

# Keysight Technologies

## PXI Vector Network Analyzer Series

Drive down the size of test



## Full Two-Port VNA that Fits in Just One Slot

When you need to measure basic S-parameters, the right mix of speed, performance and footprint gives you an edge. Sharpen your edge with the Keysight PXIe M937XA vector network analyzer (VNA).

The Keysight PXI VNA is a full two-port VNA that fits in just one slot. The PXI VNA also performs fast, accurate measurements and reduces your cost-of-test by letting you simultaneously characterize many devices – two-port or multiport – using a single PXI chassis.

### Get more VNA in less space

It offers the best PXI VNA performance on key specifications such as dynamic range, measurement speed, and trace noise. Each module is a completely independent two-port network analyzer and up to 16 modules can be added to a chassis for multi-site and multiport applications. All ports are fully synchronous so multiple ports can be measured simultaneously with multiport error correction applied.

### Same Keysight VNA measurement science

The M937XA extends Keysight’s expertise in measurement and metrology into the modular PXI form factor. It provides the same quality results you have come to expect in our vector network analyzers.

### Main features and benefits

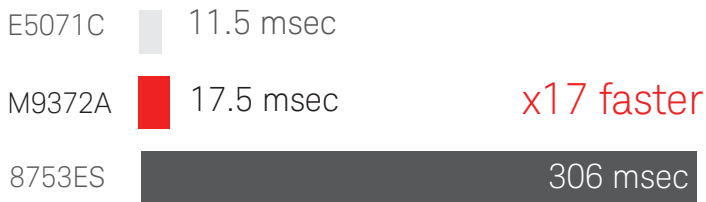
Product features	Your benefit
Choice of six frequency ranges up to 26.5 GHz (widest currently available).	Pay for only the frequency range you need.
Best PXI VNA speed, dynamic range, trace noise and stability.	Improve accuracy, yield and margins.
Full 2-port S-parameters in a single-slot PXI.	Have more slots available in your PXI chassis.
Trusted Keysight measurement science and calibration.	Get measurements you can count on.
Electronic calibration (ECal) control via USB interface.	Perform fast, easy, and accurate calibrations.
Cascade multiple modules to address multiport applications.	Test with full N-port correction capability.
Simply add modules for multi-site applications.	Increase throughput, lower cost-of-test per device.
Cost-effective VNA capability.	Achieve lower pricing as compared to other PXI VNAs.



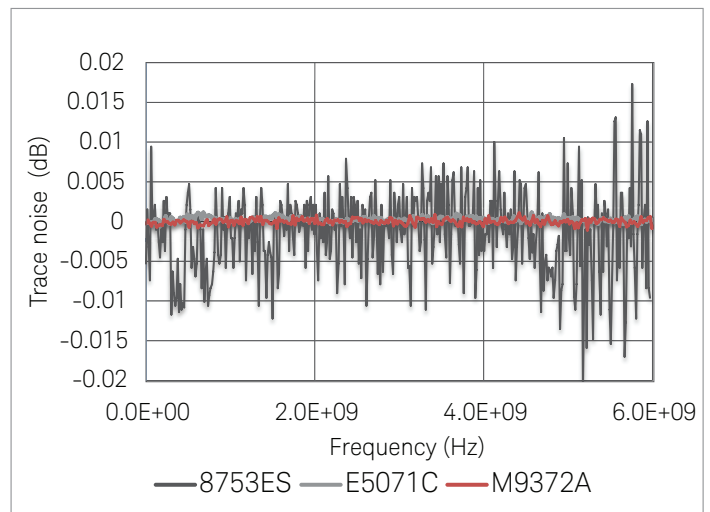
Figure 1. Pay for only the frequency range you need with the widest choice of frequency ranges from 300 kHz up to 26.5 GHz.

## Measurements You Can Count On

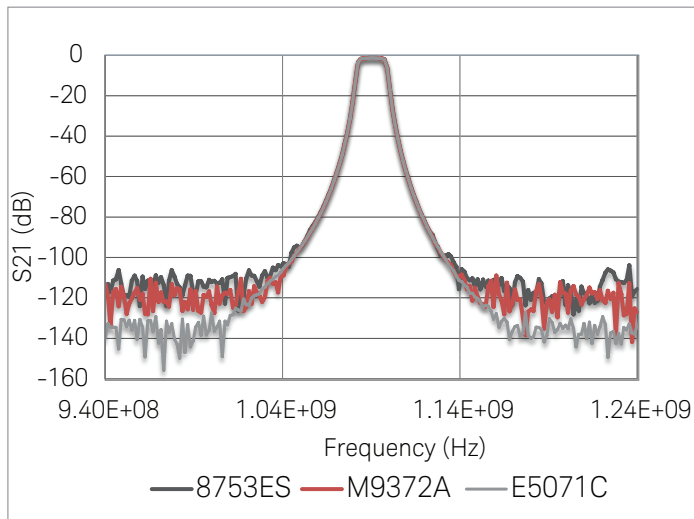
### Fast measurement speed <sup>1</sup>



### Low trace noise <sup>3</sup>



### Wide dynamic range <sup>2</sup>



1. 401 pts, full 2-port cal, 800 M to 1.8 GHz.  
IFBW = 6 kHz (8753ES), 500 kHz (E5071C), 600 kHz (M9372A).
2. IFBW = 10 Hz, max specified power.
3. Standard deviation of traces at 1 kHz IFBW: E5071C: 0.3 mdB, M9372A: 0.4 mdB, 8753ES: 5.2 mdB.

## Multiport Testing with Full N-Port Correction Capability

The PXI VNA is an ideal solution for multiport measurements. It has a two-port (2- reference receivers and 2- test receivers) architecture in a one-slot module. It can be easily configured as a true multiport VNA by using additional modules installed in the same chassis. The full N-port correction capability allows for complete and accurate characterization of multiport devices.

A multiport PXI VNA provides higher throughput with much less sweeps required than a VNA with a switch matrix for the same multiport device. For example, a 12-port device requires just 12 sweeps with a 12-port multiport M937XA vs. 132-sweeps with a 2-port VNA and a switch matrix. The true multiport VNA has no degradation in performance (i.e. dynamic range, trace noise, directivity, stability) due to external switches.

Multiple PXI VNA modules may be installed in one chassis and identified by the M937XA firmware as one VNA under a single PXI controller. One or more modules in the set must have Option 551 (N-Port Calibrated Measurements). The frequency of the multiport array is determined by the lowest frequency module configured in the array. In a multiport configuration, only one module must have a valid license for software capabilities (i.e. Option 009 or 010) to function in multiport mode.

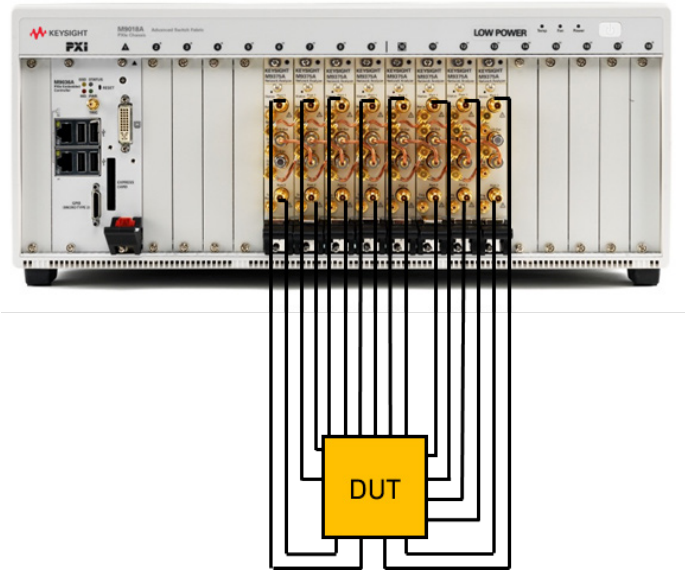


Figure 3. Easily add or subtract modules to meet all of your multiport measurement needs.

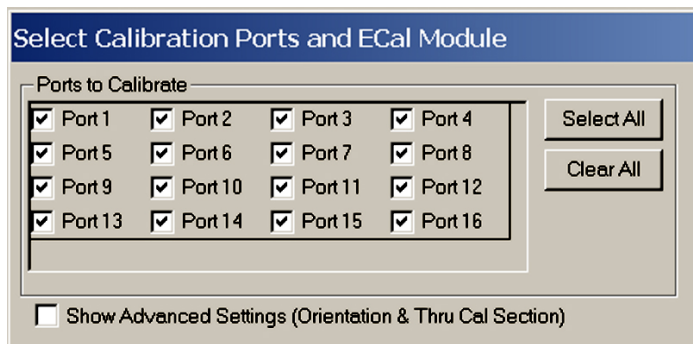


Figure 2. The full N-port correction capability allows for complete and accurate characterization of multiport devices.

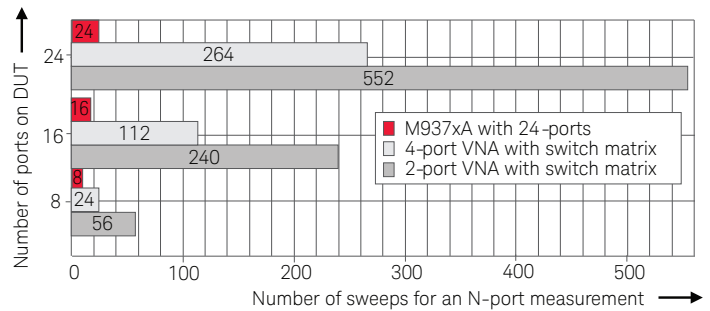


Figure 4. The multiport PXI VNA offers higher throughput with less sweeps required than a VNA with a switch matrix.

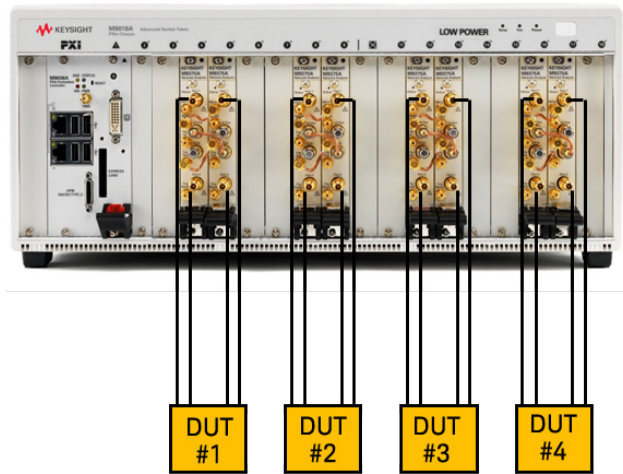
## Increase Throughput with Multi-Site Capability

Unlike sequential measurements by a switch-based solution, the PXI VNA multi-site capability offers simultaneous measurements to improve overall throughput. Each PXI module or multiport array of modules is installed and identified under a single PXI controller. This makes it possible to run measurements of different devices at the same time or different measurement paths in a single component.

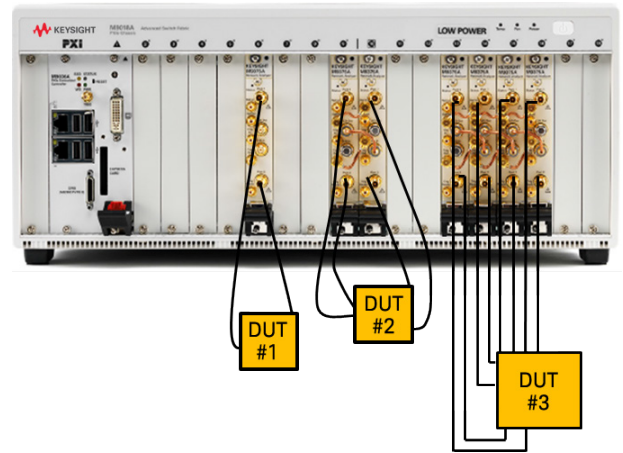
Multiple instances of the M937XA software are launched and each software instance is connected to either an individual M937XA, or a multiport array. Each instance behaves as an independent instrument to be used simultaneously. In addition, segment sweep enables you to optimize measurement conditions specifically for each device under test, so you can balance speed and accuracy. The PXI VNA multi-site capability gives you high throughput, so you can significantly lower the cost-of-test per device.



Figure 5. Multiple instances of the M937XA software are launched with each instance behaving as an independent instrument to be used simultaneously.



(a) Test multiple devices simultaneously.



(b) Test different devices simultaneously.

Figure 6. The PXI VNA multi-site capability increases throughput, resulting in a significantly lower cost-of-test per device.

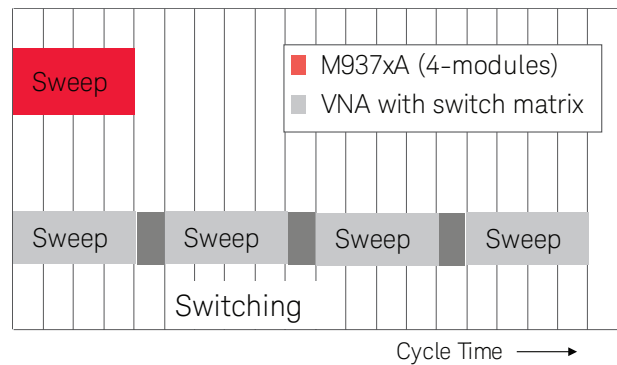


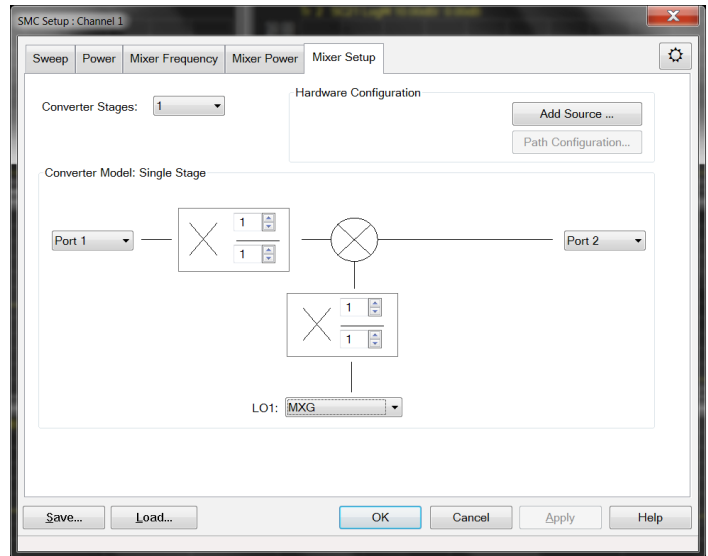
Figure 7. Unlike sequential measurements by switch-based solution, the PXI VNA offers simultaneous measurements to improve overall throughput.

## Enhanced Measurement Capability

### Accurate mixer/converter measurements

Frequency offset mode is available to set the PXI VNA's source frequency independently from where the receivers are tuned. Scalar mixer calibration (SMC) enables accurate conversion loss measurements of mixers or converters.

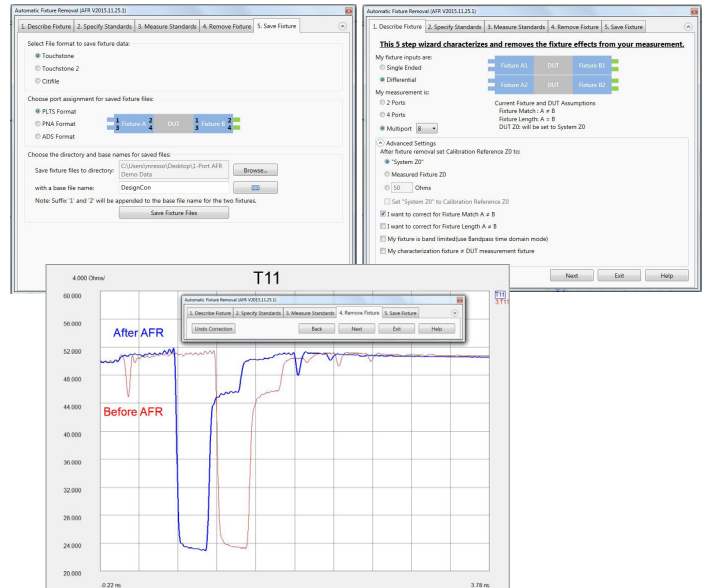
- Frequency-offset sweep
- Scalar mixer/converter measurements (SMC) for accurate conversion loss/gain measurements
- Intuitive GUI to control multiple PXI VNA modules
- External signal source control



### Automatic fixture removal

Many devices do not have coaxial connectors and are put in fixtures in order to measure them in a coaxial environment. Accurately removing the effects of the fixture is required to get a good measurement of the device under test (DUT). Automatic fixture removal adds a powerful application wizard to guide you through characterizing a fixture and removing it from the measurement.

- Easiest way to remove fixture effects from non-coaxial device measurements
- Extract fixture S-parameters from 2x thru or one-port measurements
- Step-by-step wizard to characterize your fixture and remove it from your measurements



### Advanced calibration tools

Calibrating network analyzers is critical for high accuracy measurements and can be particularly challenging in non-coaxial environments such as in-fixture, on-wafer, or waveguide. The PXI VNA supports a broad range of mechanical and electronic calibration kits, and offers advanced calibration methods to enhance ease-of-use while providing best-in-class accuracy.

Keysight calibration tools include:

- High-performance two-and four-port ECal modules, covering 300 kHz to 67 GHz, with nine connector types
- QSOLT and n-port calibration for multipoint test systems



## Easy Integration into Test Environments

### Software platform

Keysight soft front panels provide easy to use instrument communications. The graphical user interface guides developers through module setup using a similar look and feel as the popular Keysight network analyzers. Users can quickly configure the instrument parameters and perform calibrations.

### IO libraries

Keysight IO Libraries Suite offers fast and easy connection to both traditional and modular instruments. The Keysight IO Libraries Suite helps you by displaying all of the modules in your system, whether they are PXI, PXIe, or AXIe. From here you can view information about the installed software or launch the modules' soft front panel directly from Keysight Connection Expert (KCE). KCE offers an easy way to find the correct driver for your instrument.

### Drivers

The M973XA PXI VNA is supplied with a comprehensive portfolio of module drivers, documentation, examples, and software tools to help you quickly develop test systems with your software platform of choice. The module comes with IVICOM, IIVI-C, LabVIEW and MATLAB software drivers that work in the most popular T&M development environments including, LabVIEW and LabWindows/CVI from National Instruments, MATLAB from The MathWorks, Microsoft C/ C++, C#, and VB.NET.

### Automated Measurement Expert

One of critical challenges for RF component manufacturers is to reduce the burden of developing and maintaining in-house test programs. The Automated Measurement Expert (AMX) addresses this challenge by providing ready-to-use automated multiport test software supporting the M973XA PXI VNA. The AMX frontend Test Plan Builder (S94701A) generates test plan files that contain optimal VNA setups and test sequences from your DUT test plans. The AMX backend software (KS8400A/ S94702A) performs automated multiport S-parameter tests according to the generated TAP plan files. This enables you to conduct complicated tests of multiport RF components easily by just editing your DUT test plans with the Test Plan Builder. There is no need to do any programming for the core VNA setup and measurement sequences.

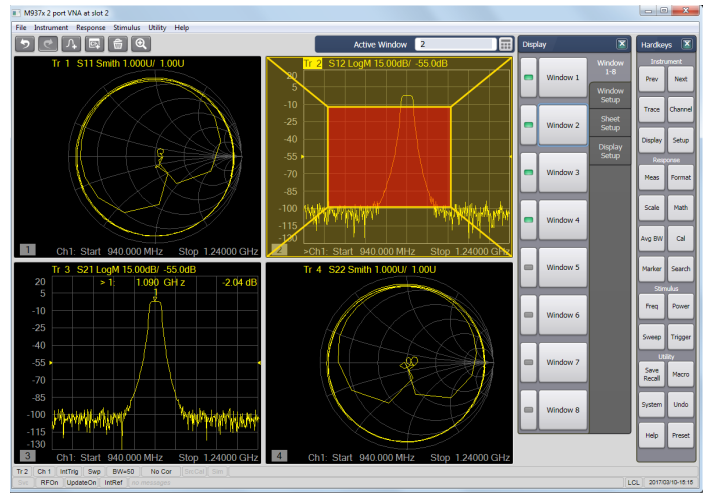


Figure 8. The graphical user interface guides test engineers using a similar look and feel as Keysight's popular network analyzers.

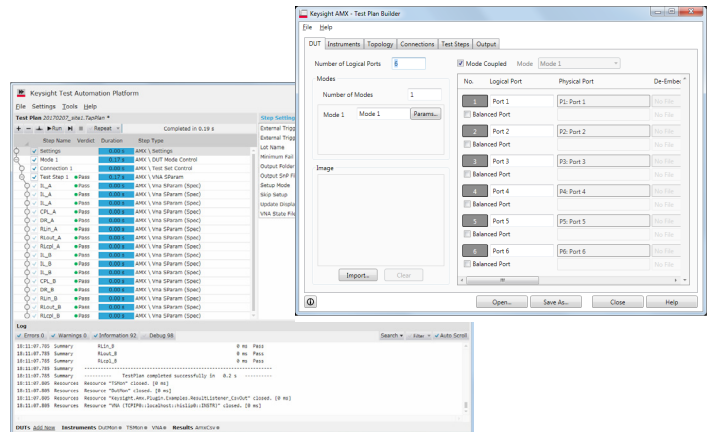


Figure 9. Automated Measurement Expert.

## Ordering Information

Model	Description
M9370A	300 kHz to 4 GHz
M9371A	300 kHz to 6.5 GHz
M9372A	300 kHz to 9 GHz
M9373A	300 kHz to 14 GHz
M9374A	300 kHz to 20 GHz
M9375A	300 kHz to 26.5 GHz
Product options	
007	Automatic fixture removal
009	Frequency offset mode/scalar calibrated converter measurements
010	Time domain
551	N-port calibrated measurement
897	Built-in performance test software for inclusive calibration, perpetual license
898	Built-in performance test software for standards compliant calibration, perpetual license
Accessories	
Y1242A	Multiport cable kit
Y1281A	Accessory and tool kit: <ul style="list-style-type: none"> <li>– Pull tool for SMB connectors</li> <li>– Custom socket for 3.5/SMA connector nuts</li> </ul>
M9019A	PXIe 18-slot chassis
M9037A	PXIe high performance embedded controller
Calibration	Electronic and mechanical kits available

## Software Information

The PXI VNA includes instrument drivers, documentation, examples and software tools to help you quickly develop test systems in your application development environment of choice.

Operating systems	Microsoft Windows Vista SP1 and SP2 (32/64-bit) Microsoft Windows 7 (32/64-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW, MATLAB
Application development environments (ADE)	Visual Studio (C/C++, C#, VB.NET), LabVIEW, LabWindows/CVI, MATLAB, VEE
Keysight Command Expert	Instrument control for SCPI or IVI-COM drivers
Keysight IO libraries (version 16.3.16603.3 or newer)	Includes: VISA libraries, Keysight Connection Expert, IO Monitor



## Download your next insight

Keysight software is downloadable expertise. From first simulation through first customer shipment, we deliver the tools your team needs to accelerate from data to information to actionable insight.



- Electronic design automation (EDA) software
- Application software
- Programming environments
- Productivity software

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

Start with a 30-day free trial. [www.keysight.com/find/free\\_trials](http://www.keysight.com/find/free_trials)

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)

### Americas

Canada	(877) 894 4414
Brazil	55 11 3351 7010
Mexico	001 800 254 2440
United States	(800) 829 4444

### Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 11 2626
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

### Europe & Middle East

Austria	0800 001122
Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	800 000154
Sweden	0200 882255
Switzerland	0800 805353
	Opt. 1 (DE)
	Opt. 2 (FR)
	Opt. 3 (IT)
United Kingdom	0800 0260637

For other unlisted countries: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus) (BP-9-7-17)

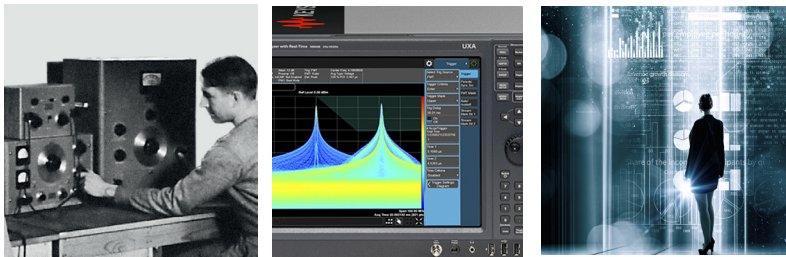


[www.keysight.com/go/quality](http://www.keysight.com/go/quality)  
 Keysight Technologies, Inc.  
 DEKRA Certified ISO 9001:2015  
 Quality Management System

This information is subject to change without notice.  
 © Keysight Technologies, 2017 - 2018  
 Published in USA, May 15, 2018  
 5992-0098EN  
[www.keysight.com](http://www.keysight.com)

## Evolving Since 1939

Our unique combination of hardware, software, services, and people can help you reach your next breakthrough. We are unlocking the future of technology. From Hewlett-Packard to Agilent to Keysight.



### myKeysight

**myKeysight**  
[www.keysight.com/find/mykeysight](http://www.keysight.com/find/mykeysight)  
 A personalized view into the information most relevant to you.

[http://www.keysight.com/find/emt\\_product\\_registration](http://www.keysight.com/find/emt_product_registration)  
 Register your products to get up-to-date product information and find warranty information.



**Keysight Services**  
[www.keysight.com/find/service](http://www.keysight.com/find/service)  
 Keysight Services can help from acquisition to renewal across your instrument's lifecycle. Our comprehensive service offerings—one-stop calibration, repair, asset management, technology refresh, consulting, training and more—helps you improve product quality and lower costs.



**Keysight Assurance Plans**  
[www.keysight.com/find/AssurancePlans](http://www.keysight.com/find/AssurancePlans)  
 Up to ten years of protection and no budgetary surprises to ensure your instruments are operating to specification, so you can rely on accurate measurements.

**Keysight Channel Partners**  
[www.keysight.com/find/channelpartners](http://www.keysight.com/find/channelpartners)  
 Get the best of both worlds: Keysight's measurement expertise and product breadth, combined with channel partner convenience.

[www.keysight.com/find/pxivna](http://www.keysight.com/find/pxivna)

