

Using the DaqBoard 2000

Abstract

The DaqBoard 2000 is a versatile board that adds capabilities for analog voltage input, analog voltage output, and digital I/O control. These capabilities can be used for monitoring a temperature probe (analog input), for controlling a PIFOC or Monochromator (analog output), and for controlling shutters (digital I/O).

Instructions

The DaqBoard 2000 works with Windows 98, Windows NT, and Windows 2000.

You must install software that came on the CD-ROM included with the DaqBoard 2000, before installing the hardware! See the installation instructions further down in this document for more details.

This document explains how to install the hardware and get it working with Meta Imaging Series version 4.6 or later.

Install DaqBoard Software

- Install software from the DaqBoard 2000 CD-ROM. If the CD does not "autostart" when you insert it, then browse the CD and double-click "autorun.exe".
- Check the "32-bit" checkbox next to DaqBook/DaqBoard Support, from the CD's installation menu, and press Install.
- The current version of this CD is 7.9.3.
- You may get a message that it wants to overwrite "roboex32.dll". Choose NO in response to this (roboex32.dll runs the help system for MetaMorph).
- After the main install it will prompt you a bunch of times, Just keep pressing "Next" until the installation finishes.
- Once the installation is done, open the Windows Control Panel. You should see a control panel in there called "Daq* Configuration". If you see this, then the installation has been successful.

Special Considerations for Windows NT

- When installing under Windows NT, you may receive a message indicating that some files could not be updated because they are being used by the system. The message appears as:

Document ID
T10253

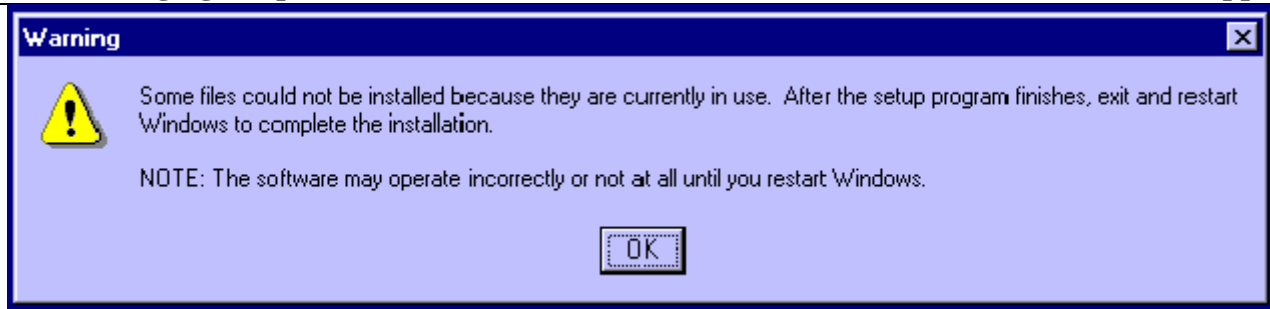
Product
MetaMorph
MetaFluor
MetaVue

Platform
Windows 95/98
Windows NT
Windows 2000

Created
04-Sep-2001

Last Reviewed
11/21/2001

Keywords: daqboard
Issue Type: Hardware



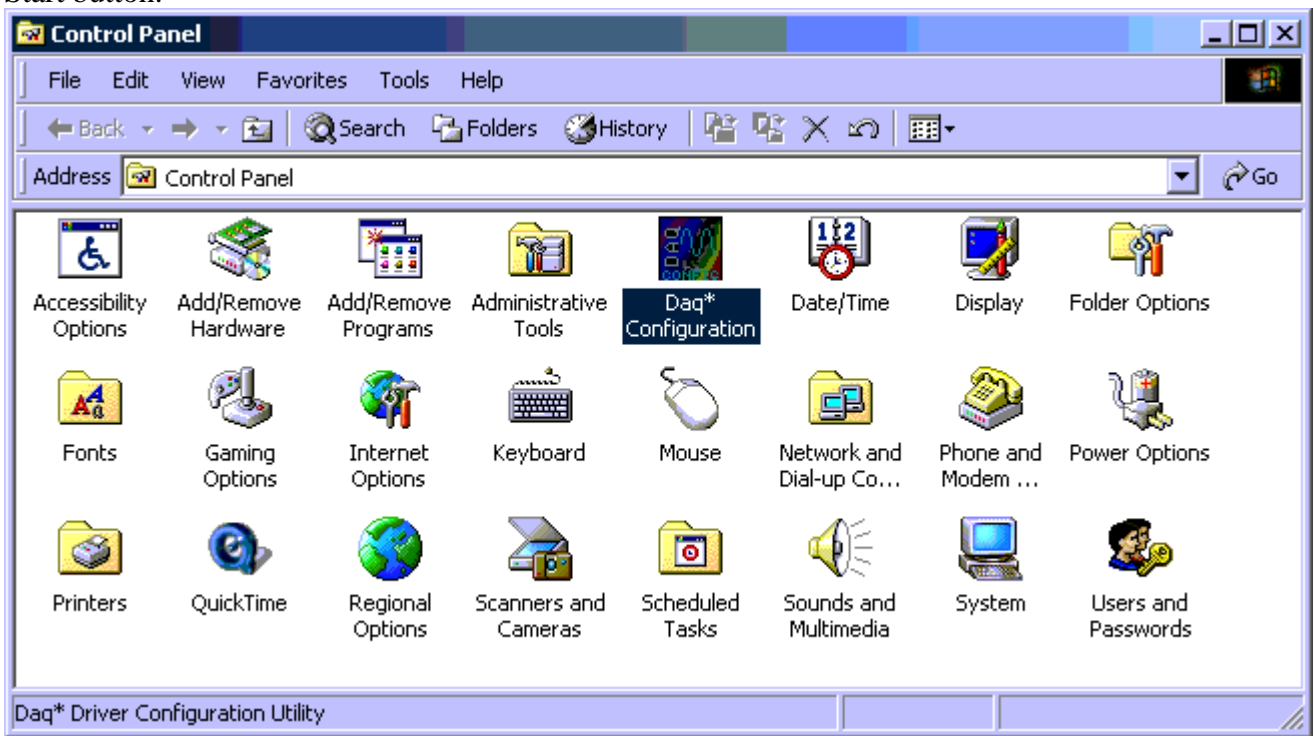
- Since the next step is to shutdown the computer, you can just press OK to this message.

Install DaqBoard Hardware

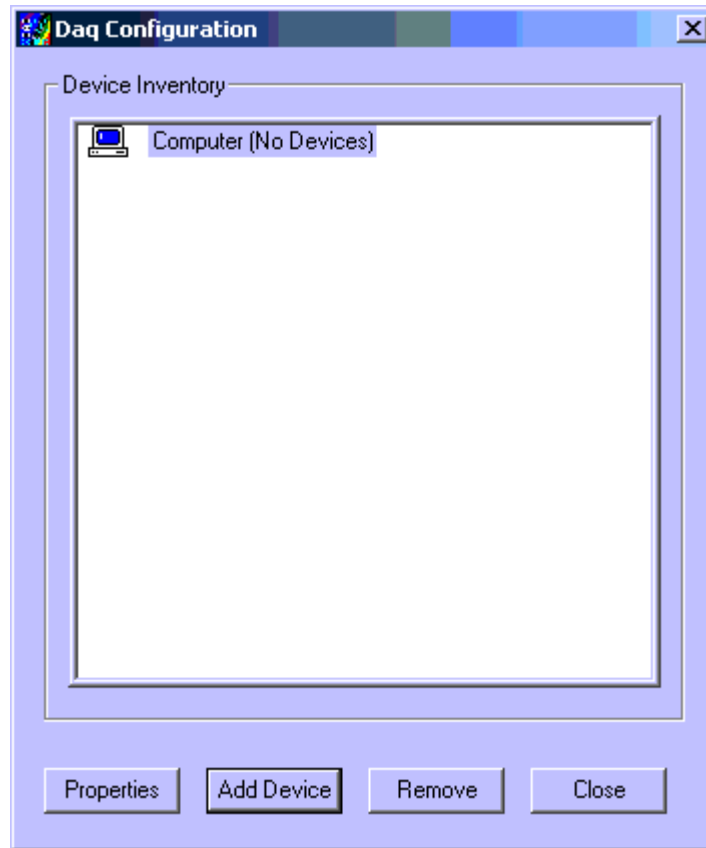
- Shutdown the computer
- Install the DaqBoard 2000 board in a free PCI slot. It does not use an IRQ so you should be able to install it in any free PCI slot.
- Windows 98 or 2000 will recognize the PCI card. Because you installed the DaqBoard software first, Windows does not need to ask you to identify the board, and will install the driver automatically.
- See Appendix 1 to confirm the settings in Device Manager, for Windows 98 and Windows 2000.

Run Daq* Configuration Control Panel

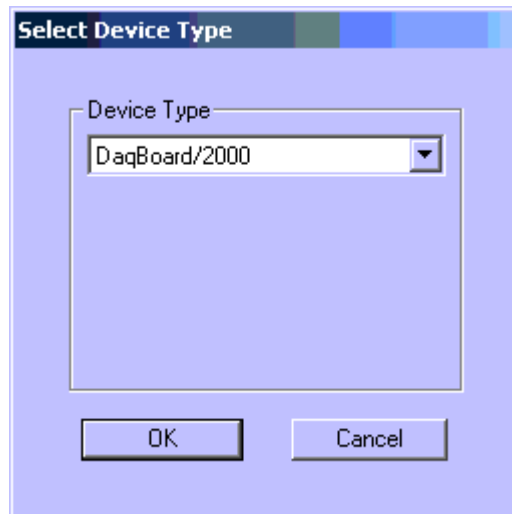
- Double-click the Daq* Configuration Control Panel. This is in the Control Panels that can be viewed by choosing "Control Panel" from the Settings Menu of the Start button.



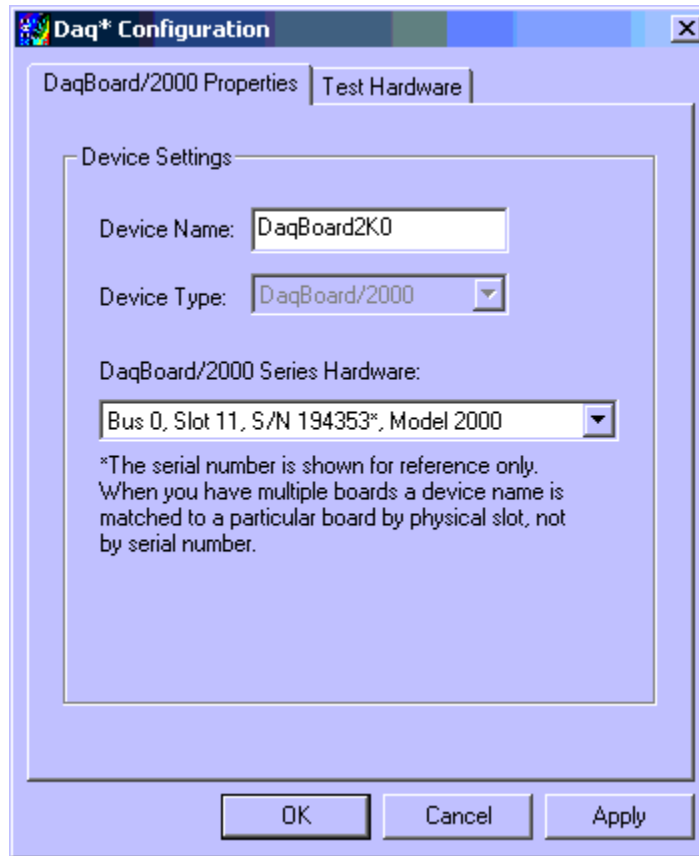
- The Control Panel will appear as:



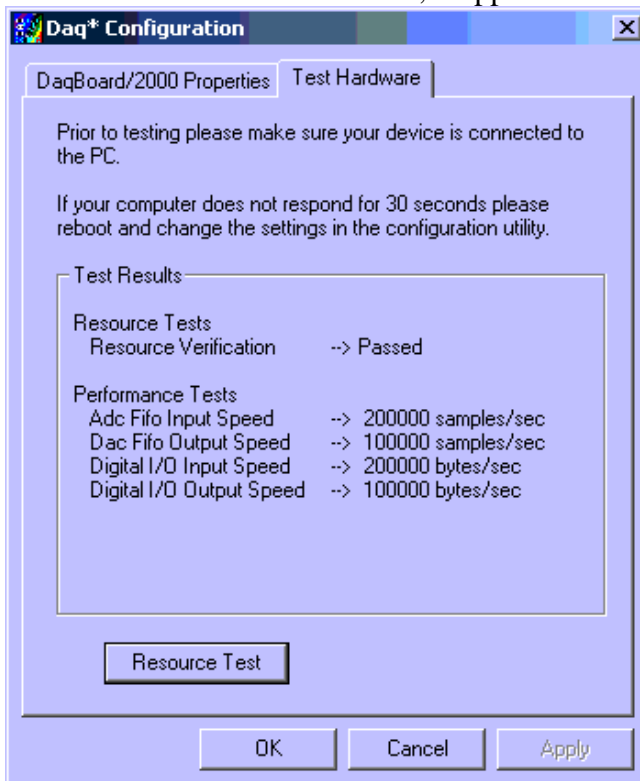
- Press the "Add Device" button:



- Choose "DaqBoard/2000" from the list and press the OK button. The following dialog will then appear:



- You can leave the default settings. This identifies that it detected the board and reports its serial number.
- Switch to the Test Hardware tab, it appears as:



- Press the "Resource Test" button to have it run the tests. After it passes the tests, then you can OK to exit out of the Daq* Configuration control panel.

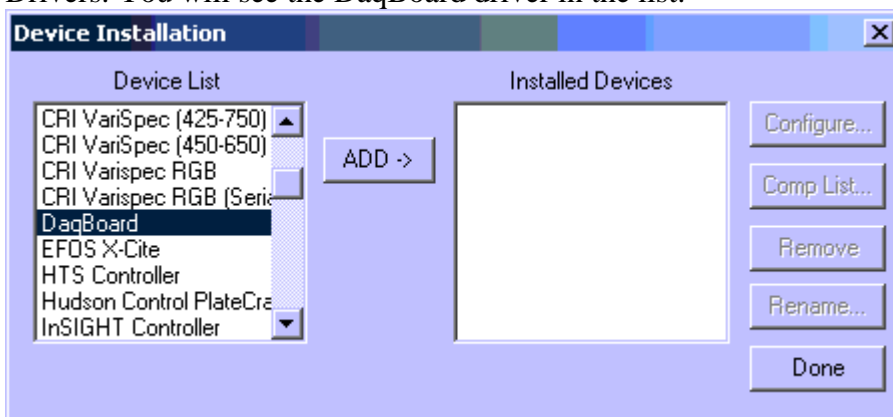
Possible Devices that can be Controlled

The Meta Imaging Series driver for the DaqBoard 2000 is capable of controlling the following types of devices:

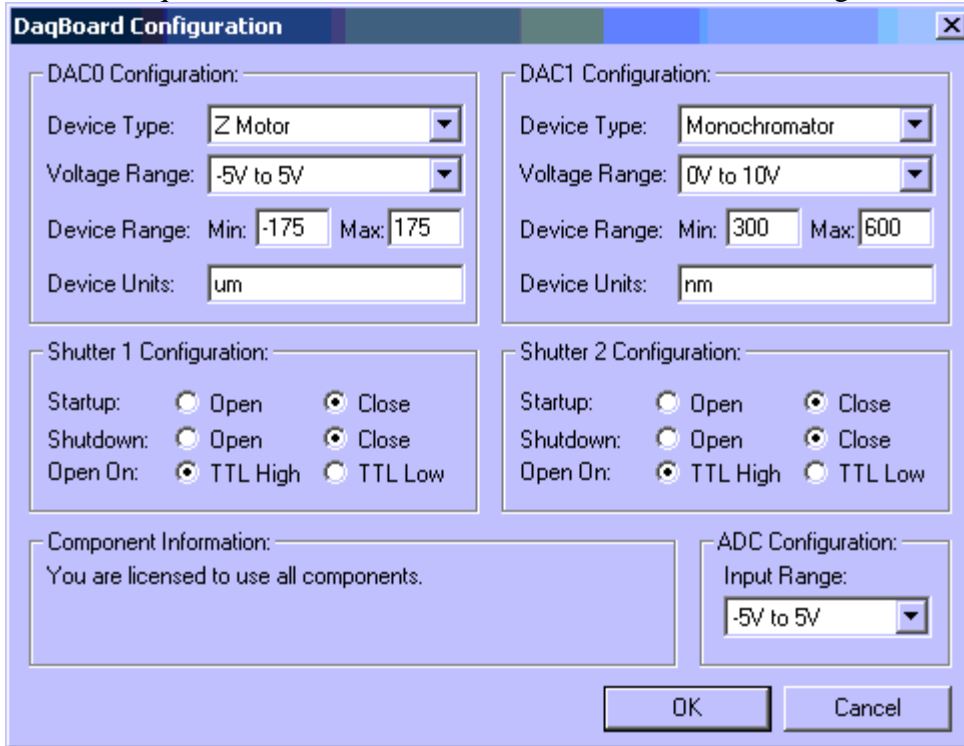
- PIFOC:** The driver can control the Physik Instrumente PIFOC focusing device by outputting an analog voltage to the PIFOC controller. Either DAC 0 or DAC 1 can be used for this purpose. You must have part numbers 40094 and 30847, or 40094 and MetaMorph Complete.
- Piezo Stage:** The driver can control a Piezo stage by outputting an analog voltage representing X and another analog voltage representing Y, to the stage controller. Both DAC 0 (x) and DAC 1 (y) need to be used. You must have part numbers 40094 and 40014, or 40094 and MetaMorph Complete.
- Monochromator:** The driver can control the TILL Polychrome monochromator or the PTI DeltaRAM monochromator by outputting an analog voltage to the monochromator controller. Either DAC 0 or DAC 1 can be used for this purpose. You must have part number 40094 and either 40010, MetaFluor, or MetaMorph Complete.
- Uniblitz Shutter:** The driver can control two Uniblitz-compatible shutters by outputting a digital voltage to control the shutter. Shutter 1 and Shutter 2 can be used for the two shutters. You must have part number 40094 and either 40010, 31020, MetaFluor, or MetaMorph Complete.
- Analog Input:** The driver can receive an analog input from a device that outputs either +/- 5v or +/- 10v. You must have part numbers 40094 and 40093. The analog input is a differential input. This means the signal is inputted into one connector (IN 0 on the cable) and the reference is inputted into another connector (IN 8 on the cable). If you are not generating a differential input, then supply a ground to the IN 8 connector.

Install Hardware Driver in MM Administrator

- Run the Administrator, go to Configure Hardware, go to Configure Devices, go to Hardware Drivers. You will see the DaqBoard driver in the list:



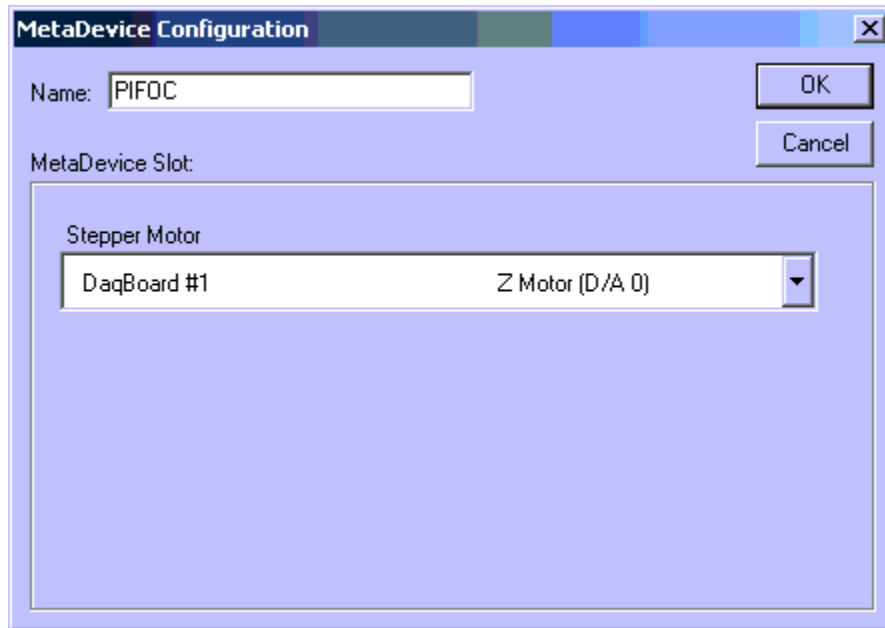
- Note: If you do not see the DaqBoard in the list, it means that your registration code does not contain the DaqBoard driver. Contact UIC to get a new code. You also have to be running MM 4.6.3 or later.
- Add the DaqBoard driver into the Installed Devices list. Its configuration dialog looks like this:



- DAC0 Configuration is the channel 0 analog output. In this example, that has been configured to run a PIFOC. This has been done by selecting the device type to be a Z motor, and by selecting the voltage range applicable for a PIFOC (which is -5 to +5 Volts). Then you need to enter the PIFOC range, if you have the 350 micron unit, you enter the min as -175 and the max as 175. The Device Units will be "um" for microns.
- DAC1 Configuration is the channel 1 analog output. In this example, that has been configured to run a monochromator. This has been done by selecting the device type to be a Monochromator, and by selecting the voltage range applicable to the Polychrome (which is -10 to +10 Volts). Then you need to enter the Monochromator range, in this example it is from 300 to 600 nanometers. The Device Units will be "nm" for nanometers.
- You can also control two shutters, these are configured in the Shutter1 and Shutter2 sections.
- You can also configure the analog input section, which is configured in the ADC Configuration section.
- Press OK to exit out of the dialog

Create MetaDevices in the Administrator

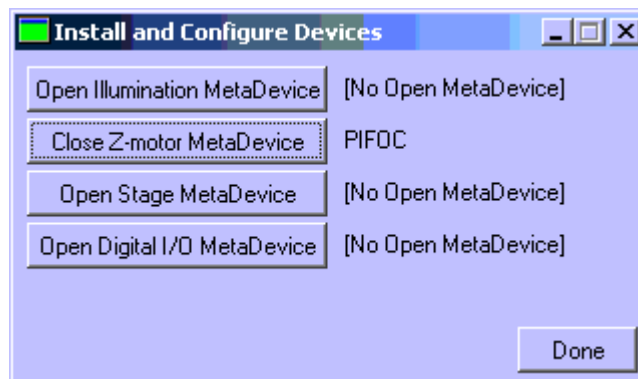
- Press Configure Hardware, press Configure Devices, press MetaDevices. Make a new MetaDevice for each piece of hardware run by the DaqBoard that you want to use in MetaMorph. For example, to get the PIFOC to work, make a New Z-motor MetaDevice and configure it as follows:



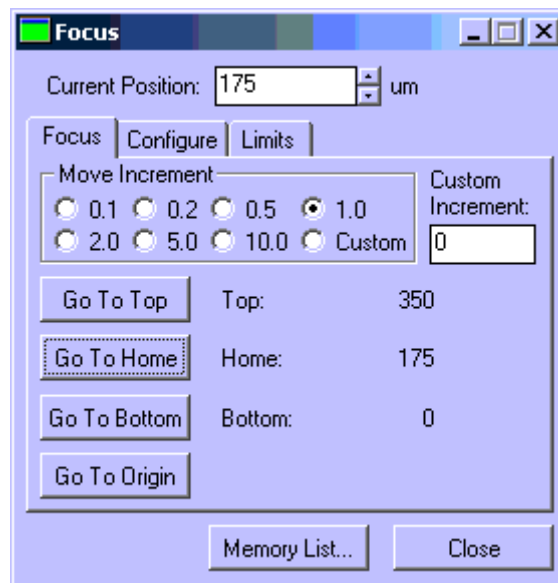
- OK and exit out of the Administrator.

Use Devices in MetaMorph

- You now can use the MetaDevices in MetaMorph just like any other ones. For example, to get the PIFOC to work, first select it in Install and Configure Devices:



- Then use it in the Focus dialog:



The DaqBoard 2000 Cable

The DaqBoard 2000 Cable consists of a high-density 100 pin ribbon connector at one end, and 7 BNC connectors on the other end. The BNC connectors and their purpose are described below:

- DAC 0: An analog output voltage used to drive the device configured in the DAC 0 Configuration section of the Hardware configuration dialog. Typically this is used to control a PIFOC Z motor, or the X component of a Piezo xy stage.
- DAC 1: An analog output voltage used to drive the device configured in the DAC 1 Configuration section of the Hardware configuration dialog. Typically this is used to control a Monochromator, or the Y component of a Piezo xy stage.
- TTL 1: A digital output used to drive Shutter 1.
- TTL 2: A digital output used to drive Shutter 2.
- IN 0: The Analog Input signal enters the DaqBoard 2000 through this connection. If you are using a differential input, the reference voltage should enter IN 8, see below. If you are using a single ended input, the ground voltage should enter IN 8, see below.
- IN 8: The ground or reference voltage to the Analog Input signal used for IN 0 should enter through this connection.
- COUNTER/TIMER: This connection is reserved for future use.

Special Considerations for Windows NT Systems

On occasion, after installing the DaqBoard 2000 software, the low-level board driver will be installed in Windows NT, but will not be activated. The symptom of this is that the software will look like it installed fine, but the Daq* control panel will not be able to find the DaqBoard 2000 board.

If this is the case, you must perform the following operations to activate the driver:

- Open the Control Panel folder
- Open the Devices control panel
- Find and Highlight the "Daqbrd2k driver" in the list of device services.
- Press the Startup button
- Set the startup mode to Automatic
- OK all dialog boxes
- Restart Windows NT

Appendix 1: Device Manager

- The Device Manager applies only to Windows 98 or Windows 2000. You can verify from the Device Manager that the hardware installed correctly.

