

# PCL-730

## 32-channel Isolated I/O Card

### Packing List

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

- PCL-730
- 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 PCL-730 User Manual on the CD-ROM (PDF format).

CD\Documents\Hardware Manuals\PCL\PCL-730

### 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.

### Overview

The Advantech PCL-730 offers 32 isolated digital I/O channels (16 DI and 16 DO) and 32 TTL digital I/O channels (16 DI and 16 DO) on a PC add-on card. Providing 2500 V isolation, each I/O channel corresponds to a bit in a PC I/O port, making the PCL-730 very easy to program. The PCL-730 offers one PC interrupt with jumper-selectable IRQ.

### Notes

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

<http://www.advantech.com/eAutomation>

For technical support and service:

<http://www.advantech.com/support/>

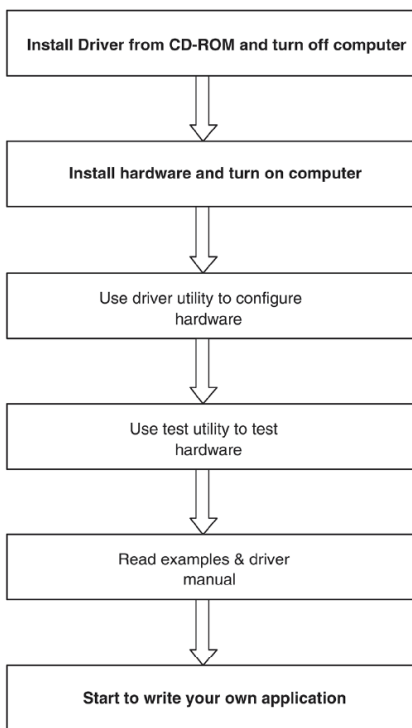
This startup manual is for PCL-730

Part No.2003730060

1st Edition

June 2011

### Software Installation



### 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 PCL-730 card into an ISA 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 PCL-730 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 PCL-730 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.

## Pin Assignments

### Connector CN1 – Isolated output

IDO 0	1 2	IDO 1
IDO 2	3 4	IDO 3
IDO 4	5 6	IDO 5
IDO 6	7 8	IDO 7
IDO 8	9 10	IDO 9
IDO 10	11 12	IDO 11
IDO 12	13 14	IDO 13
IDO 14	15 16	IDO 15
E.GND	17 18	E.GND
*PCOM1/E.GND	19 20	PCOM2

### Connector CN2 — Isolated input

IDI 0	1 2	IDI 1
IDI 2	3 4	IDI 3
IDI 4	5 6	IDI 5
IDI 6	7 8	IDI 7
IDI 8	9 10	IDI 9
IDI 10	11 12	IDI 11
IDI 12	13 14	IDI 13
IDI 14	15 16	IDI 15
EI.GND1	17 18	EI.GND2
EI.GND1	19 20	EI.GND2

### Connector CN3 – Digital output

DO 0	1 2	DO 1
DO 2	3 4	DO 3
DO 4	5 6	DO 5
DO 6	7 8	DO 7
DO 8	9 10	DO 9
DO 10	11 12	DO 11
DO 12	13 14	DO 13
DO 14	15 16	DO 15
D.GND	17 18	D.GND
+5 V	19 20	+12 V

### Connector CN4 — Digital input

DI 0	1 2	DI 1
DI 2	3 4	DI 3
DI 4	5 6	DI 5
DI 6	7 8	DI 7
DI 8	9 10	DI 9
DI 10	11 12	DI 11
DI 12	13 14	DI 13
DI 14	15 16	DI 15
D.GND	17 18	D.GND
+5 V	19 20	+12 V

### Connector CN5 — Isolated output ground terminal

E.GND	1 2	E.GND
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### Connector CN6 – Isolated input and output

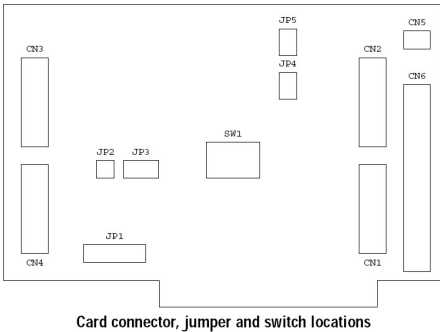
IDI 0	1 20	IDI 1
IDI 2	2 21	IDI 3
IDI 4	3 22	IDI 5
IDI 6	4 23	IDI 7
IDI 8	5 24	IDI 9
IDI 10	6 25	IDI 11
IDI 12	7 26	IDI 13
IDI 14	8 27	IDI 15
EI.GND1	9 28	EI.GND2
*PCOM1/E.GND	10 29	E.GND
IDO 0	11 30	IDO 1
IDO 2	12 31	IDO 3
IDO 4	13 32	IDO 5
IDO 6	14 33	IDO 7
IDO 8	15 34	IDO 9
IDO 10	16 35	IDO 11
IDO 12	17 36	IDO 13
IDO 14	18 37	IDO 15
PCOM2	19	

Abbreviations	
DO	Digital Output
DI	Digital Input
IDO	Isolated Digital Output
IDI	Isolated Digital Input
E.GND	External Ground for Isolated Output
EI.GND	External Ground for Isolated Input
D.GND	Digital Ground
VDD	External Power for Isolated Outputs
PCOM	Free Wheeling Common Diode

\*NOTE: When JP4 is set to B1, Pin 19 on CN1 and Pin 10 on CN6 will both be assigned PCOM1. When JP4 is set to A1, both pins will be assigned E.GND. For JP5, Pin 17 & 19 and Pin 18 & 20 on CN2 will combine together (be the same GND) when JP5 is set to A1. But Pin 17 & 19 and Pin 18 & 20 on CN2 will be different GND (EI.GND1 and EI.GND2 separately) when JP5 is set to B1.

## Switch and Jumper Settings

Please refer to the below jumper and switch locations on PCL-730.



### Base address selection (SW1)

You control the PCL-730's operation by reading or writing data to the PC's I/O (input/output) port addresses. The PCL-730 requires four consecutive address locations. Switch SW1 sets the card's base (beginning) address. Valid base addresses range from Hex 200 to Hex 3F0. Other devices in your system may, however, be using some of these addresses.

We set the PCL-730 for a base address of Hex 300 at the factory. If you need to adjust it to some other address range, set switch SW1 as shown in the following table:

Card I/O addresses (SW1)								
Range (hex)	Switch position							
	1	2	3	4	5	6	7	8
200 - 203	○	●	●	●	●	●	●	●
204 - 207	○	●	●	●	●	●	●	○
□								
* 300 - 303	○	○	●	●	●	●	●	●
□								
3F0 - 3F7	○	○	○	○	○	○	●	●

○ = Off    ● = On    \* = default

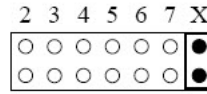
Note: Switches 1-8 control the PC bus address lines as shown below:

Switch Line	1	2	3	4	5	6	7	8
	A9	A8	A7	A6	A5	A4	A3	A2

### Interrupt level (JP1)

Jumper JP1 controls the card's IRQ level, as shown below. Position X disables the interrupt.

#### JP1 Interrupt level



(default)

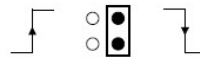
### Interrupt triggering (JP2)

Jumper JP2 selects the trigger edge (rising or falling) on which the card will trigger an interrupt. Jumper settings appear below:

#### JP2 Trigger method



Rising edge interrupt triggering (default)

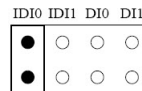


Falling edge interrupt triggering

### Interrupt source (JP3)

Jumper JP3 selects the source of the card's interrupt.

#### JP3 Interrupt source

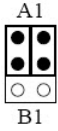


Setting	Channel	Connector
IDI0	Isolated DI Channel 0	CN2 pin1
IDI1	Isolated DI Channel 1	CN2 pin 2
IDI0	TTL DI Channel 0	CN4 pin1
IDI1	TTL DI Channel 1	CN4 pin 2

## Version control (JP4/JP5)

Jumper JP4 controls the pin assignments for CN1 and CN6 while JP5 controls it for CN2 and CN6. Setting this jumper to A1 makes the card's pin assignments the same as the A1 version.

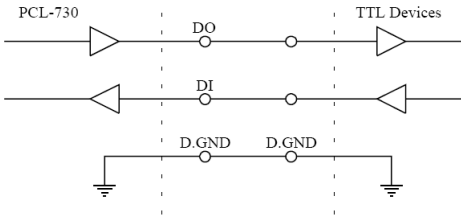
### JP4/JP5 Version Control



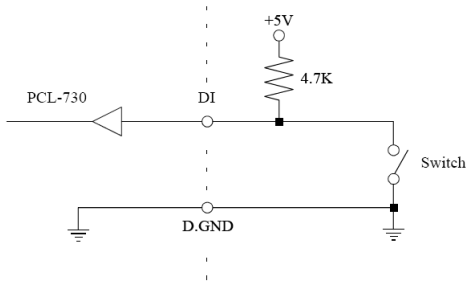
## Signal Connections

### TTL-level I/O

The PCL-730 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:

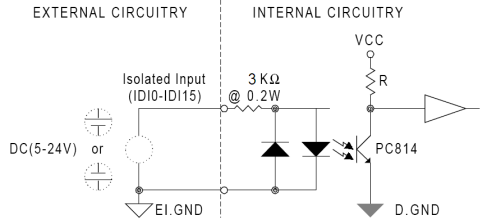


If you want to receive an OPEN/SWITCH signal from a switch or relay, add a pull-up resistor to ensure that the input is held at a high level when the contacts are open. See the figure below:



## Isolated Input

Each of the 16 isolated digital input channels accept voltages from 5 to 24 V and have a resistance of 3 k $\Omega$ . Every eight input channels share one external ground. (Channels 0~7 use EI.GND1. Channels 8~15 use EI.GND2.) The following figure shows how to connect an external input source to the card's isolated inputs:



## Isolated Output

Each of the 16 isolated digital output channels comes equipped with a MOSFET. Every eight output channels share common emitters and integral suppression diodes for inductive load, activated by connecting PCOM to VDD. (Channels 0~7 use PCOM1. Channels 8~15 use PCOM2.)

If the external voltage (5~40 V) is connected to each isolated output channel (IDO) and its isolated digital output turns on (200 mA per channel maximum), the card's current will sink from the external voltage.

