NATIONAL INSTRUMENTS™
LabVIEW™

Quick Reference

Welcome to LabVIEW — graphical programming for data acquisition, instrument I/O, measurement analysis, and visualization. This card provides information about getting started with LabVIEW quickly.

Installing LabVIEW

Complete the following steps to install LabVIEW.

1. Run the setup program on the CD.
2. Be sure to register online on **www.ni.com/register**. You also can fill out the LabVIEW **Product Registration Card** and return it to National Instruments. Registering qualifies you for support, upgrades, and other important product information.
3. If you are new to LabVIEW**,** complete the **LabVIEW Tutorial** by starting LabVIEW and clicking the **LabVIEW Tutorial** button.

Read and complete the exercises in the **Getting Started with LabVIEW** manual. For data acquisition or instrument I/O examples, click the **DAQ Solutions** button. The **DAQ Solutions** button is available on Windows and Macintosh only. For other examples, click the **Search Examples** button.

Where to Go Next

While you are in LabVIEW, select **Help»Show Context Help** to display the **Context Help** window. Select **Help»Contents and Index** to display the *LabVIEW Help*. Refer to the following manuals for additional LabVIEW information:

Data Acquisition ..... *LabVIEW Measurements Manual*
Instrument Control ..... *LabVIEW Measurements Manual*
LabVIEW programming ..... *LabVIEW Help* or *LabVIEW User Manual*

Refer to **www.ni.com/library** for LabVIEW books and other resources.

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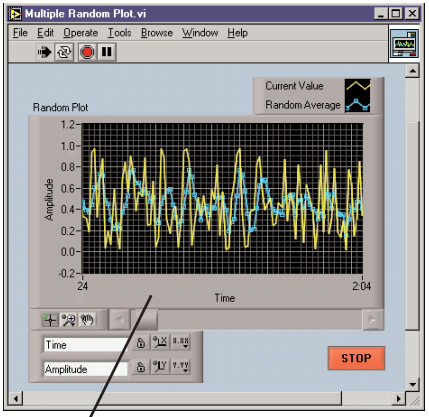
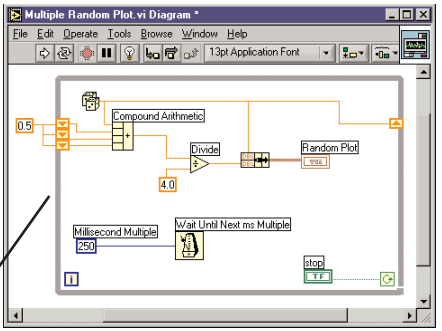
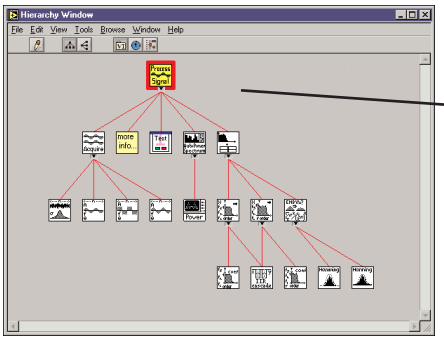
LabVIEW Environment



The front panel contains controls that supply data to the block diagram of the VI. Indicators display data the block diagram acquires or generates.



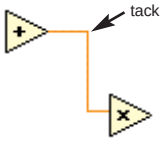
The block diagram is the source code for the VI. You build the block diagram by wiring together objects that send or receive data, perform specific tasks, and control the flow of execution.



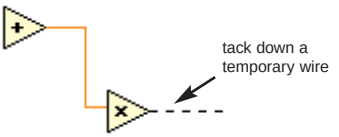
The **VI Hierarchy** window displays a graphical representation of the calling hierarchy for all VIs in memory. Select **Browse»Show VI Hierarchy** to display the VI hierarchy.

Wiring Techniques

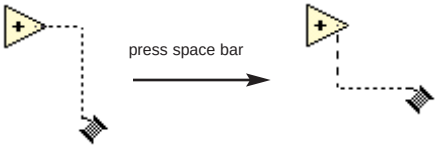
1 Click to tack down a wire



2 Double-click to tack down a temporary wire

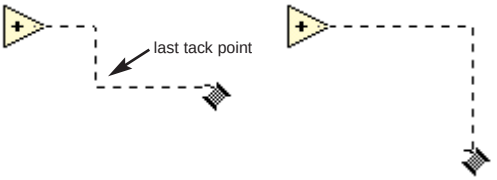


3 Use space bar to change direction of wire

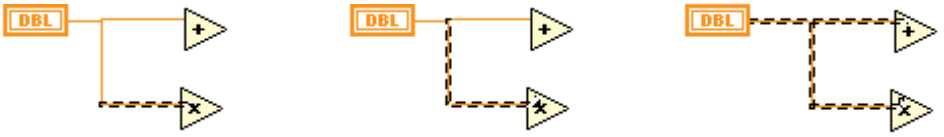


4 Remove last tack point

Windows: Ctrl-left-click
Macintosh: Option-click
UNIX: Middle-click

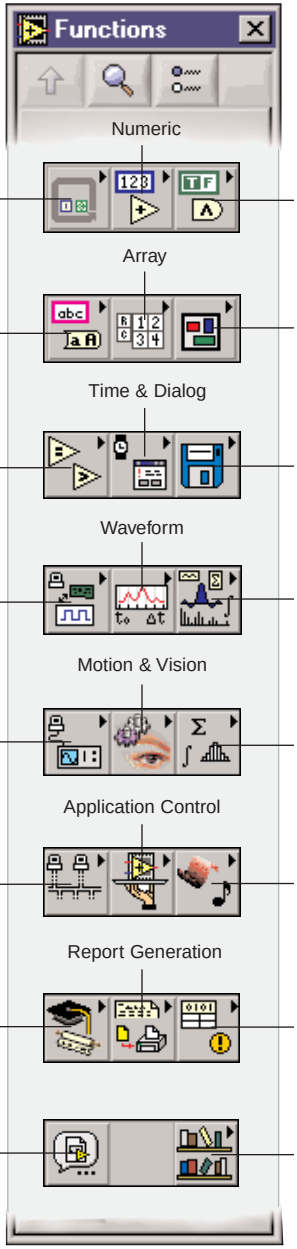


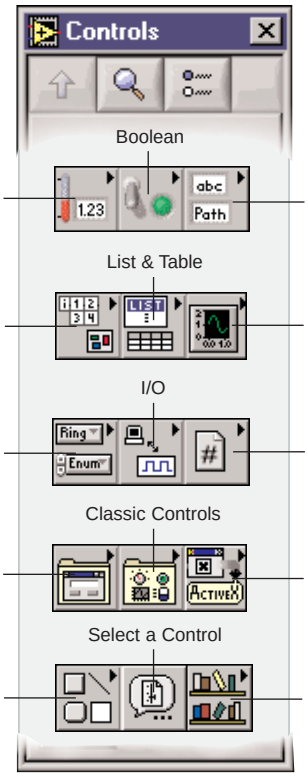
5 Highlight wire segments

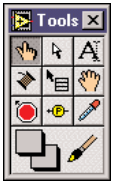


single-click double-click triple-click

Functions, Controls, & Tools Palettes







Operating Tool—Changes the value of a control or selects the text within a control.

Positioning Tool—Positions, resizes, and selects objects.

Labeling Tool—Edits text and creates free labels.

Wiring Tool—Wires objects together on the block diagram and connects control to connector pane.

Object Shortcut Menu Tool—Opens the shortcut menu of an object.

Scroll Tool—Scrolls the window without using the scroll bars.

Breakpoint Tool—Sets breakpoints on VIs, functions, wires, loops, sequences, and cases.

Probe Tool—Creates probes on wires.

Color Copy Tool—Copies colors for pasting with the Color Tool.

Color Tool—Sets the foreground and background colors.

VI Navigation

Description	Technique
1. Find terminals, local variables, references, invoke nodes, and property nodes on the block diagram associated with a front panel control	Right-click the control on the front panel and select **Find** from the shortcut menu to locate the terminal, local variable, reference, invoke node, or property node on the block diagram.
2. Find text and objects in memory	Select **Edit»Find** or: Windows: Ctrl-f Macintosh: Command-f UNIX: meta-f
3. Find a VI, global variable, or type definition in the VI hierarchy	Select **Browse»Show VI Hierarchy** then select **Edit»Find** or type object name
4. Open subVI front panel	Double-click subVI
5. Open subVI block diagram	Double-click subVI while pressing: Windows: Ctrl Macintosh: Option UNIX: meta

Debugging Techniques

Technique	Icon	Description	Shortcut Keys
Probe Tool		Displays intermediate values on a wire in a running VI. 	
Breakpoint Tool		Specifies node you pause on during execution.	
Execution Highlighting		Animates the movement of data on the block diagram using bubbles that move along the wires.	
Pause		Temporarily stops execution to debug a portion of VI.	
Step Into		Single-steps into a subVI or structure to debug it.	Windows: Ctrl-⇩ Macintosh: Command-⇩ Sun: Meta-⇩ HP-UX: Alt-⇩
Step Over		Executes a subVI or structure and resumes single-stepping in next main function.	Windows: Ctrl-⇨ Macintosh: Command-⇨ Sun: Meta-⇨ Windows: Alt-⇨
Step Out		Executes a subVI or structure and resumes single-stepping in calling VI or structure.	Windows: Ctrl-⇧ Macintosh: Command-⇧ Sun: Meta-⇧ Windows: Alt-⇧
Call Chain		Lists the chain of callers from the top-level VI down to the opened subVI. When you choose a VI from the ring control, the block diagram of the VI opens. The ring control is in the toolbar when the subVI executing or running is in Execution Highlighting on single-step mode. If a subVI has multiple instances, you can observe which instance is executing.	

Block Diagram Navigation

Description	Technique
1. Create subVI from selected block diagram objects.	Select block diagram objects and select **Edit»Create SubVI**.
2. Create constant, control, or indicator on block diagram	Right-click terminal and select **Create»Constant, Control,** or **Indicator** from the shortcut menu.
Create a constant on the block diagram Create a control on the front panel	Drag front panel control to block diagram. Drag block diagram constant to front panel.
3. List errors	Right-click broken wire and select **List Errors** from shortcut menu -or- click the **Run** arrow that appears broken.
4. Delete broken wires	Windows: Ctrl-b Macintosh: Command-b Sun: Meta-b UNIX: Meta-b HP-UX: Alt-b -or- select **Edit»Remove Broken Wires**.

Wire Types

Scalars

Controls Data Source

Indicators Data Display

NOTE: Controls have thicker borders

1D Array

2D Array

NOTE: Array wires are thicker than scalar wires, and array terminals have [ ] around base type

Terminal Data Types wire styles and colors are unique for each data type

Signed Integers	8-bit I8	16-bit I16	32-bit I32
Unsigned Integers	8-bit U8	16-bit U16	32-bit U32
Real Floating-Point	Single SGL	Double DBL	Extended EXT
Complex Floating-Point	Single CSG	Double CDB	Extended CXT

Boolean TF

String abc

Path

Variant

Refnum

Cluster of numerics

Cluster of mixed data type

Waveform

Polymorphic POLY

I/O Name Control I/O

NOTE: The Polymorphic Terminal Data Type represents a terminal to which multiple data types can be input or output.

Keyboard Shortcuts

File

Ctrl-N	New VI (skips **New** dialog box)
Ctrl-O	Opens file
Ctrl-W	Closes file
Ctrl-S	Saves VI
Ctrl-P	Prints
Ctrl-I	Displays VI properties
Ctrl-Q	Quits LabVIEW

Edit

Ctrl-V	Pastes object
Ctrl-Shift-F	Displays search results
Ctrl-B	Removes broken wires
Ctrl-C	Copies an object
Ctrl-D	Allows you to redraw (**VI Hierarchy** window only)
Ctrl-F	Finds a terminal, local variable, reference, invoke node or property node
Ctrl-X	Cuts object
Ctrl-Z	Allows you to undo last action
Ctrl-Shift-Z	Allows you to redo last action

Operate

Ctrl-R	Runs VI
Ctrl-M	Changes to run/edit mode
Ctrl-.	Aborts VI

Tools

Ctrl-Y	Adds to VI Revision History

Window

Ctrl-E	Displays block diagram/front panel
Ctrl-L	Displays error list
Ctrl-T	Tiles the block diagram and front panel windows
Ctrl-/	Adjusts window to full size

Help

Ctrl-H	Displays context help
Ctrl-?	Displays help contents and index
Ctrl-Shift-L	Locks context help

Font

Ctrl-0	Displays **Font** dialog box
Ctrl-1	Changes Application font
Ctrl-2	Changes System font
Ctrl-3	Changes Dialog font
Ctrl-4	Changes Current font

Other Shortcuts

Ctrl-A	Adds a comment (**VI Revision History** window only) Shows all VIs (**VI Hierarchy** window only) Performs last alignment

LabVIEW Web Resources

Support

www.ni.com/support
- KnowledgeBase – searchable database of tips, common questions, and more
- Troubleshooting Wizards
- Application notes and white papers
- Wishlist (online suggestions)

Training

www.ni.com/custed
- Course schedules, descriptions, and registration information
- Self-paced training information

Consulting

(Alliance Program Members)
www.ni.com/alliance

Instrument Drivers

www.zone.ni.com/idnet

Additional LabVIEW-Related Sites

www.vimarket.com
www.ltrpub.com

Developer Resources

zone.ni.com
- Resource Library – example programs, technical presentations, and tutorials
- Developer Exchange
- Product Advisor
- Measurement Glossary