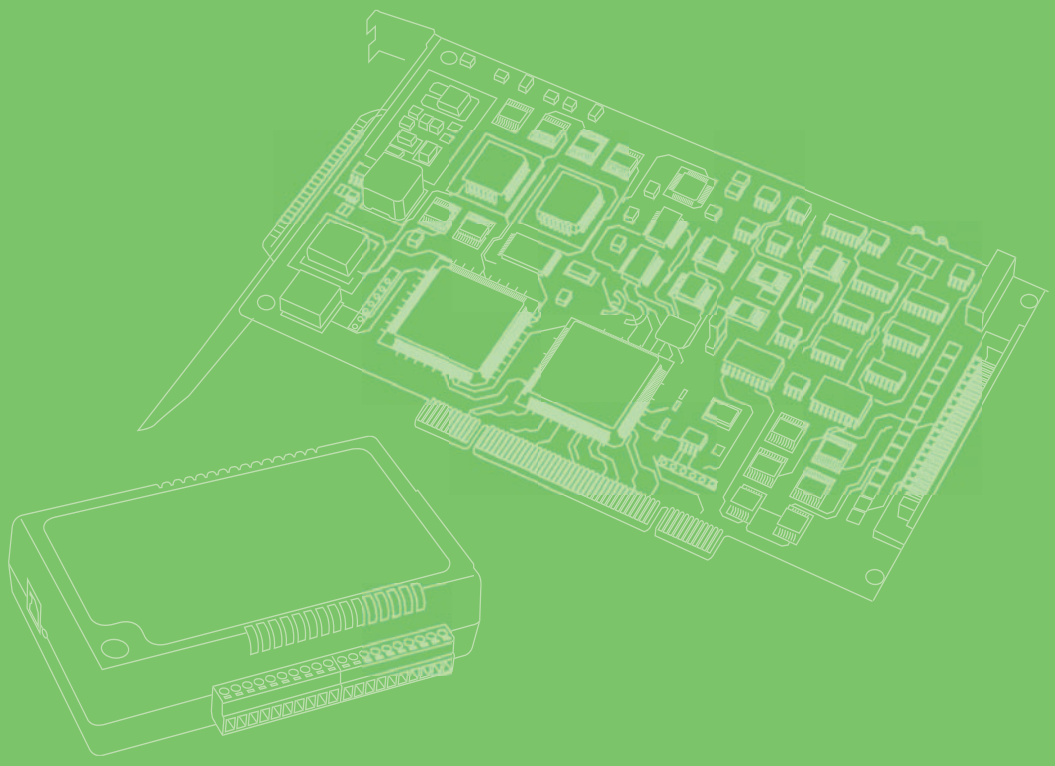

User Manual

PCIE-1756H

64-ch Isolated Digital I/O with Digital Filter PCI Express Card

ADVANTECH

Enabling an Intelligent Planet

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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.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

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 merchandize 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.

Part No. 2001175610 Edition 1

Printed in Taiwan April 2017

Declaration of Conformity

CE

This product 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.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

1. Visit the Advantech web site at 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

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- PCIE-1756H DAQ Card
- StartUp or User Manual
- Companion DVD-ROM with DAQNavi drivers included

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any internal components, the CPU, or any adapter cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Contents

Chapter 1

Introduction

This chapter introduces the PCIE-1756H cards and their typical applications.

Sections include:

- Features
- Applications
- Installation Guide
- Software Overview
- Device Driver Roadmap
- Accessories

1.1 Introduction

Thank you for buying the Advantech PCIE-1756H, which is a 32/32-ch isolated digital input/output card. It is an advanced-performance data acquisition card based on PCI Express bus architecture. It features a unique circuit design and complete functions for data acquisition and control. The following sections of this chapter will provide further information about features of PCIE-1756H, a Quick Start for installation, together with some brief information on software and accessories.

1.2 Features

- 32-ch isolated DI/O (16-ch digital input w/ Digital filter, 16-ch digital output)
- Wide input range (10 ~ 30 V_{DC})
- Either +/- voltage input for IDI by group
- Wide output range (5 ~ 40 V_{DC})
- High sink current on isolated output channels (500 mA max./ch)
- High over-voltage protection (70 V_{DC})
- High-voltage isolation (2,500 V_{DC})
- 2,000 VDC ESD protection
- Output status read-out
- Keeps output settings and values after system hot reset
- Interrupt handling capability for IDI channels
- Channel-freeze function
- Board ID

PCIE-1756H provides the following benefits:

Robust Protection

The PCIE-1756H features a robust isolation protection for applications in industry, lab and machine automation. The PCIE-1756H can durably withstand a voltage up to 2,500 VDC, preventing your host system from harm.

Wide Input Range

The PCIE-1756H accepts a wide range of input voltage, from 10 to 30 V_{DC}, and it is suitable for most industrial applications with 12 V_{DC} and 24 V_{DC} input voltage. We are also ready to serve your special needs for specific input voltage ranges. Do not hesitate to ask us about tailoring our standard products to meet your specifications.

Wide Output Range

The PCIE-1756H also features a wide output voltage range from 5 to 40 V_{DC}, suitable for most industrial applications with 12 V_{DC}/24 V_{DC} output voltage. Similarly to the input voltage offer above, we are ready to serve your special needs for specific output voltage range. Do not hesitate to ask us about tailoring our standard products to meet your specifications.

Board ID Setting

The PCIE-1756H has a built-in DIP switch that defines each card's ID when multiple cards have been installed in the same PC chassis. The board ID setting function is very useful when users build systems with multiple PCIE-1756H cards. With correct Board ID settings, you can easily identify and access each card during hardware configuration and software programming.

Channel-Freeze Function

The PCIE-1756H provides Channel-Freeze function, which can be enabled either in dry contact or wet contact mode (selectable by the on-board jumper). When the Channel-Freeze function is enabled, the last status of each digital output channel will be safely kept for emergency use. Moreover, you can enable this function through software as it is useful in software simulation and testing programs.

Reset Protection

When the system has undergone a hot reset (i.e., without turning off the system power), the PCIE-1756H can either retain output 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.

All these merits make PCIE-1756H an excellent choice for industrial applications.

Note! *For detailed specifications of the PCIE-1756H, please refer to Appendix A.*

1.3 Applications

- Industrial ON/OFF control
- Switch status sensing
- BCD interfacing
- Digital I/O control
- Industrial and lab automation

1.4 Installation Guide

Before you install your PCIE-1756H card, please make sure you have the following necessary components:

- **PCIE-1756H DAQ Card**
- **PCIE-1756H Startup or User Manual**
- **Driver Software** Advantech DAQNavi software (included in DVDROM)
- **Wiring Cable** PCL-10250 or PCL-101100M (optional)
- **Wiring Board** ADAM-3951 or ADAM-39100 (optional)
- **Computer** Personal computer or workstation with a PCI Express-bus slot

Other optional components are also available for enhanced operation:

- Advantech DAQ tools, LabView or other 3rd-party software

After you get the necessary components and maybe some accessories for enhanced operation for your DA&C card, you can begin the Installation procedures. Figure 1.1 provides a concise flow chart to give users a broad picture of the software and hardware installation procedures:

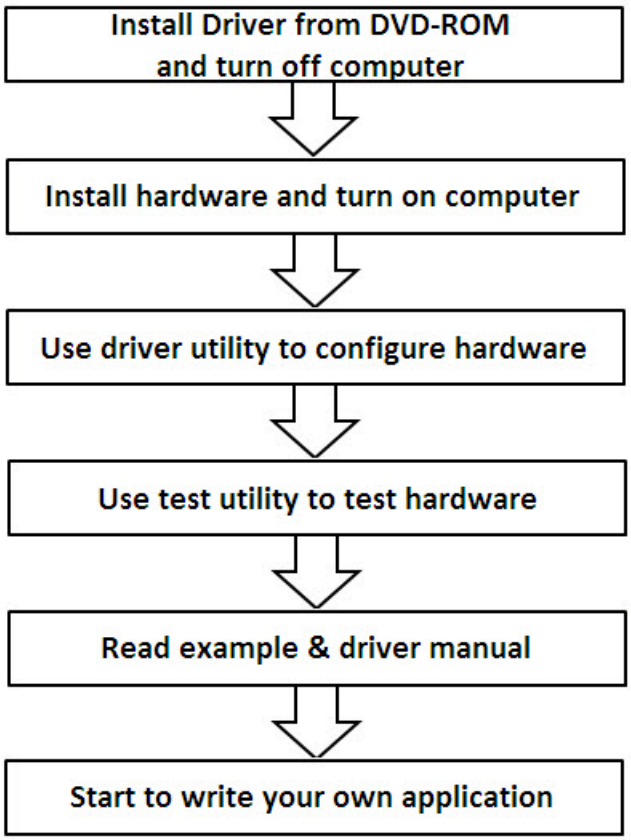


Figure 1.1 Installation Flow Chart

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 PCIE-1756H card:

- DAQNavi software (on the companion DVD-ROM)
- LabView driver
- Advantech DAQ tools

Programming choices for DA&C cards

You may use Advantech application software such as Advantech DAQNavi software. On the other hand, advanced users can use register level programming, although this is not recommended due to its laborious and time-consuming nature.

DAQNavi Software

Advantech DAQNavi software includes device drivers and SDK which features a complete I/O function library to help boost your application performance. This software is included in the companion DVD-ROM at no extra charge and comes with all Advantech DA&C cards. The Advantech DAQNavi software for Windows XP/Vista/7 works seamlessly with development tools such as Visual Studio .Net, Visual C++, Visual Basic and Borland Delphi.

Register-level Programming

Register-level programming is available for experienced programmers who find it necessary to write code directly at the level of the device register. Since register-level programming requires much effort and time, we recommend that you use the Advantech DAQNavi software instead. However, if register-level programming is unavoidable, please contact the technical support team to request the relative information.

1.6 DAQNavi Device Driver Programming Roadmap

This section will provide you a roadmap to demonstrate how to build an application from scratch using Advantech DAQNavi device drivers with your favorite development tools such as Visual Studio.Net, Visual C++, Visual Basic and Borland Delphi. The step-by-step instructions on how to build your own applications using each development tool are given in the DAQNavi SDK Manual. A rich set of example source code is also provided for your reference.

1.6.1 Programming Tools

Programmers can develop application programs with their favorite development tools:

- Visual Studio.Net
- Visual C++ and Visual Basic
- Borland Delphi

For instructions on how to begin programming works in each development tool, Advantech offers Tutorial Chapter in the DAQNavi SDK Manual for your reference. Please refer to the corresponding sections in this chapter on the DAQNavi SDK Manual to begin your programming efforts. You can also look at the example source code provided for each programming tool, which can help you get very well oriented.

The DAQNavi SDK Manual can be found on the companion DVD-ROM. Alternatively, if you have already installed the DAQNavi SDK on your system, the DAQNavi SDK Manual can be readily accessed through the Start button:

Start\Programs\Advantech Automation\DAQNavi\DAQNavi Manuals\DAQNavi SDK Manual

The example source code could be found under the corresponding installation folder such as the default installation path:

\Advantech\DAQNavi\Examples

For information about using other function groups or other development tools, please refer to the Using DAQNavi SDK chapter in the DAQNavi SDK Manual, or the video tutorials in the Advantech Navigator.

1.6.2 Programming with DAQNavi Device Drivers Function Library

Advantech DAQNavi device drivers offer a rich function library that can be utilized in various application programs. This function library consists of numerous APIs that support many development tools, such as Visual Studio .Net, Visual C++, Visual Basic and Borland Delphi.

According to their specific functions or services, APIs can be categorized into several function groups:

- Analog Input Function Group
- Analog Output Function Group
- Digital Input/Output Function Group
- Counter Function Group

For the usage and parameters of each function, please refer to the Using *DAQNavi SDK* chapter in the *DAQNavi SDK Manual.*

1.6.3 Troubleshooting DAQNavi Device Driver Error

Driver functions will return a status code when they are called to perform a certain task for the application. Sometimes a function does not succeed, and returns an error code. To troubleshoot a device driver error, you can check the error code and error description within the Error Control of each function in the *DAQNavi SDK Manual*.

1.7 Accessories

Advantech offers a complete set of accessory products to support the PCIE-1756H card. These accessories include:

Wiring Cables

- **PCL-10250** The PCL-10250 is a 100-pin SCSI to two 50-pin SCSI shielded cables that is specially designed for the PCIE-1756H card. It should be used with the ADAM-3951 wiring board.
- **PCL-101100M** The PCL-101100M cable is a 100pin SCSI shielded cable. It can be used with ADAM-39100 wiring board.

Wiring Boards

- **ADAM-3951** The ADAM-3951 is a 50-pin SCSI wiring terminal module with LED indicators for DIN-rail mounting.
- **ADAM-39100** The ADAM-39100 is a 100-pin SCSI wiring terminal module with DIN-rail mounting.

Chapter 2

Installation

This chapter provides a packaged item checklist, proper instructions for unpacking and step-by-step procedures for both driver and card installation.

Sections include:

- **Unpacking**
- **Driver Installation**
- **Hardware Installation**
- **Device Setup & Configuration**

2.1 Unpacking

After receiving your PCIE-1756H package, please inspect its contents first. The package should contain the following items:

- PCIE-1756H DAQ Card
- StartUp and User Manual
- Companion DVD-ROM with DAQNavi drivers included.

The PCIE-1756H card has certain electronic components vulnerable to electrostatic discharge (ESD). ESD can easily damage the integrated circuits and certain components if preventive measures are ignored.

Before removing the card from the antistatic plastic bag, you should take the following precautions to ward off possible ESD damage:

- Touch the metal part of your computer chassis with your hand to discharge static electricity that may be accumulated on your body. Alternatively, one can also use a grounding strap.
- Touch the anti-static 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 from the bag.

After taking out the card, you should first:

- 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.
- Do not install a damaged card into your system.

Also, pay extra attention to the following aspects during installation:

- 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 connector pins or any electronic components.

Note! *Keep the anti-static bag for future use. You might need the original bag to store the card if you have to remove the card from a PC or transport it elsewhere.*

2.2 Driver Installation

We recommend you install the driver before you install the PCIE-1756H card into your system, since this will guarantee a smooth installation process.

The Advantech DAQNavi Device Drivers Setup program for the PCIE-1756H card is included in the companion DVD-ROM that is shipped with your DA&C card package.

2.3 Hardware Installation

Note! *Make sure you have installed the driver before you install the card (please refer to Chapter 2.2 Driver Installation)*

After the Device Drivers installation is completed you can install the PCIE-1756H card into any PCI slot on your computer. However, it is suggested that you refer to the computer's user manual or related documentation if you have any doubts. Please follow the steps below to install the card onto 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 PCIE-1756H 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 (100-pin cable, wiring terminals, etc. if necessary) to the PCIE-1756H 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 your card is properly installed on your system, you can now configure your device using the Advantech Navigator 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.

Chapter 3

Signal Connections

This chapter provides useful information about how to connect input and output signals to the PCIE-1756H cards via the I/O connector.

Sections include:

- **Overview**
- **Switch and Jumper Settings**
- **Signal Connections**
- **Field Wiring Considerations**

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 PCIE-1756H cards via the I/O connector.

3.2 Switch and Jumper Settings

Please refer to Figure 3.1 for jumper and switch locations on PCIE-1756H.

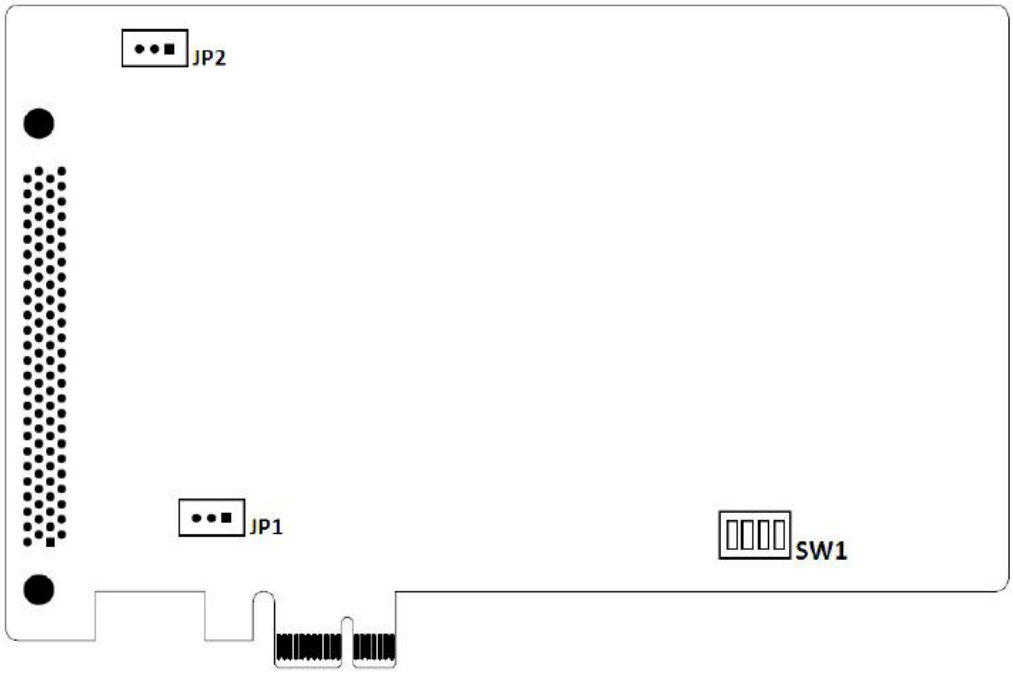


Figure 3.1 Connector and Switch Locations

3.2.1 Board ID (SW1)

The PCIE-1756H has a built-in DIP switch (SW1), which is used to define each card's board ID. When there are multiple cards in the same chassis, this board ID switch is useful for identifying each card's device number. After setting for each PCIE-1756H, you can identify each card in the system with a different device number. The default value of board ID is 0 and if you need to adjust it to another value, please set SW1 by referring to Table 3.1.

Table 3.1: Board ID Setting (SW1)

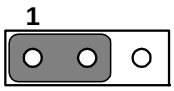
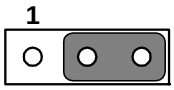
BoardID (dec)	**Switch Position**			
* = default	1 (ID3)	2 (ID2)	3 (ID1)	4 (ID0)
0	ON	ON	ON	ON
1	ON	ON	ON	OFF
2	ON	ON	OFF	ON
3	ON	ON	OFF	OFF
4	ON	OFF	ON	ON
5	ON	OFF	ON	OFF
6	ON	OFF	OFF	ON
7	ON	OFF	OFF	OFF
8	OFF	ON	ON	ON
9	OFF	ON	ON	OFF
10	OFF	ON	OFF	ON
11	OFF	ON	OFF	OFF
12	OFF	OFF	ON	ON
13	OFF	OFF	ON	OFF
14	OFF	OFF	OFF	ON
15	OFF	OFF	OFF	OFF

Default Setting is 0.

3.2.2 Power On Configuration(JP1)

Default configuration after power on, and hardware reset is to set all the isolated output channels to open status (the current of the load can't be sink) so that the external devices will not be damaged when the system starts or resets. When the system is hot reset, then the status of isolated digital output channels are selected by jumper JP1. Table 3.2 shows the configuration of jumper JP1.

Table 3.2: Power on configuration after hot reset (JP1)

JP1	Power on configuration after hot reset
	Default configuration
	Keep last status after hot reset

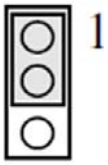
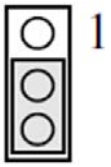
3.2.3 Channel-Freeze Function (JP2)

The PCIE-1756H provides the channel-freeze function for isolated digital output channels. When Channel-Freeze function is enabled, all ports on the card will be locked so that the data transmitted (from the host PC) to the card won't be transferred to the DO ports. Once the Channel-Freeze function is enabled, each port status is immediately frozen into its last valid value before the Channel-Freeze. Since the value transmitted (from the host PC) to the card is also stored in the buffers on PC, users can call the relative function to read back the DO channel value, this function will determine that:

- If Channel-Freeze function is disabled, it will return the DO value on the port
- If Channel-Freeze function is enabled, it will return the value from the buffers on host PC

Refer to Table 3.3 for setting dry/wet contact of Channel-Freeze function.

Table 3.3: Dry/Wet Contact of Channel-Freeze Function (JP2)

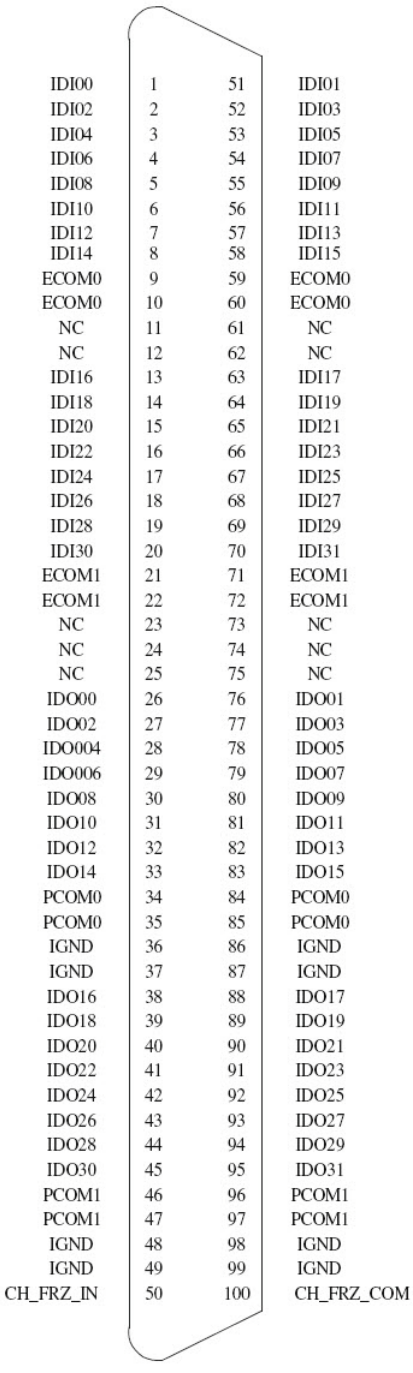
JP2	Input Mode
	Dry contact input mode
	Wet contact input mode (Default setting)

3.3 Signal Connections

Pin Assignment

The I/O connector on the PCIE-1756H is a 100-pin connector that enable you to connect to accessories with the PCL-10250 or PCL-101100M shielded cable.

Figure 3.2 shows the pin assignments for the 100-pin I/O connector on the PCIE-1756H, and Table 3.4 shows the I/O connector signal description.



IDI00	1	51	IDI01
IDI02	2	52	IDI03
IDI04	3	53	IDI05
IDI06	4	54	IDI07
IDI08	5	55	IDI09
IDI10	6	56	IDI11
IDI12	7	57	IDI13
IDI14	8	58	IDI15
ECOM0	9	59	ECOM0
ECOM0	10	60	ECOM0
NC	11	61	NC
NC	12	62	NC
IDI16	13	63	IDI17
IDI18	14	64	IDI19
IDI20	15	65	IDI21
IDI22	16	66	IDI23
IDI24	17	67	IDI25
IDI26	18	68	IDI27
IDI28	19	69	IDI29
IDI30	20	70	IDI31
ECOM1	21	71	ECOM1
ECOM1	22	72	ECOM1
NC	23	73	NC
NC	24	74	NC
NC	25	75	NC
IDO00	26	76	IDO01
IDO02	27	77	IDO03
IDO004	28	78	IDO05
IDO006	29	79	IDO07
IDO08	30	80	IDO09
IDO10	31	81	IDO11
IDO12	32	82	IDO13
IDO14	33	83	IDO15
PCOM0	34	84	PCOM0
PCOM0	35	85	PCOM0
IGND	36	86	IGND
IGND	37	87	IGND
IDO16	38	88	IDO17
IDO18	39	89	IDO19
IDO20	40	90	IDO21
IDO22	41	91	IDO23
IDO24	42	92	IDO25
IDO26	43	93	IDO27
IDO28	44	94	IDO29
IDO30	45	95	IDO31
PCOM1	46	96	PCOM1
PCOM1	47	97	PCOM1
IGND	48	98	IGND
IGND	49	99	IGND
CH_FRZ_IN	50	100	CH_FRZ_COM

Figure 3.2 I/O Connector Pin Assignments

Note! *The PCL-10250 shielded cable is especially designed for the PCIE-1756H to reduce noise in the signal lines. Please refer to Appendix C for the pin assignments for connecting PCL-10250 and ADAM-3951.*

3.3.1 I/O Connector Pin Definition

Table 3.4: I/O Connector Signal Descriptions

Pin Name	Reference	Direction	Description
IDI<00 ~ 15>	ECOM0	Input	Isolated digital input of group 0
IDI<16 ~ 31>	ECOM1	Input	Isolated digital input of group 1
IDO<00 ~ 15>	PCOM0	Output	Isolated digital output of group 0
IDO<16 ~ 31>	PCOM1	Output	Isolated digital output of group 1
ECOM0	-	Input	Common pin for IDI00~IDI15
ECOM1	-	Input	Common pin for IDI16~IDI31
PCOM0	-	Output	Common pin of IDO00~IDO15 for inductive loads
PCOM1	-	Output	Common pin of IDO16~IDO31 for inductive loads
IGND	-	-	Isolated ground
CH_FRZ_IN	CH_FRZ_COM	Input	Channel-Freeze function input pin
CH_FRZ_COM	-	Input	Common pin for Channel-Freeze function input

3.3.2 Isolated Digital Input

Each of isolated digital input channels accepts bi-directional 10 ~ 30 V_{DC} voltage inputs. Meaning that you can apply positive or negative voltage to an isolated input pin (V_{IN}). Every 16 input channels share one common pin. Figure 3.3 shows how to connect an external input source to one of the card's isolated input channels.

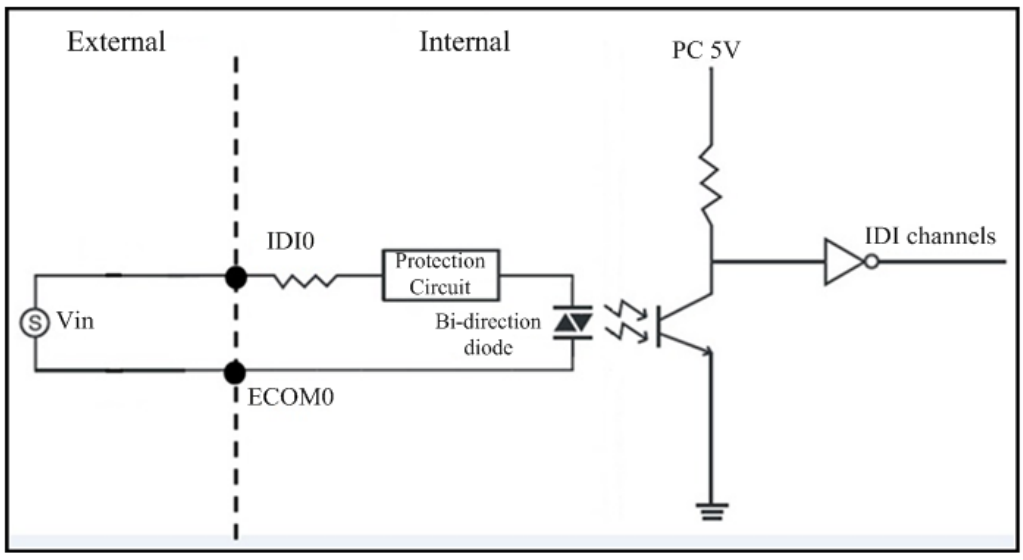


Figure 3.3 Isolated Digital Input Connection

3.3.3 Isolated Digital Output

Each isolated output channel comes equipped with a MOSFET, polyswitch (for current protection) and flywheel diode for using with inductive loads which can be activated by connecting PCOM to V_{DC}. If an external voltage (5 ~ 40 V_{DC}) is applied to an isolated output channel, the current will flow from the external voltage source to the card. Please note that the current through each IDO channel should not exceed 500 mA.

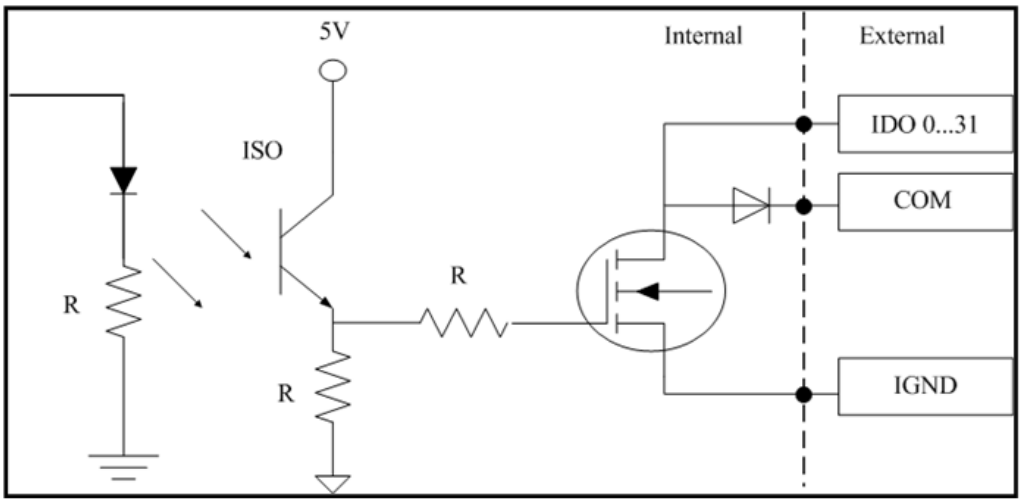


Figure 3.4 Isolated Digital Output Connection

3.3.4 Channel-Freeze Function

The PCIE-1756H provides a digital input channel (CH_FRZ_IN) to enable the channel-freeze function. The channel-freeze function acts when the pin CH_FRZ_IN is activated. Moreover, you can set up the input mode of channel-freeze function input channel CH_FRZ_IN as dry contact input mode or wet contact input mode selected by on-board jumper JP2. The wiring in wet contact and dry contact input mode are shown in Figures 3.5 and 3.6.

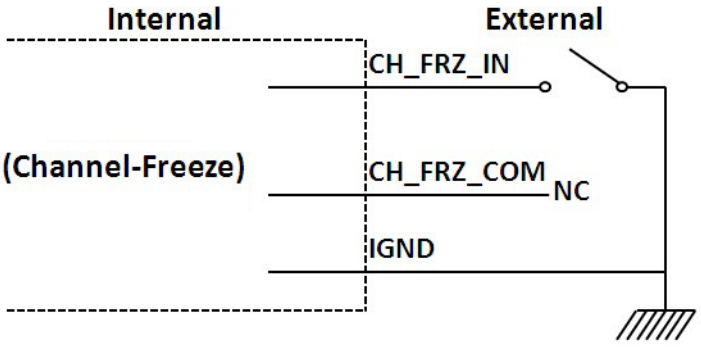


Figure 3.5 Wiring in wet contact input mode

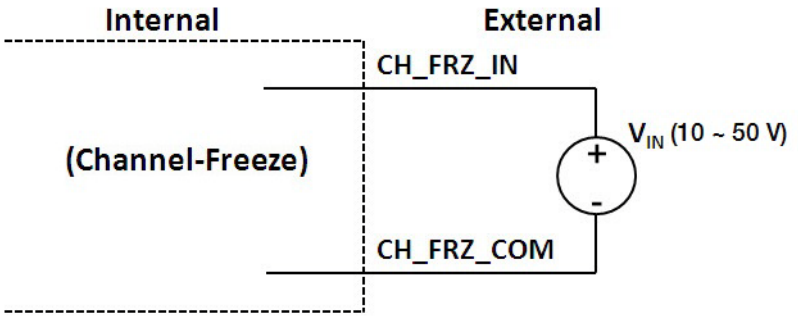


Figure 3.6 Wiring in dry contact input mode

3.4 Field Wiring Considerations

When you use PCIE-1756H cards to acquire data from outside, noises in the environment might significantly affect the accuracy of your measurements if due cautions are not taken. The following measures will be helpful to reduce possible interference running signal wires between signal sources and the PCIE-1756H card.

- The signal cables must be kept away from strong electromagnetic sources such as power lines, large electric motors, circuit breakers or welding machines, since they may cause strong electromagnetic interference. Keep the analog signal cables away from any video monitor, since it can significantly affect a data acquisition system.
- If the cable travels through an area with significant electromagnetic interference, you should adopt individually shielded, twisted-pair wires as the analog input cable. This type of cable has its signal wires twisted together and shielded with a metal mesh. The metal mesh should only be connected to one point at the signal source ground.
- Avoid running the signal cables through any conduit that might have power lines in it.
- If you have to place your signal cable parallel to a power line that has a high voltage or high current running through it, try to keep a safe distance between them. Alternatively, you can place the signal cable at a right angle to the power line to minimize the undesirable effect.
- The signals transmitted on the cable will be directly affected by the quality of the cable. In order to ensure better signal quality, we recommend that you use the PCL-10250 or PCL-101100M shielded cable.

Appendix A

Specifications

A.1 Isolated Digital Input

Number of Input Channel	32	
Interrupt Inputs	32	
Digital Filter inputs	32	
Optical Isolation	2500 V_{DC}	
Opto-isolator Response Time	50 µs	
Over-voltage Protect	70 V_{DC}	
Input Voltage	VIH (max.)	30 V_{DC}
	VIH (min.)	10 V_{DC}
	VIL (max.)	3 V_{DC}
Input Current	10 V_{DC}	2.97 mA (typical)
	12 V_{DC}	3.18 mA (typical)
	24 V_{DC}	6.71 mA (typical)
	30 V_{DC}	9.73 mA (typical)

A.2 Digital Filter Time

Digital Filter Time[sec.] = 2n / (8 x 10^6) n: = setting data(0 - 20)

Setting Data (n)	Digital Filter Time	Setting Data (n)	Digital Filter Time	Setting Data (n)	Digital Filter Time
0 (00h)	The filter function is not used.	7 (07h)	16µsec	14 (0Eh)	2.048msec
1 (01h)	0.25µsec	8 (08h)	32µsec	15 (0Fh)	4.096msec
2 (02h)	0.5µsec	9 (09h)	64µsec	16 (10h)	8.192msec
3 (03h)	1µsec	10 (0Ah)	128µsec	17 (11h)	16.384msec
4 (04h)	2µsec	11 (0Bh)	256µsec	18 (12h)	32.768msec
5 (05h)	4µsec	12 (0Ch)	512µsec	19 (13h)	65.536msec
6 (06h)	8µsec	13 (0Dh)	1.024msec	20 (14h)	131.072msec

A.3 Isolated Digital Output

Number of Output Channel	32
Optical Isolation	2500 V_{DC}
Opto-isolator Response Time	50 µs
Supply Voltage	5 ~ 40 V_{DC}
Sink Current	500 mA max/channel

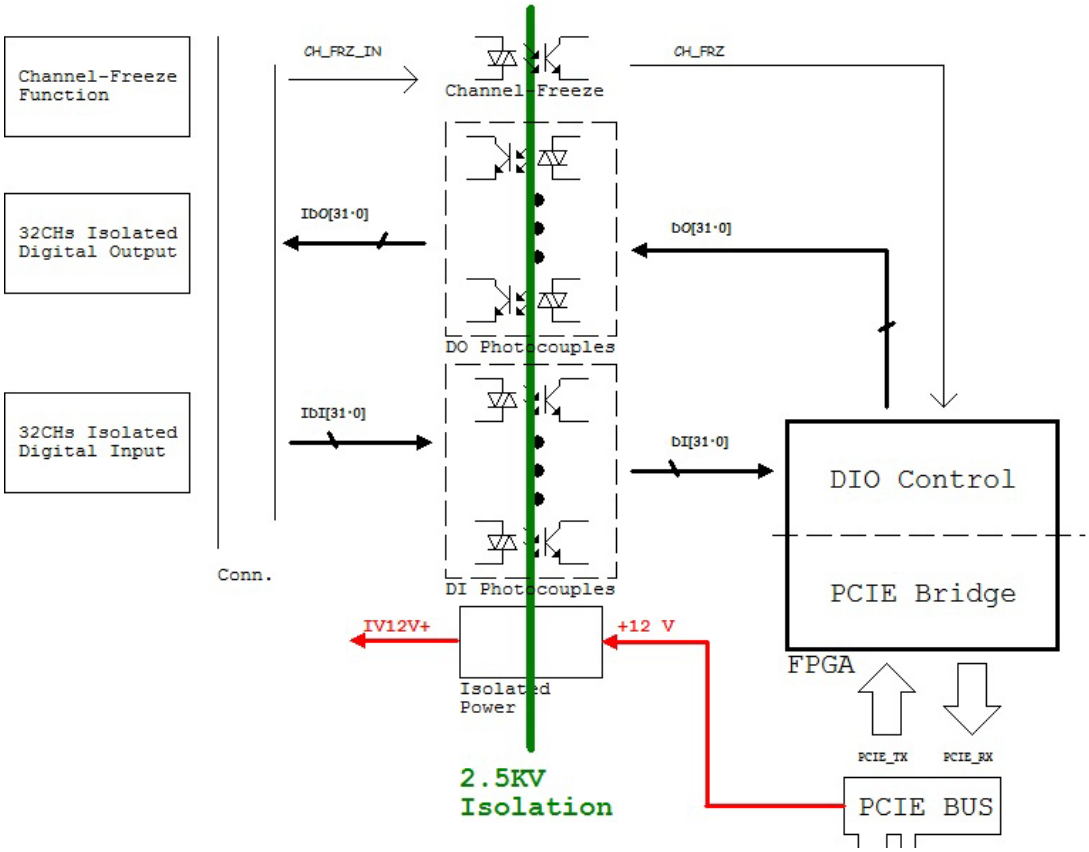
A.4 General

I/O Connector Type	100-pin SCSI-II female	
Dimensions	175 mm x 100 mm (6.8” x 3.9”)	
Power Consumption	PCIE-1756H	+5 V @ 285 mA (typical)
		+5 V @ 475 mA (typical)
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 60068-2-3)	
Certification	CE Class A certified	

Appendix B

Block Diagram

B.1 Block Diagram



Appendix C

ADAM-3951 Pin Assignment

C.1 ADAM-3951 Pin Assignment

Please refer to Figure C.1 and Figure C.2 for the pin assignments if you select Advantech ADAM-3951 as your wiring board for connecting to PCL-10250 and PCIE-1756H.

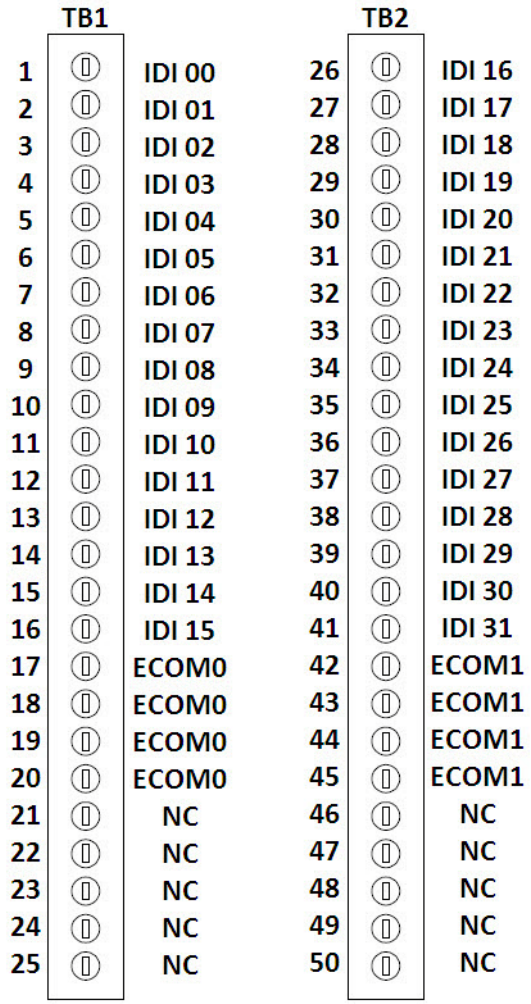


Figure C.1 Connect to PCL-10250 CON1

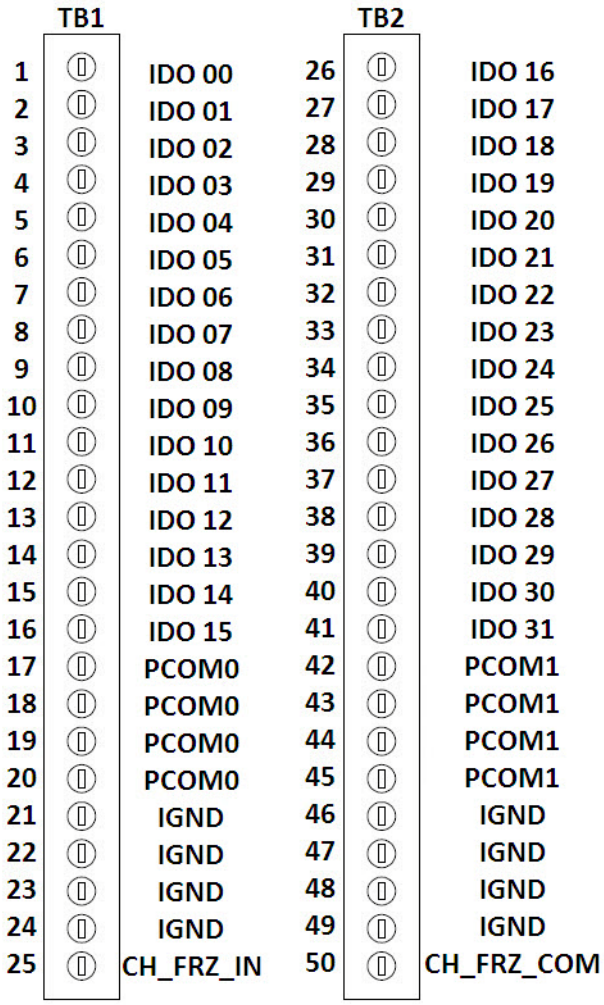


Figure C.2 Connect to PCL-10250 CON2

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