NATIONAL INSTRUMENTS LabVIEW™ 2013

What's New in LabVIEW 2013

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Automation Laboratory Experts - ALE LLC

Presented to the IEEE Long Island Section Instrumentation & Measurement Society and the Long Island LabVIEW Users Group (LILUG) on Thursday September 5, 2013

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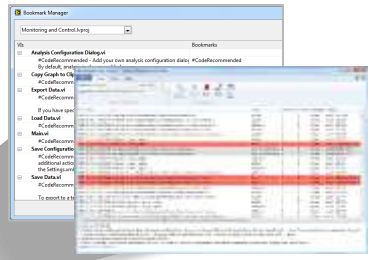
Code Reuse and
Mobile Device Integration

Access the Newest
Hardware Technology

Code Management and
Debugging Tools



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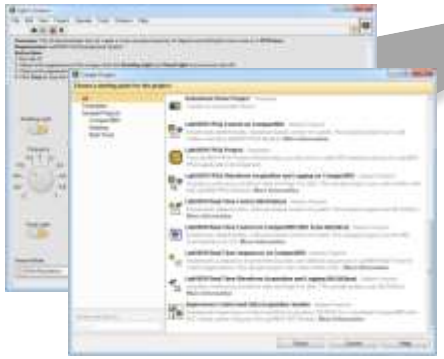
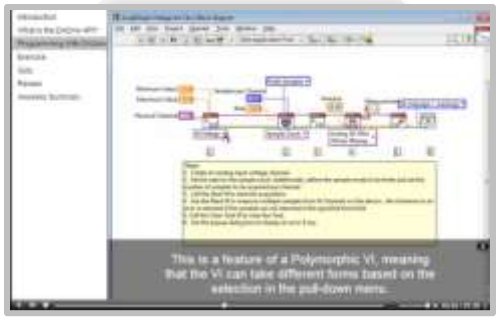
All Systems. Go.



New Sample Projects and
Improved Examples



Expanded Online Training

Streamlined Application Deployment

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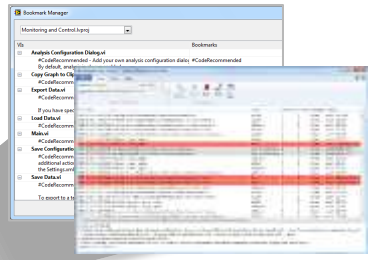

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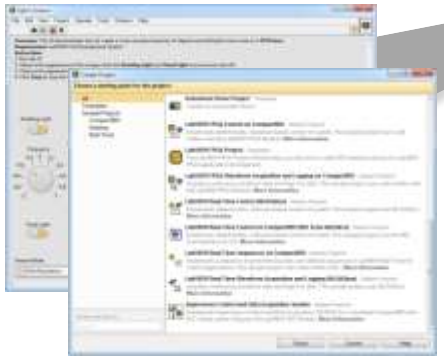

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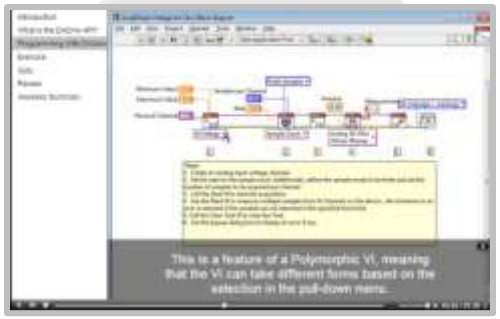

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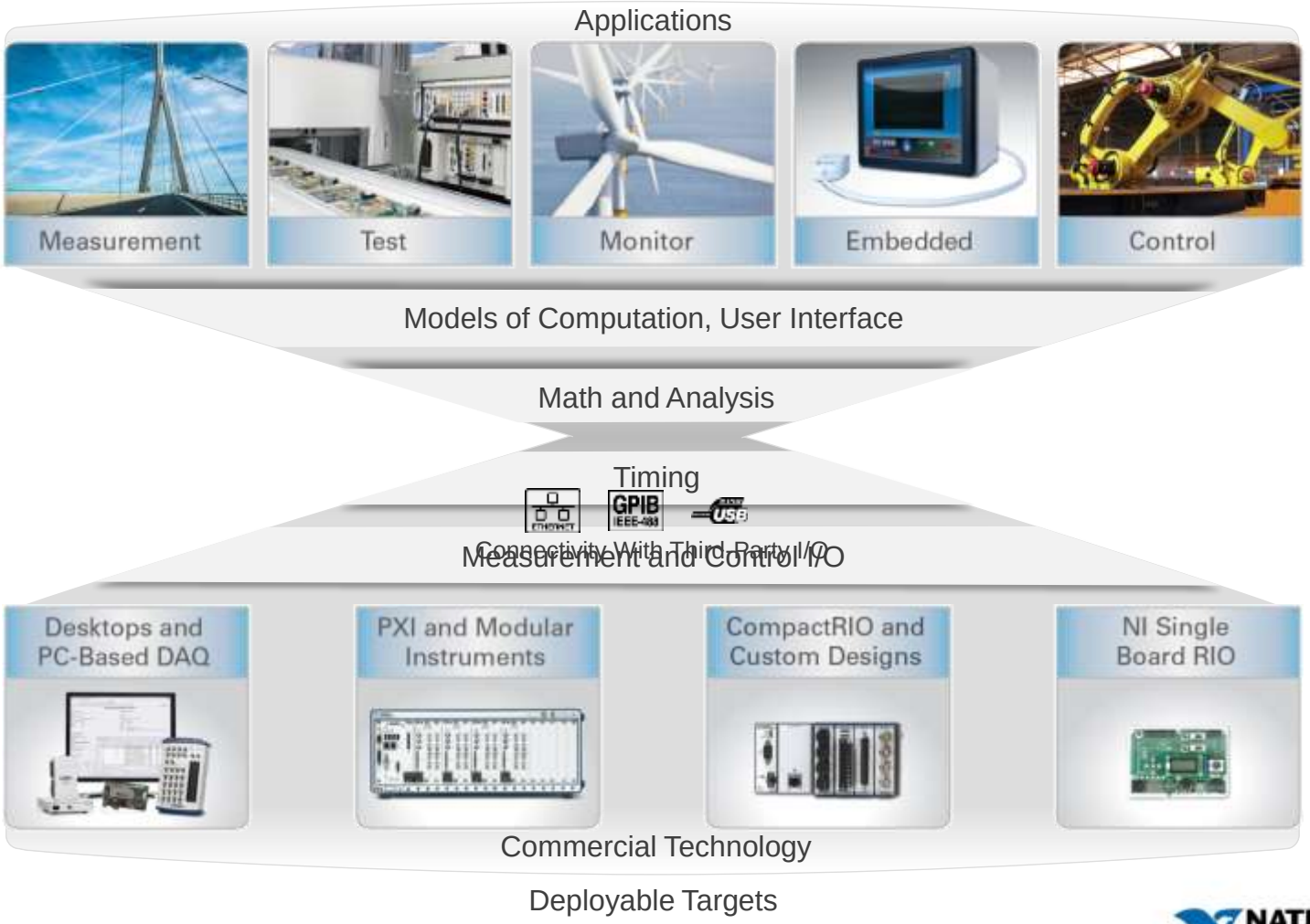
Graphical System Design

A platform-based approach for measurement and control



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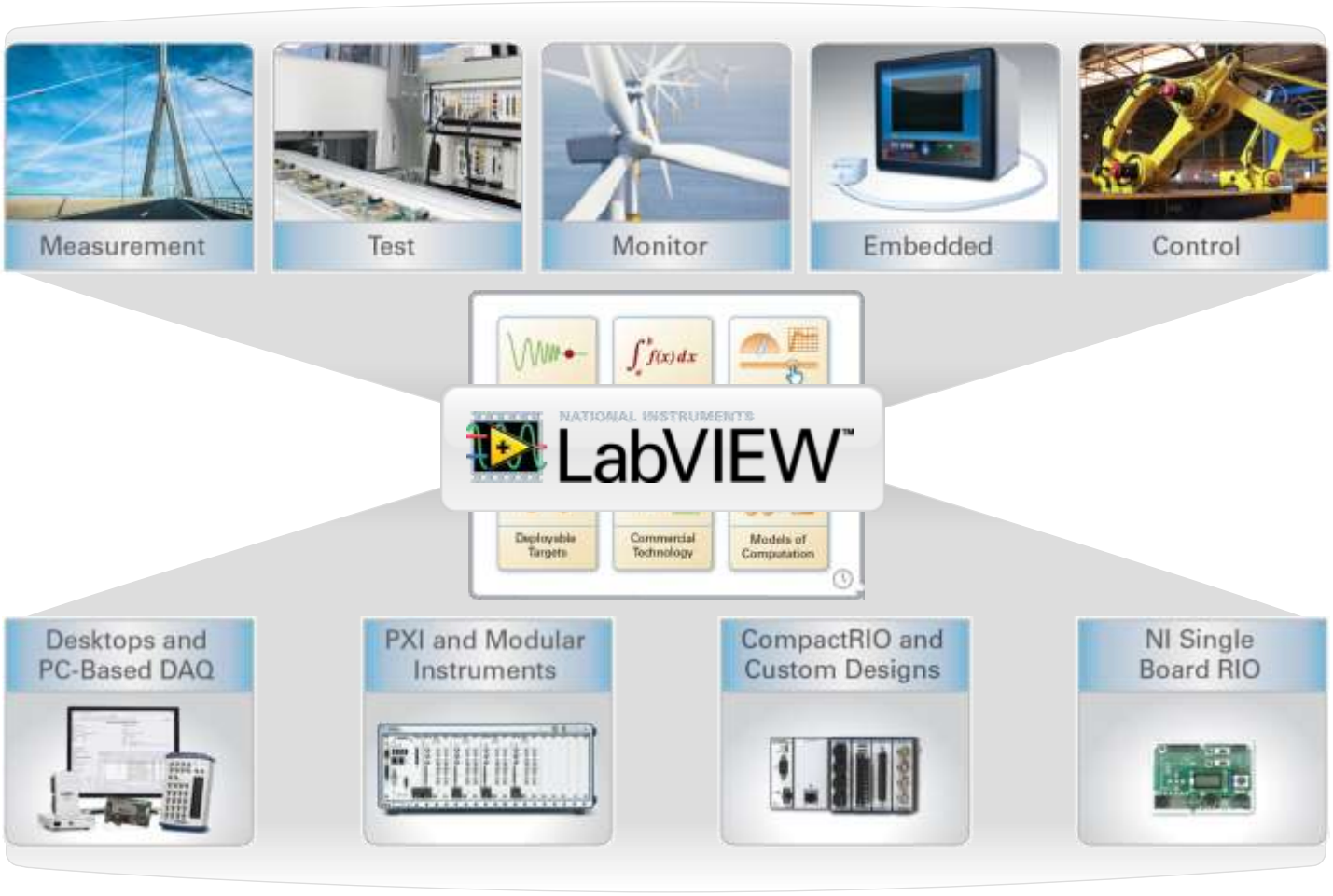

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Unrivaled Integration with the Latest Technology

NI cDAQ-9188XT

Rugged 8-slot Ethernet Chassis

NI cRIO-9068

Software-Designed Controller

NI PXIe-7975R
Featuring Kintex-7 FPGA

Instrument Driver FPGA Extensions
for NI VSTs

NI PCIe-8236 and PCIe-8237R

Power over Ethernet Frame
Grabbers

NATIONAL INSTRUMENTS LabVIEW 2013

New Hardware Products

7 New C Series Modules

Expanded Platform Functionality

NI myRIO

Embedded Student Design Device

Digilent chipKIT

LabVIEW Interface for chipKIT Arduino

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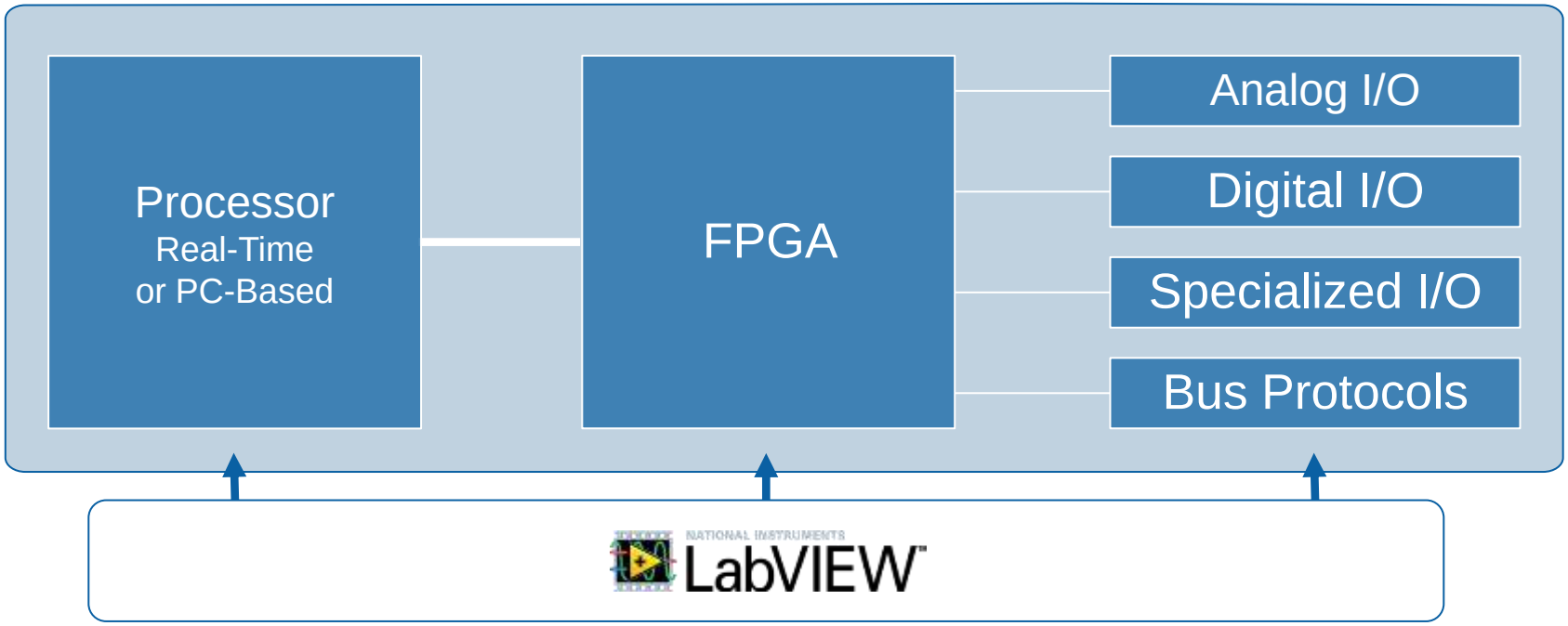
LabVIEW RIO Architecture



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LabVIEW Programmed NI CompactRIO

cRIO-9002
cRIO-9004
cRIO-9072
cRIO-9074
cRIO-9075
cRIO-9076
cRIO-9012
cRIO-9014
cRIO-9024
cRIO-9025
cRIO-9081
cRIO

VIRTEX-II

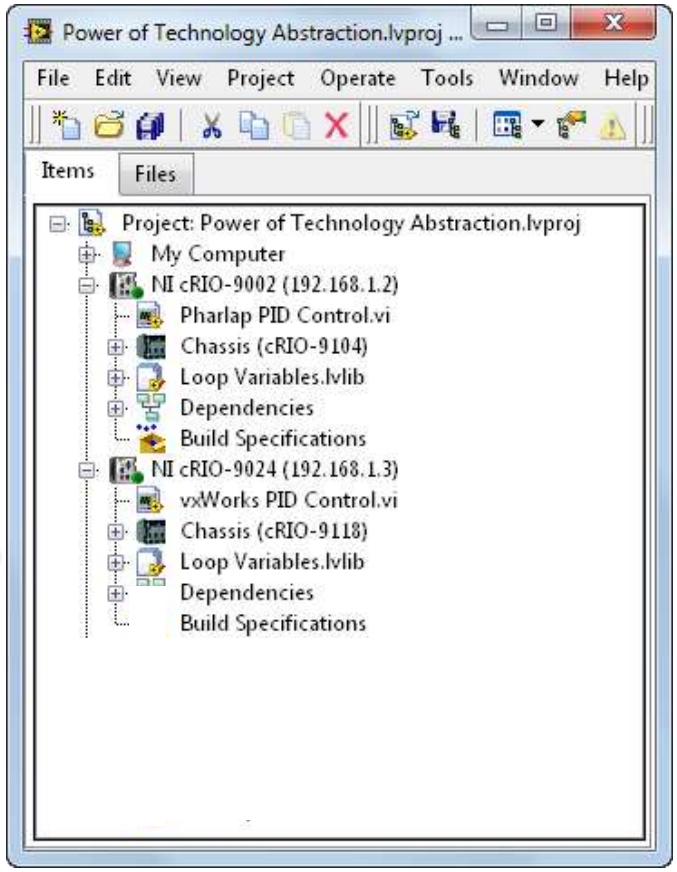
PowerPC

VIRTEX 5

VxWorks

ZYNQ

cRIO-9068



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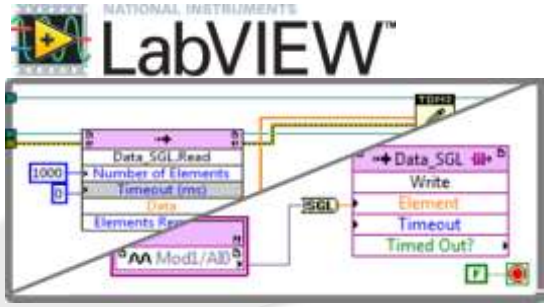
The Redesigned CompactRIO



NI LabVIEW System Design

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

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

Ultra Rugged

-40 to 70° C operating temperature range
50 g shock and 5 g vibration tolerance

Community and Code Reuse

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

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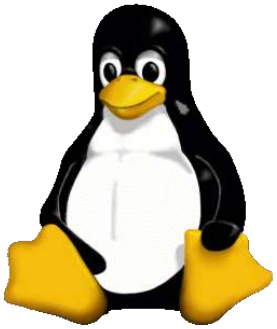
LabVIEW Support for NI Linux Real-Time OS®

LabVIEW 2013 Real-Time Module supports developing, debugging and deploying applications to the NI Linux Real-Time OS® deterministic operating system

- For users familiar with Linux, unlock the vast Linux **ecosystem** on the new CompactRIO controller
- **Reuse** C/C++ code in and alongside LabVIEW Real-Time built applications on the redesigned CompactRIO controller
- Freedom in **Connectivity**
  - Expanded LabVIEW design flow for open web service creation
  - Secure file transfer with WebDAV
  - Improved network interface



Data Dashboard for LabVIEW 2.2

Alternate Servers

Now you can set up one dashboard to monitor multiple targets and use the drop down menu to switch where the data is streaming from while the dashboard is running

Multi-Plot

Data Dashboard now supports 2D array of numerics as a datatype for charts and graphs.

Android Tablets

Data Dashboard 2.2 on Android tablets now supports monitor and control applications and free canvas customizations.

Transparency

Adjust the transparency of images, controls, and indicators on your dashboard

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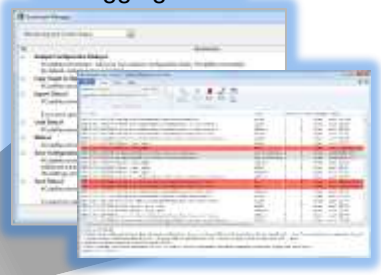

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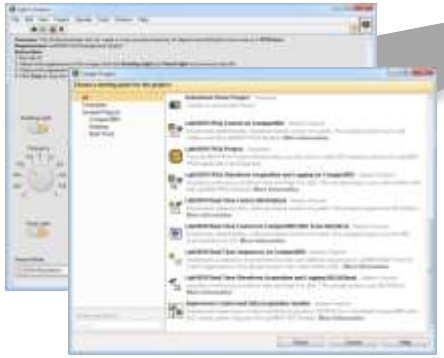

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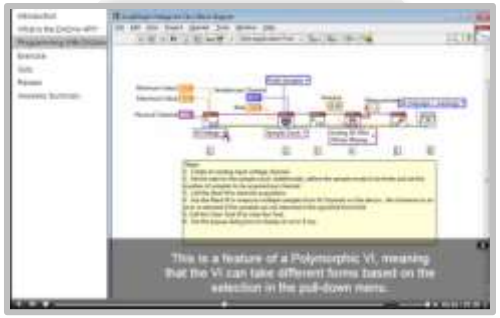
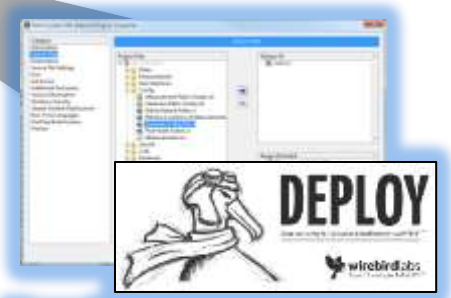


Expanded Online Training



Streamlined Application Deployment

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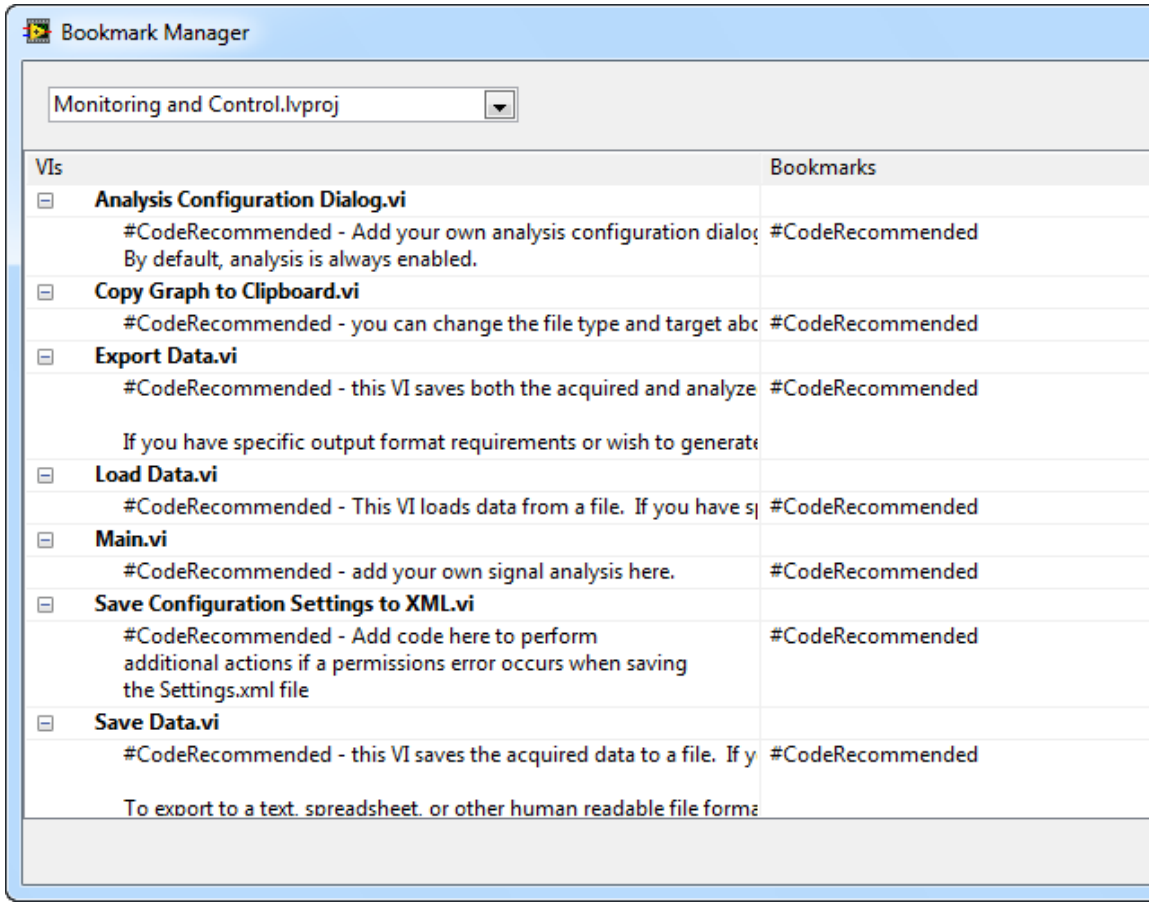
Tools to Document Code

Bookmark Manager

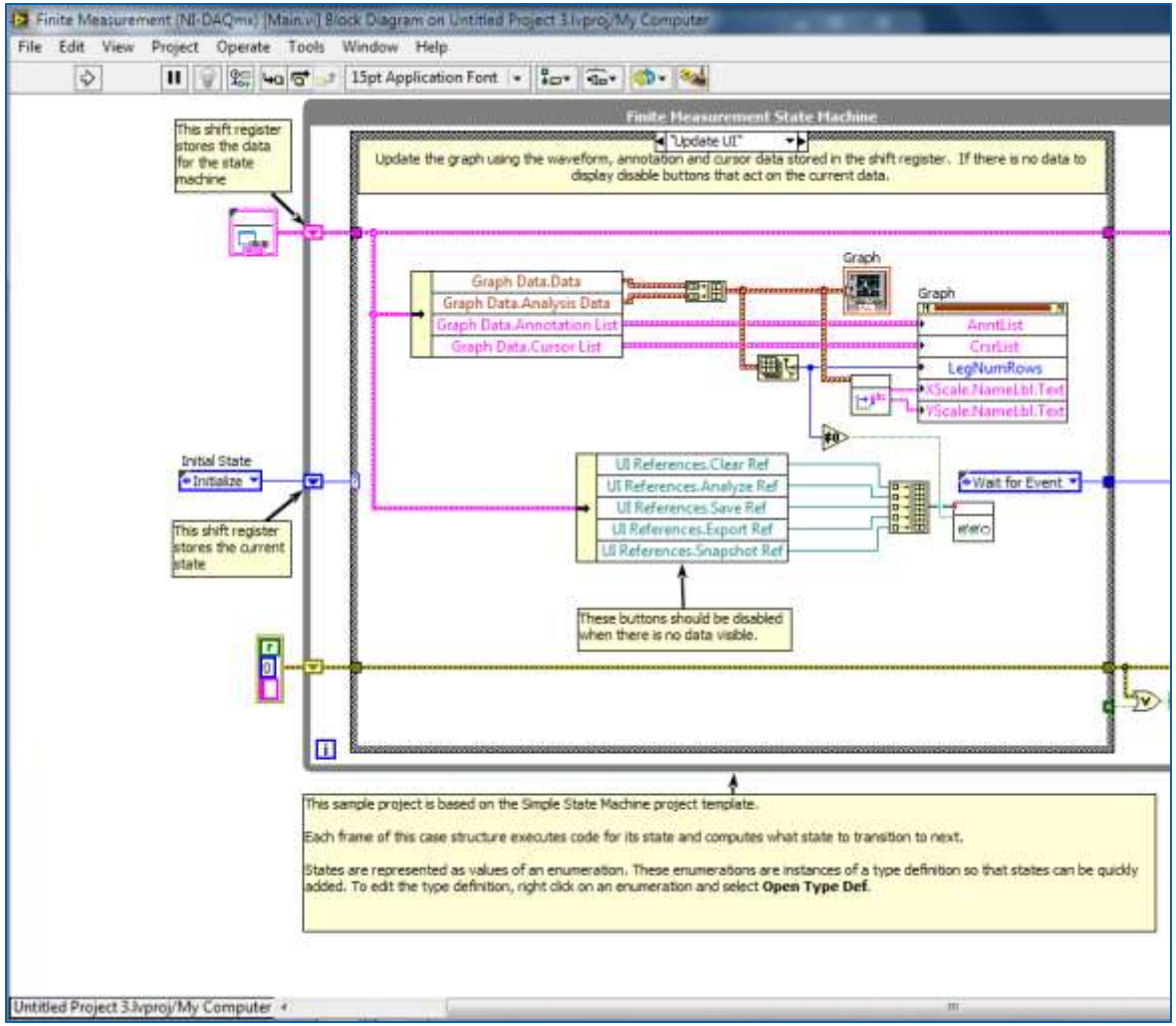
- Aggregates tags from code comments into a single window
- Allows developers to easily navigate through large code hierarchies
- Built on an open and extensible API



Tools to Document Code

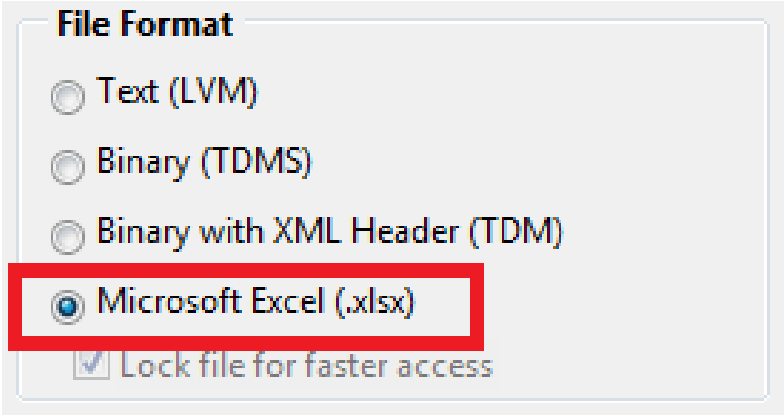
Attached Comments

- Drag arrows from comment to code to create explicit link
- Improve code readability
- Associations preserved with block diagram clean-up



Improved Excel Integration

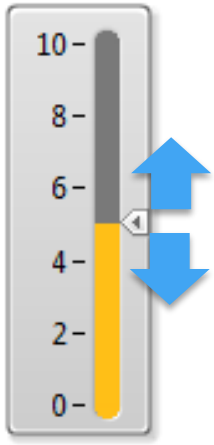
- Write to measurement file can create an xlsx file
- Does not use ActiveX interface; therefore, Excel does not need to be installed
- Available for use on Real-Time



Mouse Wheel Support for Controls and Indicators

Numeric Controls

Sliders

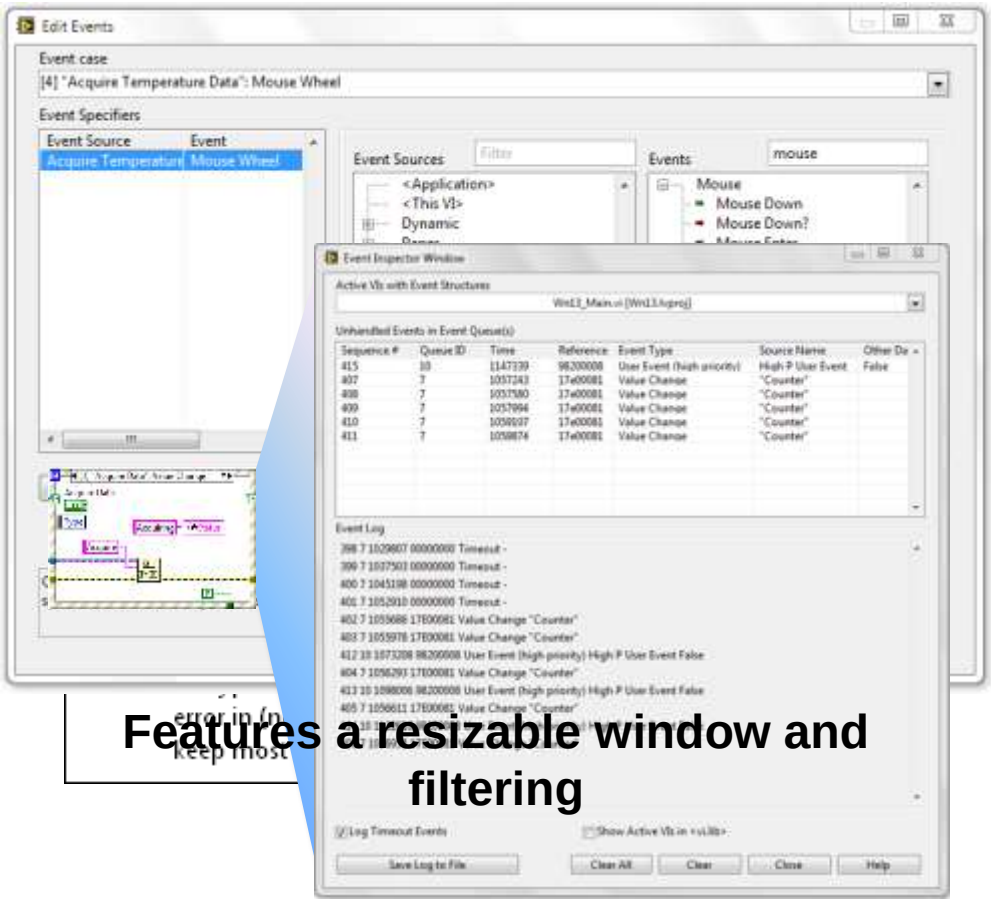


Knob

You can change the values of selected controls using the scroll wheel

Event Structure and API Improvements

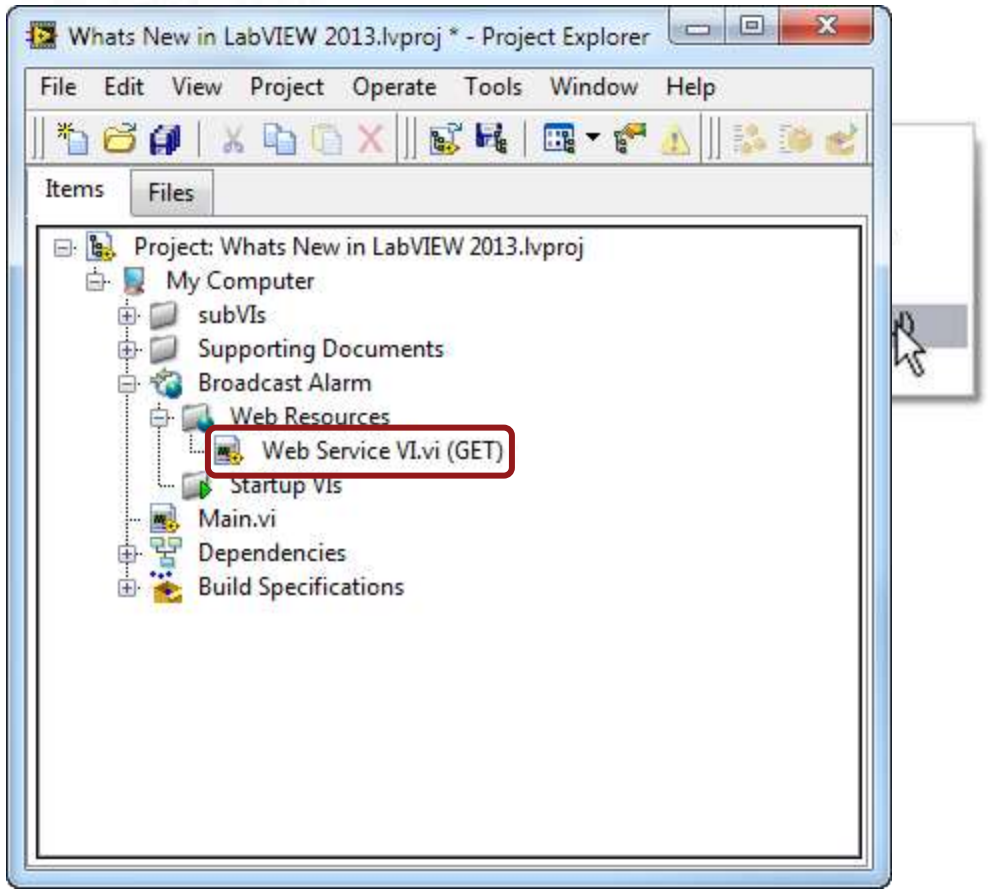
- Mouse scrolling included in static events
- Improvements to user interface of ‘Edit Events’ dialog
- New Event Inspector Window to simplify debugging
- New User Event primitives for advanced control over buffer



New Web Service Experience

Design → Verify → Deploy

- Provide Remote Access To LabVIEW Applications
- Formerly a Build Specification Item
- Now a Project Item – Faster Edits and Deployment



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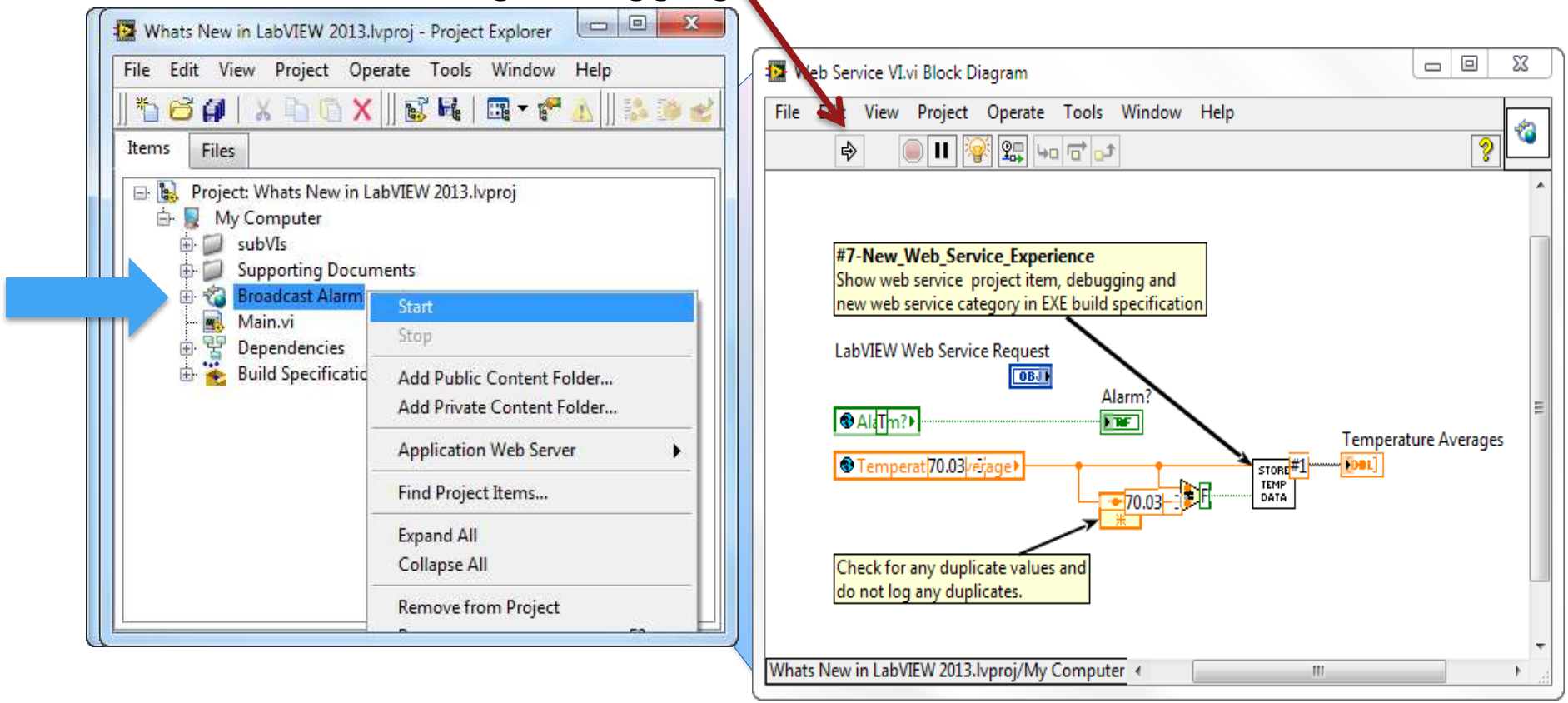
New Web Service Experience

Design → Verify → Deploy

Debuggable Web Services integrated into the LabVIEW project

*Reserved VI during debugging



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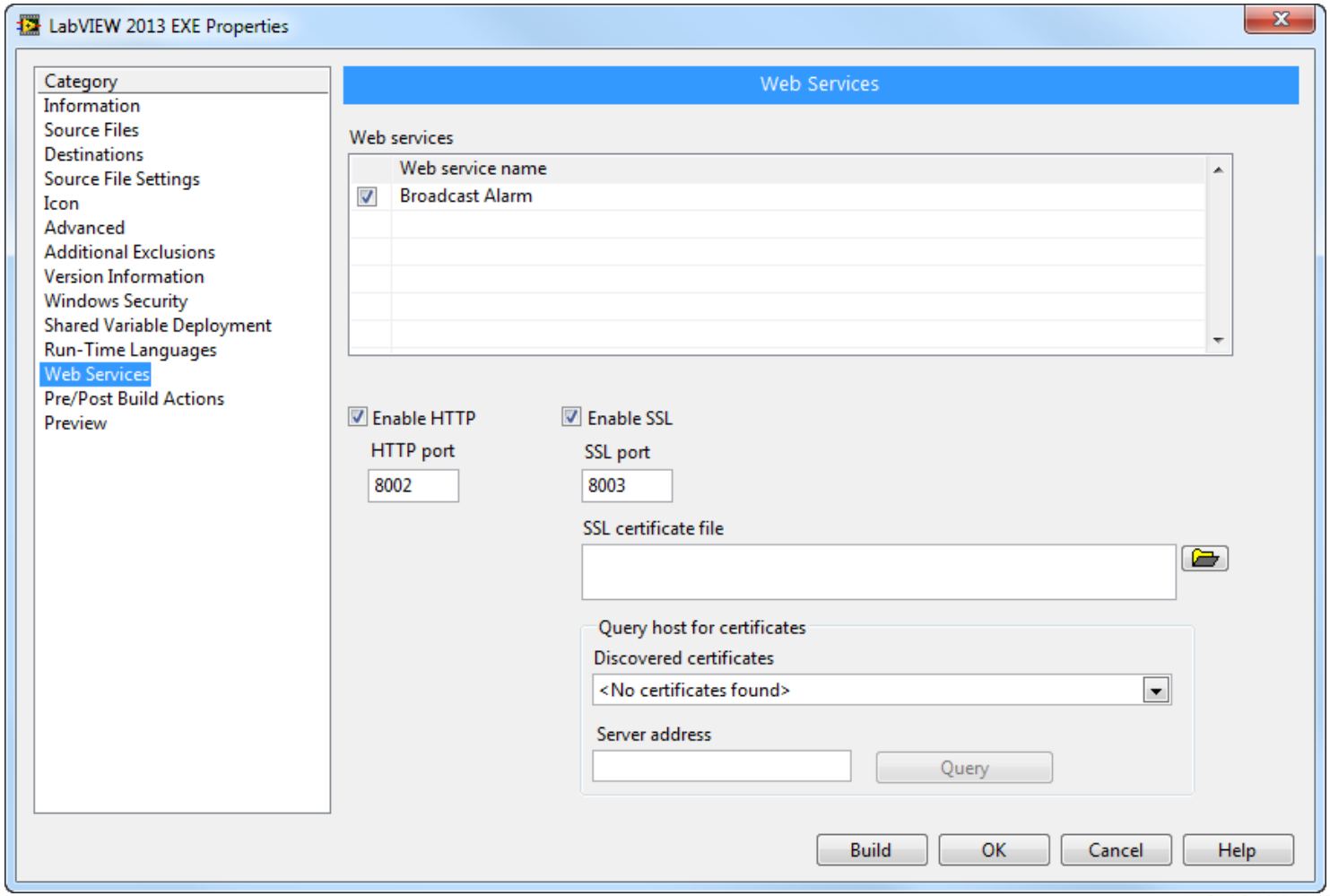
New Web Service Experience

Design → Verify → Deploy

New EXE Build Specification Category to Include & Auto-Deploy



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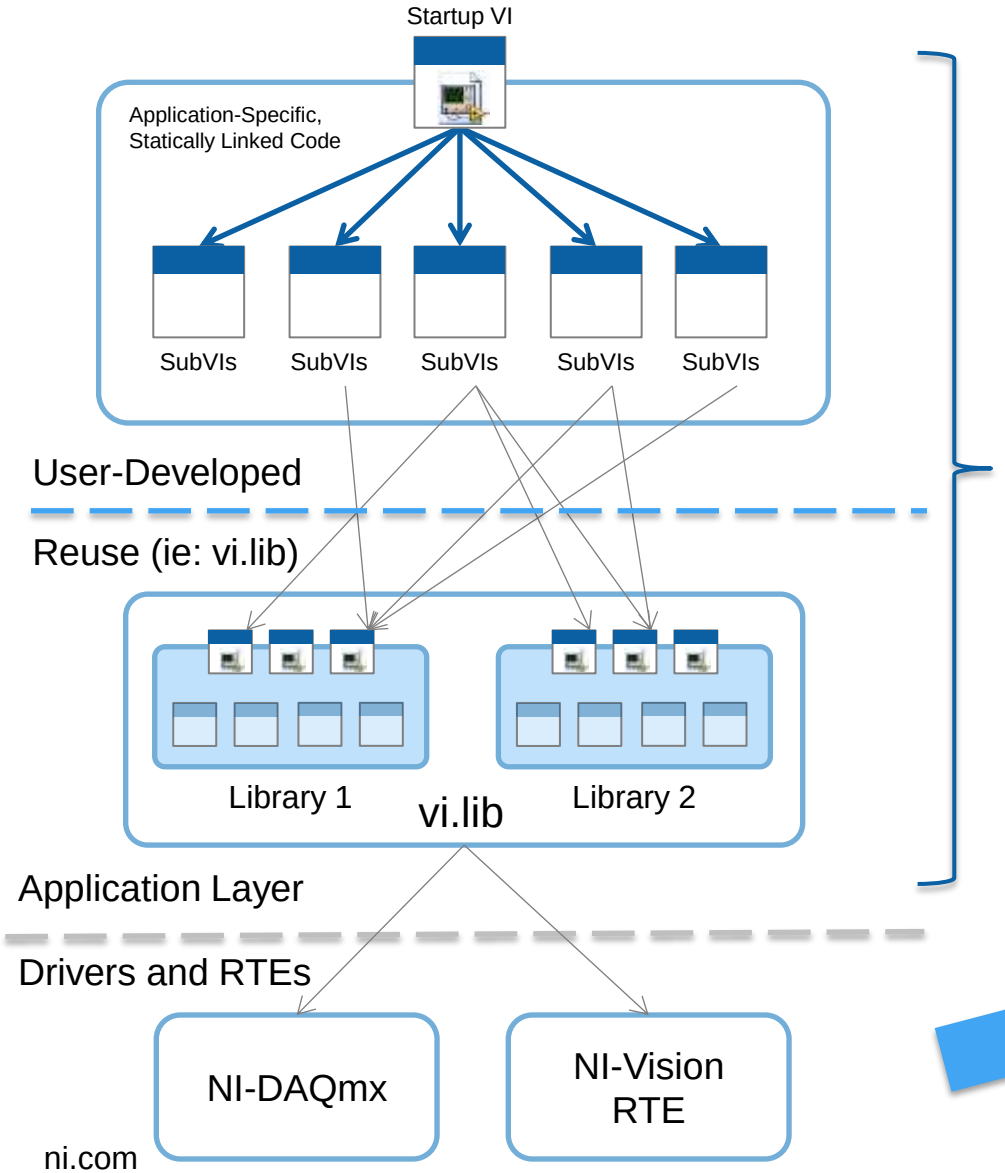
Simplifying the Creation of Installers



An executable packages all statically linked application software.

Executable

An executable typically still depends on external drivers and run-times

Installer

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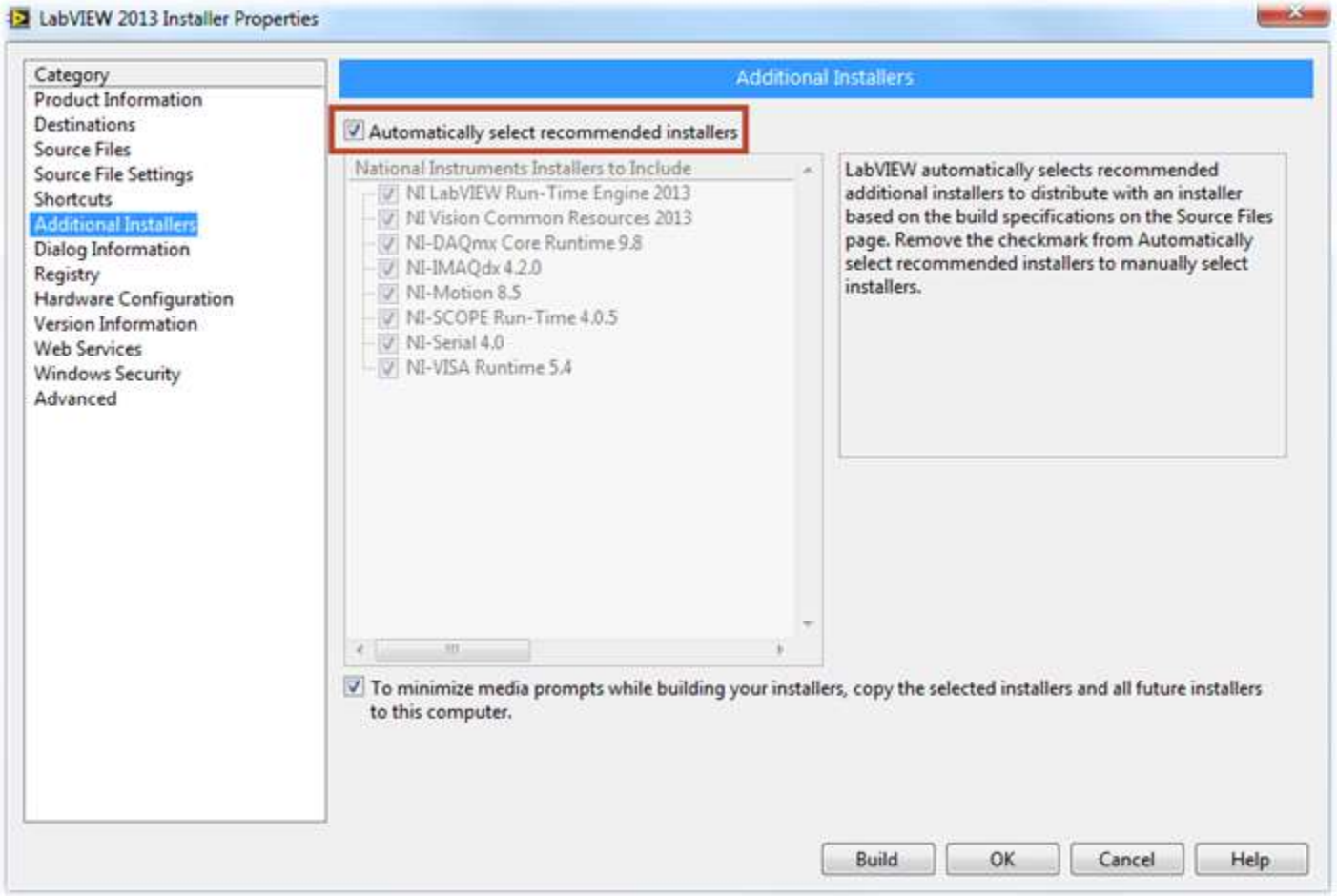
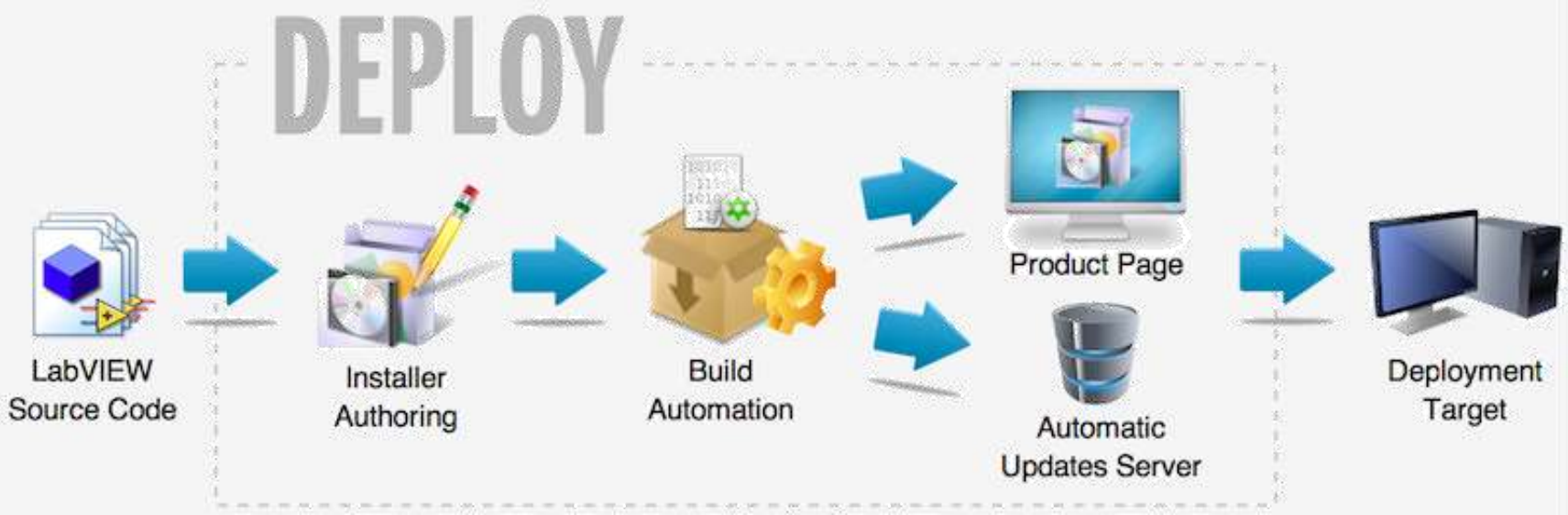
Simplifying the Creation of Installers

NI LabVIEW Application Builder auto-includes dependencies



From Wirebird Labs LLC

Setup Authoring & Application Distribution Add-On for LabVIEW



Automate time-consuming tasks to deliver professional software:

- Inclusion of third-party drivers and run-time engines
- Includes Amazon Cloud hosting services*
- Minimize download footprint by silently downloading dependencies
- Single click install for customers
- In product update notifications

*Deploy can use other services, including local and private servers

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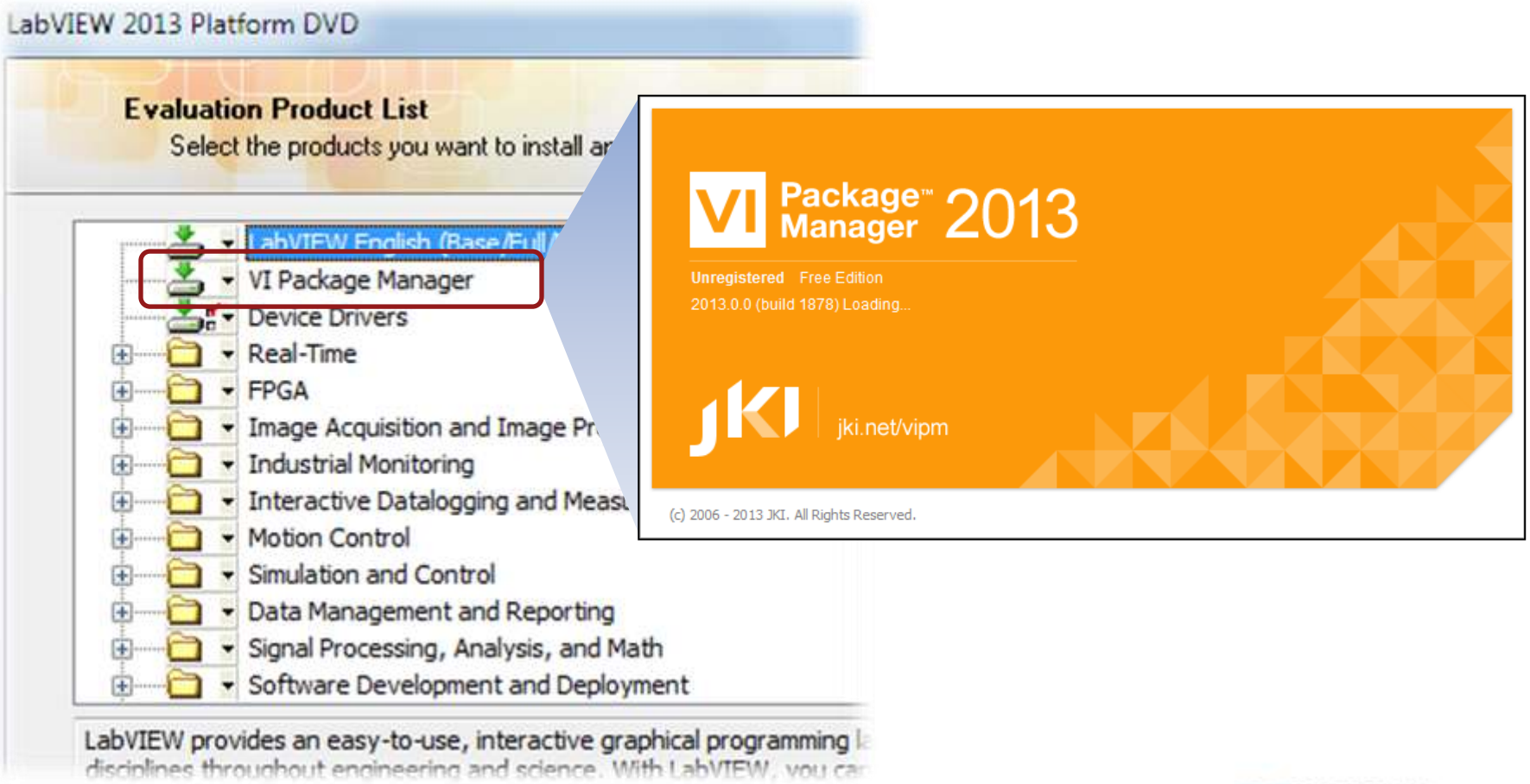
VI Package Manager Installed with LabVIEW 2013

Now every LabVIEW user can access and reuse IP and tools from the community



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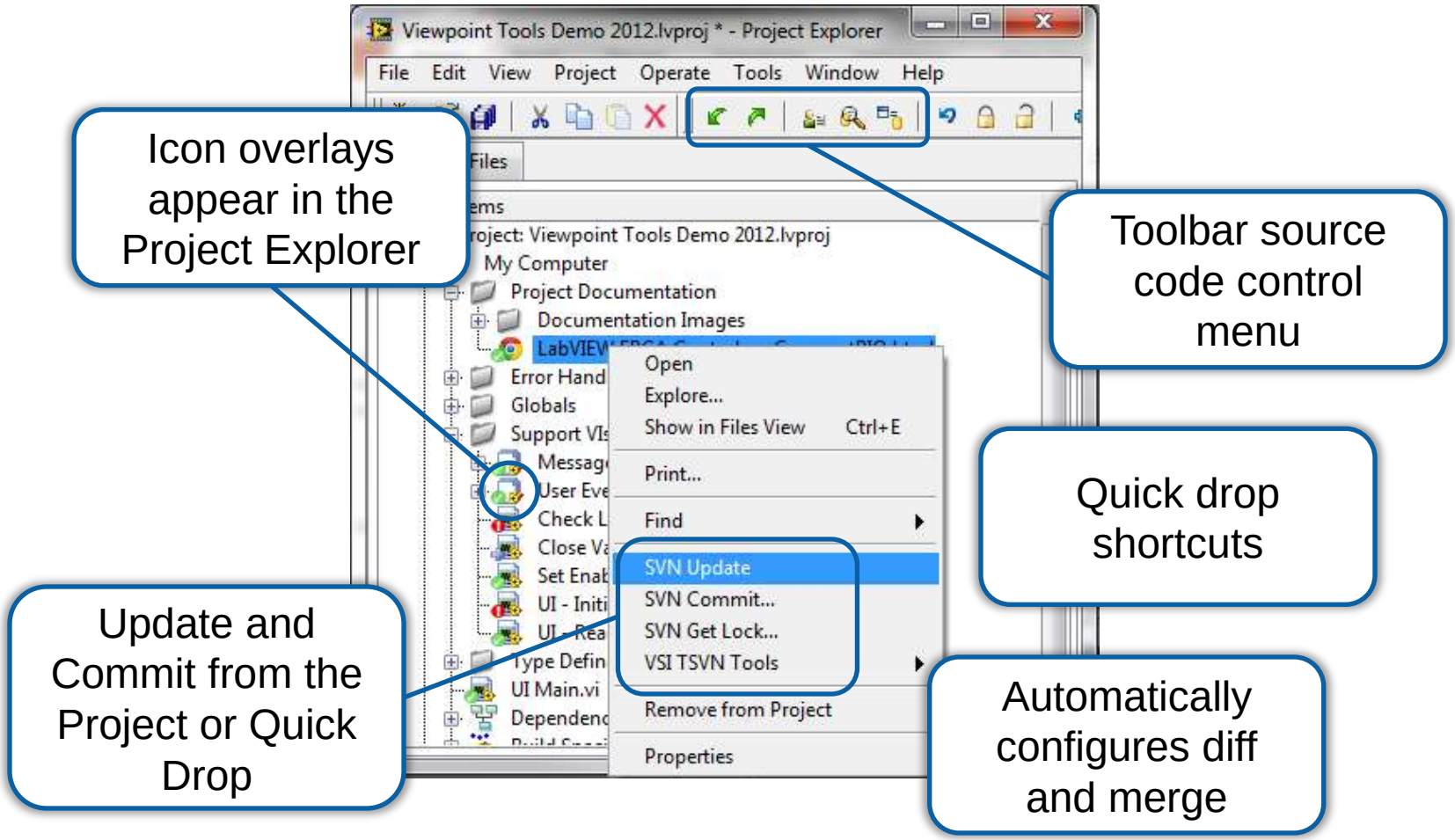
Viewpoint's TortoiseSVN Toolkit



Free Subversion provider for LabVIEW

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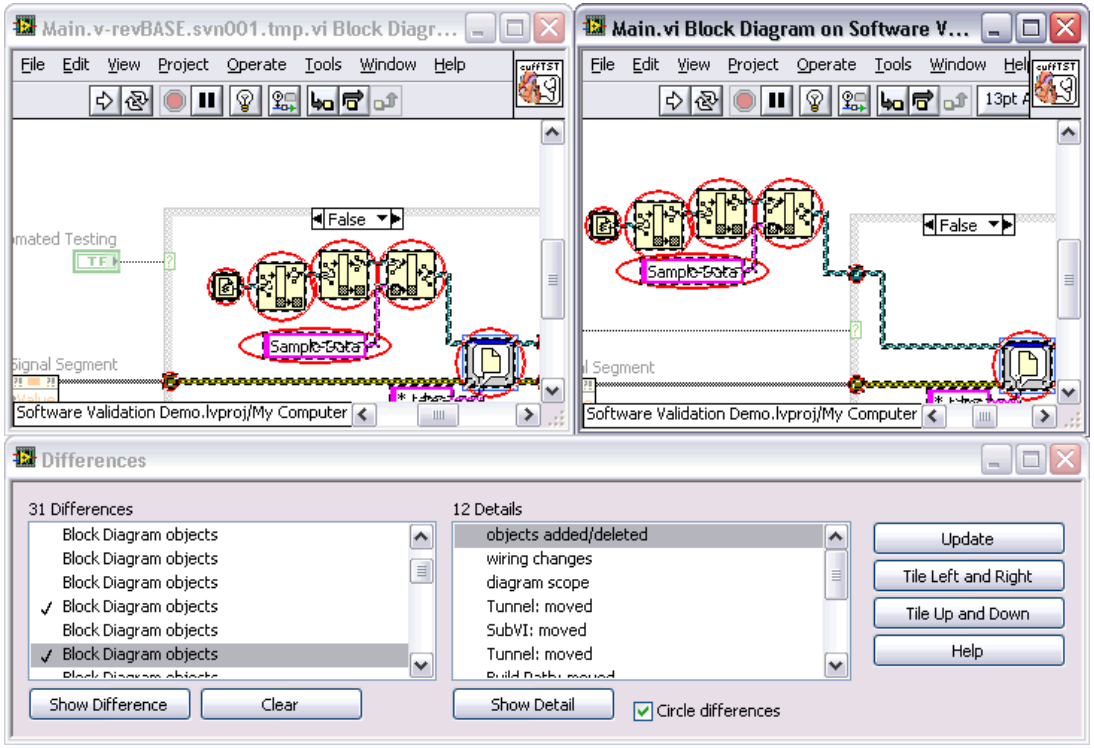
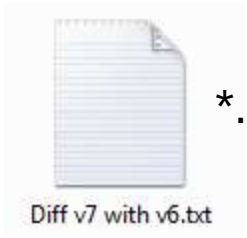
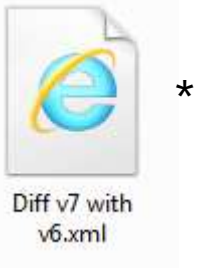
Tools to Manage Code

Export graphical comparisons* to external files that can be viewed outside the LabVIEW editor





*.txt



*.xml

*.doc

*The LabVIEW compare tool, can be configured for use with source code control tools, such as SVN and Perforce

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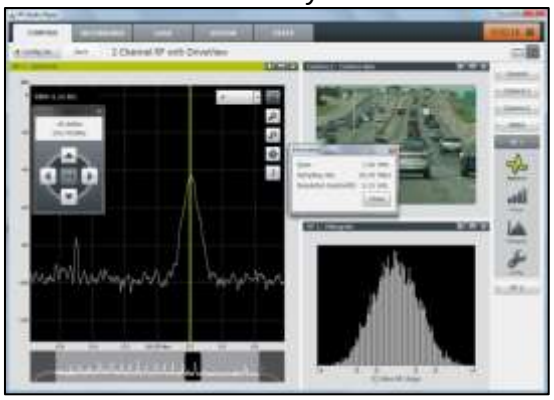
RF Studio by Averna



RF Record and Playback for USRP

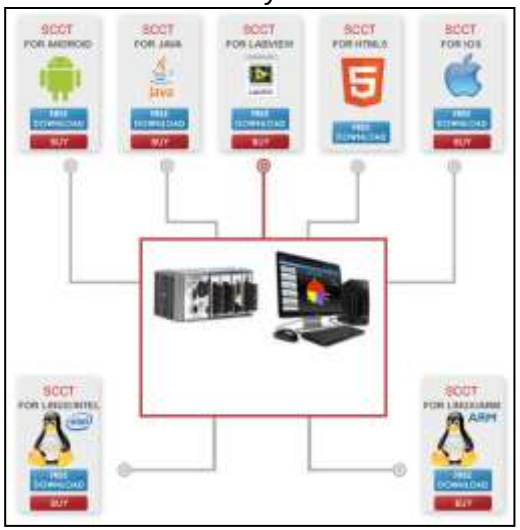
ImagingLab Robotics Libraries

Control Common Industrial Robots

LabVIEW TOOLS NETWORK

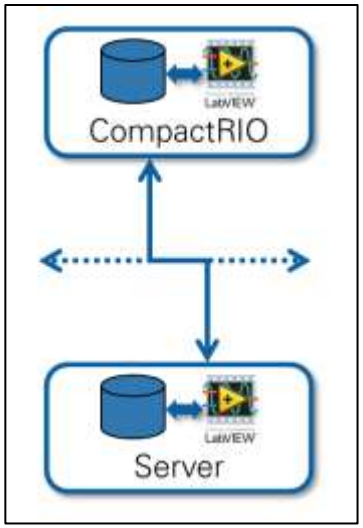
http://www.ni.com/labview-tools-network/

SCCT by T4SM



Exchange Data Between Multiple Mobile Platforms

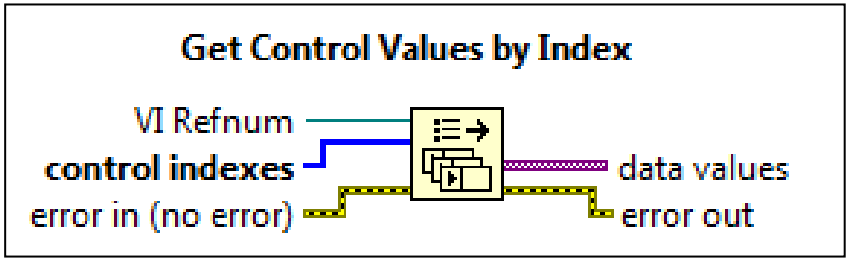
Raima Database API for LabVIEW



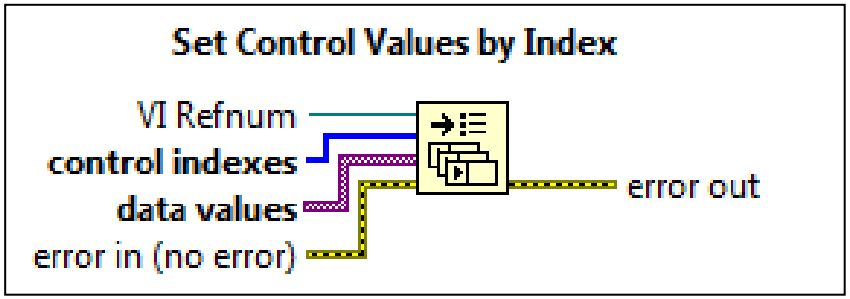
Local Database Solution For NI CompactRIO

New Primitives for Controlling UIs

Advanced API for updating and retrieving values from UI controls and indicators.



Designed for updating extremely large numbers of UI components with maximum performance



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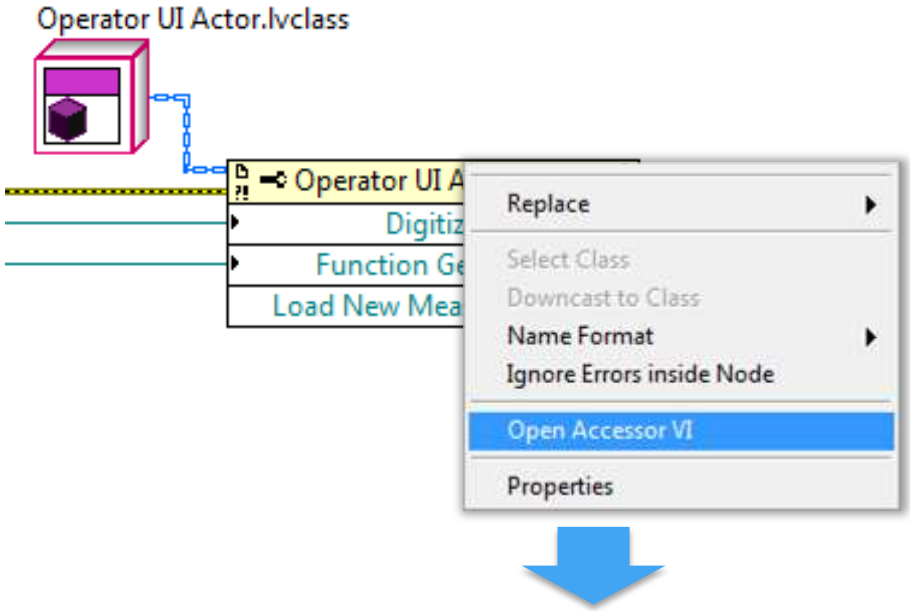
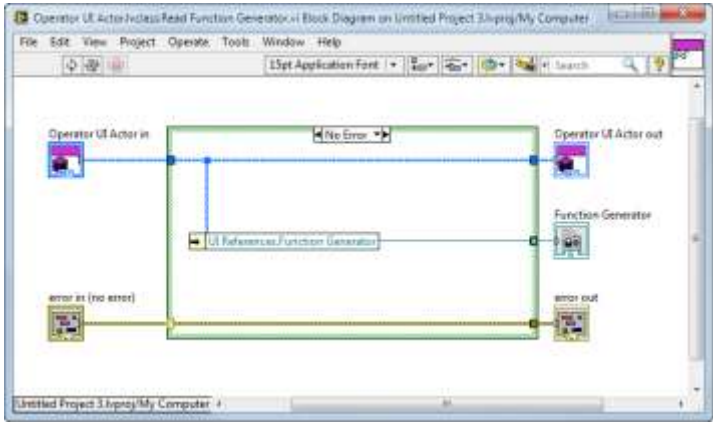
Tools to Manage Code

Accessor Navigation

- Simplifies finding the source code of a class data accessor
- Right-click menu includes ‘Open Accessor VI’ option
- Only applicable to accessors that are exposed via property nodes

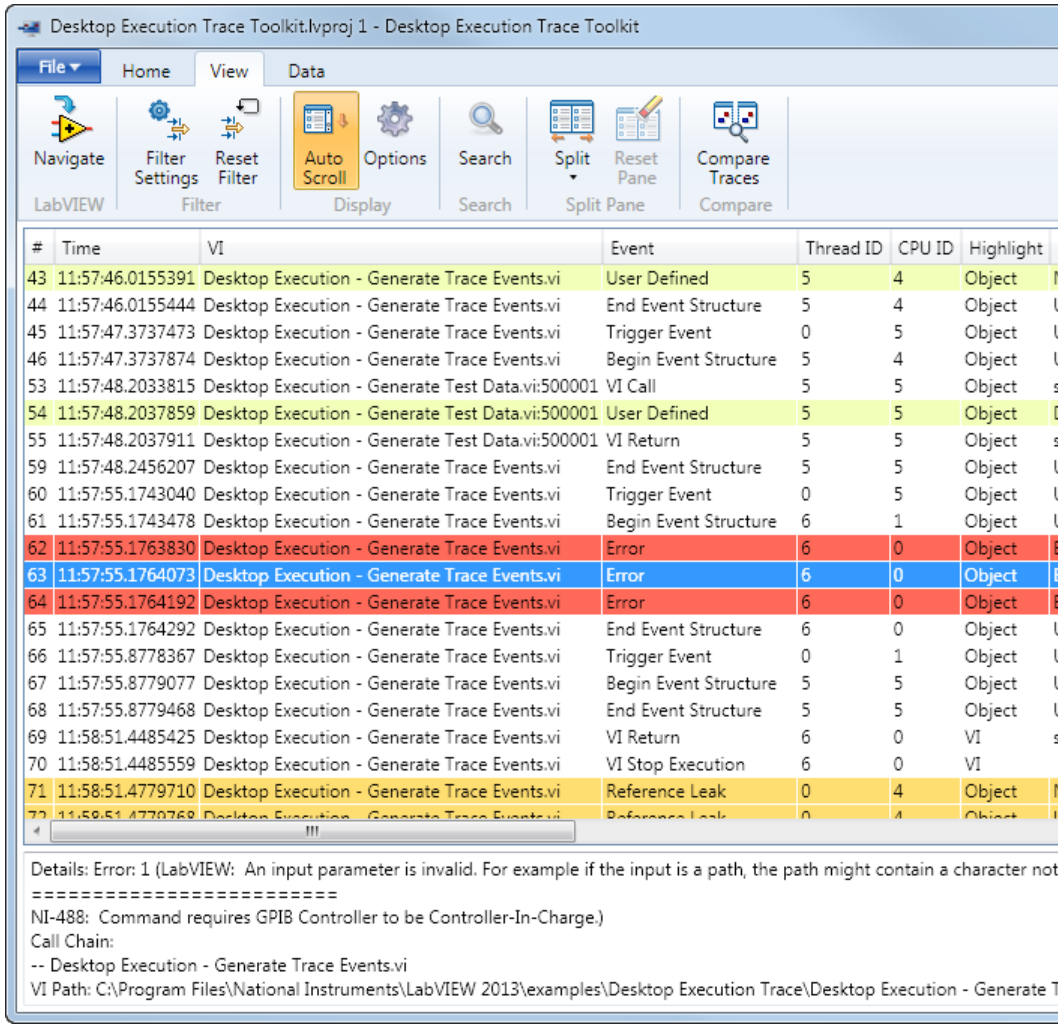




LabVIEW 2013 Desktop Execution Trace Toolkit

New Desktop Execution Trace Toolkit

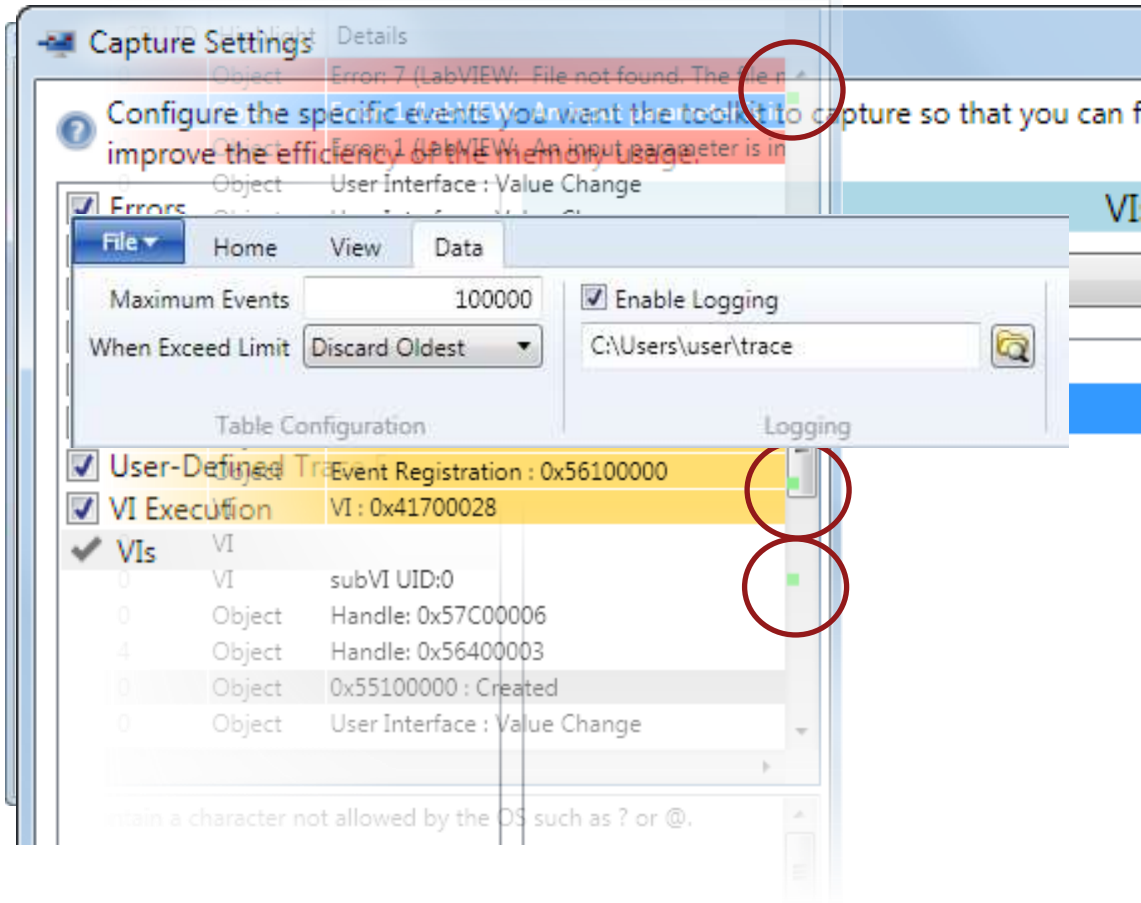
- Reinvented user interface based on user feedback
- Capable of handling much larger traces
- Improved filtering and sorting options
- Comparison tool for diff'ing trace data



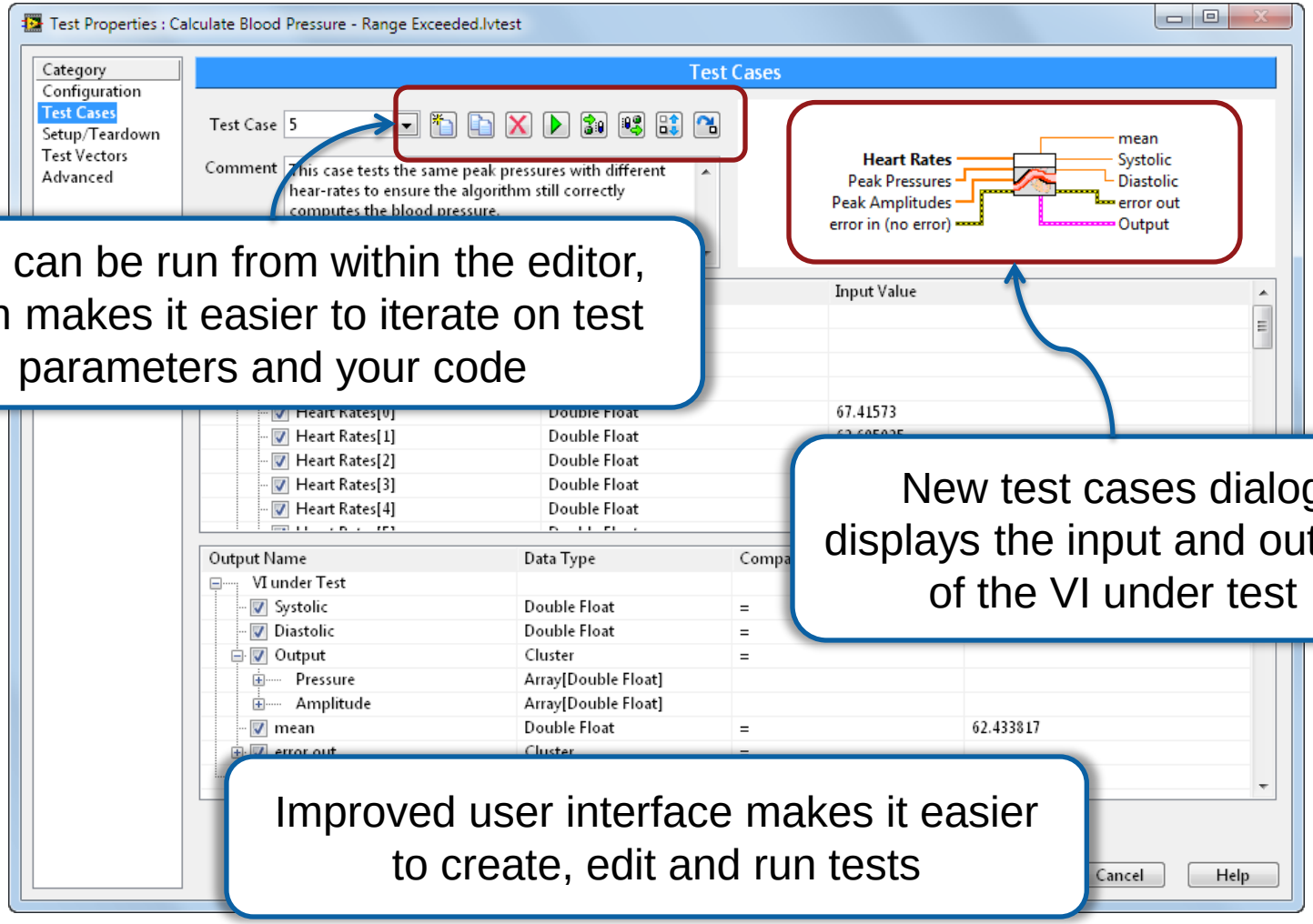
LabVIEW 2013 Desktop Execution Trace Toolkit

Feature Highlights

- Compare different sessions to examine behavioral changes
- User-requested trace configuration options
- Bookmarks make navigating multiple traces simple
- Automatic logging allows extended trace sessions



LabVIEW 2013 Unit Test Framework



Tests can be run from within the editor, which makes it easier to iterate on test parameters and your code

New test cases dialog displays the input and outputs of the VI under test

Improved user interface makes it easier to create, edit and run tests

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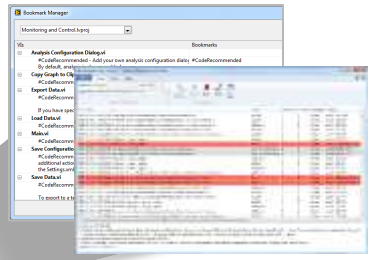

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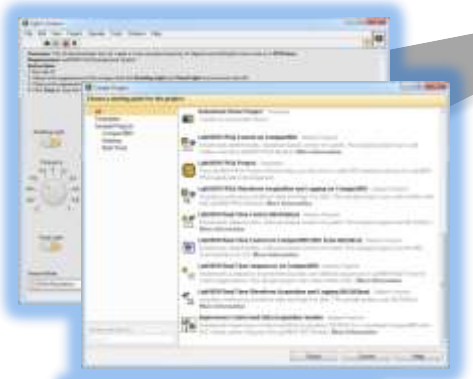

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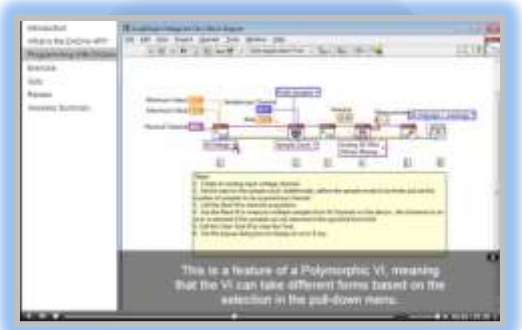
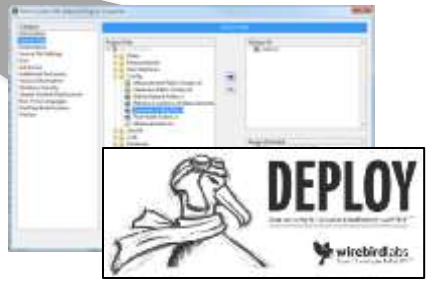


Expanded Online Training



Streamlined Application Deployment

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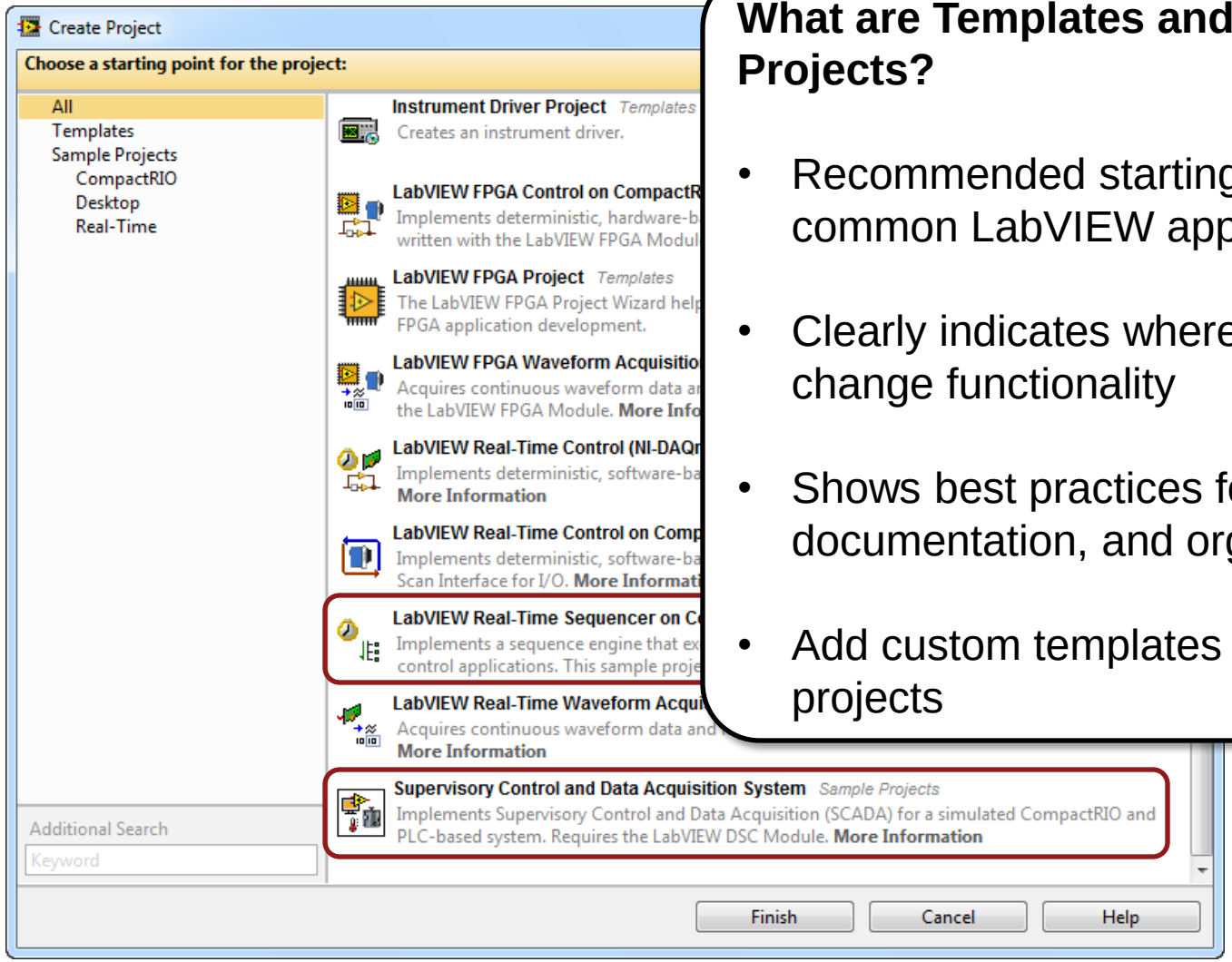
New Templates and Sample Projects

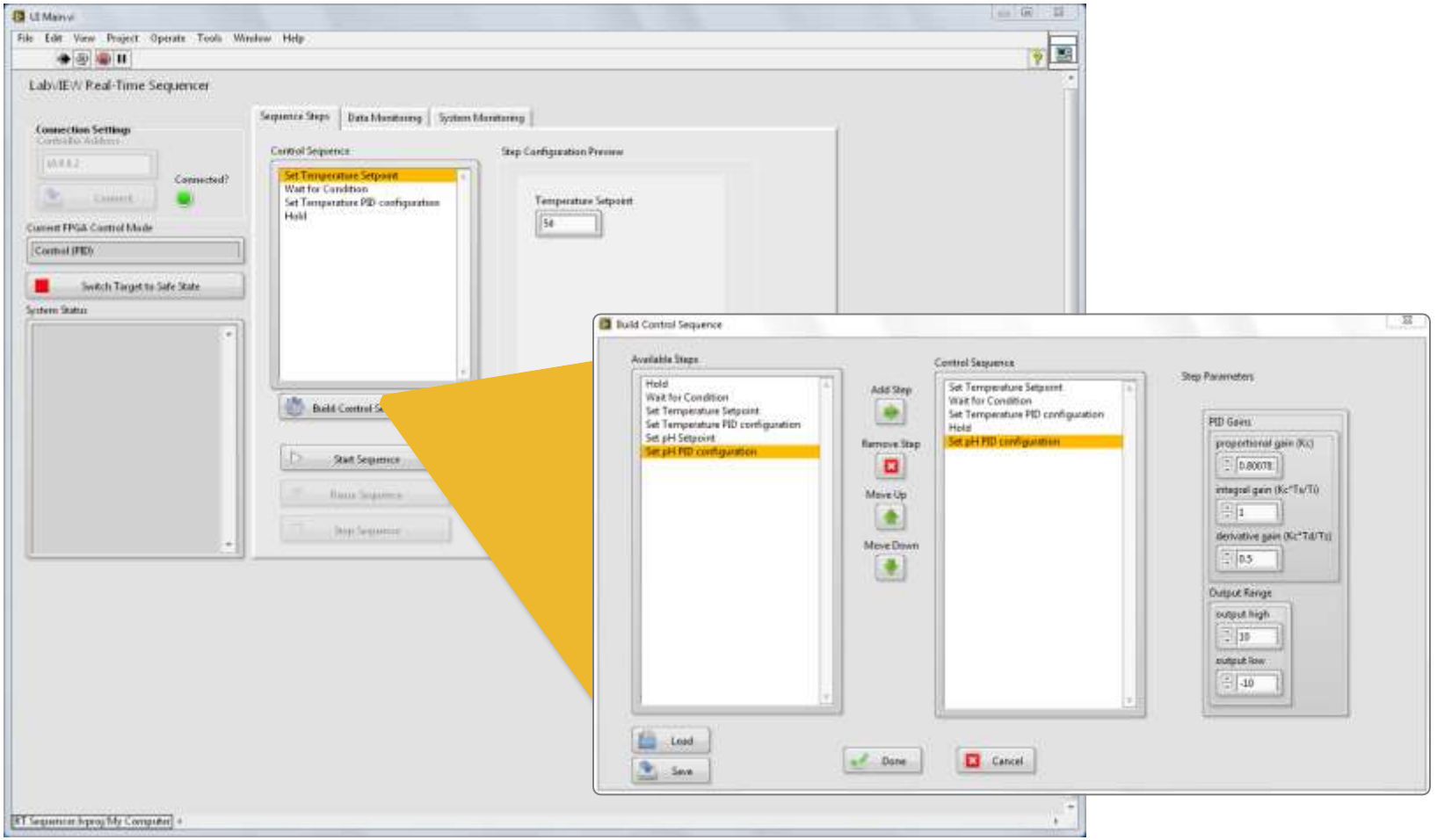


What are Templates and Sample Projects?

- Recommended starting points for common LabVIEW applications
- Clearly indicates where to add or change functionality
- Shows best practices for code design, documentation, and organization
- Add custom templates and sample projects

LabVIEW 2013 Sample Project Additions

Real-Time Sequencer



LabVIEW + LabVIEW Real-Time Module Required

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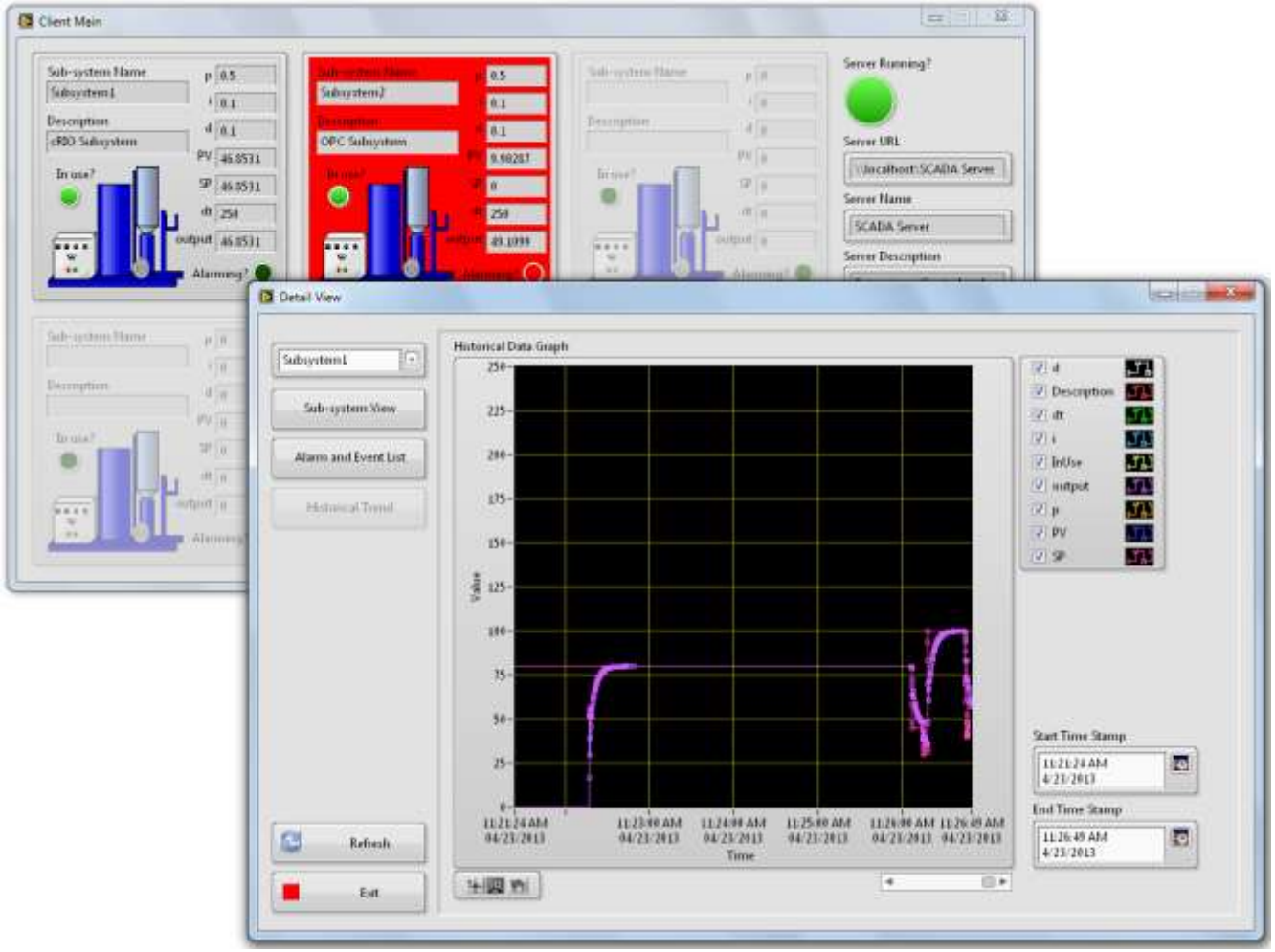
LabVIEW 2013 Sample Project Additions

Supervisory Control and Data Acquisition System



LabVIEW + LabVIEW DSC Module Required

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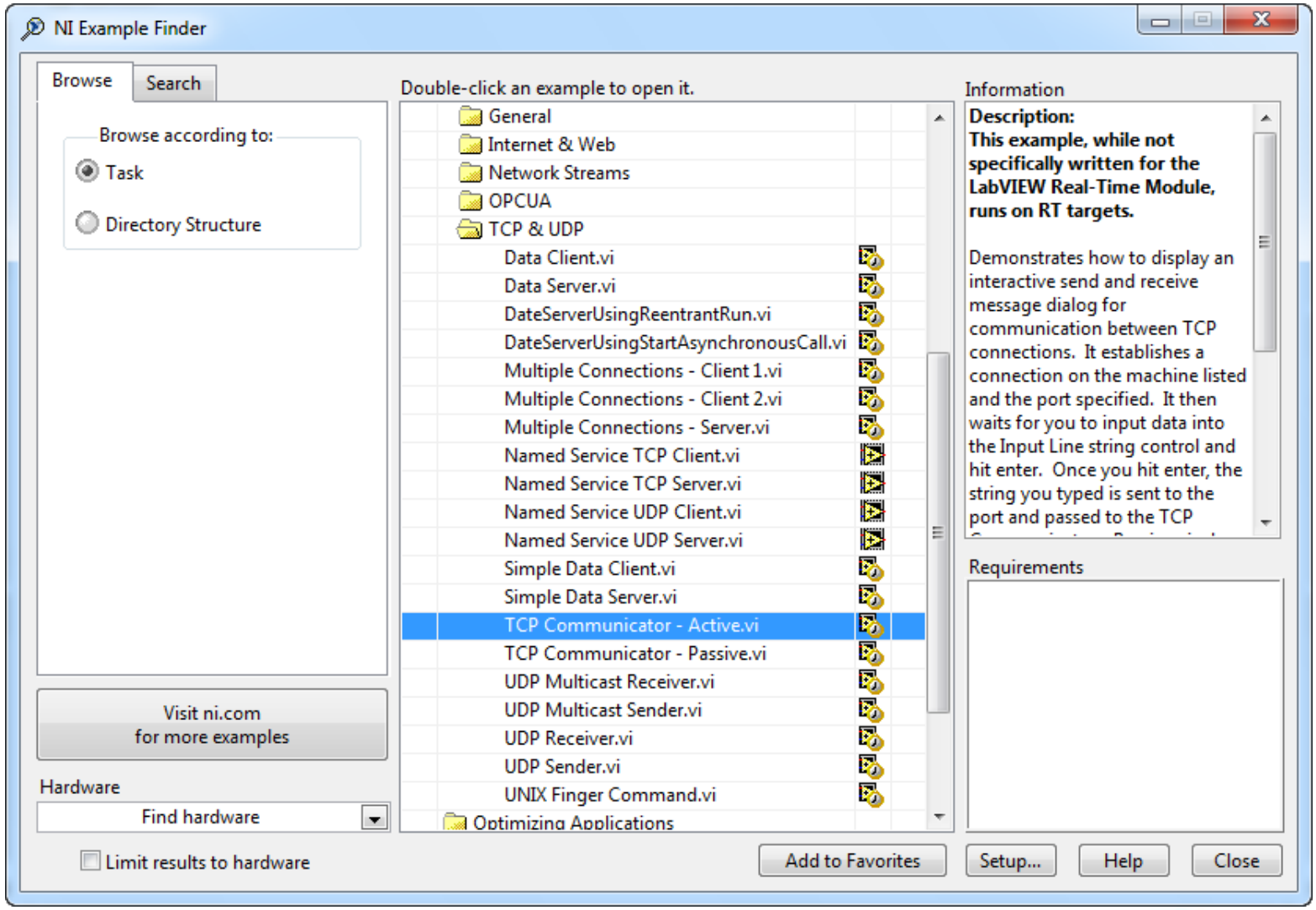
Shipping Example Refresh – Separate Files

2012



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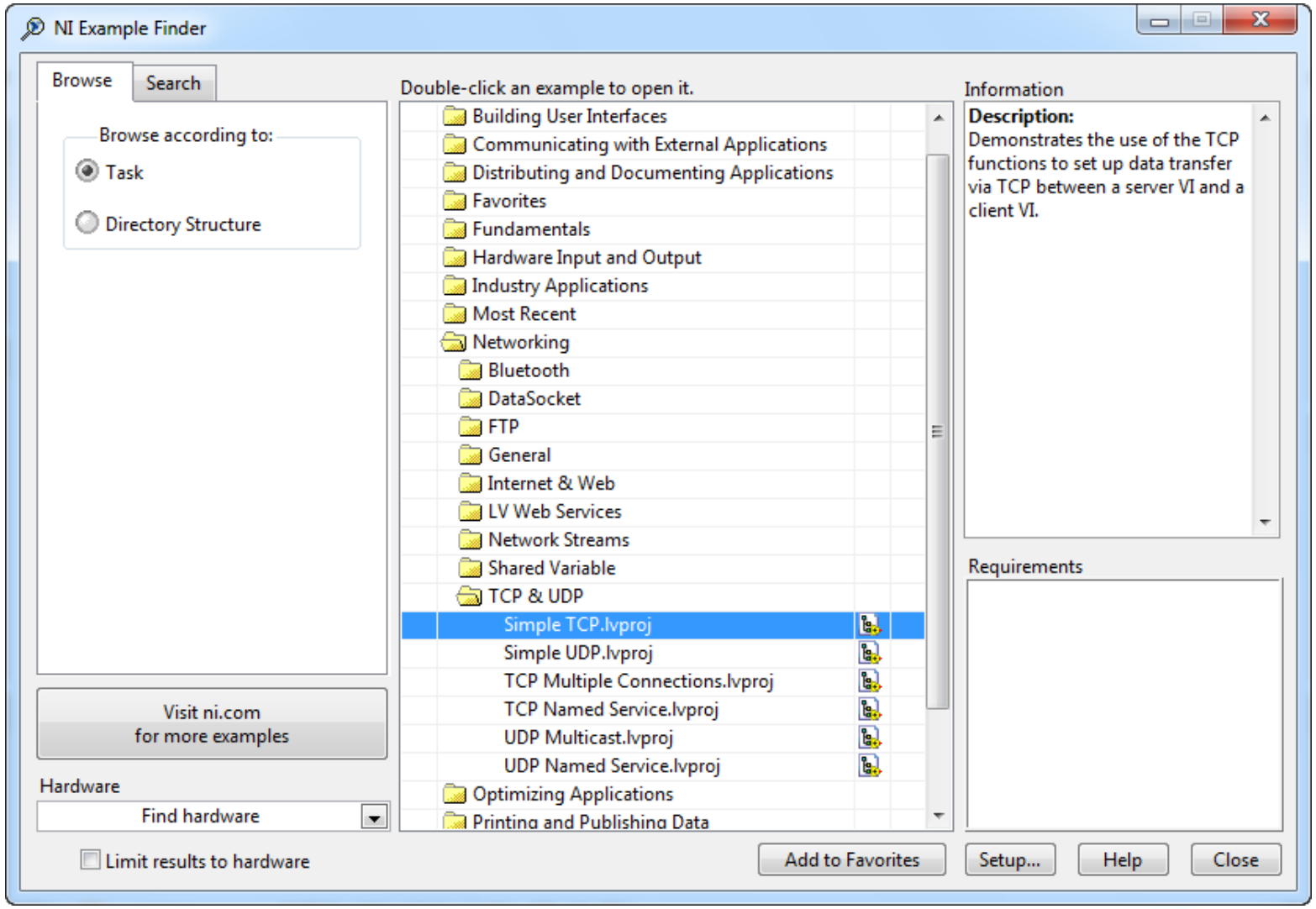
Shipping Example Refresh – Project Based

2013



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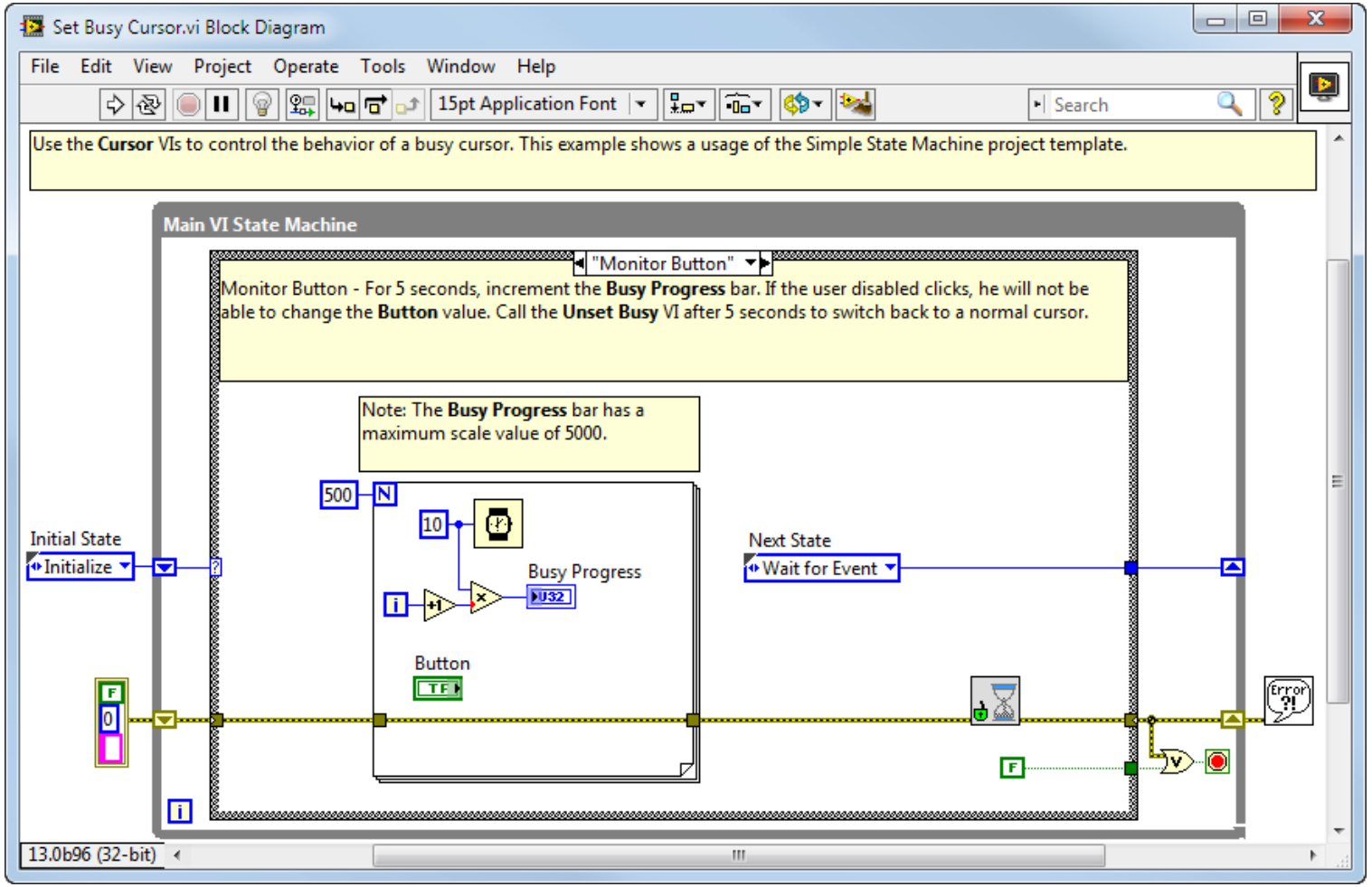
Shipping Example Refresh - Documentation



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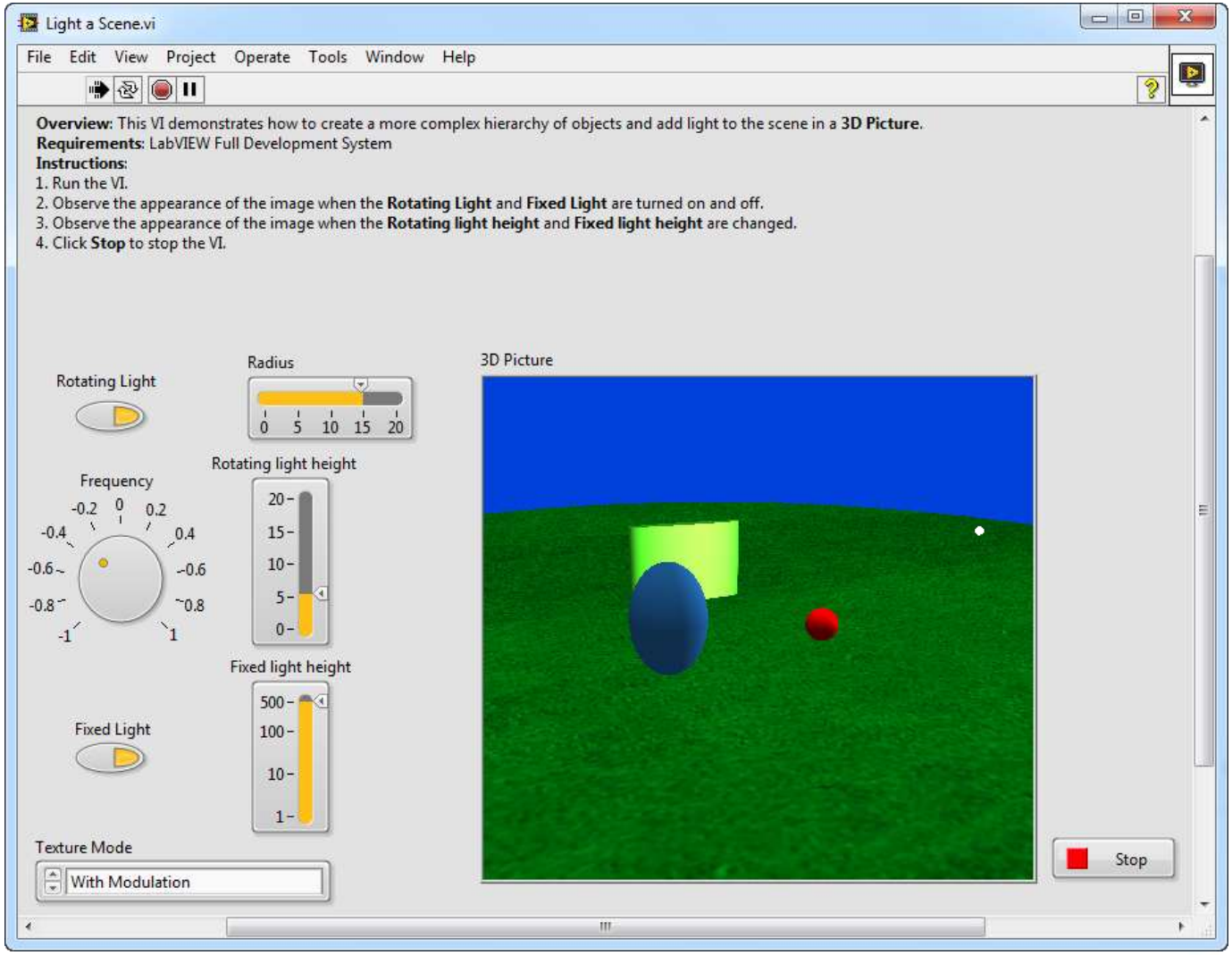
Shipping Example Refresh – New Examples



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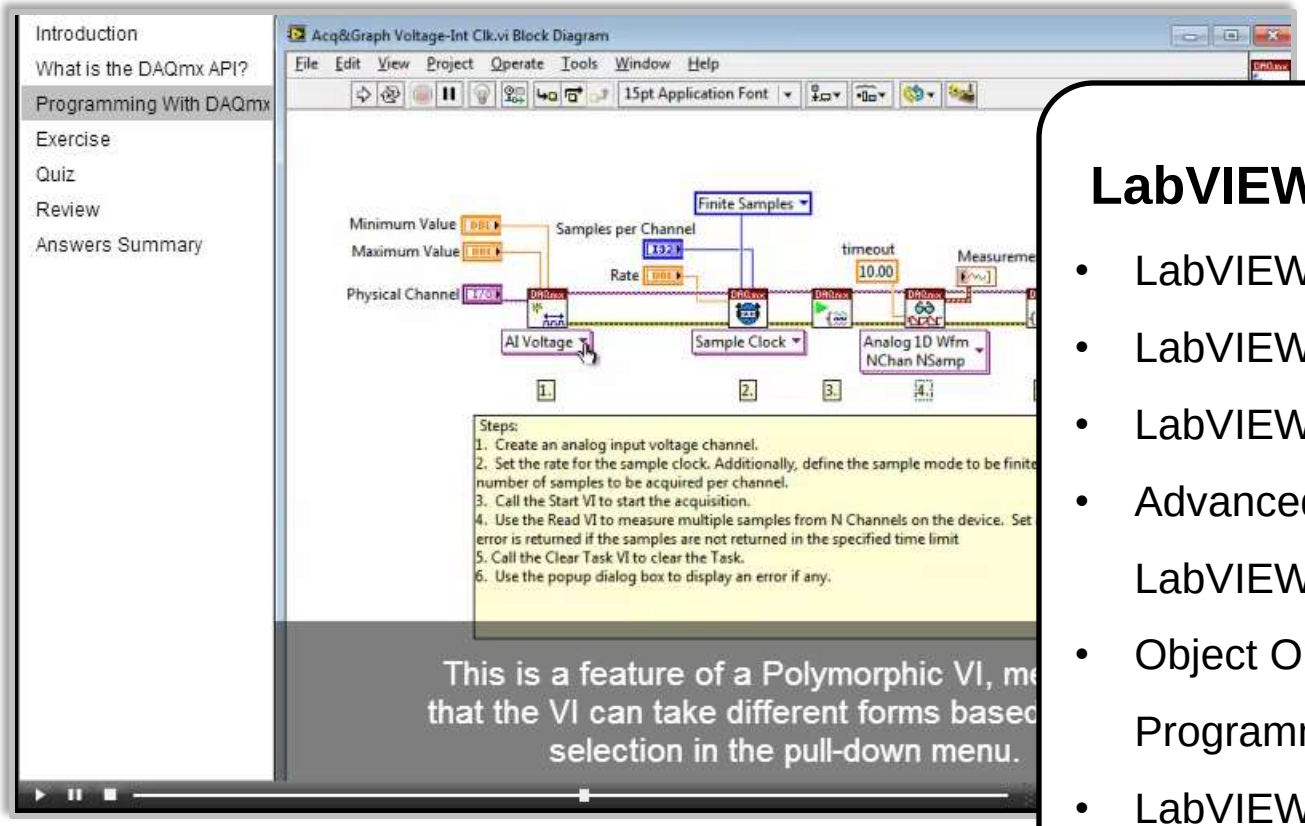
Expanded LabVIEW Online Training

Core LabVIEW skills included with your software purchase



LabVIEW Online Training

- LabVIEW Core 1
- LabVIEW Core 2
- LabVIEW Core 3
- Advanced Architectures in LabVIEW
- Object Oriented Design and Programming in LabVIEW
- LabVIEW FPGA
- LabVIEW Real-Time 1 & 2

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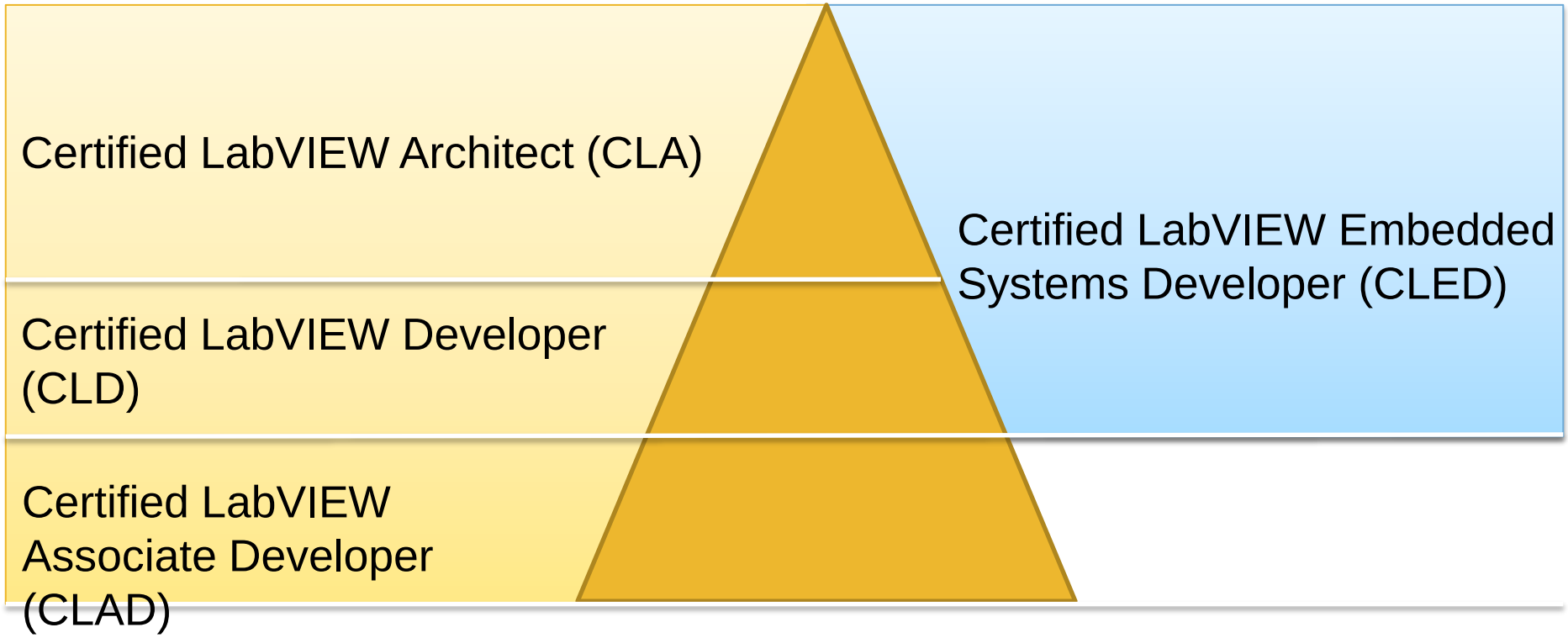
NI LabVIEW Certifications



New Embedded Systems Developer Certification

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- 17 exercises that can be completed in 30 minutes covering key exam requirements
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Thank you for your interest in NI training and certification. The following resources can help

Exam Details

Prerequisite: Certified LabVIEW Associate Developer

Exam format: Application development

Exam duration: Four hours

Preparation Resources for the CLD Exam

CLD Preparation Guide (PDF)

CLD success package

CLD Sample Exams

NI technical representatives worldwide can answer your hardware and software questions you now or call (866) 463-3364.

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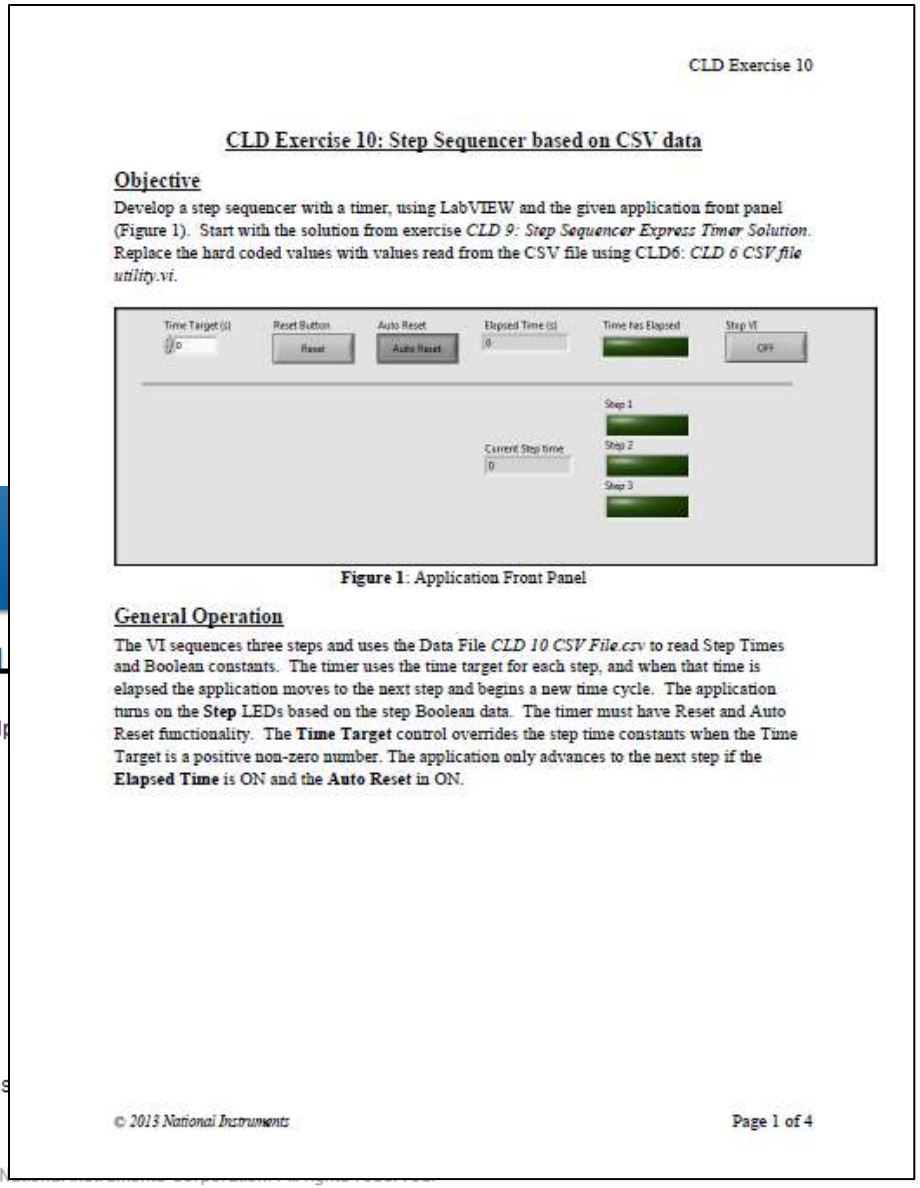

CLD Exercise 10

CLD Exercise 10: Step Sequencer based on CSV data

Objective

Develop a step sequencer with a timer, using LabVIEW and the given application front panel (Figure 1). Start with the solution from exercise *CLD 9: Step Sequencer Express Timer Solution*. Replace the hard coded values with values read from the CSV file using CLD6: *CLD 6 CSV file utility.vi*.

Figure 1: Application Front Panel

General Operation

The VI sequences three steps and uses the Data File *CLD 10 CSV File.csv* to read Step Times and Boolean constants. The timer uses the time target for each step, and when that time is elapsed the application moves to the next step and begins a new time cycle. The application turns on the **Step** LEDs based on the step Boolean data. The timer must have Reset and Auto Reset functionality. The **Time Target** control overrides the step time constants when the Time Target is a positive non-zero number. The application only advances to the next step if the **Elapsed Time** is ON and the **Auto Reset** in ON.

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