PCLD-8751

48-Channel Opto-isolated D/I Board

PCLD-8761

24-Channel Opto-isolated D/I and 24-Channel Relay Board

User Manual

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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.

Technical Support and Assistance

Step 1. Visit the Advantech web site at **www.advantech.com/support** where you can find the latest information about the product.

Step 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.

1 x PCLD-8751 48-Channel Isolated Digital Input Board

1 x User Manual

OR

1 x PCLD-8761 24-Channel Opto-isolated D/I and 24-Channel Relay Board

1 x User Manual

Contents

Introduction

This chapter introduces PCLD-8751 and PCLD-8761.

Sections include:

- General Information
- Applications
- Features
- Specifications

Chapter 1 Introduction

1.1 General Information

PCLD-8751 and PCLD-8761 are daughter boards that feature 48 isolated digital I/O channels. PCLD-8751 is equipped with 48 opto-isolated digital input channels, while PCLD-8761 provides 24 isolated DI and 24 relay channels, which can be used by all Advantech TTL DI/O cards with a 68-pin SCSI connector, like the PCI-1751 and PCI-1753 series.

In addition to on-board screw terminals for easy wiring, each channel is equipped with an LED to indicate the status. If the input voltage level is high or the output channel is activated, the LED will be lit, otherwise the LED is off. You may configure the channels to work in either positive logic mode or negative logic mode by setting the on-board jumpers.

1.2 Applications

- Digital signal sensing
- Switch status monitoring
- Limit switch monitoring
- Signal switching
- ON/OFF control
- Valve/solenoid control
- External high-power relay control
- Test automation

1.3 Features

- Works with Advantech TTL DIO cards equipped with 48 D/IO channels on SCSI 68-pin cable connectors
- 48 opto-Isolated digital input channels
- Detachable screw terminal for easy wiring
- LEDs indicate input logic status
- Inputs buffered with voltage comparators

1.4 Specifications

1.4.1 Isolated Digital Inputs
- **Isolation Voltage**: 3500 Vrms

- **Channels:** 48 IDI with LEDs

- **Contact Modes:** Wet contact
  Dry contact (set by switch)

- **Logic Mode:** Positive Logic
  Negative Logic (set by jumper)

- **Digital Input Activation Voltage:**
  Wet contact mode, Vin = 0 ~ 30 V
    activated: Vin (MIN) 4 V
    deactivated: Vin (Max) 1 V
  Dry contact mode, external power = DC +5 ~ 30 V
    activated: short
    deactivated: open

1.4.2 Relay
- **Type:** Form C (SPDT)

- **Contact Resistance**: < 100 ohm

- **Operation Time:** 5 ms max.

- **Release Time:** 6 ms max.

- **Contact Rating:** DC 30 V @ 1 A
  AC 120V@0.5A

- **Power Selection:** PCI Bus or External power(7~30 V) by jumper

- **Mechanical Endurance:** 10^8 times

- **Electrical Endurance:** $5*10^7$ times at 12 V / 10 mA

1.4.3 General

PCLD-8751

- **Dimensions:** 255 x 121mm
- **Power Consumption:** Max. +5 V @ < 0.6 A
- **Screw Terminals:** Accepts #14 to #24 AWG wires

PCLD-8761

- **Dimensions:** 285 x 121mm
- **Power Consumption:** Max. +5 V @ < 1.6 A
- **Screw Terminals:** Accepts #14 to #24 AWG wires

Installation

This chapter show how to install and configure PCLD-8751 and PCLD-8761.

Sections include:

- Initial Inspection
- Connectors and Jumpers

Chapter 2 Installation

2.1 Initial Inspection

PCLD-8751 and PCLD-8761 was thoroughly inspected before being shipped. Before installing the card, make sure that everything has been included with the package. You should also inspect the card for any defects or damage that may have occurred during shipment. If you find anything missing, defective or damaged, contact your dealer immediately.

Here is a list of the materials included with your PCLD-8751 package:

1 x PCLD-8751 48-Channel Isolated Digital Input Board

1 x User Manual

Here is a list of the materials included with your PCLD-8761 package:

1 x PCLD-8761 24-Channel relay output and 24-channel Isolated Digital Input Board

1 x User Manual

Remove PCLD-8751/PCLD-8761 from its protective packaging. Keep the packaging, since it may be used to return the card if it needs repairs in the future. The packaging may also be used if the card is to be stored for any length of time.

The board should be handled by the edges only. Static electric discharge can damage the integrated circuits on the board

2.2 Connectors and Jumpers

2.2.1 PCLD-8751

Following is the layout of PCLD-8751.
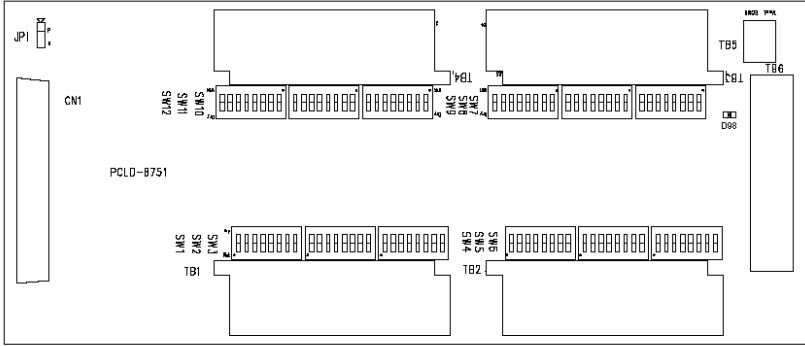
CN1:

CN1 is a SCSI 68-pin connector.

Terminal Block: TB1 ~ TB4

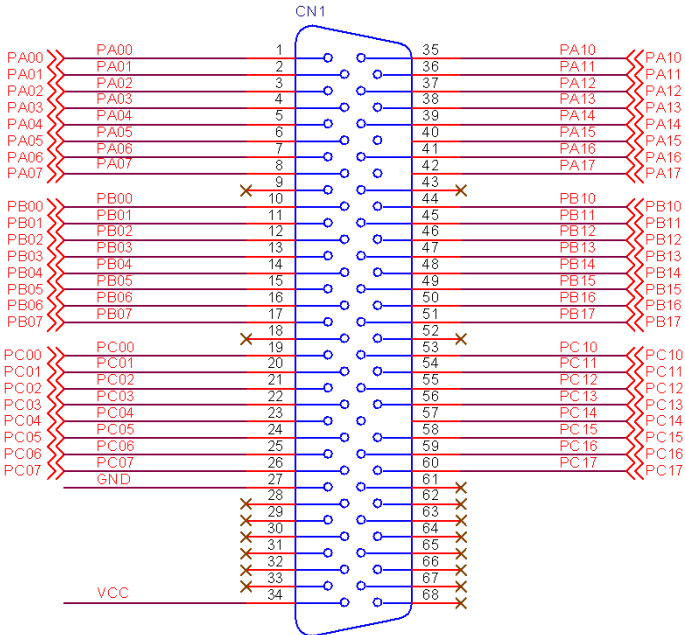| TB1		TB2	
Name	**Pin**	**Name**	**Pin**
PA00	1+,1-	**PB04**	13+,13-
PA01	2+,2-	**PB05**	14+,14-
PA02	3+,3-	**PB06**	15+,15-
PA03	4+,4-	**PB07**	16+,16-
PA04	5+,5-	**PC00**	17+,17-
PA05	6+,6-	**PC01**	18+,18-
PA06	7+,7-	**PC02**	19+,19-
PA07	8+,8-	**PC03**	20+,20-
PB00	9+,9-	**PC04**	21+,21-
PB01	10+,10-	**PC05**	22+,22-
PB02	11+11-	**PC06**	23+,23-
PB03	12+,12-	**PC07**	24+,24-

TB3		TB4	
Name	**Pin**	**Name**	**Pin**
PA10	25+,25-	**PB14**	37+,37-
PA11	26+,26-	**PB15**	38+,38-
PA12	27+,27-	**PB16**	39+,39-
PA13	28+,28-	**PB17**	40+,40-
PA14	29+,29-	**PC10**	41+,41-
PA15	30+,30-	**PC11**	42+,42-
PA16	31+,31-	**PC12**	43+,43-
PA17	32+,32-	**PC13**	44+,44-
PB10	33+,33-	**PC14**	45+,45-
PB11	34+,34-	**PC15**	46+,46-
PB12	35+,35-	**PC16**	47+,47-
PB13	36+,36-	**PC17**	48+,48-

TB5: External power source connector for Dry contact mode isolation input channels.

When using Dry contact input mode, it is necessary to provide external power through TB5. The voltage range is +5V ~ 30V DC.

**TB6:** Reserved for the counter function on PCI-1751.

SW1 ~ SW12:

SW1 ~ SW12 are used to switch the input channels as "Wet contact" or "Dry Contact".

The factory settings of the switches are in "Off" position, and the input channels are in Wet contact mode.

You can set each input channel as Dry contact mode by setting the switch to the "On" position. Following is the mapping table of the DIP switch and the input channels.

|	No.1	No.2	No.3	No.4
SW1	PA00	PA01	PA02	PA03
SW2	PA04	PA05	PA06	PA07
SW3	PB00	PB01	PB02	PB03
SW4	PB04	PB05	PB06	PB07
SW5	PC00	PC01	PC02	PC03
SW6	PC04	PC05	PC06	PC07
SW7	PA10	PA11	PA12	PA13
SW8	PA14	PA15	PA16	PA17
SW9	PB10	PB11	PB12	PB13
SW10	PB14	PB15	PB16	PB17
SW11	PC10	PC11	PC12	PC13
SW12	PC14	PC15	PC16	PC17

JP1: Logic Control for Input Channels.
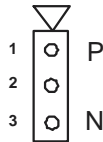
The control logic is positive when pin1 and pin2 of JP1 are shorted.

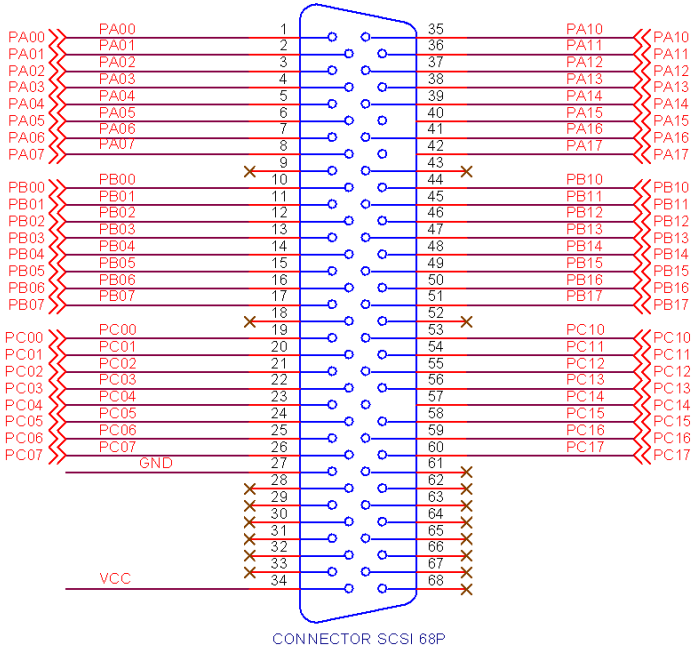If pin2 and pin3 of JP1 are shorted, then the control logic becomes negative.

The factory setting is positive control logic.

2.2.2 PCLD-8761
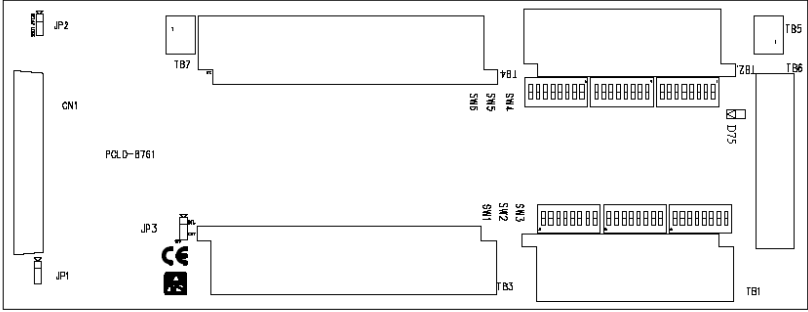
CN1:

CN1 is SCSI 68-pin connector

CONNECTOR SCSI 68P

Terminal Blocks: TB1 ~ TB4

TB1		TB2	
Name	**Pin**	**Name**	**Pin**
PA00	1+,1-	**PB04**	13+,13-
PA01	2+,2-	**PB05**	14+,14-
PA02	3+,3-	**PB06**	15+,15-
PA03	4+,4-	**PB07**	16+,16-
PA04	5+,5-	**PC00**	17+,17-
PA05	6+,6-	**PC01**	18+,18-
PA06	7+,7-	**PC02**	19+,19-
PA07	8+,8-	**PC03**	20+,20-
PB00	9+,9-	**PC04**	21+,21-
PB01	10+,10-	**PC05**	22+,22-
PB02	11+11-	**PC06**	23+,23-
PB03	12+,12-	**PC07**	24+,24-

TB3		TB4	
Name	**Pin**	**Name**	**Pin**
PA10	25COM, 25NC, 25NO	**PB14**	37COM, 37NC, 37NO
PA11	26COM, 26NC, 26NO	**PB15**	38COM, 38NC, 38NO
PA12	27COM, 27NC, 27NO	**PB16**	39COM, 39NC, 39NO
PA13	28COM, 28NC, 28NO	**PB17**	40COM, 40NC, 40NO
PA14	29COM, 29NC, 29NO	**PC10**	41COM, 41NC, 41NO
PA15	30COM, 30NC, 30NO	**PC11**	42COM, 42NC, 42NO
PA16	31COM, 31NC, 31NO	**PC12**	43COM, 43NC, 43NO
PA17	32COM, 32NC, 32NO	**PC13**	44COM, 44NC, 44NO
PB10	33COM, 33NC, 33NO	**PC14**	45COM, 45NC, 45NO
PB11	34COM, 34NC, 34NO	**PC15**	46COM, 46NC, 46NO
PB12	35COM, 35NC, 35NO	**PC16**	47COM, 47NC, 47NO
PB13	36COM, 36NC, 36NO	**PC17**	48COM, 48NC, 48NO

TB5: External power source connector for Dry contact mode Isolation input channels.

When using Dry contact input mode, it is necessary to provide external power through TB5. The voltage range is +5V ~ 30V DC.

TB6: Reserved for counter function on PCI-1751.

TB7: External power source connector.

PCLD-8761's driving power can be set as external by JP3, and the input voltage range is DC +7 ~ +30V.

SW1 ~ SW6:

SW1 ~ SW6 are used to switch the input channels as "Wet contact" or "Dry Contact".

The factory setting of the switches are in "Off" position, and the input channels are in Wet contact mode.

You can set each input channel as Dry contact mode by simply setting the switches to the "On" position. Following is the mapping table of the DIP switch and input channels.

	No.1	No.2	No.3	No.4
SW1	PA00	PA01	PA02	PA03
SW2	PA04	PA05	PA06	PA07
SW3	PB00	PB01	PB02	PB03
SW4	PB04	PB05	PB06	PB07
SW5	PC00	PC01	PC02	PC03
SW6	PC04	PC05	PC06	PC07

JP1: Logic control for input channels.
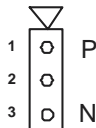
```
     ▽
 1 |o|  P
 2 |o|
 3 |o|  N
```
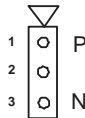
The input channel control logic is positive when pin1 and pin2 of JP1 are shorted.

If you short pin2 and pin3 of JP1, the control logic becomes negative.

The factory setting is positive control logic.

JP2: Logic control for relay channels.

```
     ▽
 1 |o|  P
 2 |o|
 3 |o|  N
```
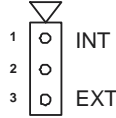
The input and relay control logic can be set separately.

The relay control logic is positive when pin1 and pin2 of JP2 are shorted.

If you short pin2 and pin3 of JP2, the control logic becomes negative.

The factory setting is positive control logic.

JP3: Relay driving power source selection

```
        ▽
  1  [ o ]  INT
  2  [ o ]
  3  [ o ]  EXT
```

It is necessary to provide +5 V as the relay channels driving power source. And the power source can be selected as internal or external by JP3.

The default setting of JP3 is an internal power source, which means +5V is provided from the PC. However, you can also select an external power source by shorting pin2 and pin3 of JP3.

The external power source is provided through TB7. Since there is a transformer on the circuit, the voltage range of external power should be within DC +7V ~ +30V.

CHAPTER **3**

Operations

This chapter has information for operating PCLD-8751 and PCLD-8761.

Sections include:

- Power Source Selection
- Control Logic
- Wiring

Chapter 3 Operations

3.1 Power Source Selection

PCLD-8751 and PCLD-8761 require a +5V power supply for correct operation. When using the SCSI 68-pin connector, the card can be powered directly from the PC's I/O bus by connecting CN1 to any Advantech PC-LabCard product.

However, it is also possible to connect external supplies to PCLD-8761 by connecting an external power supply to terminal TB7. It is recommended to use an external power source when more than 8 relay channels are operated. Correct connections are shown in section 2.2.

3.2 Control Logic

The preferred control logic can be defined by setting the on-board jumper JP1 (PCLD-8751, PCLD-8761) or JP2 (PCLD-8761). The default setting the positive logic, which means logic "1" = device activated. For input channels, when the inputs are activated, the DI channels will be TTL "1". And for DO channels, the relay will operate for a TTL high (+5V) on the input (common contact connected to NO contact). The relay will release for a TTL low on the input (common contact connected to NC contact).

On the other hand, when the jumper was set as negative logic, which means logic "0" = device activated. For input channels, the relay will operate for a TTL low (0V) on the input (common contact connected to NO contact). The relay will release for a TTL high on the input (common contact connected to NC contact).

3.3 Wiring

3.3.1 Isolated DI

Wet Contact

Dry Contact

Relay

470

LED

DO_NC

DO_NO

10

8

3

5

RELAY

9

4

1

12

DO_COM

VCC

VCC

DO