

Installation

This chapter gives a general procedure for setting up and installing your card.

Sections include:

- Initial inspection
- Gain switch settings
- Jumper settings
- Power supply
- Connector pin assignments

Initial Inspection

Inside the shipping container, you should find:

- PCLD-789D card
- Two 20-pin flat cable connectors
- One 37-pin DB-type connector
- Utility diskette
- This users manual

The PCLD-789D was carefully inspected both mechanically and electrically before shipment. It should be free of marks and scratches and in perfect electrical order on receipt.

When unpacking, check the unit for signs of shipping damage (damaged box, scratches, dents, etc.). If there is damage to the unit or it fails to meet specifications, notify our service department or your local sales representative immediately. Also, call the carrier immediately and retain the shipping carton and packing material for inspection by the carrier. We will make arrangements to repair or replace the unit.

Remove the PCLD-789D interface card from its protective packaging carefully. Keep the anti-vibration package. Whenever you are not using the board, please store it in the package for protection.

Warning! *Discharge your body's static electric charge by touching the back of the grounded chassis of the system unit (metal) before handling the board. You should avoid contact with materials that hold a static charge such as plastic, vinyl and styrofoam. Handle the board only by its edges to avoid static damage to its integrated circuits. Avoid touching the exposed circuit connectors.*



Installation

After you have unpacked the PCLD-789D you will need to configure the card to suit your particular application. This is done simply by inserting or removing the appropriate jumpers. Also some of the filter characteristics can be altered by changing components on the card. The jumpers and switches are as follows:

| PCLD-789D Jumpers and switches | |
|---|-----------|
| Function | Name |
| Gain setting | SW1 |
| Cold junction compensation output | JP1 |
| Analog output channel selection | JP2 |
| Filter selection 2nd stage | JP3 |
| Power supply select | JP4 |
| Filter selection 1st stage channel 0~15 | JP5~JP20 |
| Thermo measurement channel 0~15 | JP21~JP36 |

Default Settings

For the most common working configurations the card is shipped with the above jumpers preset to default positions as follows:

| PCLD-789D Default Settings | |
|---|-----------------|
| Function | Default |
| Gain setting | Gain = 1 |
| Cold junction compensation output | Channel 7 |
| Analog output channel selection | Channel 0 |
| Filter selection 2nd stage | Off |
| Power supply select | Int (PC supply) |
| Filter selection 1st stage channel 0~15 | On |
| Thermo measurement channel 0~15 | On |

Gain Switch Setting (SW1)

The PCLD-789D uses a high grade instrumentation amplifier to provide switch selectable gains of 1, 2, 10, 50, 100, 200, 500 and 1000 or user definable gain. The specific gain is selected through an 8 position DIP switch (SW1) labeled "GAIN". Refer to the diagram on page 5 for the location of the switch. The following table illustrates the switch setting and corresponding gain.

| Switch Position | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Gain |
| * | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 1 |
| | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | 2 |
| | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | 10 |
| | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | 50 |
| | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | 100 |
| | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | 200 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | 500 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | 1000 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | USER |

○ = OFF ● = ON * = Default

Note: USER refers to user definable gains which are covered in chapter 4

Jumper Settings

CJC Output Channel Jumper (JP1)

PCLD-789D provides cold-junction compensation (CJC) for thermocouple applications. This is done by placing a shorting link in JP1. JP1 consists of 10 channels 0 through 9 and a not used position "X". This feature permits up to 5 PCLD-789Ds to be connected to a 10 channel analog input card. Place the jumper in the output channel according to the channel of the analog input card selected for that PCLD-789D board.

If the CJC is required, place the jumper in the channel position allocated to the PCLD-789D.

Analog Output Channel Jumper (JP2)

PCLD-789D supports 10 separate jumper selectable analog output channels. This is done by placing a shorting link in JP2. JP2 consists of 10 channels 0 through 9 and a not used position "X". This feature permits up to 10 PCLD-789Ds to be connected to a 10 channel analog input card. Place the jumper in the output channel according to the channel of the analog input card selected for that PCLD-789D board (see below).

Identifying Channel Allocations

If the PCLD-789D is one of several cards connected to a DAS board then it must be identifiable from the others. When setting up the DAS card you will have used the software utility to allocate its analog input channels to the various amplifier/multiplexer cards. Each amplifier/multiplexer card will have its own channel number different from the others.

Using both Analog and CJC

The DAS card's output is limited to ten addresses. Each card uses one address for the analog output channel jumper JP2 (which is the same as the DAS card's input channel). This allows up to ten amplifier/multiplexer cards to be cascaded. If a card uses CJC then that card will use two addresses, one for the analog output channel and one for the CJC. This limits the number of cards that can use CJC to five (five x two addresses = ten addresses).

2nd Stage Low Pass Filter Jumper (JP3)

JP3 is a second stage low pass filter to reject the output noise from the PCLD-789D's amplifier (JP5 through JP20 are used to reduce unwanted high frequency input noise). This low pass filter is constructed with a 0.1 μ F capacitor and a 5.11 K Ω resistor. The time constant is 0.511 msec., i.e. the cutoff frequency is 310 Hz. If this cut-off frequency is not suitable, you can replace the resistor R73 (located below JP3) to meet your application requirements. The default setting is with the filter disconnected.

Filter On



Filter Off (default)



Low Pass Filter Jumpers (JP5 to JP20)

To reject high frequency noise from the low frequency input signals, the PCLD-789D provides low pass filtering on each of the input channels. Jumpers JP5 through JP20 control the use of the filtering function on different input channels. For low frequency input signals, such as thermocouple signals, place the jumper on the selected channels. For high frequency signals, remove the jumper from the selected channels. The cards default setting is on with the jumper in-place.

The low pass filter is constructed with one $1\mu\text{F}$ capacitor and two $1.2\text{ k}\Omega$ resistors. The time constant is 2.4 msec., i.e. the cut-off frequency is 66 Hz. If this cut-off frequency is not suitable for the applications, the users can change it by changing the resistors and/or capacitor.

Filter Off Filter On (default)



Cut-off frequency calculation

If you need to change either of the above cut-off frequencies you will need to calculate the value of the filter components. Firstly the cut-off frequency can be calculated using:

$$\text{Freq} = \frac{1}{2 \times \pi \times C \times R}$$

Where C and R are the values of the capacitor and resistor(s) in the filter network. The easiest way to change the cut-off frequency is to change the resistor(s). Firstly decide the cut-off frequency required and use the equation below to find the resistor value. Remember to add the values of the resistors together when more than one is used.

$$R = \frac{1}{\text{Freq} \times 2 \times \pi \times C}$$

Thermo Measuring Jumper (JP21 to JP36)

These jumpers are used in certain thermo measuring applications where isolation from other channels are required. By shorting the jumpers each CH LO terminal is connected to GND via a 10 K Ω resistor. The board is shipped with the jumpers shorted, this is the default position.

Off



On (default)



CH 7

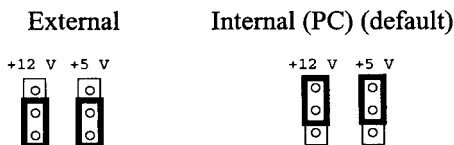
Power supply

The PCLD-789D requires both +5 V and +12 V power supplies for correct operation. You can get the power supply from your PC or an external source selectable via JP4. There are two power supply entry points on the PCLD-789D, via the connectors (CN2, CN3) or a three lead terminal block for an external supply.

Connectors CN2 (pins 19 +5 V, pin 20 +12 V) and CN3 (pins 19 +5 V, pin 13 +12 V) are wired to use the PC's power supply. This is the case if you connect the PCLD-789D to our DAS cards, such as the PCL-711, PCL-812, PCL-812PG, PCL-818, PCL-818L Rev A2, PCL-818H and PCL-818HD.

Power Supply selection (JP4)

To use PC's power supply or external power supply, please set jumper JP4 in the correct way, according to the following diagram:



An alternative to the PC's supply is a three-lead terminal block designed for those who want to use an external power supply. (Please refer to the diagram on page 5 to find the position of this terminal block). It is recommended to use an external power supply for a daisy chain configurations where power consumption is likely to be higher.

Pin assignments are shown below.



Connector Pin Assignments

PCLD-789D is equipped with two 20-pin insulation displacement (mass termination) connectors and one DB-37 pin connector. Connector 1 is used for the analog outputs. Connector 2 is for the multiplexer control digital inputs, digital ground and + 5 V, + 12 V power. Connector 3 is designed to support PCLD-789D daisy chaining as it contains all the pin functions of connector 1 and 2. The diagram on page 5 specifies the location of each of the connectors. The following diagrams illustrate the pin assignment of each connector.

► Connector CN1 – Analog output

| | | |
|-----------|-------|-------|
| ANA out 0 | 1 2 | A.GND |
| ANA out 1 | 3 4 | A.GND |
| ANA out 2 | 5 6 | A.GND |
| ANA out 3 | 7 8 | A.GND |
| ANA out 4 | 9 10 | A.GND |
| ANA out 5 | 11 12 | A.GND |
| ANA out 6 | 13 14 | A.GND |
| ANA out 7 | 15 16 | A.GND |
| ANA out 8 | 17 18 | A.GND |
| ANA out 9 | 19 20 | A.GND |

► Connector CN2 — Multiplexer input control, ground and power supply

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

► Connector CN3 – Analog output channels, multiplexer input control, ground and power supply

| | | | |
|-----------|----|----|-------|
| ANA out 0 | 1 | 20 | A.GND |
| ANA out 1 | 2 | 21 | A.GND |
| ANA out 2 | 3 | 22 | A.GND |
| ANA out 3 | 4 | 23 | A.GND |
| ANA out 4 | 5 | 24 | A.GND |
| ANA out 5 | 6 | 25 | A.GND |
| ANA out 6 | 7 | 26 | A.GND |
| ANA out 7 | 8 | 27 | A.GND |
| A.GND | 9 | 28 | A.GND |
| A.GND | 10 | 29 | A.GND |
| N/C | 11 | 30 | N/C |
| S0 | 12 | 31 | N/C |
| +12 V | 13 | 32 | S1 |
| S2 | 14 | 33 | S3 |
| D.GND | 15 | 34 | D.GND |
| N/C | 16 | 35 | N/C |
| N/C | 17 | 36 | N/C |
| N/C | 18 | 37 | N/C |
| +5 V | 19 | | |