

## DAQ-700 PCMCIA A/D Converter

The **DAQ-700 PCMCIA A/D CONVERTER** is a 12-bit analog-to-digital converter card that connects our spectrometers to notebook PCs. This 16-channel single-ended, 8-channel differential card -- also known by its National Instruments DAQCard-700 designation -- fits into a slot in a notebook PC.

You must first configure your computer to properly detect and use the DAQ-700 and then follow several steps to use it as an interface to your Ocean Optics spectrometer. Because A/D converter installation goes hand-in-hand with software installation, directions for installing OOIBase32 Spectrometer Operating Software are included.

### Install OOIBase32

Before installing OOIBase32, make sure that no other applications are running.

1. Execute **Setup.exe**. At the "Welcome" dialog box, click **Next>**.
2. At the "Destination Location" dialog box, accept the default or choose **Browse** to pick a directory. Click **Next>**.
3. At the "Backup Replaced Files" dialog box, select either **Yes** or **No**. We recommend selecting Yes. If you select Yes, accept the default or choose **Browse** to pick a destination directory. Click **Next>**.
4. Select a Program Manager Group. Click **Next>**. At the "Start Installation" dialog box, click **Next>**.
5. Follow all prompts regarding the Spectrometer Configuration diskette that came with your system. For more on the Spectrometer Configuration diskette, see the **Note** below. (If you downloaded OOIBase32 from the Ocean Optics web site, you will not have this diskette. Select **No** when first asked about the diskette.)
6. At the "Installation Complete" dialog box, choose **Finish>**.
7. When prompted to do so, **restart your computer** when the installation is complete.
8. **Do not** run OOIBase32 at this time. Your computer must be properly configured to use the DAQ-700 before you can use OOIBase32.

#### **Note:**

In your spectrometer shipment box, you received a Wavelength Calibration Data Sheet wrapped around a floppy diskette. The Wavelength Calibration Data Sheet and the spectrometer configuration file on the floppy diskette contain the same information, which is unique to your spectrometer. When you install OOIBase32, you are prompted to insert this diskette into your computer so that this data is installed with the software. However, if the diskette is ever lost, or if you downloaded OOIBase32 from our web site and did not receive one, use the data on the Wavelength Calibration Data Sheet to enter into OOIBase32 fields.

### Install NI-DAQ

1. Insert your NI-DAQ version 6 CD into your CD-ROM drive.
2. A setup program should automatically start. If it does not, run the **Setup.exe** program from the CD.
3. The installation program has an option called **Install NI-DAQ**. Select that option.
4. In the "Select Components" dialog box, make sure **NI-DAQ Driver Files (Minimal Install)** is checked. Choose any of the other options you wish to install. Click **Next>**.
5. Accept the default destination directory and the default Program Group.
6. In the "Ready to Install" dialog box, click **Next>**. When prompted to do so, **RESTART YOUR COMPUTER**.

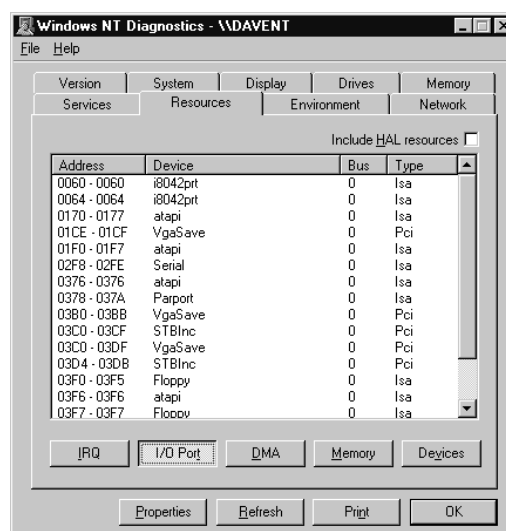
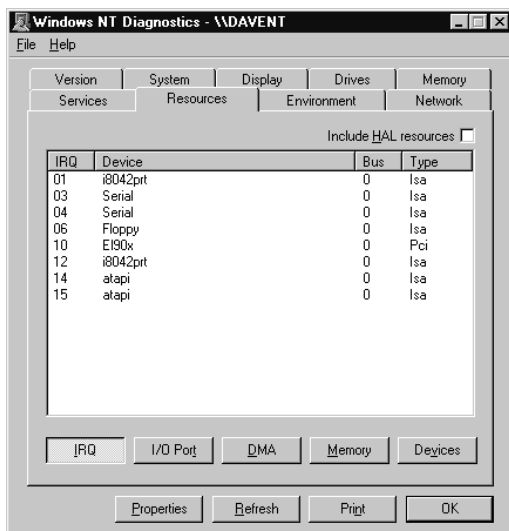
### Install the DAQ-700

1. After the computer restarts, wait until all disk drive activity stops -- that is, wait until your computer is *completely* restarted. Connect the spectrometer cable between your DAQ-700 and your spectrometer. Now, insert the DAQ-700 into any available PCMCIA slot.

- Windows 95/98 will play a sound consisting of two tones of increasing pitch. If you do not hear this sound, and you do have internal speakers in your notebook computer, try turning the speaker volume up and reinserting the DAQ-700. If you still do not hear the “happy” sound, contact our Technical Support Department.

## Find the IRQ and I/O Range

- If you hear the “happy” sound, go to **Start | Programs | Administrative Tools (Common) | Windows NT Diagnostics**.
- In the “Windows NT Diagnostics” dialog box, click on the **Resources** tab.
- Select the **IRQ** button. Find the IRQ that your computer assigned to the DAQ-700. *Note this number.*
- Select the **I/O Port** button. Find the I/O Range (Base Address) that your computer assigned to the DAQ-700. *Note this number.* (This number is in hexadecimal.)



## Run OOIBase32

After you restart your computer, navigate to the OOIBase32 icon and select it. The very first time you run OOIBase32 after installation, you must follow several prompts before you can begin taking measurements.

### Operator and Serial Number Dialog Box

First, a prompt to enter a user name and serial number appears. Certain data files will include this information in the header. (If, at a later date, you wish to change the operator name and serial number, select **Edit | Settings** from the menu and then choose the **Registration** tab.) Click **OK**.

### Default Spectrometer Configuration File

Next, the following message appears:

This appears to be the first time OOIBase32 has been executed. Please select a spectrometer configuration file from the following screen. This spectrometer configuration file will be used each time OOIBase32 is started.

A file open dialog box then appears. Navigate to the OOIBase32 directory, and choose the default spectrometer configuration file -- the file with **.spec** as the extension, preceded by the serial number of your spectrometer. (A default spectrometer configuration file will be named something similar to **I2J613.spec**.)

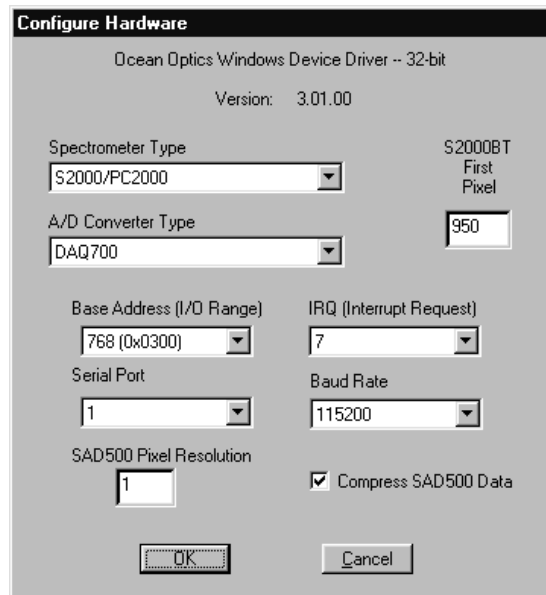
### Configure Hardware Dialog Box

Next, the **Configure Hardware** dialog box opens. The parameters in this dialog box are usually set only once -- when OOIBase32 is first installed and the software first opens.

1. Under **Spectrometer Type**, choose your spectrometer.
2. Under **A/D Converter Type**, choose DAQ700.
3. Choose the same **Base Address** value selected in step 4 on page 2.

The I/O Range (Base Address) you selected was expressed in hexadecimal. In this dialog box, the Base Address is given in decimal, followed by the hexadecimal equivalent in parenthesis. For example, “**768 (0x0300)**” is 768 decimal, 300 hexadecimal.

4. Choose the same **IRQ** value selected in step 3 on page 2.
5. For your setup, only these parameters apply to your system. (Ignore the other settings; they apply to other A/D converters.) Click **OK**. You can always change these settings once OOIBase32 is fully operational by selecting **Spectrometer | Configure | A/D Interface**.



The **Configure Hardware** dialog box is titled "Ocean Optics Windows Device Driver -- 32-bit" with version "3.01.00". It contains the following settings:

- Spectrometer Type:** S2000/PC2000
- A/D Converter Type:** DAQ700
- Base Address (I/O Range):** 768 (0x0300)
- IRQ (Interrupt Request):** 7
- Serial Port:** 1
- Baud Rate:** 115200
- SAD500 Pixel Resolution:** 1
- Compress SAD500 Data:** ☒

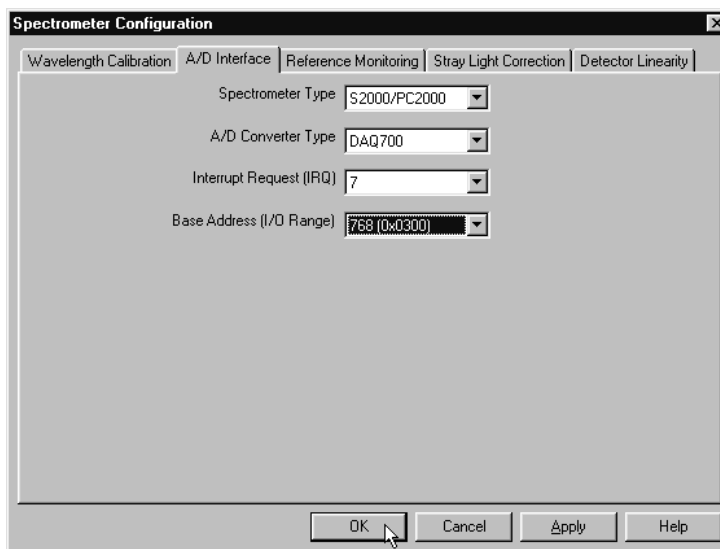
Buttons at the bottom: **OK**, **Cancel**.

¶ If you do not see the “Configure Hardware” screen, exit the software. Then select **Start | Run**, and type `c:\winnt\oidrv.ini` for Windows NT systems. Notepad will open. Edit this file for our device driver by finding the “Initialized” entry and making sure this line reads **Initialized=0**. Save the OOIDRV.INI file and exit Notepad. Restart OOIBase32. You should now see the “Configure Hardware” dialog box.

### Spectrometer Configuration Dialog Box

Now that OOIBase32 is running, you need to configure your system. Select **Spectrometer | Configure** from the menu. Go through each page in the **Spectrometer Configuration** dialog box to set system parameters. (See the **OOIBase32 Spectrometer Operating Software Manual** for details.)

- ◆ In the **Wavelength Calibration** page, the coefficients for each spectrometer channel in your system have already been loaded as part of the spectrometer configuration file that came on a floppy diskette with your spectrometer. (See the **Note** on page 1.) If you did not receive this floppy diskette, you can enter the wavelength coefficients of your system from the Wavelength Calibration Data Sheet that came with your spectrometer. Check the **Enabled** box for each spectrometer channel in your system.
- ◆ In the **A/D Interface** page, enter the same values as you did in the **Configure Hardware** dialog box.
- ◆ The **Detector Linearity** page in this dialog box allows you to enter coefficients for an algorithm that corrects for rare occurrences of non-linearity of the detector. Contact Ocean Optics for more information.



The **Spectrometer Configuration** dialog box has tabs for: **Wavelength Calibration**, **A/D Interface**, **Reference Monitoring**, **Stray Light Correction**, and **Detector Linearity**. The **A/D Interface** tab is selected, showing the same settings as the Configure Hardware dialog box:

- Spectrometer Type:** S2000/PC2000
- A/D Converter Type:** DAQ700
- Interrupt Request (IRQ):** 7
- Base Address (I/O Range):** 768 (0x0300)

Buttons at the bottom: **OK**, **Cancel**, **Apply**, **Help**.

Save the spectrometer configuration file by choosing **Spectrometer | Save Configuration As** from the OOIBase32 menu. You can rename the file or use the default file name ([your serial number].spec). You will then be asked if you would like to make this file the default spectrometer configuration file. Choose **Yes**. The next time you run OOIBase32, the software will use the file as the standard for your spectrometer configuration. When you exit OOIBase32, any changes to the configuration file will be automatically saved to the default file.

### **OOIBase32 Settings Dialog Box**

At this point, it is a good idea to configure several OOIBase32 operation parameters. Choose **Edit | Settings** from the menu to open the **OOIBase32 Settings** dialog box. Go through each page of this dialog box to select options for saving, opening, and printing data; to choose waveform sound files for various program events; to configure default setting files; and to select other important options such as storing and copying data and choosing warning messages. (See the **OOIBase32 Spectrometer Operating Software Manual** for details.)

### **Configure Data Acquisition Dialog Box**

Finally, select **Spectrum | Configure Data Acquisition** from the menu to set your data acquisition parameters in the **Configure Data Acquisition** dialog box. The **Basic** page allows you to set the integration time and choose averaging and boxcar smoothing values. The **External Trigger** page allows you to specify the external trigger mode. The **Strobe** page allows you to control external strobe events with the spectrometer. (See the **OOIBase32 Spectrometer Operating Software Manual** for details.)

## **Specifications**

Type:	PCMCIA Type II
Resolution:	12-bit
Sampling frequency:	100 kHz (maximum)
Channels:	16-channel single-ended; 8-channel differential
Interface cable:	50-pin connector to A/D card; 25-pin connector to spectrometer
Multiple-channel capability:	supports up to 4 spectrometer channels (number of supportable channels is function of electrical current limitations)