

#### Taking an NI-DAQ™mx Measurement in NI LabVIEW SignalExpress™

January 2008, 372132C-01

This tutorial teaches you how to take an NI-DAQmx measurement in LabVIEW SignalExpress 2.*x* or later using the DAQmx Acquire Step. You also will learn how to log this data to disk and how to play back the recorded data.

In this tutorial, you acquire a voltage measurement, log the data, and play back the data using LabVIEW SignalExpress.



**Note** If you are a new user of LabVIEW SignalExpress, refer to *Getting Started with LabVIEW SignalExpress*.

To navigate this help file, use the **Contents**, **Index**, and **Search** tabs to the left of this window.

To comment on National Instruments documentation, refer to the <u>National</u> <u>Instruments Web site</u>.

© 2003–2008 National Instruments Corporation. All rights reserved.

#### Introduction to Taking an NI-DAQmx Measurement in LabVIEW SignalExpress

This tutorial teaches you how to take an NI-DAQmx measurement in LabVIEW SignalExpress 2.*x* or later using the DAQmx Acquire Step and how to configure that step using the DAQ Assistant. You also will learn how to log this data to disk and how to play back the recorded data.

In this tutorial, you will complete the following:

- Create a DAQmx Acquire Step
- Configure the DAQmx Acquire Step using the DAQ Assistant in LabVIEW SignalExpress
- Log acquired data to disk
- Play back the recorded data

Note If you are a new user of LabVIEW SignalExpress, refer to Getting Started with LabVIEW SignalExpress.

Next: Before You Begin

## **Before You Begin**

To use this tutorial, you must have the following software and hardware installed in your system:

- LabVIEW SignalExpress 2.x or later
- NI-DAQmx (Refer to the *LabVIEW SignalExpress Readme* for versions of NI-DAQmx that support using the DAQ Assistant in LabVIEW SignalExpress.)
- A data acquisition (DAQ) device, physical or simulated, that is supported by NI-DAQmx and is connected to a voltage signal. Refer to the *Measurement & Automation Explorer Help for NI-DAQmx* for instructions on creating an NI-DAQmx simulated device. Refer to the *NI-DAQ Readme* file to see if NI-DAQmx supports your device.

Refer to the *DAQ Getting Started Guide* and the device documentation for information about installing and configuring the software and hardware.

Previous: Introduction to Taking an NI-DAQmxMeasurement in SignalExpress

<u>Next: 1. Create a</u> DAQmx Acquire Step

## **1. Create a DAQmx Acquire Step**

Complete the following steps to create a DAQmx Acquire step that measures analog input voltage.

- 1. Open LabVIEW SignalExpress.
- 2. Click Add Step, and select Acquire Signals»DAQmx Acquire»Analog Input»Voltage.
- 3. In the **Add Channels** dialog box, select the physical channel(s) to use in the step.

#### 💡 Tip

Use + to insert channels to the step.

- Use  $\boxed{s}$  to change the physical channels used in the step.
- Use  $\boxed{\times}$  to remove selected channels from the step.

Previous: Before You Begin

Next: 2. Configure the Step

# **2. Configure the DAQmx Acquire Step**

After you create a step, you can use the Configuration tab to modify channel settings and basic timing settings. Using the other tabs, you can configure more advanced timing and triggering settings.

To configure the voltage measurement step, complete the following steps.

- 1. Specify the input range. You can use the default values.
- 2. Select the terminal configuration you used to connect the signal.

1- 90 1- 1- -1-		
6:00:00.000 PM	6:00:25.000 PM 6:00:50.000 PM 6:01:15.0 Graph Display Type	00 PM 6:01:40.000 PM 6:02:05.000 PM 6:02:30.000 PM 6:02:55.000 P AutoScale Y-Axis 🗹
	Configuration Triggering Advanced Ti Channel Settings Details Details Voltage Dev1_ai0 Click the Add Channels button (+) to add more channels to the task.	Voltage Input Setup   Settings   Calibration   Signal Input Range   Max   5   Volts   Terminal Configuration Differential Custom Scaling <no scale=""></no>

3. Under Timing Settings, select N Samples as the Acquisition Mode. Enter 100.00 for Samples To Read, and enter 1000.00 for Rate (Hz), as shown in the following figure.

ng Settings uisition Mode	Samples t	o Read Rate (Hz)	)
N Samples	~	100	1k
	N Samples	N Samples 💉	N Samples 100

Note This example does not use custom scaling or triggering. To learn about scaling and triggering, refer to the *NI-DAQmx Help*.

Previous: 1. Create a DAQmx Acquire Step Next: 3. Test the Step

## 3. Test the Step

You can view data acquired in the DAQ Assistant to test the step and signal connection. Click **Run Once** to test the step. Data acquired appears in the graph. Verify that you are acquiring expected data and that you connected the signal properly. If necessary, modify any settings and run your step again.



Previous: 2. Configure the Step

Next: 4. Log the Data

## 4. Log the Data

After you verify that you are acquiring data using NI-DAQ, you can log the data to disk.

- 1. Click Record.
- 2. In the **Logging Signals Selection** dialog, place a checkmark in the box next to the signals to log or record.
- 3. Click OK.

Logging Signals Selection	
Signals to include	
Voltage	
······ ▼K∑ Dev1_au	

- 4. LabVIEW SignalExpress begins logging the signals. When you finish logging your data, click **Stop** to stop logging the signals.
- 5. A **First Log Complete** dialog box informs you that you have completed your data log. Click **OK** to close this window.

Previous: 3. Test the Step

Next: 5. Play Back the Data

## **5. Play Back the Data**

After you log data, you can view your data file. Complete the following steps to play back the data.

- 1. Select Edit»Work Areas»Playback. You can also use the Work Area Selector drop-down menu in the top left.
- 2. Select the timestamp of the data you want to play back from the drop-down menu.



3. Drag your data from the **Logged Data** window in the lower left corner, as shown in the following image, and drop it on the graph in the **Data View**.

□ - Cogs □	
]	_

The graph displays the recorded data.

Previous: 4. Log the Data

Next: What's Next

### What's Next

In this tutorial, you learned how to do the following:

- Create a DAQmx Acquire Step
- Configure the DAQmx Acquire Step using the DAQ Assistant in LabVIEW SignalExpress
- Test the step using the DAQ Assistant
- Log data to disk
- Play back the recorded data

#### **Related Documentation**

The following documents contain information that you might find helpful as you use NI-DAQmx and LabVIEW:

- Getting Started with LabVIEW SignalExpress—This manual contains information you use to familiarize yourself with LabVIEW SignalExpress and basic SignalExpress features you use to perform data acquisition, instrument control, data logging, and analysis. Select Start»Programs»National Instruments»LabVIEW SignalExpress»Getting Started with LabVIEW SignalExpress.
- DAQ Assistant Help—This help file contains information about using the DAQ Assistant to interactively configure common measurement tasks, channels, or scales. In LabVIEW 7.x or later, LabWindows™/CVI™ 7.x or later, or Measurement Studio 7.x or later, you also can use the DAQ Assistant to generate NI-DAQmx code from the tasks and channels. You can also use the DAQ Assistant in LabVIEW SignalExpress 2.x and later to configure DAQmx steps.
- *DAQ Getting Started Guide*—This guide describes how to install NI-DAQmx driver software and data acquisition (DAQ) devices and how to confirm that the device is operating properly.
- *LabVIEW Help*—This help file contains information about LabVIEW SignalExpress palettes, menus, tools, VIs, and functions. This help file also includes step-by-step instructions for using LabVIEW SignalExpress features. In LabVIEW SignalExpress, select **Help**.
- Measurement & Automation Explorer Help for NI-DAQmx—This help file contains information on configuring and testing DAQ devices, SCXI devices, SCC devices, and RTSI cables using Measurement & Automation Explorer (MAX) for NI-DAQmx and information about special considerations for operating systems. In MAX, select **Help»NI-DAQmx**.

To learn more about tasks, channels, and other NI-DAQmx concepts, refer to the *NI-DAQmx Help* located at **Start»Programs»National Instruments»NI-DAQmx»NI-DAQmx Help**.

The *LabVIEW SignalExpress Help* also includes information about creating and using other NI-DAQmx measurements.

You also can look at the examples that ship with LabVIEW SignalExpress. Examples that ship with LabVIEW SignalExpress can be found in the following directory:

C:\Program Files\National Instruments\SignalExpress\Examples\

Previous: 5. Play Back the Data