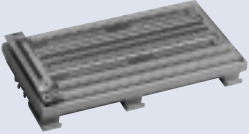
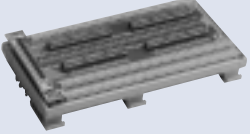
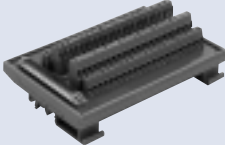
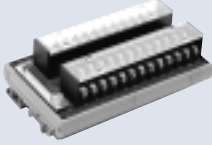
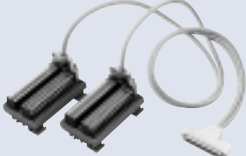
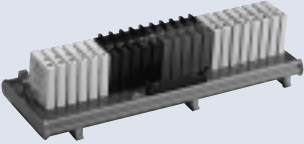
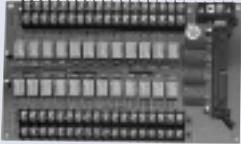

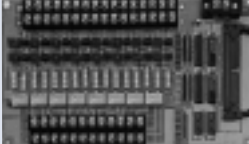
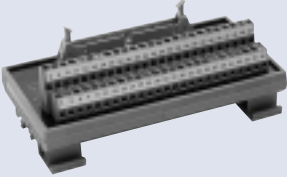
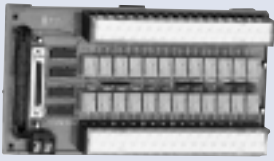
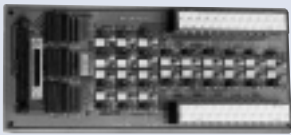
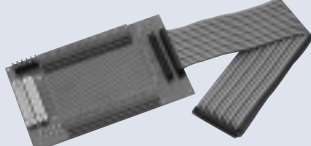
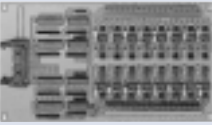
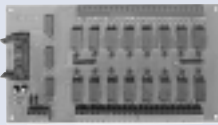
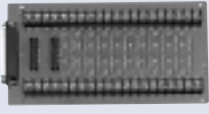

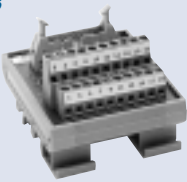

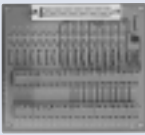
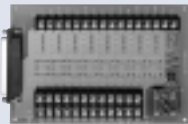
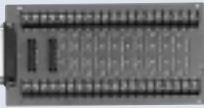
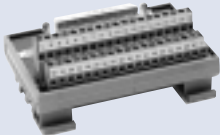


# Termination Boards Selection Guide

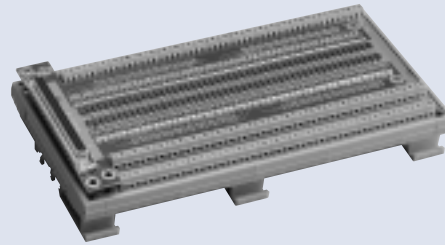
100-pin or 50-pin SCSI-type Connectors				
3E-2 	3E-2 	3E-3 	3E-3 	3E-3 
<b>DIN-96DI</b> (Includes ACL-102100)	<b>DIN-96DO</b> (Includes ACL-102100)	<b>DIN-100S</b> (Includes ACL-102100)	<b>DIN-50S</b> (Includes ACL-10250)	<b>DIN-502S</b>
50-pin Ribbon Connectors				
3E-6 	3E-4 	3E-5 	3E-6 	
<b>DIN-24G or TB-24G</b> ( for Grayhill IO modules)	<b>TB-24R</b> (Includes ACL-10150-1.5)	<b>TB-24P</b> (Includes ACL-10150-1.5)	<b>TB-16P8R</b> (Includes ACL-10150-1.5)	
3E-3 	3E-4 	3E-5 	3E-6 	
<b>DIN-50P</b>	<b>DIN-24R</b>	<b>DIN-24P</b>	<b>TB-24</b> (Includes ACL-10150-1.5)	
20-pin Header Connectors				
3E-8 	3E-8 	3E-7 	3E-7 	3E-3 
<b>ACLD-9182A</b> (Includes ACL-10120-1)	<b>ACLD-9185</b> (Includes ACL-10120-1)	<b>ACLD-9188</b> (Includes 2 ACL-10120-1)	<b>ACLD-9178</b> (Includes 2 ACL-10120-1)	<b>DIN-20P</b>
37-pin D-type Connectors				
3E-7 	3E-7 	3E-9 	3E-7 	3E-3 
<b>ACLD-9137</b> (male) <b>ACLD-9137F</b> (female)	<b>ACLD-9138</b> (Includes ACL-10237-1)	<b>ACLD-8125</b> (Includes ACL-10137-1)	<b>ACLD-9188</b> (Includes 2 ACL-10120-1)	<b>DIN-37D</b>

# DIN-96DI

## Termination Board with 96-Channel Opto-Isolated Digital Inputs

### Features

- 96 Opto-Isolated digital input channels
- For use with PCI-7396
- AC or DC polarity-free DI
- Screw terminals for easy field wiring



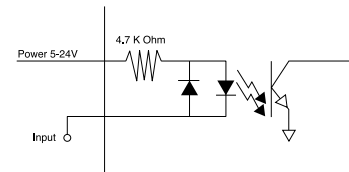
### Specifications

- Numbers of channel: 96
- Opto-isolator: PC3H4
- Input impedance: 4.7K Ohms
- Input voltage range: 0~24VDC
- Input voltage threshold:
  - $20V_{DC}$  for external 24V input
  - $8.8V_{DC}$  for external 12V input
  - $1.8V_{DC}$  for external 5V input
- Isolation voltage: 2,500 Vdc channel-to-ground
- Connector: 100-Pin SCSI-type
- Dimension: 112.7 mm x 225 mm
- Operating temp.:  $0^{\circ} \sim 60^{\circ}C$
- Storage temp.:  $-20^{\circ} \sim 80^{\circ}C$
- Humidity: 5~95%, non-condensing
- Power consumption:
  - 5V: 48mA(max.) from SCSI cable
  - External digital input current:
    - 24V: 490mA(max.)
    - 12V: 250mA(max.)
    - 5V: 102mA(max.)

### Ordering Information

#### DIN-96DI

96 Channel Isolated Digital Input  
Terminal Board  
(includes 1m ACL-105100-1)

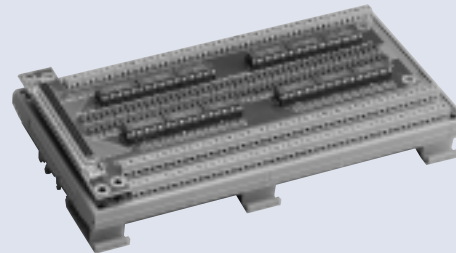


# DIN-96DO

## Termination Board with 96-Channel Opto-Isolated Digital Outputs

### Features

- 96 Opto-Isolated digital output channels
- For use with PCI-7396
- On-board relay driver circuitry
- Screw terminals for easy field wiring



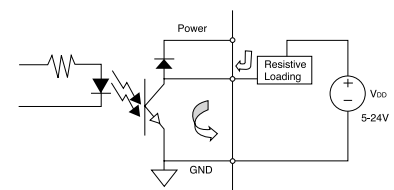
### Specifications

- Numbers of channel: 96
- Opto-isolator: PC3H7
- Output type: Darlington transistors, open collector up to 35Vdc
- Sink current:
  - 350mA max. @ 100% duty, one of transistors device ON
  - 370mA @ duty 10% for all transistors devices ON
  - 140mA @ duty 50% for all transistors devices ON
  - 60mA @ duty 100% for all transistors devices ON
- Isolation voltage: 2500 Vrms
- Dimensions: 112.7 mm x 225.0 mm
- Operating temp.:  $0^{\circ}C \sim 60^{\circ}C$
- Storage temp.:  $-20^{\circ} \sim 80^{\circ}C$
- Power consumption:
  - 5V: 102mA(max.) from cable

### Ordering Information

#### DIN-96DO

96 Channel Isolated Digital Input  
Terminal Board (includes 1m ACL-105100-1)



# DIN Rail Screw Terminal Boards

## Features

### General

- Universal screw terminal boards for easily wiring
- DIN socket for easily mounting on DIN-rail

### DIN-100S

- General purpose termination board for 100-pin SCSI-II cable
- On-board connector type is female 100-pin
- Shipped with 1 meter ACL-102100 cable
- Dimensions: 157 x 112 x 51 mm<sup>3</sup> (WxLxH)

### DIN-50S

- General purpose termination board for 50-pin SCSI -II cable
- On-board connector type is female 50-pin
- Plastic cover for protection of wiring
- Shipped with 1 meter ACL-102100 cable
- Dimension: 124 x 77 x 50 mm<sup>3</sup> (WxLxH)

### DIN-502S

- Split 100 signals of 100-pin SCSI-II connector to two DIN-50S sockets
- Shipped with 1 meter ACL-10252 cable

### DIN-50P

- General purpose termination board for 50-pin ribbon flex cable
- Shipped with 1.5 meters ACL-10150-1.5 cable
- Dimension: 145 x 77 x 52 mm<sup>3</sup> (WxLxH)

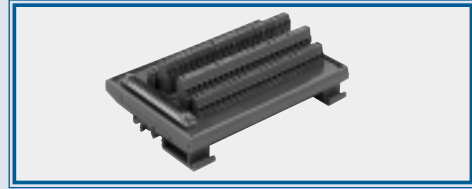
### DIN-37D

- General purpose termination board for D-type 37-pin cable
- On-board connector type is female 37-pin
- Shipped with 1 meter ACL-10137-1 cable
- Dimension: 112 x 77 x 52 mm<sup>3</sup> (WxLxH)

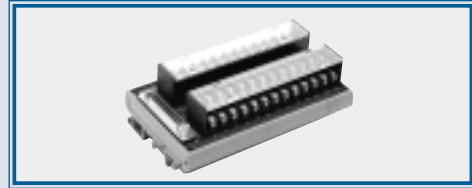
### DIN-20P

- General purpose termination board for 20-pin ribbon flex cable
- Shipped with 1 meters ACL-10120-1 cable
- Dimension: 67 x 77 x 51 mm<sup>3</sup> (WxLxH)

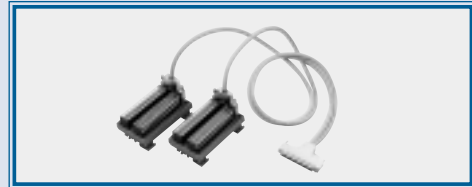
DIN-100S



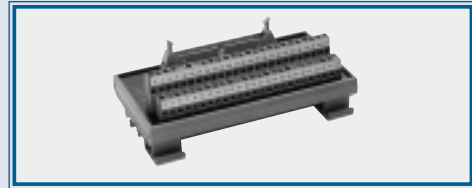
DIN-50S



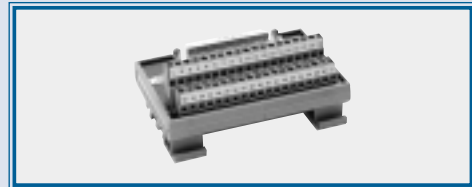
DIN-502S



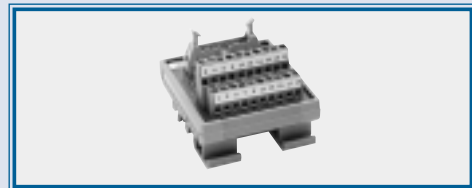
DIN-50P



DIN-37D



DIN-20P



## Ordering Information

### DIN-100S

Termination board with 100-pin SCSI-II connector with DIN socket

### DIN-50S

Termination board with 50-pin SCSI-II connector with DIN socket

### DIN-502S

Two pieces of termination board DIN-50S with cable

### DIN-50P

Termination board with 50-pin ribbon connector with DIN socket

### DIN-37D

Termination board with 37-pin D-type connector with DIN socket

### DIN-20P

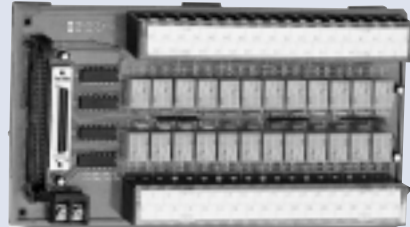
Termination board with 20-pin ribbon connector with DIN socket

# DIN-24R/TB-24R

Termination Board  
With 24 Relay Outputs

## Features

- 24 single-pole, double-throw (SPDT form C) relays
- 50-pin Opto-22TM compatible connector
- 220VDC/250VAC maximum switching voltage
- 2A DC, AC maximum switching current
- On-board relay driver circuitry
- LEDs indicate relay status
- Screw terminals for easy field wiring
- DIN-24R with DIN socket is available for easily mounting
- 50-pin SCSI-type connector is available for interface with ND-6058



DIN-24R



TB-24R

## Introduction

The DIN-24R and TB-24R relay output boards are designed for industrial control applications. It contains 24 electro-mechanical SPDT relays that can be driven by the 24-bit digital output ports of the PCI-7248, PCI-7296, ACL-7122, ACL-7124 and PET-48DIO, ND-6058.

Each relay's switching capacity is 60W/120V. The normally open, normally closed, and common contacts for each relay are made available for maximum flexibility.

## Specifications

- 24 Matsushita DS-Relays
- Indication display: 24 LEDs
- Indication mode:
  - logic "1": LED on, relay set
  - logic "0": LED off, relay reset
- Relay form: Single Pole, Double Throw (SPDT)
- Input terms: Normally open or normally closed
- Relay coil:

	12V Version	24V Version
Relay model	DS1E-S-DC1 2V	DS1E-S-DC2 4V
Nominal voltage	12VDC	24VDC
Min. set and reset voltage	9.6VDC	19.2VDC
Max. allowable voltage	19.2VDC	38.4VDC
Coil resistance	1600Ω	6400Ω

- Power consumption:
  - TB-24R: +5V @ 40mA for each relay is ON
  - DIN-24R:
    - +5V @ 200mA max.
    - +12V @ 33mA for each relay
    - 530 mA for all relays on.
- Operating temperature: 0° ~ 60°C
- Storage temperature: -20° ~ 80°C
- Operating humidity: 5 ~ 95%, non-condensing
- Dimensions:
  - TB-24R: 220 mm x 132 mm
  - DIN-24R: 205 mm x 114 mm

## Matsushita DS-Relay

- High sensitivity, high switching power
- UL/CSA recognized
- Contact material: Gold-clad silver
- Rating (resistive):
  - Max. switching power: 60W, 125VA
  - Max. switching voltage: 220VDC, 250VAC
  - Max. switching current: 2A DC, AC
  - Max. carrying current: 3A DC, AC
- UL/CSA rating:
  - 6A 125V AC
  - 6A 10V DC
  - 2A 30V DC
- Expected life (min. operations):
  - Mechanical: 10<sup>8</sup>
  - Electrical 2A 30V DC resistive: 5 x 10<sup>5</sup>
  - Electrical 1A 30V DC resistive: 2 x 10<sup>6</sup>

- Coil (polarized):
  - Min. set and reset power: 45mW
  - Normal set and reset power: Approx. 90mW
- Max. operating speed: 20cpm at rated load
- Operating time (at nominal voltage): 3 ms typical. 10ms max..
- Release time (at nominal voltage): 2 ms typical. 5ms max..
- Set time (latching): Approx. 3msec.
- Initial breakdown voltage:
  - Between open contacts: 500 Vrms
  - Between contact and coil: 1,000 Vrms
- Initial insulation resistance:
  - Min. 1,000MΩ

## Ordering Information

### TB-24R/12

Termination Board with 24 Relay Outputs and 12 Volt Coil  
(includes one 1.5meters, 50-pin flat cable)

### TB-24R/24

Termination Board with 24 Relay Outputs and 24 Volt Coil  
(includes one 1.5meters, 50-pin flat cable)

### DIN-24R/24, DIN-24R/12

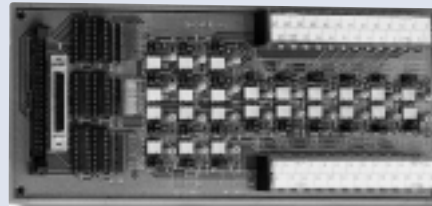
Termination Board of 24 Relay Outputs and 24 or 12 Volt Coil with DIN Socket

# DIN-24P/TB-24P

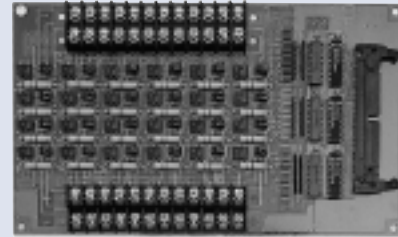
Termination Board with  
24 Opto-isolated Digital Inputs

## Features

- 24 opto-isolated digital input channels
- 50-pin Opto-22TM compatible connector
- 50-pin SCSI-type connector available on DIN-24R to interface with ND-6058
- AC or DC polarity-free input, isolated or dry-contact (without isolation) by jumper selection
- Thresholds from 3VDC to 24VDC, adjustable by changing current-limiting resistors
- 2500Vrms optical isolation
- LEDs indicate input channel status
- Jumper selectable for voltage input mode or dry contact input mode
- Screw terminal for easy field wiring



DIN-24P



TB-24P

## Introduction

The DIN-24P and TB-24P digital input termination boards feature high-voltage opto-isolation on all input channels. They provide 24 channels that are accessed through a single 50-pin connector, standard on the NuDAQ digital I/O boards, such as ACL-7122, ACL-7124, PET-48DIO, and PCI-7248, PCI-7296 and ND-6058.

Each opto-isolated digital input accepts from 3VDC to 24VDC or 6.3mA to 50mA by changing a current limiting resistor for logic high. In addition, opto-isolated inputs provide isolation between separate channels and between each input channel of your PC system. Isolation prevents floating potential and ground loop problems from damaging the PC.

## Specifications

### General Information

- Numbers of channel: 24
- Opto-isolator: 4N35
- Input impedance: 1.2K Ohms or 4.7K Ohms for 24V input version
- Isolation voltage: 2500VDC or Peak AC
- Input mode: Isolation or dry contact (non-isolation)
- Input electrical characteristics:
  - Logic "Low": 0.8V max.
  - Logic "High": 3VDC to +24VDC
  - Logic input high current: 6.3mA to 50mA

- Response time:
  - 20 ms without AC filter
  - 2.2 ms with AC filter
- Dry contact input:
  - Internal pull-up voltage supply : +5VDC
  - Logic "1": Input Closed
  - Logic "0": Input Open
- Indication display: 24 LEDs
  - Logic "1": LED on
  - Logic "0": LED off
- Power requirement: +5V@40mA (max.)
- Operating temperature: 0° ~ 60°C
- Storage temperature: -20° ~ 80°C
- Operating humidity: 5 ~ 95%, non-condensing
- Dimension:
  - TB-24P: 220 mm x 132 mm
  - DIN-24P: 205 mm x 114 mm

## Ordering Information

### TB-24P

24-CH Isolation/Dry contact termination board (includes one 1.5 meter 50-pin flat cable)

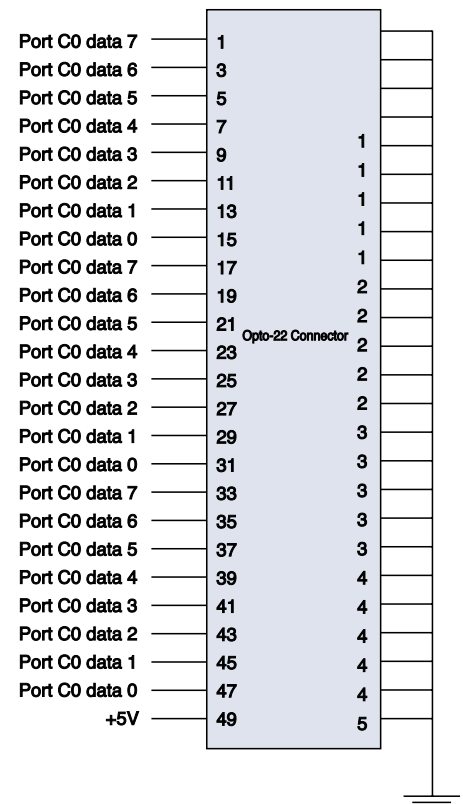
### DIN-24P

24-CH Isolation/Dry contact termination board with DIN socket (include 1 m cable ACL-10250-1)

### DIN-24/P24, TB-24P/24

24V input version of DIN-24P & TB-24P

## Pin Assignments for 50-pin connector of TB-24P



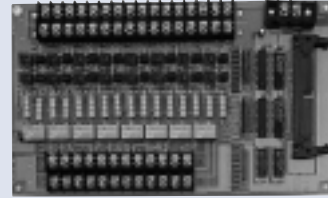


# TB-16P8R

## Termination Board with 16-CH-Isolated DI & 8-CH Relay

### Features

- 16 isolated digital input and 8 SPDT form-C relay output
- 2500V rms isolation voltage
- Maximum 220V DC / 250 V AC switching voltage, 2A DC switching current
- LEDs indicated relay and input status
- 50-pin male mating connector
- Screw terminal for easily filed wiring



### Specifications

- Number of isolated DI channels: 16
  - +5V@ 40mA (max.)
  - +12V@ 100mA (max.)
- Electronics characteristics of isolated DI: refer to the TB-24P's specifications
- Number of relay output channels: 8
- Electronics characteristics of relay: refer to the TB-24R's specifications
- Operating temperature: 0° ~ 60°C
- Storage temperature: -20° ~ 80°C
- Operating humidity: 5~95%, non-condensing
- Power requirements:
  - Dimensions: 220 mm x 132 mm

### Ordering Information

#### TB-16P8R/12

Termination Board with 16 Opto-isolated inputs & 8 relay outputs and 12 volt relay coils. (includes one 1.5 meter 50-pin flat cable)

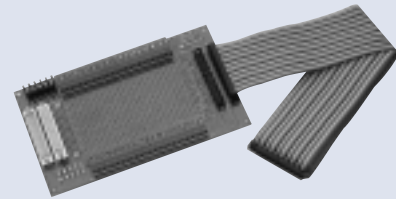
#### TB-16P8R/24

24V relay coil version

# TB-24

## General Purpose Termination Board for DB-37 and Opto-22 Connectors

- Connects easily to all 50-pin mating connector or 37-pin D type connector system boards
- Breadboard area for customer design
- 37-pin male D type connector: 2
- 50-pin male mating connector: 2
- Breadboard area: 125 mm x 73 mm



### Ordering Information

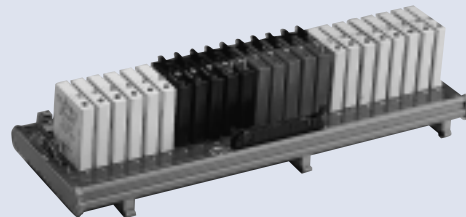
#### TB-24

General Purpose Termination Board (Includes one 1.5 meter 50-pin flat cable)

# DIN-24G

## Termination Board for 24-CH Grayhill I/O Modules

- Supports any standard or miniature G5 size modules
- Termination board for installing Grayhill I/O modules
- At most 24 modules can be installed
- Every 8 channels form a group of input or output channels



### Ordering Information

#### DIN-24G

24-CH Grayhill I/O module Termination Board with DIN socket

# ACLD Screw Terminal Boards

## Features

### General

- Low cost universal screw terminal board
- Blank pads accommodate applications such as break detection, low-pass filter, current shunt and voltage attenuator on ACLD-9178, 9188, 9138
- Table-top mounting using nylon standoffs

### ACLD-9178

- 40 terminal points for two 20-pin connectors
- Reliable screw clamp terminal blocks
- Dimension: 102 mm x 114 mm

### ACLD-9188

- 40 terminal points for two 20-pin flat cable connectors or one DB-37 connectors
- Reliable screw clamp terminal blocks

### ACLD-9138

- One 37-pin DB-37 connector
- Blank RC circuits for analog input boards
- Reliable screw clamp terminal blocks

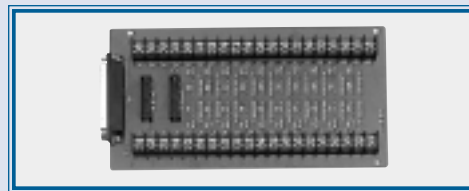
### ACLD-9137 / ACLD-9137F

- ACLD-9137 is with 37-pin DB-37 male connector, ACLD-9137F is with female connector
- Reliable screw clamp terminal blocks

ACLD-9178



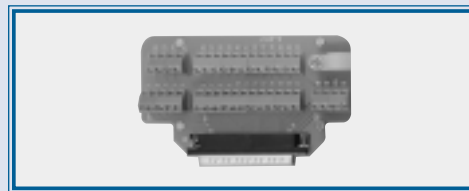
ACLD-9188



ACLD-9138



ACLD-9137



Termination Boards

## Ordering Information

### ACLD-9178

Screw Termination Board for Two 20-pin Headers (Includes two 20-pin flat cable ACL-10120-1)

### ACLD-9188

Industrial Termination Board

### ACLD-9138

Screw Termination Board for DB-37 Connector (Includes 1 meter cable ACL-10237-1)

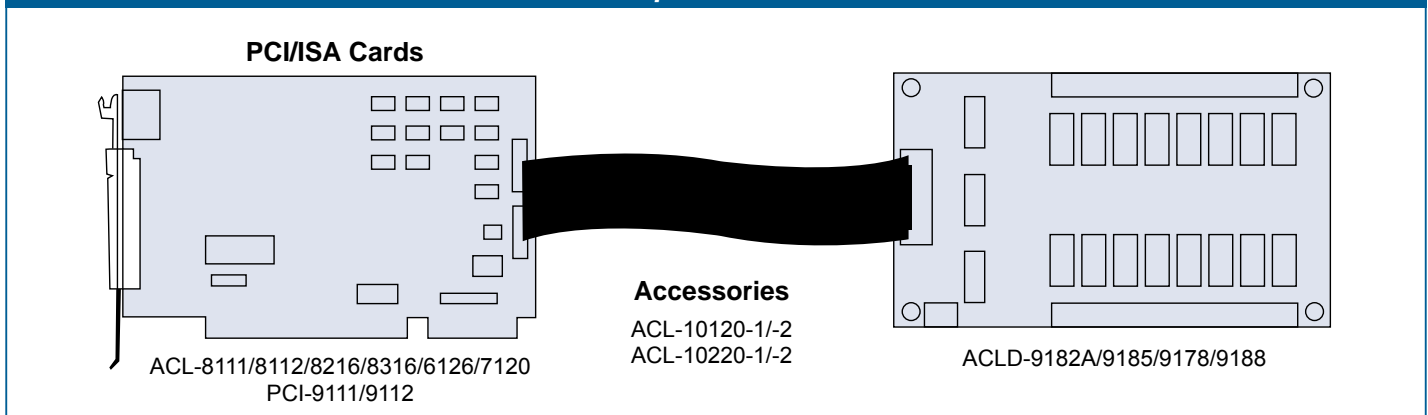
### ACLD-9137

Screw termination board with male DB-37 Connector

### ACLD-9137F

Screw termination board with female DB-37 Connector

## Selection Guide of the 20-pin Header ACLD Termination Board

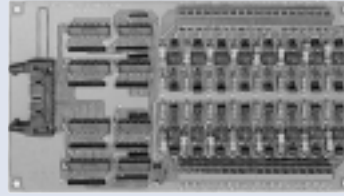


# ACLD-9182A

## Termination Board with 16-Channel Opto-Isolated Digital Inputs

### Features

- 16 Opto-Isolated digital input channels
- For use with 20-pin digital input connector of NuDAQ cards
- AC or DC polarity-free digital input
- On-board LEDs reflect the input logic status
- Screw terminals for easy field wiring
- Isolation and dry contact



### Specifications

- Number of channels: 16
- Opto-isolator: 4N35
- Input impedance: 1.2K Ohms
- Input voltage range: 0~24VDC
- Threshold voltage: 1.5VDC
- Isolation voltage: 1,000 Vdc channel-to-channel and channel-to-ground
- Input mode: Isolation and Dry Contact Input Range
- Response time: 20msec without AC filter
- 2.2m sec with AC filter
- Connector: 20-Pin flat ribbon cable connector
- Screw terminal: #22 to #12 AWG wires
- Dimension: 205 mm x 114 mm
- Operating temp.: 0°~ 60°C
- Storage temp.: -20°~ 80°C
- Humidity: 5~95%, non-condensing

### Ordering Information

#### ACLD-9182A

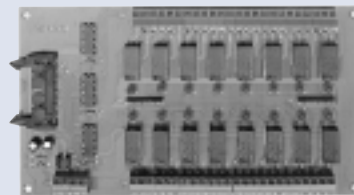
16 Channel Isolation/Non-Isolation DI Terminal Board (includes 1m 20-pin flat cable ACL-10120-1)

# ACLD-9185

## 16-Channel Output Termination Board

### Features

- 16 Single-Pole-Double-Throw (SPDT Form C) Relays
- For use with 20-pin digital input connector of NuDAQ cards
- LED Indicators to show relay status
- On-board relay driver circuitry
- Screw terminals for easy field wiring



### Specifications

- Number of channels: 16
- Relay type: SPDT (Form C)
- Contact rating:
  - AC 120V/0.5A Resistive
  - DC 30V/1A Resistive
- Breakdown voltage: 500VAC 1 min. DC/Peak AC min.
- Relay ON time: 6 msec typical
- Relay OFF time: 3 msec typical
- Control logic: Input TTL High (5V) relay on
- Insulation resistance: 100M Ohms
- Life expectancy: > 5 million operations at full load
- Dimension: 205mm x 114cm
- Operating temp.: 0°~ 60°C
- Storage temp.: -20°~ 80°C
- Humidity: 5~95%, non-condensing
- Power consumption:
  - +12V: 33mA for each relay
  - 528 mA for all relays on
  - +5V: 200mA maximum

### Ordering Information

#### ACLD-9185

16 Channel Relay Output Terminal Board (includes 1m 20-pin flat cable ACL-10120-1)

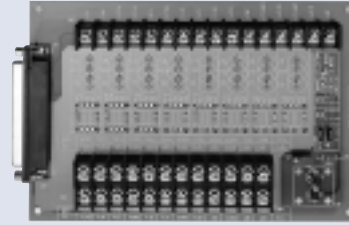


# ACLD-8125

## Termination Board with Cold-Junction Temperature Sensor

### Features

- Low cost universal screw terminal board
- Blank pads accommodate applications such as break detection, low-pass filter, current shunt and voltage attenuator
- Table-top mounting using nylon standoffs
- One DB-37 connector for multi-function DAQ boards
- Reliable screw clamp terminal blocks



### Specifications

- Cold-junction temperature sensor
  - LM334 & LM335 generate voltage proportional to temperature,
  - Jumper selectable SE or DI output
  - Output to analog input channels #0
  - Power from DB-37 Pin-13: +12V
  - Calibrated by VR
- DB-37 Connector
  - Pin1..8: Single-ended voltage input channel 0~7
  - Pin10..17: Single-ended voltage input channel 8~15 or differential input channel 0~7
  - Analog ground screw terminal for every analog input channels
  - Screw terminal for two analog output and their reference voltage
  - Screw terminal for counter input, output and gate signals
  - Screw terminal for +5V and external A/D trigger
- Dimension: 168 mm x 114 mm

### Ordering Information

#### ACLD-8125

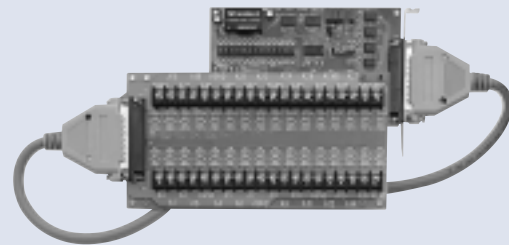
Termination Board with cold-junction temperature sensor

# ACLD-9881

## Termination Board of General Purpose 32-CH Signal Conditioning

### Features

- Low cost universal screw terminal board
- Table-top mounting using nylon standoffs
- Pin definition for 32-CH analog input board such as ACL-8113 and PCI-9113A.
- Blank RC-filter pads accommodate applications such as break detection, low-pass filter, current shunt and voltage attenuator
- Industrial type terminal blocks permit heavy-duty and reliable connection of signals
- One 37-pin connector



### Specifications

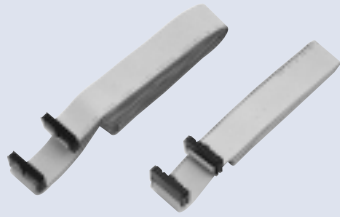
- Number of screw terminals: 40
  - 32-Screw terminal for AI signal
  - 8 Screw terminal for GND
- Number of RC-filter pads: 32
- Dimension: 221mm x 105cm
- Connector: DB-37
- Pin definition: The same as ACL-8113 and PCI-9113A
- Pin 9,10,28,29 are grounding pins.

### Ordering Information

#### ACLD-9881

Terminal board for general purpose 32-CH signal conditioning

# Accessories



**ACL-10120-1/-2**  
20-pin Flat Cable, 1M/2M



**ACL-10220-1/-2**  
20-pin Shielded & Grounded Cable, 1M/2M



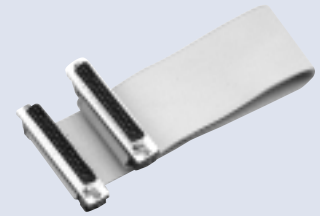
**ACL-10232**  
DB-9 RS-232 male-female Cable, 5M



**ACL-10137-1/-2**  
DB-37 Cable, 1M/2M, (male-male)



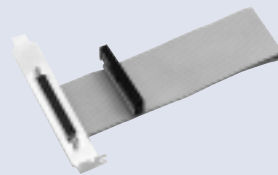
**ACL-10137-1 MF**  
DB-37 1M male/female Cable(for ACLD-9137)



**ACL-10237-1**  
DB-37 Flat Cable, 1M



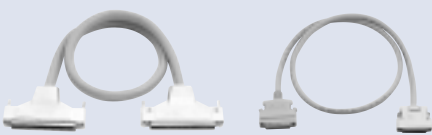
**ACL-10337**  
Two 20-pin header to DB-37 PC back panel



**ACL-10437**  
40-pin Header to DB-37 PC back panel  
(for ACL-7225, PCI-7200)



**ACL-10150-1.5**  
50-pin Flat Cable, 1.5M



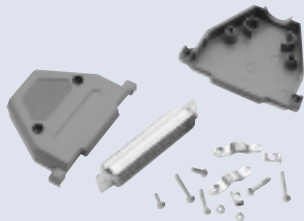
**ACL-10250:** 50-pin SCSI-II Cable  
**ACL-102100:** 100-pin SCSI-II Cable



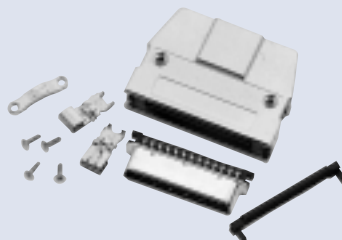
**ACL-10252**  
100-pin to 2x50-pin Cable (for DIN-502S)



**ACL-10450**  
50-pin Header to SCSI-II with PC back Panel



**ACL-10537**  
DB-37 Assembly



**ACL-10550**  
50-pin SCSI-II Assembly



**ACL-105100**  
100-pin SCSI-II Assembly