

# 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	DI10	11	12	DI11
DO2	3	4	DO3	DO12	13	14	DO13	DI12	13	14	DI13
DO4	5	6	DO5	DO14	15	16	DO15	DI14	15	16	DI15
DO6	7	8	DO7	DO8	9	10	DO9	DI8	9	10	DI9
DO8	9	10	DO9	DO10	11	12	DO11	DI10	11	12	DI11
DO10	11	12	DO11	DO12	13	14	DO13	DI12	13	14	DI13
DO12	13	14	DO13	DO14	15	16	DO15	DI14	15	16	DI15
DO14	15	16	DO15	GND	17	18	GND	DI17	18	GND	
+5Vout	19	20	+12Vout	+5Vout	19	20	+12Vout				

#### CN2: Digital Input

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

AI0 (AIH0)	1	20	(AILO) 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
COU0	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