ADLINK’s wide range of PC-based data acquisition modules support analog input, load cell sensor measurement, analog output, digital I/O, relay outputs, and timer/counter boards. Tailored to a wide range of applications and available in a variety of form factors including USB, PCI, PCI Express, PXI, CompactPCI, PC/104+, and ISA, ADLINK’s data acquisition modules embrace more than one hundred DAQ and DIO modules. All ADLINK boards support NI® LabVIEW™, MATLAB® Data Acquisition Toolbox™, Microsoft® Visual Studio .NET, and Provide Ready to Run Applications providing fast startup of ADLINK data acquisition modules without any programming requirement.

Overview

ADLINK Comprehensive Product Offerings

USB DAQ | PCI Express DAQ | General-Purpose DAQ | High-Performance DAQ

Analog Output | Digital I/O High-Speed DIO | Load Cell Measurement | Timer/Counter
Selection Guide

Selecting the right hardware, software, and accessories

PC-based data acquisition systems primarily utilize a combination of measurement hardware, accessories, and software to provide a flexible system for automating measurement, acquiring important data for analysis, and presenting the result. Even so, such systems can constitute a wide variety of different configurations and address multitudes of diverse applications. It is necessary, accordingly, to determine the various parameters of use for the DAQ system, such as type of measurement, optimum interface, accuracy levels and output resolution at each data collection point, the required number of channels, data collection speeds, and sampling rate. This selection guide provides basic overviews and specifications for ADLINK data acquisition hardware, related accessories, and supporting software. We’ve provided these simple steps to guide you through the process of selecting the very best ensemble of components for your data acquisition system:

Step 1: Hardware Selection
Select the hardware required to best suit your measurement applications. ADLINK provides a variety of boards for analog and digital I/O needs, with PCI, PCI Express, PXI, CompactPCI and USB products available. Refer to the following criteria and use the table on page 3-2 to 3-4 to determine the ideal measurement hardware for your data acquisition system.

Step 2: Accessory Selection
Most applications require additional accessories, normally acquired as separate items. Refer to pages 3-46 to 3-47 for details. These can include:

Step 3: Software Selection
More than any other single factor, software can influence system startup time, overall effectiveness, suitability for your application, and ease of modification. Refer to pages 2-1 to 2-4 for details. Major criteria in determining a choice of software include:

Hardware

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<th>Category</th>
<th>Page</th>
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Accessory

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<td>Comparison table of terminal boards and cables</td>
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Software

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<td>8 steps to get ADLINK products ready</td>
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## Analog Input/Output Cards

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**Note:**
- (1) HR: High gain
- (2) PCI-6x08A: Current Output available
- (3) Isolated analog input card
- (4) Current input: 0~20 mA
- (5) Universal input: Support voltage/current input, full/half bridge, TC, RTD, resistance measurement.
### Digital Input/Output Cards

<table>
<thead>
<tr>
<th>Interface</th>
<th>Type</th>
<th>Digital Input</th>
<th>Digital Output</th>
<th>DIO Update Rate (Max.)</th>
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<td>PCI-7249</td>
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**Note:** (1) Opto-22 compatible (2) with 6U Eurocard form factor (3) HIR: High input range

- **Low-Profile PCI Available**
- **PCI Express® Version Available**
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<td>USB-7250</td>
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Note:
(1) Windows Support for Windows 2000/XP, and Windows 7/8 x64/x86
(2) Linux Support for Ubuntu 12.04.1 LTS, Fedora Core 17, and OpenSuSe 12.1
(3) Compatible with LabVIEW™ 8.0 and above
(4) Compatible with Visual Studio .NET 2005/2008, DASK for API, and DAQPilot for Componentware
(5) MATLAB® Data Acquisition Toolbox 2.2 (and above) compliant
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<td>Linux® (Note2)</td>
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</table>
ADLINK’s USB DAQ/DIO modules leverage the expertise of ADLINK’s analog and digital design capability deliver high-performance measurement while benefiting from the simplicity and portability of USB interfaces. Enable accurate, fast, simple setup by providing built in signal conditioning, USB-powered, and plug-and-play USB connectivity. Reducing manpower requirements and associated development costs while increasing overall accuracy, ADLINK’s USB DAQ/DIO modules are the optimum solution for most measurement and industrial control applications.

**Features Highlights**

- **Removable screw terminal** with quick release enables easy signal connection, with costs saved from no extension cable or terminal board needs.
- **Lockable USB connector** enhances reliability, securing connection in vibration-prone environments.
- **USB Bus powered** eliminates the need for external power supply, suitable for portable measurement with notebook or I/O expansion requirements.
- **Multi-function stand** allows universal desktop, rail, or wall mounting.
- **Easy Device Identification** via rotary control provides convenient identification of active module when more than one module is installed.
Built-in Signal Conditioning

Extra Signal Conditioning  DAQ Card & Cable & Terminal Board

Replace with a single ADLINK USB DAQ/DIO modules

Increased Accuracy

Decreased Costs

Ready-to-Use ADLINK U-Test Utility

U-Test is a free ready-to-use testing program allowing configuration and test data acquisition with no programming required. Easy out-of-the-box configuration and generation of simple functions, including full data monitoring, logging and FFT analysis is easy and fast, with no programming requirement.

- No programming necessary for operating and full function testing of ADLINK USB DAQ/DIO
- Intuitive interface for data monitoring and logging, waveform generation, and digital I/O control panel use as virtual instrument
- Useful analysis functions, such as direct cursor measurement of traces and real-time FFT analysis
- Data exportable to Microsoft Excel for offline analysis
- Supports auto-recollection of configuration settings for future use

ADLINK USB DAQ/DIO Modules Offering

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<th>Analog Output</th>
<th>Digital I/O</th>
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<td>16 SE/8 P-DI</td>
<td>250 kS/s</td>
<td>16-Bit</td>
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<tr>
<td></td>
<td></td>
<td>8 Di/4 DO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TTL</td>
</tr>
<tr>
<td>16 SE/8 P-DI</td>
<td>250 kS/s</td>
<td>16-Bit</td>
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<tr>
<td></td>
<td></td>
<td>8 Di/4 DO</td>
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<td></td>
<td></td>
<td>TTL</td>
</tr>
<tr>
<td>8 Current-IN</td>
<td>250 kS/s</td>
<td>16-Bit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 Di/4 DO</td>
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<tr>
<td></td>
<td></td>
<td>TTL</td>
</tr>
<tr>
<td>4 DI</td>
<td>(Universal for voltage/current/full-bridge/half-bridge/TC /RTD/resistor)</td>
<td>4 Di/2 DO</td>
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<tr>
<td>2 kS/s</td>
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<td>TTL</td>
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<tr>
<td>24-Bit</td>
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USB-1901
USB-1902
USB-1903
USB-2401
USB-7230
USB-7250
Introduction

The ADLINK USB-1900 series provides a range of USB 2.0-based multi-functional DAQ modules. The USB-1901 and USB-1902 16-Bit 250 kS/s USB 2.0-based high-performance DAQ modules allow four different voltage input ranges, while the USB-1903 features additional built-in precision current-to-voltage resistors capable of direct measurement of current signal from 0 to 20 mA.

The USB-1900 series is USB bus powered and equipped with removable screw-down terminals for easy device connectivity. The attached multi-functional stand can be used for desktop, rail, or wall mounting. Suitable for mixed-signal tests, laboratory research, and factory automation, the USB-1900 series provide a simple measurement solution at an affordable price.

Features

- USB 2.0 high-speed
- USB bus powered
- 16-CH 250 kS/s voltage input (USB-1901/1902)
- 8-CH 250 kS/s current input (USB-1903)
- 2-CH 1 MS/s voltage output (USB-1902/1903)
- Analog and Digital triggering
- Removable screw terminal on module
- Lockable USB cable for secure connectivity
- Ready-to-use testing application (U-Test) provided

OS Information

- Windows XP, Windows 7/8 x64/x86

Software Compatibility

- LabVIEW, MATLAB, Visual Studio.NET

Software Recommendations

- U-Test, DAQBench, DAQMaster

Standard Shipped Accessories

- One pair of 20-pin removable screw terminals
- 2 M USB Type A to USB Mini-B cable with lockable connector
- Module stand
- Rail-mount kit

Ordering Information

- **USB-1901**
  16-CH 16-Bit 250kS/s Analog Input USB DAQ
- **USB-1902**
  16-CH 16-Bit 250kS/s Multi-Function USB DAQ
- **USB-1903**
  8-CH 16-Bit Current Input Multi-Function USB DAQ

Optional Accessories

- **RST-20P**
  One pair of 20-pin removable screw terminals
- **USB-2M-L**
  2 M USB Type A to USB Mini-B cable with lockable connector
### Specifications

#### Analog Input

<table>
<thead>
<tr>
<th>Model Name</th>
<th>USB-1901</th>
<th>USB-1902</th>
<th>USB-1903</th>
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<tbody>
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<td>Resolution</td>
<td>16-Bit</td>
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<td>-</td>
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<tr>
<td>Number of channels</td>
<td>16 SE / 8 Pseudo-diff, voltage input</td>
<td>8 Current inputs</td>
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<tr>
<td>Maximum sampling rate (single channel)</td>
<td>250 kS/s (Multiplexing, channel-gain-queue)</td>
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<tr>
<td>Programmable gain</td>
<td>1, 5, 10, 50</td>
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<td>-</td>
</tr>
<tr>
<td>Input range (voltage)</td>
<td>± 10 V, ± 2 V, ± 1 V, ± 200 mV</td>
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<td>N/A</td>
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<tr>
<td>Input range (Current)</td>
<td>N/A</td>
<td>0-20 mA</td>
<td>N/A</td>
</tr>
<tr>
<td>Offset error</td>
<td>± 0.1 mV (gain=1)</td>
<td>±0.01 mV</td>
<td>±0.05% of FSR (typical)</td>
</tr>
<tr>
<td>Gain error</td>
<td>± 0.05% of FSR (gain=1)</td>
<td>±0.05% of FSR (typical)</td>
<td>-</td>
</tr>
<tr>
<td>-3dB small signal bandwidth (gain=1)</td>
<td>600 kHz</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CMRR (gain=1)</td>
<td>90 dB</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SFDR (gain=1)</td>
<td>100 dB</td>
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<td>-</td>
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<tr>
<td>SINAD (gain=1)</td>
<td>89 dB</td>
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<td>THD (gain=1)</td>
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<td>SNR (gain=1)</td>
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<td>ENOB (gain=1)</td>
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<td>FIFO buffer size</td>
<td>4 k samples</td>
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<tr>
<td>Trigger sources</td>
<td>Software, external digital, analog trigger (from one of analog input channels)</td>
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<tr>
<td>Trigger mode</td>
<td>Post trigger, delay trigger, retrigger, gate trigger</td>
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<td>-</td>
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<tr>
<td>External conversion source</td>
<td>Yes (up to 250 kS/s)</td>
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<td>-</td>
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<tr>
<td>Input coupling</td>
<td>DC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>Continuous ± 24 V</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Input impedance</td>
<td>High impedance &gt; 1 GΩ</td>
<td>249.5 Ω (input resistor)</td>
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</tr>
<tr>
<td>Data transfer</td>
<td>Programmed I/O, continuous (USB bulk transfer mode)</td>
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</tbody>
</table>

#### Analog Output

| Number of channels | N/A | 2 voltage outputs |
| Maximum update rate | - | 1 MS/s (simultaneous update) |
| Output range | - | ± 10 V |
| Offset error | - | ± 0.15 mV |
| Gain error | - | ± 0.05% of FSR |
| INL | - | ± 1 LSB |
| DNL | - | < 1 LSB |
| Output driving capacity | - | ± 5 mA |
| Slew rate | - | 2.2 V/µs |
| Settling time (0.1% of Full scale) | - | 28 µs |
| Rising time | - | 6 µs |
| Falling time | - | 6 µs |
| FIFO | - | 10 k samples (2-CH sharing) |
| Output mode | - | Programmed I/O, continuous (USB bulk transfer mode) |

#### Function I/O

| Mode* | Digital I/O | General timer/counter, pulse generation |
| Digital I/O | 8 DI / 4 DO (TTL level) | Two 32-Bit, base clock: 80 MHz, external to 10 MHz |
| General timer/counter | Two PWM outputs (Modulation frequency: 0.01 Hz to 5 MHz; Duty cycle: 1%-99%) | |
| Pulse generation | - | |

#### General Specifications

| Interface | USB 2.0 high speed, mini-USB connector |
| I/O connector | Two 20-pin screw terminals |
| Operating temperature | 0 to 55°C (32°F to 131°F) |
| Storage temperature | -20 to 70°C (-4°F to 158°F) |
| Relative humidity | 5 to 95% non-condensing |
| Power requirements | 5V/402 mA (USB bus powered) |
| Dimensions | 114 mm (H) x 156.5 mm (L) x 41.3 mm (W) (4.5” x 6.16” x 1.63”) (without connector and stand) |

Note: The function I/O share the same I/O pins. Only one of these modes can be selected.
Introduction
The USB-2401 is a 24-Bit, 4-channel simultaneous-sampling universal input USB DAQ modules featuring built-in signal conditioning circuitry, providing direct measurement of commonly used sensors including current output transducers, thermocouple, RTD, load cell, strain gauge, and others. Individual channels can be programmed to measure different signal types.

The USB-powered USB-2401 is equipped with removable screw-down terminals for easy device connectivity, and the included multi-functional stand fully supports desktop, rail, or wall mounting.

The USB-2401 is suitable for basic measurement applications requiring high resolution and accuracy, laboratory research and material testing environments, and industrial temperature measurement. U-test, a free ready-to-use testing program is included to enable operation or testing of all ADLINK USB DAQ series functions with no programming requirement.
## Specifications

<table>
<thead>
<tr>
<th>Model Name</th>
<th>USB-2401</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analog Input</strong></td>
<td></td>
</tr>
<tr>
<td>Number of channels</td>
<td>4 differential</td>
</tr>
<tr>
<td>Resolution</td>
<td>24-Bit</td>
</tr>
<tr>
<td>Measurement types</td>
<td>Voltage, current, thermocouple, RTD, half-bridge, full-bridge, resistance</td>
</tr>
<tr>
<td>Maximum sampling rate</td>
<td>2 kS/s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input ranges</th>
<th>Mode</th>
<th>Input range or supporting type</th>
<th>Actual Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>±25 V, ±12.5 V, ±2.5 V, ±312.5 mV</td>
<td>±25 V, ±12.5 V, ±2.5 V, ±312.5 mV</td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td>±20 mA</td>
<td>±20 mA</td>
<td></td>
</tr>
<tr>
<td>Thermocouple</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTD (3-wire, 4-wire)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Half-Bridge (120Ω, 350Ω)</td>
<td>Max. 30 mV</td>
<td>78.125 mV</td>
<td></td>
</tr>
<tr>
<td>Full-Bridge (120Ω, 350Ω)</td>
<td>Max. 30 mV</td>
<td>78.125 mV</td>
<td></td>
</tr>
<tr>
<td>2-Wire Resistance</td>
<td>25 kΩ</td>
<td>2.5 V</td>
<td></td>
</tr>
</tbody>
</table>

| Input coupling | DC |
| FIFO size | 4k samples |
| Data Transfer | Programmed I/O, continuous (USB bulk transfer mode) |

### Function I/O

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of channels</td>
<td>4 inputs and 2 outputs</td>
</tr>
<tr>
<td>Compatibility</td>
<td>5V/TTL</td>
</tr>
<tr>
<td>Support modes</td>
<td>General timer/counter: One 32-Bit; base clock 80 MHz, external to 10 MHz</td>
</tr>
<tr>
<td></td>
<td>PWM: One channel, modulation frequency: 0.01 Hz to 5 MHz; duty cycle: 1%–99%</td>
</tr>
<tr>
<td>Data Transfer</td>
<td>Programmed I/O, continuous (USB bulk transfer mode)</td>
</tr>
</tbody>
</table>

### General Specifications

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O connector</td>
<td>Two 20-pin removable screw terminals</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0 to 55°C (32°F to 122°F)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20 to 70°C (-4°F to 158°F)</td>
</tr>
<tr>
<td>Power requirements</td>
<td>5V @ 400 mA (USB powered)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>114 (H) x 156.5 (L) x 41 mm (W) (4.5&quot; x 6.16&quot; x 1.63&quot;) (without connector and stand)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>5% to 95%, non-condensing</td>
</tr>
</tbody>
</table>

Note: Function I/O shares the same I/O pins. Only one of these modes can be selected.
Introduction

The USB-7230/7250 USB-based digital I/O modules feature high voltage on/off control and monitoring, and isolation voltage supported up to 2500Vrms. The USB-7230 provides 32-CH isolated digital I/O and 2-CH frequency/event counters. The USB-7250 provides 8-CH relay output (4 form C and 4 form A), 8-CH isolated DI, and 2-CH frequency/event counters.

The USB-powered USB-7230/7250 features removable screw-down terminals for easy device connectivity, and the included multi-functional stand fully supports desktop, rail, or wall mounting.

The USB-7230/7250 is suitable for industrial I/O control applications requiring high voltage and superior protection. High isolation voltage protects against damage from accidental contact with external voltages and eliminates troublesome ground loops. U-Test, a free ready-to-use testing program, is included to enable operation or testing of all ADLINK USB DAQ series functions with no programming requirement.

Pin Assignment

<table>
<thead>
<tr>
<th>USB-7230</th>
<th>USB-7250</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDD</td>
<td>NO7</td>
</tr>
<tr>
<td>D07</td>
<td>D015</td>
</tr>
<tr>
<td>D06</td>
<td>D014</td>
</tr>
<tr>
<td>D05</td>
<td>D013</td>
</tr>
<tr>
<td>D04</td>
<td>D012</td>
</tr>
<tr>
<td>D03</td>
<td>D011</td>
</tr>
<tr>
<td>D02</td>
<td>D010</td>
</tr>
<tr>
<td>D01</td>
<td>D09</td>
</tr>
<tr>
<td>D00</td>
<td>D08</td>
</tr>
<tr>
<td>IGN0</td>
<td>IGN1</td>
</tr>
<tr>
<td>CNT0</td>
<td>CNT1</td>
</tr>
<tr>
<td>GND0</td>
<td>GND1</td>
</tr>
<tr>
<td>D17</td>
<td>NO2</td>
</tr>
<tr>
<td>D16</td>
<td>D15</td>
</tr>
<tr>
<td>D15</td>
<td>D14</td>
</tr>
<tr>
<td>D14</td>
<td>D13</td>
</tr>
<tr>
<td>D13</td>
<td>D12</td>
</tr>
<tr>
<td>D12</td>
<td>D11</td>
</tr>
<tr>
<td>D11</td>
<td>D10</td>
</tr>
<tr>
<td>D10</td>
<td>D9</td>
</tr>
<tr>
<td>D9</td>
<td>NO8</td>
</tr>
<tr>
<td>D8</td>
<td>COMD</td>
</tr>
</tbody>
</table>

Features

- USB 2.0, USB bus powered
- Programmable digital filter removes unexpected glitches from input channels
- Programmable DO/Relay initial status
- Up to 2500Vrms isolation voltage
- Removable screw terminal on module
- Lockable USB cable for secure connectivity
- Ready-to-use testing application (U-Test) provided

OS Information
- Windows XP, Windows 7/8 x64/x86

Software Compatibility
- LabVIEW, MATLAB, Visual Studio .NET

Software Recommendations
- U-Test, DAQBench, DAQMaster

Standard Shipped Accessories

- One pair of 20-pin removable screw terminals
- 2 M USB Type A to USB Mini-B cable with lockable connector
- Module stand
- Rail-mount kit

Ordering Information

- **USB-7230**
  - 2-CH isolated Digital I/O & 2-CH counter USB module

- **USB-7250**
  - 8-CH relay output, 8-CH isolated DI, & 2-CH counter USB module

Optional Accessories

- **RST-20P**
  - One pair of 20-pin removable screw terminals

- **USB-2M-L**
  - 2 M USB Type A to USB Mini-B cable with lockable connector
## Specifications

### Relay output

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Channels</th>
<th>Max. switching power</th>
<th>Max. switching voltage</th>
<th>Max. switching current</th>
<th>Max. carrying current</th>
<th>Max. contact rating</th>
<th>Relay on/off time</th>
<th>Resistance</th>
<th>Expected life</th>
<th>Breakdown voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB-7230</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>USB-7250</td>
<td></td>
<td>-</td>
<td>60 W, 125 VA</td>
<td>-</td>
<td>-</td>
<td>30 VDC, 2 A (Resistive)</td>
<td>Operating time: 2 ms</td>
<td>-</td>
<td>75mΩ</td>
<td>50 VDC; 0.1A (resistive), 1x10^9</td>
</tr>
</tbody>
</table>

### Optical Isolated input

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Channels</th>
<th>Max. switching power</th>
<th>Max. switching voltage</th>
<th>Max. switching current</th>
<th>Max. carrying current</th>
<th>Max. contact rating</th>
<th>Relay on/off time</th>
<th>Resistance</th>
<th>Expected life</th>
<th>Breakdown voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB-7230</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>USB-7250</td>
<td></td>
<td>-</td>
<td>60 W, 125 VA</td>
<td>-</td>
<td>-</td>
<td>30 VDC, 2 A (Resistive)</td>
<td>Operating time: 2 ms</td>
<td>-</td>
<td>75mΩ</td>
<td>50 VDC; 0.1A (resistive), 1x10^9</td>
</tr>
</tbody>
</table>

### Optical Isolated Frequency/Event Counter

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Channels</th>
<th>Logic level</th>
<th>Event counter width</th>
<th>Min. input frequency (DC coupled)</th>
<th>Max. frequency error</th>
<th>Min. pulse-width for change of state (COS) detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB-7230</td>
<td></td>
<td>HDD=5 to 12V, VL=0 to 0.15V</td>
<td>32-Bit</td>
<td>1 MHz</td>
<td>0.1 Hz</td>
<td></td>
</tr>
<tr>
<td>USB-7250</td>
<td></td>
<td>HDD=5 to 12V, VL=0 to 0.15V</td>
<td>32-Bit</td>
<td>1 MHz</td>
<td>0.1 Hz</td>
<td></td>
</tr>
</tbody>
</table>

### Optical Isolated Output

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Channels</th>
<th>Output type</th>
<th>Supply voltage</th>
<th>Max. sink current</th>
<th>Operating time</th>
<th>Release time</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB-7230</td>
<td></td>
<td>Open drain MOSFET</td>
<td>5-35VDC</td>
<td>250 mA @ 100% duty (per channel)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>USB-7250</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### General Specifications

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Interface</th>
<th>Data transfer</th>
<th>Dimensions</th>
<th>I/O Connector</th>
<th>Power requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB-7230</td>
<td>High speed USB 2.0 compatible, mini-USB connector</td>
<td>Programmed I/O</td>
<td>156.5 (L) x 114 (W) x 41.3 (H) mm (6.16” x 4.49” x 1.63”)</td>
<td>Two 20-pin removable screw-down terminals</td>
<td>USB power (5 V @ 400 mA)</td>
</tr>
<tr>
<td>USB-7250</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
## Features
- Supports a 32-Bit 3.3 V or 5 V PCI bus
- Programmable gains for analog inputs: 1, 2, 4, 5, 6, 10, 20, 40 (PCI-9222/9223) 1, 2, 4, 5, 6, 10, 20, 40 (PCI-9221)
- 2-CH 16-Bit simultaneous analog outputs, up to 1 MS/s analog output update rate (PCI-9222/9223)
- Programmable function I/O, supporting modes:
  - TTL DI and TTL DO
  - 2 MHz High-Speed DIO (PCI-9222/9223 only)
  - General-purpose timer/counter
  - PWM outputs
  - Encoder inputs
- Dedicated 2-CH 4 MHz encoder inputs, supporting AB phase, and CW/CCW (PCI-9222/9223)
- Dedicated DMA channels for A/D, D/A, and high-speed DIO (PCI-9222/9223)
- External digital trigger for A/D, D/A, and high-speed DIO (PCI-9222/9223)
- Multiple card synchronization through SSI (System Synchronization Interface) bus (PCI-9222/9223)
- Auto-calibration
- OS Information
  - Windows XP, Windows 7/8 x64/x86, Linux
- Software Compatibility
  - LabVIEW, MATLAB, Visual Studio.NET
- Software Recommendations
  - AD-Logger, DAQBench, DAQMaster

## Terminal Boards & Cables
- DIN-68S-01 (for PCI-9222/9223)
- DIN-37D-01 (for PCI-9221)
- ACL-10568-1 (for PCI-9222/9223)
- DIN-37D-01 (for PCI-9222/9223)

* For more information on mating terminal board and cables, please refer to P3-46/47.

## Specifications

### Analog Input

<table>
<thead>
<tr>
<th>Model Name</th>
<th>PCI-9221</th>
<th>PCI-9222</th>
<th>PCI-9223</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>16 Bit</td>
<td>16 Bit</td>
<td>16 Bit</td>
</tr>
<tr>
<td>Number of channels</td>
<td>16 SEE/ 8 DIFF</td>
<td>16 SEE/ 8 DIFF</td>
<td>32 SEE/ 16 DIFF</td>
</tr>
<tr>
<td>Maximum sampling rate (single channel)</td>
<td>250 kS/s</td>
<td>250 kS/s</td>
<td>500 kS/s</td>
</tr>
<tr>
<td>Programmable gain</td>
<td>1, 5, 10, 25</td>
<td>1, 2, 4, 5, 6, 10, 20, 40</td>
<td>1, 2, 4, 5, 6, 10, 20, 40</td>
</tr>
<tr>
<td>Input range</td>
<td>±5 V, ±1 V, ±500 mV, ±200 mV</td>
<td>±10 V, ±5 V, ±2.5 V, ±2 V, ±1.25 V, ±1 V, ±500 mV, ±250 mV</td>
<td>±10 V, ±5 V, ±2.5 V, ±2 V, ±1.25 V, ±1 V, ±500 mV, ±250 mV</td>
</tr>
<tr>
<td>Offset error</td>
<td>±0.7 mV typical, after calibration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gain error</td>
<td>±0.015% of FSR, after calibration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIFO buffer size</td>
<td>1 k samples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger sources</td>
<td>Software, external digital, SSI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger mode</td>
<td>Post trigger, retrigger, gate trigger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External conversion source</td>
<td>Yes (up to 250 kS/s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input coupling</td>
<td>DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>±10 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input impedance</td>
<td>High impedance &gt; 1 GΩ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input capacitance</td>
<td>No limitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting time (0.1% of full scale)</td>
<td>1395 μs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rising time</td>
<td>395 μs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falling time</td>
<td>390 μs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gain error</td>
<td>±0.02% FSR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset error</td>
<td>±1 mV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting time</td>
<td>200 μs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rising time</td>
<td>200 μs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falling time</td>
<td>200 μs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mode</td>
<td>Digital I/O (1), General Timer/Counter (2), Pulse Generation (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital I/O</td>
<td>Digital I/O, General Timer/Counter/Pulse Generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Timer/Counter</td>
<td>General Timer/Counter/Pulse Generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse generation</td>
<td>Two PWM outputs (Modulation frequency: 0.005 Hz to 5 MHz; Duty cycle: 1%-99%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encoder input</td>
<td>2CH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encoder type</td>
<td>CW/CCW encoder, x 1 AB phase encoder, x 2 AB phase encoder, x 4 AB phase encoder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Specifications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCI Bus</td>
<td>5 V and 3.3 V universal PCI bus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto-calibration</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I/O Connector</td>
<td>One 37-pin D-Sub connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation temperature</td>
<td>0°C to 45°C (32°F to 113°F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>0°C to 55°C (32°F to 131°F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>5 to 95% non-condensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power requirements</td>
<td>+5 V 1A typical, +12 V 100 mA typical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>120 mm x 87 mm (4.68&quot; x 3.39&quot;)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Ordering Information
- **PCI-9221**
  - 2-CH 16-Bit 250 kS/s Multi-Function DAQ Card with Encoder Input
- **PCI-9222**
  - 16/32-CH 16-Bit 250/500 kS/s Multi-Function DAQ Card with Encoder Input
- **PCI-9223**
  - 16/32-CH 16-Bit 500 kS/s Multi-Function DAQ Card with Encoder Input
**Features**
- Supports a 32-Bit 3.3 V or 5 V PCI bus (DAQ-2000 series)
- 1 lane PCI Express® Interface (DAQe-2000 series)
- PXI specification Rev. 2.2 compliant (PXI-2000 series)
- 4-CH differential analog inputs
- Bipolar or unipolar analog input ranges
- Programmable gains of x1, x2, x4, x8
- Scatter-gather DMA for both analog inputs and outputs
- 2-CH 12-Bit multiplying analog outputs with waveform generation
- 24-CH TTL digital input/output
- 2-CH 16-Bit general-purpose timer/counter
- Analog and digital triggering
- Fully auto calibration
- Multiple cards synchronization through SSI (System Synchronization Interface) bus or PXI trigger bus

**Software Compatibility**
- LabVIEW, MATLAB, Visual Studio.NET
- AD-Logger, DAQBench, DAQMaster

**Terminal Boards & Cables**
- DIN-685-01
- ACL-10568-1
- ACL-SSI-2/3/4

*For more information on mating terminal board and cables, please refer to P3-46/47.

### Specifications

<table>
<thead>
<tr>
<th>Model Name</th>
<th>PXI/DAQ/DAQe-2010</th>
<th>PXI/DAQ/DAQe-2005</th>
<th>PXI/DAQ/DAQe-2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analog Input</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>14 Bit</td>
<td>16 Bit</td>
<td>16 Bit</td>
</tr>
<tr>
<td>Number of channels</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Maximum sampling rate</td>
<td>2 MS/s</td>
<td>500 kS/s</td>
<td>250 kS/s</td>
</tr>
<tr>
<td>Programmable gain</td>
<td>1, 2, 4, 8</td>
<td>1, 2, 4, 8</td>
<td>1, 2, 4, 8</td>
</tr>
<tr>
<td>Bipolar input ranges</td>
<td>±10 V, ±5 V, ±2.5 V, ±1.25 V</td>
<td>±10 V, ±5 V, ±2.5 V, ±1.25 V</td>
<td>±10 V, ±5 V, ±2.5 V, ±1.25 V</td>
</tr>
<tr>
<td>Offset error</td>
<td>±3 mV</td>
<td>±2 mV</td>
<td>±1 mV</td>
</tr>
<tr>
<td>Gain error</td>
<td>±0.1% of FSR</td>
<td>±0.04% of FSR</td>
<td>±0.03% of FSR</td>
</tr>
<tr>
<td>Input Coupling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>Power on: Continuous ±3.5 V, Power off: Continuous ±15 V</td>
<td>Power on: Continuous ±3.5 V, Power off: Continuous ±15 V</td>
<td>Power on: Continuous ±3.5 V, Power off: Continuous ±15 V</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>1 GΩ/100 pF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger modes</td>
<td>Pre-trigger, post-trigger, middle-trigger, delay-trigger, and repeated trigger</td>
<td>Pre-trigger, post-trigger, middle-trigger, delay-trigger, and repeated trigger</td>
<td>Pre-trigger, post-trigger, middle-trigger, delay-trigger, and repeated trigger</td>
</tr>
<tr>
<td>FIFO buffer size</td>
<td>512 samples</td>
<td>512 samples</td>
<td>512 samples</td>
</tr>
<tr>
<td>Data transfers</td>
<td>Polling, scatter-gather DMA</td>
<td>Polling, scatter-gather DMA</td>
<td>Polling, scatter-gather DMA</td>
</tr>
<tr>
<td><strong>Analog Output</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of channels</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Resolution</td>
<td>12 Bit</td>
<td>12 Bit</td>
<td>12 Bit</td>
</tr>
<tr>
<td>Output ranges</td>
<td>0-10 V, ±10 V, 0.0-10 V, ±10 V, 0-10 V, ±10 V</td>
<td>0-10 V, ±10 V, 0.0-10 V, ±10 V, 0-10 V, ±10 V</td>
<td>0-10 V, ±10 V, 0.0-10 V, ±10 V, 0-10 V, ±10 V</td>
</tr>
<tr>
<td>Maximum update rate</td>
<td>1 μs</td>
<td>1 μs</td>
<td>1 μs</td>
</tr>
<tr>
<td>Slew rate</td>
<td>20 V/μs</td>
<td>20 V/μs</td>
<td>20 V/μs</td>
</tr>
<tr>
<td>Setting time</td>
<td>3 μs to ±0.5 LSB accuracy</td>
<td>3 μs to ±0.5 LSB accuracy</td>
<td>3 μs to ±0.5 LSB accuracy</td>
</tr>
<tr>
<td>Offset error</td>
<td>±3 mV</td>
<td>±1 mV</td>
<td>±1 mV</td>
</tr>
<tr>
<td>Gain error</td>
<td>±0.05% of max. output</td>
<td>±0.04% of max. output</td>
<td>±0.04% of max. output</td>
</tr>
<tr>
<td>Driving capacity</td>
<td>5 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability</td>
<td>Any passive load, up to 1500 pF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger sources</td>
<td>Software, external digital/analog trigger, SSI bus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger modes</td>
<td>Post-trigger, delay-trigger, and repeated trigger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIFO buffer size</td>
<td>2 k samples</td>
<td>2 k samples</td>
<td>2 k samples</td>
</tr>
<tr>
<td>Data transfers</td>
<td>Programmed I/O, scatter-gather DMA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Digital I/O</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of channels</td>
<td>8255 24-bit programmable inputs/outputs</td>
<td>8255 24-bit programmable inputs/outputs</td>
<td>8255 24-bit programmable inputs/outputs</td>
</tr>
<tr>
<td>Compatibility</td>
<td>5-V TTL</td>
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<td></td>
</tr>
<tr>
<td>Data transfers</td>
<td>Programmed I/O</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Timer/Counter</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Number of channels</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Resolution</td>
<td>16 Bit</td>
<td>16 Bit</td>
<td>16 Bit</td>
</tr>
<tr>
<td>Compatibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clock sources available</td>
<td>40 MHz, external clock up to 10 MHz</td>
<td>40 MHz, external clock up to 10 MHz</td>
<td>40 MHz, external clock up to 10 MHz</td>
</tr>
</tbody>
</table>

### General Specifications
- Auto Calibration: Yes (+3 V ±0.2 ppm/C)
- Dimensions: 160 mm x 100 mm (not including connectors) (PXI-2000 series)
- 175 mm x 107 mm (not including connectors) (DAQ-2000 series)
- 160 mm x 100 mm (not including connectors) (DAQe-2000 series)
- Connector: 68-pin VHDCI-type female
- Operating temperature: 0°C to 55°C (32°F to 131°F)
- Storage temperature: -20°C to 70°C (4°F to 158°F)
- Humidity: 5% to 95%, non-condensing
- Power requirements: ±5 V 1.82 A typical (PXI/DAQ-2010)
  +3.3 V 1.246 A, ±12 V 0.448 A typical (DAQe-2010)
**Features**
- Supports 3.3 V and 5 V PCI signaling
- PXI specification Rev 2.2 compliant
- 8/16-CH differential analog inputs (PXI-2020/PXI-2022)
- Bipolar analog input
- Programmable gains of x1, x4
- Scatter gather DMA transfer for AI continuously data acquisition
- 4-CH TTL digital input/output
- 3U EuroCard form factor
- 2-CH 32-Bit general purpose timer/counters
- Digital triggering
- Fully auto calibration
- Multiple cards synchronization through PXI trigger bus
- Onboard 8 K-sample (16 KB) memory for data storage

**OS Information**
- Windows XP, Windows 7/8 x64/x86, Linux

**Software Compatibility**
- LabVIEW, MATLAB, Visual Studio.NET

**Software Recommendations**
- AD-Logger, DAQBench, DAQMaster

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### Ordering Information / Quick Selection Guide

<table>
<thead>
<tr>
<th>Model Name</th>
<th>PXI-2020</th>
<th>PXI-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Input</td>
<td>PXI-2020</td>
<td>PXI-2022</td>
</tr>
<tr>
<td>Resolution</td>
<td>16 Bit</td>
<td>16 Bit</td>
</tr>
<tr>
<td>Number of Channels</td>
<td>8 differential channels</td>
<td>16 differential channels</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>1 GΩ/pF</td>
<td>1 GΩ/pF</td>
</tr>
<tr>
<td>Bipolar Input Signal Range</td>
<td>± 10 V ± 2.5 V</td>
<td>± 10 V ± 2.5 V</td>
</tr>
<tr>
<td>Programmable gain</td>
<td>1, 4</td>
<td>1, 4</td>
</tr>
<tr>
<td>Overvoltage Protection</td>
<td>Power on: ±30 V continuous</td>
<td>Power on: ±30 V continuous</td>
</tr>
<tr>
<td>Data FIFO Size</td>
<td>8 K-sample (16 KB)</td>
<td>8 K-sample (16 KB)</td>
</tr>
<tr>
<td>DNL (gain = 1)</td>
<td>±0.8 LSB</td>
<td>±1.5 LSB (typical), ±3.0 LSB (MAX)</td>
</tr>
<tr>
<td>INL (gain = 1)</td>
<td>±1.5 LSB (typical), ±3.0 LSB (MAX)</td>
<td>0.6 mV (typical)</td>
</tr>
<tr>
<td>Gain Error (gain = 1)</td>
<td>0.05% of input</td>
<td>0.05% of input</td>
</tr>
<tr>
<td>Data Transfer</td>
<td>16 differential channels</td>
<td>16 differential channels</td>
</tr>
</tbody>
</table>

**Digital I/O**
- Number of Channel | 4 input/output |
- Compatibility | TTL/CMOS |
- Input Logic Levels | Input low voltage: 0.8 V (max) |
- Output Logic Levels | Output low voltage: 0.4 V (max) |
- Output Driving Capacity | Output high voltage: 2.8 V (min) |
- Power-on State | Input, pull-down with 10 KΩ resistor |
- Data Transfer | Polling mode |

**General Specifications**
- Auto Calibration: Yes (±5 V, ±3 ppm/˚C)
- Dimensions | Single 3U PXI module, 100 mm x 160 mm (not including connector) |
- Connector | ACL-10568-1, 68-pin VHDCI-type female |
- Operating Environment | Ambient temperature: 0˚C to 55˚C (32˚F to 131˚F) |
- Relative humidity: 10% to 90% non-condensing |
- Storage Environment | Ambient temperature: -20˚C to 80˚C (-4˚F to 176˚F) |
- Relative humidity: 5% to 95% non-condensing |

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**Terminal Boards & Cables**
- DIN-68S-01
- ACL-10568-1

* For more information on mating terminal board and cables, please refer to P3-46/47.

**Accessories**
- SMB-SMB-1M
- SMB-BNC-1M
PXI/DAQ/DAQe-2208
96-CH 12-Bit 3 MS/s Ultra High-Density Analog Input Cards

Ordering Information / Quick Selection Guide

<table>
<thead>
<tr>
<th>Model Name</th>
<th>PXI/DAQ/DAQe-2208</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Input</td>
<td>96 single-ended or 48 differential</td>
</tr>
<tr>
<td>Number of channels</td>
<td>1024</td>
</tr>
<tr>
<td>Maximum sampling rate</td>
<td>3 MS/s</td>
</tr>
<tr>
<td>Programmable gain</td>
<td>1, 2, 4, 5, 8, 10, 20, 40, 50, 200</td>
</tr>
<tr>
<td>Bipolar input ranges</td>
<td>±10 V, ±5 V, ±2.5 V, ±1 V, ±0.5 V, ±0.25 V, ±0.1 V</td>
</tr>
<tr>
<td>Unipolar input ranges</td>
<td>0-10 V, 0-5 V, 0-4 V, 0-2.5 V, 0-1 V, 0-0.5 V, 0-0.4 V, 0-0.1 V</td>
</tr>
<tr>
<td>Offset error</td>
<td>±0.2 mV</td>
</tr>
<tr>
<td>Gain error</td>
<td>±0.006% of FSR</td>
</tr>
<tr>
<td>Input Coupling</td>
<td>DC</td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>Power on: Continuous ±30 V, Power off: Continuous ±15 V</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>1 GΩ/100 pF</td>
</tr>
<tr>
<td>Trigger sources</td>
<td>Software, external digital/analog trigger, SSI bus</td>
</tr>
<tr>
<td>Trigger modes</td>
<td>Pre-trigger, post-trigger, middle-trigger, delay-trigger, and repeated trigger</td>
</tr>
<tr>
<td>FIFO buffer size</td>
<td>1 k samples</td>
</tr>
<tr>
<td>Data Transfers</td>
<td>Polling, scatter-gather DMA</td>
</tr>
<tr>
<td>Digital I/O</td>
<td>24-CH 8255 programmable input/output</td>
</tr>
<tr>
<td>Compatibility</td>
<td>5 V/TTL</td>
</tr>
</tbody>
</table>

Specifications

Analog Input

- Resolution: 12 Bit, no missing codes
- Number of channels: 96 single-ended or 48 differential
- Channel gain queue size: 1024
- Maximum sampling rate: 3 MS/s
- Programmable gain: 1, 2, 4, 5, 8, 10, 20, 40, 50, 200
- Bipolar input ranges: ±10 V, ±5 V, ±2.5 V, ±1 V, ±0.5 V, ±0.25 V, ±0.1 V
- Unipolar input ranges: 0-10 V, 0-5 V, 0-4 V, 0-2.5 V, 0-1 V, 0-0.5 V, 0-0.4 V, 0-0.1 V
- Offset error: ±0.2 mV
- Gain error: ±0.006% of FSR
- Input Coupling: DC
- Overvoltage protection: Power on: Continuous ±30 V, Power off: Continuous ±15 V
- Input Impedance: 1 GΩ/100 pF
- Trigger sources: Software, external digital/analog trigger, SSI bus
- Trigger modes: Pre-trigger, post-trigger, middle-trigger, delay-trigger, and repeated trigger
- FIFO buffer size: 1 k samples
- Data Transfers: Polling, scatter-gather DMA

Digital I/O

- Number of channels: 24-CH 8255 programmable input/output
- Compatibility: 5 V/TTL

Terminal Boards & Cables

- DIN-68S-01
- ACL-10568-1
- ACL-SSI-2/3/4

* For more information on mating terminal board and cables, please refer to PI-46/47.

Features

- Supports a 32-Bit 3.3 V or 5 V PCI bus (DAQ-2208)
- x1 lane PCI Express® Interface (DAQe-2208)
- PXI Specification Rev. 2.2 compliant (PXI-2208)
- 96-CH single-ended or 48-CH differential analog inputs
- Onboard 1 k-sample A/D FIFO
- Bipolar or unipolar analog input ranges
- Programmable gains of x1, x2, x4, x5, x8, x10, x20, x40, x50, x200
- 1024-configuration channel gain queue
- Scatter-gather DMA for analog inputs
- 24-CH TTL digital input/output
- Analog and digital triggering
- Fully auto calibration
- Multiple cards synchronization through SSI (System Synchronization Interface) bus or PXI trigger bus

OS Information

- Windows XP, Windows 7/8/64/86, Linux

Software Compatibility

- LabVIEW, MATLAB, Visual Studio.NET

Software Recommendations

- AD-Logger, DAQBench, DAQMater
PXI/DAQ/DAQe-2200 Series
64-CH 12/16-Bit Up to 3 MS/s Multi-Function DAQ Cards

Features
- Supports a 32-Bit 3.3 V or 5 V PCI bus (DAQ-2200 series)
- x1 lane PCI Express® Interface (DAQe-2200 series)
- PXI specification Rev 2.2 compliant (PXI-2200 series)
- 64-CH single-ended or 32-CH differential analog inputs
- Onboard 1 x-sample A/D FIFO
- Bipolar or unipolar analog input ranges
- Programmable gains:
  - x1, x2, x4, x5, x8, x10, x20, x40, x50, x200 (DAQ/DAQe-2204)
  - x1, x2, x4, x8 (DAQ/DAQe-2205 & DAQ/DAQe-2206)
- 512-configuration channel gain queue
- Scatter-gather DMA for both analog inputs and outputs
- 2-CH 12-Bit multiplying analog outputs with waveform generation
- Onboard 1 x-sample D/A FIFO
- 24-CH TTL digital input/output
- 2-CH 16-Bit general-purpose timer/counter
- Analog and digital triggering
- Fully auto calibration
- Multiple cards synchronization through SSI (System Synchronization Interface) bus or PXI trigger bus

OS Information
- Windows XP, Windows 7/8 x64/x86, Linux

Software Compatibility
- LabVIEW, MATLAB, Visual Studio.NET

Software Recommendations
- AD-Logger, DAQBench, DAQMaster

Terminal Boards & Cables
- DIN-685-01
- ACL-10568-1

* For more information on mating terminal board and cables, please refer to P3-46/47.

Ordering Information / Quick Selection Guide

<table>
<thead>
<tr>
<th>Model Name</th>
<th>PXI/DAQ/DAQe-2204</th>
<th>PXI/DAQ/DAQe-2205</th>
<th>PXI/DAQ/DAQe-2206</th>
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</thead>
<tbody>
<tr>
<td>No. of channels</td>
<td>12 Bit, no missing codes</td>
<td>16 Bit, no missing codes</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>12 Bit</td>
<td>16 Bit</td>
<td></td>
</tr>
<tr>
<td>Input range</td>
<td>±0.05 V to ±10 V</td>
<td>±0.05 V to ±10 V</td>
<td></td>
</tr>
<tr>
<td>Number of channels</td>
<td>64 single-ended or 32 differential (software selectable per channel)</td>
<td>64 single-ended or 32 differential (software selectable per channel)</td>
<td></td>
</tr>
<tr>
<td>Channel gain queue size</td>
<td>512</td>
<td>512</td>
<td></td>
</tr>
<tr>
<td>Maximum sampling rate</td>
<td>3 MS/s</td>
<td>500 kS/s</td>
<td>250 kS/s</td>
</tr>
<tr>
<td>Programmable gain</td>
<td>1, 2, 4, 5, 8, 10, 20, 40, 50, 200</td>
<td>1, 2, 4, 8</td>
<td></td>
</tr>
<tr>
<td>Bipolar input ranges Max. : ±10 V, Min : ±0.05 V to ±10 V, ±10 V, ±5 V, ±2.5 V, ±1.25 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unipolar input ranges Max. : ±10 V, Min : ±0.1 V to ±10 V, ±5 V, ±2.5 V, ±1.25 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset error</td>
<td>±2 mV</td>
<td>±1 mV</td>
<td>±2 mV</td>
</tr>
<tr>
<td>Gain error</td>
<td>±0.06% of FSR</td>
<td>±0.08% of FSR</td>
<td>±0.06% of FSR</td>
</tr>
<tr>
<td>Input coupling</td>
<td>DC</td>
<td>DC</td>
<td>DC</td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>Power on: Continuous ±30 V, Power off: Continuous ±15 V</td>
<td>Power on: Continuous ±30 V, Power off: Continuous ±15 V</td>
<td>Power on: Continuous ±30 V, Power off: Continuous ±15 V</td>
</tr>
<tr>
<td>Input impedance</td>
<td>1 GΩ/100 pF</td>
<td>1 GΩ/100 pF</td>
<td>1 GΩ/100 pF</td>
</tr>
<tr>
<td>CMRR (gain = 1)</td>
<td>90 dB</td>
<td>83 dB</td>
<td>67 dB</td>
</tr>
<tr>
<td>Settling time</td>
<td>1 μs to ±0.1% error</td>
<td>2 μs to ±0.1% error</td>
<td>4 μs to ±0.01% error</td>
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<tr>
<td>-3 dB small signal bandwidth (±10V, 1-to-10 Gain=1)</td>
<td>2 MHz</td>
<td>850 kHz</td>
<td>600 kHz</td>
</tr>
<tr>
<td>Trigger modes</td>
<td>Pre-trigger, post-trigger, middle-trigger, delay-trigger, and repeated trigger</td>
<td>Pre-trigger, post-trigger, middle-trigger, delay-trigger, and repeated trigger</td>
<td>Pre-trigger, post-trigger, middle-trigger, delay-trigger, and repeated trigger</td>
</tr>
<tr>
<td>FIFO buffer size</td>
<td>1 k samples</td>
<td>1 k samples</td>
<td>1 k samples</td>
</tr>
<tr>
<td>Data transfers</td>
<td>Polling, scatter-gather DMA</td>
<td>Polling, scatter-gather DMA</td>
<td>Polling, scatter-gather DMA</td>
</tr>
<tr>
<td>Analog Output</td>
<td>2 voltage outputs</td>
<td>2 voltage outputs</td>
<td>2 voltage outputs</td>
</tr>
<tr>
<td>Number of channels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
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<td></td>
<td></td>
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<tr>
<td>Output range</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Maximum output rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slew rate</td>
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<tr>
<td>Settling time</td>
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<td></td>
<td></td>
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<td>Offset error</td>
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<tr>
<td>Gain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving capacity</td>
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<td></td>
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<tr>
<td>Stability</td>
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</tr>
<tr>
<td>Trigger sources</td>
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<tr>
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<td>FIFO buffer size</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Data transfers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital I/O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of channels</td>
<td>24-CH 8255 programmable input/output</td>
<td>24-CH 8255 programmable input/output</td>
<td>24-CH 8255 programmable input/output</td>
</tr>
<tr>
<td>Compatibility</td>
<td>5 V/15 V</td>
<td>5 V/15 V</td>
<td>5 V/15 V</td>
</tr>
<tr>
<td>Data transfers</td>
<td>Programmed I/O</td>
<td>Programmed I/O</td>
<td>Programmed I/O</td>
</tr>
<tr>
<td>General-Purpose Timer/Counter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of channels</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Resolution</td>
<td>16-Bit</td>
<td>16-Bit</td>
<td>16-Bit</td>
</tr>
<tr>
<td>Base clock available</td>
<td>40 MHz, external clock up to 10 MHz</td>
<td>40 MHz, external clock up to 10 MHz</td>
<td>40 MHz, external clock up to 10 MHz</td>
</tr>
<tr>
<td>General Specifications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto Calibration</td>
<td>Yes (+5 V, ±2 ppm/°C)</td>
<td>Yes (+5 V, ±2 ppm/°C)</td>
<td>Yes (+5 V, ±2 ppm/°C)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>160 mm x 100 mm (6.24” x 3.94”) (not including connectors) (PXI-2200 series) 168 mm x 107 mm (6.61” x 4.21”) (not including connectors) (DAQ-2200 series)</td>
<td>160 mm x 100 mm (6.24” x 3.94”) (not including connectors) (PXI-2200 series) 168 mm x 107 mm (6.61” x 4.21”) (not including connectors) (DAQ-2200 series)</td>
<td></td>
</tr>
<tr>
<td>Connector</td>
<td>68-pin VHDCI female x 2</td>
<td>68-pin VHDCI female x 2</td>
<td>68-pin VHDCI female x 2</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0°C to 55°C (32°F to 131°F)</td>
<td>0°C to 55°C (32°F to 131°F)</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20°C to 70°C (-4°F to 158°F)</td>
<td>-20°C to 70°C (-4°F to 158°F)</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>5 to 95%, non-condensing</td>
<td>5 to 95%, non-condensing</td>
<td>5 to 95%, non-condensing</td>
</tr>
<tr>
<td>Power requirements</td>
<td>5 V 1.3 A typical (PXI/DAQ-2204)</td>
<td>5 V 1.2 A typical (PXI/DAQ-2205)</td>
<td>5 V 1.2 A typical (PXI/DAQ-2205)</td>
</tr>
<tr>
<td></td>
<td>3.3 V 0.8 A, +12 V 1.56 A typical (DAQ-2204)</td>
<td>3.3 V 0.81 A, +12 V 0.58 A typical (DAQ-2205)</td>
<td>3.3 V 0.756 A, +12 V 0.58 A typical (DAQ-2205)</td>
</tr>
</tbody>
</table>

Specifications

| Model Name | DIN-68S-01 | ACL-SII-2/3/4 |

- *For more information on mating terminal board and cables, please refer to P3-46/47.*
Features

- Supports a 32-Bit 3.3 V or 5 V PCI bus (DAQ-2500 series)
- PXI specification Rev 2.2 compliant (PXI-2500 series)
- x1 lane PCI Express Interface (DAQe-2500 series)
- Hardware-based arbitrary waveform generation
- Onboard 8 k-sample D/A FIFO (PXI/DAQ/DAQe-2501)
- Onboard 16 k-sample D/A FIFO (PXI/DAQ/DAQe-2502)
- Programmable bipolar or unipolar analog output ranges / internal or external reference sources on per channel basis
- 8-CH 400 kS/s 14-Bit single-ended analog inputs (PXI/DAQ/DAQe-2501) ; 4-CH 400 kS/s 14-Bit single-ended analog inputs (PXI/DAQ/DAQe-2502)
- Onboard 2 k-sample A/D FIFO
- Bipolar or unipolar analog input ranges
- Scatter-gather DMA for both analog inputs and outputs
- 24-CH TTL digital input/output
- 2-CH 16-Bit general-purpose timer/counter
- Analog & digital triggering
- Fully auto-calibration
- Multiple cards synchronization through SSI (System Synchronization Interface) bus or PXI trigger bus

OS Information
- Windows XP, Windows 7/8 x64/x86, Linux

Software Compatibility
- LabVIEW, MATLAB, Visual Studio.NET

Software Recommendations
- AD-Logger, DAQBench, DAQMaster

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>PXI/DAQ/DAQe-2501</th>
<th>PXI/DAQ/DAQe-2502</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>+3.3 V ±0.3 A, +12 V ±1.0 A</td>
<td>+3.3 V ±0.3 A, +12 V ±1.0 A</td>
</tr>
<tr>
<td>Dimensions</td>
<td>175 mm x 107 mm (6.82” x 4.17”) (not including connectors) (DAQ-2500 series)</td>
<td></td>
</tr>
<tr>
<td>Connector</td>
<td>68-pin VHDCI female</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-10°C to +60°C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40°C to +85°C</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>5 to 95%, non-condensing</td>
<td></td>
</tr>
<tr>
<td>Power requirements</td>
<td>+0.5 V, 1.8 A typical (PXI/DAQ/DAQe-2501) ; +3.3 V 0.78 A, +12 V 0.66 A typical (DAQ/DAQe-2501)</td>
<td></td>
</tr>
<tr>
<td>Hardware-based arbitrary waveform generation</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Base clock available</td>
<td>40 MHz, external clock up to 10 MHz</td>
<td></td>
</tr>
<tr>
<td>General Specifications</td>
<td>2-Ch general-purpose timer/counter</td>
<td></td>
</tr>
<tr>
<td>Dimensional accuracy</td>
<td>±0.001 mm (±0.00004”)</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>248 g (550 g with terminator boards)</td>
<td></td>
</tr>
</tbody>
</table>

Ordering Information / Quick Selection Guide

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Analog Output</th>
<th>Analog Input</th>
<th>O/D</th>
<th>Time/Counter</th>
</tr>
</thead>
<tbody>
<tr>
<td>PXI/DAQ/DAQe-2501</td>
<td>4 12 Bit</td>
<td>±10 V or 0 to 10 V</td>
<td>4</td>
<td>2-Ch, 4-Bit</td>
</tr>
<tr>
<td>PXI/DAQ/DAQe-2502</td>
<td>8 12 Bit</td>
<td>±10 V or 0 to 10 V</td>
<td>4</td>
<td>2-Ch, 4-Bit</td>
</tr>
</tbody>
</table>

Terminal Boards & Cables

- DIN-685-01
- ACL-10568-1
- ACL-SSI-2/3/4

* For more information on mating terminal board and cables, please refer to P3-46/47.
### Features
- Supports a 32-Bit 3.3 V or 5 V PCI bus (DAQ-2213, DAQ-2214)
- x1 lane PCI Express® Interface (DAQe-2213, DAQe-2214)
- Onboard 1 k-sample A/D FIFO
- Bipolar or unipolar analog input ranges
- Programmable gains: x1, x2, x4, x8
- 512-configuration channel gain queue
- Scatter-gather DMA
- 2-CH 12-Bit multiplying analog outputs with waveform generation (DAQ/DAQe-2214)
- Onboard 1 k-sample D/A FIFO (DAQ-2214, DAQe-2214)
- 24-CH TTL digital input/output
- 2-CH 16-Bit general-purpose timer/counter
- Analog and digital triggering
- Fully auto calibration
- Multiple cards synchronization through SSI (System Synchronization Interface) bus

### OS Information
- Windows XP, Windows 7/8 x64/x86, Linux

### Software Compatibility
- LabVIEW, MATLAB, Visual Studio.NET

### Software Recommendations
- AD-Logger, DAQBench, DAQMaster

### Terminal Boards & Cables
- DIN-68S-01
- ACL-10568-1
- ACL-SSI-2/3/4 (for DAQ/DAQe-2214)

* For more information on mating terminal board and cables, please refer to P3-46/47.

### Specifications

#### Analog Input
- **Model Name**: DAQ/DAQe-2213 / 2214
- **Specifications**:
  - **Resolution**: 16 Bit, no missing codes
  - **Number of channels**: 16 single-ended or 8 differential (software selectable per channel)
  - **Channel gain queue size**: 512
  - **Maximum update rate**: 250 kS/s
  - **Programmable gain**: 1, 2, 4, 8
  - **Bipolar input ranges**: ±10 V, ±5 V, ±2.5 V, ±1.25 V
  - **Unipolar input ranges**: 0-10 V, 0-5 V, 0-2.5 V, 0-1.25 V
  - **Offset error**: ±1 mV
  - **Gain error**: ±0.08% of FSR
  - **Input coupling**: DC
  - **Overvoltage protection**: Power on: Continuous ±30 V, Power off: Continuous ±15 V

#### Analog Output
- **Model Name**: DAQ/DAQe-2213 / 2214
- **Specifications**:
  - **Number of voltage outputs**: 2
  - **Resolution**: 12 Bit
  - **Output ranges**: 0-10 V, ±10 V, ±AOEXTREF, ±AOEXTREF
  - **Maximum update rate**: 1 μs
  - **Slew rate**: 20 V/μs
  - **Settling time**: 3 μs to ±0.5 LSB accuracy
  - **Gain error**: ±0.04% of max. output
  - **Driving capacity**: ±5 mA
  - **Output accuracy**: ±2 mV

#### Digital I/O
- **Model Name**: DAQ/DAQe-2213 / 2214
- **Specifications**:
  - **Number of channels**: 24-CH 8255 programmable input/output
  - **Resolution**: 16 Bit
  - **Compatibility**: 5 V TTL
  - **Data transfers**: Programmed I/O

#### General-Purpose Timer/Counter
- **Model Name**: DAQ/DAQe-2213 / 2214
- **Specifications**:
  - **Number of channels**: 2
  - **Resolution**: 16 Bit
  - **Compatibility**: 5 V TTL
  - **Base clock available**: 40 MHz, external clock up to 10 MHz

#### General Specifications
- **Auto Calibration**: Yes (+5 V, ±2 ppm°C)
- **Dimensions**: 175 mm x 107 mm (6.89” x 4.21”) (not including connectors) (DAQ-2213/2214), 168 mm x 107 mm (6.61” x 4.21”) (not including connectors) (DAQe-2213/2214)
- **Connector**: 68-pin VHDCI female x 2
- **Operating temperature**: 0°C to 55°C (32°F to 131°F)
- **Storage temperature**: -20°C to 70°C (-4°F to 158°F)
- **Humidity**: 5% to 95%, non-condensing
- **Power requirements**: +5 V 1.2 A typical (DAQ-2213), +3.3 V 0.84 A, +12 V 0.694 A typical (DAQ-2214), +3.3 V 0.77 A, +12 V 0.572 A typical (DAQ-2213)

### Ordering Information / Quick Selection Guide

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Analog Input</th>
<th>Analog Output</th>
<th>DIO</th>
<th>Timer/Counter</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAQ/DAQe-2213 / 2214</td>
<td>B DI/16 SE</td>
<td>12-bit, 250 kS/s</td>
<td>±1.25 V to ±10 V</td>
<td>2-CH, 16-bit</td>
</tr>
<tr>
<td>DAQ/DAQe-2213 / 2214</td>
<td>B DI/16 SE</td>
<td>12-bit, 250 kS/s</td>
<td>±1.25 V to ±10 V</td>
<td>2-CH, 16-bit</td>
</tr>
</tbody>
</table>

### Terminal Boards & Cables
- **DIN-68S-01**
- **ACL-10568-1**
- **ACL-SSI-2/3/4 (for DAQ/DAQe-2214)**

* For more information on mating terminal board and cables, please refer to P3-46/47.
**PCI-9114 Series**

32-CH 16-Bit Up to 250 kS/s Multi-Function DAQ Cards

### Features
- Supports a 32-Bit 5 V PCI bus
- 16-Bit A/D resolution
- Up to 100 kS/s sampling rate (PCI-9114DG)
- Up to 250 kS/s sampling rate (PCI-9114A-DG and PCI-9114A-HG)
- 32-CH single-ended or 16-CH differential analog inputs
- Bipolar or unipolar analog input ranges
- Onboard 1 k-sample A/D FIFO
- Programmable gains:
  - 1 x, 2 x, 4 x, 8 x (PCI-9114DG and PCI-9114A-DG)
  - 1 x, 10 x, 100 x (PCI-9114A-HG)
- Automatic analog inputs scanning
- 16-CH isolated digital inputs and 16-CH isolated digital outputs
- 2500 VRMS optical isolation for digital inputs and outputs
- 1-CH 16-Bit general-purpose timer/counter
- +12 V and -12 V power available on the 37-pin D-sub connector
- Onboard resettable fuses for power output protection
- Compact, half-size PCB
- OS Information
  - Windows XP, Windows 7/8 x64/x86, Linux
- Software Compatibility
  - LabVIEW, MATLAB, Visual Studio.NET
- Software Recommendations
  - AD-Logger, DAQBench, DAQMaster

### Specifications

#### Analog Input
- Number of channels: 32 single-ended or 16 differential
- Resolution: 16 Bit
- Conversion time:
  - 10 μs (PCI-9114DG)
  - 4 μs (PCI-9114A-DG & PCI-9114A-HG)
- Maximum sampling rate
  - PCI-9114DG: 100 kS/s
  - PCI-9114A-DG: 250 kS/s
- Input ranges (software programmable)
  - PCI-9114DG
    - 1 x: ±10 V
    - 2 x: ±5 V
    - 4 x: ±2.5 V
    - 8 x: ±1.25 V
    - 10 x: ±10 V
    - 100 x: ±0.1 V
- Input coupling: DC
- Overvoltage protection: continuous ±35 V
- Input impedance: 1 GΩ
- Trigger modes: software, pacer, and external trigger (5 V/TTL compatible)
- FIFO buffer size: 1 k samples
- Data transfers: polling, interrupt

#### Isolated Digital Input
- Number of channels: 16
- Maximum input range: 24 V, non-polarity
- Digital logic levels:
  - 0 – 24 V, non-polarity
  - Input high voltage: 5 – 24 V
  - Input low voltage: 0 – 1.5 V
- Input resistance: 2.4 kΩ @ 0.5 W
- Isolation voltage: 2500 VRMS
- Data transfers: programmed I/O

#### Isolated Digital Output
- Number of channels: 16
- Output type: open emitter Darlington transistors
- Sink current:
  - 350 mA for one channel @ 100% duty
  - 260 mA for all channels @ 10% duty
- Power dissipation: Max. 1.47 W per chip (8 DO channels)
- Supply voltage: 5-35 V
- Isolation voltage: 2500 VRMS
- Data transfers: programmed I/O

#### Power Output
- Output voltage: +12 V and -12 V
- Resettable fuse protection: 500 mA

### General-Purpose Timer/Counter
- Number of channels: 1
- Resolution: 16 Bit
- Compatibility: 5 V/TTL
- Base clock available: 2 MHz, external clock to 2 MHz

### General Specifications
- I/O connector:
  - 37-pin D-sub female
  - 20-pin ribbon male x 2
- Operating temperature: 0°C to 55°C (32°F to 131°F)
- Storage temperature: 20°C to 80°C (4°F to 176°F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements:
  - +5 V: 600 mA typical
  - +12 V: 100 mA typical
- Dimensions (not including connectors):
  - 175 mm x 107 mm (6.82" x 4.17")

### Terminal Boards & Cables
- **DIN-37D-01**
  - Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting
- **DIN-20P-01**
  - Terminal Board with One 20-pin Ribbon Connector and DIN-Rail Mounting
- **ACLD-9137-01**
  - General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- **ACLD-9188-01**
  - General-Purpose Terminal Board with Two 20-pin Ribbon Connectors and One 37-pin D-sub Connector

*Cables are not included. For information on mating cables, refer to P3-46/47.*

### Ordering Information
- **PCI-9114DG**
  - 32-CH 16-Bit 100 kS/s Normal-Gain Multi-Function DAQ Card
- **PCI-9114A-DG**
  - 32-CH 16-Bit 250 kS/s Normal-Gain Multi-Function DAQ Card
- **PCI-9114A-HG**
  - 32-CH 16-Bit 250 kS/s High-Gain Multi-Function DAQ Card

www.adlinktech.com/3-22
### Specifications

#### Analog Input
- Number of channels: 16 single-ended
- Resolution: 12 Bit (PCI-9111DG)
- 16 Bit (PCI-9111HR)
- Conversion time: 8 μs
- Maximum sampling rate: 100 kS/s
- Input signal ranges (software programmable)

<table>
<thead>
<tr>
<th>Gain</th>
<th>Input Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>±10 V</td>
</tr>
<tr>
<td>2</td>
<td>±5 V</td>
</tr>
<tr>
<td>4</td>
<td>±2.5 V</td>
</tr>
<tr>
<td>8</td>
<td>±1.25 V</td>
</tr>
<tr>
<td>16</td>
<td>±0.625 V</td>
</tr>
</tbody>
</table>

#### Accuracy
- Input coupling: DC
- Overvoltage protection: continuous ±35 V
- Input impedance: 10 MΩ
- Trigger modes: software, pacer, and external trigger (5 V/TTL compatible)
- FIFO buffer size: 1 k samples
- Data transfers: polling, interrupt

#### Analog Output
- Number of channels: 1 voltage output (NO s)
- Resolution: 12 Bit
- Output ranges (jumper selectable)

<table>
<thead>
<tr>
<th>Output Range</th>
<th>Bipolar</th>
<th>Unipolar</th>
</tr>
</thead>
<tbody>
<tr>
<td>±10 V</td>
<td>0 to 10 V</td>
<td></td>
</tr>
</tbody>
</table>

- Output driving capacity: ±5 mA max
- Settling time: 30 μs
- 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 Specifications
- I/O connector
  - 37-pin D-sub female
  - 20-pin ribbon male x 2
- Operating temperature: 0°C to 60°C (32°F to 140°F)
- Storage temperature: -20°C to 80°C (-4°F to 176°F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

<table>
<thead>
<tr>
<th>Device</th>
<th>±5 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI-9111DG</td>
<td>570 mA typical</td>
</tr>
<tr>
<td>PCI-9111HR</td>
<td>570 mA typical</td>
</tr>
</tbody>
</table>

- Dimensions (not including connectors): 175 mm x 107 mm (6.82" x 4.17")

### Terminal Boards & Cables
- DIN-37D-01*
  - Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting
- DIN-20P-01*
  - Terminal Board with Two 20-pin Ribbon Connectors and One 37-pin D-sub Connector
- ACLD-9137-01
  - General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- ACLD-9188A-01*
  - Terminal Board with 16-CH Isolated Digital Inputs
- ACLD-9185-01*
  - Terminal Board with 16-CH Relay Outputs

* Cables are not included. For information on mating cables, refer to P3-46/47.

### Ordering Information
- PCI-9111DG
  - 16-CH 12-Bit 100 kS/s Low-Cost Multi-Function DAQ Card
- PCI-9111HR
  - 16-CH 16-Bit 100 kS/s Low-Cost Multi-Function DAQ Card
**PCI-9112**

16-CH 12-Bit 110 kS/s Multi-Function DAQ Card

### Features
- Supports a 3.3 V or 5 V PCI bus (PCI-9112)
- 12-Bit A/D resolution
- Up to 110 kS/s sampling rate
- 16-CH single-ended or 8-CH differential inputs
- Bipolar or unipolar analog input ranges
- Programmable gains of x0.5, x1, x2, x4, x8
- Automatic analog inputs scanning
- Bus-mastering DMA for analog inputs
- 2-CH 12-Bit multiplying analog outputs
- 16-CH TTL digital inputs and 16-CH TTL digital outputs
- I-Ch 16-Bit general-purpose timer/counter

### General Specifications
- Calibration:
  - General-Purpose Timer/Counter
  - Digital 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 Bit
  - Compatibility: 5 V TTL
  - Base clock available: 2 MHz, external clock to 10 MHz

### Calibration
- PCI-9112: Calibrate Analog Output on 5V
- PCI-9112A: Calibrate Analog Output on 10V

### General Specifications
- I/O connector: 37-pin D-sub female
- Operating temperature: 0°C to 60°C (32°F to 140°F)
- Storage temperature: -20°C to 80°C (-4°F to 176°F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements
  - ±5 V: 460 mA typical
  - ±12 V: 110 mA typical
- Dimensions (not including connectors)
  - 175 mm x 107 mm (6.82" x 4.17")

### Analog Input
- Number of channels: 16 single-ended or 8 differential
- Resolution: 12 Bit
- Conversion time: 8 μs
- Maximum sampling rate: 110 kS/s
- Input signal ranges

<table>
<thead>
<tr>
<th>Gain</th>
<th>Input Range</th>
<th>Bipolar</th>
<th>Unipolar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>±10 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>±3 V</td>
<td>0 to 10 V</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>±12 V</td>
<td>0 to 2.5 V</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>±1.25V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>±0.625 V</td>
<td>0 to 1.25 V</td>
<td></td>
</tr>
</tbody>
</table>

### Analog Output
- Number of channels: 2 voltage outputs
- Resolution: 12 Bit
- Output ranges (software programmable)

<table>
<thead>
<tr>
<th>Output Range</th>
<th>Bipolar</th>
<th>Unipolar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0 to 10 V to 5 V to EXTREF</td>
</tr>
</tbody>
</table>

- Output driving capacity: ±5 mA max
- Settling time: 30 μs to 0.5 LSB
- Data transfers: programmed I/O

### Terminal Boards & Cables
- For PCI-9112:
  - DIN-37D-01: Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting
  - DIN-20P-01: Terminal Board with One 20-pin Ribbon Connector and DIN-Rail Mounting
  - ACLD-9137-01: General-Purpose Terminal Board with One 37-pin D-sub Male Connector
  - ACLD-9138-01: General-Purpose Terminal Board with One 37-pin D-sub Connector
  - ACLD-9188-01: General-Purpose Terminal Board with Two 20-pin Ribbon Connectors and One 37-pin D-sub Connector
  - ACLD-9182A-01: Terminal Board with 16-CH Isolated Digital Inputs
  - ACLD-9185-01: Terminal Board with 16-CH Isolated Digital Outputs
  - ACL-10137-1MM: 37-pin D-sub male/male, 1 M
  - ACL-10137-1MF: 37-pin D-sub male/female, 1 M
  - ACL-10120-1: 20-pin flat cable, 1 M
  - ACL-10237-1: 37-pin D-sub male/female flat cable, 1 M

* For more information on mating cables, please refer to P3-46/47.

### Ordering Information
- PCI-9112
  - 16-CH 12-Bit 110 kS/s Multi-Function DAQ Card (AO Calibrated on 5V)
- PCI-9112A
  - 16-CH 12-Bit 110 kS/s Multi-Function DAQ Card (AO Calibrated on 10V)

### Software Recommendations
- LabVIEW, MATLAB, Visual Studio.NET
- AD-Logger, DAQBench, DAQMaster

### OS Information
- Windows XP, Windows 7/8 x64/x86, Linux

### Software Compatibility
- Windows XP, Windows 7/8 x64/x86, Linux

### Terminal Boards & Cables
- Terminal Board with 16-CH Isolated Digital Inputs
- Terminal Board with 16-CH Isolated Digital Outputs
- 37-pin D-sub male/male, 1 M
- 37-pin D-sub male/female, 1 M
- 20-pin flat cable, 1 M

* For more information on mating cables, please refer to P3-46/47.

### Ordering Information
- PCI-9112
  - 16-CH 12-Bit 110 kS/s Multi-Function DAQ Card (AO Calibrated on 5V)
- PCI-9112A
  - 16-CH 12-Bit 110 kS/s Multi-Function DAQ Card (AO Calibrated on 10V)
### Specifications

#### Analog Input
- **Number of channels**: 16 single-ended or 8 differential
- **Channel gain queue size**: 256 configurations
- **Resolution**: 12 Bit
- **Conversion time**: 3 μs
- **Input signal ranges**:
  - Bipolar: ±5 V
  - Unipolar: 0 to 10 V
  - Gain: x1, x2, x4, x8 (PCI-9118DG/L) x1, x10, x100 (PCI-9118HG/L)
- **Input impedance**: 1 GΩ
- **Trigger modes**: software, pacer, and external trigger (5 V/TTL compatible)
- **FIFO buffer size**: 1 k samples
- **Data transfers**: polling, interrupts, bus-mastering DMA

#### Accuracy
- **PCI-9118DG/L**
  - 1: 0.008% of FSR ± 1 LSB
  - 2: 0.01% of FSR ± 1 LSB
  - 4: 0.02% of FSR ± 1 LSB
  - 8: 0.04% of FSR ± 1 LSB
- **PCI-9118HG/L**
  - 1: 0.000% of FSR ± 1 LSB
  - 2: 0.01% of FSR ± 1 LSB
  - 4: 0.02% of FSR ± 1 LSB
  - 8: 0.04% of FSR ± 1 LSB

#### Digital I/O
- **Number of channels**: 4 inputs and 4 outputs
- **Compatibility**: 5 V/TTL
- **Data transfers**: programmed I/O

### Ordering Information
- **PCI-9118DG/L**
  - 16-CH 12-Bit 333 kS/s Normal-Gain Analog Input Card
- **PCI-9118HG/L**
  - 16-CH 12-Bit 333 kS/s High-Gain Analog Input Card

### Terminal Boards & Cables
- **DIN-50S-01**
  - Terminal Board with One 50-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included.)
- **ACL-10250-1**
  - 50-pin SCSI-II cable (mating with AMP-787082-5), 1 M
  
* For more information on mating cables, please refer to P3-46/47.

### Features
- **Supports a 32-Bit 5 V PCI bus**
- **12-Bit A/D resolution**
- **Up to 333 kS/s sampling rate**
- **16 single-ended or 8 differential inputs**
- **256-configuration channel gain queue**
- **Onboard 1 k-sample A/D FIFO**
- **Bipolar or Unipolar analog input ranges**
- **Programmable gains**:
  - x1, x2, x4, x8 (PCI-9118DG/L)
  - x1, x10, x100 (PCI-9118HG/L)
- **Bus-mastering DMA for analog inputs**
- **4-CH TTL digital inputs and 4-CH TTL digital outputs**
- **Compact, half-size PCB**

### OS Information
- Windows XP, Windows 7/8 x64/x86, Linux

### Software Compatibility
- LabVIEW, MATLAB, Visual Studio.NET

### Software Recommendations
- AD-Logger, DAQBench, DAQMaster

### General Specifications
- **I/O connector**: 50-pin SCSI-II female
- **Operating temperature**: 0°C to 55°C (32°F to 131°F)
- **Storage temperature**: -20°C to 80°C (-4°F to 176°F)
- **Relative humidity**: 5% to 95%, non-condensing
- **Power requirements**: 50 mm x 107 mm (2.0" x 4.2")
- **Dimensions (not including connectors)**: 173 mm x 40 mm (6.74" x 1.57")
- **Power requirements**: +5 V
- **450 mA typical

---

3-25, www.adlinktech.com
**PCI-9113A**

32-CH 12-Bit 100 kS/s Isolated Analog Input Card

### Specifications

**Analog Input**
- Number of channels: 32 single-ended or 16 differential
- Resolution: 12 Bit
- Conversion time: 8 μs
- Maximum sampling rate: 100 kS/s
- Input signal ranges

<table>
<thead>
<tr>
<th>Gain</th>
<th>Input Range</th>
<th>Bipolar</th>
<th>Unipolar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>±10 V</td>
<td>±5 V</td>
<td>0 to 10 V</td>
</tr>
<tr>
<td>10</td>
<td>±1 V</td>
<td>±0.5 V</td>
<td>0 to 1 V</td>
</tr>
<tr>
<td>100</td>
<td>±0.1 V</td>
<td>±0.05 V</td>
<td>0 to 0.1 V</td>
</tr>
</tbody>
</table>

- Accuracy: 0.01% of FSR ± 1 LSB
- Input coupling: DC
- Overvoltage protection: continuous ±35 V
- Input impedance: 1 GΩ
- Trigger modes: software, pacer
- FIFO buffer size: 1 k samples
- Data transfers: polling, interrupt
- Isolation Voltage: 2500 VRMS

**General Specifications**
- I/O connector: 37-pin D-sub female
- Operating temperature: 0°C to 55°C (32°F to 131°F)
- Storage temperature: -20°C to 80°C (-4°F to 176°F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

<table>
<thead>
<tr>
<th>+5 V</th>
<th>960 mA typical</th>
</tr>
</thead>
</table>

**Terminal Boards & Cables**
- DIN-37D-01
  - Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included.)
- ACLD-9137-01
  - General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- ACL-10137-1MM
  - 37-pin D-sub male/male cable, 1 M
- ACL-10137-1MF
  - 37-pin D-sub male/female cable, 1 M

* For more information on mating cables, please refer to P3-46/47.

### Ordering Information
- PCI-9113A
  - 32-CH 12-Bit 100 kS/s Isolated Analog Input Card

---

**Features**
- Supports a 32-Bit 5 V PCI bus
- 12-Bit A/D resolution
- Up to 100 kS/s sampling rate
- 32-CH single-ended or 16-CH differential inputs
- Onboard 1 k-sample A/D FIFO
- Bipolar or unipolar analog input ranges
- Programmable gains of x1, x10, x100
- Automatic analog inputs scanning
- Onboard low-pass filtering capability for analog inputs
- 2500 Vrms optical isolation
- Compact, half-size PCB

**OS Information**
- Windows XP, Windows 7/8 x64/x86, Linux

**Software Compatibility**
- LabVIEW, MATLAB, Visual Studio.NET

**Software Recommendations**
- AD-Logger, DAQBench, DAQMaster

---

**Input Range**

- **Unipolar**
  - ±10 V
  - ±5 V
  - ±0.5 V
  - ±0.05 V

- **Bipolar**
  - ±5 V
  - ±0.5 V
  - ±0.05 V

---

**Dimensions**

173 mm x 107 mm (6.74” x 4.17”)
cPCI-9116
64-CH 16-Bit 250 kS/s Multi-Function DAQ Card

Features
■ 3U/6U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1)
■ 16-Bit A/D resolution, up to 250 kS/s sampling rate
■ Up to 250 kS/s sampling rate
■ 64-CH single-ended or 32-CH differential inputs
■ Onboard 1 k-sample A/D FIFO
■ Bipolar or unipolar analog input ranges
■ Programmable gains of x1, x2, x4, x8
■ 512-configuration channel-gain queue
■ Bus-mastering DMA for analog inputs
■ 8-CH TTL digital inputs and 8-CH TTL digital outputs
■ 1-CH 16-Bit general purpose timer/counter

OS Information
• Windows XP, Windows 7/8 x64/x86, Linux

Software Compatibility
• LabVIEW, MATLAB, Visual Studio.NET

Software Recommendations
• AD-Logger, DAQBench, DAQMaster

Specifications

**Analog Input**
■ Number of channels: 64 single-ended or 32 differential (software selectable per channel)
■ Resolution: 16 Bit
■ Maximum sampling rate: 250 kS/s
■ Input signal ranges (software programmable)

<table>
<thead>
<tr>
<th>Gain</th>
<th>Input Range</th>
<th>Bipolar</th>
<th>Unipolar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>±5 V</td>
<td>0 to 10 V</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>±2.5 V</td>
<td>0 to 5 V</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>±1.25 V</td>
<td>0 to 2.5 V</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>±0.625 V</td>
<td>0 to 1.25 V</td>
<td></td>
</tr>
</tbody>
</table>

■ Accuracy

<table>
<thead>
<tr>
<th>Gain</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.01% of FSR ± 1 LSB</td>
</tr>
<tr>
<td>2, 4</td>
<td>0.02% of FSR ± 1 LSB</td>
</tr>
<tr>
<td>8</td>
<td>0.04% of FSR ± 1 LSB</td>
</tr>
</tbody>
</table>

■ Input coupling: DC
■ Overvoltage protection: Continuous ±35 V
■ Input impedance: 1 GΩ
■ Trigger modes: Software, pre-trigger, post-trigger, middle trigger, delay trigger, and repeated trigger
■ Channel-gain queue size: 512 configurations
■ FIFO buffer size: 1 k samples
■ Data transfers: polling, interrupt, bus-mastering DMA

**Digital I/O**
■ Number of channels: 8 inputs and 8 outputs
■ Compatibility: 5 V/TTL
■ Data transfers: programmed I/O

**General-Purpose timer/counter**
■ Number of channels: 1
■ Resolution: 16 Bit
■ Compatibility: 5 V/TTL
■ Base clock available: 24 MHz, external clock up to 24 MHz

**General Specifications**
■ I/O connector: 100-pin SCSI-II female
■ Operating temperature: 0°C to 55°C (32°F to 131°F)
■ Storage temperature: -20°C to 80°C (-4°F to 176°F)
■ Relative humidity: 5% to 95%, non-condensing
■ Power requirements

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>±15 V</td>
<td>560 mA typical</td>
</tr>
<tr>
<td>±12 V</td>
<td>100 mA typical</td>
</tr>
</tbody>
</table>

■ Dimensions (not including connectors)
• 160 mm x 100 mm (6.24” x 3.9”) (3U)

Terminal Boards & Cables
■ DIN-1005-01
Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (cables are not included.)
■ ACL-102100-1
100-pin SCSI-II cable (rating with AMP-787082-9), 1 M
* For more information on mating cables, please refer to P3-46/47.

Ordering Information
■ cPCI-9116
64-CH 16-Bit 250 kS/s Multi-Function DAQ Card
### Features
- Supports a 32-Bit 5 V PCI bus
- 12-Bit D/A resolution (PCI-6308V & PCI-6308A)
- Isolated 8-CH 12-Bit voltage output (PCI-6308V & PCI-6308A)
- Isolated 8-CH 12-Bit current output (PCI-6308A)
- Bipolar or unipolar output ranges
- External reference input for user-defined ranges
- 4-CH isolated digital outputs and 4-CH isolated digital inputs
- 2500 Vrms optical isolation
- Compact, half-size PCB

**OS Information**
- Windows XP, Windows 7/8 x64/x86, Linux

**Software Compatibility**
- LabVIEW, MATLAB, Visual Studio.NET

**Software Recommendations**
- AD-Logger, DAQBench, DAQMaster

---

### Specifications

#### Isolated Analog Output
- **Number of channels:** 8 voltage outputs (PCI-6308V & PCI-6308A)
- **Resolution:** 12 Bit
- **Output ranges (jumper selectable):**
  - **Bipolar:** ± 10 V
  - **Unipolar:** 0 to 10 V 0 to EXTREF
- **Settling time:** 16 μs (20 V step)
- **Maximum update interval:** 90 μs for four channels simultaneously
- **Gain error:** ±0.2 % max.
- **DNL:** ±1 LSB
- **Output driving capacity:** ±5 mA
- **Isolation voltage:** 2500 Vrms
- **Output initial status:** 0 V (after RESET or POWER-ON)
- **Data transfers:** programmed I/O

#### Current Output (PCI-6308A)
- **Number of channels:** 8
- **Resolution:** 12 Bit
- **Output ranges (software programmable):**
  - 0-20 mA, 4-20 mA, and 5-25 mA
- **Gain error:** 0.3%
- **Settling time:** 17 μs (0-20 mA)
- **Slew rate:** 1.3 mA/μs
- **DNL:** ±1 LSB maximum
- **Output resistance:** 10 Ω typical
- **Current load resistance:** 0 - 500 Ω
- **Output initial status:** 4 mA (after RESET or POWER-ON)
- **Data transfers:** programmed I/O

#### Isolated Digital Input
- **Number of channels:** 4
- **Maximum input range:** 24 V, non-polarity
- **Digital logic levels**
  - **Input high voltage:** 5 - 24 V
  - **Input low voltage:** 0 - 1.5 V
- **Input resistance:** 2.4 kΩ @ 0.5 W
- **Isolation voltage:** 2500 Vrms
- **Data transfers:** programmed I/O

#### Isolated Digital Output
- **Number of channels:** 4 (PCI-6308V & PCI-6308A)
- **Output type:** photo-coupler transistors
- **Supply voltage:** 5 to 35 V
- **Isolation voltage:** 2500 Vrms
- **Data transfers:** programmed I/O

---

### Order Information
- **PCI-6308V**
  - 8-CH 12-Bit Isolated Voltage Output Card
- **PCI-6308A**
  - 8-CH 12-Bit Isolated Voltage & Current Output Card

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**Terminal Boards & Cables**
- **DIN-37D-01**
  - Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included.)
- **ACLD-9137-01**
  - General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- **ACL-10137-1MM**
  - 37-pin D-sub male/male cable, 1 M
- **ACL-10137-1MF**
  - 37-pin D-sub male/female cable, 1 M

* For more information on mating cables, please refer to P3-46/47.

---

**Ordering Information**
- **PCI-6308V**
  - 8-CH 12-Bit Isolated Voltage Output Card
- **PCI-6308A**
  - 8-CH 12-Bit Isolated Voltage & Current Output Card

---

### General Specifications
- I/O connector: 37-pin D-sub female
- Operating temperature: 0˚C to 55˚C (32˚F to 131˚F)
- Storage temperature: -20˚C to 80˚C (-4˚F to 176˚F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements
<table>
<thead>
<tr>
<th>Device</th>
<th>+5 V</th>
<th>+12 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI-6308V</td>
<td>220 mA typical</td>
<td>175 mA typical</td>
</tr>
<tr>
<td>PCI-6308A</td>
<td>220 mA typical</td>
<td>250 mA typical</td>
</tr>
<tr>
<td></td>
<td>530 mA maximum</td>
<td></td>
</tr>
</tbody>
</table>
- Dimensions (not including connectors): 175 mm x 107 mm (6.82” x 4.17”)

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**Ordering Information**
- **PCI-6308V**
  - 8-CH 12-Bit Isolated Voltage Output Card
- **PCI-6308A**
  - 8-CH 12-Bit Isolated Voltage & Current Output Card
PCI-6202
4-CH 16-Bit 1 MS/s Analog Output & 32-CH Isolation DIO Card

**Features**
- Supports a 32-Bit 3.3 V or 5 V PCI bus
- Hardware-based waveform generation
- DNL Linearity less than 1 LSB
- Digital triggering for waveform generation
- 16-CH isolation digital inputs & 16-CH isolation digital outputs
- 8-CH TTL DI and 8-CH TTL DO
- 2-CH timer/counter, base clock: 40 MHz
- 4-CH PWM output
- 3-CH encoder inputs, supporting AB phase and CW/CCW
- Multiple card synchronization through SSI (System Synchronization Interface) bus

**OS Information**
- Windows XP, Windows 7/8 x64/x86, Linux

**Software Compatibility**
- LabVIEW, MATLAB, Visual Studio.NET

**Software Recommendations**
- AD-Logger, DAQBench, DAQMaster

**Specifications**

### Analog Output
- Resolution: 16 Bit
- Number of channels: Four (simultaneous update)
- Maximum update rate: 1 MS/s
- FIFO buffer size: 8k Samples (4-CH Sharing)
- Output range: ±10 V
- DNL: Less than ±1 LSB
- Offset Error: 0.3 mV
- Positive Gain Error: 0.3 mV
- Negative Gain Error: 0.3 mV
- Settling Time: 3 μs
- Slew Rate: 20 V/μs
- Rise Time: 0.67 μs
- Falling Time: 0.705 μs
- Output Current Capacity: 5 mA
- Trigger source: Software, External digital, SSI bus
- Data Transfer: Software polling, DMA

### Isolated Digital Output
- Number of channels: 16
- Sink current limitation: 250 mA for one channel @ 100% duty
- Supply voltage: 5-35 VDC
- Isolation voltage: 2500 VRMS

### Encoder Input
- Number of channels: Three Encoder type
  - CW/CCW encoder
  - x1 AB phase encoder
  - x2 AB phase encoder
  - x4 AB phase encoder

### Function I/O
- Digital I/O: Eight DO (3.3 V TTL Level)/Eight DI (3.3 V or 5 V TTL Level)
- General Timer/Counter: Two 32-Bit, Base clock: 80 MHz, external to 10 MHz
- Pulse Generation: Four PWM Outputs
  - Single pulse generation
  - Pulse train generation
- AF10/AF11: DI/DA Convert Clock or Start Trigger

### General Specifications
- PCI Bus: 5 V and 3.3 V universal PCI bus
- I/O Connector: Two 68-pin SC51-VHDCI female
- Operation temperature: 0°C to 55°C (32°F to 131°F)
- Storage temperature: -20°C to 70°C (-4°F to 158°F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements:
  - +5 V: 500 mA typical
  - +12 V: 110 mA typical
- Dimensions: 175 mm x 107 mm (6.82” x 4.17”) (not including connectors)

**Terminal Boards & Cables**
- DIN-68S-01
  - Terminal Board with One 68-pin SCSI-II connector and DIN-Rail Mounting (Cables are not included.)
- ACL-10568-1
  - 68-pin SCISI-VHDCI cable (mating with AMP-787082-7), 1 M
- For more information about mating cables, please refer to P3-46/47.

**SSI Bus Cables**
(for multiple PCI/PCIe cards synchronization)
- ACL-SSI-2
  - SSI Bus cable for two devices
- ACL-SSI-3
  - SSI Bus cable for three devices
- ACL-SSI-4
  - SSI Bus cable for four devices

**Ordering Information**
- PCI-6202
  - 4-CH 16-Bit 1 MS/s Analog Output & 32-CH Isolation DIO Card
### Features
- Supports a 32-Bit 3.3 V or 5 V PCI bus (PCI-6208/6216/6208A)
- x1 lane PCI Express® Interface (PCIe-6208/6216-GL)
- 3U Eurocard form factor, CompactPCI compliant PICMG 2.0 R2.1 (PCI-6208/6216 series)
- 16-Bit D/A resolution
- Effective 15-Bit resolution current transducers (PCI-6208/6216-GL)
- 8-CH voltage outputs (PCI/PCIe/PCI-6208V-GL & PCIe-6216V-GL)
- 16-CH voltage outputs (PCI/PCIe/cPCI-6216V-GL)
- 8-CH current outputs (PCI/PCi-6208A)
- Bipolar analog output range
- 4-CH TTL digital inputs and 4-CH TTL digital outputs
- OS Information
  - Windows XP, Windows 7/8 x64/x86, Linux
- Software Compatibility
  - LabVIEW, MATLAB, Visual Studio.NET
- Software Recommendations
  - AD-Logger, DAQBench, DAQMaster

### Specifications
#### Voltage Output
- Number of channels
  - 8 voltage outputs (PCI/PCIe/PCI-6208V-GL & PCIe-6216V-GL)
  - 16 voltage outputs (PCI/PCIe/cPCI-6216V-GL)
- Resolution: 16 Bit
- Monotonicity: 15 Bit typical
- Output ranges: ±10 V
- Slew rate: 2.6 V/jus typical
- Settling time: 130 µs typical (20 V step)
- Gain Error: ±0.2% maximum
- DNL: ±0.5 LSB typical
- Output driving capacity: ±5 mA maximum
- Output initial status: 0 V
- Data transfer: programmed I/O

#### Current Output
- Number of channels: 8 current outputs (PCI/PCi-6208A)
- Resolution: 15 Bit typical
- Monotonicity: 14 Bit typical
- Output ranges: (Software programmable)
  - 0-20 mA, 4-20 mA, 5-25 mA
- Slew rate: 1.3 mA/jus typical
- Settling time: 17 µs typical (20 mA step)
- Span Error: ±0.3% typical
- Output initial status: 4 mA (after RESET or POWER-ON)
- Data transfer: programmed I/O

#### Digital I/O
- Number of channels: 4 inputs and 4 outputs
- Compatibility: 5 V TTL
- Data transfer: programmed I/O

#### General Specifications
- I/O connector: One 37-pin D-sub female
- Operating temperature: 0°C to 50°C (32°F to 122°F)
- Storage temperature: -20°C to 80°C (-4°F to 176°F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

#### Terminal Boards & Cables
- DIN-37D-01
  - Terminal Board with One 37-pin D-sub Connector and DIN Rail Mounting (Cables are not included.)
- ACLD-9137-01
  - General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- ACLD-9137F-01
  - General-Purpose Terminal Board with One 37-pin D-sub female Connector.
- ACL-10137-1MM
  - 37-pin D-sub male/male cable, 1 M
- ACL-10137-1MF
  - 37-pin D-sub male/female cable, 1 M
* For more information about mating cables, please refer to P3-46/47.

#### Ordering Information
- PCI-6208V-GL
  - 8-CH 16-Bit Voltage Output Card
- PCI-6216V-GL
  - 16-CH 16-Bit Voltage Output Card
- PCI-6208A
  - 8-CH 16-Bit Voltage and Current Output Card
- PCIe-6208V-GL
  - 8-CH 16-Bit Voltage Output Module
- PCIe-6216V-GL
  - 16-CH 16-Bit Voltage Output Module
- PCIe-6208V-GL
  - 8-CH 16-Bit Voltage and Current Output Card
- PCIe-6216V-GL
  - 16-CH 16-Bit Voltage Output Card

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### Dimensions (not including connectors)
- PCI-6208/6216: 175 mm x 107 mm (6.82" x 4.17")
- PCIe-6208/6216: 168 mm x 112 mm (6.55" x 4.36")
- cPCI-6208/6216: 160 mm x 100 mm (6.24" x 3.9")

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www.adlinktech.com/3-30
PCle-7350
50 MHz 32-CH High-Speed Digital I/O Card

Features
- x1 lane PCI Express® Interface
- Maximum 50 MHz clock rate from internal timer or 100 MHz from external clock
- 200 MB/s maximum throughput
- Software selectable voltage level of 1.8 V, 2.5 V, and 3.3 V
- 16-steps phase shift in external clock mode
- Per group (8-bit) input/output direction selectable
- Supports I2C and SPI programmable serial interfaces for external device communication
- Scatter-gather DMA support
- Flexible handshaking and external digital trigger modes
- 8-channel auxiliary programmable I/O

OS Information
- Windows XP, Windows 7/8 x64/x86, Linux

Software Compatibility
- LabVIEW, MATLAB, Visual Studio.NET

Software Recommendations
- AD-Logger, DAQBench, DAQMaster

Specifications
Digital I/O
- Number of channels:
  - 32, per group (8-channel) input/output direction selectable
- Logic levels: 1.8 V, 2.5 V, 3.3 V (software selectable)
- Power-up status: All digital inputs
- Impedance:
  - Input: 10 kΩ
  - Output: 50 Ω
- Input protection: -1 to 6 V
- Data transfer: Programmable I/O, bus-mastering DMA with scatter-gather
- Maximum data transfer rate: 200 MB/s
- Digital logic levels:

<table>
<thead>
<tr>
<th>Logic Levels</th>
<th>1.8 V</th>
<th>2.5 V</th>
<th>3.3 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Input</td>
<td>Min. input high voltage</td>
<td>1.2 V</td>
<td>1.6 V</td>
</tr>
<tr>
<td></td>
<td>Max. input low voltage</td>
<td>0.63 V</td>
<td>0.7 V</td>
</tr>
<tr>
<td>Digital Output</td>
<td>Min. output high voltage</td>
<td>1.6 V</td>
<td>2.3 V</td>
</tr>
<tr>
<td></td>
<td>Max. output low voltage</td>
<td>0.2 V</td>
<td>0.2 V</td>
</tr>
<tr>
<td></td>
<td>Max. output driving current</td>
<td>8 mA</td>
<td>16 mA</td>
</tr>
</tbody>
</table>

Clocking mode
- Internal clock: Max. 50 MHz (100 MHz / N; 2 < N < 65535)
- External clock: Max. 100 MHz (support 8/16-bit data width only, data throughput must be less than 200 MB/s)
- Handshaking
- Burst handshaking

Trigger sources
- Software trigger
- External digital trigger: AFI[0…7]

Trigger modes
- Post trigger, Retrigger, Pattern match, Handshaking

Change of State Interrupt
- Interrupt sources: Any of 32 channels or a pre-define channel Change-of-State

Application Function I/O
- Number of channels: 8
- Supporting modes: static I/O, I2C or SPI master node, external clock input/output, external digital trigger input, handshaking

Terminal Boards & Cables
- DIN-68H-01
  - Terminal Board with One 68-pin SCSI-VHDCI Connector and 0 or 50 Ω Jumper Selectable Impedance (Cables are not included.)
- ACL-10279
  - 68-pin SCSI-VHDCI Cable with 50 Ω Impedance
- SMB-SMB-1M
  - SMB to SMB Cable, 1M
* For more information about mating cables, please refer to P3-46/47.

Ordering Information
- PCle-7350
  - 50 MHz 32-CH High-Speed Digital I/O PCI Express® Card

Specifications
- Digital I/O
  - Number of channels:
    - 32, per group (8-channel) input/output direction selectable
  - Logic levels: 1.8 V, 2.5 V, 3.3 V (software selectable)
  - Power-up status: All digital inputs
  - Impedance:
    - Input: 10 kΩ
    - Output: 50 Ω
  - Input protection: -1 to 6 V
  - Data transfer: Programmable I/O, bus-mastering DMA with scatter-gather
  - Maximum data transfer rate: 200 MB/s
  - Digital logic levels:

<table>
<thead>
<tr>
<th>Logic Levels</th>
<th>1.8 V</th>
<th>2.5 V</th>
<th>3.3 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Input</td>
<td>Min. input high voltage</td>
<td>1.2 V</td>
<td>1.6 V</td>
</tr>
<tr>
<td></td>
<td>Max. input low voltage</td>
<td>0.63 V</td>
<td>0.7 V</td>
</tr>
<tr>
<td>Digital Output</td>
<td>Min. output high voltage</td>
<td>1.6 V</td>
<td>2.3 V</td>
</tr>
<tr>
<td></td>
<td>Max. output low voltage</td>
<td>0.2 V</td>
<td>0.2 V</td>
</tr>
<tr>
<td></td>
<td>Max. output driving current</td>
<td>8 mA</td>
<td>16 mA</td>
</tr>
</tbody>
</table>

Clocking mode
- Internal clock: Max. 50 MHz (100 MHz / N; 2 < N < 65535)
- External clock: Max. 100 MHz (support 8/16-bit data width only, data throughput must be less than 200 MB/s)
- Handshaking
- Burst handshaking

Trigger sources
- Software trigger
- External digital trigger: AFI[0…7]

Trigger modes
- Post trigger, Retrigger, Pattern match, Handshaking

Change of State Interrupt
- Interrupt sources: Any of 32 channels or a pre-define channel Change-of-State

Application Function I/O
- Number of channels: 8
- Supporting modes: static I/O, I2C or SPI master node, external clock input/output, external digital trigger input, handshaking
Features

- x1 lane PCI Express® Interface (PCIe-7300A)
- Supports a 32-Bit 5 V PCI bus (PCI-7300A)
- 3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1) (cPCI-7300)
- 32-CH 5 V/TTL digital inputs/outputs
- 20 MHz (80 MB/s) maximum transfer rate
- 8, 16, or 32-Bit transfers
- 4 auxiliary DI & 4 auxiliary DO
- Onboard 64 kB FIFO
- Onboard programmable timer pacer clock
- Timed digital input sampling controlled by internal timer or external clock
- Independent trigger signals to start data acquisition and pattern generation
- Scatter-gather DMA
- Supports handshake digital I/O transfer mode
- Repeated digital pattern generation from FIFO
- Active terminators for high-speed and longdistance data transfer

OS Information

- Windows XP, Windows 7/8 x64/x86, Linux

Software Compatibility

- LabVIEW, MATLAB, Visual Studio.NET

Software Recommendations

- AD-Logger, DAQBench, DAQMaster

Specifications

Digital I/O

- Numbers of channel (Software configurable)
  - 16 DI & 16 DO
  - 32 DI
  - 32 DO
- Compatibility: 5 V/TTL
- Digital logic levels
  - Input high voltage: 2.5-2.25 V
  - Input low voltage: 0.0-0.8 V
  - Output high voltage: 2.7 V minimum
  - Output low voltage: 0.5 V maximum
- Input load
  - Terminater OFF
  - Input high current: 1 mA
  - Input low current: 20 mA
  - Terminater ON
  - Terminater resistor: 111 Ω
  - Terminater voltage: 2.9 V
  - Input high current: 1 mA
  - Input low current: 22.4 mA
- Output driving capacity
  - Source current: 8 mA
  - Sink current: 48 mA

Transfer characteristics

- Data transfers
  - Bus-mastering DMA with Scatter/Gather
  - Data width: 32/16/8 Bit (programmable)

Data transfer count

- 2 M double words (8 MB) for non-chaining mode DMA
- No limitation for chaining mode (scatter/gather) DMA

Max transfer rate

- DO: 80 MB/s, 32-Bit output @ 20 MHz
- DI: 80 MB/s, 32-Bit input @ 20 MHz

Trigger

- DI_TRG for digital inputs,
- DO_TRG for digital outputs
- Compatibility: 5 V/TTL
- Trigger types: rising or falling edges
- Minimum pulse width: 32 ns

Clocking mode

- Internal clock
  - Internal clock sources: 20 MHz, 10 MHz, Timer #0 output (digital input pacer) and Timer #1 output (digital output pacer)
  - External clock up to 40 MHz
- Handshaking
- Burst handshaking

Programmable counter

- Base clock: 10 MHz
- Timer #0 as digital input pacer
- Timer #1 as digital output pacer
- Timer #2: as interrupt source

Auxiliary digital I/O

- Number of channels
  - 4-CH digital inputs
  - 4-CH digital outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

General Specifications

- I/O connector: One 100-pin SCSI-II female
- Operating temperature: 0°C to 60°C (32°F to 140°F)
- Storage temperature: -20°C to 80°C (-4°F to 176°F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

<table>
<thead>
<tr>
<th>Device</th>
<th>Power</th>
<th>Onboard terminator off</th>
<th>Onboard terminator on</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI-7300A</td>
<td>+5 V</td>
<td>830 mA typical</td>
<td>1.0 A typical</td>
</tr>
<tr>
<td>PCIe-7300A</td>
<td>+12 V</td>
<td>119 mA typical</td>
<td>287 mA typical</td>
</tr>
<tr>
<td>cPCI-7300</td>
<td>+12 V</td>
<td>499 mA typical</td>
<td>543 mA typical</td>
</tr>
<tr>
<td></td>
<td>+3.3 V</td>
<td>830 mA typical</td>
<td>1.0 A typical</td>
</tr>
</tbody>
</table>

- Dimensions (not including connectors)
  - 179 mm x 106 mm (6.98” x 4.13”) (PCI-7300A)
  - 168 mm x 112 mm (6.55” x 4.36”) (PCIe-7300A)
  - 160 mm x 100 mm (6.24” x 3.9”) (cPCI-7300)

Terminal Boards & Cables

- DIN-1005-01
  - Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included.)
  - Note:
    - Legacy DIN-5025 can be replaced by two DIN-505-01 and ACL-10232-1 (100-Pin to two 50-Pin Cable, 1 M)

- ACL-102100-1
  - 100-pin SCSI-II cable (mating with AMP-787082-9), 1 M
  - For more information on mating cables, please refer to P3-46/47.

Ordering Information

- PCI-7300A
  - 80 MB/s High-Speed 32-CH Digital I/O PCI Card
- PCIe-7300A
  - 80 MB/s High-Speed 32-CH Digital I/O PCIe Card
- cPCI-7300
  - 80 MB/s High-Speed 32-CH Digital I/O CompactPCI Card
**PCI/PCIe-7200**

32-CH DI & 32-CH DO 12 MB/s High-Speed Cards

---

### Features
- Supports a 32-Bit 5 V PCI bus (PCI-7200)
- x1 lane PCI Express® interface (PCIe-7200)
- 32-CH TTL digital inputs and 32-CH TTL digital outputs
- Up to 12 MB/s transfer rate
- Bus-mastering DMA for both digital inputs and outputs
- Onboard programmable timer pacer clock
- Supports handshaking digital I/O transfer mode
- Multiple programmable interrupt sources
- 5 V power available on connectors
- Compact, half-size PCB (PCI-7200/PCIe-7200)

### OS Information
- Windows XP, Windows 7/8 x64/x86, Linux

### Software Compatibility
- LabVIEW, MATLAB, Visual Studio.NET

### Software Recommendations
- AD-Logger, DAQBench, DAQMaster

---

### Specifications

#### Digital I/O
- Number of channels:
  - 32-CH digital inputs
  - 32-CH digital outputs
- Compatibility: 5 V/TTL
- Data transfer rate:
  - 12 MB/s with external 3 MHz clock, handshaking or external strobe
  - 8 MB/s with internal 2 MHz timer pacer
- Digital logic levels:
  - Input high voltage: 2.5-5.25 V
  - Input low voltage: 0-0.8 V
  - Output high voltage: 2.7 V minimum
  - Output low voltage: 0.5 V maximum
- Output driving capacity:
  - Source current: 3.0 mA
  - Sink current: 24 mA
- Data transfers:
  - programmed I/O, interrupt, bus-mastering DMA

#### Programmable Counter
- Base clock: 4 MHz
- Timer 0: DI clock source
- Timer 1: DO clock source
- Timer 2: Base clock source of timer 0 & 1

#### Interrupt
- Sources:
  - EO_ACK, EI_REQ, Timer 0, Timer 1 or Timer 2

---

### General Specifications

#### I/O connector
- PCI/PCIe-7200
  - 37-pin D-sub female
  - 40-pin Header

#### Operating temperature:
- 0°C to 60°C (32°F to 140°F)

#### Storage temperature:
- -20°C to 80°C (-4°F to 176°F)

#### Relative humidity:
- 5% to 95%, non-condensing

#### Power requirements

<table>
<thead>
<tr>
<th>Device</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI-7200</td>
<td>5 V @ 720 mA typical</td>
</tr>
<tr>
<td>PCIe-7200</td>
<td>12 V @ 200 mA, 3.3 V @ 500 mA</td>
</tr>
</tbody>
</table>

#### Dimensions (not including connectors)
- 148 mm x 102 mm (5.77” x 3.97”) (PCI/PCIe-7200)

---

### Terminal Boards & Cables

**PCI/PCIe-7200**

- DIN-37D-01
  - Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included.)
- ACLD-9137-01
  - General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- ACLD-9137F-01
  - General-Purpose Terminal Board with One 37-pin D-sub Female Connector

**ACLI-10137-MM**

- 37-pin D-sub male/male cable, 1 M

**ACLI-10137-1MF**

- 37-pin D-sub male/female cable, 1 M

* For more information on mating cables, please refer to P3-46/47.

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### Ordering Information

**PCI-7200**

- 12 MB/s High-Speed 32-CH DI & 32-CH DO Card

**PCIe-7200**

- 12 MB/s High-Speed 32-CH DI & 32-CH DO

PCI Express® card
PCI-7260
8-CH High-Power Relay Outputs & 8-CH Isolated Digital Inputs Card

**Features**
- Supports a 32-Bit 3.3 V or 5 V PCI bus
- 8-CH high power relay outputs
- 5 A at 250 Vac
- 5 A at 30 Vdc
- 8-CH isolated digital inputs
- 8-CH relay status outputs
- 1-CH emergency shutdown input
- Pluggable connector for high current input
- Onboard LED indicators for relay status
- Initial and safety state setting by DIP switches
- Interrupts generated from
  - COS (Change-of-State) of DI
  - CH0/CH1 rising edge
- Built-in watchdog timer

**OS Information**
- Windows XP, Windows 7/8 x64/x86, Linux

**Software Compatibility**
- LabVIEW, MATLAB, Visual Studio.NET

**Software Recommendations**
- AD-Logger, DAQBench, DAQMaster

**Specifications**

**Relay Output**
- Number of channels: 8
- Relay type: Non-latching SPST-NO + SPST-NC (for output indicator)
- Contact rating
  - AC: 250 V @ 5 A
  - DC: 30 V @ 5 A
- Insulation resistance: 1000 MΩ min. (at 500 Vdc)
- Breakdown voltage: 2000 Vdc, 50/60 Hz for 1 minute
- Contact resistance: 30 mΩ max
- Operate time: 10 ms max.
- Release time: 10 ms max.
- LED indicators: onboard LEDs for relay status
- Expected relay life
  - > 10⁶ operations @ 5 A, 250 Vac/30 Vdc
- Data transfer: programmed I/O

**Isolated Digital Input**
- Number of channels: 8
- Current
  - Rated current: 10 mA
  - Max current: 50 mA, for isolated input.
- Input voltage: Up to 24 Vdc
- Input high voltage: 10-24 Vdc
- Input low voltage: 0-2 V
- Input resistance: 4.7 KΩ ± 5%
- Input mode: AC-filter/ Non-AC-filter
- Isolation voltage: 2,500 Vrms channel-to-system
- Interrupt sources
  - Change-of-state (COS)
  - CH0/CH1 rising edge
- Data transfer: programmed I/O

**Isolation +5 V Power Supply**
- Output Voltage: +5 V
- Output Current: 170 mA max. (Rated @ 40°C)

**Relay Status Output**
- Number of channels: 8
- Driving capacity: 15 mA

**General Specifications**
- I/O connector
  - 18-pin pluggable terminal block connector
  - 20-pin ribbon male x2
- Operating temperature: 0°C to 60°C (32°F to 140°F)
- Storage temperature: -20°C to 70°C (-4°F to 158°F)
- Relative humidity: 35% to 85%, non-condensing
- Power requirements
  - +5 V
  - 990 mA typical (when all relays are activated simultaneously)
- Dimensions (not including connectors)
  - 175 mm x 107 mm (6.82” x 4.17”)

**Certificate**
- EMC/EMI: CE, FCC Class A
- Safety: EN61010: 2001

**Ordering Information**
- PCI-7260
  - 8-CH High-Power Relay Outputs & 8-CH Isolated Digital Inputs Card
- ACL-10337 (for JP2/JP3)
  - Two 20-Pin Header to 37-Pin D-Sub PC Back Panel

www.adlinktech.com/3-34
PCI/LPCI/LPCie-7250, PCI-7251, cPCI-7252
8-CH Relay Outputs & 8-CH Isolated DI Cards

Features
- Supports a 32-Bit 5 V PCI bus (PCI-7250/7251)
- Supports a 32-Bit 3.3 V or 5 V PCI bus (LPCI-7250)
- x1 lane PCI Express Interface (LPCIe-7250)
- 3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1) (cPCI-7252)
- 4-CH SPDT & 4-CH SPST relays (PCI-7250)
- 8-CH SPDT & 8-CH SPST relays (PCI-7250 + 1 x PCI-7251)
- 12-CH SPDT & 12-CH SPST relays (PCI-7250 + 2 x PCI-7251)
- 16-CH SPDT & 16-CH SPST relays (PCI-7250 + 3 x PCI-7251)
- 8-CH SPDT (LPCI-7250/LPCIe-7250/cPCI-7252)
- Non-latching relays
- Onboard LED indicators for relay status
- Onboard relay driving circuits
- Relay output status read back
- B-CH isolated digital inputs (cPCI-7252/LPCI-7250/LPCIe-7250)
- 8-CH isolated digital inputs (PCI-7250 + 1 x PCI-7251)
- 24-CH isolated digital inputs (PCI-7250 + 2 x PCI-7251)
- 32-CH isolated digital inputs (PCI-7250 + 3 x PCI-7251)
- Onboard low-pass filtering for digital inputs
- Compact, low-profile size PCB (LPCI-7250/LPCIe-7250)
- OS Information
  - Windows XP, Windows 7/8 x64/x86, Linux
- Software Compatibility
  - LabVIEW, MATLAB, Visual Studio.NET
- Software Recommendations
  - AD-Logger, DAQBench, DAQMaster

Specifications

Relay Output
- Number of channels: 8
- Relay types
  - PCI-7250/7251:
    - Channel 0-3: SPDT (normal open)
    - Channel 4-7: SPST (normal open)
  - LPCie-7250/LPCIe-7250/cPCI-7252:
    - Channel 0-7: SPDT (normal open)
- Contact rating
  - PCI-7250/7251 & cPCI-7252:
    - AC: 120 V @ 0.5 A
    - DC: 24 V @ 1 A
  - LPCie-7250/LPCIe-7250:
    - DC: 30 V @ 2 A
- Breakdown voltage: 1000 Vrms
- Contact resistance: 100 m
- Relay ON/OFF time
  - Operate time: 8 ms
  - Release time: 8 ms
- LED indicators: onboard LEDs for relay status
- Expected life
  - PCI-7250/7251 & cPCI-7252:
    - >5x10^6 operations @ 1 A, 24 Vdc
    - >2x10^6 operations @ 0.5 A, 120 Vac
  - LPCie-7250/LPCIe-7250:
    - >10^6 operations @ 2 A, 30 Vdc
    - >5x10^6 operations @ 1 A, 30 Vdc
- Data transfers: programmed I/O

Isolated Digital Input
- Number of channels: 8
- Maximum input range: 24 V, non-polarity
- Digital logic levels
  - 0.24 V, non-polarity
  - Input high voltage: 5-24 V (PCI/LPCI/LPCIe-7250, PCI-7251)
  - 3-24 V (cPCI-7252)
  - Input low voltage:
    - 0-1.5 V (PCI/LPCI/LPCIe-7250, PCI-7251)
    - 0-1 V (cPCI-7252)
  - Input resistance:
    - 2.2 kΩ @ 0.33 W (PCI/LPCI/LPCIe-7250, PCI-7251)
  - 1 kΩ @ 0.5 W (cPCI-7252)
- Isolation voltage: 5000 Vrms
- Data transfers: programmed I/O

General Specifications
- I/O connector
  - PCI-7250/7251
    - 37-pin D-sub female
  - LPCie-7250/LPCIe-7250/cPCI-7252
    - 50-pin SCSI-ll female

Operating temperature: 0°C to 60°C (32°F to 140°F)
Storage temperature: -20°C to 80°C (-4°F to 176°F)
Relative humidity: 5% to 95%, non-condensing
Power requirements

<table>
<thead>
<tr>
<th>Device</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI-7250</td>
<td>+5 V @ 140 mA typical</td>
</tr>
<tr>
<td>PCI-7251</td>
<td>+5 V @ 125 mA typical</td>
</tr>
<tr>
<td>LPCie-7250</td>
<td>+5 V @ 200 mA typical</td>
</tr>
<tr>
<td>LPCie-7250</td>
<td>+3.3 V @ 280 mA + 12 V @ 180 mA</td>
</tr>
</tbody>
</table>

Dimensions (not including connectors)
- 162 mm x 107 mm (6.31” x 4.17”) (PCI-7250)
- 141 mm x 102 mm (5.49” x 3.97”) (PCI-7251)
- 120 mm x 65 mm (4.68” x 2.53”) (LPCIe-7250)
- 120 mm x 69 mm (4.68” x 2.69”) (LPCI-7250)
- 160 mm x 100 mm (6.24” x 3.9”) (cPCI-7252)

Terminal Boards & Cables
- PCI-7250/7251:
  - DIN-37D-01
  Terminal Board with One 37-pin D-sub Connector and DIN-Rail Mounting (Cables are not included.)
  - ACLD-9137-01
  General-Purpose Terminal Board with One 37-pin D-sub Male Connector
  - ACLD-10137-1MM
  37-pin D-sub male/male cable, 1 M
- LPCie-7250/LPCIe-7250/cPCI-7252:
  - DIN-505-01
  Terminal Board with One 50-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included.)
  - ACLD-10250-1
  50-pin SCSI-II cable (mating with AMP-787082-5), 1 M
* For more information on mating cables, please refer to P3-46/47.

Ordering Information
- PCI-7250
  8-CH Relay Outputs & 8-CH Isolated DI Card
- PCI-7251
  8-CH Relay Outputs & 8-CH Isolated DI Extension Card for PCI-7250
- LPCie-7250
  8-CH Relay Outputs & 8-CH Isolated DI Low-Profile PCI Card
- LPCie-7250
  8-CH Relay Outputs & 8-CH Isolated DI Low-Profile PCI Express Card
- cPCI-7252
  8-CH Relay Output & 16-CH Isolated DI Module
PCI-7256
16-CH Latching Relay Outputs & 16-CH Isolated DI Card

Features
- Supports a 32-Bit 3.3 V or 5 V PCI bus
- 16-CH latching SPDT relays
- Latching relays
- Power saving on relay actuation
- Output status unchanged when power-off
- Onboard LED indicators for relay status
- Relay output status read back
- Onboard relay driving circuits
- Onboard connectors for external LED connection
- 16-CH isolated digital inputs
- 2500 Vrms optical isolation for digital inputs
- Change-of-state (COS) interrupt
- Onboard low-pass filtering for digital inputs
- Two external interrupt sources
- Onboard isolated +5 V power for dry contact inputs
- Compact, half-size PCB
- Board ID

OS Information
- Windows XP, Windows 7/8 x64/x86, Linux

Software Compatibility
- LabVIEW, MATLAB, Visual Studio.NET

Software Recommendations
- AD-Logger, DAQBench, DAQMaster

Specifications

**Relay Output**
- Number of channels: 16
- Relay type: Latching SPDT (Form C), latching
- The output status will keep unchanged when power-off
- Isolation voltage: 1500 Vrms
- Contact rating
  - AC: 125 V @ 0.5 A
  - DC: 30 V @ 1 A
- Breakdown voltage: 1000 Vrms
- Contact resistance: 60 mΩ
- Relay ON/OFF time
  - Operate time: 3 ms
  - Release time: 3 ms
- LED indicators
  - Onboard LEDs for relay status
  - Onboard connectors for external LED connection
- Expected relay life:
  - >2x10^5 operations @ 1 A, 30 Vdc
  - >10^5 operations @ 0.5 A, 125 Vdc
- Data transfer: programmed I/O

**Isolated Digital Input**
- Number of channels: 16
- Maximum input range: 24 V, non-polarity
- Digital logic levels
  - 0-24 V, non-polarity
  - Input high voltage: 10-24 V
  - Input low voltage: 0-2 V
- Input resistance: 4.7 kΩ @ 0.5 W
- Isolation voltage: 2500 Vrms channel-to-system
- Interrupt sources: Change-of-state interrupt, digital input channel 0 and 1
- Data transfer: programmed I/O

**Isolated Power Supply**
- Output voltage: +5 V
- Output current: 170 mA max @ 40°C

**General Specifications**
- I/O connector: 68-pin SCSI-II female
- Operating temperature: 0°C to 60°C (32°F to 140°F)
- Storage temperature: -20°C to 80°C (-4°F to 176°F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements
  - +5 V
    - 340 mA typical
    - 980 mA max. (when all relays are activated simultaneously)
- Dimensions (not including connectors)
  - 175 mm x 107 mm (6.82" x 4.17")

Terminal Boards & Cables
- DIN-68S-01
  - Terminal Board with One 68-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included.)
- ACL-10569-1
  - 68-pin SCSI-II cable (mating with AMP-787082-7), 1 M
* For more information on mating cables, please refer to P3-46/47.

Ordering Information
- PCI-7256
  - 16-CH Latching Relay Outputs & 16-CH Isolated DI Card
**Features**
- Supports a 32-Bit 3.3 V or 5 V PCI bus
- 32-CH long-life PhotoMos relay outputs
- Relay output status read back
- 1500 VRMS optical isolation for relay outputs
- Onboard LED indicators for relay status
- Onboard connectors for external LED connection
- Onboard relay driving circuits
- 2-CH isolated digital inputs
- Two external interrupt sources
- 2500 VRMS optical isolation for digital inputs
- Compact, half-size PCB
- Board ID

**OS Information**
- Windows XP, Windows 7/8 x64/x86, Linux

**Software Compatibility**
- LabVIEW, MATLAB, Visual Studio.NET

**Software Recommendations**
- AD-Logger, DAQBench, DAQMaster

**Specifications**

### Relay Output
- Number of channels: 32
- Relay type: PhotoMos SPST (Form A)
- Load voltage (peak AC): 350 V
- Continuous load current: 0.12 A
- Peak load current: 0.3 A
- Maximum switching power: 300 mW
- Isolation voltage: 1500 VRMS
- Output turn-on resistance: 17 Ω typical
- Output off-state leakage current: 1 μA maximum
- Turn-on time: 0.23 ms typical
- Turn-off time: 0.04 ms typical
- Data transfers: programmed I/O

### Isolated Digital Input
- Number of channels: 2
- Maximum input range: 24 V, non-polarity
- Digital logic levels
  - Input high voltage: 5-24 V
  - Input low voltage: 0-1.5 V
- Input resistance: 2.4 kΩ @ 0.5 W
- Isolation voltage: 2500 VRMS
- Interrupt sources: digital input channel 0 and 1
- Data transfers: programmed I/O

### General Specifications
- I/O connector: 68-pin SCSI-II female
- Operating temperature: 0˚C to 60˚C (32˚F to 140˚F)
- Storage temperature: -20˚C to 80˚C (-4˚F to 176˚F)
- Relative humidity: 5% to 95%, non-condensing

**Ordering Information**
- **PCI-7258**
  - 32-CH PhotoMos Relay Outputs & 2-CH Isolated DI Card

**Terminal Boards & Cables**
- **DIN-68S-01**
  - Terminal Board with One 68-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included.)
- **ACL-10569-1**
  - 68-pin SCSI-II cable (mating with AMP-787082-7), 1 M
* For more information on mating cables, please refer to P3-46/47.

**3-37. www.adlinktech.com**
**Specifications**

**Isolated Digital Input**
- Number of channels:
  - 64 (PCI-7442)
  - 128 (PCI-7443)
- Maximum input range: 28 V, non-polarity
- Digital logic levels: 0 V to 28 V, non-polarity
- Input high voltage: 5 V to 28 V
- Input low voltage: 0 V to 1.5 V
- Input resistance: 4.7 kΩ @ 0.5 W
- ESD protection CKT switch (front)
- Isolation voltage: 1250 Vrms channel-to-system
- Interrupt sources: 64/128-channel Change-of-State (COS)
- Data transfer: programmed I/O

**Isolated Digital Output**
- Number of channels:
  - 64 (PCI-7442)
  - 128 (PCI-7444)
- Output type: open drain Power MOSFET driver
- Output range: 5 V to 40 V
- Sink current: 250 mA for all channels @ 100% duty (300 mA max.)
- Isolation voltage: 1250 Vrms channel-to-system
- Data transfer: programmed I/O

**Isolation +5 V Power Supply (PCI-7442/7444 only)**
- Output Voltage: +5 V
- Output Current: 100 mA max. (@ 40˚C)

**Safety Functions (PCI-7442/7444 only)**
- Programmable power-up DO status
- Watchdog timer
  - Base clock available: 10 MHz, fixed
  - Counter width: 32-Bit

**General Specifications**
- I/O connector: 68-pin Dual port VHDCI female
- Operating temperature: 0˚C to 60˚C (32˚F to 140˚F)
- Storage temperature: -20˚C to 80˚C (-4˚F to 176˚F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

<table>
<thead>
<tr>
<th>Device</th>
<th>+5 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI-7442</td>
<td>800 mA typical</td>
</tr>
<tr>
<td>PCI-7443</td>
<td>550 mA typical</td>
</tr>
<tr>
<td>PCI-7444</td>
<td>800 mA typical</td>
</tr>
</tbody>
</table>

- Dimension: 175 mm x 107 mm (6.82” x 4.17”)

**Features**
- Supports universal 32-Bit 3.3 V and 5 V PCI bus, plug-and-play
- High-density, opto-isolated digital input and/or digital output
- PCI-7442: 64-CH digital input and 64-CH digital output
- PCI-7443: 128-CH digital input
- PCI-7444: 128-CH digital output
- 1250 Vrms isolation voltage
- Programmable Change-of-State (COS) detection for all digital input channels
- Voltage protection of up to 28 V for isolated input
- Dry contact input (PCI-7442 only)
- Up to 300 mA high-output driving capability for all output channels
- 250 mA sink current on isolated output channels
- Digital output status read back function
- Digital output value retained after hot system reset
- Programmable power-up DO status
- Programmable safety DO status functions when WDT interruption occurs
- Watchdog timer counter prevents system crashes (PCI-7442/PCI-7444 only)
- 32-CH programmable TTL I/O function
- Board ID feature

**Terminal Boards & Cables**
- DIN-68S-01
  - Terminal Board with One 68-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included.)
- ACL-1056BD
  - Dual-68-Pin Head to Two 68-Pin SCSI-VHDCI Cable
- ACL-1056BF
  - 68-Pin SCSI-VHDCI Flat Cable

*For more information on mating cables, please refer to P3-46/47.

**Ordering Information**
- **PCI-7442**
  - 64-CH Isolated DI and 64-CH isolated DO card
- **PCI-7443**
  - 128-CH Isolated DI card
- **PCI-7444**
  - 128-CH Isolated DO card

**Digital I/O**

**Modular Instruments**

**DAQ**

**GPIB & Bus Expansion**

**Vision**

**Motion Control**

**Real-time Distributed I/O**

**PAC**

**Remote I/O**

**Communications**

**Fanless Embedded Computers**

www.adlinktech.com/3-38
64-CH Isolated Digital I/O Cards

**Specifications**

### Isolated Digital Input

- **Number of channels**
  - 32 (PCI-7432/7432HIR, cPCI-7432)
  - 64 (PCI-7433/7433HIR, cPCI-7433)

- **Maximum input range (Non-polarity)**
  - 24 V, non-polarity (PCI-7432/7433, PCI-7432/7433HIR)

- **Digital logic levels:** 0 V to 24 V, non-polarity
  - Input high voltage: 5 V to 24 V
  - Input low voltage: 0 V to 1.5 V

- **Input impedance**
  - 2.4 kΩ @ 0.5 W (PCI-7432, cPCI-7432, cPCI-7433)
  - 2.4 kΩ @ 1 W (PCI-7433)
  - 4.7 kΩ @ 0.5 W (PCI-7432HIR)
  - 4.7 kΩ @ 1 W (PCI-7433HIR)

- **Isolation voltage:**
  - 2500 VRMS: PCI-7432/7432HIR/7433/7433HIR
  - 5000 VRMS: cPCI-7432/7433

- **Interrupt sources:** digital input channel 0 & 1
- **Data transfers:** programmed I/O

### Isolated Digital Output

- **Number of channels**
  - 32 (PCI-7432/7432HIR, cPCI-7432)
  - 64 (PCI-7433/7434)

- **Output type:** open collector Darlington transistor

- **Sink current** (PCI-7432/7432HIR/7434, cPCI-7434)
  - 500 mA for single channel @ 100% duty cycle
  - 500 mA for all channels @ 20% duty cycle

- **Source current** (cPCI-7434P)
  - 500 mA for single channel @ 100% duty cycle
  - 260 mA for all channels @ 10% duty cycle

- **Power dissipation:**
  - Max. 2.25 W per chip (8 DO channels) (PCI-7432/7432HIR/7434, cPCI-7432/7434)
  - 1.47 W per chip (8 DO channels) (cPCI-7434P)

- **Supply voltage:** 5-35 V

### General Specifications

- **I/O connector:** 100-pin SCSI-II female
- **Operating temperature:** 0°C to 60°C (32°F to 140°F)

### Terminal Boards & Cables

- **DIN-100S-01**
  - Terminal Board with One 100-pin SCSI-II Connector
  - DIN-Rail Mounting (Cables are not included.)

- **ACL-102100-1**
  - 100-pin SCSI-II cable (mating with AMP-787082-9), 1 M

* For more information on mating cables, please refer to P3-46/47.

Note: Legacy DIN-502S can be replaced by two DIN-50S-01 and ACL-10252-1 (100-Pin to two 50-Pin Cable, 1 M)

### Ordering Information

- **PCI-7432**
  - 32-CH Isolated DI & 32-CH Isolated DO Card
- **PCI-7432HIR**
  - 32-CH Isolated DI & 32-CH Isolated DO Card with High Input Range
- **PCI-7433**
  - 64-CH Isolated DI Card
- **PCI-7433HIR**
  - 64-CH Isolated DI Card with High Input Range
- **PCI-7434**
  - 64-CH Isolated DO Card
- **cPCI-7433**
  - 64-CH Isolated DI Card
- **cPCI-7434**
  - 64-CH Isolated DO Card
- **cPCI-7434P**
  - 64-CH Isolated DO Card with Source Current Transistor

### Storage information
- **Temperature:** -20°C to 80°C (-4°F to 176°F)
- **Relative humidity:** 5% to 95%, non-condensing

### Power requirements

<table>
<thead>
<tr>
<th>Device</th>
<th>+5 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI-7432/7432HIR, cPCI-7432</td>
<td>530 mA typical</td>
</tr>
<tr>
<td>PCI-7433/7433HIR, cPCI-7433</td>
<td>500 mA typical</td>
</tr>
<tr>
<td>PCI-7434, cPCI-7434P</td>
<td>560 mA typical</td>
</tr>
</tbody>
</table>

### Dimensions (not including connectors)

- **156 mm x 106 mm (6.08” x 4.13”)** (PCI-7432 & PCI-7432HIR)
- **175 mm x 107 mm (6.82” x 4.17”)** (PCI-7433, PCI-7433HIR)
- **156 mm x 106 mm (6.08” x 4.13”)** (PCI-7434)
- **156 mm x 106 mm (6.08” x 4.13”)** (PCI-7434P)
- **160 mm x 100 mm (6.24” x 3.9“)** (cPCI-7432/7433/7434)

**Features**

- Supports a 32-Bit 5 V PCI bus (PCI-7432/7433/7434)
- 3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1) (cPCI-7432/7433/7434)
- 32-CH isolated digital inputs & 32-CH isolated digital outputs (PCI-7432/7432HIR, cPCI-7432)
- 64-CH isolated digital inputs (PCI-7433/7433HIR, cPCI-7433)
- 64-CH isolated digital outputs (PCI-7434, cPCI-7434/7434P)
- Isolation Voltage:
  - 2500 VRMS: PCI-7432/7432HIR/7433/7433HIR
  - 5000 VRMS: cPCI-7432/7433
- Two external interrupt sources (PCI-7432/7432HIR/7433/7433HIR, cPCI-7432/7432/7433)

**OS Information**

- Windows XP, Windows 7/8 x64/x86, Linux

**Software Compatibility**

- LabVIEW, MATLAB, Visual Studio.NET

**Software Recommendations**

- AD-Logger, DAQBench, DAQMaster
PCI/LPCI/LPCIe/cPCI-7230, PCI-7233/7234
32-CH Isolated DIO Cards

Specifications

### Isolated Digital Input

- **Number of channels**
  - 16 (PCI-7230/LPCI-7230/LPCIe-7230/cPCI-7230)
  - 32 (PCI-7233)
- **Maximum input range**
  - 24 V, non-polarity
  - PCI-7230/LPCI-7230/LPCIe-7230/LPCI-7230
- **Digital logic levels**
  - 0-24 V non-polarity
  - Input high voltage: 5-24 V
  - Input low voltage: 0-1.5 V
- **Input resistance**: 1.2 kΩ @ 0.5 W
- **Isolation voltage**
  - 2500 Vrms (PCI-7230/LPCI-7230/LPCIe-7230)
  - 5000 Vrms (PCI-7230/LPCI-7230/LPCIe-7230)
- **Interrupt sources**
  - Digital input channel 0 and 1 (PCI-7233)
  - Change-of-state (PCI-7233)
- **Data transfers**: programmed I/O

### Isolated Digital Output

- **Number of channels**
  - 16 (PCI-7230/LPCI-7230/PCIe-7230/cPCI-7230)
  - 32 (PCI-7234)
- **Output type**: Darlington transistor
- **Sink current**
  - 500 mA for one channel @ 100% duty (PCI-7230/LPCI-7230/LPCIe-7230)
  - 370 mA for all channels @ 10% duty (PCI-7230/LPCI-7230/LPCIe-7230)
  - 130 mA for all channels @ 50% duty (PCI-7230/LPCI-7230/LPCIe-7230)
  - 500 mA for single channel @ 100% duty (PCI-7234)
  - 500 mA for all channels @ 20% duty (PCI-7234)
- **Source current**
  - 500 mA for one channel @ 100% duty cycle (PCI-7234P)
  - 260 mA for all channels @ 10% duty cycle (PCI-7234P)
- **Power dissipation**
  - Max. 1.47 W per chip (8 DO channels)
  - PCI-7230/LPCI-7230/LPCIe-7230/LPCI-7230
  - Max. 2.25 W per chip (8 DO channels)
- **Supply voltage**: 5-35 VDC
- **Isolation voltage**: 2500 Vrms
- **Data transfers**: programmed I/O

### Power requirements

<table>
<thead>
<tr>
<th>Device</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI-7230</td>
<td>+5 V @ 150 mA typical (needs external DC power)</td>
</tr>
<tr>
<td>PCI-7233</td>
<td>+5 V @ 300 mA typical</td>
</tr>
<tr>
<td>PCI-7234</td>
<td>+5 V @ 180 mA typical (with internal DC-DC power)</td>
</tr>
<tr>
<td>PCI-7234P</td>
<td>+5 V @ 150 mA typical</td>
</tr>
<tr>
<td>LPCI-7230</td>
<td>+3.3 V @ 279 mA</td>
</tr>
<tr>
<td>LPCIe-7230</td>
<td>+12 V @ 133 mA</td>
</tr>
<tr>
<td>cPCI-7230</td>
<td>+5 V @ 270 mA typical</td>
</tr>
</tbody>
</table>

### Dimensions (not including connectors)

- 153 mm X 107 mm (5.96” x 4.17”) (PCI-7230)
- 158 mm X 107 mm (6.16” x 4.17”) (PCI-7233)
- 175 mm X 107 mm (6.89” x 4.17”) (PCI-7234 & PCI-7234P)
- 120 mm X 65 mm (4.68” x 2.53”) (LPCI-7230)
- 119.9 mm x 68.9 mm (4.67” x 2.68”) (LPCIe-7230)
- 160 mm x 100 mm (6.24” x 3.9”) (cPCI-7230)

### Terminal Boards & Cables

- **PCI-7230/7233/7234/7234P:**
  - Terminal Board with One 37-pin D-sub connector and DIN-Rail Mounting (Cables are not included.)
  - PCI-7230/7233/7234/7234P: General-Purpose Terminal Board with One 37-pin D-sub Male Connector
  - PCI-7230/7233: 37-pin D-sub male/male cable, 1 M
  - LPCI-7230/LPCIe-7230/cPCI-7230: 50-pin SCSI-II cable (mating with AMP-787082-5), 1 M
  - LPCI-7230/LPCIe-7230/cPCI-7230: 37-pin D-sub male/male cable, 1 M
  - LPCI-7230/LPCIe-7230/cPCI-7230: 50-pin SCSI-II cable with inversed input logic
  - LPCI-7230/LPCIe-7230/cPCI-7230: 37-pin D-sub male/male cable, 1 M
  - LPCI-7230/LPCIe-7230/cPCI-7230: 50-pin SCSI-II cable (mating with AMP-787082-5), 1 M

### Ordering Information

- **PCI-7230:**
  - 16-CH Isolated DI & 16-CH Isolated DO Card
  - PCI-7230P: 32-CH Isolated DI Card with Source Current Transistor
  - PCI-7230P: 32-CH Isolated DO Card with Source Current Transistor
  - PCI-7230P: 32-CH Isolated DO Card with Source Current Transistor
  - PCI-7230P: 32-CH Isolated DO Card with Source Current Transistor

### General Specifications

- **I/O connector**
  - PCI-7230/7230/7234/7234P
  - 37-pin D-sub female
  - PCI-7230/7230/7234/7234P
  - One 50-pin SCSI-II female
- **Operating temperature**: 0°C to 60°C (32°F to 140°F)
- **Storage temperature**: -20°C to 80°C (-4°F to 176°F)
- **Relative humidity**: 5% to 95%, non-condensing

### Features

- Supports a 32-Bit 5 V PCI bus (PCI-7230/7233/7234/7234P)
- Supports a 32-Bit 3.3 V or 5 V PCI bus (LPCI-7230)
- x1 lane PCI Express Interface (LPCIe-7230)
- 3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1) (cPCI-7230)
- 16-CH isolated digital inputs & 16-CH isolated digital outputs (PCI-7230/LPCI-7230/LPCIe-7230/cPCI-7230)
- 32-CH isolated digital inputs (PCI-7233)
- 32-CH isolated digital outputs (PCI-7234/7234P)
- 5000 Vrms optical isolation (PCI-7230 & PCI-7233/cPCI-7230)
- 2500 Vrms optical isolation (PCI-7234/7234P/LPCIe-7230/LPCI-7230)
- Sink current up to 500 mA on single isolated output
- Two external interrupt sources (PCI-7230/LPCI-7230/LPCIe-7230/LPCI-7230)
- Charge-of-state interrupt sources (PCI-7233)
- Compact, low-profile PCI/PCI Express (PICMG 2.0 R2.1) (cPCI-7230)
- 5000 VRMS optical isolation (PCI-7230/LPCI-7230/LPCIe-7230/cPCI-7230)
- Change-of-state interrupt sources (PCI-7233)
- Compact, low-profile PCI Express (PICMG 2.0 R2.1) (cPCI-7230)
- 5000 VRMS optical isolation (PCI-7230/LPCI-7230/LPCIe-7230/cPCI-7230)
- Change-of-state interrupt sources (PCI-7233)
- Compact, low-profile PCI Express (PICMG 2.0 R2.1) (cPCI-7230)

### Software Recommendations

- LabVIEW, MATLAB, Visual Studio.NET
- Software Recommendations
  - AD-Logger, DAQBench, DAQMaster

### Hardware Specifications

- **Dimensions (not including connectors)**
  - 153 mm X 107 mm (5.96” x 4.17”) (PCI-7230)
  - 158 mm X 107 mm (6.16” x 4.17”) (PCI-7233)
  - 175 mm X 107 mm (6.89” x 4.17”) (PCI-7234 & PCI-7234P)
  - 120 mm X 65 mm (4.68” x 2.53”) (LPCI-7230)
  - 119.9 mm x 68.9 mm (4.67” x 2.68”) (LPCIe-7230)
  - 160 mm x 100 mm (6.24” x 3.9”) (cPCI-7230)

### Terminal Boards & Cables

- **PCI-7230/7233/7234/7234P:**
  - Terminal Board with One 37-pin D-sub connector and DIN-Rail Mounting (Cables are not included.)
- **ACLD-9137-01:**
  - General-Purpose Terminal Board with One 37-pin D-sub Male Connector
- **ACLD-10137-1MM:**
  - 37-pin D-sub male/male cable, 1 M
- **LPCI-7230/LPCIe-7230/cPCI-7230:**
  - 50-pin SCSI-II cable with inversed input logic (mating with AMP-787082-5), 1 M

* For more information on mating cables, please refer to P3-46/47.
PCI/PCIe-7296/7248, PCI-7224
96/48/24-CH Opto-22 Compatible DIO Cards

Features
- Supports a 32-Bit 5 V PCI bus (PCI-7224/7248/7296)
- x1 PCI Express® interface (PCIe-7248/7296)
- 96-CH digital TTL/DTL inputs/outputs (PCI/PCIe-7296)
- 48-CH digital TTL/DTL inputs/outputs (PCI/PCIe-7248)
- 24-CH digital TTL/DTL inputs/outputs (PCI-7224)
- Emulates 4/2/1 industry standard 8255 PPI (mode 0)
- Direct interface with OPTO-22 compatible I/O modules
- Output status read back
- Onboard 8254 timer/counter chip
- One 12-Bit timer for timed interrupt generation
- One 16-Bit event counter to generate event interrupt
- Programmable interrupt sources
- +12 V and +5 V power available on OPTO-22 connectors
- Onboard resettable fuses for power output protection
- Compact, half-size PCB

OS Information
- Windows XP, Windows 7/8 x64/x86, Linux

Software Compatibility
- LabVIEW, MATLAB, Visual Studio.NET

Software Recommendations
- AD-Logger, DAQBench, DAQMaster

Specifications

Digital I/O
- Number of channels
  - 96 inputs/outputs (PCI/PCIe-7296)
  - 48 inputs/outputs (PCI/PCIe-7248)
  - 24 inputs/outputs (PCI-7224)
- Compatibility: 5 V/TTL
- Digital logic levels
  - Input high voltage: 2-5.25 V
  - Input low voltage: 0-0.8 V
  - Output high voltage: 2.4 V minimum
  - Output low voltage: 0.5 V maximum
- Output driving capacity
  - Source current: 2.6 mA for port A & B, and 15 mA for port C.
  - Sink current: 24 mA
- Data transfers: programmed I/O

General Specifications
- I/O connector
  - 50-pin ribbon male x 1 (PCI-7224)
  - 50-pin ribbon male x 2 (PCI/PCIe-7248)
  - 50-pin ribbon male x 4 (PCI/PCIe-7296)
- Operating temperature: 0˚C to 60˚C (32˚F to 140˚F)
- Storage temperature: -20˚C to 80˚C (-4˚F to 176˚F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

Terminations
- TB-24R-01* Terminal Board with 24-CH Relay Outputs
- TB-24P-01* Terminal Board with 24-CH Isolated Digital Inputs
- TB-16DI-8O-01* Terminal Board with 16-CH Isolated DI & 8-CH Relay Outputs
- DIN-24R-01* Terminal Board with 24-CH Relay Outputs
- DIN-24P-01* Terminal Board with 24-CH Isolated Digital Inputs and DIN-Rail Mounting
* For more information on mating cables, please refer to P3-46/47.

Ordering Information
- PCI-7296
  - 96-CH Opto-22 Compatible DIO Card
- PCI-7248
  - 48-CH Opto-22 Compatible DIO Card
- PCI-7224
  - 24-CH Opto-22 Compatible DIO Card
- PCIe-7248
  - 48-CH Opto-22 Compliant PCIe DIO Card
- PCIe-7296
  - 96-CH Opto-22 Compliant PCIe DIO Card

Note:
The PCI-7224 is the 24-CH version of the PCI-7248. The software drivers of the PCI-7224 are exactly the same as those of the PCI-7248.
## Specifications

### Digital I/O

- **Number of channels**: 48 inputs/outputs
- **Compatibility**: 5 V/TTL
- **Power-on states**: pull-high, pull-low, floating (programmable)
- **Digital logic levels**
  - Input high voltage: 2.5-2.25 V
  - Input low voltage: 0.0-0.8 V
  - Output high voltage: 2.4 V minimum
  - Output low voltage: 0.5 V maximum
- **Output driving capacity**
  - Source current: 15 mA
  - Sink current: 24 mA
- **Data transfers**: programmed I/O

### Interrupt

- **Interrupt #0 sources**
  - P1C0
  - P1/C3
  - 16-Bit event counter
- **Interrupt #1 sources**
  - P2C0
  - P2/C3
  - 32-Bit timer (based on 2 MHz internal clock)

### General Specifications

- **I/O connector**: One 100-pin SCSI-II female
- **Operating temperature**: 0°C to 60°C (32°F to 140°F)
- **Storage temperature**: -20°C to 80°C (-4°F to 176°F)
- **Relative humidity**: 5% to 95%, non-condensing
- **Power requirements**

<table>
<thead>
<tr>
<th>Device</th>
<th>+5 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>cPCI-7248</td>
<td>470 mA typical</td>
</tr>
</tbody>
</table>

### Terminal Boards & Cables

- **DIN-1005-01**
  - Terminal Board with One 100-pin SCSI-II Connector
  - DIN-Rail Mounting (Cables are not included.)
- **ACL-102100-1**
  - 100-pin SCSI-II cable (rating with AMP-787082-9), 1 M
* For more information on mating cables, please refer to P3-46/47.

## Ordering Information

- **cPCI-7248**
  - 48-CH DIO & Timer/Counter Card

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### Features

- **3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R2.1)**
- **48-CH digital TTL inputs/outputs**
- **Emulates 4/2/1 industry standard 8255 PPI (mode 0)**
- **Buffered circuits for higher driving capability**
- **Ports are independently configurable as input or output**
- **External latch signal available for digital inputs**
- **Output status read back**
- **Known power-up states**
- **Onboard 8254 timer/counter chip**
- **I-CH 16-Bit event counter to generate event interrupt**
- **I-CH 32-Bit timer to generate watchdog timer interrupt**
- **Multiple programmable interrupt sources**
- **+12 V and +5 V power available on the connector**
- **Onboard resettable fuses for power output protection**

### OS Information

- Windows XP, Windows 7/8 x64/x86, Linux

### Software Compatibility

- LabVIEW, MATLAB, Visual Studio.NET

### Software Recommendations

- AD-Logger, DAQBench, DAQMaster

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For more information on mating cables, please refer to P3-46/47.
cPCI-7452
128-CH Isolated DI & 128-CH Isolated DO Card

**Features**
- 6U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R3.0)
- 128-CH isolated digital inputs and 128-CH isolated digital outputs
- Non-polarity digital input range
- Isolated input voltage up to 28 VDC
- Isolation voltage up to 2500 VRMS
- Sink current up to 300 mA on each isolated output
- Interrupt sources: 128 channel Change-of-State (COS)
- Output status read back

**OS Information**
- Windows XP, Windows 7/8 x64/x86, Linux

**Software Compatibility**
- LabVIEW, MATLAB, Visual Studio.NET

**Software Recommendations**
- AD-Logger, DAQbench, DAQMaster

**Specifications**

### Isolated Digital Input
- Number of channels: 128
- Maximum input range: 24 V, non-polarity
- Digital logic levels: 0-24 V, non-polarity
  - Input high voltage: 5-24 V
  - Input low voltage: 0-2 V
- Input resistance: 2.4 kΩ @ 1/2 W
- ESD protection CKT switch (Forward)
- Isolation voltage: 2500 Vrms channel-to-system
- Interrupt sources: 128 channel Change-of-state (COS)
- Data transfer: programmed I/O

### Isolated Digital Output
- Number of channels: 128
- Supply voltage: 5-35 V
- Output type: open collector Darlington transistor
- Sink current: 500 mA for one channel @ 100% duty
- Isolation voltage: 2500 Vrms channel-to-system
- Data transfer: programmed I/O

### Isolation +5 V Power Supply
- Output Voltage: +5 V
- Output Current: 100 mA max. (@ 40°C)

### General Specifications
- I/O connector: Two 200-pin dual port VHDCI female
- Operating temperature: -20°C to 80°C (-4°F to 176°F)
- Storage temperature: -20°C to 60°C (32°F to 140°F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

<table>
<thead>
<tr>
<th>Voltage</th>
<th>3.3 V</th>
<th>+5 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>300 mA typical</td>
<td>1.26 A typical</td>
</tr>
</tbody>
</table>

- Dimensions (not including connectors)
  233.35 mm x 160 mm (9.1" x 6.24")

**Terminal Boards & Cables**
- DIN-100S-01
  - Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included.)
- ACL-102150-1
  - SCSI-100 to MINI SCSI-100 connector, 1 M (cPCI-7452 only)
  * For more information on mating cables, please refer to P3-46/47.

**Ordering Information**
- cPCI-7452
  - 128-CH Isolated DI & 128-CH Isolated DO Card
**PCI-7396**

96-CH High-Driving DIO Card

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### Features
- Supports a 32-Bit 5 V PCI bus
- 96-CH digital TTL inputs/outputs (PCI-7396)
- High driving up to 48 mA (sink) and 15 mA (source)
- Emulates 4/2 industry standard 8255 PPI (mode 0)
- Ports are independently configurable as input or output
- External latch signal available for digital inputs
- Output status read back
- Known power-up states
- Onboard 8254 timer/counter chip
- I-Ch 16-Bit event counter for external signal
- I-Ch 32-Bit timer for timed interrupt generation
- Change-of-state (COS) interrupt
- Multiple programmable interrupt sources
- Compact, half-size PCB

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### OS Information
- Windows XP, Windows 7/8 x64/x86, Linux

### Software Compatibility
- LabVIEW, MATLAB, Visual Studio.NET

### Software Recommendations
- AD-Logger, DAQBench, DAQMaster

---

### Specifications

**Digital I/O**
- Number of channels: 96 input/output
- Compatibility: 5 V/TTL
- Power-on state: input
- Digital logic levels:
  - Input high voltage: 2.5-5.25 V
  - Input low voltage: 0-0.8 V
  - Output high voltage: 2.4 V minimum
  - Output low voltage: 0.3 V maximum
- Output driving capacity:
  - Source current: 15 mA
  - Sink current: 48 mA
- Data transfers: programmed I/O

**Interrupt**
- Interrupt #0 sources:
  - P1C0
  - P1C3
- 16-Bit event counter
- Change-of-state detection on any bit of PPI 1 & PPI 2
- Interrupt #1 sources:
  - P2C0
  - P2C3
- 32-Bit timer (based on 2 MHz internal clock)
- Change-of-state detection on any bit of PPI 3 & PPI 4

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### General Specifications
- I/O connector: One 100-pin SCSI-II female
- Operating temperature: 0˚C to 60˚C (32˚F to 140˚F)
- Storage temperature: -20˚C to 80˚C (-4˚F to 176˚F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements:
  - Device: 450 mA typical
  - -5 V

---

### Terminal Boards & Cables

- **DIN-1005-01**: Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included.)
- **DIN-96DI-01**: 96-CH Isolated DI Terminal Board with DIN-Rail Mounting (Cables are not included.)
- **DIN-96DO-01**: 96-CH Isolated DO Terminal Board with DIN-Rail Mounting (Cables are not included.)
- **ACL-102100-1**: 100-pin SCSI-II cable (mating with AMP-787082-9), 1 M

*For more information on mating cables, please refer to P3-46/47.

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### Ordering Information

- **PCI-7396**: 96-CH High-Driving DIO Card

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**Digital I/O**

- **Device**: PCI-7396
- **Power requirements**: 450 mA typical
- **Dimensions**: (not including connectors) 138 mm x 107 mm (5.46” x 4.17”)
**PCI/cPCI-8554**

10-CH General Purpose Timer/Counter & 8-CH DIO Cards

---

**Features**

- Supports a 32-Bit 5 V PCI bus (PCI-8554)
- 3U Eurocard form factor, CompactPCI compliant (PICMG 2.0 R3.0) (cPCI-8554)
- Onboard four 8254 programmable timer/counter chips
- 10-CH independent 16-Bit down counters
- 1-CH 32-Bit cascaded timer
- Onboard 8 MHz clock source
- Four programmable clock sources for each timer/counter
- Programmable de-bounce filters for external clock & external interrupt inputs
- Programmable interrupt sources
- 8-CH TTL digital inputs & 8-CH TTL digital outputs
- +12 V and +5 V power available on the connector
- Onboard resetable fuses for power output protection

- OS Information
  - Windows XP, Windows 7/8 x64/x86, Linux
- Software Compatibility
  - LabVIEW, MATLAB, Visual Studio.NET
- Software Recommendations
  - AD-Logger, DAQBench, DAQMaster

**Specifications**

**General-Purpose Timer/Counters**

- Number of channels: 10
- Counter width: 16 Bit
- Compatibility: 5 V/TTL
- Base clock available: 8 MHz or external clock up to 10 MHz
- Programmable clock sources:
  - cascaded 32-Bit timer output
  - external clock
  - timer/counter output of the last channel
  - Onboard 8 MHz clock

**Cascaded Timer**

- Number of channels: 1
- Counter width: 32 Bit
- Compatibility: 5 V/TTL
- Base clock available: 8 MHz, fixed

**Programmable De-bounce Filters for External Clocks**

- Number of channels: 11
- Filtered inputs: external clock, external interrupt
- Glitch rejection pulse width: 4 periods of the de-bounce clock
- De-bounce clock: up to 2 MHz, programmable

**Interrupt**

- Number of interrupt sources: 2
- Sources: external interrupt input and output of counter #12

**Digital I/O**

- Number of channels: 8 inputs and 8 outputs
- Compatibility: 5 V/TTL
- Data transfers: programmed I/O

**General Specifications**

- I/O connector: One 100-pin SCSI-II female
- Operating temperature: 0°C to 60°C (32°F to 140°F)
- Storage temperatures: -20°C to 80°C (-4°F to 176°F)
- Relative humidity: 5% to 95%, non-condensing
- Power requirements

<table>
<thead>
<tr>
<th>Device</th>
<th>+5 V</th>
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<tbody>
<tr>
<td>PCI-8554/cPCI-8554</td>
<td>350 mA typical</td>
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</tbody>
</table>

- Dimensions (not including connectors):
  - 134 mm x 107 mm (5.22” x 4.17”) (PCI-8554)
  - 160 mm x 100 mm (6.24” x 3.9”) (cPCI-8554/8554R)

**Terminal Boards & Cables**

- **DIN-100S-01**
  - Terminal Board with One 100-pin SCSI-II Connector and DIN-Rail Mounting (Cables are not included. For more information about mating cables, please refer to P3-46/47.)
  - Note: Legacy DIN-502S can be replaced by two DIN-505S-01 and ACL-10252-1 (100-Pin to two 50-Pin Cable, 1 M)

**Ordering Information**

- **PCI-8554**
  - 10-CH General Purpose Timer/Counter & 8-CH DIO Card
- **cPCI-8554**
  - 12-CH 16-Bit Timer/Counter & Digital I/O Card
## Terminal Board & Cable Selection Guide for DAQ

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<th>Type</th>
<th>DAQ (Data Acquisition Card)</th>
<th>Terminal Board</th>
<th>Mating Cable</th>
<th>Terminal Board Connector Type</th>
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## Cable Connector Type

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<th>50-pin SCSI-II</th>
<th>68-pin SCSI-VHDCI 50 Ω</th>
<th>100-pin SCSI-II</th>
<th>37-pin D-sub</th>
<th>37-pin D-sub</th>
<th>50-pin Flat Cable</th>
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### Cable Option Options

**Note:**

1. For PCI-7396 users, please use the ACL-10252 (male/male), 100-pin to two 50-pin cables.
2. For PCI-7442/PCI-7443/PCI-7444 users, please use the ACL-10568D/ACL-10568F (male/male), 68-pin SCSI-VHDCI cables.
3. For PCI-7256/PCI-7258 users, please use the ACL-10569 (male/male), 68-pin SCSI-II cable.
4. For cPCI-7452 users, please use the ACL-102150 (male/male), SCSI-100 to MINI SCSI-100 cable.
General Purpose Terminal Boards

DIN Rail Screw Terminal Boards
- Universal screw terminal boards for easy wiring
- DIN socket for easy mounting in DIN-rail

ACLD Screw Terminal Boards
- Low-cost universal screw terminal boards
- Blank pads accommodate applications such as break detection, low-pass filter, current shunt and voltage attenuator on ACLD-9881-01, ACLD-9188-01, and ACLD-9138-01
- Table-top mounting using nylon standoffs

DIN-100S-01
Terminal Board with One 100-pin SCSI-II Connector and DIN-rail Mounting
- On-board Connector Type: 100-pin SCSI-II female
- Dimensions: 158 mm x 120 mm x 52 mm (W x L x H)
- Mating Cable:
  - ACL-102100-1: 100-pin SCSI-II cable, 1 M

DIN-68S-01
Terminal Board with One 68-pin SCSI-II Connector and DIN-rail Mounting
- On-board Connector Type: 68-pin SCSI-II female
- Dimensions: 103 mm x 85 mm x 46.2 mm (W x L x H)
- Mating Cables:
  - ACL-10568-1: 68-pin SCSI-VHDCI cable, 1 M
  - ACL-10569-1: 68-pin SCSI-II cable, 1 M

DIN-50S-01
Terminal Board with One 50-pin SCSI-II Connector and DIN-rail Mounting
- On-board Connector Type: 50-pin SCSI-II female
- Dimensions: 125 mm x 85 mm x 50 mm (W x L x H)
- Mating Cable:
  - ACL-10250-1: 50-pin SCSI-II cable, 1 M

DIN-68H-01
Terminal Board with One 68-pin SCSI-VHDCI Connector and 0 or 50 Ω Jumper Selectable Impedance
- On-board Connector Type: 68-pin SCSI-VHDCI
- Dimensions: 103 mm x 85 mm x 43 mm (W x L x H)
- Mating Cable:
  - ACL-10279: 68-pin SCSI-VHDCI cable with 50 Ω impedance

ACLD-9881-01
General Purpose Terminal Board with One 37-pin D-sub Connector for PCI-9113A and ACL-8113A
- For use with PCI-9113A and ACL-8113A
- On-board Connector Type: 37-pin D-sub female
- Reliable screw clamp termination blocks
- Dimensions: 222 mm x 114 mm
- Mating Cable:
  - ACL-10137-1M/1MM: 37-pin D-sub male/male cable, 1 M

ACLD-9188-01
General Purpose Terminal Board with Two 20-pin Headers or One 37-pin D-sub Connector
- On-board Connector Options: Two 20-pin Headers or One 37-pin D-sub Connector
- Reliable screw clamp terminal blocks
- Dimensions: 222 mm x 114 mm
- Mating Cables:
  - ACL-10120-1: 20-pin flat cable, 1 M
  - ACL-10220-1: 20-pin shielded & grounded cable, 1 M

ACLD-9138-01
General Purpose Terminal Board with One 37-pin D-sub Connector
- On-board Connector Type: 37-pin D-sub female
- Blank RC circuits for analog input boards
- Reliable screw clamp terminal blocks
- Dimensions: 103 mm x 114 mm
- Mating Cables:
  - ACL-10237-1: 37-pin D-sub male/flat cable, 1 M
  - ACL-10137-1MM: 37-pin D-sub male/male cable, 1 M

ACLD-9137-01 / ACLD-9137F-01
General Purpose Terminal Board with One 37-pin D-sub Connector
- On-board Connector Type: 37-pin D-sub male connector
- Dimensions: 124 mm x 72 mm
- Mating Cables:
  - ACL-10137-1M/1MF: 37-pin D-sub male/male cable, 1 M (for ACLD-9137F-01)
  - ACL-10137-1MM: 37-pin D-sub male/male cable, 1 M (for ACLD-9137-01)

TB-6201-01 / TB-6221-01 / TB-6231-01
General Purpose/Multiplexer/Matrix Switch Terminal Board with One 62-pin D-sub Connector
- For use with PXI-7901, PXI-7921, and PXI-7931
- On-board Connector Type: 62-pin D-sub female
- Dimensions: 105.81 mm x 230 mm
- Mating Cable:
  - ACL-10262: 62-pin D-sub male/male cable, 1 M

DIN-37D-01
Terminal Board with One 37-pin D-sub Connector and DIN-rail Mounting
- On-board Connector Type: 37-pin D-sub female
- Dimensions: 113 mm x 85 mm x 52 mm (W x L x H)
- Mating Cable:
  - ACL-10137-1MM: 37-pin D-sub male/male cable, 1 M

DIN-37D-01 / DIN-50S-01 / DIN-68S-01

DIN-20P-01
Terminal Board with One 20-pin Header and DIN-rail Mounting
- On-board Connector Type: 20-pin header
- Dimensions: 68 mm x 85 mm x 55 mm (W x L x H)
- Mating Cable:
  - ACL-10120-1: 20-pin flat cable, 1 M

DIN-37D-01 / DIN-50P-01 / DIN-68S-01

ACL-10137-1MM: 37-pin D-sub male/male cable, 1 M
ACL-10237-1: 37-pin D-sub male/flat cable, 1 M
ACL-10137-1M: 37-pin D-sub male/male cable, 1 M
ACL-10120-1: 20-pin flat cable, 1 M
ACL-10250-1: 50-pin SCSI-II cable, 1 M
ACL-10279: 68-pin SCSI-VHDCI cable with 50 Ω impedance
ACL-10137-1MM: 37-pin D-sub male/male cable, 1 M
ACL-10137-1MF: 37-pin D-sub male/male cable, 1 M
ACL-10220-1: 20-pin shielded & grounded cable, 1 M
ACL-10120-1: 20-pin flat cable, 1 M
ACL-10220-1: 20-pin shielded & grounded cable, 1 M
ACL-10250-1: 50-pin SCSI-II cable, 1 M
ACL-10137-1MM: 37-pin D-sub male/male cable, 1 M
ACL-10220-1: 20-pin shielded & grounded cable, 1 M
ACL-10120-1: 20-pin flat cable, 1 M
ACL-10250-1: 50-pin SCSI-II cable, 1 M
ACL-10250-1: 50-pin SCSI-II cable, 1 M
ACL-10137-1MM: 37-pin D-sub male/male cable, 1 M
DIN-96DI-01
96-CH Isolated DI Terminal Board with DIN-Rail Mounting

Features
- 96-CH isolated digital inputs
- For use with PCI-7396
- Isolated input voltage up to 24 V
- 2500 Vrms optical isolation
- Screw terminals for easy field wiring

Specifications
- Number of Channels: 96
- Maximum Input Range: 24 V
- Digital Logic Levels
  - 0 to 24 V non-polarity
  - Input high voltage: 10 V to 24 V
  - Input low voltage: 0 to 24 V
- Input Resistance: 4.7 kΩ @ 0.5 W
- Isolation Voltage: 2500 Vrms
- I/O Connector: 100-pin SCSI-II female
- Operating Temperature: 0°C to 60°C (32°F to 140°F)
- Storage Temperature: -20°C to 80°C (-4°F to 176°F)
- Relative Humidity: 5% to 95%, non-condensing
- Power Consumption:
  - +5 V
    - 48 mA maximum
- Dimensions: 226 mm (W) x 121 mm (L) x 48 mm (H)
  (8.81” x 4.71” x 1.87”)

Ordering Information
- DIN-96DI-01
  96-CH isolated DI terminal board with DIN-rail mounting
- Accessory
  - Cabling
    ACL-102100-1: 100-pin SCSI-ll cable, 1 M
Contact your sales representative for cable length options.

DIN-96DO-01
96-CH Isolated DO Terminal Board with DIN-Rail Mounting

Features
- 96-CH isolated digital outputs
- For use with PCI-7396
- Sink current up to 500 mA on each isolated output
- 2500 Vrms optical isolation
- Screw terminals for easy field wiring

Specifications
- Number of Channels: 96
- Output Type: open collector Darlington transistor
- Sink Current
  - Max. 500 mA for only one Darlington pair
  - 500 mA for all Darlington pair @ 20% duty
- Power Dissipation: Max. 2.25 W per chip
  (8 DO channels)
- Supply Voltage: 5 Vcc to 35 Vcc
- Isolation Voltage: 2500 Vrms
- I/O Connector: 100-pin SCSI-II female
- Operating Temperature: 0°C to 60°C (32°F to 140°F)
- Storage Temperature: -20°C to 80°C (-4°F to 176°F)
- Relative Humidity: 5% to 95%, non-condensing
- Power Consumption:
  - +5 V
    - 102 mA maximum
- Dimensions: 226 mm (W) x 121 mm (L) x 48 mm (H)
  (8.81” x 4.71” x 1.87”)

Ordering Information
- DIN-96DO-01
  96-CH isolated DO terminal board with DIN-rail mounting
- Accessory
  - Cabling
    ACL-102100-1: 100-pin SCSI-ll cable, 1 M
Contact your sales representative for cable length options.
**ACLD-9182A-01**

**Terminal Board with 16-CH Isolated Digital Inputs**

**Features**
- 16-CH opto-isolated digital inputs
- For use with 20-pin ribbon digital input connector of NuDAQ cards
- Non-polarity digital input range
- Isolated input voltage up to 24 V
- 5000 Vrms optical isolation
- Jumper configurable for voltage input or dry-contact input mode
- LED indicator for input status
- Screw terminals for easy field wiring

**Specifications**
- Isolated Digital Input
  - Number of Channels: 16
  - Maximum Input Range: 24 V, non-polarity
  - Digital Logic Levels
    - Input High Voltage: 5 to 24 V
    - Input Low Voltage: 0.7 to 0 V
  - Input Resistance: 560 Ω @ 1 W
  - Isolation Voltage: 2500 Vrms

**Ordering Information**
- ACLD-9182A-01
  - Terminal board with 16-CH isolated digital inputs

**Accessories**
- Cabling
  - ACL-10120-1: 20-pin flat cable, 1 M
  - ACL-10220-1: 20-pin shielded and grounded cable, 1 M

**ACLD-9185-01**

**Terminal Board with 16-CH Relay Outputs**

**Features**
- 16-CH single-pole, double-throw (SPDT form C) relay outputs
- For use with 20-pin digital input connector of NuDAQ cards
- Maximum switching voltage up to 60 VAC/120 VAC
- Maximum switching current up to 1 A DC/AC
- Onboard relay driver circuitry
- LED indicators for relay status
- Screw terminals for easy field wiring

**Specifications**
- Relay Output
  - Number of Channels: 16
  - Relay Type: SPDT (Form C)
  - Isolation Voltage: 1500 Vrms
  - Contact Rating
    - AC: 120 V @ 0.5 A
    - DC: 24 V @ 1 A
  - Breakdown Voltage: 1000 Vrms
  - Contact Resistance: 100 mΩ
  - Relay ON/OFF time
    - Operate Time: 6 ms
    - Release Time: 3 ms
  - LED Indicators for Relay Status: one per channel
    - Expected Life:
      - > 5 x 10⁶ operations @ 1 A, 24 VAC
      - > 2 x 10⁶ operations @ 0.5 A, 120 VAC
  - I/O Connector: 20-pin ribbon male
  - Operating Temperature: 0°C to 60°C (32°F to 140°F)
  - Storage Temperature: -20°C to 80°C (-4°F to 176°F)

**Ordering Information**
- DIN-96DO-01
  - 96-CH isolated DO terminal board with DIN-rail mounting

**Accessory**
- Cabling
  - ACL-102100-1: 100-pin SCSI-II cable, 1 M

**Relative Humidity**: 5% to 95%, non-condensing
- **Power Consumption**:
<table>
<thead>
<tr>
<th>+5 V</th>
<th>+12 V</th>
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<tr>
<td>200 mA maximum</td>
<td>528 mA maximum</td>
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</table>
- **Dimensions**: 205 mm x 114 mm (7.99” x 4.44”)

www.adlinktech.com
**DIN-24R-01, TB-24R-01**

Terminal Boards with 24-CH Relay Outputs

**Features**
- 24-CH single-pole, double-throw (SPDT form C) relay outputs
- 50-pin Opto-22 compatible connector
- Contact Rating
  - AC: 125 V @ 0.6 A
  - DC: 30 V @ 2 A
- Breakdown Voltage: 1500 Vrms
- Contact Resistance: 50 mΩ
- Relay ON/OFF Time: 3 ms
- Operating Voltage: 12 V nominal, 19.2 V maximum
- Expected Life: 5 × 10⁵ operations @ 2 A, 30 VDC
- External Coil Excitation Voltage:
  - DC: 30 V @ 2 A
  - AC: 125 V @ 0.6 A
- Relay ON Time: 3 ms
- Relay OFF Time: 3 ms
- LED Indicator for Relay Status: per channel

**Specifications**
- Contact Rating
  - TB-24R/12-01: 288 mA
  - TB-24R/24-01: 44 mA

**Dimensions**
- DIN-24R-01: 203 mm (W) x 120 mm (L) x 55 mm (H)
- TB-24R-01: 220 mm (W) x 132 mm (L) x 15 mm (H)

**Ordering Information**
- TB-24R/12-01
  - Terminal board with 24-CH relay outputs @ 12 V coil voltage
- TB-24R/24-01
  - Terminal board with 24-CH relay outputs @ 24 V coil voltage
- DIN-24R/12-01
  - Terminal board with 24-CH relay outputs @ 12 V coil voltage and DIN-rail mounting
- DIN-24R/24-01
  - Terminal board with 24-CH relay outputs @ 24 V coil voltage and DIN-rail mounting

**Accessory**
- Cabling
  - DIN-10150: 50-pin flat cable
  - Contact your sales representative for cable length options.

---

**DIN-24P-01, TB-24P-01**

Terminal Boards with 24-CH Opto-Isolated Digital Inputs

**Features**
- 24-CH opto-isolated digital inputs
- 50-pin Opto-22 compatible connector
- Non-polarity digital input range
- Isolated input voltage up to 24 V
- 5000 Vrms optical isolation
- Jumper configurable for voltage input or dry-contact input mode
- LED Indicator for Input Status
- Screw terminals for easy field wiring
- DIN socket is available on DIN-24P-01
- 50-pin SCSI-type connector available on DIN-24P-01 to interface with ND-6058

**Specifications**
- Input Modes
  - Voltage input
  - Dry-contact input
- Isolated Digital Input
  - Number of channels: 24, maximum
  - Maximum input range: 24 V, non-polarity
  - Digital logic levels:
    - 0 to 24 V: non-polarity
    - Input high voltage: 5 V to 24 V
    - Input low voltage: 0 to 1.5 V
    - Input resistance: 1.2 kΩ @ 0.5 W
  - Isolation voltage: 5000 Vrms
  - Dry Contact Input:
    - Number of channels: 24
    - Internal pull-up voltage supply: +5 VDC
- LED Indicators for Input Status: one per channel

**Specifications**
- Contact Rating:
  - 40 mA maximum

**Dimensions**
- DIN-24P-01: 259 mm (W) x 120 mm (L) x 55 mm (H)

**Ordering Information**
- TB-24P-24-01
  - Terminal Board with 24-CH isolated digital inputs
- DIN-24P-01
  - Terminal Board with 24-CH isolated digital inputs and DIN-rail mounting

**Accessory**
- Cabling
  - DIN-10150: 50-pin flat cable
  - Contact your sales representative for cable length options.

---

**Introduction**
The DIN-24R-01 and TB-24R-01 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-7224, PCI-7248, PCI-7296, ACL-7112, ACL-7124, PET-48DIO, and ND-6058. Each relay’s switching capacity is 60 W, 125 VAC. The normally closed, and common contacts for each relay are made available for maximum flexibility.

---

**Introduction**
The DIN-24P-01 and TB-24P-01 digital input terminal boards feature high-voltage optoisolation on all input channels. They provide 24 channels that are accessed through a single 50-pin connector that is standard on the NuDAQ digital I/O boards, including ACL-7122, ACL-7124, PET-48DIO, PCI-7224, PCI-7248, PCI-7296 and ND-6058. Each channel’s input mode is configurable via jumper settings.
**TB-16P8R-01**

Terminal Board with 16-CH Isolated DI & 8-CH Relay Outputs

---

**Features**

- 16-CH isolated digital inputs
- Non-polarity digital input range
- Isolated input voltage up to 24 V
- 5000 Vrms optical isolation
- Jumper configurable for voltage input or dry contact input mode
- 8-CH single-pole double-throw (SPDT form C) relays
- Maximum switching voltage 220 Vdc/250 Vac
- Maximum switching current up to 2 A
- Onboard relay driver circuitry
- LED indicators for both input and relay status
- Screw terminals for easy field wiring

---

**Specifications**

- Number of Isolated DI Channels: 16
- Number of Relay Output Channels: 8
- LED Indicators for Input and Output Status: one per channel
- Electronics Characteristics of Isolated DI: refer to the TB-24P-01’s specifications
- Electronics Characteristics of Relay Outputs: refer to the TB-24R-01’s specifications
- I/O Connector: 50-pin ribbon male
- Operating Temperature: 0°C to 60°C (32°F to 140°F)
- Storage Temperature: -20°C to 80°C (-4°F to 176°F)
- Relative Humidity: 5% to 95%, non-condensing
- Power Requirements:
<table>
<thead>
<tr>
<th>+5 V</th>
<th>+12 V</th>
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</thead>
<tbody>
<tr>
<td>40 mA maximum</td>
<td>100 mA maximum</td>
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</tbody>
</table>
- Dimensions: 220 mm (W) x 132 mm (L) x 22 mm (H)
  (8.58” x 5.14” x 0.85”)

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**Ordering Information**

- **TB-16P8R/12-01**
  Terminal board with 16-CH isolated DI & 8-CH relay outputs
- **TB-16P8R/24-01**
  Terminal board with 16-CH isolated DI & 8-CH relay outputs
- **Accessory**
  - Mating Cable
  ACL-10150: 50-pin flat cable
  Contact your sales representative for cable length options.

---

**3U to 6U PXI/CompactPCI Adapter**

**Introduction**

Order additional adapter kits to convert 3U PXI/CompactPCI cards to 6U size to fit in with 6U PXI/CompactPCI systems.

**Ordering Information**

- **SCSI-100/6U Panel w/FRP**
  6U adapter for 3U DAQ/DIO PXI/CompactPCI cards with 100-pin SCSI-II connector
  - Compliant with cPCI-9116 series, cPCI-7300, cPCI-7432/7433/7434, cPCI-724B, and cPCI-8554 series
- **DB-37/62 6U Panel w/FRP**
  6U adapter for 3U DAQ/DIO PXI/CompactPCI cards with 37-pin/62-pin D-Sub connector
  - Compliant with cPCI-6208/6216 series, cPCI-7230, and cPCI-7252
- **PXI-22XX 6U/Panel w/FRP**
  6U adapter for 3U PXI-22XX cards with dual 68-pin SCSI-VHDCI connectors
  - Compliant with PXI-2200 series, and PXI-220B
## Cable Accessories

<table>
<thead>
<tr>
<th>ACL-10568-1</th>
<th>68-pin SCSI-VHDCI cable (mating with AMP-787082-7), 1 M</th>
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<tbody>
<tr>
<td>ACL-10569-1</td>
<td>68-pin SCSI-II cable (mating with AMP-787082-7), 1 M</td>
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<tr>
<td>ACL-102100-1</td>
<td>100-pin SCSI-II cable (mating with AMP-787082-9), 1 M</td>
</tr>
<tr>
<td>ACL-10120-1</td>
<td>20-pin flat cable, 1 M</td>
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<tr>
<td>ACL-10150</td>
<td>50-pin flat cable</td>
</tr>
<tr>
<td>ACL-10237-1 (male/male)</td>
<td>37-pin D-sub male/male flat cable, 1 M</td>
</tr>
<tr>
<td>ACL-10262</td>
<td>62-pin D-sub male/female cable, 1 M</td>
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<tr>
<td>ACL-10250-1</td>
<td>50-pin SCSI-II cable (mating with AMP-787082-5), 1 M</td>
</tr>
<tr>
<td>ACL-10137-1MM</td>
<td>37-pin D-sub male/male cable, 1 M</td>
</tr>
<tr>
<td>ACL-10137-1MF</td>
<td>37-pin D-sub male/female cable, 1 M</td>
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<tr>
<td>ACL-10232</td>
<td>9-pin D-sub (RS-232) male/female cable, 5 M</td>
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<tr>
<td>ACL-105100</td>
<td>100-pin SCSI-II assembly</td>
</tr>
<tr>
<td>ACL-10537</td>
<td>37-pin D-sub assembly</td>
</tr>
<tr>
<td>ACL-10550</td>
<td>50-pin SCSI-II assembly</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
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<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>ACL-10568F-1</td>
<td>68-pin SCSI-VHDCI flat cable, 1 M (for PCI-7442, PCI-7443, and PCI-7444)</td>
</tr>
<tr>
<td>ACL-10568D-1</td>
<td>Dual-68-pin head to two 68-pin SCSI-VHDCI cable, 1 M (for PCI-7442, PCI-7443, and PCI-7444)</td>
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<tr>
<td>ACL-10220-I</td>
<td>20-pin shielded &amp; grounded cable, 1 M</td>
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<tr>
<td>ACL-IEEE488-1/2/4/8</td>
<td>IEEE 488 standard cable, 1/2/4/8 M</td>
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<tr>
<td>ACL-10252-I</td>
<td>100-pin to two 50-pin cable, 1 M (for DIN-502S)</td>
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<tr>
<td>ACL-PCIEXT-2/5/10</td>
<td>Extension cable, 2/5/10 M (for PCIS-8580-4S/13S)</td>
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<tr>
<td>ACL-10279</td>
<td>68-pin SCSI-VHDCI cable with 50 Ω impedance</td>
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<tr>
<td>ACL-PXIES-2</td>
<td>Copper cable kit, 2 M (for PCI-8570 and PXI-8570)</td>
</tr>
<tr>
<td>ACL-102150-I</td>
<td>SCSI-100 to MINI SCSI-100 connector, 1 M (for cPCI-7452 only)</td>
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<tr>
<td>ACL-SSI-2/3/4</td>
<td>SSI bus cable for 2/3/4 devices</td>
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<tr>
<td>ACL-10337</td>
<td>Two 20-Pin header to 37-Pin D-sub PC back panel</td>
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<tr>
<td>SMB-BNC-1M</td>
<td>SMB to BNC cable, 1 M</td>
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<tr>
<td>ACL-10437</td>
<td>40-pin header to 37-pin D-sub PC back panel (for ACL-7225 and PCIe-7200)</td>
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<td>SMB-SMB-1M</td>
<td>SMB to SMB cable, 1 M</td>
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<tr>
<td>USB-2M-L</td>
<td>2 M USB Type A to USB Mini-B cable with lockable connector</td>
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<tr>
<td>ACL-EXPRESS-1/3/7</td>
<td>Expansion Cable, 1/3/7 M (for PCES-8581-4L/4S/13S)</td>
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