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CE notification

The PCI-1762, developed by ADVANTECH CO., LTD., has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

On-line Technical Support

For technical support and service, please visit our support website at:

http:\\www.advantech.com/support

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1. Introduction

Thank you for buying the Advantech PCI-1762 DAS card. The Advantech PCI-1762 DAS card is a 16-ch relay actuator and 16-ch isolated digital input card for the PCI bus.

Its sixteen on-board SPDT relays are ideal for applications such as device ON/OFF control or small power switched. For easy monitoring, each relay is equipped with one red LED to show its ON/OFF status.

The PCI-1762's sixteen optically-isolated digital input channels are ideal for digital input in noisy environments or with floating potentials.

PCI-1762 16-ch Isolated Digital Input and 16-ch Relay Output Card

The following sections of this chapter will provide further information about features of the DAS cards, a Quick Start for installation, together with some brief information on software and accessories for the PCI-1762 card.

1.1   Features

- 16 relay output channels and 16 isolated digital input channels
- LED indicators to show activated relays
- Jumper selectable Form A/Form B-type relay output channel
- Output status read-back
- Keep relay output values when hot system reset
- High-voltage isolation on input channels (2,500 V_{DC})
- High ESD protection (2,000 V_{DC})
- High over-voltage protection (70 V_{DC})
- Wide input range (10 ~ 50 V_{DC})
- Interrupt handling capability
- High-density DB-62 connector
- Board ID

The Advantech PCI-1762 offers the following main features:

Robust Protection

The PCI-1762 digital input channels feature a robust isolation protection for industrial, lab and machinery automation applications. It durably withstands voltage up to 2,500 V_{DC}, preventing your host system from any incidental harms. If connected to an external input source with surge-protection, the PCI-1762 can offer up to a maximum of 2,000 V_{DC} ESD (Electrostatic Discharge) protection. Even with an input voltage rising up to 70 V_{DC}, the PCI-1762 can still manage to work properly albeit only for short period of time.

Wide Input Range

The PCI-1762 has a wide range of input voltage from 10 to 50 V_{DC}, and it is suitable for most industrial applications with 12 V_{DC}, 24 V_{DC} and 48 V_{DC} input voltage.

Board ID

The PCI-1762 has a built-in DIP switch that helps define each card's ID when multiple PCI-1762 cards have been installed on the same PC chassis. The board ID setting function is very useful when users build their system with multiple PCI-1762 cards. With the correct Board ID settings, the user can easily identify and access each card during hardware configuration and software programming.

Reset Protection Fulfills Requirement for Industrial Applications

When the system has undergone a hot reset (i.e. without turning off the system power), the PCI-1762 can either retain outputs values of each channel, or return to its default configuration as open status, depending on its on-board jumper setting. This function protects the system from wrong operations during unexpected system resets.

Plug-and-Play Function

The PCI-1762 is a Plug-and-Play device, which fully complies with PCI Specification Rev 2.2. During card installation, there is no need to set jumpers or DIP switches. Instead, all bus-related configurations such as base I/O address and interrupt are automatically done by the Plug-and-Play function.

1.2 Applications

- Industrial ON/OFF control
- Switch status sensing
- Digital I/O control
- Industrial and lab automation
- SMT/PCB machinery
- Semi-conductor machinery
- PC-based Industrial Machinery
- Testing & Measurement
- Laboratory & Education
- External relay driving

1.3 Installation Guide

Before you install your PCI-1762 card, please make sure you have the following necessary components:

❏ **PCI-1762 DAS card**

❏ **PCI-1762 User's Manual**

❏ **Driver software**　　　Advantech DLL drivers
　　　　　　　　　　　　(included in the companion CD-ROM)

❏ **Wiring cable**　　　　PCL-10162

❏ **Wiring board**　　　　ADAM-3962

❏ **Computer**　　　　　Personal computer or workstation with a PCI-
　　　　　　　　　　　　bus slot (running Windows 95/98/NT/2000)

Some other optional components are also available for enhanced operation:

❏ **Application software**　ActiveDAQ, GeniDAQ or other third-party
　　　　　　　　　　　　software packages

After you get the necessary components and maybe some of the accessories for enhanced operation of your DAS card, you can then begin the Installation procedures. Figure 1-1 on the next page provides a concise flow chart to give users a broad picture of the software and hardware installation procedures:

Install Driver from CD-ROM, then power-off PC

Install Hardware and power-on PC

Use driver utility to configure hardware

Use test utility to test hardware

Read examples & driver manual

Start to write your own application

Figure 1-1: Installation Flow Chart

1.4 Software

Advantech offers a rich set of DLL drivers, third-party driver support and application software to help fully exploit the functions of your PCI-1762 card:

- DLL driver (on the companion CD-ROM)
- LabVIEW driver
- Advantech ActiveDAQ
- Advantech GeniDAQ

For more information on software, please refer to *Chapter 4, Software Overview.*

Users who intend to program directly at the registers of the DAS card can have register-level programming as an option. Since register-level programming is often difficult and laborious, it is usually recommended only for experienced programmers. For more information, please refer to *Appendix C, Register Structure and Format.*

1.5 Accessories

Advantech offers a complete set of accessory products to support the PCI-1762 cards. These accessories include:

Wiring Cable

❏ **PCL-10162**   The PCL-10162 shielded cable is specially designed for PCI-1762 cards to provide high resistance to noise. To achieve a better signal quality, the signal wires are twisted in such a way as to form a "twisted-pair cable", reducing cross-talk and noise from other signal sources. Furthermore, its analog and digital lines are separately sheathed and shielded to neutralize EMI/EMC problems. Advantech provides 1 m, 3m and 5m cables for different user requirements.

Wiring Boards

❏ **ADAM-3962**   The ADAM-3962 is a D-Sub 62-pin wiring terminal module for DIN-rail mounting. This terminal module can be readily connected to the Advantech PC-Lab cards and allow easy yet reliable access to individual pin connections for the PCI-1762 card.

Chapter 1

2. Installation

This chapter gives users a package item checklist, proper instructions about unpacking and step-by-step procedures for both driver and card installation.

2.1 Unpacking

After receiving your PCI-1762 package, please inspect its contents first. The package should contain the following items:

- ☑ PCI-1762 card
- ☑ Companion CD-ROM (DLL driver included)
- ☑ User's Manual
- ☑ Quick Start

The PCI-1762 card harbors certain electronic components vulnerable to electrostatic discharge (ESD). ESD could easily damage the integrated circuits and certain components if preventive measures are not carefully paid attention to. **Before removing the card from the antistatic plastic bag, you should take following precautions to ward off possible ESD damage:**

- Touch the metal part of your computer chassis with your hand to discharge static electricity accumulated on your body. Or one can also use a grounding strap.

- Touch the antistatic bag to a metal part of your computer chassis before opening the bag.

- Take hold of the card only by the metal bracket when removing it out of the bag.

After taking out the card, first you should:

- Inspect the card for any possible signs of external damage (loose or damaged components, etc.). If the card is visibly damaged, please notify our service department or our local sales representative immediately. Avoid installing a damaged card into your system.

**Also pay extra caution to the following aspects to ensure proper instal-
lation:**

Avoid physical contact with materials that could hold static electricity
such as plastic, vinyl and Styrofoam.

Whenever you handle the card, grasp it only by its edges. DO NOT
TOUCH the exposed metal pins of the connector or the electronic
components.

Note:
✎ Keep the antistatic bag for future use. You might need the original bag
to store the card if you have to remove the card from PC or transport it
elsewhere.

2.2 Switch and Jumper Settings

The PCI-1762 card has one function switch and two jumper settings.
The following sections tell how to configure the card. You may want to
refer to the figure below for help in identifying card components.
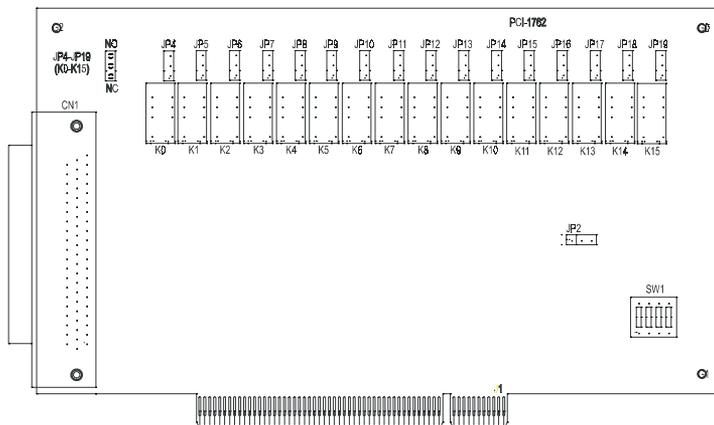
Figure 2-1: Card connector, jumper and switch locations

Table 2-1: Summary of jumper settings

Names of Jumpers	Function description	
JP4 ~ 19	NO / NC	Sets relay output to be normally open (default)
	NO / NC	Sets relay output to be normally closed
JP2		Clears relay outputs to "OFF" when the system (or PC) issues a reset signal on the PCI bus.
		Clears relay outputs to "OFF" only when system powers-on.
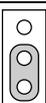
Setting relay outputs to be NC/NO

Sixteen relay outputs, K0 ~ K15, are single-pole single-throw (SPST), which can be jumper set as either nornally open (NO) or normally close (NC) (see Table 2.2). The default settings for K0 ~ K15 are normally open. For detailed information, please refer to *Appendix C.*

Table 2-2: Summary of jumper settings for relay

Relay Output channel	Corresponding Jumper
K0	JP4
K1	JP5
K2	JP6
K3	JP7
K4	JP8
K5	JP9
K6	JP10
K7	JP11
K8	JP12
K9	JP13
K10	JP14
K11	JP15
K12	JP16
K13	JP17
K14	JP18
K15	JP19

Setting the time to reset the relay outputs

Some users will want the capability of clearing each relay output when the system (or PC) issues a reset signal on the PCI bus. Some users will want to clear their relays only as part of system power-on. The PCI-1762 satisfies both these needs by providing jumper JP2. Depending on the application, this capability may allow relay outputs to be "OFF" without requiring a complete shutdown of processes controlled by the card.

Complete loss of power to the chip clears the chip memory. Thus, no matter how JP2 is set, if the power to the PCI-1762 is disconnected, the relay initial power-on state will be "OFF" (NC or NO, depending on the user's settings).

2.3 Connector Pin Assignments

Description of pin use:

		21 R0_OUT	
R11_OUT	62	42 20 R0_COM	42 R6_OUT
R11_COM	61	41 19 R1_OUT	41 R6_COM
R12_OUT	60	40 18 R1_COM	40 R7_OUT
R12_COM	59	39 17 R2_OUT	39 R7_COM
R13_OUT	58	38 16 R2_COM	38 R8_OUT
R13_COM	57	37 15 R3_OUT	37 R8_COM
R14_OUT	56	36 14 R3_COM	36 R9_OUT
R14_COM	55	35 13 R4_OUT	35 R9_COM
R15_OUT	54	34 12 R4_COM	34 R10_OUT
R15_COM	53	33 11 R5_OUT	33 R10_COM
NC	52	32 10 R5_COM	32 NC
NC	51	31 9 NC	31 NC
ECOM3	50	30 8 IDI15	30 NC
ECOM3	49	29 7 IDI13	29 IDI14
ECOM2	48	28 6 IDI11	28 IDI12
ECOM2	47	27 5 IDI9	27 IDI10
ECOM1	46	26 4 IDI7	26 IDI8
ECOM1	45	25 3 IDI5	25 IDI6
ECOM0	44	24 2 IDI3	24 IDI4
ECOM0	43	23 1 IDI1	23 IDI2
		22	22 IDI0

IDI0 ~ IDI3	: Isolated digital input of Group 0
IDI4 ~ IDI7	: Isolated digital input of Group 1
IDI8 ~ IDI11	: Isolated digital input of Group 2
IDI12 ~ IDI15	: Isolated digital input of Group 3
ECOM0	: External common input of Group 0
ECOM1	: External common input of Group 1
ECOM2	: External common input of Group 2
ECOM3	: External common input of Group 3
NC	: No connection

Figure 2-2: I/O connector pin assignments for the PCI-1762

2.4 Driver Installation

We recommend you to install the driver before you install the PCI-1762 card into your system, since this will guarantee a smooth installation process.

The 32-bit DLL driver Setup program for the PCI-1762 card is included on the companion CD-ROM that is shipped with your DAS card package. Please follow the steps below to install the driver software:

Step 1: Insert the companion CD-ROM into your CD-ROM drive.

Step 2: The Setup program will be launched automatically if you have the autoplay function enabled on your system. When the Setup Program is launched, you'll see the following Setup Screen.

Note:

✎ If the autoplay function is not enabled on your computer, use Windows Explorer or Windows *Run* command to execute SETUP.EXE on the companion CD-ROM.
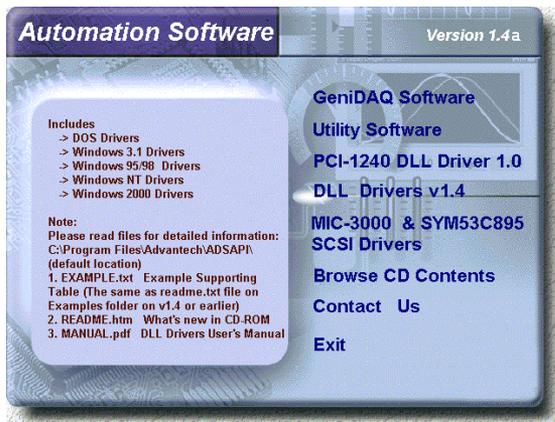
Figure 2-3: The Setup Screen of Advantech Automation Software

Step 3: Select the *DLL Drivers* option.

Step 4: Select the *Windows 95/98, Windows NT or Windows 2000* option according to your operating system. Just follow the installation instruc-tions step by step to complete your DLL driver setup.
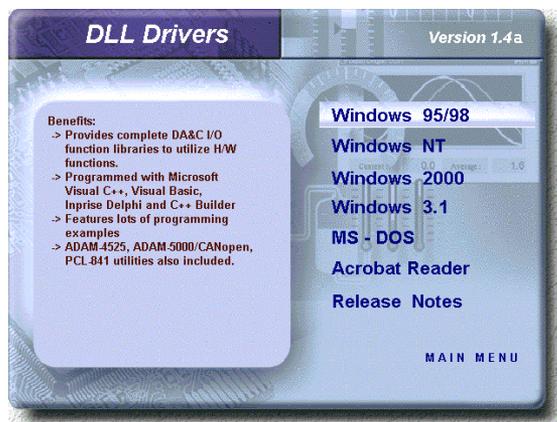
Figure 2-4: Different options for Driver Setup

For further information on driver-related issues, an online version of *DLL Drivers Manual* is available by accessing the following path:

Start/Programs/Advantech Driver for 95 and 98 (or for NT/2000)/ Driver Manual

2.5 Hardware Installation

Note:

✎ Make sure you have installed the driver first before you install the card (please refer to *2.4 Driver Installation*)

After the DLL driver installation is completed, you can now go on to install the PCI-1762 card in any PCI slot on your computer. But it is suggested that you should refer to the computer user manual or related documentations if you have any doubt. Please follow the steps below to install the card on your system.

Step 1: Turn off your computer and unplug the power cord and cables. TURN OFF your computer before installing or removing any components on the computer.

Step 2: Remove the cover of your computer.

Step 3: Remove the slot cover on the back panel of your computer.

Step 4: Touch the metal part on the surface of your computer to neutralize the static electricity that might be on your body.

Step 5: Insert the PCI-1762 card into a PCI slot. Hold the card only by its edges and carefully align it with the slot. Insert the card firmly into place. Use of excessive force must be avoided, otherwise the card might be damaged.

Step 6: Fasten the bracket of the PCI card on the back panel rail of the computer with screws.

Step 7: Connect appropriate accessories (62-pin cable, wiring terminals, etc. if necessary) to the PCI card.

Step 8: Replace the cover of your computer chassis. Re-connect the cables you removed in step 2.

Step 9: Plug in the power cord and turn on the computer .

Note:

✎ In case you installed the card without installing the DLL driver first, Windows 95/98 will recognize your card as an "unknown device" after rebooting, and will prompt you to provide the necessary driver. You should ignore the prompting messages (just click the **Cancel** button) and set up the driver according to the steps described in *2.4 Driver Installation.*

After the PCI-1762 card is installed, you can verify whether it is properly installed on your system in the *Device Manager:*

1. Access the *Device Manager* through *Control Panel/System/ Device Manager*.

2. The *device name* of the PCI-1762 should be listed on the *Device Manager* tab on the *System Property Page*.
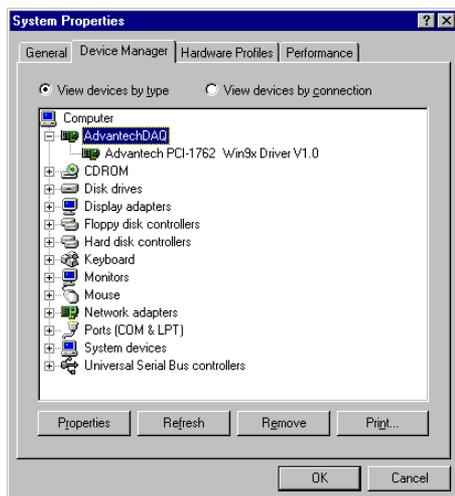
Figure 2-5: The device name listed on the Device Manager

Note:

✎ If your card is properly installed, you should see the device name of your card listed on the *Device Manager* tab. **If you do see your device name listed on it but marked with an exclamation sign "!", it means your card has not been correctly installed.** In this case, remove the card device from the *Device Manager* by selecting its device name and press the *Remove* button. Then go through the driver installation process again.

After your card is properly installed on your system, you can now configure your device using the *Device Installation* Program that has itself already been installed on your system during driver setup. A complete device installation procedure should include *device setup*, *configuration* and *testing*. The following sections will guide you through the Setup, Configuration and Testing of your device.

2.6 Device Setup & Configuration

The *Device Installation* program is a utility that allows you to set up, configure and test your device, and later stores your settings on the system registry. These settings will be used when you call the APIs of Advantech 32-bit DLL drivers.

Setting Up the Device

Step 1: To install the I/O device for your card, you must first run the Device Installation program (by accessing *Start/Programs/ Advantech Driver for 95 and 98 (or for NT/2000)/Device Installa-tion)*.

Figure 2-6: The Advantech Device Installation utility program

Step 2: On the *Device Installation* program window, select the Setup menu item on the menu bar, and click the Device command (Fig. 2-6) to bring up the I/O *Device Installation* dialog box (Fig. 2-7). You can then view the device(s) already installed on your system (if any) on the *Installed Devices* list box. Since you haven't installed any device yet, you might see a blank list such as the one on the next page (Fig. 2-7).
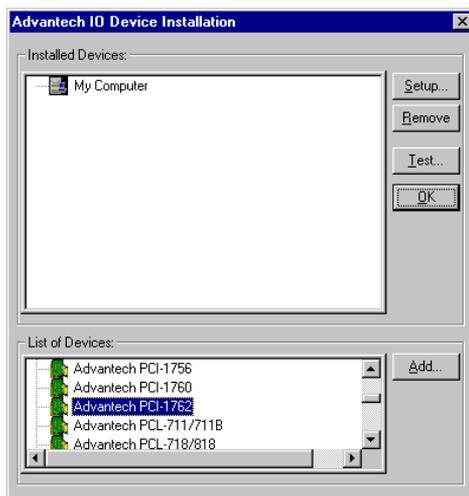
Figure 2-7: The I/O Device Installation dialog box

Step 3: Scroll down the *List of Devices* box to find the device that you wish to install, then click the *Add*... button to evoke the *Device(s) found* dialog box such as one shown in Fig. 2-8. The *Device(s) found* dialog box lists all the installed devices on your system. Select the device you want to configure from the list box and press the *OK* button. After you have clicked *OK*, you will see a *Device Setting* dialog box such as the one in Fig. 2-9.
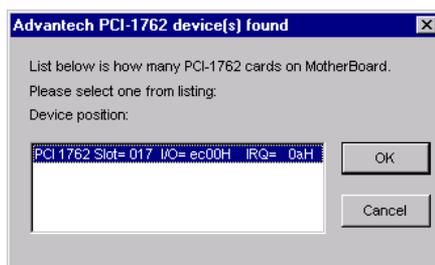
Figure 2-8: The "Device(s) Found" dialog box

Configuring the Device

Step 4: On the *Device Setting* dialog box (Fig. 2-9), you can configure the ID0/ID8 Interrupt trigger mode either as *Rising Edge* or *Falling Edge*, and *Enable* of *Disable* the ID0/ID8.
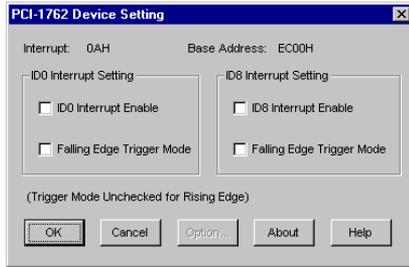
Figure 2-9: The Device Setting dialog box

Step 5: After you have finished configuring the device, click *OK* and the *device name* will appear in the *Installed Devices* box as seen below:
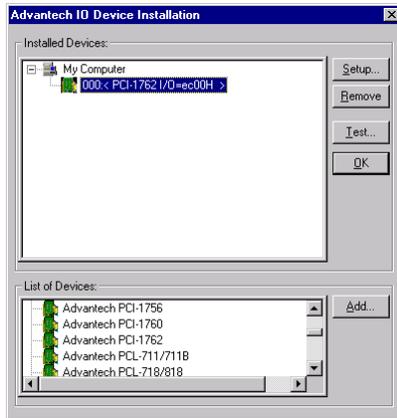
Figure 2-10: The Device Name appearing on the list of devices box

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Note:

✎ As we have noted, the *device name* "**000**: **<PCI-1762 I/O=EC00H>** " begins with a *device number* "000", which is specifically assigned to each card. The *device number* is passed to the driver to specify which device you wish to control.

If you want to test the card device further, go right to the next section on the *Device Testing*.

2.7   Device Testing

Following through the *Setup* and *Configuration* procedures to the last step described in the previous section, you can now proceed to test the device by clicking the ***Test*** Button on the *I/O Device Installation* dialog box (Fig. 2-10). A *Device Test* dialog box will appear accordingly:
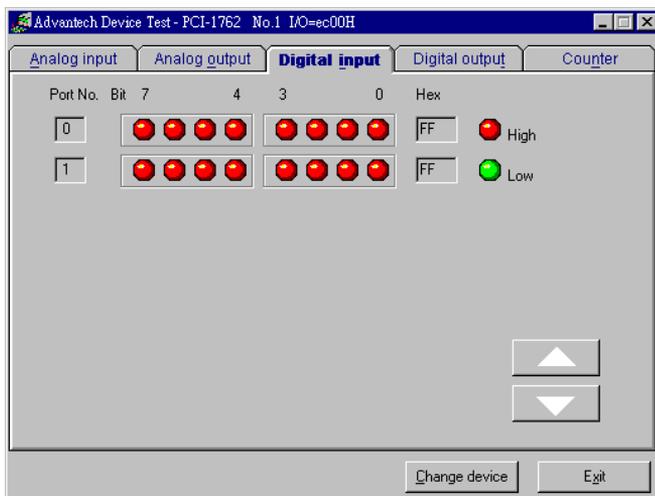
Figure 2-11: Digital Input tab on the Device Test dialog box

On the *Device Test dialog* box, users are free to test various functions of PCI-1762 on the *Digital input* and *Digital output* tabs.

Note:

✎ You can access the Device Test dialog box either by the previous procedure for the Device Installation Program or simply by accessing ***Start/Programs/Advantech Driver for 95 and 98 (or for NT/2000) / Test Utility.***

Testing Digital Input Function

Click the *Digital Input* tab to show forth the *Digital Input* test panel as seen below. Through the color of the lamps, users can easily discern whether the status of each digital input channel is either high or low.
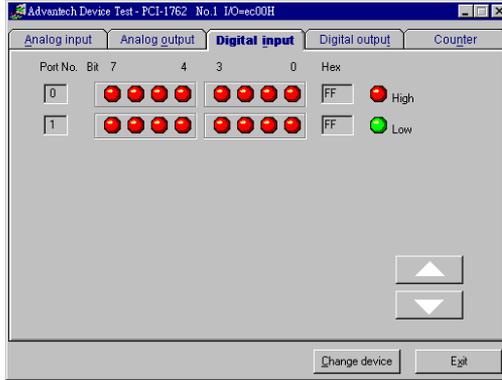
Figure 2-12: Digital Input tab on the Device Test dialog box

Testing Digital Output Function

Click the *Digital Output* tab to bring up the *Digital Output* test panel such as the one seen on the next page. By pressing the buttons on each tab, users can easily set each digital output channel as *high* or *low* for the corresponding port.

Figure 2-13: Digital Output tab on the Device Test dialog box

Only after your card device is properly set up, configured and tested, can the device installation procedure be counted as complete. After the device installation procedure is completed, you can safely proceed to the next chapter, *Signal Connections.*

3. Signal Connections

3.1 Overview

Maintaining signal connections is one of the most important factors in ensuring that your application system is sending and receiving data correctly. A good signal connection can avoid unnecessary and costly damage to your PC and other hardware devices. This chapter provides useful information about how to connect input and output signals to the PCI-1762 via the I/O connector.

3.2 Isolated Digital Input Connections

The PCI-1762 has 16 isolated digital input channels designated IDI0~IDI15.

Each of isolated digital input channel accepts 10~50 V_{DC} voltage inputs, and accept bi-directional input. It means that you can apply positive or negative voltage to an isolated input pin (V_{in}). The figure below shows how to connect an external input source to one of the card's isolated input channels
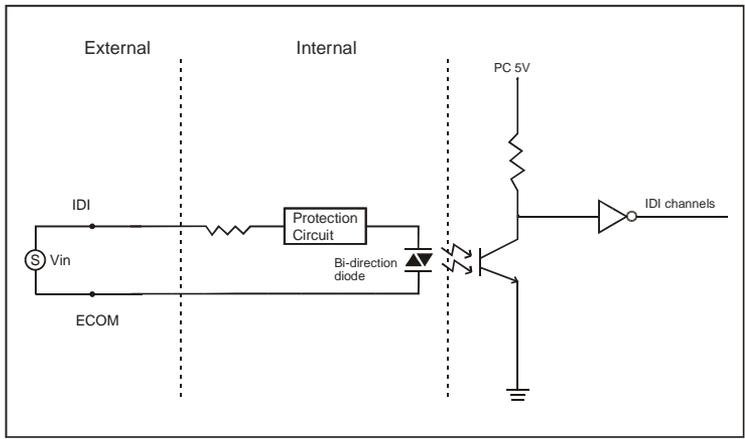
Figure 3-1: Isolated digital input connection

3.3 Relay Output

After power on, the initial relay output status of PCI-1762 is shown as below:
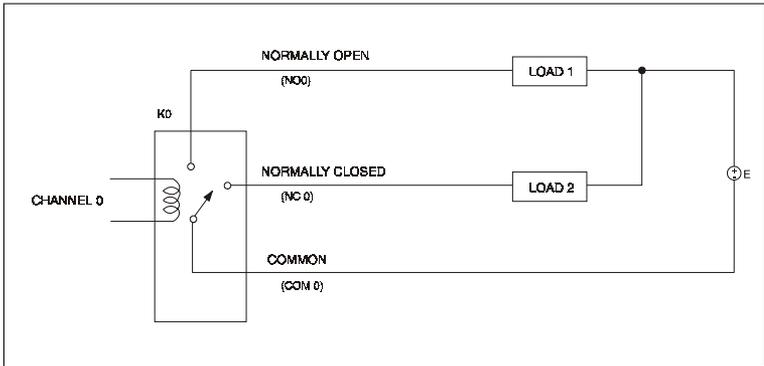
Figure 3-2: Relay output connection

A write operation to I/O address, BASE +0, will change the output status of each relay. For example, if Bit 0 of BASE +0 is set "1" (logic high), relay 0, K0, will switch from position "NORMALLY CLOSED", NC0, to position "NORMALLY OPEN", NO0. This means that LOAD2 will be de-energized, while LOAD1 is energized.

To summarize, the "COMMON" line connect to the "NORMALLY CLOSED" line, if the corresponding bit is set as 0 (power-on initial status). Otherwise, if the corresponding bit is set as 1, then the "COMMON" line will connect to the "NORMALLY OPEN" line.

A. Specification

Isolated Digital Input

Number of Input Channel	16	
Optical Isolation	2500 V_{DC}	
Opto-isolator response time	25µs	
Over-voltage Protect	70 V_{DC}	
Input Voltage	VIH (max.)	50 V_{DC}
	VIH (min.)	10 V_{DC}
	VIL (max.)	3 V_{DC}
VIL (max.)	10 V_{DC}	1.6 mA (typical)
	12 V_{DC}	1.9 mA (typical)
	24 V_{DC}	4.1 mA (typical)
	48 V_{DC}	8.5 mA (typical)
	50 V_{DC}	8.9 mA (typical)

Relay Output

Number of Output Channel	16
Relay Type	SPDT (Form A or Form B, Jumper selectable)
Nominal Switching Capacity	1A 30V_{DC}
Max. Switching Power	30 W
Max. Switching Voltage	110 V_{AC}
Max. Switching Current	1 A
Min. Switching Capacity	10µA 10mV$_{DC}$
Breakdown Voltage	1,500 V_{AC} for 1 min. (Between coil and contacts)
Operate time	6 ms max.
Release time	4 ms max.
Insulation Resistance	1,000 MΩ min. (at 500 V_{DC})
Life Expectancy	5 105 min. (at 1A 30V_{DC} resistive)

General

Power Consumption	+5V @ 250 mA (typical) +5V @ 620 mA (max.)	
Temperature	Operation	0 ~ +60° C (32 ~ 140° F) (refer to IEC 68-2-1,2)
	Storage	-20 ~ +70° C (-4 ~ 158° F)
Relative Humidity	5 - 95 % RH non-condensing(refer to IEC 68-2-3)	
Certification	CE Class A certified	

B. Block Diagram

```
PCI          PLX           Address Bus        Control Logic
BUS          PCI 9052
                           Control Bus

                           Data Bus


                                              IDI0 ~ IDI15

                                              ECOM0 ~ ECOM3        Isolation      D-Sub
                                                                                 62 Pin
                                              R0_OUT ~ R15_OUT                    Connector

                                              R0_COM ~ R15_COM


             Interrupt          IDI0
             Control
             Logic              IDI8
```
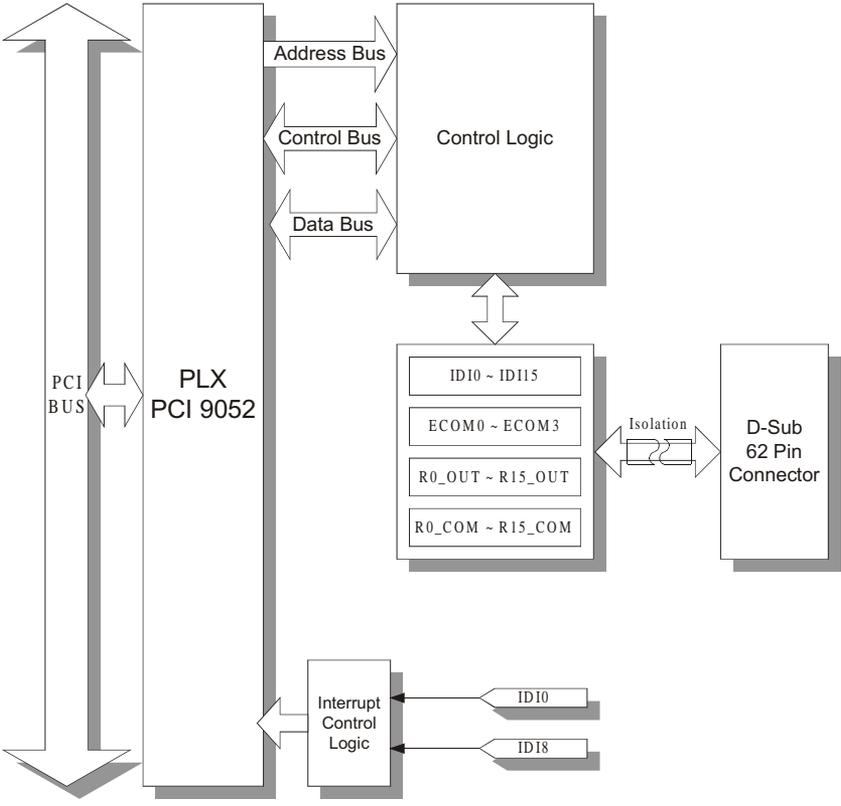
C. Register Structure and Format

C.1 Overview

The PCI-1762 is delivered with an easy-to-use 32-bit DLL driver for user programming under the Windows 95/98/NT/2000 operating system. We advise users to program the PCI-1762 using the 32-bit DLL driver provided by Advantech to avoid the complexity of low-level programming by register.

The most important consideration in programming the PCI-1762 at the register level is to understand the function of the card's registers. The information in the following sections is provided only for users who would like to do their own low-level programming.

C.2 I/O Port Address Map

The PCI-1762 requires 32 consecutive addresses in the PC's I/O space. The address of each register is specified as an offset from the card's base address. For example, BASE+0 is the card's base address and BASE+7 is the base address plus seven bytes.

The table C-1 shows the function of each register of the PCI-1762 or driver and its address relative to the card's base address.

Table C-1: PCI-1762 register format

Base Address +decimal		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	R	Relay Output Status															
		RS15	RS14	RS13	RS12	RS11	RS10	RS9	RS8	RS7	RS6	RS5	RS4	RS3	RS2	RS1	RS0
	W	Relay Output															
		RO15	RO14	RO13	RO12	RO11	RO10	RO9	RO8	RO7	RO6	RO5	RO4	RO3	RO2	RO1	RO0
2	R	Isolated Digital Input															
		IDI15	IDI14	IDI13	IDI12	IDI11	IDI10	IDI9	IDI8	IDI7	IDI6	IDI5	IDI4	IDI3	IDI2	IDI1	IDI0
	W	N/A															
4	R	Board ID Register															
														ID3	ID2	ID1	ID0
	W	N/A															
6	R	Interrupt Status Register															
							ID8 RF	ID8 EN	ID8F						ID0 RF	ID0 EN	ID0F
	W	Interrupt Control Register															
							ID8 RF	ID8 EN	ID8 CLR						ID0 RF	ID0 EN	ID0 CLR

C.3 Relay I/O Registers - BASE+0 and BASE+1

The PCI-1762 offers 16-ch relay Actuators. These I/O channels use the input and output ports at addresses BASE+0 and BASE+1.

Table C-2: Register for relay output status

Read	Relay Output Status							
Bit #	7	6	5	4	3	2	1	0
BASE + 1	RS15	RS14	RS13	RS12	RS11	RS10	RS9	RS8
BASE + 0	RS7	RS6	RS5	RS4	RS3	RS2	RS1	RS0

Table C-3: Register for relay output

Write	Relay Output							
Bit #	7	6	5	4	3	2	1	0
BASE + 1	RO15	RO14	RO13	RO12	RO11	RO10	RO9	RO8
BASE + 0	RO7	RO6	RO5	RO4	RO3	RO2	RO1	RO0

Note!

✎ The default configuration of the digital output channels is a logic 0.

This avoids damaging external devices during system start-up or reset since the power on status is set to the default value.

C.4 Isolated Digital Input Registers - BASE+2 and BASE+3

The PCI-1762 offers 16-ch isolated digital input channels. These channels use the input ports at addresses BASE+2 and BASE+3.

Table C-4: Register for isolated digital input

Read	Isolated Digital Input							
Bit #	7	6	5	4	3	2	1	0
BASE + 3	IDI15	IDI14	IDI13	IDI12	IDI11	IDI10	IDI9	IDI8
BASE + 2	IDI7	IDI6	IDI5	IDI4	IDI3	IDI2	IDI1	IDI0

C.5 Board ID Register - BASE+4

The PCI-1762 offers Board ID register BASE+4. With correct Board ID settings, user can easily identify and access each card during hardware configuration and software programming.

Table C-5: Register for Board ID

Read	Board ID							
Bit #	7	6	5	4	3	2	1	0
BASE + 4					BD3	BD2	BD1	BD0

BD3 ~ DB0   Board ID
                       BD0   LSB of the Board ID
                       BD3   MSB of the Board ID

C.6   Interrupt Status Register - BASE+6 and BASE+7

The Interrupt Status Register control the status of two interrupt signal sources (IDI0 and IDI8).

Table C-6: Register for interrupt status

Read	Interrupt Status Register							
Bit #	7	6	5	4	3	2	1	0
BASE + 7						ID8RF	ID8EN	ID8F
BASE + 6						IDORF	IDOEN	IDOF

IDnF   Interrupt flag bits (n = 0 or 8)
                  This bit is a flag indicating the status of an interrupt.
                  User can read this bit to get the status of the
                  interrupt
                      0   No interrupt
                      1   Interrupt occurred

IDnEN   Interrupt enable control bits (n = 0 or 8)
                  Read this bit to Enable/Disable the interrupt.
                      0   Disable
                      1   Enable

IDnRF   Interrupt triggering control bits (n = 0 or 8)
                  The interrupt can be triggered by a rising edge or
                  falling edge of the interrupt signal, as determined by
                  the value in this bit.
                      0   Rising edge trigger
                      1   Falling edge trigger

C.7 Interrupt Control Register - BASE+6 and BASE+7

The Interrupt Control Register control the status of two interrupt signal sources (IDI0 and IDI8). The user can clear the interrupt by writing its corresponding value to the Interrupt Control Register, as shown in below table.

Table C-7: Register for interrupt control

Write	Interrupt Control Register							
Bit #	7	6	5	4	3	2	1	0
BASE + 7						ID8RF	ID8EN	ID8CLR
BASE + 6						ID0RF	ID0EN	ID0CLR

IDnCLR   Interrupt clear control bits (n = 0 or 8).
This bit must first be cleared to service the next interrupt.
0   Don't care
1   Clear the interrupt

IDnEN   Interrupt enable control bits (n = 0 or 8)
Set this bit to Enable/Disable the interrupt.
0   Disable
1   Enable

IDnRF   Interrupt triggering control bits (n = 0 or 8)
The interrupt can be triggered by a rising edge or falling edge of the interrupt signal, as determined by the value in this bit.
0   Rising edge trigger
1   Falling edge trigger

D. Flow Chart

To write a command or confirm the command status, please follow the follow chart below.

```
            ┌──────────────────────────┐
            │   Interrupt Enable Start  │
            └──────────────────────────┘
                        │
                        ▼
     ┌──────────────────────────────────────────┐
     │             Initial Sethug:              │
     │  1. Interrupt clear (IDOCLR or ID8CLR = "1") │
     │  2. Interrupt enable (IDOEN or ID8EN = "1")  │
     │  3. Triggering edge control (Rising: IDORF or │
     │   ID8RF = "0" Falling: IDORF or ID8RF = "1") │
     └──────────────────────────────────────────┘
                        │
                        ▼
              ◇ IDI0 or IDI8 has an
        NO    ◇ INT signal, or not.
                        │
                      YES
                        ▼
     ┌──────────────────────────────────────────┐
     │          Interrupt Service Routing:       │
     │  1. Intenupt disable (IDOEN or ID8EN = "0") │
     │  2. Read interrupt status from IDOF or ID8F │
     │      (No interrupt: IDOF or ID8F = "0"      │
     │   Interrupt occur: IDOF or ID8F = "1")      │
     │  3. Interrupt clear (IDOCLR or ID8CLR = "1") │
     │            4. Processing desired            │
     │  5. Interrunt enable (IDOEN or ID8EN = "1") │
     └──────────────────────────────────────────┘
                        │
                        ▼
            ┌──────────────────────────┐
            │   Interrupt Enable Ending │
            └──────────────────────────┘
```