

# 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