Daq PC-Cards (Daq/112B & Daq/216B)　　User's Manual

Data Acquisition for Notebook, Desktop, and Tower PCs

the smart approach to instrumentation ™

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Daq PC-Cards (Daq/112B & Daq/216B)

Data Acquisition for PCs

p/n **457-0908** Rev. **2.0**

Warranty Information

Your IOtech warranty is as stated on the *product warranty card*. You may contact IOtech by phone, fax machine, or e-mail in regard to warranty-related issues.
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CE Notice

Many IOtech products carry the CE marker indicating they comply with the safety and emissions standards of the European Community. As applicable, we ship these products with a Declaration of Conformity stating which specifications and operating conditions apply.

Warnings, Cautions, Notes, and Tips

Refer all service to qualified personnel. This caution symbol warns of possible personal injury or equipment damage under noted conditions. Follow all safety standards of professional practice and the recommendations in this manual. Using this equipment in ways other than described in this manual can present serious safety hazards or cause equipment damage.

This warning symbol is used in this manual or on the equipment to warn of possible injury or death from electrical shock under noted conditions.

This ESD caution symbol urges proper handling of equipment or components sensitive to damage from electrostatic discharge. Proper handling guidelines include the use of grounded anti-static mats and wrist straps, ESD-protective bags and cartons, and related procedures.

This symbol indicates the message is important, but is not of a Warning or Caution category. These notes can be of great benefit to the user, and should be read.

In this manual, the book symbol always precedes the words "Reference Note." This type of note identifies the location of additional information that may prove helpful. References may be made to other chapters or other documentation.

Tips provide advice that may save time during a procedure, or help to clarify an issue. Tips may include additional reference.

Specifications and Calibration

Specifications are subject to change without notice. Significant changes will be addressed in an addendum or revision to the manual. As applicable, IOtech calibrates its hardware to published specifications. Periodic hardware calibration is not covered under the warranty and must be performed by qualified personnel as specified in this manual. Improper calibration procedures may void the warranty.

Quality Notice

IOtech has maintained ISO 9001 certification since 1996. Prior to shipment, we thoroughly test our products and review our documentation to assure the highest quality in all aspects. In a spirit of continuous improvement, IOtech welcomes your suggestions.

<table>
<tr><td colspan="2" style="text-align:center">**CAUTION**</td></tr>
<tr><td>⚠️</td><td>**Using this equipment in ways other than described in this manual can cause personal injury or equipment damage. Before setting up and using your equipment, you should read *all* documentation that covers your system. Pay special attention to Warnings and Cautions.**</td></tr>
</table>

Note: During software installation, Adobe® PDF versions of user manuals will automatically install onto your hard drive as a part of product support. The default location is in the **Programs** group, which can be accessed from the *Windows Desktop*. Initial navigation is as follows:

Start [on Desktop] ⇒ **Programs** ⇒ **IOtech DaqX Software**

You can also access the PDF documents directly from the data acquisition CD by using the <**View PDFs**> button located on the opening screen.

Refer to the PDF documentation for details regarding both hardware and software.

A copy of the Adobe Acrobat Reader® is included on your CD. The Reader provides a means of reading and printing the PDF documents. Note that hardcopy versions of the manuals can be ordered from the factory.

PDF
457-0908

Daq PC_Card Users Manual.pdf
Provides instructions for installing a Daq/112B and Daq/216B PC-Card.
The following PDFs are companion documents.

PDF
457-0909

DaqView_DaqViewXL.pdf

Discusses how to install and use these "out-of-the-box" data acquisition programs.

PDF
1086-0926
1086-0922

PostAcquisition Analysis.pdf
Discusses *eZ-PostView*, a free post-data acquisition analysis program and two others, *eZ-FrequencyView* and *eZ-TimeView*. These last two applications have more features and are available for purchase. They can; however, be used freely during a 30-day trial period.

PDF
457-0905

DBK Options.pdf
The DBK Option Cards and Modules Manual discusses each of the DBK products available at the time of print.

Note: Only passive DBKs, i.e., DBK1, DBK11A, and DBK40 pertain to the Daq PC-Card.

PDF
1008-0901

ProgrammersManual.pdf
The programmer's manual pertains to developing custom programs using Applications Program Interface (API) commands.

Programmers should check the **readme.file** on the install CD-ROM for the location of program examples included on the CD.

Table of Contents

Your order was carefully inspected prior to shipment. When you receive your system, carefully unpack all items from the shipping carton and check for physical signs of damage that may have occurred during shipment. Promptly report any damage to the shipping agent and your sales representative. Retain all shipping materials in case the unit needs returned to the factory.

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Daq Systems, the Modular Concept

Daq equipment and software form a modular, interrelated family of products that provide great flexibility in data acquisition system design. This flexibility allows for the development of custom systems that are unique to the user, and which can be optimized for his or her specific application needs. With the Daq product line, system expansion or redesign can typically be accomplished with relative ease.

- *Primary Acquisition Device*. This is the main data acquisition device, e.g., a DaqBook, DaqBoard, or Daq PC-Card. These devices provide a vital data conversion and communications link between the data source of transducers and signal conditioners and the data processor of the host computer. Note the DaqBoards can be one of three types: (1) ISA, (2) PCI, or (3) compact PCI (cPCI).

- *DBK Option Cards and Modules*. Over 35 DBK cards and modules (the number is constantly growing) provide various types of signal conditioning and system expansion. Note that certain DBK modules exist for the purpose of supplying power to other members of the acquisition system. The DBK options are discussed in a *DBK Basics* document module and in the detailed *DBK Option Cards and User's Manual* (p/n 457-0905).

  Note: Only *passive* DBKs, such as the DBK1 BNC module, the DBK11A screw terminal card, and the DBK40 BNC analog interface, can be used with a Daq PC-Cards.

  Reference Note:
  DBK options are discussed in the *DBK Option Cards and Modules User's Manual* (p/n 457-0905). As a part of product support, this manual is automatically loaded onto your hard drive during software installation. The default location is the Programs directory, which can be accessed through the Windows Desktop.

- *Software*. DaqView *out-of-the-box* software provides a graphical user interface with easy to read spreadsheet formats for viewing channel data, as well as a choice of analog, digital, and bar-graph meters. Waveform analysis can be performed, when applicable. A product support option, included on the data acquisition CD, provides a means of performing post data analysis. More information is included in the software-specific PDF documents that are installed on your hard-drive as a part of product support.

  In addition to the included out-of-the-box software, Daq products can be controlled via user-written custom programs through Applications Program Interface (API). Several languages are supported, e.g., C/C++, VisualBASIC, Delphi.

  Reference Note:
  Programming topics are covered in the *Programmer's User Manual* (p/n 1008-0901). As a part of product support, this manual is automatically loaded onto your hard drive during software installation. The default location is the Programs group, which can be accessed through the Windows Desktop.

DaqBooks, DaqBoards and Daq PC-Cards

Daq products connect to one or more DBKs on their signal input side and a computer on their output side. Each type of Daq device connects to the computer in a different way:

- The **DaqBook** is an external module that connects to a computer's enhanced parallel port (EPP) interface or PC-Card link.
- The **DaqBoard** [**ISA type**] board is an internal card that plugs into an ISA-bus slot within a computer.
- **DaqBoard/2000 Series Boards** plug into a PCI-bus slot, within a host PC.
- **cPCI DaqBoard/2000c Series** boards plug into a cPCI-bus slot, within a host PC.
- The **Daq PC-Card** slides into the PCMCIA slot of a host computer, typically a notebook PC.

Features common to the Daq products include:

- 100-kHz channel-to-channel scan *and* gain switching (10 µs);
  200-kHz for DaqBoard/2000 Series and DaqBoard/2000c Series Boards.
- 512-location sequence memory that can be loaded with any combination of channels and gains.
- Ability to access up to 256 different channels of DBK signals while maintaining the channel-to-channel scan rate. The DBK expansion options can accommodate mixed-signal inputs from thermocouples and RTDs to isolated high-voltage inputs and strain gages.
- Ability to handle 8 differential or 16 single-ended signal inputs without DBK expansion units.
- Ability to handle fixed digital I/O up to 4 TTL lines in and 4 TTL lines out (accessible only if no analog expansion cards are in use).

The following table lists various features of DaqBooks, ISA-DaqBoards, and Daq PC-Cards. Note that PCI and cPCI-type DaqBoards (the DaqBoard/2000 Series and DaqBoard/2000c Series Boards) are covered in separate documentation.

Daq Products, Models and Features								
Models	A/D Resolution	Analog Output Channels	Unipolar/ Bipolar Selection	Single-ended/ Differential Selection	Programmable Digital I/O Lines	Program mable Counter/ Timers	Size (inches)	Power Consumption
DaqBooks								
DaqBook/100	12 bit	2	Jumper	Jumper	16 high speed 24 gen purpose	5 ch 7 MHz	8.5×11 ×1.375	510 mA @ 12V
DaqBook/112	12 bit	2	Jumper	Jumper	N/A	N/A	8.5×11 ×1.375	360 mA @ 12V
DaqBook/120	12 bit	2	Jumper	Jumper	16 high speed 24 gen purpose	5 ch 7 MHz	8.5×11 ×1.375	510 mA @ 12V
DaqBook/200	16 bit	2	Software	Software	16 high speed 24 gen purpose	5 ch 7 MHz	8.5×11 ×1.375	620 mA @ 12V
DaqBook/216	16 bit	2	Software	Software	N/A	N/A	8.5×11 ×1.375	600 mA @ 12V
DaqBook/260	16 bit	2	Software	Software	16 high speed 24 gen purpose	5 ch 7 MHz	11×13 ×3.5	620***** mA @ 12V
ISA-DaqBoards								
DaqBoard/100A	12 bit	2	Sequencer	Software	16 high speed 24 gen purpose	5 ch 7 MHz	4.5×13.125	1330 mA @ 5V
DaqBoard/112A	12 bit	2	Sequencer	Software	N/A	N/A	4.5×13.125	970 mA @ 5V
DaqBoard/200A	16 bit	2	Sequencer	Software	16 high speed 24 gen purpose	5 ch 7 MHz	4.5×13.125	1700 mA @ 5V
DaqBoard/216A	16 bit	2	Sequencer	Software	N/A	N/A	4.5×13.125	1340 mA @ 5V
Daq PC-Cards								
Daq/112B	12 bit	N/A	Bipolar Only	Software	N/A	N/A	3.375×0.2	160 mA @ 5V
Daq/216B	16 bit	N/A	Bipolar Only	Software	N/A	N/A	3.375×0.2	160 mA @ 5V

* Does not include power consumption of internal DBK options.

Using DBK Cards and Modules for Signal Conditioning

The DBK signal-conditioning cards and module are designed for use with DaqBooks, LogBooks, and various types of data acquisition boards, i.e., ISA, PCI, and compact PCI (cPCI) types. The DBKs perform best when used with an acquisition device that can dynamically select channel, gain, and range. DBK cards and modules with dynamic channel and gain/range selection allow for high channel-to-channel scan rates with a variety of transducers.

Note: Only *passive* DBKs, such as the DBK1 BNC module, the DBK11A screw terminal card, and the DBK40 BNC analog interface, can be used with Daq PC-Cards.

DBK output signals can be bipolar, e.g., -5 to +5 V, or unipolar, e.g., 0 to 10 V. The user can select a range of relevant values to correspond to the lowest signal (e.g., -5 or 0 V) and the highest signal (e.g., 5 or 10 V) signal. This type of range selection guarantees the highest resolution in 12-bit or 16-bit conversion.

DBK modules share the same footprint as the DaqBook and a typical notebook PCs; allowing for convenient stacking. The majority of these modules have their own power supply; however, several options exist for packaging and powering the DBKs.

Reference Note:
DBK options are detailed in the *DBK Option Cards and Modules User's Manual* (p/n 457-0905). As a part of product support, this manual is automatically loaded onto your hard drive during software installation. The default location is the Programs directory, which can be accessed through the Windows Desktop.

Daq Software

The Daq devices have software options capable of handling most applications. Three types of software are available:

- ready-to-use graphical programs, e.g., DaqView, DaqViewXL, and post acquisition data analysis programs such as PostView, DIAdem, and eZ-View

- drivers for third-party, icon-driven software such as DASYLab and LabView

- various language drivers to aid custom programming using API

Ready-to-use programs are convenient for fill-in-the-blank applications that do not require programming for basic data acquisition and display:

- DaqView is a Windows-based program for basic set-up and data acquisition. DaqView lets you select desired channels, gains, transducer types (including thermocouples), and a host of other parameters with a click of a PC's mouse. DaqView lets you stream data to disk and display data in numerical or graphical formats. PostView is a post-acquisition waveform-display program within DaqView.

- DaqViewXL allows you to interface directly with Microsoft Excel to enhance data handling and display. Within Excel you have a full-featured Daq control panel and all the data display capabilities of Excel.

- Post acquisition data analysis programs, e.g., PostView, DIAdem, and eZ-View, typically allow you to view and edit post-acquisition data.

- The Daq Configuration control panel allows for interface configuration, testing, and troubleshooting.

Each Daq system comes with an Application Programming Interface (API). API-language drivers include: C/C++, Delphi, and Visual Basic. The latest software is a 32-bit version API.

Reference Notes:

➤ The software document modules, *DaqView*, *DaqViewXL*, and *Post Acquisition Data Analysis User's Guide*, are not included as part of the hardcopy manual, but are available in PDF version. See the PDF Note, below.

➤ Programming topics are covered in the *Programmer's User Manual* (1008-0901). As a part of product support, this manual is automatically loaded onto your hard drive during software installation. The default location is the Programs directory, which can be accessed through the Windows Desktop.

PDF Note: During software installation, Adobe® PDF versions of user manuals will automatically install onto your hard drive as a part of product support. The default location is in the **Programs** group, which can be accessed from the *Windows Desktop*. Refer to the PDF documentation for details regarding both hardware and software.

A copy of the Adobe Acrobat Reader® is included on your CD. The Reader provides a means of reading and printing the PDF documents. Note that hardcopy versions of the manuals can be ordered from the factory.

Installing Daq PC-Cards 2

This chapter provides basic installation instructions for Daq PC-Cards for use with notebook PCs, or for use with desktop or tower-type PCs that have a PCMCIA slot. The Daq PC-Cards comply with *PC Card Standard Specification 2.1, PCMCIA Type II (5mm)*. Input power for the Daq PC-Card comes from the host computer. **The PC-Cards do not provide output power**.

A CA-134 Interface Cable provides DB37 termination to the inputs of the Daq PC-Card. The CA-134 can connect the Daq PC-Card to a single "passive" card or module, for a variety of input signals. The passive DBKs are:
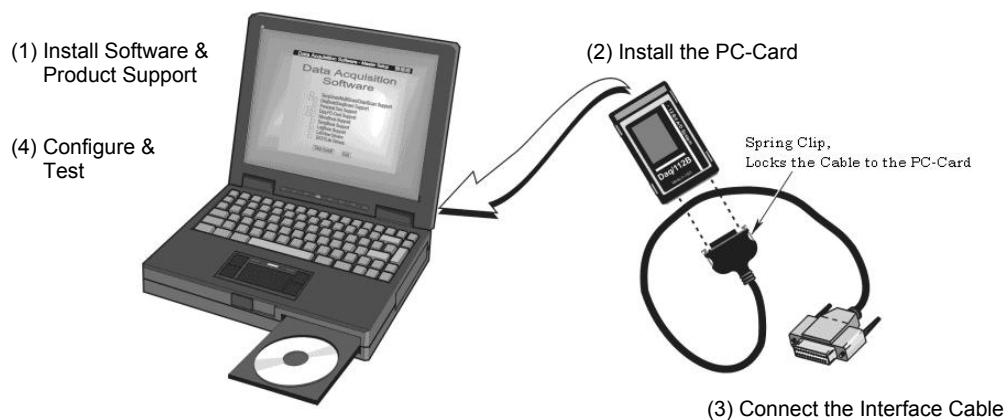
- **DBK1 – 16 Connector BNC Module**
- **DBK11A – Screw Terminal Option Card**
- **DBK40 – BNC Analog Interface**

Reference Note:
Daq PC-Cards plug into a PCMCIA Type II slot. The cards will also work in PCMCIA Type III slots. Consult your PC owner's manual as needed.

Note: **Daq PC-Cards are not compatible with Windows NT operating systems.**

PC-Card Installation, A Pictorial Overview

Step 1 - *Install Software and Product Support*

IMPORTANT: **Software must be installed before installing hardware.**

1. Remove previous version Daq drivers, if present. You can do this through Microsoft's **Add/Remove Programs** feature.
2. Place the Data Acquisition CD into the CD-ROM drive. *Wait for PC to auto-run the CD. This may take a few moments, depending on your PC.* If the CD does not auto-run, use the Desktop's Start/Run/Browse feature.
3. After the intro-screen appears, follow the screen prompts.

Upon completing the software installation, continue with step 2, *Install and Configure the PC-Card*.

Step 2 - *Install the PC-Card*

To avoid installing the wrong driver, be sure to use the instructions that are intended for your PC's Windows operating system. Refer to the following sections as applicable.

> ➤ Windows XP …… pg. 2-2
> ➤ Windows 2000 …… pg. 2-3
> ➤ Windows95/98/Me …… pg. 2-4
> ➤ Windows NT …… Not Compatible

Regardless of which Windows operating system being used, place the Data Acquisition CD into your CD ROM drive and …

(a) *If you have not yet installed the software and product support* for your device do so at this time. See *Step 1* on page 2-1.

(b) *If you have already installed the software and product support* for your PC-card, *and if* your CD drive has *auto-run*, wait for the Master Setup Screen to appear, then click <**Exit**> before continuing with the steps for the applicable OS-system.

☛ For Windows XP Operating Systems Only

1. With your computer system powered up, insert the Daq PC-card into PCMCIA slot 0. Windows XP will start the Hardware Wizard.

If the Windows Operating System detects the Daq PC-Card, skip directly to the section entitled, *Connect the Interface Cable* [Step 3]. The procedure begins on page 2-5.

2. After the dialog box appears, verify that "**Install from a list or specific location**" is selected.

3. Click <**Next**>. A new dialog box will appear.

4. Check "**Include this location in the search**."

5. Click <**Browse**,> then expand the CD-ROM node that is labeled "**IOtech**."

6. Highlight the "**Windows 2K Driver Disk**" folder.

7. Select the file named, "**DAQPCC2K.INF**;" then click <**Open**>.

8. Click <**Ok**>. A dialog box will appear, indicating the driver path.

9. Click <**Next**>. Windows will locate the device driver, and then install the software.

10. After the software install is complete, click <**Finish**>. The Hardware Wizard will close.

This completes the driver installation for Windows XP.

☞ For Windows 2000 Operating Systems Only

1. Insert the Daq PC-Card, *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.

   If the Windows Operating System detects the Daq PC-Card, skip directly to the section entitled, *Connect the Interface Cable* [Step 3]. The procedure begins on page 2-5.

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

4. Select the radio button that reads, "**Search for a suitable driver for my device**."

5. Click <**Next**>. The "Locate Driver Files" screen appears.

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. 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**."

9. Select the file named, "**DAQPCC2K.INF**;" then click <**Open**>. You will once again see the Hardware Wizard's prompt to insert the manufacturer's installation disk.

10. Click <**Ok**>.

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

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**.>

This completes the Windows 2000 Software setup for the Daq PC-Card.

☞ For Windows 95/98/Me Operating Systems Only

1. Insert the Daq PC-Card, *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.

   If the Windows Operating System detects the Daq PC-Card, skip directly to the section entitled, *Connect the Interface Cable* [Step 3]. The procedure begins on page 2-5.

2. Click <**Next**>. The Wizard will proceed to a second screen that pertains to how the new driver is to be located.

3. **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**."

4. Click <**Next**>. A screen for *locating driver files* appears.

5. **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**."

6. Using Window's <**Browse**> feature, locate your Data Acquisition CD.

7. 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.

8. Click <**OK**.> The Hardware Wizard now displays the driver disk location in the browse box.

9. Click <**Next**.>.

10. **Windows Me** users - select the radio button for installing "**The updated software**," and then click <**Next**.> *This step does not apply to Windows 95/98*.

    The Hardware Wizard indicates its search results, i.e., the device, the port, and the location of the driver. Windows 95/98/Me will use the **DAQPCC.INF** file.

11. Verify that the **DAQPCC.INF** file has been located; then click <**Next**> to indicate that the driver is suitable. Windows will begin the install.

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 for the Windows CD, remove the data acquisition CD and insert the Windows CD; then click <**Ok**.>

12. The Hardware Wizard will inform you when the installation is complete. At that point click <**Finish**.>

This completes the Windows 95/98/Me Software setup for the Daq PC-Card.

Step 3 - *Connect the Interface Cable*

Digital I/O is supported and includes four general-purpose digital inputs and four general-purpose digital outputs. The PC can access these TTL-level digital I/O lines when the Daq PC-Card is not transferring data from the A/D converter.

Spring Clip,
Locks Cable to Card
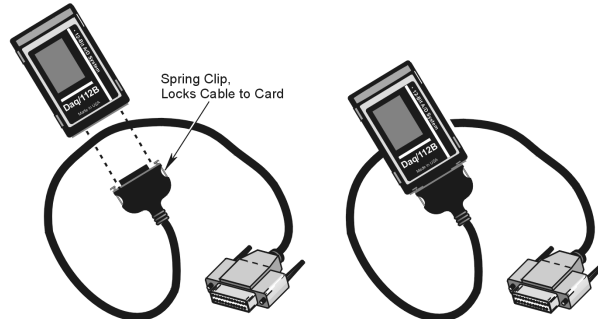
Daq/112B PC-Card, before and after attaching to a CA-134 Interface Cable

 Damage to the card or cable may result if not properly connected! Never force the connection. The Daq PC-Card and cable are keyed, and should connect easily when properly oriented. Make sure the connectors slide together at a level angle. Excessive or angular force can damage the connectors.

To connect the Daq PC-Card to the Interface Cable (CA-134):

1. Hold the Daq PC-Card so that the label is face up and the bottom edge is facing you.
2. Verify key alignment is correct for the card and the cable.
3. Depress the cable's spring-clips and connect the cable to the PC-Card.
4. After connection is made, release the spring-clips.

The following page pertains to connecting a passive DBK card or module to the CA-134 cable, with use of a CN-86-F interface.

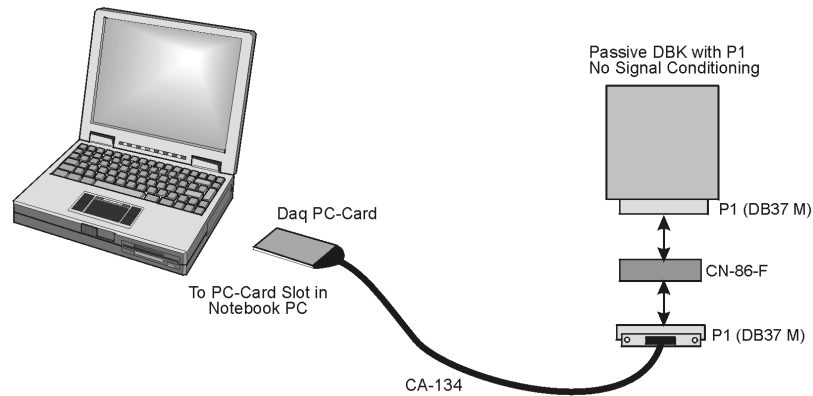### *Connecting the PC-Card to a Passive DBK Card or Module*

A CA-134 Interface Cable provides a DB37 P1 connection for the Daq PC-Card. The CA-134 can connect the Daq PC-Card to a single "passive" card or module. The passive DBKs are:

- **DBK1 – 16 Connector BNC Module**
- **DBK11A – Screw Terminal Option Card**
- **DBK40 – BNC Analog Interface**

Note: A CN-86-F (dual-socket type, DB37 connector) is used as an interface to connect CA-134's male P1 connector to the DBK's P1 connector. See the following figure. The CN-86-F connector is included with orders for the CA-134 cable.

Do not use the Daq PC-Card in conjunction with signal-conditioning type DBK cards. The Daq PC-Card is only intended for connections to a P1 connector of a single "passive" DBK card or module. A passive DBK card or module is one that provides a desired connectivity (such as BNCs or screw terminals), but performs no signal conditioning or channel count increase.


Daq PC-Card Cabling

1. Plug the DB37 (P1) connector of the Interface Cable into one end of the CN-86-F.

2. Plug the free end of the CN-86-F into the P1 connector of the compatible "passive" DBK card or module; i.e., DBK1, DBK11A, or DBK40.

Step 4 – *Configure and Test the System using the Daq Configuration Applet*

The *Daq* Configuration* applet, designed for 32-bit Windows 95/98/Me/NT/2000/XP systems, is located in the Windows *Control Panel*. The applet allows you to add or remove a device and change configuration settings. The included test utility provides feedback on the validity of current configuration settings, as well as performance summaries.

1. Open the Daq* Configuration Applet.
   a. Open the Control Panel by navigating from the Windows' Desktop as follows:
      Start Menu ⟹ Settings ⟹ Control Panel
   b. From the Control Panel, double-click the ***Daq* Configuration*** icon.

2. Add the Daq PC-Card to the Device Inventory and test the hardware.
   a. Select the Computer image in the Device Inventory configuration tree.
   b. Click the <**Add Device**> button. The "Select Device Type" box will appear.
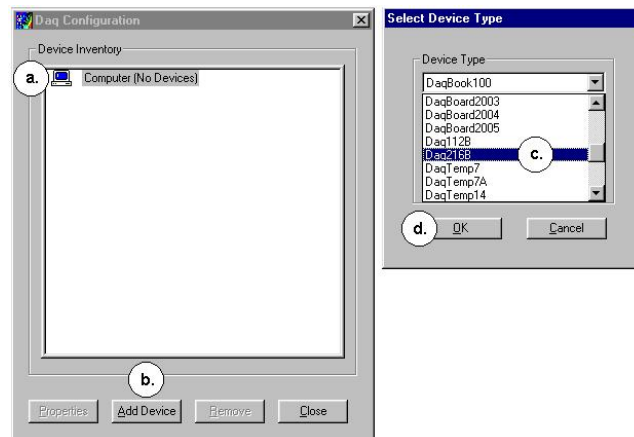
Using Daq* Configuration Device Inventory & Select Device Type to Add a Device

   c. Select the **Daq/112B** or the **Daq216B** PC-Card, as applicable.

   d. Click the <**OK**> button.

   The Daq Configuration box will now show the Device Settings for the PC-Card. Verify that the settings are correct and make changes if necessary; for example, if you have a Daq/216B PC-Card make sure the Device Type box indicates shows that device. If desired, change the Device Name.
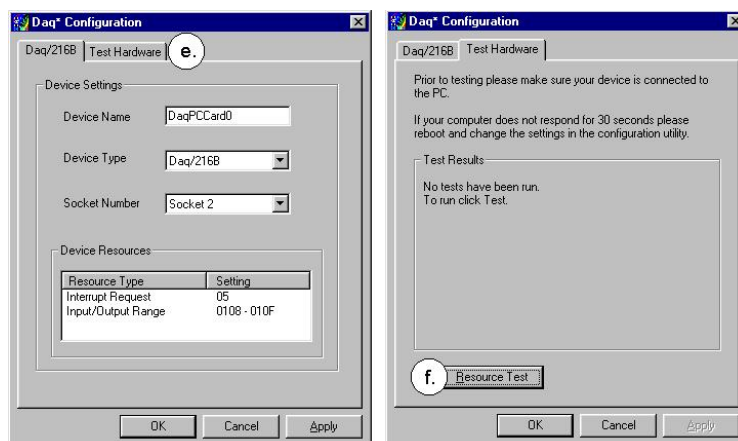
Device Settings for Daq/216B

   e. Click the <**Apply**> button, then click the "Test Hardware" tab.

   f. From the "Test Hardware" tab click the <**Resource Test**> button.

What do the tests tell me?

Resource Tests. The resource tests are intended to test system capability for the current device configuration. Resource tests are *pass/fail*. Test failure may indicate a lack of availability of the resource, or a possible resource conflict.

Base Address Test. This resource test checks the base address for the selected port. Failure of this test may indicate that the port is not properly configured within the system. See relevant operating system and computer manufacturer's documentation to correct the problem.

Interrupt Level Test – Tests the ability of the port to generate interrupts. Failure of this test may indicate that the port may be currently unable to generate the necessary hardware interrupt. Should this test fail, refer to your specific operating system and computer documentation for corrective actions.

With the presence of "Passed" messages you can exit the test program and run your application.

Performance Tests. These types of tests are intended to check various device functions, using the current device configuration. Performance tests provide quantitative results for each supported functional group.

Test results represent maximum rates the various operations can be performed. The rates depend on the selected protocol, and vary according to port hardware capabilities.

The ADC FIFO Input Speed part of the test results in a display of the maximum rate at which data can be transferred from the tested device's internal ADC FIFO to computer memory through the port. Results are given in samples/second, where a sample (2 bytes in length) represents a single A/D value.
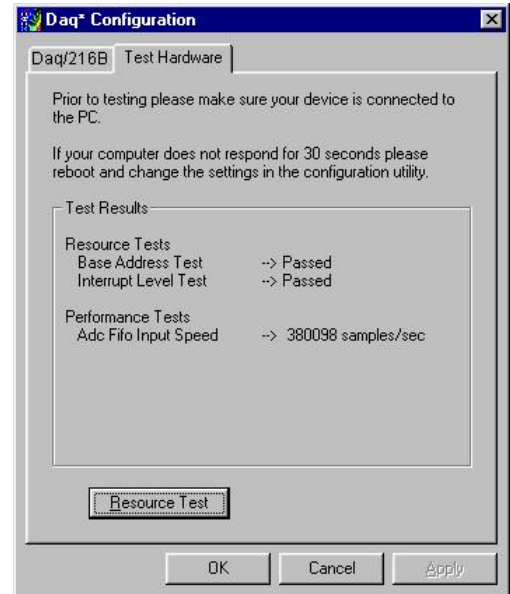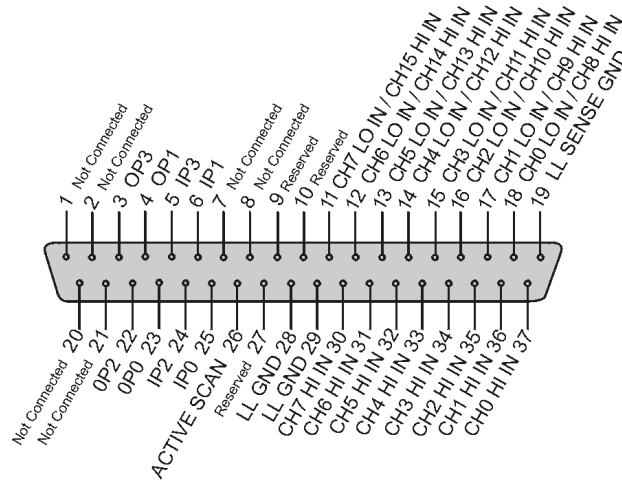

Daq Configuration
Test Hardware Dialog Box

Note: After you successfully add a device it will appear listed in the Device Inventory.

A Daq PC-Card listed
in Device Inventory

Daq PC-Card   **P1** Analog I/O

Pin	Signal Name	Description for P1 Pin Use in the Daq PC-Card
1	Not Connected	--
2	Not Connected	--
3	OP 3	Digital out bit 3
4	OP 1	Digital out bit 1
5	IP 3	Digital in bit 3
6	IP 1	Digital in bit 1
7	Not Connected	--
8	Not Connected	--
9	Reserved	--
10	Reserved	--
11	CH 7 LO IN / CH 15 HI IN	Ch 7 LO IN (differential mode), or Ch 15 HI IN (single ended mode)
12	CH 6 LO IN / CH 14 HI IN	Ch 6 LO IN (differential mode), or Ch 14 HI IN (single ended mode)
13	CH 5 LO IN / CH 13 HI IN	Ch 5 LO IN (differential mode), or Ch 13 HI IN (single ended mode)
14	CH 4 LO IN / CH 12 HI IN	Ch 4 LO IN (differential mode), or Ch 12 HI IN (single ended mode)
15	CH 3 LO IN / CH 11 HI IN	Ch 3 LO IN (differential mode), or Ch 11 HI IN (single ended mode)
16	CH 2 LO IN / CH 10 HI IN	Ch 2 LO IN (differential mode), or Ch 10 HI IN (single ended mode)
17	CH 1 LO IN / CH 9 HI IN	Ch 1 LO IN (differential mode), or Ch 9 HI IN (single ended mode)
18	CH 0 LO IN / CH 8 HI IN	Ch 0 LO IN (differential mode), or Ch 8 HI IN (single ended mode)
19	L.L. GND	Low level ground (analog ground; for use with analog inputs)
20	Not Connected	--
21	Not Connected	--
22	OP 2	Digital output bit 2
23	OP 0	Digital output bit 0
24	IP 2	Digital input bit 2
25	IP 0	Digital input bit 0
26	Active Scan	Active Scan
27	Reserved	--
28	L.L. GND	Low level ground (analog ground; for use with analog inputs)
29	L.L. GND	Low level ground (analog ground; for use with analog inputs)
30	CH 7 HI IN	Ch 7 HI IN (single ended mode, or differential mode)
31	CH 6 HI IN	Ch 6 HI IN (single ended mode, or differential mode)
32	CH 5 HI IN	Ch 5 HI IN (single ended mode, or differential mode)
33	CH 4 HI IN	Ch 4 HI IN (single ended mode, or differential mode)
34	CH 3 HI IN	Ch 3 HI IN (single ended mode, or differential mode)
35	CH 2 HI IN	Ch 2 HI IN (single ended mode, or differential mode)
36	CH 1 HI IN	Ch 1 HI IN (single ended mode, or differential mode)
37	CH 0 HI IN	Ch 0 HI IN (single ended mode, or differential mode)

Note!

(1) Only use Daq PC-Card with passive DBK cards or modules.

(2) No power or analog output is available from P1.

Reference Notes:

➣ If you experience difficulties, please consult the additional user documentation before calling technical support. User documentation is included on your data acquisition CD, and is installed automatically as a part of product support, when your software is installed. The default location is in the **Programs** group.

➣ Information regarding the passive DBKs that can be used with Daq PC-Cards, i.e., **DBK1**, **DBK11A**, and **DBK40**, is included in the *DBK Option Cards and Modules User's Manual* (457-0905).

➣ Instructions for removing Daq-PC cards, i.e., locating and removing the applicable .inf files, are included in *Appendix B*, Removal of .inf files and Device [for PCMCIA Card Applications].

➣ Hardcopy versions of our documents may be purchased. If interested, please contact your sales representative.

Specifications, Daq PC-Cards

General

Operating Temperature: 0° to 50°C

Storage: -55° to 150°C

Humidity: 5% to 90% RH, non-condensing

Size: 5 mm (PC-Card)

Expansion Channel Capacity: 256 max

Power

    Normal Operation: 5V @ 160 mA

    Power Down Mode: 5V @ 40 mA

A/D Specifications

Type: Successive approximation

Resolution:

    Daq/112B: 12 bit

    Daq/216B: 16 bit

Conversion Time: 8 µs

Monotonicity: No missing codes

Linearity: ±0.9 LSB

Zero Drift: ±2 ppm/°C

Gain Drift: ±7 ppm°C

Sample & Hold Amplifier

    Acquisition Time: 2 µs max

    Aperture Delay: 40 ns

Analog Inputs

Channels: 16 single-ended, or 8 differential, expandable up to 256 via expansion options

Connector: DB37 male or female connector available (see CA-134)

Range: Gains and ranges are sequencer selectable on a per-channel basis; ±10, ±5, ±2.5, ±1.25

Maximum Overvoltage: 10V

Input Current: 1 nA

Input Impedance: 100M Ohm

Triggering

Digital Trigger

    Logic Level Range: 0.8V low / 2.2V high

    Trigger to A/D Latency: 10 µs max

Software Trigger

    Trigger to A/D latency: Dependent on PC

Channel Sequencer

Depth: 512 locations

Speed: 10 µs per channel, fixed

Internal Between Scans: 10 µs to 167s, software programmable

Gains: Sequencer programmable per channel

Note: Specifications are subject to change without notice.

Digital I/O

Number: 4-bit input and 4-bit output, TTL compatible (not accessible if analog expansion options are in use)

Input High Voltage: 2V min

Input Low Voltage: 0.8V max

Output High Voltage: 3V min @ 2.5 mA source

Output Low Voltage: 0.4V max @ 2.5 mA sink

Cable Information	Part No.
DB37 cable, 2 ft.; Connects a Daq PC-Card to a DBK1, a DBK11A, or a DBK40; Includes a gender changer.	CA-134

Notes

Removal of .inf files and Device   B

for PCMCIA Card Applications

These instructions are for users of *Microsoft Windows 95/98/Me** who want to remove any of the following from their computer:

- Data Acquisition PCMCIA cards, such as the Daq/112B, Daq/216B and DigiCard/24.
- Parallel Port PCMCIA cards, such as WBK20, EPPCard/1, DBK35, and LPTCard/1.

*Note: If your computer makes use of a different operating system, such as *Windows 2000*, or *Windows XP*, the removal process will be similar in that (1) you will remove the .inf file and (2) you will remove the device from the device manager; however, the graphic user interface (GUI) differences will be noticeable.

Perform the following steps, in sequence, to fully remove the applicable configuration from the computer.

1) Remove the .INF file

Use care to avoid deleting configuration files that you want to maintain, such as modems, network cards, and other PCMCIA devices.

This portion of the procedure involves locating the applicable **.inf** file and removing it. Note that if you do not see the .INF directory folder listed (after completing step "c" below) use the **View** pull-down menu, select **Options**, then select **Show all Files**.

(a) Insert card into PCMCIA slot.

(b) Access Windows Explorer.

(c) Double-click Windows directory folder.

(d) Double-click Inf directory folder.

(e) Locate Oem*.inf files.

(f) After locating the Oem files (step e), check each file for the applicable IOtech card (or adapter) that you want to remove. Once you locate the correct Oem file, delete it. A portion of an IOtech Oem file follows as an example.

```
Oem2.inf - Notepad
File  Edit  Search  Help

; PCMCIA Data Acquisition Cards

[Version]
Signature=$WINDOWS95$
Class=Data_Acquisition
Provider=%strProvider%

[Manufacturer]
%strIOtech%=IOtech_DataAcq_Devices

[IOtech_DataAcq_Devices]
%strDAQPi_12%=DAQP.Install,PCMCIA\IOTECH_INC-PCMCIA_12-BIT_ANALOG_INPUT-85C0
%strDAQPi_12%=DAQP.Install,PCMCIA\IOTECH_INC-PCMCIA_12-BIT_ANALOG_INPUT-A50C
%strDAQPi_16%=DAQP.Install,PCMCIA\IOTECH_INC-PCMCIA_16-BIT_ANALOG_INPUT-AF12
%strDAQPi_16%=DAQP.Install,PCMCIA\IOTECH_INC-PCMCIA_16-BIT_ANALOG_INPUT-DEC0

[Strings]
strProvider="Card Manufacturer"
strIOtech="IOtech"

strDAQPi_12="IOtech Daq/112B: PCMCIA 12-bit Analog Input"
strDAQPi_16="IOtech Daq/216B: PCMCIA 16-bit Analog Input"
strDAQPi_208="IOtech Daq/100B: PCMCIA 12-bit Analog I/O"
strDAQPi_308="IOtech Daq/200B: PCMCIA 16-bit Analog I/O"
strIOPi_241="IOtech DigiCard/24: PCMCIA Digital I/O Card"
```

(g) After deleting the file, check the remaining Oem files to ensure there are no additional occurrences of that particular IOtech configuration.

(h) Delete additional Oem files, as applicable. Be sure you do not delete Oem files that you want to maintain, such as files for modems and network cards.

This completes the procedure for removing the .inf files.

(2) Remove the IOtech device from the Device Manager

(a) Ensure the card (or adapter) is installed for the IOtech device to be removed.

(b) Access Windows' *Device Manager*. You can access the *Device Manager* by using Windows Start Menu and navigating as follows:

Start ⇒ Settings ⇒ Control Panel ⇒ System ⇒ Device Manager
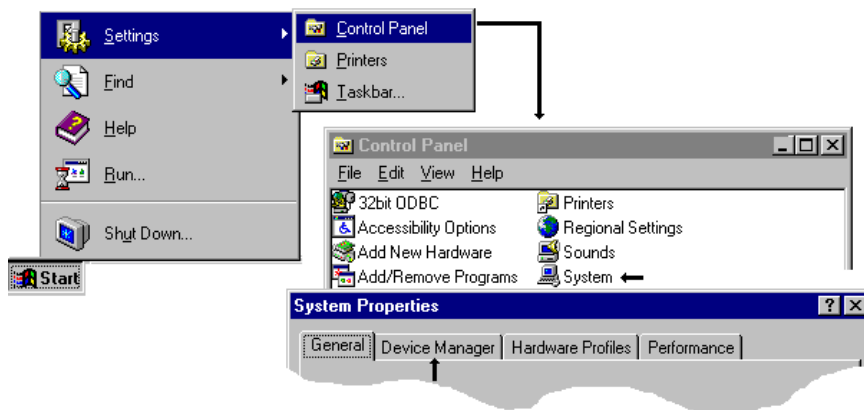
(c) **For Daq112B, Daq216B, and DigiCard/24:** In the *Device Manager* listing, double-click on **Data Acquisition** and locate the device to be removed. In the example (below, left) an IOtech 16-bit Analog Input device will be removed.

For WBK20, EPPCard/1, DBK35, and LPTCard/1: In the *Device Manager* listing, double-click on **Ports (COM & LPT)** and locate the device to be removed. In the example (below, right) an IOtech WBK20 card will be removed.
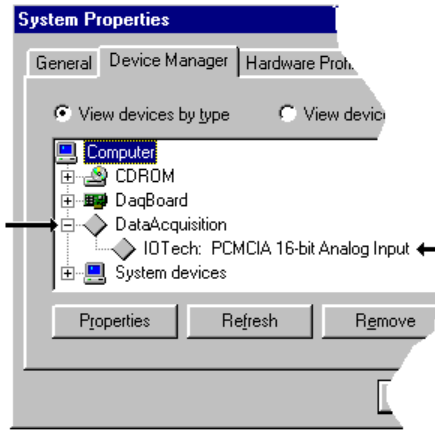
For Daq112B, Daq216B, and DigiCard
select DataAcquisition
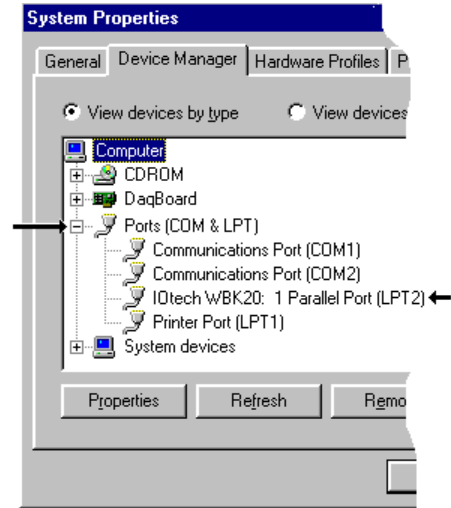
For WBK20, EPPCard/1, DBK35, and LPTCard/1
select Ports (COM & LPT)

(d) Click on the applicable IOtech device (the one to be removed).

(e) Click on the *Device Manager's* **Remove** button. A "Confirm Device Removal" box appears, click **OK**.

(f) Remove the actual card (or adapter) from the computer. The device is now completely removed from the system.

(g) Reboot the computer.

This completes the procedure.

Notes