

PXI and AXIe Instruments, Software, Reference Solutions and Services

Unlocking measurement insights

For more than 75 years, Keysight Technologies, Inc. has been unlocking measurement insights. Along the way, we've created industry-leading test equipment in the shapes and sizes you've asked for: full-size benchtop, small benchtop, handheld and modular. Our goal is to deliver comprehensive worldwide test solutions — hardware, software, worldwide support and application expertise — to give your teams what they need to stay on the leading edge in your industry.

Software is an essential element of any test system—and 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. We also provide soft front panels and essential utilities that make our modular products usable within minutes out of the box, ensuring rapid time to first measurement.



Our modular hardware innovations are focused in two specific forms: PXI and AXIe. We're putting our unrivaled performance—and consistent measurement science—into the RF, microwave and highspeed digital instruments in our PXI and AXIe portfolio. To provide time-saving starting points for test system creation, we're documenting Reference Solutions that address specific application areas that range from power amplifier testing to satellite signal monitoring.



Keysight has the industry's largest network of experienced local application engineers covering RF, microwave and digital—and no one can match their cumulative years of experience. Keysight's three-year standard warranty—worldwide—is our commitment to superior product quality. Our multi-vendor One-Stop Calibration and uptime services ensure the ongoing accuracy, performance and availability of your instruments. We can create a customized service plan with response times as fast as four hours. Our network of over 50 service locations worldwide and mobile calibration teams, provide greater convenience and flexibility to keep your products and test systems operating to warranted specifications.

Keysight's modular solutions help you tackle your toughest RF, microwave and digital challenges by delivering unrivaled PXI and AXIe performance. Our foundation is the industry's most accurate measurement science, giving you maximum confidence to achieve your first, best measurement and insight into what's next.

Keysight reference solutions

Gain insights faster with Keysight Reference Solutions, proven test systems for specific applications. Developed to solve critical test issues for specific applications, the reference solutions provide a starting point for a test system, including:

- Hardware configurations - PXI, AXIe or benchtop instruments.
- Application software, such as 89600 VSA, Signal Studio and more.
- Open source programming commands provided to perform specific tests and optimize test speed and throughput.

A sample of our reference solutions is provided below. For a complete list, visit:

www.keysight.com/find/solution-modular

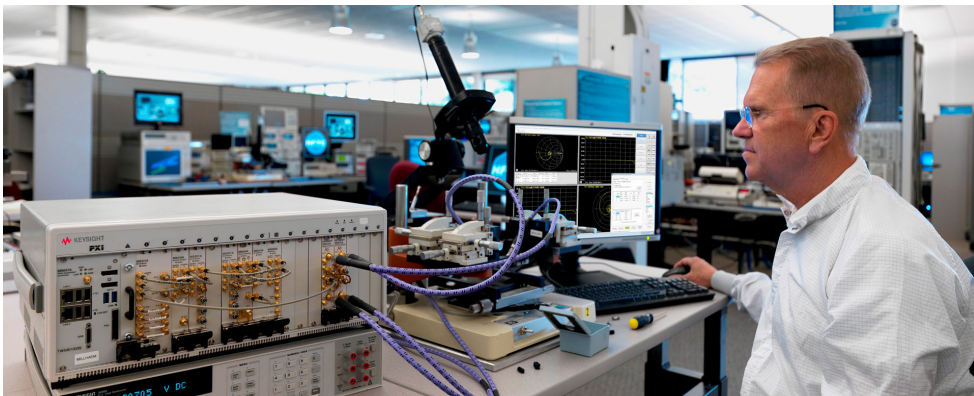
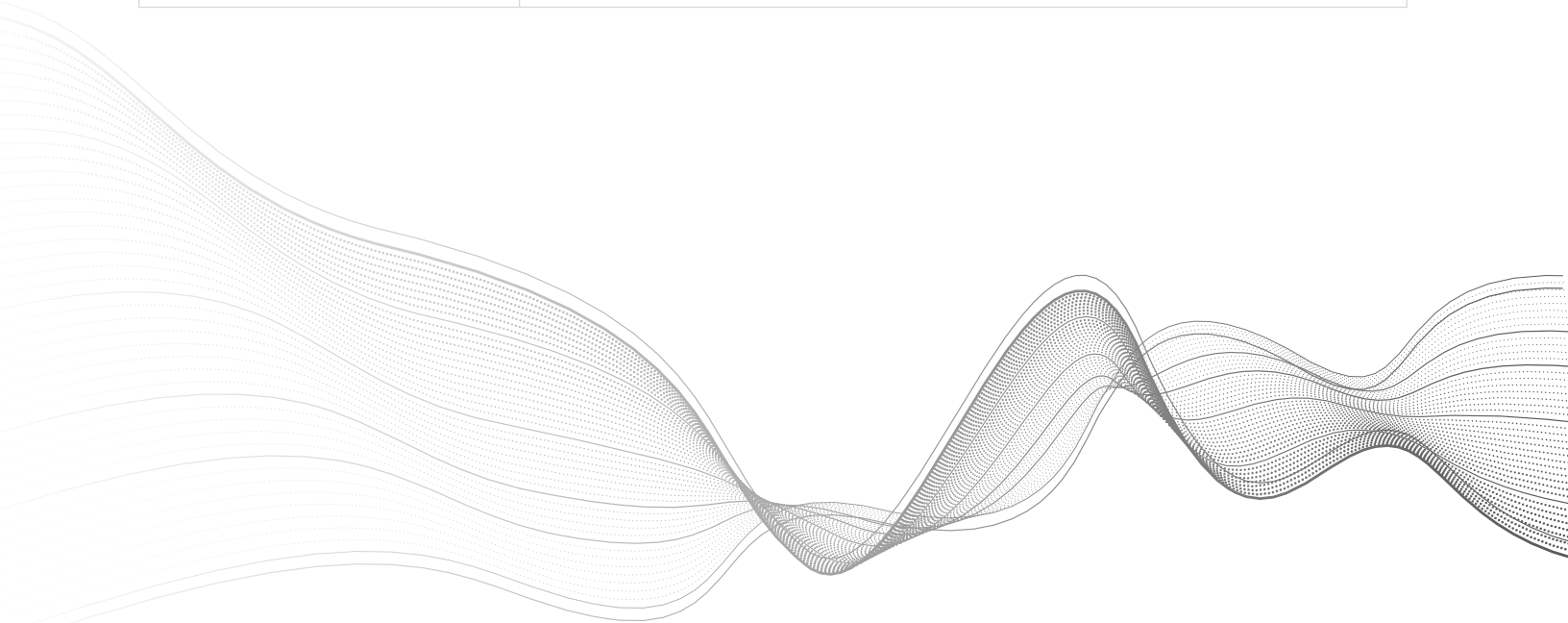


Figure 1. Using Keysight's M937xA PXIe vector network analyzer, M9381A PXIe vector signal generator and M9391A PXIe vector signal analyzer with measurement application software for power amplifier test.

Keysight reference solutions

RF PA/FEM Characterization & Test www.keysight.com/find/solution-padvt	Rapid, full characterization of next-generation power amplifier modules such as PAD devices, including S-parameter, demodulation, power, adjacent channel power and harmonic distortion measurements are provided by this Reference Solution. Digital pre-distortion and envelope tracking signal generation and analysis are enabled by Keysight's N7614B Signal Studio for power amplifier test software.
5G Channel Sounding www.keysight.com/find/solution-5Gsounding	Accelerate 5G channel sounding research with mmWave, ultra-broadband and MIMO solution providing fastest data capture with real-time correlation and wideband MIMO channel processing.
LTE-A Multi-Channel www.keysight.com/find/solution-LTE	Quickly set up, measure, visualize and characterize your most complicated multi-channel carrier aggregation, beamforming and MIMO designs. Easily configure and calibrate phase coherent PXIe VSAs, VSGs and software with convenient configuration and calibration utilities.
Automotive Functional Test www.keysight.com/find/ts8989ref	This unique, flexible test configuration is designed for reliable automotive body and safety testing. It features 8 PXI slots and 11 slots of sensor signal emulation, waveform analysis, discrete input switching or high-power load switching for a complete functional test solution in a compact space.
Satellite Signal Monitoring www.keysight.com/find/solutionsatsigmon	With this fast, flexible, compact and cost effective Reference Solution, you can monitor large blocks of spectrum and perform precise digital modulation analysis with increased configuration flexibility for validating satellite signal integrity.



PXI instruments - interoperability, size, speed & scalability

PXI is an open, multi-vendor standard governed by the PXI systems alliance, that ensures interoperability of modules and chassis from different vendors.

The PXIe backplane bus leverages PCI Express® technology, greatly increasing test speed and reducing latency, especially for data and transaction intensive test applications. The bus also enables scalability of the system as test needs change. And PXI can also be integrated into an existing test system of benchtop or AXIe instruments.

Keysight's growing portfolio of PXI instruments extends its measurement expertise to provide the right solution for multiple test scenarios.

For a complete list of PXI instruments, visit:

www.keysight.com/find/PXI



Figure 2. Keysight's M9019A PXIe 18-slot chassis, Gen 3

<p>PXI Chassis, Controllers & IO Components www.keysight.com/find/pxi-chassis</p>	<p>PXI 18-slot chassis with PCI Express® Gen 2 and 3 performance, 16 PXI hybrid slots, multi-chassis connections, and an innovative cooling design that saves rack space and lowers maintenance cost. PXIe controller with Intel i7-4700EQ, 2.4 GHz processor, up to 16 GB RAM and front removable 240 GB solid state drive.</p>
<p>PXI Data Acquisition www.keysight.com/find/pxi-converters</p>	<p>Address the need for high input voltage or current ranges often found in functional test with a choice of digital to analog converters and V/I sources. Products include isolated D/A converter with multi-channel high voltage supplies, multi-channel dynamic DAC for typical waveforms generation at high voltages and more.</p>
<p>PXI Digital IO & Stimulus/Response www.keysight.com/find/pxi-digitalIO</p>	<p>High channel digital I/O control with up to 50 v and 12.5 mW resolution. Digital stimulus/response provides speed, configuration flexibility, multi-site and pattern generation capability for automated test.</p>
<p>PXI Vector Signal Analyzers & Vector Transceivers www.keysight.com/find/pxi-vsa</p>	<p>PXI RF and μW vector signal analyzers (9 kHz to 50 GHz), and vector transceiver (60 MHz to 6 GHz), offer high speed measurement capability with up to 160 MHz bandwidth.</p>
<p>PXI Switches www.keysight.com/find/pxi-switch</p>	<p>High-speed, 500 μsec multiplexers, 300 W GP switches, RF and microwave switches up to 40 GHz with low insertion loss and VSWR for excellent signal integrity.</p>
<p>PXI Vector Network Analyzers www.keysight.com/find/pxivna</p>	<p>Select from full 2-port vector network analyzers that fit in just one slot and high performance multi-port vector network analyzers.</p>
<p>Other PXI Instruments www.keysight.com/find/pxi</p>	<ul style="list-style-type: none"> • Amplifier/attenuators • Digital input output • Digitizers • Digital multimeters • Frequency reference • FPGA • Optical extenders • Quad downconverter • Source/measure unit • Vector signal generator • Waveform generators

AXle instruments - truly advanced, cutting edge technology

AXle is a next-generation open standard based on Advance Telecom Computing Architecture. By increasing the power and headroom available to each slot, higher performance modules have been developed with faster switching speeds, larger power draws and more complex measurement architectures.

An augmented local bus, providing communication and synchronization between slots, facilitates complex multi-instrument configurations, data storage and co-processing. As a result, AXle instruments provide timing, triggering, and module-to-module data movement features for high-performance test and measurement systems used in aerospace defense, high-energy physics, semiconductor test and other industries.

AXle products use horizontal configurations for minimal rack space and vertical for larger systems. The chassis and modules compliment benchtop and PXI products and include PCIe and LAN interfaces that allow them to act like virtual PXI or benchtop instruments.

For a complete list of AXle instruments, visit:

www.keysight.com/find/AXle



7 Tips for RF & μ W PXI & AXle Test Solutions DVD

Get our 7 Tips DVD packed with tips, myth busters, application content including:

- How to achieve multi-vendor interoperability in PXI systems
- One size does not fit all - choosing the right instrument form factor

Get started: www.keysight.com/find/7modulartips



Figure 3. M8190A arbitrary waveform generator, M9703A digitizer in a M9505A 5-slot AXle chassis.

<p>AXIe Chassis, Controllers & IO Components</p> <p>www.keysight.com/find/axie-chassis</p>	<p>Select from an AXIe 2-, 5-slot and 14-slot chassis, all fully compatible with the AXIe 1.0 or 2.0 specification. The high performance, one-slot M9537A embedded controller offers AXIe-wide PCIe support, multiple 4K video outputs and more.</p>
<p>AXIe Arbitrary Waveform Generators</p> <p>www.keysight.com/find/axie-awgt</p>	<p>From low-observable systems to high-density communications, testing is more realistic with our high resolution, wide bandwidth AWGs.</p>
<p>AXIe Digitizers</p> <p>www.keysight.com/find/axie-digitizers</p>	<p>Our revolutionary digitizers capture signals with good resolution and excellent measurement accuracy. The M9703B offers 8-channels up to 1.6 GS/s and the M9709A offers 32 channels up to 1 GS/s.</p>
<p>BERTs</p> <p>www.keysight.com/find/m8000</p>	<p>We offer BERTs to streamline receiver test setup by providing the highest level of integration and automating stressed eye calibration. We also provide a highly integrated BERT for physical layer characterization and compliance testing.</p>
<p>Logic & Protocol Analyzers</p> <p>www.keysight.com/find/axie-logic</p>	<p>Address multi-protocol analysis, traffic generation, performance and conformance verification to debug, validate and optimize your designs using high speed protocol standards.</p>

Software & programming

Speed your project's design to manufacturing cycle with Keysight's PXI and AXIe instruments combined with its portfolio of software. Select from trusted measurement applications for proven performance, usable with both benchtop and modular instruments to enable code re-use and measurement consistency from design to manufacturing. Enhance hardware capability with smart drivers to quickly connect, configure and ensure proper calibration before making measurements. We support multiple programming environments (i.e., Visual Studio.NET, MATLAB, LabView) so that you can use the software of your choice.

Software & programming

X-Series Measurement Applications www.keysight.com/find/m90xa	X-Series measurement apps transform X-Series and modular signal analyzers into standards-based RF transmitter testers. They provide fast, one-button RF conformance measurements to help you design, evaluate, and manufacture devices and equipment.
89600 VSA Software www.keysight.com/find/vsa	The 89600 VSA software is a comprehensive set of tools for demodulation and vector signal analysis. These tools enable you to explore virtually every facet of a signal and optimize your most advanced designs.
Signal Studio Software www.keysight.com/find/signalstudio	Signal Studio software, reduces the time you spend on signal simulation and simplifies signal creation. Its performance-optimized reference signals – validated by Keysight – enhance the characterization and verification of your devices.
SystemVue Software www.keysight.com/find/systemvue	SystemVue is a system-level EDA environment that enables design of the physical layer of next-generation communications systems. Re-use the same verification set-ups, scripts, test vectors and wireless IP as you move from algorithm into testware.
Waveform Creator Software www.keysight.com/find/m9099	Waveform Creator provides easy development of complex baseband and vector signals used in the validation and test of digital communications products. Built around a drag-and-drop graphical user interface, Waveform Creator allows quick development of custom multi-format, multi-track waveforms.
IO Libraries Suite 17 www.keysight.com/find/iosuite	The IO Libraries Suite 17 auto discovers instruments physically connected to your PC and many of those on your local LAN subnet. The PXI/AXIe chassis view in Connection Expert provides details to make it easy to connect and control across instrument platforms.
Command Expert Software www.keysight.com/find/commandexpert	Command Expert is complementary software that provides instrument control in PC application environments, combining instrument commands, documentation, syntax checking and command execution all in one simple interface.
MATLAB Software www.keysight.com/find/matlab	MATLAB software, available for purchase from Keysight, extends the capabilities of Keysight modular hardware. Three MATLAB configurations are available from basic MATLAB capabilities that allow acquisition and analysis of data to full support for signal processing, communications, filter design and automated testing.

List of PXI & AXIe instruments, reference solutions, software

PXI Instruments	Model #
Amplifier/attenuator	M9352A
Arbitrary waveform generator	M9330A, 31A
Attenuator – programmable step attenuator	M9168C, 68E, 69E
Attenuator/switch driver	M9170A
Chassis – 18-slot	M9018A, 19A
Controller – embedded controller	M9036A, 37A
CXA-m signal analyzer	M9290A
D/A converter – 8/16-channel isolated	M9185A
Data acquisition module – 32-channel high-voltage	M9216A
Digital IO control	M9187A
Digital stimulus/response with PMU – Pattern editing software for PXIe DSR	M9195B M9192A, 93A
Digitizer – 12-bit wideband IF	M9202A
Digitizer – 12-bit, wideband digital receiver	M9203A
Digitizer – 2-channel, high-voltage, 20 MSa/s, isolated	M9217A
DMM – basic	M9181A
DMM – high performance	M9182A, 83A
Dynamic analog output – 16-channel	M9188A
Frequency reference	M9300A
Measurement accelerator	M9451A
Optical RF amplifier	M9405A
Optical receiver	M9404A
Optical RF reflectometer	M9408A
Optical transmitter	M9403A
Optical USB 2.0	M9406A, 07A
PC adapter –PCIe desktop PC adapter, host adapters	M9048A, 48B, 49A
PCIe cable interface, system modules	M9021A, 22A, 23A, 24A

PXI Instruments continued	Model #
Quad downconverter	M9362AD01
Source – CW	M9380A
Source/measure unit	M9111A, M9601A, 02A, 03A, 14A, 15A
Switches – dual SP4T solid state	M9161D
Switches – general purpose	M9130A-35A
Switches – DC to 26.5 GHz	M9155C-57C
Switches – DC to 40 GHz	M9155CH40 57CH40
Switches – matrix	M9120A-22A
Switches – multiplexer	M9101A-03A
Switches – RF	M9128A, 46A, 47A, 48A, 49A
VI source – isolated voltage/current source	M9186A
Vector network analyzers	M9370-75A
Vector network analyzers, multiport	M9485A
Vector signal analyzer – up to 50 HGz	M9393A
Vector signal analyzer	M9391A
Vector signal generator	M9381A
Vector transceiver (VTX)	M9420A
AXIe Instruments	Model #
Arbitrary waveform generator	M8190A, 95A, 96A
BERT –64 GBaud	M8040A
Chassis: 2-slot	M9502A
5-slot	M9505A
14-slot	M9514A
Controller – embedded controller	M9536A, 37A
Digitizer	M9703B, 09A
J-BERTs	M8020A, 30A, 40A
Logic analyzer – 4 Gb/s state mode	U4164A
PC adapter – PCIe desktop PC adapter, host adapters	M9048A, 48B, 49A

PCIe cable interface, system modules	M9021A, 22A, 23A, 24A
Protocol analyzer –MIPI	U4421A, 31A
Protocol analyzer –PCIe	U4301B
System module	M9521A
Software	Model #
89600 VSA software	89601B
IO Libraries Suite 17	E2094
MATLAB software	N6171A
Signal Studio software	N76xxB
SystemVue software	W1461BP
Waveform Creator software	M9099
X-Series measurement application	Various
Reference Solutions	
Reference solutions	
– RF PA/FEM	
– LTE/LTE-A multi-channel	
– 5G channel sounding	
– 5G waveform generation & analysis testbed	
– 802.11ad testbed	
– Multi-channel antenna calibration	
– Satellite signal monitoring	
– Automotive functional test	
– Radio test	

Learn more at: www.keysight.com

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

