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CONNECT

2023 AUSTIN



What's New in LabVIEW™

Kiran Nagaraj and Christina Rogers
Principal Product Managers, LabVIEW

Tuesday, 23 May 2023

10:15 AM – 11:15 AM

Ballroom F

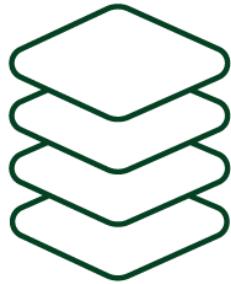


Agenda

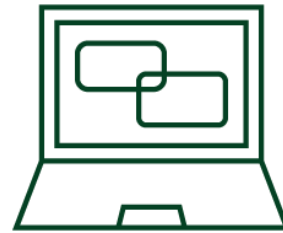
- LabVIEW 2023 Q1
 - Improvements in three focus areas
- Preview of LabVIEW 2023 Q3
 - Coming in August
- Roadmap



LabVIEW 2023 Q1 Improvements



Streamlined
installation for drivers
and toolkits



Python integration
with virtual
environment support

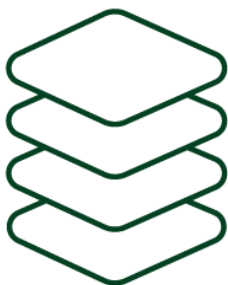


Code sharing
improvements



STREAMLINED INSTALLATION

LabVIEW 2023 Q1 Improvements



**Streamlined
installation for drivers
and toolkits**



Python integration
with virtual
environment support



Code sharing
improvements



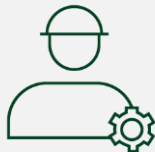
Addressing Longstanding Upgrade Pain Points



“I need to update all my drivers since I updated LabVIEW versions”

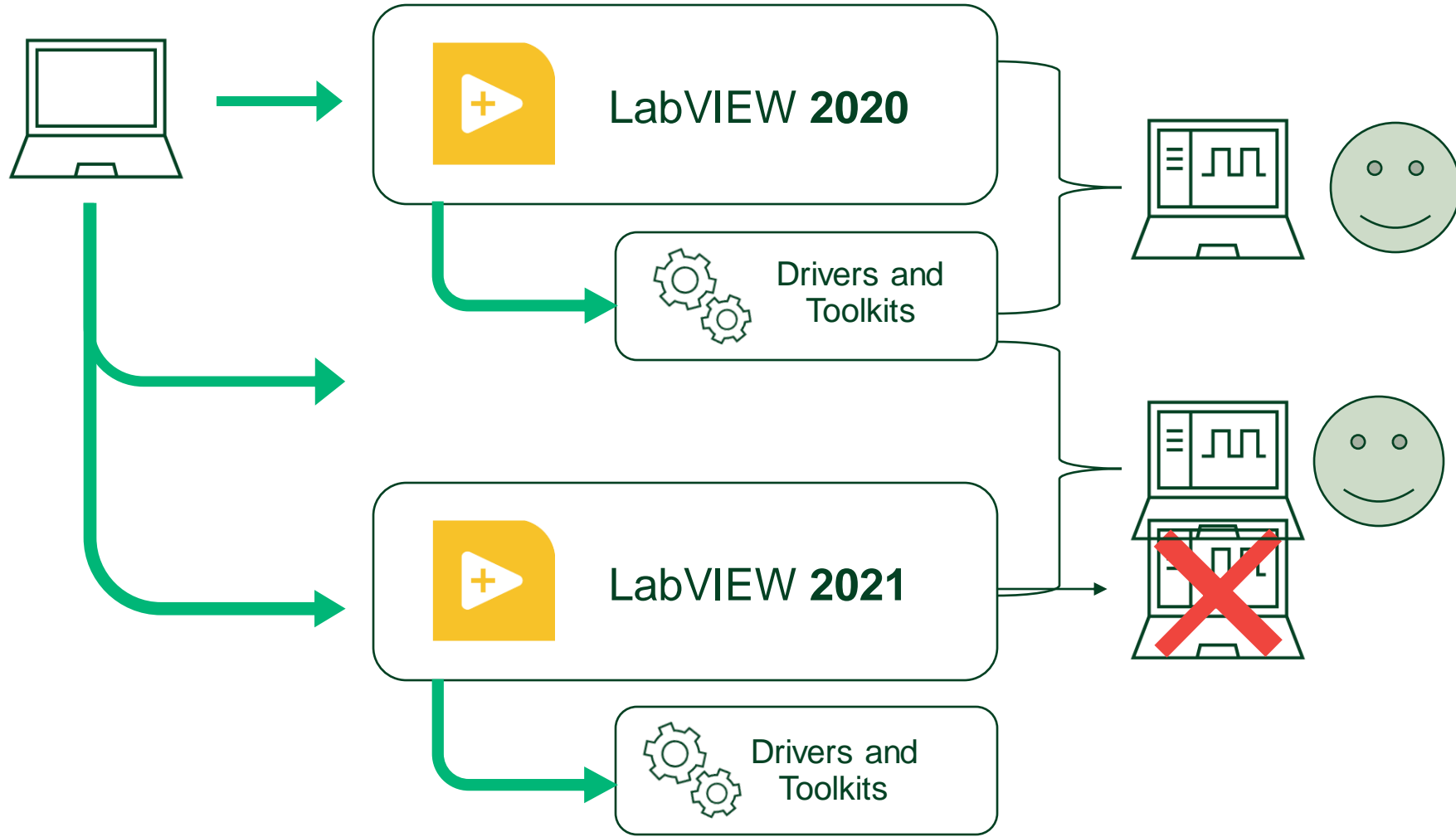


It takes time and effort to install drivers even when I don't have a change in my hardware set-up



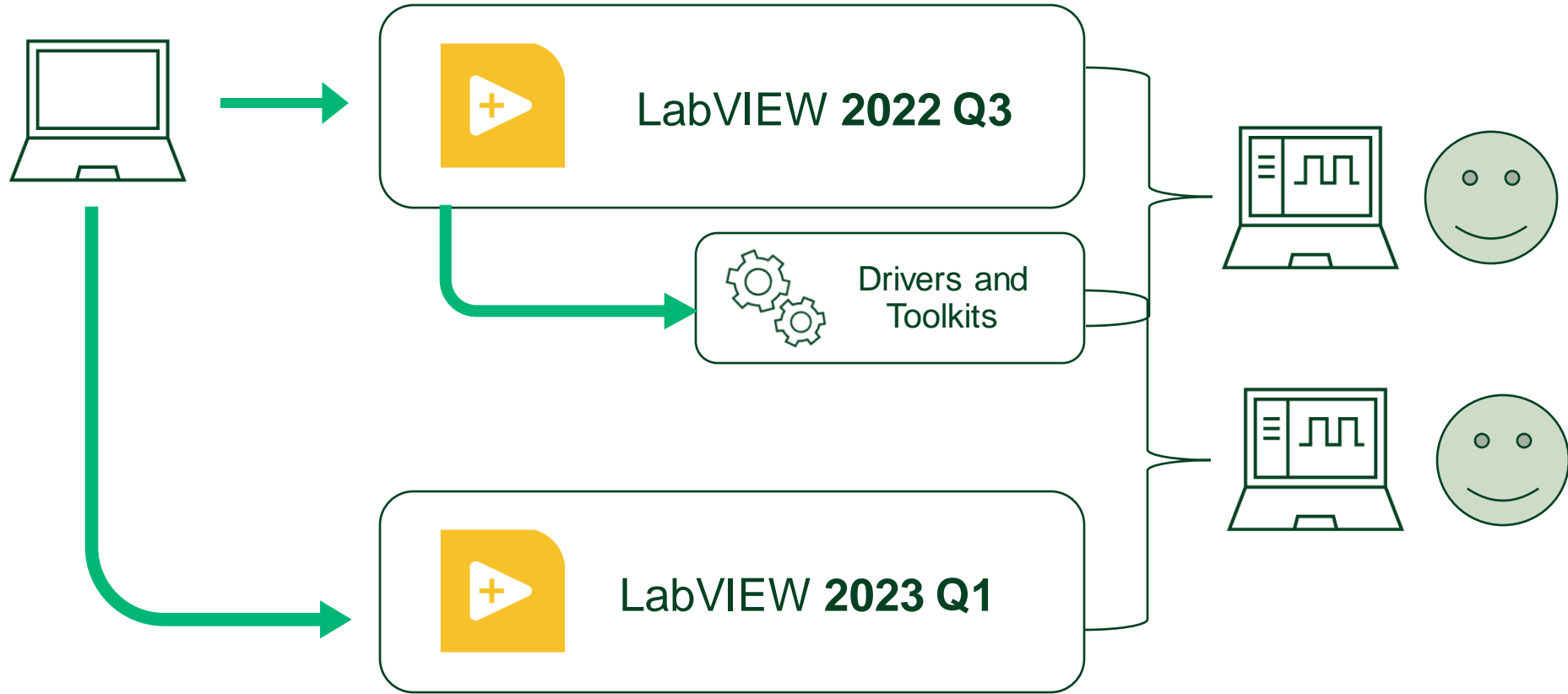
Revalidation efforts for existing applications take longer when drivers are updated

Installation for Drivers and Toolkits (Previous State)





Streamlined Installation for Drivers and Toolkits



Drivers with Addon Support: Decoupled from LabVIEW Versions

Addon Support begins with LabVIEW 2022 Q3

Driver/Toolkit	Version where support begins	Driver/Toolkit	Version where support begins
Automotive Diagnostic Command Set Toolkit	2022 Q4	NI-Industrial Communications for Ethernet/IP	2022 Q3
ECU Measurement and Calibration Toolkit	2022 Q4	NI-RDMA	2022 Q4
IVI Compliance Package	2022 Q3	NI-SCOPE	2022 Q3
LabVIEW OPC UA Toolkit	2022 Q4	NI-SLSC	2022 Q4
NI-5690 Driver Software	2023 Q2	NI-SWITCH	2022 Q4
NI-845x Driver Software	2022 Q3	NI-Sync	2022 Q3
NI-DAQmx	2022 Q3	NI-VISA (excluding macOS)	2022 Q3
NI-DCPower	2022 Q3	PXI Platform Services	2022 Q3
NI-Digital Pattern Driver*	2022 Q4	RMX-400x Electronic Load Driver	2022 Q4
NI-DMM	2022 Q3	RMX-410x Power Supply Driver	2022 Q3
NI-FGEN	21.8	RMX-412x Power Supply Driver	2022 Q4
NI-HSDIO	2022 Q4	System Configuration	2022 Q3
NI-Industrial Communications for CANOpen	2022 Q4		
NI-Industrial Communications for DeviceNet	2022 Q4		

Addon Support begins with LabVIEW 2023 Q1

Driver/Toolkit	Version where support begins
FlexRIO	2023 Q1
Industrial Controller Device Drivers	2023 Q1
LabVIEW Instrument Design Libraries for IF Digitizers	2023 Q1
LabVIEW Instrument Design Libraries for Reconfigurable Oscilloscopes	2023 Q2
NI CompactRIO	2023 Q1
NI-Embedded CAN for sbRIO	2023 Q2
NI-RFSA	2023 Q1
NI-RFSG	2023 Q1
NI R Series Multifunction RIO	2023 Q1
NI Switch Executive	2023 Q1
NI-568x Driver Software	2023 Q1
NI-XNET	2023 Q1
NI-Industrial Communications for EtherCAT	2023 Q1
PXIe-7899 API and Design Files	2023 Q2
Vision Acquisition Software	2023 Q1
NI-VRTS	2023 Q2



Toolkits and Modules: Decoupling from LabVIEW Versions

Addon Support begins with LabVIEW 2024 Q1
Toolkits and Modules
Report Generation Toolkit
Unit Test Framework
Desktop Execution Trace Toolkit
Advanced Signal Processing Toolkit
Database Connectivity Toolkit
Digital Filter Design Toolkit
VI Analyzer
Data Finder Connectivity VIs
Datalogging & Supervisory Control Module



Drivers and Toolkits: Decoupled from LabVIEW Versions



<https://www.ni.com/en-us/support/documentation/supplemental/22/extending-compatibility-between-labview-and-ni-drivers-with-addo.html>

NI Hardware Configuration Utility

- A modern graphical utility to discover, configure and manage NI hardware on Windows and Linux desktop
- Improved workflows from NI MAX
- Ships now with NI-DAQmx, NI-XNET, System Configuration
- NI Linux Real-Time hardware and more devices to be supported in upcoming releases
- All feedback & feature requests are welcome!
 - In product feedback button
 - Contact: Harsha.Bhushan@ni.com
- Experience Lounge
 - 'Linux at NI'
 - 'Validate Electromechanical components'

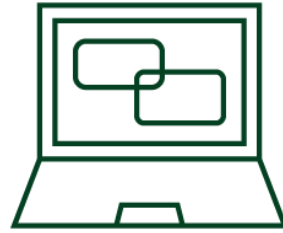
A screenshot of a 'Send Feedback' dialog box. The dialog has a title bar with a close button (X). Below the title bar is a dark grey header with the text 'Tell us how we're doing...'. The main content area contains the text 'Have feedback?' followed by 'We'd love to hear from you.' and a large text input field. Below the input field is a label 'Email address (NI may contact you for more information)' and a text input field with the placeholder 'optional'. There is a small paperclip icon and a link 'NI privacy statement'. At the bottom right are 'Send' and 'Cancel' buttons.



LabVIEW 2023 Q1 Improvements



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LabVIEW vs Python – Why Not Both?

Use the right tool for the job

On-Demand Webinar

LabVIEW

- Seamless hardware integration
- RT and FPGA application development
- Built-in multi-threading support
- Easy UI development

Python

- Large community
- Highly portable
- Massive set of packages and libraries
- Available for free



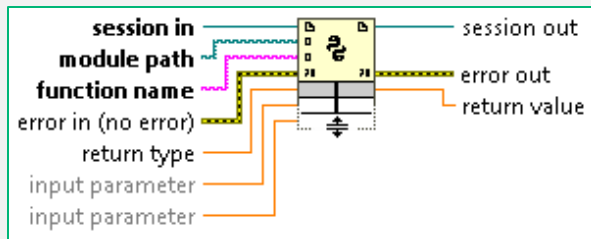


Continued Python Support



LabVIEW 2018

Python Node



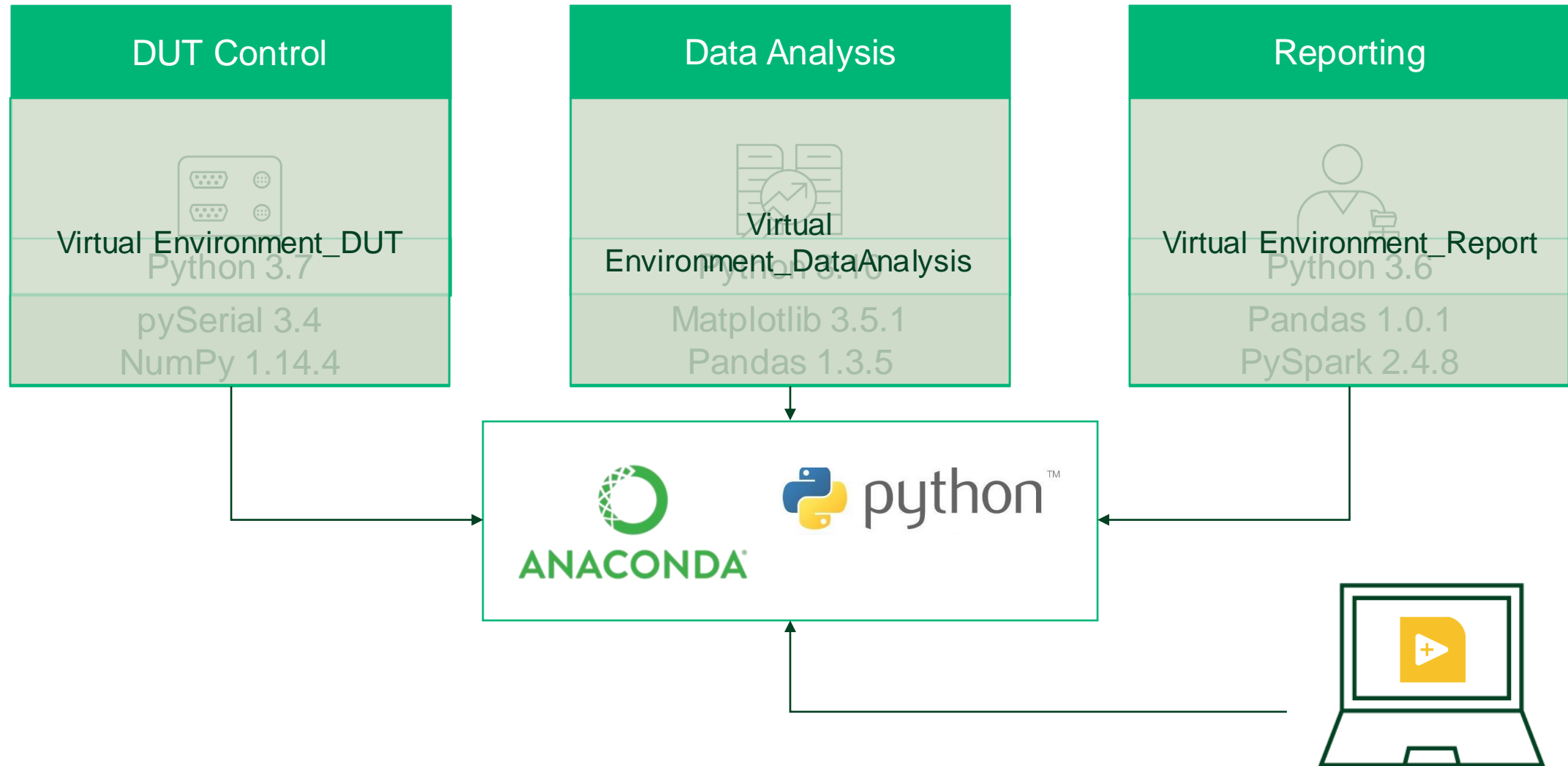
2019-2022 Q3

- Update supported Python versions (3.6-3.9)
- Specify Python path for session
- Support Python named tuples
- Support reference to Python class object

2023 Q1

- Add support for Python 3.10
- Support virtual environments (Anaconda and venv)

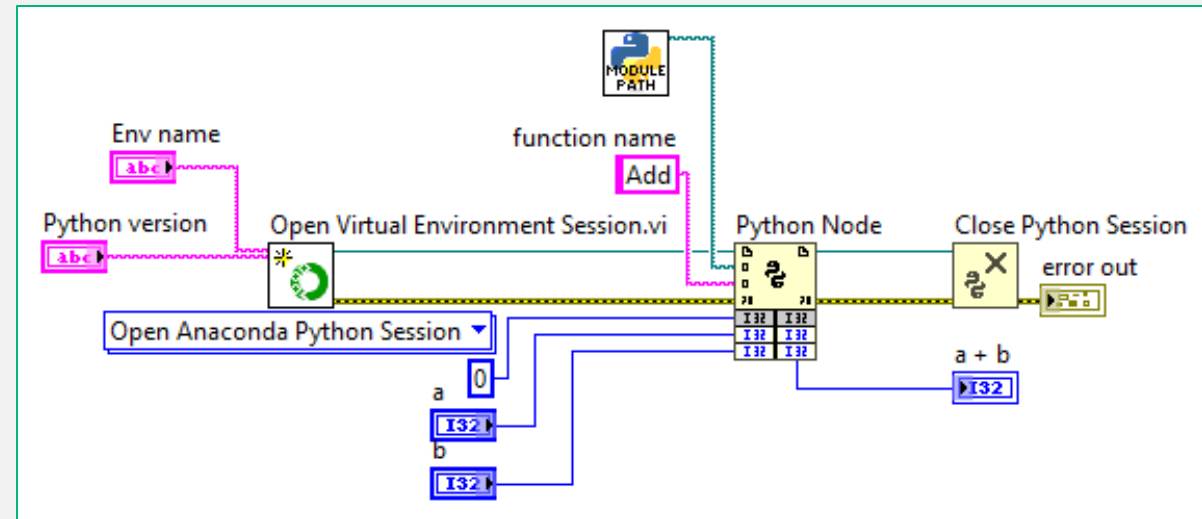
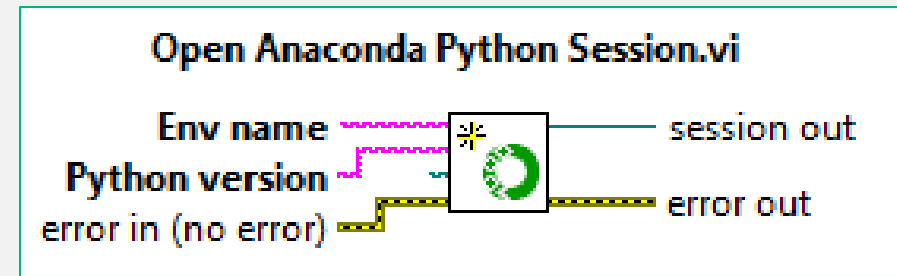
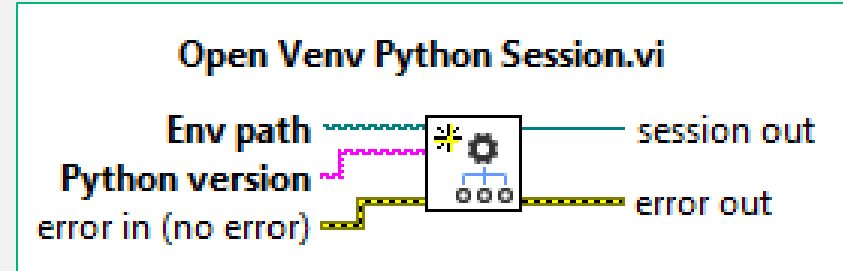
Python Virtual Environments





Python Virtual Environments

Support for running Python code in Anaconda and venv



Python Virtual Environment Demo

Software used in the demo

- LabVIEW 2023 Q1
- Anaconda 3
 - Python 3.10 and 3.9
 - Numpy 1.23.5
 - Scipy 1.10.0





ANACONDA.NAVIGATOR

Connect ▾

Home

Environments

Learning

Community

Anaconda Notebooks
Cloud notebooks with hundreds of packages ready to code.
[Learn More](#)

Documentation

Anaconda Blog



Create



Clone



Import



Backup



Remove

Search Environments

base (root)



Installed

Channels

Update index...

impYX

Name	Description	Version
<input checked="" type="checkbox"/> bottleneck	Fast numpy array functions written in cython.	1.3.5
<input checked="" type="checkbox"/> mkl_fft	Numpy-based implementation of fast fourier transform using intel (r) math kernel library.	1.3.1
<input checked="" type="checkbox"/> mkl_random	Intel (r) mkl-powered package for sampling from common probability distributions into numpy arrays.	1.2.2
<input checked="" type="checkbox"/> numba	Numpy aware dynamic python compiler using llvm	0.56.4
<input checked="" type="checkbox"/> numexpr	Fast numerical expression evaluator for numpy.	2.8.4
<input checked="" type="checkbox"/> numpy	Array processing for numbers, strings, records, and objects.	1.23.5
<input checked="" type="checkbox"/> numpy-base	Array processing for numbers, strings, records, and objects.	1.23.5
<input checked="" type="checkbox"/> numpydoc	Numpy's sphinx extensions	1.5.0
<input checked="" type="checkbox"/> pytables	Brings together python, hdf5 and numpy to easily handle large amounts of data.	3.7.0

9 packages available matching "numpy"

Python Debugging Demo

Software used in the demo

- LabVIEW 2023 Q1
- Microsoft Visual Studio Code
- Microsoft Python extension for Visual Studio Code
- Anaconda 3
 - Python 3.10 and 3.9
 - Numpy 1.23.5
 - Scipy 1.10.0



LabVIEW™



ANACONDA®



python



Visual Studio Code

The screenshot shows the Visual Studio Code interface with the Extensions Marketplace open. The 'Python v2023.8.0' extension by Microsoft is highlighted with a red box. The extension details include:

- Python v2023.8.0**
- 85.1M | 4 stars
- IntelliSense (Pylance), Linting, Debugging (multi-threaded, remote), Jupyter Notebooks, code formatting, refactoring, unit tests, and more.
- This publisher has verified ownership of microsoft.com
- This extension is enabled globally.
- This extension has a Pre-Release version available

Below the extension details, a list of keyboard shortcuts is displayed:

- Show All Commands: `Ctrl + Shift + P`
- Go to File: `Ctrl + P`
- Find in Files: `Ctrl + Shift + F`
- Start Debugging: `F5`
- Toggle Terminal: `Ctrl + ``

The Windows taskbar at the bottom shows the time as 1:43 AM on 5/9/2023.



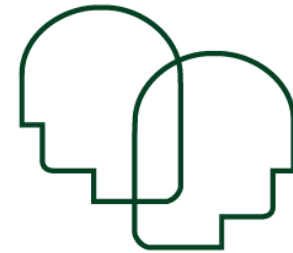
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improvements

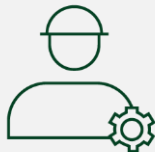
Project Dependencies Pain Points



I need to modify an old LabVIEW project, but I don't know what drivers I need to install.



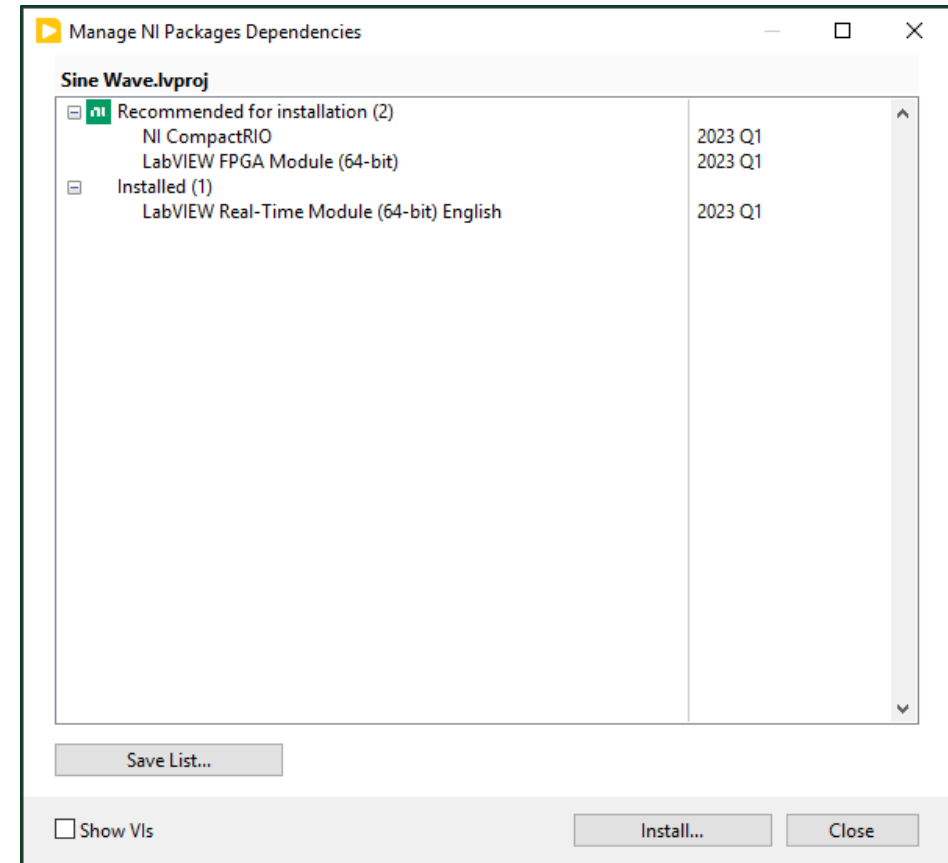
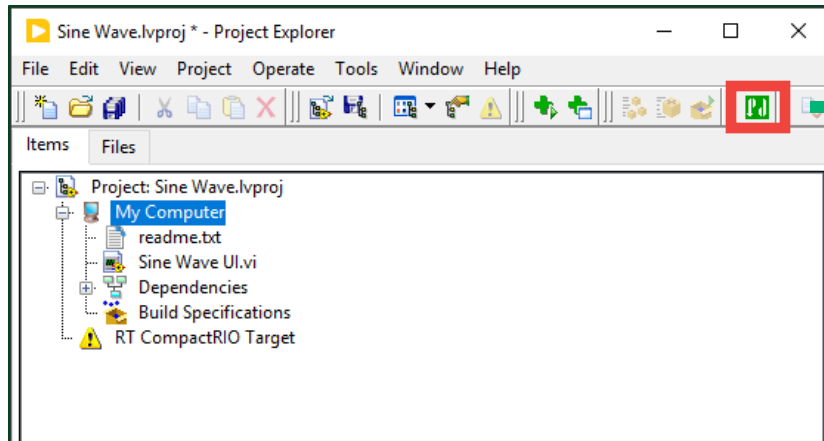
I synced the latest code from source control, and the top-level VI is broken. SubVIs from a third-party library are missing.



My build pipeline failed because it's using the wrong version of a package.



Tool for NI Drivers and Toolkits (NI Package Manager)





CODE SHARING

Package Management

NI and JKI long-term partnership on package related workflows

New VI Package Manager (VIPM) Free edition

- Available starting in 2023 Q1
- Includes VIPM package building features



JKI Dragon

Dragon helps you **open your LabVIEW project fast...**

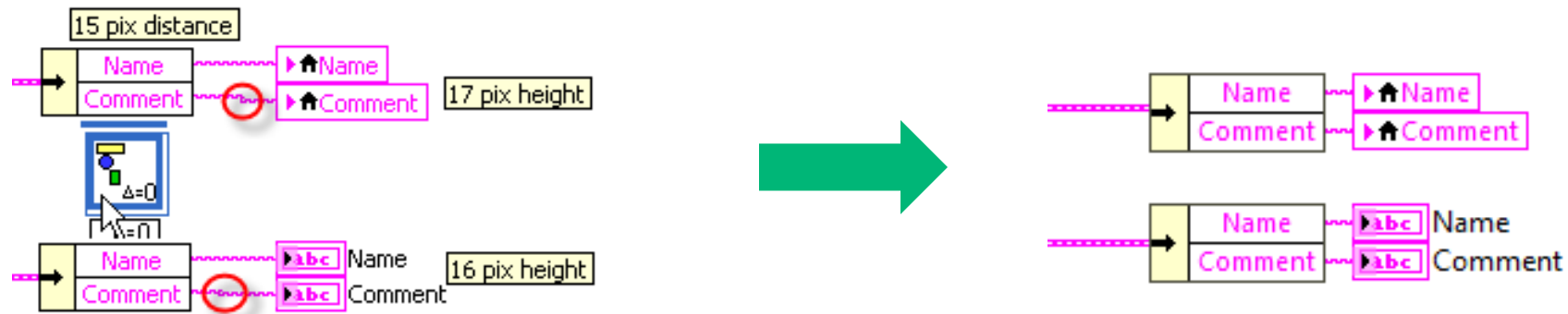
- always in the **correct version of LabVIEW**
- with **all the packages your project needs**
- so you can **get your work done (and complete your project) fast!**



Visit
dragon.vipm.io
to learn more

Other LabVIEW 2023 Q1 Improvements

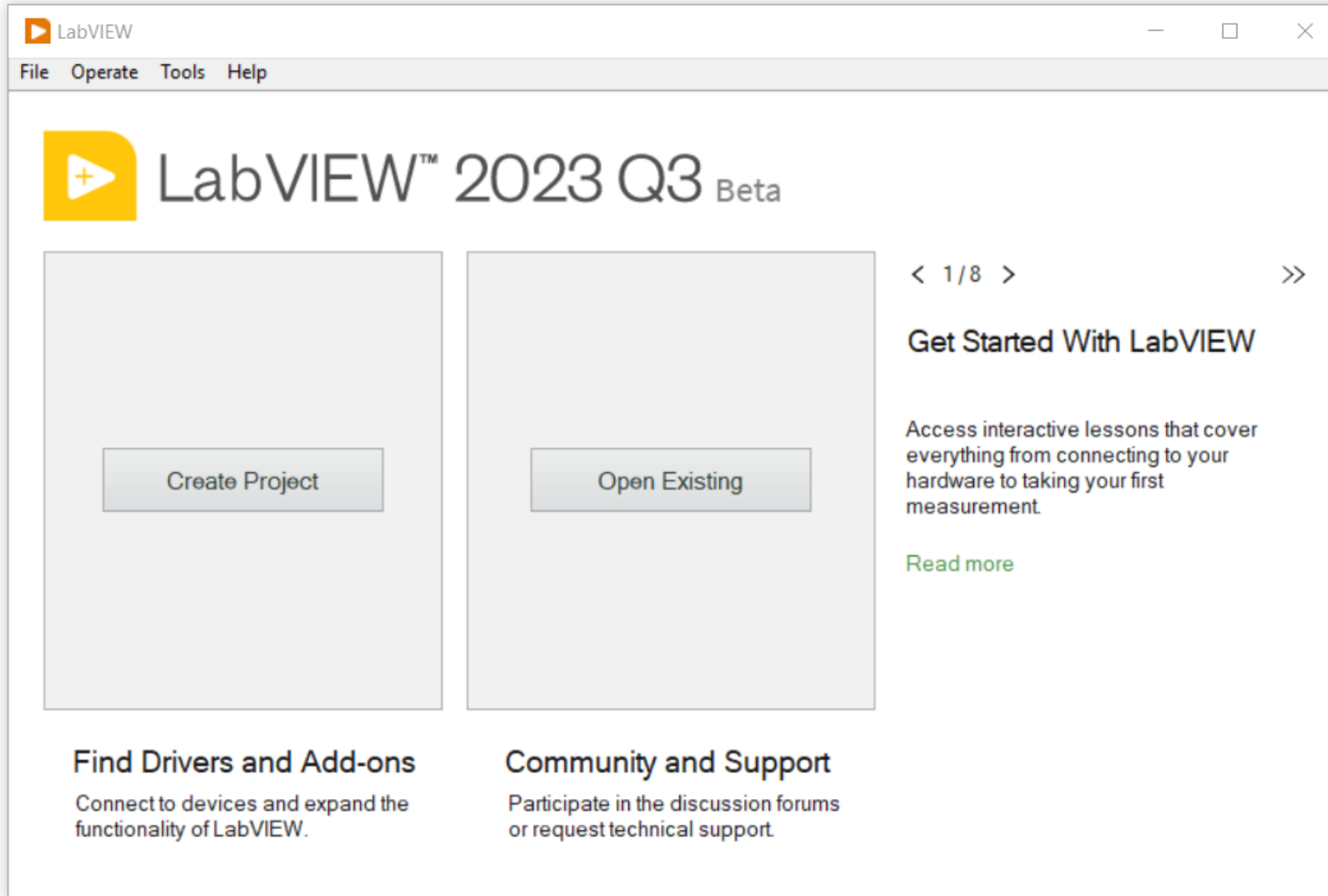
- Unbundle terminals (and other diagram terminals containing text) now fixed height
 - Inspired by the LabVIEW Idea Exchange



- Ability to customize the application name and icon for built applications on Linux
- Added support for macOS 13



Preview of Upcoming Release





Public Beta – LabVIEW 2023 Q3

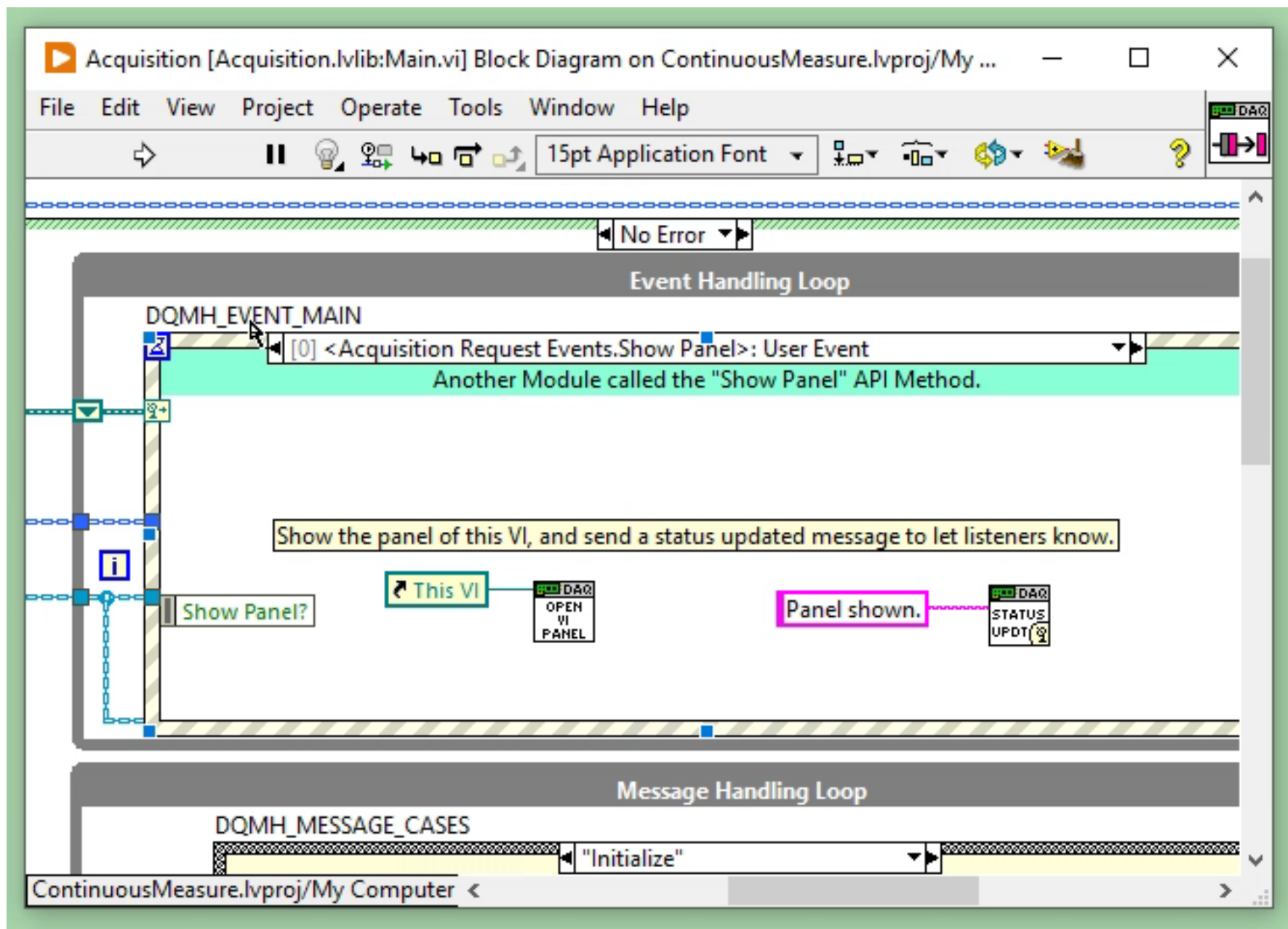
- Visit ni.com/beta and follow the link to the NI discussion forums
- “Welcome” post provides link to download and serial number to activate

New Features

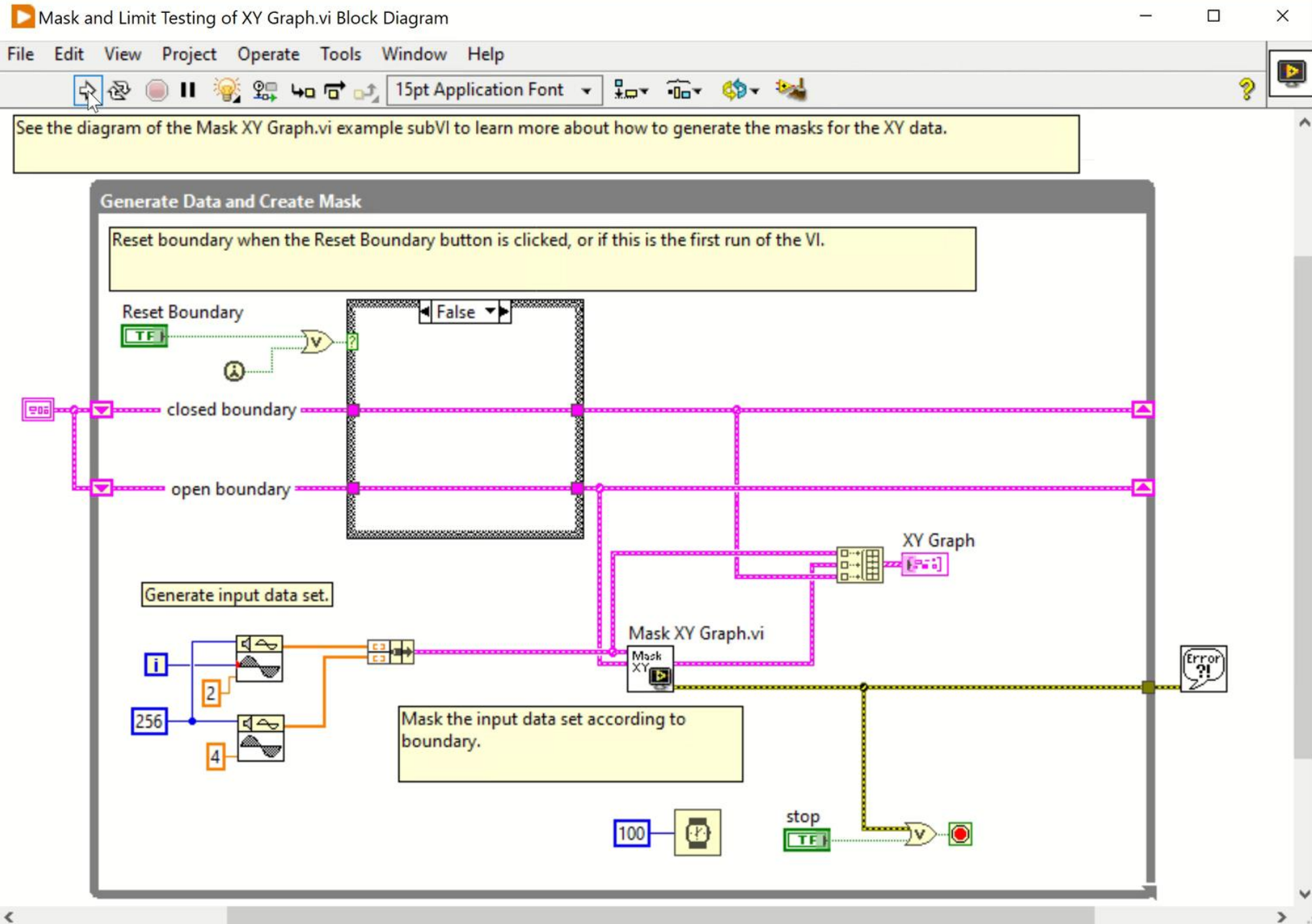
1. Productivity-enhancing editor improvements
2. Performance improvements to building applications, packed project libraries, and source distributions
3. Apple silicon support for LabVIEW on macOS

Zoom



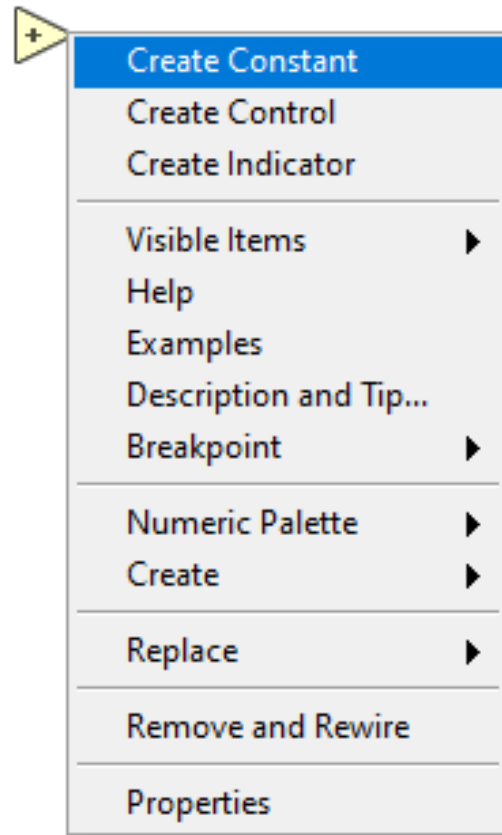


Execution Highlighting Improvements



Double-Click When Wiring

Current Way to Create Constants from Terminals

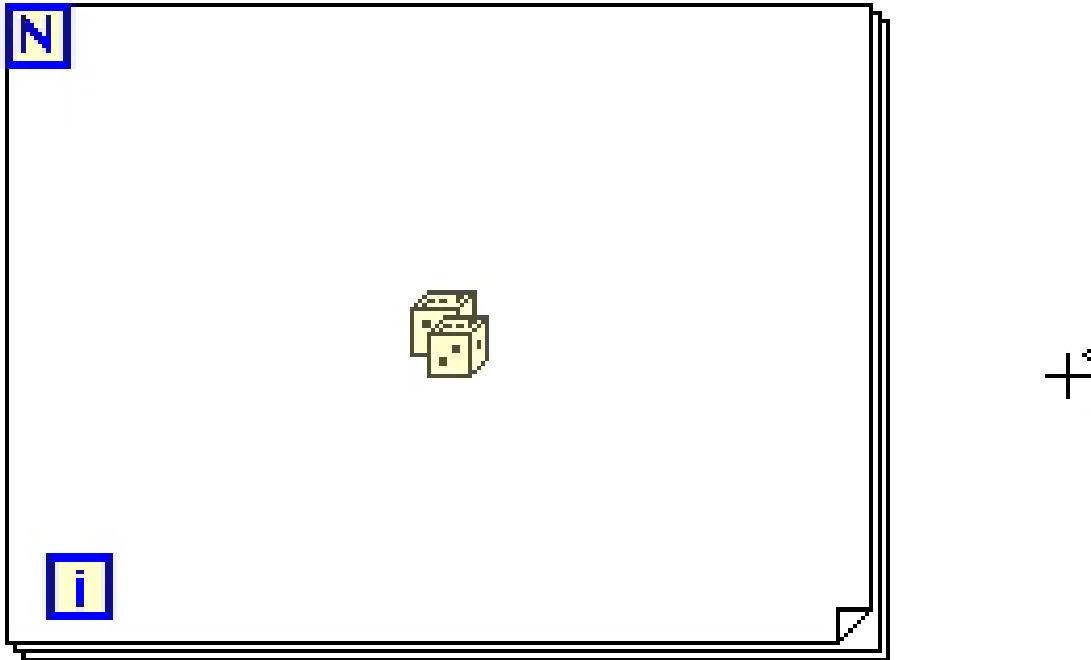


The screenshot shows the LabVIEW Block Diagram Editor window titled "Trend.vi Block Diagram on ContinuousMeasure.lvproj/My Computer *". The menu bar includes File, Edit, View, Project, Operate, Tools, Window, and Help. The toolbar contains various icons for navigation and editing, with a font size of 15pt Application Font. The block diagram features a "Max" control, a "DBL" constant, a "Trend" indicator, and a "SIGNAL" terminal. A yellow callout box at the bottom of the diagram area contains the following instructions:

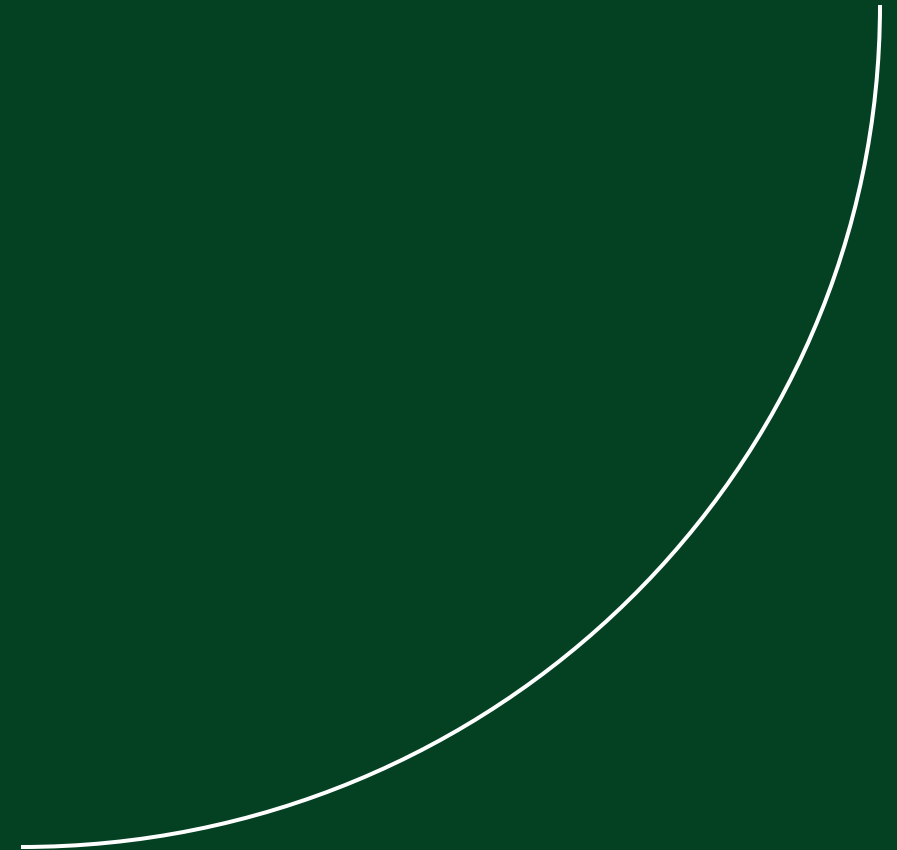
1. Start a wire, double-click to create a control or indicator.
2. Use Ctrl and double-click to create a constant.

At the bottom of the window, the path "ContinuousMeasure.lvproj/My Computer" is visible.

Double-click to finish wire also works across loop boundary!

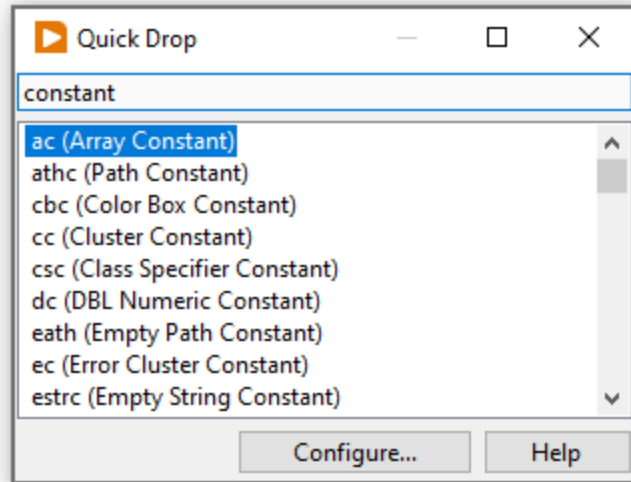


Quick Change



Quick Change

- *Quick Drop*: place the right type of constant and then enter the value.



- **Quick Change list**: enter the value and then pick the type of object!
- **Quick Change palette**: select the location and then pick the structure!
- **Paste Special**: paste text, create object!

Changes.vi Block Diagram on ContinuousMeasure.lvproj/My Computer *

File Edit View Project Operate Tools Window Help

15pt Application Font

1. Create a label and **Ctrl+Space** to show Quick Change List.
 2. **Edit>Paste Special** to paste and show Quick Change List.
 3. Select area and **Ctrl+Space** to show Quick Change palette.

ContinuousMeasure.lvproj/My Computer

Excel Book 3 - Saved

File Home Insert Draw P

Clipboard

Calibri 11

B I U D ab

M14

	A	B	C
1	Parameters	Values	
2	Temperature	25	
3	Pressure	1.01	
4	X_Position	3	
5	Y_Position	8	
6	Z_Position	0	
7	Fan_Voltage	120	
8			
9			
10			
11			
12			
13			
14			
15			
16			

Sheet1

Calculation Mode: Automatic Internal Work

Beta Program - NI

https://www.ni.com/en-us/support/beta-program.ht...

ni

HOME / SUPPORT / BETA PROGRAM

NI Beta Program

The NI Beta Program enables you to access and work with NI beta software programs.

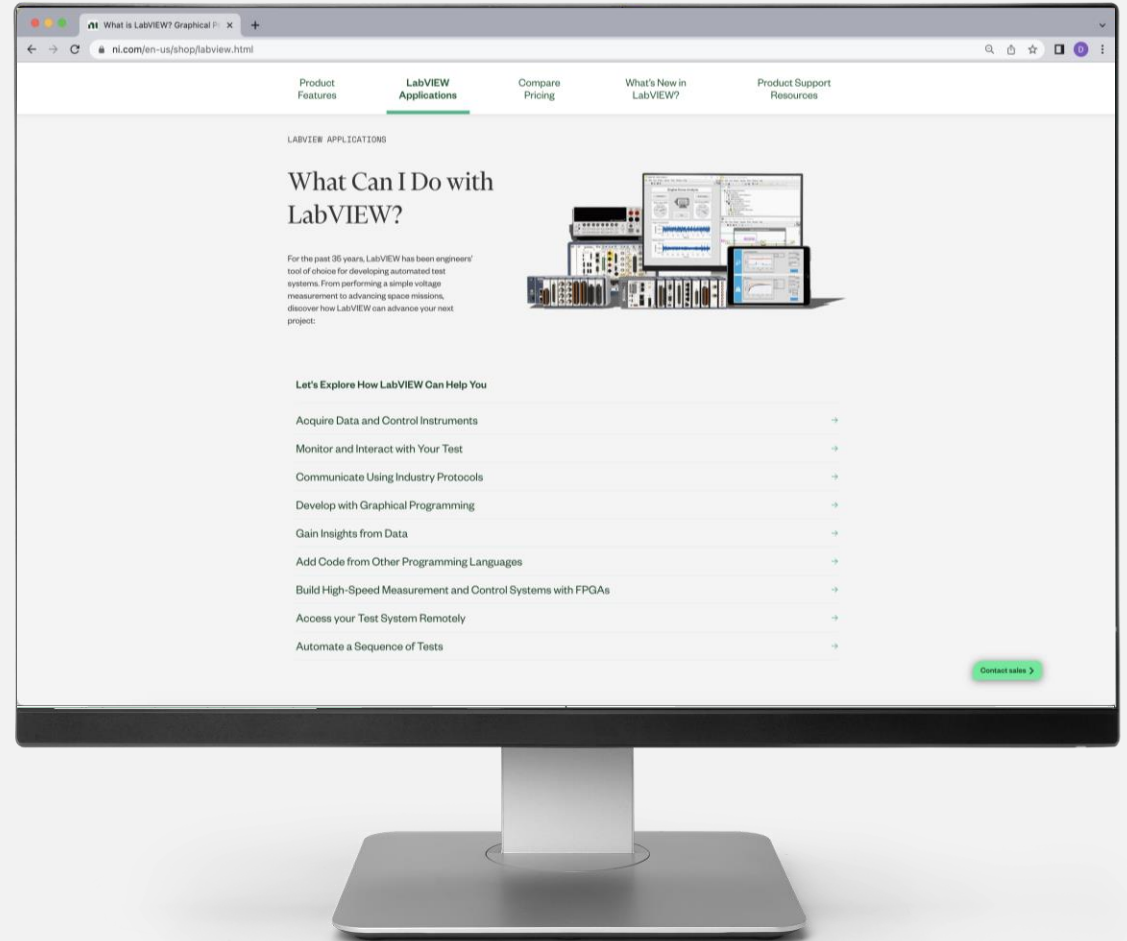
Visit
ni.com/beta



What Can I Do with LabVIEW?

- 9 New pages on ni.com/LabVIEW
- Each page includes:
 - Product highlights
 - Video
 - Additional learning resources

What can I do with LabVIEW?
Nine Tasks LabVIEW Is Best At



ni.com/LabVIEW



Test Workflow Bundle

Test Workflow Standard








Recommended for applications that require hardware automation, data analysis, automated reporting, and remote access to test.

-
-  LabVIEW™ Full
 -  G Web Development Software
 -  FlexLogger™
 -  DIAdem™ Standard
 -  SystemLink™ Cloud
 -  InstrumentStudio™
-

ni.com/TestWorkflow

Test Workflow Professional

Recommended for applications that need test sequencing, more data visualization capabilities, and advanced analysis features.

-
-  LabVIEW Professional
 -  G Web Development Software
 -  FlexLogger
 -  DIAdem Professional
 -  SystemLink Cloud
 -  InstrumentStudio
 -  TestStand™
-



LabVIEW Roadmap



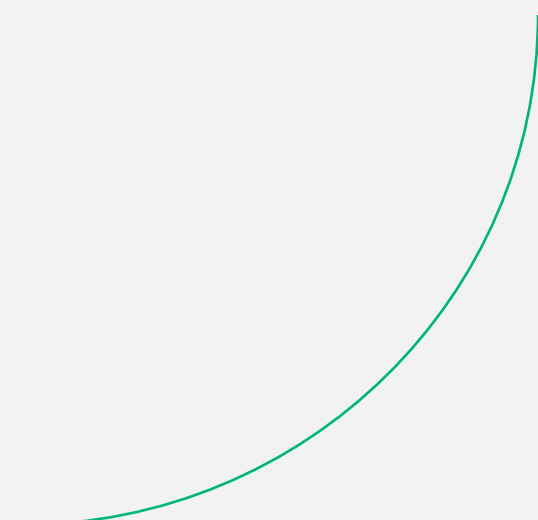
LabVIEW is a graphical programming environment engineers and scientists use to develop automated research, validation, and production test systems. Access the latest improvements with an active subscription. <https://www.ni.com/content/dam/web/pdfs/test-workflow-roadmap.pdf>

Capability	Next Release	Next 2-3 Releases	Requirements Gathering
Project Management			
Improvements to workflows with source code control tools		✓	
Improved LabVIEW Project Dependency Management	✓	✓	
Improvements to the speed of building applications	✓		
Additional capabilities when building package installers			✓
Driver version independence from LabVIEW		Shipped - 2023 Q1	
Interoperability			
Deploy Python scripts to NI Linux RT devices			✓
Native gRPC server/client interfaces in LabVIEW		✓	
Support for calling .NET Core Assemblies (.NET 5 or later)			✓
Call Python code running in virtual environments		Shipped - 2023 Q1	
Better integration with MATLAB®		Shipped - 2022 Q3	
System Support			
Support for MacOS on Apple M1/M2 devices	✓		
Data Communication additions (SSH API, IPv6 support)			✓
UI Improvements			
Support for Unicode in IDE		✓	
Data Grid Control			✓



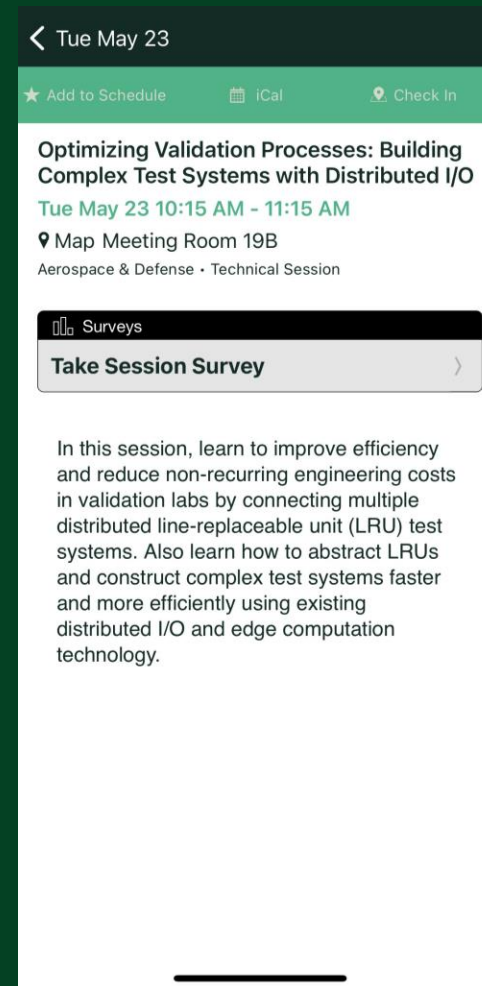
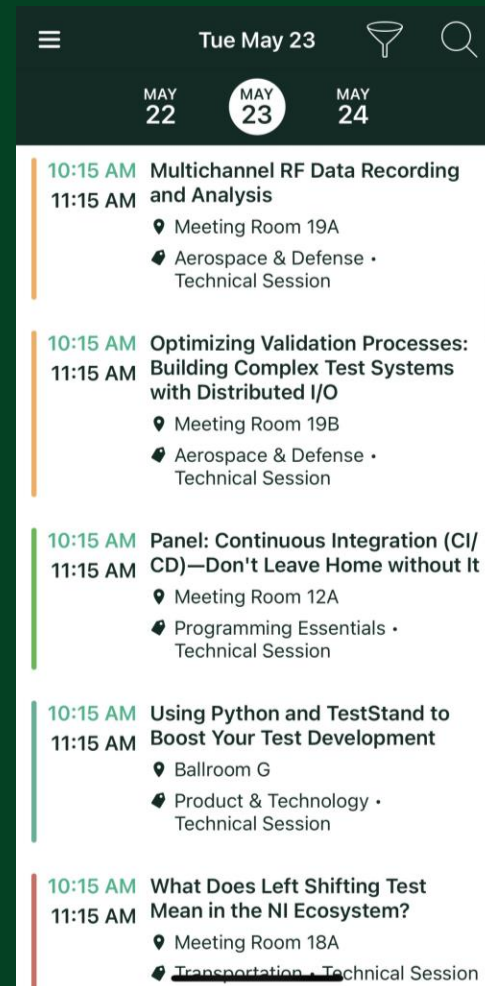
Question & Answers

Please rate this session in the NI Connect app!



Give us your feedback! Quick 2 Question Survey

In the mobile app,
click into the
session you would
like to provide
feedback for



Click “Take the
Session Survey”

At NI, we're revolutionizing how enterprises use test insights to drive product and business performance.



Reduce time to market by accelerating product development



Deliver customer satisfaction by improving functionality and reliability



Improve the bottom line by reducing operational cost



Prepare for the future by adapting to evolving test needs

Make Test Strategy a Differentiator for Your Business



AUTOMATION

Increase test coverage with software-connected and model-based test methodologies.

STANDARDIZATION

Drive organizational consistency in test processes, systems, software, and data.

DIGITAL TRANSFORMATION

Deploy and connect enterprise-wide tools for asset and data management and analytics.

BUSINESS PERFORMANCE

Realize the benefits of an intentional test strategy.



Reduce time to market



Deliver customer satisfaction



Improve the bottom line



Prepare for the future