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NuIPC® / NuDAQ®

743X Series

64-CH Isolated Digital I/O Board

User's Guide

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Questions			
Product Model			
Environment to Use	OS: Computer Brand: M/B: CPU: Chipset: BIOS: Video Card: Network Interface Card: Other:		
Detail Description			
Suggestions to ADLINK			

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How to Use This Guide

This manual is designed to help you use the 743X series products. It describes how to modify and control various functions of the 743X card to meet the requirements of your application. It is divided into four chapters:

Chapter 1, **"Introduction",** gives an overview of the product features, applications, and specifications.

Chapter 2, **"Getting Started",** describes how to install the board. The PCB layout, connector specifications, and installation notes are also described.

Chapter 3, **"Registers",** describes the details of the registers and its structure. This information is important for programmers who want to control the hardware with low-level programming

Chapter 4, **"C/C++ Library",** describes the functions in the DOS C/C++ Library and Windows 95 DLL.

1

Introduction

The 743X series products are 64-CH high-density isolated digital input and/or output cards. The 743X series products include the following cards and are available in different form factors.

The following items are PCI bus products:

- PCI-7432: Isolated 32-CH DI and 32-CH DO card
- PCI-7433: Isolated 64-CH DI card
- PCI-7434: Isolated 64-CH DO card

The following items are 3U CompactPCI products:

- cPCI-7432 : Isolated 32-CH DI and 32-CH DO card
- cPCI-7433 : Isolated 64-CH DI card
- cPCI-7434 : Isolated 64-CH DO card with common ground configuration
- cPCI-7434P: Isolated 64-CH DO card with common power configuration

The following items are for 3U CompactPCI with rear I/O:

- cPCI-7432R : Isolated 32-CH DI and 32-CH DO card
- cPCI-7432RP : Isolated 32-CH DI and 32-CH DO card with common power configuration
- cPCI-7433R : Isolated 64-CH DI card
- cPCI-7434R : Isolated 64-CH DO card with common ground configuration
- cPCI-7434RP: Isolated 64-CH DO card with common power configuration

The above I/O cards are isolated up-to 5000 Vdc (excluding cables) for **channel-to-computer isolation**. It protects your computer against damage caused by accidental contact with high external voltage and eliminates troublesome ground loops.

The 743X series products use PCI-9050 PCI controller to interface the board to the PCI bus. The PCI-9050 fully implements the PCI local bus specification Rev 2.1. All bus relative configurations, such as base memory and interrupt assignment, are automatically controlled by BIOS software.

1.1 Features

The PCI-743X Isolated D/I cards provide the following advanced features:

PCI bus	PCI-7432	PCI-7433	PCI-7434
3U CompactPCI	cPCI-7432	cPCI-7433	cPCI-7434 cPCI-7434P
3U CompactPCI with Rear I/O	cPCI-7432R cPCI-7432RP	cPCI-7433R	cPCI-7434R cPCI-7434RP
32 Isolated Digital Input / Output Channels	√	--	--
64 Isolated Digital Input Channels	--	√	--
64 Isolated Digital Output Channels	--	--	√
High output driving capability	√	--	√
500mA sink current on isolated output channels	√	--	√
5000 Vrms high voltage isolation	√*[1]	√*[1]	√
Up to 24V voltage protection for isolated input	√	√	--
External interrupt signal on DI channels	√	√	--
Dual interrupt trigger	√	√	--
100-pin SCSI-II connector	√	√	√

Table 1. Features between different 743X Models

*1: For PCI-7433, cPCI-7433R and cPCI-7432R/P, the isolation voltage is up to 2500 Vrms.

1.2 Applications

- Laboratory and Industrial automation
- Watchdog timer
- Event counter
- Frequency counter and generator
- Low level pulse generator
- Time delay

1.3 Specifications

♦ **Optical Isolated Input Channel**

	PCI-7432 cPCI-7432 cPCI-7432R/P	**PCI-7433 cPCI-7433 cPCI-7433R**
Number of Channel	32 DI	64 DI
Input Voltage	0 – 24V dc logic H: 5~24V logic L: 0~1.5V	
Input Resistance	2.4KΩ@0.5W (2.4 KΩ @1W for PCI-7433)	
Isolated Voltage	5000 Vrms (2500 Vrms for PCI-7433, cPCI-7433R, cPCI-7432R/P)	
Throughput	10K Hz (0.1 ms)	
Interrupt Sources	Digital input channel 0 and channel 1	
Power Consumption	+5V @ 530 mA typical	+5V @ 500 mA typical

Table 2. Optical Isolated Input Channel Specifications

♦ **Optical Isolated Output Channel**

	PCI-7432 cPCI-7432 cPCI-7432R/P	PCI-7434 cPCI-7434/P cPCI-7434R/P
Number of Channel	32 DO	64 DO
Output Type	Darlington transistor with common ground/common power	
Output Voltage	$5V_{DC}$ min, $35V_{DC}$ maximum	
Output Device	ULN2803A (common ground) TD62783 (common power)	
Sink Current	● Max. 500mA/ch if only one of the ULN2083A transistor is ON ● 500mA/ch if all of the ULN2803A transistors are ON @ 20% duty (T_{amb} = 50?) ● Max. 2.25W per ULN2803A device	
Isolation Voltage	5000 Vrms (2500 Vrms for cPCI-7432R/P)	
Throughput	10K Hz (0.1 ms)	
On Board Isolated +5V Output Power	200mA	150mA
Power Consumption	+5V @ 530 mA typical	+5V @ 560 mA typical

Table 3. Optical Isolated Output Channel Specifications

♦ **General Specifications**

Connector: 100-pin SCSI-II connector

Operating temperature: 0°C ~ 60°C

Storage temperature: -20°C ~ 80°C

Humidity: 5 ~ 95%, non-condensing

Dimension:

- **PCI-7432/33/34:** Compact size only 106mm(H) X 173mm(L)
- **cPCI-7432/33/34:** Standard 3U CompactPCI form factor
- **cPCI-7432R/33R/34R:** Standard 3U CompactPCI form factor with rear I/O

1.4 Supporting Software

ADLINK provides versatile software drivers and packages for users' different approach to building a system. We not only provide programming libraries such as DLL for many Windows systems, but also provide drivers for many other software package such as LabVIEW®, HP VEE™, DASYLab™, InTouch™, InControl™, ISaGRAF™, and so on.

All software options are included in the ADLINK CD. Non-free software drivers are protected with licensing codes. Without the software code, you can install and run the demo version for two hours for trial/demonstration purposes. Please contact ADLINK dealers to purchase the formal license.

1.4.1 Programming Library

For customers who are writing their own programs, we provide function libraries for many different operating systems, including:

- DOS Library: Borland C/C++ and Microsoft C++, the functions descriptions are included in this user's guide.
- Windows 95 DLL: For VB, VC++, Delphi, BC5, the functions descriptions are included in this user's guide.

- PCIS-DASK: Includes device drivers and DLL for Windows 98, Windows NT and Windows 2000. DLL is binary compatible across Windows 98, Windows NT and Windows 2000. This means all applications developed with PCIS-DASK are compatible across Windows 98, Windows NT and Windows 2000. The developing environment can be VB, VC++, Delphi, BC5, or any Windows programming language that allows calls to a DLL. The user's guide and function reference manual of PCIS-DASK are in the CD. Please refer to the PDF manual files under \\Manual_PDF\Software\PCIS-DASK

The above software drivers are shipped with the board. Please refer to the "Software Installation Guide" for installation procedures.

1.4.2 PCIS-LVIEW: LabVIEW® Driver

PCIS-LVIEW contains the VIs, which are used to interface with NI's LabVIEW® software package. The PCIS-LVIEW supports Windows 95/98/NT/2000. The LabVIEW® drivers is shipped free with the board. You can install and use them without a license. For more information about PCIS-LVIEW, please refer to the user's guide in the CD. (\\Manual_PDF\Software\PCIS-LVIEW)

1.4.3 PCIS-VEE: HP-VEE Driver

The PCIS-VEE includes user objects, which are used to interface with the HP VEE software package. PCIS-VEE supports Windows 95/98/NT. The HP-VEE drivers are shipped free with the board. For more information about PCIS-VEE, please refer to the user's guide in the CD. (\\Manual_PDF\Software\PCIS-VEE)

1.4.4 DAQBench™: ActiveX Controls

We suggest customers who are familiar with ActiveX controls and VB/VC++ programming use the DAQBenchTM ActiveX Control components library for developing applications. The DAQBenchTM is designed under Windows NT/98. For more information about DAQBench, please refer to the user's guide in the CD. (\\Manual_PDF\Software\DAQBench\DAQBench Manual.PDF)

1.4.5 PCIS-DDE: DDE Server and InTouch™

DDE stands for Dynamic Data Exchange. The PCIS-DDE includes the PCI cards' DDE server. The PCIS-DDE server is included in the ADLINK CD. It needs a license. The DDE server can be used in conjunction with any DDE client under Windows NT.

1.4.6 PCIS-ISG: ISaGRAF™ driver

The ISaGRAF WorkBench is an IEC1131-3 SoftPLC control program development environment. The PCIS-ISG includes ADLINK product drivers for ISaGRAF under Windows NT environment. The PCIS-ISG is included in the ADLINK CD. A license is needed to use the drivers.

1.4.7 PCIS-ICL: InControl™ Driver

PCIS-ICL is the InControl driver, which supports Windows NT. The PCIS-ICL is included in the ADLINK CD. A license is needed to use the drivers.

1.4.8 PCIS-OPC: OPC Server

PCIS-OPC is an OPC Server, which can link with OPC clients. There are several software packages on the market, which can provide the OPC clients. The PCIS-OPC supports Windows NT and requires a license to operate.

2

Getting Started

This chapter describes how to install and setup the 743X Series cards. The contents in the package and unpacking information that you should be aware of are outlined first.

2.1 What You Have

In addition to the User's Manual, the package should include the following items:

- 743X Board
- ADLINK CD
- Software Installation Guide
- Rear I/O transition board (DB-100RU) for cPCI-743XR rear I/O version only

If any of these items are missing or damaged, contact ADLINK or the dealer from whom you purchased the product. Save the shipping materials and carton in case you want to ship or store the product in the future.

2.2 Unpacking

The PCI-7432/33/34 card contains electro-static sensitive components that can be easily be damaged by static electricity.

Therefore, the card should be handled on a grounded anti-static mat. The operator should be wearing an anti-static wristband, grounded at the same point as the anti-static mat.

Inspect the card module carton for obvious damages. Shipping and handling may cause damage to your module. Be sure there are no shipping and handling damages on the modules carton before continuing.

After opening the card module carton, extract the system module and place it only on a grounded anti-static surface with component side up.

Again, inspect the module for damages. Press down on all the socketed IC's to make sure that they are properly seated. Do this only with the module place on a firm flat surface

Note: DO NOT ATTEMPT TO INSTALL A DAMAGED BOARD IN THE COMPUTER.

You are now ready to install your card.

2.3 PCB Layout

2.3.1 PCI-743X PCB Layout

CN1 is the I/O interface and is a 100-pin SCSI-type connector.

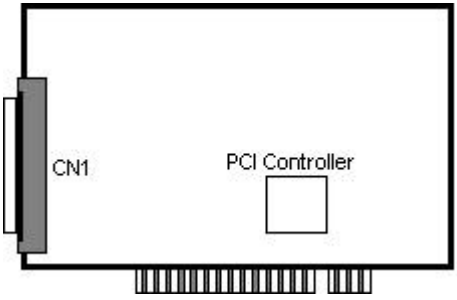


Figure 1: PCI-743X PCB Layout

2.3.2 cPCI-743X PCB Layout

The CN1 is the I/O interface and is a 100-pin SCSI-type connector.

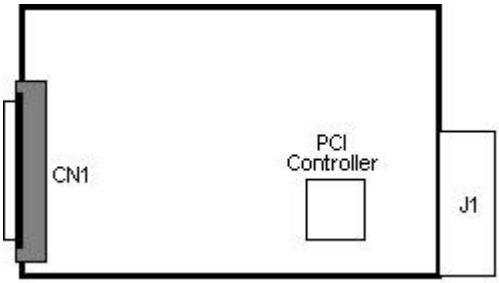


Figure 2: cPCI-743X PCB Layout

2.3.3 cPCI-743XR PCB Layout

CN1 is the I/O interface and is a 100-pin SCSI-type connector. J2 is used for rear I/O signaling. There are no connectors on the main board.

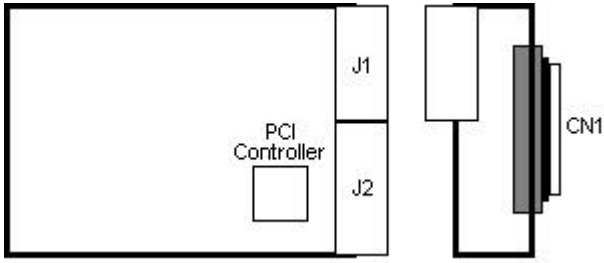


Figure 3: cPCI-743XR PCB Layout

2.4 Hardware Installation Outline

PCI configuration

The PCI cards (or CompactPCI cards) are equipped with plug and play PCI controllers, it can request base addresses and interrupts according to the PCI standard. The system BIOS will assign the system resources based on the PCI cards' configuration registers and system parameters (which are set by the system BIOS). Interrupt assignment and memory usage (I/O port locations) can only be assigned by the system BIOS. These system resource assignments are done on a board-by-board basis. It is not suggested to assign the system resource by any other methods.

PCI slot selection

The PCI card can be inserted into any PCI slot without any configuration of the system resources. The CompactPCI card can also be inserted into any CompactPCI I/O slot.

Installation Procedures

1. Turn off your computer
2. Turn off all accessories (printer, modem, monitor, etc.) connected to your computer.
3. Remove the cover from your computer.
4. Setup jumpers on the PCI or CompactPCI card.
5. Select a 32-bit PCI slot. PCI slot are shorter than ISA or EISA slots, and are usually white or ivory.
6. Before handling the PCI cards, discharge any static buildup on your body by touching the metal case of the computer. Hold the edge and do not touch the components.
7. Position the board into the PCI slot you selected.
8. Secure the card in place at the rear panel of the system.

For cPCI-743X products (with and without rear I/O)

1. Read through this manual, and setup the jumper according to your application needs.
2. Turn off your computer and all accessories (printer, modem, monitor, etc.) connected to the computer.
3. Remove the cover from the slot of your cPCI computer.
4. Select a 32-bit cPCI expansion slot on the back plane for cPCI-743X card.
5. Before handling the cPCI-743X card, discharge any static buildup from your body by touching the metal casing of the computer. Hold the edge and do not touch the components.
6. Position the board into the cPCI slot you selected.
7. Secure the card on the back plane by using screws removed from the slot.

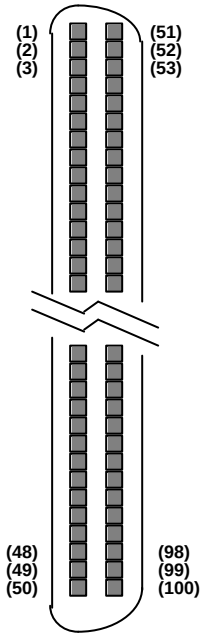
CAUTION!! Don't put cPCI-743XR (rear I/O) cards into the cPCI back plane of other manufacturers because the rear I/O definition might be different, and permanent damage could happen.

2.5 Device Installation for Windows Systems

Once Windows 95/98/2000 has started, the Plug and Play functions of the Windows system will find and locate the new NuDAQ/NuIPC card. If this is the first time a NuDAQ/NuIPC card is installed in your Windows system, you will be prompted to input the device information source. Please refer to the **"Software Installation Guide"** for installation procedures of the device drivers.

2.6 Connector Pin Assignment for PCI-7432, cPCI-7432, cPCI-7432R

The pin assignment of the 100-pin SCSI-II connector for the 7432 Series is shown in figure 4 below.



(1) IDI_0	(26) IDO_0	(51) IDI_8	(76) IDO_8
(2) IDI_1	(27) IDO_1	(52) IDI_9	(77) IDO_9
(3) IDI_2	(28) IDO_2	(53) IDI_10	(78) IDO_10
(4) IDI_3	(29) IDO_3	(54) IDI_11	(79) IDO_11
(5) IDI_4	(30) IDO_4	(55) IDI_12	(80) IDO_12
(6) IDI_5	(31) IDO_5	(56) IDI_13	(81) IDO_13
(7) IDI_6	(32) IDO_6	(57) IDI_14	(82) IDO_14
(8) IDI_7	(33) IDO_7	(58) IDI_15	(83) IDO_15
(9) COM1	(34) VDD1	(59) COM2	(84) VDD2
(10) COM1	(35) IGND	(60) COM2	(85) IGND
(11) COM1	(36) IGND	(61) COM2	(86) IGND
(12) COM1	(37) IGND	(62) COM2	(87) IGND
(13) IDI_16	(38) IDO_16	(63) IDI_24	(88) IDO_24
(14) IDI_17	(39) IDO_17	(64) IDI_25	(89) IDO_25
(15) IDI_18	(40) IDO_18	(65) IDI_26	(90) IDO_26
(16) IDI_19	(41) IDO_19	(66) IDI_27	(91) IDO_27
(17) IDI_20	(42) IDO_20	(67) IDI_28	(92) IDO_28
(18) IDI_21	(43) IDO_21	(68) IDI_29	(93) IDO_29
(19) IDI_22	(44) IDO_22	(69) IDI_30	(94) IDO_30
(20) IDI_23	(45) IDO_23	(70) IDI_31	(95) IDO_31
(21) COM3	(46) VDD3	(71) COM4	(96) VDD4
(22) COM3	(47) IGND	(72) COM4	(97) IGND
(23) COM3	(48) IGND	(73) COM4	(98) IGND
(24) COM3	(49) IGND	(74) COM4	(99) IGND
(25) NC	(50) V5V	(75) NC	(100) V5V

Figure 4: Pin Assignment of 7432 CN1 Connector

Legend:

IDI_n: Isolated digital input channel n

IDO_n: Isolated digital output channel n

VDDm: Common pin for output channel group m (VDD1 is common pin for isolated output channel 0~7, VDD2 is common pin for isolated output channel 8~15, and so on).

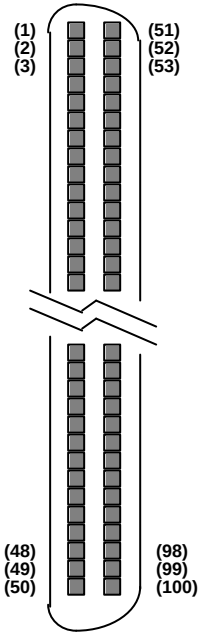
IGND: Ground return path for isolated output channels

COMm: Common junction for isolated input channel group m (COM1 is common junction for input channel 0~7, COM2 is common junction for input channel 8~15, and so on).

V5V: Onboard un-regulated 5V power supply output

2.7 Connector Pin Assignment of cPCI-7432RP

The cPCI-7432RP's pin assignment is shown in Figure 5.



(1) IDI_0	(26) IDO_0	(51) IDI_8	(76) IDO_8
(2) IDI_1	(27) IDO_1	(52) IDI_9	(77) IDO_9
(3) IDI_2	(28) IDO_2	(53) IDI_10	(78) IDO_10
(4) IDI_3	(29) IDO_3	(54) IDI_11	(79) IDO_11
(5) IDI_4	(30) IDO_4	(55) IDI_12	(80) IDO_12
(6) IDI_5	(31) IDO_5	(56) IDI_13	(81) IDO_13
(7) IDI_6	(32) IDO_6	(57) IDI_14	(82) IDO_14
(8) IDI_7	(33) IDO_7	(58) IDI_15	(83) IDO_15
(9) COM1	(34) IGND	(59) COM2	(84) IGND
(10) COM1	(35) VDD1	(60) COM2	(85) VDD2
(11) COM1	(36) VDD1	(61) COM2	(86) VDD2
(12) COM1	(37) VDD1	(62) COM2	(87) VDD2
(13) IDI_16	(38) IDO_16	(63) IDI_24	(88) IDO_24
(14) IDI_17	(39) IDO_17	(64) IDI_25	(89) IDO_25
(15) IDI_18	(40) IDO_18	(65) IDI_26	(90) IDO_26
(16) IDI_19	(41) IDO_19	(66) IDI_27	(91) IDO_27
(17) IDI_20	(42) IDO_20	(67) IDI_28	(92) IDO_28
(18) IDI_21	(43) IDO_21	(68) IDI_29	(93) IDO_29
(19) IDI_22	(44) IDO_22	(69) IDI_30	(94) IDO_30
(20) IDI_23	(45) IDO_23	(70) IDI_31	(95) IDO_31
(21) COM3	(46) IGND	(71) COM4	(96) IGND
(22) COM3	(47) VDD3	(72) COM4	(97) VDD4
(23) COM3	(48) VDD3	(73) COM4	(98) VDD4
(24) COM3	(49) VDD3	(74) COM4	(99) VDD4
(25) NC	(50) V5V	(75) NC	(100) V5V

Figure 5: Pin Assignment of cPCI-7432RP CN1 Connector

Legend:

IDI_n: Isolated digital input channel n.

IDO_n: Isolated digital output channel n.

VDDm: Common pin for output channel group m, m=1 for output channel 0~7, m=2 for output channel 8~15, m=3 for output channel 16~23, m=4 for output channel 24~31.

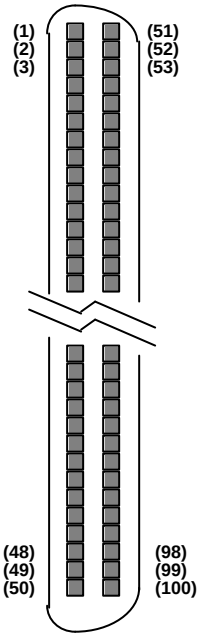
IGND: Ground return path for isolated output channels.

COMm: Common junction for isolated input channel group m, m=1 for input channel 0~7, m=2 for input channel 8~15, m=3 for input channel 16~23, m=4 for input channel 24~31.

V5V: Onboard un-regulated 5V power supply output

2.8 Connector Pin Assignment of cPCI-7433/R & PCI-7433

The pin assignment of the 100-pin SCSI-II connector for the 7433 Series is shown in figure 6 below.



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

Figure 6: Pin Assignment of 7433 CN1 Connector

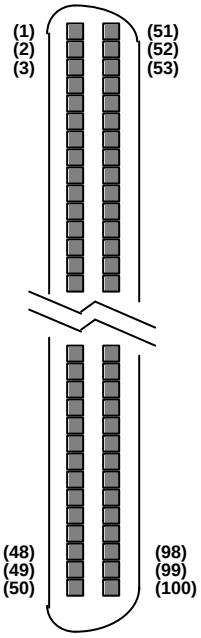
Legend:

IDI_n: Isolated digital input channel n.

COMm: Common junction for isolated input channel group m, (COM1 is common junction for input channel 0~7, COM2 is common junction for input channel 8~15, COM3 is common junction of input channel 16~23, and so on.)

2.9 Connector Pin Assignment of PCI-7434

The pin assignment of the 100-pin SCSI-II connector for the PCI-7434 Series is shown in figure 7 below.



(1) IDO_0	(26) IDO_32	(51) IDO_8	(76) IDO_40
(2) IDO_1	(27) IDO_33	(52) IDO_9	(77) IDO_41
(3) IDO_2	(28) IDO_34	(53) IDO_10	(78) IDO_42
(4) IDO_3	(29) IDO_35	(54) IDO_11	(79) IDO_43
(5) IDO_4	(30) IDO_36	(55) IDO_12	(80) IDO_44
(6) IDO_5	(31) IDO_37	(56) IDO_13	(81) IDO_45
(7) IDO_6	(32) IDO_38	(57) IDO_14	(82) IDO_46
(8) IDO_7	(33) IDO_39	(58) IDO_15	(83) IDO_47
(9) VDD1	(34) VDD5	(59) VDD2	(84) VDD6
(10) IGND	(35) IGND	(60) IGND	(85) IGND
(11) IGND	(36) IGND	(61) IGND	(86) IGND
(12) IGND	(37) IGND	(62) IGND	(87) IGND
(13) IDO_16	(38) IDO_48	(63) IDO_24	(88) IDO_56
(14) IDO_17	(39) IDO_49	(64) IDO_25	(89) IDO_57
(15) IDO_18	(40) IDO_50	(65) IDO_26	(90) IDO_58
(16) IDO_19	(41) IDO_51	(66) IDO_27	(91) IDO_59
(17) IDO_20	(42) IDO_52	(67) IDO_28	(92) IDO_60
(18) IDO_21	(43) IDO_53	(68) IDO_29	(93) IDO_61
(19) IDO_22	(44) IDO_54	(69) IDO_30	(94) IDO_62
(20) IDO_23	(45) IDO_55	(70) IDO_31	(95) IDO_63
(21) VDD3	(46) VDD7	(71) VDD4	(96) VDD8
(22) IGND	(47) IGND	(72) IGND	(97) IGND
(23) IGND	(48) IGND	(73) IGND	(98) IGND
(24) IGND	(49) IGND	(74) IGND	(99) IGND
(25) NC	(50) V5V	(75) NC	(100) V5V

Figure 7: Pin Assignment of PCI-7434 CN1Connector

Legend:

IDO_n: Isolated digital output channel n.

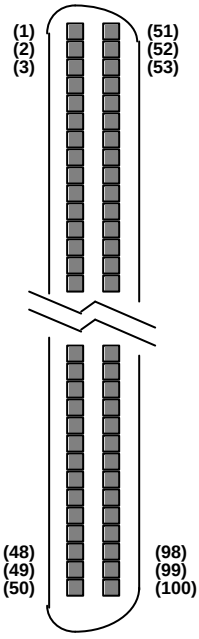
VDDm: Common pin for isolated output channel group m, (VDD1 is the common pin for isolated output channel 0~7, VDD2 is for channel 8~15, VDD3 is for channel 16~23, VDD4 is for channel 24~31, VDD5 is for channel 32~39, VDD6 is for channel 40~47, VDD7 is for channel 48~55, and VDD8 is for channel 56~63).

IGND: Ground return path for isolated output channels.

V5V: Onboard un-regulated 5V power supply output

2.10 Connector Pin Assignment of cPCI-7434R

cPCI-7434R's pin assignment is shown in Figure 8.



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

Figure 8: Pin Assignment of cPCI-7434R CN1 Connector

Legend:

IDO_n: Isolated digital output channel n.

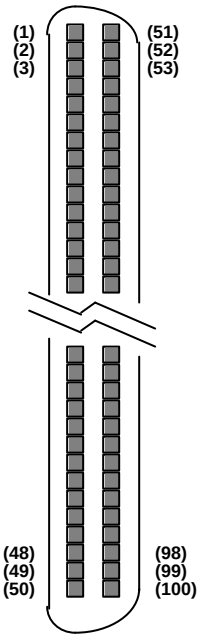
VDDm: Common pin for isolated output channel group m (Note: All outputs share the same power supply).

IGND: Ground return path for isolated output channels.

V5V: Onboard un-regulated 5V power supply output

2.11 Connector Pin Assignment of cPCI-7434RP

cPCI-7434RP's pin assignment is shown in Figure 9.



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

Figure 9: Pin Assignment of cPCI-7434RP CN1 Connector

Legend:

IDO_n: Isolated digital output channel n.

VDDm: Common pin for isolated output channel group m. (Note: All outputs share the same power supply).

IGND: Ground return path for isolated output channels.

V5V: Onboard un-regulated 5V power supply output

2.11 Jumpers Setting

Digital I/O cards often operate in noisy environments and may suffer electrostatic discharge or transient voltage up to several 1000 volts. To protect the system from potential damage, the PCI-7433 have implemented protection circuits on its input channels. Eight jumpers on the PCI-7433 are used to enable or disable the transient voltage suppressors. Each jumper is responsible for up to 8 digital input channels. The following table and figure illustrates the jumper settings. Please note that these setting are only available for the PCI-7433.

Jumper	Isolated digital input channel
J1	0 ~ 7
J2	8 ~ 15
J3	16 ~ 23
J4	24 ~ 31
J5	32 ~ 39
J6	40 ~ 47
J7	47 ~ 55
J8	56 ~ 63

Table 4. PCI-7433 jumper setting table

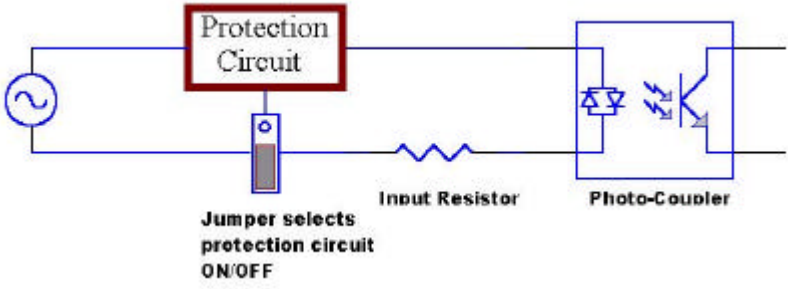


Figure 10: Simplified digital input circuit diagram

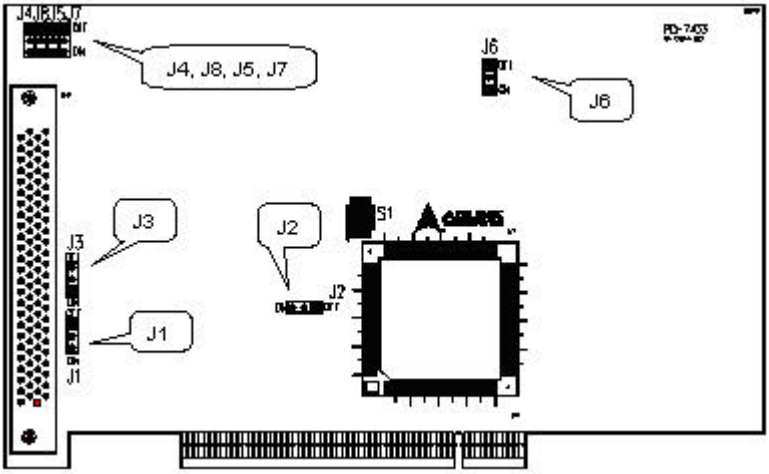


Figure 11: PCI-7433 (rev. B2) Jumper Locations

3

Registers

The descriptions of the registers and structure of the 743X Series are outlined in this chapter. The information in this chapter will assist programmers, who wish to handle the card with low-level programs.

In addition, the low level programming syntax is introduced. This information can help beginners to operate the 743X in the shortest possible time.

3.1 PCI PnP Registers

This PCI card functions as a 32-bit PCI target device to any master on the PCI bus. There are three types of registers: PCI Configuration Registers (PCR), Local Configuration Registers (LCR) and 743x series registers.

The PCR, which is PCI-bus specifications compliant, is initialized and controlled by the plug & play (PnP) PCI BIOS. Users may obtain more information on the PCI BIOS specification to better understand the operation of the PCR. Please contact PCISIG to acquire the specifications of the PCI interface.

The PCI bus controller PCI-9050 is provided by PLX technology Inc. (www.plxtech.com). For more information about the LCR, please visit PLX technology's web site to download relative information. It is not necessary for users to fully understand the details of the LCR if the software library provided is used. The PCI PnP BIOS assigns the base address of the LCR. The assigned address is located at an offset of 14h from the PCR.

The 743x series registers are discussed in the next section. The base address, which is also assigned by the PCI PnP BIOS, is located at an offset of 18h from the PCR. Therefore, users can read the address 18h from the PCR to obtain its base address by using the BIOS function call. Do not attempt to modify the base address and interrupt that have been assigned by the PCI PnP BIOS, it may cause resource conflicts with your system.

3.2 I/O Address Map

All 743X series registers are 32 bits long. Users can access these registers using 32-bit I/O instructions. The following table shows the registers address map, including descriptions and their offset addresses relative to the base address

	Address	Write	Read
PCI-7432 cPCI-7432	Base + 0x00	Isolated DO	Isolated DI
	Base + 0x40	Clear IRQ	--
CPCI-7432R/P	Base + 0x04	LED Control	Slot Number

	Address	Write	Read
PCI-7433 cPCI-7433 cPCI-7433R	Base + 0x00	--	Isolated DI
	Base + 0x04	--	Isolated DI
	Base + 0x08	Clear IRQ	--
cPCI-7433R	Base + 0x50	LED Control	Slot Number

	Address	Write	Read
PCI-7434 cPCI-7434[P] cPCI-7434R[P]	Base + 0x00	Isolated DO	--
	Base + 0x04	Isolated DO	--
cPCI-7434R[P]	Base + 0x50	LED Control	Slot Number

Table 5. I/O Address Map of c/PCI-7432/33/34

Caution: 1. I/O port is 32 bits width
2. 8-bit or 16-bit I/O access is not allowed.

3.3 Digital Input Register

There are 32 isolated digital input channels on the PCI-7432 and 64 isolated digital input channels on the PCI-7433, each bit of based address corresponds to a signal on the digital input channel.

Address: BASE + 0 ~ BASE + 3 for 7432
BASE + 0 ~ BASE + 7 for 7433

Attribute: read only

Data Format:

7432

	7	6	5	4	3	2	1	0
Base + 0	IDI_7	IDI_6	IDI_5	IDI_4	IDI_3	IDI_2	IDI_1	IDI_0
Base + 1	IDI_15	IDI_14	IDI_13	IDI_12	IDI_11	IDI_10	IDI_9	IDI_8
Base + 2	IDI_23	IDI_22	IDI_21	IDI_20	IDI_19	IDI_18	IDI_17	IDI_16
Base + 3	IDI_31	IDI_30	IDI_29	IDI_28	IDI_27	IDI_26	IDI_25	IDI_24

7433

	7	6	5	4	3	2	1	0
Base + 0	IDI_7	IDI_6	IDI_5	IDI_4	IDI_3	IDI_2	IDI_1	IDI_0
Base + 1	IDI_15	IDI_14	IDI_13	IDI_12	IDI_11	IDI_10	IDI_9	IDI_8
Base + 2	IDI_23	IDI_22	IDI_21	IDI_20	IDI_19	IDI_18	IDI_17	IDI_16
Base + 3	IDI_31	IDI_30	IDI_29	IDI_28	IDI_27	IDI_26	IDI_25	IDI_24
Base + 4	IDI_39	IDI_38	IDI_37	IDI_36	IDI_35	IDI_34	IDI_33	IDI_32
Base + 5	IDI_47	IDI_46	IDI_45	IDI_44	IDI_43	IDI_42	IDI_41	IDI_40
Base + 6	IDI_55	IDI_54	IDI_53	IDI_52	IDI_51	IDI_50	IDI_49	IDI_48
Base + 7	IDI_63	IDI_62	IDI_61	IDI_60	IDI_59	IDI_58	IDI_57	IDI_56

Table 6. IDI_N: Isolated Digital Input CH N

3.4 Digital Output Register

There are 32 digital output channels on the PCI-7432 and 64 isolated digital output channels on the PCI-7434, each bit of based address corresponds to a signal on the digital output channel.

Address: BASE + 0 ~ BASE + 3 for 7432
BASE + 0 ~ BASE + 7 for 7434

Attribute: write only

Data Format:

7432

	7	6	5	4	3	2	1	0
Base + 0	IDO_7	IDO_6	IDO_5	IDO_4	IDO_3	IDO_2	IDO_1	IDO_0
Base + 1	IDO_15	IDO_14	IDO_13	IDO_12	IDO_11	IDO_10	IDO_9	IDO_8
Base + 2	IDO_23	IDO_22	IDO_21	IDO_20	IDO_19	IDO_18	IDO_17	IDO_16
Base + 3	IDO_31	IDO_30	IDO_29	IDO_28	IDO_27	IDO_26	IDO_25	IDO_24

7434

	7	6	5	4	3	2	1	0
Base + 0	IDO_7	IDO_6	IDO_5	IDO_4	IDO_3	IDO_2	IDO_1	IDO_0
Base + 1	IDO_15	IDO_14	IDO_13	IDO_12	IDO_11	IDO_10	IDO_9	IDO_8
Base + 2	IDO_23	IDO_22	IDO_21	IDO_20	IDO_19	IDO_18	IDO_17	IDO_16
Base + 3	IDO_31	IDO_30	IDO_29	IDO_28	IDO_27	IDO_26	IDO_25	IDO_24
Base + 4	IDO_39	IDO_38	IDO_37	IDO_36	IDO_35	IDO_34	IDO_33	IDO_32
Base + 5	IDO_47	IDO_46	IDO_45	IDO_44	IDO_43	IDO_42	IDO_41	IDO_40
Base + 6	IDO_55	IDO_54	IDO_53	IDO_52	IDO_51	IDO_50	IDO_49	IDO_48
Base + 7	IDO_63	IDO_62	IDO_61	IDO_60	IDO_59	IDO_58	IDO_57	IDO_56

Table 7. IDO_N: Isolated Digital Output CH N

4

Operation Theory

4.1 Isolated Digital Input Channels

The isolated digital input has an open collector transistor structure. The input voltage range is 0V to 24V (0V to 50V for PCI-7433) and the input resistance is 2.4KΩ (4.7KΩ for PCI-7433). The connection between external signals and the 7432/33 is shown in Fig 12. Please note that the input common junction could be common ground or common power, they are dependent on the user's environment. Therefore, the digital input could be either a current source or a current sink.

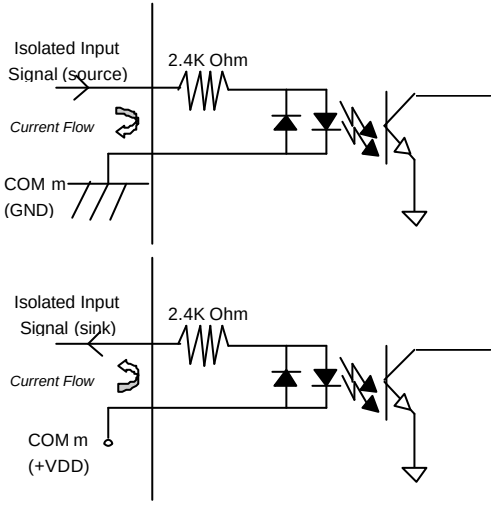


Figure 12: Isolated input connection

4.2 Isolated Digital Output Channels

The common ground connection of isolated digital output is shown figure 13, while common power connection of isolated digital output as figure 14. When the isolated digital output goes “ON”, the sink current will be conducted through the transistors. When the isolated digital output goes “OFF”, no current is conducted flow through the transistors. Please note that when the load is of an “inductance nature” such as a relay, coil or motor, the VDD pin must be connected to an external power source. The extra connection is utilized for the ‘fly-wheel diode’ to form a current-release closed loop, so that the transistors are protected from any high reverse voltage which can be generated by the inductance load when the output is switched from “ON” to “OFF”.

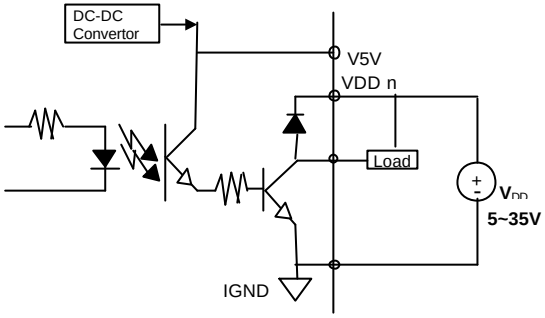


Figure 13: Common Ground Connection for cPCI-7434R and cPCI-7432R

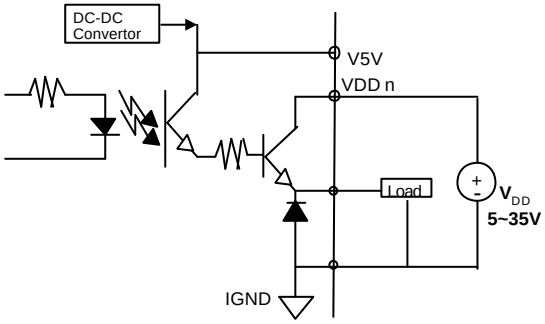


Figure 14: Common Power Connection for cPCI-7434R/P and cPCI-7432R/P

5

C/C++ Libraries

This chapter describes the software libraries for operating this card. Only the functions in the DOS library and Windows 95 DLL are described. Refer to the PCIS-DASK function reference manual, which is included in the ADLINK CD, for descriptions of Windows 98/NT/2000 DLL functions.

The function prototypes and useful constants are defined in the header files located in the LIB directory (DOS) and INCLUDE directory (Windows 95). For Windows 95 DLL, the developing environment can be Visual Basic 4.0 or above, Visual C/C++ 4.0 or above, Borland C++ 5.0 or above, Borland Delphi 2.x (32-bit) or above, or any Windows programming language that allows calls to a DLL.

5.1 Libraries Installation

Refer to the “Software Installation Guide” for information regarding software installation of libraries for DOS, Windows 95 DLL, or PCIS-DASK for Windows 98/NT/2000.

The device drivers and DLL functions for Windows 98/NT/2000 are included in the PCIS-DASK. Refer to the PCIS-DASK user’s guide and function reference, which is included in the ADLINK CD, for programming information.

5.2 Programming Guide

5.2.1 Naming Convention

The functions of the NuDAQ PCI or NuIPC CompactPCI card software drivers uses full-names to represent the functions' real meaning. The naming convention rules are:

In DOS Environment :

_{hardware_model}_{action_name}. e.g. _7432_Initial().

All functions in the PCI-7432 driver have 7432 as {hardware_model} and can be used by both PCI-7432 and cPCI-7432. All functions in the PCI-7433 driver have 7433 as {hardware_model}. And again can be used by PCI-7433, cPCI-7433 and cPCI-7433R. All functions in the PCI-7434 driver have 7434 as {hardware_model}. And can be used by PCI-7434, cPCI-7434 and cPCI-7434R.

In order to recognize the difference between the DOS library and Windows 95 library, a capital "W" is placed at the start of each function name for Windows 95 DLL drivers. e.g. **W_7432_Initial()**.

5.2.2 Data Types

We have defined some data types in the Pci_743X.h (DOS) and Acl_pci.h (Windows 95) header files. These data types are used by the NuDAQ Cards' library. We recommend you use these data types in your application programs. The following table shows the data type names and their range.

Type Name	Description	Range
U8	8-bit ASCII character	0 to 255
I16	16-bit signed integer	-32768 to 32767
U16	16-bit unsigned integer	0 to 65535
I32	32-bit signed integer	-2147483648 to 2147483647
U32	32-bit ingle-precision floating-point	0 to 4294967295
F32	32-bit ingle-precision floating-point	-3.402823E38 to 3.402823E38
F64	64-bit double-precision floating-point	-1.797683134862315E308 to 1.797683134862315E309
Boolean	Boolean logic value	TRUE, FALSE

Table 8. Function Data Types

5.3 Running the Testing Utility

After installation, execute the DOS utility by typing the following command:

C> cd \7432\DOS\UTIL

C> 7432UTIL

(Use 7433UTIL.EXE or 7434UTIL.EXEdepending on the model of your 743X series card).

5.4 Initial

@ Description

The 743X cards are initialized by this function. The software library could be used to control multiple 743X cards. Because the 743X is designed with the PCI bus architecture and meets the plug and play specifications, the IRQ and I/O address are assigned by the system BIOS directly

@ Syntax

PCI-7432 / cPCI-7432 cPCI-7432R

C/C++ (DOS)

```
U16  _7432_Initial (U16 *existCards, PCI_INFO *pciInfo)
```

C/C++ (Windows 95)

```
U16  W_7432_Initial (U16 *existCards, PCI_INFO *pciInfo)
```

Visual Basic (Windows 95)

```
W_7432_Initial (existCards As Integer, info As PCI_INFO)
As Integer
```

PCI-7433 / cPCI-7433 / cPCI-7433R

C/C++ (DOS)

```
U16  _7433_Initial (U16 *existCards, PCI_INFO *pciInfo)
```

C/C++ (Windows 95)

```
U16  W_7433_Initial (U16 *existCards, PCI_INFO *pciInfo)
```

Visual Basic (Windows 95)

```
W_7433_Initial (existCards As Integer, info As PCI_INFO)
As Integer
```

PCI-7434 / cPCI-7434 / cPCI-7434R

C/C++ (DOS)

```
U16  _7434_Initial (U16 *existCards, PCI_INFO *pciInfo)
```

C/C++ (Windows 95)

```
U16  W_7434_Initial (U16 *existCards, PCI_INFO *pciInfo)
```

Visual Basic (Windows 95)

```
W_7434_Initial (existCards As Integer, info As PCI_INFO)
As Integer
```

@ Argument

existCards : The number of installed 7432/33/34 cards. The returned value shows how many 7432/33/34 cards are installed in the system.

Pciinfo : It is a structure used to memorize the PCI bus plug and play initialization information which is decided by the p&p BIOS. The PCI_INFO structure is defined in ACL_PCI.H. The base I/O address and the interrupt channel number are stored in pciinfo which is used for reference.

@ Return Code

ERR_NoError
ERR_PCIBiosNotExist

5.5 Digital Input Relative Functions

@ Description

These functions are used to read 32-bit digital inputs data from the digital input port. To obtain a 32-bit data from the 7432, use function "_7432_DI". To obtain a 32 bit data (MSB double word) from the 7433, use "7433_DI_HiDW", or use "7433_DI_LoDW" (LSB double word) for the PCI-7433.

@ Syntax

PCI-7432 / cPCI-7432 / cPCI-7432R

```
C/C++ (DOS)

    U16  _7432_DI (U16 cardNo,  U32  *di_data)

C/C++ (Windows 95)

    U16  W_7432_DI (U16 cardNo,  U32  *di_data)

Visual Basic (Windows 95)

    W_7432_DI (ByVal cardNo As Integer, di_data As Long) As
    Integer
```

PCI-7433 / cPCI-7433 / cPCI-7433R

```
C/C++ (DOS)

    U16  _7433_DI_HiDW (U16 cardNo,  U32  *di_data)
    U16  _7433_DI_LoDW (U16 cardNo,  U32  *di_data)

C/C++ (Windows 95)

    U16  W_7433_DI_HiDW (U16 cardNo,  U32  *di_data)
    U16  W_7433_DI_LoDW (U16 cardNo,  U32  *di_data)

Visual Basic (Windows 95)

    W_7433_DI_HiDW (ByVal cardNo As Integer, di_data As Long)
    As Integer
    W_7433_DI_LoDW (ByVal cardNo As Integer, di_data As Long)
    As Integer
```

@ Argument

cardNo: card number of selected board
di_data: return 32-bit value from digital port.

@ Return Code

ERR_NoError
ERR_BoardNoInit

5.6 Digital Output Relative Functions

@ Description

These functions are used to write data to the digital output ports. You can write 32-bit data to the 7432 by using function "_7432_DO"; write 32-bit data (MSB double word) to the 7434 by using "_7434_DO_HiDW"; or write 32-bit data (LSB double word) to 7434 by using "_7434_DO_LoDW".

@ Syntax

PCI-7432 / cPCI-7432 / cPCI-7432R

```
C/C++ (DOS)

    U16  _7432_DO (U16 cardNo,  U32  do_data)

C/C++ (Windows 95)

    U16  W_7432_DO (U16 cardNo,  U32  do_data)

Visual Basic (Windows 95)

    W_7432_DO (ByVal cardNo As Integer, ByVal do_data As Long)
    As Integer
```

PCI-7434 / cPCI-7434 / cPCI-7434R

```
C/C++ (DOS)

    U16  _7434_DO_HiDW (U16 cardNo,  U32  do_data)
    U16  _7434_DO_LoDW (U16 cardNo,  U32  do_data)

C/C++ (Windows 95)

    U16  W_7434_DO_HiDW (U16 cardNo,  U32  do_data)
    U16  W_7434_DO_LoDW (U16 cardNo,  U32  do_data)

Visual Basic (Windows 95)

    W_7434_DO_HiDW (ByVal cardNo As Integer, ByVal do_data As
    Long) As Integer
    W_7434_DO_LoDW (ByVal cardNo As Integer, ByVal do_data As
    Long) As Integer
```

@ Argument

cardNo : card number of selected board
do_data : value will be written to digital output port

@ Return Code

ERR_NoError
ERR_BoardNoInit

5.7 Interrupt Source Control

@ Description

The 7432 and 7433 both have a dual interrupt system. Two interrupt sources can be generated and be checked by the software. This function is used to select and control the 7432/33 interrupt sources by writing data to the interrupt control register. The interrupt source can be set as Channel 0 (INT1) and/or channel 1 (INT2) of the digital input channels.

@ Syntax

PCI-7432 / cPCI-7432 /cPCI-7432R

```
C/C++ (DOS)

    void  _7432_Set_INT_Control (U16 cardNo, U16 int1Flag,
    U16 int2Flag)

C/C++ (Windows 95)

    void W_7432_Set_INT_Control (U16 cardNo, U16 int1Flag,
    U16 int2Flag)

Visual Basic (Windows 95)

    W_7432_Set_INT_Control (ByVal cardNo As Integer, ByVal
    int1Flag As Integer, ByVal int2Flag As Integer)
```

PCI-7433 / cPCI-7433 / cPCI-7433R

```
C/C++ (DOS)

    void  _7433_Set_INT_Control (U16 cardNo, U16 int1Flag,
    U16 int2Flag)

C/C++ (Windows 95)

 void W_7433_Set_INT_Control (U16 cardNo, U16 int1Flag, U16
    int2Flag)

Visual Basic (Windows 95)

 W_7433_Set_INT_Control (ByVal cardNo As Integer, ByVal
    int1Flag As Integer, ByVal int2Flag As Integer)
```

@ Argument

cardNo: card number of selected board
int1Flag: INT1 setting; 0: disable, 1: enable
int2Flag: INT2 setting; 0: disable, 1: enable

5.8 Get Interrupt Status

@ Description

The 7432 and 7433 both have a dual interrupt system. Two interrupt sources can be generated and be checked by the software. This function is used to distinguish which interrupt is inserted if both INT1 and INT2 are in use.

@ Syntax

PCI-7432 / cPCI-7432 / cPCI-7432R

```
C/C++ (DOS)

    void  _7432_Get_IRQ_Status (U16 cardNo, U16 *int1Status,
    U16 *int2Status)

C/C++ (Windows 95)

    void W_7432_Get_IRQ_Status (U16 cardNo, U16 *int1Status,
    U16 *int2Status)

Visual Basic (Windows 95)

    W_7432_Get_IRQ_Status (ByVal cardNo As Integer,
    int1Status As Integer, int2Status As Integer)
```

PCI-7433 / cPCI-7433 / cPCI-7433R

```
C/C++ (DOS)

    void  _7433_Get_IRQ_Status (U16 cardNo, U16 *int1Status,
    U16 *int2Status)

C/C++ (Windows 95)

    void W_7433_Get_IRQ_Status (U16 cardNo, U16 *int1Status,
    U16 *int2Status)

Visual Basic (Windows 95)

    W_7433_Get_IRQ_Status (ByVal cardNo As Integer,
    int1Status As Integer, int2Status As Integer)
```

@ Argument

cardNo: card number of selected board
int1Status: 0: interrupt not INT1, 1: interrupt is INT1
int2Status: 0: interrupt not INT2, 1: interrupt is INT2

5.9 Interrupt Enable

@ Description

This function is only available to Windows 95 drivers. It is used to activate the interrupt controller. After calling this function, every time an interrupt request signal is generated, a software event is signaled. Please refer to the sample program 7432int.c or 7433int.c.

@ Syntax

PCI-7432 / cPCI-7432 / cPCI-7432R

```
C/C++ (Windows 95)

   U16  W_7432_INT_Enable (U16 cardNo, HANDLE *hEvent)

Visual Basic (Windows 95)

   W_7432_INT_Enable (ByVal cardNo As Integer, hEvent As
   Long) As Integer
```

PCI-7433 / cPCI-7433 / cPCI-7433R

```
C/C++ (Windows 95)

   U16  W_7433_INT_Enable (U16 cardNo, HANDLE *hEvent)

Visual Basic (Windows 95)

   W_7433_INT_Enable (ByVal cardNo As Integer, hEvent As
   Long) As Integer
```

@ Argument

cardNo : card number of selected board
hEvent : the address of an array of two handles. HEvent[0] and hEvent[1] are the events for interrupt signals INT1 and INT2 respectively.

@ Return Code

ERR_NoError
ERR_BoardNoInit

5.10 Interrupt Disable

@ Description

This function is only available to Windows 95 drivers. This function is used to disable the generation of interrupt signals.

@ Syntax

PCI-7432 / cPCI-7432 / cPCI-7432R

```
C/C++ (Windows 95)
    U16  W_7432_INT_Disable (U16 cardNo)
Visual Basic (Windows 95)
    W_7432_INT_Disable (ByVal cardNo As Integer) As Integer
```

PCI-7433 / cPCI-7433 / cPCI-7433R

C/C++ (Windows 95)

```
    U16  W_7433_INT_DIsable (U16 cardNo)
```

Visual Basic (Windows 95)

```
    W_7433_INT_Disable (ByVal cardNo As Integer) As Integer
```

@ Argument

`cardNo :` `card number of selected board`

@ Return Code

```
ERR_NoError
ERR_BoardNoInit
```

5.11 LED Control Function

@ Description

The LED control function is only available to the CompactPCI rear I/O version. The cPCI-7432R/33R/34R has four user defined LED's. This function is used to control the LED's.

@ Syntax

cPCI-7432R / cPCI-7433R / cPCI-7434R

```
C/C++ (DOS)

    Void  _7432R_LED (U16 cardNo, U32 LED_Data)
    void  _7433R_LED (U16 cardNo, U32 LED_Data)
    void  _7434R_LED (U16 cardNo, U32 LED_Data)

C/C++ (Windows 95)

    void W_7432R_LED (U16 cardNo, U32 LED_Data)
    void W_7433R_LED (U16 cardNo, U32 LED_Data)
    void W_7434R_LED (U16 cardNo, U32 LED_Data)

Visual Basic (Windows 95)

    W_7432R_LED (ByVal cardNo As Integer , ByVal
                 LED_Data As Long) As Integer
    W_7433R_LED (ByVal cardNo As Integer , ByVal
                 LED_Data As Long) As Integer
    W_7434R_LED (ByVal cardNo As Integer , ByVal
                 LED_Data As Long) As Integer
```

@ Argument

cardNo: card number of selected board
LED_Data: control LED data (only use finally byte)

5.12 Get Slot Number

@ Description

The ***Get slot number*** function is only available to the CompactPCI rear I/O version. The slot number is read back from the geographic address, which is defined on the backplane.

@ Syntax

cPCI-7432R / cPCI-7433R / cPCI-7434R

C/C++ (DOS)

```
void  _7432R_SlotNo (U16 cardNo, U32 *slot_No)
void  _7433R_SlotNo (U16 cardNo, U32 *slot_No)
void  _7434R_SlotNo (U16 cardNo, U32 *slot_No)
```

C/C++ (Windows 95)

```
void W_7432R_SlotNo (U16 cardNo, U32 *slot_No)
void W_7433R_SlotNo (U16 cardNo, U32 *slot_No)
void W_7434R_SlotNo (U16 cardNo, U32 *slot_No)
```

Visual Basic (Windows 95)

```
W_7432R_SlotNo (ByVal cardNo As Integer , slot_No
As Long) As Integer
W_7433R_SlotNo (ByVal cardNo As Integer , slot_No
As Long) As Integer
W_7434R_SlotNo (ByVal cardNo As Integer , slot_No
As Long) As Integer
```

@ Argument

cardNo: card number of selected board
slot_No: tne slot number of the cPCI card (only use LSB byte)

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