

LabWindows/CVI Basics I Course

Overview

The LabWindows/CVI Basics I course prepares you to create your own applications using LabWindows/CVI. After completing this course, you will have mastered the LabWindows/CVI programming environment, and will be able to create basic solutions using many of the built-in features of LabWindows/CVI. By the end of the course, you will know how to develop applications using the LabWindows/CVI programming environment. The hands-on format of the course enables you to apply skills learned in the course to your application.

Duration – Three Days

Audience

- New users and users preparing to develop applications using LabWindows/CVI
- Users and technical managers evaluating LabWindows/CVI

Prerequisite

- Experience with C programming or ANSI C Primer Course

NI Products Used During the Course

- LabWindows/CVI 7.0
- E-Series DAQ Board
- IEEE 488.2 (GPIB) Board
- DAQ Signal Accessory
- NI Instrument Simulator

REGISTRATION

Register online at ni.com/china/events or call (800) 820-3622 • Fax: 021-65556244
china.events@ni.com

Worldwide Contact Info: ni.com/global

NI can also hold this class onsite at your facility.

Ordering Information 910019-xx

-01 NI Corporate or Branch, -11 Regional, -21 Onsite

After attending this course you will be able to:

- Develop your applications within the LabWindows/CVI environment
- Create professional-looking user interfaces with strip charts, graphs, and buttons
- Understand the fundamentals of event-driven programming
- Create and use an instrument driver
- Use the powerful formatting and scanning functions in LabWindows/CVI
- Control a GPIB and serial instrument
- Develop stand-alone LabWindows/CVI applications
- Configure and use data acquisition within LabWindows/CVI

Suggested Next Courses:

- LabWindows/CVI Basics II
- Instrument Driver Development Course (for developing IVI-compliant instrument drivers)

LabWindows/CVI Basics I Course Outline

Day 1

Introduction to LabWindows/CVI

This lesson introduces LabWindows/CVI. You will learn how to navigate within the integrated environment to develop, compile, and debug C code. Topics include:

- LabWindows/CVI features
- Advantages to writing code inside the LabWindows/CVI environment
- Creating Function Panels, help for Function Panels, and Function Panel variables
- Using Interactive Execution to quickly run a Function Panel
- Building and linking your projects all within the integrated environment
- Techniques to debug your application

Graphical User Interface

This lesson describes how to design and build a graphical user interface. You will be introduced to the components of a user interface and how the user interface can be used to control your code with event-driven programming. You will learn how easy it is to use LabWindows/CVI to create “skeleton code” that can be modified for your own application. Topics include:

- Using the User Interface Editor to develop professional user interfaces
- Developing “skeleton-code” based on the user interface you designed with a push of a button
- Callback functions to process user interface data
- Efficient applications that use and process events
- Building applications that plot data on charts and graphs
- Developing customized controls

Day 2

Instrument Drivers

This lesson describes the use of instrument drivers. You will learn how to create function panels for your own functions that can be accessed similarly like a shipping LabWindows/CVI function. You also learn how to document your function panels and create help for your instrument driver. Topics include:

- Using an instrument driver
- Developing applications that can call functions from other modules
- Creating specific function panels for your custom functions to take advantage of the capabilities of LabWindows/CVI

Formatting and Scanning

This lesson describes the functions that allow you to easily convert between numeric data and character array strings. You will also learn how you can use the formatting functions in LabWindows/CVI to arrange data in arrays, create and modify character strings, and discard unwanted data. Topics include:

- Formatting and scanning differences between LabWindows/CVI and ANSI C
- Converting data within the language
- Developing applications that need to manipulate strings

Day 3

Distributing LabWindows/CVI Applications

This lesson describes how to take an application in LabWindows/CVI and distribute the application. Topics include:

- Developing stand-alone applications that can be released without the development environment
- Running stand-alone applications and the implications of a stand-alone executable

Data Acquisition

This lesson describes how LabWindows/CVI and the NI-DAQmx driver can be used to perform data acquisition using a National Instruments E-Series data acquisition device. You will learn how to use LabWindows/CVI to take advantage of the primary functions on an E-Series data acquisition device. Topics include:

- Data acquisition overview
- Overview of data acquisition within the LabWindows/CVI environment
- Configuring your data acquisition system
- NI-DAQmx architecture and how tasks and channels are used to perform data acquisition
- Functions needed to program a data acquisition system
- Performing single point, multiple point, and continuous analog input acquisition
- Performing digital input and output to monitor switches or control relays
- Counters and how they can be used to perform edge counting
- Using the DAQ Assistant to perform data acquisition in 90 seconds without writing any code

Instrument Control

This lesson teaches you how to use LabWindows/CVI to perform instrument control using GPIB and serial communication. You will learn powerful programming techniques that can be used to control the latest instruments. Topics include:

- Instrument control overview
- Overview of GPIB communication
- GPIB hardware specifications
- Developing an understanding how to configure a GPIB board and GPIB instruments
- Virtual Instruments Software Architecture (VISA) as a high-level, easy-to-use programming method for communicating with instruments
- Using VISA to program a GPIB instrument
- Using the Instrument I/O Assistant to communicate with an instrument in 90 seconds without writing any code
- Using a pre-built instrument driver to communicate with an instrument
- Serial communication overview
- Using serial communication to communicate to instruments through RS-232

Note: In-depth training on building IVI-compliant instrument drivers is covered in the Instrument Driver Development Course.