



ADC2000-PCI A/D Converter Operating Instructions

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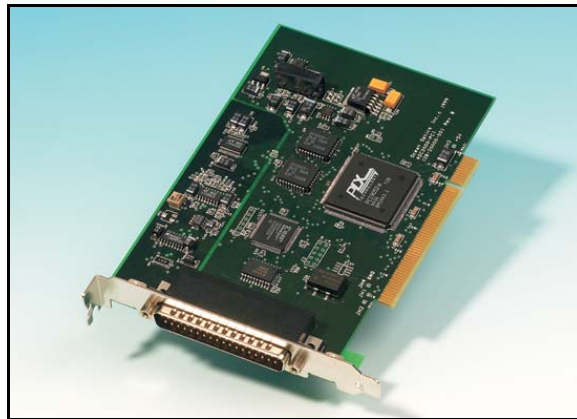
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1 Overview

The ADC2000-PCI internal PC A/D Converter is a plug-and-play high-speed analog-to-digital (A/D) converter designed for hassle-free instrument-to-PC interfacing. An A/D converter is necessary to interface all Ocean Optics spectrometers to PCs.



ADC2000-PCI A/D Converter

The ADC2000-PCI fits into a PCI-bus slot on any PCI-equipped desktop PC. It couples to any S2000 spectrometer via a DB-37 to DB-25 interface cable provided with the ADC2000-PCI unit. The ADC2000-PCI is compatible with any 32-bit version of the Windows operating system.

Benefits of PCI-bus Connectivity

The ADC2000-PCI A/D Converter offers the following benefits:

High-speed Data Processing

The 12-bit 8-channel ADC2000-PCI provides a 2 MHz sampling frequency and captures 2048 data points in the spectra in 2 milliseconds, far exceeding the requirements of most applications. For applications requiring longer integration times, the ADC2000-PCI features a maximum integration time of 60 seconds.

Individual Input/Output Port Control

The ADC2000-PCI features 8 General Purpose Input/Output (GPIO) ports that you can control individually via TTL signals using the OOIWinIP Windows Interface Driver package. A custom cable with a male DB-25 connector is required for GPIO control.

The ADC2000-PCI is the only Ocean Optics A/D converter that supports GPIO functionality. Contact an Ocean Optics Application Scientist for more details on GPIO control.

2 Installing and Using the ADC2000-PCI

This chapter provides instruction on installing and configuring the ADC2000-PCI:

Install OOIBase32

Before installing your ADC2000-PCI hardware, you must first install the OOIBase32 Spectrometer Operating Software. It is critical that the software be installed prior to hardware installation.

Consult the OOIBase32 operating instructions for specific installation instructions. You can view the latest version of the OOIBase32 Operating Instructions on your Software and Technical Resources CD, or by visiting the following web address:

<http://www.oceanoptics.com/technical/ooibase32bit.pdf>

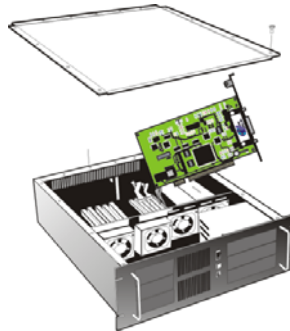
Note: If you installed the hardware prior to installing OOIBase32, you will not be able to load the drivers for the ADC2000-PCI. For instructions on fixing this issue, consult the Correcting Device Driver Issues document at the following address:

<http://www.oceanoptics.com/technical/engineering/correctingdevicedriverissues.pdf>

Install the ADC2000-PCI Hardware

Follow the instructions below to install the ADC2000-PCI card in your PC:

1. Turn off the computer and remove the PC access panel.

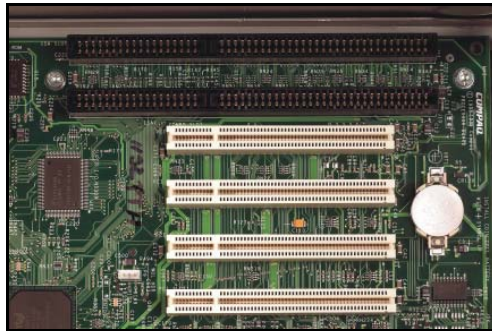


PC with access panel removed

2. Ground yourself to the computer chassis or power supply.
3. Remove the ADC2000-PCI card from its static-shielded bag.

Installing and Using the ADC2000-PCI

4. Locate an open PCI-bus slot on the PC motherboard and remove the slot protector from the rear of the PC.



PCI slots on the PC motherboard (shorter white slots)

5. Insert the A/D card into a PCI slot on the motherboard. Press down gently and rock the card back and forth until it settles firmly into the PCI slot. The card must be fully seated in the motherboard for proper operation.
6. Fasten a screw through the A/D card into the rear panel of the computer to secure the card in place.

Note: Do not bend the card or move it from side to side once it is seated in the PCI slot.

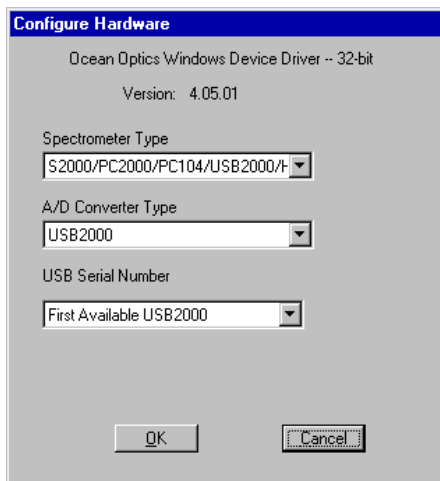
7. Attach the D37 end of the cable that came with your ADC2000-PCI and connect the D25 end to the spectrometer.
8. Reinstall the PC access panel and power up the PC.

Configure the OOIBase32 Software

You will need to configure OOIBase32 before using the ADC2000-PCI and your spectrometer. For details on using OOIBase32, consult the *OOIBase32 Spectrometer Operating Software Manual*, which can be found on the *Software and Technical Resources* CD and the Ocean Optics web site.

The following steps provide instruction on starting and configuring the OOIBase32 software with the ADC2000-PCI:

1. Select **Start > Programs > Ocean Optics > OOIBase32** and click on the OOIBase32 icon. If you are configuring OOIBase32 for the first time, the Configure Hardware screen appears:



Installing and Using the ADC2000-PCI

2. Select **S2000/PC2000/USB2000/HR2000** from the Spectrometer Type drop-down menu. Select **ADC2000-PCI** from the A/D Converter Type drop-down menu. Select your PCI Card channel from the PCI Card Identifier drop-down menu. Select 0 if this is the only ADC2000-PCI in your system. Then, click the **OK** button. The User Name and Serial Number screen appears.
3. Enter a user name and software serial number, and then click the **Next** button. The Select Default Spectrometer Message appears:



4. Click the **OK** button. The Default Spectrometer Configuration screen appears.
5. Go to the OOIBase32 installation directory and select the file named **XXX.spec**, where XXX represents the serial number of your ADC2000-PCI. Then, click the **OK** button.

Note: You will typically only set the parameters in this screen once -- when OOIBase32 is first installed and the software first opens. However, you can access this configuration screen at any time by selecting **Configure > Hardware** from the menu bar.

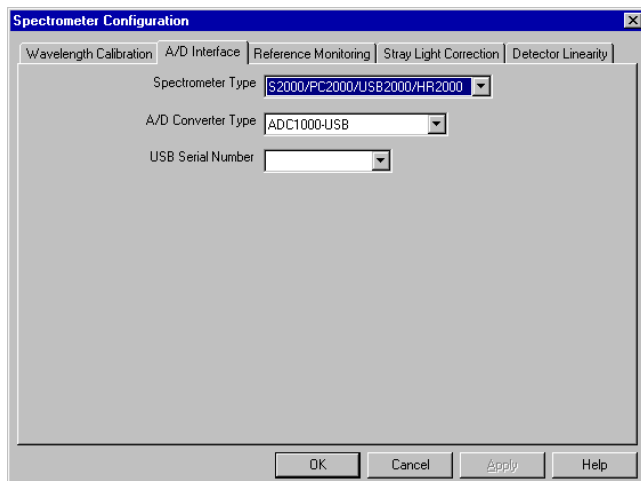
The system should now be configured to acquire data and respond to light. If you encounter problems, exit and restart the OOIBase32 program.

Configuring the Spectrometer

The following section provides information on configuring your spectrometer and setting system parameters:

Open the Spectrometer Configuration Screen

Select **Spectrometer > Configure** from the menu bar. The Spectrometer Configuration screen appears:



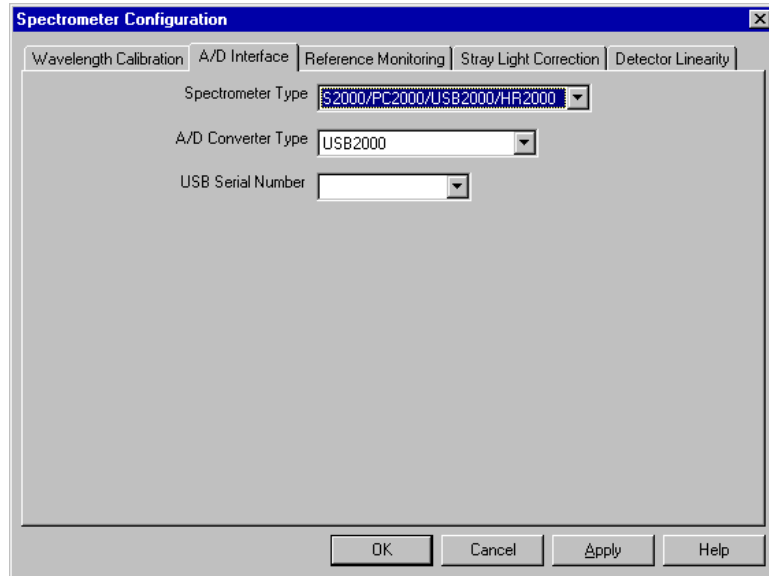
Wavelength Calibration Tab

The numbers in the Wavelength Calibration tab must match the coefficients from the Wavelength Calibration Data Sheet that came with your spectrometer. Copy the coefficients that are on the floppy diskette that you received with your spectrometer to your hard drive, or manually enter the values from the Wavelength Calibration Data Sheet, and then click the **Apply** button.

Installing and Using the ADC2000-PCI

A/D Interface Tab

Enter the same values as you did in the Configure Hardware dialog box in the first part of this section.



When you exit OOIBase32, this data is stored in the **.spec** file.

Setting OOIBase32 Parameters

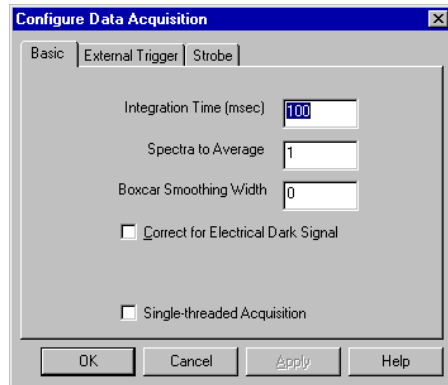
Select **Edit > Settings** from the OOIBase32 menu bar to open the OOIBase32 Settings screen.

From this screen, you can configure the following items:

- Configure options for saving, opening, and printing data
- Associate .WAV sounds with various program events
- Configure default-setting files
- Store data
- Copy data
- Configure warning messages

Configuring Data Acquisition

Select **Spectrum > Configure Data Acquisition** from the OOIBase32 menu bar to open the Configure Data Acquisition screen.



From this screen, you can configure your data acquisition parameters such as integration time, averaging, boxcar smoothing, and several other parameters.

3 Troubleshooting

The following sections contain information on resolving some of the most common problems encountered when using the ADC2000-PCI:

Troubleshooting Device Driver Installation

Issue:

After connecting the ADC2000-PCI to the PC, the Add New Hardware Wizard does not locate a device driver for the ADC2000-PCI. Ultimately, a message appears stating that Windows has not installed a device driver.

Probable Cause:

You installed the ADC2000-PCI in the PC prior to completing the OOIBase32 software installation. The ADC2000-PCI driver is installed as part of the OOIBase32 package. If you install the device prior to installing OOIBase32, no device driver will be available for the ADC2000-PCI.

Resolution:

Obtain the "Correcting Device Driver Issues" document from the document library located at the following page:

<http://www.oceanoptics.com/technical/engineering/>

An Older Version of OOIBase32 is Installed on the PC

Issue:

The PC you wish to use with the ADC2000-PCI has an older version of OOIBase32 installed on it.

Probable Cause:

Not applicable.

Resolution:

Install the latest version of OOIBase32 from the Software and Technical Resources CD. Alternately, you can download the latest version from the Ocean Optics website at the following address:

<http://www.oceanoptics.com/technical/softwaredownloads.asp>

You do not need to uninstall the older version first.

Software and Hardware are not Synchronized

Issue:

The software and hardware do not seem to be synchronized.

Probable Cause:

A variety of factors may have caused the hardware and software to fall out of synchronization.

Troubleshooting

Resolution:

To resolve synchronization problems:

1. Exit OOIBase32 software.
2. Restart the PC.
3. Restart the OOIBase32 software.

Appendix 1 – Specifications

ADC2000-PCI Specifications

Dimensions:	168.8 mm x 127.9 mm x 18.3 mm
Weight:	90 g
Power consumption:	250 mA @ 5 VDC
Board architecture/design:	32-bit PCI bus
Sampling frequency:	2 MHz (maximum)
Integration time:	2 ms to 60 s (with S2000)
Data transfer rate:	Full scans into memory every 4 ms; OOIBase32 software time acquisition ~25 ms
A/D resolution/channels:	12-bit/8
Operating systems:	Any 32-bit Windows operating system
Digital inputs/outputs:	8 digital I/Os
Interface cable:	Comes with a 25-pin, 1-meter cable for connecting the ADC2000-PCI to the spectrometer
Spectrometer compatibility:	Supports S2000 Spectrometers
Software compatibility:	Supports all 32-bit Ocean Optics software
Multiple-channel capability:	Up to eight S2000 Spectrometer channels

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