3. PCI Bus Data Acquisition Boards

Selection Guide

3-1 High Speed Multifunction Board | *3-2 Multifunction Board*

Model		PCI-2602U (NEW)	PCI-826 LU	PCI-822 LU	PCI-1802 LU	PCI-1802 HU	PCI-1800 LU	PCI-1800 HU	PCI-1602 U	PCI-1602 FU	PCI-1202 LU	PCI-1202 HU	PCI-1002 LU	PCI-1002 HU	PIO-821 (NEW) LU	PIO-821 (NEW) HU	PISO-813U (NEW)
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 NEW

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

Features

- Universal PCI (3.3 V/5 V) Interface
- Supports Card ID (SMD Switch)
- 2-channel 16-bit Voltage Output
  - 512-sample Hardware FIFO for 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)

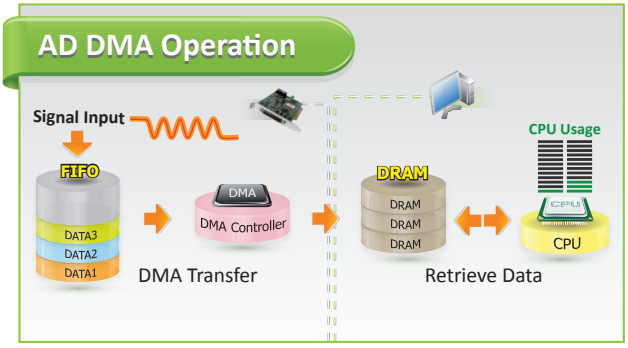
Programmable Digital Input filters can be employed to remove noise, glitches, and spikes on Digital Input ports, as well as to denounce the signal from the switch and relays in noisy industrial environments to prevent false readings caused by noise. The filter for the Digital Input channel can be configured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

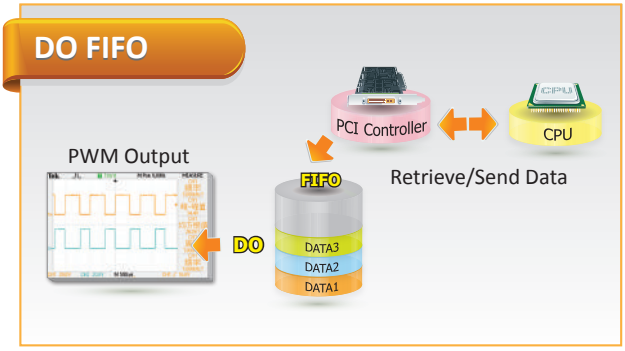
❸ Analog Pattern Generator (DA)

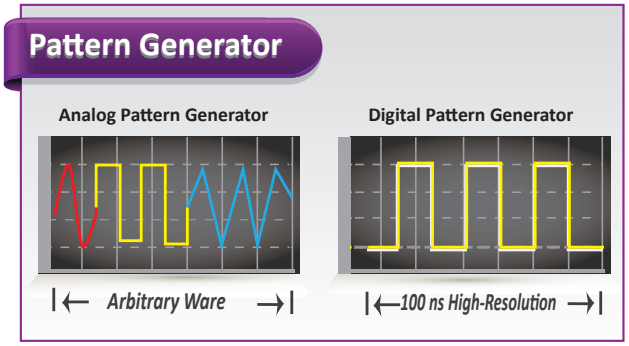
The PCI-2602 can be used to generate arbitrary wave shapes on a single Analog Output port based on user-defined waveform patterns. The Analog Pattern Generator operates at a full 20 MHz rate and is suitable for control systems or radar simulation, etc. The user-defined waveform pattern is stored in the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

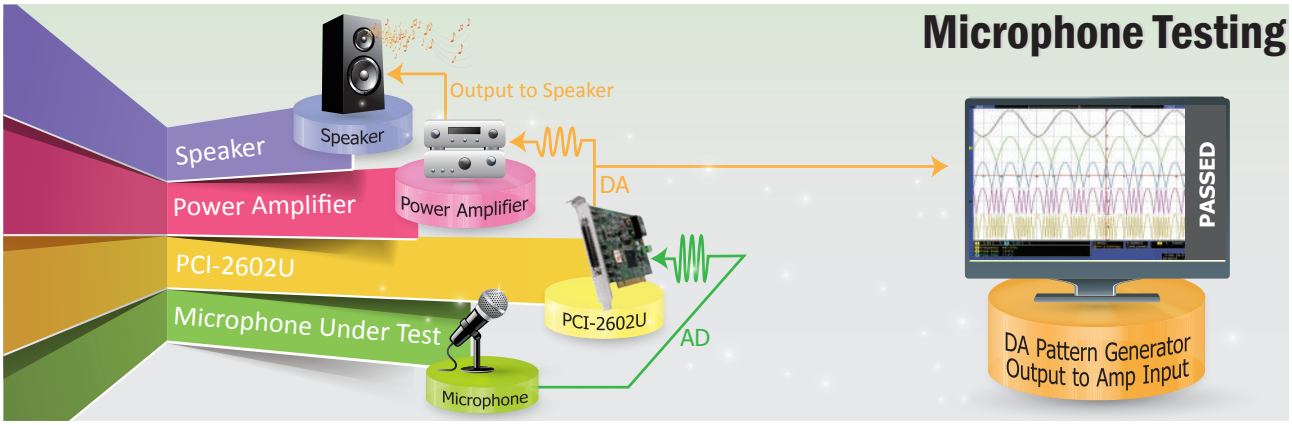
❹ Digital Pattern Generator (DO)

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).







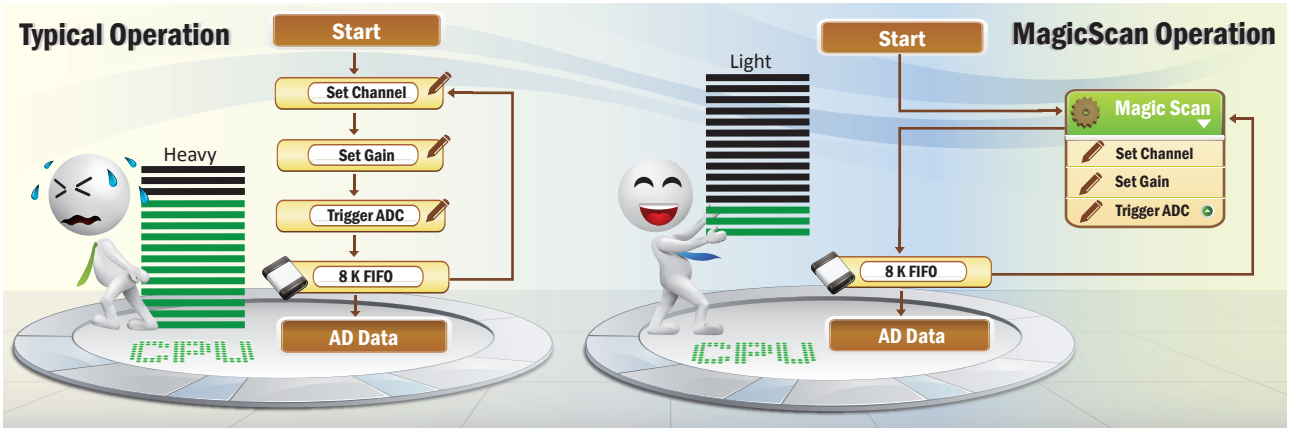


❺ AD Continuous Capture

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.

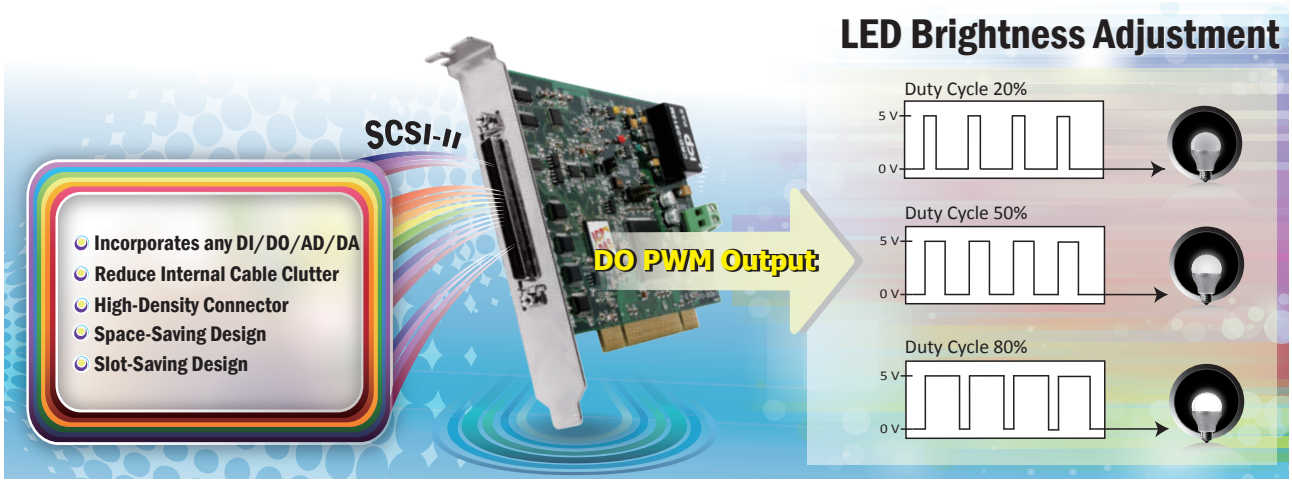


❼ Pulse Width Modulation (PWM, DO)

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.

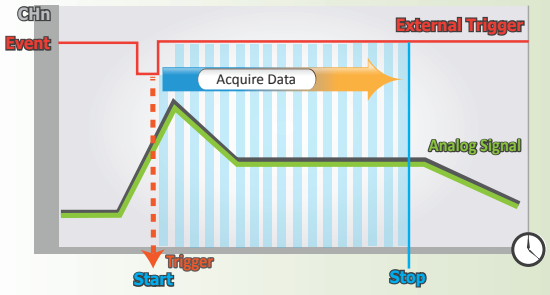


❾ AD External Trigger

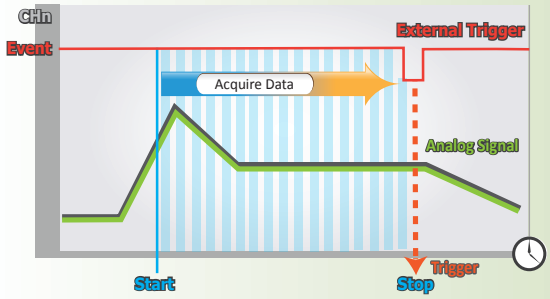
Synchronization of the data acquisition process relative to an external event is an important criterion in many applications. For example, user may want to collect data after receiving a pulse signal from an encoder or when the temperature of a chamber exceeds a critical value. In such instances, the 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**

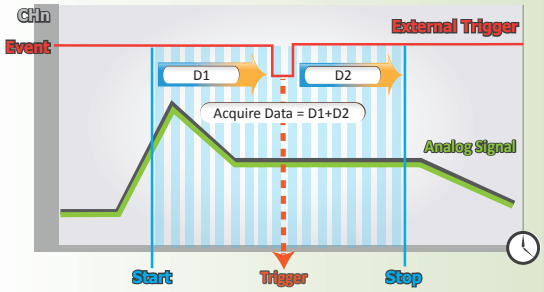
○ **Post-trigger Mode:** In post-trigger mode, the signals are digitized after a trigger condition occurs.



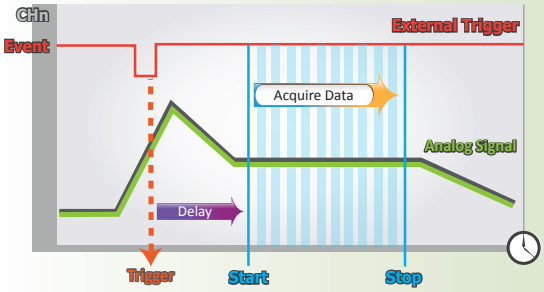
○ **Pre-trigger Mode:** In pre-trigger mode, the signals are digitized before a trigger condition occurs.



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

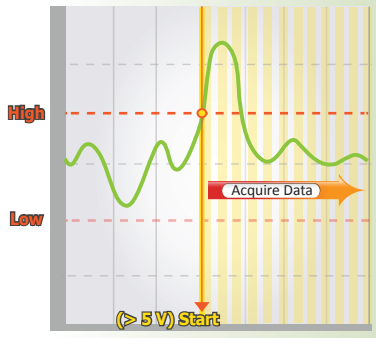


○ **Delay-trigger Mode:** In delay-trigger mode, signal capture begins once the programmed delay period from the trigger has elapsed.

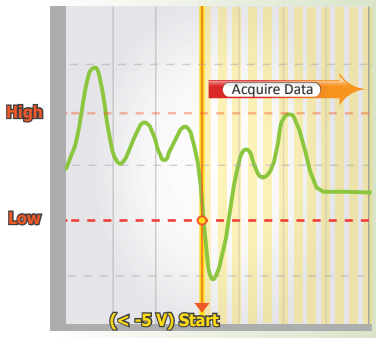


■ **Analog Trigger:** There are six different types of analog trigger, as illustrated below:

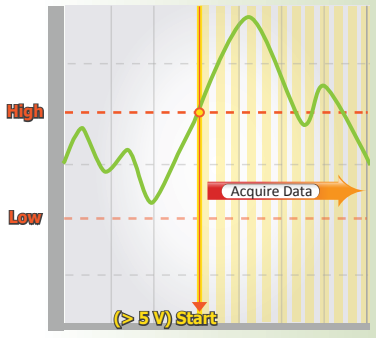
○ Type 1: Above High



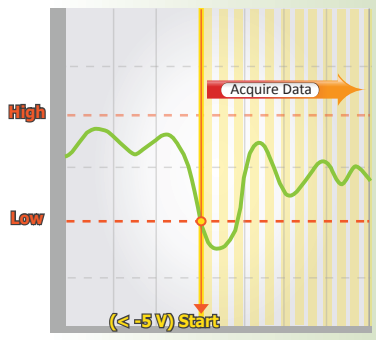
○ Type 2: Below Low



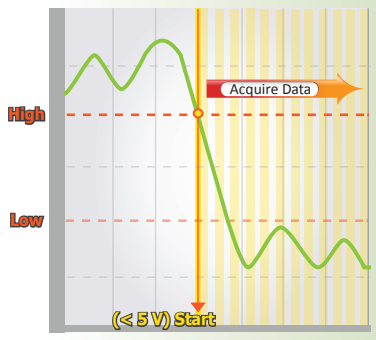
○ Type 3A: Leave-region



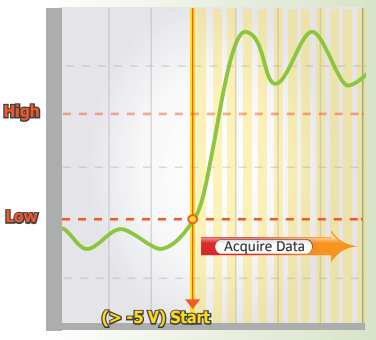
○ Type 3B: Leave-region



○ Type 4A: Entry-region



○ Type 4B: Entry-region



Software

Drivers

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

Sample Programs

- ✓ LabVIEW Toolkit
- ✓ 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

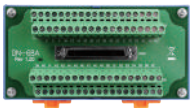
Analog Input	
Channels	16 Single-ended/8 Differential
AD Converter	16-bit, 1 μs conversion time
Sampling Rate	1 MS/s (Max.)
FIFO Size	8192 Samples
Bipolar Range	±10.24 V, ±5.12 V, ±2.56 V
Analog Output	
Channels	2
Resolution	16-bit
FIFO Size	512 Samples
Output Rate	20 MS/s (Max.)
Output Range	±10 V, ±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/Vista/7/8
- 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	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/Vista/7/8
- 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	
	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/Vista/7/8
- 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

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

Software

Drivers

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

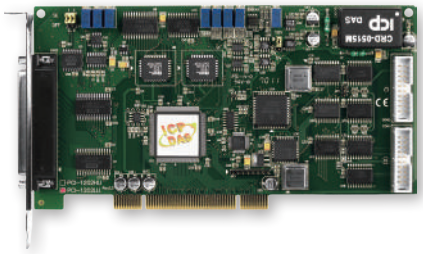
Model		PCI-1602U	PCI-1602FU
Analog Input			
Channels		32 Single-ended/16 Differential	
AD Conversion		16-bit, 2 µs Conversion Time	
Accuracy		0.01% of FSR ±1 LSB @ 25 °C, ±10 V	
FIFO Size		8192 Samples	
Sampling Rate		100 kS/s	200 kS/s
Analog Output			
Channels		2	
Resolution		12-bit	
Accuracy		0.06% 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		
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
Da1 out	18	36	Da2 out
Ext_Trg	19	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/Vista/7/8
- 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		0.01% 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/Vista/7/8
- Linux
- DASYLab

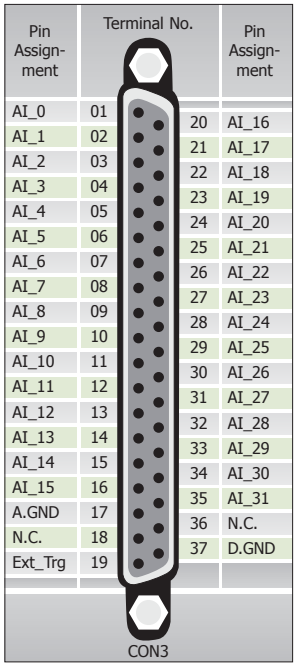
Sample Programs

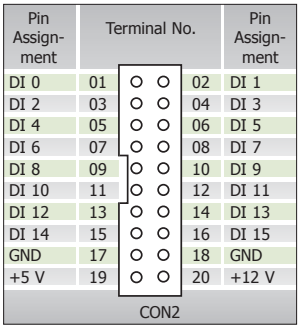
- DOS Lib and TC/BC/MSC Demo
- LabVIEW Toolkit
- VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

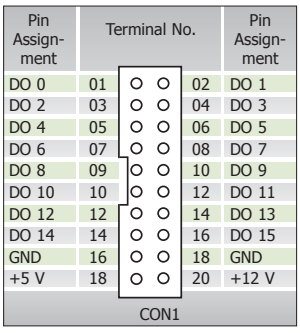
Hardware Specifications

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





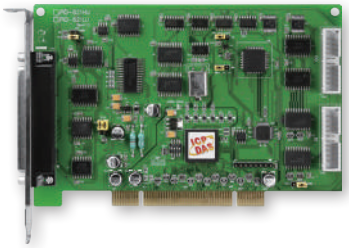


Ordering Information

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 NEW

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/Vista/7/8
- ✓ 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

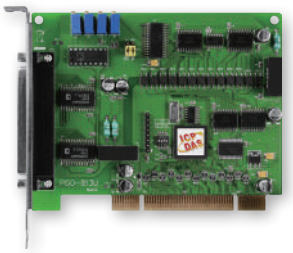
Model		PIO-821LU	PIO-821HU
Analog Input			
Channels		16 Single-ended/8 Differential	
AD Conversion		12-bit, 8 µs Conversion Time	
Accuracy		0.01% of FSR ±1 LSB @ 25 °C, ±10 V	
Sampling Rate		45 kS/s	
Analog Output			
Channels		2	
Resolution		12-bit	
Accuracy		0.01% of FSR ±1/2 LSB @ 25°C, ±10 V	
Output 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 NEW

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/Vista/7/8
- ☑ 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

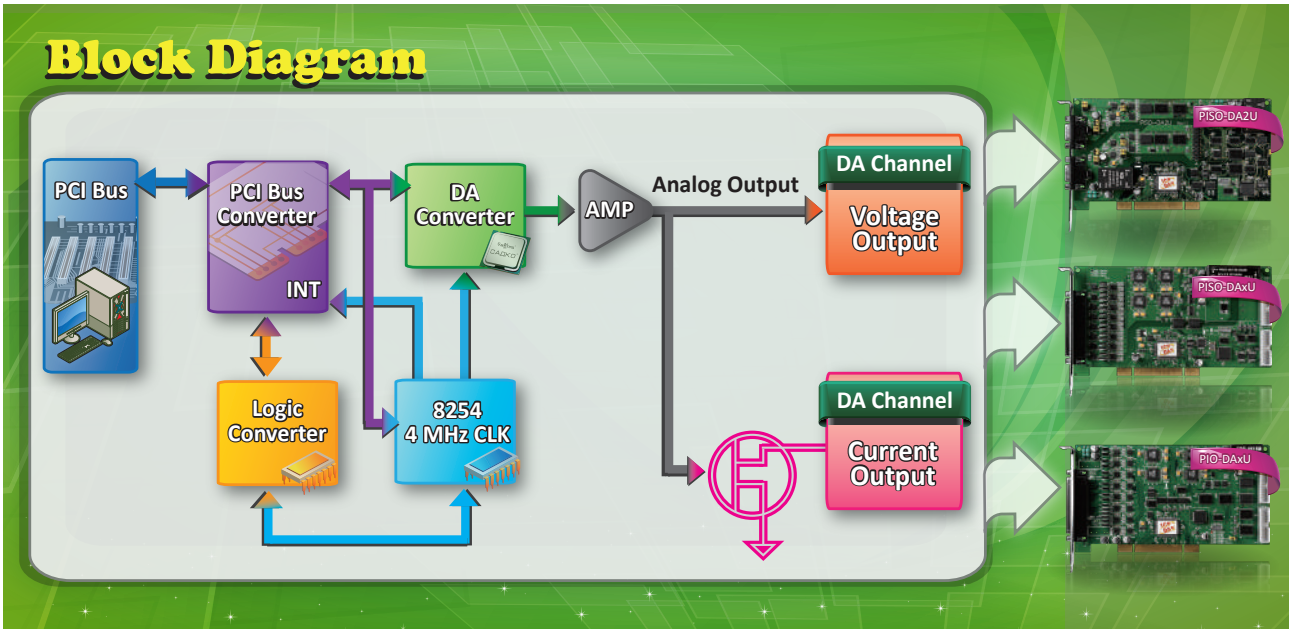
Pin Assignment	Terminal No.		Pin Assignment
AI_0	01	20	AI_1
AI_2	02	21	AI_3
AI_4	03	22	AI_5
AI_6	04	23	AI_7
AI_8	05	24	AI_9
AI_10	06	25	AI_11
AI_12	07	26	AI_13
AI_14	08	27	AI_15
A.GND	09	28	A.GND
A.GND	10	29	A.GND
AI_16	11	30	AI_17
AI_18	12	31	AI_19
AI_20	13	32	AI_21
AI_22	14	33	AI_23
AI_24	15	34	AI_25
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
GND	05	
GND	04	
ExtREF V Int	03	
GND	02	
V OUT	01	
	09	+15 V
	08	GND
	07	I OUT
	06	GND

CN1

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

CN2

Software

Drivers

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

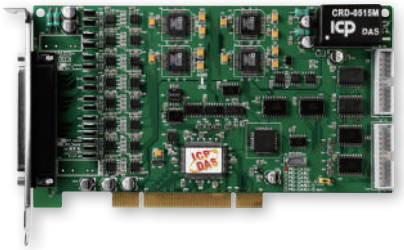
Model		PISO-DA4U	PISO-DA8U	PISO-DA16U
Analog Output				
Channels		4	8	16
Isolation Voltage		2500 V_{DC} (Bus Type)		
Resolution		14-bit		
Accuracy		0.04% of FSR ±2 LSB @ 25°C, ±10 V		
Output Driving		±5 mA		
Output Range	Voltage	±10 V		
	Current	0 ~ +20 mA		
Output Impedance		0.1 Ω Max.		
Digital I/O				
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

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/Vista/7/8
- 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

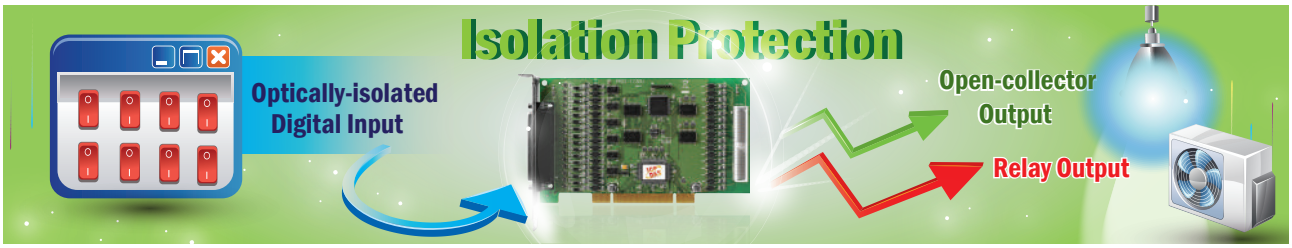
Hardware Specifications

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		
	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		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



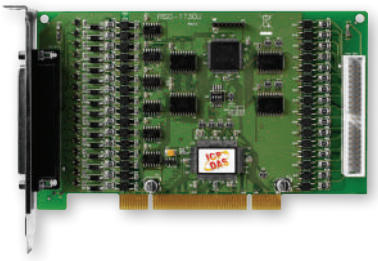
Selection Guide

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	
Page	**3-19**	**3-20**		**3-21**		**3-22**	**3-23**		**3-24**		**3-25**		**3-26**	

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	5 x Form C 3 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
Page	**3-27**		**3-28**	**3-29**	**3-30**	**3-30**		**3-31**	**3-32**

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/Vista/7/8
- ☑ 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
IDO_0	01	20	IDO_1
IDO_2	02	21	IDO_3
IDO_4	03	22	IDO_5
IDO_6	04	23	IDO_7
PCOM	05	24	IDO_8
IDO_9	06	25	IDO_10
IDO_11	07	26	IDO_12
IDO_13	08	27	IDO_14
IDO_15	09	28	PCOM
IDO_16	10	29	IDO_17
IDO_18	11	30	IDO_19
IDO_20	12	31	IDO_21
IDO_22	13	32	IDO_23
PCOM	14	33	IDO_24
IDO_25	15	34	IDO_26
IDO_27	16	35	IDO_28
IDO_29	17	36	IDO_30
IDO_31	18	37	PCOM
EGND	19		

CON1 (Female DB-37)

Pin Assignment	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/Vista/7/8
- 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/Vista/7/8
- 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

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/Vista/7/8
- [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

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

CON1

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.

CON2

Software

Drivers

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

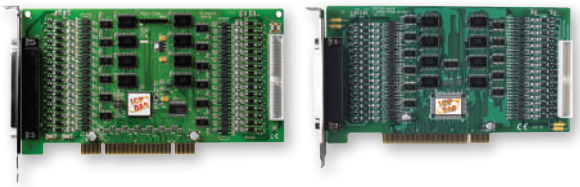
Ordering Information

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/Vista/7/8
- 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/Vista/7/8
- 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	

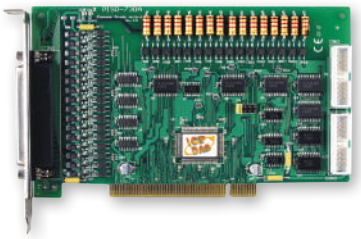
Ordering Information

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/Vista/7/8
- 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

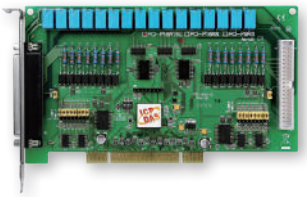
PISO-730A CR	PCI bus, 32-channel Isolated DI/O and 32-channel TTL DI/O Board (Source, RoHS). Includes one CA-4002 D-sub Connector
PISO-730A-5V CR	PCI bus, 32-channel Isolated DI/O (Input Logic High: +5 ~ +12 V) and 32-channel TTL DI/O Board (Source, RoHS). Includes one CA-4002 D-sub Connector.

PCI-P8R8U/PCI-P16R16U NEW

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/Vista/7/8
- 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-P16C16

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

Features

- PCI (5 V) Interface
- 16-channel Optically-isolated Digital Input
- 16-channel Open-collector Digital Output (Sink, NPN)
- Selectable DC Signal Input Filter
- AC Signal Input with Filter
- External Power Status LED Indicator

Introduction

The PCI-P16C16 is a 5 V PCI card that support Plug & Play functionality for automatic allocation of I/O resources from the BIOS. The card provides 16 optically-isolated Digital Input channels and 16 open-collector (Sink, NPN) Digital Output channels. The DI channels provide 5000 Vrms 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-P16C16 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.

Software

Drivers

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

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	5 V PCI, 32-bit, 33 MHz
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

Hardware Specifications

Pin Assignment	Terminal No.		Pin Assignment
OUT_0	01	20	Ext. Power 1
OUT_1	02	21	Ext. Power1
OUT_2	03	22	GND_1
OUT_3	04	23	GND_1
OUT_4	05	24	Ext. Power2
OUT_5	06	25	Ext. Power2
OUT_6	07	26	GND_2
OUT_7	08	27	GND_2
N/A	09	28	N/A
N/A	10	29	N/A
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
DO_8	01	02	Ext. Power3
DO_9	03	04	Ext. Power3
DO_10	05	06	GND3
DO_11	07	08	GND3
DO_12	09	10	Ext. Power4
DO_13	11	12	Ext. Power4
DO_14	13	14	GND4
DO_15	15	16	GND4
N/A	17	18	N/A
N/A	19	20	N/A
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

Ordering Information

PCI-P16C16	PCI bus, 16-channel Isolated Digital Input and 16-channel Open-collector Digital Output Board (Sink, NPN). Includes one CA-4037W Cable and two CA-4002 D-sub Connectors.

PCI-P16POR16U NEW

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/Vista/7/8
- ✓ 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		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

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/Vista/7/8
- 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			

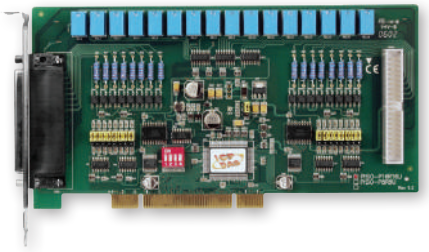
CON1

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/Vista/7/8
- ✓ Linux

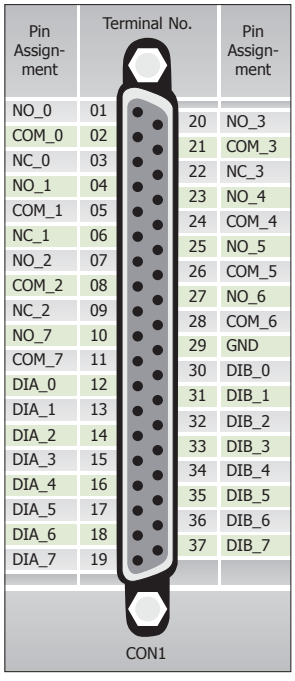
Sample Programs

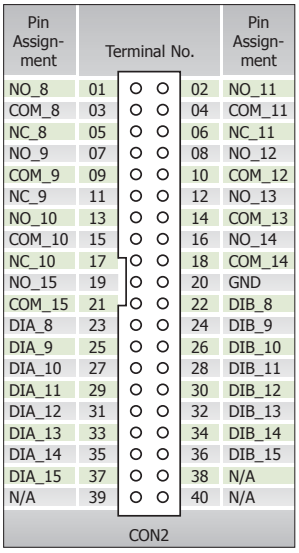
- ✓ DOS Lib and TC/BC/MSC Demo
- ✓ LabVIEW Toolkit
- ✓ VB/VC/Delphi/BCB/VB.NET/C#.NET/VC.NET/MATLAB Demo

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



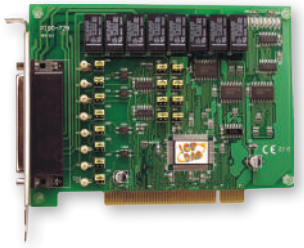


Ordering Information

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/Vista/7/8
- ✓ 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

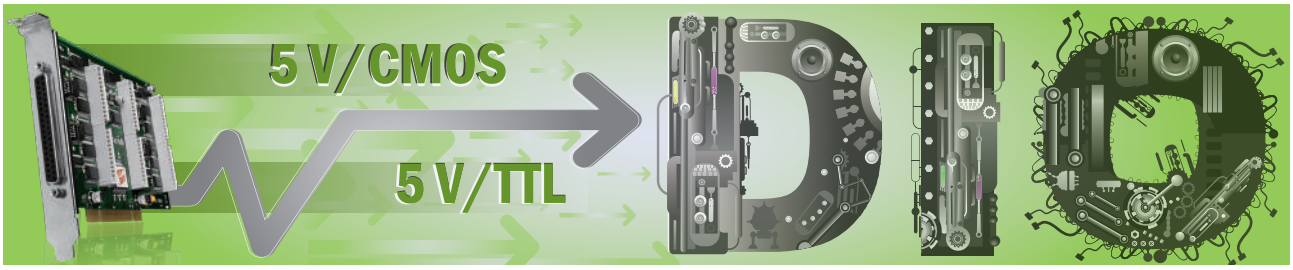
Pin Assign-ment	Terminal No.		Terminal No.	Pin Assign-ment
NO_0	01		20	NO_3
COM_0	02		21	COM_3
NC_0	03		22	NC_3
NO_1	04		23	NO_4
COM_1	05		24	COM_4
NC_1	06		25	NO_5
NO_2	07		26	COM_5
COM_2	08		27	NO_6
NC_2	09		28	COM_6
NO_7	10		29	GND
COM_7	11		30	DIB_0
DIA_0	12		31	DIB_1
DIA_1	13		32	DIB_2
DIA_2	14		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	PCI-TMC12A
Interface		Universal PCI											PCI Bus
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.											
	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
	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
	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/Vista/7/8

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

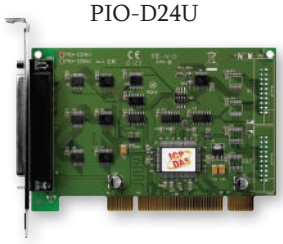
Ordering Information

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/Vista/7/8
- ☑ 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		

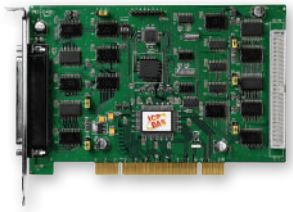
Ordering Information

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

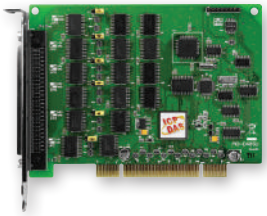
PIO-D48U/PIO-D48SU

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/Vista/7/8
- 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.	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.	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.	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/Vista/7/8
- ✓ 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	-

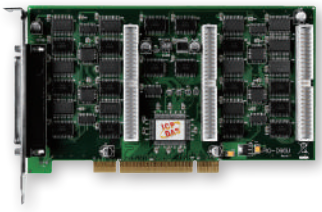
Ordering Information

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	

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)

Software

Drivers

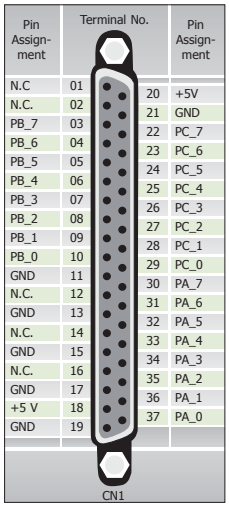
- 32/64-bit Windows XP/2003/2008/Vista/7/8
- Linux
- DASYLab

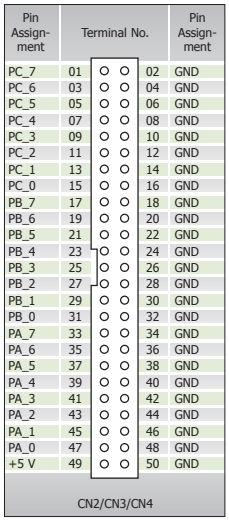
Sample Programs

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

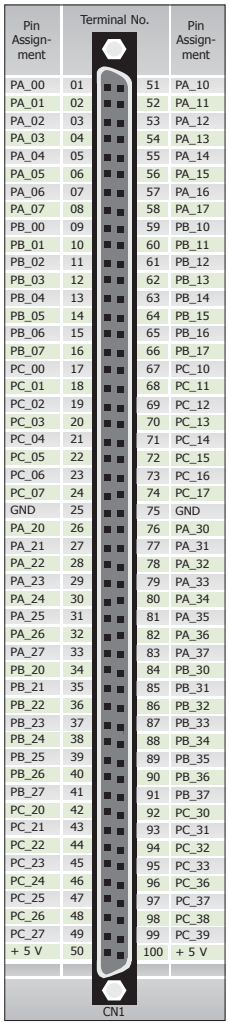
Pin Assignments

• PIO-D96U





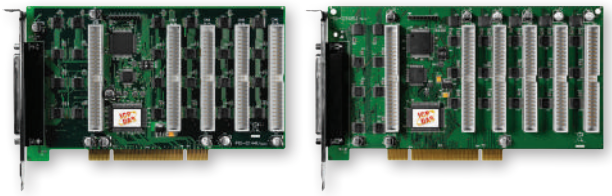
• PIO-D96SU



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/Vista/7/8
- 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

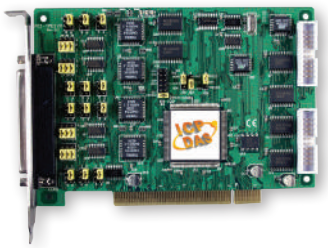
Models		PIO-D144LU	PIO-D144U	PIO-D168U
Programmable DIO				
Channels		144		168
Digital Input				
Compatibility		5 V/CMOS	5 V/TTL	
Input Voltage	Logic 0	0.8 V Max.		
	Logic 1	2.0 V Min.		
Response Speed		1 MHz		
Digital Output				
Compatibility		5 V/CMOS	5 V/TTL	
Output Voltage	Logic 0	0.1 V Max.	0.4 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-TMC12A

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



Features

- PCI (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
- 16-bit Timer/Counter can be cascaded to create a 32/48-bit Timer/Counter
- 16-channel, 5 V/TTL Digital Input and 16-channel, 5 V/TTL Digital Output
- Gate Input can be sourced from External or Previous Timer/Counter Output
- 2 Internal Clock Sources
- More Flexible Interrupt Mechanism
- Hardware Mechanism to generate two Starting Clocks

Introduction

The PCI-TMC12A is a general purpose timer/counter card that supports the 5 V PCI bus and "Plug & Play" functionality to automatically obtain I/O resources from the BIOS. This card contains 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/Vista/7/8
- 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	5 V 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-TMC12A	PCI Bus, 12-channel Timer/Counter Board. Includes one CA-4002 D-sub Connector.
PCI-TMC12A CR	PCI Bus, 12-channel Timer/Counter Board (RoHS). Includes one CA-4002 D-sub Connector.