

GETTING STARTED GUIDE

NI-DAQ™ mx Base 1.0

This guide describes how to install and configure the NI-DAQmx Base 1.0 for Pocket PC driver software and a data acquisition (DAQ) device. This guide also describes how to verify that the device is operating properly.

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Conventions

The following conventions are used in this guide.

» The » symbol leads you through nested menu items and dialog box options to a final action. The sequence **File»Page Setup»Options** directs you to pull down the **File** menu, select the **Page Setup** item, and select **Options** from the last dialog box.



This icon denotes a tip, which alerts you to advisory information.



This icon denotes a note, which alerts you to important information.



This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash. When this symbol is marked on the device, refer to the *Read Me First: Safety and Radio-Frequency Interference* document, shipped with the device, for precautions to take.

bold Bold text denotes items that you must select or click in the software, such as menu items and dialog box options.

italic Italic text denotes a cross reference, an introduction to a key concept, or a placeholder for a word or value that you must supply.

monospace Text in this font denotes text or characters you should enter from the keyboard, the proper names of disk drives, paths, directories, programs, functions, filenames, and extensions.

monospace italic Italic text in this font denotes text that is a placeholder for a word or value that you must supply.

Related Documentation

The following documents contain information you might find helpful as you read this manual:

- *NI-DAQmx Base Help*
- *NI-DAQmx Base 1.0 Readme*
- *NI-DAQmx Help*
- *Getting Started with the LabVIEW PDA Module*
- *LabVIEW PDA Module User Manual*
- *LabVIEW PDA Module Release Notes*
- *LabVIEW Help*, available by selecting **Help»VI, Function, & How-To Help**
- *LabVIEW User Manual*, available in PDF format by selecting **Start»Programs»National Instruments»LabVIEW 7.1»Search the LabVIEW Bookshelf** and clicking the LabVIEW User Manual link
- *E Series Help*
- Documentation for the Personal Digital Assistant (PDA) device you use

Overview

National Instruments measurement devices are packaged with NI-DAQ driver software, an extensive library of functions and VIs which you can call from your application software, such as LabVIEW or LabWindows™/CVI™, to program all the features of your NI measurement devices. Driver software has an application programming interface (API), which is a library of VIs, functions, classes, attributes, and properties for creating applications for your device.

There are three drivers associated with NI-DAQ driver software: Traditional NI-DAQ, NI-DAQmx, and NI-DAQmx Base.

Traditional NI-DAQ

Traditional NI-DAQ 7.x is an upgrade to the earlier version of NI-DAQ. Traditional NI-DAQ has the same VIs and functions and works the same way as NI-DAQ 6.9.3, except that you can use Traditional NI-DAQ and NI-DAQmx on the same computer.

NI-DAQmx

NI-DAQmx 7.x is the latest NI-DAQ driver with the following advantages over Traditional NI-DAQ:

- DAQ Assistant, which offers a graphical way to configure channels and measurement tasks for your device, and to generate NI-DAQmx code based on your channels and tasks in LabVIEW.
- Increased performance, including faster single-point analog I/O and multithreading.
- Simpler, more intuitive APIs for creating DAQ applications using fewer functions and VIs than earlier versions of NI-DAQ.
- Expanded functionality for LabVIEW, including property nodes and waveform data type support.

NI-DAQmx Base

NI-DAQmx Base is a driver that allows you to build applications that run on a PDA. NI-DAQmx Base includes the following features:

- NI-DAQmx Base provides a high-level interface on LabVIEW PDA for Pocket PC 2003.
- NI-DAQmx Base is a subset of the NI-DAQmx API. If you are familiar with NI-DAQmx, you should be able to comfortably use NI-DAQmx Base.
- NI-DAQmx Base is comprised of LabVIEW VIs, which allows you to customize the driver, if needed.

Refer to the *NI-DAQmx Base Readme* for more information about the differences between NI-DAQmx Base and NI-DAQmx.

Step 1. Confirm That You Have Installed the Correct Application Software Version

Install LabVIEW 7.1 or later and LabVIEW PDA Module 7.1 or later. You must use LabVIEW 7.1 or later with NI-DAQmx Base 1.0 for Pocket PC. Refer to the *Operating System, Application Software, Programming Language, and Device Support in NI-DAQmx Base 1.0* section at the end of this guide for more information. Also, refer to *Getting Started with the LabVIEW PDA Module* and the *LabVIEW PDA Module User Manual* for more information.



Note Be sure LabVIEW PDA is completely installed and configured before continuing.

Step 2. Install the NI-DAQmx Base Software

The following sections describe how to install the NI-DAQmx Base software.

Insert the CD

Inserting the CD launches the NI-DAQmx Base install window.

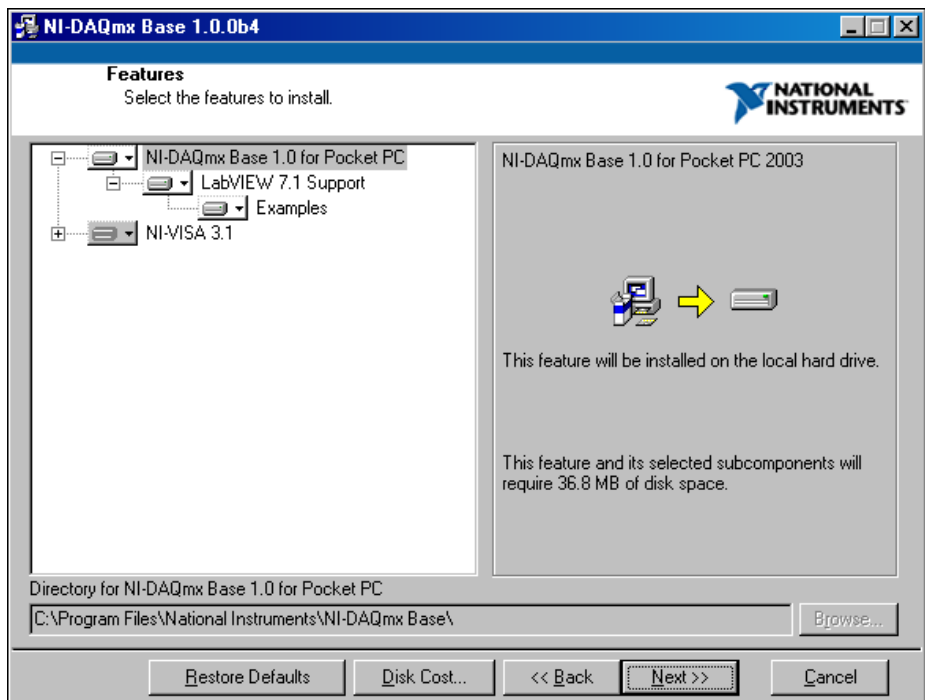
If the NI-DAQmx Base install window does not open automatically, complete the following steps:

1. Select **Start»Run**.
2. Enter `x:\setup.exe`, where `x` is the letter of the CD drive.
3. Click **Install NI-DAQmx Base 1.0**.

Install Support Files

The NI-DAQmx Base installer detects the NI software installed on the operating system and automatically selects the latest versions of the driver, application software, and language support files from the CD.

The NI-DAQmx Base installer displays which features will be installed to your operating system, as shown.



Complete the following steps to install NI-DAQmx Base 1.0 for Pocket PC:

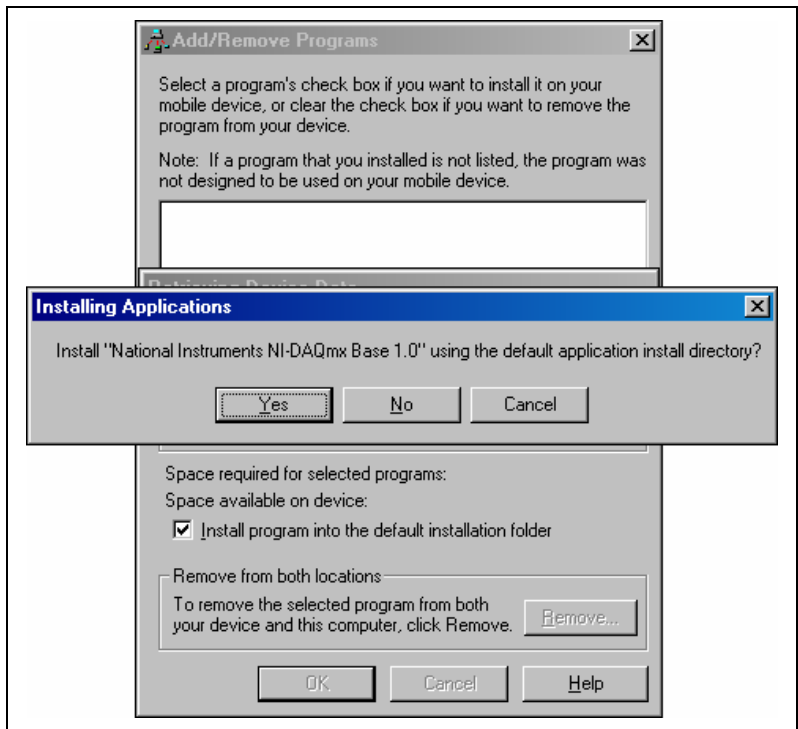
1. In the Features window, shown in the previous figure, verify that the installer detected and selected the correct support files and the correct version number of the application software.
2. Click the + in front of the feature to expand the list of feature subcomponents as shown in the previous figure. You can select additional options to install the support files, examples, and documentation.
3. Follow the software prompts.
4. Click **Finish** and wait for the installer to complete. NI-DAQmx Base 1.0 might require you to reboot your computer to complete installation.

You have completed the steps to install NI-DAQmx Base 1.0 for Pocket PC on the Windows host platform.

Step 3. Run the PDA Setup Utility (Pocket PC 2003 only)

After running the NI-DAQmx Base installation, you must copy the driver files to the PDA. Complete the following steps to run the Pocket PC Driver Installation utility:

1. Select **Start»Programs»National Instruments»NI-DAQmx Base**.
2. Click **PocketPC Driver Installation**. This launches the Pocket PC ADD/Remove Programs utility window, as shown in the following figure.



3. Click **Yes** to install the device driver into the default application install directory.
4. Check the Pocket PC screen to see if any additional steps are requested, such as replacing an older driver.

If there are no error messages, you have completed the steps to install the driver files onto the PDA.

Step 4. Unpack the Devices, Accessories, and Cables

Your device ships in an antistatic package to prevent electrostatic damage (ESD) to the device. ESD can damage several components on the device.



Caution *Never* touch the exposed pins of connectors.

To avoid such damage, take the following precautions:

- Ground yourself using a grounding strap or by touching a grounded object.
- Touch the antistatic package to a metal part of the computer chassis before removing the device from the package.

Remove the device from the package and inspect the device for loose components or any sign of damage. Notify NI if the device appears damaged in any way. Do *not* install a damaged device in the computer, PDA, or PXI chassis.

Store the device in the antistatic package when the device is not in use.

For safety and compliance information, refer to the device documentation packaged with your device, or on the Device Document Browser in the NI-DAQ software kit.

Step 5. Install the Devices, Accessories, and Cables

The following section discusses how to install the NI PCMCIA device and the I/O cable.

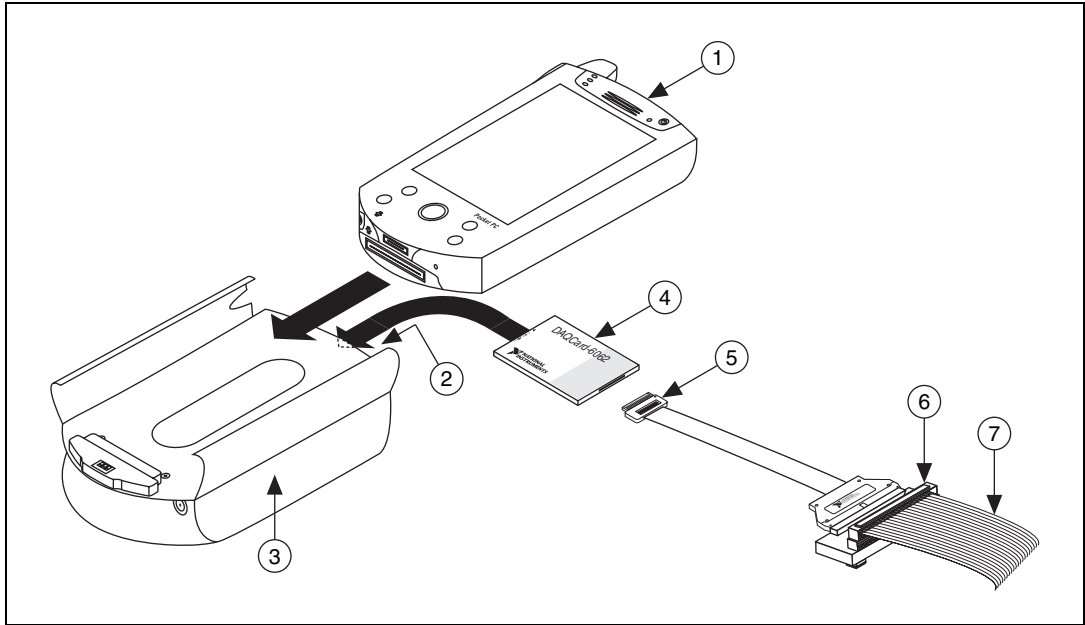
PCMCIA Device Installation



Caution Follow proper ESD precautions to ensure you are grounded before installing the hardware.

The PCMCIA device supports hot insertion on the PDA, which means the PCMCIA device can be installed and removed without rebooting the PDA. You can install an NI PCMCIA device in any available Type II PC Card slot.

To install the NI PCMCIA device, refer to the following figure and complete the following steps.



- | | |
|------------------------|---------------|
| 1 PDA with PCMCIA Slot | 5 I/O Cable |
| 2 PCMCIA Socket | 6 Accessory |
| 3 PDA Expansion Pack | 7 I/O Signals |
| 4 NI PCMCIA Device | |

1. Attach the PCMCIA sleeve or expansion pack to the PDA, if necessary.
2. NI PCMCIA devices have two connectors: a 68-pin PCMCIA bus connector on one end and an I/O connector on the other end. The NI PCMCIA device is keyed so that you can insert it only one way. Insert the PCMCIA bus connector of the NI PCMCIA device in the slot until the connector is firmly seated.
3. Attach the I/O cable. Be careful not to put strain on the I/O cable when inserting or removing the cable connector.



Caution Always grasp the cable by the connector you are inserting or removing. *Never* pull directly on the I/O cable to unplug it from the NI PCMCIA device.

You have completed the steps to install the NI PCMCIA device.

Accessories

Install accessories and/or terminal blocks according to the instructions in their user guides.

Step 6. Confirm That Your Device Is Recognized

Pocket PC only indicates whether a hardware installation error occurred. If you receive an unknown device error message, you have not correctly installed NI-DAQmx Base 1.0 for Pocket PC on the PDA. Refer to [Step 2. Install the NI-DAQmx Base Software](#) for more information about how to install the Pocket PC features of the NI-DAQmx Base driver. If there are no error messages, you have successfully installed the features and the device is recognized by the NI-DAQmx Base 1.0 driver.

Step 7. Create and Configure Tasks

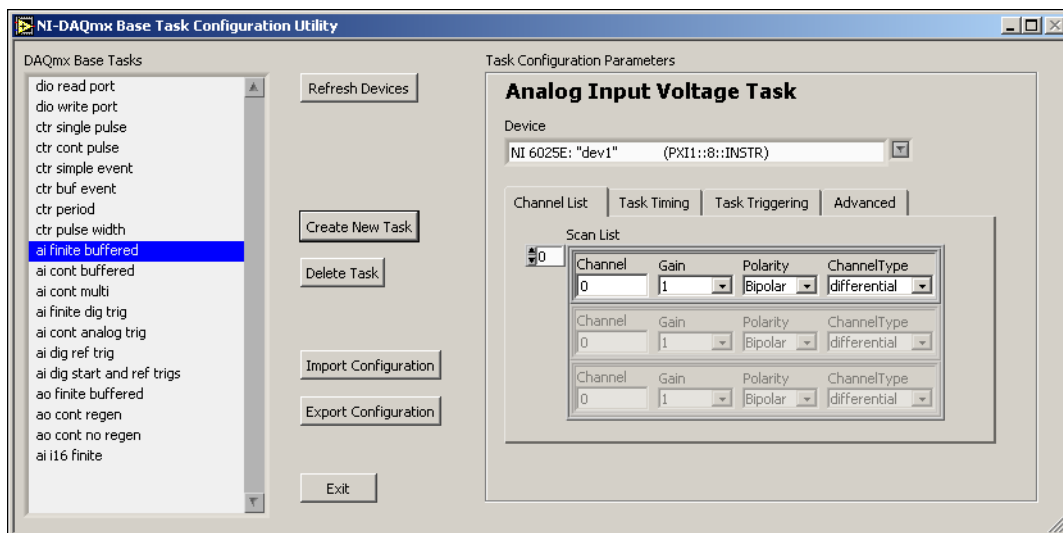
A *task*, an important concept for NI-DAQmx and NI-DAQmx Base, is a collection of one or more channels with timing, triggering, and other properties. Conceptually, a task represents a measurement or generation you want to perform. You can set up and save all configuration information in a task and use the task in an application.

Currently, NI-DAQmx Base only supports interactive task configuration. Settings such as channel gain, trigger levels, and terminal configuration, cannot be programmatically set and must be statically configured as part of the task. However, you can create multiple tasks, each with a unique configuration, and switch between them in your application.

Using the NI-DAQmx Base Configuration Utility in NI-DAQmx Base

In NI-DAQmx Base 1.0 for Pocket PC, task information is embedded in the built application. Prior to building and downloading your VI to the PDA, you must configure and save the tasks you want to use. To configure and save your tasks, use the Task Configuration utility included with NI-DAQmx Base. To use the Task Configuration Utility, complete the following steps:

1. Select **Start»Programs»National Instruments»NI-DAQmx Base**.
2. Click **NI-DAQmx Base Task Configuration Utility**. The Task Configuration Utility launches.

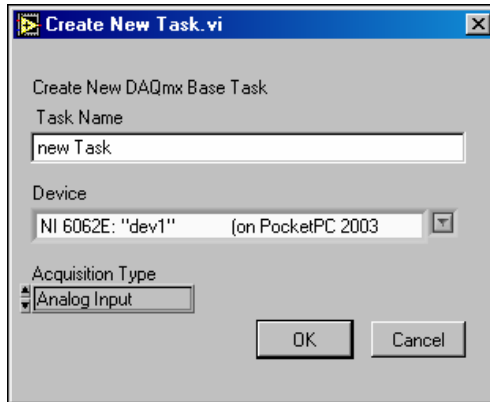


Note You also can launch the Task Configuration Utility from within LabVIEW by selecting **Tools»NI-DAQmx Base Task Configuration Utility**.

Create, Modify, and Configure a Task In NI-DAQmx

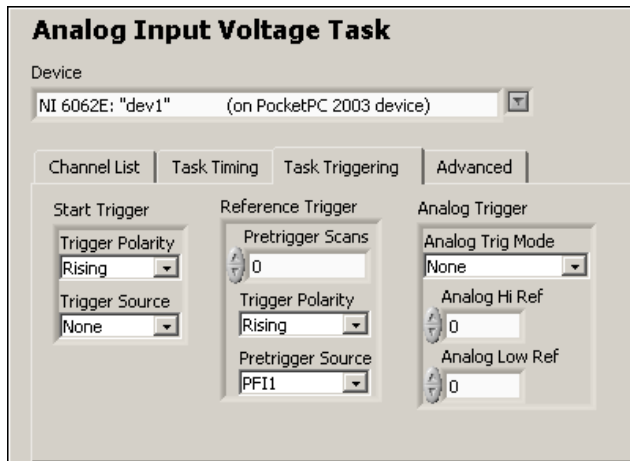
Create a new task or modify one of the existing ones in the Task Configuration Utility task list. The pre-installed tasks are configured to work with the examples without modifications. To modify an existing task, select it in the task list. Complete the following steps to create a new task:

1. Click **Create New Task**. The Create New Task.vi window opens.



2. Enter a name for the new task.
3. Select the acquisition type.
4. Select the device. For NI PCMCIA devices on Pocket PC 2003, select the device that matches your installed hardware.

Each acquisition type contains a set of tabbed dialog boxes for configuring the task.





Tip You can view context help for the Task Configuration Utility by pressing <Ctrl-H>.

5. Click **Exit** when you are finished configuring your tasks. The task configuration is automatically saved into LabVIEW global variables. You do not need to explicitly save the configuration.

To transfer the task configuration to other computers, click **Export Configuration** and save the tasks to a file. You then can use **Import Configuration** to import the task configuration.



Notes The Import Configuration and Export Configuration options operate on the entire set of tasks shown in the Task Configuration Utility. Importing a configuration will replace any existing tasks, including the predefined tasks for the example process.

When using LabVIEW for Pocket PC 2003, the task configuration is built into the target application. You *cannot* retrieve the task information after it is embedded in a built application. Exporting the configuration allows you to preserve the task in case of accidental deletion in the Task Configuration Utility.

Using Tasks In An Application

Because NI-DAQmx Base currently supports interactive task configuration only, you must use a task control or constant in your application to specify the configuration to use.

Complete the following steps to create a task control or constant:

1. Right-click the **task/channels in** terminal on a NI-DAQmx Base VI.
2. Select **Create»Control** or **Create»Constant**.
3. Type the name of the task in the control or constant.
4. To set the value as the default for the control, right-click the control and select **Data Operations»Make Current Value Default**.

Documentation

The NI-DAQmx Base software kit includes online documentation for supported devices and accessories, including PDF and help files describing device terminals, specifications, features, and operation.

After installation, the documents are accessible from **Start»Programs»National Instruments»NI-DAQmx Base»Documentation**.



Note You must have Internet Explorer version 5.0 or later to use some features of the NI-DAQmx Base 7.x documentation, including the help system.

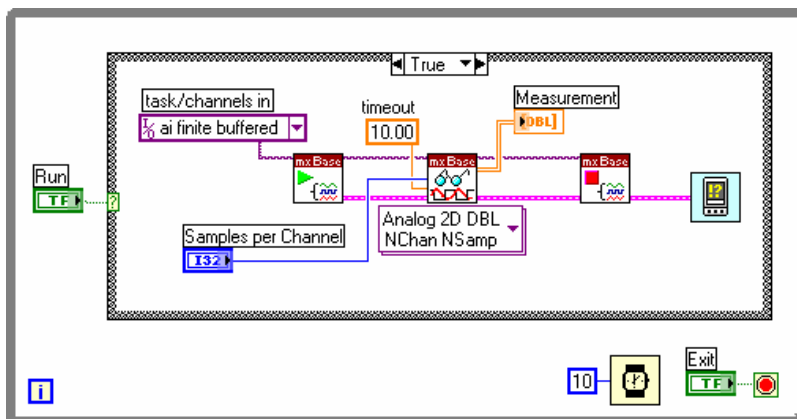
Getting Started Developing an Application

Examples

NI-DAQmx Base includes a collection of programming examples to help you get started developing an application. You can modify example code and save it in an application. You can use examples to develop a new application or add example code to an existing application.

NI-DAQmx Base examples for LabVIEW are in the `LabVIEW\examples\DAQmxBase` directory.

The following figure illustrates a typical NI-DAQmx Base application which uses a preconfigured task to acquire and display a finite number of points for multiple channels.



Refer to *Getting Started with the LabVIEW PDA Module* and the *LabVIEW PDA Module User Manual* for more information about how to create a PDA application.

Obtaining Information about Measurement Applications and Devices

Each application software package and driver includes information about writing applications for taking measurements and controlling measurement devices. The following references assume you have NI-DAQmx Base and, where applicable, LabVIEW 7.1 installed on your computer.

LabVIEW

If you are a new user, complete *Getting Started with LabVIEW* to get acquainted with LabVIEW. Select **Start»Programs»National Instruments»LabVIEW»Search the LabVIEW Bookshelf**.

The *LabVIEW NI-DAQmx Base VI Reference Help* describes the LabVIEW VIs and properties. In LabVIEW, select **Help»LabVIEW Help** and the VI reference help section for NI-DAQmx Base.

Training Courses

National Instruments offers training courses for those interested in receiving more help developing an application with NI products. To enroll in a course or obtain a detailed course outline, refer to ni.com/training.

Worldwide Technical Support

For additional support, refer to ni.com/support or ni.com/zone.

For further support information for signal conditioning products, refer to the *Signal Conditioning Technical Support Information* document packaged with your device.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world to help address your support needs.

Using NI-DAQmx Base and NI-DAQmx on the Same Computer

You can run NI-DAQmx Base and NI-DAQmx on the same computer. However, NI-DAQmx Base 1.0 is specifically designed for use with LabVIEW PDA and Pocket PC 2003.

Operating System, Application Software, Programming Language, and Device Support in NI-DAQmx Base 1.0

Operating System Support

NI-DAQmx Base 1.0 supports Pocket PC 2003 with LabVIEW 7.1 PDA. The development environment runs in LabVIEW 7.1 and is supported on Windows 2000/XP.

Device Support

NI-DAQmx Base 1.0 supports the following devices:

- NI DAQCard-6024E for PCMCIA
- NI DAQCard-6062E for PCMCIA



Note For specific device model names or a list of newly supported devices, refer to the *NI-DAQmx Base 1.0 Readme* on the CD, or select **Start»Programs»National Instruments»NI-DAQmx Base**.

