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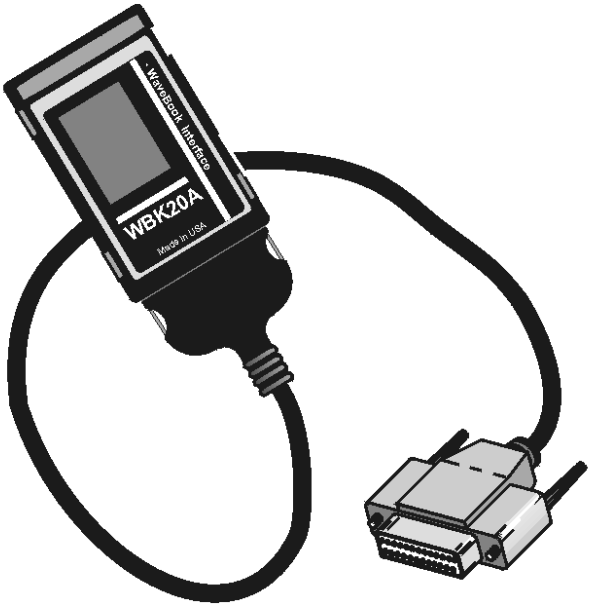
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WBK20A

User's Guide

PCMCIA/EPP Interface Card and Cable



For connecting a PC to a WaveBook or DaqBook.

Released per EO #: 2086R16 November 2001 p/n **274-0901** rev **2.0**

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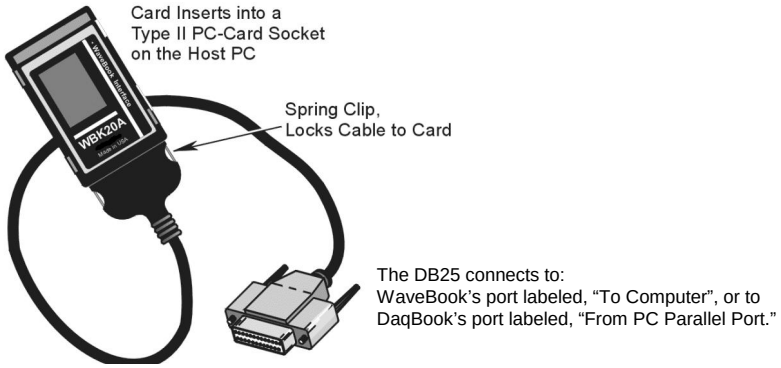
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Reference Note - For DOS and Windows 3.x users:
If using DOS or Windows 3.x, refer to the Win3x_DOS .txt file located on the data acquisition CD. The ASCCII file contains software setup information pertaining to the DOS and the Windows 3.x operating systems. The file is located in the root directory of the data acquisition CD, in the folder named **Windows 3x_DOS Driver Disk**.

Overview



WBK20A Interface Card and Cable

The WBK20A is a *PCMCIA/EPP Interface Card*. Together, the card and associated cable provide a PC with an EPP port by way of the computer's PCMCIA slot.

The WBK20A typically has a data rate of 600 K to 1000 Kbytes/sec, or in terms of samples, 300 K to 500 K samples/sec [since 2 bytes is equal to 1 sample]. Although the WBK20A is capable of higher rates, these are seldom realized because of such factors as: PC architecture, operating system, available resources, and software implementation.



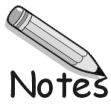
The earlier WBK20 and EPPCard/1 function the same as the WBK20A. The difference in the devices is that the WBK20A uses cable CA-191-1, which has a locking cable connector; whereas the earlier devices use a non-locking cable (CA-157-1). The two cable types cannot be interchanged.



The WBK20A is not a "Hot-Swap" card. To ensure proper operation of the WBK20A card, boot up the computer only after verifying that the WBK20A is inserted in the PC's card slot. Failure to do so may prevent the application software from recognizing the card as a parallel port device.



Windows NT does not support the WBK20 or the WBK20A.


Notes

Windows 2000 Setup for WBK20A

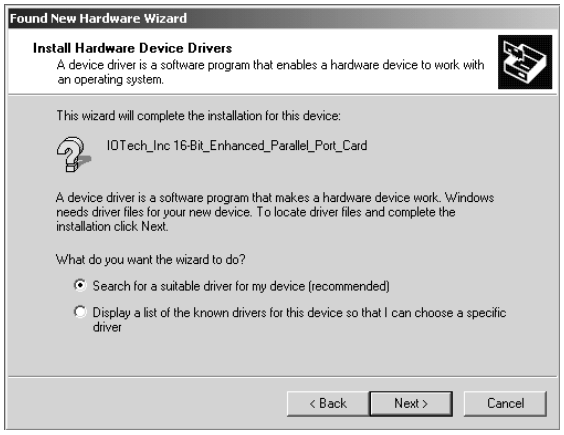
Reference Note:
This section applies only to Windows 2000. If you are using Windows 95, Windows 98, or Windows Me, refer to the subsequent section, *Windows 95/98/Me Setup for WBK20A*.

1. Place the Data Acquisition CD into your CD ROM drive.
   (a) ***If you have not yet installed product support*** for your device; i.e., WaveBook Support or DaqBook Support, do so at this time. Consult your WaveBook or DaqBook documentation as needed. After installation, with the CD still in the drive, *continue with step 2*.
   (b) ***If you have already installed product support*** for your device, *and if* your CD drive has *auto-run*, wait for the Master Setup Screen to appear, then click <Exit>.
2. Insert the WBK20A, *label-side up*, into your computer's PCMCIA adapter slot.
   A dialog box should appear, indicating that Windows has begun the installation process; and a "Found New Hardware Wizard" will open, indicating that Windows 2000 is ready to install drivers for the new hardware.



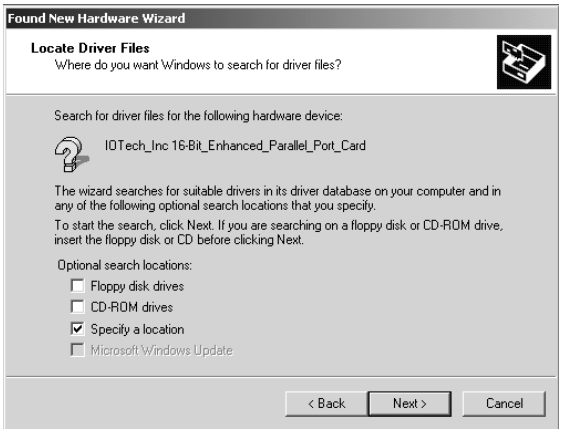
Found New Hardware Wizard, Intro Screen

3. Click <Next>. The Wizard will proceed to a screen with the text, "Install Hardware Device Drivers" (following figure).



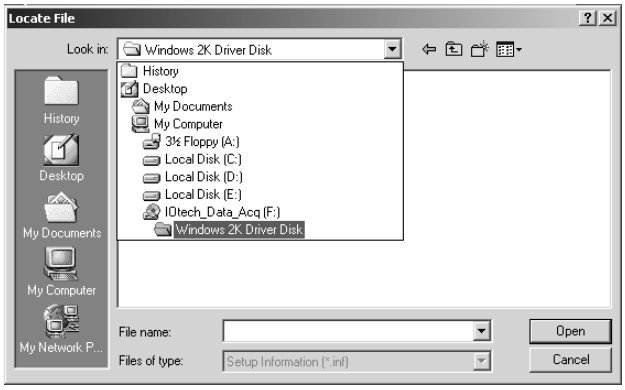
Install Hardware Device Drivers Screen

4. Select the radio button that reads, "Search for a suitable driver for my device."
5. Click <Next>. The "Locate Driver Files" screen appears (following figure).



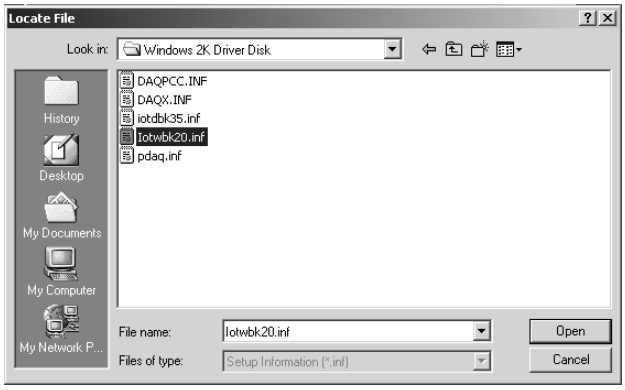
Locate Driver Files Screen

6. Check the "Specify a location" check box. Then click <Next>.
   At this point you will be prompted to insert the manufacturer's installation disk. On the prompt [not shown], click <OK>.
7. Using Window's browse feature, locate your Data Acquisition CD.
8. Expand the contents of the CD; then click on the folder labeled, "Windows 2K Driver Disk." (See following figure.)



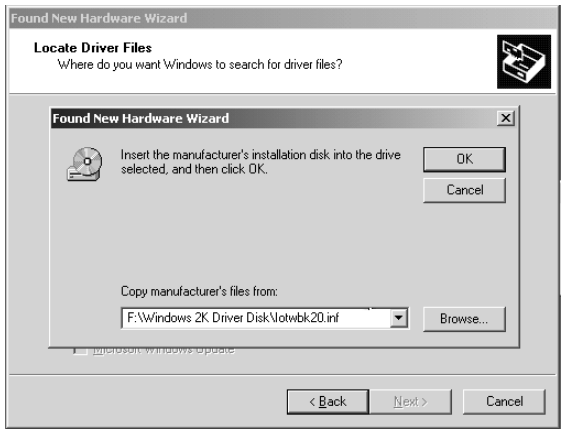
Locating the "Windows 2K Driver Disk" Folder

9. Select the file, "**Iotwbk20.inf**;" then click <Open> (see following figure).



Locating the Iowbk20.inf File

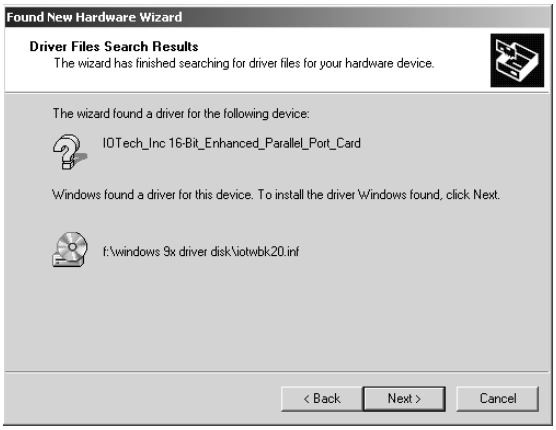
After clicking <Open>, you will once again see the Hardware Wizard's prompt to insert the manufacturer's installation disk (following figure).



A Prompt to Insert the Manufacturer's Disk

10. Click <Ok> (see above figure, central dialog box).

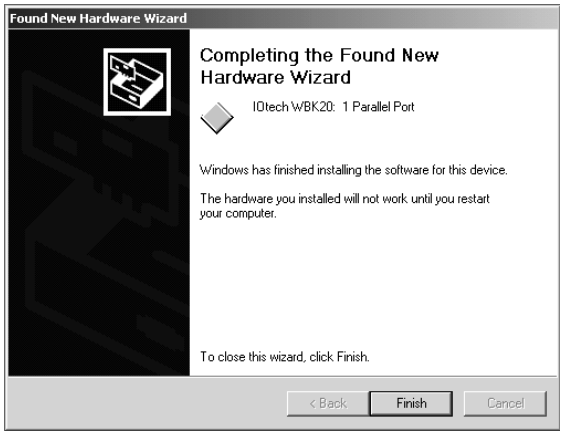
    A screen with the text, "Driver Files Search Results," appears (following figure). The screen identifies the device and driver that were found.



Driver Files Search Results Screen

11. Click <Next> to install the driver.

12. After the Hardware Wizard indicates that "Windows has finished installing the software for this device," Click <Finish.>



Confirmation that the software has been installed.

This completes the Windows 2000 Software setup for the WBK20A. You will need to reboot the computer with the card installed.



The WBK20A is not a "Hot-Swap" card. To ensure proper operation of the WBK20A card, boot up the computer only after verifying that the WBK20A is inserted in the PC's card slot. Failure to do so may prevent the application software from recognizing the card as a parallel port device.



Reference Note:
Refer to *Connecting the WBK20A to Hardware*, beginning on page 11, in regard to connecting the WBK20A to the WaveBook or DaqBook.

Windows 95/98/Me Setup for WBK20A

Reference Note:
This section only applies to Windows 95, Windows 98, and Windows Me. If you are using Windows 2000, refer to the preceding section, *Windows 2000 Setup for WBK20A*.

1. Place the Data Acquisition CD into your CD ROM drive.
   (a) ***If you have not yet installed product support*** for your device; i.e., WaveBook Support or DaqBook Support, do so at this time. Consult your WaveBook or DaqBook documentation as needed. After installation, with the CD still in the drive, *continue with step 2*.
   (b) ***If you have already installed product support*** for your device, *and if* your CD drive has *auto-run*, wait for the Master Setup Screen to appear, then click <Exit>.
2. Insert the WBK20A, *label-side up*, into your computer's PCMCIA adapter slot.

   A dialog box should appear, indicating that Windows has begun the installation process for your hardware; then the "Add New Hardware Wizard" will open, indicating that Windows is ready to install drivers for the new hardware.



Add New Hardware Wizard, Intro Screen

3. Click <Next>. The Wizard will proceed to a second screen that pertains to how the new driver is to be located. The Windows Me screen differs slightly from the Windows 9x screen, as can be seen in the following figures.



Selecting, "Search for the best driver …"
(for Windows 95 and Windows 98)



Selecting, "Specify the location of the driver …"
(for Windows Me)

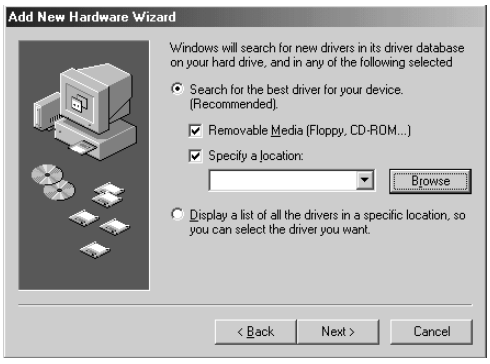
4. **Windows 95/98 Users**: Select the radio button that reads, "Search for the best driver for your device."

   Windows Me Users: Select the radio button that reads, "Specify the location of the driver."

5. Click <Next>. A screen for *locating driver files* appears. See the following figures.



Specifying a Location for Driver Files
(for Windows 95/98)



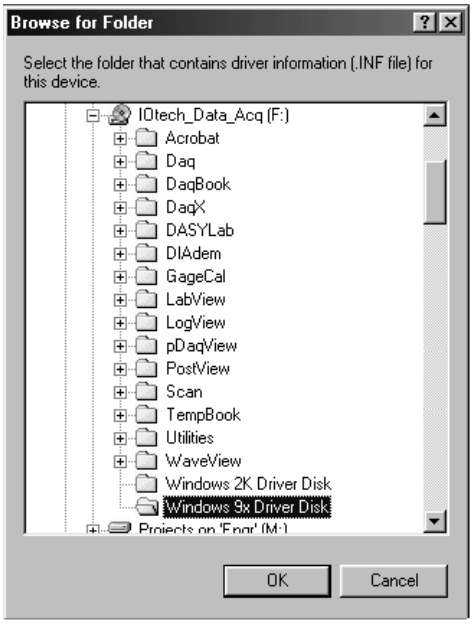
Specifying a Location for Driver Files
(for Windows Me)

6. **Windows 95/98 Users**: Ensure that only the "Specify a location" check box is selected.

   Windows Me Users: Ensure that the radio button, "Search for the best driver for your device" is selected; and select the two check boxes located above the browse pull-down list. These are: "Removable Media," and "Specify a Location."

7. Click <Browse>, then use the Window's browse feature to locate your Data Acquisition CD.

8. Expand the CD contents and click on the folder named "Windows 9x Driver Disk." Note that the Windows 9x Driver Disk folder is the correct folder for both Windows 9x and Windows Me applications.



Selecting the Windows 9x Driver Disk Folder
(For Windows 95/98/Me)

9. Click <OK.>

10. The Hardware Wizard now displays the driver disk location in the browse box. Click <Next.> At this point, Windows 95/98 users skip to step 12.



Specifying a Location for Driver Files **(for Windows 95/98)**



Specifying a Location for Driver Files **(for Windows Me)**

11. **Windows Me** users - select the radio button for installing "The updated software," and then click <Next.> Note that this step and the associated screen do not apply to Windows 95/98.



Selecting "Updated Software" **(for Windows Me)**

12. The Hardware Wizard indicates its search results, i.e., the device, the port, and the location of the driver. Click <Next> to indicate that the driver is suitable. Windows will begin the install.



Hardware Wizard's Search Results

Note: Windows may prompt you to insert the Windows CD, so it can install Microsoft Drivers that are not found on your PC. If prompted, remove the data acquisition CD and insert the Windows CD; then click <Ok.>

13. The Hardware Wizard will inform you when the installation is complete, as indicated in the following figure. At that point click <Finish.>



Confirmation that the software has been installed.

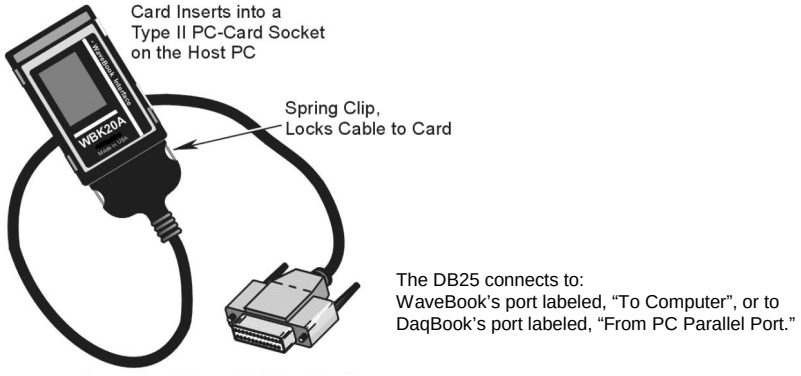
This completes the Windows 95/98/Me Software setup for the WBK20A. You will need to reboot the computer with the card installed.

The WBK20A is not a "Hot-Swap" card. To ensure proper operation of the WBK20A card, boot up the computer only after verifying that the WBK20A is inserted in the PC's card slot. Failure to do so may prevent the application software from recognizing the card as a parallel port device.

Reference Note:
Refer to *Connecting the WBK20A to Hardware*, beginning on page 11, in regard to connecting the WBK20A to the WaveBook or DaqBook.

Connecting the WBK20A to Hardware

If you have not already setup your Windows operating system for the WBK20A, do so at this time. Instructions for Windows 2000 begin on page 3. Instructions for Windows 95/98/Me begin on page 7.



WBK20A Interface Card and Cable

CAUTION

Do not force the WBK20A or the cable connections in a way that can damage the pins. Apply a gentle force and adjust the WBK20A's angle, as needed.

The WBK20A is not a "Hot-Swap" card. To ensure proper operation of the WBK20A card, boot up the computer only after verifying that the WBK20A is inserted in the PC's card slot. Failure to do so may prevent the application software from recognizing the card as a parallel port device.

If you own a WBK20 [WBK20A's predecessor], you can use it and cable CA-157-1 to connect your WaveBook or DaqBook to the PC. WBK20 is identical to WBK20A in performance, but requires a non-locking cable (CA-157-1). **It is important to note that cables CA-191-1 and CA-157-1 are not interchangeable.**

Note: No hardware configuration is required, i.e., there are no jumpers or DIP switches to set. All configuration is performed via the provided software.

Complete the following steps to link a WaveBook or DaqBook to a PC, via a WBK20A.

1. Ensure the PC is powered "OFF; if not, shutdown and turn the PC "OFF" at this time.
2. Connect the PCMCIA-end of cable (CA-191-1) to the WBK20A.
3. If you have not already done so, insert the WBK20A, *label-side up*, into a Type II PCMCIA slot on the PC.
4. Connect the cable's DB25 connector to the WaveBook or DaqBook, as applicable. The WaveBook and DaqBook connectors can be identified as follows:
    - The WaveBook's DB25 connector is labeled "To Computer."
    - The DaqBook's DB25 connector is labeled "From PC Parallel Port."

5. Power “ON” the PC.
6. Apply power to the WaveBook or DaqBook.
7. Check the *Window’s Device Manager* and make note of the WBK20A’s port assignment. If needed, refer to *Finding the Port Assignment*, which begins on page 13.



If *IOtech WBK20A* is not listed in the *Windows Device Manager*, refer to the section entitled, *“Troubleshooting, Symptom 1,”* located on page 21 of this document.

8. Before using the WBK20A in an actual application, test the interface as described in *Testing the WBK20A Interface*. The section begins on page 17.



If the interface test fails, refer to the section entitled, *“Troubleshooting, Symptom 2,”* located on page 22 of this document.

Finding the Port Assignment

Using Windows 2000 to Find the Port Assignment

Reference Note:
This section applies only to Windows 2000. If you are using Windows 95, Windows 98, or Windows Me, refer to the subsequent section, *Using Windows 95/98/Me to Find the Port Assignment.*

Prior to testing and using the WBK20A interface, you need to know the logical LPT port that Windows assigned to the card. For Windows 2000 users, the port assignment can be found in the Window's Device Manager, as follows:

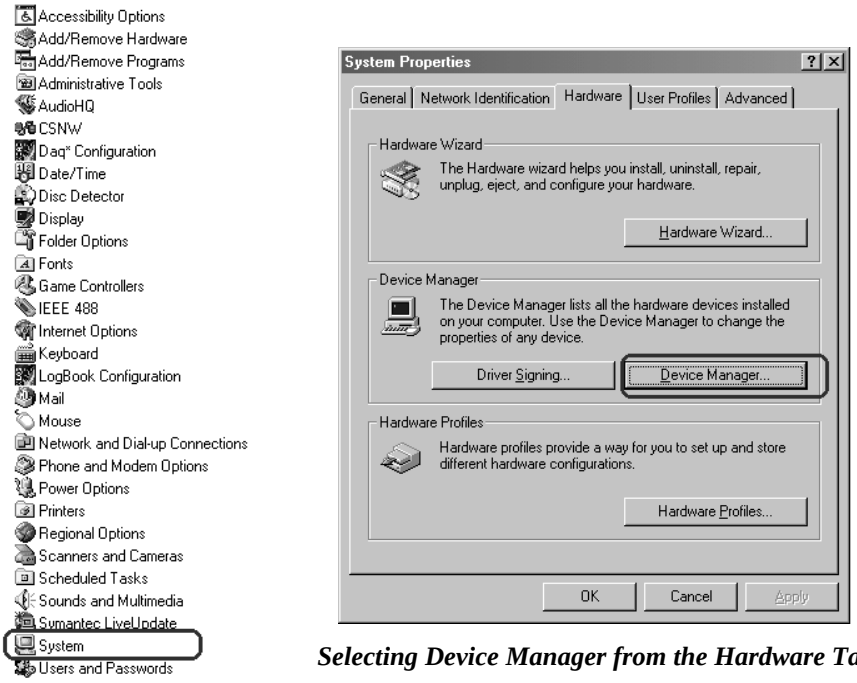
1. From the desktop, navigate to the **System Properties** window as follows:

   Settings
   ⇒Control Panel
   ⇒ System

   The System Properties window will appear.

2. Click on the **Hardware** Tab.

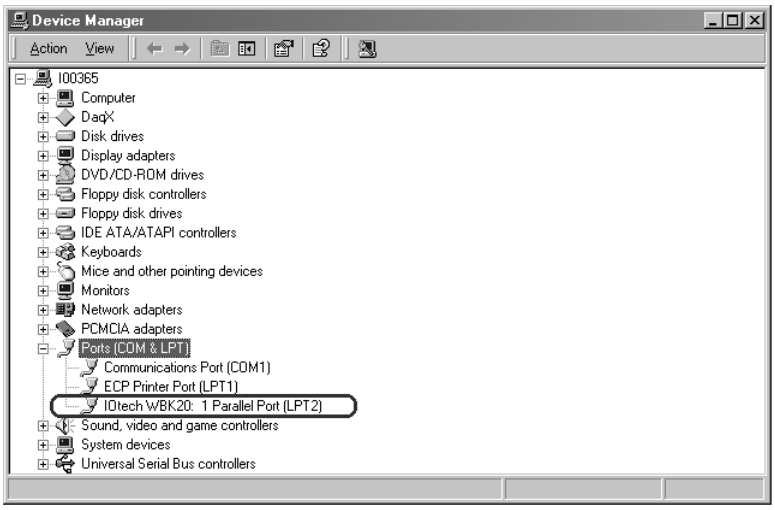
3. Click the <Device Manager> button (see following figure.)



Selecting Device Manager from the Hardware Tab

For Windows 2000

After clicking the <Device Manager> button, a device tree (similar to that seen in the following figure) appears.



Finding the Port Assignement of the WBK20A

for Windows 2000

4. On the device tree (above figure) expand the **Ports (COM & LPT)** selection. At this point you should see a WBK20 listed. Note that the Device Manager recognizes WBK20A as a WBK20, since the two cards are identical in function.
5. Look at the WBK20 [WBK20A] port designation. In the above example we see that the WBK20A is assigned to port LPT2.
6. Make a note of the port designation for use in the WBK20A interface test. The test is discussed in, *Testing the WBK20A Interface*, beginning on page 17.

If *IOtech WBK20A* is not listed in the *Windows Device Manager*, refer to the section entitled, *"Troubleshooting, Symptom 1,"* located on page 21 of this document.

Using Windows 95/98/Me to Find the Port Assignment

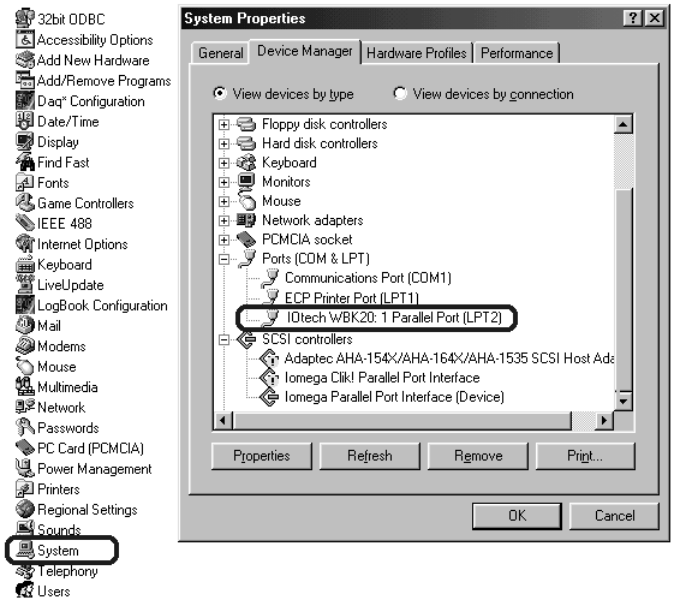
Reference Note:
This section applies to Windows 95, Windows 98, and Windows Me. If you are using Windows 2000, refer to the previous section, *Using Windows 2000 to Find the Port Assignment.*

1. From the desktop, navigate to the **System Properties** window as follows:

   Settings
   ⇒Control Panel
   ⇒ System

   The System Properties window will appear.

2. In the **Systems Properties** window, click on the **Device Manager** Tab. A device tree will appear, similar to that seen in the following figure.
3. On the device tree, expand the **Ports (COM & LPT)** selection. At this point you should see a WBK20 listed (see figure). Note that the Device Manager recognizes WBK20A as a WBK20, since the two cards are identical in function.
4. Look at the WBK20 [WBK20A] port designation. In the following example we see that the WBK20A is assigned to port LPT2.
5. Make a note of the port designation for use in the WBK20A interface test. The test is discussed in the following section.



Finding the Port Assignment of the WBK20A

If *IOtech WBK20A* is not listed in the *Windows Device Manager*, refer to the section entitled, *"Troubleshooting, Symptom 1,"* located on page 21 of this document.


Notes

Testing the WBK20A Interface

During the installation of DaqBook Support, or WaveBook Support, from the data acquisition CD, a device configuration utility (*Daq* Configuration*) is automatically installed in the Window's Control Panel. The utility checks and measures the PC's port capabilities; and will check the interface of an installed WBK20A that links a PC to a DaqBook or WaveBook.



Use the *Daq* Configuration* utility to test the WBK20A interface before running an application.

To test the WBK20A Interface you must:

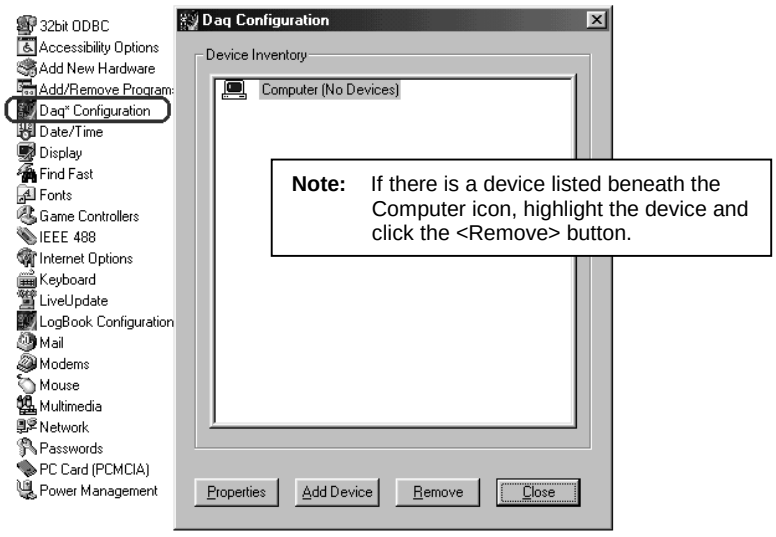
- **Access the *Daq* Configuration* Utility**
- **Add your DaqBook or WaveBook to the computer system.**
- **Ensure the Device Settings are correct.**
- **Run the "Resource Test."**
- **Check the test results.**

A detailed description of these actions follows.

1. **Access the *Daq* Configuration* Utility.**
   You can access *Daq* Configuration* by navigating from the desktop as follows:

   Settings
   ⇒Control Panel
   ⇒ Daq* Configuration

   The *Daq* Configuration* window appears (following figure).



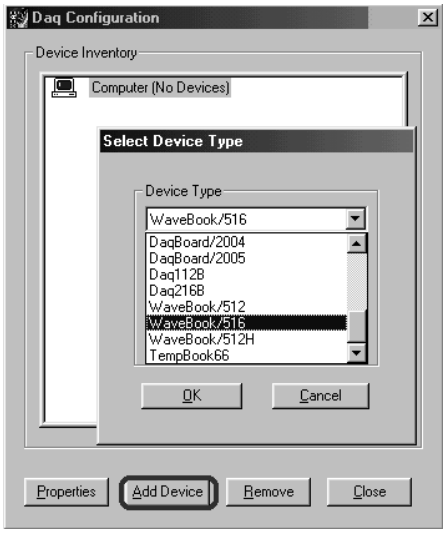
Accessing the Daq* Configuration Window

2. Add your DaqBook or WaveBook to the computer system.

(a) Click the <Add Device> button (following figure).

(b) Select the applicable DaqBook or WaveBook from the pull-down list.

(c) Click <OK>.



Selecting the Applicable DaqBook or WaveBook

3. Ensure the device settings are correct.

(a) Click on the <Properties> button (lower left button, previous figure). A screen similar to the following will appear.

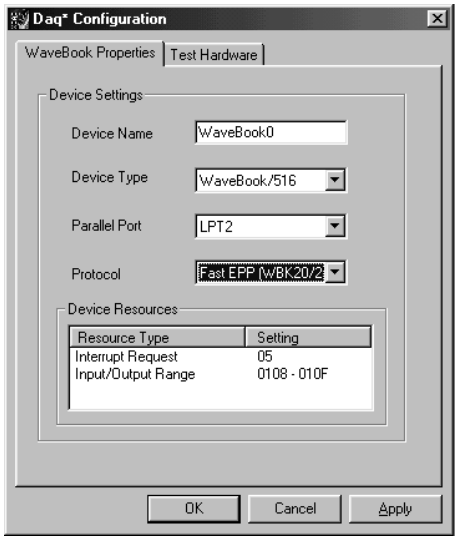
(b) If desired, use the Device Name text box (following figure) to rename the device.

(c) Verify the Device Type is correct.

(d) Verify that the Parallel Port agrees with the one that is designated for the WBK20A. If needed, refer to the section, *Finding the Port Assignment*, beginning on page 13. Select the correct Parallel Port from the pull-down list, if applicable.

(e) For best performance, select a Protocol of "**Fast EPP(WBK20/21)**."

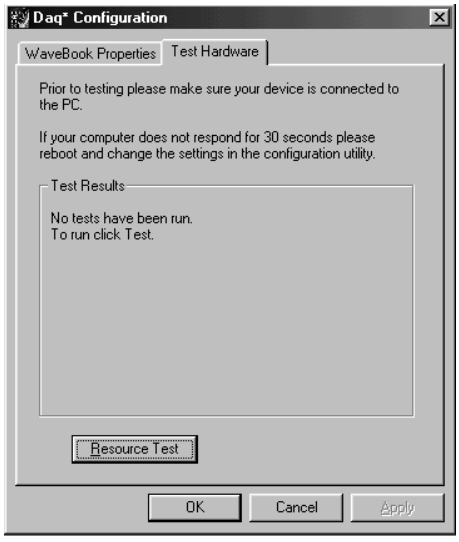
(f) Click the <Apply> button. If the <Apply> button is "grayed-out," click the <OK> button and proceed to the next step.



Verifying Device Settings

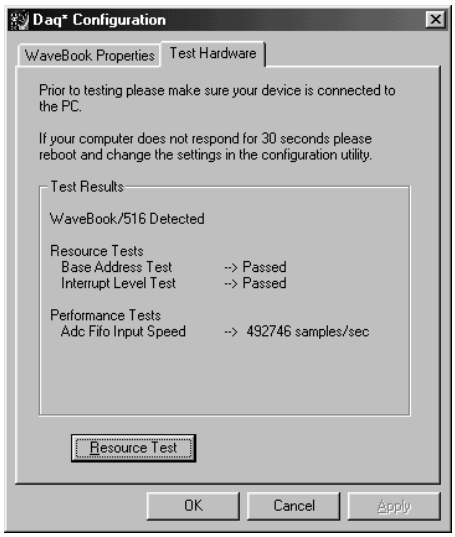
4. Run the "Resource Test."

(a) Click on the "Test Hardware" Tab. A screen similar to the following figure will appear.



Daq* Configuration, "Test Hardware" Tab

(b) Click the <Resource Test> button. The utility will run the test and display the results. An example of test results is included in the following figure.



Test Results

5. Check the "Test results."

The *Test Results* (see previous figure) let you know if the WaveBook or DaqBook was detected, and if the Base Address and Interrupt Level tests passed or failed. In addition, the test provides performance information in terms of *samples/sec*. This is the maximum speed at which the data was transferred.

If your Resource Tests "Passed," click <OK> and close out of the *Daq*Configuration Window*.



If either Resource Test fails, refer to the section entitled, *"Troubleshooting, Symptom 2,"* located on page 22 of this document.

This completes the WBK20A interface test.


Notes

Troubleshooting

Symptom 1. The WBK20A does not appear in the *Windows Device Manager*.

Symptom Overview

If the *Windows Device Manager* fails to list the WBK20A, the installation was unsuccessful. The most likely cause of an unsuccessful installation is the use of a wrong initialization file (inf).

For Windows 2000 and Windows 95/98/Me operating systems, an initialization file named **Iotwbk20.inf** must be installed. Without this WBK20A-specific file, the installation will fail.

Note: In regard to WBK20A installations - in the *Windows Device Manager*, a yellow question mark and a device labeled "unknown device" [or "other device"] is usually indicative of a failed installation.

Note: If you completed the installation using an old WBK floppy diskette, or a data acquisition CD (p/n 1022-0601) that precedes version 2.1; then an outdated or a wrong **inf** file was selected.

Solution

To solve the problem of an incorrect WBK20A **inf** file, complete the following steps:

1. Obtain a recent version of the file named: **Iotwbk20.inf**. You can acquire the file from your data acquisition CD (version 2.1 or later), or you can download the WBK20A.exe file from an FTP site. If you prefer to do the later, call for technical assistance.
2. In the *Windows Device Manager*, highlight the "unknown device," or the "other device" entry.
3. Click the <Remove> button. This will remove the *unknown* device.
4. Physically remove the WBK20A from the computer. Note that you can do this while Windows is running.
5. Reinsert the WBK20A into the computer.
6. Redo the installation process and, when prompted, select the correct **inf** file (**Iotwbk20.inf**). You can obtain the file from the data acquisition CD, or from the file location where you stored the downloaded **inf** file.



Reference Notes:

- **Windows 2000 Users -** Refer to the *Windows 2000 Setup for WBK20A* section of this document, beginning on page 3.
- **Windows95/98/Me Users -** Refer to the *Windows 95/98/Me Setup for WBK20A* section of this document, beginning on page 7.

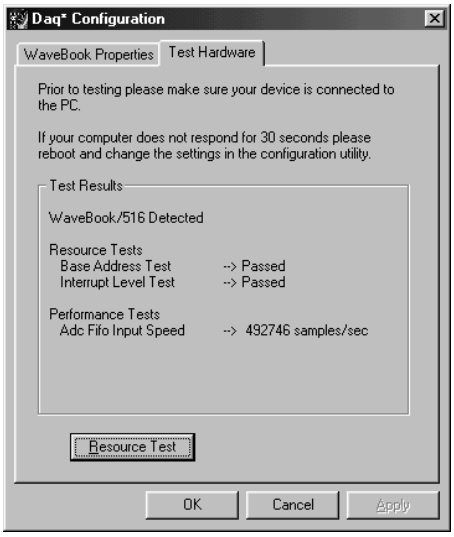
After completing the installation procedure, you should find that the WBK20A is listed in the *Windows Device Manager*.

7. Make a note of the WBK20A's LPT port.
8. Use the *Daq* Configuration* utility, located in the *Windows Control Panel*, to test the WBK20A's parallel port interface. Refer to previous sections of this document as needed.

Symptom 2. Resource tests in the *Daq* Configuration* utility failed.

Symptom Overview

The resource tests consist of a Base Address Test and an Interrupt Level Test. These tests are performed through the *Daq* Configuration* utility. If either test "Fails," complete the steps that are provided in the following Solution.



Test Results

Solution

If either of the Resource Tests failed, complete the following steps:

1. Make sure that the primary data acquisition device, e.g., DaqBook or WaveBook, has adequate power, and that the power is turned on.
2. Check for obvious defects in the WBK20A cable.
3. Verify that good connections exist between the WBK20A and the primary data acquisition device.
4. Make sure that you have installed the proper software support, i.e., DaqBook Support or WaveBook Support from the data acquisition CD (p/n 1022-0601, rev 2.1 or later).
5. When running the *Daq* Configuration* utility, make sure that you have selected the parallel port that is assigned to the WBK20A. In general, this parallel port is not LPT1, since LPT1 is typically the computer's native parallel port.



If the only selection is LPT1, and LPT1 is not the port assigned to the WBK20A, then the installation has failed and you need to revisit the previous troubleshooting section entitled, *Symptom 1*.



Although Windows 2000 lets you select a port designated LPT1, LPT2, LPT3, or LPT4, you must be sure to select the LPT port that agrees with the WBK20A label in the *Windows Device Manager*.

If you have determined that the WBK20A has been installed successfully as an LPT device but that the *Daq*Configuration* test does not work (after making sure that you have selected the correct LPT port), then continue with step 6.

6. From the *Windows Device Manager* (in Control Panel ⇒System), see if there is an exclamation point (!) in front of the WBK20A parallel port designation.

   The exclamation point (!), if present, indicates that the parallel port was installed with a resource conflict (I/O address or IRQ interrupt assignment).

   If this is the case, complete the following:

   - Double-click on the WBK20A designation.
   - Select the *Resources* tab.
   - Uncheck the "use automatic settings" box.
   - Try different Basic Configuration options until you find one that shows no resource conflicts.

     An option is to try selecting either the interrupt request setting number or the I/O address range and then clicking on the "Change Setting" button to change the resources individually.

     Note: Windows will give a message about whether the new configuration conflicts with other devices or not.

7. After you have found an acceptable new resource setting, i.e., one that shows no conflicts, restart the computer, then go to the *Daq*Configuration* utility and try the communication test again.

   You can find out what resources are currently free by going to the *Windows Device Manager* and double-clicking on the Computer icon located at the top of the list. This brings up a "View Resources" window that has an interrupt request (IRQ) option and an Input/Output (I/O) resources option. Select each option in turn, and note which IRQs and I/O addresses are not being used and are available.

8. If software support for other PCMCIA devices has been installed on the computer, but are not currently being used, it is possible that there is a resource conflict that Windows is not reporting. You can try to eliminate this conflict through the following process:

   - One at a time, insert each other PCMCIA device into your computer.
   - In the Device Manager, highlight the device, and click the <Remove> button to remove the device from the list.
   - Repeat this process until you have removed all other PCMCIA devices from the computer. This frees up the resources that these devices have been using and eliminates any conflicts that were present.
   - If necessary, search for available resources and select them (*see steps 6 and 7*). Restart the computer, go to the *Daq*Configuration* utility, then retry the communication test.

Note: If the Resource Tests still fail after performing these steps, and there are no other devices to be removed, it is likely that a successful WBK20A installation cannot be completed. If this is the case, you will need to use the computer's native parallel port. If the native parallel port is available, and if you can run the port in either ECP or EPP mode, you will be able to obtain a data transfer rate that approaches the WBK20A throughput.

WBK20A – Specifications

Name/Function: WBK20A PC-Card Interface, or PCMCIA/EPP Card;
PC Parallel Port Interface and cable for WaveBooks and DaqBooks

Bus Interface: 16-bit PCMCIA Card Standard 2.1

Dimensions: 5 mm (PCMCIA Type II) card

Transfer Rate:
In Kbytes/sec: 600 Kbytes/sec to 1000 Kbytes/sec (typical)[1]
In samples/sec: 300 K samples/sec to 500 K samples/sec (typical)[1]

Power Consumption: 5 V @ 35 mA

Cable: CA-191-1. The card-end of this 2-foot long cable includes latches for locking onto the WBK20A; the Parallel-Port end of the cable has a DB25F connector. The CA-191-1 cable is included with the WBK20A. [2]

Notes

[1] The WBK20A is capable of higher transfer rates, but is limited in actual applications due to such factors as: PC architecture, operating system, available resources, and software implementation.

[2] The CA-191-1 cable [used with WBK20A] can not be used with the WBK20. WBK20 uses cable CA-157-1. The two cables are not interchangeable.

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