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Find the *Ocean Optics ADC500* at our website: ***Click HERE***

ADC500 ISA-bus A/D Converter

The **ADC500 ISA-BUS A/D CONVERTER** is a 12-bit, 8-channel ISA-bus analog-to-digital converter card that connects our spectrometers to desktop PCs. This single-ended, half-length card fits into an ISA slot in a desktop PC, and has a 500 kHz sampling frequency. The following are directions for installing your ADC500. Because A/D converter installation goes hand-in-hand with software installation, you will find directions for installing OOIBase32 Spectrometer Operating Software included in this section as well.

Each device in or connected to your computer is assigned specific settings; it's similar to giving each device its own name so that your computer will know what to call and how to recognize the device. In order for your ADC500 to work as a device in your computer, it has to be assigned a Base Address setting and an IRQ setting. The default settings for each are:

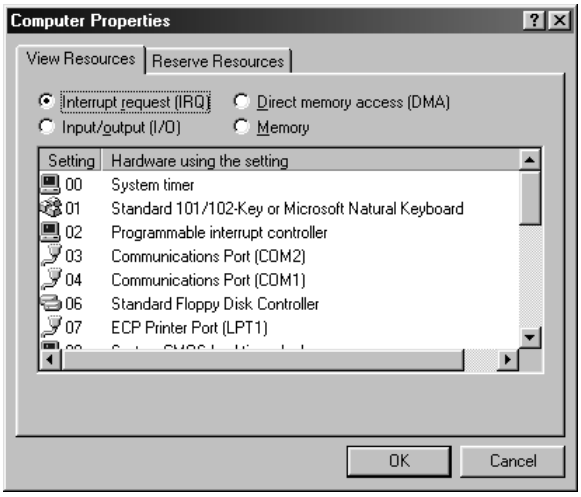
Base Address (I/O Range): 768 decimal (300 hexadecimal)
IRQ (Interrupt Request): 07

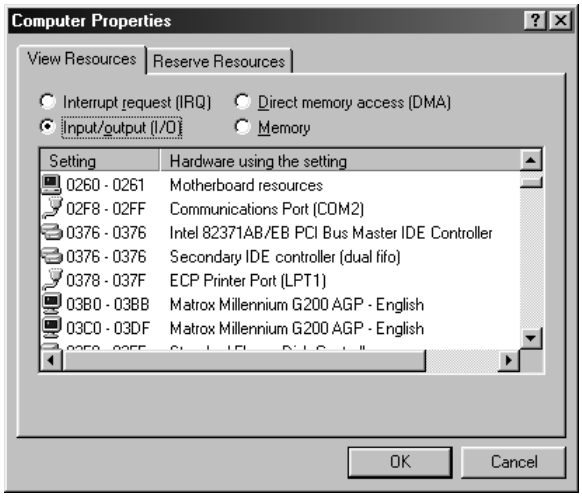
These default values are set on the A/D converter. There are dip switches on the A/D board and their positions determine the values. These default values are set in the operating software as well. Most of the time, these default settings will work with your computer. However, if you have many devices installed in your computer, you may have a conflict; other devices may be using these settings. If there is a conflict with another device in your computer, you must change the positions of the switches on the A/D board and change the values in the software.

For the ADC500, the Base Address is set via the bank of 6 switches labeled SW1 on the A/D board and the IRQ is set via the bank of 4 switches labeled SW2 on the A/D board. To first check your computer to see which settings are available, see the section below.

Find Available Base Address and IRQ Settings

1. Go to **Start | Settings | Control Panel** and double-click on the **System** icon.
2. Choose the **Device Manager** tab and double-click on "Computer" at the top of the list.
3. Under **View Resources**, find available settings -- numbers unassigned to hardware. Note these available settings for both the Interrupt request (IRQ) and the Input/output (Base Address). When you first run OOIBase32, you must enter these values in the "Configure Hardware" dialog box. (Remember that Input/output settings are expressed in hexadecimal.)





For most computers, the default settings work well. In the picture above left, it appears that the Printer occupies IRQ 07, but for most computers, our A/D converters can share the IRQ 07 setting with a printer and conflicts will not arise. All computers have multiple Base Address (Input/output) settings from which to choose.

Install the ADC500

1. Turn off the computer and remove the computer cover.
2. Ground yourself to the computer chassis or power supply and remove the A/D card from its static-shielded bag.
3. If necessary, change the position of the switches on the A/D board. Position the switches to match the available settings you found in the previous section -- numbers not being used by other hardware devices. See pages 5 and 6 for switch setting positions.
4. Find an open ISA-bus slot and remove the slot protector.
5. Insert the A/D card into an available expansion slot on the motherboard by *gently* rocking the card into the slot. Make sure the card is fully seated in the motherboard before screwing the tab on the A/D card to the computer. Do not bend the card or move it from side to side once it is seated in the slot.
6. Attach the D37 end of the cable to the card and the D25 end to the spectrometer. Reinstall the cover.

Install OOIBase32

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

1. Execute **Setup.exe**.
2. At the "Welcome" dialog box, click **Next>**.
3. At the "Destination Location" dialog box, accept the default or choose **Browse** to pick a directory. Click **Next>**.
4. 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>**.
5. Select a Program Manager Group. Click **Next>**. At the "Start Installation" dialog box, click **Next>**.
6. 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.)
7. At the "Installation Complete" dialog box, choose **Finish>**.
8. **Restart your computer** when the installation is complete.

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 the our web site and did not receive a diskette, you can use the data on the Wavelength Calibration Data Sheet to enter into OOIBase32 fields.

Run OOIBase32

After you restart your computer, navigate to the OOIBase32 icon and select it. The 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 default spectrometer configuration file from the following screen. This spectrometer configuration file will be used each time OOIBase32 is started.

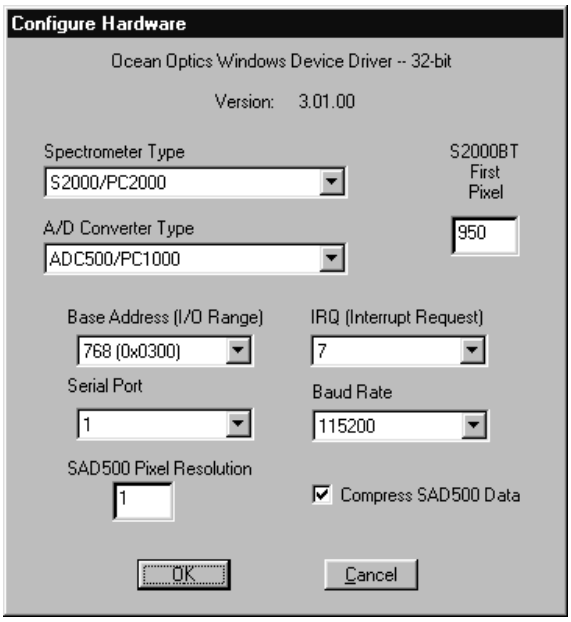
A file open dialog box then appears. Navigate to the OOIBase32 directory, and choose the default spectrometer configuration file -- the file with **.spec** as the extension, preceded by the serial number of your spectrometer. (A default spectrometer configuration file will be named something similar 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 ADC500/PC1000.
3. Under **Base Address**, choose the same setting as the dip switches on the A/D board (and the same available setting you found in your computer).

   Remember that the Input/output 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)**" gives the base address as 768 decimal and 300 hexadecimal.
4. Under **IRQ**, choose the same setting as the dip switches on the A/D board (and the same available setting you found in your computer).
5. For your setup, only these parameters apply. (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**.

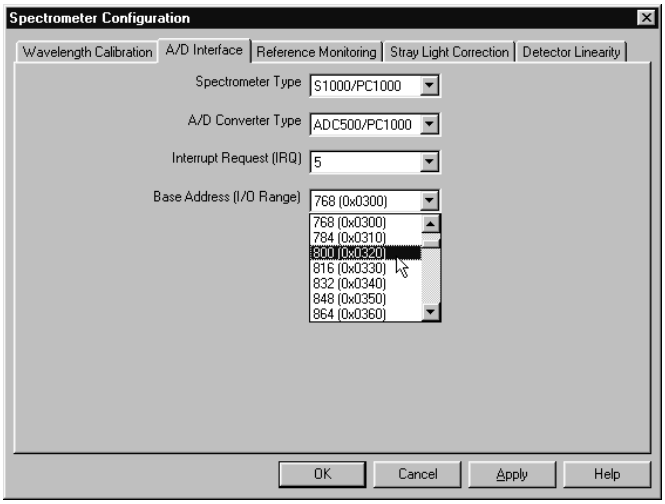


If you do not see the "Configure Hardware" screen, exit the software. Then select **Start** | **Run**, and type **`C:\windows\ooidrv.ini`**. Notepad will open. Edit this file for our device driver by finding the "Initialized" entry and making sure this line reads **`Initialized=0`**. Save the OOIDRV.INI 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 2.) 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 algorthim that corrects for rare occurances of non-linearity of the detector. Contact Ocean Optics for more information.

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**). When prompted 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 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

Board architecture/design:	half-length ISA-bus card for single slot in desktop PC
Resolution:	12-bit
Sampling frequency:	500 kHz (maximum)
Interface cable:	37-pin end to A/D card, 25-pin end to spectrometer length is ~3.5' (slightly >1 meter)
Multiple-channel capability:	supports up to 8 spectrometer channels
Installation parameters:	set dip switch for Base Address (default = 768 decimal, 300 hexadecimal) set dip switch for IRQ (default = 7)
Integration time:	5 milliseconds to 60 seconds with S2000 series spectrometers

Changing the Base Address Settings for the ADC500

To change the Base Address settings on the ADC500 board, see the bank of 6 dip switches labeled SW1. Switches in the OFF position have the decimal values shown. Switches in the ON position have a value of zero. The Base Address is the sum of the values of the switches. In the default setting, switches 5 and 6 are added to give a total of 768. A few of the many combinations for Base Address settings are below. After you have changed the switches, reinstall the card and change the software settings to match the hardware settings. (See pages 1-4 for instructions.) The gray block indicates the position of the switch.

Example: 768 decimal = Hex300 = 0x300 (Default Setting)

Switch #	1	2	3	4	5	6
ON	■	■	■	■		
OFF					■	■

Decimal equivalent	16	32	64	128	256	512
Value as shown					256	512

Example: 784 decimal = Hex310 = 0x310

Switch #	1	2	3	4	5	6
ON		■	■	■		
OFF	■				■	■

Value as shown	16				256	512

Example: 800 decimal = Hex320 = 0x320

Switch #	1	2	3	4	5	6
ON	■		■	■		
OFF		■			■	■

Value as shown		32			256	512

Example: 816 decimal = Hex330 = 0x330

Switch #	1	2	3	4	5	6
ON			■	■		
OFF	■	■			■	■

Value as shown	16	32			256	512

switch is in the on, upward position = ■

Changing the Interrupt Request Settings for the ADC500

To change the IRQ settings on the ADC500 board, see the bank of 4 dip switches labeled SW2. In the default setting, the IRQ is set to 7. Other combinations for IRQ settings are below. After you have changed the switches, reinstall the card and change the software settings to match the hardware settings. (See pages 1-4 for instructions.) The gray block indicates the position of the switch.

Interrupt Request 3

Switch #	1	2	3	4
ON		■		
OFF	■		■	■

IRQ value		3	5	7
Value as shown		3		

Interrupt Request 5

Switch #	1	2	3	4
ON			■	
OFF	■	■		■

IRQ value		3	5	7
Value as shown			5	

Interrupt Request 7 (Default Setting)

Switch #	1	2	3	4
ON				■
OFF	■	■	■	

IRQ value		3	5	7
Value as shown				7

switch is in the on, upward position = ■

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