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?

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Write Code Faster.

Write Faster Code.
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
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
Right-Click Plug-Ins

Transpose 2D Array
Right-Click Plug-Ins

Change to Array or Element
Right-Click Plug-Ins

Remove and Rewire Objects
Right-Click Plug-Ins

Size Array Constants to Contents
Right-Click Plug-Ins

Wire All Unwired Terminals
Right-Click Plug-Ins

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 ni.com/lvmenus/
- All Right-Click Shortcuts previously required NI R&D development
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Document VIs Faster

Hyperlinks in Free Labels

- Quickly link to comments through hashtags viewable in the Bookmark Manager

- Native hyperlink support on front panels and block diagrams
Debug VIs Faster

Smarter Probes

- Automatically scaled view of strings and arrays
Create Advanced Architectures Faster
Natively Create Actor Framework Actors and Messages
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
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

Warm Load Time in Seconds

- 2013: 3.6X
- 2014: 8.7X
Use Less Memory – Footprint in MB

LabVIEW 2015 applications are built to use less dynamic memory.

The chart shows a comparison of memory footprint between 2013 and 2015, with a reduction of 2.1X. The footprint breakdown is as follows:

- **LabVIEW IDE**: 300 (2013) vs. 300 (2015)
- **WLAN**: 400 (2013) vs. 200 (2015)
- **VST**: 300 (2013) vs. 200 (2015)
- **Dynamic**: 650 (2015)

The overall footprint is reduced from 1850 MB in 2013 to 650 MB in 2015.
Optimize Memory Usage Faster

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

Tools > Profile > Profile Buffer Allocations…

![Profile Buffer Allocations](image_url)
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
- Enhanced security feature support

Download New Packages to Integrate with the Web
- Packages on NI-hosted repository help connect targets to web applications
- Tools to work with existing 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 with the Desktop Execution Node
- New examples for 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
Integration with the Latest Hardware Products

- System SMU
- CompactDAQ Controller
- Zynq Single-Board RIO
- Controller for FlexRIO
- Eight-core PXIe Controller
- Quad-core Performance CompactRIO
- 14-slot CompactDAQ Chassis

LabVIEW 2015
New Hardware Products
High-Performance CompactDAQ Controllers
Starting at $4,499

Simplify System Complexity
Integrated PC and signal conditioning
Built in RS232, and trigger port
Removable SD data storage

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

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

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<td>cDAQ-9136 WES7</td>
<td>$ 4,499</td>
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<tr>
<td>cDAQ-9137 WES7</td>
<td>$ 4,999</td>
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* For Linux RTOS, price increases $500

ni.com
CompactDAQ 14-Slot USB 3.0 Chassis
Priced at $1,850

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
High Voltage System SMU

PXle-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

NI SourceAdapt™ Technology
Extended Range Pulsing
Hardware timing & triggering

Safety Interlock
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 Design
- Program with LabVIEW Real-Time and LabVIEW FPGA modules
- Quickly port existing LabVIEW applications

High 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

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

Community and Code Reuse
- NI Linux Real-Time Operating System
- Integrate existing applications and libraries
- Develop, debug, and deploy C/C++
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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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?

- 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

Now Included: One Year Unlimited Training and Certification Access
LabVIEW Suites

LabVIEW Automated Test Suite
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

Certified LabVIEW Architect (CLA)

Certified LabVIEW Developer (CLD)

Certified LabVIEW Associate Developer (CLAD)

Certified LabVIEW Embedded Systems Developer (CLED)
Appendix – Other Resources
Finding Elements in the IDE

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

ni.com
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!

 sensations of LabVIEW from LabVIEW 2015 and later. (This can be done programmatically)

LabVIEW, you can add it to Menus \<choose subdirectory>
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 Keyboard Shortcuts

List of Community Quick Drop Keyboard Shortcuts

The following is a list of community-contributed Quick Drop Keyboard Shortcuts for LabVIEW 2000 and later. If the shortcut has a default key specified, it is shown in parentheses after the name:

- Find Static Events (S)
- 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)
- Toggle "Visible Items -> Radio/Display Style" (X)
- VI 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)
- Restart LabVIEW (Q)
- Replace or Insert (W)
- Show VI in Windows Explorer (F)
Darren’s Quick-Programming Tips