

# Data Acquisition: 7 Steps to Success

## Overview

This course kit is an introduction to key concepts of data acquisition and aims to help you get started quickly. The tutorial takes you through the seven steps of designing, configuring, and testing your data acquisition application. It also includes a brief overview of signal theory and definitions, as well as numerous hands-on exercises using National Instruments LabVIEW, National Instruments LabWindows/CVI or Microsoft Visual Basic .NET. Using these seven steps will reduce your hardware set-up and software development time for your data acquisition applications. This course kit is recommended reading for the NI Data Acquisition and Signal Processing course.

## Audience

- New and existing users of data acquisition devices
- Users preparing for the NI Data Acquisition and Signal Processing course

## Prerequisites

- Familiarity with computers and MS Windows
- Familiarity with NI LabVIEW, NI LabWindows/CVI or Microsoft Visual Basic .NET

## NI Products Recommended for use with this kit

- LabVIEW Professional Development System
- LabWindows/CVI Full Development Systems
- NI Data Acquisition Device

## After reviewing this material, you will be able to:

- Identify different types of signals
- Categorize and describe signals
- Identify necessary connection issues when setting up your system
- Configure your DAQ device
- Use Test panels to test and troubleshoot your connections and settings

## Ordering and Registration

Order the course kit or register for an instructor-led course online at [ni.com/training](http://ni.com/training) or call (800)433-3488  
 Fax: (512)683-9300 [info@ni.com](mailto:info@ni.com)

Outside North America, contact your local NI Office.  
 Worldwide Contact Info: [ni.com/global](http://ni.com/global)

## Special Offer

Deduct the price of this course kit if you register for the Data Acquisition and Signal Processing course within 90 days of purchasing the course kit.

**Part Number:** 779489-01

- Leverage available resources to locate example programs as starting points for your applications

## Suggested Next Courses

- LabVIEW Basics I and II
- Data Acquisition and Signal Processing
- LabVIEW Modular Instruments

## Data Acquisition Training Series



Training	Analog Input and Output	Digital Input and Output	Counter Functions	Triggering	Instructor Led
Data Acquisition: 7 Steps to Success Tutorial Kit	X	X			
Data Acquisition and Signal Condition Course Kit	X	X	X	X	
Data Acquisition and Signal Condition Training Course	X	X	X	X	X

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## Step 1

### Define Your Application Needs

- A. Virtual Instrumentation
- B. What Is Data Acquisition?
- C. Transducers

## Step 2

### Identify Your Signal

- A. DAQ Terminology
- B. Apply DAQ Terminology to Your Signal
- C. Describe Your DAQ Application

## Step 3

### Connect Your Signal

- A. Install Your DAQ Device
- B. Determine Connection Points
- C. Connect Your Signal

## Step 4

### Test Your Hardware

- A. Test Your DAQ Hardware Device
- B. Test with an NI-DAQmx Simulated Device  
Exercise 4-1 MAX Connect
- C. Troubleshooting Resources

## Step 5

### Prototype Your Application

- A. Types of Configurations
- B. Settings and Considerations  
Exercise 5-1 Configuring a DAQmx Task in MAX
- C. Taking Measurements with LabVIEW SignalExpress LE

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## Step 6

### Program Your Software Application

- A. Sequence of NI-DAQmx Operations
- B. Recommended Starting Points
- C. Hands-On Programming
- D. Analog Input (AI) Applications
  - Exercise 6-1 Analog Input: LabVIEW
  - Exercise 6-2 Analog Input: LabVIEW
  - Exercise 6-3 Analog Input: LabWindows/CVI
  - Exercise 6-4 Analog Input: Visual Basic .NET
- E. Analog Output (AO) Applications
  - Exercise 6-5 Analog Output: LabVIEW
  - Exercise 6-6 Analog Output: LabWindows/CVI
  - Exercise 6-7 Analog Output: Visual Basic .NET
- F. Digital Input/Output Applications
  - Exercise 6-8 Digital Input: LabVIEW
  - Exercise 6-9 Digital Input: LabWindows/CVI
  - Exercise 6-10 Digital Input: Visual Basic .NET
  - Exercise 6-11 Digital Output: LabVIEW
  - Exercise 6-12 Digital Output: LabWindows/CVI
  - Exercise 6-13 Digital Output: Visual Basic .NET

## Step 7

### Deploy Your Software Application

- A. Troubleshooting Techniques
- B. Other Testing Resources
- C. Deployment
- D. Using the MAX Export Wizard with Deployment
- E. Creating Your Executable and Installer in LabVIEW
- F. Creating Your Executable and Installer in LabWindows/CVI
- G. Creating Your Executable and Installer in Visual Basic .NET
- H. NI-DAQmx Runtimes