ACLD-9185
ACLD-9182
ACLD-8125
Daughter Boards

Manual Rev. 2.11: September 15, 1999

Trademarks

Table of Contents

How to Use This Guide

This manual is designed to help users to use the ACLD-9185 / 9182 or 8125. The manual describes how to modify various settings on the daughter boards to meet your requirements. It is divided into 4 Chapters.

- ❑ Chapter 1, "Introduction", gives an overview of the product features, applications and specifications.
- ❑ Chapter 2, "ACLD-9185", describes how to install and use the ACLD-9815.
- ❑ Chapter 3, "ACLD-9182", describes how to install and use the ACLD-9812.
- ❑ Chapter 4, "ACLD-8125", describes how to install and use the ACLD-8125.

1

Introduction

The ACLD-9185 is a low cost 16-channel SPDT form C relay output board. It provides 16 electromechanical SPDT relay, which can be used by any ACL series or PCI digital output board with D/O channels on 20-pin flat ribbon connector. You can use 16 on-board relay to control power switches. Each relay is matched with one LED to reflect it's ON/OFF status.

Each relay consumes about 33 mA when energized. When all relays on the board are active, the board takes about 0.53 A from the computer's 12 volts power supply. Normally the current driving capability of the 12V power source is not good enough . The ACLD-9185 has a jumper switch allowing the users to connect an external +12V power source.

The ACLD-9182 isolated D/I board provide 16 opto-isolated digital inputs which can be used by any ACL or PCI series digital input board with D/I channels on 20-pin flat ribbon connectors. It is a good solution for preventing floating potential and ground loop problems.

Each input channel has a red LED to reflect the ON/OFF status. If the input voltage is high, the LED will be on otherwise the LED is off. Each input channel is jumper selectable to either AC or DC input, also, the users do not need to care the polarity.

1.1 ACLD-9185 Features

The ACLD-9185 Relay Actuator and D/I Card provides the following advanced features:

- ❑ 16 Single-Pole-Double-Throw relays
- ❑ LED indicators to show activated relays
- ❑ On-board relay driving circuits
- ❑ 120V/1 Amp contact rating
- ❑ Simple to program
- ❑ Controlled through TTL/CMOS signals or digital output ports of any ACL series board
- ❑ Screw terminal for wiring
- ❑ Fully compatible with Advantech's PCLD-785

1.2 ACLD-9182 Features

The ACLD-9182 16 channel opto-isolated D/I board provides the following advanced features:

- ❑ 16 Opto-Isolated digital input channels
- ❑ Build-in screw terminals for wiring
- ❑ Threshold adjustable for isolated input mode
- ❑ On board LEDs to reflect the input logic status
- ❑ Compatible with Advantech's PCLD-782

1.3 ACLD-8125 Features

The ACLD-8125 Signal Conditioning Daughter board provides the following advanced features:

- ❑ 37-pin D-sub connector
- ❑ Build-in screw terminals for wiring
- ❑ Cold junction temperature sensor
- ❑ On board signal conditioning circuits for every analog input channels

1.4 Applications

- ❑ Industrial ON/OFF control
- ❑ External high power relay driving, Signal switching
- ❑ Laboratory automation
- ❑ Alarm Control
- ❑ Lighting Control
- ❑ Motor starter control
- ❑ Signal control
- ❑ Valve/solenoid control
- ❑ Switch status monitoring

1.5 ACLD-9185 Specifications:

Output Channels	16
Relay Type	16 SPDT (Form C)
Contact rating	120V AC/DC , 1 A
Breakdown Voltage	1000 V AC/DC min..
Release time	5 msec max.
Operate time	5 msec max..
Relay ON time	3 msec typical
Relay OFF time	3 msec typical
Total switching time	10 msec typical
Insulation Resistance	100 mega Ohms min.
Life Expectancy	> 5 million operations at full load
Power Consumption	+12V , 33 mA for each relay , total 0.264 A if all relay are energized +5V, less than 0.2A
Power supply	+ 12V from the PC-Bus
Size	203 mm X 132mm
Connectors	20-pin flat cable

1.6 ACLD-9182 Specifications

Input channels	16
Opto-coupler	PC-814
Input current	50 mA max. for DC input
Input voltage	0~24V$_{DC}$ or AC 50 ~1,000 Hz Logic high : > 2.0 V
Input impedence	1.2 K Ohm
Isolation Voltage	1,000V channel-to-channel and channel-to-ground
Input Signal	AC or DC, polarity-free(don't care polarity)
Connector	20-Pin Flat Ribbon Cable Connector
Screw Terminal	5mm wiring spacing, 18-22 AWG
Indication Display	16 red LEDs
Size	20.5 cm (8.06") x 11.43 cm (4.5")

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ACLD-9185

This chapter describes how to install and use the ACLD-9185. At first, the contents in the package and unpacking information that you should be careful are described. The jumpers setting for the ACLD-9185's base power source selection are also specified.

2.1 What You Have

In addition to this *User's Manual*, the package includes the following items:

- ACLD-9185 Relay Output Board
- 20-pin 1-meter flat cable assembly
- Nylon standoffs for table-top or panel mounting

If any of these items is missing or damaged, contact the dealer from whom you purchased the product. Save the shipping materials and carton in case you want to ship or store the product in the future.

2.2 ACLD-9185's Layout

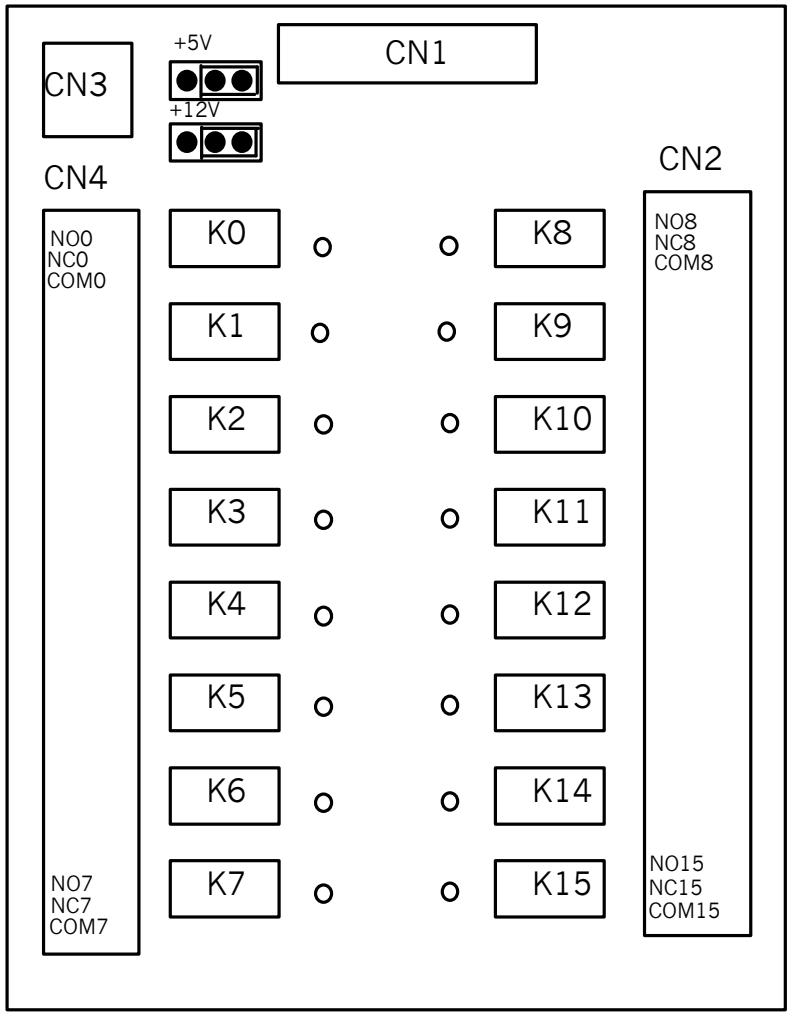


Figure 2.1

2.3 Connector Pin Assignments

The relationship between connector pins driver IC's, relay connects, LED's, and resistor arrays on the ACLD-9185 is shown in the following table:

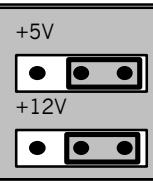
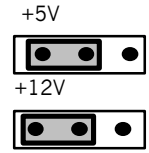
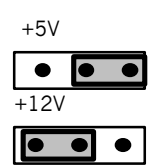
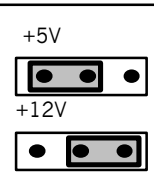
CN1 PIN	ULN2003 IN OUT	RELAY	RELAY Contacts	LED	Resistor Array
1	U3 4 13	K0	COM0 NC0 NO0	0	RP1
2	U3 5 12	K1	COM1 NC1 NO1	1	RP1
3	U3 3 14	K2	COM2 NC2 NO2	2	RP1
4	U3 6 11	K3	COM3 NC3 NO3	3	RP1
5	U3 2 15	K4	COM4 NC4 NO4	4	RP1
6	U3 7 10	K5	COM5 NC5 NO5	5	RP1
7	U3 1 16	K6	COM6 NC6 NO6	6	RP1
8	U2 1 16	K7	COM7 NC7 NO7	7	RP1
9	U2 7 16	K8	COM8 NC8 NO8	8	RP2
10	U2 2 16	K9	COM9 NC9 NO9	9	RP2
11	U2 6 16	K10	COM10 NC10 NO10	10	RP2
12	U2 3 16	K11	COM11 NC11 NO11	11	RP2
13	U2 5 16	K12	COM12 NC12 NO12	12	RP2
14	U2 4 16	K13	COM13 NC13 NO13	13	RP2
15	U1 7 10	K14	COM14 NC14 NO14	14	RP2
16	U1 6 10	K15	COM15 NC15 NO15	15	RP2
17	Ground				
18	Ground				
19	+5 DC				
20	+12 DC				

2.4 Power Source Setting

The ACLD-9185's power source can come from internal (provided by PC bus) or external (provided by external DC +12V). Both of internal and external source can provide +12V and +5V, respectively. The description of power source is specified as following table:

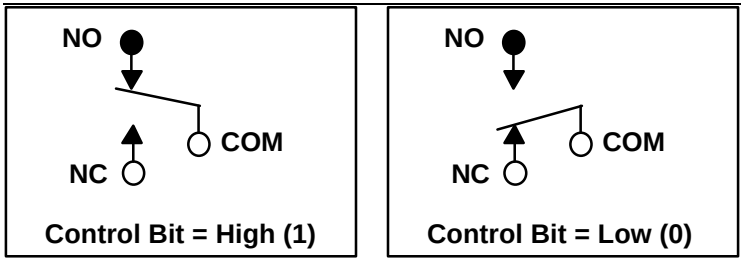
Internal power	+12V +5V	Provided by PC bus
External power	+12V +5V	Provided by external DC source through connector CN2

The desired power source is selected by jumpers :

Internal +5V **Internal +12V** **(Default Setting)**	
External +5V **External +12V**	
Internal +5V **External +12V**	
External +5V **Internal +12V**	

2.5 Using Relay Output

The ACLD-9185 contains 16 SPDT Form C relays, the connection of Form C realy is shown as the following diagram.



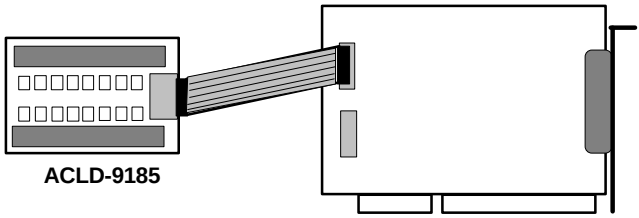
This relay has three contacts : NC (Normal Close), NO (Normal Open), and COM(Common). The CM post, located at the middle, can make contact either NO post or NC post. When the control bit is high (1), the COM post and NO post are contacted. If the control bit is low (0), the COM post and NC post make contact.

In normal power-up and reset, the relay is in ***low*** status.

2.6 Connection

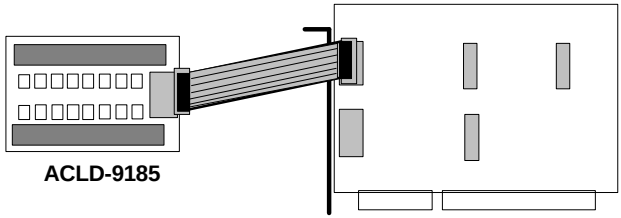
The ACLD-9185 is digital output daughter board which comes equipped with ACL series multi-function data acquisition cards and digital I/O card. The connection configurations of ACL series cards and the ACLD-9185 are shown as below.

2.6.1. Multi-function Cards and ACLD-8195



PCI-9112, ACL-8316
ACL-812PG, ACL-8112 Series
ACL-8111, ACL-8216
ACL-6126, ACL-8118 Series

2.6.2. ACL Digital I/O Cards and ACLD-8195



ACL-7120, ACL-720

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ACLD-9182

This chapter describes how to install and use the ACLD-9182. At first, the contents in the package and unpacking information that you should care are described. The jumpers setting for the ACLD-9182 digital input channel configuration (Isolated or Non-isolated) are also specified.

3.1 What You Have

In addition to this *User's Manual*, the package includes the following items:

- ACLD-9182 16-channel Opto-isolated D/I Board
- one 1-meter 20-pin flat cable assembly

If any of these items is missing or damaged, contact the dealer from whom you purchased the product. Save the shipping materials and carton in case you want to ship or store the product in the future.

3.2 ACLD-9182's Layout

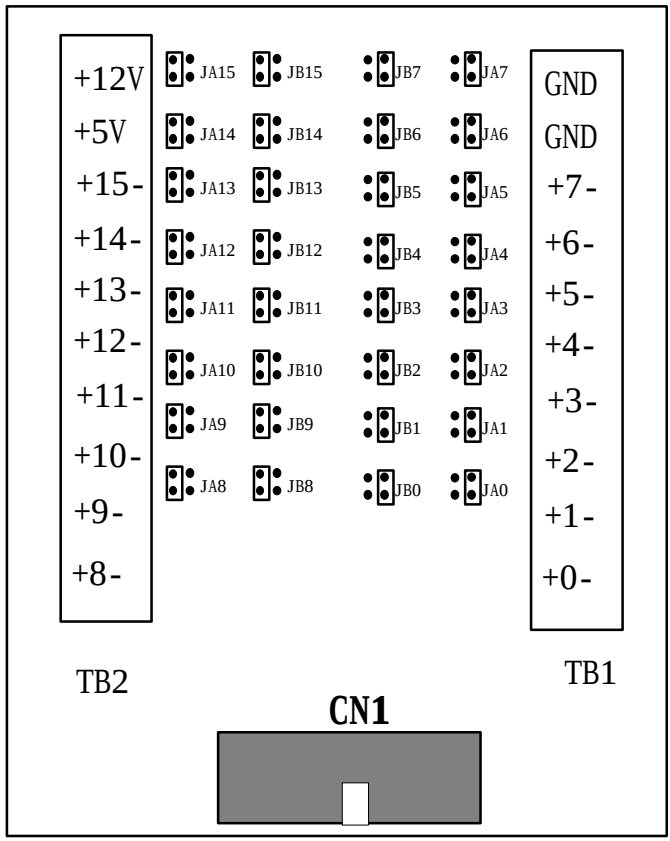


Figure 3.1

3.3 Connector Pin Assignments

The relationship between connector CN1's pins (shown in figure 3.2 below), terminal blocks(TB1 & TB2), LED's, and their related jumpers are shown in the following table (Table 3.1):

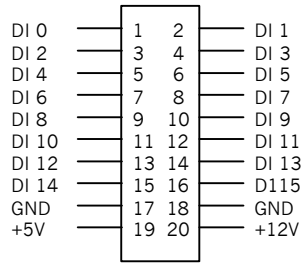


Figure 3.2 Pin Assignment of CN1

CN1 PIN NO.	D/I Channel	TB1 & TB2 LABEL	L ED NO.	RELATED JUMPER
1	DI 0	TB1 0+,0-	0	JA0, JB0
2	DI 1	TB1 1+,1-	1	JA1, JB1
3	DI 2	TB1 2+,2-	2	JA2, JB2
4	DI 3	TB1 3+,3-	3	JA3, JB3
5	DI 4	TB1 4+,4-	4	JA4, JB4
6	DI 5	TB1 5+,5-	5	JA5, JB5
7	DI 6	TB1 6+,6-	6	JA6, JB6
8	DI 7	TB1 7+,7-	7	JA7, JB7
9	DI 8	TB2 8+,8-	8	JA8, JB8
10	DI 9	TB2 9+,9-	9	JA9, JB9
11	DI 10	TB2 10+,10-	10	JA10, JB10
12	DI 11	TB2 11+,11-	11	JA11, JB11
13	DI 12	TB2 12+,12-	12	JA12, JB12
14	DI 13	TB2 13+,13-	13	JA13, JB13
15	DI 14	TB2 14+,14-	14	JA14, JB14
16	DI 15	TB2 15+,15-	15	JA15, JB15
17		GND		
18		GND		
19		+5V		
** 20		+12V		

Table 3.1

****** Pin-20 (+12V) depends on the output form digital input connector, such as ACL-8111, ACL-8112 are ***+12V***, and ACL-7120 is ***strobe*** signal.

3.4 Input Mode Setting

There are 32 jumpers (JA0...JAP15, JB0...JB15) associated with each digital input channel for configuring the channel as isolated or non-isolated (Dry Contact) input. The equivalent circuit of a input channel is shown in the Figure.3.3. The digital input channels and their corresponding jumper is shown in the Table 3.1.

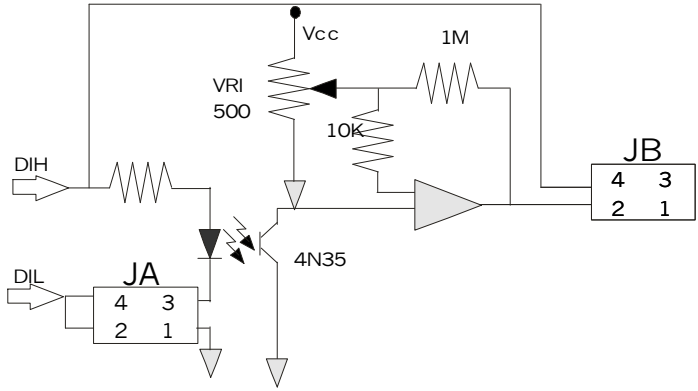


FIgure 2.2

Each channel comes equipped with a pair of jumpers for either isolated or non-isolated selection. If the jumper plugs are installed on the upper posts of JAn, and JBn (n =0..15), the jumper n is configured as ISOLATED, otherwise the jumper plugs should be installed on the lower posts to configure as Non-isolated. Figure 3.4 are given here to illustrate how to configure the digital input channel 1 to 7.

The jumper setting for isolated / non-isolated of input channels 8~15 are different from channel 1~7. Figure 3.5 illustrate how to configure the digital input channel 8~15.

For channel 0~7 (n=0..7)

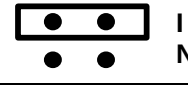
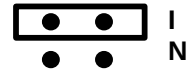
Input Signal Selection	Isolated	Non-isolated
JAn		
JBn		

Figure 3.4

For channel 8~15 (n=8..15)

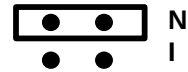
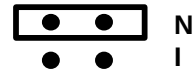
Input Signal Selection	Isolated	Non-isolated
JAn		
JBn		

Figure 3.5

3.5 Adjust Threshold for Isolated Mode

The input isolated mode of the ACLD-9182 is actually driven by current instead of voltage level. The logic low means the input leakage current should be less than 1mA, otherwise the input status will be treated as logic High (1).

To avoid the logic high voltage as low, the ACLD-9182 is equipped with a variable resistor VR1, which is used to adjust the threshold level for all of the 16 isolated input channels.

Adjusting procedures:

1. Apply a +5V voltage source at DIH and DIL along with a 4K Ohms resistor. It lets input current limit about 1mA.

2. Adjust the VR1 until the LED0 is off.

Follow the adjusting procedures, if channel 0's input voltage is low, and the input leakage current is less than 1mA, the input status is considered as logical low (TTL 0). To prevent higher input leakage current, you can change the 3.9K Ohms resistor by a lower one, and use the above procedures to meet your requirements.

3.6 Customize the Current Limit Resistor

The default voltage input range of the ACLD-9182 is from 0V to 24V. To accept higher voltage input, you should replace the current limit resistor, RA0...RA15, for each channel.

The current rating of the 4N35 photocoupler is about 60mA. It is recommended that the input current is within 20mA. If you want to choose the proper current limit resistor, please use the following formula to calculate the input current(IF).

$$Vin = I_F \times Ri$$
$$Pw = Vin \times I_F$$

Where

Vin : Input voltage
I_F: Input current
Pw : Power rating
Ri : Current Limit resistor

For example:

If the input voltage is 40V, then the maximum input current is within 20mA, using the above formular:

Ri = 40 (V) / 20 (mA) = **2 KW**
Pw = 40 (V) X 20 (mA) = **0.8 W**

You should choose a 2K**W** resistor and the power rating of this resistor should be 1 Watt.

4

ACLD-8125

This chapter describes how to install and use the ACLD-8125. At first, the contents in the package and unpacking information that you should care are described. The circuits for the ACLD-8125 are also specified.

4.1 What You Have

In addition to this *User's Manual*, the package includes the following items:

- ACLD-8125 Signal Conditioning Daughter Board
- One 1-meter 37-pin flat cable assembly

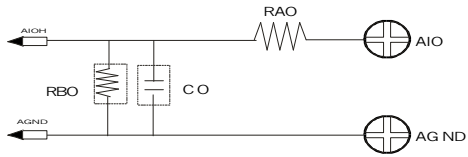
If any of these items is missing or damaged, contact the dealer from whom you purchased the product. Save the shipping materials and carton in case you want to ship or store the product in the future.

4.2 ACL-8125 Connections

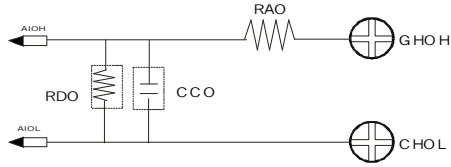
The ACL-8125 comes equipped with a DB-37 female connector, this board is designed for ACL-8112/8216/8316 and PCI-

9111/9112 series cards for convenient wiring. This board provides two kinds of wiring style: single-ended and differential. The connections are illustrated as following figures.

(1) Single-ended connection

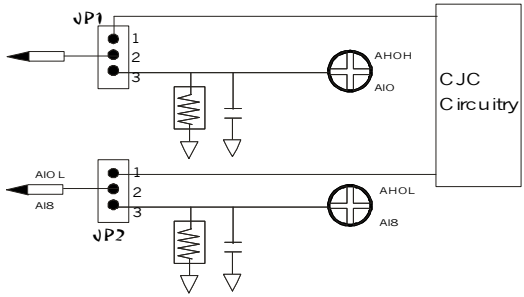


(2) Differential connection



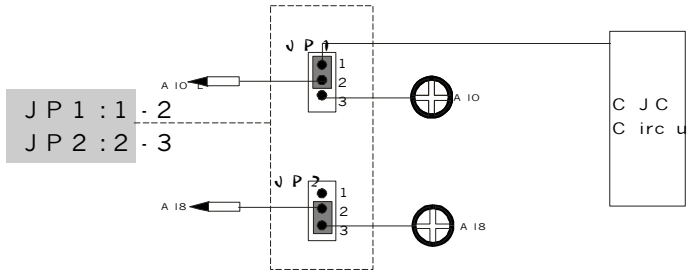
4.3 CJC Output Configurations

An on-board Cold Junction Compensation (CJC) circuit is provided by the ACLD-8125 for thermal couple measurement. The CJC is connected with Channel 0 of the internal connector. The circuit of CJC and CH0 is shown as following:

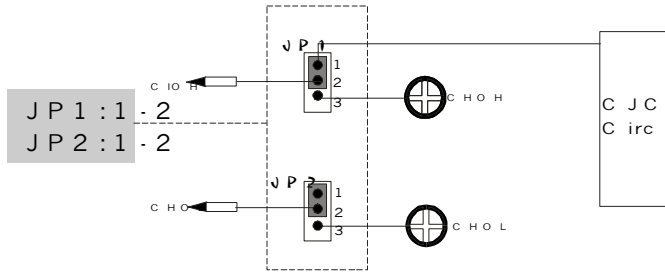


The jumper setting for CJC output configuration are as following:

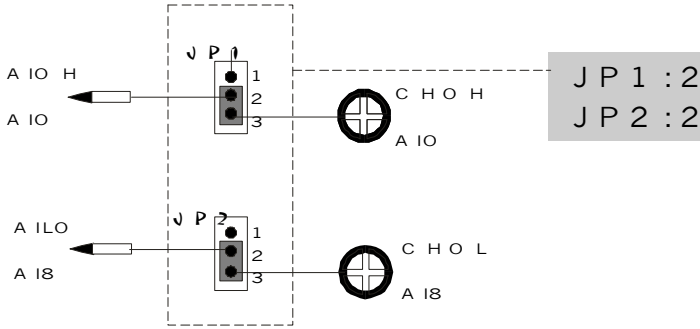
(1) Single-ended with CJC



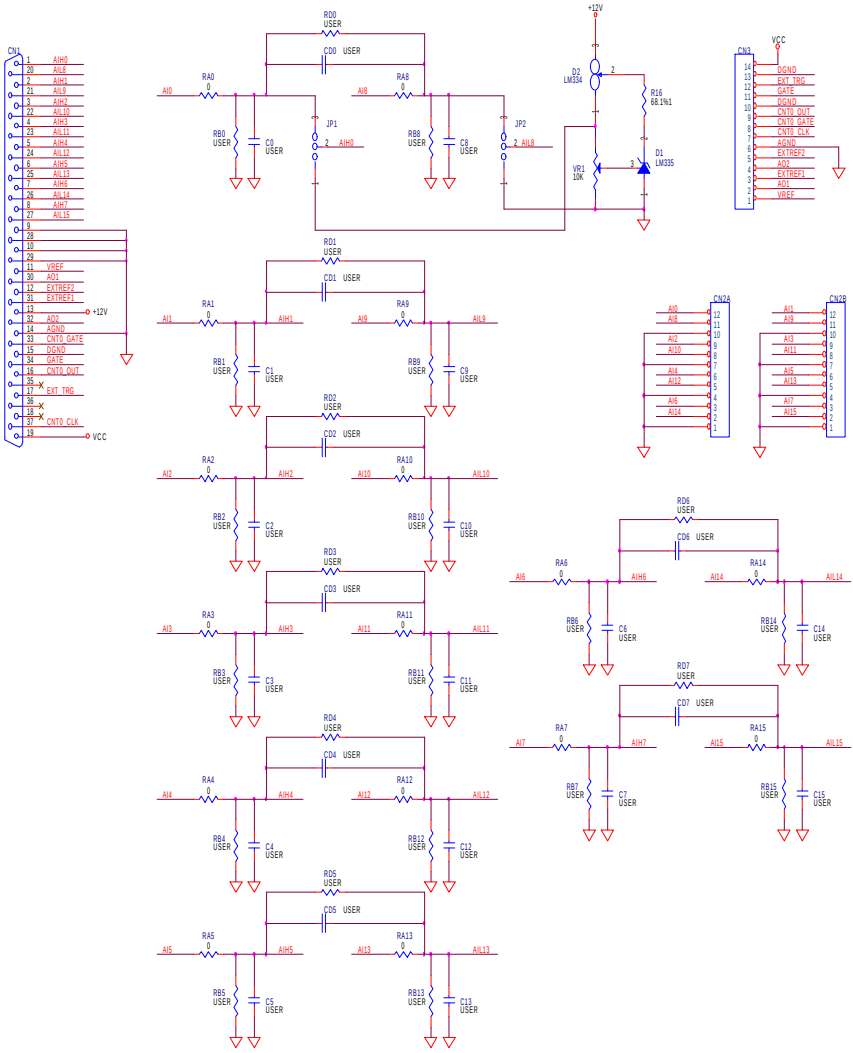
(2) Fully Differential with CJC



(3) Disable CJC



4.4 Circuit Diagram of ACLD-8125



Product Warranty/Service

Seller warrants that equipment furnished will be free form defects in material and workmanship for a period of one year from the confirmed date of purchase of the original buyer and that upon written notice of any such defect, Seller will, at its option, repair or replace the defective item under the terms of this warranty, subject to the provisions and specific exclusions listed herein.

This warranty shall not apply to equipment that has been previously repaired or altered outside our plant in any way as to, in the judgment of the manufacturer, affect its reliability. Nor will it apply if the equipment has been used in a manner exceeding its specifications or if the serial number has been removed.
Seller does not assume any liability for consequential damages as a result from our products uses, and in any event our liability shall not exceed the original selling price of the equipment.

The equipment warranty shall constitute the sole and exclusive remedy of any Buyer of Seller equipment and the sole and exclusive liability of the Seller, its successors or assigns, in connection with equipment purchased and in lieu of all other warranties expressed implied or statutory, including, but not limited to, any implied warranty of merchant ability or fitness and all other obligations or liabilities of seller, its successors or assigns.

The equipment must be returned postage-prepaid. Package it securely and insure it. You will be charged for parts and labor if you lack proof of date of purchase, or if the warranty period is expired.