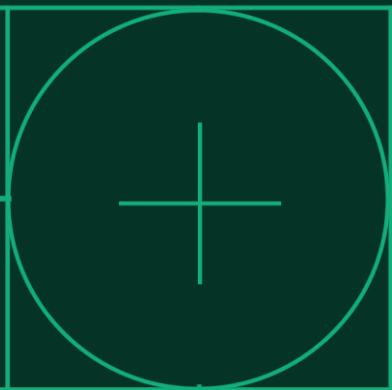




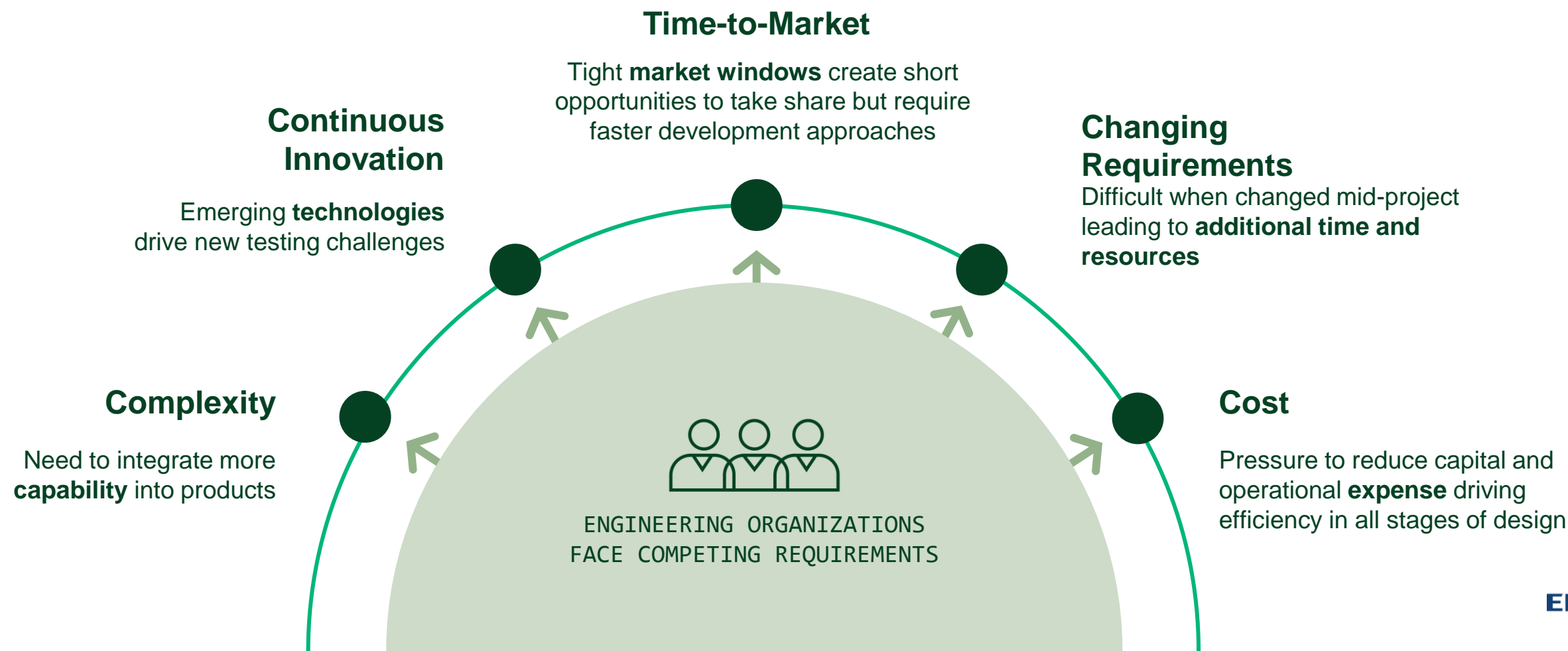
ni connect

2024 AUSTIN



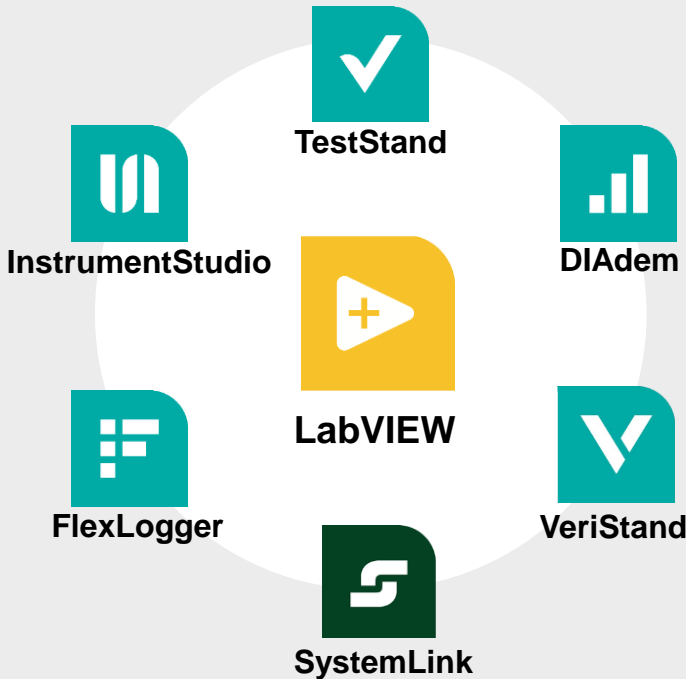
Make Measurement Reuse Your New Super Power

Companies Face Pressure to Accelerate Innovation



Evolving NI Test Software

Enable Automated Test & Measurement Professionals



1

Strengthen LabVIEW

Deliver new capabilities in **LabVIEW & NI Software** to meet the evolving requirements of applications and users

2

Connect LabVIEW+

Bridge seamlessly between tools, tasks and teams to accelerate the productivity of test professionals

3

Build Community

Engage and collaborate with the community to empower their continued success

Software for Professional Test Workflows

Electronics Validation Test

Characterizing electronic prototypes to ensure quality and performance

Set-up & Configure

Measure & Automate

Analyze & Share



Electronics Production Test

Functional test ensuring manufactured products meet specifications

Set-up & Configure

Measure & Automate

Deploy & Maintain



Electromechanical Validation Test

Characterizing physical prototypes to ensure quality and performance

Build & Customize

Configure

Analyze & Share



Embedded Software Test

Testing deployed software for defects across wide parameter variations

Configure & Map

Test & Bring Up

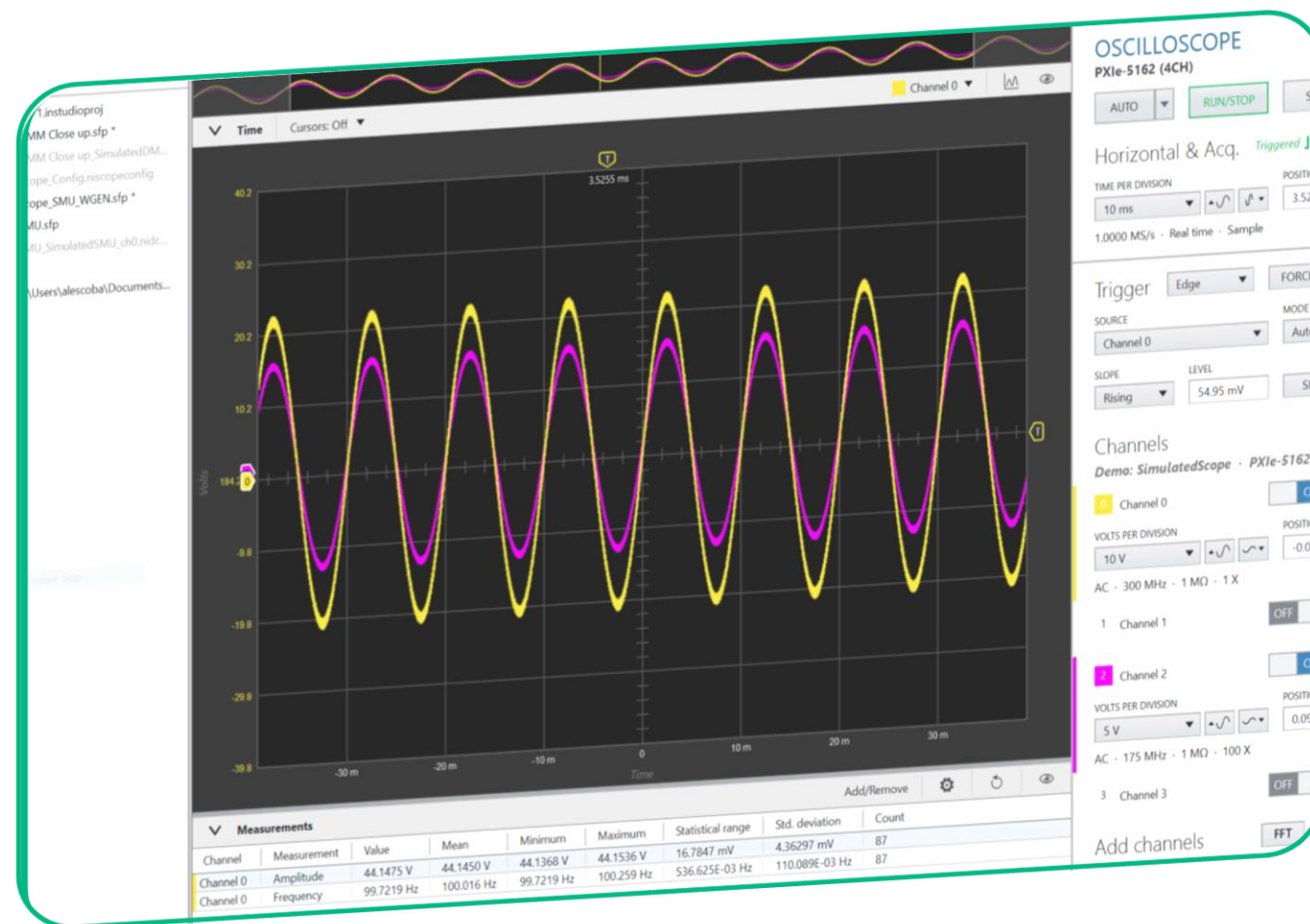
Automate & Execute





Instrument Studio™

Free Companion Software for PXI Instruments



Visualize and Control PXI Instruments

Interact with Multiple Instruments

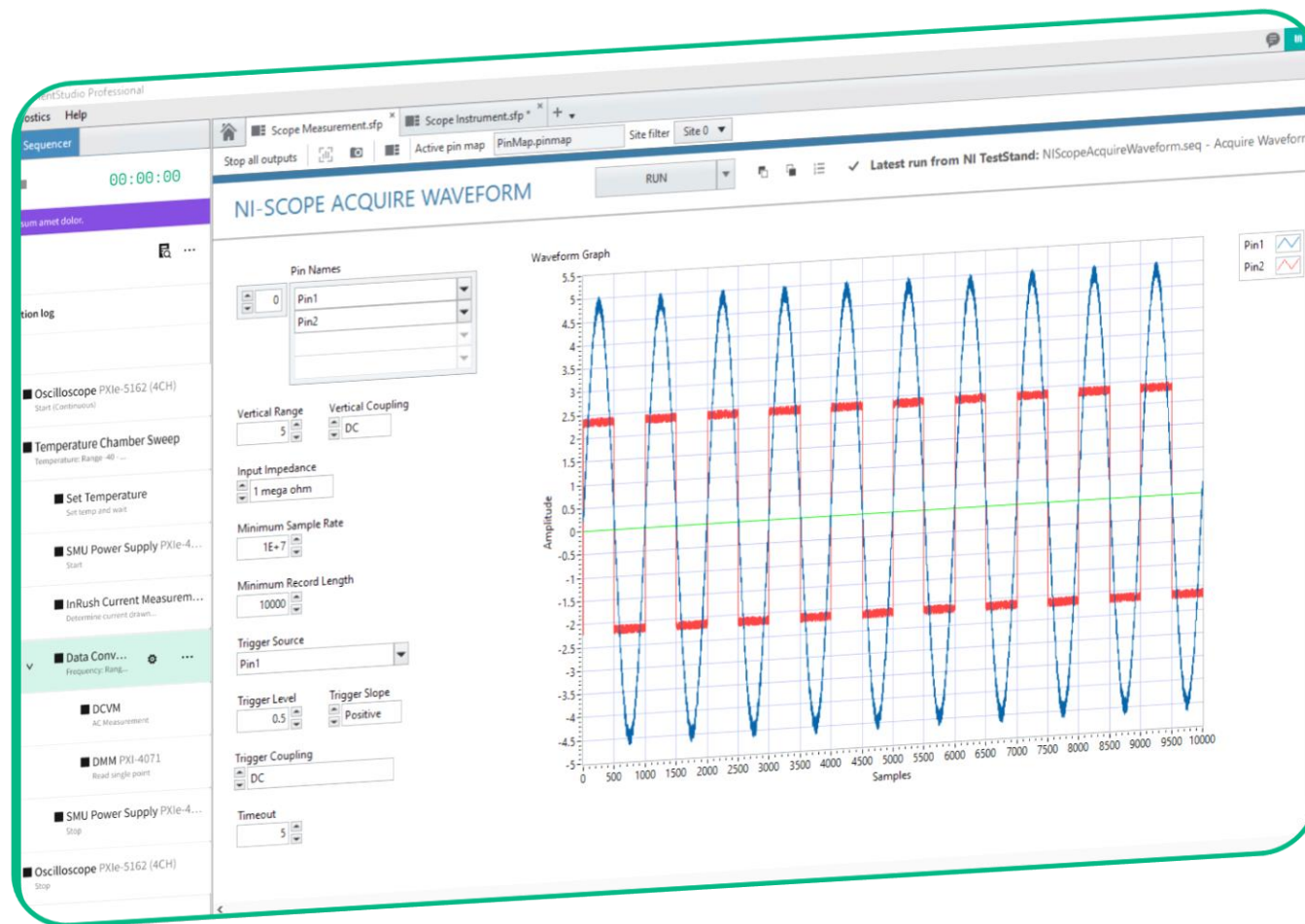
Monitor and Debug Applications



Instrument Studio™ Professional

Extensible Automated Validation

Coming
in July!



Run Custom Measurements

Automate Measurements

Control Any Instrument

Benefits of Standardization for Reuse



Speed

- Reduce Time to First Measurements
- Shorten Validation Cycle Times
- Accelerate Release to Manufacturing (RTM)



Consistency

- Create Similar Software Experience
- Incorporate Multiple Programming Languages
- Ensure Consistent Data Format and Access



Efficiency

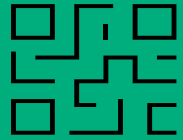
- Align Workflow Between Interactive and Automated Tasks
- Reuse Code Across Projects, Teams, and Sites
- Simplify Duplication, Deployment, and Maintenance of Systems



Lower Cost

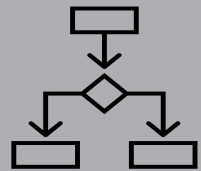
- Minimize or Eliminate Time Spent on Infrastructure
- Reduce Time Spent Developing Duplicate Measurement IP
- Lessen Cost to Upgrade Systems with New Measurements

Challenges for reuse



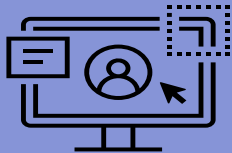
Technical Challenges

- System Topology Changes
- Hardware Abstraction
- Debugging Plug-in Architectures



Process & Organizational Challenges

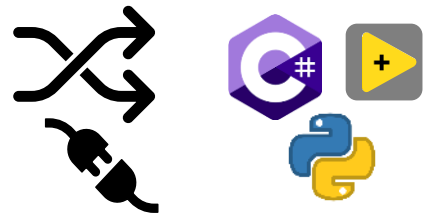
- Multi-Language Support
- Different Departments on Different Tools
- Different Phases of Test
- Connected Workflows



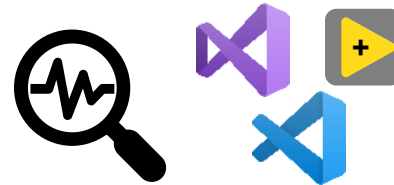
UX Challenges

- Discoverability of Existing IP
- Approachability of Reusable Code
- Maintenance Burden
- Low/No Code Challenges

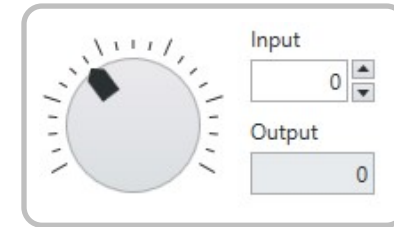
Characteristics of a solution



Language Agnostic



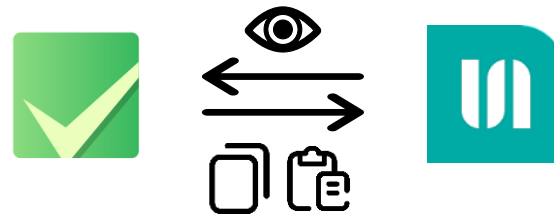
Allows debugging in
the native IDE



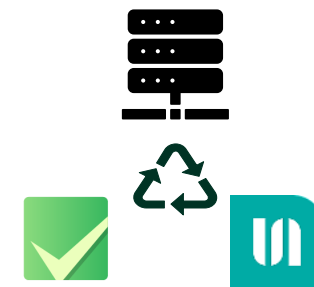
Interactive Measurement
UIs



Support for No Code
Automation



Enables seamless transfer
between interactive measurement
& automation



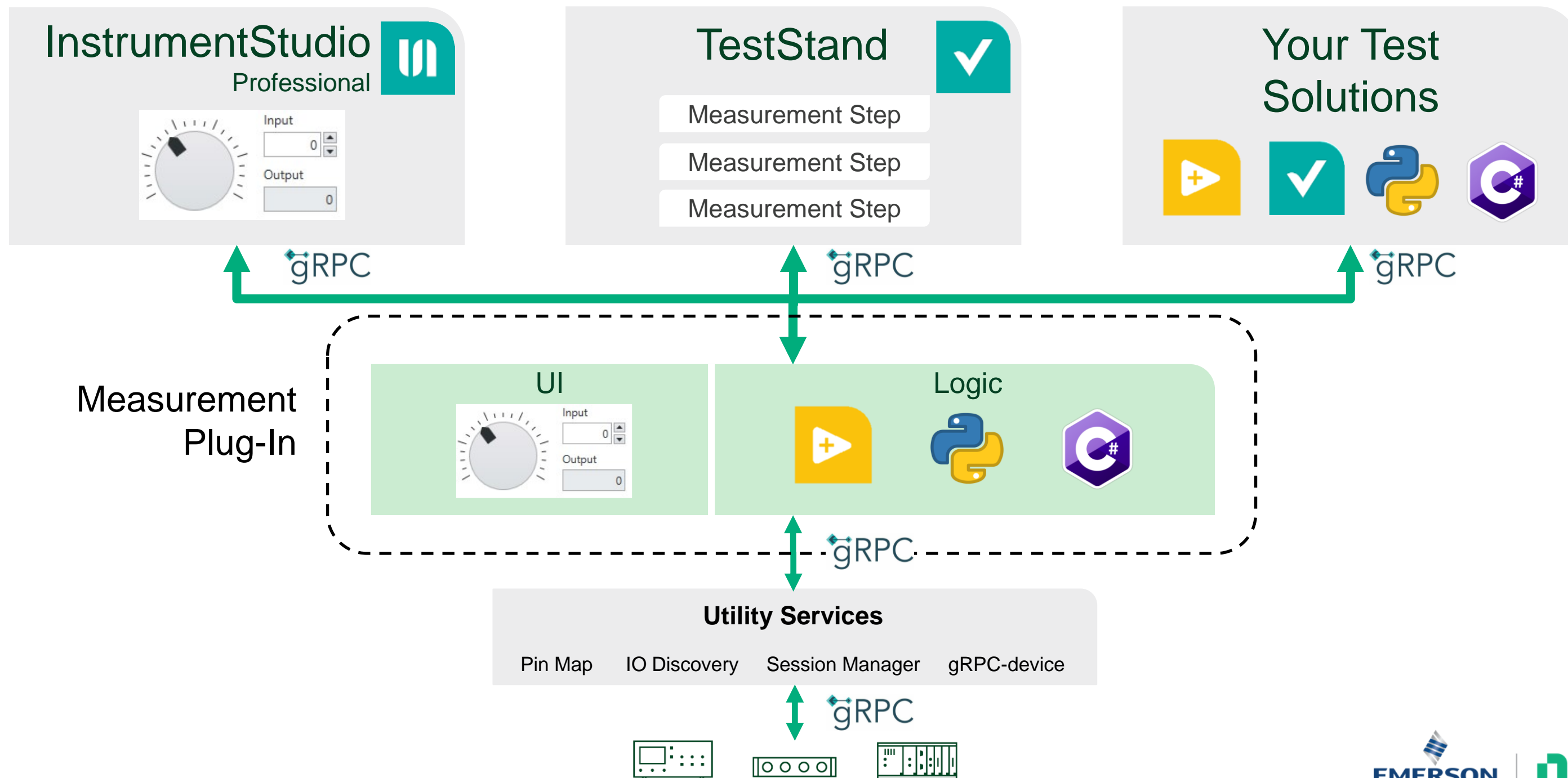
Hardware Session
Management across your tools

Service-based Architecture

- **Support for Any Programming Language**
 - Service-based APIs are universally usable
 - Enables native development / debugging / deployment
- **Use in Multiple Applications**
 - Architecture not coupled to any hosting application
- **Decoupled Implementation**
 - Reduce challenges with incompatible dependencies
 - Reduce challenges with process models and thread use (Root Loop)
- **Support for Distributed Systems**
 - Enables support for multi-machine and cloud-based systems
- **Serviceability**
 - Independently serviceable components
 - Clearly defined APIs with no back doors



InstrumentStudio Measurement Plug-Ins



gRPC Utility Services

Service	Purpose	Timeframe
Discovery	Discovering, retrieving and resolving services	Today
Pin Map	Look up pin connection aliases	Today
Session Management	Reserve and retrieve hardware sessions	Today
User-defined Measurement Plug-Ins	Run custom measurement logic	Today
Monitoring	Monitoring running measurements	Today
gRPC-device	Access hardware across processes/computers	Today
gRPC-TestStand	Control TS Engine from multiple languages/processes	Today
Hardware Capabilities	Discover system hardware and capabilities	24Q3
Publish	Publish versioned measurements	24Q3
Library	Discover versioned measurements	24Q3
Deploy	Download and load versioned measurements	24Q3
Switching	Automatically switch connections	Future
Logging	Publish data into multiple formats	Future
Alarms	Receive rules-based notifications	Future
Synchronization	Synchronize instrumentation	Future

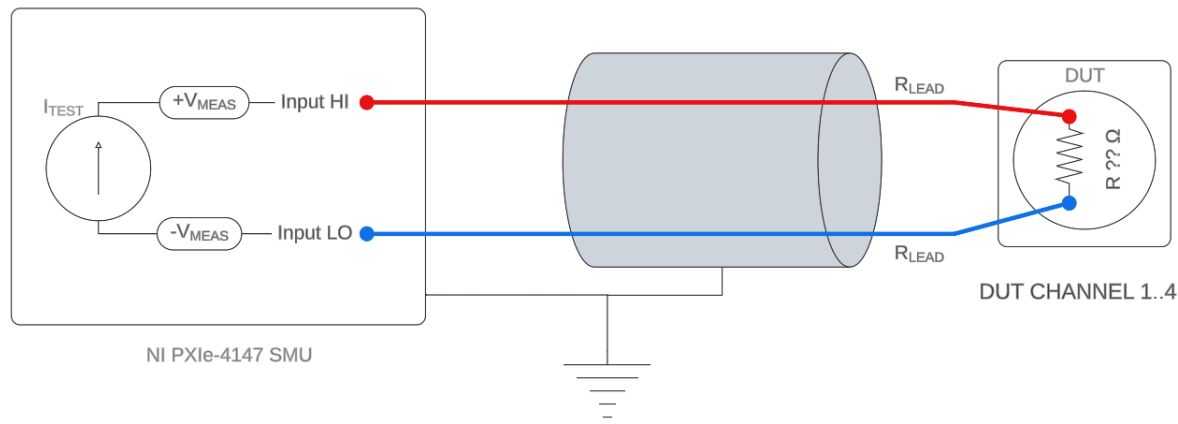
Re-use across Test Scenarios

Reuse Scenarios

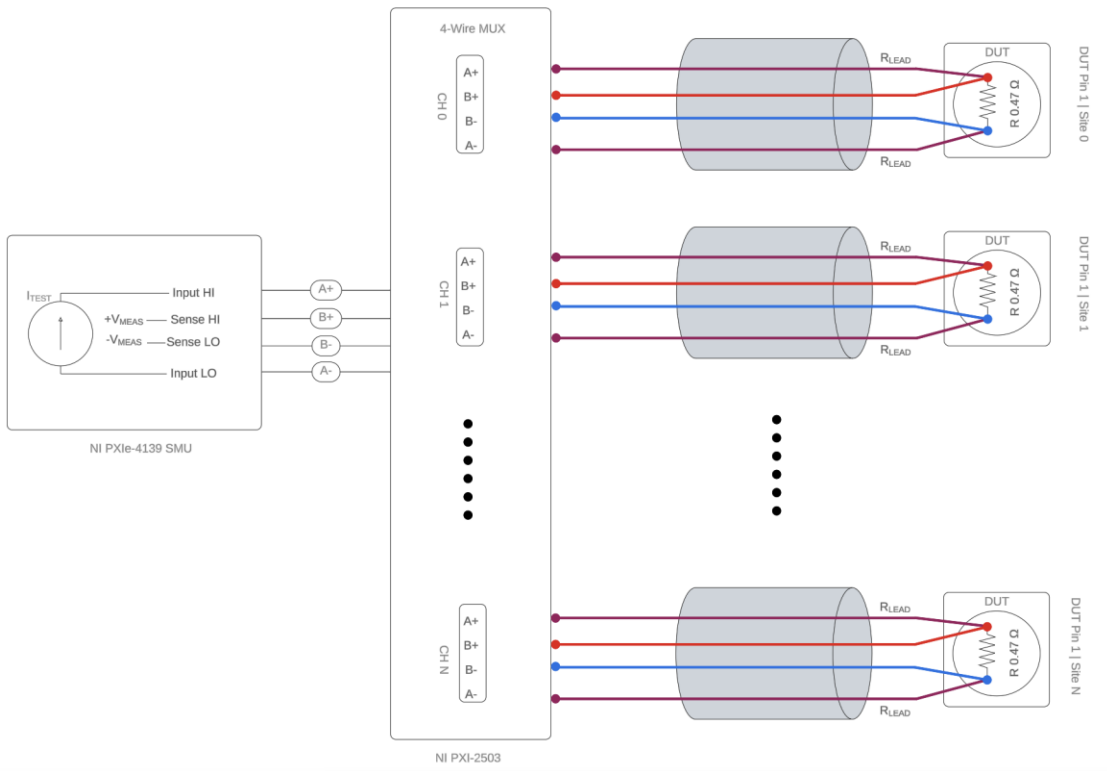
- Reuse IP from interactive to automation environments
- Reuse measurements written by other groups using other languages
- Reuse measurement in multiple testing scenarios without modification:
 - 1 System, 1 DUT (show panel and monitoring and automation)
 - 1 System, N DUTs (show panel working with pin abstraction and sites)
 - N Systems, N DUTs (show panel working with remote instruments, show code calling remote)

Demo Wiring Diagrams

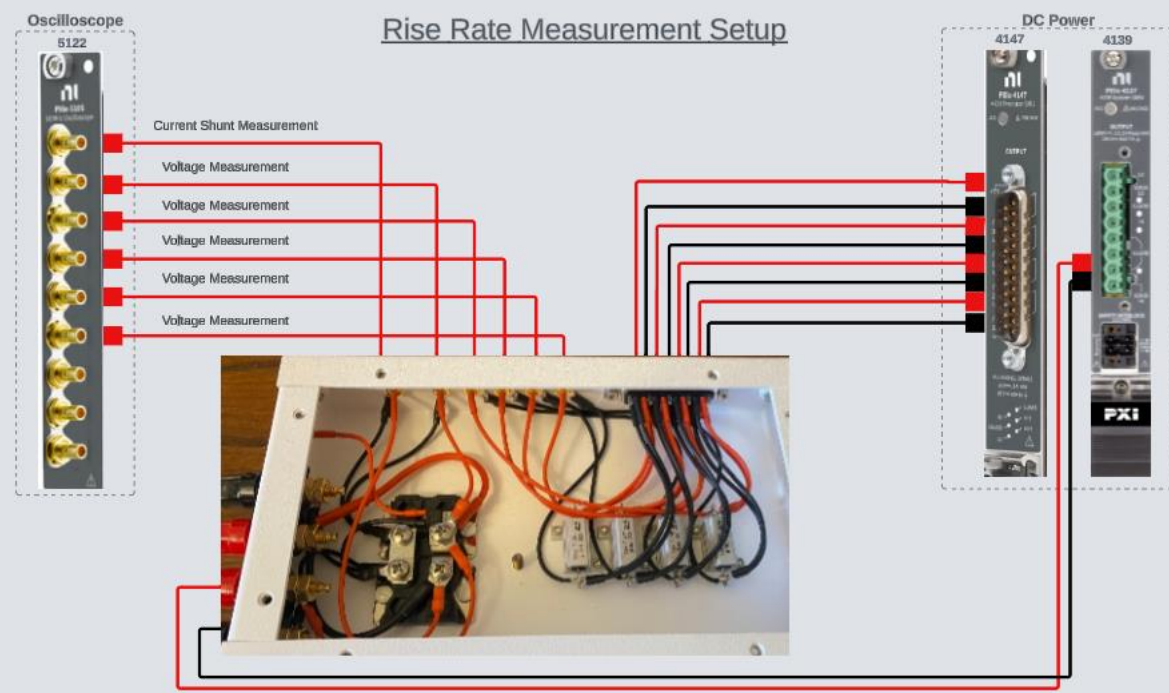
Continuity Measurement (2-Wire)



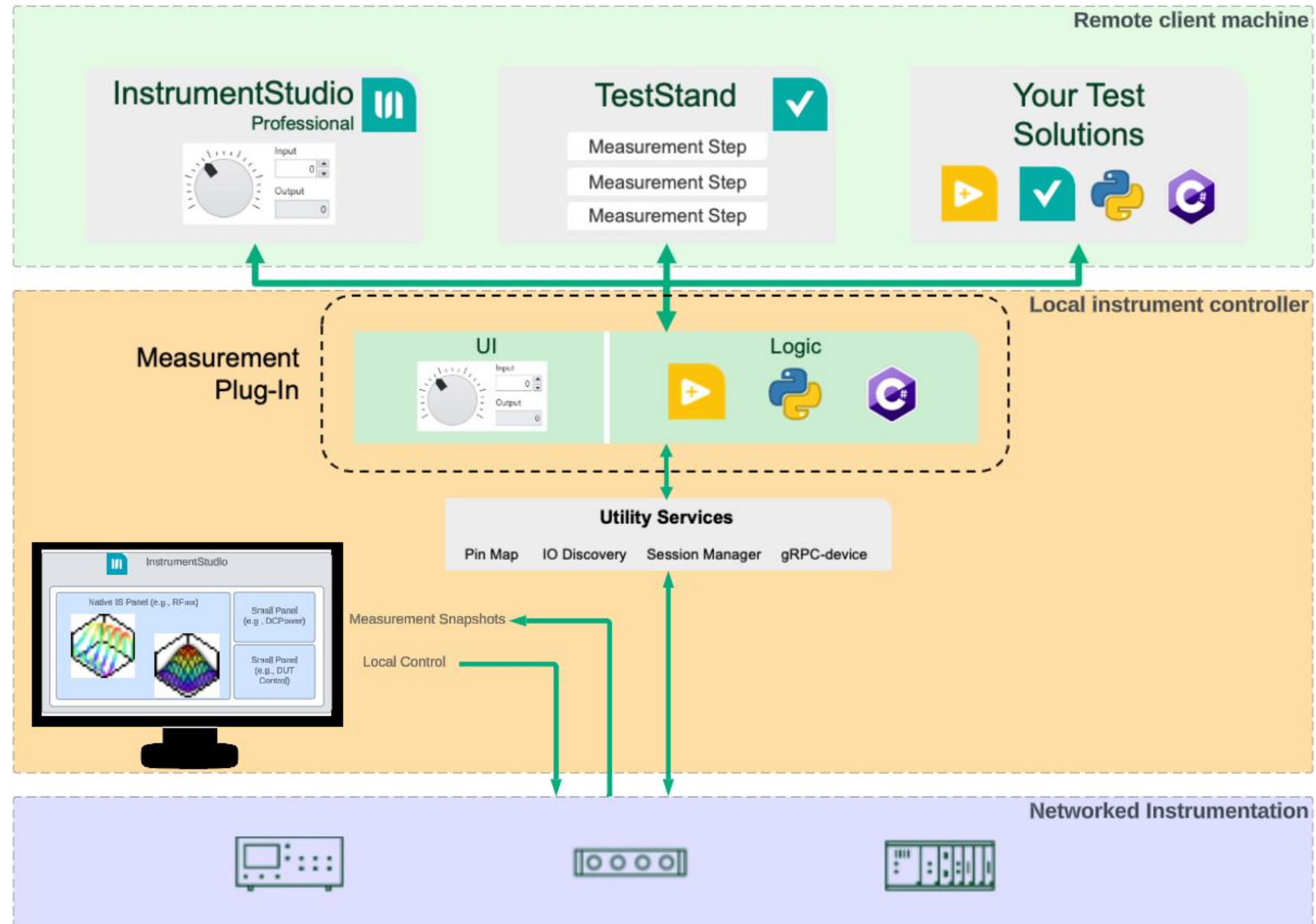
4-Wire Resistance Measurement w/ Multiplexer



Rise Rate Measurement Setup



Remotability workflow diagram



What's Next?

Instrument Studio[™] Roadmap

Short-term product focus

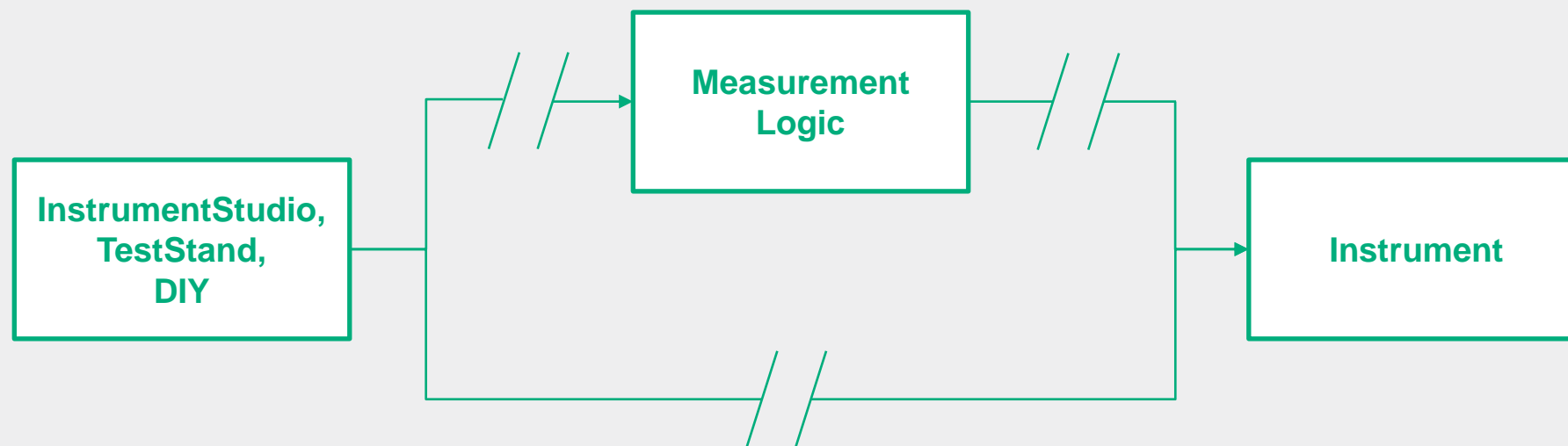
- Cover broad range of electronics test validation and production debug operations
- Allow basic automation of interactive operations
- Allow the creation and sharing of custom panels
- Deliver more out-of-the-box panel functionality

Long-term product focus

- Support more advanced testing topologies
- Increase data connectivity
- Improve path to fully optimized production test
- Streamline and improve customization capabilities

	Capability	Shipped	2024	2025+
	Panels			
	RFmx S-Parameter measurement workflows	2023 Q4		
	Support for electronic loads	2023 Q4		
Pro	Measurement-centric panels		✓	
Pro	Support for non-NI hardware		✓	
	Support for additional NI hardware			✓
	Workflow			
	Measurement organization and search	2023 Q4		
	Improved channel alias and pin map options		✓	✓
	Improved system configuration			✓
	Additional data logging options			✓
Pro	Additional remote-control support			✓
Pro	Additional parallelism support			✓
	Automation			
Pro	In-app sequencing and sweeping		✓	
Pro	Streamlined sequence creation			✓
	TestStand Semiconductor Module support			✓
	Extensibility			
	LabVIEW VISA gRPC driver APIs	2024 Q1		
	Simplified session management	2024 Q1		
Pro	Publish and share custom measurements		✓	
Pro	Additional datatypes and controls			✓
	Full C# support for custom measurements			✓
Roadmap Date: 2024 Q2 Next Release: 2024 Q3 Release Cadence: Quarterly Roadmap is a snapshot and can change based on a variety of factors, including development execution and customer input.				

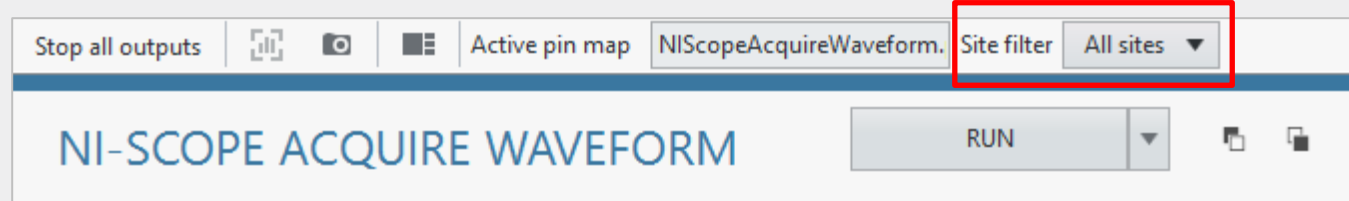
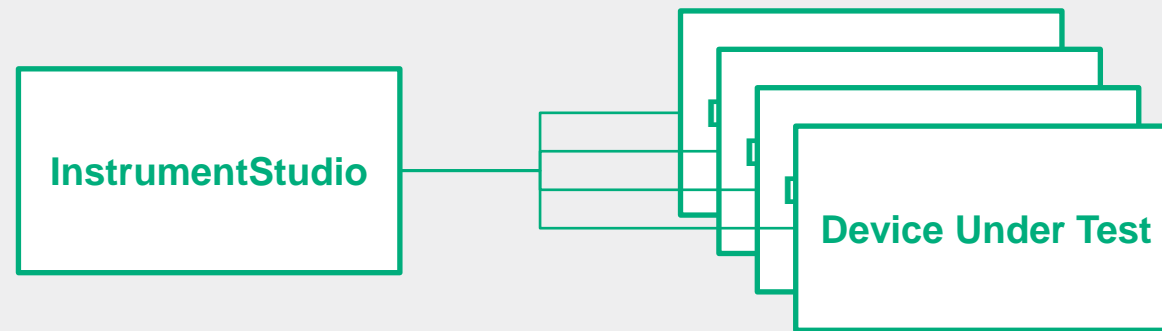
Additional remote control support



Description

- Easy and secure control of remote measurements and instruments from InstrumentStudio

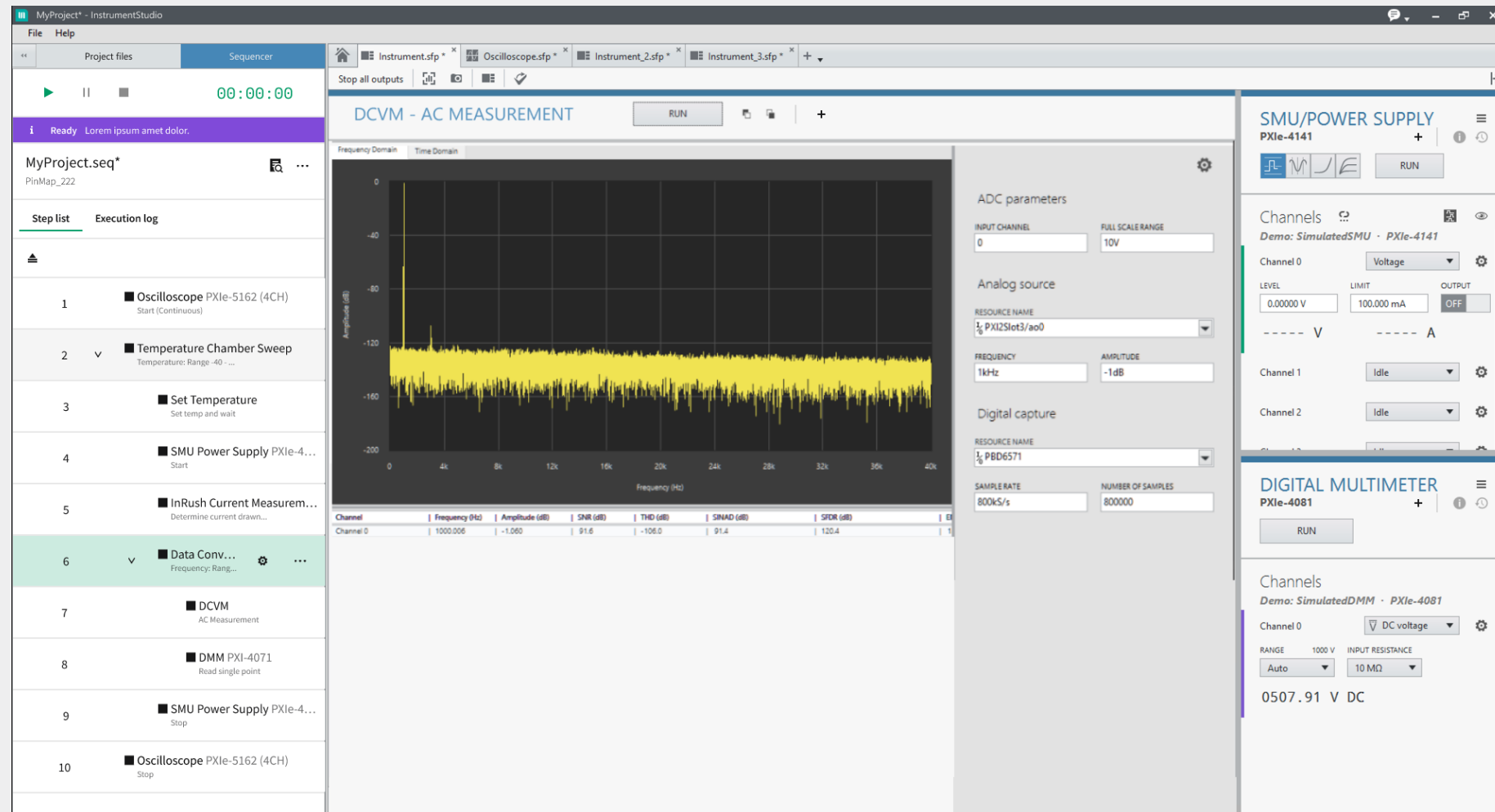
Additional parallelism support



Description

- Streamline and enhance the capability of measuring multiple devices simultaneously

In-app sequencing and sweeping

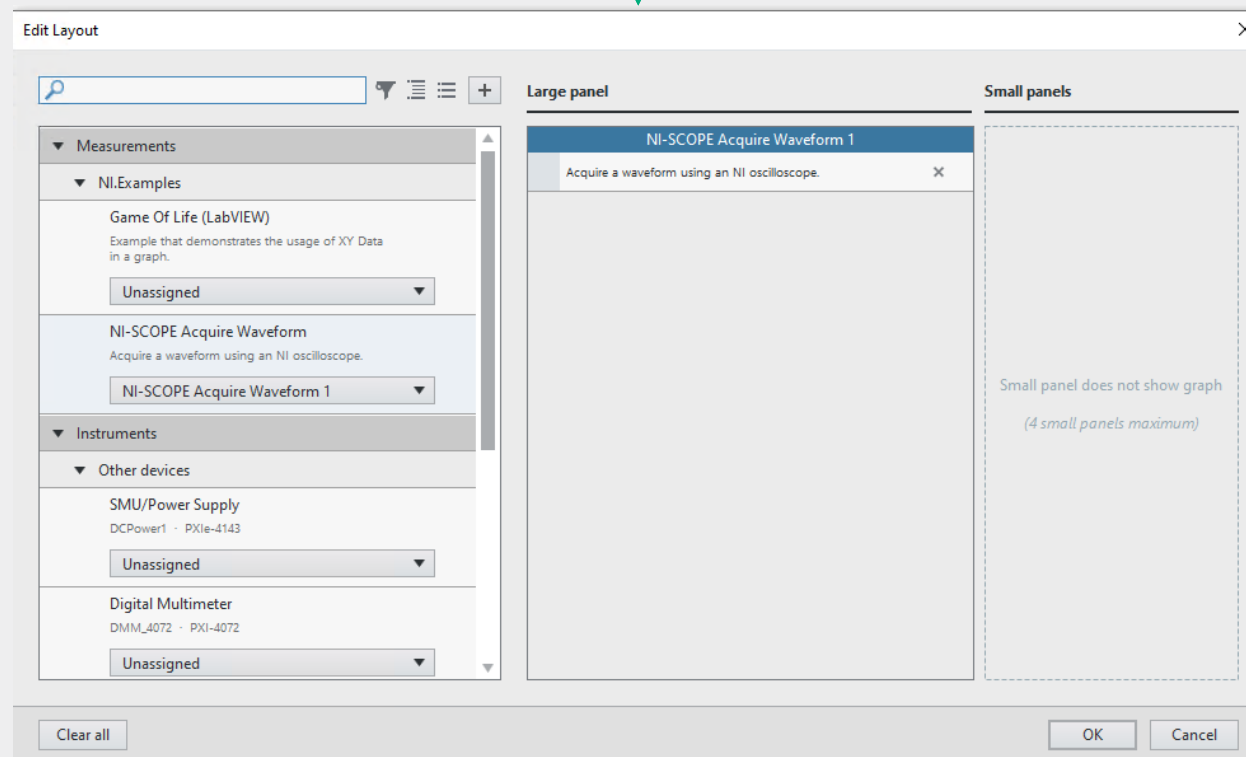
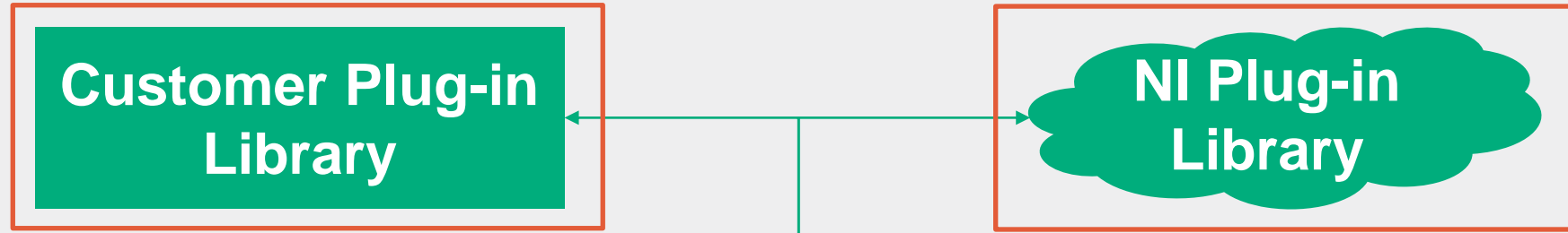


Automated sequence next to live interactive panels

Description

- Sequence interactive panels as steps, sweep parameters, monitor steps during execution and view the report from within one application
- Built using the TestStand Engine and TestStand sequences

Plug-In Library




Accessing Plug-In library from within InstrumentStudio

Description

- Discover and use plug-ins and collections of plug-ins shared locally on a customer's network or externally by partners and NI
- Plug-ins available in the library may also include source code to improve code debug workflows

Additional datatypes and controls

Waveform

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dt	0
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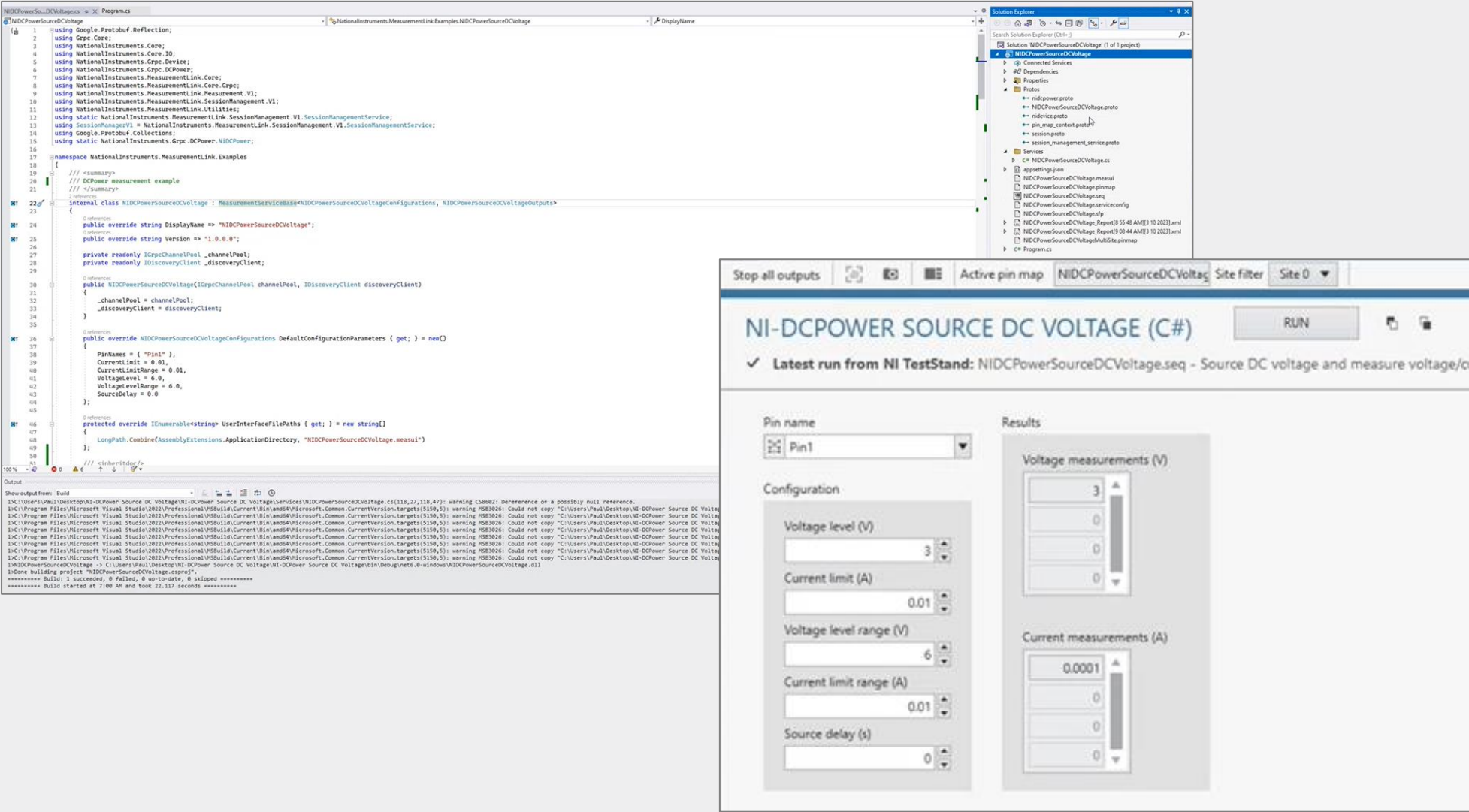
Description

- Add more available data types to custom measurements and represent more data types in language-agnostic UI controls

Full C# Support for Measurement Plug-Ins

Description

- Full support and ease-of-use for developing custom Measurements using C#



InstrumentStudio Pro Information

InstrumentStudio Pro Webinar

Register for the August 7, 2024 session



Current Plug-In training (valid until July)

Check out the existing learning path for creating Plug-Ins.
The name will change in July but the technology will not

