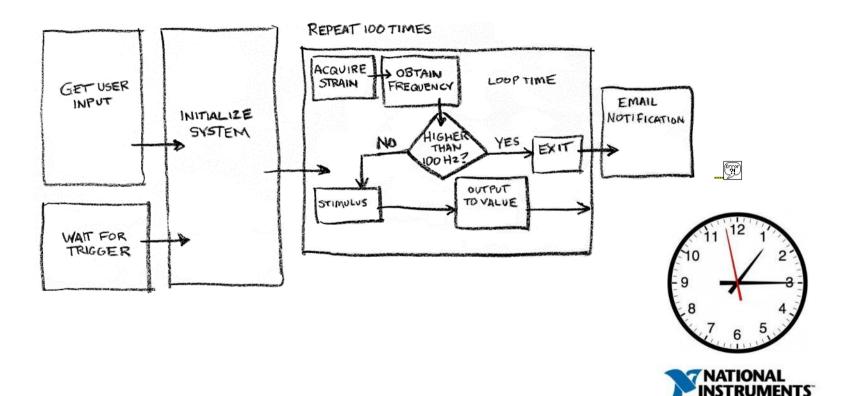


What's New in LabVIEW 2015

Write Code Faster. Write Faster Code.

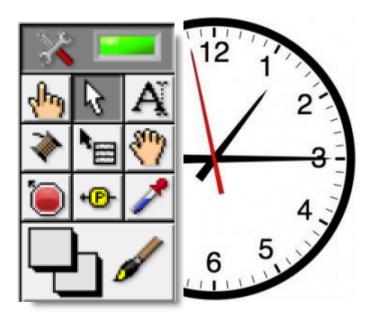


Pressure to Decrease the Time from Idea to Solution



How do you spend your time in LabVIEW?

Dropping elements Configuring elements □ Wiring elements □ Architecting code Developing algorithms Documenting code Debugging code Optimizing code □ Running deployed code





How do you spend your time in LabVIEW?

Dropping elements Configuring elements □ Wiring elements □ Architecting code Developing algorithms Documenting code Debugging code Optimizing code □ Running deployed code

Write Code Faster.

Write Faster Code.

LabVIEW²⁰¹⁵





Write Code Faster.



Configuring Elements through Right-Click Shortcuts

- Replace common tasks with right-click shortcuts
 - · "Change to Indicator"
 - "Make Current Value Default"
 - "Delete Chart History"
- Popular requests on Idea Exchange
- Each shortcut required NI R&D development

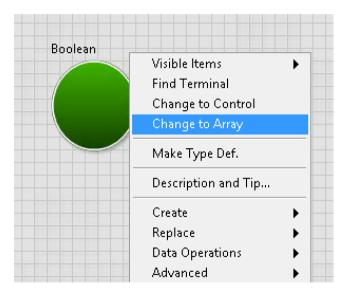
	Visible Items	•			
	Change to Control				
	Change to Indicator				
	Make Type Def.				
	Description and Tip				
	Numeric Palette				
	Create	•			
	Replace	•			
	Data Operations	•			
	Advanced	•			
1	Adapt To Entered Data				
	Representation	•			
	Display Format				
-	Properties				



7 New Right-Click Plugins

Included in LabVIEW 2015

- Change to Array or Element
- Empty Listboxes
- Explore
- Remove and Rewire Objects
- Size Array Constants To Contents
- Transpose 2D
- Create >> All Controls and Indicators

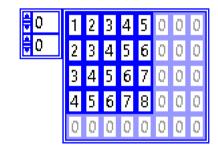




Transpose 2D Array

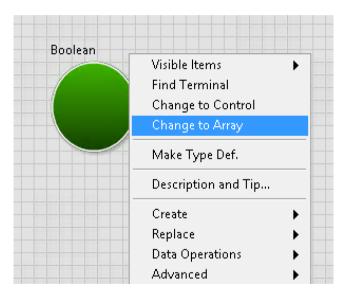
‡0 ‡0

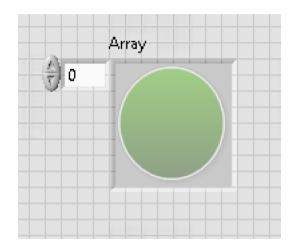
1	2	3	4	0	0 0 0		
2	3	4	5	0	Visible Items	•]
3	4	5	6	0	Change to Control		
4			7	0	Change to Indicator		
5		7	8	0	Change to Element		
					Make Type Def.		
					Description and Tip		
					Numeric Palette	•	
					Array Palette	•	
					Create	►	
					Replace	١,	
					Data Operations	×	Cut Data
					Advanced		Copy Data
					Representation	•	Paste Data
					Display Format		Insert Row Before
					Properties		Insert Column Befor Delete Row
							Delete Column
							Transpose Array





Change to Array or Element





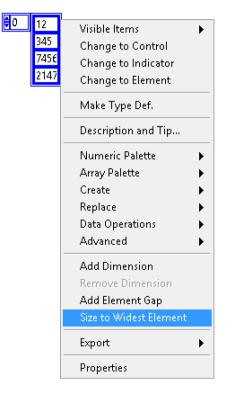


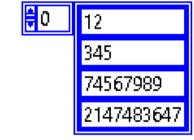
Remove and Rewire Objects





Size Array Constants to Contents

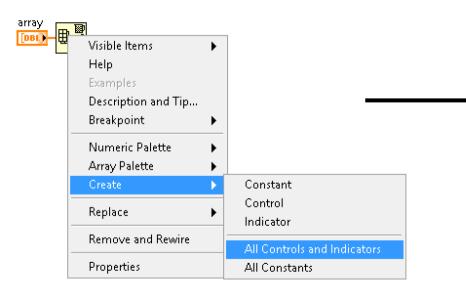


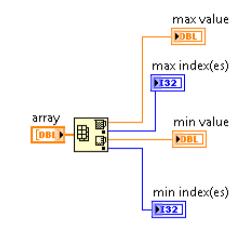




ni.com

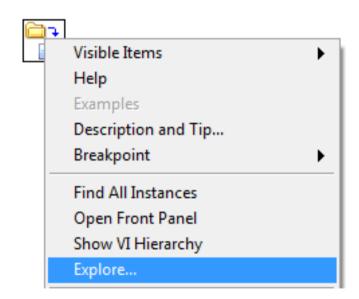
Wire All Unwired Terminals

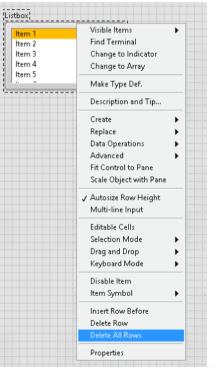






Explore and Empty Listboxes







Extend LabVIEW with Your Own Shortcuts

Create Shortcut Menu Plug-in From Template in LabVIEW 2015

- Automate common repeated tasks by using a template VI to write your own plug-ins
- Extend the LabVIEW environment with VI Scripting
- Share and download plug-ins at <u>ni.com/lvmenus/</u>
- All Right-Click Shortcuts previously required NI R&D development

今壺		15pt Applic	ation Font	-	lov	T	* 1 +i~	10 ×	Search		
v G		15pt Apple							Jocarcii		
Complete the	ollowing	steps to cre	ate a shorto	ut m	enu pl	lug-in.					
1. Specify the r	ame of y	our plug-in.									
Test Plug-	n										
2. Specify whe	her the sl	hortcut men	u plug-in a	ffects	edit t	ime or	run-tir	me shorto	cut menus.		
Edit time Run time											
3. Specify whe	her to op	en the plug	in VIs after	they	are cr	eated.					
Open Pl	igin VIs a	fter creation									
4. Run this VI.	he indica	ator below w	ill display t	he pa	th to t	he nev	v LLB.				
		cuments\La			Pluga	^	After	creation,	follow further i	nstructions on the pane	el
in.llb	us (cuit ti	ine panerai	ia alagrafii	(rest	r lag-		and o	liagram o	of the new VIs to	complete your plug-in	1.
						~					



How do you spend your time in LabVIEW?

- ✓ Dropping elements
- Configuring elements
- ✓ Wiring elements
- Documenting code
- Debugging code
- Architecting code
- Developing algorithms
- □ Optimizing code
- □ Running deployed code





Document VIs Faster

Hyperlinks in Free Labels

 Quickly link to comments through hashtags viewable in the Bookmark Manager

#MemoryLeak need to replace this logic.

 Native hyperlink support on front panels and block diagrams

<u></u>	Bookmark Manager
2013 Application Instance	
dookmarks	VIs
#MemoryLeak	
#MemoryLeak need to replace this logic.	Untitled 2
🖃 #Queue	
#Queue is destroyed here.	Buffer VI.vi



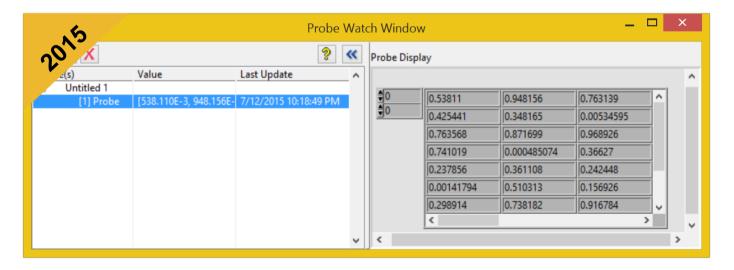
The **One Button Dialog** function displays the State 3 text. Go to <u>http://www.ni.com/labview</u> for more information



Debug VIs Faster

Smarter Probes

Automatically scaled view of strings and arrays





Create Advanced Architectures Faster

Natively Create Actor Framework Actors and Messages

💀 Actor Framework	Example.lvproj - P	- 🗆 🗙							
🏝 😅 🞒 🗶 🖻 tems Files		indow Help ▼ 🚰 <u>A</u> 🗍 🔝							
□- S Project: Actor Framework Example.lvproj □- S My Computer □- Project New									
🖶 🎝 Actor F – 🕀 🎝 Actor F – 🕀 🎝 Alpha A	Virtual Folder Control								
🖶 🚺 Beta Ac – 🕀 😨 Depenc 🕀 🎽 Build St	Find Project Items Arrange By	Library Variable Class							
- Eulia S	Collapse All	Actor XControl							
Help Veb Service Veb Service									

5	Add an Actor to This Project
Name of A	Actor
Alpha	
Inherit fro	m:
Actor	-
Save files t	·O
Save files t C:\Users\I Example	:o Ivadmin\Documents\LabVIEW Data\Actor Framework
C:\Users\	
C:\Users\	



LabVIEW Tools Network

The App Store for Engineers and Scientists

- Download 300+ Free and Paid Add-Ons
- More than 4,000,000 downloads
- ni.com/labviewtools





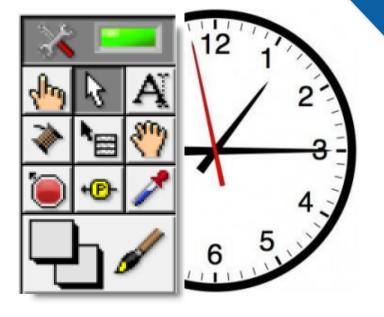


How do you spend your time in LabVIEW?

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 Optimizing code
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Write Code Faster.

> Write Faster Code.





Write Faster Code.



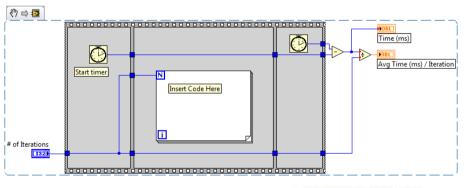
LabVIEW Without Limits

Internal R&D architectural effort to improve:

- Load Times
- Memory Usage
- Application Build Time
- Execution Speed

Timing statistics Timing details Time unit	1	Profile memory Memory usa te unit					Applicati	on Instances	^	
milliseconds	•	kilobytes		Select Ap	plication In:	stances			-	
Profile Data										
	VI Time	Sub VIs Time	Total Time	Avg Bytes	Min Bytes	Max Bytes	Avg Blocks	Min Blocks	Max Blocks	
Frequency Response.vi	296.9	328.1	625.0	14.99k	14.99k	14.99k	8	\$	8	
Demo Tek FG 5010.vi	109.4	15.6	125.0	8.14k	\$.14k	8.14k	34	34	34	
Demo Fluke \$840A.vi	78.1	125.0	203.1	4.27k	4.27k	4.27k	\$	\$	8	
Incremental Filter.vi	62.5	0.0	62.5	3.68k	3.68k	3.68k	0	0	0	
Demo Receive.vi	46.9	62.5	109.4	4.59k	4.59k	4.59k	4	4	4	
Demo Send.vi	31.2	0.0	31.2	3.92k	3.92k	4.05k	4	4	4	
Frequency.gbl	0.0	0.0	0.0	0.01k	0.01k	0.01k	0	0	0	
< .										
										_

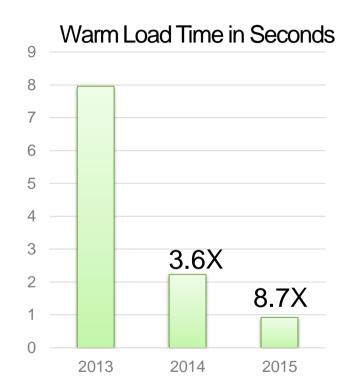
Build status	×							
Creating installer								
Building distribution (this could take several minutes)								
building distribution (this could take several minutes)								
Warnings								
	Done Cancel							





Open Code Faster

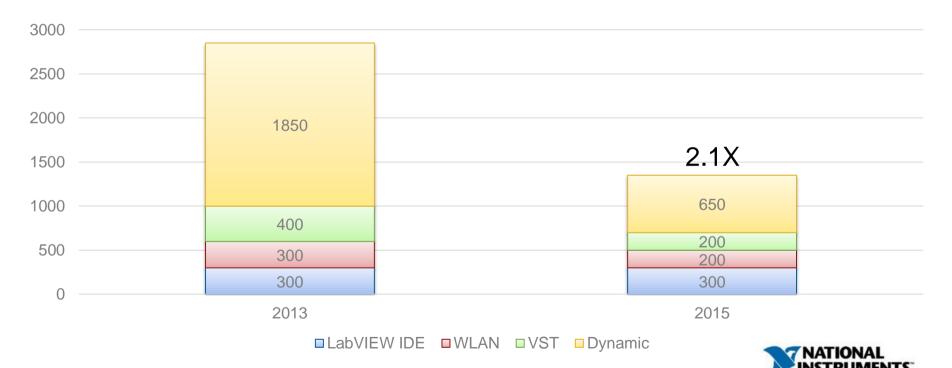
- Faster LabVIEW IDE launch times
- 8X faster load times of large packed project libraries
- Open code without searching for missing VIs from NI modules, toolkits, and drivers





Use Less Memory – Footprint in MB

LabVIEW 2015 applications are built to use less dynamic memory



Optimize Memory Usage Faster

- New Profile Buffer Allocations tool
- Visualize and identify large memory allocations in VIs

Tools > Profile > Profile Buffer Allocations...

Pa											
File Help	File Help										
	Application Instances All v Maximum buffers to display 100 🔹 Size unit kilobytes v										
Buffer ID	VI Name	Max Bytes	Avg Bytes	Min Bytes	# Runs 🔺						
16	Untitled 2	24.076k	24.076k	24.076k	6						
22	Untitled 2	44880.144k	7540.112k	24.08k	6						
					~						
50.00M 40.00M 30.00M 20.00M 10.00M	▼ Time vs Memory Graph 50.00M 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <t< th=""></t<>										
	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 Time(s)		25 20 21		+ 🙉 🧐						
	Threshold (B) 20.480k	•	Start		Help						



LabVIEW Real-Time Module

Flexibility to meet your IIoT application needs

Run Faster with Updated NI Linux Real-Time kernel

On average 11% faster benchmarked loop rates for single point I/O applications

ate whethe Web

· Enhanced security feature support

Download New Packages to Int

- Packages on the NI-house repositive help connect targets to web all that its
- Tools to when vitre kisting php, node.js, and json-c applications and improved Python support

Build Reusable Shared Libraries

- New LabVIEW Real-Time shared library support
- Built using LabVIEW Application Builder





ni.com

LabVIEW FPGA Module

Develop, Debug and Compile Faster

Develop Your Code Faster with High Quality IP

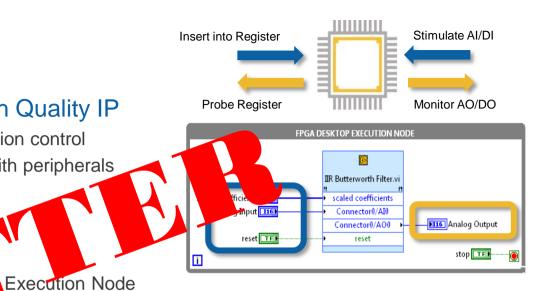
- Floating-point PID VI for higher precision control
- SPI and I2C VIs for communication with peripherals
- Motor simulation with ANSYS

Validate Your Designs Faster

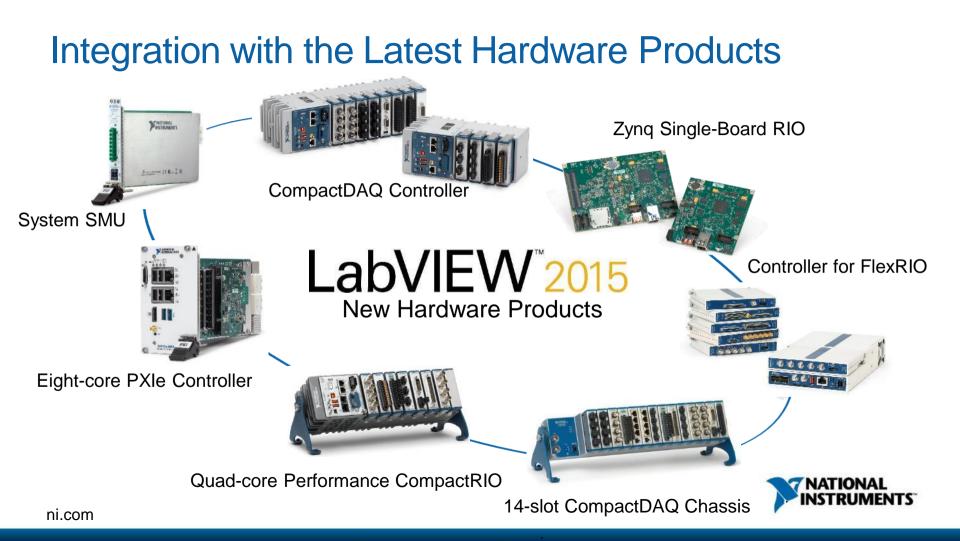
- Create test benches
 the Dest
- New examples working with analog and digital stimuli

Compile Your Code Faster

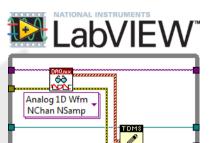
- LabVIEW FPGA Compile Cloud Service included with SSP
- Offload LabVIEW FPGA compilations to the cloud
- · Compile up to 5 designs in parallel







High-Performance CompactDAQ Controllers Starting at \$4,499



Simplify System Comple

Integrated PC and a Built in RS232, a Removable SD o

Easy Measurements and Logging

Familiar experience with Windows 7 Easy streaming and logging with DAQmx Port code from existing systems

CO

Jage

High-Performance

1.91 GHz Atom Quad-Core Processor Option for Linux Real-Time for ultimate reliability

i.

Pricing*									
cDAQ-9136 WES7	\$ 4,499	€ 4,930	¥ 594,000						
cDAQ-9137 WES7	\$ 4,999	€ 5,480	¥ 660,000						

* For Linux RTOS, price increases \$500



CompactDAQ 14-Slot USB 3.0 Chassis Priced at \$1,850



TDMS

Analog 1D Wfm

NChan NSamp

Easily Scale Your Application

14 slots for high channel count needs Supplement existing systems with additional I/O

Easy Measurements and Logging

Familiar experience with Windows 7 Easy streaming and logging with DAQmx Port code from existing systems

Higher Data Throughput

Supports USB 3.0 Super-Speed Data streaming rates more than 250 MB/s Backwards compatible with USB 2.0

i



SUPERSPEED

CERTIFIED

USB

High Voltage System SMU

PXIe-4137

High Power

- 200 V
- 1 A DC (3 A Pulse)
- · 20 W (500 W Pulse)

High Precision

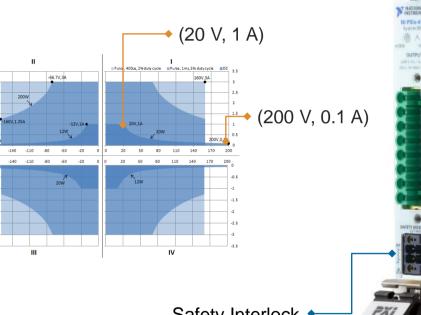
- 100 fA
- 100 nV

High Speed:

- Sampling 1.8 MS/s
- Update: 100 kS/s

Safety Interlock
NI SourceAdapt™ Technology
Extended Range Pulsing
Hardware timing & triggering

-1.5



6

ΝΔΤΙΟΝΑΙ

Refer

ni.com

NI PXIe-8880 Embedded Controller

Industry's First Embedded Controller with Intel Xeon Technology

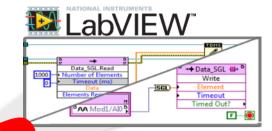
Highest PXIe Performance and Throughput

- Intel[®] Xeon[®] E5-2618L v3 processor
- 2.3 GHz (base) and 3.4 GHz (Turbo Boost)
- 8 Physical and 16 Logical CPU Cores
- 8 GB DDR4 1866 MHz RAM (standard); 24 GB max
- Up to 24 GB/s System Bandwidth (each direction)
- 240 GB, 1.8 in. SSD Hard Drive





New Performance CompactRIO



LabVIEW System Desig

Program with Labie W Here Tome and LabVIEW FP modes Quickly port elenge VL-vV applications

Simplify System Complexity

Embedded UI driven by NI Linux Real-Time Integrate vision with FPGA co-processing Removable SDHC data storage

gh Throughput and Performance

Up to a Quad Core Intel Atom 1.91 GHz processor

Xilinx Kintex-7 FPGAs with up to 325k logic cells 16 DMA FIFO channels for data streaming

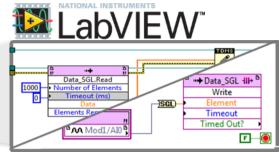
Community and Code Reuse

NI Linux Real-Time Operating System Integrate existing applications and libraries Develop, debug, and deploy C/C+ NATIONAL

ni.com

New! Single-Board RIO with Zynq and Linux





Reuse Existing Designs

Form, fit, function replacement for existing Single-Board RIO systems Quickly port existing LabVIEW applications

New Features to Improve Your System

Improved C Series module support Gigabit Ethernet, power over RMC, USB device over RMC, and RTC battery

High Throughput and Performance

Dual-Core ARM 667 MHz processor Xilinx 7 Series FPGA fabric with 85k logic cells 16 DMA FIFO channels for data streaming

Community and Code Reuse

Unlock ecosystem with NI Linux Real-Time OS Integrate existing applications and libraries Develop, debug, and deploy C/C++ code



ni.com

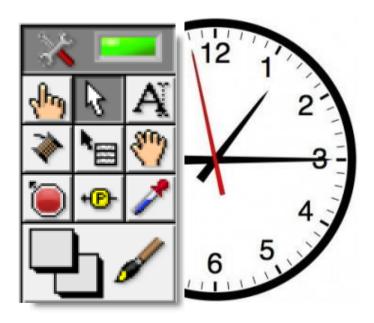
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- ✓ Optimizing code

✓ Running deployed code

Write Code Faster.

Write Faster Code.





LabVIEW Editions

Full Edition

Make advanced control applications through included PID and Fuzzy Logic palettes

Professional Edition

Trace low-level bugs, validate coding practices, and manipulate data through the now included:

- VI Analyzer Toolkit
- Unit Test Framework Toolkit
- Desktop Execution Trace Toolkit
- Database Connectivity Toolkit
- Report Generation Toolkit

LabVIEW Base Edition

- Graphical development
 environment
- Drag-and-drop UI libraries
- PC-based data acquisition

LabVIEW Full Edition

LabVIEW Base Edition plus:

- 950+ built-in analysis libraries
- Core edition for add-ons

LabVIEW Professional Edition

LabVIEW Full Edition plus:

- Building and distributing EXEs
- Unit testing and code validation
- Source code control integration



ni.com

What is a LabVIEW Suite?



Now Included: One Year Unlimited Training and Certification Access

- Combination of LabVIEW Professional and application software
- Single P/N and distribution created for a specific application area
- Each LabVIEW Suite now comes with a one year Training and Certification Membership
- Distributed on USB 3.0 with appropriate drivers



LabVIEW Suites

abVIEW 20

LabVIEW Automated Test Suite

14/24/CH

Includes TestStand and Switch Executive LabVIEW Embedded Control and Monitoring Suite

Includes LabVIEW Real-Time and FPGA modules LabVIEW HIL and Real-Time Test Suite

Includes VeriStand and LabVIEW Real-Time and FPGA modules









Standard Service Program (SSP)

Technical Support

Solve problems quickly with phone and email support from degreed engineers in your region

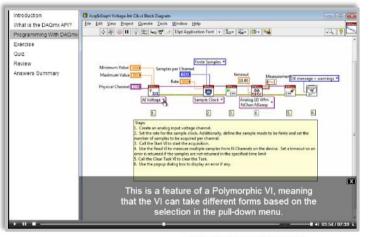
Access the Latest Version

Upgrade to 2015 when you are ready with online access to download any current or past version of LabVIEW

Online Training

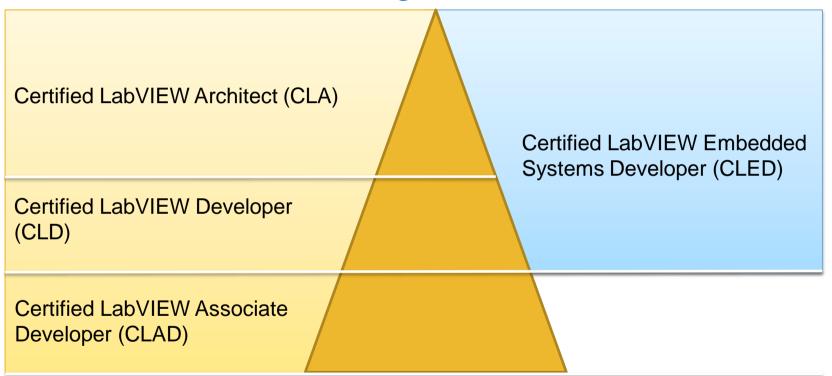
Learn LabVIEW at your own pace with general and advanced course offerings in multiple languages







Accelerate Growth Through Certifications



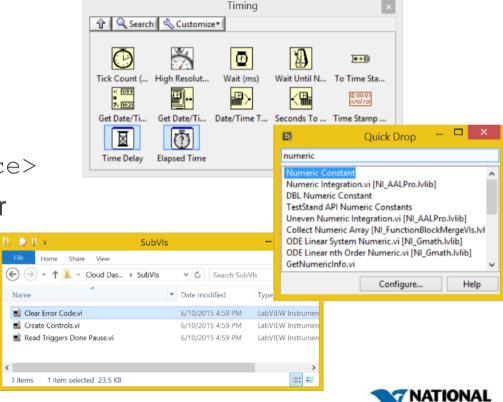


Appendix – Other Resources



Finding Elements in the IDE

- Palettes
 - Browse
 - Search
 - Pin
- Quick Drop <Ctrl + Space>
- Drag and drop from explorer



INSTRUMENTS

DEMO – Customizing Palettes

- User Libraries: <LabVIEW>/user.lib
 - Restart to effect change
- Tools > Advanced > Edit Palette Set...
 - Restore to Default Settings when you make a mess
- Add favorite VIs to Favorites Palette
 - All-time faves or just for the current project
 - NI VIs or your own



Introducing: Right-click Menu plug-ins!

- New feature of LabVIEW 2015
- Write G code to augment LabVIEW right-click menus
 - Edit-time panel and diagram right-click menus
 - Run-time diagram right-click menus
 - NOT run-time panel right-click menus (you already have these!)
- "Augmenting" the menus can mean:
 - Adding new menu entries
 - ∘ Including new pull-rights
 - Removing/replacing existing menu entries
 - · Manipulating menu entries (enable/disable, check/uncheck, etc.)



Introducing: Right-click Menu plug-ins!





Quick-Drop Keyboard Shortcuts

- <Ctrl + Space>
- VI Scripting extension point for custom editor scripts
 - Ctrl+W auto wire
 - Ctrl+I insert VI and rewire
- Free and open to the community
 - Create custom shortcuts
 - Share shortcuts online
 - Download shortcuts

Quick Drop × (,,,) FROM.vi (Incomplete) Beta Function.vi [Nl_Gmath.lvlib] (Incomplete) Gamma Function.vi [Nl_Gmath.lvlib] * (Riemann) Zeta Function.vi [Nl_Gmath.lvlib] * .NET Object To Variant.vi 1D ANOVA.vi [Nl_AALPro.lvlib] 1D ANOVA.vi [NI_AALPro.lvlib] 1D Linear Evaluation PtByPt.vi [Nl_PtbyPt.lvlib] 1D Polar to Rectangular PtByPt.vi [Nl_PtbyPt.lvlib] * Configure... Help

List of Community Quick Drop Keyboard Shortcuts

VERSION 50

Created on: Feb 12, 2010 2:39 PM by Darren - Last Modified: May 21, 2015 2:16 PM by Alex5

The following is a list of community-contributed Quick Drop Keyboard Shortcuts for LabVIEW 2009 and later. If the shortcut has a default key specified, it is show in parenthesis after the name:

- Find Static Events (S)
- Ul Server Rename (B)
- Create Object from Terminal (Q)
- Commands for "Create" Menu Options (A)
 Rename LVOOP FP Object Labels (Z)
- Rename LVOOP FP Object
 I VOOP Assistant
- EVOOP Assistant
 Change To/From Array (A)
- Selective Wire Cleanup (B)
- Paste to Array Constant/Control (E)
- Clean All Wires (W)



Quick-Drop Keyboard Shortcuts

List of Community Quick Drop Keyboard Shortcuts

Created on: Feb 12, 2010 2:39 PM by Darren - Last Modified: Aug 18, 2015 2:37 PM by Darren

The following is a list of community-contributed Quick Drop Keyboard Shortcuts for LabVIEW 2009 and later. If the shortcut has a default key specified, it is shown in parentheses after the name:

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- VI Server Rename (B)
- Create Object from Terminal (Q)
- Commands for "Create" Menu Options (A)
- Rename LVOOP FP Object Labels (Z)
- LVOOP Assistant
- Change To/From Array (A)
- Selective Wire Cleanup (B)
- Paste to Array Constant/Control (E)
- Clean All Wires (W)
- Create Place VI Contents VI (G)
- Insert State Into JKI State Machine (J)
- Align front panel controls to connector pane pattern (A)
- <u>loggle "Visible Items -> Radix/Display Style"</u> (X)
- U Snippet Quick Drop Plugins (U)
- Align & Compress BD/FP Objects (A)
- Colour Up Structure (Q)
- Alphabetize Case Structure Cases
- Better Move(Shift) Block Diagram Objects (C, S, X, and Z)
- Reset Origin (O)

ni.com

- 🛛 🚊 Restart LabVIEW (Q)
- Replace or insert (W)
 - Show VI in Windows Explorer (F)



VERSION 52 Q

Darren's Quick-Programming Tips

