U

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

Features

- Universal PCI (3.3 V/5 V) Interface
- 12-bit, 2-channel Analog Output
  - 3750 V_{DC} Bus and Channel Isolation Protection
  - 3000 V_{DC} Power Isolation Protection
  - Unipolar or Bipolar Analog Output
  - Software Calibration
  - Two Timer-triggered Interrupt Sources
  - Calibration data stored in EEPROM
  - Double-buffered DA Latch
- Supports Card ID (SMD Switch)

Introduction

The PISO-DA2U has 2 Analog Output channels with high-voltage isolation protection and is based on the Universal PCI interface (3.3 V/5V). The PISO-DA2U is fully compatible with the PISO-DA2, and is designed as a direct replacement without requiring any modification to the software or the driver.

The built-in high-quality isolation components on the PISO-DA2U provide 3750 V_{DC} bus-type and channel-to-channel isolation, and offer durable abilities. The voltage output range for the PISO-DA2U can be set to ±10 V, ±5 V, 0 to 10 V, or 0 to 5 V, and the current output range can be either 0 to 20 mA or 4 to 20 mA.

In addition, the PISO-DA2U also features the following innovative advantages:

1. Accurate and easy-to-use calibration:
ICP DAS provides a software calibration function rather than manual calibration so that jumpers and trim-pots are no longer required for calibration, and the calibration data can be saved in the EEPROM for long-term use.

2. Channel-to-channel configuration:
Each channel can be individually configured as either voltage or current output and can be set to a different output range.

3. Card ID:
ICP DAS has also included an onboard Card ID switch on the PISO-DA2U that enables the board to be recognized via software if two or more boards are installed in the same computer.

Pin Assignments

Pin Assignment		Pin Assign-ment		Pin Assignment		Pin Assign-ment
GND	05	09 +15 V		GND	05	09 +15 V
GND	04	08 GND		GND	04	08 GND
ExtREF V Int	03	07 I OUT		ExtREF V Int	03	07 I OUT
GND	02	06 GND		GND	02	06 GND
V OUT	01			V OUT	01	

CN1 CN2

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

Analog Output		
Channels		2
Isolation Voltage		3750 V (Bus Type, Channel-to-Channel)
Resolution		12-bit
Accuracy		0.015% of FSR ±1/2 LSB @ 25°C, ±10 V
Output Range	Voltage	±10 V, ±5 V, 0 ~ +10 V, 0 ~ +5 V
	Current	0 ~ +20 mA, +4 ~ +20 mA
Output Driving		±5 mA
Slew Rate		0.15 V/μs
Output Impedance		0.1 Ω Max.
General		
Bus Type		3.3 V/5 V Universal PCI, 32-bit, 33 MHz
Card ID		Yes (4-bit)
Connectors		Male DB9 x 2
Power Consumption		1350 mA @ +5 V
Operating Temperature		0°C to +60°C
Humidity		5 to 85% RH, Non-condensing

Ordering Information

PISO-DA2U CR	Universal PCI,12-bit, 2-channel Isolated Analog Output Board (RoHS). Includes two CA-PC09M D-sub Connectors.
PISO-DA2U/S	PISO-DA2U with DB-8425 daughterboard.

PISO-DA4U/DA8U/DA16U

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

Features

- Universal PCI (3.3 V/5 V) Interface
- 14-bit, 4/8/16-channel Analog Output
  - 2500 V_{DC} Bus and Power Isolation Protection
  - Built-in DC/DC Converter with 3000 V_{DC} Protection
  - Software Calibration
  - Two Timer-triggered Interrupt Sources
  - Double-buffered DA Latch
- Supports Card ID (SMD Switch)
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
  - Pull-high and Pull-low Function for DI Channels

Introduction

The PISO-DA4U/DA8U/DA16U card is designed as an easy replacement for the PIO-DA4/DA8/DA16 without requiring any modification to the software or the driver.

The PISO-DA4U/DA8U/DA16U series provides an additional high-voltage isolation design that protects the Host PC from damage due to unexpected power surges, while the built-in high-quality isolation components provide the boards with 2500 V_{DC} bus-type isolation. The voltage output range for the PISO-DA4U/DA8U/DA16U series is from -10 V to +10 V, and the current output range is from 0 to 20 mA.

In addition, the PISO-DA4U/DA8U/DA16U series also features the following innovative advantages:

1. Accurate and easy-to-use calibration:
ICP DAS provides a software calibration function rather than manual calibration so that jumpers and trim-pots are no longer required for calibration, and the calibration data can be saved in the EEPROM for long-term use.

2. Individual channel configuration:
Each channel can be individually configured as either voltage or current output.

3. Card ID:
ICP DAS has also included an onboard Card ID switch on the PISO-DAxU series that enables the board to be recognized via software if two or more boards are installed in the same computer.

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	A.GND
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	A.GND
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
+5V	19	20	+12V

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
+5V	18	20	+12V

CON2

Software

Drivers

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

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		PISO-DA4U	PISO-DA8U	PISO-DA16U
Analog Output				
Channels		4	8	16
Isolation Voltage		2500 V_{DC} (Bus Type)		
Resolution		14-bit		
Accuracy		0.04% of FSR ±2 LSB @ 25°C, ±10 V		
Output Driving		±5 mA		
Output Range	Voltage	±10 V		
	Current	0 ~ +20 mA		
Output Impedance		0.1 Ω Max.		
Digital I/O				
Channels	DI	16, 5 V/TTL		
	DO	16, 5 V/TTL		
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		
Timer/Counter				
Channels		3		
Resolution		16-bit		
Input Frequency		10 MHz Max.		
Reference Clock		Internal: 4 MHz		
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		2200 mA @ +5 V	2400 mA @ +5 V	3000 mA @ +5 V
Operating Temperature		0°C to +60°C		
Humidity		5 to 85% RH, Non-condensing		

Ordering Information

PISO-DA4U CR	Universal PCI, 4-channel Isolated DA Board (RoHS). Includes one CA-4002 D-sub Connector.
PISO-DA8U CR	Universal PCI, 8-channel Isolated DA Board (RoHS). Includes one CA-4002 D-sub Connector.
PISO-DA16U CR	Universal PCI, 16-channel Isolated DA Board (RoHS). Includes one CA-4002 D-sub Connector.

PIO-DA4U/DA8U/DA16U

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

Features

- Universal PCI (3.3 V/5 V) Interface
- 14-bit, 4/8/16-channel Analog Output
  - Software Calibration
  - Two Timer-triggered Interrupt Sources
  - Double-buffered DA Latch
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
  - Pull-high and Pull-low Function for DI Channels
- Supports Card ID (SMD Switch)

Introduction

The PIO-DA4U/DA8U/DA16U series cards are compatible with the PCI versions of the PIO-DA4/DA8/DA16 cards and, in most cases, the PIO-DA4U/DA8U/DA16U series can be used as a direct replacement for the PIO-DA4/DA8/DA16 series without requiring any modification to the software or the driver.

The voltage output range for the PIO-DA4U/DA8U/DA16U series is from -10 V to +10 V, and the current output range is from 0 to 20 mA.

In addition, the PIO-DA4U/DA8U/DA16U series also features the following innovative advantages:

1. Accurate and easy-to-use calibration:
ICP DAS provides a software calibration function rather than manual calibration so that jumpers and trim-pots are no longer required for calibration, and the calibration data can be saved in the EEPROM for long-term use.

2. Individual channel configuration:
Each channel can be individually configured as either voltage or current output.

3. Card ID:
ICP DAS has also included an onboard Card ID switch on the PIO-DA4U/DA8U/DA16U series that enables the board to be recognized via software if two or more boards are installed in the same computer.

Pin Assignments

CON3

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/A
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/A
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		

CON1

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

CON2

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

Software

Drivers

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

Sample Programs

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

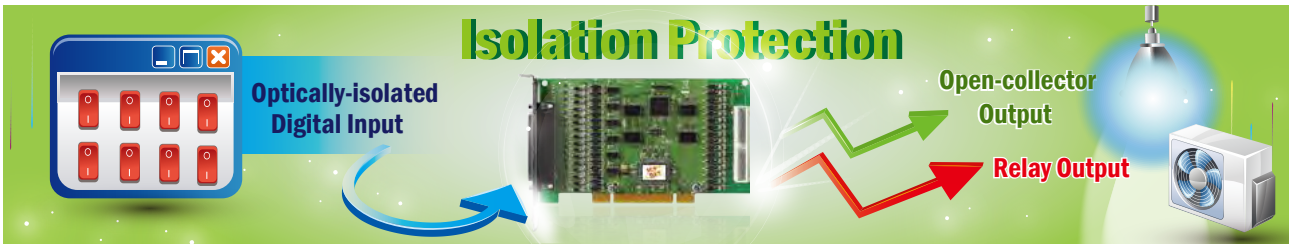
Hardware Specifications

Model	PIO-DA4U	PIO-DA8U	PIO-DA16U
Analog Output			
Channels	4	8	16
Resolution	14-bit		
Accuracy	0.04% of FSR ±2 LSB @ 25°C, ±10 V		
Output Driving	±5 mA		
Output Range – Voltage	±10 V		
Output Range – Current	0 ~ +20 mA		
Output Impedance	0.1 Ω Max.		
Digital I/O			
Channels – DI	16, 5 V/TTL		
Channels – DO	16, 5 V/TTL		
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		
Timer/Counter			
Channels	3		
Resolution	16-bit		
Input Frequency	10 MHz Max.		
Reference Clock	Internal: 4 MHz		
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	600 mA @ +5 V	800mA @ +5 V	1400 mA @ +5 V
Operating Temperature	0°C to +60°C		
Humidity	5 to 85% RH, Non-condensing		

Ordering Information

PIO-DA4U CR	Universal PCI, 4-channel DA Board (RoHS). Includes one CA-4002 D-sub Connector.
PIO-DA8U CR	Universal PCI, 8-channel DA Board (RoHS). Includes one CA-4002 D-sub Connector.
PIO-DA16U CR	Universal PCI, 16-channel DA Board (RoHS). Includes one CA-4002 D-sub Connector.

3-4 Isolated Digital I/O Boards



Selection Guide

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
Interface	Universal PCI					Universal PCI				PCI	Universal PCI	PCI		
Isolated Digital Input														
Channels	32	32		32		32	64		-	-	16		16	
Isolation Voltage	3750 V_{rms}								-	-	3750 V_{rms}			
Input Voltage Logic 0	0 ~ +1 V								-	-	0 ~ +1 V			
Input Voltage 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
Input Impedance	3 KΩ, 0.5 W						1.2 KΩ, 1 W	3 KΩ, 1 W	-	-	1.2 KΩ, 1 W			
Built-in DC/DC Converter	3000 V_{Dc}					-	3000 V_{Dc}		-	-	3000 V_{Dc}		-	
Isolated Digital Output														
Channels	32	32		32		32	-		64	64	16		16	
Type	Sink (NPN)			Source (PNP)		Sink (NPN)	-		Sink (NPN)	Source (PNP)	Sink (NPN)		Source (PNP)	
Isolated Voltage	3750 V_{rms}						-		3750 V_{rms}					
Output Range	100 mA/+30 V for each channel @ 100% duty					500 mA (Max.)	-		100 mA/+30 V for each channel @ 60% duty		100 mA/+30 V for each channel @ 100% duty			
Non-isolated Digital I/O														
DI Channels	-	-		-		-	-		-	-	16		16	
DO Channels	-	-		-		-	-		-	-	16		16	
Compatibility	-	-		-		-	-		-	-	5 V/TTL		5 V/TTL	
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Model	PCI-P8R8U	PCI-P16R16U	PCI-P16C16	PCI-P16POR16U	PISO-P8R8U	PISO-P8SSR8AC	PISO-P8SSR8DC	PISO-P16R16U	PISO-725
Interface	Universal PCI		PCI	Universal PCI	Universal PCI	PCI		Universal PCI	PCI
Isolated Digital Input									
Channels	8 (Optical)	16 (Optical)	16 (Optical)	16 (Optical)	8 (Optical)	8 (Optical)	8 (Optical)	16 (Optical)	8 (Optical)
Isolation Voltage	5000 V_{rms}							3750 V_{rms}	
Input Voltage Logic 0	AC/DC 0 ~ +1 V								
Input Voltage Logic 1	AC/DC +5 ~ +24 V (AC 50 ~ 1 kHz)								
Isolated Digital Output									
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 V_{rms}	-	-	-	-	-	-
Contact Rating DC	24 V @ 1 A		600 mA/ 30 V	Load Voltage: 300 V (AC Peak or DC)	30 V @ 5 A	-	3 ~ 30 V	24 V @ 1 A	1 A/30 V
Contact Rating AC	120 V @ 0.5 A		-		250 V @ 1.6 A	24 ~ 265 V	-	120 V @ 0.5 A	0.3 A/120 V
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PISO-1730U

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

Features

- Universal PCI (3.3 V/5 V) Interface
- 32 Optically-isolated Digital Input Channels
- 32 Optically-isolated Digital Output Channels (Sink, NPN)
- Built-in DC/DC Converter with 3000 V_{DC} Isolation
- 3750 V_{rms} Photo-isolation Protection
- Four Isolated Banks
- Supports Card ID (SMD Switch)

Introduction

The PISO-1730U card offers 32 optically-isolated Digital Input channels and 32 optically-isolated Digital Output channels, arranged into four isolated banks. Each input channel uses a photocoupler, while each output channel contains a Darlington transistor. Both the output port and the input port should use an external power supply. The board eliminates ground-loop problems and isolates the host computer from potentially damaging voltage spikes.

The PISO-1730U card also includes an onboard Card ID switch that enables the board to be recognized via software if two or more boards 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

Pin Assignments

Pin Assignment	Terminal No.		Terminal No.	Pin Assignment
IDO_0	01	20	21	IDO_1
IDO_2	02	21	22	IDO_3
IDO_4	03	22	23	IDO_5
IDO_6	04	23	24	IDO_7
PCOM	05	24	25	IDO_8
IDO_9	06	25	26	IDO_10
IDO_11	07	26	27	IDO_12
IDO_13	08	27	28	IDO_14
IDO_15	09	28	29	PCOM
IDO_16	10	29	30	IDO_17
IDO_18	11	30	31	IDO_19
IDO_20	12	31	32	IDO_21
IDO_22	13	32	33	IDO_23
PCOM	14	33	34	IDO_24
IDO_25	15	34	35	IDO_26
IDO_27	16	35	36	IDO_28
IDO_29	17	36	37	IDO_30
IDO_31	18	37	38	PCOM
EGND	19			

CON1 (Female DB-37)

Pin Assignment	Terminal No.		Terminal No.	Pin Assignment
IDI_0	01		02	IDI_1
IDI_2	03		04	IDI_3
IDI_4	05		06	IDI_5
IDI_6	07		08	IDI_7
PCOM	09		10	IDI_8
IDI_9	11		12	IDI_10
IDI_11	13		14	IDI_12
IDI_13	15		16	IDI_14
IDI_15	17		18	PCOM
IDI_16	19		20	IDI_17
IDI_18	21		22	IDI_19
IDI_20	23		24	IDI_21
IDI_22	25		26	IDI_23
PCOM	27		28	IDI_24
IDI_25	29		30	IDI_26
IDI_27	31		32	IDI_28
IDI_29	33		34	IDI_30
IDI_31	35		36	PCOM
EGND	37		38	N/A
N/A	39		40	N/A

CON2 (40-pin Box Header)

Hardware Specifications

Digital Input	
Channels	32
Isolation Voltage	3750 V_{rms} (Using external power)
Compatibility	Photocoupler (Bi-directional)
Input Voltage	Logic 0: 0 ~ +1 V Logic 1: 9 ~ +24 V
Input Impedance	3 KΩ, 0.5 W
Response Speed	4 kHz (Typical)
Digital Output	
Channels	32
Isolation Voltage	3750 V_{rms}
Compatibility	Sink, Open Collector
Output Capability	100 mA/+30 V for one channel @ 100% duty
Response Speed	4 kHz (Typical)
General	
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz
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

Ordering Information

PISO-1730U CR	Universal PCI Board with 32 Optically-isolated Digital Input Channels and 32 Optically-isolated Open-collector Digital Output Channels (Sink, NPN) (RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.

PISO-P32C32U/PISO-P32C32U-5V

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

Features

- Universal PCI (3.3 V/5 V) Interface
- 32 Optically-isolated Digital Input Channels
- 32 Optically-isolated Digital Output Channels (Sink, NPN)
  - Supports DO Status Readback (Register Level)
- 3750 V_{rms} Photo-isolation Protection
- Four Isolated Banks
- Built-in DC/DC Converter with 3000 V_{DC} Isolation
- Supports Card ID (SMD Switch)

Introduction

The PISO-P32C32U/P32C32U-5V card features 32 optically 32 optically-isolated Digital Input channels and 32 optically-isolated Digital Output channels, arranged into four isolated banks. Each input channel uses a photocoupler, while each output channel contains a Darlington transistor. Either an external power supply or an isolated internal power supply from the PC via a DC/DC converter can be used for the input port, which is selected via a jumper, whereas the output port should use an external power supply. The board eliminates ground-loop problems and isolates the host computer from potentially damaging voltage spikes.

The PISO-P32C32U/P32C32U-5V cards also include an onboard Card ID switch (version 1.1 or above) that enables the board to be recognized via software if two or more boards are installed in the same computer.

The PISO-P32C32U-5V uses lower input impedance that is suitable for 5 V signal applications, while the PISO-P32C32U uses higher input impedance that is suitable for 12 or 24 V signal applications and produces less heat.

Software

Drivers

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

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
Ext. GND0	01	20	Ext. GND0
DI_0	02	21	DO_0
DI_1	03	22	DO_1
DI_2	04	23	DO_2
DI_3	05	24	DO_3
DI_4	06	25	DO_4
DI_5	07	26	DO_5
DI_6	08	27	DO_6
DI_7	09	28	DO_7
DI_8	10	29	DO_8
DI_9	11	30	DO_9
DI_10	12	31	DO_10
DI_11	13	32	DO_11
DI_12	14	33	DO_12
DI_13	15	34	DO_13
DI_14	16	35	DO_14
DI_15	17	36	DO_15
ECOM0	18	37	Ext. PWR0
IGND0	19		

CON1

Pin Assignment	Terminal No.		Pin Assignment
Ext. GND1	01	02	Ext. GND1
DI_16	03	04	DO_16
DI_17	05	06	DO_17
DI_18	07	08	DO_18
DI_19	09	10	DO_19
DI_20	11	12	DO_20
DI_21	13	14	DO_21
DI_22	15	16	DO_22
DI_23	17	18	DO_23
DI_24	19	20	DO_24
DI_25	21	22	DO_25
DI_26	23	24	DO_26
DI_27	25	26	DO_27
DI_28	27	28	DO_28
DI_29	29	30	DO_29
DI_30	31	32	DO_30
DI_31	33	34	DO_31
ECOM1	35	36	Ext. PWR1
IGND1	37	38	N/A
N/A	39	40	N/A

CON2

Hardware Specifications

Model	PISO-P32C32U	PISO-P32C32U-5V
Digital Input		
Channels	32	
Isolation Voltage	3750 V_{rms} (Using external power)	
Compatibility	Photocoupler (Bi-directional)	
Input Voltage	Logic 0: 0 ~ +1 V Logic 1: +9 ~ +24 V	Logic 0: 0 ~ +1 V Logic 1: +5 ~ +12 V
DI Power	External	Internal/External
Input Impedance	3 KΩ, 0.5 W	
Response Speed	4 kHz (Typical)	
Digital Output		
Channels	32	
Isolation Voltage	3750 V_{rms}	
Compatibility	Sink, Open-collector	
Output Capability	100 mA/+30 V for each channel @ 100% duty	
Response Speed	4 kHz (Typical)	
General		
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	
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	

Ordering Information

PISO-P32C32U CR	Universal PCI, 32-channel Optically-isolated Digital Input and 32-channel Optically-isolated Digital Open-collector Digital Output Board. (Sink, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.
PISO-P32C32U-5V CR	Universal PCI, 32-channel Optically-isolated Digital Input (Logic High: +5 ~ +12 V) and 32-channel Optically-isolated Digital Open-collector Digital Output Board. (Sink, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.

PISO-P32A32U/PISO-P32A32U-5V

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

Features

- Universal PCI (3.3 V/5 V) Interface
- 32 Optically-isolated Digital Input Channels
- 32 Optically-isolated Digital Output Channels (Source, PNP)
  - Supports DO Status Readback (Register Level)
- 3750 V_{rms} Photo-isolation Protection
- Built-in DC/DC Converter with 3000 V_{DC} Isolation
- Supports Card ID (SMD Switch)

Introduction

The PISO-P32A32U/P32A32-5V card features 32 optically-isolated Digital Input channels and 32 optically-isolated Digital Output channels, arranged into four isolated banks.

Each Digital Output channel includes a PNP transistor and an integral suppression diode for the inductive load. Isolated input channels 0 - 15 are allocated to Group A, while channels 16 - 31 are allocated to Group B. Isolated output channels are allocated to Groups C and D. The photocoupler input for the PISO-P32A32-5V can be powered by using either an internal current source or an external power supply, while the input for the PISO-P32A32U operates using an external power supply only.

The PISO-P32A32U/P32A32-5V cards also include an onboard Card ID switch that enables the board to be recognized via software if two or more boards are installed in the same computer.

The PISO-P32A32-5V uses lower input impedance that is suitable for 5 V signal applications, while the PISO-P32A32U uses higher input impedance that is suitable for 12 or 24 V signal applications and produces less heat.

Hardware Specifications

Model	PISO-P32A32U	PISO-P32A32U-5V
Digital Input		
Channels	32	
Isolation Voltage	3750 V_{rms} (Using external power)	
Compatibility	Photocoupler (Bi-directional)	
Input Voltage	Logic 0: 0 ~ +1 V Logic 1: +9 ~ +24 V	Logic 0: 0 ~ +1 V Logic 1: +5 ~ +12 V
DI Power	External	Internal/External
Input Impedance	3 KΩ, 0.5 W	
Response Speed	4 kHz (Typical)	
Digital Output		
Channels	32	
Isolation Voltage	3750 V_{rms}	
Compatibility	Source, Open-collector	
Output Capability	100 mA/+30 V for each channel @ 100% duty	
Response Speed	4 kHz (Typical)	
General		
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	
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	

Software

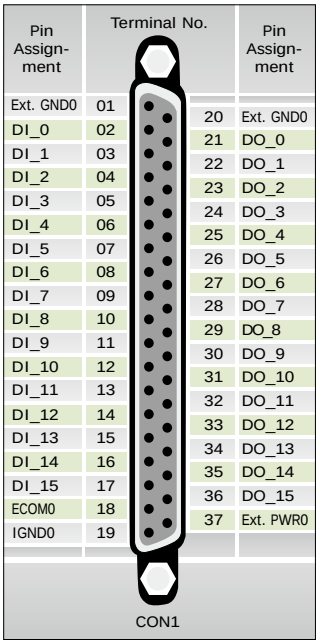
Drivers

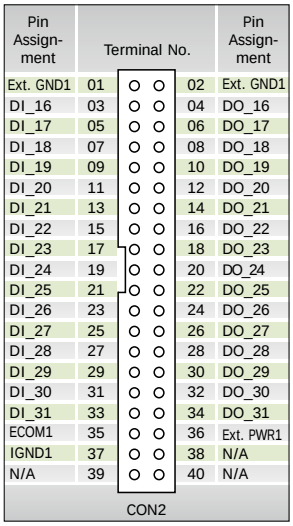
- 32/64-bit Windows XP/2003/2008/7/8/10
- Linux
- DASYLab

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





Ordering Information

PISO-P32A32U CR	Universal PCI, 32-channel Optically-isolated Digital Input and 32-channel Optically-isolated Open-collector Digital Output Board. (Source, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.
PISO-P32A32U-5V CR	Universal PCI, 32-channel Optically-isolated Digital Input (Logic High: +5 ~ +12 V) and 32-channel Optically-isolated Open-collector Digital Output Board. (Source, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.

PISO-P32S32WU

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

Features

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 3750 V_{rms} Photo-isolation Protection
- Input Range up to 30 V_{DC}
- 32 Optically-isolated Digital Input Channels
- 32 Optically-isolated Digital Output Channels (Sink, NPN)
  - 100 mA (24 Channels) Low Driving
  - 500 mA (8 Channels) High Driving

Introduction

PISO-P32S32WU card supports both 3.3 V and 5 V PCI slots and provides 32 optically-isolated Digital Input channels and 32 optically-isolated open-collector Digital Output channels (8 channels for 500 mA and 24 channels for 100 mA current sinking output, NPN), arranged into four isolated banks. Each Digital Input channel uses a photocoupler to isolate the card and the computer from external signals, while each Digital Output channel includes an NPN transistor and an integral suppression diode for the inductive load. The PISO-P32S32WU requires an external power supply to drive the DI and DO ports, and supports Card ID (jumper) features for multi-board identification if two or more boards are installed in the same computer.

The board interfaces to field logic signals, eliminating ground-loop problems and isolating the host computer from potentially damaging voltage spikes.

PISO-P32S32WU contains a single 37-pin D-sub connector and a single 40-pin male header. A 40-pin to DB-37 flat cable is used to fix with the case. The digital signal can be connected through the second D-sub connector, and each D-sub connector supports 16 input and 16 output channels.

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
Ext. GND0	01	20	Ext. GND0
DI_0	02	21	DO0 for high drive
DI_1	03	22	DO1 for high drive
DI_2	04	23	DO2 for high drive
DI_3	05	24	DO3 for high drive
DI_4	06	25	DO_4
DI_5	07	26	DO_5
DI_6	08	27	DO_6
DI_7	09	28	DO_7
DI_8	10	29	DO_8
DI_9	11	30	DO_9
DI_10	12	31	DO_10
DI_11	13	32	DO_11
DI_12	14	33	DO_12
DI_13	15	34	DO_13
DI_14	16	35	DO_14
DI_15	17	36	DO_15
GND for High drive	18	37	Ext. PWR0
GND for High drive	19		

CON1

Pin Assignment	Terminal No.		Pin Assignment
Ext. GND1	01	02	Ext. GND1
DI_16	03	04	DO16 for high drive
DI_17	05	06	DO17 for high drive
DI_18	07	08	DO18 for high drive
DI_19	09	10	DO19 for high drive
DI_20	11	12	DO_20
DI_21	13	14	DO_21
DI_22	15	16	DO_22
DI_23	17	18	DO_23
DI_24	19	20	DO_24
DI_25	21	22	DO_25
DI_26	23	24	DO_26
DI_27	25	26	DO_27
DI_28	27	28	DO_28
DI_29	29	30	DO_29
DI_30	31	32	DO_30
DI_31	33	34	DO_31
GND for High drive	35	36	Ext. PWR1
GND for High drive	37	38	N/A
N/A	39	40	N/A

CON2

Software

Drivers

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

Sample Programs

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

Hardware Specifications

Digital Input	
Channels	32
Isolation Voltage	3750 V_{rms} (Using external power)
Compatibility	Photocoupler (Bi-directional)
Input Voltage	Logic 0: 0 ~ +1 V; Logic 1: +9 ~ +24 V
Input Impedance	3 KΩ, 0.5 W
Response Speed	4 kHz (Typical)
Digital Output	
Channels	32
Isolation Voltage	3750 V_{rms}
Compatibility	Sink, Open-collector
Output Capability	500 mA for one high-driving channel @ 100% duty 500 mA for all high-driving channels @ 100% duty 100 mA for one low-driving channel @ 100% duty 100 mA for all low-driving channels @ 100% duty
Response Speed	4 kHz (Typical)
General	
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz
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

Ordering Information

PISO-P32S32WU CR	Universal PCI, 32-channel Optically-isolated Digital Input and 32-channel Optically-isolated Open-collector Digital Output Board (8 channels for 500 mA and 24 channels for 100 mA Current Sinking Output, NPN, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.

PISO-P64U/PISO-P64U-24V

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

Features

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 3750 V_{rms} Photo-isolation Protection
- Built-in DC/DC Converter with 3000 V_{DC} Isolation
- 64-channel Optically-isolated Digital Input
  - Jumper-selectable Internal or External Power Source for DI
  - 4 Isolated Banks when using 4 Isolated External Power Supplies

Introduction

The PISO-P64U/P64U-24V Universal PCI card supports the 3.3 V/5 V PCI bus and provides 64 optically-isolated Digital Input channels. Either an internal or an external power supply can be used, which can be selected via a jumper. The internal power is provided by an onboard isolated DC/DC converter that provides 3000 V_{DC} isolation and is used for connecting dry-contact input devices. The Digital Input channels are arranged into four isolated banks when using four isolated external power supplies. DI channels 0 - 15 are allocated to Bank A, DI channels 16 - 31 are allocated to Bank B, DI channels 32 - 47 are allocated to Bank C, and DI channels 48 - 63 are allocated to Bank D.

The onboard photocouplers provide 3750 V_{rms} isolation, and act as an interface to field logic signals, eliminate ground-loop problems, and isolate the host computer from potentially damaging voltage spikes. The PISO-P64U/P64U-24V card contains a single DB-37 connector and a single 40-pin male header, each supporting 32 input channels.

The PISO-P64U/P64U-24V card also includes an onboard Card ID switch that enables the board to be recognized via software if two or more boards are installed in the same computer.

Pin Assignments

CON1

Pin Assignment	Terminal No.	Pin Assignment	Terminal No.
IGND0	01		20
DI_0	02	IGND1	21
DI_1	03	DI_16	22
DI_2	04	DI_17	23
DI_3	05	DI_18	24
DI_4	06	DI_19	25
DI_5	07	DI_20	26
DI_6	08	DI_21	27
DI_7	09	DI_22	28
DI_8	10	DI_23	29
DI_9	11	DI_24	30
DI_10	12	DI_25	31
DI_11	13	DI_26	32
DI_12	14	DI_27	33
DI_13	15	DI_28	34
DI_14	16	DI_29	35
DI_15	17	DI_30	36
ECOM0	18	DI_31	37
N.C.	19	ECOM1	

CON2

Pin Assignment	Terminal No.	Pin Assignment
IGND2	01 02	IGND3
DI_32	03 04	DI_48
DI_33	05 06	DI_49
DI_34	07 08	DI_50
DI_35	09 10	DI_51
DI_36	11 12	DI_52
DI_37	13 14	DI_53
DI_38	15 16	DI_54
DI_39	17 18	DI_55
DI_40	19 20	DI_56
DI_41	21 22	DI_57
DI_42	23 24	DI_58
DI_43	25 26	DI_59
DI_44	27 28	DI_60
DI_45	29 30	DI_61
DI_46	31 32	DI_62
DI_47	33 34	DI_63
ECOM2(+)	35 36	ECOM3
ECOM2(-)	37 38	N.C.
N.C.	39 40	N.C.

Software

Drivers

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

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	PISO-P64U	PISO-P64U-24V
Digital Input		
Channels	64	
Isolation Voltage	3750 V_{rms} (Using external power)	
Compatibility	Photocoupler (Bi-directional)	
Input Voltage	Logic 0: 0 ~ +1 V Logic 1: +5 ~ +15 V (Max. +24 V)	Logic 0: 0 ~ +1 V Logic 1: +20 ~ +28 V (Max. +30 V)
Input Impedance	1.2 KΩ, 1 W	3 KΩ, 1 W
Response Speed	4 kHz (Typical)	
General		
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	
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

PISO-P64U CR	Universal PCI, 64-channel Optically-isolated Digital Input Board (RoHS). Includes one CA-4037B cable and two CA-4002 D-sub Connectors.
PISO-P64U-24V CR	Universal PCI, 64-channel Optically-isolated Digital Input (Logic High: +20 ~ +28 V) Board (RoHS). Includes one CA-4037B cable and two CA-4002 D-sub Connectors

PISO-C64U/PISO-A64

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

PISO-C64U

PISO-A64

Features

- PISO-C64U: Universal PCI (3.3 V/5 V) Interface
  - 64-channel Optically-isolated Open-collector Digital Output
  - Current Sinking, NPN type
  - Supports Card ID (SMD Switch)
  - Supports DO Status Readback (Register Level)
- PISO-A64: PCI (5 V) Interface
  - 64-channel Optically-isolated Open-collector Digital Output
  - Current Sourcing, PNP type
- 3750 V_{rms} Photo-isolation Protection
- 4 Isolated Banks when using 4 Isolated External Power Supplies

Introduction

The PISO-C64U Universal PCI card supports the 3.3 V/5 V PCI bus while the PISO-A64 only supports the 5 V PCI bus. These cards provide 64 optically-isolated Digital Output channels, each of which includes a PNP transistor (PISO-A64) or a Darlington transistor (PISO-C64U) and an integrated suppression diode for the inductive load.

The Digital Output channels are allocated to four isolated banks when using four isolated external power supplies, and act as an interface to field logic signals, eliminating ground-loop problems, and isolating the host computer from potentially damaging voltage spikes. The open-collector Digital Output channels are typically used for alarm and warning notifications, signal output control, control for external circuits that require a higher voltage level, or signal transmission applications, etc.

The PISO-C64U card also includes an onboard Card ID switch that enables the board to be recognized via software if two or more boards are installed in the same computer. Both cards contain a single DB-37 connector and a single 40-pin male header, each supporting 32 output channels.

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		

CON1

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

Software

Drivers

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

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	PISO-C64U	PISO-A64
Digital Output		
Channels	64	
Isolation Voltage	3750 V_{rms} (Using external power)	
Compatibility	Sink, Open-collector	Source, Open-collector
Output Capability	100 mA/+30 V for each channel @ 100% duty	100 mA/+30 V for each channel @ 60% duty
Response Speed	4 kHz (Typical)	
General		
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	5 V PCI, 32-bit, 33 MHz
Card ID	Yes (4-bit)	No
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

PISO-C64U CR	Universal PCI, 64-channel Optically-isolated Open-collector Digital Output Board (Sink, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors
PISO-A64 CR	PCI Bus, 64-channel Optically-isolated Open-collector Digital Output Board (Source, RoHS). Includes one CA-4037B Cable and two CA-4002 D-sub Connectors.

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

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

Features

- Universal PCI (3.3 V/5 V) 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
- Built-in DC/DC Converter with 3000 V_{DC} Isolation
- 3750 V_{rms} Photo-isolation Protection
- Supports Card ID (SMD Switch)
- Supports DO Status Readback (Register Level)
- 2 Interrupt Sources

Introduction

The PISO-730U/730U-5V 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 Digital Input and the Digital Output 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 V_{rms} isolation protection, the DI/O channels allow the input signals to be completely floated so as to prevent ground loops and isolate the host computer from potentially damaging voltage spikes.

Each Digital Output includes a Darlington (NPN) transistor and an integrated suppression diode for the inductive load. The open-collector Digital Output channels are typically used for alarm and warning notifications, signal output control, control for external circuits that require a higher voltage level, or signal transmission applications, etc.

The PISO-730U/730U-5V cards also include an onboard Card ID switch that enables the board to be recognized via software if two or more boards are installed in the same computer.

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
IDI_0	01		
IDI_2	02	20	IDI_1
IDI_4	03	21	IDI_3
IDI_6	04	22	IDI_5
IDI_8	05	23	IDI_7
IDI_10	06	24	IDI_9
IDI_12	07	25	IDI_11
IDI_14	08	26	IDI_13
EI.COM1	09	27	IDI_15
EO.COM1	10	28	EI.COM2
IDO_0	11	29	IGND
IDO_2	12	30	IDO1
IDO_4	13	31	IDO3
IDO_6	14	32	IDO5
IDO_8	15	33	IDO7
IDO_10	16	34	IDO9
IDO_12	17	35	IDO11
IDO_14	18	36	IDO13
EO.COM2	19	37	IDO15

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	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

Software

Drivers

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

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	PISO-730U	PISO-730U-5V
Isolated Digital Input		
Channels	16	
Compatibility	Optical	
Isolation Voltage	3750 V_{rms}	
Input Voltage	Logic 0: 0 ~ +1 V Logic 1: +9 ~ +24 V	Logic 0: 0 ~ +1 V Logic 1: +5 ~ +12 V
Input Impedance	1.2 KΩ, 1 W	
Response Speed	4 kHz (Typical)	
Isolated Digital Output		
Channels	16	
Compatibility	Sink (NPN), Open-collector	
Isolation Voltage	3750 V_{rms}	
Output Capability	100 mA/+30 V for each channel @ 100% duty	
Response Speed	4 kHz (Typical)	
Non-isolated Digital Input		
Channels	16	
Compatibility	5 V/TTL	
Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.	
Response Speed	1.2 MHz (Typical)	
Non-isolated Digital Output		
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	1.2 MHz (Typical)	
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	600 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

Ordering Information

PISO-730U CR	Universal PCI, 32-channel Isolated Digital I/O and 32-channel TTL Digital I/O Board (Sink, RoHS). Includes one CA-4002 D-sub Connector.
PISO-730U-5V CR	Universal PCI, PCI, 32-channel Isolated Digital I/O (Input Logic High: +5 ~ +12 V) and 32-channel TTL Digital I/O Board (Sink, RoHS). Includes one CA-4002 D-sub Connector.

PISO-730A
PISO-730A-5V

Available soon

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

Features

- PCI (5 V) Interface
- 16-channel Optically-isolated Digital Input
- 16-channel Optically-isolated Digital Output (Source, NPN)
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
- 3750 V_{rms} Photo-isolation Protection
- 2 Interrupt Sources

Introduction

The PISO-730A/730A-5V 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 Digital Input and the Digital Output 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 V_{rms} isolation protection, the DI/O channels allow the input signals to be completely floated so as to prevent ground loops and isolate the host computer from potentially damaging voltage spikes.

Each Digital Output includes a PNP transistor and an integral suppression diode for the inductive load. The open-collector Digital Output channels are typically used for alarm and warning notifications, signal output control, control for external circuits that require a higher voltage level, or signal transmission applications, etc.

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
IDI_0	01		
IDI_2	02	20	IDI_1
IDI_4	03	21	IDI_3
IDI_6	04	22	IDI_5
IDI_8	05	23	IDI_7
IDI_10	06	24	IDI_9
IDI_12	07	25	IDI_11
IDI_14	08	26	IDI_13
EI.COM1	09	27	IDI_15
EO.COM1	10	28	EI.COM2
IDO_0	11	29	IGND
IDO_2	12	30	IDO1
IDO_4	13	31	IDO3
IDO_6	14	32	IDO5
IDO_8	15	33	IDO7
IDO_10	16	34	IDO9
IDO_12	17	35	IDO11
IDO_14	18	36	IDO13
EO.COM2	19	37	IDO15

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	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

Software

Drivers

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

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	PISO-730A	PISO-730A-5V
Isolated Digital Input		
Channels	16	
Compatibility	Optical	
Isolation Voltage	3750 V_{rms}	
Input Voltage	Logic 0: 0 ~ +1 V Logic 1: +9 ~ +24 V	Logic 0: 0 ~ +1 V Logic 1: +5 ~ +12 V
Input Impedance	1.2 KΩ, 1 W	
Response Speed	4 kHz (Typical)	
Isolated Digital Output		
Channels	16	
Compatibility	Source (PNP), Open-collector	
Isolation Voltage	3750 V_{rms}	
Output Capability	100 mA/+30 V for each channel @ 100% duty	
Response Speed	4 kHz (Typical)	
Non-isolated Digital Input		
Channels	16	
Compatibility	5 V/TTL	
Input Voltage	Logic 0: 0.8 V Max., Logic 1: 2.0 V Min.	
Response Speed	1.2 MHz (Typical)	
Non-isolated Digital Output		
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	1.2 MHz (Typical)	
General		
Bus Type	5 V PCI, 32-bit, 33 MHz	
Connectors	Female DB37 x 1, 20-pin Box Header x 2	
Power Consumption	640 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

Ordering Information

PISO-730A CR	PCI bus, 32-channel Isolated DI/O and 32-channel TTL DI/O Board (Source, RoHS). Includes one CA-4002 D-sub Connector
PISO-730A-5V CR	PCI bus, 32-channel Isolated DI/O (Input Logic High: +5 ~ +12 V) and 32-channel TTL DI/O Board (Source, RoHS). Includes one CA-4002 D-sub Connector.

PCI-P8R8U/PCI-P16R16U

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

PCI-P8R8U

PCI-P16R16U

Features

- Universal PCI (3.3 V/5 V) Interface
- 8/16-channel Optically-isolated Digital Input
- 8/16-channel Relay Output
- Selectable DC Signal Input Filter
- AC Signal Input with Filter
- 5000 V_{rms} Photo-isolation Protection

Introduction

The PCI-P8R8U/P16R16U Universal PCI card supports the 3.3 V/5 V PCI bus and provides 8 or 16 optically-isolated Digital Input channels and 8 or 16 Relay Output channels. The DI channels provide 5000 V_{rms} isolation protection that allows the input signals to be completely floated so as to prevent ground loops and isolate the host computer from potentially damaging voltage spikes. The Relay Output channels can be used where it is necessary to control a circuit using a low-power signal, with complete electrical isolation between the control and the controlled circuits, or where several circuits need to be controlled by a single signal.

The PCI-P8R8U/P16R16U cards also includes an onboard Card ID switch that enables the board to be recognized via software if two or more boards are installed in the same computer.

PCI-P8R8U/P16R16U cards can be used in a variety of applications, such as controlling the ON/OFF state of external devices, driving external relays or small power switches, activating alarms, contact closure, or sensing external voltages or switches, etc.

Software

Drivers

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

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
NO_0	01	20	NO_3
COM_0	02	21	COM_3
NC_0	03	22	NC_3
NO_1	04	23	NO_4
COM_1	05	24	COM_4
NC_1	06	25	NO_5
NO_2	07	26	COM_5
COM_2	08	27	NO_6
NC_2	09	28	COM_6
NO_7	10	29	GND
COM_7	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		

CON1

Pin Assignment	Terminal No.		Pin Assignment
NO_8	01	02	NO_11
COM_8	03	04	COM_11
NC_8	05	06	NC_11
NO_9	07	08	NO_12
COM_9	09	10	COM_12
NC_9	11	12	NO_13
NO_10	13	14	COM_13
COM_10	15	16	NO_14
NC_10	17	18	COM_14
NO_15	19	20	GND
COM_15	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/A
N/A	39	40	N/A

CON2 (PCI-P16R16 only)

Hardware Specifications

Models	PCI-P8R8U	PCI-P16R16U
Digital Input		
Channels	8	16
Isolation Voltage	5000 V_{rms} (Photocoupler)	
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)	
Digital Output		
Channels	8	16
Relay Type	4 SPDT, 4 SPST	8 SPDT, 8 SPST
Contact Rating	AC:120 V @ 0.5 A DC: 24 V@ 1 A	
Operating Time	5 ms (Typical)	
Release Time	10 ms (Typical)	
Insulation Resistance	100 MΩ	
Lifetime	Mechanical: 5,000,000 ops. Electrical: 100,000 ops.	
General		
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	
I/O Connector	Female DB37 x 1	Female DB37 x 1 40-pin Box Header x 1
Power Consumption	500 mA @ +5 V	800 mA @ +5 V
Operating Temperature	0 to +60 °C	
Humidity	5 to 85% RH, Non-condensing	

Ordering Information

PCI-P8R8U CR	Universal PCI, 8-channel Isolated Digital Input and 8-channel Relay Output Board (RoHS). Includes one CA-4002 D-sub Connector.
PCI-P16R16U CR	Universal PCI, 16-ch Isolated Digital Input and 16-channel Relay Output Board (RoHS). Includes one CA-4037W Cable and two CA-4002 D-sub Connectors.

PCI-P16C16U

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

Features

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

Introduction

The PCI-P16C16U Universal PCI card supports the 3.3 V/5 V PCI bus and provides 16 optically-isolated Digital Input channels and 16 open-collector (Sink, NPN) Digital Output channels. The DI channels provide 5000 V_{rms} isolation protection that allows the input signals to be completely floated so as to prevent ground loops and isolate the host computer from potentially damaging voltage spikes. The open-collector DO channels are typically used for alarm and warning notifications, control of signal output, control of external circuits that require a higher voltage level, or signal transmission applications, etc. The PCI-P16C16U contains a single DB-37 connector and a single 40-pin box header, and includes a 40-pin to DB-37 flat cable for easy wiring.

The PCI-P16C16U cards also includes an onboard Card ID switch that enables the board to be recognized via software if two or more boards are installed in the same computer.

Software

Drivers

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

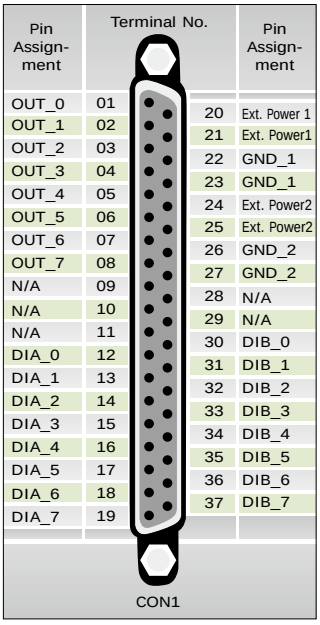
Sample Programs

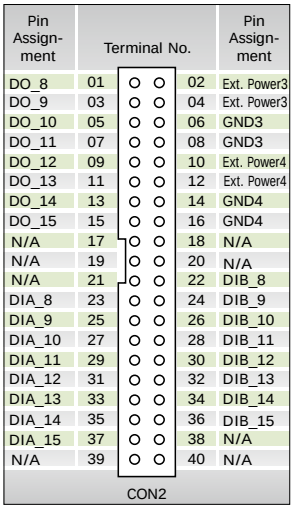
- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

Hardware Specifications

Digital Input	
Channels	16
Isolation Voltage	5000 V_{rms} (Photocoupler)
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)
Digital Output	
Channels	16
Isolation Voltage	5000 V_{rms}
Compatibility	Transistor (Sink, Open-collector)
Output Capability	DC: 600 mA/+30 V for each channel @ 100% duty
Response Speed	1 kHz (Typical)
General	
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz
Card ID	Yes (4-bit)
I/O Connector	Female DB37 x 1 40-pin Box Header x 1
Power Consumption	800 mA @ +5 V
Operating Temperature	0 to +60 °C
Humidity	5 to 85% RH, Non-condensing

Pin Assignments





Ordering Information

PCI-P16C16U CR	Universal PCI, 16-channel Isolated Digital Input and 16-channel Open-collector Digital Output Board (Sink, NPN) (RoHS). Includes one CA-4037W Cable and two CA-4002 D-sub Connectors.

PCI-P16POR16U

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

Features

- Universal PCI (3.3 V/5 V) Interface
- LED Power Indicator
- 16-channel Optically-isolated Digital Input
  - 5000 V_{rms} Photo-isolation Protection
  - Selectable DC Signal Input Filter
  - AC Signal Input with Filter
- High-speed DI/O 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 or Sparking

Introduction

The PCI-P16POR16U Universal PCI card supports the 3.3 V/5 V PCI bus and provides 16 optically-isolated Digital Input channels and 16 PhotoMOS Relay Output channels. Both the isolated DI channels and the PhotoMOS Relay channels use a short optical transmission path to transfer an electronic signal between elements of a circuit and keep them electrically isolated.

ThePCI-P16POR16U provides 5000 V_{rms} isolation protection for the DI channels, allowing the input signals to be completely floated so as to prevent ground loops and isolate the host computer from potentially damaging voltage spikes. The PhotoMOS Relays are used where it is necessary to control a circuit using a low-power signal, with complete electrical isolation between the control and the controlled circuits), or where several circuits must be controlled by a single signal.

This card can be used in a variety of applications, such as controlling the ON/OFF state of external devices, driving external relays or small power switches, activating alarms, contact closure, or sensing external voltages or switches, etc.

The PCI-P16POR16U cards also include an onboard Card ID switch that enables the board to be recognized via software if two or more cards are installed in the same computer. The PCI-P16POR16U is designed as a direct replacement for the PCI-P16POR16 without requiring any modification to the software or the driver.

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/A	09	28	N/A
N/A	10	29	N/A / GND
N/A	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		

CON1

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/A	17	18	N/A
N/A	19	20	N/A / GND
N/A	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/A
N/A	39	40	N/A

CON2

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 Input		
Channels		16
Isolation Voltage		5000 V_{rms} (Photocoupler)
Input Voltage		Logic 1:AC/DC +5 ~ +24 V (AC 50 ~ 1 kHz) Logic 0: AC/DC 0 ~ +1 V
Input Impedance		1.2 KΩ, 0.5 W
Response Speed		Without Filter: 50 kHz (Typical) With Filter: 0.455 kHz (Typical)
Digital Output		
Channels		16
Relay Type		PhotoMOS (Form A)
Contact Rating	Load Voltage	300 V (AC Peak or DC)
	Load Current	130 mA
Operating Time		0.7 ms (Typical)
Release Time		0.05 ms (Typical)
Insulation Resistance		23 MΩ
Electrical Endurance		Long Life and No Spike
General		
Bus Type		5 V PCI, 32-bit, 33 MHz
I/O Connector		Femable DB37 x 1 40-pin Box Header x 1
Power Consumption		800 mA @ +5 V
Operating Temperature		0 to +60 °C
Humidity		5 to 85% RH, Non-condensing

Ordering Information

PCI-P16POR16U CR	Universal PCI, 16-channel Isolated Digital Input and 16-channel PhotoMOS Relay Output Board (RoHS). Includes one CA-4037W Cable and two CA-4002 D-sub Connectors.

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

PISO-P8SSR8AC

PISO-P8SSR8DC

Features

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

Introduction

The PISO-P8R8U Universal PCI card supports the 3.3 V/5 V PCI bus while the PISO-P8SSR8AC/P8SSR8DC card supports the 5 V PCI bus, and offers 8 optically-isolated Digital Input channels and 8 electromechanical Relay or 8 solid-state Relay Output channels. The DI channels provide 5000 V_{rms} isolation protection that allows the input signals to be completely floated so as to prevent ground loops and isolate the host computer from potentially damaging voltage spikes. The Relay Output channels are used where it is necessary to control a circuit using a low-power signal, with complete electrical isolation between the control and the controlled circuits, or where several circuits must be controlled by a single signal.

The PISO-P8R8U/PISO-P8SSR8AC/P8SSR8DC can be used in a variety of applications, such as controlling the ON/OFF state of external devices, driving external relays or small power switches, activating alarms, contact closure, or sensing external voltages or switches, etc.

The PISO-P8R8U cards also include an onboard Card ID switch that enables the board to be recognized via software if two or more PISO-P8R8U cards are installed in the same computer. The PISO-P8R8U is designed as a direct replacement for the PISO-P8R8 without requiring any modification to the software or the driver.

Hardware Specifications

Models	PISO-P8R8U	PISO-P8SSR8AC	PISO-P8SSR8DC
Digital Input			
Channels	8		
Isolation Voltage	5000 V_{rms} (Photocoupler)		
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)		
Digital Output			
Channels	8		
Relay Type	SPST N.O. (Form A)		
Contact Rating	AC: 250 V @ 1.6 A, DC: 30 V @ 5 A	AC: 24 ~ 265 V	DC: 3 ~ 30 V
Release Time	3 ms	0.5 cycle +1 ms	1 ms
Lifetime	Mechanical: 2,000,000 ops., Electrical: 100,000 ops.		
General			
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	5 V PCI, 32-bit, 33 MHz	
I/O Connector	Female DB37 x 1		
Power Consumption	300 mA @ +5 V		
Operating Temperature	0 to +60 °C		
Humidity	5 to 85% RH, Non-condensing		

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

Pin Assignments

Pin Assignment	Terminal No.		Terminal No.	Pin Assignment
NO_0	01		20	NO_3
COM_0	02		21	COM_3
N/A	03		22	N/A
NO_1	04		23	NO_4
COM_1	05		24	COM_4
N/A	06		25	NO_5
NO_2	07		26	COM_5
COM_2	08		27	NO_6
N/A	09		28	COM_6
NO_7	10		29	N/A
COM_7	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			

CON1

Ordering Information

PCI-P8R8U CR	Universal PCI, 8-channel Isolated Digital Input and 8-channel Relay Output Board (RoHS). Includes one CA-4002 D-sub Connector.
PISO-P8SSR8AC CR	PCI bus, 8-channel Isolated AC-type SSR Output and 8-channel Isolated Digital Input Board (RoHS). Includes one CA-4002 D-sub Connector.
PISO-P8SSR8DC CR	PCI bus, 8-channel Isolated DC-type SSR Output and 8-channel Isolated Digital Input Board (RoHS). Includes one CA-4002 D-sub Connector.

PISO-P16R16U

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

Features

- 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_{rms} Photo-isolation Protection
  - Selectable DC Signal Input Filter
  - AC Signal Input with Filter

Introduction

The PISO-P16R16U is a Universal PCI card supporting both the 3.3 V and 5 V PCI bus, and contains 16 photocoupler Digital Input channels that provide 3750 Vrms isolation protection, allowing the input signals to be completely floated so as to prevent ground loops and isolate the host computer from potentially damaging voltage spikes. The cards are also equipped with 16 Relay Output channels to enable the control of the ON/OFF state of external devices, drive external relays or small power switches, or activate alarms, etc.

The PISO-P16R16U card is fully compatible with the PISO-P16R16 card, and is designed as a direct replacement without requiring any modification to 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 Input	
Channels	16
Isolation Voltage	3750 V_{rms} (Photocoupler)
Input Voltage	Logic 1: AC/DC +5 ~ +24 V (AC 50 ~ 1 kHz) Logic 0: AC/DC 0 ~ +1 V
Input Impedance	1.2 KΩ, 0.5 W
Response Speed	Without Filter: 50 kHz (Typical) With Filter: 0.455 kHz (Typical)
Digital Output	
Channels	16
Relay Type	8 SPDT, 8 SPST
Contact Rating	AC: 120 V @ 0.5 A DC: 24 V @ 1 A
Operating Time	1 ms (Typical)
Release Time	7 ms (Typical)
Insulation Resistance	1000 MΩ
Lifetime	Mechanical: 5,000,000 ops. Electrical: 100,000 ops.
General	
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz
Card ID	Yes (4-bit)
I/O Connector	Female DB37 x 1 40-pin box header x 1
Power Consumption	800 mA @ +5 V
Operating Temperature	0 to +60 °C
Humidity	5 to 85% RH, Non-condensing

Pin Assignments

CON1

Pin Assignment	Terminal No.		Pin Assignment
NO_0	01	20	NO_3
COM_0	02	21	COM_3
NC_0	03	22	NC_3
NO_1	04	23	NO_4
COM_1	05	24	COM_4
NC_1	06	25	NO_5
NO_2	07	26	COM_5
COM_2	08	27	NO_6
NC_2	09	28	COM_6
NO_7	10	29	GND
COM_7	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		

CON2

Pin Assignment	Terminal No.		Pin Assignment
NO_8	01	02	NO_11
COM_8	03	04	COM_11
NC_8	05	06	NC_11
NO_9	07	08	NO_12
COM_9	09	10	COM_12
NC_9	11	12	NO_13
NO_10	13	14	COM_13
COM_10	15	16	NO_14
NC_10	17	18	COM_14
NO_15	19	20	GND
COM_15	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/A
N/A	39	40	N/A

Ordering Information

PISO-P16R16U	Universal PCI, 16-channel Isolated Digital Input and 16-channel Relay Output. Includes one CA-4037W Cable and two CA-4002 D-sub Connectors.
PISO-P16R16U CR	Universal PCI, 16-channel Isolated Digital Input and 16-channel Relay Output (RoHs). Includes one CA-4037W Cable and two CA-4002 D-sub Connectors.

PISO-725

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

Features

- 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_{rms} Photo-isolation Protection
  - State-changed Interrupt for all Digital Inputs
  - Jumper-selectable Isolated or Non-isolated Digital Inputr

Introduction

The PISO-725 card supports the 5 V PCI bus, and provides 8 isolated or non-isolated Digital Input channels and 8 electromechanical Relay Output channels. The DI channels can be set to either isolated or non-isolated via a hardware jumper, and each channel will generate an interrupt signal if the state is changed, which is very useful when monitoring contact openings/closures as it is not necessary to continuously poll the inputs. The isolated DI channels use a short optical transmission path to transfer an electronic signal between elements of a circuit and keep them electrically isolated. With 3750 V_{rms} isolation protection, the DI channels allow the input signals to be completely floated so as to prevent ground loops and isolate the host computer from potentially damaging voltage spikes.

The Relay Output channels are used where it is necessary to control a circuit using a low-power signal, with complete electrical isolation between the control and the controlled circuits, or where several circuits must be controlled by a single signal. All relays are de-energized (switched off) during power-on, and support ON/OFF status read back.

The PISO-725 can be used in a variety of applications, including contact closure, external voltage sensing, load sensing and I/O control, etc.

Software

Drivers

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

Sample Programs

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

Hardware Specifications

Digital Input	
Channels	8
Isolation Voltage	3750 V_{rms} (Photocoupler)
Input Voltage	Logic 0: 0 ~ +1 V, Logic 1: +9 ~ +24 V
Input Impedance	1.2 KΩ, 1 W
Response Speed	4 kHz (Typical)
Digital Output	
Channels	8
Relay Type	Form C
Contact Rating	AC: 0.3 A/120 V, DC: 1 A/30 V
Operating Time	5 ms (Typical)
Release Time	10 ms (Typical)
Lifetime	Mechanical: 100,000 ops. (30 V/1 A)
General	
Bus Type	5 V PCI, 32-bit, 33 MHz
I/O Connector	Female DB37 x 1
Power Consumption	300 mA @ +5 V
Operating Temperature	0 ~ 60 °C
Humidity	5 ~ 85% RH, non-condensing

Pin Assignments

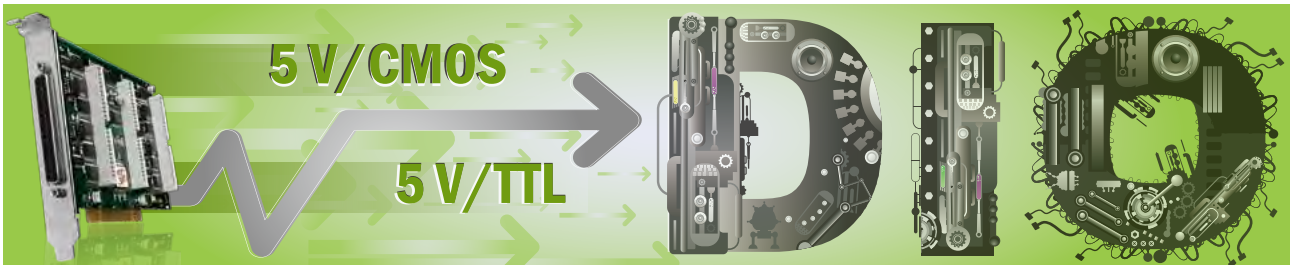
Pin Assign-ment	Terminal No.		Pin Assign-ment
NO_0	01	20	NO_3
COM_0	02	21	COM_3
NC_0	03	22	NC_3
NO_1	04	23	NO_4
COM_1	05	24	COM_4
NC_1	06	25	NO_5
NO_2	07	26	COM_5
COM_2	08	27	NO_6
NC_2	09	28	COM_6
NO_7	10	29	GND
COM_7	11	30	DIB_0
DIA_0	12	31	DIB_1
DIA_1	13	32	DIB_2
DIA_2	14	33	DIB_3
DIA_3	15	34	DIB_4
DIA_4	16	35	DIB_5
DIA_5	17	36	DIB_6
DIA_6	18	37	DIB_7
DIA_7	19		

CON1

Ordering Information

PISO-725	PCI, 8-channel Isolated Digital Input and 8-channel Relay Output Board. Includes one CA-4002 D-sub Connector.

3-5 Non-isolated Digital I/O Boards



Selection Guide

Model	PCI-D64HU	PIO-D24U	PIO-D48U	PIO-D48SU	PIO-D56U	PIO-D64U	PIO-D96U	PIO-D96SU	PIO-D144U	PIO-D144LU	PIO-D168U	NEW PCI-TMC12AU
Interface	Universal PCI											
Programmable DI/O												
Channels	-	24	48		24	-	96		144		168	-
Digital Input												
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/TTL	5 V/CMOS	5 V/TTL	5 V/CMOS	5 V/TTL	5 V/TTL
Input Voltage Logic 0	0.8 V Max.											
Input Voltage Logic 1	2.0 V Min.											
Digital Output												
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/TTL	5 V/CMOS	5 V/TTL	5 V/TTL
Output Voltage Logic 0 (Max.)	0.55 V	0.4 V	0.4 V		0.4 V	0.4 V	0.4 V	0.1 V	0.4 V	0.1 V	0.4 V	0.4 V
Output Voltage Logic 1 (Min.)	2.0 V	2.4 V	2.4 V		2.4 V	2.4 V	2.4 V	4.4 V	2.4 V	4.4 V	2.4 V	2.4 V
Output Capability Sink	64 mA @ 0.55 V	64 mA @ 0.8 V	64 mA @ 0.8 V		CN1: 2.4 mA @ 0.8 V CN3: 64 mA @ 0.8 V	24 mA @ 0.8 V	64 mA @ 0.8 V	6 mA @ 0.33 V	64 mA @ 0.8 V	6 mA @ 0.33 V	64 mA @ 0.8 V	24 mA @ 0.8 V
Output Capability Source	-32 mA @ 2.0 V	32 mA @ 2.0 V	32 mA @ 2.0 V		CN1: 0.8 mA @ 2.0 V CN3: 32 mA @ 2.0 V	15 mA @ 2.0 V	32 mA @ 2.0 V	6 mA @ 4.77 V	32 mA @ 2.0 V	6 mA @ 4.77 V	32 mA @ 2.0 V	15 mA @ 2.0 V
Timer/Counter												
Channels	3	-	2		-	6	-		-		-	12
Resolution	16-bit	-	16-bit		-	16-bit	-		-		-	16-bit
Clock Source	-	-	4 MHz		-	4 MHz	-		-		-	8 MHz
Connector												
100-pin SCSI II	-	-	-	1	-	-	-	1	-		-	-
50-pin Header	-	-	1	-	-	-	3	-	5		6	-
40-pin Header	1	-	-	-	-	-	-	-	-		-	-
37-pin D-sub	1	1	1	-	1	-	1	-	1		1	1
20-pin Header	-	-	-	-	2	5	-	-	-		-	2
Page	**3-34**	**3-35**	**3-36**		**3-35**	**3-37**	**3-38**		**3-39**			**3-40**

PCI-D64HU

Universal PCI, 40 MB/s High-speed 32-channel DI and 32-channel DO Board

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
- 8-channel Optically-isolated Digital Input
- Data Transfer Modes:
  - Direct Program Control, Internal Timer Pacer
  - External Clock (DI only), Handshaking

Introduction

The PCI-D64HU is a high-speed digital I/O card containing 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 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 direct programmed I/O control, timer pacer control, external clock mode and handshaking mode.

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

Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
DI_0	01	20 DO_0
DI_1	02	21 DO_1
DI_2	03	22 DO_2
DI_3	04	23 DO_3
DI_4	05	24 DO_4
DI_5	06	25 DO_5
DI_6	07	26 DO_6
DI_7	08	27 DO_7
DI_8	09	28 DO_8
DI_9	10	29 DO_9
DI_10	11	30 DO_10
DI_11	12	31 DO_11
DI_12	13	32 DO_12
DI_13	14	33 DO_13
DI_14	15	34 DO_14
DI_15	16	35 DO_15
+5 V	17	36 GND
I_ACK	18	37 I_TRG
I_REQ	19	

CON1

Pin Assignment	Terminal No.		Pin Assignment
DI_16	01	02	DO_16
DI_17	03	04	DO_17
DI_18	05	06	DO_18
DI_19	07	08	DO_19
DI_20	09	10	DO_20
DI_21	11	12	DO_21
DI_22	13	14	DO_22
DI_23	15	16	DO_23
DI_24	17	18	DO_24
DI_25	19	20	DO_25
DI_26	21	22	DO_26
DI_27	23	24	DO_27
DI_28	25	26	DO_28
DI_29	27	28	DO_29
DI_30	29	30	DO_30
DI_31	31	32	DO_31
+5 V	33	34	GND
O_ACK	35	36	O_TRG
O_REQ	37	38	N.C.
N.C.	39	40	N.C.

CON2

Software

Drivers

- [x] 32-bit Windows 2000/XP/2003/2008/7/8/10

Sample Programs

- [x] VB/VC/BCB Demo

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

Ordering Information

PCI-D64HU CR	Universal PCI, 40 MB/s High-speed 32-channel DI and 32-channel DO (RoHS). Includes one CA-4037W cable and two CA-4002 D-sub connectors.

PIO-D24U/PIO-D56U

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

PIO-D24U

PIO-D56U

Features

- Universal PCI (3.3 V/5 V) Interface
- 24/56 Buffered TTL Digital I/O Lines
- Three 8-bit Bi-directional Programmable I/O Ports
- Emulates two Industrial-standard 8255 PPI Ports (Mode 0)
- 4-channel Interrupt Source
- Supports Card ID (SMD Switch)
- Supports DO Status Readback (Register Level)
- DI/O Response Time approximately 1 µs (1 MHz)

Introduction

The PIO-D24U/D56U cards are designed to be fully compatible with PIO-D24/D56 boards. The PIO-D24U/D56U series can be used as a direct replacement for PIO-D24/D56 boards without requiring any modification to the software or the driver.

The PIO-D24U/D56U supports the 3.3 V/5 V PCI bus, and contains three 8-bit bi-directional I/O ports, referred to as Port A (PA), Port B (PB) and Port C (PC), respectively. Each port is configured as an input on power-up or after a reset. In addition, the PIO-D56U also provides 16 Digital Input channels and 16 Digital Output channels.

The PIO-D24U/D56U cards also include an onboard Card ID switch that enables the board to be recognized via software if two or more boards are installed in the same computer.

Software

Drivers

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

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
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		

CON3

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 (PIO-D56U 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 (PIO-D56U only)

Hardware Specifications

Model	PIO-D24U	PIO-D56U	
Programmable DIO			
Channels	24		
Digital Input			
Channels	-	16	
Compatibility	5V/TTL		
Input Voltage	Logic 0: 0.8 V Max. Logic 1: 2.0 V Min.		
Response Speed	1 MHz		
Digital Output			
Channels	-	16	
Compatibility	5V/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	1 MHz		
General			
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz		
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

PIO-D24U CR	Universal PCI, 24-channel Digital I/O Board (RoHS).
PIO-D56U CR	Universal PCI, 56-channel Digital I/O Board (RoHS).

PIO-D48U/PIO-D48SU

Universal PCI, 48-channel Digital I/O Board

PIO-D48U

PIO-D48SU

Features

- Universal PCI (3.3 V/5 V) Interface
- 48 Buffered TTL Digital I/O Lines
- Six 8-bit Bi-directional Programmable I/O Ports
- Emulates two Industrial-standard 8255 PPI Ports (Mode 0)
- All I/O Lines Buffered on the Board
- 4-channel Interrupt Source
- Supports Card ID (SMD Switch)
- Supports DO Status Readback (Register Level)
- Buffer Output for Higher Driving Capability
- DI/O Response Time approximately 1 µs (1 MHz)

Introduction

The PIO-D48U/D48SU card is designed to be fully compatible with the PIO-D48, meaning that a PIO-D48 card can be directly replaced with a PIO-D48U/D48SU without requiring any modification to the software or the driver.

The PIO-D48U provides two connectors for I/O wiring, while the PIO-D48SU provides a single high-density connector that reduces the amount of installation space required for the card in the computer.

The PIO-D48U/D48SU supports the 3.3 V/5 V PCI bus, and provides 48 TTL Digital I/O lines that are grouped into six 8-bit bi-directional ports. Each group of three 8-bit ports is arranged on the connector as Port A (PA), Port B (PB) and Port C (PC), and Port C can be split into two nibble-wide (4-bit) parts. All ports are configured as inputs on power-up or after a reset.

The PIO-D48U/D48SU card also includes an onboard Card ID switch and pull-high/low resistors for the Digital Input. The Card ID switch can be set so that the board is able to be 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.

Hardware Specifications

Model	PIO-D48U	PIO-D48SU
Programmable DIO		
Channels	48	
Digital Input		
Compatibility	5 V/TTL	
Input Voltage	Logic 0: 0.8 V Max.; Logic 1: 2.0 V Min.	
Response Speed	1 MHz	
Digital Output		
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	
Response Speed	1 MHz	
Timer/Counter		
Channels	2 (Event timer x1/ 32-bit Timer x1)	
Resolution	16-bit	
Reference Clock	Internal: 4 MHz	
General		
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1 50-pin Box Header x 1	Female SCSI II 100-pin x 1
Power Consumption	900 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

Ordering Information

PIO-D48U CR	Universal PCI, 48-channel Digital I/O Board (RoHS).
PIO-D48SU CR	Universal PCI, 48-channel Digital I/O Board (SCSI II Connector, RoHS).

Software

Drivers

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

Sample Programs

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

Pin Assignments

● PIO-D48U

Pin Assignment	Terminal No.	Pin Assignment
N.C	01	
N.C.	02	
PB_7	03	
PB_6	04	
PB_5	05	
PB_4	06	
PB_3	07	
PB_2	08	
PB_1	09	
PB_0	10	
GND	11	
N.C.	12	
GND	13	
N.C.	14	
GND	15	
N.C.	16	
GND	17	
+5 V	18	
GND	19	
	20	+5 V
	21	GND
	22	PC_7
	23	PC_6
	24	PC_5
	25	PC_4
	26	PC_3
	27	PC_2
	28	PC_1
	29	PC_0
	30	PA_7
	31	PA_6
	32	PA_5
	33	PA_4
	34	PA_3
	35	PA_2
	36	PA_1
	37	PA_0

CN1

Pin Assignment	Terminal No.	Pin Assignment
PC_7	01	02 GND
PC_6	03	04 GND
PC_5	05	06 GND
PC_4	07	08 GND
PC_3	09	10 GND
PC_2	11	12 GND
PC_1	13	14 GND
PC_0	15	16 GND
PB_7	17	18 GND
PB_6	19	20 GND
PB_5	21	22 GND
PB_4	23	24 GND
PB_3	25	26 GND
PB_2	27	28 GND
PB_1	29	30 GND
PB_0	31	32 GND
PA_7	33	34 GND
PA_6	35	36 GND
PA_5	37	38 GND
PA_4	39	40 GND
PA_3	41	42 GND
PA_2	43	44 GND
PA_1	45	46 GND
PA_0	47	48 GND
+5 V	49	50 GND

CN2

● PIO-D48SU

Pin Assignment	Terminal No.	Pin Assignment
PA_00	01	51 PA_10
PA_01	02	52 PA_11
PA_02	03	53 PA_12
PA_03	04	54 PA_13
PA_04	05	55 PA_14
PA_05	06	56 PA_15
PA_06	07	57 PA_16
PA_07	08	58 PA_17
PB_00	09	59 PB_10
PB_01	10	60 PB_11
PB_02	11	61 PB_12
PB_03	12	62 PB_13
PB_04	13	63 PB_14
PB_05	14	64 PB_15
PB_06	15	65 PB_16
PB_07	16	66 PB_17
PC_00	17	67 PC_10
PC_01	18	68 PC_11
PC_02	19	69 PC_12
PC_03	20	70 PC_13
PC_04	21	71 PC_14
PC_05	22	72 PC_15
PC_06	23	73 PC_16
PC_07	24	74 PC_17
GND	25	75 GND
-	26	76 -
-	27	77 -
-	28	78 -
-	29	79 -
-	30	80 -
-	31	81 -
-	32	82 -
-	33	83 -
-	34	84 -
-	35	85 -
-	36	86 -
-	37	87 -
-	38	88 -
-	39	89 -
-	40	90 -
-	41	91 -
-	42	92 -
-	43	93 -
-	44	94 -
-	45	95 -
-	46	96 -
-	47	97 -
-	48	98 -
-	49	99 -
+ 5 V	50	100 + 5 V

CN1

PIO-D64U

Universal PCI, 64-channel Digital I/O Board with Timer/Counter

Features

- Universal PCI (3.3 V/5 V) Interface
- 32-channel Digital Input
- 32-channel Digital Output
- Interrupt Trigger via Event/Timer Trigger
- 3 Independent Programmable 16-bit Down Counters
- Supports Card ID (SMD Switch)
- Programmable Interrupt Handling
- DI/O Response Time approximately 1 µs (1 MHz)

Introduction

The PIO-D64U card is designed as a direct replacement for the PIO-D64 without requiring any modification to the software or the driver.

The PIO-D64U Universal PCI card supports the 3.3 V/5 V PCI bus, and provides 32 Digital Input channels and 32 Digital Output channels that consist of two 16-bit input ports and two 16-bit output ports. The PIO-D64U also includes a 6-channel counter/timer that can use four clock sources, 250 kHz, 500 kHz, 1 MHz, and 2 MHz, which can be sourced from the soldering pad. Three of the six channels can be used for general purposes, such as frequency measurement, event counting or pulse generation, while the remaining channels are for interrupt functions.

The PIO-D64U card also includes an onboard Card ID switch that enables the board to be recognized via software if two or more boards are installed in the same computer.

Software

Drivers

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

Sample Programs

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

Hardware Specifications

Digital Input	
Channels	32
	5 V/TTL
Input Voltage	Logic 0: 0.8 V Max.; Logic 1: 2.0 V Min.
Response Speed	1 MHz
Digital Output	
Channels	32
	5 V/TTL
Output Voltage	Logic 0: 0.4 V Max.; Logic 1: 2.4 V Min.
Output Capability	Sink: 24 mA @ 0.8 V; Source: 15 mA @ 2.0 V
Response Speed	1 MHz
Timer/Counter	
Channels	6 (Independent x 3/EVTIRQ x 1/TMRIRQ x 1/EXTIRQ x 1)
Resolution	16-bit
Input Frequency	10 MHz Max.
Reference Clock	Internal: 4 MHz
General	
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz
Card ID	Yes (4-bit)
Connectors	20-pin Box Header x 5
Power Consumption	580 mA @ +5 V
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

Pin Assignments

CN1

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

CN2

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	STROBE1

CN3

Pin Assignment	Terminal No.		Pin Assignment
DO 16	01	02	DO 17
DO 18	03	04	DO 19
DO 20	05	06	DO 21
DO 22	07	08	DO 23
DO 24	09	10	DO 25
DO 26	10	12	DO 27
DO 28	12	14	DO 29
DO 30	14	16	DO 31
GND	16	18	GND
+5 V	18	20	+12 V

CN4

Pin Assignment	Terminal No.		Pin Assignment
DI 16	01	02	DI 17
DI 18	03	04	DI 19
DI 20	05	06	DI 21
DI 22	07	08	DI 23
DI 24	09	10	DI 25
DI 26	11	12	DI 27
DI 28	13	14	DI 29
DI 30	15	16	DI 31
GND	17	18	GND
+5 V	19	20	STROBE2

CN5

Pin Assignment	Terminal No.		Pin Assignment
CLK 2	01	02	CLK 1
OUT 2	03	04	OUT 1
GATE 2	05	06	GATE 1
CLK 3	07	08	CLK 0
OUT 3	09	10	OUT 0
GATE 3	10	12	GATE 0
GATE 4	12	14	CLK 4
-	14	16	OUT 4
GND	16	18	GND
+5 V	18	20	-

Ordering Information

PIO-D64U CR	Universal PCI, 64-channel Digital I/O Board with Timer/Counter (RoHS).

PIO-D96U/PIO-D96SU

Universal PCI, 96-channel Digital I/O Board

PIO-D96U

PIO-D96SU

Features

- Universal PCI (3.3 V/5 V) Interface
- 96-channel Digital I/O
- Twelve 8-bit Bi-directional Programmable I/O Ports
- All I/O Lines Buffered on the Board
- 4-channel Interrupt Source
- Buffer Output for Higher Driving Capability
- Supports Card ID (SMD Switch)
- DI/O Response Time approximately 1 µs (1 MHz)

Introduction

The PIO-D96U/D96SU card is designed as a direct replacement for the PIO-D96, without requiring any modification to the software or the driver.

The PIO-D96U provides four connectors for I/O wiring, while the PIO-D96SU provides a single high-density connector that reduces the amount of installation space required for the card in the computer.

The PIO-D96U/D96SU Universal PCI card supports the 3.3 V/5 V PCI bus, and provides 96 TTL Digital I/O lines that consist of twelve 8-bit bi-directional ports. Each group of three 8-bit ports is arranged on the connector as Port A (PA), Port B (PB) and Port C (PC), respectively, and all ports are configured as inputs on power-up or after a reset.

The PIO-D96U/D96SU card also includes an onboard Card ID switch that enables the board to be recognized via software if two or more boards are installed in the same computer.

Hardware Specifications

Models	PIO-D96U	PIO-D96SU
Programmable DIO		
Channels	96	
Digital Input		
Compatibility	5 V/TTL	5 V/CMOS
Input Voltage	Logic 0: 0.8 V Max. ; Logic 1: 2.0 V Min.	
Response Speed	1 MHz	
Digital Output		
Compatibility	5 V/TTL	5 V/CMOS
Output Voltage	Logic 0: 0.4 V Max.; Logic 1: 2.4 V Min.	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	Sink: 64 mA @ 0.8 V Source: 32 mA @ 2.0 V
Response Speed	1 MHz	
General		
Bus Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	
Card ID	Yes (4-bit)	
Connectors	Female DB37 x 1 50-pin Box Header x 3	Female SCSI II 100-pin x 1
Power Consumption	600 mA @ +5 V	
Operating Temperature	0°C to +60°C	
Humidity	5 to 85% RH, Non-condensing	

Software

Drivers

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

Sample Programs

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

Pin Assignments

● PIO-D96U

Pin Assignment	Terminal No.		Pin Assignment
N.C	01	20	+5V
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		

CN1

Pin Assignment	Terminal No.		Pin Assignment
PC_7	01	02	GND
PC_6	03	04	GND
PC_5	05	06	GND
PC_4	07	08	GND
PC_3	09	10	GND
PC_2	11	12	GND
PC_1	13	14	GND
PC_0	15	16	GND
PB_7	17	18	GND
PB_6	19	20	GND
PB_5	21	22	GND
PB_4	23	24	GND
PB_3	25	26	GND
PB_2	27	28	GND
PB_1	29	30	GND
PB_0	31	32	GND
PA_7	33	34	GND
PA_6	35	36	GND
PA_5	37	38	GND
PA_4	39	40	GND
PA_3	41	42	GND
PA_2	43	44	GND
PA_1	45	46	GND
PA_0	47	48	GND
+5 V	49	50	GND

CN2/CN3/CN4

● PIO-D96SU

Pin Assignment	Terminal No.		Pin Assignment
PA_00	01	51	PA_10
PA_01	02	52	PA_11
PA_02	03	53	PA_12
PA_03	04	54	PA_13
PA_04	05	55	PA_14
PA_05	06	56	PA_15
PA_06	07	57	PA_16
PA_07	08	58	PA_17
PB_00	09	59	PB_10
PB_01	10	60	PB_11
PB_02	11	61	PB_12
PB_03	12	62	PB_13
PB_04	13	63	PB_14
PB_05	14	64	PB_15
PB_06	15	65	PB_16
PB_07	16	66	PB_17
PC_00	17	67	PC_10
PC_01	18	68	PC_11
PC_02	19	69	PC_12
PC_03	20	70	PC_13
PC_04	21	71	PC_14
PC_05	22	72	PC_15
PC_06	23	73	PC_16
PC_07	24	74	PC_17
GND	25	75	GND
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_36
PC_25	47	97	PC_37
PC_26	48	98	PC_38
PC_27	49	99	PC_39
+ 5 V	50	100	+ 5 V

CN1

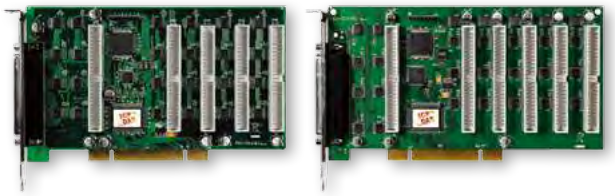
Ordering Information

PIO-D96U CR	Universal PCI, 96-channel Digital I/O Board (RoHS).
PIO-D96SU CR	Universal PCI, 96-channel Digital I/O Board (SCSI II Connector, RoHS)

PIO-D144U/PIO-D144LU
PIO-D168U

Universal PCI, 144/168-channel Digital I/O Board

PIO-D144U/PIO-D144LU PIO-D168U



Features

- Universal PCI (3.3 V/5 V) Interface
- 144/168 Digital I/O Channels
- 18/21 8-bit Bi-directional Programmable I/O Ports
- Emulates 6/7 Industrial-standard 8255 PPI Ports (Mode 0)
- All I/O Lines Buffered on the Board
- 4-channel Interrupt Source
- Supports Card ID (SMD Switch)
- Supports DO Status Readback (Register Level)
- DI/O Response Time approximately 1 µs (1 MHz)

Introduction

The PIO-D144U/D144LU/D168U cards are designed as direct replacements for PIO-D144/D168 cards without requiring any modification to the software or the driver.

The PIO-D144U/D144LU/D168U Universal PCI cards support the 3.3 V/5 V PCI bus, and provide 144/168 TTL Digital I/O lines that are grouped into 18/21 8-bit bi-directional ports. Each group of three 8-bit ports is arranged on the connector as Port A (PA), Port B (PB) and Port C (PC), respectively, and all ports are configured as inputs Channels on power-up or after a reset.

The PIO-D144U uses 5V/TTL to provide high DO driving capability. The PIO-D144LU uses 5V/CMOS to provide low power consumption and producing less heat.

The PIO-D144U/D144LU/D168U cards also include an onboard Card ID switch that enables the board to be recognized via software if two or more boards are installed in the same computer.

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		

CN1

Pin Assignment	Terminal No.		Pin Assignment
PC_7	01	02	GND
PC_6	03	04	GND
PC_5	05	06	GND
PC_4	07	08	GND
PC_3	09	10	GND
PC_2	11	12	GND
PC_1	13	14	GND
PC_0	15	16	GND
PB_7	17	18	GND
PB_6	19	20	GND
PB_5	21	22	GND
PB_4	23	24	GND
PB_3	25	26	GND
PB_2	27	28	GND
PB_1	29	30	GND
PB_0	31	32	GND
PA_7	33	34	GND
PA_6	35	36	GND
PA_5	37	38	GND
PA_4	39	40	GND
PA_3	41	42	GND
PA_2	43	44	GND
PA_1	45	46	GND
PA_0	47	48	GND
+5 V	49	50	GND

CN2/CN3/CN4/CN5/CN6
CN7 (for PIO-D168U only)

Software

Drivers

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

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

Models		PIO-D144LU	PIO-D144U	PIO-D168U
Programmable DIO				
Channels		144		168
Digital Input				
Compatibility		5 V/CMOS	5 V/TTL	
Input Voltage	Logic 0	0.8 V Max.		
	Logic 1	2.0 V Min.		
Response Speed		1 MHz		
Digital Output				
Compatibility		5 V/CMOS	5 V/TTL	
Output Voltage	Logic 0	0.1 V Max.	0.4 V Max.	
	Logic 1	4.4 V Min.	2.4 V Min.	
Output Capability	Sink	6 mA @ 0.33 V	64 mA @ 0.8 V	
	Source	6 mA @ 4.77 V	32 mA @ 2.0 V	
Response Speed		1 MHz		
General				
Bus Type		3.3 V/5 V Universal PCI, 32-bit, 33 MHz		
Card ID		Yes (4-bit)		
Connectors		Female DB37 x 1, 50-pin Box Header x 5		Female DB-37 x 1, 50-pin Box Header x 6
Power Consumption		250 mA @ +5 V	600 mA @ +5 V	1300 mA @ +5 V
Operating Temperature		0°C to +60°C		
Humidity		5 to 85% RH, Non-condensing		

Ordering Information

PIO-D144U CR	Universal PCI, 144-channel Digital I/O Board (5 V/TTL, RoHS).
PIO-D144LU CR	Universal PCI, 144-channel Digital I/O Board (5 V/CMOS, RoHS).
PIO-D168U CR	Universal PCI, 168-channel Digital I/O Board (RoHS)

PCI-TMC12AU NEW

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

Features

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

Introduction

The PCI-TMC12AU card is designed as a direct replacement for the PCI-TMC12A without requiring any modification to the software or the driver.

The PCI-TMC12AU Universal PCI cards support the 3.3 V/5 V PCI bus, and provide twelve 16-bit timers/counters (four 82C54 chips x 3 timers/counters), 16 TTL Digital Input channels and 16 TTL Digital Output channels. The two onboard clocks (8 M/1.6 M and 0.8 M/80 K) are jumper selectable and provide a high-resolution clock source for timers/counters. Counters/timers can be used for industrial and laboratory applications such as pulse/event/switch-toggle counting, frequency readings, elapsed time measurement, pulse-width measurement, PWM (pulse-width-modulated) output, and pulse (square wave) and rate generation, etc.

Software

Drivers

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

Sample Programs

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

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
ECLK1	01	20	EXTG1
COUT1	02	21	ECLK2
EXTG2	03	22	COUT2
ECLK3	04	23	EXTG3
COUT3	05	24	ECLK4
EXTG4	06	25	COUT4
ECLK5	07	26	EXTG5
COUT5	08	27	ECLK6
EXTG6	09	28	COUT6
ECLK7	10	29	EXTG7
COUT7	11	30	ECLK8
EXTG8	12	31	COUT8
ECLK9	13	32	EXTG9
COUT9	14	33	ECLK10
EXTG10	15	34	COUT10
ECLK11	16	35	EXTG11
COUT11	17	36	ECLK12
EXTG12	18	37	COUT12
GND	19		

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	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

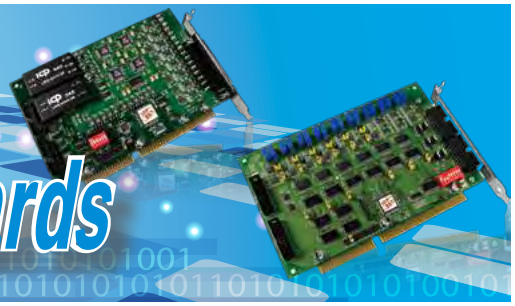
Hardware Specifications

Digital Input	
Channels	16
Compatibility	5 V/TTL
Input Voltage	Logic 0: 0.8 V Max. Logic 1: 2.0 V Min.
Response Speed	2.0 MHz (Typical)
Digital Output	
Channels	16
Compatibility	5 V/TTL
Output Voltage	Logic 0: 0.4 V Max. Logic 1: 2.4 V Min.
Output Capability	Sink: 24 mA @ 0.8 V Source: 15 mA @ 2.0 V
Response Speed	2.0 MHz (Typical)
Timer/Counter	
Channels	12 (Independent x 12)
Resolution	16-bit
Input Frequency	10 MHz Max.
Reference Clock	Internal: 8 MHz
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	500 mA @ +5 V
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing

Ordering Information

PCI-TMC12AU CR	Universal PCI, 12-channel Timer/Counter Board (RoHS). Includes one CA-4002 D-sub Connector.

4. ISA Bus Data Acquisition Boards



Multifunction Board Selection Guide

Model	A-826PG	A-823PGL A-823PGH	A-822PGL A-822PGH	A-821PGL A-821PGH	A-812PG	A-8111
Interface	ISA Bus					
Analog Input						
Channels	16 SE/ 8 Diff.	16 SE/ 8 Diff.	16 SE/ 8 Diff.	16 SE/ 8 Diff.	16 S.E.	8 S.E.
Resolution	16-bit	12-bit	12-bit	12-bit	12-bit	12-bit
Sampling Rate	100 kS/s	125 kS/s	125 kS/s	45 kS/s	62.5 kS/s	35 kS/s
Analog Output						
Channels	2	2	2	1	2	1
Resolution	12-bit	12-bit	12-bit	12-bit	12-bit	12-bit
Digital I/O (5 V/TTL)						
DI Channels	16	16	16	16	16	16
DO Channels	16	16	16	16	16	16
Timer/Counter						
Channels	3	3	3	3	3	3
Page	4-2					

Isolated Data Acquisition Board Selection Guide

Model	ISO-AD32		ISO-813	ISA-DA	
	L	H		8	16
Interface	ISA Bus				
Analog Input					
Channels	32 SE/ 16 Diff.		32 SE	-	
Resolution	12-bit		12-bit	-	
Sampling Rage	200 kS/s		10 kS/s	-	
Isolation Voltage	500 V_{rms}		3000 V_{rms}	-	
FIFO Size	1 kB		-	-	
Analog Output					
Channels	-		-	8	16
Isolated Voltage	-		-	2500 V_{DC}	
Resolution	-		-	14-bit	
Output Range	-		-	±10 V, 0~+20 mA	
Page	4-3				

Model	ISO-P64	ISO-C64	ISO-P32C32	ISO-P32S32W	ISO-730	P8R8 DIO	P16R16 DIO
Interface	ISA Bus						
Isolated Digital Input							
Channels	64	-	32	32	16	8	16
Isolation Voltage	3750 V_{rms}	-	3750 V_{rms}	3750 V_{rms}	3750 V_{rms}	5000 V_{rms}	
Input Voltage	9 ~ 24 V	-	9 ~ 24 V	5 ~ 24 V	9 ~ 24 V	5 ~ 24 V	
Isolated Digital Output							
Channels	-	64	32	32	16	8	16
Isolated Voltage	-	3750 V_{rms}	3750 V_{rms}	3750 V_{rms}	3750 V_{rms}	-	
Compatibility	-	Sink	Sink	Sink	Sink	-	
Relay Type	-	-	-	-	-	4 SPDT, 4 SPST	8 SPDT, 8 SPST
Digital I/O (5 V/TTL)							
DI Channels	-	-	-	-	16	-	-
DO Channels	-	-	-	-	16	-	-
Page	4-3						

Non-isolated Data Acquisition Board Selection Guide

Model	A-726	A-626	A-628	DIO-24	DIO-48	DIO-64/3	DIO-64/6	DIO-96	DIO-144	TMC-10
Interface	ISA Bus									
Analog Output										
Channels	6	6	8	-	-	-		-	-	-
Resolution	12-bit	12-bit	12-bit	-	-	-		-	-	-
Digital I/O (5 V/TTL)										
DI Channels	16	16	16	-	-	32		-	-	8
DO Channels	16	16	16	-	-	32		-	-	8
Programmable DI/O	-	-	-	24	48	-		96	144	-
Timer/Counter										
Channels	-	-	-	-	3	3	6	-	-	10
Page	4-4									

4-1 Multifunction Boards

16-channel, 100 kS/s 16-bit AD, 2-channel 12-bit DA and 16-channel TTL DIO Multifunction Board

A-826PG

- ISA Bus Interface
- 16 Single-ended/8 Differential Analog Input Channels
- 16-bit, 100 kS/s Sampling Rate
- 2-channel, 12-bit Analog Output
- Analog Output Range: 0 ~ +5 V, 0 ~ +10 V
- 16-channel, 5 V/TTL Digital Input
- 16-channel, 5 V/TTL Digital Output
- Software Programmable Gain: 0.5, 1, 2, 4, 8
- Trigger Mode: Software, Pacer, External, Event
- Data Transfer Mode: Polling, Interrupt
- 1-channel General-purpose Programmable 16-bit Counter/Timer

16-channel, 125 kS/s 12-bit AD, 2-channel Unipolar/ Bipolar 12-bit DA and 16-channel TTL DIO Multifunction Board

A-823PGL
A-823PGH

- ISA Bus Interface
- 16 Single-ended/8 Differential Analog Input Channels
- 12-bit, 125 kS/s Sampling Rate
- 2-channel, 12-bit Analog Output
- Analog Output Range: 0 ~ +5 V, 0 ~ +10 V, ±5 V, ±10 V
- 16-channel, 5 V/TTL Digital Input
- 16-channel, 5 V/TTL Digital Output
- Software Programmable Gain:
  - PGL: 0.5, 1, 2, 4, 8
  - PGH: 0.5, 1, 5, 10, 50, 100, 500, 1000
- Trigger Mode: Software, Pacer, External, Event
- Data Transfer Mode: Polling, Interrupt
- 1-channel General-purpose Programmable 16-bit Counter/Timer

16-channel, 125 kS/s 12-bit AD, 2-channel Unipolar 12-bit DA and 16-channel TTL DIO Multifunction Board

A-822PGL
A-822PGH

- ISA Bus Interface
- 16 Single-ended/8 Differential Analog Input Channels
- 12-bit, 125 kS/s Sampling Rate
- 2-channel, 12-bit Analog Output
- Analog Output Range: 0 ~ +5 V, 0 ~ +10 V
- 16-channel, 5 V/TTL Digital Input
- 16-channel, 5 V/TTL Digital Output
- Software Programmable Gain:
  - PGL: 0.5, 1, 2, 4, 8
  - PGH: 0.5, 1, 5, 10, 50, 100, 500, 1000
- Trigger Mode: Software, Pacer, External, Event
- Data Transfer Mode: Polling, Interrupt
- 1-channel General-purpose Programmable 16-bit Counter/Timer

16-channel, 45 kS/s 12-bit AD, 1-channel 12-bit DA and 16-channel TTL DIO Multifunction Board

A-821PGL
A-821PGH

- ISA Bus Interface
- 16 Single-ended/8 Differential Analog Input Channels
- 12-bit, 45 kS/s Sampling Rate
- 1-channel, 12-bit Analog Output
- Analog Output Range: 0 ~ +5 V, 0 ~ +10 V
- 16-channel, 5 V/TTL Digital Input
- 16-channel, 5 V/TTL Digital Output
- Software Programmable Gain:
  - PGL: 1, 2, 4, 8
  - PGH: 1, 10, 100, 1000
- Trigger Mode: Software, Pacer
- Data Transfer Mode: Polling, Interrupt
- 1-channel General-purpose Programmable 16-bit Counter/Timer

16-channel, 62.5 kS/s 12-bit AD, 2-channel 12-bit DA and 16-channel TTL DIO Multifunction Board

A-812PG

- ISA Bus Interface
- 16 Single-ended Analog Input Channels
- 12-bit, 62.5 kS/s Sampling Rate
- 2-channel, 12-bit Analog Output
- Analog Output Range: 0 ~ +5 V, 0 ~ +10 V
- 16-channel, 5 V/TTL Digital Input
- 16-channel, 5 V/TTL Digital Output
- Software Programmable Gain: 0.5, 1, 2, 4, 8
- Trigger Mode: Software, Pacer, External
- Data Transfer Mode: Polling, Interrupt
- 1-channel General-purpose Programmable 16-bit Counter/Timer

8-channel, 35 kS/s 12-bit AD, 1-channel 12-bit DA and 16-channel TTL DIO Multifunction Board

A-8111

- ISA Bus Interface
- 8 Single-ended Analog Input Channels
- 12-bit, 35 kS/s Sampling Rate
- 1-channel, 12-bit Analog Output
- Analog Output Range: 0 ~ +5 V, 0 ~ +10 V
- 16-channel, 5 V/TTL Digital Input
- 16-channel, 5 V/TTL Digital Output
- Software Programmable Gain:1, 2, 4, 8, 16
- Trigger Mode: Software, Pacer
- Data Transfer Mode: Polling, Interrupt
- 1-channel General-purpose Programmable 16-bit Counter/Timer

4-2 Isolated Data Acquisition Boards

32-channel, 12-bit, 200 kS/s Isolated Analog Input Board

ISO-AD32L
ISO-AD32H

- ISA Bus Interface
- 32 Single-ended/16 Differential Analog Input Channels
- Built-in DC/DC Converter with 1000 V_{DC} Isolation
- 5000 V_{rms} Photo-isolation Protection
- 12-bit Sampling Rate, 200 kHz Max.
- Built-in 1 KB FIFO
- Gap-free AD Conversion
- Automatic Channel/Gain Scan

32-channel, 12-bit, 10 kS/s Isolated Analog Input Board

ISO-813

- ISA Bus Interface
- 32 Single-ended Analog Input Channels
- Built-in DC/DC Converter with 3000 V_{DC} Isolation
- 3000 V_{rms} Photo-isolation Protection
- 12-bit Sampling Rate, 10 kHz Max.
- Trigger Mode: Software
- Transfer Mode: Polling
- Programmable Gain: 1, 2, 4, 8, 16

8/16-channel, 14-bit, Isolated Analog Output Board

ISO-DA8
ISO-DA16

- ISA Bus Interface
- 8/16-channel, 14-bit Analog Output
- Built-in DC/DC Converter with 3000 V_{DC} Isolation
- 2500 V_{rms} Photo-isolation Protection
- Software Calibration
- 0 ~ 20 mA Current Sink
- Double-buffered DA Latch

64-channel, Optically-isolated Digital I/O Board

ISO-C64

ISO-P64

- ISA Bus Interface
- ISO-P64:
  - 64-channel Optically-isolated DI
  - Built-in DC/DC Converter with 3000 V_{DC} Isolation
- ISO-C64:
  - 64-channel Optically-isolated Open-collector DO (Sink, NPN)
- 3750 V_{rms} Photo-isolation Protection
- Two Interrupt Sources

32-channel, Optically-isolated DI and 32-channel Optically-isolated Open-collector Output Board

ISO-P32C32

- ISA Bus Interface
- 32-channel Optically-isolated Open-collector Output (Sink, NPN)
- 32-channel Optically-isolated Digital Input
- 3750 V_{rms} Photo-isolation Protection
- Built-in DC/DC Converter with 3000 V_{DC} Isolation
- Two Interrupt Sources

32-channel, Optically-isolated DI and 32-channel Optically-isolated Open-collector Output Board (8-ch for 500 mA)

ISO-P32S32W

- ISA Bus Interface
- 32-channel Optically-isolated Open-collector Output (Sink, NPN)
  - 100 mA (24-channel) Low Driving
  - 500 mA (8-channel) High Driving
- 32-channel Optically-isolated Digital Input
- 3750 V_{rms} Photo-isolation Protection
- Two Interrupt Sources

32-channel, Isolated Digital I/O and 32-channel TTL Digital I/O Board

ISO-730

- ISA Bus Interface
- 16-channel Optically-isolated Open-collector Output (Sink, NPN)
- 16-channel Optically-isolated Digital Input
- 3750 V_{rms} Photo-isolation Protection
- Built-in DC/DC Converter with 3000 V_{DC} Isolation
- 16-channel, 5 V/TTL Digital Input
- 16-channel, 5 V/TTL Digital Output
- Two Interrupt Sources

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

P8R8DIO

P16R16DIO

- ISA Bus Interface
- 8/16-channel Optically-isolated Digital Input
- 8/16-channel Relay Output
- AC/DC Signal Input
- AC Signal Input with Filter
- Relay Status LED Indicators
- Power Requirements:
  - 200 mA @ +5 V (Max.)
  - 260 mA @ +12 V (Max.)

4-3 Non-isolated Data Acquisition Boards

6-channel, 12-bit Analog Output Board

A-726

- ISA Bus Interface
- 6-channel, 12-bit Analog Output
- Voltage Output Range:
  0 ~ +5 V, 0 ~ +10 V, ±5 V, ±10 V
- Current Output Range: 4 ~ 20 mA
- 16-channel, 5 V/TTL Digital Input
- 16-channel, 5 V/TTL Digital Output
- Connectors: 20-pin Box Header x 4

6-channel, 12-bit Analog Output Board

A-626

- ISA Bus Interface
- 6-channel, 12-bit Analog Output
- Voltage Output Range:
  0 ~ +5 V, 0 ~ +10 V, ±5 V, ±10 V
- Current Output Range: 4 ~ 20 mA
- 16-channel, 5 V/TTL Digital Input
- 16-channel, 5 V/TTL Digital Output
- Connectors: Female DB-37 x 1 and
  20-pin Box Header x 4

8-channel, 12-bit Analog Output Board

A-628

- ISA Bus Interface
- 8-channel, 12-bit Analog Output
- Voltage Output Range:
  0 ~ +5 V, 0 ~ +10 V, ±5 V, ±10 V
- Current Output Range: 4 ~ 20 mA
- 16-channel, 5 V/TTL Digital Input
- 16-channel, 5 V/TTL Digital Output
- Connectors: Female DB-37 x 1 and
  20-pin Box Header x 4

24-channel, OPTO-22 Compatible Digital I/O Board

DIO-24

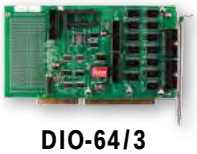
- ISA Bus Interface
- 24-channel Digital Input/Output
- All I/O lines are buffered on the Board
- Emulates one Industrial-standard
  8255 PPI Ports (Mode 0)
- Direct Interface with OPTO-22
  Compatible I/O Modules
- Programmable Interrupt Source
- Supports Output Status Readback

48-channel, OPTO-22 Compatible Digital I/O Board

DIO-48

- ISA Bus Interface
- 48-channel Digital Input/Output
- All I/O lines are buffered on the Board
- Emulates one Industrial-standard
  8255 PPI Ports (Mode 0)
- Direct Interface with OPTO-22
  Compatible I/O Modules
- 1-channel 16-bit Timer/Counter
- 4 Clock Sources
- Programmable Interrupt Source

32-channel DI, 32-channel DO with Timer/Counter Board



DIO-64/3
DIO-64/6

- ISA Bus Interface
- 32-channel Digital Input
- 32-channel Digital Output
- DIO-64/3: 3 Independent Programmable
  16-bit Down Counters
- DIO-64/6: 6 Independent Programmable
  16-bit Down Counters
- 4 Clock Sources
- 3 Frequency Dividers: 100, 10, 1
- 1-channel 16-bit Counter, 1-channel 32-bit Timer with a 4 MHz
  Clock Source
- Interrupt Source Triggers: Timer, Event, External

96/144-channel, OPTO-22 Compatible Digital I/O Board

DIO-96

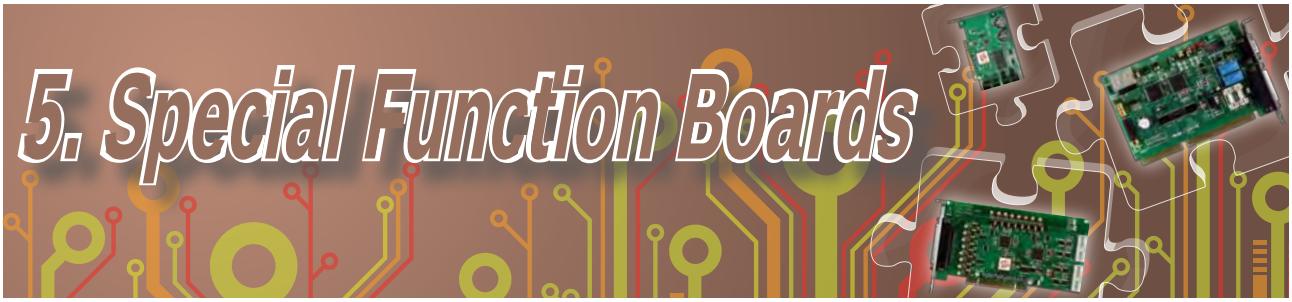
DIO-144

- ISA Bus Interface
- DIO-96: 96-channel Digital Input/Output
- DIO-144: 144-channel Digital Input/Output
- Direct Interface with OPTO-22 Compatible
  I/O Modules
- Emulates 6/4 Industrial-standard 8255
  PPI Ports (Mode 0)
- Supports Output Status Readback
- Programmable Interrupt Source

10-channel, Timer/Counter Board

TMC-10

- ISA Bus Interface
- Four 8254 Timer/Counter Chips
- 2 Internal Clock Sources:
  8 MHz /1.6 MHz, and 0.8 MHz/80 kHz
- 8 Independent 16-bit Timers/Counters
- 8 External Clock Inputs
- 8 External Gate Control Signals
- 8-bit General purpose Digital Output
- 2 Cascaded 32-bit Timers/Counters
- 11 Jumper-selectable Interrupt Levels



5-1 Memory Board

PCI-M512U

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

Features

- Universal PCI (3.3 V/5 V) Interface
- Two Li-ion Batteries to prevent Loss of SRAM Data
- 16-channel, 5 V/TTL Digital Output
- 12-channel, 5 V/TTL Digital Input
- 512 KB SRAM Onboard
- LED Indicators to monitor Battery Status (Low Voltage/Fault)
- 4-bit Battery Status Readback (DI0~3)

Introduction

The PCI-M512U is a 512 KB SRAM Memory Board with battery backup and supports both the 3.3 V and the 5 V Universal PCI bus. The PCI-M512U provides 12 Digital Input channels and 16 Digital Output channels, and is designed as a direct replacement for the PCI version of the PCI-M512 board without requiring any modification to the software or the driver

The PCI-M512U is equipped with two Li-ion batteries to ensure that the content of the SRAM is maintained if a power loss occurs. The batteries can continue supplying power to the SRAM for 10 years, ensuring any important data is retained. The main benefit of the double-battery design is that either of the batteries can be replaced without losing data, so when one battery is removed, the other continues to provide power to the SRAM.

Four LED indicators are included on the board to provide a clear visual indication of whether the batteries are operating normally, whether the voltage is low, or whether the battery is bad or has encountered a fault. The PCI-M512U is an ideal solution for improving system reliability.

Pin Assignments

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

CN1

Pin Assignment	Terminal No.		Pin Assignment
	01	02	
	03	04	
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

CN2

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 Input	
Channels	12
Compatibility	5 V/TTL
Input Voltage	Logic 0: 0.8 V Max. Logic 1: 2.0 V Min.
Response Speed	1.4 MHz (Typical)
Digital Output	
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	1.4 MHz (Typical)
Special	
SRAM Size	512 KB
Li-ion Battery	BT1 and BT2
Battery Status Bits	BT1 Low, BT1 Bad, BT2 Low, BT2 Bad (Low Voltage = 2.3 V, Fault = 2.1 V)
LED Indicators	BT1 Low (Green), BT1 Bad (Red) BT2 Low (Green), BT2 Bad (Red)
General	
Bus Type	3.3 V/ 5 V Universal PCI, 32-bit, 33 MHz
Connectors	20-pin Box Header x2
Power Consumption	420 mA @ +5 V
Operating Temperature	-20°C to +60°C
Humidity	0 to 90% RH, Non-condensing

Ordering Information

PCI-M512U CR	Universal PCI, 512 KB Memory Board with DI/O (RoHS).

5-2 Counter/Frequency Board

PCI-FC16U

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

Features

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

Introduction

PCI-FC16U is a 32-bit hardware-type high-speed Counter/Frequency card 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 also includes 32 programmable Digital I/O channels.

The PCI-FC16U card includes an onboard Card ID switch that enables the board to be 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

Sample Programs

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

Pin Assignments

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

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

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 V_{DC}
	OFF Voltage	+1 V_{DC} Max.
Isolation Voltage		2500 V_{DC}
ESD Protection		2 KV (Contact for each Channel)
Programmable I/O		
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

Ordering Information

PCI-FC16U CR	Universal PCI, 16-channel Counter/Frequency with 32-channel Programmable Digital I/O (RoHS). Includes one CA-4002 D-sub Connector.

WDT-01/WDT-02

Intelligent Watchdog Timer Board

WDT-01 WDT-02

Features

- No need to modify the original program
- Can be used in either an ISA bus or a printer port interface
- Early detection and warning prevents system failure in harsh environments
- Cost-effective Solution

Introduction

The WDT-01 and WDT-02 are watchdog cards that provide watchdog timer, temperature monitoring and power monitoring functions. They also provide a variety of signals and mechanisms, such as relay control, reset signal, and power-good signal, which allow the system to be controlled as soon as an error occurs. There are also many signals available, such as IRQ, I/O status, RS-232, LED, and Buzzer, etc., to advise the user or operator that an error has occurred. Once the WDT-01 has been powered on, it will automatically monitor the power and the temperature of the PC.

After enabling the WDT-01 via software, the watchdog timer will monitor the software and hardware operations, providing the most cost-efficient solution with high-quality protection. The WDT-02 provides the same functionality as the WDT-01, but is a lower-cost version.

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
GND	05	09	NC
NC	04	08	NC
NC	03	07	NC
TxD	02	06	NC
NC	01		

CN1 (RS-232) — 9-pin Male D-sub Connector

	Terminal No.		
NO_TIM	01	14	NO_TIM
NC_TIM	02	15	NC_TIM
TIM_COM	03	16	TIM_COM
Reserved	04	17	Reserved
NO_TEM	05	18	NO_TEM
NC_TEM	06	19	NC_TEM
TEM_COM	07	20	TEM_COM
Reserved	08	21	5 V
SPK_OUT	09	22	NL_TEM
NH_TEM	10	23	NH_TIM
NL_TIM	11	24	EX_GND
EX_GND	12	25	EX_12 V
EX_12 V	13		

CN2 — 25-pin Male D-sub Connector

Ordering Information

WDT-01	Intelligent Watchdog Timer Card with Terminal Board and 1 meter Cable. Includes one CA-0205 (2-pin Black & Red Cable, 0.5 m) and one CA-2520 (25-pin D-sub Cable, 2.0 m).
WDT-02	Intelligent Watchdog Timer Card (No Terminal Board, Cable, Buzzer Relay, LED, or Temperature Sensor. Includes one CA-0205 (2-pin Black & Red Cable, 0.5 m) and one CA-2520 (25-pin D-sub Cable, 2.0 m).

Software

Drivers

- ✓ Windows 95/98/NT/2000
- ✓ Linux
- ✓ 32-bit Windows XP
- ✓ DOS

Hardware Specifications

Analog Input		
Watchdog Timer		Software programmable from 0.01 second to 167772.15 seconds
Computer Power Monitor		PC Power +5 V
		External Power +12 V
RS-232 Output (Speed)		9600/4800/2400/1200 bps
Printer-like I/O Interface		LPT0 (3bch), LPT1 (378h), LPT (278h) or user-defined ports
IRQ		3/4/5/6/7/9/10/11/12/14/15
4-bit TTL Output		
Output Voltage	Logic 0	0.5 V_{DC} (Max.)
	Logic 1	24 V_{DC} (Min.)
Output Capability	Sink	-10 mA
	Source	400 µA
Two Relay for Watchdog or Temperature Failure		Contacts: FORM c.
Max. Switched Current		1 A 30 V_{DC}
Max. Switched Voltage		120 V_{AC}/60 V_{DC}
Max. Carry Current		1.25 AC/DC
General		
Bus Type		ISA bus
Connectors		Male DB9 x 1; Male DB25 x 1
Power Required	External	3 W @ +12 V
	Internal	3 W @ +12 V
Operating Temperature		0°C to +60°C
Humidity		5 to 85% RH, Non-condensing

Output Signals			
Signal/Function	WDT Timeout	Over-temperature Protection	Power Failure
Reset	✓	×	×
IRQ	✓	✓	×
I/O Status	✓	✓	✓
Relay	✓	✓	×
TTL	✓	✓	×
LED	✓	✓	✓
RS-232	✓	✓	✓
Buzzer	✓	✓	✓

WDT-03

Intelligent Watchdog Timer Board

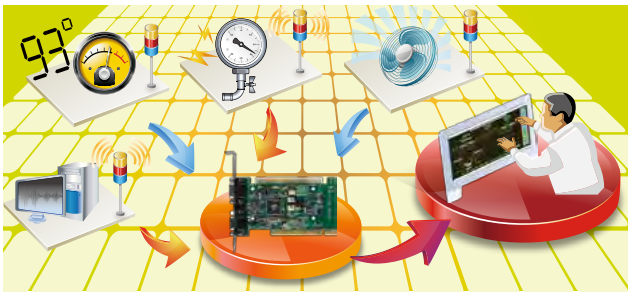
Features

- No need to modify the original program
- Can be used in ISA bus, PCI bus or any system with an RS-232 interface
- Early detection and warning prevents system failure in harsh environments
- Cost-effective Solution

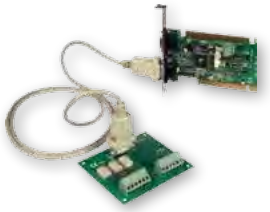
Introduction

PC hardware and/or software may sometimes fail for whatever reason. To prevent failure, a wide variety of different solutions have been proposed. However, none of these solutions can offer a 100% assurance. Since preventing a failure is difficult, detecting a failure becomes increasingly important. The WDT-03 is used to detect failures in both the software and the hardware, and can also be used to reduce the risks involved in potential PC failures. The WDT-03 is useful even for those systems that include a built-in watchdog circuit.

The WDT-03 includes a software utility for windows that can be used to monitor the status of the system. If the system malfunctions, the WDT-03 can send an alarm via the Digital Output, and if the system fails, the WDT-03 can automatically reset the system. The WDT-03 Utility is executed when Windows starts and can be accessed from the Taskbar Notification Area ("System Tray"). On a Windows NT system, the WDT-03 utility will record an event so that, when Windows NT is restarted, the system automatically logs into the administrator account. The WDT-03 Utility uses very few system resources, but can be used to monitor a variety of the system information, such as the voltage, the temperature, and the fan speed and system errors.



The WDT-03 is able to control a 3-channel Digital Input terminal and a 3-channel signal relay output from its attached DB-3R daughterboard.



Software

Drivers

- Windows 95/98/NT/2000
- Linux
- 32-bit Windows XP
- DOS

Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
GND	05 09	NC
NC	04 08	NC
RxD	03 07	NC
TxD	02 06	NC
NC	01	

CN1 (RS-232) — 9-pin Male D-sub Connector

Pin Assignment	Terminal No.	Pin Assignment
GND	05 09	DO_3
DO_2	04 08	DO_1
Power	03 07	DI_1
TxD	02 06	DI_2
DI_3	01	

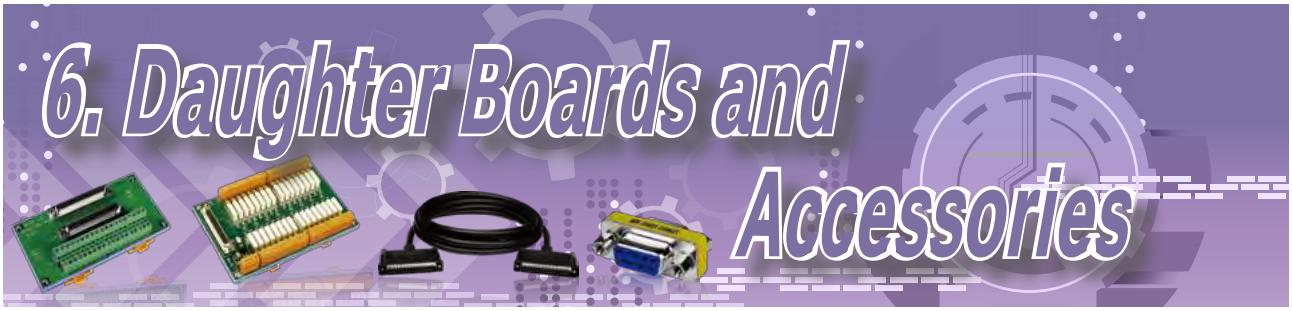
CN2 (RS-232) — 9-pin Female D-sub Connector

Ordering Information

WDT-03	Intelligent Watchdog Timer Card. Includes one CA-0205 (2-pin Black and Red Cable, 0.5 m) and one CA-0910F (9-pin Female-Female D-sub Cable, 1.0 m).

Hardware Specifications

Interface	RS-232 x 1 for Local CPU
	RS-232 x 1 for Remote Host (for monitoring the Local)
	Four through-hole mounting for any system with RS-232
Watchdog Timer	Enabled/Disabled via Software; from 0.03 to 1966.05 seconds
Baud Rate	2400 ~ 115200 bps
Data Bit	8
Stop Bit	1
Parity	None
Bus Voltage Monitoring	-12 V, -5 V, +3.3 V, +5 V, +12 V
Fan Speed Monitoring	3 channels
Temperature Monitoring	3 channels
EEPROM	63 Bytes
Read/Write Cycles	100,000 Times
Reset Mechanism	Power-good Signal for the PC System
	Reset Signal that simulates when an external Reset Key is pressed
General	
Bus Type	ISA bus and PCI bus
Connectors	Male DB9 x 1 Female DB9 x 1
Power Consumption	2 W
Operating Temperature	0°C to +60°C
Humidity	5 to 85% RH, Non-condensing



6-1 Daughter Boards (Screw Terminal Boards)

Digital I/O Daughter Board Selection Guide

★: Full-function Support ☆: Uses a 20-pin Header, 16-channel Support only (Cable Option: /F)

Model	DB-16R	DB-24R	DB-24PR	DB-24C	DB-24OD	DB-24POR	DB-24SSR	DB-16P8R	DB-16P	DB-24P
Function	Digital Output (DO)							DI/DO	Digital Input (DI)	
DIN-Rail Mounting	-	Option	Option	Option	Option	Option	Option	Option	Option	-
Page	**6-4**	**6-4**	**6-4**	**6-4**	**6-4**	**6-5**	**6-5**	**6-5**	**6-4**	**6-4**
PCI Express/PCI Bus, Non-isolated AD, DA Board										
PEX-1002L/H	★	-	☆	☆	☆	☆	-	-	★	-
PEX-1202L/H	★	-	☆	☆	☆	☆	-	-	★	-
PEX-DA4/DA8/DA16	★	-	☆	☆	☆	☆	-	-	★	-
PCI-1802LU/HU	★	-	☆	☆	☆	☆	-	-	★	-
PCI-1800LU/HU	★	-	☆	☆	☆	☆	-	-	★	-
PCI-1602U/FU	★	-	☆	☆	☆	☆	-	-	★	-
PCI-1202LU/HU	★	-	☆	☆	☆	☆	-	-	★	-
PCI-1002LU/HU	★	-	☆	☆	☆	☆	-	-	★	-
PIO-821H/L	★	-	☆	☆	☆	☆	-	-	★	-
PIO-DA4U/DA8U/DA16U	★	-	☆	☆	☆	☆	-	-	★	-
PISO-DA4U/DA8U/DA16U	★	-	☆	☆	☆	☆	-	-	★	-
PCI Express/PCI Bus, Digital I/O Board										
PEX-D24	-	★	★	★	★	★	★	★	-	★
PEX-D48	-	★	★	★	★	★	★	★	-	★
PEX-D56	★	★	☆	★	★	★	★	★	★	★
PEX-730	★	-	☆	☆	☆	☆	-	-	★	-
PIO-D24U	-	★	★	★	★	★	★	★	-	★
PIO-D48U	-	★	★	★	★	★	★	★	-	★
PIO-D56U	★	★	☆	★	★	★	★	★	★	★
PIO-D64U	★	-	☆	☆	☆	☆	-	-	★	-
PIO-D96U	-	★	★	★	★	★	★	★	-	★
PIO-D144U/D144LU	-	★	★	★	★	★	★	★	-	★
PIO-D168U	-	★	★	★	★	★	★	★	-	★
PCI-M512U	★	-	☆	☆	☆	☆	-	-	★	-
PISO-730U/730-5V	★	-	☆	☆	☆	☆	-	-	★	-
PISO-730A(-5V)	★	-	☆	☆	☆	☆	-	-	★	-
PCI-TMC12A	★	-	☆	☆	☆	☆	-	-	★	-
ISA Bus, Non-isolated AD, DA Board										
A-826PG	★	-	☆	☆	☆	☆	-	-	★	-
A-823PGL/PGH	★	-	☆	☆	☆	☆	-	-	★	-
A-822PGL/PGH	★	-	☆	☆	☆	☆	-	-	★	-
A-821PGL/PGH	★	-	☆	☆	☆	☆	-	-	★	-
A-812PG	★	-	☆	☆	☆	☆	-	-	★	-
A-8111	★	-	☆	☆	☆	☆	-	-	★	-
A-726/626/628	★	-	☆	☆	☆	☆	-	-	★	-
ISA Bus, Isolated DA Board										
ISO-DA8/DA16	★	-	☆	-	-	☆	-	-	★	-
ISA Bus, Digital I/O Board										
DIO-96/144	-	★	★	★	★	★	★	★	-	★
DIO-64	★	-	☆	☆	☆	☆	-	-	★	-
DIO-48	-	★	★	★	★	★	★	★	-	★
DIO-24	-	★	★	★	★	★	★	★	-	★
ISO-730	★	-	☆	☆	☆	☆	-	-	★	-

General Purpose Daughter Board Selection Guide for PCI Bus I/O Boards

●: Recommended Daughter Board ❍: Connects to 20-pin Header only (Digital I/O)

Model	DB-32R DB-16P16R	DB-8025	DB-8125	DB-8225	DB-8325	DB-8425	DB-1825	DB-889D	DB-37	DN-20	DN-37	DN-50	DN-68A	DN-100
Function	Relay Output	Analog Input Screw Terminal Board						MUX		General Purpose Screw Terminal Board				
DIN-Rail Mounting	Option	-	-	Option	-	-	Option	-	-	Standard				
Page	**6-4**	**6-5**	**6-5**	**6-5**	**6-6**	**6-6**	**6-5**	**6-5**	**6-6**	**6-6**	**6-6**	**6-6**	**6-6**	**6-6**
PCI Express/PCI Bus, Non-iolated AD, DA Board														
PEX-1002L/H	-	❍	❍	-	-	-	●	-	●	❍	●	-	-	-
PEX-1202L/H	-	❍	❍	-	-	-	●	-	●	❍	●	-	-	-
PEX-DA4/DA8/DA16	-	❍	❍	-	-	-	●	-	●	❍	●	-	-	-
PCI-2602U	-	-	-	-	-	-	-	-	-	-	-	-	●	-
PCI-1802LU/HU	-	❍	❍	-	-	-	●	-	●	❍	●	-	-	-
PCI-1800LU/HU	-	❍	❍	●	-	-	-	●	●	❍	●	-	-	-
PCI-1602U/FU	-	❍	❍	-	-	-	●	-	●	❍	●	-	-	-
PCI-1202LU/HU	-	❍	❍	-	-	-	●	-	●	❍	●	-	-	-
PCI-1002LU/HU	-	❍	❍	-	-	-	●	-	●	❍	●	-	-	-
PCI-822LU/826LU	-	❍	❍	-	-	-	●	-	●	❍	●	-	-	-
PIO-821H/L	-	❍	❍	●	-	-	-	●	●	❍	●	-	-	-
PIO-DA4U/DA8U/DA16U	-	❍	❍	-	-	-	-	-	●	❍	●	-	-	-
PCI Bus, Isolated AD, DA Board														
PISO-813	-	-	-	-	●	-	-	-	●	-	●	-	-	-
PISO-DA2U	-	-	-	-	-	●	-	-	-	-		-	-	-
PISO-DA4U/DA8U/DA16U	-	❍	❍	-	-	-	-	-	●	-	●	-	-	-
PCI Express/PCI Bus, Isolated Digital I/O Board														
PEX-P8R8i/P16R16i	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PEX-P8POR8i/P16POR16i	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PEX-P64(-24V)	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PEX-C64	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PEX-P32C32/P32A32	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PEX-730	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PCI-P16R16U	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PCI-P16C16	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PCI-P16POR16U	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PISO-P8R8U/P8SSR8	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PISO-P32A32U(-5V)	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PISO-P32C32U(-5V)	●DB-16P16R	-	-	-	-	-	-	-	●	-	●	-	-	-
PISO-P64U(-24V)	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PISO-C64U	●DB-32R	-	-	-	-	-	-	-	●	-	●	-	-	-
PISO-A64	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PISO-730U(-5V)	-	❍	❍	-	-	-	-	-	●	❍	●	-	-	-
PISO-730A(-5V)	-	❍	❍	-	-	-	-	-	●	❍	●	-	-	-
PISO-725	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PCI Express/PCI Bus, Digital I/O Board														
PEX-D24	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PEX-D48	-	-	-	-	-	-	-	-	●	-	●	●	-	-
PEX-D56	-	❍	❍	-	-	-	-	-	●	❍	●	●	-	-
PEX-D96S	-	-	-	-	-	-	-	-	-	-	-	-	-	●
PEX-D144S	-	-	-	-	-	-	-	-	-	-	-	●	-	●
PIO-D24U	-	-	-	-	-	-	-	-	●	-	●	-	-	-
PIO-D48U	-	-	-	-	-	-	-	-	●	-	●	●	-	-
PIO-D48SU	-	-	-	-	-	-	-	-	-	-	-	-	-	●
PIO-D56U	-	❍	❍	-	-	-	-	-	●	❍	●	●	-	-
PIO-D64U	-	●	●	-	-	-	-	-	●	●	●	-	-	-
PIO-D96U	-	-		-	-	-	-	-	●	-	●	●	-	-
PIO-D96SU	-	-	-	-	-	-	-	-	-	-	-	-	-	●
PIO-D144U/D144LU	-	-	-	-	-	-	-	-	●	-	●	●	-	-
PIO-D168U	-	-	-	-	-	-	-	-	●	-	●	●	-	-
PCI-M512	-	●	●	-	-	-	-	-	-	●	-	-	-	-
PCI Bus, Timer/Counter Board														
PCI-TMC12A	-	❍	❍	-	-	-	-	-	●	❍	●	-	-	-

General Purpose Daughter Board Selection Guide for ISA Bus I/O Boards

●: Recommended Daughter board ❍: Connects to 20-pin Header only (Digital I/O)

Model	DB-32R DB-16P16R	DB-8025	DB-8125	DB-8225	DB-8325	DB-1825	DB-889D	DB-37	DN-20	DN-25	DN-37	DN-50
Function	Relay Output	Analog Input Screw Terminal Board					MUX		General Purpose Screw Terminal Board			
DIN-Rail Mounting	Option	-	-	Option	-	Option	-	Option	Standard			
Page	**6-4**	**6-5**	**6-5**	**6-5**	**6-6**	**6-5**	**6-5**	**6-6**	**6-6**	**6-6**	**6-6**	**6-6**
ISA Bus, Non-iolated AD, DA Board												
A-826PG	-	❍	❍	●	-	-	●	●	❍	-	●	-
A-823/822/821 PGL/PGH	-	❍	❍	●	-	-	●	●	❍	-	●	-
A-812PG	-	●	●	-	-	-	-	-	●	-	-	-
A-8111	-	❍	❍	●	-	-	●	●	❍	-	●	-
A-628/626	-	❍	❍	-	-	-	-	●	❍	-	●	-
A-726	-	❍	❍	-	-	-	-	-	●	-	-	-
ISA Bus, Isolated AD, DA Board												
ISA-AD32L/H	-	-	-	-	-	●	-	●	-	-	●	-
ISO-813	-	-	-	-	●	-	-	●	-	-	●	-
ISO-DA8/DA16	-	❍	❍	-	-	-	-	●	❍	-	●	-
ISA Bus, Isolated Digital I/O Board												
P16R16DIO/P8R8DIO	-	-	-	-	-	-	-	●	-	-	●	-
ISO-P32C32	●DB-16P16R	-	-	-	-	-	-	●	-	-	●	-
ISO-P64	-	-	-	-	-	-	-	●	-	-	●	-
ISO-C64	●DB-32R	-	-	-	-	-	-	●	-	-	●	-
ISO-730	-	❍	❍	-	-	-	-	●	❍	-	●	-
PCI Express/PCI Bus, Digital I/O Board												
DIO-24/48	-	-	-	-	-	-	-	-	-	-	-	●
DIO-64	-	●	●	-	-	-	-	●	●	●	-	-
DIO-96/144	-	-	-	-	-	-	-	-	-	-	-	●
ISA Bus, Timer/Counter Board												
TMC-10	-	-	-	-	-	-	-	●	-	-	●	-

Option Table for Digital I/O Daughter Boards

Model	External Power Input (Relay Coil Voltage)		Cable Option				Without DIN-Rail Mount	With DIN-Rail Mount (/DIN)	Remarks
			CA-5015	CA-3710	CA-2010				
	/12 V	/24 V	-	-	/D	/F	-	/DIN	
DB-24R	✓	✓	✓	-	-	-	✓	✓	Example: **1. DB-24PRD/24V/DIN:** DB-24PRD, with 24 V Coil Voltage, 37-pin D-sub Cable and DIN-Rail Mounting. **2. DB-24PR/12/DIN:** DB-24PR, with 12 V Coil Voltage, 50-pin Flat Cable and DIN-Rail Mounting. **3. DB-16P8R/D/DIN:** DB-16P8R, with 37-pin D-sub Cable and DIN-Rail Mounting.
DB-24RD	-	-	-	✓	-	-	✓	✓	
DB-24PR	✓	✓	✓	-	-	✓	✓	✓	
DB-24PRD	✓	✓	-	✓	-	-	✓	✓	
DB-24C	-	-	✓	-	✓	✓	✓	✓	
DB-24SSR	-	-	✓	-	✓	-	✓	✓	
DB-24POR	-	-	✓	-	✓	✓	✓	✓	
DB-16P8R	-	-	✓	-	✓	✓	✓	✓	
DB-24P	-	-	✓	-	-	-	✓	✓	
DB-24PD	-	-	-	✓	-	-	✓	✓	

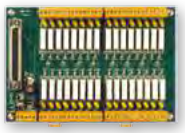
Option Table for Daughter Boards

Model	1 Meter Cable	2 Meter Cable	Without DIN-Rail Mount		With DIN-Rail Mount		Remarks
	-	/2	-	/N	-	/DIN	
DB-8225	✓	✓	✓	-	-	✓	Example: **1. DN-37/N:** DN-37 without DIN-Rail Mounting. **2. DB-1825/2/DIN:** DB-1825, with 37-pin D-sub Cable (2 m) and DIN-Rail Mounting.
DB-1825	✓	✓	✓		-	✓	
DB-8325	✓	✓	-	-	-	-	
DB-8425	-	-	✓	-	-	✓	
DN-20	✓	-	-	✓	✓	-	
DN-25	✓	-	-	✓	✓	-	
DN-37	✓	✓	-	✓	✓	-	
DN-50	✓	-	-	✓	✓	-	

DB-32R

32-channel Relay Output Board

- 32-channel Relay Output (Form A)
- LED Indicator for Relay Status
- Screw Terminals for easy Field Wiring
- The DB-32R uses a DB37 Connector to control 32 Form A Relay channels for use with PISO-C64 and ISO-C64 Boards.



DB-16P16R

16-channel Input Terminal and 16-channel Relay Output Board

- 16-channel Digital Input (Pin-to-Pin)
- 16-channel Relay Output (Form A)
- LED Indicator for Relay Status
- Screw Terminals for easy Field Wiring
- The DB-16P16R uses a DB37 Connector to control 16 Form A Relay channels and a 16-channel Input Terminal for use with PISO-P32C32 and ISO-P32C32 Boards.

DB-16P

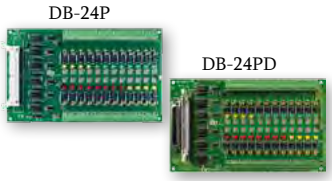
16-channel Bi-directional Isolated Input Board

- 16-channel Optically-isolated Input
- AC/DC Signal Input
- AC Signal Input with Filter
- Input Buffer with Voltage Comparators
- 3000 V Isolation Voltage
- Input Status LED Indicators

DB-24P/DB-24PD

24-channel Bi-directional Isolated Input Board

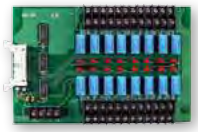
- 24-channel Optically-isolated Input
- AC/DC Signal Input
- AC Signal Input with Filter
- Input Buffer with Voltage Comparators
- 3000 V Isolation Voltage
- Input Status LED Indicators
- DB-24PD includes one CA-3710 Cable
- DB-24P includes one CA-5015 Cable



DB-16R

16-channel Relay Output Board

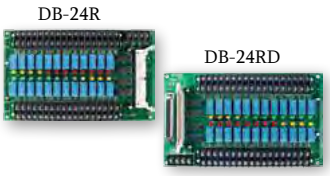
- 16 Form C Relay Output Channels
- Relay Output Status LED Indicators
- Screw Terminals for easy Field Wiring



DB-24R/DB-24RD

24-channel Relay Output Board

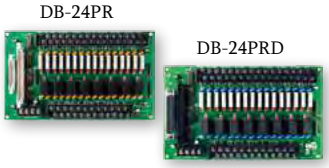
- 24 Form C Relay Output Channels
- Relay Output Status LED Indicators
- Screw Terminals for easy Field Wiring
- DB-24R includes one CA-5015 Cable
- DB-24RD includes one CA-3710 Cable



DB-24PR/DB-24PRD

24-channel Power Relay Output Board

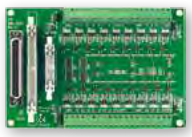
- 8 Form C Relay Output Channels
- 16 Form A Relays Output Channels
- Relay Output Status LED Indicators
- Screw Terminals for easy Field Wiring
- Built-in Varistors protect the Input Channels from being damaged by External High-voltage Spikes



DB-24C

24-channel Open-collector Output Board

- 24 Open-collector Output Channels (NPN)
- Max. Load Voltage: 30 V_{DC}
- Max. Load Current: 600 mA/Channel
- Output Status LED Indicators
- Screw Terminals for easy Field Wiring



DB-24OD

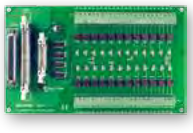
24-channel Open-drain Output Board

- 24-channel Open-drain Output
- Max. Load Current: 400 mA/Channel
- Max. Load Voltage: 35 V_{DC}
- Output Status LED Indicators

DB-24POR

24-channel PhotoMos Relay Output Board

- 24 Form A PhotoMos Relay Output Channels
- Switch up to 0.13 A @ 350 V_{AC} (Max.)
- 5 V_{DC} Logic Level
- 5000 V Optical Isolation
- Relay Output Status LED Indicators
- Screw Terminals for easy Field Wiring



DB-3R

Daughterboard for WDT-03

- 3-channel Relay Output (Form A)
- 3-channel Digital Input
- The DB-3R is equipped with one DB9 connector and 3 Relay Output Channels

DB-16P8R

16-channel Isolated Digital Input and 8-channel Relay Output Board

- 16 OPTO-isolated Digital Input Channels
- 8 Form C Relay Output channels (SPDT)
- Switch up to 5 A @ 250 V_{AC}/30 V_{DC}
- Input and Output Status LED Indicators
- Voltage Input or Dry Contact Input Mode
- Optional Varistors protect the Input Channels from being damaged by External High-voltage Spikes
- Screw Terminals for easy Field Wiring

DB-12SSR/DB-24SSR/DB-24SSRDC

12/24-channel Solid-state (AC/DC) Relay Output Board

- DB-12SSR/DB-24SSR:
  - 12/24 Form A Solid-state (AC) Relay Output Channels
  - Switch up to 4 A @ 250 V_{AC}
- 5 V_{DC} Logic Level
- 2500 V Optical Isolation
- DB-24SSRDC:
  - 24 Form A Solid-state (DC) Relay Output Channels
  - Switch up to 4 A @ 50 V_{DC}
- Relay Output Status LED Indicators
- Screw Terminals for easy Field Wiring

DB-12SSR

DB-24SSR
DB-24SSRDC

DB-889D

16-channel Analog Multiplexer Board

- 16-channel Differential Analog Input
- Input Filtering
- Connects directly to A-82x and PCI-1800 Series Boards
- Cold-junction Compensation for Thermocouples, Thermocouple Open Detection Daisy chain up to eight DB-889D Daughter Boards

DB-1825

Daughterboard for PCI-1802 with 1 Meter DB37 Cable

- 32 Single-ended/16 Differential
- Screw Terminal Board using a DB37 Connector for PEX/PCI-1202, PCI-1602, PCI-1802, PCI-822 and PCI-826 Series Boards
- Blank Pads for Break Detection, Low-pass Filter, Current Shut and Voltage Attenuation

DB-8025

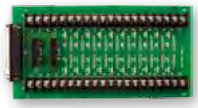
Daughterboard with two 20-pin Flat Cables

- Two 20-pin Box Header Connectors
- Blank Pads for Break Detection, Low-pass Filter, Current Shut and Voltage Attenuation

DB-8125

Daughterboard with 1 m DB37 Cable

- Screw Terminal Board using two 20-pin Cable Connectors or one DB37 Connector
- Blank Pads for Break Detection, Low-pass Filter, Current Shut and Voltage Attenuation



DB-8225

Daughterboard for A-82x/PCI-1800 Series with 1 m DB37 Cable

- 16 Single-ended/8 Differential Input Channels
- Blank Pads for Break Detection, Low-pass Filter, Current Shut and Voltage Attenuation
- Onboard Cold-junction Circuit on AI Channel 1 (Single-ended or Differential)
- Includes one DB37 Connector for A-82x and PCI-1800 Series Boards

DB-8325

Daughterboard with 1 m DB37 Cable

- The DB-8325 includes one DB37 Connector for ISO-813 or PISO-813 Series Boards
- Blank Pads for Break Detection, Low-pass Filter, Current Shut and Voltage Attenuation

DB-8425

Daughterboard for PISO-DA2U with 1.5 m DB9 Cable

- Pin-to-Pin Screw Terminal for PISO-DA2U Boards with DB9 Connector
- Screw Terminals for easy Field Wiring

DB-37

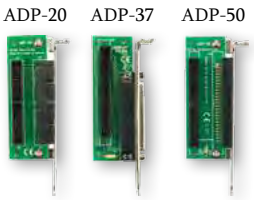
Direct Connection Board

- Pin-to-Pin Screw Terminal for any I/O Board that uses a DB37 Connector

ADP-20/ADP-37/ADP-50

Connector Extender

- ADP-20: 20-pin to 20-pin Connector Extender for PCI/ISA Board and includes one CA-2002 Cable
- ADP-50: 50-pin to 50-pin Connector Extender for PCI/ISA Board and include one CA-5002 Cable
- ADP-37: 50-pin OPTO-22 Connector to Female DB37 Connector Extender for PCI/ISA Board and include one CA-5002 Cable



DN-09-2/DN-09-2F

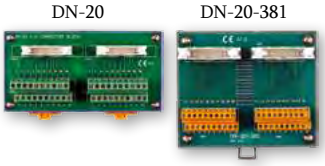
I/O Connector Block with DIN-Rail Mounting and two DB9 Male Headers

- Two Male DB9 Connectors
- DN-09-2 includes two CA-0915 Cables
- DN-09-2F includes two CA-0910F Cables
- Pitch: 5.08 m/m
- Pin-to-Pin Screw Terminal

DN-20/DN-20-381

I/O Connector Block with DIN-Rail Mounting and two 20-pin Headers

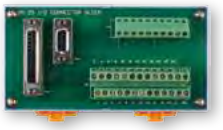
- Two 20-pin Headers
- Includes one CA-2010 Cable
- Pin-to-Pin Screw Terminal
- Pitch:
  - DN-20: 5.08 mm
  - DN-20-381: 3.81 mm



DN-25

I/O Connector Block with DIN-Rail Mounting and DB9/DB25 Connector

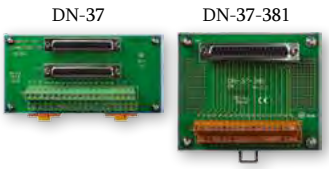
- One DB9 Connector
- One DB25 Connector
- Includes one CA-0920 Cable and one CA-2520 Cable
- Pin-to-Pin Screw Terminal
- Pitch: 5.08 mm



DN-37/DN-37-381

I/O Connector Block with DIN-Rail Mounting and DB37 Connector

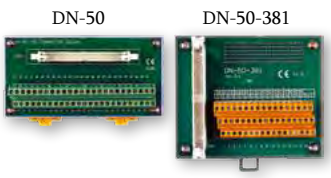
- DN-37 contains two DB37 Connectors
- DN-37-381 contains one DB37 Connector
- Pin-to-Pin Screw Terminal
- Includes one CA-3710 DB37 Cable
- Pitch:
  - DN-37: 5.08 mm
  - DN-37-381: 3.81 mm



DN-50/DN-50-381

I/O Connector Block with DIN-Rail Mounting and 50-pin Header

- One 50-pin Header
- Pin-to-Pin Screw Terminal
- Includes one CA-5015 Cable
- Pitch:
  - DN-50: 5.08 mm
  - DN-50-381: 3.81 mm

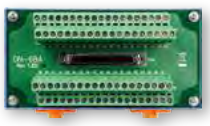


DN-68A

NEW

I/O Connector Block with DIN-Rail Mounting and 68-pin SCSI II Header

- One 68-pin SCSI II Female Connector
- Screw Terminals for easy Field Wiring
- Pin-to-Pin Screw Terminal

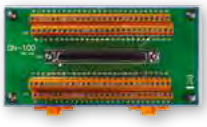


DN-100

NEW

I/O Connector Block with DIN-Rail Mounting and 100-pin SCSI II Header

- One 100-pin SCSI II Female Connector
- Screw Terminals for easy Field Wiring
- Pitch: 3.81 mm
- Pin-to-Pin Screw Terminal
- DN-100-CA includes one CA-SCSI100-15 Cable



6-2 Accessories and Cables

2-pin

CA-0205

2-pin Black and Red Cable
Length: 0.5 m

9-pin

CA-0910F

DB9 Female-to-Female Cable
Length: 1 m

CA-0910N

DB9 Female-to-Female Null Modem Cable
Length: 1 m

CA-0915

DB9 Male-to-Female Cable
Length: 1.5 m

CA-0920

DB9 Male-to-Male Cable
Length: 2 m

CA-0909

DB9 Female-to-Female Connector

CA-PC09F

DB9 Female Connector with Plastic Cover

CA-PC09M

DB9 Male Connector with Plastic Cover

20-pin

CA-2002

Two 20-pin Flat Cables for ADP-20 and ADP-20/PCI
Length: 20 cm

CA-2010

20-pin Flat Cable
Length: 1 m

CA-2020

20-pin Flat Cable
Length: 2 m

CA-20006

Two 20-pin Flat Cables
Pitch: 2.0 mm
Length: 6 cm

25-pin

CA-2520

DB25 Male-to-Male Cable
Length: 2 m (45°)

CA-2520D

DB25 Male-to-Male Cable
Length: 2 m (180°)

37-pin

CA-3710

DB37 Male-to-Male Cable
Length: 1 m (45°)

CA-3710D

DB37 Male-to-Male Cable
Length: 1 m (180°)

CA-3720

DB37 Male-to-Male Cable
Length: 2 m (45°)

CA-3720D

DB37 Male-to-Male Cable
Length: 2 m (180°)

CA-3710DM

Thin Monolithic DB37 Male-to-Male Cable (RoHS)
Length: 1 m (180°)

CA-3730DM

Thin Monolithic DB37 Male-to-Male Cable (RoHS)
Length: 3 m (180°)

CA-3750DM	CA-3705A	CA-3710A	CA-3715A	CA-4002
				
Thin Monolithic DB37 Male-to-Male Cable (RoHS) Length: 5 m (180°)	DB37 Male-to-Female Cable Length: 0.5 m	DB37 Male-to-Female Cable Length: 1 m	DB37 Male-to-Female Cable Length: 1.5 m	DB37 Male Connector with Plastic Cover

	40-pin		50-pin	
CA-4002F	CA-4037B	CA-4037W	CA-5002	CA-5015
				
DB37 Female Connector with Plastic Cover	40-pin Flat to DB37 Female Cable for PISO-DIO Series Cards Length: 24 cm	40-pin Flat to DB37 Female Cable for PCI-DIO/ISO-DIO Series Cards Length: 24 cm	50-pin Flat Cable Length: 20 cm	50-pin Flat Cable Length: 1.5 m

68-pin				100-pin
CA-SCSI15	CA-SCSI15-H	CA-SCSI30	CA-SCSI50	CA-SCSI100-15
				
68-pin SCSI-II Male-to-Male Cable Length: 1.5 m	68-pin SCSI-II Male-to-Male Cable Length: 1.5 m	68-pin SCSI-II Male-to-Male Cable Length: 3 m	68-pin SCSI-II Male-to-Male Cable Length: 5 m	100-pin SCSI-II Male-to-Male Cable Length: 1.5 m

ICP DAS Catalogs & Brochures

High Reliability Industrial Ethernet Switch Catalog

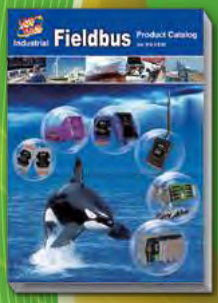
- Managed Ethernet Switches
- Unmanaged Ethernet Switches
- PoE Ethernet Switches
- Media Converters
- Real-time Redundant Ring Ethernet Switches
- IP67 Waterproof Switches
- Cyber-Ring Ethernet Self-healing Technology

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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