# Analog output board, optically isolated, 8/4 differential outputs, 16-bit

## APCIe-3521

PCI Express interface

8/4 analog outputs, 16-bit

Optical isolation 500 V

8 digital I/O, 24 V, optically isolated, timer, watchdog

RoHS 2002/95/EC

Also for **PCI**
and APCI-3501, page 192

Signed 64-bit drivers for Windows 7/XP

on request

**LabVIEW™**

**LabWindows/CVI™**

## Features

### Analog outputs
- 4 or 8 analog outputs, optically isolated 500 V
- Voltage or current outputs
- 16-bit resolution (15-bit for 0-10 V)
- Output ranges: ±10 V, 0-10 V (through software)
- Output voltage after reset: 0 V
- Each output has its own ground line (without optical isolation)
- Output current ±5 mA max. for voltage outputs
- Current outputs: 0-20 mA,
  min. load 10 Ω, max. load 560 Ω, at 20 mA
- EMI filters

### Digital
- 4 dig. inputs including 1 interruptible input
- 4 dig. outputs, 24 V, optically isolated

### Timer
- 2 timers, incl. 1 which can be used as a watchdog

## Safety features
- Optical isolation 500 V min.
- Creeping distance IEC 61010-1
- Protection against high-frequency EMI
- Noise neutralisation of the PC supply

## Applications
- Industrial process control
- Industrial measurement and monitoring
- Control of chemical processes
- Factory automation
- Laboratory equipment, instrumentation

## Software drivers

A CD-ROM with the following software and programming samples is supplied with the board.

Standard drivers for:
- Linux
- 32-bit drivers for Windows 8 / 7 / Vista / XP / 2000
- Signed 64-bit drivers for Windows 8 / 7 / XP
- Real-time use with Linux and Windows on request

Drivers and samples for the following compilers and software packages:
- .NET
- Microsoft VC++ • Borland C++
- Visual Basic • Delphi
- LabVIEW • LabWindows/CVI

ADDIPACK functions
- Analog input • Analog output • Digital input
- Digital output • Watchdog • Timer

On request:
Further operating systems, compilers and samples.

Driver download: www.addi-data.com/downloads

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# Specifications

## Analog outputs

| | |
|---|---|
| Number of outputs: | 8 or 4 |
| Resolution: | 16-bit resolution |
| Optical isolation: | 500 V through opto-couplers |
| Output range: | 0-10 V, ±10 V switchable through software (0-20 mA optional) |
| Overvoltage protection: | ±15 V |
| Max. output current / load: | ±5 mA, 2 kΩ |
| Short-circuit current: | ±35 mA (short time) |
| Output voltage after reset: | 0 V |
| **Current outputs** | |
| Resolution: | 15-bit |
| Output range: | 0-20 mA |
| LSB: | 610.35 nA |
| Load (at 20 mA): | 10 Ω min., 560 Ω max. |
| Output current after reset: | 0 mA |

## Digital I/O

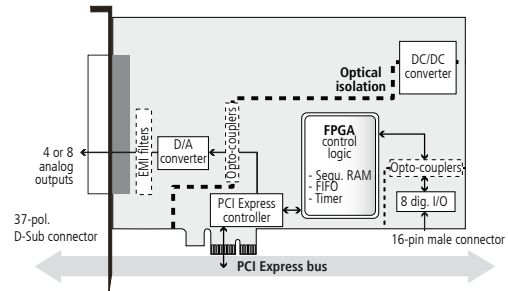| | |
|---|---|
| Number of I/O channels: | 4 dig. inputs, 4 dig. high-side outputs, 24 V |
| Optical isolation: | 1000 V through opto-couplers |
| Input current at 24 V: | 10 mA typ. |
| Input range: | 0-30 V |
| Supply voltage: | 8-32 V |
| Max. switching current: | 65 mA typ. |

## EMC – Electromagnetic compatibility

The product complies with the European EMC directive. The tests were carried out by a certified EMC laboratory in accordance with the norm from the EN 61326 series (IEC 61326). The limit values as set out by the European EMC directive for an industrial environment are complied with. The respective EMC test report is available on request.
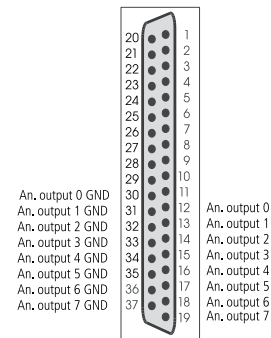
## Physical and environmental conditions

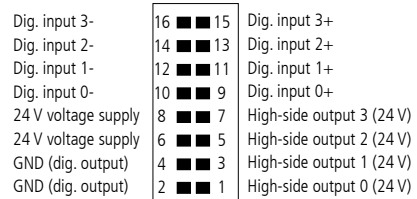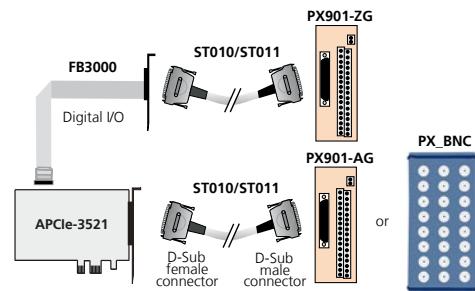| | |
|---|---|
| Dimensions: | 168 x 99 mm |
| System bus: | Acc. to PCI Express base specification, Revision 1.0a (PCI Express 1.0a) |
| Space required: | 1-/4-lane PCI Express slot |
| Operating voltage: | + 3.3 V, + 12 V from PC |
| Front connector: | 37-pin D-Sub male connector |
| Temperature range: | 0 to 60 °C (with forced cooling) |

### Simplified block diagram



### Pin assignment – 37-pin D-Sub male connector



| | |
|---|---|
| An. output 0 GND | An. output 0 |
| An. output 1 GND | An. output 1 |
| An. output 2 GND | An. output 2 |
| An. output 3 GND | An. output 3 |
| An. output 4 GND | An. output 4 |
| An. output 5 GND | An. output 5 |
| An. output 6 GND | An. output 6 |
| An. output 7 GND | An. output 7 |

### Pin assignment – 16-pin male connector

| | | | |
|---|---|---|---|
| Dig. input 3- | 16 | 15 | Dig. input 3+ |
| Dig. input 2- | 14 | 13 | Dig. input 2+ |
| Dig. input 1- | 12 | 11 | Dig. input 1+ |
| Dig. input 0- | 10 | 9 | Dig. input 0+ |
| 24 V voltage supply | 8 | 7 | High-side output 3 (24 V) |
| 24 V voltage supply | 6 | 5 | High-side output 2 (24 V) |
| GND (dig. output) | 4 | 3 | High-side output 1 (24 V) |
| GND (dig. output) | 2 | 1 | High-side output 0 (24 V) |

### ADDI-DATA connection



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## Ordering information

### APCIe-3521

Analog output board, optically isolated, 8/4 differential outputs, 16-bit, for PCI Express.
Incl. technical description and software drivers.

#### Versions

**Voltage**

| | |
|---|---|
| APCIe-3521-8 | Version with 8 analog voltage outputs |
| APCIe-3521-4 | Version with 4 analog voltage outputs |

**Current**

| | |
|---|---|
| APCIe-3521-8C | Version with 8 analog current outputs |
| APCIe-3521-4C | Version with 4 analog current outputs |

#### Accessories

| | |
|---|---|
| PX901-A: | Screw terminal panel for connecting the analog I/O |
| PX901-AG: | Same as PX901-A with housing for DIN rail |
| PX_BNC: | BNC connection box for connecting the analog I/O |
| PX901-ZG: | Screw terminal panel for connecting the dig. I/O |
| ST010: | Standard round cable, shielded, twisted pairs, 2 m |
| ST011: | Standard round cable, shielded, twisted pairs, 5 m |
| FB3000: | Ribbon cable for digital I/O |