

# ACL-8316/8312 Series

## 16-CH, 16/12-Bit, 100 kS/s Multi-Function DAQ Cards

### Features

- 16-bit A/D resolution (ACL-8316)
- 12-bit A/D resolution (ACL-8312)
- Up to 100 kS/s sampling rate
- 16-CH single-ended or 8-CH differential inputs
- On-board 1k-sample A/D FIFO
- Bipolar analog inputs ranges
- Programmable gains of x1, x2, x4, x8
- Automatic analog input scanning
- DMA transfer for analog inputs
- 2-CH 12-bit multiplying analog outputs
- 16-CH TTL digital inputs and 16-CH TTL digital outputs
- 1-CH 16-bit general purpose timer/counter
- Compact, half-size PCB

- **Operating Systems**
  - Windows 2000/NT/XP/9x
  - DOS

- **Recommended Software**
  - VB/VC++/BCB/Delphi
  - Turbo C/Borland C

- **Driver Support**
  - ACLS-LVIEW
  - ACLS-DLL/DLL2
  - DOS library



### Introduction

ADLINK ACL-8316/12 series is high resolution and high performance data acquisition card based on the 16-bit PC/ISA bus architecture. Both ACL-8316 and ACL-8312 share a common architecture and core features making each card ideal for data logging and signal analysis applications.

The ACL-8316/12 series features continuous, high speed, gap-free data acquisition under Windows or DOS environments. An on-board FIFO buffer and 16-bit DMA data transfer allows the acquisition of large amounts of data without losing data. The channel auto-scanning enables a high-speed acquisition in a sequential order to select channel.

A lite(L) version of ACL-8316/12 is offered for the customer who does not need any D/A analog output channels.

### Specifications

#### Analog Input

- Number of channels: 16 single-ended or 8 differential
- Resolution: 16 bits (ACL-8316)
- Resolution: 12 bits (ACL-8312)
- Conversion time: 8  $\mu$ s
- Maximum sampling rate: 100 kS/s
- Input signal ranges (software programmable)

Gain	Input Range
1	$\pm 10$ V
2	$\pm 5$ V
4	$\pm 2.5$ V
8	$\pm 1.25$ V

#### Accuracy

Gain	Accuracy
1	0.01% of FSR $\pm 1$ LSB
2, 4	0.02% of FSR $\pm 1$ LSB
8	0.04% of FSR $\pm 1$ LSB

- Input coupling: DC
- Overvoltage protection: continuous  $\pm 35$  V
- Input impedance: 1 G $\Omega$
- Trigger modes: software, pacer, and external trigger (5 V/TTL compatible)
- FIFO buffer size: 1k samples
- Data transfers: polling, interrupt, DMA

#### Analog Output

- Number of channels: 2 voltage outputs
- Resolution: 12 bits
- Output ranges (jumper selectable)

Output ranges	
Bipolar	$\pm 10$ V
Unipolar	0 to 10 V

- Output driving capacity: 5 mA max
- Settling time: 30 $\mu$ s to 0.5 LSB
- Data transfers: programmed I/O

#### Digital I/O

- Number of channels: 16 inputs and 16 outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

#### General-Purpose Timer/Counter

- Number of channels: 1
- Resolution: 16 bits
- Compatibility: 5 V/TTL
- Base clock available: 2 MHz, external clock to 10 MHz

#### General Specifications

- IRQ levels: 3, 5, 6, 7, 9, 10, 11, 12, 15
- DMA level: 5, 6, 7 (16-bit DMA)
- I/O connector
  - 37-pin D-sub female
  - 20-pin ribbon male
- Operating temperature: 0 to 55  $^{\circ}$ C
- Storage temperature: -20 to 80  $^{\circ}$ C
- Relative humidity: 5 to 95%, noncondensing
- Power requirements

+5 V	+12 V
400 mA typical	260 mA typical

- Dimensions (not including connectors)  
163 mm x 123 mm

### Termination Boards

#### DIN-37D

Termination Board with a 37-pin D-sub Connector and DIN-Rail Mounting (Including One 1-meter ACL-10137 Cable)

#### DIN-20P

Termination Board with a 20-pin Ribbon Connector and DIN-Rail Mounting (Including One 1-meter ACL-10120 Cable)

#### ACLD-9137

General-Purpose Termination Board with a 37-pin D-sub Male Connector

#### ACLD-9138

General-Purpose Termination Board with a 37-pin D-sub Connector (Including One 1-meter ACL-10237 Cable)

#### ACLD-9178

General-Purpose Termination Board with Two 20-pin Ribbon Connectors (Including Two 1-meter ACL-10120 Cables)

#### ACLD-8125

Termination Board with a 37-pin D-sub Connector and One Cold Junction Temperature Sensor (Including One 1-meter ACL-10137 Cable)

#### ACLD-9188

General-Purpose Termination Board with Two 20-pin Ribbon Connectors and One 37-pin D-sub Connector (Including Two 1-meter ACL-10120 Cables)

#### ACLD-9182A

Termination Board with 16-CH Isolated Digital Inputs (Including One 1-meter ACL-10120 Cable)

#### ACLD-9185

Termination Board with 16-CH Relay Outputs (Including One 1-meter ACL-10120 Cable)

### Pin Assignment

#### CN1: Digital Output

DO0	1	2	DO1	DO10	11	12	DO11
DO2	3	4	DO3	DO12	13	14	DO13
DO4	5	6	DO5	DO14	15	16	DO15
DO6	7	8	DO7	DO16	17	18	DO17
DO8	9	10	DO9	DO18	19	20	DO19
+5Vout	19	20	+12Vout	+5Vout	19	20	+12Vout

#### CN2: Digital Input

DI0	1	2	DI1
DI2	3	4	DI3
DI4	5	6	DI5
DI6	7	8	DI7
DI8	9	10	DI9
DI10	11	12	DI11
DI12	13	14	DI13
DI14	15	16	DI15
GND	17	18	GND
+5Vout	19	20	+12Vout

#### CN3: Analog Input/Output & Counter/Timer

AI0 (AIH0)	1	20	(AIL0) AI8
AI1 (AIH1)	2	21	(AIL1) AI9
AI2 (AIH2)	3	22	(AIL2) AI10
AI3 (AIH3)	4	23	(AIL3) AI11
AI4 (AIH4)	5	24	(AIL4) AI12
AI5 (AIH5)	6	25	(AIL5) AI13
AI6 (AIH6)	7	26	(AIL6) AI14
AI7 (AIH7)	8	27	(AIL7) AI15
AGND	9	28	AGND
AGND	10	29	AGND
VREF	11	30	AO1
N/C	12	31	N/C
+12Vout	13	32	AO2
AGND	14	33	GATE0
DGND	15	34	GATE
COUT0	16	35	N/C
ExtTrg	17	36	N/C
N/C	18	37	EXTCLK
+5Vout	19		

### Ordering Information

- **ACL-8316**  
16-CH 16-Bit 100 kS/s Multi-Function DAQ Card
- **ACL-8316/L**  
16-CH 16-Bit 100 kS/s Multi-Function DAQ Card without analog output
- **ACL-8312**  
16-CH 12-Bit 100 kS/s Multi-Function DAQ Card
- **ACL-8312/L**  
16-CH 12-Bit 100 kS/s Multi-Function DAQ Card without analog output