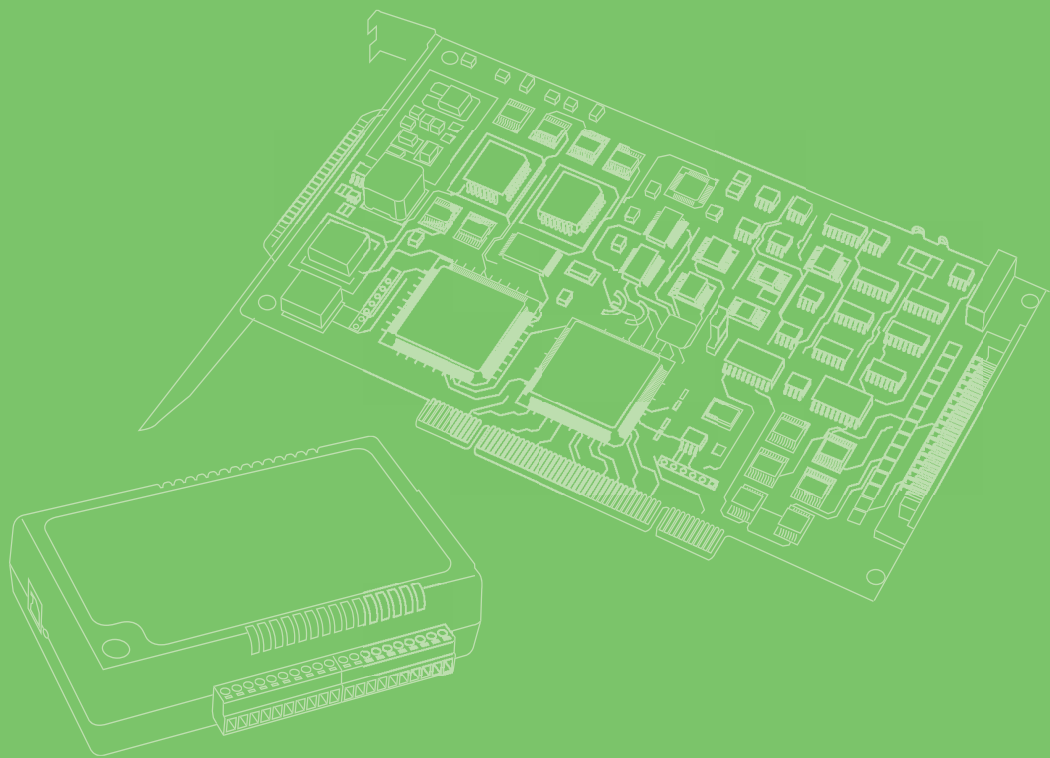


User Manual



## PCI-1762

16-ch Relay & 8-ch Isolated  
Digital Input PCI Card

**ADVANTECH**  
eAutomation

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## Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

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If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

# Declaration of Conformity

## CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

# Technical Support and Assistance

1. Visit the Advantech web site at [www.advantech.com/support](http://www.advantech.com/support) where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
  - Product name and serial number
  - Description of your peripheral attachments
  - Description of your software (operating system, version, application software, etc.)
  - A complete description of the problem
  - The exact wording of any error messages

# Warnings, Cautions and Notes

**Warning!** *Warnings indicate conditions, which if not observed, can cause personal injury!*



**Caution!** *Cautions are included to help you avoid damaging hardware or losing data. e.g.*



*There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

**Note!** *Notes provide optional additional information.*



# Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: [support@advantech.com](mailto:support@advantech.com)

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## Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
  15. The power cord or plug is damaged.
  16. Liquid has penetrated into the equipment.
  17. The equipment has been exposed to moisture.
  18. The equipment does not work well, or you cannot get it to work according to the user's manual.
  19. The equipment has been dropped and damaged.
  20. The equipment has obvious signs of breakage.
21. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
22. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**
23. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

**DISCLAIMER:** This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

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# Chapter 1

Overview

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## 1.1 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.

### 1.1.1 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.

## 1.2 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<sub>DC</sub>)
- High ESD protection (2,000 V<sub>DC</sub>)
- High over-voltage protection (70 V<sub>DC</sub>)
- Wide input range (10 ~ 50 V<sub>DC</sub>)
- 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<sub>DC</sub>, 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<sub>DC</sub> ESD (Electrostatic Discharge) protection. Even with an input voltage rising up to 70 V<sub>DC</sub>, 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<sub>DC</sub>, and it is suitable for most industrial applications with 12 V<sub>DC</sub>, 24 V<sub>DC</sub> and 48 V<sub>DC</sub> 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.

## **1.3 Applications**

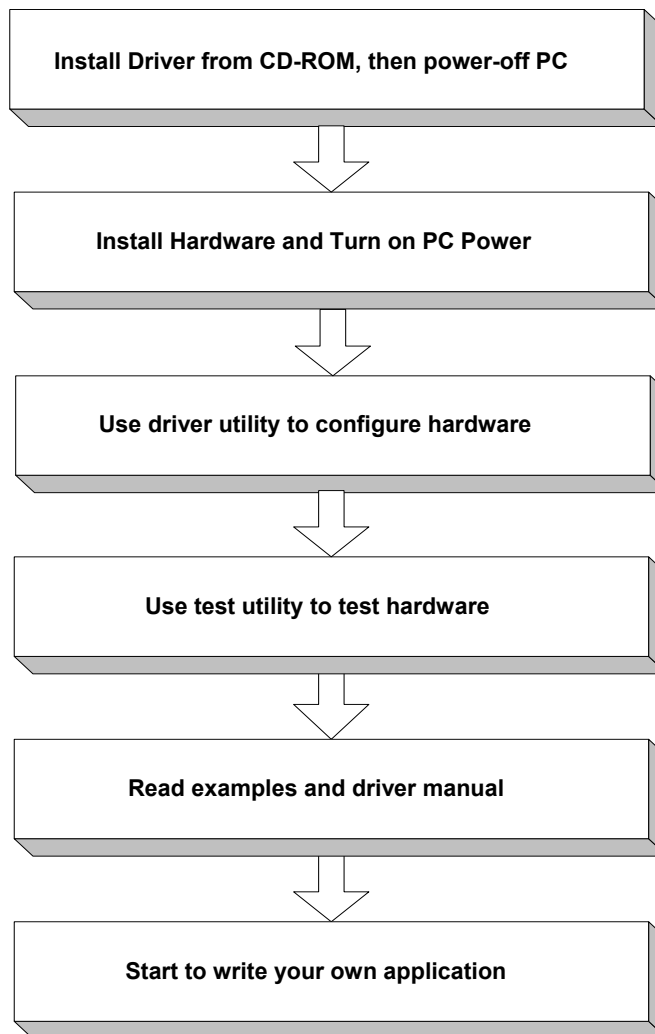
- Industrial On/Off control
- Switch status sensing
- Digital I/O control
- Industrial and lab automation
- SMT/PCB machinery
- Semi-conductor machinery
- PC-based Industrial Machinery
- Testing & Measurement
- Laboratory & Education
- External relay driving

## **1.4 Installation Guide**

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

- PCI-1762 card
- PCI-1762 User's Manual
- Driver software - Advantech DLL drivers (included in the companion CD-ROM)
- Wiring cable - PCL-10162 (optional)
- Wiring board - ADAM-3962 (optional)
- PC or workstation with a PCI-bus slot (running Windows XP/Vista/7)
- Application software - ActiveDAQ Pro or other 3rd-party software

After you get the necessary components and maybe some of the accessories for enhanced operation of your Multifunction card, you can then begin the Installation procedures.



**Figure 1.1 Installation Flow Chart**

## 1.5 Software Overview

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 Pro

Programming choices for DA&C cards: You may use Advantech application software such as Advantech DLL driver. On the other hand, advanced users are allowed another option for register-level programming, although not recommended due to its laborious and time-consuming nature.

### DLL Driver

The Advantech DLL Drivers software is included on the companion CD-ROM at no extra charge. It also comes with all the Advantech DA&C cards. Advantech's DLL driver features a complete I/O function library to help boost your application performance. The Advantech DLL driver for Windows XP/Vista/7 works seamlessly with development tools such as Visual C++, Visual Basic and Visual Studio .Net

### **Register-level Programming**

Register-level programming is reserved for experienced programmers who find it necessary to write codes directly at the level of device registers. Since register-level programming requires much effort and time, we recommend that you use the Advantech DLL drivers instead. However, if register-level programming is indispensable, you should refer to the relevant information in Appendix C, Register Structure and Format.

## **1.6 Accessories**

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

### **Wiring Cable**

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 Board**

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 2

Installation

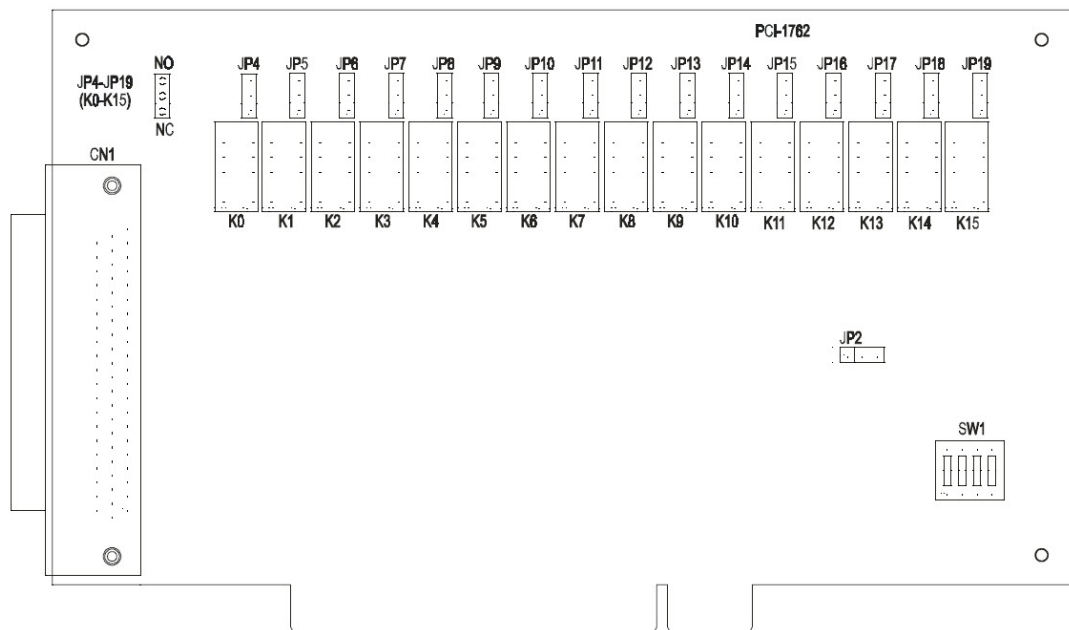
## 2.1 Unpacking

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)
- Startup Manual

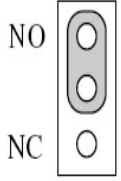
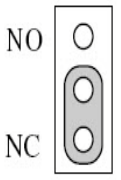

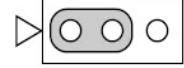
## 2.2 Switch and Jumper Settings

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	 Sets relay output to be normally open
	 Sets relay output to be normally closed
JP2	 Keep last status after hot reset
	 Default configuration

**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 normally open (NO) or normally close (NC) (see Table 2.2). The default settings for K0 ~ K15 are normally open.

**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 I/O Connectors

<b>IDI0 ~ IDI3 :</b> Isolated digital input of Group 0	R11_OUT 62	42	21	R0_OUT	42	R6_OUT
<b>IDI4 ~ IDI7 :</b> Isolated digital input of Group 1	R11_COM 61	41	20	R0_COM	41	R6_COM
<b>IDI8 ~ IDI11 :</b> Isolated digital input of Group 2	R12_OUT 60	40	19	R1_OUT	40	R7_OUT
<b>IDI12 ~ IDI15 :</b> Isolated digital input of Group 3	R12_COM 59	39	18	R1_COM	39	R7_COM
<b>ECOM0 :</b> External common input of Group 0	R13_OUT 58	38	17	R2_OUT	38	R8_OUT
<b>ECOM1 :</b> External common input of Group 1	R13_COM 57	37	16	R2_COM	37	R8_COM
<b>ECOM2 :</b> External common input of Group 2	R14_OUT 56	36	15	R3_OUT	36	R9_OUT
<b>ECOM3 :</b> External common input of Group 3	R14_COM 55	35	14	R3_COM	35	R9_COM
<b>NC : No connection</b>	R15_OUT 54	34	13	R4_OUT	34	R10_OUT
	R15_COM 53	33	12	R4_COM	33	R10_COM
	NC 52	32	11	R5_OUT	32	NC
	NC 51	31	10	R5_COM	31	NC
	ECOM3 50	30	9	NC	30	NC
	ECOM3 49	29	8	IDI15	29	IDI14
	ECOM2 48	28	7	IDI13	28	IDI12
	ECOM2 47	27	6	IDI11	27	IDI10
	ECOM1 46	26	5	IDI9	26	IDI8
	ECOM1 45	25	4	IDI7	25	IDI6
	ECOM0 44	24	3	IDI5	24	IDI4
	ECOM0 43	23	2	IDI3	23	IDI2
	ECOM0 42	22	1	IDI1	22	IDI0

Figure 2.2 I/O connector pin assignments for the PCI-1762



## 2.4 Driver Installation

We recommend you install the driver before you install 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 DA&C card package. Please follow the steps below to install the driver software:

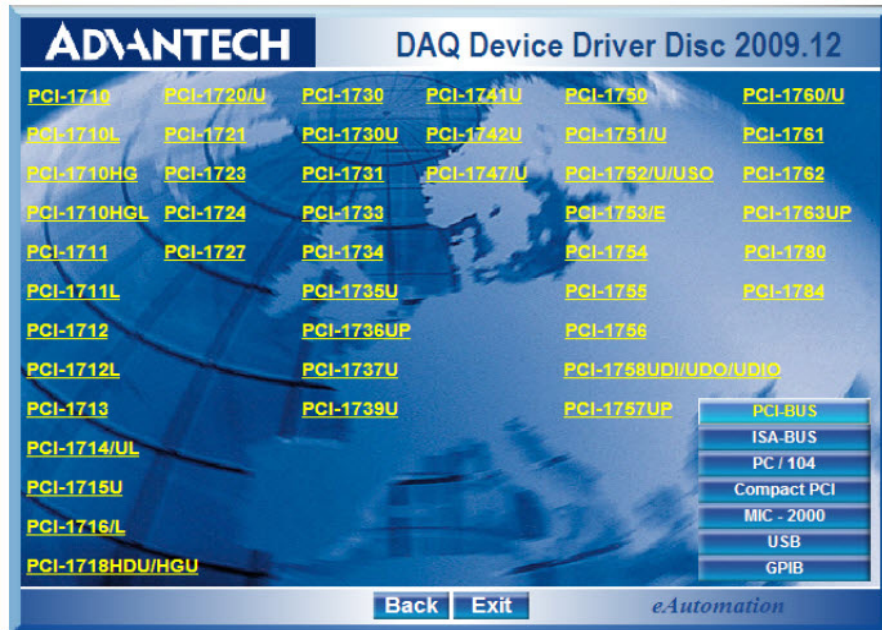
1. Insert the companion CD-ROM into your CD-ROM drive.
2. The Setup program will be launched automatically if you have the autoplay function enabled on your system. When the Setup Program is launched, you'll see the following Setup Screen.

**Note!** *If the autoplay function is not enabled on your computer, use Windows Explorer to execute SETUP.EXE on the companion CD-ROM.*



**Figure 2.3 Advantech Automation Software Setup**

3. Select the Device Manager option to install.
4. Select the Individual Driver option.
5. Select the specific device then follow the installation instructions step by step to complete your device driver installation and setup.



**Figure 2.4 Driver Setup Options**

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

*Start/Programs/Advantech Automation/Device Manager/Device Drivers 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)



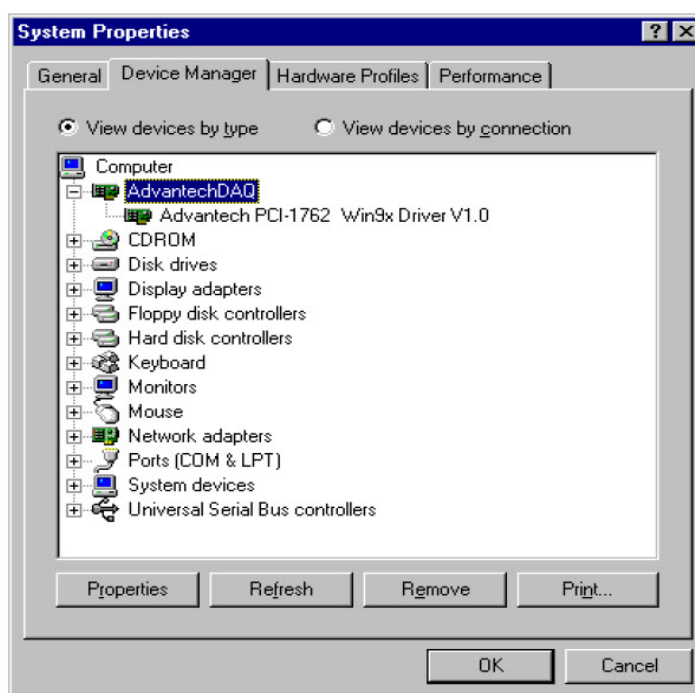
After the DLL driver installation is completed, you can now go on to install the PCI-1762 card in any PCI slot on your computer. But it is suggested that you should refer to the computer user manual or related documentation if you have any doubt. Please follow the steps below to install the card on your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

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.
2. Remove the cover of your computer.
3. Remove the slot cover on the back panel of your computer.
4. Touch the metal part on the surface of your computer to neutralize the static electricity that might be on your body.
5. Insert the 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.
6. Fasten the bracket of the PCI card on the back panel rail of the computer with screws.


7. Connect appropriate accessories (62-pin cable, wiring terminals, etc. if necessary) to the PCI card.
8. Replace the cover of your computer chassis. Re-connect the cables you removed in step 2.
9. Plug in the power cord and turn on the computer.

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 Device Name 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 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 Advantech Device Manager 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 Device Drivers.

### Setting Up the Device

1. To install the I/O device for your card, you must first run the Device Manager program (by accessing Start/Programs/Advantech Automation/Device Manager/ Advantech Device Manager ).
2. You can then view the device(s) already installed on your system (if any) on the Installed Devices list box. If the software and hardware installation are completed, you will see PCI-1762 card in the Installed Devices list.

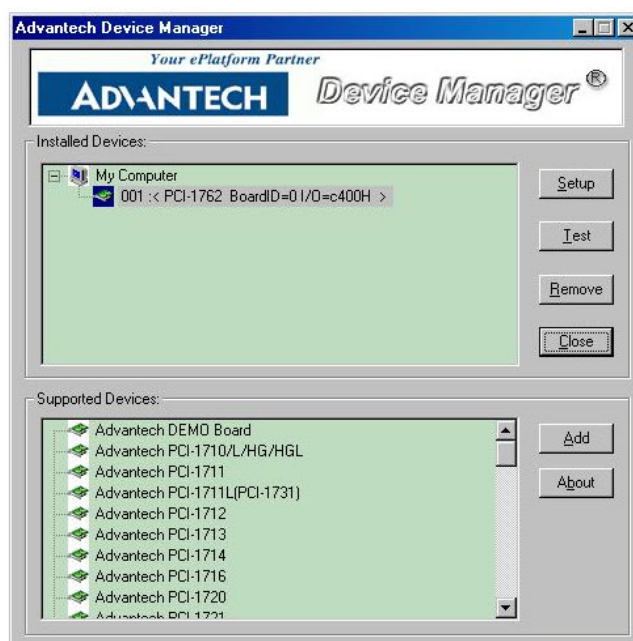
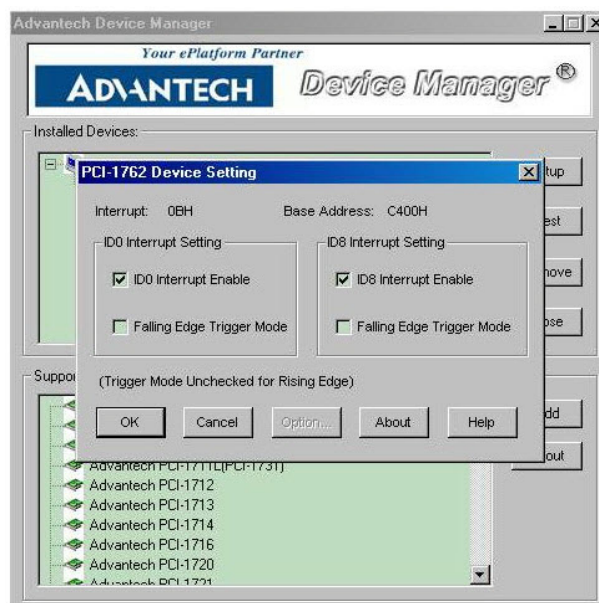


Figure 2.6 Device Manager Dialog Box

### Configuring the Device

3. Click the Setup button to configure your device. On the Device Setting dialog box (Fig. 2-7), you can configure the ID0/ID8 Interrupt trigger mode either as Rising Edge or Falling Edge, and Enable of Disable the ID0/ID8.



**Figure 2.7 Device Setting Dialog Box**

After your card is properly installed and configured, you can click the Test button to test your hardware by using the testing utility we supplied.

**Note!** *As we have noted, the device name 001:<PCI-1762 BoardID=0 I/O=c400H> begins with a device number "001", which is specifically assigned to each card. The device number is passed to the driver to specify which device you wish to control.*





# Chapter 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<sub>DC</sub> voltage inputs, and accept bi-directional input. It means that you can apply positive or negative voltage to an isolated input pin (V<sub>in</sub>). The figure below shows how to connect an external input source to one of the card's isolated input channels.

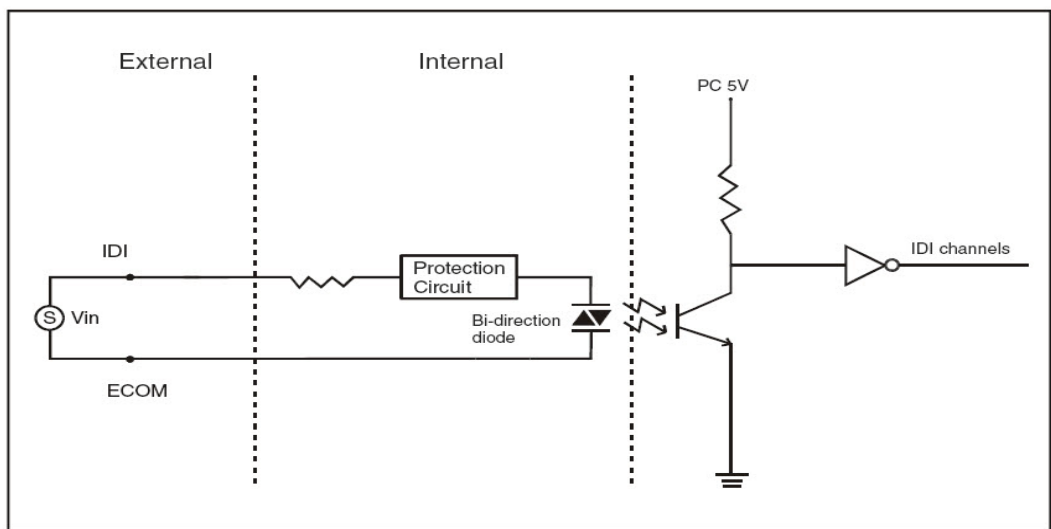
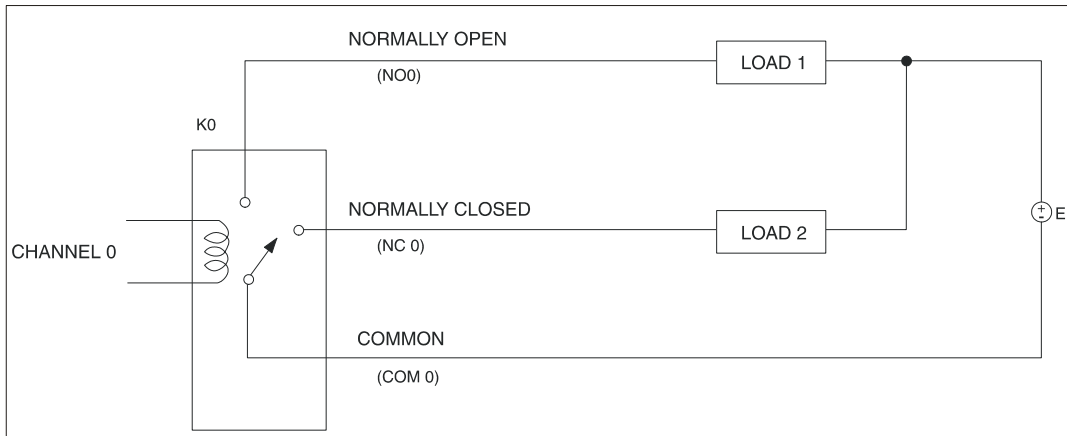


Figure 3.1 Isolated Digital Input Connections



### 3.3 Relay Connections

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.



# Appendix **A**

## Specifications

## A.1 Specifications

**Table A.1: Isolated Digital Input**

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

**Table A.2: Relay Output**

Number of Output Channels	16	
Relay Type	SPDT (Form A or Form B, Jumper selectable)	
Contact Rating (resistive)	0.25A@250V <sub>AC</sub> , 2A@30V <sub>DC</sub>	
Max. Switching Power	62.5VA, 60W	
Max. Switching Voltage	250V <sub>AC</sub> , 220V <sub>DC</sub>	
Max. Switching Current	5A	
Min. Switching Voltage	100μV	
Breakdown Voltage	Between Coil and Contacts	1500V <sub>AC</sub> min. (1 minute)
	Between Open Contacts	1000V <sub>AC</sub> min. (1 minute)
	Between Adjacent Contacts	1000V <sub>AC</sub> min. (1 minute)
Operate/Release Time	typ. 3 / 2 ms, max. 5 / 4 ms	
Resistance	Contact: 50 mΩ max. @ 10mA/20mV Insulation: 1 GΩ min. @ 500V <sub>DC</sub>	
Life Expectancy	Mechanical	10 <sup>8</sup> cycles typ.
	Electrical	5 x 10 <sup>7</sup> cycles typ. @ 10mA/12V 2 x 10 <sup>5</sup> cycles typ. @ 2000mA/30V

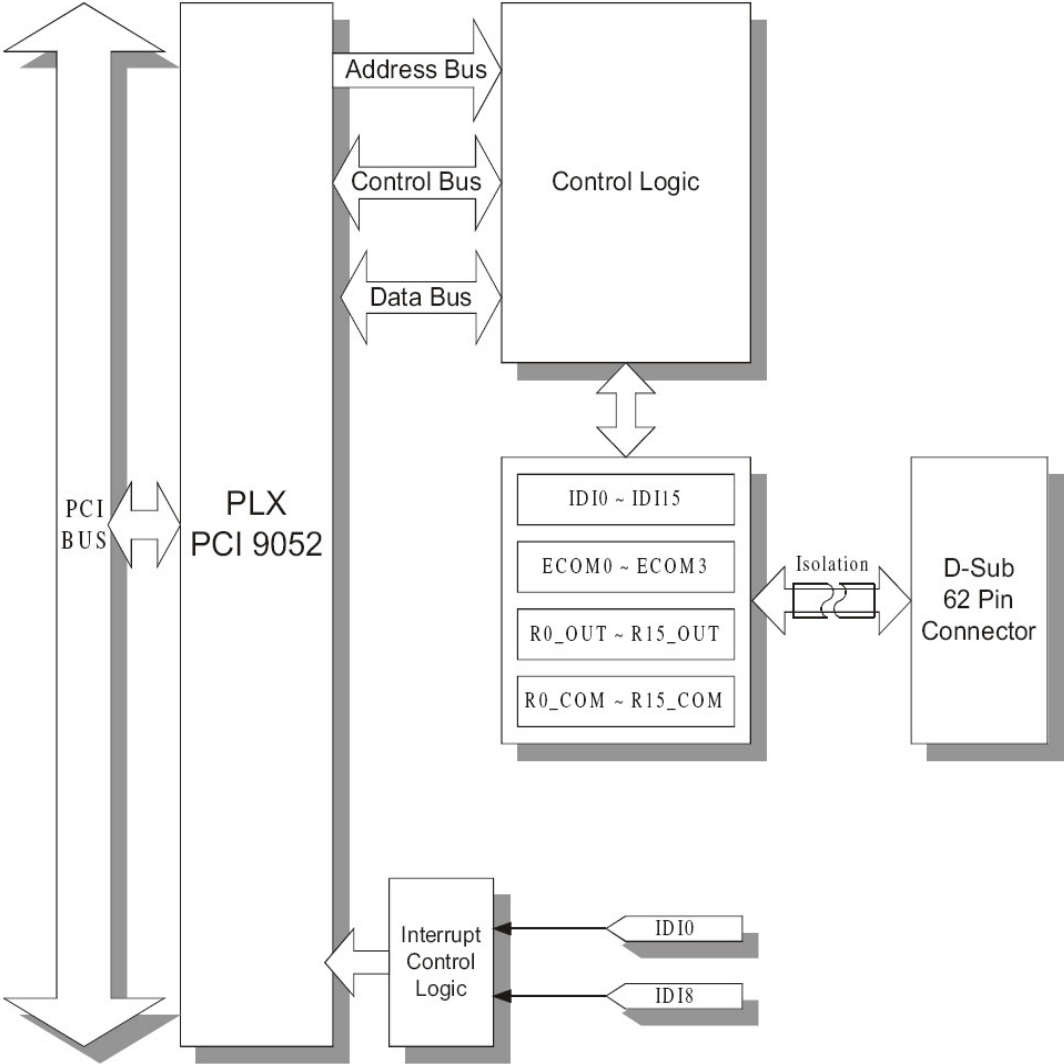
**Table A.3: General Specifications**

Power Consumption	+5V @ 250 mA (typical)	
	+5V @ 620 mA (max.)	
Temperature	Operating	0 ~ +60°C (32 ~ 140°F)
	Storage	-20 ~ +70°C (-4 ~ 158°F)
Relative Humidity	5 - 95 % RH non-condensing (refer to IEC 68-2-3)	
Certifications	CE/FCC	

# Appendix **B**

## Block Diagram

# B.1 Block Diagram



# Appendix **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 XP/Vista/7 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 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.

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: Register Functions																
Base Addr, + Decimal	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	R	Relay Output Status														
		RS	RS	RS	RS	RS	RS	RS	RS	RS	RS	RS	RS	RS	RS	RS
	W	Relay Output														
		RO	RO	RO	RO	RO	RO	RO	RO	RO	RO	RO	RO	RO	RO	RO
2	R	Isolated Digital Input														
		IDI	IDI	IDI	IDI	IDI	IDI	IDI	IDI	IDI	IDI	IDI	IDI	IDI	IDI	IDI
	W	N/A														
4	R	Board ID Register														
											ID3	ID2	ID1	ID0		
	W	N/A														
6	R	Interrupt Status Register														
								ID8	ID8	ID8				ID0	ID0	ID0
	W	Interrupt Control Register														
								ID8	ID8	ID8						ID0
						RF	EN	F				RF	EN	F		
						RF	EN	CL						RF	EN	CL
								R								



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


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+2H and BASE+3H

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

**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 - BASE+4H

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.4: 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+6H and BASE+7H

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

**Table C.5: Register for Interrupt Status**

Read	Interrupt Status Register							
Bit #	7	6	5	4	3	2	1	0
BASE +7						ID8RF	ID8EN	ID8F
BASE +6						ID0RF	ID0EN	ID0F

**ID<sub>n</sub>F**

**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

**ID<sub>n</sub>EN**

**Interrupt enable control bits (n = 0 or 8)**

Read this bit to Enable/Disable the interrupt.

0 Disable

1 Enable

**ID<sub>n</sub>RF**

**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+6H and BASE+7H

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.6: 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

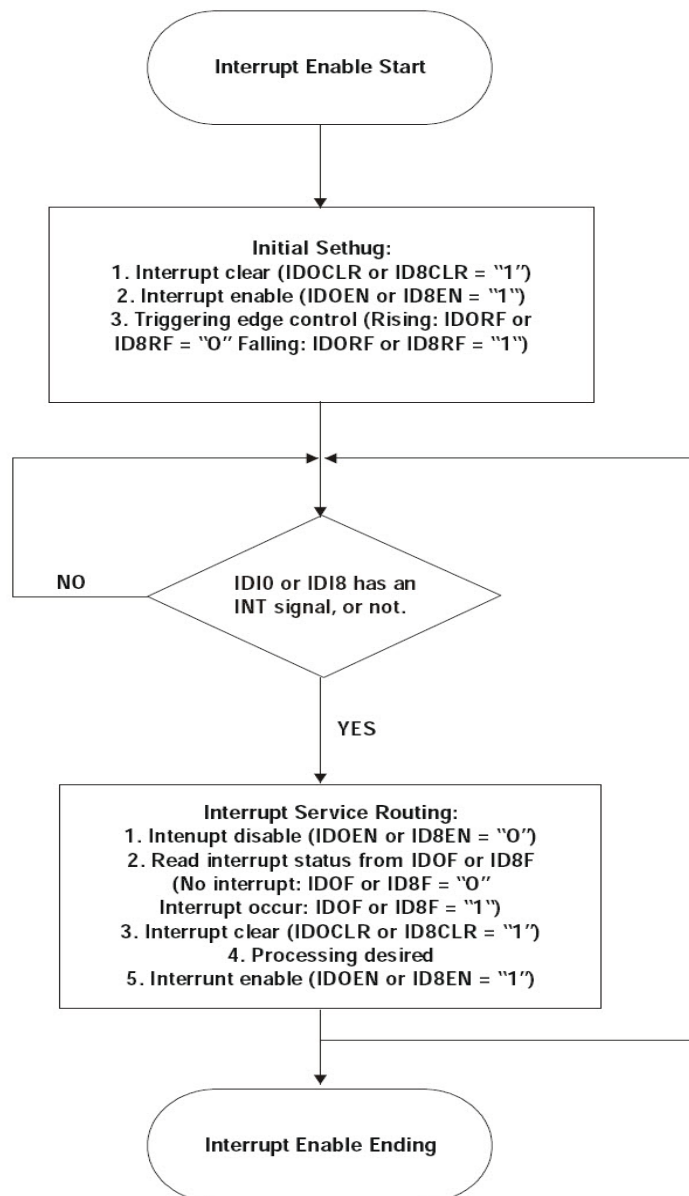


# Appendix **D**

Flow Chart

## D.1 Flow Chart

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





# ADVANTECH

## eAutomation

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