

## PCIE-1730H 32-ch Isolated Digital I/O with Digital Filter PCI Express Card

### Startup Manual

#### Packing List

Before installation, please make sure that you have received the following:

- PCIE-1730H card
- Driver CD
- Quick Start User Manual

If anything is missing or damaged, contact your distributor or sales representative immediately.

#### User Manual

For more detailed information on this product, please refer to the PCIE-1730H User Manual on the CD-ROM (PDF format)

#### Declaration of Conformity

##### FCC Class A

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 interference in which case the user is required to correct interference at his own expense.

##### 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.

For more information on this and other Advantech products, please visit our website at:

<http://www.advantech.com/products/ProView/>

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

<http://support.advantech.com>

This manual is for the PCIE-1730H.

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#### Overview

The Advantech PCIE-1730H is a 32-channel, isolated digital input/output card for the PCI Express bus. The isolated digital input/output channels feature high isolation protection which can save your system investment. In addition, this card also offers 32-channel 5V/TTL compatible digital input/output channels. The PCI Express interface makes this card workable with latest computing platform.

#### Specifications

##### Isolated Digital Input

- Input Channels: 16
- Input Voltage:
  - Logic 0: 3 V max. (0 VDC min.)
  - Logic 1: 10 V min. (30 VDC max.)
- Input Current:
  - 12 VDC @ 3.18 mA
  - 24 VDC @ 6.71 mA
- Interrupt Capable Channel: 16
- Digital Filter Channel: 16
- Isolation Protection: 2,500 VDC
- Overvoltage Protection: 70 VDC
- ESD Protection: 2,000 VDC
- Opto-Isolator Response: 50  $\mu$ s

##### Isolated Digital Output

- Output Channels: 16
- Output Type: Sink (NPN)
- Isolation Protection: 2,500 VDC
- Output Voltage: 5 ~ 40 VDC
- Sink Current: 500 mA/channel (max.)
- Opto-isolator Response: 50  $\mu$ s

##### Non-isolated Digital Input/Output

- Input Channels: 16 (support digital filter and interrupt function)
- Input Voltage:
  - Logic 0: 0.8 V max.
  - Logic 1: 2 V min.
- Output Channels: 16
- Output Voltage:
  - Logic 0: 0.5 V max. @ 24 mA (sink)
  - Logic 1: 2.4 V min. @ -15 mA (source)
- Digital Filter for DI/ IDI:  
Digital Filter Time[sec.] =  $2n / (8 \times 106) n$ : = setting data(0 - 20)

## Specifications (Cont.)

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)	16 $\mu$ sec	14 (0Eh)	2.048 msec
1 (01h)	0.25 $\mu$ sec	8 (08h)	32 $\mu$ sec	15 (0Fh)	4.096 msec
2 (02h)	0.5 $\mu$ sec	9 (09h)	64 $\mu$ sec	16 (10h)	8.192 msec
3 (03h)	1 $\mu$ sec	10 (0Ah)	128 $\mu$ sec	17 (11h)	16.384 msec
4 (04h)	2 $\mu$ sec	11 (0Bh)	256 $\mu$ sec	18 (12h)	32.768 msec
5 (05h)	4 $\mu$ sec	12 (0Ch)	512 $\mu$ sec	19 (13h)	65.536 msec
6 (06h)	8 $\mu$ sec	13 (0Dh)	1.024 msec	20 (14h)	131.072 msec

## General

- Bus Type: PCI Express V1.0
- I/O Connector Type™ 37-pin D-Sub female
- Dimensions: 175 mm x 100 mm (6.9" x 3.9")
- Power Consumption:  
+3.3 V @ 280 mA, +12 V @ 330 mA (typical)  
+3.3 V @ 420 mA, +12 V @ 400 mA (max)
- Operation Temperature: 0 ~ 60°C (32 ~ 140°F)
- Storage Temperature: -25 ~ 85°C (-4 ~ 185°F)
- Relative Humidity: 5 ~ 95% (non-condensing)
- Certification: CE certified

## Hardware Installation

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-1730H card into a PCI Express 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 Express card on the back panel rail of the computer with screws.
7. Connect appropriate accessories (37-pin cable, wiring terminals, etc. if necessary) to the PCI Express card.
8. Replace the cover of your computer chassis. Reconnect the cables you removed in step 2.
9. Plug in the power cord and turn on the computer.

## Pin Assignments

CN1				CN2			
IDO 0	1	2	IDO 1	IDO 0	1	2	IDO 1
IDO 2	3	4	IDO 3	IDO 2	3	4	IDO 3
IDO 4	5	6	IDO 5	IDO 4	5	6	IDO 5
IDO 6	7	8	IDO 7	IDO 6	7	8	IDO 7
IDO 8	9	10	IDO 9	IDO 8	9	10	IDO 9
IDO 10	11	12	IDO 11	IDO 10	11	12	IDO 11
IDO 12	13	14	IDO 13	IDO 12	13	14	IDO 13
IDO 14	15	16	IDO 15	IDO 14	15	16	IDO 15
EGND	17	18	EGND	ECOM 0	17	18	ECOM 1
NC	19	20	NC	ECOM 0	19	20	ECOM 1

CN3				CN4			
DO 0	1	2	DO 1	DI 0	1	2	DO 1
DO 2	3	4	DO 3	DI 2	3	4	DO 3
DO 4	5	6	DO 5	DI 4	5	6	DO 5
DO 6	7	8	DO 7	DI 6	7	8	DO 7
DO 8	9	10	DO 9	DI 8	9	10	DO 9
DO 10	11	12	DO 11	DI 10	11	12	DO 11
DO 12	13	14	DO 13	DI 12	13	14	DO 13
DO 14	15	16	DO 15	DI 14	15	16	DO 15
GND	17	18	GND	NC	17	18	GND
NC	19	20	NC	NC	19	20	NC

CN5	
EGND	1 2 EGND

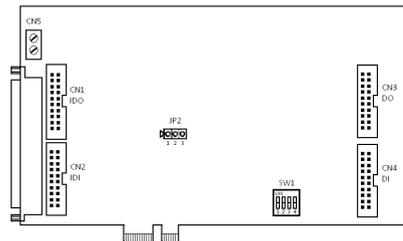
Description of pin use:

IDIn (n = 0 ~ 15): Isolated digital input  
 IDON (n = 0 ~ 15): Isolated digital output  
 ECOMn (n = 0~1): External common Vcc/GND of IDI  
 PCOM: Free wheeling common diode for IDO  
 EGND: External ground for IDO  
 NC: Not Connected

DI n (n = 0 ~ 15): TTL Digital input  
 DO n (n = 0 ~ 15): TTL Digital output  
 GND: TTL Digital ground

CN6			
IDIO	1	20	IDI 1
IDI 2	2	21	IDI 3
IDI 4	3	22	IDI 5
IDI 6	4	23	IDI 7
IDI 8	5	24	IDI 9
IDI 10	6	25	IDI 11
IDI 12	7	26	IDI 13
IDI 14	8	27	IDI 15
ECOM 0	9	28	ECOM 1
PCOM 0	10	29	EGND
IDO 0	11	30	IDO 1
IDO 2	12	31	IDO 3
IDO 4	13	32	IDO 5
IDO 6	14	33	IDO 7
IDO 8	15	34	IDO 9
IDO 10	16	35	IDO 11
IDO 12	17	36	IDO 13
IDO 14	18	37	IDO 15
PCOM 1	19		

## Switch and Jumper Settings



### Jumper JP2

Connection	Function Description
JP2 (1, 2 short)	Output channels will keep last status after system resets
JP2 (2,3 short)	Output channels will set their values to Low after system resets (Default)

## Board ID Settings

Board ID setting(SW1)

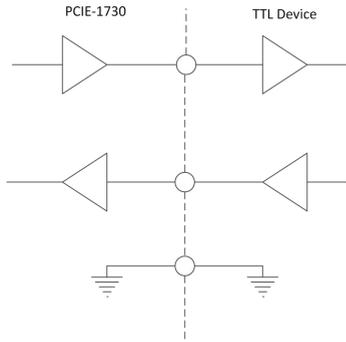
ID3	ID2	ID1	ID0	Board ID
1	1	1	1	0
1	1	1	0	1
1	1	0	1	2
1	1	0	0	3
1	0	1	1	4
1	0	1	0	5
1	0	0	1	6
1	0	0	0	7
0	1	1	1	8
0	1	1	0	9
0	1	0	1	10
0	1	0	0	11
0	0	1	1	12
0	0	1	0	13
0	0	0	1	14
0	0	0	0	15

Note: On: 1, Off: 0; Default setting: All Off

## Connections

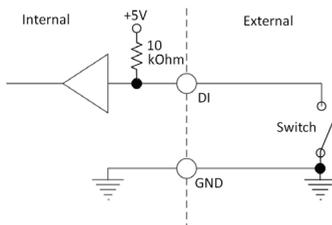
### TL-level Digital Input/Output

The PCIE-1730H has 16 TTL-level digital inputs and 16 TTL-level digital outputs. The following figure shows connections to exchange digital signals with other TTL devices:



If you want to receive an OPEN/SWITCH signal from a switch or relay, add a pull-up resistor to ensure that the input is held at a high level when the contacts are open.

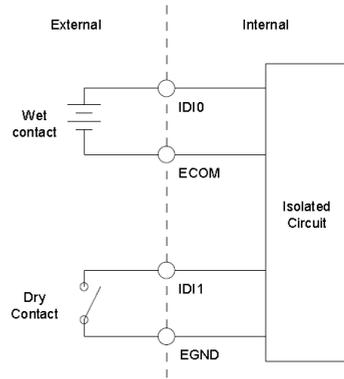
See the figure below:



## Connections (Cont.)

### Isolated Digital Input

Each of the 16 isolated digital input channels accepts voltages from 10V to 30 V. Every eight input channels share one external common. (Channels 0 ~ 7 use ECOM0. Channels 8 ~ 15 use ECOM1.) The following figure shows how to connect an external input source to the card's isolated inputs.



### Isolated Digital Output

If the external voltage source (5~40 V) is connected to each isolated output channel (IDO) and its isolated digital output turns on (500 mA max./ch), the card's current will sink from the external voltage source. CN5 provides two EGND pins for IDO connection. The following figure shows how to connect an external output load to the card's isolated outputs.

