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CHAPTER 1. GENERAL INFORMATION

1.1. Introduction

The PCLD-785B 24/16 Channel Relay Output Board carries 24 SPDT electro-mechanical relays, designed to be driven by the digital outputs of a range of PC-LabCards. The number of output channels available depends on the type of connector used. The 50-pin opto-22 compatible connector (CN2) will provide 24 channels, while the 20-pin connector (CN1) provides 16 channels. CN1 and CN2 may not be used concurrently.

Each relay has three contacts: common, normally-open, and normally-closed. These contacts are extended to easily accessible screw-connector strips on each side of the board. LEDs situated adjacent to each relay indicate the ON/OFF status of that relay.

1.2. Features

- Compatible with PC-Labcards utilizing either a 50-pin opto-22 connector or a 20-pin connector for DO ports
- 24/16 single-pole double-throw (SPDT) relays
- On-board relay driver circuits
- Screw terminals for easy output wiring
- LED status indicators
- Cable and mounting accessories

1.3. Applications

- Signal switching
- ON/OFF control
- Valve/solenoid control
- External high-power relay control
- Alarm activation
- Annunciator control
- Test automation

1.4. Specifications

- **Channels** : 24 (50-pin connector) or 16 (20-pin connector)
- **DI connector** : 50-pin opto-22 or 20-pin flat cable connector
- **Relay type** : SPDT (Form C)
- **Contact ratings:**
  Maximum switching power : 30 VA
  Maximum switching voltage : 125 V (AC or DC)
  Maximum switching current : 2 A
- **Contact resistance** : < 100 mΩ
- **Operation time** : 8 ms max.
- **Release time** : 8 ms max.
- **Insulation resistance** : 100 MΩ
- **Output connector** : Universal screw terminals
- **Power requirements:**
  +5 V_{DC}: Jumper selectable from either the PC bus or external supply.
  +12 V_{DC}: Jumper selectable when using the 20-pin connector from either the PC bus or external supply. An external 12 V supply **must** be used when the PCLD-785B is connected via a 50-pin connector.
- **Control Logic:**
  Using the 20-pin flat cable connector : TTL high = +5 V ON
  Using the 50-pin opto-22 connector : TTL low = 0 V ON
- **Power consumption**: +12 V: 33 mA for each relay; +5 V: < 100mA
- **Board dimensions**: 132 mm x 220 mm

CHAPTER 2. INSTALLATION

2.1. Initial Inspection

The PCLD-785B was thoroughly inspected before being shipped to you. 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-785B package:

- One PCLD-785B 24/16 Channel Relay Output Board
- User's Manual
- One 20-pin flat cable assembly (P/N PCL-10120-1)
- One 50-pin opto-22 cable assembly (P/N PCL-10150-1.2)

Remove the PCLD-785B from its protective package. Keep the package, since it may be used to return the card if it needs repairs in the future. The package 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

IMPORTANT NOTE: CN1 and CN2 must not be used at the same time.

Locations of all jumpers, connectors and wiring blocks are shown in Figure 1 on page 7.

CN1: CN1 is a 20-pin connector. Pin assignments are as shown below.

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

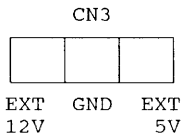
LEGEND: CH: Channel
GND: Ground
+5V: +5 V supply from PC
+12V: +12 V supply from PC

CN2: CN2 is a 50-pin, opto-22 connector. Pin assignments are shown below.

CH 23	-	1	2	-	GND
CH 22	-	3	4	-	GND
CH 21	-	5	6	-	GND
CH 20	-	7	8	-	GND
CH 19	-	9	10	-	GND
CH 18	-	11	12	-	GND
CH 17	-	13	14	-	GND
CH 16	-	15	16	-	GND
CH 15	-	17	18	-	GND
CH 14	-	19	20	-	GND
CH 13	-	21	22		GND
CH 12		23	24	-	GND
CH 11		25	26		GND
CH 10	-	27	28	-	GND
CH 9	-	29	30	-	GND
CH 8	-	31	32	-	GND
CH 7	-	33	34	-	GND
CH 6	-	35	36	-	GND
CH 5	-	37	38	-	GND
CH 4	-	39	40	-	GND
CH 3	-	41	42	-	GND
CH 2	-	43	44	-	GND
CH 1	-	45	46	-	GND
CH 0	-	47	48		GND
+5V	-	49	50		GND

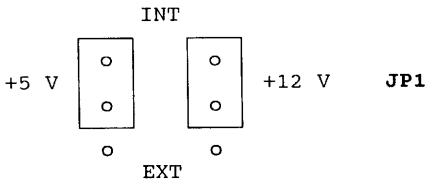
LEGEND: CH: Channel
GND: Ground
+5V: +5 V supply from PC

CN3: CN3 is used to connect an external power supply to the PCLD-785B. Pin assignments are shown below.



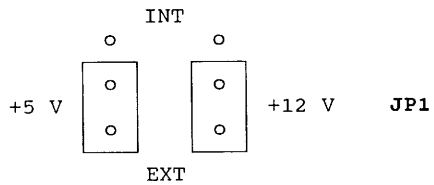
JP1: Jumper JP1 is used for selecting the +5 and +12 V power source. An external 9-12 V_{DC} supply **must** be used for operation with the 50-pin opto-22 connector. See Figure 1 on page 7 for jumper locations.

To select the PC's power supply, set JP1 as shown below.



Note: This is the factory default setting

To select an external power supply, set JP1 as shown below.



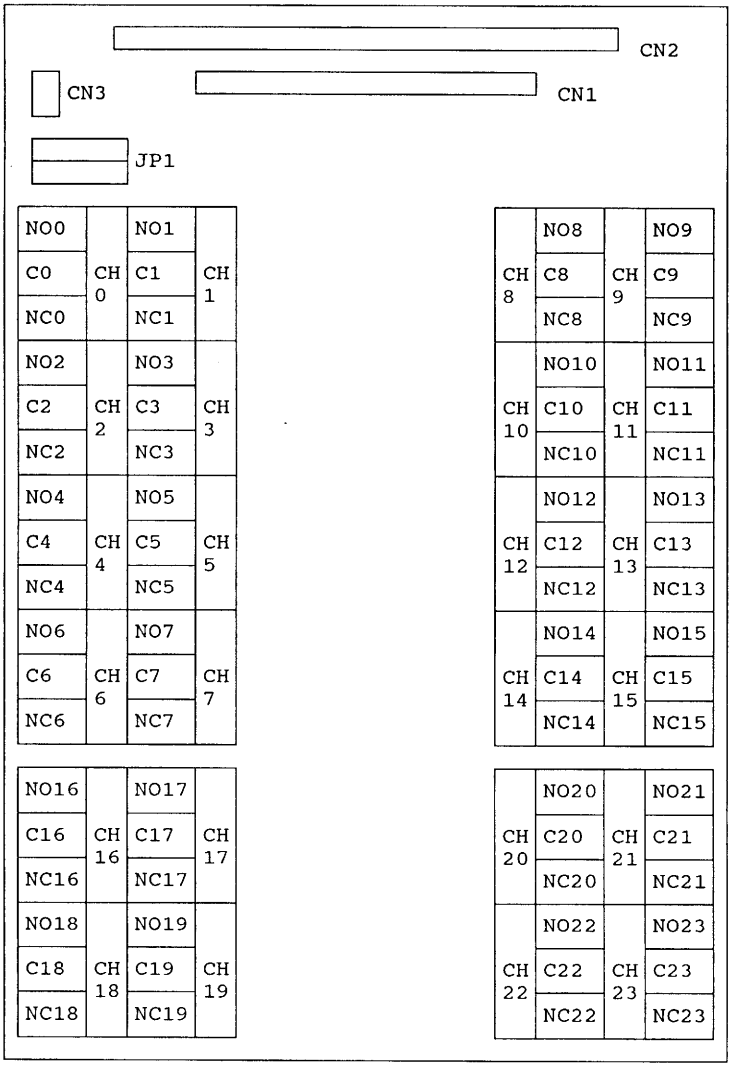


Figure 1. PCB Layout

CHAPTER 3. OPERATION

3.1. Power source selection

The PCLD-785B requires both +5 V and +12 V supplies for correct operation. When using the 20-pin connector, the card can be powered directly from the PC's I/O bus by connecting CN1 to almost any PC-LabCard, and setting jumper JP1 to select +5 and +12 V power supplies from the PC (See Section 2.2 above for the correct jumper settings). This is the factory default configuration.

It is also possible, however, to connect external supplies when the PCLD-785B is using the 20-pin connector. Set JP1 for an external supply configuration (See Section 2.2 above), and connect the external +5 and +12 V supplies to connector CN3. Correct connections are shown in Section 2.2.

When using the 50-pin connector, it is essential to provide an external +12 V supply, since the opto-22 compatible connector (CN2) does not provide a +12 V power supply pin. The +5 V supply may be selected as described for 20-pin connector operation.

3.2. Control Logic

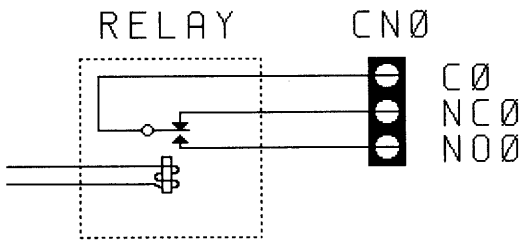
When using the 20-pin connector, TTL high = +5 V ON. The relay will operate for a TTL high (+5 V) on the input (common contact connected to NO contact). The relay will release for a TTL low on the input (common contact connected to NC contact).

When the 50-pin connector is used, TTL low = 0 V ON. The relay will operate for a TTL low (0 V) 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).

The PCLD-785B will auto-detect which connector is being used. There are no changes to be made by the user.

3.3. Output Wiring

Connections to the relay contacts may be made as shown in the diagram below. Location and pin assignments of the output wiring terminal blocks are detailed in Figure 1 on page 7 of this manual.



Typical Output Wiring Diagram

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