

Create a Measurement with BenchVue & Mass Data Analysis Software

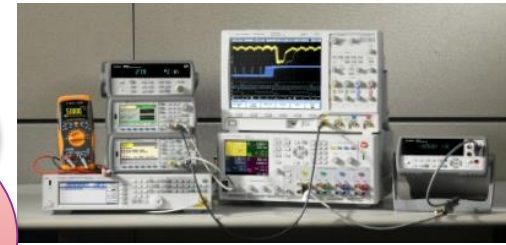
Moon Jong-Won



Agenda

- What's in BenchVue?
 - BenchVue Basic
 - Apps
 - Test Flow
- How to use the Benchvue in labs and classrooms?
- BenchVue Demo
 - Test Flow using DMM
 - Battery Drain Analysis using the Power Analyzer
- Introduce N8844A Data Analytic Web Service Software

How do I program this instrument?

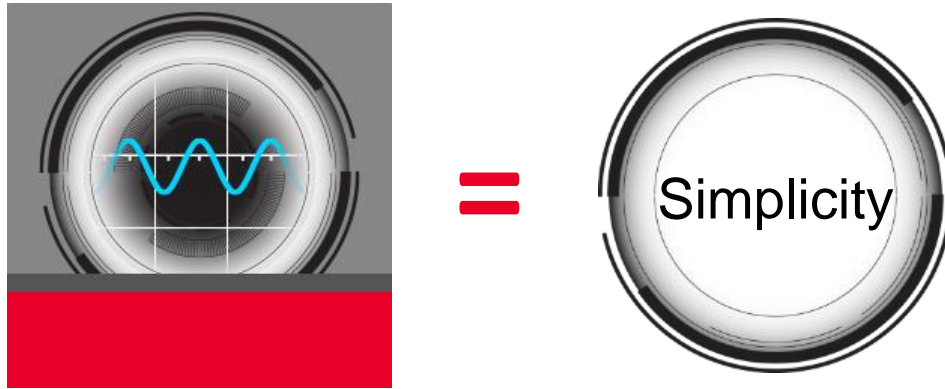


What are the instrument commands?



How do I make screen capture easy?

```
:CALCulate:MARKer  
[1]|2|...|12:X  
<freq|time>....  
OMG
```



BenchVue takes the complex and makes it simple.

1

Control.

2

Automate

3

Simplify

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BenchVue Overview

An intuitive software platform for R&D and validation that enables simple to advanced measurement solutions without the need to program.



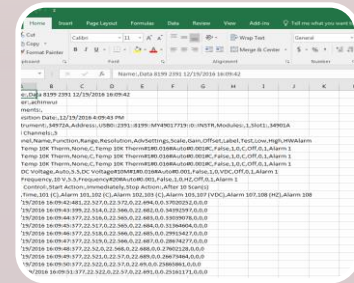
- **Plug and play** connectivity
- **Simple** point-and-click and data capturing
- **No programming** or separate instrument drivers required
- One software platform to **integrate** all your bench instrumentation
- Dedicated **apps** designed for your instruments
- Easily **build** your own automated tests in seconds
- Intuitively **combine** multiple instrument controls

Control. Automate.
Simplify

A New User Experience

End to end workflow measurements with BenchVue software

Control. Automate. Simplify.



Easy Setup

- Simply plug in your instrument via USB, LAN, or GPIB and BenchVue will allow you to start controlling the instrument in moments

Instrument Control

- Visualize multiple measurements simultaneously
- Easily control your instrument with a consistent interface no matter the model that you own

Test Sequencing

- Rapidly build custom test sequences
- Automate measurements and improve productivity

Report Generation

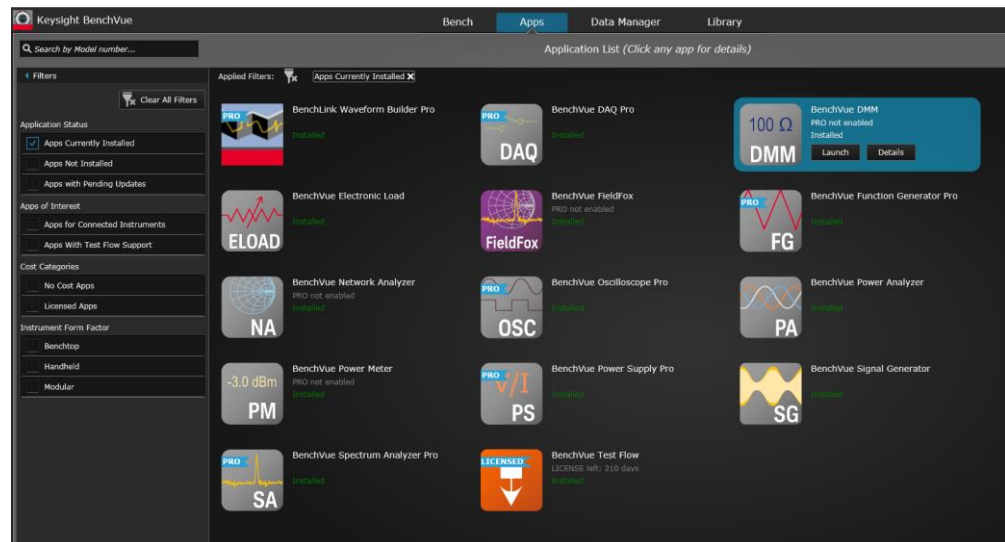
- Export measurement data in desired format fast
- Export to common data types such as .csv, Microsoft Excel or Word, or Matlab

BenchVue Overview



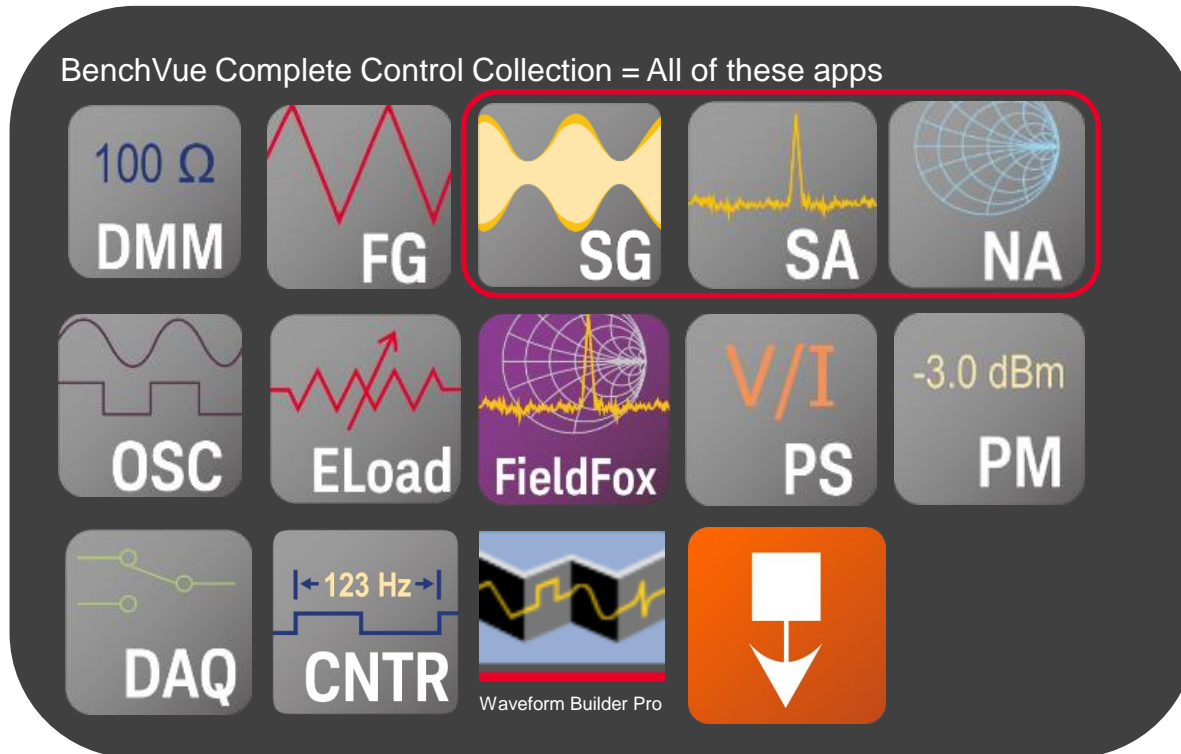
The **Bench** Control and view measurements across multiple instruments simultaneously

The **App** Tab Download new instrument support and measurement solutions as they become available from Keysight



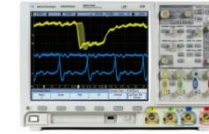
Available BenchVue Apps

A single bundle with all BenchVue instrument control apps



- BenchVue supports over 470 instruments...and counting
- Exclusive access to powerful SA, NA, SG apps

BenchVue: Oscilloscope App



Supported Functionality

Base Application:

- Capture single trace data and export (Microsoft Excel, MATLAB, CSV, Word, HDF5)
- Capture and annotate screen shots, and exporting (Microsoft Word, clipboard,...)
- Instrument controls: Run/Stop and Single, Analog Channel Control: On/Off, scale and offset, Main Time base, Trigger Control: Source, Slope, Level, Display of measurements
- Measurement logging < 1 hour, with exporting (Excel, MATLAB, CSV, Word)
- Save/recall instrument state or bench state



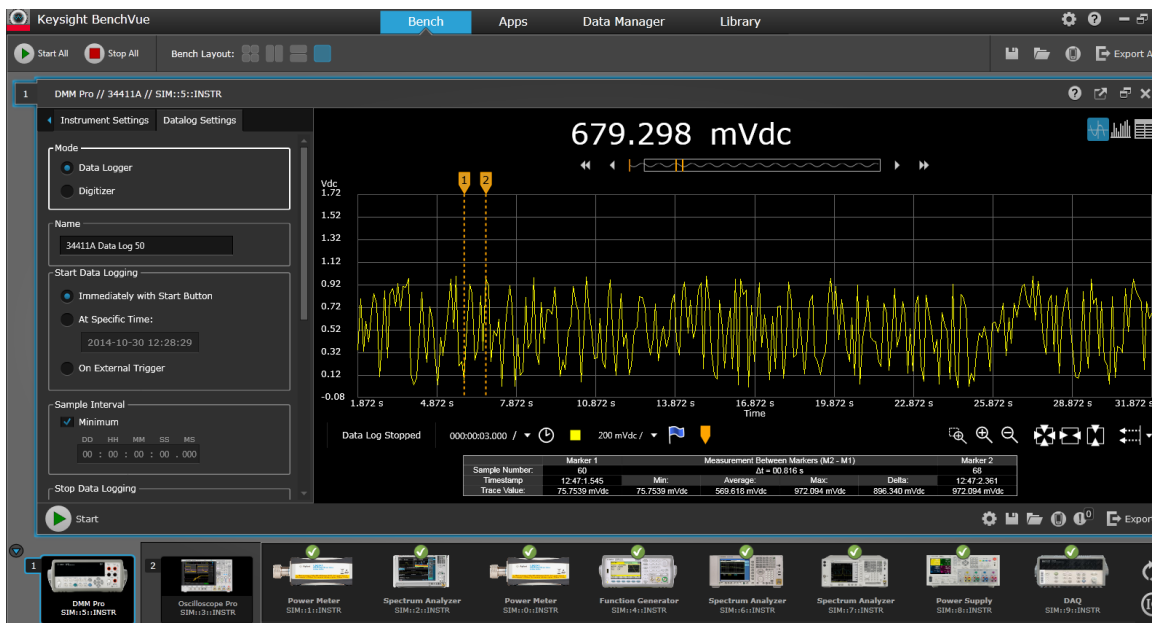
BenchVue: DMM App



Supported Functionality

Base Application:

- Basic data log with strip chart and controls (1 hour duration) and export (Microsoft Excel, MATLAB, CSV, Microsoft Word)
- Visualization and full annotation zoom in/out, change trace color, display sample count & markers
- Instrument Control: Function and Range selection, Integration Time (NPLC/Res.), Input Impedance, Auto Zero, Null State, Capacitance, ACAL
- Save/recall instrument state or bench state
- BenchVue Mobile companion App



BenchVue: Power Supply App



Supported Functionality

Base Application:

- Instrument Control: Set voltage output and Range, Set current Limit, Limit Mode and Range, Enable/Disable OVP w/Limit
- Enable/Disable Voltage and Current Log
- Basic voltage and current data log with strip chart and controls (1 hour duration) and export (Microsoft Excel, MATLAB, CSV, Word)
- Visualization and full annotation zoom in/out, change trace color, display sample count & markers
- Save/recall instrument state or bench state
- BenchVue Mobile companion App



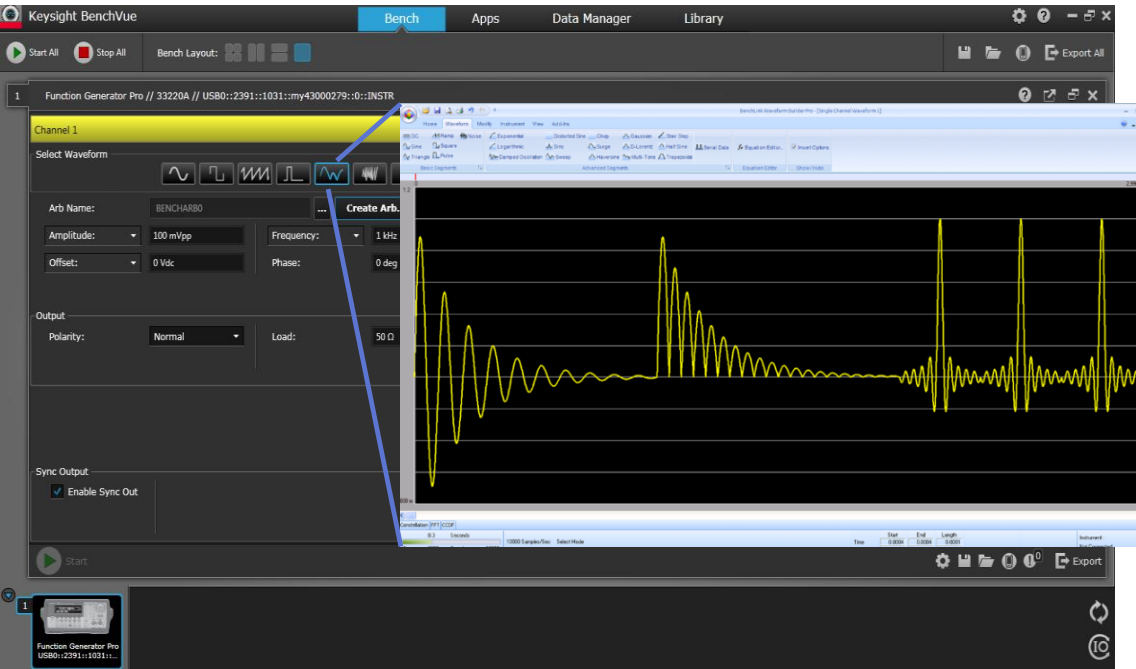
BenchVue: Function Generator App



Supported Functionality

Base Application:

- Waveform selection
- Instrument configuration
- Load custom arbitrary waveforms from files or drag-and-drop from an oscilloscope
- Exporting
 - Instrument properties
- Save/recall instrument state
- BenchVue Mobile companion App



BenchVue: Power Meter App



Supported Functionality

Base Application:

- Multi USB sensors in single App
- Droop measurement, FDO Table
- S-Parameters & Gamma correction
- Different representation of data (digital, analog, strip chart, trace chart, multi-list, etc.)
- Measurement value logging
- Trace logging (selected models)
- Basic and advanced pulse measurements
- Many different types of markers (point, line, dual, gate)
- 100% coverage of instrument control
- Screen shots, exporting (Word, clipboard,...)
- Save/recall instrument state or bench state



BenchVue: Spectrum Analyzer App



Supported Functionality

Base Application:

- Capture single trace data and export (Microsoft Excel, MATLAB, CSV, Word)
- Capture and annotate screen shots, and exporting (Microsoft Word, clipboard,...)
- Instrument controls: Start/Stop/Center/Span, 0-Span, RBW, VBW, Ref Level, Attenuation Scale Type (Log/Lin), Sweep Time, Nbr. of Points
- Trace data logging < 1 hour, with exporting (Excel, MATLAB, CSV, Word)
- Screen shot logging < 1 hour, w/export Viewing function
- Save/recall instrument state or bench state
- BenchVue Mobile companion App



BenchVue: Network Analyzer App

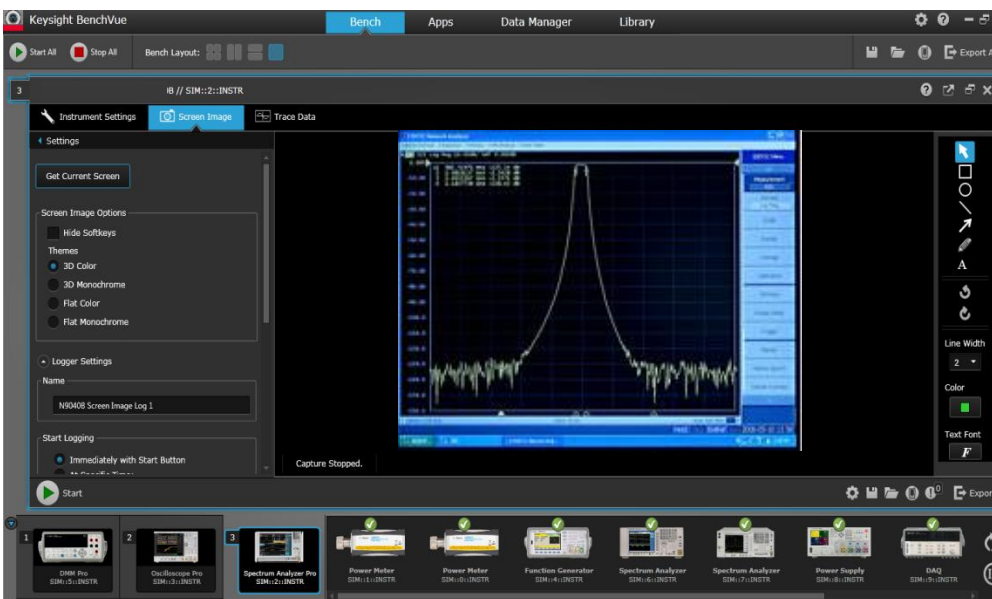


Supported Functionality

Base Application:

Capture single trace data and export

- 16 Traces max [S11 – S44], 100k, Sa (complex) per trace max
- Formatted data, unformatted trace data FDATA/SDATA
- Formatted and unformatted memory data FMEM/SMEM
- Includes acquire /export Touchstone .Sxp format
- Microsoft Excel, MATLAB, CSV, Word
- Capture and annotate screen shots, and exporting (Microsoft Word, clipboard)
- Instrument controls: Start/Stop/Center/Span, IF BW, Ref Level, Trigger Setup, Scale Type (Log/Lin), Sweep Time, Nbr. of Points
- Save/recall instrument state or bench state

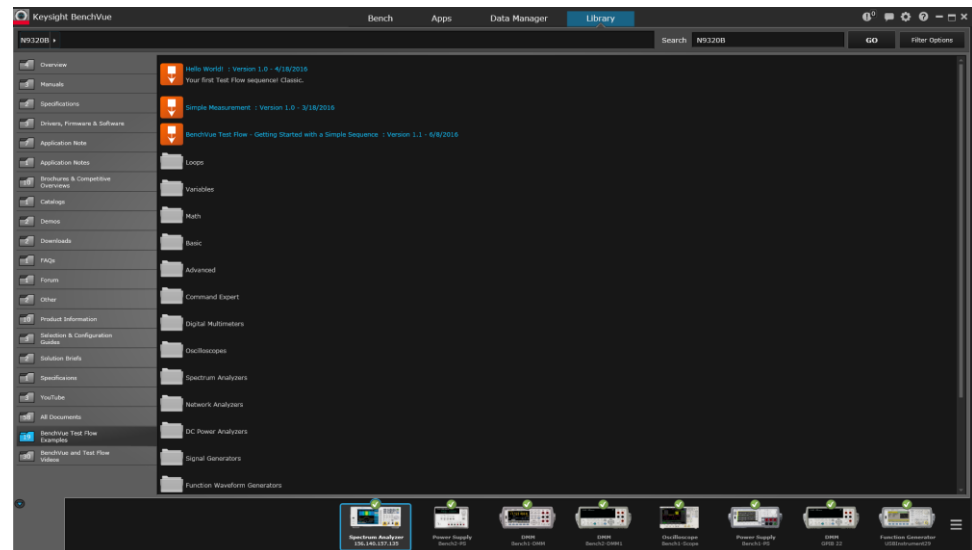


BenchVue Overview



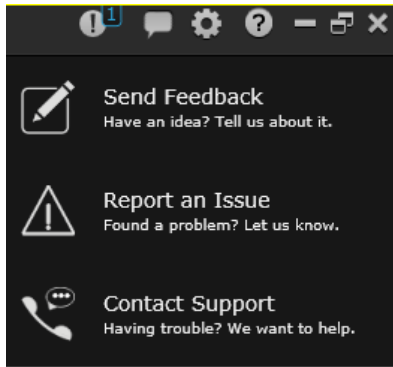
The **Data Manager** A common repository to store, browse and view your measurement history

The **Library** Relevant instrument information available only a few clicks away

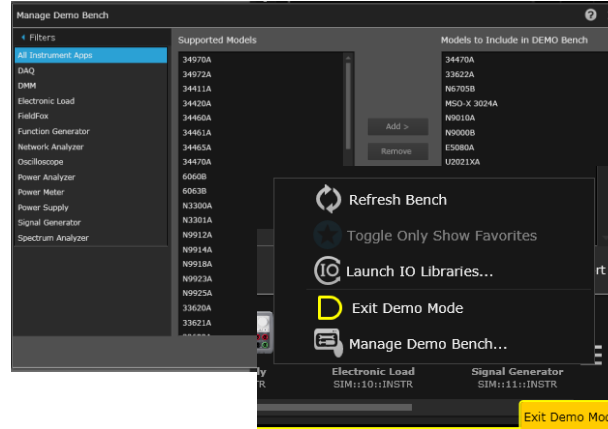


More Platform Features

Usability = Simplicity



Contact Keysight with built in tools



Want to try out an instrument you don't have? Enable it in the demo mode and you can try out various apps and instrument models *

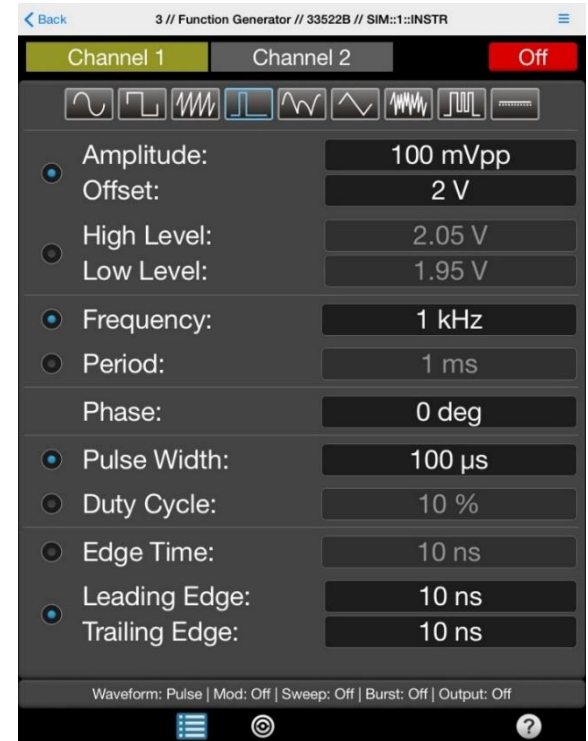
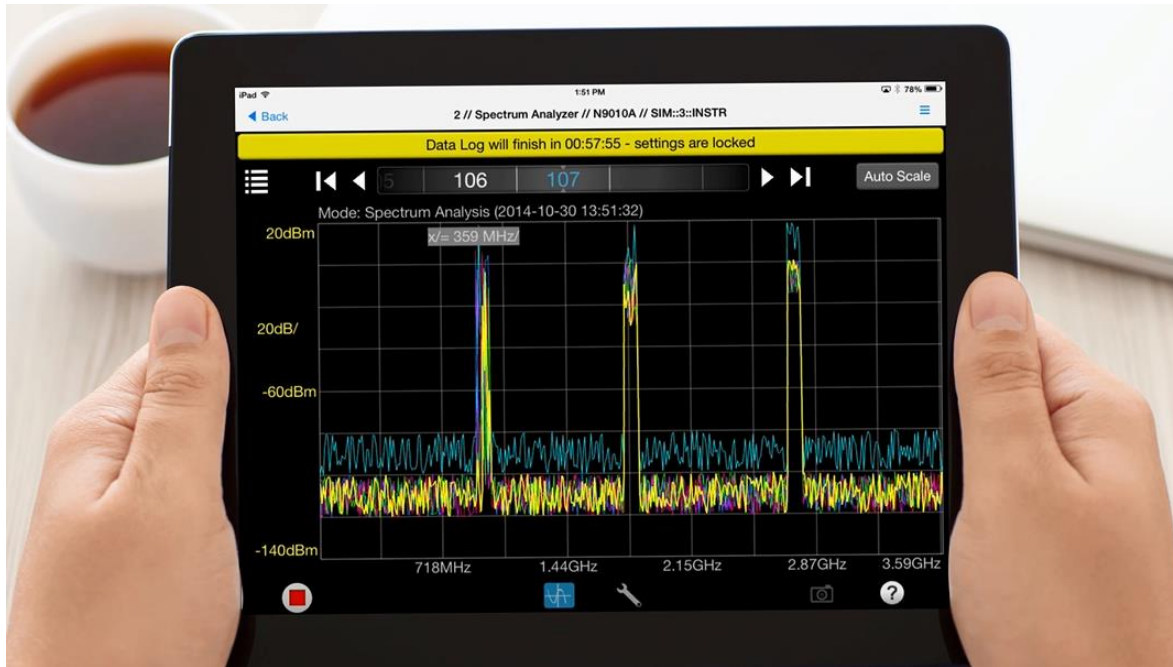


Our update apps tab is easier to navigate to find the right apps for your instruments

* Simulated instrument results not indicative of instrument capability/accuracy

BenchVue Mobile

Available for IOS and Android



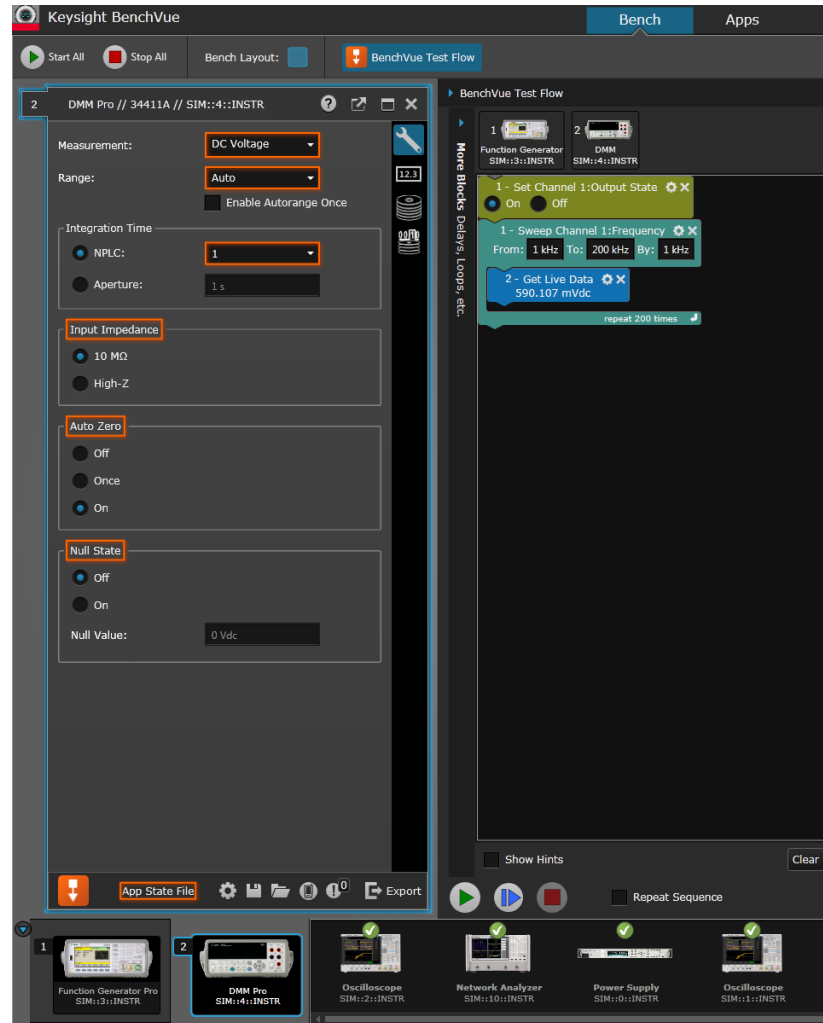
(Mobile Support : DMM, Function Generator, Power Supply, Oscilloscope, Spectrum Analyzer)

BenchVue Test Flow

Build Automated Tests as easily as using your Front Panel

- Easily create **custom sequences** and analyze **automated tests** using your instruments – increased test flexibility with **no programming**

- Easily build your own automated tests
- **Combine** multiple instrument controls
- **Visualize** and make sense of your test results

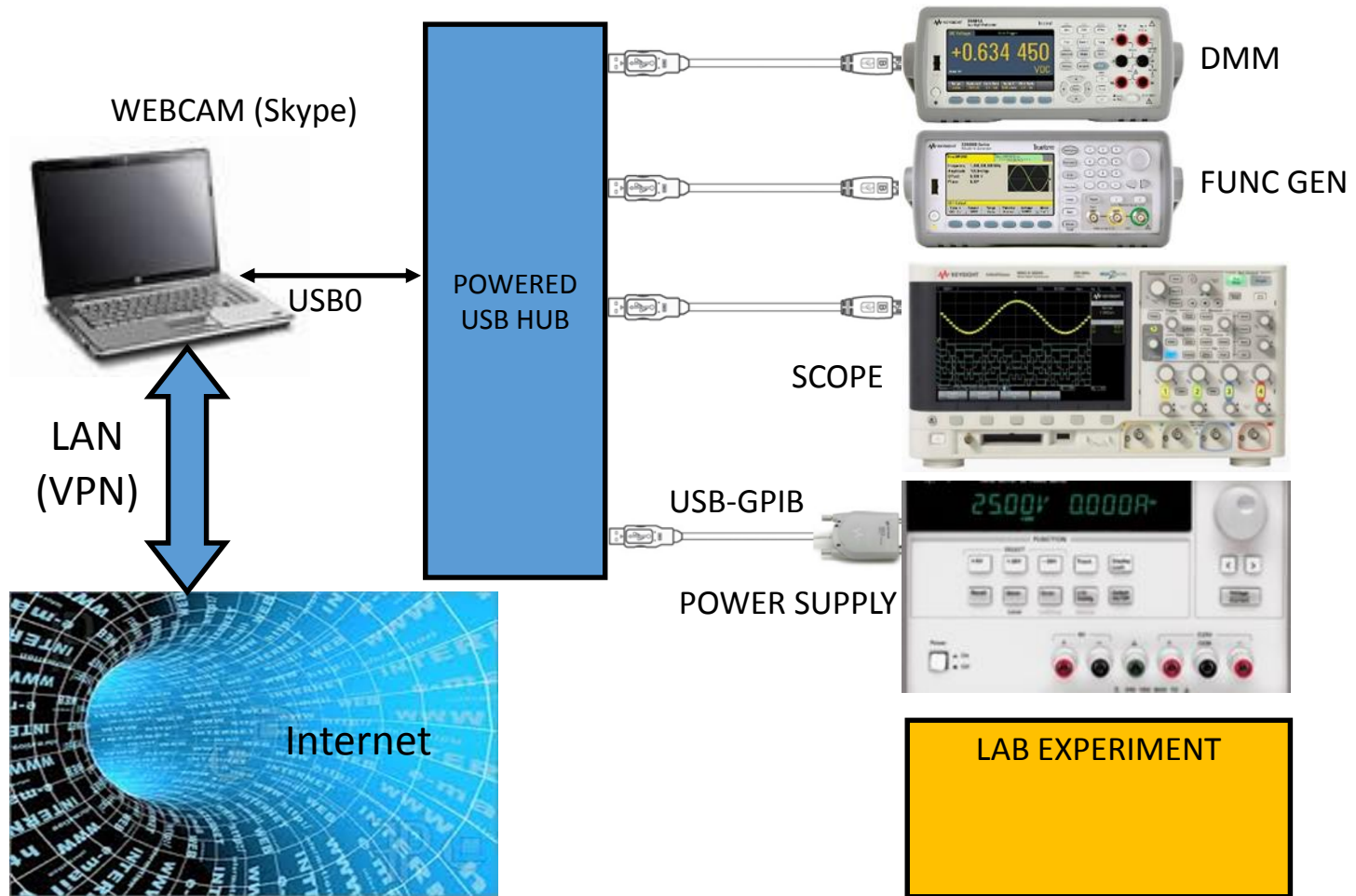


Agenda

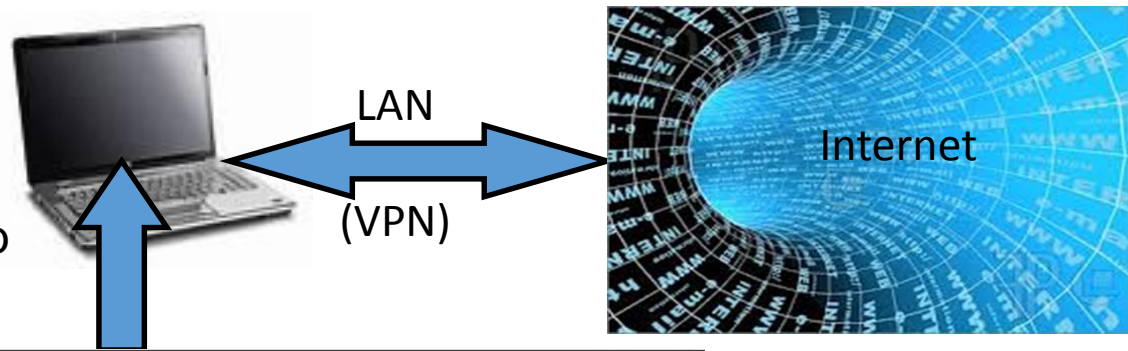
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BenchVue helps with remote teaching/learning

Hardware is set up remotely and accessed from anywhere



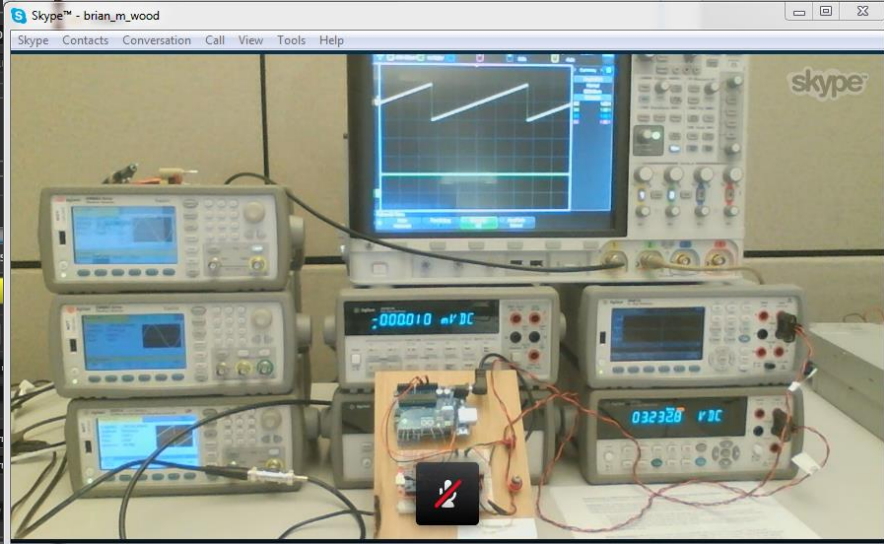
- Instructors can teach remotely
- Students can run labs remotely
- Admins can monitor an entire lab



The screenshot displays the Keysight BenchVue - BETA software interface. The main workspace is divided into four panels:

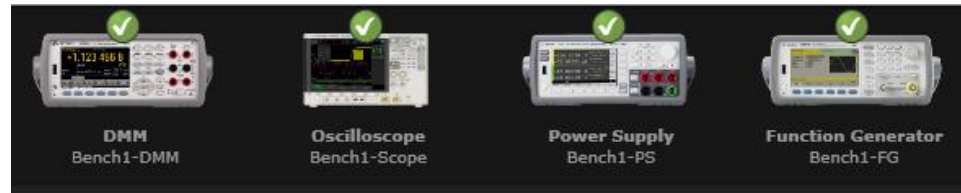
- Panel 1 (Top Left):** DMM Pro // 34461A // USB1::0x0957::0x1c07::US0000077::0::INSTR. Measurement: Resistance (2W). Value: .6503654 kOhm. Graph shows a noisy signal over time.
- Panel 2 (Top Right):** DMM Pro // 34410A // USB1::0x0957::0x0607::MY45000342::0::INSTR. Measurement: DC Voltage. Value: 3.11194 Vdc. Graph shows a steady DC signal.
- Panel 3 (Bottom Left):** Oscilloscope Pro // DSO-X 4034A // USB1::0x0957::0x17b4::MY54270705::0::INSTR. Shows a sine wave waveform on a time scale from -100 ms to 100 ms.
- Panel 4 (Bottom Right):** Function Generator Pro // 335. Channel 1 settings: Select Waveform, Amplitude: 100, Offset: 0 V, Output Mode: Non, Polarity: Non, Voltage Limits: Low Limit: -5 V.

At the bottom, there is a taskbar with icons for various instruments: DMM Pro, Oscilloscope Pro, Power Meter, Power Supply, and DAQ. A Skype window is overlaid on the right side of the interface, showing a video call with a lab setup.

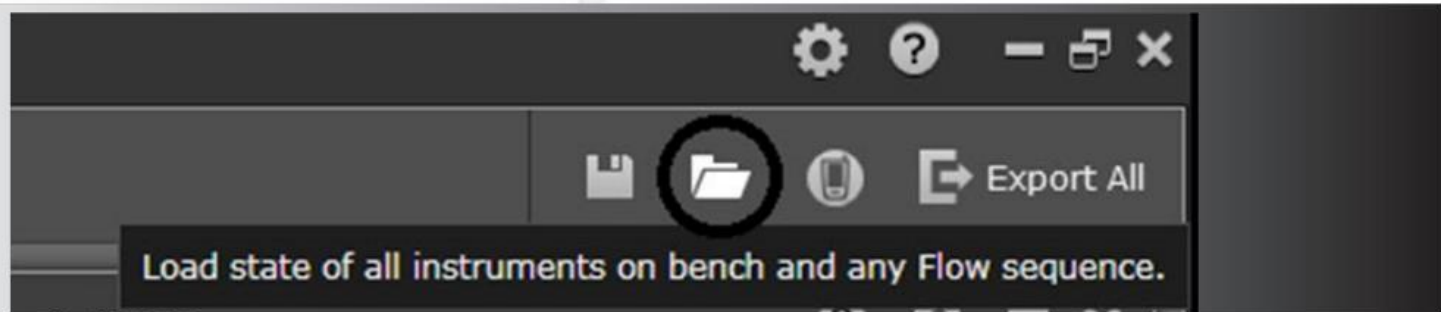
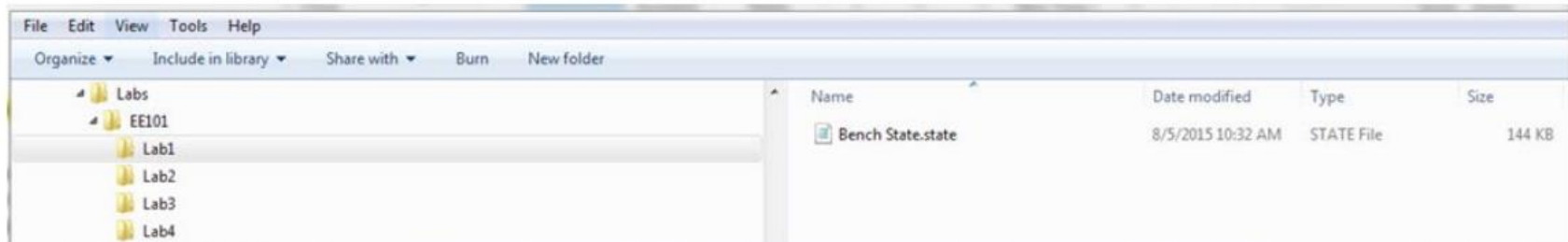


Utilize the BenchVue

Centralized monitoring of lab stations



Saving and recalling lab state info is easy!

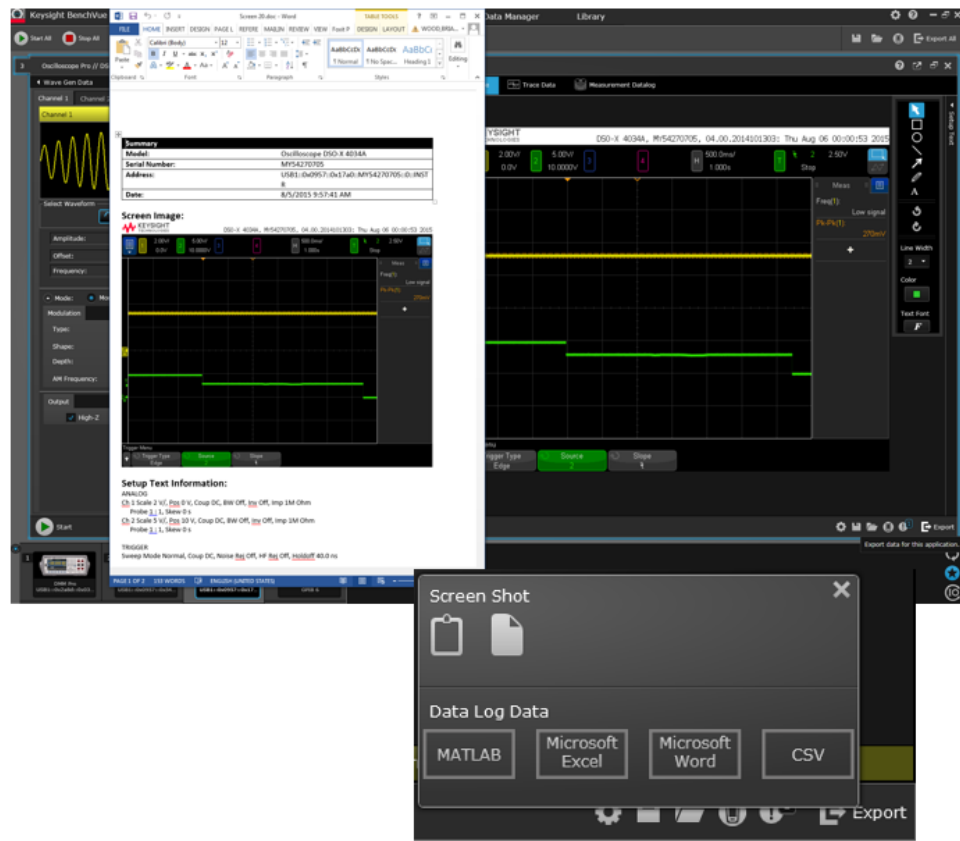


Utilize the BenchVue

Save experiment results in multiple formats

Saving lab experiment results

Students can run BenchVue on each station and easily export screen images and trace data to Word, Excel, MATLAB or CSV files and save them anywhere on the LAN network. Students can then access the data from their PCs or mobile devices as long as they have access to the school's network.



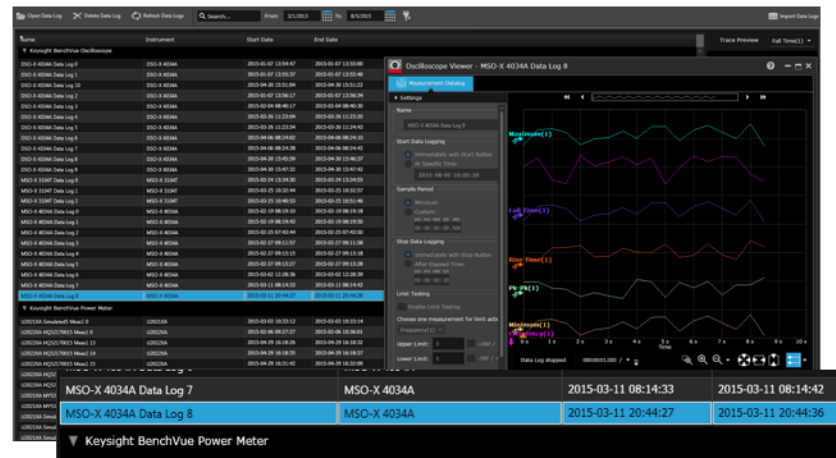
Utilize the BenchVue

Log files are saved automatically for

- * easy retrieval later by students
- * instrument info access by lab administrators

Automatic logging of instrument usage

Lab managers often need to see who's used what instruments and when. BenchVue's Data Manager archives all logged data by start and end time and users can bring it up in a viewer:



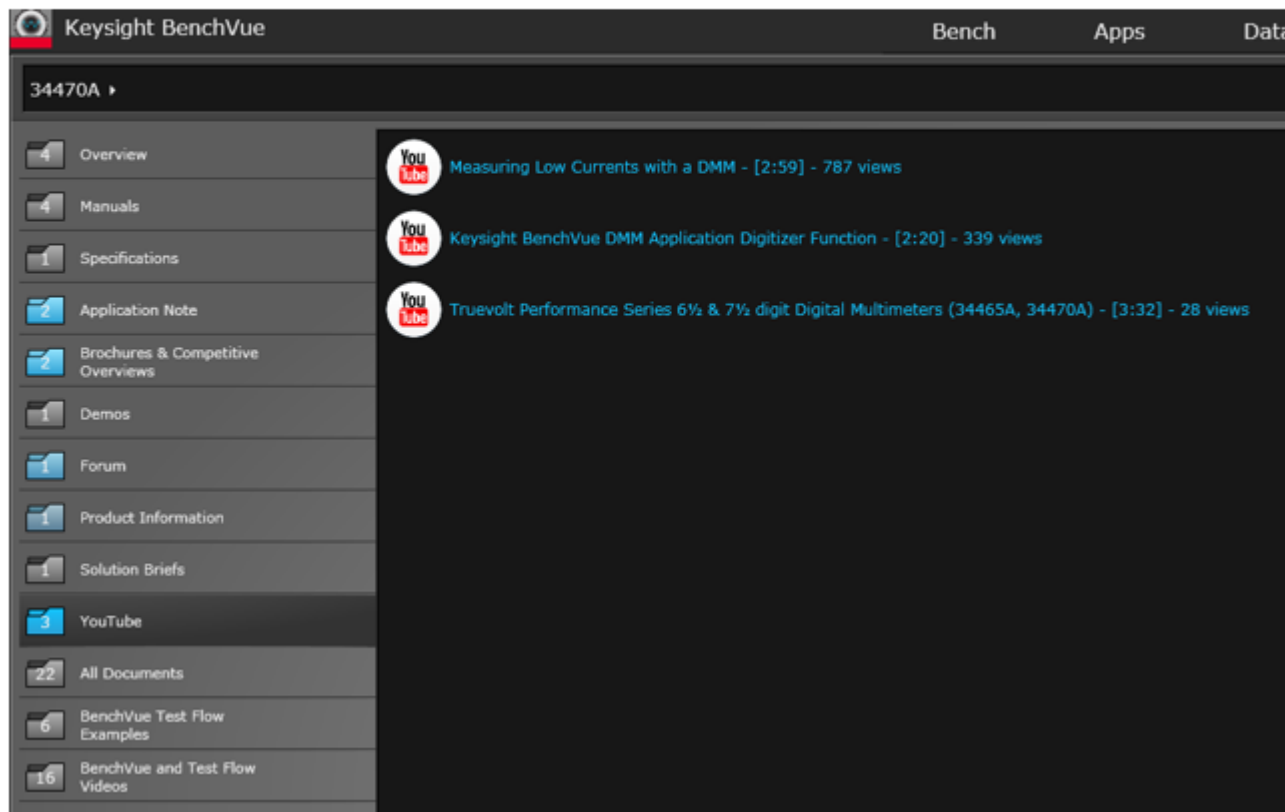
Any file can be exported. The document contains chart images, trace data and information about the instrument:

Summary	
Model:	DMM 34465A
Serial Number:	MY54500329
Address:	USB0::0x2A8D::0x0101::MY54500329::0::INSTR
Acquisition Date:	2015-05-07 10:06:48
Sample Count:	10000

Utilize the BenchVue

Easy access to a wealth of documentation

Students have access to manuals, videos, app notes, and more in the BenchVue Library tab, sorted by instrument number. This is a great way to quickly access information.

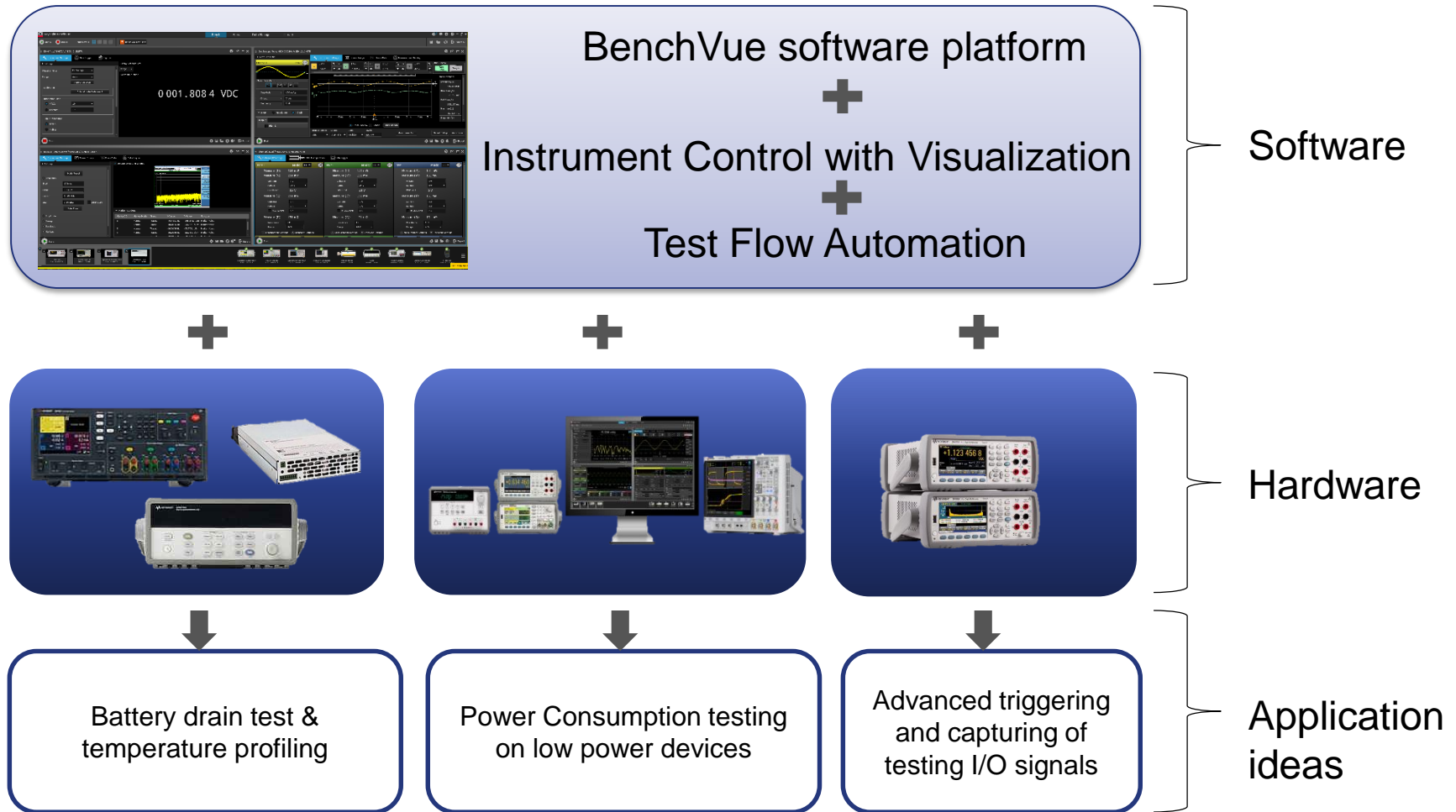


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Application Ideas

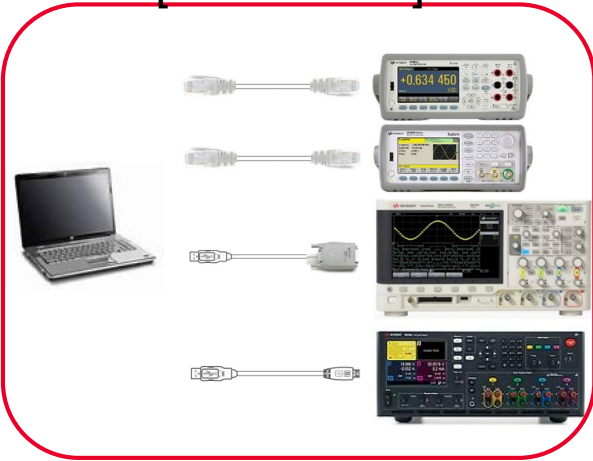
How to reach broad customer base with BenchVue?



BenchVue Demo

Test Flow & Battery Drain Analysis

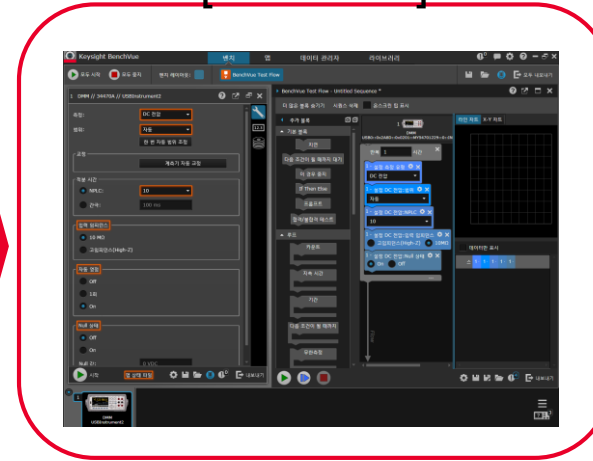
[Connection]



[Overview]



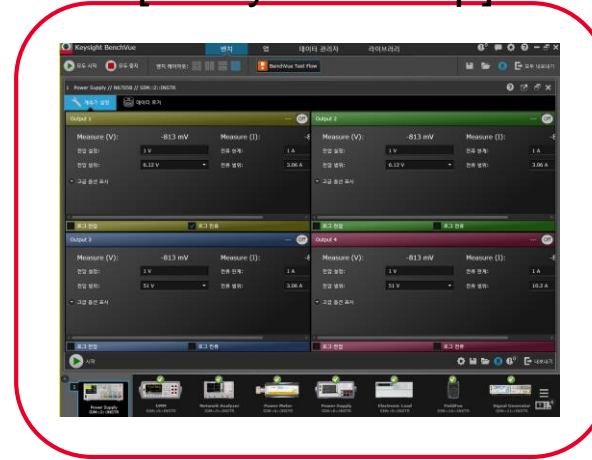
[Test Flow]



[Battery Drain Analysis]



[Analysis Set up]



Summary

BenchVue enables users to be more productive

- Easy to learn and use
- Understand your data with built in analysis or easy export
- Similar interfaces for different instrument types reduces the learning curve
- Test Flow is a major innovation
 - Test automation without instrument programming
- BenchVue supports over 470 instruments
- New updates with more instrument support and more capabilities are constantly in development
- It is a clear differentiator for customers looking for instrument solutions



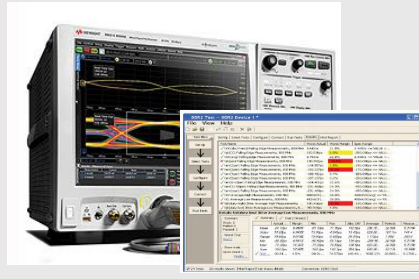
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Today's Testing Environment



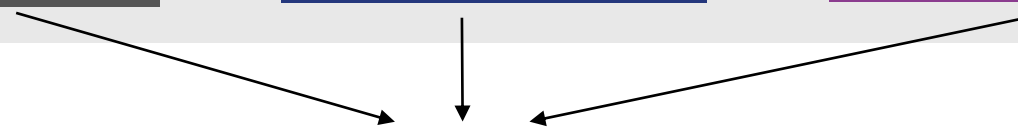
Make manual measurement with test equipment and record data



Use compliance test software with test equipment to automate measurement and collect data



Use simulation software with compliance test software to automate measurement and collect data.



Use pivot table or other graphing software to view and analyze test result.

Challenges in today's testing environment

Designers need help with managing test result

Lots of Data



- Designers require lots of measurements data to have confidence in their test results.

Time Consuming



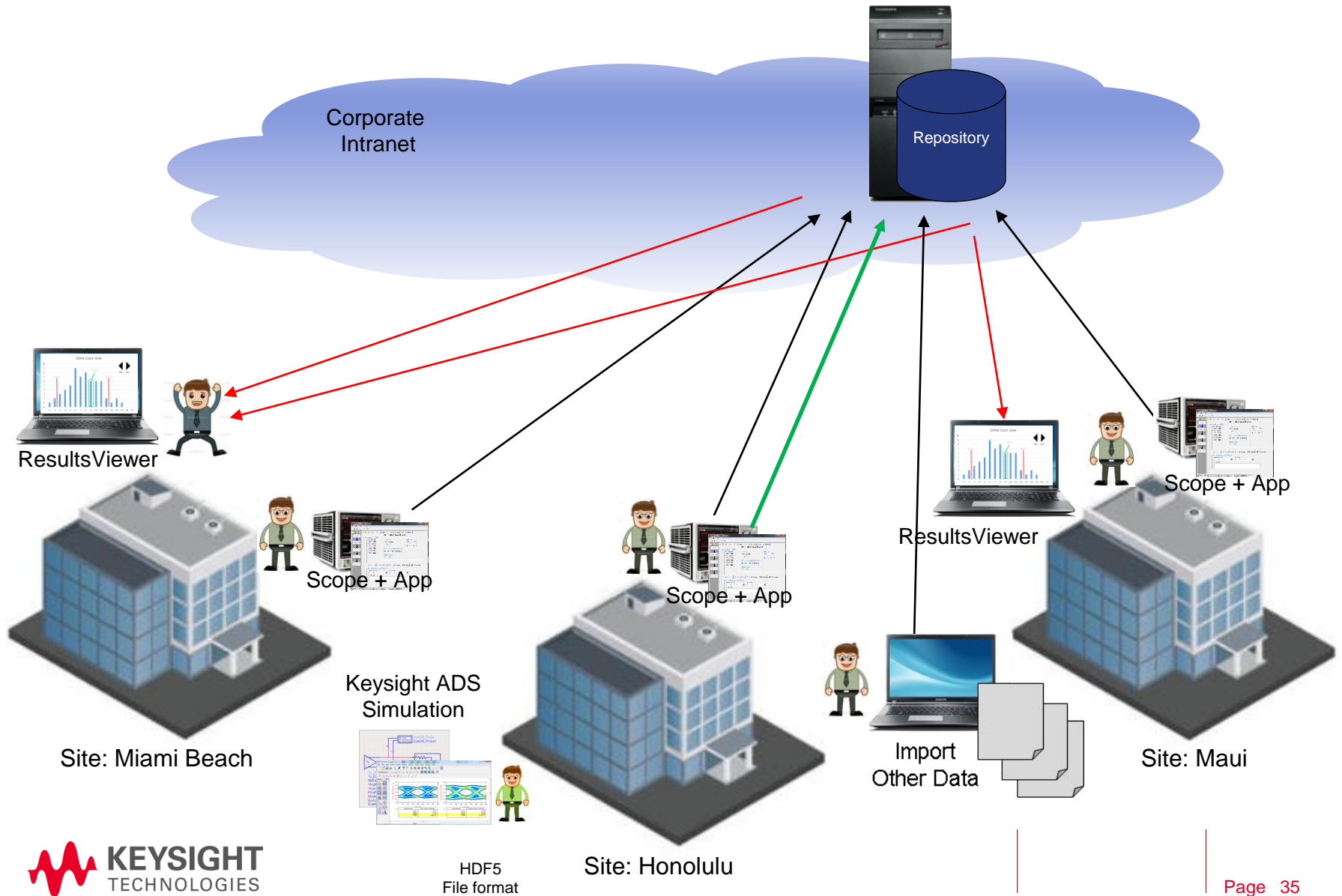
- Designers spend a lot of time creating pivot tables for data viewing instead of design work.

Decision Making



- Designers need to be able to make decisions based on data.
- Managers need to know how to analyze data to facilitate decision making process.

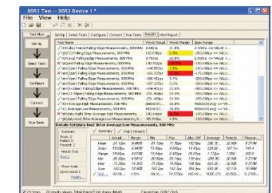
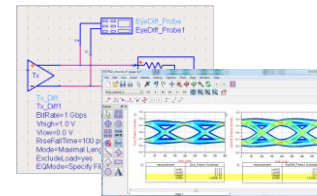
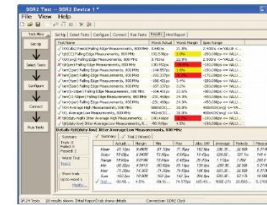
Keysight Data Analytics System Architecture



N8844A Data Analytics Web Server Application

Data Sources

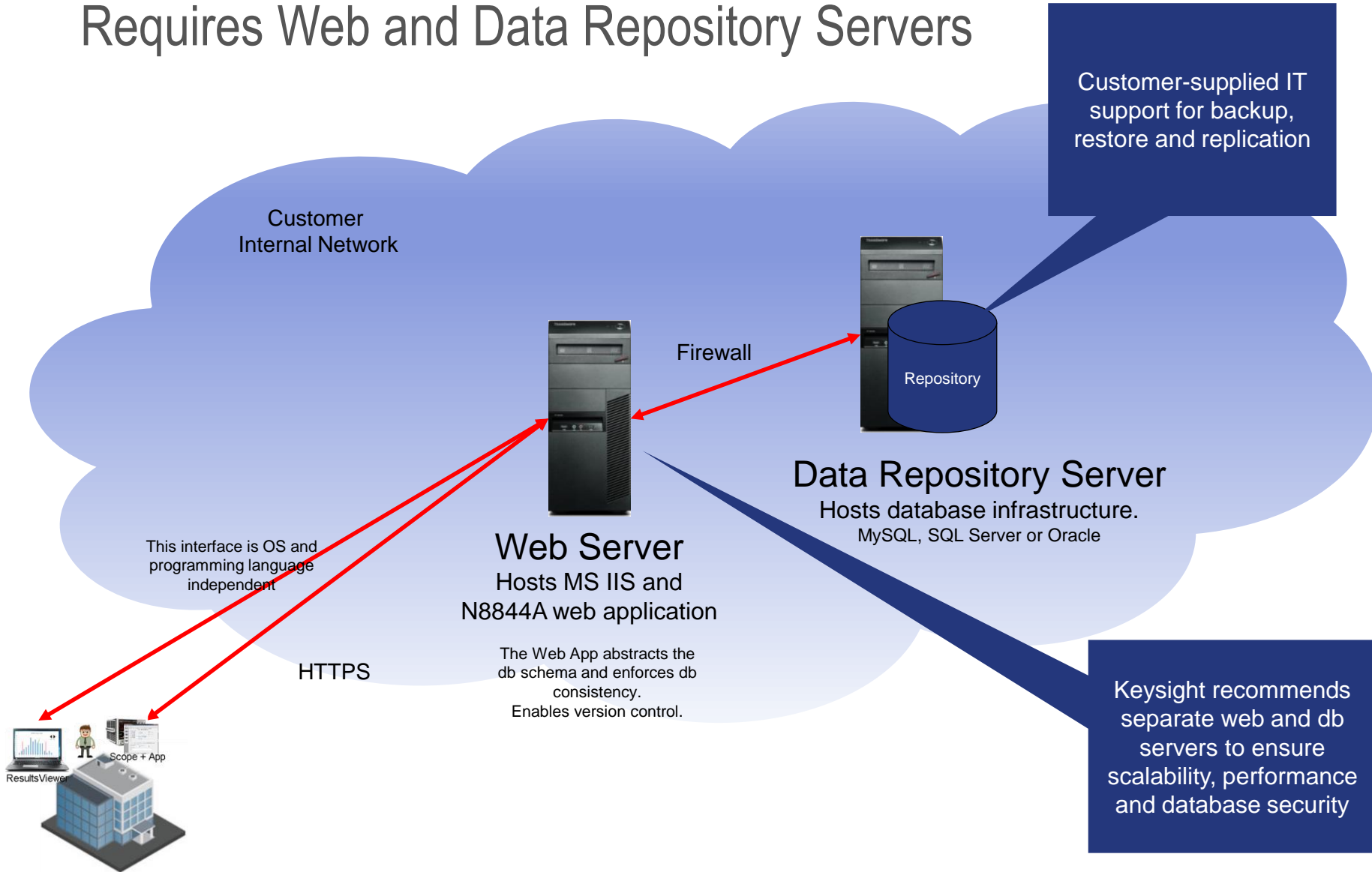
- Infiniium DDR4 and LPDDR4 Compliance Application Software
- Keysight ADS Simulation input (via Infiniium Offline)
- Other Keysight Data Sources (test result collected from Keysight test equipment or test environment)
- Non-Keysight Data Sources (test result collected from other vendor equipment or customized data source from user setup)



Name	Date Modified	Size	Type
1. Local			
2. private	8/20/2018	409600	File
3. address	8/20/2018	409600	File
4. address	8/20/2018	409600	File
5. ECC	8/20/2018	409600	File
6. control	8/20/2018	409600	File
7. control	8/20/2018	409600	File
8. data	8/20/2018	409600	File
9. data	8/20/2018	409600	File
10. DCPyMMA	8/20/2018	409600	File
11. DCPyMMA	8/20/2018	409600	File
12. DCPyMMA	8/20/2018	409600	File
13. data	8/20/2018	409600	File
14. explorer	8/20/2018	409600	File

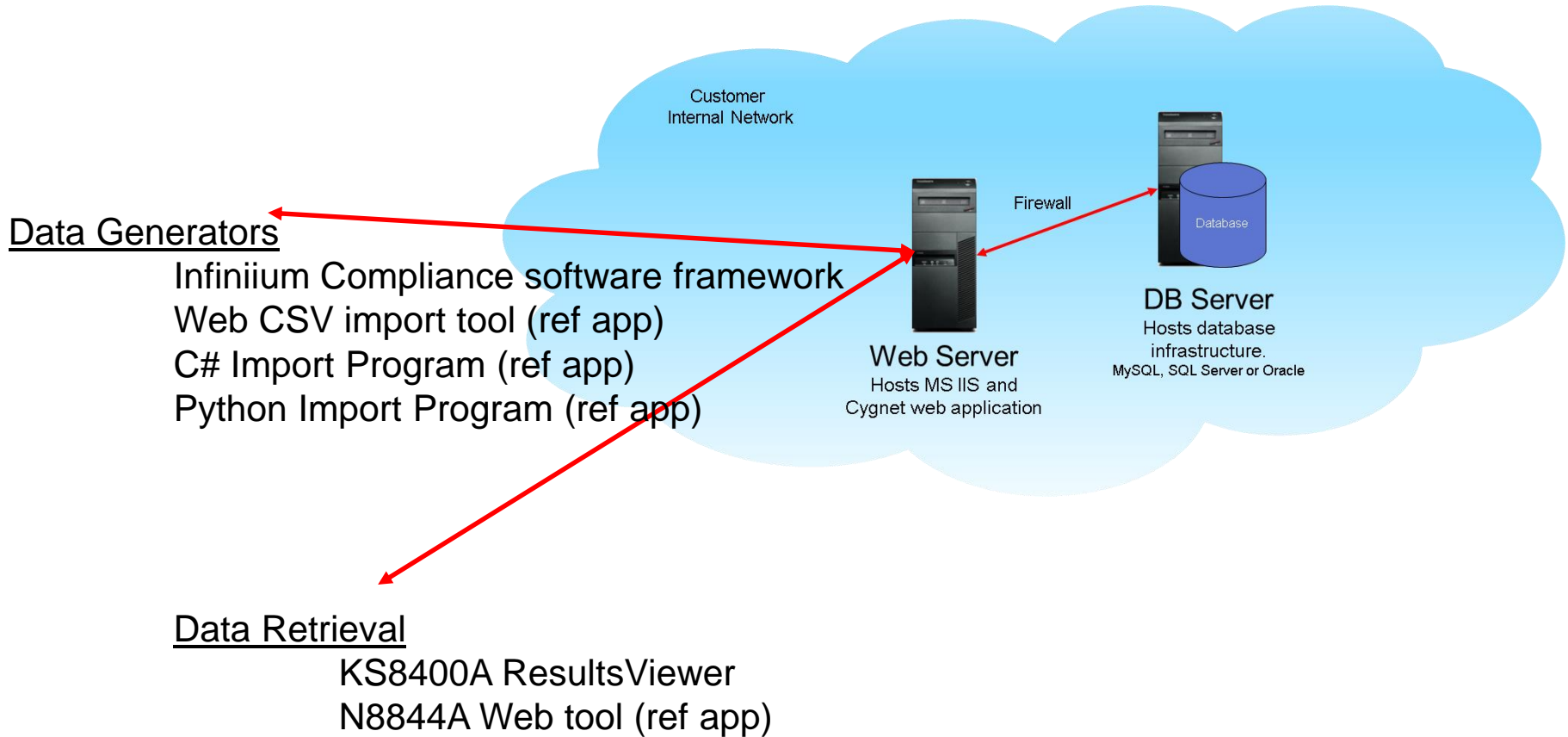
Setting up Data Analytics Software

Requires Web and Data Repository Servers



Data Analytics Clients

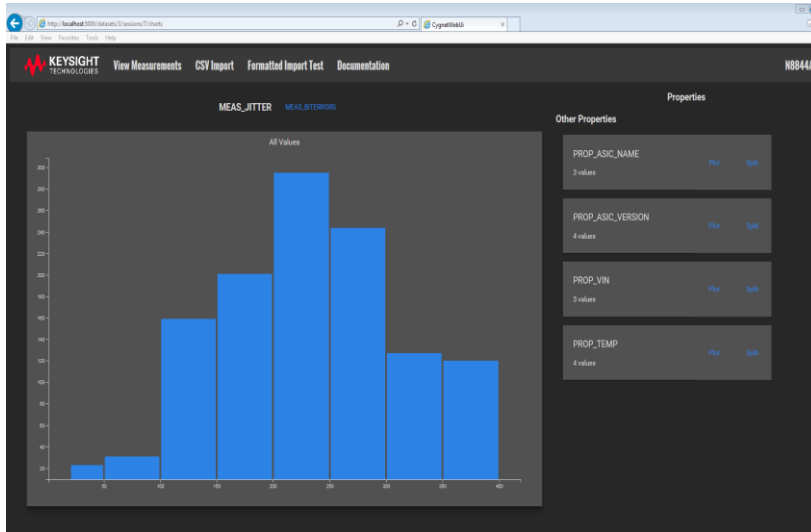
Supports a wide range of clients



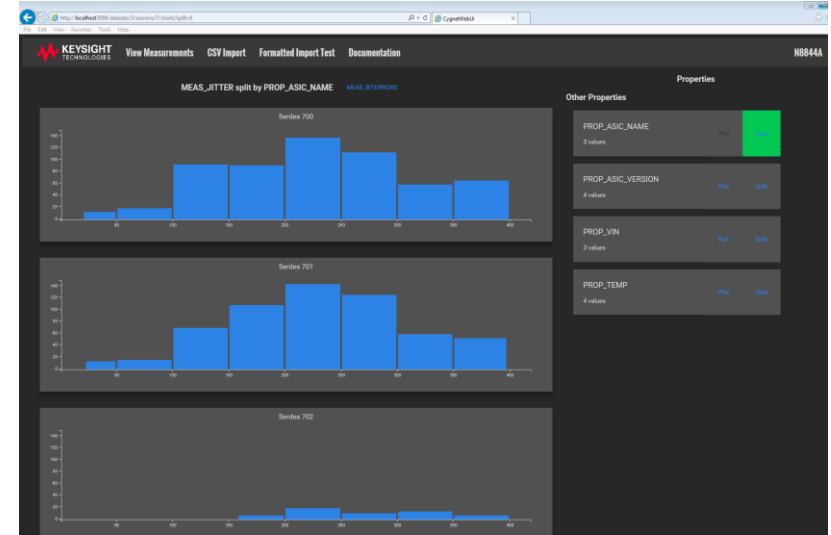
Infinium (for example) will also retrieve data from the database to populate property choice lists for data storage.

N8844A Web ResultsViewerTool

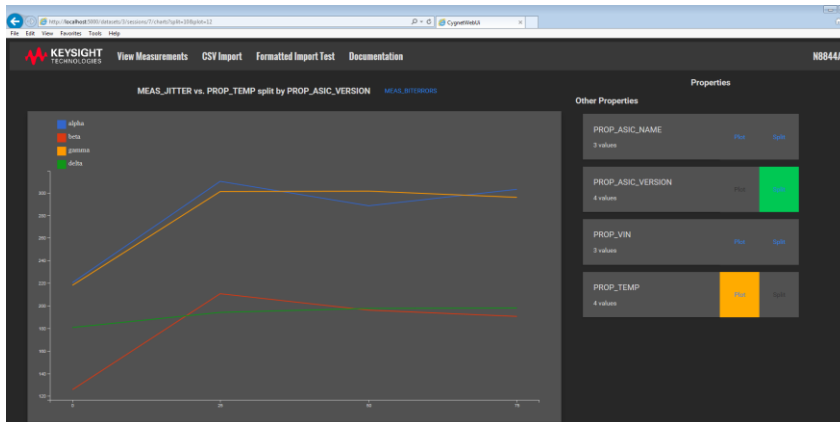
View and Analyze the measurements results



Histogram mode

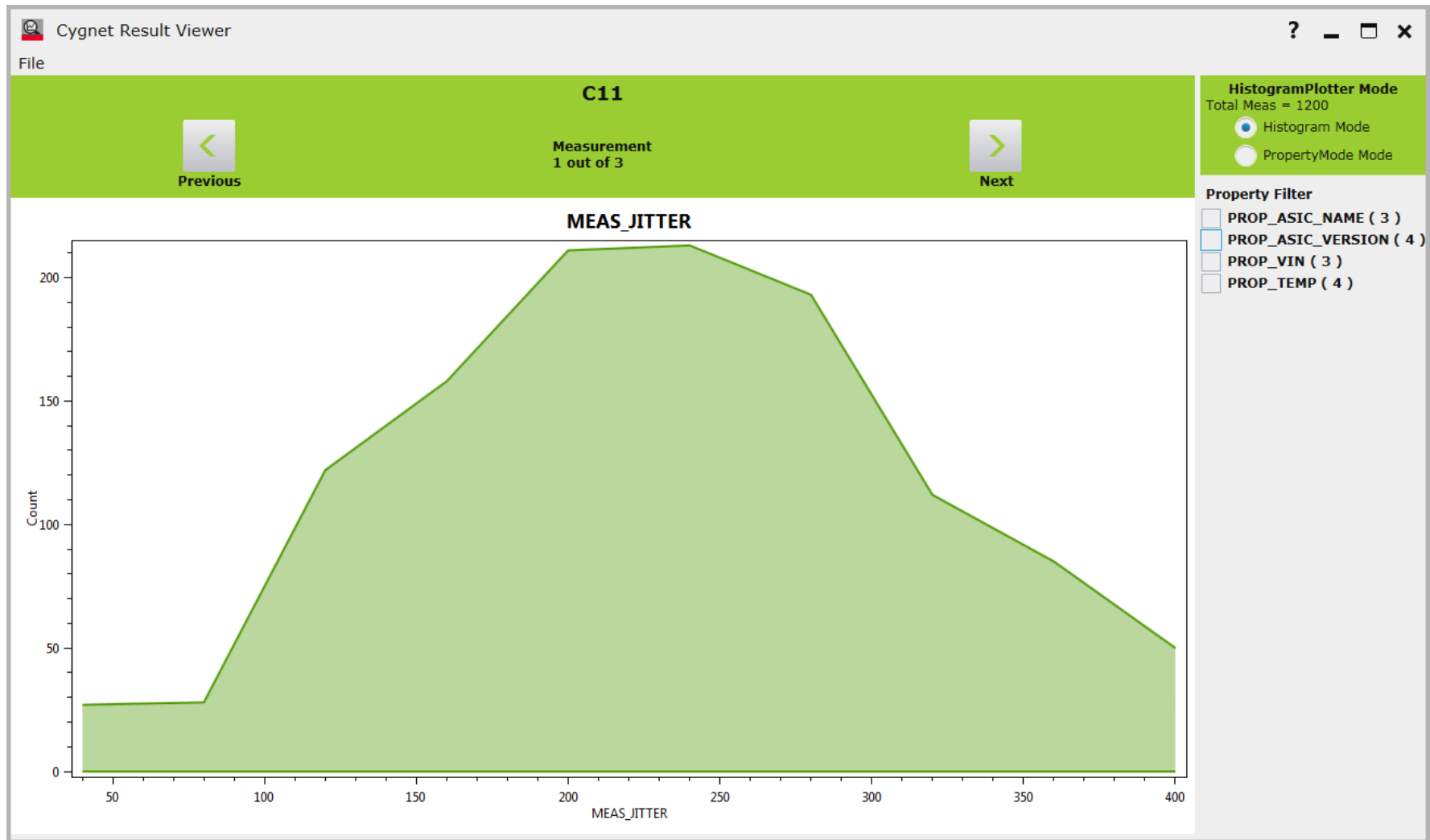


Histogram Split mode



Line/Property mode

KS8400A ResultsViewer Software



Questions?



www.Keysight.com/find/BenchVue