



# LabWindows/CVI

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## LabWindows/CVI Master Index

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# About This Manual

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The *LabWindows/CVI Master Index* contains a comprehensive index and glossary, as well as a list of chapter titles for each manual of the LabWindows/CVI documentation set.

## Organization of This Manual

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This manual is organized as follows:

- The *Master List of Contents* contains the chapter titles of every manual in the LabWindows/CVI set.
- The *Master Glossary* is a compilation of all the LabWindows/CVI manual glossaries.
- The *Master Index* contains a comprehensive index of important terms and concepts and tells where you can find them in the LabWindows/CVI manual set.
- Appendix A, *Customer Communication*, contains forms you can use to request help from National Instruments or to comment on our products and manuals.

## Conventions Used in This Manual

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This index is for use with the following manuals. Each page number entry is preceded by a code in capital letters that identifies the manual in which it appears. The following manual list indicates which code indicates each manual:

ANLS	<i>LabWindows/CVI Advanced Analysis Library Reference Manual</i>
GS	<i>Getting Started with LabWindows/CVI</i>
INST	<i>LabWindows/CVI Instrument Driver Developers Guide</i>
PRGREF	<i>LabWindows/CVI Programmer Reference Manual</i>
STDLIB	<i>LabWindows/CVI Standard Libraries Reference Manual</i>
USER	<i>LabWindows/CVI User Manual</i>
USRINT	<i>LabWindows/CVI User Interface Reference Manual</i>

# Customer Communication

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National Instruments wants to receive your comments on our products and manuals. We are interested in the applications you develop with our products, and we want to help if you have problems with them. To make it easy for you to contact us, this manual contains comment and configuration forms for you to complete. These forms are in Appendix A, *Customer Communication*, at the end of this manual.

# Master List of Contents

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# Master Glossary

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Prefix	Meanings	Value
p-	pico	$10^{-12}$
n-	nano-	$10^{-9}$
$\mu$ -	micro-	$10^{-6}$
m-	milli-	$10^{-3}$
k-	kilo-	$10^3$
M-	mega-	$10^6$

## Numbers/Symbols

1D One-dimensional.

2D Two-dimensional.

## A

A Analog input.

A/D Analog-to-digital.

AC Alternating current.

active window The window affected by user input at a given moment. The title of an active window is highlighted.

analog trigger A trigger that occurs at a user-selected point on an incoming analog signal. You can set triggering to occur at a specific level on an increasing or a decreasing signal, that is, a positive or negative slope. You can implement analog triggering in software or in hardware. When you implement it in software, all data is collected, transferred into system memory, and analyzed for the trigger condition. When you implement it in hardware, no data is transferred to system memory until the trigger condition has occurred.

ANOVA	Analysis of variance.
ANSI	American National Standards Institute.
AO	Analog output.
API	Application Programming Interface. A set of functions exported by a library.
Array Display	A mechanism for viewing and editing numeric arrays.
asynchronous	(1) Hardware—A property of an event that occurs at an arbitrary time, without synchronization to a reference clock. (2) Software—A property of a function that begins an operation and returns prior to the completion or termination of the operation.
auto-exclusion	A mechanism that prevents pre-existing lines from executing in the Interactive Execution Window.
automatic serial	A feature in which the GPIB polling driver automatically executes serial polls whenever a device asserts the SRQ line.

## **B**

B	Bytes.
binary control	A function panel control that resembles a physical on/off switch and can produce one of two values depending upon the position of the switch.
binary switch	A control that selects between two states: on and off.
bitmap	A set of data that can be used to draw a graphic image. The data consist of information determining the height and width of the image or pixel grid, and the color of each pixel.
bps	Bits per second.
breakpoint	An interruption in the execution of a program.
Breakpoint	A function that interrupts the execution of a program.
Breakpoint command	A specific command that interrupts the execution of a program.

**C**

C locale	The minimal environment for compiling a C program.
canvas	An arbitrary drawing surface to display text, shapes, and bitmap images.
cdecl	A function calling convention in which function calls pass arguments from right to left and the caller restores the stack pointer after the call.
check box	A dialog box item that allows you to toggle between two possible options.
click	A mouse-specific term; to quickly press and release the mouse button.
clipboard	A temporary storage area LabWindows/CVI uses to hold text that is cut, copied, or deleted from a work area.
cm	Centimeters.
CodeBuilder	The LabWindows/CVI feature that creates source code based on a .uir file to connect your GUI to the rest of your program. This code can be compiled and run as soon as it is created.
command button	A dialog box item that, when selected, executes a command associated with the dialog box.
common control	A function panel control that specifies the first parameter in both primary and secondary functions associated with a function panel. A common control appears on a function panel in the same color or intensity as a primary control.
compiler define	A command line argument passed to the compiler that defines an identifier as a macro to the preprocessor.
confirm pop-up panel	Allows you to confirm an action before it is taken.
control	An input and output device that appears on a function panel for specifying function parameters and displaying function results.
counter/timer	A circuit that counts external pulses or clock pulses (timing).
coupling	The manner in which a signal is connected from one location to another.

- cursor The flashing rectangle that shows where you can enter text on the screen. If you have a mouse installed, there is also a mouse cursor.
- cursor location indicator An element of the LabWindows/CVI screen that specifies the row and column position of the cursor in the window.

## D

- D/A Digital-to-analog.
- Data acquisition (1) Collecting and measuring electrical signals from sensors, transducers, and test probes or fixtures and inputting them to a computer for processing. (2) Collecting and measuring the same kinds of electrical signals with A/D and/or DIO boards plugged into a PC and possibly generating control signals with D/A and/or DIO boards in the same PC.
- DC Direct current.
- default command The action that takes place when <Enter> is pressed and no command is specifically selected. Default command buttons are indicated in dialog boxes with an outline.
- device Refer to a DAQ device inside your computer or attached directly to your computer via a parallel port. Plug-in boards, PCMCIA cards, and devices such as the DAQPad-1200, which connects to your computer parallel port, are all examples of DAQ devices. SCXI modules are distinct from devices with the exception of the SCXI-1200, which is a hybrid.
- DFT Discrete Fourier Transform.
- dialog box A prompt mechanism in which you specify additional information needed to complete a command.
- differential input An analog input consisting of two terminals, both of which are isolated from computer ground, whose difference is measured.
- digital port Refer to *port*.
- DIO Digital I/O.
- DLL Dynamic Link Library. A file that contains a collection of functions that can be used by multiple applications (.exe files).
- double-click A mouse-specific term; to click the mouse button twice in rapid succession.

drag	A mouse-specific term; to hold down the mouse button while moving the mouse across a flat surface, such as a mouse pad.
DSP	Digital signal processing.
<b>E</b>	
entry mode indicator	An element of the LabWindows/CVI screen that indicates the current text entry mode (insert or overwrite).
event	Informs the application program that the user has performed an action. An event is generated whenever the user selects a command from the menu bar or manipulates a control that was configured to generate events.
excluded code	Code that is ignored during compilation and execution. Excluded lines of code are displayed in a different color than included lines of code.
external module	A <code>.lib</code> , <code>.obj</code> , or <code>.dll</code> file that can be loaded and executed.
<b>F</b>	
FFT	Fast Fourier Transform.
FHT	Fast Hartley Transform.
FIFO	A first-in first-out memory buffer; the first data stored is the first data sent to the acceptor.
file select pop-up panel	A predefined pop-up panel that displays a list of files on disk from which the user can select.
FIR	Finite impulse response.
format string	A mini-program that instructs the formatting and scanning functions how to transform the input arguments to the output arguments. For conciseness, format strings are constructed using single-character codes.
<code>.fp</code> file	A file that contains information about the function tree and function panels of an instrument module.
full-screen mode	A screen display mode in which one window occupies the entire screen.

function panel	A screen-oriented user interface to the LabWindows/CVI libraries in which you can interactively execute library functions and generate code for inclusion in a program.
Function Panel Editor window	The window used to create and modify instrument driver function panels. It is described in the <i>LabWindows/CVI Instrument Driver Developer's Guide</i> .
Function Panel window	A window that contains one or more function panels.
function tree	The hierarchical structure in which the functions in a library or an instrument driver are grouped. The function tree simplifies access to a library or instrument driver by presenting functions organized according to the operation they perform, as opposed to a single linear listing of all available functions.
Function Tree Editor window	The window in which you build the skeleton of a function panel file. It is described in the <i>LabWindows/CVI Instrument Driver Developer's Guide</i> .
<b>G</b>	
gender	Refers to cable connector types. A male connector is one with protruding pins, like a lamp plug. A female connector has holes, like an outlet.
gender changer	A small device you can attach to serial cable connectors or PC sockets, among others, to convert a female connector into a male or a male connector into a female.
Generated Code window	A small window located at the bottom of the function panel that displays the function call code that corresponds to the current state of the function panel controls.
global control	A function panel control that displays the contents of global variables in a library function. Global controls allow you to monitor global variables in a function that are not specifically returned as results by the function. These are read-only controls that cannot be altered by the user, and do not contribute a parameter to the generated code.
glue code	Special code that provides the interface between 32-bit LabWindows/CVI applications and 16-bit DLLs.

GPIB	General Purpose Interface Bus is the common name for the communications interface system defined in ANSI/IEEE Standards 488.1-1987 and 488.2-1992.
graph control	Displays graphical data as one or more plots.
graph pop-up panel	A predefined pop-up panel for displaying numerical data graphically. There are different functions for graphing X, Y, X-Y, and waveform data sets.
group	A collection of digital ports, combined to form a larger entity for digital input and/or output.

## H

handshaking	Prevents overflow of the input queue that occurs when the receiver is unable to empty its input queue as quickly as the sender is able to fill it. The RS-232 Library has two types of handshaking. You should enable one or the other if you want to ensure that your application program synchronizes its data transfers with other serial devices that perform handshaking.
hex	Hexadecimal.
highlight	The way in which input focus is displayed on a LabWindows/CVI screen; to move the input focus onto an item.
hot control	Similar to normal control except that the control generates commit events.
Hz	Hertz.

## I

I/O	Input/output.
ID	Identification.
IDFT	Inverse Discrete Fourier Transform.
IEEE	Institute of Electrical and Electronics Engineers.
IFFT	Inverse Fast Fourier Transform.
IFHT	Inverse Fast Hartley Transform.

IIR	Infinite impulse response.
immediate action command	A menu bar item that has no menu items associated with it and causes a command to execute immediately when you select it. An exclamation point (!) appears at the end of any immediate action command.
in.	Inches.
indicator control	A control that can be changed programmatically but cannot be operated by the user. LED, scale, text, text box, graph (without cursors), and strip chart controls are always indicators.
input control	A function panel control that accepts a value typed in from the keyboard. An input control can have a default value associated with it. This value appears in the control when the panel is first displayed.
input focus	A mechanism for emphasis displayed on the screen as a highlight on an item, signifying that the item is active. User input affects the item in the dialog box that has the input focus.
instrument driver	A set of high-level functions for controlling an instrument. It encapsulates many low-level operations, such as data formatting and GPIB, RS-232, and VXI communication, into intuitive, high-level functions. An instrument driver can pertain to one particular instrument or to a group of related instruments. An instrument driver consists of a program and a set of function panels. The program contains the code for the high-level functions. Associated with the instrument program is an include file that declares the high-level functions you can call, the global variables you can access, and the defined constants you can use.
Instrument Library	A LabWindows/CVI library that contains instrument drivers.
Interactive Execution window	A LabWindows/CVI work area in which sections of code may be executed without creating an entire program.
interrupt	A computer signal that indicates the CPU should suspend its current task to service a designated activity.
<b>K</b>	
KB	Kilobytes of memory.



**L**

.lbw file	A file that contains code stored in LabWindows for DOS binary format, a format translatable into C or BASIC source code by the LabWindows for DOS environment.
LED	A control that is modeled to operate like light emitting diodes, which indicate on/off states. When an LED is on, it appears lighted.
list box	A dialog box item that displays a list of possible choices for completing a command in the dialog box.
lvalue	A C expression that refers to an object that can be examined and modified. The name lvalue comes from the fact that only lvalues may appear on the left side of an assignment. Examples of lvalues are variables, parameters, array element references such as <code>a[i]</code> , <code>struct</code> element references such as <code>s-&gt;name</code> or <code>s.name</code> , and pointer dereferences such as <code>*ptr</code> . Expressions that are not lvalues are called rvalues.
.lwi file	A file that contains instrument include statements in LabWindows for DOS binary format.

**M**

manual scaling	Where <code>SetAxRange</code> is called to explicitly set the maximum and minimum X and Y values.
MB	Megabytes of memory.
menu	An area accessible from the command bar that displays a subset of the possible command choices.
menu bar	A mechanism for encapsulating a set of commands. A menu bar appears at the top of the screen and contains a set of menu titles.
message pop-up panel	A predefined pop-up panel for displaying a message.
MIO	Multifunction I/O.
mouse cursor	A mouse-specific term; the rectangular block on the screen that shows the current mouse position.

ms	Milliseconds.
mse	Mean squared error.

## N

new style (function definition)	A function definition in which parameters are declared directly in the parameter list.
NI-488 functions	National Instruments functions you use to communicate with GPIB devices built according to the ANSI/IEEE Standards 488.1-1987 and 488.2-1992.
NI-488.2 routines	National Instruments routines you use to communicate with GPIB devices built according to the ANSI/IEEE Standard 488.2-1992.
normal control	A control that can be operated by the user and changed programmatically. Normal controls generate all events except commit events.
numeric control	A function panel control that allows you to specify a numeric value using the mouse.
numeric/string control	Used to input or view numeric values or text strings. A typical use of this control might be to input a person's name or to display a voltage value.

## O

old style (function definition)	A function definition in which parameters are declared outside of the parameter list.
ordinal number	A numeric value that corresponds to a function within a DLL. It is arbitrarily defined by the linker that creates the DLL or it may be specified in the <code>.def</code> file when the DLL is created.
output control	A function panel control that displays a value that the function you execute generates. An output control parameter must be a string, an array, or a reference parameter of type integer, long, single-precision, or double-precision.

**P**

panel	A rectangular region of the screen that contains a set of controls that accept input from the user and display information to the user. Panels can perform many different functions, from representing the front panel of an instrument to allowing the user to select a file name.
PASCAL	A Windows 3.1 function calling convention in which function arguments are passed left to right, and the function restores the stack pointer before it returns.
pen	A drawing construct which defines the characteristics to be used to draw images on a canvas control. The settable attributes include width, style, color, mode and pattern of the line or object drawn.
pixel	An element of a picture. The smallest resolvable rectangular area of an image, either on a screen or stored in memory. Each pixel has its own brightness and color, usually represented as a red, green, and blue intensities (refer to <i>RGB</i> ).
plot	Consists of a curve, a point, a geometric shape, or a text string.
point	A mouse-specific term; to move the mouse until the pointer rests on the item to which you want to click on.
pointer	A mouse-specific term; the rectangular block on the screen that shows the current mouse position.
pop-up panel	A panel that pops up, accepts user input, and then disappears.
port	A digital port that consists of four or eight lines of digital input and/or output.
press	A mouse-specific term; to hold down the mouse button.
primary control	A function panel control that specifies parameters in the function panel's primary function.
primary function	The function that performs the main task associated with a function panel. A function panel has only one primary function, but can have many secondary functions.

Project window	A window that keeps track of the components that make up your current project. The Project window maintains a list of files such as source files, uir files, header files, or object modules, and also contains status information about each file in your project.
prompt command	A command that requires additional information before it can be executed; a prompt command appears on a pull-down menu followed by an ellipsis (. . .).
prompt pop-up panel	A predefined pop-up panel for requesting input from the user.
pull-down menu	A menu title without an exclamation point contains a collection of commands that appear when you select it.
push button	Used to trigger an action indicated by a label on the button.

## R

rect	A structure used to specify the location and size of a rectangle in the Cartesian coordinate systems used in canvas controls and bitmaps. The structure contains four integer values, top, left, height, and width.
resolution	The smallest signal increment a measurement system can detect. Resolution can be expressed in bits, in proportions, or in percent of full scale. For example, a system has 12-bit resolution, one part in 4,096 resolution, and 0.0244 percent of full scale.
resource file	Contains all of the object associated with a user interface. This includes menu bars, panels, controls, pop-up panels, preferences, images, and fonts. To display user interface objects, an application program must call the User Interface Library to load them from the resource file. A single application program can use multiple resource files.
return value control	A function panel control that displays a value returned from a function as a return value rather than as a formal parameter.
RGB	Red-green-blue. The three colors of light which can be mixed to produce any other color.

ring control	A function panel control that represents a range of values much like the slide control, but displays only a single item in a list, rather than displaying the whole list at once as the slide control does. Each item has a different value associated with it. This value is placed in the function call.
rms	Root mean squared.
<b>S</b>	
s	Seconds.
scroll bars	Areas along the bottom and right sides of a window that show your relative position in the file. Scroll bars can be used with a mouse to move about in the window.
scrollable text box	A dialog box item that displays text in a scrollable display.
SCXI	Signal Conditioning eXtensions for Instrumentation is the National Instruments product line for conditioning low-level signals within an external chassis near sensors so only high-level signals are sent to DAQ boards in the noisy PC environment.
SDK	Windows Software Development Kit. An API for the Windows operation system.
select	To choose the item that the next executed action will affect by moving the input focus (highlight) to a particular item or area.
selection list control	Used to select a item from a list.
shortcut key command	A combination of keystrokes that provide a means of executing a command without accessing a menu in the command bar.
slide control	A function panel control that resembles a physical slide switch. A slide control is a means for selecting one item from a list of options; it inserts a value in a function call that depends upon the position of the cross-bar on the switch.
slider	The cross-bar on the slide control which determines the value placed in the function call.
software trigger	A programmed event that triggers an event such as data acquisition.

Source window	A LabWindows/CVI work area in which complete programs are edited and executed. This window is designated by the file extension <code>.c</code> .
Standard Input/ Output window	A LabWindows/CVI work area in which output to and input from the user take place.
standard libraries	The LabWindows/CVI User Interface, Analysis, GPIB-488/488.2, RS-232, Easy I/O for DAQ, VISA, IVI, TCP, X Property (UNIX Only), DDE (Windows Only), ActiveX Automation, Formatting and I/O, Utility, and ANSI C libraries.
step mode	A program execution mode in which a program is manually executed one instruction at a time; each instruction in the program is highlighted as it is executed.
<code>stdcall</code>	A Windows 95/NT calling convention in which function calls pass arguments from left to right, and the function restores the stack pointer before it returns.
string control	Refer to <i>numeric/string control</i> .
String Display window	A window for viewing and editing string variables and arrays.
strip chart control	A graph that displays graphical data as one or more traces in real time.
stylized fonts	Fixed-size, bitmapped fonts that have a variety of type faces.
synchronous	<ol style="list-style-type: none"><li>1. Hardware—Property of an event that is synchronized to a reference clock.</li><li>2. Software—Property of a function that begins an operation and returns only when the operation is complete.</li></ol>

## T

TC	Terminal count.
text box	A dialog box item in which text is entered from the keyboard or view text.
text controls	Display a string of text.

timer control      A user interface control that schedules the periodic execution of a callback function. A typical use of this control might be to update a graph every second.

traces      Curves in strip charts.

## U

User Interface Editor      Environment where you create resource files for a user interface.

User Interface Editor window      The window in which you build pull-down menus, dialog boxes, panels, and controls and save them to a User Interface Resource (.uir) file. It is described in the *LabWindows/CVI User Interface Reference Manual*.

User Interface Library      Includes a set of functions for controlling the interface programmatically, as well as a resource editor for defining the user interface components.

## V

V      Volts.

validate control      Similar to hot control except that all numeric/scalar controls on the panel are validated before the event is generated. The value of each numeric/scalar control is checked against its predefined range. If an invalid condition is found, a dialog box appears to inform you.

Variables window      A window that shows the values of the currently active variables.

## W

Watch window      A window that shows the values of selected variables and expressions that are currently active.

window      A working area that supports operations related to a specific task in the development and execution processes.

work area      The area of the LabWindows/CVI screen that contains the text displayed in a window.

## **X**

Xmodem functions Allow you to transfer files using a data transfer protocol. The protocol uses a generally accepted technique for performing serial file transfers with error-checking. Files are sent in packets that contain data from the files plus error-checking and synchronization information.



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# Customer Communication

For your convenience, this appendix contains forms to help you gather the information necessary to help us solve your technical problems and a form you can use to comment on the product documentation. When you contact us, we need the information on the Technical Support Form and the configuration form, if your manual contains one, about your system configuration to answer your questions as quickly as possible.

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Finland	09 725 725 11	09 725 725 55
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Korea	02 596 7456	02 596 7455
Mexico	5 520 2635	5 520 3282
Netherlands	0348 433466	0348 430673
Norway	32 84 84 00	32 84 86 00
Singapore	2265886	2265887
Spain	91 640 0085	91 640 0533
Sweden	08 730 49 70	08 730 43 70
Switzerland	056 200 51 51	056 200 51 55
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# Technical Support Form

Photocopy this form and update it each time you make changes to your software or hardware, and use the completed copy of this form as a reference for your current configuration. Completing this form accurately before contacting National Instruments for technical support helps our applications engineers answer your questions more efficiently.

If you are using any National Instruments hardware or software products related to this problem, include the configuration forms from their user manuals. Include additional pages if necessary.

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Company \_\_\_\_\_

Address \_\_\_\_\_

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Fax ( \_\_\_\_ ) \_\_\_\_\_ Phone ( \_\_\_\_ ) \_\_\_\_\_

Computer brand \_\_\_\_\_ Model \_\_\_\_\_ Processor \_\_\_\_\_

Operating system (include version number) \_\_\_\_\_

Clock speed \_\_\_\_\_ MHz RAM \_\_\_\_\_ MB Display adapter \_\_\_\_\_

Mouse \_\_\_\_ yes \_\_\_\_ no Other adapters installed \_\_\_\_\_

Hard disk capacity \_\_\_\_\_ MB Brand \_\_\_\_\_

Instruments used \_\_\_\_\_

\_\_\_\_\_

National Instruments hardware product model \_\_\_\_\_ Revision \_\_\_\_\_

Configuration \_\_\_\_\_

National Instruments software product \_\_\_\_\_ Version \_\_\_\_\_

Configuration \_\_\_\_\_

The problem is: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

List any error messages: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

The following steps reproduce the problem: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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Record the settings and revisions of your hardware and software on the line to the right of each item. Complete a new copy of this form each time you revise your software or hardware configuration, and use this form as a reference for your current configuration. Completing this form accurately before contacting National Instruments for technical support helps our applications engineers answer your questions more efficiently.

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