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DAQCard-AI-16E-4

LabVIEW™ PDA Module Release Notes

Version 7.0

These release notes contain system requirements for the LabVIEW PDA Module software, installation and licensing instructions, a tutorial that guides you through building, running, and debugging PDA VIs, and known issues with the PDA Module.

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Required System Configuration

The PDA Module has the following requirements:

- LabVIEW 7.0
- One of the following PDA devices:
 - A Palm OS device with Palm OS 3.1 or later. National Instruments recommends Palm OS 3.5 or later.
 - A Pocket PC 2002 device.
- To debug a PDA VI on a PDA device, you must have a serial cable or serial cradle for your PDA device.

Installing the PDA Module

Complete the following steps to install the PDA Module.

1. If you are installing the PDA Module on Windows 2000/NT/XP, log in as an administrator or as a user with administrator privileges.
2. If it isn't already installed, install LabVIEW 7.0 and the PDA software provided with your PDA device on the host computer. For Palm OS devices, the PDA software is Palm Desktop and HotSync. For Pocket PC 2002 devices, the PDA software is ActiveSync.
3. **(Pocket PC 2002)** Insert the Microsoft eMbedded Visual Tools CD into the CD-ROM drive. The Microsoft eMbedded Visual Tools installation program runs automatically.

If the Microsoft eMbedded Visual Tools 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.

4. **(Pocket PC 2002)** Select to install **eMbedded Visual Tools 3.0** and **Microsoft Windows SDK for Pocket PC 2002** and follow the instructions that appear on the screen.
5. Insert the PDA Module CD into the CD-ROM drive. The PDA Module installation program runs automatically.

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.

6. Follow the instructions that appear on the screen. When the installer completes, restart the computer.
7. **(Palm OS)** Use the Palm Desktop and HotSync software to install `DatalogMgr.prc` and `Mathlib.prc`, located in the `\LabVIEW 7.0\PDA\Utilities` directory, on the PDA device.

Additional Sony Clié Installation Instructions

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

1. On the host computer, create the 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 PDA Emulator

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

Installing the Palm OS Emulator

Complete the following steps to install the Palm OS emulator.



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

1. On the host computer, create the `\Program Files\Palm OS Emulator` directory.
2. Navigate to the `\LabVIEW 7.0\PDA\Utilites` directory and extract the contents of the `emulator35-win.zip` file to the directory you created in step 1.
3. (Optional) 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 OS Emulator` directory you created in step 1 and paste the copy of `USBPort.dll`.

Transferring a ROM Image from a Palm OS Device to the Host Computer

You must have a ROM image to run the Palm OS emulator. A ROM image contains information about the capabilities of a Palm OS device. Palm OS emulators use ROM images to enable the emulator to behave like a Palm OS device. You can download ROM images from the Palm Web site, or transfer the ROM from a Palm OS device.

Complete the following steps to transfer a ROM image from a Palm OS device to the host computer for use with the Palm emulator.

1. Place the Palm OS device in the cradle and use the Palm Desktop and HotSync software to install the `ROM Transfer.prc` file you just extracted from the ZIP file onto the Palm OS device.
2. When the HotSync operation is complete, disable the HotSync Manager and any other applications that are using the serial port.
3. If the cradle is connected to the USB port, you must copy `USBPort.dll`, located in the `Palm` directory, to the `Palm OS Emulator` directory you created in step 1 of the *Installing the Palm OS Emulator* section.
4. Run the **ROM Transfer** application on the PDA device and tap the **Begin Transfer** button.
5. On the host computer, double-click the `emulator.exe` and click the **Download** button. In the **Transfer ROM** dialog box that appears, select **USB** from the **Port** pull-down menu and click the **Begin** button. The transfer will take several minutes.
6. Save the ROM image on the host computer. You now can use this ROM image to run the emulator. Click the **Exit** button to leave the **Palm OS Emulator**.
7. Restart HotSync to be able to 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 your developer program ID by email, return to the link in step 1 and select 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 the emulator and the ROM image.

Installing the Pocket PC 2002 Emulator

The Pocket PC 2002 emulator was automatically installed when you installed the Microsoft eMbedded Tools. The Pocket PC 2002 emulator launches automatically when you download a PDA VI to the Pocket PC 2002 emulator from LabVIEW.

You also can launch the Pocket PC 2002 emulator when LabVIEW is not running. Complete the following steps to launch the Pocket PC 2002 emulator outside of LabVIEW.

1. Navigate to `\Win CE Tools\BIN` and run `CEFILEVW.EXE`.
2. In the **Windows CE Remote File Viewer** that appears, select **Connection»Add Connection**.
3. In the dialog box that appears, select **Pocket PC 2002 Emulation** and click the **OK** button. The emulator launches in a new window.

Licensing the PDA Module

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

1. In Windows, select **Start»Programs»National Instruments»NI License Manager**.
2. In the left pane of **NI License Manager**, expand **Software Licenses»LabVIEW»Version 7.0»Modules** and right-click **PDA Module** and select **Activate License**.
3. In the NI License Wizard that appears, select **No** and click the **Next** button.
4. Enter your serial number, name, and organization in the fields provided and click the **Next** button.
5. Select the **Auto** option and click the **Next** button. The NI License Wizard automatically sends your registration information over a secure internet connection and activates the PDA Module license.

If you select **Email**, **Phone**, **Fax**, or **Web** as options, follow the instructions that follow to complete licensing the PDA Module.
6. Click the **Finish** button to exit the NI License Wizard.



Note You also can activate the PDA Module license by selecting **Tools»Build for PDA** from an unlicensed installation of the PDA Module. When you attempt to build a PDA VI from an unlicensed installation of the PDA Module, a dialog box appears that allows you to open the NI License Manager.

PDA Module Tutorial

This tutorial shows you how to build, run, and debug a PDA VI.

Part 1—Building the VI on the Host Computer

The PDA Tutorial VI generates simulated data and saves the data to file. When you sync the PDA device with the host computer, the data files are copied to a directory you create, `C:\PDAdata`.

Complete the following steps to build the PDA Tutorial VI on the host computer.

1. On the host computer, create a new directory, `C:\PDAdata`. This new directory is where the PDA Tutorial VI will copy the data it collects when you sync the PDA device with the host computer.
2. Open LabVIEW. From the **Execution Target** pull-down menu, select **PalmOS Device** or a Pocket PC 2002 device.
3. Open a new VI using the PalmScreen or PocketPCScreen VI template by clicking the arrow on the **New** button and selecting `PalmScreen.vit` or `PocketPCScreen.vit` from the pull-down menu.

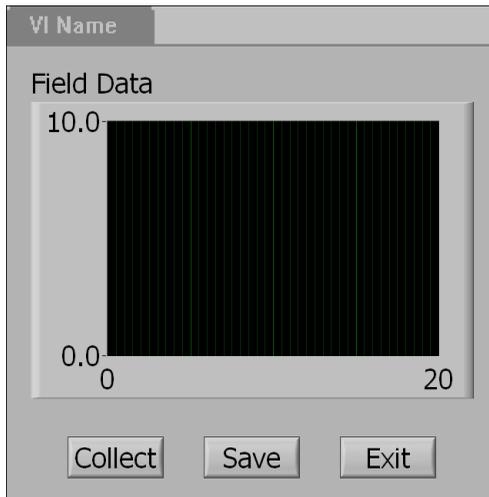


Tip You also can open the PalmScreen or PocketPCScreen VI templates by selecting **File»New** and selecting `PalmScreen.vit` or `PocketPCScreen.vit` and clicking the **OK** button.

Front Panel

1. Build the following front panel. Notice the controls and indicators are larger sizes than controls and indicators on VIs built for the LabVIEW for Windows execution target.

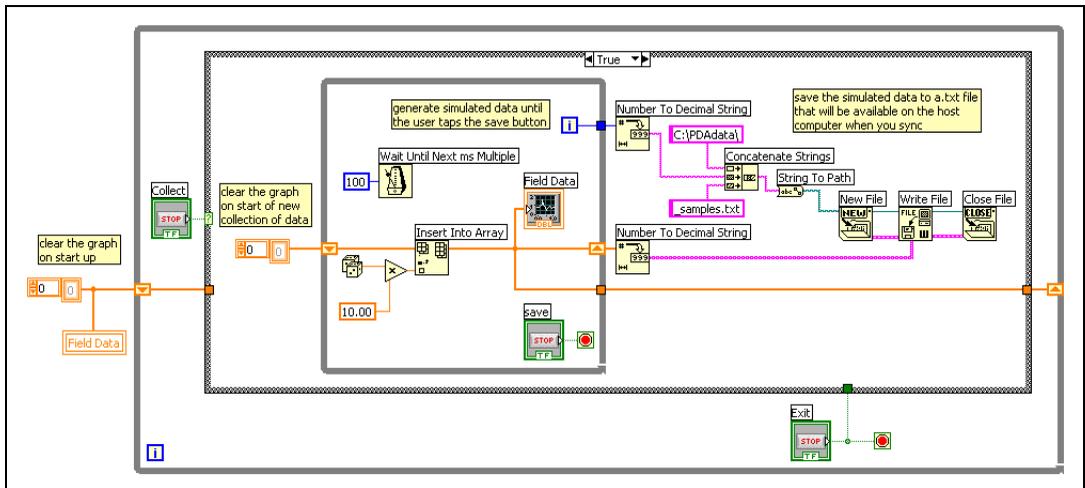
(Palm OS) Notice the standard Palm OS title bar. The **VI Name** automatically changes to the name of the PDA VI when you build the PDA VI.

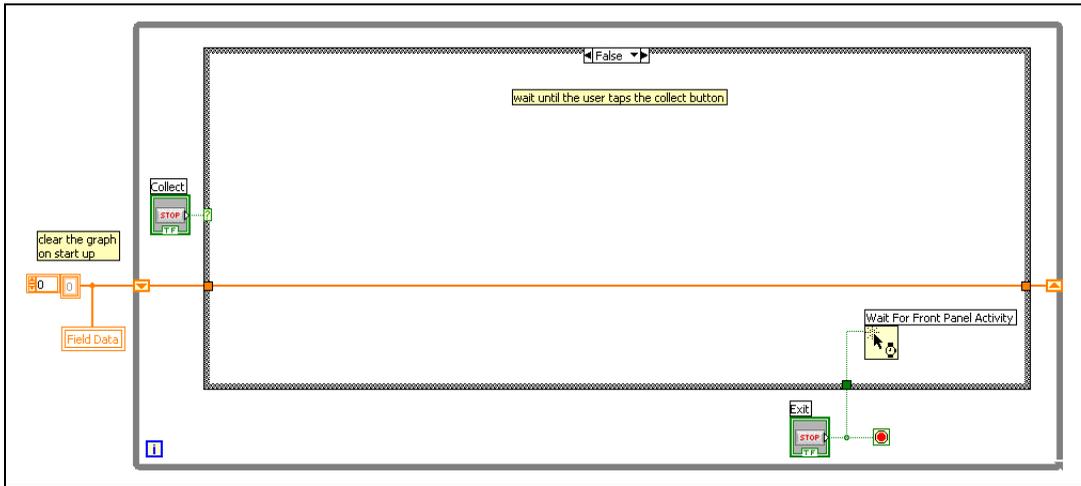


Block Diagram

1. Build the following block diagram. The TRUE and FALSE cases are shown in the following figures.

(Optional) Instead of building the block diagram, you can open the PDA Tutorial VI, located in the `\examples\PDA` directory, and skip to *Part 2—Build the PDA VI*.





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

Part 2—Build the PDA VI

Complete the following steps to build the PDA VI.

1. Select **Tools»Build for PDA**. The **Build PDA Application** dialog box appears. Set the **Destination Directory** to the same directory as the top-level VI.

If you want to build the PDA VI in another location, enter the path to the directory or click the **Browse** button and navigate to the directory where you want LabVIEW to save the PDA VI.

2. Click the **OK** button. LabVIEW builds the PDA VI, which is a .prc file for Palm OS targets or a .exe file for Pocket PC 2002 targets.

Notice that the space in the filename PDA Tutorial.vi is replaced by an underscore (_) character for the PDA VI file.

Part 3—Download the PDA VI

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

1. On the host computer, select **Operate»Download Application**.
2. If you saved the PDA VI in the default directory (the same directory as the top-level VI on the host computer), (**Palm OS**) LabVIEW prompts you to press the **HotSync** button on the PDA cradle, or (**Pocket PC 2002**) LabVIEW automatically downloads the PDA VI to the Pocket PC 2002 device.

If you saved the PDA VI to another location, a file dialog box appears. Navigate to the **(Palm OS)** `PDA_Tutorial.prc` or **(Pocket PC 2002)** `PDA_Tutorial.exe` file and click the **Open** button.

Part 4—Run the PDA VI on the PDA Device

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

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

Part 5—Sync with the Host Computer

The way you synchronize data between the PDA and the host computer is different for Palm OS and Pocket PC 2002.

Synching with Palm OS Devices

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

1. Place the PDA 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. Notice DatalogMgr copied the data files you created on the PDA to this directory.

Synching with Pocket PC 2002 Devices

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

1. Place the PDA in the cradle.
2. ActiveSync automatically syncs the data files on the PDA to the `C:\PDAdata` directory host computer.

Part 6—Debug the PDA VI

To debug a PDA VI on the PDA device, you must connect the PDA device to the host computer using a serial cradle or serial cable.

Complete the following steps to debug the PDA VI.

1. On the host computer, enable debugging on the host VI by selecting **File»VI Properties** and placing a checkmark in the **Allow debugging** checkbox on the **Execution** page. Click the **OK** button.
2. Open the **Build PDA Application** dialog box by selecting **Tools»Build for PDA**.
3. Click the **Settings** button. In the dialog box that appears, place a checkmark in the **Generate debug info** checkbox. Click the **OK** button.
4. In the **Build PDA Application** dialog box, click the **OK** button to build the PDA VI. If a warning dialog box appears, click the **OK** button to confirm that you want to replace the existing file.
5. When the PDA Module finishes building the PDA VI, download the `PDA_tutorial.prc` or `.exe` file to the PDA device as you did in [Part 3—Download the PDA VI](#).
6. With the PDA in the cradle, launch the PDA_Tutorial on the PDA device. A dialog box appears on the PDA that indicates the PDA device is waiting to connect to LabVIEW on the host computer.
To abort the connection, tap the **Cancel** button on the PDA device. The PDA VI runs as if it is not being debugged.
7. If it is not open already, open the PDA Tutorial VI on the host computer and set the execution target to the PDA device or emulator that you want to debug. Select any debugging tools you need—for this tutorial, add probes.



Note Execution Highlighting is not supported when debugging PDA VIs.

8. Run the PDA Tutorial VI on the host computer. LabVIEW on the host computer connects to the PDA device using the serial port and baud rate specified in the **Target Settings** dialog box.



Tip To modify these settings, select **Operate»Switch Execution Target»Select Target with Options**. Changing the baud rate to a higher setting increases the execution speed of the PDA device, but some settings can be incompatible with some PDA devices.

9. When LabVIEW on the host computer connects to the PDA VI, PDA_Tutorial 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 VI or the block diagram displayed on the host computer.

10. Notice the VI is running on the host computer and that the probes on the block diagram of the PDA Tutorial VI return values from PDA_Tutorial on the PDA device.

You can use additional debugging tools on the block diagram of the host computer while PDA_Tutorial runs on the PDA device.

11. To end the debug session and stop execution, tap the **Exit** button on PDA_Tutorial or click the **Abort** button on PDA Tutorial VI on the host computer. Notice the PDA Tutorial VI on the host computer stops when the PDA VI stops on the PDA device.

DAQ for Pocket PC 2002

You can perform data acquisition on Pocket PC 2002 devices using the DAQ for Pocket PC 2002 VIs.

To perform data acquisition on a Pocket PC 2002 device, you need a PC Card Expansion Pack for the Pocket PC 2002 device and one of the following National Instruments PCMCIA DAQ cards:

- DAQCard-6062E
- DAQCard-6024E
- DAQCard-AI-16XE-50
- DAQCard-AI-16E-4

The DAQCard-6062E is the only card that supports waveform analog output.



Caution Using a different PCMCIA DAQ card might damage the Pocket PC 2002 device.

Contact the manufacturer of your Pocket PC 2002 device for information about purchasing a PC Card Expansion Pack.

Installing DAQ for Pocket PC 2002

You must install DAQ for Pocket PC 2002 for each Pocket PC 2002 device on which you want to run PDA VIs that use the Pocket PC 2002 DAQ VIs. Complete the following steps to install DAQ for Pocket PC 2002.

1. Make sure the Pocket PC 2002 device is connected to the host computer.
2. On the host computer, open `\LabVIEW 7.0\PDA\Utilities\DAQ-PPC Installer` and run `setup.exe`.

3. In the dialog box that appears, click the **OK** button to install the files on the PDA device.



Note You also can set up the host computer to install the DAQ for Pocket PC 2002 files when the PDA is not connected to the host computer. When the PDA is not connected to the host system, the installer copies the files to the `Mobile Device` directory on the host computer. When you later connect the Pocket PC 2002 device, open the ActiveSync utility and tap **Sync** on the Pocket PC 2002 device. ActiveSync copies DAQ for Pocket PC 2002 to the PDA and completes the installation.

You can uninstall DAQ for Pocket PC 2002 by running `setup.exe` and clicking the **Uninstall** button.

Known Issues with the PDA Module

The following are known issues with the PDA Module:

- You must use strict C code in Formula Nodes you use in PDA VIs. However, LabVIEW does not check the C code in the Formula Node syntax while in edit mode. If you build a PDA VI that contains a Formula Node with non-strict C code, the PDA Module returns a general error.
- Serial communication is not supported on Palm OS 3.1.
- The PDA Module does not work in non-English versions of Windows NT 4.0. The PDA Module works on non-English versions of Windows 2000/XP, but the software and documentation are not localized.
- **(Palm OS Emulator)** If you enter data into a string or numeric control using the keyboard in a PDA VI running on a Palm OS emulator, the emulator does not update the control until the control loses focus.
- **(Palm OS Emulator)** Running IrDA application on Palm OS emulator with the Palm OS 4.0 debug ROM crashes the emulator. Use the release version of the ROM to avoid the crash.
- **(Palm OS 5 Simulator)** You must complete the following additional steps to debug PDA VIs on the Palm OS 5 Simulator.
 1. On the host computer, connect two serial ports to each other using a loopback cable.
 2. In LabVIEW, select **Operate»Switch Execution Target** and select **Select Target with Options**.
 3. In the **Select Execution Target** dialog box, select **Palm OS Device** as the execution target and select a COM port.
 4. In the Palm OS Simulator, configure the other COM port to the Palm OS Simulator by right-clicking the **Simulator** window,

selecting **Settings»Communication»Communication Ports**, and selecting the COM port.

Differences and Known Issues with DAQ for Pocket PC 2002

The following are notable differences between the behavior of the DAQ for Pocket PC 2002 VIs and the DAQ 6.x Easy I/O VIs that they resemble. Also listed are known issues with DAQ for Pocket PC 2002:

- Automatic power off is unsupported. DAQ operations crash when the PDA powers off.
- DAQ for Pocket PC 2002 does not support interleaved analog output.
- DAQ for Pocket PC 2002 supports only counter 0 for counter/timer operations.
- Data acquisition in PDA VIs built for the Pocket PC 2002 emulator do not output actual data, regardless of whether the PDA VI is running on the emulator or on a Pocket PC 2002 device.
- DAQ for Pocket PC 2002 attempts to identify invalid configuration settings, but it cannot detect all errors. Verify the channel, counter, and min/max settings with the DAQ hardware manual.
- If an error occurs during processing, DAQ for Pocket PC 2002 passes the error to **error out** and stops processing. This differs from traditional Easy I/O VI behavior, which displays a dialog box as soon as an error occurs. You must explicitly handle output errors for the DAQ for Pocket PC 2002 VIs to operate correctly. Use the PDA Error Handler VI to handle errors on PDA devices.
- DAQ for Pocket PC 2002 uses min/max settings to calculate optimal gain settings for the DAQ hardware. If the min/max settings do not exactly match the dynamic range of a particular gain setting, the effective range of the acquisition is larger than specified. While no data is lost, consider this behavior when you design PDA VIs that use DAQ for Pocket PC 2002.
- The AO Update Channel Chip VI is locked to bipolar operation.
- The AO Update Waveform Chip VI returns an obtained frequency.
- Because DAQ for Pocket PC 2002 does not use interrupts, the output FIFO size of the DAQCard you are using constrains the maximum safe acquisition size that is guaranteed to succeed. Under certain conditions, the acquisition FIFO might underflow at rates of 20,000 samples per second or greater.

Where to Go from Here

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*.
- Documentation for the PDA device you use.

You must have Adobe Acrobat Reader with Search and Accessibility 5.0.5 or later installed to view the PDFs. Refer to the Adobe Systems Incorporated Web site at www.adobe.com to download Acrobat Reader.