

ABET II Behavioral Scheduling & Data Acquisition Software & 2G Hardware Installation Guide



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Introduction

ABET II Standard is designed to run under Windows XP™, 2000, Vista™, Windows 7™ and Windows 8™. Whisker Server (required for ABET II Touch) is not currently compatible with Windows 8™. Administrative rights are required in order to run. The manual for using ABET II is included on the installation disk. After completing this install, please click the ABET II Icon to open the application. Go to the Help menu and click on "Open Manual". Print a copy and/or save a copy on your desktop for future use.

Refer to Appendix A for proper installation of the ABET Hardware and NI-DAQ PCI-DIO-96 Interface card. Refer to Appendix B for the proper connection of and general wiring specifications of common chamber components. And, refer to Appendix C for proper installation of the Advantech PCI Card and Drivers for use with the BNC Mark II Hardware Interface and I/O Modules.

Note: Before the ABET II software can be used to control an ABET Interface, it is necessary to install the interface card drivers and the interface card itself as well as making sure Windows recognizes the card in addition to installing the ABET II software. Although this could be done in any order, following the order presented here may make the task easier.

Uninstalling Old ABET

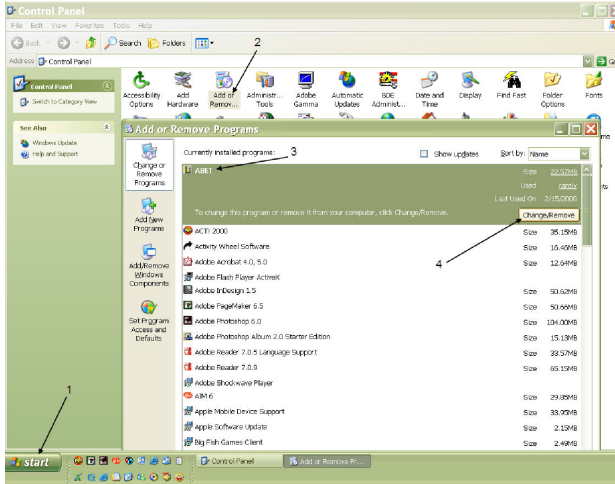
If installing ABET for the first time skip to [Installing ABET II] on page 4. If the computer you plan to use has a copy of the old ABET installed this will have to be removed along with the old NI-DAQ 9.6.1 Drivers before proceeding. Please read the note below the illustration before removing the old ABET program.

Note: Schedules created in old ABET can not be imported to the new ABET II. We recommend you print any schedule that you wish to retain before removing the old program. Simple schedules will be easy to design from the printout although you may want to add variables for clarity. Complex programs in old ABET may have required "tricks" that are now unnecessary with the many new features of ABET II. We would recommend that you incorporate variables, lists, multiple output aliases and other features of ABET II to accomplish schedule tasks with the simplest schedule design as possible. The new Schedule Designer is extremely intuitive; however, we recommend completing the tutorials provided in the ABET II manual before you start to convert existing schedules. Data should be backed up as well. It can not be imported in to the ABET II Data Manager, but data from both could be inserted in a common spreadsheet.

Installation Guide

The following illustrations were made on a computer running Windows XP and should be similar to what you will see on your computer.

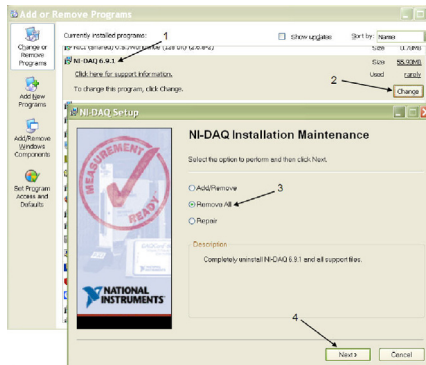
1. Begin by clicking the Start Icon in the lower left corner of your desktop and selecting the Control Panel.
2. Click the "Add or Remove Programs" Icon on the Control Panel
3. Locate and Highlight the ABET Program line.
4. Click Change/Remove and follow the instructions to remove the program.



Uninstalling the 6.9.1 NI-DAQ Drivers

Repeat Steps 1 and 2 above to open the Add or Remove Programs window shown below.

1. Locate and highlight the
2. Click "Change" to open the NI-DAQ Setup Window
3. Click "Remove All"
4. Click "Next" and follow the instructions to remove the drivers and support software.



Installing ABET II Software

Computer Requirements

- Full Size PC Pentium (tower or desktop) or compatible
- 2.0 GHz Duo Core Processor CPU or faster
- Minimum Virtual Memory Settings of 4096 Initial & Maximum (3072 & 6144 recommended) See Appendix D
- Microsoft Windows XP™ Pro (SP3) recommended or Windows 7/8
- RAM Minimum of 2GB (4GB recommended)
- Hard Drive Minimum 160 GB (higher recommended)
- CD/DVD Optical Drive
- An available full size PCIe Slot for NI PCI 6509 Card (LIC # 81504CRD)

Windows 2000 or XP

ABET II will not operate under a limited (Windows XP) or restricted (Windows 2000) account. If you do not have administrative rights, please see your computer administrator to set up an Administrative account for you.

Step by Step Installation

We recommend that you install the ABET II software and the NI Drivers BEFORE installing the 81504CRD PCI Digital I/O Interface Card (Included in Model 81504 ABET 2G Cable & Card) . Driver installation is covered in the next section beginning on page 7. Hardware installation is covered in the section after that beginning on page 11.

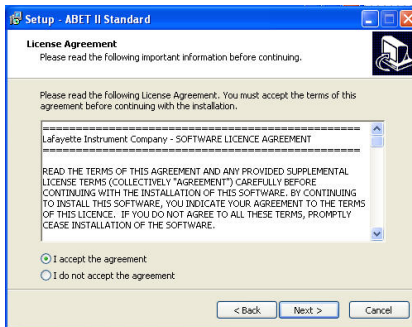
Insert the ABET II installation disk in the CD Drive and wait for the auto run installer to open to the first window shown below. (Windows 7 may take as long as a couple of minutes before the following acknowledge screen appears. Click OK to proceed with new software installation.) If the CD fails to run, click “Start” in the lower left hand corner of your monitor, “Run” on the Start menu, and Browse the CD Drive (ex. D:\) for the Setup.exe application and click on it. The following notice may also appear. Uninstall ABET II if needed.



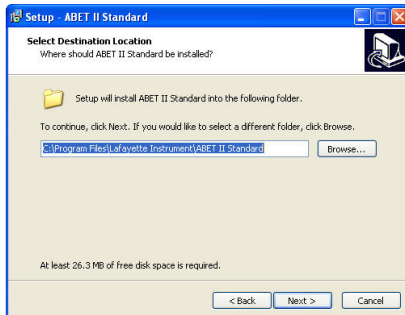
1. Click "Next" on the Welcome Window.



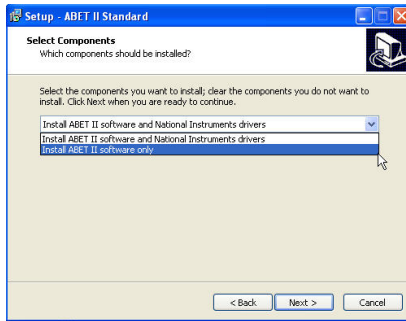
2. Click "I accept" And "Next" after reading the License Agreement.



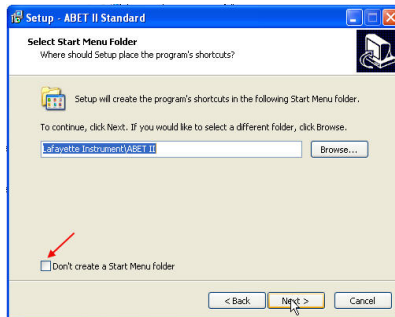
3. The default destination is recommended but may be changed if needed. Click "Next" when ready to proceed.



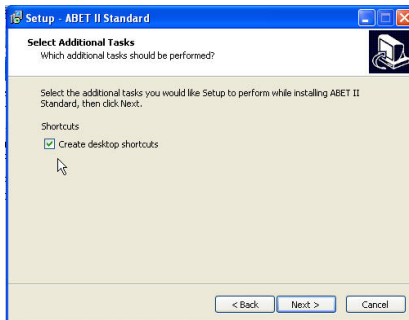
4. The default selection is for laboratory computers that will be running test chambers. Click “Next” to continue for this application. ABET II may also be installed on a computer without hardware and run with a virtual interface for working through the tutorials or for developing new schedules for the lab. In this case, use the pull down menu and select Install ABET II Software only, and click “Next”.



5. Select Start Menu. A link to ABET II may be placed in the Start Menu or on the Desktop. Check “Don’t create a Start Menu folder” if you do not want this option.

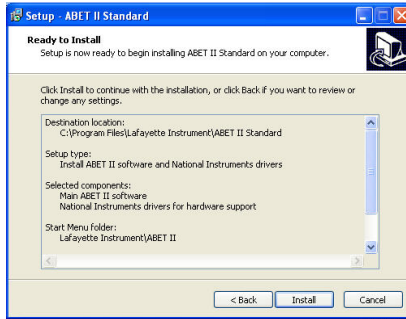


6. Select Additional Tasks. We recommend checking “Create desktop shortcuts”.

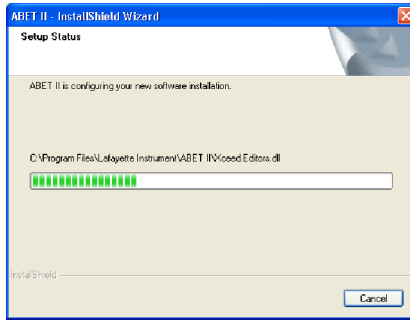


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7. Review the selected settings and click “Install” when satisfied. Click “Back” to edit any of the previous windows. The illustration below is for a lab computer that will be running hardware.



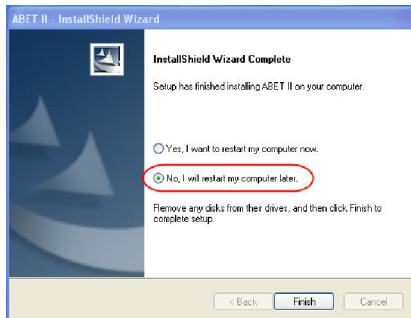
8. Status Screen only - No input required unless you want to cancel the installation.



9a. Lab Installation: If you selected “Install ABET II software and National Instruments drivers” in Step 4, installation will automatically proceed to the NI-DAQmx Installation shown in the next section and eventually return to the finish screen below.

9a. Virtual Installation: If you selected “Install ABET II software only”, the Setup Status screen above will be replaced by the finish screen. Simply click Finish and the ABET II Icon to begin using this product in the virtual mode.

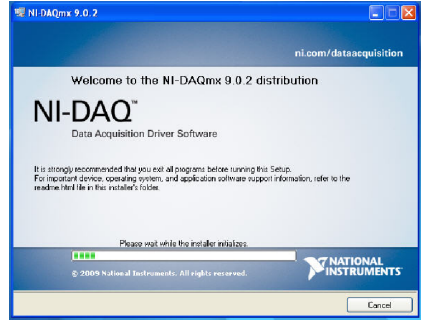
When the finish screen appears, click: “No, I will restart my computer later”, and click Finish. Shut the computer down, and proceed to the Hardware Installation of the PCI card on page 11.



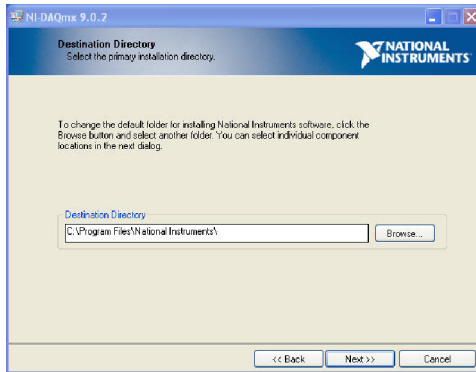
Installing NI-DAQ v9.0.2 Software Components and Drivers

The following Welcome screen may be displayed before the first action screen appears. With Windows 7 it may take up to 2 minutes for the disk signature to be scanned before any screen appears. At the present time we have no way around this delay.

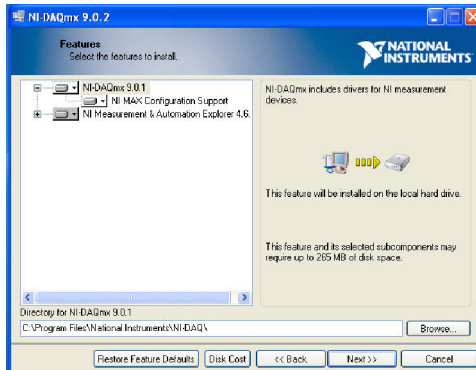
Note: During this installation, the error, "The NI-MXEF 2.3.0 installation has failed with the following error:" may appear followed by additional information and "Continue ?". Click Yes. After the installation finishes, remove and reinsert the ABET II Disk and rerun the installation. Do not remove old files for the second attempt. The driver portion of the installation should now consist of a single component and should finish in a relatively brief amount of time.



1. Click Next to accept the default Destination Directory.

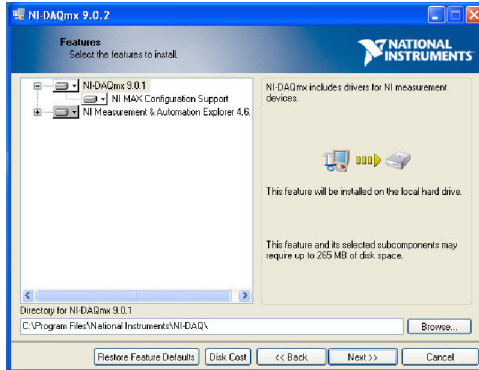


2. Click "Next" to except the default installation.

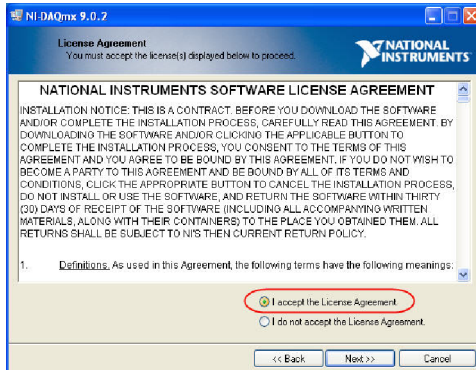


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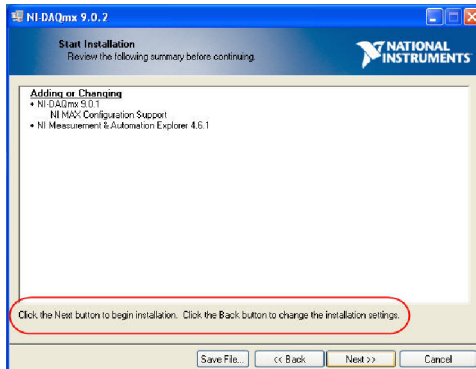
3. Uncheck the product notification check box and click “Next” to proceed.



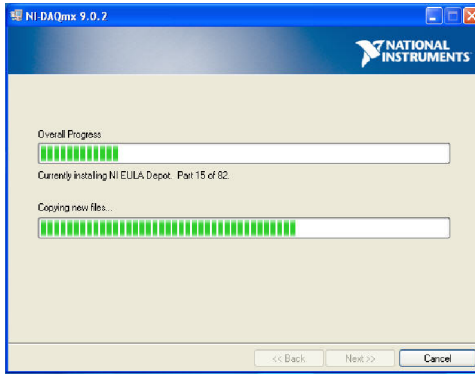
4. Click the “I accept” check box and “Next” to proceed.



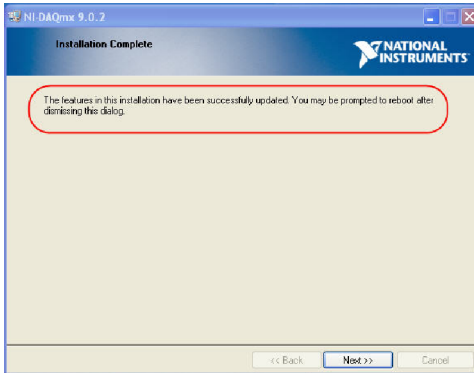
5. Click “Next” to Start the Installation.



6. Several Progress Lines will be displayed similar to the one shown here. This process could take up to 30 minutes to complete.



7. Click “Next” or Finish when the Installation Complete frame appears.



8. Remove the Installation Disk and Click the “Shut Down” button.



PCI Card Installation

After shutting down the computer as instructed above, make certain that the line cord to the computer is disconnected before removing the case and installing the card. Detailed procedures for installing any third party card should be provided with the computer. Additional information is also provided in *Appendix A – Hardware Installation* beginning on page 13.

Once the card is installed, power up the computer and proceed to the next section.

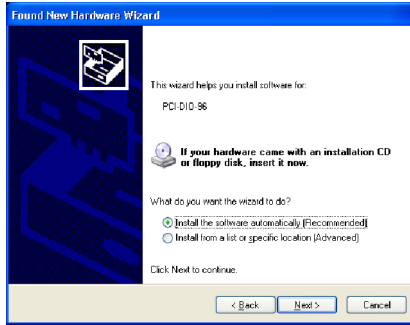
Windows New Hardware Installation Guide for ABET Model 81504CRD Interface Card

The NI-DAQ Drivers were placed on your computer in the previous section; however it is still necessary for Windows to recognize the new hardware and update the properties of your computer. The following screen captures illustrate the typical sequence for Windows XP. Windows 7 Installations may be more seamless.

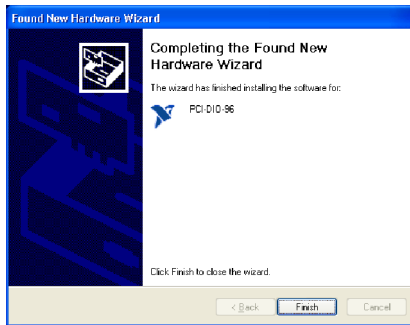
- 1. Power up the computer after installing the PCI Interface Card and the following Wizard should open automatically. If this does not happen, try opening ABET II by clicking the ABET II Icon from your desktop.**
- 2. Select “No, not at this time” from the window displayed below and click “Next”.**



3. Click “Next” to continue with the default installation.



4. When complete the following screen will appear. Click “Finish”.



Additional Notes

We recommend you reboot the computer at this time to make sure all Windows updates have taken place.

The first time you reboot and open the ABET II Application, click Help and select **Open Manual**.

Save a copy to your desktop for future reference. A hard copy may also be printed if desired.

If the computer is on line, click Help and select **Check for Updates** to download any updates for the installed version.

Next click **Edit** and select **Preferences** and confirm that the Hardware Interface selection agrees with the hardware that will be connected to the installed card.

If running in virtual mode, either Standard or Split may be selected, but it is recommend that you select the one that agrees with the hardware connected to your lab computer.

Appendix A: Installation of Interface Components

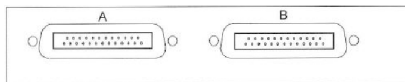
The following procedures are for the 81504 Interface/Cable package, 81501 or 81501-NL Starter Interface Module, and 81502 or 81502-NL Expansion Interface Modules only. Contact Lafayette Instrument for assistance with any other interface package.

Step by Step guide to installing the interface components

1. We recommend installing the NI Drivers before installing the hardware as described earlier in this manual and detailed on pages 7 – 12. A full PCI slot will be needed. Turn the PC off, disconnect the power cord, and remove the cover from your PCI using the instructions supplied with that device. Firmly seat the card in any suitable slot and reassemble the PC. Do not install the drivers supplied by NI. The appropriate drivers have been included with the ABET II installation disk.
2. Connect the 100-pin connector of the 81504CBL Interface Cable to the 81504CRD PCI Digital I/O card connector.
3. Connect the two 50-pin connectors of the interface cable to the 81501 or 81501-NL ABET 2G Starter Interface Module. Check to make sure that the 1-50 labeled cable is connected to the 1-50 connector and that the 51-100 labeled cable is connected to the 51-100 connector as shown below:



4. Multiple modules ordered together will be linked at the factory. To install an expansion module, gently plug the first 81502 or 81502-NL Expansion Interface into the top of the 81501/81501-NL Starter Interface. Note: You can not mix legacy hardware with the new 2G hardware. Also, you can not mix latched hardware with non-latched (NL). Use the alignment tabs and seat the top unit completely down on the bottom unit. Insert the locking screws into the side of the bottom unit and into the alignment tabs of the above unit. Connect each additional expansion interface to the top of the stack in a similar manner.
5. Connect a 30VDC Power Supply (Lafayette Instrument Co. Model 86319 or 83619*C) to the Starter Interface Module and appropriate line voltage source. A small LED on the supply (if provided) will light; however the LED on the interface module will not. The ABET 2G Interface Modules feature a software controlled relay to protect animals and chamber components. Power is not turned ON until some software control is present. Opening ABET II Standard or Whisker Server (used with ABET II Touch) will energize the safety relay. Multiple interfaces may require multiple power supplies depending on the current requirements of the chamber components being controlled. Additional supplies may be connected to any of the expansion modules. It is not necessary for each module to have its own supply unless required to meet the total current capacity of the system. Each module is connected in parallel. One supply provides 2 Amps of power; two supplies provide 4 Amps of power and so on. Power is distributed across chambers as needed.



Note: The 81501 and 81501-NL are designed as a split unit. Each half is separately fused although they share a single power supply. The power light will be Red if only Side A is ON, Green if only Side B is ON and Orange when both Side A and B are ON. If either side fails, check the external fuses on the side of the module. The left hand fuse is for Side A while the right hand fuse is for Side B. Exterior fuses (5x20mm 1.25A fast acting) are easily changed with a small screwdriver. Additional information on a single internal fuse may be found at the end of this section.

The two halves of the interface modules are wired to the chambers through separate DB-25 connectors as shown. The ABET II Environment configuration will refer to these as 1A/1B for the Starter Module, 2A/2B for the first Expansion Module and so on. Each additional module in the stack increments from the bottom up as shown in the diagrams that follow. The generic term chamber is used here, but any test environment operating on 24 – 28 V DC such as a radial arm maze, or human response panel could replace it.

80501(-NL) & 80502(-NL) Hardware with two chambers per module

Interface	Connector	Function	Location	Chamber
Expansion Interface n	Right Hand (B)	Input 1-8, Output 1-15	nB	2n
	Left Hand (A)	Input 1-8, Output 1-15	nA	2n-1
Expansion Interface 2	Right Hand (B)	Input 1-8, Output 1-15	3B	6
	Left Hand (A)	Input 1-8, Output 1-15	3A	5
Expansion Interface 1	Right Hand (B)	Input 1-8, Output 1-15	2B	4
	Left Hand (A)	Input 1-8, Output 1-15	2A	3
Bottom Unit	Right Hand (B)	Input 1-8, Output 1-15	1B	2
	Left Hand (A)	Input 1-8, Output 1-15	1A	1

This configuration requires two 81409 I/O Connection Blocks

80501(-NL) & 80502(-NL) Hardware with one chamber per module

Interface	Connector	Function	Location	Chamber
Expansion Interface n	Right Hand (B)	Input 9-16, Output 16-30	n	n
	Left Hand (A)	Input 1-8, Output 1-15		
Expansion Interface 2	Right Hand (B)	Input 9-16, Output 16-30	3	3
	Left Hand (A)	Input 1-8, Output 1-15		
Expansion Interface 1	Right Hand (B)	Input 9-16, Output 16-30	2	2
	Left Hand (A)	Input 1-8, Output 1-15		
Bottom Unit	Right Hand (B)	Input 9-16, Output 16-30	1	1
	Left Hand (A)	Input 1-8, Output 1-15		

This configuration requires one 81508 I/O Connection Block

Connecting the Chamber I/O

WARNING: Make sure the ABET II Software is closed or the 28VDC Supply turned OFF before working with any chamber connections. Either condition will result in the power light on the Interface Module (81501, 81501-NL, 81502, 81502-NL) to be OFF.

5. Connect the chamber I/O connection block to the interface modules using one or two 81406-25 DB-25 cables as appropriate using the above tables as a guide. The 81508 I/O Block features 16 Inputs and 30 Outputs while the 81409 I/O Block is used for 8 Inputs and 15 Outputs.
6. Wire the chamber components or other compatible devices to the 81408 or 81409 I/O modules. General wiring guidelines are provided below. Refer to any additional wiring information that may have been supplied with the device itself. Recheck all of the wiring connections to ensure they were properly made before turning the 28 V DC supply(s) ON.
7. One or more 83619 28 VDC power supplies may be needed for your system. Each supplies 2 amps of current and may be connected to the power jack on the starter interface or on any expansion interface.
8. Before turning the power supply(s) on, note the order of power up should be:
 - a) Power on the computer.
 - b) Power on the 28 VDC power supply(s) connected to the interfaces .
 - c) Open the ABET II Software.

Note: The reverse order should be used when turning power off.

Appendix B: Component I/O Wiring Guidelines

If you have an 81401, 81401-NL, 81401S or 81401S-NL Starter Interface Module detailed instructions are provided in MAN495. The following procedures are for the 81504 Interface/Cable package and 81501 or 81501-NL Starter Interface Module.

Wiring Guidelines for ABET Model 81409 and 81508 I/O Blocks

Chamber components may be wired in any order to the I/O Connection Blocks; however, it is much easier to complete the Hardware Configuration when all chambers are wired the same. A few “standard” connections are listed below.

Inputs

- First or Left Response Lever – Input 1
- Second or Right Response Lever – Input 2
- Omnidirectional lever or shaping push button – Input 3

Outputs

Without Intensity Control:

- First or Left Stimulus Light – Output 1
- Second or Right Stimulus Light – Output 2
- Pellet Dispenser – Output 3
- Liquid Dispenser – Output 4

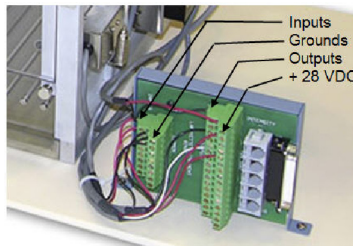
With Intensity Control:

- Outputs 1,2,3
- Outputs 4,5,6
- Output 7
- Output 8

Note: Connections can be made anywhere on the I/O block and mapped with the Environment Designer in ABET II. It is helpful for all chambers to be the same, but this is not essential to the operation of an ABET system. For example, if a single input or output becomes damaged, move the device to a new position, change the mapping in the Environment Designer for just that one chamber and load the same experiments or schedules that you’ve been running until you have an opportunity to have the interface repaired.

Wiring Connections:

Four rows of terminal screws are provided on the 81508 and 81409 I/O Connection Blocks. Inputs and Outputs are number with one terminal screw for each control line. The tall block of terminal screws behind the inputs are for connecting ground wires. The tall block of terminal screws behind the outputs are for connecting +28 V DC. Model 81409 is shown below.



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These Lafayette Instrument Devices connect to the following screw terminal connections:

Model	Wire Color	Connection	Function
80110 Response Lever	Red	Input	
	Black	Ground	
80111 Omnidirectional Lever	Red	Input	
	Black	Ground	
80209-45 Pellet Dispenser	Red	+28VDC	
	White	Output	Initiate
	Black	Ground	
80201 Liquid Dispenser	White	+28VDC	
	Green	Output	Initiate
	Black	Ground	
80221 Stimulus Light	Red	+28VDC	
	Black	Output	
80223 Sonalert	Red	+28VDC	
	Black	Output	
80136M & 80136M14 White Noise Generator	Red	+28VDC	
	Black	Ground	
	White	Output	
80137M & 80137M14 Clicker	Red	+28VDC	
	Black	Output	

Appendix C: Installation with BNC Hardware

This section provides Installation Instructions for ABET II when used with the Advantech PCI Interface card (Model 80626-CARD) and the BNC Mark II Interface Cabinet and Power Supply (Model 80626-3)

ABET II is designed to run under Windows XP or Windows 7 and requires Administrative rights in order to run. The manual for using ABET II is included on the ABET II installation disk. After completing this install, click the ABET Icon to open the application. Go to the Help menu and click on "Open Manual". Print a copy and/or save a copy on your desktop for future use.

There are three steps to this installation. These steps may be completed in any order.

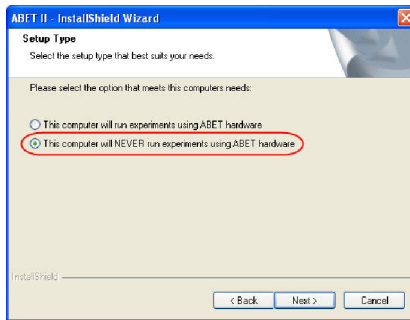
Step 1: Install the PCI Interface card in the PC. Follow guidelines supplied with the PC for cover removal and card installation of any PCI component. When the PC is turned ON, cancel the auto add new hardware routine if it occurs.

Step 2: Install the ABET II Software

Step 3: Install and set up the Advantech Card Drivers

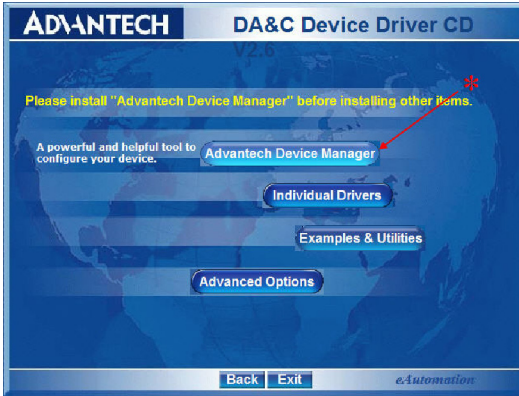
ABET II Installation

The printed Software Installation Guide supplied with ABET II covers installation of a virtual system and installation for the standard ABET Hardware and NI-DAQ PCI 6509 Card. You will need to install ABET II as if no hardware is installed and then use the instructions that follow to cover the hardware portion of the installation. Insert the ABET II CD and follow the ABET II installation guide until you reach Step 5 from page 6 of Section 2 as shown below. Select the option circled below and continue with the ABET II installation until finished.



Advantech Device Driver Installation

1. Insert the Advantech DA&C Device Driver CD into the computer; if autorun does not start the installer navigate to the CD and manually start it.
2. Begin by clicking on the “Advantech Device Manager” button shown below. *



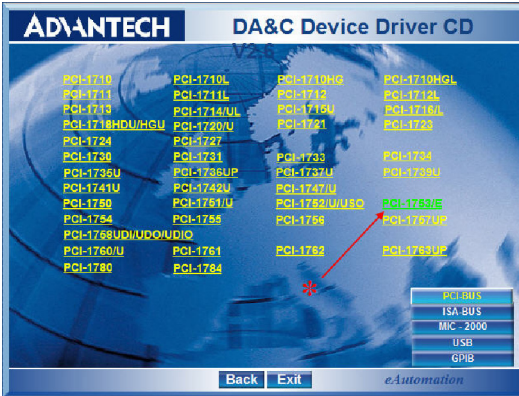
3. After the install finishes, go back to the main menu and Select “Individual Drivers” as shown below.



4. Select "PCI Series"



5. Select "PCI-1753/E"



6. After the install finishes, go back to the main menu and select "Advanced Options"



7. Select "ActiveDAQ Pro"



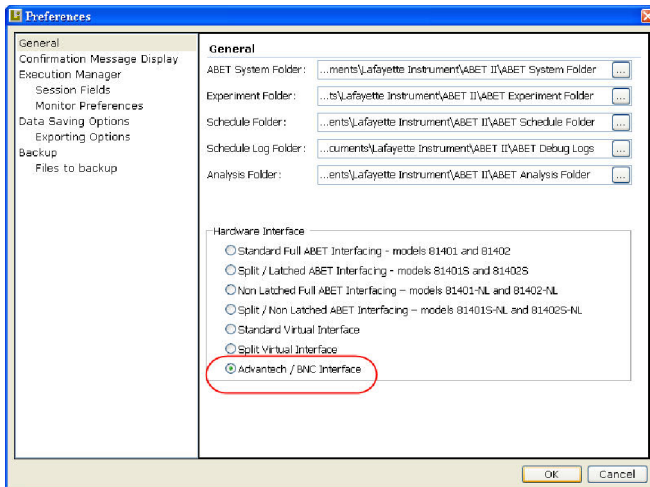
Complete the installation as directed.

After completing the three steps above, connect the BNC hardware to the Advantec PCI card with the cable supplied if this has not already been done. Be sure to shut the computer down and disconnect from the AC power line before connecting cables.

Switch the PC back ON and open ABET II from the desk top icon. When prompted select for use with Advantec/BNC hardware.



If not prompted, go to Edit/Preferences and make sure the Advantech/BNC Interface choice has been selected as shown below.



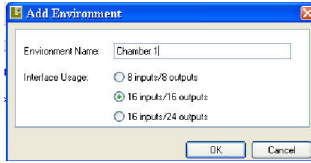
Environment Configuration

If a default environment configuration has been provided by either Lafayette Instrument Co. or Campden Instruments simply copy the file "Environments.abetEnvs" to the systems folder in the default path from the ABET II Software installation or in the custom path that you provided.

Default path:

.....My Documents\Lafayette\ABETII\System folder

To manually build a chamber configuration click the Environment Configuration Tab and select Add Environment. Provide an Environment Name of your choice and select the Interface Usage that reflects the way your chambers have been wired. For example, the 16 inputs/16 outputs configuration is used by the 5/9-Hole test chambers. Setting up environments is covered in some detail in the manual in the "Getting Started" section.

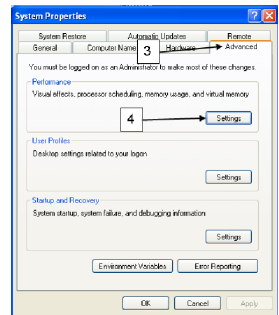
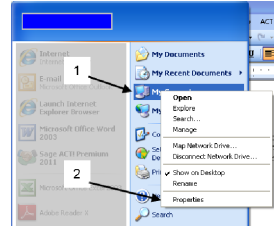


Select Chamber 1 or Box1 from the list on the left of the screen.

Click the green tick on the tool bar. If you click on the outputs here you should see corresponding LEDs lighting on the first card. If this happens the system is working OK.

Appendix D: Adjusting Virtual Memory Windows XP, Service Pack 3

- 1. Click Start followed by a right click of My Computer. (If the My Computer Icon is on your desktop, you can right click directly on that)**
- 2. Select Properties from the menu.**
- 3. Click the Advanced Tab on the System Properties frame**
- 4. Click the Settings Button on the Advanced Tab**



1. Click the **Advanced Tab** on the **Performance Options** frame.
2. Locate the **Virtual Memory** section and Click **Change**
3. The recommended settings for **Virtual Memory** are as follows

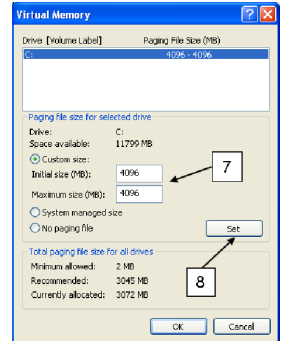
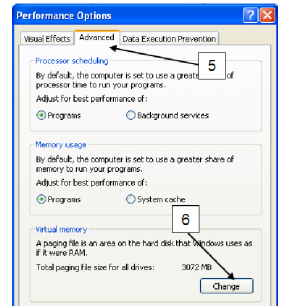
Initial size (MB): 3072
Maximum size (MB): 6144

If this is not allowed by your computer use:

Initial size (MB): 4096 or 4092
Maximum size (MB): 4096 or 4092

4. Click **Set** when finished with the settings.

Click **OK** to close the frames that have been opened. You will have to restart your computer for the new settings to take effect.



Appendix E: Installing Graphviz Open Source Software

Graphviz

Graphviz is the open source graph visualization software product used to display any ABET II Schedule in the form of a flow chart. This is not needed to display and print schedules in the form of a spread sheet. The Graphviz web site is located at www.graphviz.org. Downloading is straight forward. Once Graphviz is downloaded ABET II will automatically link to it as needed.

Instructions

1. Go to the Graphviz web site, www.graphviz.org
2. Click **Download**
3. "Accept" the terms and conditions
4. Select "Stable and development Windows Install Packages"
5. Download the "current stable release". At the time this was written, clicking on graphviz-2.28.0msi would allow you to Run the Install Wizard.
6. Accept the default folder designation

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Lafayette, IN 47904, USA.

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