

# Getting Started with the LabVIEW™ PDA Module

Version 7.1

This user guide contains system requirements, installation and licensing instructions, a tutorial that guides you through building, running, and debugging PDA VIs, and new features for the LabVIEW PDA Module.

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## System Requirements

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The PDA Module has the following requirements:

- A desktop computer with Windows 2000 with Service Pack 4 or later or Windows XP.
- LabVIEW 7.1 Full or Professional Edition.
- One of the following PDA devices:
  - A Palm OS device with Palm OS 3.5 or later.
  - A Pocket PC 2003 device. The PDA Module does not support Pocket PC 2002 devices.
- To debug a PDA application on a Palm OS device, you must have a serial cable or serial cradle. To debug a PDA application on a Pocket PC 2003 device, you can use a serial cable, serial cradle, USB cable, or USB cradle.

## Installing the PDA Module

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Complete the following steps to install the PDA Module.

1. On Windows 2000/XP, log in as an administrator or as a user with administrator privileges.
2. If it is not already installed, install LabVIEW 7.1 and the PDA software provided with the PDA device on the host computer. For Palm OS devices, the PDA software is Palm Desktop and HotSync. For Pocket PC 2003 devices, the PDA software is ActiveSync.
3. **(Pocket PC 2003)** Install the Microsoft Mobile Development Resource Kit. Refer to `readme.html`, located on the PDA Module CD, for installation instructions.
4. Install the PDA Module software.

If the PDA Module installation program does not run automatically, you can run the installer by running `x:\setup.exe`, where `x` is the CD-ROM drive on the computer.

5. When the installer completes, restart the computer.
6. **(Palm OS)** Use the Palm Desktop and HotSync software to install `DatalogMgr.prc` and `Mathlib.prc`, located in the `LabVIEW 7.1\PDA\Utilities` directory, on the PDA device.

## Additional Sony Clié Installation Instructions

For Sony Clié devices, you must complete the following additional installation steps to obtain the Sony SDK 5.0.

1. On the host computer, create a Sony folder in the Program Files\Metrowerks\CodeWarrior\Other SDKs\ directory.
2. Open a Web browser to `www.cliedeveloper.com`, click the **Obtain Development Tools** link, and click the **Sony SDK 5.0** link.
3. After reading the agreement, and if you agree, click the **Agree** link to download the `cliesdk50e.zip`.
4. When the download is complete, extract the contents of the `cliesdk50e.zip` file into the Sony directory you created in step 1.

## Installing the WIDCOMM Bluetooth DLLs on Pocket PC 2003 Devices

You must install the WIDCOMM Bluetooth DLLs on the Pocket PC 2003 device to build and run PDA applications that use Bluetooth communication.



**Note** The PDA Module supports the WIDCOMM BTW-CE 1.4 or later driver.

Complete the following steps to install the WIDCOMM Bluetooth DLLs.

1. Place the Pocket PC 2003 device in the cradle.
2. On the host computer, run `labview\PDA\Utilities\Bluetooth\setup.exe` to install the DLLs on the Pocket PC 2003 device.

Refer to `readme.txt`, located in the `labview\PDA\Utilities\Bluetooth` directory, for information about manually installing the WIDCOMM Bluetooth DLLs.

# Installing the PDA Emulator or Simulator

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Emulators and simulators are useful tools you can use during development to quickly run and test PDA VIs without having to download the PDA application to the PDA device. The PDA emulator or simulator you use depends on the PDA platform you have installed.



**Note (Palm OS)** Install the Palm OS emulator if you are using Palm OS 4.x and earlier. Install the Palm OS simulator if you are using Palm OS 5.0 and later. Refer to the Palm Web site at [www.palmos.com](http://www.palmos.com) for information about the differences between the Palm OS emulator and Palm OS simulator.

## Installing the Palm OS Emulator and ROM Image

**(Palm OS 4.x and earlier)** Palm OS emulators use ROM images to enable the emulator to behave like a specific Palm OS device. You must have a ROM image to run the Palm OS emulator. You can transfer the ROM image from a Palm OS device or download ROM images from the Palm Web site at [www.palmos.com](http://www.palmos.com).

Complete the following steps to obtain and install the Palm OS emulator and ROM image.



**Note** If you are using a Sony Clie device, skip to the [Installing the Sony Clie Palm OS Emulator and ROM Image](#) section to install the emulator and ROM image.

1. Download and install the Palm OS emulator from the Palm Web site at [www.palmos.com](http://www.palmos.com).
2. **(USB only)** Complete the following steps to enable the Palm OS emulator to access the USB port.
  - a. Navigate to the `\Palm` directory and copy `USBPort.dll`.
  - b. Navigate to the `\Palm\emulator` directory and paste the copy of `USBPort.dll`.
3. Place the Palm OS device in the cradle and use the Palm Desktop and HotSync software to install the `ROM Transfer.prc` file from the `\Palm\emulator` directory onto the Palm OS device.
4. When the HotSync operation is complete, disable the HotSync Manager and close any other applications that are using the serial or USB port.
5. Run the **ROM Transfer** application on the PDA device and tap the **Begin Transfer** button.

6. On the host computer, double-click `emulator.exe` and click the **Download** button. **(USB only)** In the **Transfer ROM** dialog box that appears, select **USB** from the **Port** pull-down menu.
7. Click the **Begin** button. The transfer takes several minutes.
8. Save the ROM image on the host computer. You now can use this ROM image to run the emulator. Click the **Exit** button to close the **Palm OS Emulator**.
9. Restart HotSync and sync the Palm OS device with the host computer.

## Installing the Sony Clié Palm OS Emulator and ROM Image

Complete the following steps to obtain the Sony Clié Palm OS emulator and ROM image.



**Note** You must register with Sony to obtain these files.

1. Open a Web browser to `www.cliedeveloper.com`, click the **Obtain Development Tools** link, and click the **Palm OS Emulator** link.
2. Click the **Register** link and follow the links to sign up for the Standard Program.
3. When you receive the developer program ID by email, return to the link in step 1 and click the **Palm OS Emulator** link.
4. Enter the developer ID and password you received when you registered.
5. Follow the instructions on the Sony Web site to download and install the emulator and the ROM image.

## Installing the Palm OS Simulator

**(Palm OS 5.0 and later)** Download and install the Palm OS simulator from the Palm Web site at `www.palmos.com`. Palm OS simulators do not use a ROM image.

## Installing the Pocket PC 2003 Emulator

The Microsoft Mobile Development Resource Kit installs the Pocket PC 2003 emulator. The Pocket PC 2003 emulator launches automatically when you download a PDA application to the Pocket PC 2003 emulator from LabVIEW.

Select **Start»Programs»Microsoft PocketPC 2003 SDK»Pocket PC 2003 Emulator** to launch the Pocket PC 2003 emulator when LabVIEW is not running.

# Licensing the PDA Module

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You must activate the PDA Module license to build PDA VIs into PDA applications that run on PDA devices. Complete the following steps to activate the license.

1. Select **Start»Programs»National Instruments»NI License Manager**.
2. In the left pane of the NI License Manager, expand **Software Licenses»LabVIEW»Version 7.1»Modules**, right-click **PDA Module**, and select **Activate License**.
3. In the **NI License Wizard** that appears, select **I have not yet activated this product on this computer** and click the **Next** button.
4. Enter the serial number in the field provided and click the **Next** button. You can find the serial number on the proof-of-ownership and registration card you receive with the PDA Module.
5. Select the activation option. If you select **Auto**, click the **Next** button. The **NI License Wizard** automatically sends the registration information over a secure internet connection and activates the PDA Module license for the current computer. If you select **Email**, follow the instructions that follow to complete licensing the PDA Module.
6. Click the **Finish** button to exit the **NI License Wizard**.



**Note** When you attempt to build a PDA VI into a PDA application using an unlicensed installation of the PDA Module, a dialog box appears that launches the **NI License Wizard** and prompts you to activate the license. You must restart LabVIEW before you can build a PDA VI into a PDA application.

## PDA Module Tutorial

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Use this tutorial to learn how to create, build, run, and debug a PDA application. The PDA Tutorial application you will create generates simulated data and saves the data to a file.

## Part 1—Creating the VI on the Host Computer

Complete the following steps to create the PDA Tutorial VI.

1. **(Palm OS)** On the host computer, create a new directory, `C:\PDAdata`. This new directory is where the PDA Tutorial application copies the data it collects when you use HotSync to sync the Palm OS device with the host computer.
2. Launch LabVIEW. In the **LabVIEW** dialog box, select **Palm OS Device** or a **Pocket PC 2003 Device** from the **Execution Target** pull-down menu.
3. Click the **New** button to display the **New** dialog box.
4. Select **VI from Template»Palm OS Screen** or **Pocket PC Screen** in the **Create new** list.
5. Click the **OK** button.



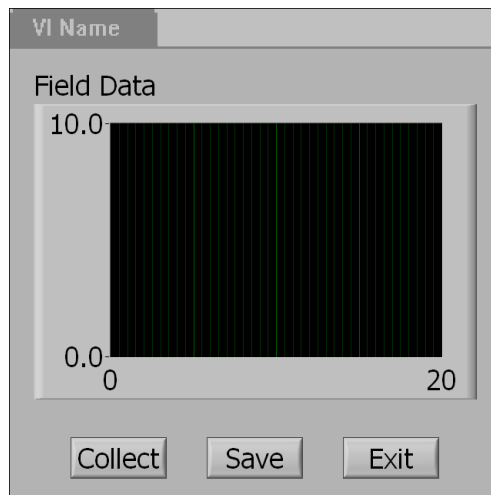
**Tip** You also can open the Palm OS Screen or Pocket PC Screen VI templates by selecting **File»New**. Select `PalmScreen.vit` or `PocketPCScreen.vit` in the **New** dialog box that appears and click the **OK** button.

## Creating the Front Panel

Complete the following steps to create the front panel.

1. Create the following front panel. The controls and indicators are larger sizes than controls and indicators on VIs created for the LabVIEW for Windows execution target.

**(Palm OS)** The **VI Name** in the Palm OS title bar automatically changes to the name of the PDA VI when you save the PDA VI.



# Creating the Block Diagram

Complete the following steps to create the block diagram.

1. Create the following block diagram using **(Palm OS)** Figure 1 and Figure 3 or **(Pocket PC 2003)** Figure 2 and Figure 3 as guides.

(Optional) Instead of creating the block diagram, you can open **(Palm OS)** PDA Tutorial - Palm OS.vi or **(Pocket PC 2003)** PDA Tutorial - Pocket PC.vi, located in the \examples\PDA directory, and skip to *Part 2—Building the PDA VI*.

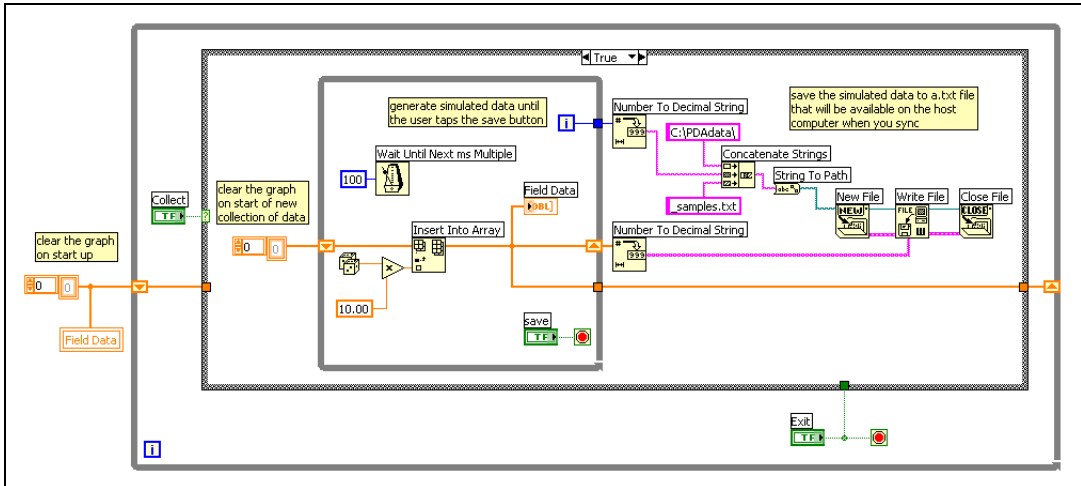


Figure 1. TRUE Case for Palm OS Tutorial

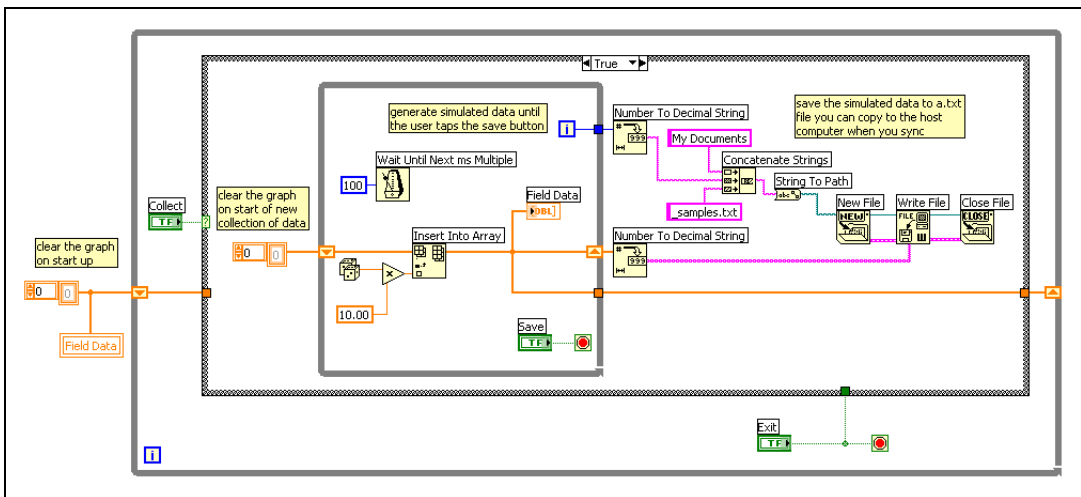
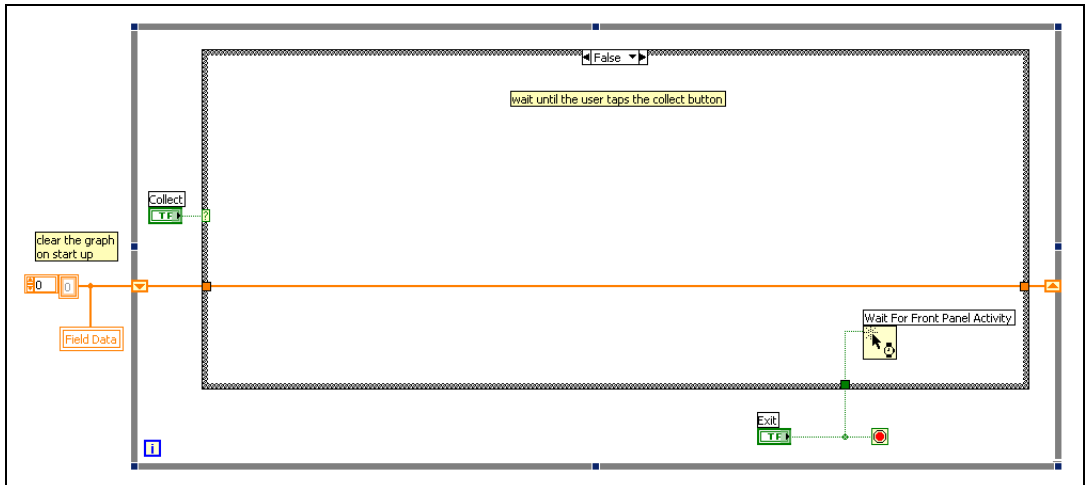


Figure 2. TRUE Case for Pocket PC Tutorial





**Figure 3.** FALSE Case for Palm OS and Pocket PC 2003 Tutorial

2. Save the VI to any location on the host computer as PDA Tutorial.vi.

## Part 2—Building the PDA VI

Complete the following steps to build the PDA VI into an executable PDA application.

1. Select **Tools»Build for PDA**. The **Build Settings** dialog box appears.
2. On the **Build Settings** tab, enter a name for the executable file you are building in the **Application filename** text box.
3. (Optional) The default destination directory is `labview\PDA`. To build the PDA VI in another location, enter the path to the directory in the **Destination Directory** box or click the **Browse** button and navigate to the directory where you want build the PDA VI.
4. Click the **Build** button. LabVIEW builds the PDA VI into an executable PDA application, which is a `.prc` file for Palm OS targets or a `.exe` file for Pocket PC 2003 targets.

## Part 3—Downloading the PDA VI

Complete the following steps to download the PDA application to the PDA device.

1. On the host computer, select **Operate»Download Application**.
2. **(Palm OS)** Navigate to `PDA Tutorial.prc` and click the **Open** button. LabVIEW prompts you to press the **HotSync** button on the PDA cradle to download the PDA application to the Palm OS device.

**(Pocket PC)** Navigate to `PDA Tutorial.exe` and click the **Open** button. LabVIEW automatically downloads the PDA application to the Pocket PC 2003 device.

## Part 4—Running the PDA Application on the PDA Device

Complete the following steps to run the PDA Tutorial application on the PDA device.

1. Remove the PDA device from its cradle.
2. Navigate to and open the PDA Tutorial application.
3. Tap the **Collect** button. The PDA Tutorial application begins displaying simulated data on the graph.
4. Tap the **Save** button. The PDA Tutorial application stops collecting the simulated data.
5. Tap the **Collect** button again. The PDA Tutorial application clears the graph and begins displaying another collection of simulated data.
6. Tap the **Save** button again to stop the PDA Tutorial application.
7. Tap the **Exit** button. The PDA Tutorial application quits and returns you to the PDA operating system.

## Part 5—Syncing with the Host Computer

The way you synchronize data between the PDA device and the host computer is different for Palm OS and Pocket PC 2003.

### Syncing with Palm OS Devices

Complete the following steps to sync data stored on the PDA device with the host computer.

1. Place the PDA device in the cradle.
2. Press the **HotSync** button on the cradle. Palm OS connects the PDA device to the host computer and syncs the files.
3. After the HotSync is complete, navigate to the `C:\PDAData` directory. The DatalogMgr copies the data files on the PDA device to this directory.

### Syncing with Pocket PC 2003 Devices

Complete the following steps to sync data stored on the PDA device with the host computer.

1. Place the PDA device in the cradle.
2. Use ActiveSync to navigate to `\My Documents` on the Pocket PC 2003 device.
3. Copy the `*_samples.txt` files to the host computer.

## Part 6—Debugging the PDA Application

**(Palm OS)** To debug a PDA application on a Palm OS device, use a serial cradle or serial cable to connect the Palm OS device to the host computer.

**(Pocket PC 2003)** To debug a PDA application on a Pocket PC 2003 device, use a serial cradle, serial cable, USB cradle, or USB cable to connect the Pocket PC 2003 device to the host computer.

Complete the following steps to debug the PDA application.

1. On the host computer, enable debugging on the PDA VI by selecting **File>VI Properties** and placing a checkmark in the **Allow debugging** checkbox on the **Execution** page. Click the **OK** button.
2. Select the debugging tools you want to use. Add probes for this tutorial.



**Note** You cannot use execution highlighting when you debug PDA applications.

3. Configure the action of the run button.
  - a. Select **Tools»Options** to display the **Options** dialog box and select **Run Button Action for PDA Targets** from the pull-down menu.
  - b. Place a checkmark in the **Download Application** checkbox.
  - c. Select **Launch and debug application**.
  - d. Click **OK**.
4. Build the PDA VI into a PDA application.
  - a. Select **Tools»Build for PDA** to open the **Build Settings** dialog box.
  - b. Click the **Code Generation Settings** tab and place a checkmark in the **Generate debug info** checkbox.
  - c. Click the **Build** button to build the PDA VI into a PDA application. If a warning dialog box appears, click the **OK** button to confirm that you want to replace the existing file.
5. Run the PDA Tutorial VI on the host computer. This downloads and launches the PDA Tutorial application on the PDA device. You can set breakpoints and/or probes when the PDA VI is running on the host computer and the corresponding PDA application is running on the PDA device.
6. When LabVIEW on the host computer connects to the PDA device, the PDA Tutorial application runs on the PDA device. The front panel is fully functional on the PDA device, but any changes you make to the front panel on the host computer have no effect on the execution of the PDA application or on the block diagram on the host computer.
7. The VI runs on the host computer, and the probes you inserted in step 2 on the block diagram of the PDA Tutorial VI return values from PDA Tutorial application on the PDA device.

You can use additional debugging tools on the block diagram of the host computer while the PDA Tutorial runs on the PDA device.
8. To end the debug session and stop execution, tap the **Exit** button on the PDA Tutorial application or click the **Abort** button on the PDA Tutorial VI on the host computer. The PDA Tutorial VI on the host computer stops when the PDA Tutorial application stops on the PDA device.

# LabVIEW 7.1 PDA Module Features

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Refer to the *LabVIEW PDA Module User Manual* and the *LabVIEW Help* for more information about PDA Module features.

## Bluetooth Communication Support

The PDA Module supports Bluetooth communication on Palm OS 5.0 or later devices and Pocket PC 2003 devices with the WIDCOMM Bluetooth driver version 1.4 or later.

**(Pocket PC 2003)** Refer to *Installing the WIDCOMM Bluetooth DLLs on Pocket PC 2003 Devices* section for more information about installing the WIDCOMM Bluetooth DLLs. Refer to the WIDCOMM Web site at [www.widcomm.com](http://www.widcomm.com) for more information about the WIDCOMM Bluetooth driver.

Refer to the *Using LabVIEW with Wireless Devices* Application Note for more information about Bluetooth communication in LabVIEW. Refer to the Bluetooth Web site at [www.bluetooth.com](http://www.bluetooth.com) for more information about Bluetooth technology.

## PDA Tab Controls

The PDA Module supports tab controls, but PDA tab controls do not support the following configuration options:

- Tabs on the left or right side of the tab control
- Disabled pages
- Images on tabs
- Variable size tabs
- Different color tabs

## Expanded Event Support for PDA Targets

The PDA Module supports the Mouse Up, Mouse Down, Mouse Move, Value Change, and Menu Selection events. The mouse events work only with picture controls.



**Note (Palm OS)** To use coordinates from the Mouse Move event on Palm OS devices in high-density display mode, you must convert the mouse coordinates to the low-density equivalent before you wire them to a picture control. For example, you must convert the high-density coordinates of  $240 \times 200$  to  $120 \times 100$ .

## Zoomable PDA Graphs and Charts

Use the Zoom Chart or Graph VI to add zoom functionality to any graph or chart in a PDA VI. You also can create a button or menu to add zoom functionality.

## High-Density Screens

**(Palm OS)** The PDA Module supports high-density screens, which you usually use with graphs, charts, and pictures.

## PDA Button Input VIs

Use the PDA Button Input VIs to read the state of the buttons on the PDA device.

## Showing and Hiding Front Panel Objects in PDA Applications

Use the Show or Hide Control VI to programmatically control the visibility of controls and indicators on the front panel of PDA applications.

## Palm OS Notifications

Use the Palm OS Notification VIs to register and receive system-level notifications on a Palm OS device. You also can use the Palm OS Notification VIs to launch other PDA VIs and to respond to Palm OS and PDA device-specific events.

## Palm OS Expansion Card Support

You can perform file I/O operations using Palm OS expansion cards. To write to or read from files on an expansion card, specify a file path of `Card#://filename`, where # is the 1-based volume reference number of the expansion card. If you have only one expansion card, the file path is usually `Card1://filename`.

## Run Button Behavior

In previous versions of the PDA Module, clicking the **Run** button debugged the PDA VI. You now can configure the behavior of this button. Select **Tools»Options** to configure the behavior of the **Run** button. The default behavior is to build, download, and debug the PDA VI.

## Scalable Fonts

**(Pocket PC 2003)** The PDA Module supports scalable fonts.

## Sound VIs

The PDA Module supports the Sound VIs on Palm OS and Pocket PC 2003.

## NI-DAQmx Base

The LabVIEW PDA Module software folder includes a new NI-DAQmx Base driver for use with the PCMCIA DAQ products. The NI-DAQmx Base driver replaces the functionality of the DAQ for Pocket PC 2002 VIs that were available in version 7.0 of the PDA Module. The NI-DAQmx Base driver increases the functionality available on PDA devices when using NI PCMCIA DAQ products. Refer to the NI-DAQmx Base installation CD for more information about the NI-DAQmx Base driver.

## Where to Go from Here

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The following documents contain information that you might find helpful:

- *LabVIEW PDA Module User Manual*, available in PDF format by selecting **Start»Programs»National Instruments»LabVIEW»Module Documents»LabVIEW PDA Module User Manual**.
- *LabVIEW User Manual*, available in PDF format by selecting **Start»Programs»National Instruments»LabVIEW»Search the LabVIEW Bookshelf** and clicking the **LabVIEW User Manual** link.
- *LabVIEW Help*, available by selecting **Help»VI, Function, & How-To Help**. Help specific to the PDA Module is available from the **PDA Module** book in the **Contents** tab of the *LabVIEW Help*.
- **(Pocket PC 2003)** NI-DAQmx Base documentation, available on the NI-DAQmx Base installation CD.
- Documentation for the PDA device, emulator, or Palm OS simulator you use.

You must have Adobe Reader with Search and Accessibility 5.0.5 or later installed with search and accessibility plug-ins to view the PDFs. Refer to the Adobe Systems Incorporated Web site at [www.adobe.com](http://www.adobe.com) to download Adobe Reader.



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