



Electro Rent & Keysight Technologies

RIGHT Instrument. RIGHT Expertise.  
Delivered RIGHT Now.

## Basic Instruments

Focus more on characterization and less  
on synchronization

Fall 2023

 Electro Rent

CATALOG

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Three years of  
KeysightCare Technical  
Support included on  
all Basic Instruments

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# Focus More on Characterization and Less on Synchronization

As devices, modules, and integrated circuits (ICs) become more highly integrated, the number of ports you need to test increases dramatically. More ports to test increases DC and dynamic measurement diversity, which in turn drives the need for additional precision power-supply channels and instruments such as pulsers and digitizers. Adding dozens of channels to your test bench is not a scalable solution. Synchronizing multiple test instruments and ensuring efficient footprint allocations, sufficient test coverage, and reduced test time become increasingly important.

The Keysight PZ2100 high-channel density precision source measure unit (SMU) solution offers 20 SMU channels within a 1U full-width rack space — five times better than SMUs of equivalent form factor on the market. This solution, together with the PW9251A PathWave IV Curve Measurement software, integrates your measurement needs across a variety of industry requirements. You can perform synchronous current-voltage (IV) measurements on all 20 SMU channels without programming, and you can review test results immediately using various analysis functions on graphs and tables. By enabling accurate and reliable data acquisition and efficient use of your test systems, the PZ2100 SMU series accelerates research, development, and design verification.

## Highest channel density 1U precision SMU in the market

- Five times higher channel density than any SMU of equivalent form factor on the market
- Save valuable rack space with 20 channel / 1U and integrated pulser / digitizer
- Avoid the need for cooling spacers as you upgrade your mainframe stacks
- Five available SMU module options in a flexible, configurable, and upgradable 1U, 4-slot mainframe
- 15 times higher sampling rate than any SMU of equivalent form factor on the market
- Superior performance from static to dynamic measurement with 15 MSa/s sampling rate at 10  $\mu$ s min pulse width
- Simple integration for multi-channels with single box solution at < 50 ns latency
- PathWave IV Curve Measurement software for quick, programming-free, IV measurements

▶ WATCH THE DEMO VIDEO

▶ LEARN MORE ABOUT THE PZ2100



# Limited Time Offers

Save 20%

ESSENTIAL RF SIGNAL ANALYZER AND SIGNAL  
GENERATOR BUNDLE



Save 10%

ON E36150 SERIES BUNDLES



Save up to 20% on essential RF signal analyzer and signal generator bundles.

Keysight offers two types of value bundles for Keysight E36150 Series DC bench power supply.

# Instrument Control Software Applications

TECHNICAL OVERVIEW

- Connect and control multiple instruments simultaneously.
- Save time with automated test sequences with no programming.
- Analyze, record results, visualize, and export data in multiple formats.



| Model                | PathWave BenchVue Basic | PathWave BenchVue Apps | PathWave BenchVue Complete Control Collection |
|----------------------|-------------------------|------------------------|---|
| Pricing              | Free                    | Paid                   | Paid  |
| Licensing            | No license required     | License required       | License required                              |
| Version              | Previous version        | Latest version         | Latest version                                |
| Instrument Support   | Individual instruments  | Individual instruments | All instrument families and models            |
| KeysightCare Support | Not available           | Available              | Available                                     |
|                      | Download                | Get a Quote >          | Get a Quote >                                 |

## I Did It on BenchVue

EXPLORE HERE

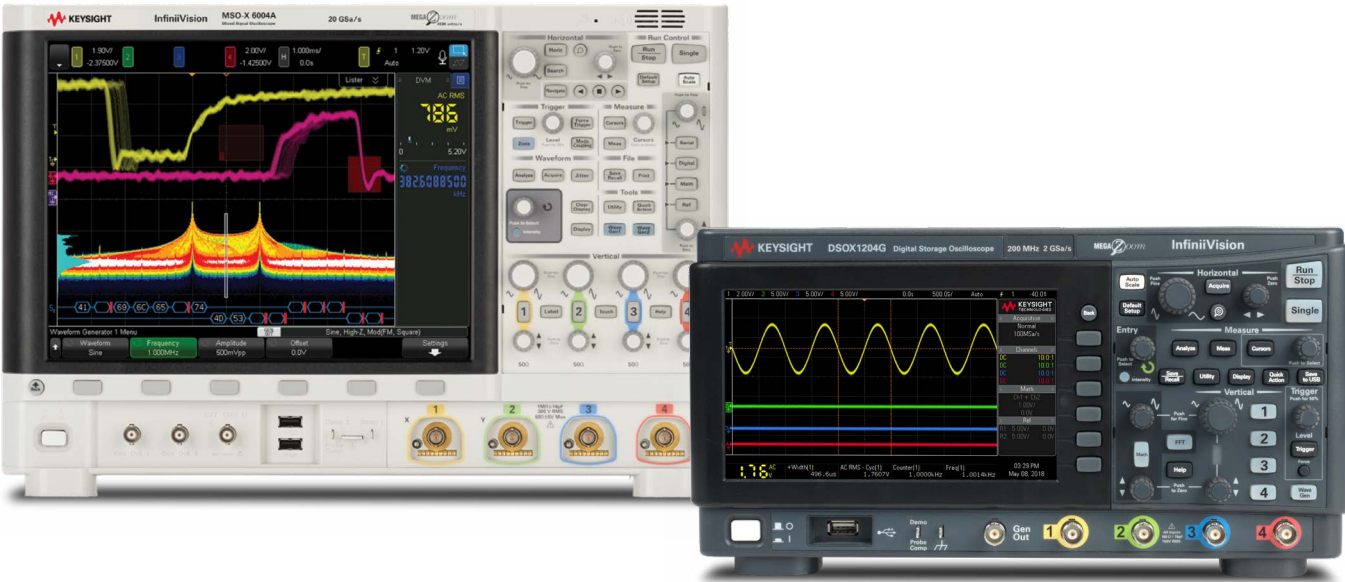
Join us here for weekly tips and tricks, how-to videos, interactive product tours, and free software trials. Discover how PathWave BenchVue saves you time by automating your testing.

Learn all you need to know — connecting and controlling your instruments, creating automated test sequences without programming, time and frequency domain analysis, creating multi-tone signals, battery run-down tests, automated I<sup>2</sup>C protocol testing, and more — in a few minutes.



# InfiniiVision Oscilloscopes

- Experience up to 1,000,000 waveforms / second update rate.
- Get MegaZoom IV and measure with uncompromised, responsive smart memory.
- Test using multiple instrument functionality.
- Expand your platform with upgradable bandwidth, a mixed-signal oscilloscope (MSO), serial analysis, and a built-in waveform function generator.



Get more functionality with available software packages

|              | Automobile      | Aerospace & Defense | Embedded  | Power     | USB       | Ultimate Bundle |
|--------------|-----------------|---------------------|-----------|-----------|-----------|-----------------|
| <b>1000X</b> | Standard (DSOX) | NA                  | Standard  | NA        | NA        | NA              |
| <b>2000X</b> | D2000AUTB       | NA                  | D2000GENB | NA        | NA        | D2000BDLB       |
| <b>3000X</b> | D3000AUTB       | D3000AERB           | D3000GENB | D3000PWRB | D3000USBB | D3000BDLB       |
| <b>4000X</b> | D4000AUTB       | D4000AERB           | D4000GENB | D4000PWRB | D4000USBB | D4000BDLB       |
| <b>6000X</b> | D6000AUTB       | D6000AERB           | D6000GENB | D6000PWRB | D6000USBB | D6000BDLB       |

| Model                              | 1000 X-Series  | 2000 X-Series  | 3000G X-Series  | 4000 X-Series   | 6000 X-Series   | Infiniium EXR-Series   |
|------------------------------------|--|--|---|---|---|--|
| <b>Description</b>                 | Professional-level capabilities in an entry-level oscilloscope <ul style="list-style-type: none"> <li>• Protocol analysis</li> <li>• Bode plots</li> <li>• Fast Fourier transform (FFT)</li> </ul> | Entry-level with more capabilities <ul style="list-style-type: none"> <li>• Serial bus options</li> <li>• Mixed-signal oscilloscope options</li> </ul> | Advanced capabilities simplified <ul style="list-style-type: none"> <li>• Advanced math</li> <li>• Standard embedded software <sup>2</sup></li> <li>• Waveform and measurement histograms <sup>2</sup></li> </ul> | Everything the 3000G has plus see more of your signal <ul style="list-style-type: none"> <li>• Higher bandwidth</li> <li>• Larger touch screen</li> <li>• Up to four active probes</li> </ul> | Dive deeper and analyze more signal detail <ul style="list-style-type: none"> <li>• Voice control</li> <li>• Advanced jitter analysis, time interval error plots, histograms, and eye diagrams</li> </ul> | Engineered for power and high-speed analysis <ul style="list-style-type: none"> <li>• Extra large touch screen</li> <li>• Advanced Fault Hunter debugging software</li> <li>• Multiscope capability</li> </ul> |
| <b>Bandwidth</b>                   | 50 MHz to 200 MHz  | 70 MHz to 200 MHz  | 100 MHz to 1 GHz  | 200 MHz to 1.5 GHz  | 1 GHz to 6 GHz  | 500 MHz to 6 GHz   |
| <b>Channels (analog + digital)</b> | 2, 4   | 2, 2+8, 4, 4+8   | 2, 2+16, 4, 4+16  |   |   | 4, 4+16, 8, 8+16   |
| <b>Sample rate</b>                 | Up to 2 GSa/s  |  | Up to 5 GSa/s   |   | Up to 20 GSa/s  | Up to 16 GSa/s   |
| <b>Memory depth</b>                | Up to 2 Mpts and segmented memory standard   | Up to 1 Mpts and segmented memory standard   | Up to 4 Mpts and segmented memory standard  |   |   | Up to 3.2 Gpts and segmented memory standard   |
| <b>Waveform update rate</b>        | > 200,000 wfms/s   | > 200,000 wfms/s   | >1,000,000 wfms/s   |   | > 450,000 wfms/s  | > 200,000 wfms/s   |
| <b>Display</b>                     | 7-inch   | 8.5-inch   | 8.5-inch capacitive touch screen  | 12.1-inch capacitive touch screen   | 12.1-inch capacitive multi-touch screen   | 15.6-inch capacitive touchscreen   |
| <b>Built-in instruments</b>        | 20-MHz function generator, 5-digit counter, frequency response analyzer <sup>1</sup>   | 20-MHz function generator, 5-digit counter <sup>1</sup>  | 20-MHz AWG, 8-digit counter, frequency response analyzer <sup>1</sup>   | Dual 20-MHz AWG, 5-digit counter, and frequency response analyzer <sup>1</sup>  | Dual 20-MHz AWG, 10-digit counter, and frequency response analyzer <sup>1</sup>   | 50 MHz AWG and frequency response analyzer, 10-digit counter, DVM, and protocol analyzers  |
| <b>Service and support</b>         | 3-year warranty and 3-year KeysightCare Technical Support included   |  |   |   |   |  |
|                                    | <b>DATA SHEET</b>  | <b>DATA SHEET</b>  | <b>DATA SHEET</b>   | <b>DATA SHEET</b>   | <b>DATA SHEET</b>   | <b>DATA SHEET</b>  |
|                                    | <a href="#">Get a Quote &gt;</a>   | <a href="#">Get a Quote &gt;</a>   | <a href="#">Get a Quote &gt;</a>  | <a href="#">Get a Quote &gt;</a>  | <a href="#">Get a Quote &gt;</a>  | <a href="#">Get a Quote &gt;</a>   |

<sup>1</sup> All X-Series models have a built-in protocol analyzer and 3-digit digital voltmeter (DVM)

<sup>2</sup> Only standard on the 3000G X-Series models



## Featured Resource

# 5 Mistakes People Make When Getting a Low-Cost Scope

Choosing the right oscilloscope is a difficult task, especially if you're on a budget. You want to make the best decision for your needs while saving money and maintaining quality.

Avoid five common mistakes people make when selecting a low-cost oscilloscope so you — and your wallet — are happy with your decision.

➔ [DOWNLOAD THE WHITE PAPER](#)





# DAQ970A and DAQ973A Data Acquisition System

Get the next-generation Keysight data acquisition (DAQ) system with a three-slot mainframe and your choice of nine plug-in modules. Interface with the DAQ using BenchVue DAQ software, the intuitive graphical front panel with task-oriented, self-guiding menus, or a web browser.

- Features an advanced 6.5-digit internal DMM with improved accuracy and faster measurement speed (50,000 readings / second) to sample more signals.
- Measures very low current ranges (1  $\mu$ A DC and 100  $\mu$ A AC) and higher resistance range (1,000 M $\Omega$ ).
- Compensates using new auto-calibration for internal drifts caused by time and temperature changes.
- Comes with additional GPIB for the DAQ973A; easy connectivity to your PC with LAN and USB.
- Code compatible with Keysight 34970A / 34972A.
- Each module updated with improved switching speeds and accuracies.
- Fast Keysight DAQM900A solid-state multiplexer with scan rate speed of up to 450 channels / second.
- New Keysight DAQM909A 4-channel simultaneous sampling digitizer module with a sampling rate of up to 800 kSa / second.



➤ DATA SHEET

Get a Quote >

| DAQ970A/73A Modules | Description                                    | Key specifications  |                                  |
|---------------------|--|---|----------------------------------|
| <b>DAQM900A</b>     | 20-channel solid-state multiplexer             | Up to 450 ch/s, 2 / 4 wire, up to 120 V   | <a href="#">Get a Quote &gt;</a> |
| <b>DAQM901A</b>     | 20-channel multiplexer plus 2 current channels | Armature 2 / 4 wire, 80 ch/s, up to 300 V, 1 A  | <a href="#">Get a Quote &gt;</a> |
| <b>DAQM902A</b>     | 16-channel high-speed multiplexer              | Reed 2 / 4 wire, 250 ch/s, up to 300 V, 50 mA   | <a href="#">Get a Quote &gt;</a> |
| <b>DAQM903A</b>     | 20-channel actuator / GP switch                | SPDT / Form C, 120 ch/s, up to 300 V, 1 A   | <a href="#">Get a Quote &gt;</a> |
| <b>DAQM904A</b>     | 4 x 8 two wire matrix switch                   | Armature 2-wire, 120 ch/s, up to 300 V, 1 A   | <a href="#">Get a Quote &gt;</a> |
| <b>DAQM905A</b>     | 2 GHz, dual 4-channel, RF mux, 50Ω             | SWR 1.4 @ 2 GHz, 60 ch/s up to 42 V, 0.7 A  | <a href="#">Get a Quote &gt;</a> |
| <b>DAQM907A</b>     | Multifunction module                           | <ul style="list-style-type: none"> <li>Two 16-bit digital I/O ports, up to 42 V, 400 mA</li> <li>26-bit 100 kHz event counter, up to 42 Vpk</li> <li>Two analog outputs, up to ± 12 V (voltage mode), ± 24 mA (current mode)</li> </ul> | <a href="#">Get a Quote &gt;</a> |
| <b>DAQM908A</b>     | 40-channel single-ended multiplexer            | Common low (without 4-wire measurements) 80 ch/s, up to 300 V, 1 A  | <a href="#">Get a Quote &gt;</a> |
| <b>DAQM909A</b>     | 4-channel simultaneous sampling digitizer      | Differential inputs, up to 800 kSa/s sampling rate, 24-bit resolution   | <a href="#">Get a Quote &gt;</a> |



## Featured Resource

# 4 Considerations for Data Acquisition Systems

There is a growing trend across all industries to design feature-rich products. However, you know that the more features added, the more complex the test development becomes.

Explore four considerations for a DAQ that will help you develop a test system optimized for speed and accuracy.

[▶ DOWNLOAD THE EBOOK](#)



# Truevolt Digital Multimeters

- 6.5- and 7.5-digit performance
- Graphical capabilities such as bar, trend, histogram and histogram charts
- Measure very low current, 1  $\mu\text{A}$  range with pA resolution, enabling measurements on very low power devices
- Auto-calibration to compensate for temperature drift to maintain measurement accuracy
- Basic measurements such as DCV, ACV, DCI, ACI, 2- and 4-wire resistance, frequency, period, continuity, diode, temperature, and capacitance

| Model  | Description   | Digits of resolution | Max reading rate at 4½ digits (RDGS/S) | Built-in PC interfaces  | Service and support  |
|--------|---|----------------------|--|-------------------------|--|
| 34460A | Display DMM results in histogram, bar, and trend charts on color graphical display for easy monitoring and to speed up statistical analysis     | 6.5                  | 300                                    | USB; optional GPIB, LAN | 3-year warranty and 3-year KeysightCare Technical Support included |
| 34461A |   |                      | 1,000                                  | USB, LAN; optional GPIB |  |
| 34465A | Comes with a digitizer and advanced triggering capability so you can make more measurements with higher speed, better accuracy, and more memory | 6.5                  | 50,000                                 | USB, LAN; optional GPIB |  |
| 34470A |   | 7.5                  |  |                         |  |



➤ DATA SHEET

Get a Quote ➤



# 3458A Digital Multimeter, 8.5-Digit

- Get 8.5-digits resolution and 0.1 ppm transfer accuracy.
- Perform accurate measurements with 8 ppm (0.0008%) 1-year DCV accuracy (4 ppm with option).
- Experience a maximum reading rate of 100,000 readings / second.
- Execute measurements that include DC and AC voltage, DC and AC current.
- Measure using 2- and 4-wire resistance, frequency, and period.
- Use the 148K reading memory for prolonged data logging (now comes standard).
- RoHS compliant.
- 3-year warranty and 3-year KeysightCare Technical Support included.



➤ [DATA SHEET](#)

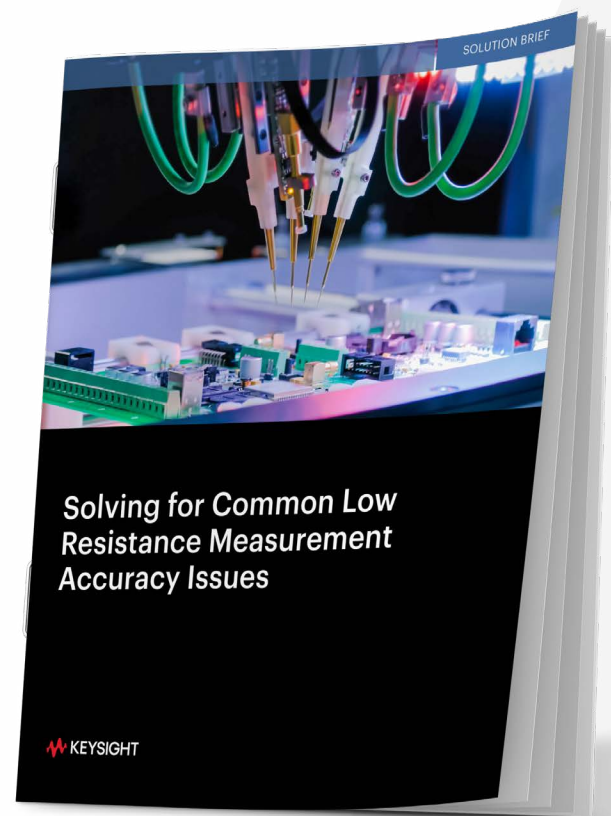
[Get a Quote >](#)

## Featured Resource

# Solving for Common Low Resistance Measurement Accuracy Issues

A 4-wire measurement method is the most accurate method to measure small resistances, especially in ranges below 100 ohms. The 4-wire method eliminates measurement errors that long leads and switches introduce in your test setups. The method is also very useful when you need to monitor for accurate and precise temperature changes. This solution brief will examine various applications that require a 4-wire measurement approach and help you make an informed decision for your testing needs.

 [DOWNLOAD THE SOLUTION BRIEF](#)



# N6700 Modular Power System

**N6700:** DC power supply — ideal for automated test systems.

- Small 1U mainframe (400, 600, 1200 W) holds up to four output modules.
- Over 35 programmable DC modules offer unique capabilities, performance, voltage, and current combinations.
- Multiple DC electronic load modules, 100 and 200 W, allow current to be sourced and sunk in the same mainframe.
- 3-year warranty and 3-year KeysightCare Technical Support included



**N6705C:** DC power analyzer — deep insight without a complex test system.

- Holds and uses up to four N6700 Series modules (600 W total).
- Integrates digital multimeter (DMM), oscilloscope, arb, and data logger capabilities.
- Characterizes and improves battery run time with a source / measure unit (SMU) and BV9200B analysis software.
- 3-year warranty and 3-year KeysightCare Technical Support included.



➤ **N6700C, N6701C, & N6702C  
DATA SHEET**

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➤ **N6705C DATA SHEET**

[Get a Quote >](#)

➤ **BV9200B DATA SHEET**

[Get a Quote >](#)



# E36300 Series Triple-Output DC Power Supplies

**PATHWAVE**  
SOFTWARE SUPPORTED

- Large display with voltages and currents for all three outputs
- Accurate programming / readback as low as 0.03%
- Low output ripple and noise less than 2 mVpp / 350 uVRms
- Precise data logging plus output sequencing and coupling
- Convenient front and rear output terminals
- Color-coded outputs and individual knobs for voltage and current
- LAN (LXI Core), USB, and GPIB (optional)

| Model                         | E36311A  |            |            | E36312A                          |           |           | E36313A                          |           |           |
|-------------------------------|--|------------|------------|----------------------------------|-----------|-----------|----------------------------------|-----------|-----------|
|                               | Economy model  |            |            | Most popular                     |           |           | Twice the current                |           |           |
| Power                         | 80 W   |            |            | 80 W                             |           |           | 160 W                            |           |           |
| Channels                      | 1  | 2          | 3          | 1                                | 2         | 3         | 1                                | 2         | 3         |
| DC output Rating (0 to 40 °C) | 0 to 6 V   | 0 to +25 V | 0 to -25 V | 0 to 6 V                         | 0 to 25 V | 0 to 25 V | 0 to 6 V                         | 0 to 25 V | 0 to 25 V |
|                               | 0 to 5 A   | 0 to 1 A   | 0 to 1 A   | 0 to 5 A                         | 0 to 1 A  | 0 to 1 A  | 0 to 10 A                        | 0 to 2 A  | 0 to 2 A  |
| Service and support           | 3-year warranty and 3-year KeysightCare Technical Support included |            |            |                                  |           |           |                                  |           |           |
|                               | <a href="#">Get a Quote &gt;</a>                                   |            |            | <a href="#">Get a Quote &gt;</a> |           |           | <a href="#">Get a Quote &gt;</a> |           |           |



[DATA SHEET](#)

# E36200 Series DC Power Supplies

- Single or dual outputs; easily combine the dual outputs into a single output with 400 W
- Auto-parallel the Keysight E36233A 400 W autoranging dual output power supply to create a single 40 A (30 V) output
- Auto-series the E36233A to create a single 120 V (10A) output
- Programming / readback accuracy as low as 0.03%
- Output ripple and noise < 350  $\mu$ Vrms
- Data logging plus output sequencing and coupling
- Front and rear output terminals
- Color-coded outputs and individual knobs for voltage and current
- LAN, USB, and GPIB (optional)

| Model                         | E36231A  |           | E36232A                          |           | E36233A                          |           | E36234A                          |           |
|-------------------------------|--|-----------|----------------------------------|-----------|----------------------------------|-----------|----------------------------------|-----------|
| Power                         | 200 W  |           | 200 W                            |           | 400 W                            |           | 400 W                            |           |
| Channels                      | 1  |           | 1                                |           | 1                                | 2         | 1                                | 2         |
| DC output Rating (0 to 40 °C) | 0 to 30 V  | 0 to 20 A | 0 to 60 V                        | 0 to 10 A | 0 to 30 V                        | 0 to 20 A | 0 to 60 V                        | 0 to 10 A |
| Service and support           | 3-year warranty and 3-year KeysightCare Technical Support included |           |                                  |           |                                  |           |                                  |           |
|                               | <a href="#">Get a Quote &gt;</a>                                   |           | <a href="#">Get a Quote &gt;</a> |           | <a href="#">Get a Quote &gt;</a> |           | <a href="#">Get a Quote &gt;</a> |           |



[DATA SHEET](#)

# E36150 Series Autoranging Benchtop Power Supplies

- Peak power that handles up to three times the maximum power rating to accommodate start-up power surge requirements from electromechanical and high capacitance devices under test
- High performance with precise output accuracy, minimal noise, and excellent load / line regulation
- Adjustable slew rate, data logging, voltage and current meter, four-wire remote sensing, LIST output programming, and digital controls
- Comprehensive overvoltage, overcurrent, and overtemperature provide device protection
- Flexible Keysight BV0003B PathWave BenchVue power supply application and test flow automation support
- Inclusive Keysight BV9200B / BV9201B PathWave BenchVue advanced power control and analysis software assistance
- Scalable and upgradable with Keysight Option E36150ADVU for scope view and arbitrary waveform generator (AWG) functions that offer advanced characterization and power simulation
- Adaptable LAN / LXI, USB, and general purpose interface bus (GPIB) (upgrade option) interfaces

| Model               | E36154A  | E36155A                          |
|---------------------|--|----------------------------------|
| Output              | 1  |                                  |
| Power               | 800 W  |                                  |
| Voltage             | 0 to 30 V  | 0 to 60 V                        |
| Current             | 0 to 80 A  | 0 to 40 A                        |
| Service and support | 3-year warranty and 3-year KeysightCare Technical Support included |                                  |
|                     | <a href="#">Get a Quote &gt;</a>                                   | <a href="#">Get a Quote &gt;</a> |



Save 10%

ON E36150 SERIES VALUE BUNDLES

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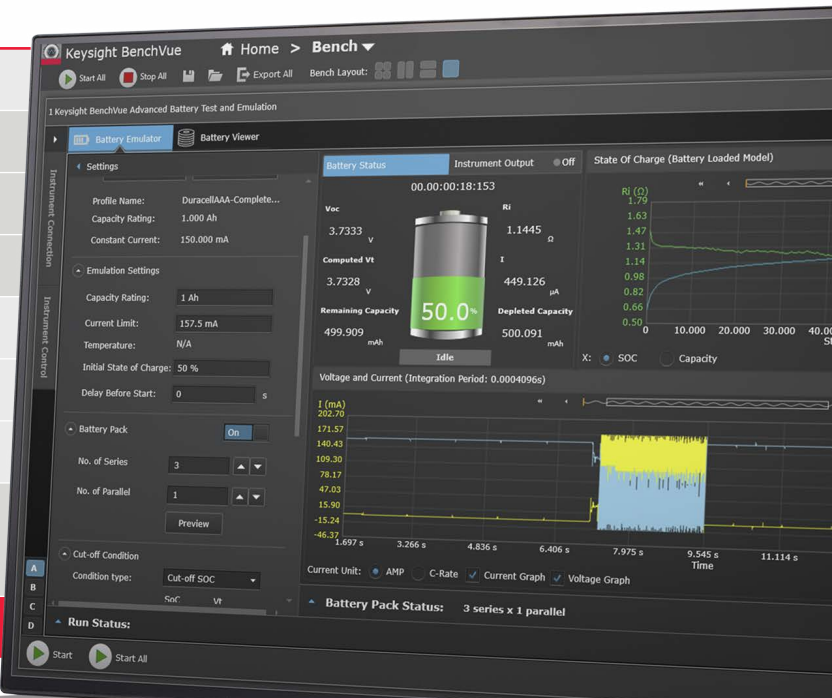
DATA SHEET

# E36731A Battery Emulator and Profiler

Designed to operate with Keysight PathWave BenchVue BV9210/11B battery emulation and test software.

- Use software plus hardware solution to:
  - Profile batteries through charge / discharge to create a unique battery model.
  - Emulate charge states to reduce test time, improve safety, and test repeatability.
  - Automates battery run-down testing to accurately determine battery life.
  - Automates battery cycling to determine aging effects
- Integrates a power supply and an electronic load.
- Power up to 200W, 30V, and 20A.
- Offers a wide dynamic measurement range and measures from microamps to amps.

| Model               |         | E36731A  |
|---------------------|---------|--|
| Output              |         | 1  |
| Power supply        | Power   | 200 W  |
|                     | Voltage | 0 to 30 V  |
|                     | Current | 0 to 40 A  |
| Electronic load     | Power   | 250 W  |
|                     | Voltage | 0 to 60 V  |
|                     | Current | 0 to 40 A  |
| Service and support |         | 3-year warranty and 3-year KeysightCare Technical Support included |
|                     |         | <a href="#">Get a Quote &gt;</a>                                   |



[E36731A DATA SHEET](#)

[BV9210B DATA SHEET](#)

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[BV9211B DATA SHEET](#)

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## Featured Resource

# 4 Ways to Build Your Power Supply Skills

Today's designs place higher demands on the systems that power them. You may find that more of your design problems are created by these power systems.

Use these four practical tips to ensure you deliver reliable power during the design phase and get the most out of your power supply.

[▶ DOWNLOAD THE EBOOK](#)





# Precision Source Measure Units (SMUs)

## PZ2100 Series High-Channel Density Precision SMU

Solve your design, test, and validation challenges using the PZ2100 SMU solution. Focus more on characterization and less on synchronization with multiple configurable SMU module options for different channel and specification needs. Save valuable test rack space with the highest-density 1U SMU in the market, with up to 20 channels within a 1U full-width rack space.

| Model   | Ch / Slot     | DC output range | Resolution | Pulse capability     | Digitizer mode | Digitizing sampling rate |
|---------|---------------|-----------------|------------|----------------------|----------------|--------------------------|
| PZ2110A | 1 Ch / 2 Slot | 210 V / 315 mA  | 10 fA      | 315 mA / 20 $\mu$ s  | Yes            | 1.25 MSa/s               |
| PZ2120A | 1 Ch / 1 Slot | 60 V / 3.5 A    | 100 fA     | 10.5 A / 50 $\mu$ s  | Yes            | 1 MSa/s                  |
| PZ2121A | 1 Ch / 1 Slot | 60 V / 3.5 A    | 100 fA     | 10.5 A / 10 $\mu$ s  | Yes            | 15 MSa/s                 |
| PZ2130A | 5 Ch / 1 Slot | 30 V / 500 mA   | 100 pA     | N/A                  | No             | 250 kSa/s                |
| PZ2131A | 5 Ch / 1 Slot | 30 V / 500 mA   | 10 pA      | 500 mA / 100 $\mu$ s | Yes            | 500 kSa/s                |



➤ LEARNING RESOURCES

➤ DATA SHEET

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**B2900B Series Precision Source Measure Units**

This compact benchtop SMUs enable you to quickly take various I-V (current versus voltage) measurements requiring high resolution and accuracy.

**B2960B Series Low Noise Power Sources**

This benchtop power source are a new generation of power sources offering precision, wide bipolar output ranges, and other innovative features.

| Model   | Number of channels | Maximum voltage | Maximum current (DC) | Output resolution | Output noise (10 Hz to 20 MHz) | Measurement resolution |
|---------|--------------------|-----------------|----------------------|-------------------|--------------------------------|------------------------|
| B2901BL | 1                  | 21 V            | 1.5 A                | 5.5 digit         | 3 mVrms                        | 6.5 digit              |
| B2910BL | 1                  | 210 V           | 1.5 A                | 5.5 digit         | 3 mVrms                        | 6.5 digit              |
| B2901B  | 1                  | 210 V           | 3.03 A               | 5.5 digit         | 3 mVrms                        | 6.5 digit              |
| B2902B  | 2                  | 210 V           | 3.03 A               | 5.5 digit         | 3 mVrms                        | 6.5 digit              |
| B2911B  | 1                  | 210 V           | 3.03 A               | 6.5 digit         | 3 mVrms                        | 6.5 digit              |
| B2912B  | 2                  | 210 V           | 3.03 A               | 6.5 digit         | 3 mVrms                        | 6.5 digit              |
| B2961B  | 1                  | 210 V           | 3.03 A               | 6.5 digit         | 3 mVrms                        | 4.5 digit              |
| B2962B  | 2                  | 210 V           | 3.03 A               | 6.5 digit         | 3 mVrms                        | 4.5 digit              |



[➤ B2900B DATA SHEET](#)

[➤ B2960B DATA SHEET](#)

[Get a Quote >](#)





## ELECTRONIC LOADS

# EL30000 Series Bench DC Electronic Loads

The Keysight EL30000 Series bench DC electronic loads provide superior performance in a compact bench form factor.

- Test up to 600 W, 1 or 2 inputs.
- Operate in constant current (CC), constant voltage (CV), constant resistance (CR), or constant power (CP) modes.
- Make accurate measurements with excellent programming / feedback accuracy.
- Perform static and dynamic tests.
- View measurements on a 4.3-inch LCD color display.
- Transfer data via USB drive, LAN, USB, or GPIB.

| Model    | Number of inputs | Input power | DC Input voltage | DC Input current               | Service and support  |                                  |
|----------|------------------|-------------|------------------|--------------------------------|--|----------------------------------|
| EL34143A | 1                | 350 W       | 150 V            | 60 A                           | 3-year warranty and 3-year KeysightCare Technical Support included | <a href="#">Get a Quote &gt;</a> |
| EL34243A | 2                | 600 W       | 150 V            | 60 A per input, 120 A parallel |  | <a href="#">Get a Quote &gt;</a> |

### Need more power?

See the Keysight E36200 Series and Keysight E36150 Series autoranging power supplies.

- [DATA SHEET](#)
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# 33500B and 33600A Series Trueform Waveform Generators

- Generate Trueform arbitrary waveforms with high fidelity and less jitter and harmonic distortion.
- Access ease-of-use features, such as modulation, sweep, burst, dual-channel coupling, and IQ baseband signal player.

| Model                          | Description   | Channels | Frequency range | Pulse   | Arbitrary waveforms |        |             |                             | Service and support  |
|--------------------------------|---|----------|-----------------|---------|---------------------|--------|-------------|-----------------------------|--|
|                                |   |          |                 |         | Std/Opt arb         | # Bits | Sample rate | Memory/ Channel             |  |
| <b>33509B</b><br><b>33510B</b> | Exclusive Trueform waveform technology with < 40 ps jitter and < 0.04% THD.                       | 1<br>2   | 20 MHz          | 20 MHz  | Optional            | 16     | 160 MSa/s   | 1 M Standard, 16 M Optional | 3-year warranty and 3-year KeysightCare Technical Support included |
| <b>33511B</b><br><b>33512B</b> |   | 1<br>2   |                 |         | Standard            |        |             |                             |  |
| <b>33519B</b><br><b>35520B</b> |   | 1<br>2   | 30 MHz          | 30 MHz  | Optional            |        | 250 MSa/s   |                             |  |
| <b>33521B</b><br><b>33522B</b> |   | 1<br>2   |                 |         | Standard            |        |             |                             |  |
| <b>33611A</b><br><b>33612A</b> | Exclusive Trueform waveform technology at higher frequency ranges with < 1 ps jitter < 0.03% THD. | 1<br>2   | 80 MHz          | 80 MHz  | Standard            | 14     | 660 MSa/s   | 4 M Standard, 64 M Optional |  |
| <b>33621A</b><br><b>33622A</b> |   | 1<br>2   | 120 MHz         | 100 MHz |                     |        | 1 GSa/s     |                             |  |



➤ DATA SHEET

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# X-Series Signal Generators

The Keysight X-Series creates signals capable of testing your very best devices. From the pure and precise MXG to the cost-effective EXG and general-purpose CXG, the X-Series helps you generate true performance.

|  | MXG-Analog   | EXG-Analog                       | CXG-Analog                       |
|--|--|----------------------------------|----------------------------------|
| Model number                           | N5181B   | N5171B                           | N5166B                           |
| Frequency range                        | 9 kHz to 6 GHz   | 9 kHz to 6 GHz                   | 9 kHz to 6 GHz                   |
| Maximum output power                   | +24 dBm  | +21 dBm                          | +18 dBm                          |
| Frequency switching (list mode)        | 800 $\mu$ s  | 800 $\mu$ s                      | 5 ms                             |
| Level accuracy                         | $\pm 0.6$ dB   | $\pm 0.6$ dB                     | $\pm 0.6$ dB                     |
| SSB phase noise (1 GHz, 20 kHz offset) | -146 dBc/Hz  | -122 dBc/Hz                      | -119 dBc/Hz                      |
| Harmonics (at 1 GHz)                   | -35 dBc  | -35 dBc                          | -35 dBc                          |
| Analog modulation                      | AM, FM, PM, and pulse modulation                                   | AM, FM, PM, and pulse modulation | AM, FM, PM, and pulse modulation |
| Digital modulation                     | N/A  | N/A                              | 120 MHz bandwidth                |
| Service and support                    | 3-year warranty and 3-year KeysightCare Technical Support included |                                  |                                  |
|  | DATA SHEET   | DATA SHEET                       | DATA SHEET                       |
|  | Get a Quote >  | Get a Quote >                    | Get a Quote >                    |



Save 20%

ON ESSENTIAL RF SIGNAL ANALYZER AND SIGNAL GENERATOR BUNDLES

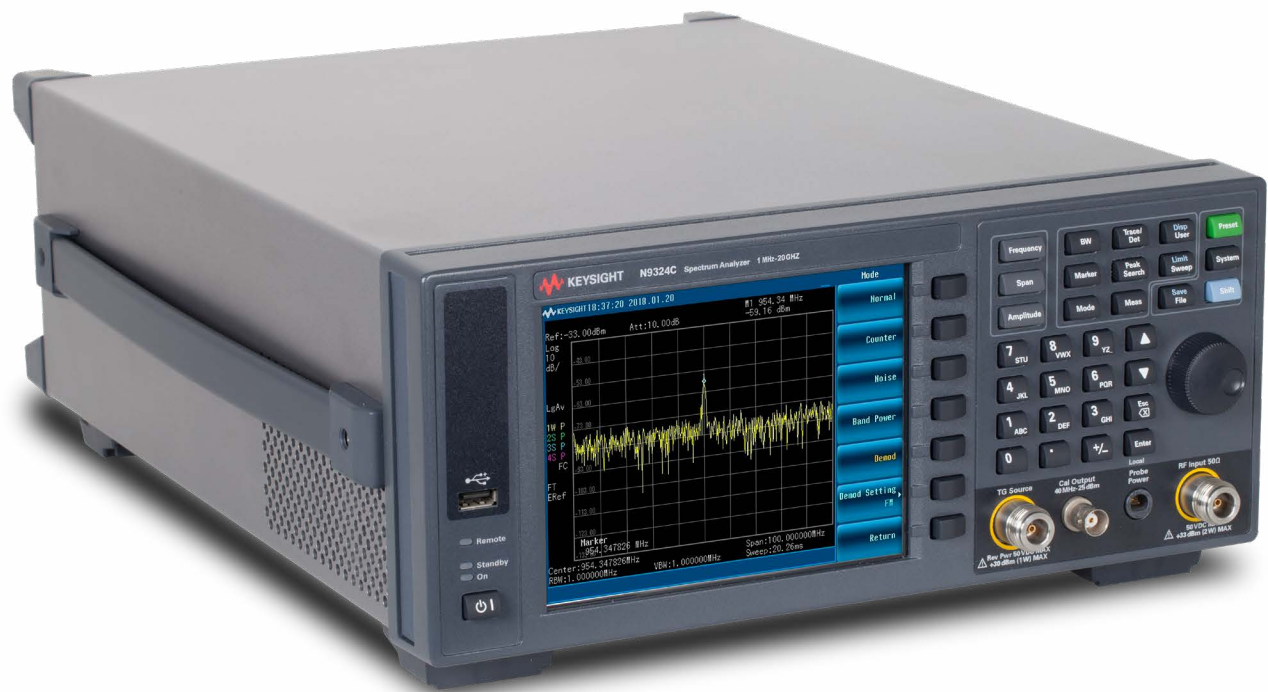
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# Basic Spectrum Analyzers (BSAs)\*

The BSAs define value-priced general-purpose instruments up to 20 GHz. You can rely on the BSA for proven testing efficiency, usability, and the flexibility to adapt to new requirements.

| Model                      | N9321C   | N9322C         | N9323C            | N9324C          |
|----------------------------|--|----------------|-------------------|-----------------|
| Frequency                  | 9 kHz to 4 GHz   | 9 kHz to 7 GHz | 1 MHz to 13.6 GHz | 1 MHz to 20 GHz |
| Overall amplitude accuracy | ±0.6 dB  | ±0.6 dB        | ±0.7 dB           | ±0.7 dB         |
| DANL at 1 GHz              | -152 dBm   | -152 dBm       | -144 dBm          | -144 dBm        |
| Maximum analysis bandwidth | 1 MHz  | 1 MHz          | 1 MHz             | 1 MHz           |
| Phase Noise at 1 GHz       | -90 dBc / Hz   | -90 dBc / Hz   | -92 dBc / Hz      | -92 dBc / Hz    |
| Service and support        | 3-year warranty and 3-year KeysightCare Technical Support included |                |                   |                 |
|                            | DATA SHEET   | DATA SHEET     | DATA SHEET        | DATA SHEET      |
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\* From selected distributors only



# E5063A ENA Vector Network Analyzer\*

- Frequency options to suit your test needs and budget, upgradable at any time
- PCB manufacturing test capability with Option 011
- Support for six languages via softkey and the embedded help manual in English / Simplified Chinese
- Support all Keysight calibration kits, including the Keysight N755xA economy ECal module

## ENA Series E5063A

|                         |  |
|-------------------------|--|
| Frequency               | 100 kHz to 500 M, 1.5, 3, 4.5, 6.5, 8.5, 14 or 18 GHz  |
| Test port               | 2-port 50 $\Omega$ S-parameter test set  |
| Dynamic range           | 117 dB (spec.), 122 dB (typ.)  |
| Trace noise             | 0.005 dBrms (spec.), 0.015 dBrms (typ.)  |
| Source power            | -20 to 0 dBm   |
| Key software capability | Fixture simulator, Time domain analysis/Test Wizard option <sup>1</sup> , Wireless power transfer analysis <sup>1</sup> , and Materials measurement <sup>2</sup> |
| Interface               | LAN, USB (front 2, rear 4), USBTMC, GPIB <sup>1</sup> , Handler I/O <sup>1</sup>   |
| Service and support     | 3-year warranty and 3-year KeysightCare Technical Support included   |

1. Optional capability.
2. External software; Keysight N1500A Material Measurement Suite required.

\* From selected distributors only

➤ DATA SHEET

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# FieldFox Handheld RF and Microwave Analyzers

- DATA SHEET
- VIEW ALL MODELS

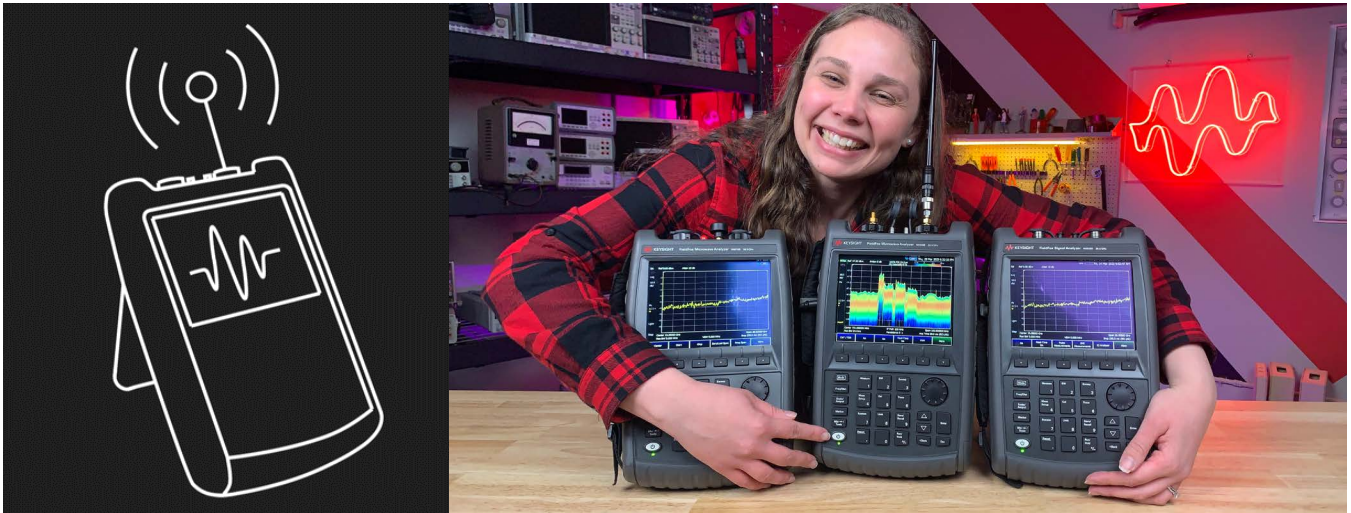
Carry precision with you

Use an all-in-one combination analyzer that performs cable and antenna testing, vector network analysis, spectrum analysis, signal analysis, and more.

| Model  | N9913A   | N9935A            | N9925A                  | N9918A         | N9960A            | N9952A         |
|--|--|-------------------|-------------------------|----------------|-------------------|----------------|
| Base model                                   | Combo Analyzer   | Spectrum Analyzer | Vector Network Analyzer | Combo Analyzer | Spectrum Analyzer | Combo Analyzer |
| Maximum frequency                            | 4 GHz  | 9 GHz             | 9 GHz                   | 26.5 GHz       | 32 GHz            | 50 GHz         |
| DANL at 1 GHz                                | -155 dBm   | -155 dBm          | —                       | -155 dBm       | -159 dBm          | -159 dBm       |
| Overall spectrum analyzer amplitude accuracy | ±0.5 dB  | ±0.5 dB           | —                       | ±0.5 dB        | ±0.5 dB           | ±0.5 dB        |
| Output power                                 | Up to 1 dBm  | Up to 1 dBm       | Up to 1 dBm             | Up to 1 dBm    | Up to 4 dBm       | Up to 4 dBm    |
| Service and support                          | 3-year warranty and 3-year KeysightCare Technical Support included |                   |                         |                |                   |                |
|  | Get a Quote >  | Get a Quote >     | Get a Quote >           | Get a Quote >  | Get a Quote >     | Get a Quote >  |



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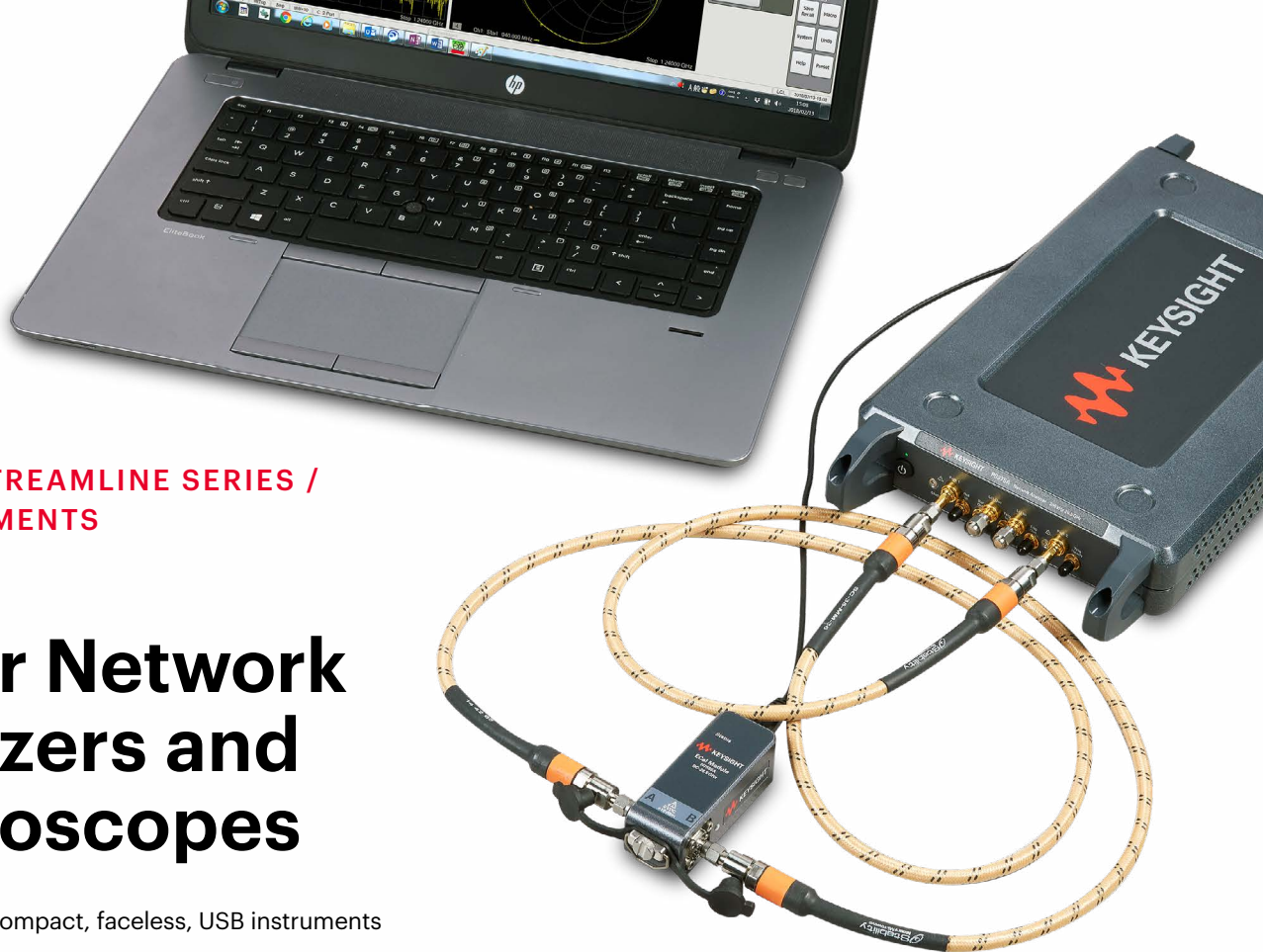
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Discover the hidden culprit slowing down your Wi-Fi and Bluetooth® connections.

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## KEYSIGHT STREAMLINE SERIES / USB INSTRUMENTS

# Vector Network Analyzers and Oscilloscopes

- Multiple new compact, faceless, USB instruments
- Common technology and measurement capabilities as benchtop and modular instruments
- Perfect for component and subassembly test, R&D labs, and light manufacturing
- Small footprint in size, weight, and power
- Ideal for a rack at 1U high

### Vector Network Analyzer (VNA)\*

### Oscilloscope

| Models              | P9370A/B, P9371A/B, P9372A/B, P9373A/B, P9374A/B P9375A/B, P9377B, P9382B, P9384B  | P9241A, P9242A, P9243A   |
|---------------------|--|--|
| Bandwidth           | 300 kHz to 26.5 GHz (P937xA)<br>9 kHz to 20 GHz (P937xB/P938xB)<br>100 kHz to 44 GHz (P937xB)  | 200 MHz, 500 MHz, and 1 GHz  |
| Capabilities        | <ul style="list-style-type: none"> <li>• Full 2-port (P937xA/B) and 4-port (P938xB) VNA</li> <li>• Ability to extend the number of ports</li> <li>• Same calibration and metrology as all trusted Keysight VNAs</li> </ul> | <ul style="list-style-type: none"> <li>• 2 analog channels</li> <li>• 5 GSa/s</li> <li>• 1,000,000 wfms/s</li> <li>• Zone triggering</li> <li>• 6-in-1 instrument: arbitrary waveform generator, frequency response analyzer, digital voltmeter, counter, protocol analyzer</li> </ul> |
| Service and support | 3-year warranty and 3-year KeysightCare Technical Support included   |  |
|                     | <a href="#">P397XA DATA SHEET</a>  | <a href="#">P93XXB DATA SHEET</a>  |
|                     | <a href="#">Get a Quote &gt;</a>   | <a href="#">Get a Quote &gt;</a>   |

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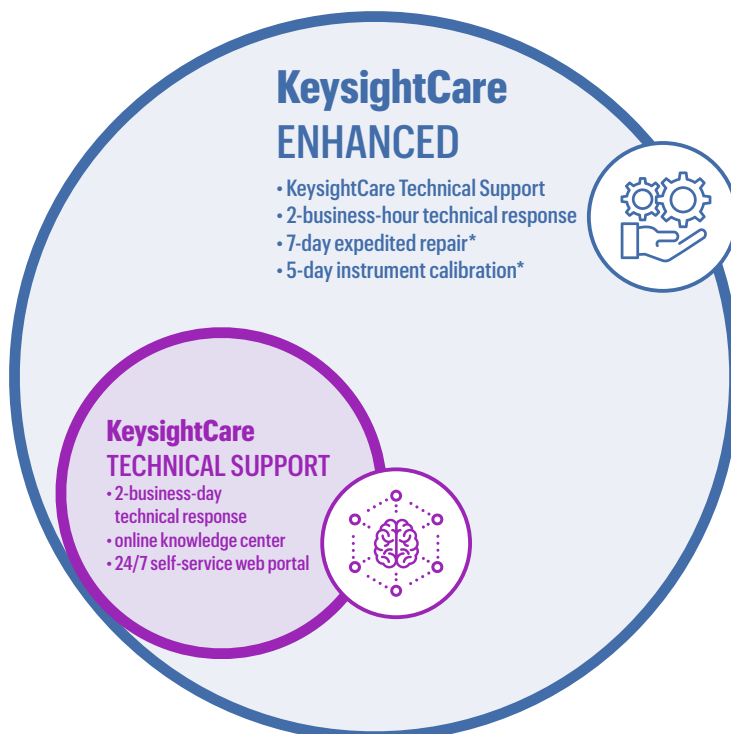
- In addition to your three-year warranty, you will receive three years of **KeysightCare Technical Support** on all basic instruments in this catalog.

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- Extend your peace of mind and eliminate budgetary surprises for up to 5 years with KeysightCare Enhanced. Trust your test results with calibrated in tolerance instruments and accurate measurements. Available in select countries.
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\* excluding shipment and customs processing

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- Open and track your support cases most efficiently through [Keysight Support](#)

Learn more at [www.keysight.com/find/KeysightCare](http://www.keysight.com/find/KeysightCare)



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- Keep your project schedules on track and receive priority repair coverage with a 7 business day committed turnaround time (excluding shipment and customs processing).

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