
PCLD-782

16 Channel Opto-isolated D/I Board

Rev.B2



1. INTRODUCTION

The PCLD-782 is a daughter board featuring 16 opto-isolated digital inputs which can be used by all PC-LabCards with D/I channels on 20-pin flat ribbon connectors.

In addition to its on-board screw terminals for easy wiring, the PCLD-782 offers opto-isolated signal conditioning--an ideal solution for preventing floating potential and ground loop problems.

Each input channel is equipped with a red LED to indicate the input status. If the input voltage level is high, the LED will be lit, or the LED is off. Users may configure each channel to work in either isolated mode or non-isolated mode by setting the on-board jumpers.

2. APPLICATIONS

- Digital signal sensing
- Switch status monitoring
- Limit switch monitoring

3. FEATURES

- Works with PC-LabCards with D/I channels on 20 pin flat cable connectors
- 16 opto-Isolated digital input channels
- On-board signal conditioning circuits
- Built-in screw terminals for easy wiring

- LEDs indicate input logic status
- Inputs buffered with voltage comparators

4. SPECIFICATIONS

- **Type of opto-isolator:** 4N25
- **Input channels:** 16
- **Input range:** 0 ~ 24V DC
- **Input resistance:** 560 Ω
- **Withstanding voltage:** 300 VDC
- **Screw terminal:** Accept #22 to #12 AWG wires
- **Connector for digital bus:** 20 pin flat cable connector
- **Dimensions:** 20.5cm (L) x 11.43 cm (W) or 8.07" (L) x 4.5" (W)

6. Connector Pin Assignments

The following chart shows the pin relations regarding to PCLD-782's connector CN1, terminal blocks, TB1 and TB2, LED's and jumper groups.

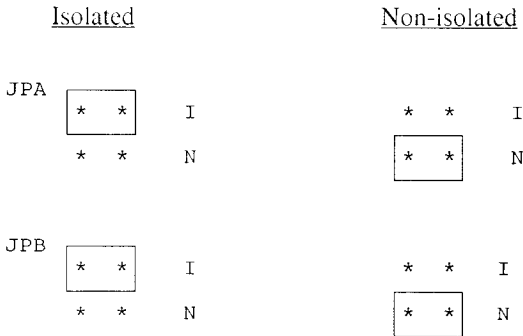
CN1 Pin No.	TB1 & TB2 Label Name	Related LED	Related Jumpers
1	TB1 0+,0-	0	JA0,JB0
2	TB1 1+,1-	1	JA1,JB1
3	TB1 2+,2-	2	JA2,JB2
4	TB1 3+,3-	3	JA3,JB3
5	TB1 4+,4-	4	JA4,JB4
6	TB1 5+,5-	5	JA5,JB5
7	TB1 6+,6-	6	JA6,JB6
8	TB1 7+,7-	7	JA7,JB7
9	TB2 8+,8-	8	JA8,JB8
10	TB2 9+,9-	9	JA9,JB9
11	TB2 10+,10-	10	JA10,JB10
12	TB2 11+,11-	11	JA11,JB11
13	TB2 12+,12-	12	JA12,JB12
14	TB2 13+,13-	13	JA13,JB13
15	TB2 14+,14-	14	JA14,JB14
16	TB2 15+,15-	15	JA15,JB15
17	GND		
18	GND		
19	+5V		
20	+12V		

7. Isolated or Non-isolated Input

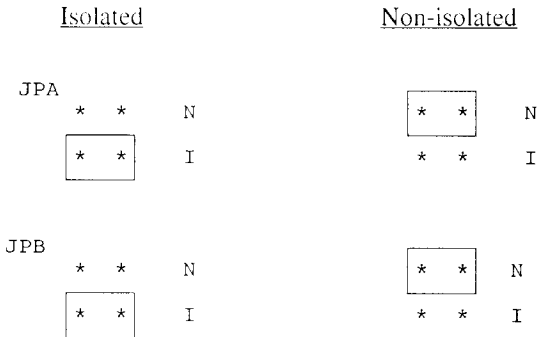
Each digital input channel on the PCLD-782 is equipped with a pair of jumpers to select the input mode as either isolated or non-isolated.

Examples for setting the input mode of channel 0 and channel 8 are shown below. Note that the isolated/non-isolated positions for channel 0-7 are different from those of channel 8-15. Please follow the same rules for the rest of channels.

For channel 0 to 7



For channel 8 to 15



8. Threshold Adjustment for Isolated Input Mode

The PCLD-782 is equipped with a variable resistor VR1 to adjust the desired threshold level for all of the 16 isolated input channels.

For isolated input mode, the PCLD-782 is actually driven by input current level instead of input voltage level. Sometimes due to the input leakage current effect, the input status will be always considered as logic high, although the input voltage level is low.

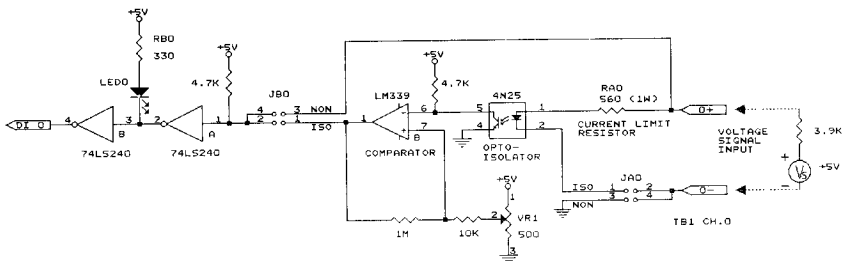
The circuit diagram shown below is used in factory to prevent input leakage current effect.

Test Procedures:

1. Apply a 5V voltage source at 0- and 0+ along with a 3.9K resistor. This will supply about 1 mA current to the photo-isolator, 4N25.
2. Then adjust the VR1 until LED0 is off.

The above adjustment ensures that if channel 0's input voltage is low, and the input leakage current is less than 1 mA, the input status will be considered as logical low (TTL 0).

To prevent higher input leakage current, users can change the 3.9K resistor by a lower one, and follow above procedures to meet your requirement.



9. Customize The Current Limit Resistor

The default voltage input range of the PCLD-782 is from 0V to 24V. To accept higher voltage input, users can replace the current limit resistors, RA0 through RA15, for each channel.

It is easy to choose the proper current limit resistor. Since the 4N25 isolator has a current rating of 60 mA, your input current can not exceed 60 mA. The formula is shown as below:

$$I_{in} = V_{in} / R_{limit}$$

where I_{in} : input current
 V_{in} : input voltage
 R_{limit} : current limit resistor

Note: It is suggested that the I_{in} is within 20 mA.

Additionally, you should consider the current limit resistor's maximum power rating. The maximum power consumption should not exceed the power rating of your resistor. The approximate formula is shown as below:

$$P_{in} = V_{in} * I_{in}$$

where I_{in} : input current
 V_{in} : input voltage
 R_{limit} : current limit resistor

For example, if your maximum voltage input is 50V, and the current limit resistor you choose is 1K Ohm, then the maximum current input becomes 50mA. The power consumption of the current limit resistor is approximately 2.5 Watts. In such situation, the power rating of your resistor should be more than 2.5 Watts.

