DAQ Quick Start Guide for NI-DAQ™ 7.0

This guide describes how to install NI-DAQ 7.0 driver software and a data acquisition (DAQ) device and confirm your device is operating properly.

This guide does not apply to NI-DAQ for the Macintosh operating system, Mac OS. Refer to the NI-DAQ for Macintosh distribution.

Contents

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.

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

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

`monospace` Text in this font denotes text or characters that 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.

Where Do I Start?

Figure 1 shows the steps for installing NI-DAQ 7.0 and a DAQ device, and where to find the relevant information in the documentation.
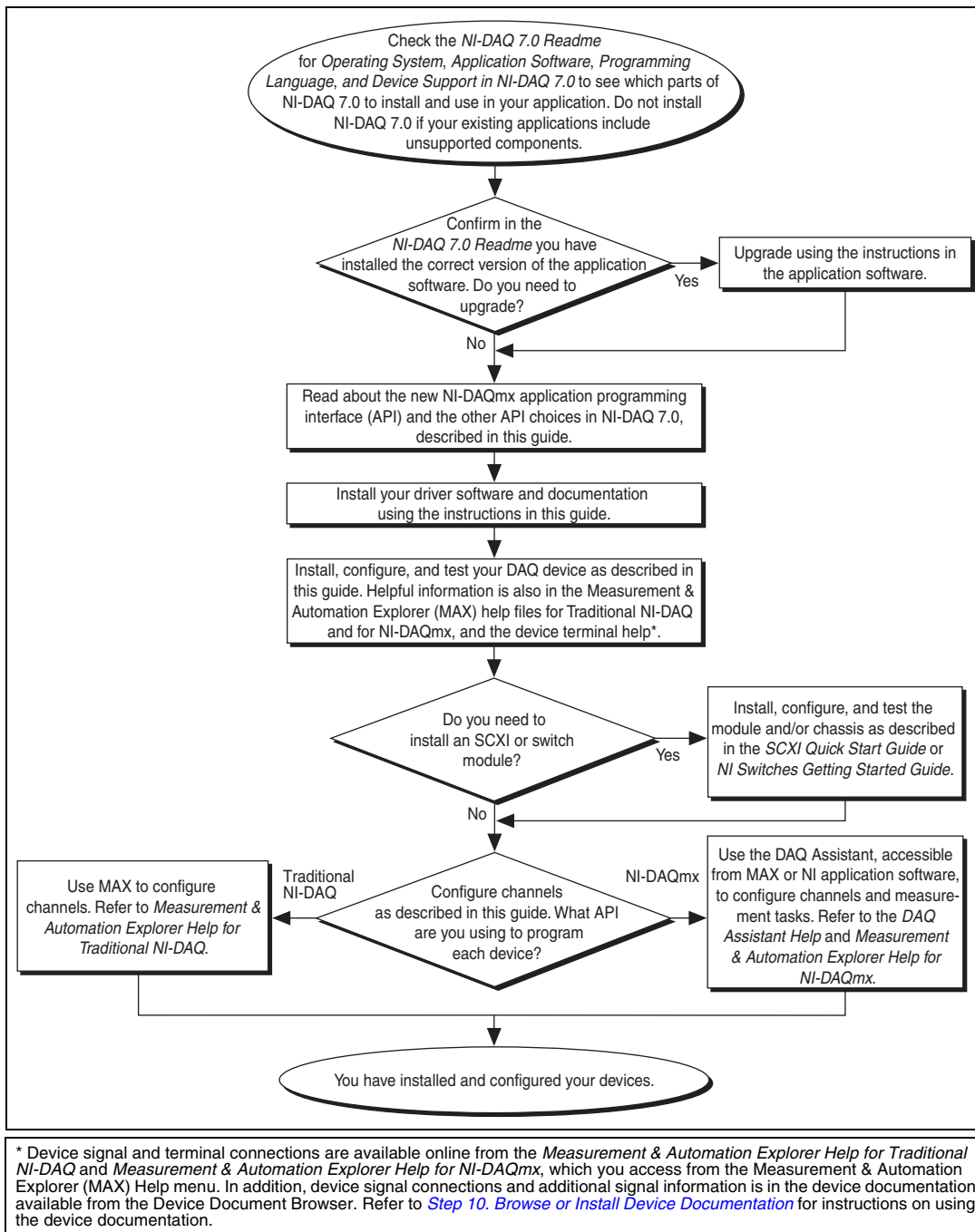
Check the *NI-DAQ 7.0 Readme*
for *Operating System*, *Application Software*, *Programming
Language*, *and Device Support in NI-DAQ 7.0* to see which parts of
NI-DAQ 7.0 to install and use in your application. Do not install
NI-DAQ 7.0 if your existing applications include
unsupported components.

↓

Confirm in the
NI-DAQ 7.0 Readme you have
installed the correct version of the application
software. Do you need to
upgrade?

→ Yes → Upgrade using the instructions in
the application software.

↓ No

Read about the new NI-DAQmx application programming
interface (API) and the other API choices in NI-DAQ 7.0,
described in this guide.

↓

Install your driver software and documentation
using the instructions in this guide.

↓

Install, configure, and test your DAQ device as described in
this guide. Helpful information is also in the Measurement &
Automation Explorer (MAX) help files for Traditional NI-DAQ
and for NI-DAQmx, and the device terminal help*.

↓

Do you need to
install an SCXI or switch
module?

→ Yes → Install, configure, and test the
module and/or chassis as described
in the *SCXI Quick Start Guide* or
NI Switches Getting Started Guide.

↓ No

Configure channels
as described in this guide. What API
are you using to program
each device?

← Traditional NI-DAQ

Use MAX to configure
channels. Refer to *Measurement &
Automation Explorer Help for
Traditional NI-DAQ.*

NI-DAQmx →

Use the DAQ Assistant, accessible
from MAX or NI application software,
to configure channels and measure-
ment tasks. Refer to the *DAQ
Assistant Help* and *Measurement
& Automation Explorer Help for
NI-DAQmx.*

↓

You have installed and configured your devices.

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* Device signal and terminal connections are available online from the *Measurement & Automation Explorer Help for Traditional NI-DAQ* and *Measurement & Automation Explorer Help for NI-DAQmx*, which you access from the Measurement & Automation Explorer (MAX) Help menu. In addition, device signal connections and additional signal information is in the device documentation available from the Device Document Browser. Refer to *Step 10. Browse or Install Device Documentation* for instructions on using the device documentation.

Figure 1. Installation Process Overview

NI-DAQ 7.0 Software

National Instruments measurement devices are packaged with *NI-DAQ driver software*, an extensive library of functions and VIs you can call from your application software, such as LabVIEW or LabWindows™/CVI™, to program all the features of your NI measurement devices. *Measurement devices* include DAQ devices such as the E Series multifunction I/O (MIO) devices, SCXI signal conditioning modules, and switch modules. 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.

NI-DAQ 7.0 includes two NI-DAQ drivers, each with its own API, hardware configuration, and software configuration.

- Traditional NI-DAQ 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 is the latest NI-DAQ driver with new VIs and functions and development tools for programming measurement devices. NI-DAQmx has advantages over Traditional NI-DAQ.

  - DAQ Assistant—a graphical way to configure channels and measurement tasks for your device for use in LabVIEW, LabWindows/CVI, and Measurement Studio. You also can use the DAQ Assistant to generate NI-DAQmx code for the task for use in NI application software programs.

  - 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 in the NI-DAQmx API for LabVIEW, including property nodes for data acquisition and improved waveform data type support for analog I/O.

  - Similar APIs and functionality for ANSI C, LabWindows/CVI, and Measurement Studio, including native .NET and C++ interfaces.

Who Can Use NI-DAQmx

Install and use NI-DAQmx if the following situations apply:

- You are using Windows.

- You are using only a PCI or PXI E Series multifunction DAQ device and/or a supported SCXI or SCC module.

- If you are using NI application software such as LabVIEW, LabWindows/CVI, or Measurement Studio, you must have version 7.0 or later of the application software to use NI-DAQmx.

Note If you use one of the Measurement Studio .NET languages, you must use NI-DAQmx.

Who Must Use Traditional NI-DAQ

Install and use Traditional NI-DAQ if one of the following situations apply:

- You have a device that is not supported by NI-DAQmx, such as the AT E Series multifunction DAQ devices, digital I/O (DIO) devices, and dynamic signal acquisition devices.

- You are using an SCXI-1530, SCXI-1531, or SCXI-1540 device with accelerometer, linear-voltage differential transformer (LVDT), or rotary variable-differential transformer (RVDT) virtual channels, which are not supported by NI-DAQmx.

- You are using the LabVIEW Real-Time (RT) module.

- You are upgrading from NI-DAQ 6.9.*x* and have existing applications that you do not want to port now.

- You are using a version of LabVIEW, LabWindows/CVI, or Measurement Studio earlier than version 7.0.

- You are using Visual Basic 6.0.

Note The earliest version of NI application software supported by Traditional NI-DAQ is version 6.0. LabVIEW, LabWindows/CVI, or Measurement Studio versions 6.*x* can use Traditional NI-DAQ from the NI-DAQ 7.0 distribution.

No Longer Supported in Traditional NI-DAQ

The following items supported by NI-DAQ 6.9.3 are no longer supported in Traditional NI-DAQ.

- NI LabVIEW, LabWindows/CVI, or Measurement Studio application software versions earlier than 6.0

- Windows 95

- Some older devices, such as the 1200 Series multifunction DAQ devices, VXI DAQ devices, or remote SCXI devices

Refer to the *Operating System, Application Software, Programming Language, and Device Support in NI-DAQ 7.0* section at the end of this guide for the list of supported and unsupported items.

How NI-DAQ Fits into Your System

Figure 2 depicts the measurement system overview, showing the path of real-world physical phenomena to your measurement application.
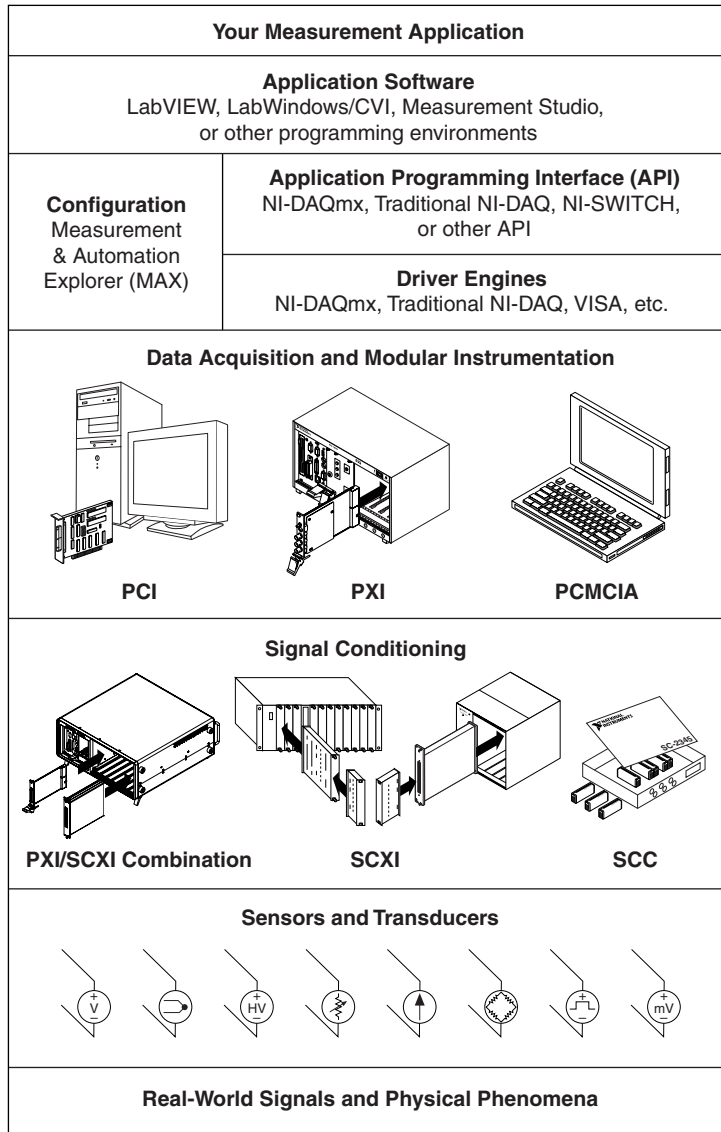

Figure 2. Measurement System Overview

The computer receives raw data through the measurement device. Signal conditioning components use sensors and transducers to condition physical phenomena so that the measurement device can easily receive the data. Software takes the raw data, presents it in a form you can understand, and

manipulates the data so it can appear in a graph, chart, or file for a report. The software also controls the measurement system, telling the measurement device when and from which channels to acquire or generate data.

NI measurement devices and application software are packaged with *NI-DAQ driver software* to program all the features of your NI measurement device such as configuring, acquiring, and generating data from, and sending data to NI measurement devices. Using NI-DAQ saves you from having to write these programs yourself. *Application software*, such as LabVIEW, sends the commands to the driver, such as acquire and return a thermocouple reading, and then displays and analyzes the data acquired.

You can use the NI-DAQ driver from LabVIEW or from any programming environment that supports calling dynamic link libraries (DLLs) through ANSI C interfaces. Regardless of the programming environment, your DAQ application uses NI-DAQ, as illustrated in Figure 2.

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

If you are using NI application software, including LabVIEW, LabWindows/CVI, and Measurement Studio, install it now. You must use NI application software version 7.0 or later with NI-DAQmx. You can use NI application software version 6.0 or later with Traditional NI-DAQ. Refer to the *Operating System, Application Software, Programming Language, and Device Support in NI-DAQ 7.0* section at the end of this guide.

Tip If you have an existing application written with an earlier version of your application software or NI-DAQ, make a backup copy of the application. You then can upgrade your software and modify the application. If you want to use the original application unchanged with the Traditional NI-DAQ API, you can use the backup copy.

Step 2. Uninstall NI-DAQ if You Are Upgrading from a Previous Version

If you are upgrading to NI-DAQ 7.0 from a previous version, uninstall the earlier version of NI-DAQ before installing the current version. Use **Control Panels»Add/Remove Programs**. Refer to `ni.com/support/install` for operating system-specific uninstallation instructions.

Step 3. Install the NI-DAQ 7.0 Software

Insert the CD
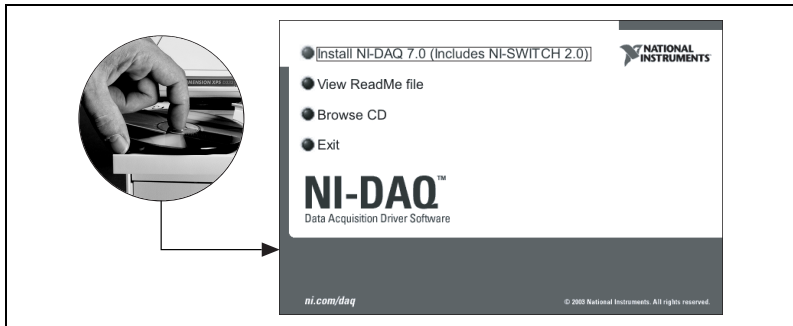
The NI-DAQ 7.0 installer should open automatically. If not, select **Start»Run**. Enter x:\setup.exe, where x is the letter of the CD drive. For troubleshooting and operating system-specific instructions, refer to the Hardware Installation Wizard at ni.com/support/install.

⚠️ **Caution** Do *not* install NI-DAQ 7.0 if your existing applications include unsupported components. Before installing the software, refer to the *NI-DAQ 7.0 Readme* file on the NI-DAQ 7.0 CD or the *Operating System, Application Software, Programming Language, and Device Support in NI-DAQ 7.0* section at the end of this guide.

💡 **Tip** Install your driver software *before* installing new devices, or Windows may not detect your device, and you may see warnings asking you to install the driver.

Choose the API/s to Install

⚠️ **Caution** NI-DAQ 7.0 cannot exist on the same system with earlier versions of NI-DAQ. When you install NI-DAQ 7.0, Traditional NI-DAQ replaces NI-DAQ 6.9.*x* and earlier versions, as well as any support files installed by that earlier version. Older versions of NI-DAQ are removed when you install NI-DAQmx.

NI-DAQ 7.0 contains several drivers and their APIs—Traditional NI-DAQ, NI-DAQmx, and NI-SWITCH. You can install any or all of the drivers, depending on the devices you are using. Refer to the *NI-DAQ 7.0 Software* section at the beginning of this guide for descriptions of Traditional NI-DAQ and NI-DAQmx.

Install and use NI-SWITCH to program an NI switch module. NI-SWITCH is an IVI-compliant switch instrument driver that supports all NI switch modules. NI-SWITCH has an interactive soft front panel for testing and

troubleshooting switch applications. NI-SWITCH 2.0 requires you to install NI-DAQmx and NI-VISA 3.0.

Install Support Files

The NI-DAQ 7.0 installer detects the NI software installed on the system and automatically selects the latest versions of the driver, application software, and language support files from the CD.
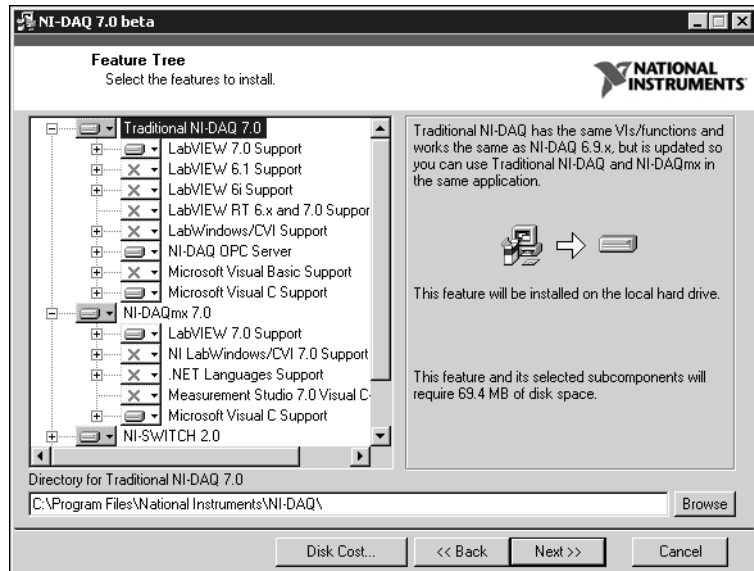
1. Verify that the installer detected and selected the correct support files and the correct version number of the application software and/or language. Double-click the plus sign in front of a feature to expand the list of feature subcomponents as shown above. You can select additional options to install the support files, examples, and documentation. Follow the software prompts.

✎ **Note** If you install NI-DAQ 7.0 first, then later install NI application software version 7.0, you need to run the NI-DAQ 7.0 installer again to install the correct application software support.

2. Click **Finish**.

3. When the installer completes, a message opens asking if you want to restart now. Click **No** and shut down the computer.

   If you need to install an RT Series product, refer to the Hardware Installation Wizard at `ni.com/support/install` for setup instructions for RT Series products.

4. Power off and unplug the computer or PXI chassis.

Step 4. Unpack the Devices, Accessories, and Cables

Your device is shipped 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 holding 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, PXI chassis, or SCXI 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 as described in *Step 10. Browse or Install Device Documentation*.

Step 5. Install the Devices, Accessories, and Cables

If you have more than one DAQ device to install, install them all now. For more information about the hardware specifics of your device, such as slot requirements, refer to the device documentation as described in *Step 10. Browse or Install Device Documentation*.

If your system includes switch or SCXI signal conditioning modules that will be connected to DAQ devices, first install the DAQ components using this guide.

📝 **Note** The following instructions do not apply to RT Series products. Refer to the Hardware Installation Wizard at `ni.com/support/install` for setup instructions for RT Series products.
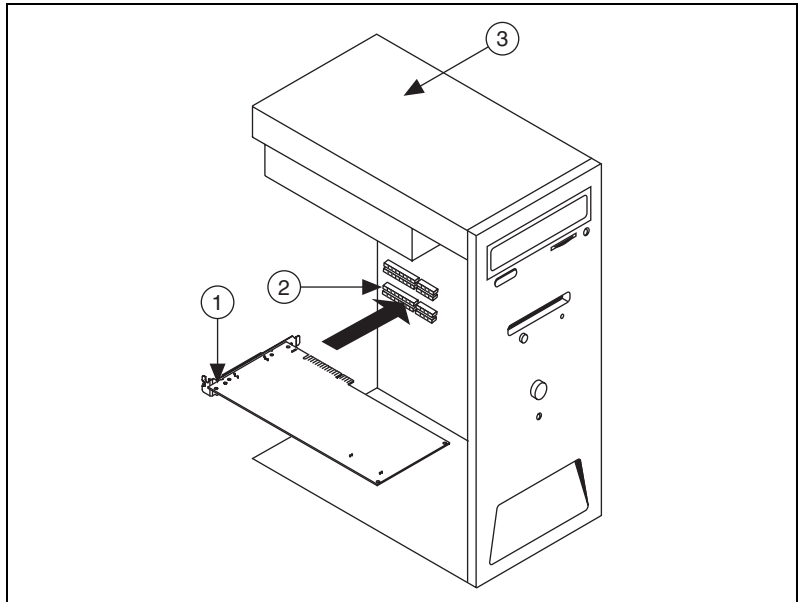
PCI Devices

⚠️ **Caution** Make sure the computer is powered off. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

Complete the following steps to install a PCI device.

1. Remove the computer cover and the expansion slot cover.

2. Touch any metal part of the computer to discharge any static electricity.

3. Insert the device into a PCI system slot. Gently rock the device into place. Do *not* force the device into place.

1	PCI DAQ Board	3	PCI Computer
2	PCI System Slot		

4. Screw the device mounting bracket to the computer back panel rail.

5. Replace the computer cover.
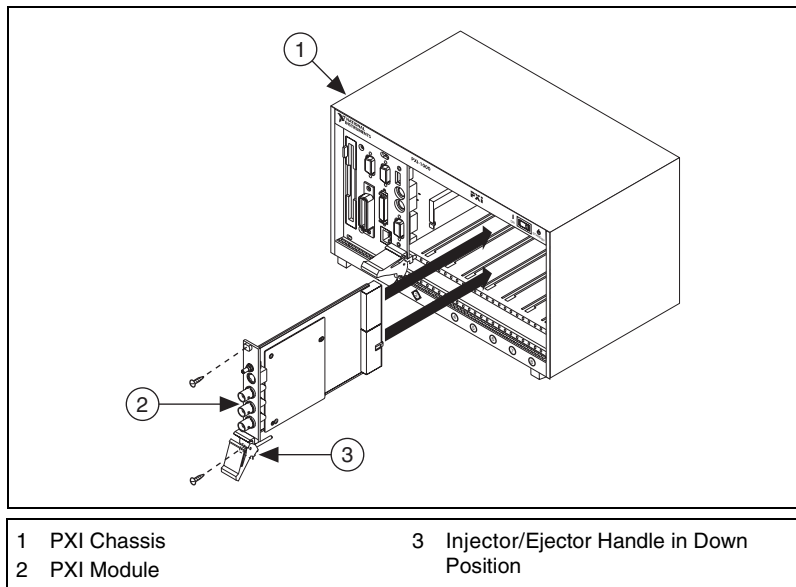
Your PCI device is installed.

PXI Devices

⚠ **Caution** Make sure the PXI chassis is powered off. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

Complete the following steps to install a PXI module.

1. Remove the filler panel of an unused PXI slot. For information on slot requirements, refer to the device documentation as described in *Step 10. Browse or Install Device Documentation*.

2. Touch any metal part of the chassis to discharge any static electricity.

3. Insert the device into the PXI slot. Use the injector/ejector handle to fully insert the device.

4. Screw the device front panel to the chassis front panel mounting rail.

| 1 | PXI Chassis | 3 | Injector/Ejector Handle in Down Position |
| 2 | PXI Module | | |

Your PXI device is installed.

PCMCIA Devices

You can install an NI PCMCIA device in any available Type II PC Card slot. Complete the following steps to install a PCMCIA device.

⚠️ **Caution** Make sure the computer is powered off. If your PCMCIA supports hot insertion, the computer may be powered on. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

1. Remove the PCMCIA slot cover on your computer, if any.

2. Insert the PCMCIA bus connector of the PCMCIA device in the slot until the connector is firmly seated. 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 PCMCIA device is keyed so that you can insert it only one way.

3. Attach the I/O cable. Be careful not to put strain on the I/O cable when inserting or removing the cable connector. 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 PCMCIA device.
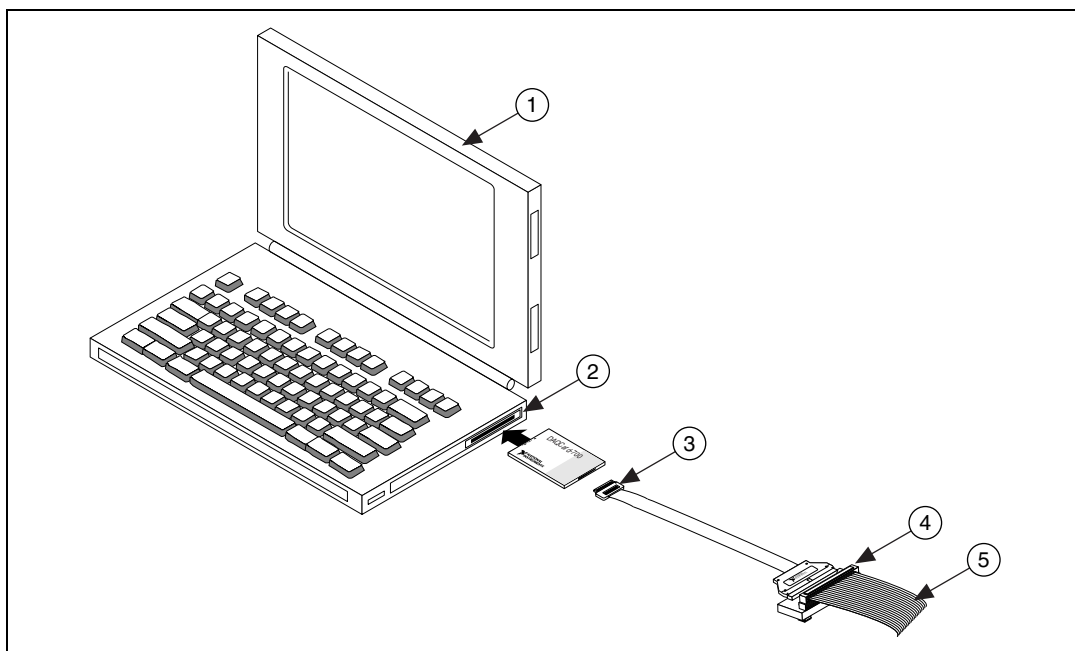
1	PCMCIA Computer	4	Accessory
2	PCMCIA Socket	5	I/O Signals
3	I/O Cable		

Your PCMCIA device is installed.
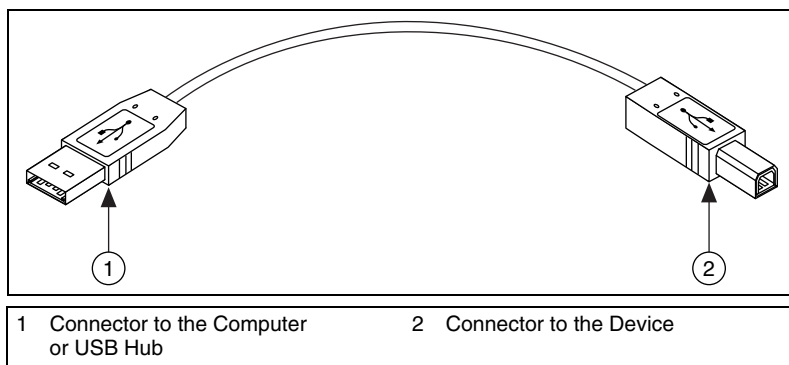
USB/IEEE 1394 Devices

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

📝 **Note** If you are using the BP-1 battery pack, follow the installation instructions in your BP-1 installation guide and disregard step 1 in this guide. The following instructions are correct if you are not using the BP-1 battery pack.

Complete the following steps to install an NI device for USB or 1394.

1. Some NI devices for USB or 1394 require external power.

   • If your device has an external power supply, verify that the voltage on the external power supply, if any, matches the voltage in your area (120 or 230 VAC) and the voltage required by your device. Connect one end of the power supply to an electrical outlet and the other end to the rear of your device.

   • If your device has a power cord, connect one end of the power cord to the device and the other end to an electrical outlet.

2. Connect the cable from the computer USB or 1394 port or from any other hub or 1394 device to any available USB or 1394 port on the device. Tighten the mounting screws, if any, for a firm connection. Connect the other end of the USB or 1394 cable to the USB or IEEE 1394 port on the device. The following figure shows the USB cable and its connectors.

| 1 | Connector to the Computer or USB Hub | 2 | Connector to the Device |

Your USB/IEEE 1394 device is installed. If you have a USB or IEEE 1394 device with a rear panel power switch, power on the device.

Accessories

Install accessories, terminal blocks, and/or SCC modules according to the instructions in their installation guides. For SCXI, continue with the instructions in this guide until *Step 12. Attach Sensors and Signals*.

Step 6. Power on Your Computer or PXI Chassis

Windows recognizes any newly installed device the first time the computer reboots after hardware is installed. On some Windows systems, the Found New Hardware Wizard opens with a dialog box for every NI device installed. **Install the software automatically (Recommended)** is selected by default. Click **Next** or **Yes** to install the software for each device so Windows recognizes the device.

When the computer recognizes a USB or IEEE 1394 device, the power LED on the device blinks or lights up, depending on the status of your device. NI devices for IEEE 1394 also have a **COM** LED, which should blink when the device is detected. For LED pattern descriptions, refer to the device documentation as described in *Step 10. Browse or Install Device Documentation*.
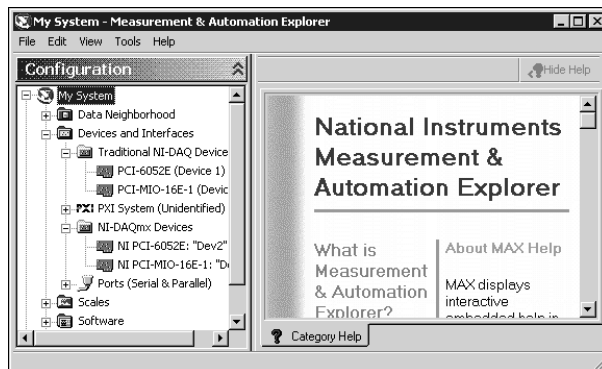
Step 7. Launch Measurement & Automation Explorer (MAX)

Double-click the **Measurement & Automation Explorer** icon on the desktop to open MAX.

# Step 8. Confirm That Your Device Is Recognized

1. Expand **Devices and Interfaces**.

2. Check that your device appears under Devices and Interfaces.

When a device is supported by both Traditional NI-DAQ and NI-DAQmx and both are installed, the same device is listed with a different name under the Traditional NI-DAQ and NI-DAQmx folders in Devices and Interfaces. If your device does not appear, press <F5>

to refresh the view in MAX. If the device is still not recognized, refer to `ni.com\support\install` for troubleshooting information.

3. Under the folder for the NI-DAQ API you are using to program the device, right-click the device you want to test.

    • If the device is under Traditional NI-DAQ, select **Properties**, then click **Test Resources** in the Properties window.

    • If the device is under NI-DAQmx, select **Self-Test**.
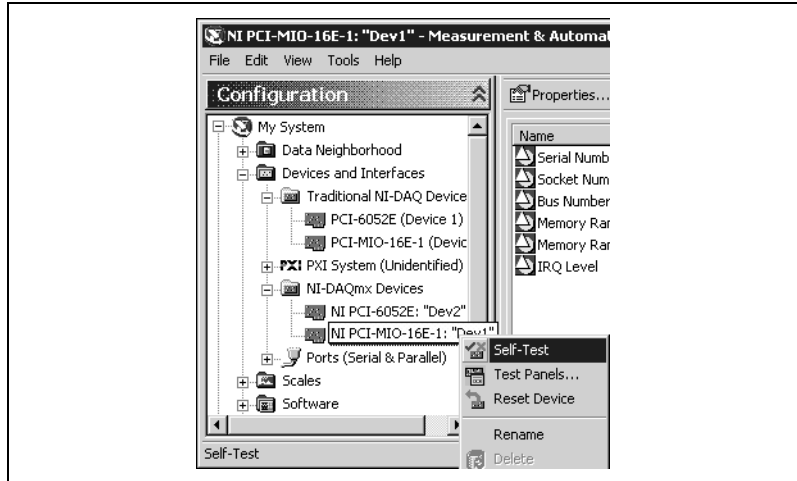
4. When the self-test finishes, a message indicates if an error occurred. If an error occurs, refer to `ni.com/support` for troubleshooting information.

Step 9. Configure Your Device Settings

Configure each device you install. To use a device in both Traditional NI-DAQ and NI-DAQmx, you must configure its properties in each.

1. Right-click the device name and select **Properties**. Be sure to click the device name under the folder for the NI-DAQ API in which you want to use the device.

2. Configure the device properties.

    • If you are using an accessory, add the accessory information.

    • If you are using a device in Traditional NI-DAQ, you can change its default settings for AI, AO, OPC, or Remote Access. Refer to your device documentation as described in the next step for more information about device default settings.

3. Click **OK** to accept the changes.

Tip For devices supported by both Traditional NI-DAQ and NI-DAQmx, you can convert Traditional NI-DAQ virtual channel and scale configurations to an NI-DAQmx configuration with the Traditional NI-DAQ to NI-DAQmx Configuration Converter Wizard. The wizard also converts SCXI and accessory configurations, but not SCC configurations. You must configure SCC information separately in each API you want to use. Refer to the *Converting Traditional NI-DAQ Configurations to NI-DAQmx Configurations* section of the *Measurement & Automation Explorer Help for NI-DAQmx* for instructions.

Step 10. Browse or Install Device Documentation

The NI-DAQ 7.0 software distribution includes the Device Documentation CD, which contains online documentation for supported DAQ, SCXI, and switch devices. Device documentation includes help files describing device terminals, device features, device operation, and PDF files of the device documents. You can use the Device Document Browser to find, view, and print the documents for each device.

You can use the NI-DAQ Device Document Browser at any time by inserting the NI-DAQ 7.0 Device Documentation CD. The NI-DAQ 7.0 document browser has the following options:

- **Browse Device Documents** opens the document browser and displays the device documentation for each device.

- **Install Device Documents** copies the document browser and all device documents to the hard drive. After installation, the browser is accessible from **Start»Programs»National Instruments»NI-DAQ» Browse Device Documentation**.

If the browser does not open automatically, select **Start»Run** and enter `x:\autorun.exe`, where *x* is the letter of the CD drive.

Note You must have Internet Explorer version 5.0 or later to use some features of the NI-DAQ 7.0 documentation, including the help system and Device Document Browser.

Step 11. Install SCXI or Switch Modules, if Applicable

If your system includes SCXI signal conditioning or switch modules to connect to DAQ devices, refer to the *SCXI Quick Start Guide* and the *NI Switches Getting Started Guide* to install and configure the SCXI and switch hardware.

The rest of this guide applies only to DAQ devices with terminal blocks or SCC accessories.

Step 12. Attach Sensors and Signals

Wire sensors and signals to the device or accessory terminals.

Helpful information is in the following documentation:

- Signal and terminal connections:
    - The *E Series Help*, device user manual PDFs, and accessory PDFs are on the Device Document Browser.
    - Pin assignments also are located in the *Measurement & Automation Explorer Help for Traditional NI-DAQ* and the *Measurement & Automation Explorer Help for NI-DAQmx*, accessible from the MAX Help menu.
- Switch specifications include a topology of the device.
- Using sensors:
    - If you are using LabVIEW, refer to the *LabVIEW Measurements Manual* packaged with LabVIEW or available from ni.com/manuals.
    - If you are using another programming environment and NI-DAQmx, refer to the *Sensors* topic of the *NI-DAQmx Help*, which you can access from **Start»Programs»National Instruments» NI-DAQ»NI-DAQmx Help**.
    - If you are using another programming environment and Traditional NI-DAQ, refer to Chapter 5, *Transducer Conversion Functions*, of the *Traditional NI-DAQ User Manual*, which you can access from **Start»Programs»National Instruments» NI-DAQ»Traditional NI-DAQ User Manual**.

Step 13. Run Test Panels

Many devices have a test panel for testing specific device functionality, such as the ability to acquire and generate signals.

1. Open the MAX help for operating test panels.
    a. In MAX, select **Help»Help Topics»NI-DAQmx** or **Traditional NI-DAQ**, whichever you will test. The MAX help opens.
    b. In the Contents tab, expand the books **Measurement & Automation Explorer»MAX for** *the version of NI-DAQ you will test***»Getting Started»DAQ Devices»Testing DAQ Devices**.
    c. Click **Testing DAQ Devices** to open the help topics for operating the test panels.
    d. Shrink the Help window and drag it to the right to uncover the MAX Configuration pane.

2. Click MAX to make it the active window.

3. Under Traditional NI-DAQ Devices or NI-DAQmx Devices, right-click the device to test.

4. Select **Test Panels** to open a test panel for the selected device.
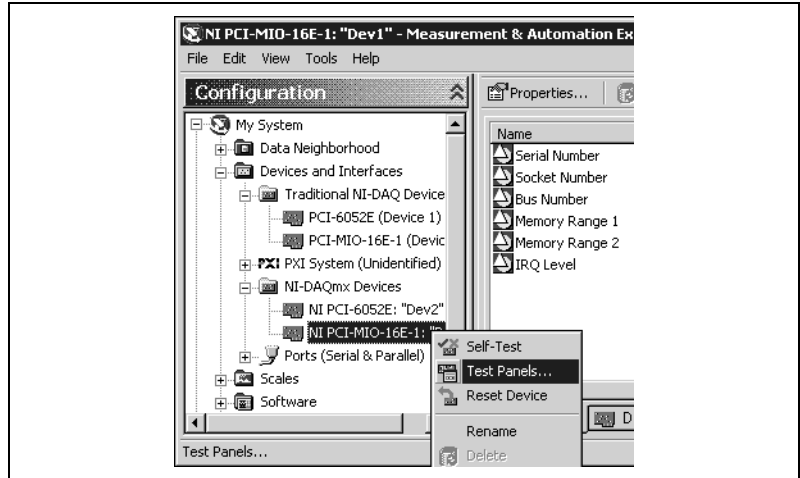
An example of a test panel is shown in the following figure.
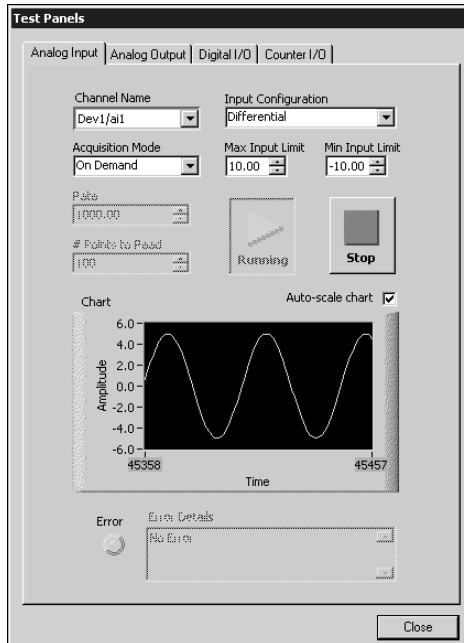
5. Click the tabs to test different functions of the device. Click the MAX Help window for instructions on operating the test panels in Traditional NI-DAQ and NI-DAQmx.

6. The test panel displays a message indicating if an error occurred. Refer to the *NI-DAQmx Reference Help* or ni.com/support for troubleshooting information.

7. When you finish, click **Close** or **OK** to exit the test panel.

Step 14. Configure Any Additional New Devices

If you installed more than one DAQ device, repeat steps 9 through 13 for each device.

Step 15. Configure Channels and Tasks

A *physical channel* is a terminal or pin at which you can measure or generate an analog or digital signal. A *virtual channel* is a collection of settings that can include a name, a physical channel, input terminal connections, the type of measurement or generation, and scaling information. In Traditional NI-DAQ and earlier versions, configuring virtual channels is an optional way to record which channels are being used for different measurements. In NI-DAQmx, virtual channels are integral to every measurement.

In Traditional NI-DAQ, you configure virtual channels using MAX. In NI-DAQmx, you can configure virtual channels with the DAQ Assistant, which you can open from MAX or your application software. You also can configure virtual channels with the NI-DAQmx API in your application program.

A *task*, an important new concept for NI-DAQmx, is a collection of one or more virtual 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 of the configuration information in a task and use the task in an application.

In NI-DAQmx, you can configure virtual channels as part of a task or separate from a task. Virtual channels created inside a task are *local channels*. Virtual channels defined outside a task are *global channels*. You can create global channels in MAX or in your application software. You can use global channels in any application or add them to a number of different tasks. If you modify a global channel, the change affects all tasks in which you reference that global channel. In most cases, it is simpler to use local channels.

Configure a Task in NI-DAQmx

Configure tasks with the DAQ Assistant when you use NI-DAQmx. You must have version 7.0 of an NI application software package to create tasks and channels with the DAQ Assistant.

- In MAX, right-click **Data Neighborhood** and select **Create New**. In the **Create New** window, select **NI-DAQmx Task** and click **Next**.

- You also can open the DAQ Assistant directly from within NI application software.

  - In LabVIEW, there are several ways to open the DAQ Assistant:

    - Drop the DAQ Assistant Express VI from the Express Input palette, as described in *Getting Started with LabVIEW.*

    - You also can use the DAQmx Task Name control to open the DAQ Assistant. Right-click the control and select **New Task (DAQ Assistant)**. The *Taking an NI-DAQmx Measurement in LabVIEW* help tutorial has step-by-step instructions on how to create a task from the DAQmx Task Name control and generate code for the task. In LabVIEW, select **Help»Taking an NI-DAQmx Measurement** to open the tutorial.

  - In LabWindows/CVI, select **Tools»Create/Edit DAQmx Tasks**.

  - In Measurement Studio, open Visual Studio .NET and select **Project»Add New Item** to open the Add New Item dialog box. In the Categories pane, select **Measurement Studio»Assistants**. In the Templates pane, select **DAQmx Task Class**.

The DAQ Assistant opens.
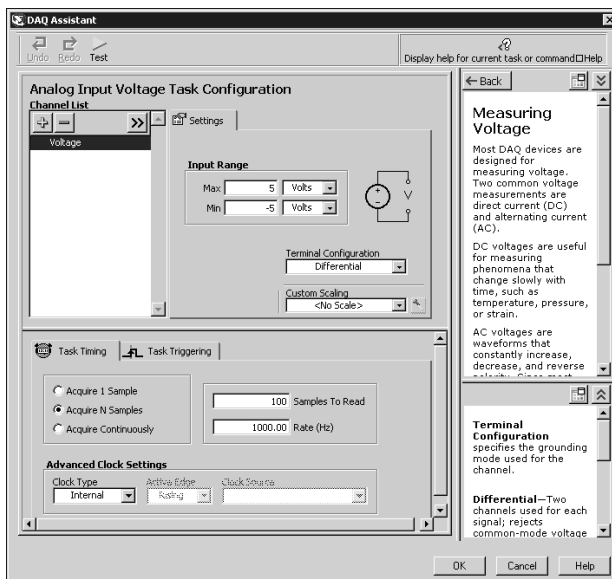
Follow the online instructions to create a new task.

1. Select an I/O type, such as analog input.

2. Select the measurement or generation to perform.

3. Choose the sensor to use, if applicable.

4. Select the channels to add to the task. You can add global channels to the task or select physical channels from which to create local channels in the task.

5. Configure measurement-specific settings, timing, and triggering, if necessary.

6. Save the task.

   • If you opened the DAQ Assistant from LabVIEW or LabWindows/CVI, click **OK**.

   • If you opened the DAQ Assistant from Measurement Studio, select **File»Save**.

   • If you opened the DAQ Assistant from MAX, click **Save Task**.

You now can use the task in an application. Refer to the *DAQ Assistant Help* or application software documentation for more information about using a task or generating code.

Configure Global Channels for NI-DAQmx

Configure global channels with the DAQ Assistant when you use NI-DAQmx.

• In MAX, right-click **Data Neighborhood** and select **Create New**. In the **Create New** window, select **NI-DAQmx Global Channel** and click **Next**.

• You also can open the DAQ Assistant directly from within LabVIEW 7.0, LabWindows/CVI 7.0, or Measurement Studio 7.0.

   – In LabVIEW, use the DAQmx Global Channel control to open the DAQ Assistant. Right-click the control and select **New Channel (DAQ Assistant)**.

   – In LabWindows/CVI or Measurement Studio, you first must create a task as previously described. In the DAQ Assistant, click **Add Existing DAQmx Global Channels** to add global channels to your task.

The DAQ Assistant opens. Follow the online instructions to create a new global channel.

1. Select an I/O type, such as analog input.

2. Select the measurement or generation to perform.

3. Choose the sensor to use, if applicable.

4. Select the physical channels to use.

5. Configure measurement-specific settings.

6. Save the task.

   - If you opened the DAQ Assistant from LabVIEW or LabWindows/CVI, click **OK**.

   - If you opened the DAQ Assistant from Measurement Studio, select **File»Save**.

   - If you opened the DAQ Assistant from MAX, click **Save Channel**.

You now can use the global channel in an application or add the global channel to a task. Refer to the *DAQ Assistant Help* or application software documentation for more information about using a channel or generating code.

Configure Virtual Channels for Traditional NI-DAQ

When you use Traditional NI-DAQ, configure virtual channels in MAX.

1. In MAX, right-click **Data Neighborhood** and select **Create New**.

2. Select **Traditional NI-DAQ Virtual Channel** in the Create New window and click **Finish**. The Create New Channel Wizard opens.

3. Follow the instructions in the Create New Channel Wizard to create a new channel. For additional information about configuring different channel types, refer to the *Measurement & Automation Explorer Help for Traditional NI-DAQ*.

Getting Started Developing an Application

Examples

Each API 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.

To locate LabVIEW and LabWindows/CVI examples, open the National Instruments Example Finder.

- In LabVIEW, select **Help»Find Examples**.
- In LabWindows/CVI, select **Help»NI Example Finder**.

Measurement Studio, Visual Basic, and ANSI C examples are in the following directories:

- NI-DAQmx examples for Measurement Studio-supported languages are in the following directories:
  - `MeasurementStudio\VCNET\Examples\DAQmx`
  - `MeasurementStudio\DotNET\Examples\DAQmx`
- Traditional NI-DAQ examples for Visual Basic are in the following directories:
  - The `NI-DAQ\Examples\Visual Basic with Measurement Studio` directory contains a link to the ActiveX control examples for use with Measurement Studio
  - The `NI-DAQ\Examples\VBasic` directory contains the examples not associated with Measurement Studio
- NI-DAQmx examples for ANSI C are in the `NI-DAQ\Examples\DAQmx ANSI C` directory.
- Traditional NI-DAQ examples for ANSI C are in the `NI-DAQ\Examples\VisualC` directory.

For additional examples, refer to `ni.com/zone`.

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 to documents assume you have NI-DAQ 7.0, and where applicable, version 7.0 of the NI application software.

LabVIEW

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

The *LabVIEW Measurements Manual* contains API overviews of Traditional NI-DAQ and NI-DAQmx, and describes measurement concepts. Select **Start»Programs»National Instruments»LabVIEW» Search the LabVIEW Bookshelf**.

The *Taking an NI-DAQmx Measurement in LabVIEW* help tutorial has step-by-step instructions on how to set up a measurement in LabVIEW and describes key new NI-DAQmx features and concepts such as the DAQ Assistant and tasks. Select **Help»Taking an NI-DAQmx Measurement** in LabVIEW to open the tutorial.

The *LabVIEW Traditional NI-DAQ VI Reference Help* and the *LabVIEW NI-DAQmx VI Reference Help* describe the LabVIEW VIs and properties. In LabVIEW, select **Help** and the LabVIEW VI reference help for the NI-DAQ API you are using.

LabWindows/CVI

The Data Acquisition Library book of the main *LabWindows/CVI Help* contains API overviews, measurement concepts, and function references for Traditional NI-DAQ and NI-DAQmx. In LabWindows/CVI, select **Help»Contents**.

Measurement Studio

The *NI Measurement Studio Help* contains the NI-DAQmx API overview, measurement tasks and concepts, and function reference. This help file is integrated into the Visual Studio .NET documentation. In Visual Studio .NET, select **Help»Contents**.

The *Measurement Studio Reference* contains the Traditional NI-DAQ API overview, measurement concepts, and function reference. In Visual Studio .NET, select **Measurement Studio»Measurement Studio Reference**.

ANSI C without NI Application Software

The *Traditional NI-DAQ User Manual* and the *NI-DAQmx Help* contain API overviews. The *NI-DAQmx Help* also contains general information about measurement concepts. The *Traditional NI-DAQ C Reference Help* and the *NI-DAQmx C Reference Help* describe the C functions and attributes. Select **Start»Programs»National Instruments»NI-DAQ** and the document title for the NI-DAQ API you are using.

.NET Languages without NI Application Software

The *NI Measurement Studio Help* contains the NI-DAQmx API overview, measurement tasks and concepts, and function reference. This help file is integrated into the Visual Studio .NET documentation. In Visual Studio .NET, select **Help»Contents**.

✎ **Note** If you use a .NET language without Visual Studio .NET, you might not be able to view the *NI Measurement Studio Help*.

Device Documentation

NI-DAQ 7.0 includes the Device Document Browser, which contains online documentation for supported DAQ, SCXI, and switch devices, such as help files describing device pinouts, features, and operation, and PDF files of the printed device documents. You can find, view, and/or print the documents for each device using the Device Document Browser at any time by inserting the CD. After installing the Device Document Browser, device documents are accessible from **Start»Programs»National Instruments»NI-DAQ»Browse Device Documentation**.

SCXI and Switch Multi-Chassis Configurations

The *SCXI-1346 Shielded Multi-Chassis Cable Adapter Installation Guide* contains setup instructions for developing SCXI and switch multi-chassis applications.

Switch

The *NI Switches Help* contains technical and programming support for the switch module and the NI-SWITCH instrument driver.

The *NI-SWITCH Instrument Driver Quick Reference Guide* contains an API overview and function/VI overview.

Training Courses

If you need more help getting started developing an application with NI products, NI offers training courses. To enroll in a course or obtain a detailed course outline, refer to ni.com/training.

Technical Support

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

Using Traditional NI-DAQ and NI-DAQmx on the Same Computer

Existing applications developed with earlier versions of NI-DAQ will run under Traditional NI-DAQ. You can use both the Traditional NI-DAQ API and the NI-DAQmx API on the same computer with the following restrictions:

- Only one API controls a given device at one time.
  - After using a device in NI-DAQmx, you must unreserve all NI-DAQmx tasks that are using that device before you can use that device through Traditional NI-DAQ. To unreserve NI-DAQmx tasks, call the DAQmx Clear Task VIs or functions.
  - After using a device in Traditional NI-DAQ, you must reset the device before you can use that device in NI-DAQmx. For SCXI devices, you must reset the communicator DAQ device.
    - Call the Traditional NI-DAQ Device Reset VI or the `Init_DA_Brds` function.
    - To reset all devices in Traditional NI-DAQ, right-click the **Traditional NI-DAQ Devices** folder in MAX and select **Reset Driver for Traditional NI-DAQ**.
- You must use the same API to program all devices—connected DAQ devices and inserted SCXI modules—in an SCXI data acquisition system.

Refer to `ni.com/support` for details and instructions about the following topics:

- How to add NI-DAQmx code to a Traditional NI-DAQ application
- How to run both Traditional NI-DAQ applications and NI-DAQmx applications that use the same device

Operating System, Application Software, Programming Language, and Device Support in NI-DAQ 7.0

Version 7.0 of NI-DAQmx does not yet support the full line of NI measurement devices. The next few releases of NI-DAQ will add support for new and existing devices in NI-DAQmx, and will continue to include Traditional NI-DAQ.

Operating System Support

NI-DAQmx, Traditional NI-DAQ, and NI-SWITCH 2.0 support Windows 2000/NT/XP/Me/98. NI-DAQ 7.0 on Windows NT requires Service Pack 6 or later. Measurement Studio requires Visual Studio .NET 2003, which requires Windows 2000/NT 4.0/XP. For operating system-specific installation instructions, use the Hardware Installation Wizard at `ni.com/support/install`.

To find and download an earlier version of NI-DAQ that supports other operating systems, refer to `ni.com/downloads`.

Application Software and Programming Language Support

Table 1 lists the application software versions supported by NI-DAQmx and Traditional NI-DAQ. If you are not using NI application software, refer to Table 2.

Table 1. NI-DAQ 7.0 Application Software Support

NI Application Software	Versions Supported by NI-DAQmx	Versions Supported by Traditional NI-DAQ
LabVIEW	7.0	6.0–7.0
LabVIEW RT module	—	6.0–7.0[1]
LabWindows/CVI	7.0	6.0–7.0
Measurement Studio	7.0	6.0–7.0[2]

[1] LabVIEW RT users must use Traditional NI-DAQ for their DAQ applications. A future version of NI-DAQmx will support LabVIEW RT.

[2] Traditional NI-DAQ does not include a Measurement Studio C++ or .NET interface.

Table 2 lists the programming languages and versions supported by NI-DAQmx and Traditional NI-DAQ.

Table 2. NI-DAQ 7.0 Programming Language Support

Programming Language	Versions Supported by NI-DAQmx	Versions Supported by Traditional NI-DAQ
ANSI C	✓	✓

Microsoft Visual C++
    Class libraries
    C DLL
	
	7.0[1]
	6.0–7.0
		
		—
		6.0–7.0

Visual Basic 6.0 through ActiveX	—	6.0
Microsoft .NET languages (C# and Visual Basic .NET)	.NET 1.1	—
[1] Requires Measurement Studio version 7.0.		

Earlier versions of NI-DAQ support other application software and language versions. To find and download an earlier version of a driver, refer to ni.com/downloads.

Device Support

For specific device model names, refer to the *NI-DAQ 7.0 Readme* file on the CD. Table 3 lists the families of devices supported by NI-DAQmx, Traditional NI-DAQ, and NI-SWITCH 2.0.

Table 3. NI-DAQ 7.0 Device Support

Device	NI-DAQmx	Traditional NI-DAQ	NI-SWITCH 2.0
PCI and PXI E Series multifunction DAQ devices, such as the NI PCI-6052E	✓	✓	not applicable
DAQPad devices for USB and FireWire (IEEE 1394)	—	✓	not applicable
DAQCard E Series PCMCIA devices	—	✓	not applicable
NI PCI-6013/6014 16-bit basic multifunction DAQ devices	—	✓	not applicable
S Series multifunction DAQ devices, such as the NI PXI-6115	—	✓	not applicable

Table 3. NI-DAQ 7.0 Device Support (Continued)

Device	NI-DAQmx	Traditional NI-DAQ	NI-SWITCH 2.0
Digital I/O devices, such as the NI 653X family of devices	—	✓	not applicable
NI PCI-4551, PCI-4552, and PCI and PXI-4472 dynamic signal acquisition devices	—	✓	not applicable
NI PCI and PXI 671X/673X analog output devices	—	✓	not applicable
NI 660X counter/timer I/O devices	—	✓	not applicable
NI SCXI-1530, SCXI-1531, and SCXI-1540 signal conditioning modules	✓[1]	✓	not applicable
All other SCXI signal conditioning modules	✓	✓	not applicable
SCC Series signal conditioning modules	✓	✓	not applicable
NI SCXI-1166 and SCXI-1193 switch modules	✓	—	✓
All other SCXI switch modules	✓	✓	✓
NI PXI-2566 and PXI-2593 switch modules	✓	—	✓
All other PXI switch modules	—	—	✓
NI PXI-4204 and PXI-4220 modules	✓	—	—

[1] These devices are supported in NI-DAQmx without support for accelerometer, linear-voltage differential transformer (LVDT), and rotary variable-differential transformer (RVDT) virtual channels.

Refer to the *NI-DAQ 7.0 Readme* file on the NI-DAQ 7.0 CD for the list of new devices supported by NI-DAQ 7.0.

More Devices in Future Releases of NI-DAQmx

Future releases of NI-DAQ will support additional devices in NI-DAQmx that are currently supported only in Traditional NI-DAQ.

Devices Restricted to Traditional NI-DAQ

NI-DAQmx does not support the following devices and will not support them in future NI-DAQ releases. The following devices are supported *only* in Traditional NI-DAQ.

- AT E Series devices
- AT-AO-6/10 analog output devices
- AT-DIO-32F 32-bit parallel DIO devices
- DAQCard-AI-16E-4 and DAQCard-AI-16XE-50 PCMCIA devices
- NI PCI-4451/4452/4454 dynamic signal acquisition and generation devices
- NI 4350/4351 data loggers

Devices No Longer Supported in NI-DAQ 7.0

The following products are *not* supported in NI-DAQ 7.0—in neither NI-DAQmx nor Traditional NI-DAQ—and will *not* be supported in future versions of NI-DAQ. You must use NI-DAQ 6.9.*x* or earlier to program these devices.

- AT-MIO-16F-5 multifunction DAQ device
- DAQCard-500, DAQCard-516, DAQCard-700, DAQCard-1200, and DAQCard-AO-2DC PCMCIA devices
- DAQPad-1200 and DAQPad-MIO-16XE-50 devices for parallel port
- Lab-PC family of ISA and PC/XT MIO devices
- PC-516 16-bit, 50 kS/s MIO device
- PC-AO-2DC low-cost AO and current loop DAQ device
- PC-LPM-16PnP MIO device for the PC
- PC-OPDIO-16 optically isolated DIO device for the PC
- PC-TIO-10 timing and DIO interface for the PC
- PCI-1200 12-bit, 100 kS/s MIO device
- SCXI-1200 12-bit DAQ and control module
- SCXI-2000 4-slot chassis
- SCXI-2400 serial interface module
- VXI DAQ modules, VXI-SC carriers and modules, and VXI-TB terminal blocks for VXI bus