Agilent PXI and AXIe Modular Products

Catalog

September 2013

Challenge the Boundaries of Test

Agilent Modular Products

Anticipate ___Accelerate ___Achieve

Agilent Technologies

A Letter from our President

Dear Valued Customer,

I am pleased to present this new edition of the Agilent PXI and AXIe Modular Instruments catalog. Agilent's modular instruments portfolio gives you expert measurement science in the PXI and AXIe form factors.

As you look through it I hope you'll find the measurement modules and companion software required for your test needs. They are optimized for testing applications that require high-performance, high-speed and high-throughput, and enable new capabilities that were not previously available across analog, digital, RF, microwave and lightwave technologies.

Agilent Technologies' Electronic Measurement Group is committed to be your measurement partner on applications that require modular instrumentation.

Give us your feedback; we count on it to ensure that we continue to meet your requirements. I hope you will look to Agilent's innovative products and solutions to help you achieve your business results.

Sincerely,

Guy Séné

Senior Vice President, Agilent Technologies, Inc.
President, Electronic Measurement Group

TABLE OF CONTENTS

	SECTION
Product Category Index	1
The Modular Advantage	2
Modular Software Environment	3
PXI: Chassis and Controllers	4
PXI: Bit Error Rate Testers	5
PXI: Data Acquisition and Switching	6
PXI: Digital Input Output	7
PXI: Digital Multimeters	8
PXI: Digitizers	9
PXI: Digital to Analog Converters	10
PXI: Function and Arbitrary Waveform Generators	11
PXI: Logic Analysis and Protocol Test	12
PXI: Optical Extenders	13
PXI: Signal Analyzers nnd Signal Conditioning	14
PXI: Signal Generators (Sources)	15
AXIe Modular Products	16
Programming Environment	17
Recommended/Tested Computer List	18
Become a Partner	19
Customer Support and Warranty Information, Specification Definitions	20
Indexes	21

PRODUCT CATEGORY INDEX

MODEL	DESCRIPTION	PAGE
PXI CHASSIS AND CONTROLLERS		
M9018A	PXIe Chassis: 18-slot, 3U, 8 GB/s	19
M9021A	PCIe® Cable Interface: x8	20
M9036A	PXIe Controller	21
M9045B	PCIe Laptop Adapter: x1	22
M9048A	PCIe Desktop PC Adapter: Gen 2, Clock Isolation	23
PXI BIT ERROR RATE TESTERS (BERTS)		
N2099A	PXI RF Synthesizer	27
N2100B	PXI Digital Communication Analyzer	28
N2101B	PXI Bit Error Rate Tester	29
N2102B	PXI Pattern Generator	30
PXI DATA ACQUISITION AND SWITCHING		
M9101A	PXI High Density Multiplexer: 64-ch, 2-wire, 100 Vdc/1A, Reed Relays	37
M9102A	PXI High Density Multiplexer: 128-ch, 1-wire, 100 Vdc/1A, Reed Relays	37
M9103A	PXI High Density Multiplexer: 99-ch, 2-wire, 100 Vdc/1A, EM Relays	37
M9120A	PXI Matrix Switch: 4x34, 2-wire, 100 Vdc/2A, EM Relays	38
M9121A	PXI Matrix Switch: 4x64, 2-wire, 100 Vdc/.5A, Reed Relays	38
M9122A	PXI Matrix Switch: 8x32, 1-wire, 100 Vdc/2A, EM Relays	38
M9128A	PXI RF Matrix Switch: 300 MHz, 8x12, 50 Ω	39
M9130A	PXI SPDT Switch: 26-ch, 100 Vdc/2A, EM Relays	40
M9131A	PXI SPDT Switch: 64-ch, 100 Vdc/2A, Reed Relays	40
M9132A	PXI SPST Switch: 50-ch, 100 Vdc/1A, Reed Relays	40
M9133A	PXI SPST Switch: 100-ch, 10 Vdc/1A, Reed Relays	40
M9135A	PXI SPST Power Relay, 20-ch, 10 A @ 250 Vac, 300 W	40
M9146A	PXI RF Multiplexer: 3 GHz, Dual 1x4, 50 Ω, Terminated	39
M9147A	PXI RF Multiplexer: 3 GHz, Dual 1x4, 50 Ω, Terminated Common	39
M9148A	PXI RF Multiplexer: 3 GHz, 1x8, 50 Ω	39
M9149A	PXI RF High Density RF Multiplexer: 3 GHz, Dual 1x16, 50 Ω	39
M9150A	PXI RF Multiplexer: 3 GHz, Dual 1x4, 75 Ω	39
M9151A	PXI RF Multiplexer: 3 GHz, Quad 1x4, 75 Ω	39
M9152A	PXI RF Multiplexer: 3 GHz, 1x8, 75 Ω	39
M9153A	PXI RF Multiplexer: 3 GHz, 1x16, 75 Ω	39
M9155C	PXI Hybrid Dual SPDT Coaxial Switch, DC to 26.5 GHz	41
M9156C	PXI Hybrid Dual Transfer Switch, DC to 26.5 GHz	41
M9157C	PXI Hybrid Single SP6T Switch, DC to 26.5 GHz	41
M9155CH40 NEW	PXI Hybrid Dual SPDT Coaxial Switch, DC to 40 GHz	42
M9156CH40 NEW	PXI Hybrid Dual Transfer Switch, DC to 40 GHz	42
M9157CH40 NEW	PXI Hybrid Single SP6T Switch, DC to 40 GHz	42
M9170A	PXI Attenuator/Switch Driver module	43
M9216A	PXI 32-Channel High Voltage Data Acquisition Module	44
PXI DIGITAL INPUT OUTPUT		
M9187A	PXI Digital IO: 32-ch, 0.3 to 50 V	46
PXI DIGITAL MULTIMETERS		
M9181A	PXI Basic Features DMM	49
M9182A	PXI Digital Multimeter: 6½ digit	50
M9183A	PXI Digital Multimeter: 6½ digit, Enhanced Performance	50

PRODUCT CATEGORY INDEX

MODEL	DESCRIPTION	PAGE
PXI DIGITIZERS		
M9202A	PXIe IF Digitizer: 12-bit, 1 GHz	53
M9210A	PXI-H Digitizing Scope: 10-bit, 2-4 GS/s	54
M9211A	PXI-H UWB IF Digitizer: 10-bit, 4 GS/s, 3 GHz	55
PXI DIGITAL TO ANALOG CONVERTERS		
M9185A	PXI 8/16-Channel Isolated D/A Converter	59
M9186A	PXI Isolated Single Channel Voltage/Current Source, 100 V	60
PXI FUNCTION AND ARBITRARY WAVEFORM GENERATORS		
M9330A	PXI-H Arbitrary Waveform Generator: 15-bit, 1.25 GS/s	63
M9331A	PXI-H Arbitrary Waveform Generator: 10-bit, 1.25 GS/s	64
PXI LOGIC ANALYSIS AND PROTOCOL TEST		
M9252A NEW	DigRF Host Adapter	66
PXIe OPTICAL EXTENDERS		
M9403A	M9403A PXIe Optical Transmitter: 300 kHz to 26.5 GHz or 50 GHz	68
M9404A	M9404A PXIe Optical Receiver: 300 kHz to 26.5 GHz or 50 GHz	68
M9405A	M9405A PXIe Optical Amplifier: 300 kHz to 26.5 GHz or 50 GH	68
M9406A	M9406A PXIe Optical to USB 2.0	68
M9407A	M9407A PXIe Optical to 4 Port USB 2.0 Hub	68
M9408A	M9408A PXIe Optical Remote RF Reflectometer	68
PXI SIGNAL ANALYZERS AND SIGNAL CONDITIONERS		
X-Series Apps NEW	X-Series Measurement Applications for Modular Instruments software	72
89601B	89600 VSA software	73
W1461BP	SystemVue software	74
M9391A NEW	PXIe Vector Signal Analyzer: 1 MHz to 6 GHz	75
Dual Channel System	PXI Dual Channel Vector Signal Analyzer	76
M9392A	PXI Vector Signal Analyzer: 50 MHz to 26.5 GHz	77
MIMO System	PXI Wideband MIMO Vector Signal Analyzer	78
M9362A-D01	PXIe Quad Downconverter	79
M9168C	PXI Programmable Step Attenuator	80
M9202A	PXIe IF Digitizer: 12 bit, 1 GHz	81
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz	82
M9351A	PXI Downconverter: 50 MHz to 2.9 GHz	83
M9352A	PXI Hybrid Amplifier Attenuator	84
M9360A	PXI Attenuator/Preselector: 100 kHz to 26.5 GHz	85
M9361A	PXI Downconverter: 2.75 GHz to 26.5 GHz	86
PXIe SIGNAL GENERATORS (SOURCES)		
M9099 NEW	Waveform Creator software	89
W1461BP	SystemVue software	90
Signal Studio	Signal Studio software	91
M9381A	PXIe Vector Signal Generator	92
M9380A	PXIe CW Source	93
M9300A	PXIe Frequency Reference	94
AXIe MODULES		
M9502A	AXIe 2-slot Chassis	97
M9505A	AXIe 5-slot Chassis	97
M9536A	AXIe Embedded PC Controller	98
M9703A	AXIe Digitizer 12-bit, 8 Channels	99

PRODUCT CATEGORY INDEX

MODEL	DESCRIPTION	PAGE
AXIe MODULES (cont'd)		
M8190A	AXIe Arbitrary Waveform Generator	100
U4154A	AXIe Logic Analyzer 4 Gb/s	101
U4301A	AXIe Protocol Analyzer PCI Express® 3.0	102
U4421A	AXIe Protocol Analyzer and Exerciser for MIPI™ D-PHY Interfaces	103
U4431A NEW	AXIe Protocol Analyzer for MIPI™ M-PHY Interfaces	104
U4998A	AXIe Protocol Analyzer HDMI 1.4b	105
M9045B	PCIe Laptop Adapter: x1	106
M9048A	PCIe Desktop PC Adapter: Gen 2, Clock Isolation	107
PROGRAMMING ENVIRONMENT		
E2094	IO Libraries Suite 16 software	110
E2300	Command Expert software	111
N6171A	Matlab software	112

THE MODULAR ADVANTAGE

High performance and easy test system design...

For your data acquisition or automated test applications, your range of choices is getting bigger and better.

Agilent modular instrumentation extends Agilent's measurement expertise into modular form factors, such as PXI and AXIe. In these form factors, Agilent helps you benefit from a large portfolio of chassis and measurement modules integrated with world-class software applications to get the most trusted measurements in the DC, analog, digital, RF, microwave and lightwave domains.

Our offering includes a new PXI RF vector signal analyzer/generator enhanced by software applications including the X-Series measurement applications for modular instruments. Products also include a modular microwave vector signal analyzer, digitizers, waveform generators, digital multimeters, voltage/current sources (V/I), and a broad range of multiplexers, matrices and general purpose switching products that cover from DC to 40 GHz.

Architecture

High performance, flexible architecture

To ensure that you get the best performance from your test platform, the entire path from the controller to the instrument has been designed for speed.

- PCI Express® IO path from the controller to the instrument enables high-speed connectivity from faster, less-expensive remote controllers.
- High-speed memory-mapped registers reduce firmware overhead and communication latency.
- Optimized software drivers.

Software

Open development software platform

Because a single software platform is rarely the right answer for every test scenario, Agilent provides modules with a comprehensive portfolio of instrument drivers, documentation, examples, and software tools to help you quickly develop test systems with your software platform of choice.

Agilent also develops application software for design automation, verification, measurement and analysis capabilities. Applications such as SystemVue, X-Series measurement applications for modular instruments, 89600 VSA software, Waveform Creator, Signal Studio and MATLAB support a number of Agilent modular products.

www.agilent.com/find/modular

THE MODULAR ADVANTAGE

Why choose Agilent modular products?

Agilent has been a pioneer in developing and supporting advanced modular platforms. From the early days of leveraging VMEbus and integrating timing and synchronization to create VXI to the popular 34970 and 34980 switching and data acquisition platforms, Agilent is taking its modular expertise to furthering advancements in PXI and AXIe.

- Measurement expertise
- Automation optimized software and hardware
- Measurement consistency and efficiency from R&D to manufacturing
- Open SW platform supporting MATLAB, VEE, LabVIEW, VisualStudio
- Worldwide support and calibration and 3 year standard warranty

Measurement expertise

Agilent's long tradition of investing in advanced research furthers the foundation of measurement science through Agilent's Technology Leadership Organization and Agilent Research Labs. Our products integrate decades of unique signal and measurement algorithms to bring the most advanced hardware and software solutions to market. You benefit from this expertise in the early stages of product design to manufacturing.

Software and hardware optimized for test automation applications

Agilent developed PXI measurement hardware, software applications and drivers, optimized for test automation, to give users the lowest latency solutions. This translates directly to lower measurement times and higher test throughput.

Measurement consistency and efficiency from R&D to manufacturing

Reduce design cycle times through use of common software applications and measurement algorithms from design to manufacturing. Implement a platform for modeling, implementing and validating next generation communications systems. Use the same measurement applications in the lab and in your manufacturing environment to generate consistent test results.

Open software platform supporting MATLAB, VEE, LabVIEW, VisualStudio

With Agilent's modular open software platform, you have the largest choice of software applications and programming environments with complete support of MATLAB, VEE, LabVIEW, and Microsoft VisualStudio software. Furthermore, Agilent provides IVI-COM and IVI-C support for integration into almost any software environment.

Comprehensive worldwide support and calibration - 3 year standard warranty

From instrument maintenance and repair, to calibration and software solutions or consulting and education, Agilent offers services and a 3 year warranty to lower your total cost of ownership.

Agilent performs calibrations at its owned service centers and offers the highest number of RF parameter accreditations. There are over 50 locations in Agilent's global network to service your needs around the globe.

Is PXI the right choice for your application?

Summarized below are some of the unique benefits offered by an Agilent modular PXI platform.

Modular platform benefits

Higher measurement throughput

Technology innovations embedded in our PXI products enable fast tests and measurements. By leveraging computer-based technology, PXI also takes advantage of the latest advances in processors, reducing post-processing time. The PXIe backplane bus utilizes the PC industry's PCI Express® Gen2 technology, greatly increasing throughput and reducing latency. This technology helps transfer information between modules and controller at higher speeds, and will reduce test time, especially for data and transaction intensive test applications. In addition, Agilent PXI systems include a built-in streamlined driver architecture with direct memory access, and the measurement science used to take the measurement.

Greater flexibility and scalability

PXI is an open, multi-vendor standard that is governed by the PXI Systems Alliance (www.pxisa.org). This ensures that modules and infrastructure from different vendors can be used together. In addition, by integrating the bus into the backplane of the chassis, it is possible to continue scaling systems using PXI timing and synchronization methods.

Integrated systems

PXI easily integrates into hybrid systems where a test platform is a combination of standalone benchtop, proprietary modular, GPIB, USB, VXI, LXI or even the new AXIe modular form factor. Agilent's IO library suite makes the integration faster, by offering easy connection to both PXI and traditional instruments and reducing system setup and configuration time to mere minutes.

Smaller footprint

The biggest contributing factor aside from taking advantage of Moore's Law of integration and miniaturization is the removal of redundant functions in a integrated system. By abstracting the measurement technology from the processing and user interface functions, PXI removes redundancy and can save up to 80% of the space of a traditional system.

Lower power consumption

By virtue of taking advantage of advances in miniaturization and integration, PXI can limit slot power to 30W and still meet many of the needs of higher-end measurements. This means that a fully loaded 18-slot chassis still uses less than 1000W.

Is AXIe the right choice for your application?

What is AXIe?

AXIe is a next-generation open standard based on Advanced Telecom Computing Architecture (AdvancedTCA®) with extensions for instrumentation and test. This standard is governed by the AXIe Consortium, a group of leading organizations in the test and measurement industry and is designed to provide users with popular PC interfaces such as TCP/IP and PCI Express® to modular configuration slots which provide resources for advanced instrumentation (www.axiestandard.org).

AXIe's key attributes

As a standard, AXIe shares many characteristics with PXI but was designed to supplement the automated test platform standard.

A quick look at a few details reveals the underlying similarities and differences offered by AXIe. As the table shows, AXIe and PXI offer similar latency and transfer speeds because both use PCI Express as the backplane fabric.

2

Discover the Agilent...		
Feature	**AXIe**	**PXIe**
Chassis base	AdvancedTCA	cPCI, cPCIe
PCIe maximum data bandwidth (Gen2) Single peripheral slot to backplane All peripheral slots to system slot	 2 GB/s 10 GB/s (5-slot chassis)	 4 GB/s 8 GB/s
PCIe fabric	Yes	Yes
LAN backplane	Yes	No
Local bus	18 pairs required 62 pairs optional	1 line (13 PXI)
Triggers	Bi-directional star trigger 13-signal MLVDS bus	Star trigger (1x TTL, 3x diff per slot) Eight-signal TTL bus
Frequency reference and sync	100 MHz; Yes	10 MHz, 100 MHz; Yes
Power per slot	200 W	30 W
Board space per slot	900 cm²	160 cm²
Modules available	Dozens and growing	>1,000
AXIe and PXI Difference		

Is AXIe the right choice for your application?

How is AXIe different than PXI?

While PXI has made a name for itself in automated validation and manufacturing test applications on the strengths of its compact size, low power draw, and best in low-cost commercial off-the-shelf ASICs and technologies, AXIe balances PXI by providing the complement of these aforementioned features.

Powerful

Truly advanced and cutting edge measurement technologies previously unavailable to modular instrumentation

By increasing the power available to each slot from 30 W to 200 W, loosening board space constraints from 160 cm² to 900 cm², and increasing the headroom of each slot, leading test and measurement providers can now use AXIe as a platform for truly advanced and cutting edge measurement technologies previously unavailable to modular instrumentation. The additional power now supports extreme ASICs with switching speeds in the tens of gigahertz and power draws greater than 30 W. The additional board space will allow the development of complex measurement architectures with their supporting circuits all on a single card. Additionally, the extra slot headroom will allow mezzanine circuits for increased densities per slot or additional shielding to support very sensitive circuits. In brief, AXIe finally supports the development of cutting edge instrumentation in a modular form factor.

Interconnected

Systems designers are now limited only by their imagination

Another subtle difference between the two platforms is the augmented local bus which allows communications and synchronization between instrumentation slots. With over 600 GB/s of throughput, local bus now facilitates complex multi-instrument configurations for channel expansion, data storage and co-processing as well as internal synchronization and triggering. System designers are now limited only by their imagination.

AXIe Interoperability

AXIe is built on the same PCI Express® backplane fabric as PXI and the same LAN connectivity as LXI. This allows the three platforms to co-exist in the same system quite seamlessly.

In addition, the PXI and AXIe platforms will share the same software architecture both taking advantage of IVI and other elements of the driver software stack. AXIe also supports embedded controllers running user familiar operating systems such as Microsoft Windows. All of this makes AXIe seamless to develop for and integrate into an advanced measurement platform.

Seamless

PXI and AXIe share the same software architecture and familiar operating systems

AXIe Products

The AXIe product portfolio includes mainframes, a controller and new modules that offer leading performance in their categories.

Agilent M8190A Arbitrary Waveform Generator

MODULAR SOFTWARE ENVIRONMENT

PXI & AXIe - Easy setup and configuration

Modular test systems require a variety of hardware and software components. When configuring your systems you need to ensure compatibility between the mechanical, electrical and software aspects and achieve successful operation. Agilent provides a wide variety of tools to accelerate your system setup and give you confidence in its operation.

Agilent provides a wide variety of tools to accelerate your system setup

Startup Assistance

An Agilent Technologies applications engineer can help you get started quickly by installing the modules in a chassis, configuring the controller, loading software and making your first measurements.

Achieve Instrument Connection

Agilent IO Library

The *free* Agilent IO Libraries Suite offers fast and easy connection to modular and traditional instruments. It automatically finds interfaces, chassis and instruments, explores your configuration and updates IVI instrument drivers.

Already have multiple vendor I/O software installed? Agilent's open IO Libraries Suite provides system interoperability by automatically detecting National Instrument's software and safely installing the Suite in a side-by-side mode allowing the existing I/O software and Agilent software to work together.
Please see more details at page 110 or
www.agilent.com/find/iosuite

Quickly Discover and Manage Modules

Agilent Connection Expert

The Agilent Connection Expert, included in the free Agilent IO Library suite, allows you to search for, verify, and update IVI instrument and soft front panel drivers. This saves you time and ensures that the most up-to-date drivers are being used within your application.

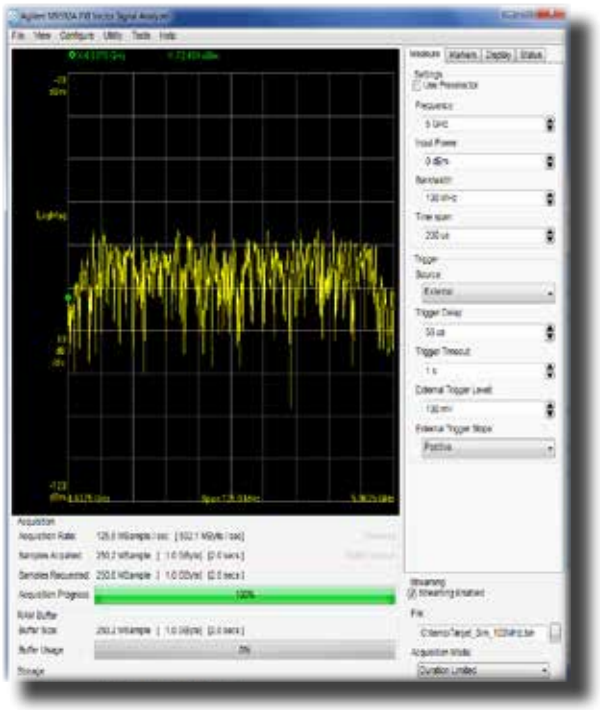
If your test system is a combination of modular and traditional instruments, the Agilent Connection Expert also identifies instruments connected though AXIe, GPIB, Ethernet/LAN and more.
Please see more details at page 110 or
www.agilent.com/find/iosuite

Easy Module Setup

Soft Front Panels

Agilent modules come with a Soft Front Panel - a Graphical User Interface (GUI), which guides you through module setup, helps you configure the instrument parameters, verifies connectivity to a module and explores its functionality.

Agilent's SFP enhances the out-of-box experience by providing measurement capabilities right away. The SFP utility is enriched with a code-generation functionality that automatically generates the code you can directly copy from the SFP setup into your system software. This is useful during software development and debug, and used to perform benchtop measurements with one or more modular devices.



Agilent Vector Signal Analyzer soft front panel

PXI & AXIe - Accelerate system development

Software...You Choose!

To support your software choice, every Agilent module includes the IVI-COM, IVI-C, LabVIEW and MATLAB software drivers that work in the most popular T&M development environments including, Visual Studio (VB. NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, and MATLAB. The instrument drivers provide context sensitive help such as Microsoft IntelliSense and LabVIEW hover-help complete documentation, and examples to decrease startup time on complex tasks.

If you work with multi-module instruments, Agilent's integrated drivers help you easily control instrument functions.

Seamless Control and Programming

Command Expert

Traditional T&M development enviroments typically do not offer assistance in finding the right instrument commands, setting the correct parameters, passing data and variables. Agilent's *free* Command Expert combines instrument commands, documentation, syntax checking and command execution all in one simple interface. It helps you run and debug command sequences before integrating them into other programming environments, such as MATLAB, Microsoft Excel, Agilent VEE, and LabVIEW.
Please see more details at page 111 or
www.agilent.com/find/commandexpert

Agilent's Measurement Science

Agilent's PXI modular products are an extension of Agilent measurement science in the PXI form factor. You can benefit from the same signal generation and analysis software that is currently used with Agilent benchtop instruments and get consistent measurements throughout the entire design and test flow.

Agilent's World-Class Software Applications

SystemVue

When used with Agilent modular products, SystemVue creates an expandable platform for modeling, implementing and validating next generation communications systems. A modular approach enables you to create a virtual system to be verified from the first day of the project - beginning with simulation models.
www.agilent.com/find/systemvue

Agilent's World-Class Software Applications (cont'd)

X-Series Measurement Applications for Modular Instruments

NEW

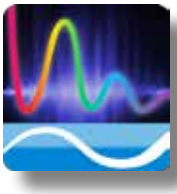
Expand the capabilities of your M9391A PXIe Vector Signal Analyzer with Agilent's library of measurement applications - the same applications used by its X-Series signal analyzers. Agilent's X-Series Measurement Applications for Modular Instruments transform PXIe VSAs into standards based RF transmitter testers, enabling you to test more products in less time while ensuring measurement continuity from design to manufacturing.
www.agilent.com/find/pxi-X-Series_apps

Vector Signal Analysis Software

Agilent's industry-leading 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 advanced designs.
www.agilent.com/find/vsa

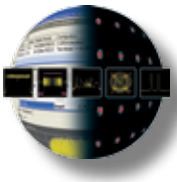
Waveform Creator Software

NEW



Easily create complex, customized waveforms with this new "drag and drop" graphical user interface and plug-in to Vector Signal Generators or Arbitrary Waveform Generators. Create multi-format, multi-track waveforms with wave segments displaced in frequency and time.
www.agilent.com/find/m9099

Signal Studio Software



Whether you're working on a single radio format or integrating multiple formats into a single device, easy access to the right test signals streamlines validation and helps ensure interoperability.

Signal Studio is a flexible suite of signal-creation tools that reduces the time you spend on signal simulation. Its performance-optimized reference signals—validated by Agilent—enhance the characterization and verification of your devices.
www.agilent.com/find/signalstudio

ACHIEVE LOWER COST OF OWNERSHIP

Calibration and repair can significantly influence the cost of owning a system. Agilent modular products are designed to maximize uptime through easy module exchange for maintenance, repair and calibration that helps keep your test systems operational.

Fast Repair Times

Core Exchange Program

Benefit from fast repair times, whether your repair strategy is return to Agilent, on-site repair, or self-maintainer.

For selected modular products, Agilent's replacement Core Exchange program allows fast and easy module repairs. A replacement core assembly is a fully functioning pre-calibrated module replacement that is updated with the defective module serial number, allowing the replacement module to retain the original serial number.

3

Standard Global Warranty - 3 years

NEW

We take pride in our product quality, as evidenced by our 3 year standard warranty. Our standard repair turnaround time averages less than 14 days. You have the option to extend the warranty to 5 years.

Express Warranty - 5 day turnaround

For selected modular products, reduce downtime with the fastest repair service in the industry. The express warranty upgrades the global warranty to provide:

- 5 day typical turnaround repair service in the US, Japan, China and many EU countries or up to a 10 day improvement in turnaround time in the rest of the world.
- Priority return shipment.

Reduce downtime with the fastest repair service in the industry

Calibration and Traceability - Providing the Highest Confidence in Test

Agilent's modular products are factory calibrated and most modules are shipped with an ISO-9002, NIST-traceable calibration certificate and a UK certification may be available upon request. Agilent performs calibrations at its owned service centers and offers the highest number of RF parameter accreditations. Calibration services can be performed:

- At one of Agilent's 46 worldwide service locations
- At your site by an Agilent expert

For some products, the calibration procedure used at the Agilent service centers is also available in the N7800A Calibration and Adjustment Software. It automates calibration to save time, reduce cost and ensure consistent quality results. The software also includes automated adjustments whenever measurement performance is outside acceptable limits.

The calibration status is maintained through the "electronic calibration sticker" which can be accessed programmatically or via the soft front panel. This utility helps ensure your instrument is calibrated by managing the calibration interval and providing messages regarding instrument and module calibration status.

Easily Upgrade Your Equipment Capability

With selected modular products, you may upgrade options such as memory, frequency range or modulation bandwidth through a license key. This means you can upgrade your equipment without shipping it to an Agilent facility. Simply place an order for the upgrade which can be activated online and installed via the instrument's soft front panel.

Self Test

A self test utility runs a set of internal tests which verifies the health of the modules and reports their status.

PXI & AXIe - INDUSTRY AWARDS

Agilent's portfolio of PXI and AXIe chassis and modules received multiple industry awards since its introduction in September 2010. The most recent awards, shown below, confirm that Agilent's modular portfolio is receiving marketplace recognition and demonstrates excellence in creating value for customers.

Winners and finalists for these awards are considered the best in the industry. They set the pace through their innovation, vision and technology leadership.

PXI CHASSIS AND CONTROLLERS

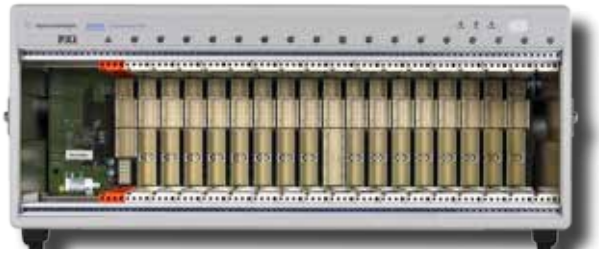
Select Agilent's PXIe chassis when you require high-performance and configurability. The M9018A PXIe chassis has unparalleled performance and flexibility including PCI Express® Gen 2 performance, 16 PXI hybrid slots, x8 links to peripheral slots, and an innovative cooling design that saves rack space and has lower maintenance costs.

To better fit with your footprint and performance needs, you have the choice between external desktop, laptop, or embedded Agilent controllers.

Product features

Chassis functionality

- 18 total slots including PXIe controller and timing module slots
- 16 PXIe hybrid slots
- Up to 867 W total power and 42 W/slot cooling



Agilent M9018A PXIe Chassis

Chassis performance characteristics

- Advanced PCIe® switch fabric that operates up to Gen 2 speeds
- Twelve x4 and four x8 links to module slots
- Backplane speeds of up to a 4 GB/s data rate from external controller to PXIe module slots
- Innovative cooling design that allows chassis to fit into 4U of rack space in most cases

Multi-chassis configurations NEW

The M9021A can be used with the M9018A PXIe Chassis to build multi-chassis systems. Up to four chassis can be connected together depending on the controller and operating system used. Many different topologies are possible including cascade and star. Two examples are shown below.

For more detailed configuration information, see: www.agilent.com/find/pxie-multichassis

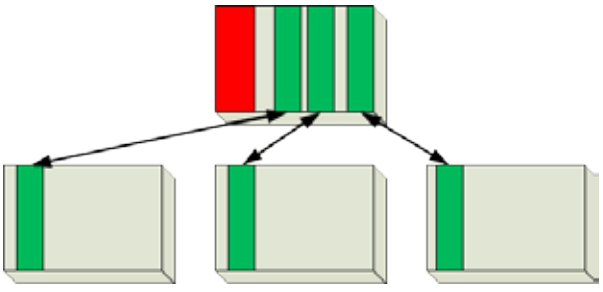


Figure 1. Star configuration with M9036A Embedded Controller and M9021A PCIe interface

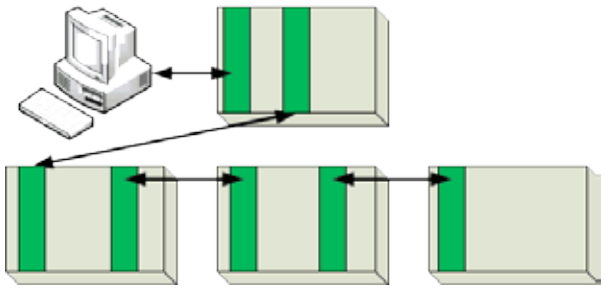


Figure 2. Cascade configuration with External Controller and M9021A PCIe interface

PXI CHASSIS AND CONTROLLERS

Chassis

	Description	Height	Type # of slots	Number of slots	Maximum data bandwidth	System slot interface	Power supply	Power per slot
M9018A	PXIe Gen 2.0 Chassis	4U	PXIe 3U 18-slots	1 system 1 timing 16 hybrid	Module-to-module: 4 GB/s System-to-backplane: 8 GB/s	Configurable: 1x8, 2x8, 4x4	867.5 W	System 140 W PXI hybrid 42 W

PXI I/O and Computer Modules

	Description	Type # of slots	Processor	RAM (min/max)	HDD	Maximum data bandwidth	Cable interface	System slot interface
M9021A	PCIe® Cable Interface	3U PXIe 1-slot	NA	NA	NA	4 GB/s	x8 Gen 2 PCIe	x8 Gen 2 PCIe
M9036A	PXIe Controller	3U PXIe 3-slots	Intel i5 520E 2.4 GHz	4 GB 8 GB option	160 GB SSD	4 GB/s	N/A	2x8 or 4x4 PCIe Gen 2

External PC cards

	Description	Type # of slots	Maximum data bandwidth	Cable interface	PC host interface
M9045B	PCIe ExpressCard Adapter: Gen 1	ExpressCard 34 1-slot	250 MB/s	x1 Gen 1 PCIe	x1 Gen 1 PCIe
M9048A	PCIe desktop PC Adapter: Gen 2, Clock Isolation	PCIe x8 or x16 1-slot	4 GB/s	x8 Gen 2 PCIe	x8 Gen 2 PCIe

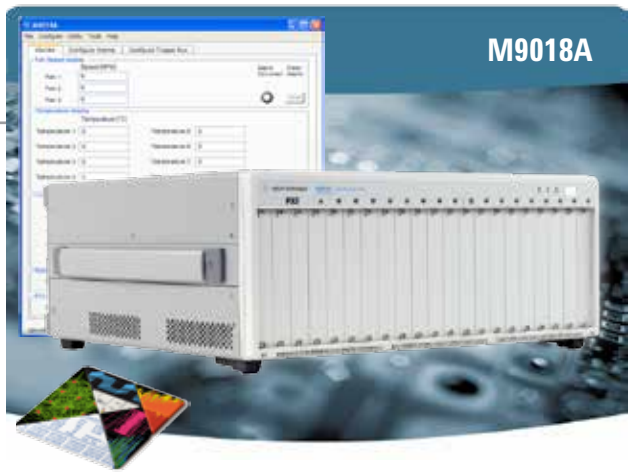
Driver information

Supported operating systems	M9018A: Microsoft Windows 7 (32/64-bit), Windows Vista (32/64-bit), Windows XP (32-bit) M9036A: Microsoft Windows 7 (32/64-bit), Windows XP (32-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW
Supported application development environments (ADE)	M9018A: Visual Studio (VB.NET, C#, C/C++), LabVIEW, LabWindows/CVI, VEE M9036A: Visual Studio (VB.NET, C#, C/C++), LabVIEW, LabWindows/CVI, MATLAB
Agilent IO Libraries	Includes: VISA Libraries, Agilent Connection Expert, IO Monitor

www.agilent.com/find/pxi-chassis

Agilent M9018A
18-Slot PXIe Chassis

www.agilent.com/find/m9018a



Industries and Applications

- Aerospace and defense communications
- Electronics test
- Semiconductor testing

Product Description

The M9018A chassis delivers the ultimate flexibility, compatibility, and performance. With 16 PXIe hybrid slots, it allows the system designer to mix and match the number and location of PXIe and hybrid PXIe-compatible modules. The advanced PCIe® switch fabric can operate up to Gen 2 speeds and can be configured for optimal performance with any PXIe controller. The innovative cooling design allows the chassis to fit in 4U of rack space. When combined with the latest 1U rack-mounted computer, you can build a powerful system using only 5U of rack space.

Main Features and Benefits

Product features	Your benefit
16 hybrid slots	Eases system integration with flexibility and compatibility
Gen 2 speeds as well as four x8 and 12 x4 links to module slots	Large data rate supports high-performance applications
Advanced PCIe switching	Provides configuration flexibility
Innovative cooling design	Saves rack space and lowers maintenance cost
867.5 W power supply	Provides power to spare for application requirements

Specifications and Characteristics

Hardware	
Size	4U
Number of slots	18 total, 16 hybrid-compatible PXI-1 and cPCI (J1 only), PXIe, PXI-H

Specifications (cont'd)

Power supply output	220-240VAC input - 867.5 W 100-120VAC input - 717.5 W
Power dissipation	System slot - 140 W max User slot - 42 W max [1]
System slot link configuration (selectable)	
2-link config for M9021A	1x8 (link 2 inactive)
2-link configuration	2x8
4-link configuration	4x4
Data bandwidth (max)	Slot-to-slot - 4 GB/s System slot-to-user slots - 8 GB/s

1. Maximum per slot power dissipation at 55°C with 15°C temperature rise; requires: a) that the chassis bottom is not blocked (1U rack space below or sitting on bench with feet extended) or b) two air inlet modules in slots 9, 10, or 11, and a slot blocker in empty controller slots. Module cooling can be impacted by each module's resistance to air flow.

Ordering Information

Model	Description
M9018A	PXIe chassis: 18-slot, 3U, 8 GB/s
Opt 900-932	Power cord options
Related products	
M9021A	PCIe cable interface: Gen 2, x8
M9036A	Embedded PXIe PC controller
M9045B	PCIe ExpressCard adaptor: Gen 1
Y1200B	PCIe cable: x1 to x8, 2.0m (used with M9045B)
M9048A	PCIe desktop PC adapter: Gen 2, x8
Y1202A	PCIe cable: x8, 2.0m (used with M9048A)
Accessories	
Y1212A	Slot blocker kit: 5 single slot
Y1213A	PXI EMC filler panel kit
Y1214A	Air inlet module kit
Y1215A	Chassis rack mount kit for M9018A

Agilent M9021A PCIe® Cable Interface

www.agilent.com/find/m9021a

Industries and Applications

- Aerospace and defense
- Communications
- Electronics test
- Semiconductor testing

Product Description

The M9021A PCIe cable interface provides a link between the M9018A PXIe chassis and an external host computer. It can also be used to link multiple M9018A together or to link an AXIe chassis to the M9018A. Once installed in the chassis and connected to the computer via a standard PCIe cable, the M9021A provides a very high bandwidth serial link between the devices. This link is transparent to computer applications and allows direct control of PXI and PXIe modules. The M9021A utilizes special features built into the M9018A PXIe chassis and is not compatible with the PXIe system slot in other PXIe chassis.

Main Features and Benefits

Product features	Your benefit
Gen 2 speeds and x8 PCIe links	Large data rate supports high-performance applications
Standard PCIe over cable	Use with any computer with an x8 PCIe interface
Transparent operation with application software	Provides ease of installation
Target and Host modes	Enables large PXIe systems or mixed PXIe-AXIe systems with a single controller

Specifications and Characteristics

Hardware	
Size	1-slot 3U
PCIe link configuration	Gen 2 x8 link to primary M9018A Gen 1 x8 link to secondary M9018A or M9502A/M9505A in multi-chassis configurations
Data bandwidth (max)	4 GB/s to external controller 4 GB/s to primary M9018A backplane 2 GB/s between chassis in multi-chassis configurations
Front panel connector	x8 PCIe cable connector
Front panel indicators	LEDs for PCIe lane status
Power consumption	*5 W (typical)*
Cable length	Up to a 2 meter passive cable supported

Ordering Information

Model	Description
M9021A	PCIe cable interface: Gen 2, x8
Related products	
M9018A	PXIe chassis: 18-slot, 3U, 8GB/s
M9045B	PCIe ExpressCard adaptor: Gen 1
Y1200B	PCIe cable: x1 to x8, 2.0m (used with M9045B)
M9048A	PCIe desktop PC adapter: Gen 2, x8
Y1202A	PCIe cable: x8, 2.0m (used with M9048A)

Connector compatibility: M9018A

Agilent M9036A
PXIe Embedded PC Controller

www.agilent.com/find/m9036a

Industries and Applications

- Aerospace/defense
- Communications
- General purpose applications
- Electronic functional test

Product Description

The Agilent M9036A is an embedded PXIe PC controller which enables a compact platform solution. With the 2-link, 2x8 Gen 2 backplane configuration, it is an ideal match for the Agilent M9018A PXIe chassis. This three-slot module easily integrates into hybrid test systems using GPIB, USB, and LAN with the built-in front panel interfaces. Built upon a mid-performance Intel Core i5 dual-core processor with Hyper-Threading Technology, the M9036A is designed for applications in multi-tasking environments.

Main Features and Benefits

Product features	Your benefits
Gen 2 PCIe® backplane switches	Enables high-speed peer-to-peer data transfers between M9018A peripheral slots
Intel Core I5 dual-core processor	Ideal for applications in multi-tasking environments
Preloaded with Agilent I/O libraries and operating system	Reduces test system development time
Designed for PXIe systems	Provides choice between embedded and external controllers
Solid-state drive (SSD)	Improves mechanical reliability

Specifications and Characteristics

Hardware	
Size	3-slot, PXIe system module
CPU	Intel i5-520E dual-core at 2.4 GHz
Storage Type Size	 2.5" SATA II SSD 160 GB
Memory	4 GB standard, 8 GB optional 8 GB maximum
PXIe PCIe link configuration	2x8 or 4x4 (automatically configured based on chassis configuration)
PXIe PCIe data bandwidth (max)	2 GB/s max to/from the processor 4 GB/s max between PCIe backplane links (2-link mode)
Front panel connections	USB (4), 10/100/1000 LAN (2), VGA 2028x1536 @75 Hz (requires DVI-VGA adapter), DVI-I up to 1920x1200 @60 Hz, GPIB (Micro-D 25-pin), ExpressCard 34 mm slot, PXI trigger in/out (SMB)

Ordering Information

Model	Description
M9036A	PXIe embedded PC controller, 4 GB RAM
M9036A-M08	Memory upgrade from 4 GB RAM to 8 GB RAM
M9036A-WE6	Windows Embedded Standard 7 Operating System (64-bit)
M9018A	18-slot PXIe chassis
Other options	
M9036A-WE3	Windows Embedded Standard 7 Operating System (32-bit)
M9036A-WXP	Downgrade to Windows XP Operating System (32-bit)

Chassis slot compatibility: PXIe system module slot (with two or more controller expansion slots)

Agilent M9045B PCIe® ExpressCard Adapter

www.agilent.com/find/m9045b

Industries and Applications

- Aerospace and defense
- Communications
- Electronics test
- Semiconductor testing

4

Product Description

The M9045B is a PCIe® interface card that can be used with an Agilent AXIe chassis, such as the M9502A/5A, or a PCIe cable interface, such as the M9021A.

This adapter uses the ExpressCard 34 format typically found in laptop computers. It provides a x1 Gen 1 link to the computer (One Stop OSS-PCIE-HIB2-EC-x1).

Main Features and Benefits

Product features	Your benefit
ExpressCard format and low power consumption	Provides a transportable solution
Standard PCIe over cable	Allows use with any computer with PCIe ExpressCard interfaces
Transparent operation with application software	Delivers ease of installation

Specifications and Characteristics

Hardware	
Card format	PCIe ExpressCard 34
Dimensions	34 mm (1.34 in) x 110.8 mm (4.36 in)
Number of PC slots	1
Data bandwidth (max)	250 MB/s
Connector	x1 PCIe cable connector
Cable length	Up to a 7-meter passive cable supported

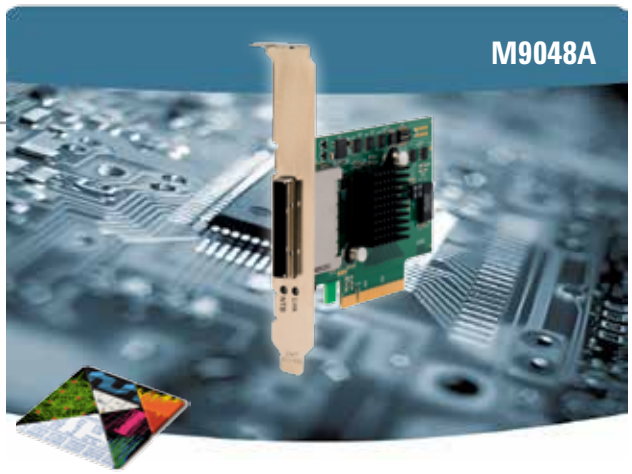
*For more complete specifications and manuals, visit the OSS Web site: **http://www.onestopsystems.com**/*
This product comes with a one year warranty and can be returned to either Agilent or OSS for warranty service.

Ordering Information

Model	Description
M9045B	PCIe ExpressCard adapter: Gen 1
Related Products	
M9021A	PCIe cable interface: Gen 2, x8
M9502A	2-slot AXIe chassis
M9505A	5-slot AXIe chassis
Accessories	
Y1200B	PCIe cable: x1 to x8, 2.0m (used with M9045B)

Agilent M9048A PCIe® Desktop PC Adapter

www.agilent.com/find/m9048a



Industries and Applications

- Aerospace and defense
- Wireless communications
- Electronics test
- Semiconductor testing

Product Description

The M9048A PCIe® desktop PC adapter provides a high-performance (Gen 2 x8) link between a host PC and PXIe or AXIe chassis.

The M9048A utilizes a PCIe switch and clock isolation to provide a high-quality clock source driven down the PCIe cable to the PXIe or AXIe chassis. As a result, the adapter always provides the same, high-performance Gen 2 link, independent of the PC. It can also operate in most Gen 3 PC slots because the PC can train to Gen 2. The adapter is compatible with desktop or rackmount computers that have either x8 or x16 PCIe expansion slots (mechanical). It connects directly to the M9502A/5A AXIe or M9018A PXIe chassis with a Y1202A PCIe cable.

Main Features and Benefits

Product features	Your benefit
PC host clock isolation	Provides superior computer compatibility
IDT PCIe switch	Compatibility with PCs that have Gen 3 PCIe slots
Gen 2 x8 PCIe capability	Enables high-performance applications
Standard PCIe over cable	Connects a PXIe or AXIe chassis to PCs with expansion slots
Transparent operation with application software	Delivers ease of installation

Specifications and Characteristics

Hardware	
Card format	PCIe half-card format (half-height and half-width)
Computer expansion slot compatibility	x8 and x16, Gen 1, 2, or 3*
Dimensions	55 mm (2.2 in) x 114 mm (4.5 in)
Number of PC slots	1
Data bandwidth (max)	4 GB/s (Gen 2 x8 PC slot)
Connector	x8 PCIe IPASS cable connector
Card indicators	LEDs for link status and transport mode
Power consumption	7 W (typ)
Cable length	Up to 2-meter passive cable
PCI bracket	Includes both low profile and standard profile brackets
Operating temperature	0 C - 55 C

** The M9048A is designed to be compatible with most Gen 3 PCIe PC slots, but the PC will train to Gen 2.*

Ordering Information

Model	Description
M9048A	PCIe desktop PC adapter: Gen 2, x8, clock isolation
Related products	
M9018A	PXIe chassis: 18-slot, 3U, 8GB/s
M9021A	PCIe cable interface: Gen 2, x8
M9045B	PCIe ExpressCard adapter
M9502A	AXIe chassis: 2-slot with integrated system module
M9505A	AXIe chassis: 5-slot with integrated system module
Accessories	
Y1202A	PCIe cable: x8, 2.0m

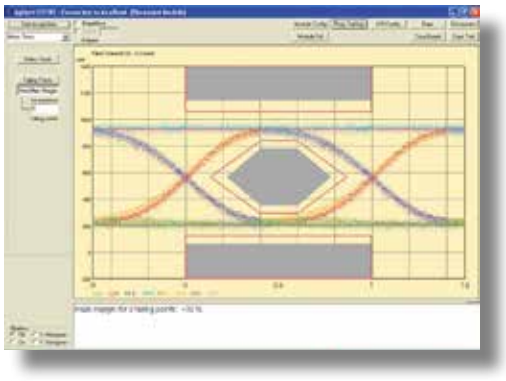
PXI BIT ERROR RATE TESTERS (BERTS)

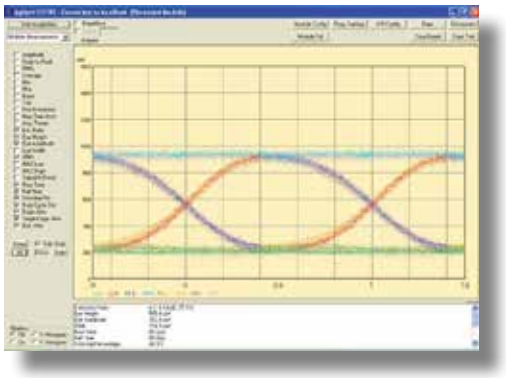
The Agilent PXI modules address the test of photonic and conventional components in the telecommunications, data communications and computing markets for bit error rate, eye diagram analysis, mask and jitter testing. For the manufacturing industry, this unique test solution combines a modular Bit Error Ratio Tester (BERT) and a Digital Communications Analyzer (DCA), providing a very wide bit rate coverage and excellent performance. Products include a Bit Error Ratio Tester, a Digital Communications Analyzer, a Pattern Generator, and a PXI Synthesizer all suitable for bitrates up to 10.3125 Gb/s.

Product features and your benefits

- Eye diagram, mask analysis and jitter testing in a single instrument
- Low cost and high throughput–ideal for manufacturing test environments
- Significantly smaller than a conventional BERT
- Jitter bathtub display
- Error injection: single error or error rate injection
- Differential data generation and analysis

Agilent PXIT Family of Modules





Agilent N2100B Digital Communication Analyzer soft front panels

www.agilent.com/find/pxi-ber

PXI BIT ERROR RATE TESTERS

RF Signal Generators (Signal Source)

	Description	Type # of slots	Frequency range	Output power	Phase noise (20 kHz offset)	Switching speed	Output Power accuracy	Software applications
N2099A	RF Synthesizer and Clock Source for N2102B, N2101B	PXI-H 2-slot	Optional 5.25 ± 1 GHz or 10.5 ± 1 GHz	Min +8 dBm (4, 5, 6 GHz); min +6 dBm (9, 10, 11 GHz)	500 MHz	100 ms	±3 dB variation over temperature, frequency	N/A

Digital Communication Analyzer (DCA)

	Description	Type # of slots	Electrical input bandwidth	Optial input	Sample rate	Clock input	Clock recovery	Clock input voltage range
N2100B	Digital Communication Analyzer	PXI-H 4-slot	1 channel, single ended AC coupled, 9.5 GHz (char)	62.5/125 µm fiber, 750–1650 nm, 10.3125 Gb/s	160 MS/s	10 MHz – 11.318 GHz (char.), 0.5 to 1 V pp	<2.7 Gb/s	500 mV to 1 V pp

Bit Error Rate Testers (BERTS)

	Description	Type # of slots	Bit rate	PRBS patterns	Data patterns	Output voltage range	Outputs	External clock input
N2101B	Bit Error Ratio Tester	PXI-H 3-slot	155 Mb/s to 10.3125 Gb/s	2^n - 1, n = 7, 9, 11, 15, 23, 31	K28.5, K28.7, CRPAT, user-loadable 2 kbits	250 mV to 1 V pp	1 x differential ports	500 MHz to 10.7 GHz

Pattern Generator

	Description	Type # of slots	Bit rate range	PRBS patterns	Data patterns	Output voltage range	Outputs	Clock input voltage range
N2102B	Pattern Generator	PXI-H 2-slot	622 Mb/s to 10.3125 Gb/s	2^n - 1, n = 7, 9, 11, 15, 23, 31	K28.5, K28.7, CRPAT, user-loadable 2 kbits	250 mV to 1 V pp	1 x differential ports	500 mV to 1 V pp

Driver information

Supported operating systems	Microsoft Windows 7 (32/64-bit), Windows XP (32-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW, MATLAB
Supported application development environments (ADE)	Visual Studio (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, MATLAB
Agilent IO Libraries	Includes: VISA Libraries, Agilent Connection Expert, IO Monitor

The N2099B, N2100B, N2101B, N2102B and their accompanying software fully comply with PXI specifications. The included Windows application enables the user to control the instrument without any software development required. An ActiveX Control makes integration into custom applications easy. The software suite provided with the N2102B enables easy setup and accelerates the time to first measurement.

www.agilent.com/find/pxi-ber

Agilent N2099A Synthesizer

www.agilent.com/find/pxi-ber

Industries and Applications

- Transceiver Test
- Telecommunication Equipment Test
- Fibre Channel, Ethernet, PON, Parallel Optics
- Multi-port system testing
- High port count burn-in test

Product Description

The N2099A PXI synthesizer is tunable over a 2 GHz range and includes synchronous dual RF outputs. There are two options available that cover different frequency ranges depending on the required application.

The N2099A is the ideal clock source for the N2102B.

Main Features and Benefits

Product features	Your benefit
Two frequency ranges available between 4.25 and 11.5 GHz	Coverage of an extended range of test applications
10 MHz clock output and two synchronous RF outputs	Provide clock or reference signals to multiple other modules, e.g. BERTs or Pattern Generators
Permanent magnet YIG (PMYTO) based synthesizer	Excellent phase noise performance
Non-volatile storage of set frequency – unit powers up at previously set frequency	Avoids operator errors

Connector compatibility: cPCI, PXI-H, PXI-1

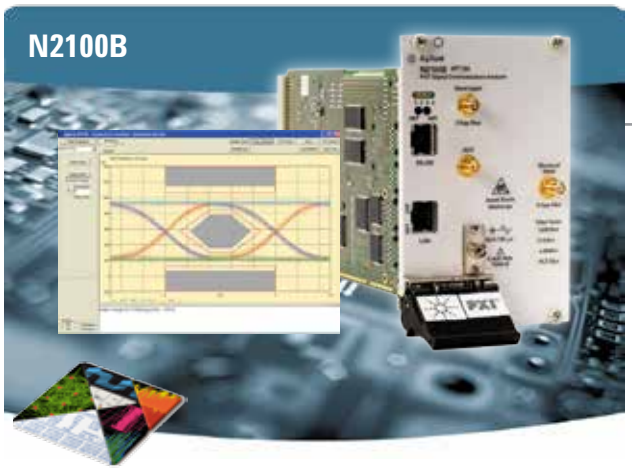
Specifications and Characteristics

Hardware	
Size	2-slot module
Output center frequency	5.25 GHz (option N2099A-052), 10.5 GHz (option N2099A-105)
Frequency tuning range	±1.0 GHz
Output power	+8 dBm (4, 5 and 6 GHz, characteristic) +6 dBm (9, 10 and 11 GHz, characteristic)
Power variation over temperature/frequency	±3 dB
Switching speed, 100 MHz step	100 ms typical
External reference oscillator output frequency (TCXO)	10 MHz

Ordering Information

Model	Description
N2099A	PXI Synthesizer
N2099A-052	4.25 GHz to 6.25 GHz
N2099A-105	9.5 GHz to 11.5 GHz

Related products	
N2100B	PXI Digital Communication Analyzer
N2101B	PXI Bit Error Ratio Tester
N2102B	PXI Pattern Generator



Agilent N2100B Digital Communication Analyzer

www.agilent.com/find/pxi-ber

Industries and Applications

- Test of Optical and Electrical Transceivers
- Telecommunication Equipment Test
- Fibre Channel, Ethernet, PON, Parallel Optics
- Multi-port system testing
- High port count burn-in test

Product Description

The N2100B PXI DCA combines the benefits and measurement capabilities of a real time scope with the bandwidth of a sampling scope, using a coherent patented vector undersampling technique. The N2100B performs accurate eye diagram analysis to characterize the quality of transmitters from 155 Mb/s to 10.3125 Gb/s.

Main Features and Benefits

Product features	Your benefit
PON and 10 GigE filters available	Extended test capabilities
Smart Post Processing	Allows optical transceiver manufacturers increase throughput
ER Correction Factor	Enables even tighter correlation with other instruments
Eye diagram, mask and jitter testing in a single instrument	Allowing DUT's quality assessment, control and binning
Wide optical bandwidth coverage from 750 nm to 1650 nm	Cover test of optical transmitters for telecommunication and data communication use

Connector compatibility: cPCI, PXI-H, PXI-1

Specifications and Characteristics

Hardware	
Size	4-slot module
Electrical input	1 channel, single ended AC coupled, 1 V pp (max)
BW of electrical input	9.5 GHz (characteristic)
Optical input	62.5/125 µm fiber, 750—1650 nm
BW of optical input	10.3125 Gb/s (option 210)
Sample rate	160 Ms/s
Waveform acquisition	1024 points per acquisition, max. 1024 acquisitions
Pattern acquisition mode	Max. 2047 bits pattern length, 128 points per bit, fixed
Clock recovery	<2.7 Gb/s
Clock input frequency range	10 MHz to 11.318 GHz (char.)
Clock input voltage range	0.5 to 1 V pp

Ordering Information

Model	Description		
N2100B	PXI Digital Communication Analyzer Must choose any 4 different filter rates:		
N2100B-300	PXI DCA 155 Mb/s to 10.3125 Gb/s		
Options			
Option 110	155 Mb/s	Option 120	622 Mb/s
Option 130	1.063 Gb/s	Option 140	1.25 Gb/s
Option 150	2.125 Gb/s	Option 160	2.488/2.5 Gb/s
Option 180	3.125 Gb/s	Option 190	4.25 Gb/s
Option 193	5.0 Gb/s	Option 195	6.25 Gb/s
Option 197	8.5 Gb/s	Option 210	9.95/10.3125 Gb/s

Related products	
N2101B	PXI Bit Error Ratio Tester
N2102B	PXI Pattern Generator
N2099A	PXI Synthesizer

Agilent N2101B
10.3125 Gb/s Bit Error Ratio Tester

www.agilent.com/find/pxi-ber

Industries and Applications

- Transceiver Test
- Telecommunication Equipment Test
- Fibre Channel, Ethernet, PON, Parallel Optics
- Multi-port system testing
- High port count burn-in test

Product Description

The N2101B PXI 10.3125 Gb/s BERT consists of a high accuracy clock source, data pattern generator, and error detector. It will automatically perform bit error ratio analysis to characterize the quality of devices at 12 standard internal rates from 155 Mb/s to 8.5 Gb/s.

In conjunction with a synthesizer such as the Agilent N2099A, the N2101B BERT can operate at any rate up to 10.3125 Gb/s.

Main Features and Benefits

Product features	Your benefit
Significantly smaller than a conventional BERT	Fits well in space constrained test environments
Easily combined with DCA, Synthesizer, Pattern Generator or multiple BERT modules in a PXI chassis	Complete, integrated, modular PXI transceiver test solution
Pattern generation and BER measurements for rates from 155 Mb/s to 8.5 Gb/s	Same test platform for a wide number of formats, including Fibre Channel, GbE, Xaui, PCI Express®, OC196/STM64

Specifications and Characteristics

Hardware	
Size	3-slot module
Pattern generator output Jitter	2.5 ps RMS (max), 1.5 ps RMS (characteristic)
Pattern generator output voltage range	250 mV to 1 V
Rise/ Fall times (20-80%)	25 ps (max), 22 ps (characteristic)
Error detector input (differential)	50 mV to 2 V range, 50 mV sensitivity
External clock input	500 mV to 1 V (characteristic), 500 MHz to 10.3125 GHz
Divided clock rate outputs	1, 2, 4, 8 & 128 (output on separate port)
Pattern generation	PRBS 2^n -1, (n=7, 9, 11, 15, 23, 31); K28.5, K28.7 and CR Pat; User defined patterns with 2048 bits max length or 16 KB if pattern length is divisible by 64.

Ordering Information

Model	Description
N2101B	PXI Bit Error Ratio Tester
N2101B-300	155 Mb/s to 10.3125 Gb/s module
Related products	
N2100B	PXI Digital Communication Analyzer
N2102B	PXI Pattern Generator
N2099A	PXI Synthesizer

Connector compatibility: cPCI, PXI-H, PXI-1

Agilent N2102B Pattern Generator

www.agilent.com/find/pxi-ber

Industries and Applications

- Transceiver Test
- Telecommunication Equipment Test
- Fibre Channel, Ethernet, PON, Parallel Optics
- Multi-port system testing
- High port count burn-in test

Product Description

The N2102B PXI Pattern Generator is capable of generating a number of low jitter patterns at rates up to 10.3125 Gb/s using an externally supplied clock. ActiveX Controls allow for easy software development and a graphical user interface is provided for manual operation of the module.

Main Features and Benefits

Product features	Your benefit
PRBS generations $2^n - 1$, (n = 7, 9, 11, 15, 23, 31); User defined patterns with 2048 bits max. length or 16 KBz if pattern length is divisible by 64	Flexible, custom pattern generation
2-slot PXI module	Minimum rack space
Clock input	Driven by the N2101B's clock output, the N2102B serves as a detached stimulus for the BERT

Specifications and Characteristics

Hardware	
Size	2-slot module
Bit rate operation	622 Mb/s to 10.3125 Gb/s
Output rise/fall time (20% - 80%)	25 ps (max), 22 ps (characteristic)
Output intrinsic jitter	2.5 ps RMS (max), 1.5 ps RMS (characteristic)
Output voltage range	250 mV to 1 V pp
Output voltage resolution	5 mV
Pattern trigger/clock output voltage	1 V pp (characteristic)
Clock input voltage range	500 mV to 1 V pp (characteristic)

Ordering Information

Model	Description
N2102B	PXI Pattern Generator
N2102B-300	622 Mb/s to 10.3125 Gb/s
Related products	
N2100B	PXI Digital Communication Analyzer
N2101B	10.3125 Gb/s Bit Error Ratio Tester
N2099A	PXI Synthesizer

Connector compatibility: cPCI, PXI-H, PXI-1

PXI DATA ACQUISITION AND SWITCHING

Whether you use switching to route signals for design verification applications or complex automated function test systems, Agilent has the data acquisition and switch platforms that will allow you to get the job done faster with confidence in your measurement results.

The PXI data acquisition and switch modules deliver modular, high-performance signal connections in the standard PXI platform. Agilent offers a wide selection of performance such as high-speed, 500 usec multiplexer relays, high-power, 300 W general purpose switches and high-density 256 2-wire cross point matrix modules. Additionally, RF and microwave switch technology delivers low insertion loss and VSWR for excellent RF signal integrity and dynamic range when routing RF signals into your measurement equipment.

The new microwave PXI hybrid switch modules (product numbers M9155CH40, M9156CH40 and M9157CH40) operate from DC to 40 GHz and have a guaranteed 0.03 dB insertion loss repeatability through the operating life of 5 million cycles (typical life of 10 million cycles).

The new 40 GHz PXI switches offer:

- Reduced downtime for re-calibration for improved test efficiency
- Unmatched isolation: 65 dB at 40 GHz

Which Data Acquisition and Switch Module is right for you?

- *Select and compare modules*
- *Compare switch platforms*
- *Define a switching solution*
- *Select and compare switch and control modules*

www.agilent.com/find/pxi-switch

PXI DATA ACQUISITION AND SWITCHING

General Purpose Switches

The PXI general purpose switch modules deliver fast, reliable switching in a variety of configurations.

Key features

- Independent, single-pole, double-throw (Form C) or single-pole, single-throw (form A) switches in a single module
- High-speed , long-life reed relays
- High-power electromechanical relay, handling up to 300 W/2500 VA

General Purpose Switches

	Description	Type # of slots	Channels	Switching speed (typical)	Max voltage	Current switch & carry	Relay type	Connectors
M9130A	SPDT switch	PXI 1-slot	26 Form C	2.7 ms	250 Vrms	2 A/2 A	Armature	78D connector block or cable
M9131A	SPDT switch	PXI 1-slot	64 Form C	2 ms	100 Vrms	0.25 A/1 A	Reed	200LFH connector block or cable
M9132A	SPST switch	PXI 1-slot	50 Form A	0.35 ms	100 Vrms	1 A/1 A	Reed	200LFH connector block or cable
M9133A	SPST switch	PXI 1-slot	100 Form A	0.35 ms	100 Vrms	1 A/1 A	Reed	200LFH connector block or cable
M9135A	SPST power relay	PXI 1-slot	20 Form A	10 ms	250 Vrms 125 Vdc	5 A/5 A	Armature	20MSM connector block or cable

Matrix Switches

The PXI matrix switch modules deliver medium to high density switching of multiple channels in a single instance.

Key features

- Up to 256 two-wire cross points can be configured in a single module
- High-speed, long life, reed relays (up to 100 VDC/100 VAC, 20 W
- Higher power electromechanical relays (up to 125 VDC/125 VAC, 60 W)

Matrix Switches

	Description	Type # of slots	Channels	Switching speed	Max voltage	Current switch & carry	Relay type	Connectors
M9120A	Matrix switch	PXI 1-slot	4 x 32, 2-wire	3 ms	100 Vrms	2 A/2 A	Armature	78 Dsub connector block or cable
M9121A	High Density Matrix switch	PXI 1-slot	4 x 64, 2-wire	< 1 ms	100 Vrms	0.5/0.5 A	Reed	200 LFH connector block or cable
M9122A	Matrix switch	PXI 1-slot	8 x 32, 1-wire	3 ms	100 Vrms	2 A/2 A	Armature	50 Dsub connector block or cable

www.agilent.com/find/pxi-switch

PXI DATA ACQUISITION AND SWITCHING

Multiplexer Modules

The PXI multiplexer modules deliver high-speed signal routing for many channels to a single point and are ideal for routing multiple analog signals to a measurement device.

Key features

- Available in 1-wire or 2-wire configurations
- High-speed, long-life, reed relays (up to 100 VDC/100 VAC, 20 W)
- Higher power electromechanical relays (up to 100 VDC/100 VAC, 60 W)

Multiplexers

	Description	Type # of slots	Channels	Switching speed (typical)	Max voltage	Current switch and carry	Relay type	Connectors
M9101A	High-density multiplexer	PXI 1-slot	64 channels, 2-wire	1,000 µs	100 Vrms	0.5 A/1.0 A	Reed	200LFH connector block or cable
M9102A	High-density multiplexer	PXI 1-slot	128 channels, 1-wire	1,000 µs	100 Vrms	0.5 A/1.0 A	Reed	200LFH connector block or cable
M9103A	High-density multiplexer	PXI 1-slot	99-channels, 2-Wire	4.5 ms	100 Vrms	1 A/1 A	Armature	200LFH connector block or cable

Data Acquisition

The M9216A is a high voltage, high channel count data acquisition module. The M9216A High Voltage DAQ is capable of parallel measurement of positive voltages that fluctuate between very low and very high levels.

Key features:

- High voltage range, high channel count
- Simultaneous dual measurement range for each channel
- Auxiliary outputs for additional measurement

Data Acquisition

	Description	Type # of slots	Channels	Scan Channel Seconds	Min Voltage	Max Voltage	Max Current
M9216A	High voltage DAQ	PXI 2-slot	32 channels	250 kSa.s	1 mV	100 V	0.5 A

www.agilent.com/find/pxi-switch

PXI DATA ACQUISITION AND SWITCHING

RF Switches

The PXI RF switch modules deliver high-performance, high-density, switching of up to 3 GHz and are available in multiple configurations.

Key features

- Low insertion loss and VSWR
- Excellent RF signal integrity and dynamic range
- Repeatable RF performance

RF Switches

	Description	Type # of slots	Frequency range	Insertion loss (typical)	Isolation (typical)	VSWR (typical)	Impedance	Connectors
M9128A	8 x 12 matrix switch	PXI 1-slot	300 Mhz	2 dB at 300 MHz	40 dB at 300 MHz	2:1 at 300 MHz	50 Ω	SMB male connectors
M9146A	Dual 1 x 4 multiplexer	PXI 1-slot	3 GHz	0.8 dB at 3 GHz	45 dB at 3 GHz	< 1.3:1 at 3 GHz	50 Ω, off channel termination	SMB male connectors
M9147A	Quad 1 x 4 multiplexer	PXI 1-slot	3 GHz	1 dB at 3 GHz	40 dB at 3 GHz	< 1.4:1 at 3 GHz	50 Ω	SMB male connectors
M9148A	1 x 8 multiplexer	PXI 1-slot	3 GHz	0.8 dB at 3 GHz	40 dB at 3 GHz	< 1.25:1 at 3 GHz	50 Ω	SMB male connectors
M9149A	1 x 16 high density multiplexer	PXI 1-slot	3 GHz	1.2 dB at 3 GHz	40 dB at 3 GHz	< 1.5:1 at 3 GHz	50 Ω	SMB male connectors
M9150A	Dual 1 x 4 multiplexer	PXI 1-slot	3 GHz	1 dB at 3 GHz	45 dB at 3 GHz	< 1.55:1 at 3 GHz	75 Ω	SMB male connectors
M9151A	Quad 1 x 4 multiplexer	PXI 1-slot	3 GHz	1.1 dB at 3 GHz	40 dB at 3 GHz	< 1.6:1 at 3 GHz	75 Ω	SMB male connectors
M9152A	1 x 8 multiplexer	PXI 1-slot	3 GHz	1 dB at 3 GHz	45 dB at 3 GHz	< 1.5:1 at 3 GHz	75 Ω	SMB male connectors
M9153A	1 x 16 multiplexer	PXI 1-slot	3 GHz	1.2 dB at 3 GHz	40 dB at 3 GHz	< 1.55:1 at 3 GHz	75 Ω	SMB male connectors

www.agilent.com/find/pxi-switch

Microwave Switches

The new Agilent PXI hybrid switch module series operate from a frequency range of DC to 40 GHz, and are used in applications where a rugged switching module is needed in high-density switching systems.

Key features

- Exceptional guaranteed 0.03 dB insertion loss repeatability
- High isolation, low SWR
- Long operating life of up to 10 million cycles

Microwave Switches

	Description	Type # of slots	Frequency range	Insertion loss	Isolation	VSWR	Impedance	Connectors
M9155C	Dual SPDT switch	PXI-H 1-slot	DC to 26.5 GHz	0.25 dB + 0.027 x f DC: 0.25 dB 8 GHz: 0.47 dB 12.4 GHz: 0.58 dB 18 GHz: 0.74 dB 26.5 GHz: 0.96 dB	DC: 110 dB 8 GHz: 92 dB 12.4 GHz: 82 dB 18 GHz: 70 dB 26.5 GHz: 50 dB	DC to 8 GHz: 1.25 8 to 18 GHz: 1.45 18 to 26.5 GHz: 1.70	50 Ω	3.5 mm (f)
M9156C	Dual transfer switch	PXI-H 2-slots	DC to 26.5 GHz	0.2 dB + 0.025 x f DC: 0.20 dB 8 GHz: 0.40 dB 12.4 GHz: 0.51 dB 18 GHz: 0.65 dB 26.5 GHz: 0.86 dB	DC: 110 dB 8 GHz: 94 dB 12.4 GHz: 85 dB 18 GHz: 74 dB 26.5 GHz: 57 dB	DC to 2 GHz: 1.10 2 to 4 GHz: 1.15 4 to 12.4 GHz: 1.25 12.4 to 20 GHz: 1.40 20 to 26.5 GHz: 1.65	50 Ω	SMA (f)
M9157C	Single SP6T switch	PXI-H 3-slots	DC to 26.5 GHz	0.3 dB + 0.015 x f DC: 0.3 dB 8 GHz: 0.42 dB 18 GHz: 0.57 dB 26.5 GHz: 0.70 dB	DC to 12 GHz: 90 dB 12 to 15 GHz: 70 dB 15 to 20 GHz: 65 dB 20 to 26.5 GHz: 60 dB	DC to 8 GHz: 1.35 8 to 18 GHz: 1.45 18 to 26.5 GHz: 1.70	50 Ω	SMA (f)
M9155CH40	Dual SPDT switch	PXI-H 1-slot	DC to 40 GHz	DC to 26.5 GHz: 0.2 dB + 0.023 x f 26.5 GHz to 40 GHz: 0.75 dB + 0..23 x f 40 GHz: 1.67 dB	DC to 26.5 GHz: 110 - 2.25f 26.5 GHz to 40 GHz: 50 dB	DC to 4 GHz: <1.10 4 to 26.5 GHz: <1.30 26.5 to 40 GHz: <1.50	50 Ω	2.92 mm (f)
M9156CH40	Dual transfer switch	PXI-H 2-slots	DC to 40 GHz	0.2 dB + 0.025 x f 40 GHz: 1.2 dB	DC to 26.5 GHz: 120 dB - 2 x f (GHz) 26.5 GHz to 40 GHz: 60 dB	DC to 12.4 GHz: 1.3 12.4 to 25 GHz: 1.4 25 to 40 GHz: 1.7	50 Ω	2.92 mm (f)
M9157CH40	Single SP6T switch	PXI-H 3-slots	DC to 40 GHz	DC to 26.5 GHz: 0.3 dB + 0.015 x f 26.5 to 40 GHz: 0.030 f - 0.1 dB	DC to 12 GHz: 100 dB 12 to 15 GHz: 80 dB 15 to 20 GHz: 70 dB 20 to 40 GHz: 65 dB	DC to 4 GHz: 1.3 max 4 to 12.4 GHz: 1.35 max 12.4 to 18 GHz: 1.5 max 18 to 26.5 GHz: 1.7 max 26.5 to 40 GHz: 1.95 max	50 Ω	2.92 mm (f)

www.agilent.com/find/pxi-switch

PXI DATA ACQUISITION AND SWITCHING

PXI Attenuator/Switch Drivers

Integrate your external programmable attenuators and switches into your test system, and maximize the PXI chassis slot utilization using PXI switch drivers.

Key features

- Dual voltage supply for compatibility with most switches
- Soft front panel provides a dynamic view and control of the connected attenuators or switches

PXI Attenuator/Switch Drivers							
	Description	Type # of slots	Voltage	Drive mode	Drive	# of Switches	Cables
M9170A	Attenuator/Switch Driver module	PXI 1-slot	5V, 24 V	Pulsed and continuous	Most switches/attenuators available today	Up to 12 external SPDT switches	6 options available

Driver information	
Supported operating systems	Microsoft Windows 7 (32/64-bit), Windows Vista (32/64-bit), Windows XP (32-bit)
Standard compliant drivers	All except RF switches: IVI-COM, IVI-C, LabVIEW, MATLAB RF switches: IVI-COM, IVI-C, LabVIEW
Supported application development environments (ADE)	Visual Studio (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, MATLAB
Agilent IO Libraries	All except MW switches, M9170A & M9216A: VISA Libraries, Agilent Connection Expert, IO Monitor

www.agilent.com/find/pxi-switch

Agilent PXI Multiplexer Switch Modules

www.agilent.com/find/pxi-switch

Industries and Applications

- Aerospace and defense
- Automotive
- Electronic test
- Medical
- Semiconductor

Product Description

The PXI multiplexer modules deliver high-speed signal routing of many different channels to a single point, and are ideal for routing multiple analog signals to a measurement device in Automated Test Environments (ATE) or data acquisition systems.

Main Features and Benefits

Product features	Your benefit
High-speed, long-life reed relays or higher power EM relays	Get the performance you need with 500 usec switches or up to 60W per channel
Modules operate in break-before-make mode	Ensure no two points are connected at the same time
Up to 128 channels in a single module	Scan many points in a compact space
Software drivers support the most common programming environments	Work in your environment of choice and reduce development time
Optional connector block, soft front panels, and Agilent Connection Expert	Fast and easy installation and configuration

Chassis slot compatibility: cPCI (J1), PXI-1, PXIe Hybrid

Specifications and Characteristics

Hardware			
	M9101A	M9102A	M9103A
Channels	64	128	99
Switch type	2-wire, reed	1-wire, reed	2-wire, armature
Max volts (CAT 1)	100 Vrms		
Max current switch/carry	0.5A/1.0A	0.5A/1.0A	1A
Max power *(nom)*	10 W	10 W	60 W
Bandwidth *(nom)*	5 MHz	5 MHz	1 MHz
Connectors	200 LFH		

Ordering Information

Model	Description
M9101A	PXI high-density multiplexer: 64-ch, 2-wire, 100V/1.0A, reed relays
M9102A	PXI high-density multiplexer: 128-ch, 1-wire, 100Vrms/1.0A, reed relays
M9103A	PXI high-density multiplexer: 99-ch, 2-wire, 100Vrms/1A, armature relays
Related products	
M9018A	18-slot PXIe chassis
M9021A	PCIe® cable interface
M9132A	50-ch SPST general purpose switch
M9187A	32-ch digital I/O
Accessories	
Y1182A	PXI connector block: 200-pin, shielded, male (recommended)
Y1189A	PXI connector cable: 200-pin, LFH male to four 50 pin Dtype female connectors, 1Meter
Y1190A	PXI connector cable: 200-pin, LFH male to four 50 pin Dtype female connectors, 2Meter

Agilent PXI Matrix Switch Modules

www.agilent.com/find/pxi-switch

Industries and Applications

- Aerospace/defense
- Automotive
- Electronic test
- Medical
- Semiconductor

Product Description

The PXI matrix switch modules deliver medium- to high-density switching of multiple channels in a single instance. Any row can be connected to any column—ideal for routing multiple signals between the device under test and instruments.

Main Features and Benefits

Product features	Your benefit
Up to 256 1-wire crosspoints	Connect multiple points for high-pin-count applications
Software drivers support the most common programming environments	Work in your environment of choice and reduce development time
Optional connector block, soft front panels, and Agilent Connection Expert	Fast and easy installation and configuration

Specifications and Characteristics

	M9120A	M9121A	M9122A
Channels	4x32	4x64	8x32
Switch type	2-wire, armature	2-wire, reed	1-wire, armature
Max volts (CAT 1)	100 Vrms	100 Vrms	100 Vrms
Max current switch/carry	2.0 A	0.5 A	2.0 A
Max power *(nom)*	60 W	10 W	60 W

Chassis slot compatibility: cPCI (J1), PXI-1, PXIe Hybrid

Specifications (cont'd)

	M9120A	M9121A	M9122A
Bandwidth *(nom)*	7.5 MHz	10 MHz	5 MHz
Connectors	78 Dsub block/cable	200 LFH block/ cable	50 Dsub block/cable

Ordering Information

Model	Description
M9120A	PXI matrix switch: 4x32, 2-wire, 100 V/2 A armature relays
M9121A	PXI matrix switch: 4x64, 2-wire, 100 V/0.5 A, reed relays
M9122A	PXI matrix switch: 8x32, 1-wire, 100 V/2 A armature relays
Related products	
M9018A	18-slot PXIe chassis
M9021A	PCIe® cable interface
M9102A	128-ch, 1-wire multiplexer switch
M9131A	64-ch SPDT general purpose switch
M9187A	32-ch digital I/O
Accessories for M9120A	
Y1181A	PXI connector block: 78-pin, shielded, female DSub (recommended)
Y1187A	PXI connector cable: 78-pin, male-to-female, 1Meter
Y1188A	PXI connector cable: 78-pin, male-to-female, 2Meter
Accessories for M9121A	
Y1182A	PXI connector block: 200-pin, shielded, male
Y1189A	PXI connector cable: 200-pin, LFH male to four 50 pin Dtype female connectors, 1 meter
Y1190A	PXI connector cable: 200-pin, LFH male to four 50 pin Dtype female connectors, 2 meter
Accessories for M9122A	
Y1180A	PXI connector block: 50-pin female DSub (recommended)
Y1185A	PXI connector cable: 50-pin, male-to-female, 1Meter
Y1186A	PXI connector cable: 50-pin, male-to-female, 2Meter

Agilent PXI RF Switch Modules

www.agilent.com/find/pxi-switch

Industries and Applications

- Aerospace/defense, semiconductor, medical
- Automotive
- Electronic test

Product Description

The PXI RF switch modules deliver high-performance, bi-directional switching up to 3GHz, and are available in multiple configurations to integrate into a variety of test environments. Modern RF relay technology delivers low insertion loss and VSWR for excellent RF signal integrity and dynamic range when routing RF signals into your measurement equipment. Each switch path is carefully designed to ensure repeatable RF performance.

Main Features and Benefits

Product features	Your benefit
Modern RF relay technology delivers low insertion loss and VSWR	Excellent RF signal integrity and dynamic range
Each switch path carefully designed	Repeatable RF performance
Software drivers support the most common programming environments	Work in your environment of choice and reduce development time
Snap-on SMB connections, soft front panels, Connection Expert	Fast and easy installation and configuration

Specifications and Characteristics

Switch	Configuration	Insertion loss *(typ)*	Isolation *(typ)*
RF 3 GHz, 50 Ω multiplexer switches			
M9146A	Dual 1x4	*0.8 dB*	*45 dB*
M9147A	Quad 1x4	*1 dB*	*40 dB*
M9148A	1x8	*0.8 dB*	*40 dB*
M9149A	1x16	*1.2 dB*	*40 dB*

Chassis compatibility: cPCI (J1), PXI-1 (J1), PXIe Hybrid

Specifications (cont'd)

Switch	Configuration	Insertion loss *(typ)*	Isolation *(typ)*
RF 3 GHz, 75 Ω multiplexer switches			
M9150A	Dual 1x4	*1 dB*	*45 dB*
M9151A	1x4	*1.1 dB*	*40 dB*
M9152A	1x8	*1 dB*	*45 dB*
M9153A	1x16	*1.2 dB*	*40 dB*
RF 300 MHz, 50Ω matrix switch			
M9128A	8x12	*2 dB*[1]	*40 dB*

Ordering Information

Model	Description
M9128A	PXI RF matrix switch: 300 MHz, 8x12, 50 Ω
M9146A	PXI RF multiplexer: 3 GHz, dual 1x4, 50 Ω, terminated
M9147A	PXI RF multiplexer: 3 GHz, quad 1x4, 50 Ω, terminated common
M9148A	PXI RF multiplexer: 3 GHz, 1x8, 50 Ω
M9149A	PXI high-density RF multiplexer: 3 GHz, 1x16, 50 Ω
M9150A	PXI RF multiplexer: 3 GHz, dual 1x4, 75 Ω
M9151A	PXI RF multiplexer: 3 GHz, quad 1x4, 75 Ω
M9152A	PXI high-density RF multiplexer: 3 GHz, 1x8, 75 Ω
M9153A	PXI high-density RF multiplexer: 3 GHz, 1x16, 75 Ω
Related products	
M9018A	18-slot PXIe chassis
M9021A	PCIe® cable interface
M9045B	PCIe ExpressCard adaptor: Gen 1
Y1200B	PCIe cable: x1 to x8, 2.0m (used with M9045B)
M9048A	PCIe desktop PC adapter
Y1202A	PCIe cable: x8, 2.0m (used with M9048B)
M9122A	8x32, 1-wire matrix switch
M9103A	99-ch, 1-wire multiplexer switch
M9133A	100-ch SPST general purpose switch
M9187A	32-ch digital I/O

Agilent General Purpose Switch Modules

www.agilent.com/find/pxi-switch

Product Description

The PXI general purpose switch modules deliver fast, reliable switching in a variety of configurations. Cycle power to products under test, control indicator, and status lights, or actuate external power relays and solenoids with independent, single-pole, double-throw (Form C) or singlepole, single-throw (Form A) switches in a single PXI module. The line also includes a module that can handle up to 300W/1250W for switching heavy loads or power supplies.

Main Features and Benefits

Product features	Your benefit
Up to 100-channel general purpose EM relays	High-density, general purpose switching in a compact module
Power relay module	Get the performance you need to switch heavy loads with up to 300W (DC resistive load)/1250W (AC resistive load)
Software drivers support the most common programming environments	Work in your environment of choice and reduce development time
Optional connector block, soft front panels, and Connection Expert	Fast and easy installation and configuration

Specifications and Characteristics

Modules	Max volts (CAT 1) *(typ)*	Max switch/ carry rating *(typ)*	Max power *(nom)*
M9130A 26-ch SPDT, Form C, armature	250 Vrms	2A/2A	60 W
M9131A 64-ch SPDT, Form C, reed	100 Vrms	0.25A/1A	3 W
M9132A 50-ch SPST, Form A, reed	100 Vrms	1A/1A	25 W
M9133A 100-ch SPST, Form A, reed	100 Vrms	1A/1A	25 W
M9135A 20-ch SPST, Form A, armature	250 Vrms/ 125Vdc	5A/5A	300 W

Ordering Information

Model	Description
M9130A	PXI SPDT switch: 26-ch, 2A, armature relays
M9131A	PXI SPDT switch: 64-ch, 100 Vrms/1A, reed relays
M9132A	PXI SPST switch: 50-ch, 100 Vrms/1A, reed relays
M9133A	PXI SPST switch: 100-ch, 100 Vrms/1A, reed relays
M9135A	PXI SPST power relay: 20-ch, 5A, 300 W
Related products	
M9018A	18-slot PXIe chassis
M9021A	PCIe® cable interface
M9120A	4x32, 2-wire matrix switch
M9101A	64-ch, 2-wire multiplexer switch
M9187A	32-ch digital I/O
Accessories for M9130A	
Y1181A	PXI connector block: 78-pin, shielded, female DSub (recommended)
Y1187A	PXI connector cable: 78-pin, male-to-female, 1 Meter
Y1188A	PXI connector cable: 78-pin, male-to-female, 2 Meter
Accessories for M9131A, M9132A, M9133A	
Y1182A	PXI connector block: 200-pin, shielded, male (recommended)
Y1189A	PXI connector cable: 200-pin, male-to-female, 1 Meter
Y1190A	PXI connector cable: 200-pin, male-to-female, 2 Meter
Accessories for M9135A	
Y1191A	PXI power cable: 20-pin, female-to-unterminated, 1 Meter
Y1192A	PXI power cable: 20-pin, female-to-unterminated, 2 Meter
Y1193A	PXI power connector: 20-pin, female (universal), solder pin (recommended)

Chassis compatibility: cPCI (J1), PXI-1 (J1), PXIe Hybrid

Agilent M9155/6/7C PXI Hybrid Switches DC to 26.5 GHz

www.agilent.com/find/pxi-switch

Industries and Applications

- Automatic Test Equipment (ATE)
- RF communications
- Engineering verification
- RF parametric measurements
- Mid and high density switching systems

Product Description

M9155/6/7C is a series of PXI hybrid switch modules based on the PXI Hybrid platform. Operating from DC to 26.5 GHz, these modules come with guaranteed 0.03 dB insertion loss repeatability throughout the operating life.

Main Features and Benefits

Product features	Your benefit
A readily scaled integrated switching solution to satisfy your unique application platform needs	Peace of mind in switch technology from Agilent who has a proven track record for providing versatile, quality RF and microwave switches
Guaranteed 0.03 dB insertion loss repeatability throughout the operating life of up to 10 million cycles	Reduce downtime for recalibration, improve testing efficiency and hence maximize throughput
Unmatched isolation of 60 dB at 26.5 GHz	Maximize measurement accuracy and system flexibility
Soft front panel is available for each switch module	The embedded graphical user interface ease the trouble-shooting of your PXI systems

Connector compatibility: PXI-H, PXI-1, cPCI

Specifications

Hardware		
Size	M9155C M9156C M9157C	1 slot wide 2 slots wide 3 slots wide
Frequency	DC to 26.5 GHz	
Insertion loss*	0.42 dB at 8 GHz 0.57 dB at 18 GHz 0.70 dB at 26.5 GHz	
Insertion loss repeatability	< 0.03 dB	
Guaranteed operating life	5 million cycles for M9155C 2 million cycles for M9155/6/7C	
Typical operating life	10 million cycles for M9155C 5 million cycles for M9155/6/7C	
VSWR*	1.35 at 8 GHz 1.45 at 18 GHz 1.70 at 26.5 GHz	
Impedance	50 Ω	
RF connector	3.5 mm (f) for M9155C SMA (f) for M9156/7C	

Ordering Information

Model	Description
M9018A	PXIe Chassis, 18- slots, 3U, 8 GB/s
M9155C	PXIh Coaxial Switch, DC-26.5 GHz, Dual SPDT, Unterminated
M9156C	PXIh Coaxial Switch, DC to 26.5 GHz, Dual Transfer
M9157C	PXIh Coaxial Switch, DC to 26.5 GHz, Single SP6T, Terminated
Related products	
M9392A	PXI Vector Signal Analyzer
M9302A	PXI Local Oscillator
M9351A	PXI Downconverter (50 MHz to 2.9 GHz)
M9360A	PXI Attenuator/Preselector
M9361A	PXI Downconverter (2.75 GHz to 26.5 GHz)

Agilent M9155/6/7 CH40 PXI Hybrid Switch Modules DC to 40 GHz

www.agilent.com/find/pxi-switch

Industries and Applications

- Automatic Test Equipment (ATE)
- RF communications
- Engineering verification
- RF parametric measurements
- Mid and high density switching systems

Product Description

M9155/6/7CH40 is a series of PXI hybrid switch modules based on the PXI Hybrid platform. Operating from DC to 40 GHz, these modules come with guaranteed 0.03 dB insertion loss repeatability throughout the operating life.

Main Features and Benefits

Product features	Your benefit
A readily scaled integrated switching solution to satisfy your unique application platform needs	Peace of mind in switch technology from Agilent who has a proven track record for providing versatile, quality RF and microwave switches
Guaranteed 0.03 dB insertion loss repeatability throughout the operating life of up to 10 million cycles	Reduce downtime for recalibration, improve testing efficiency and hence maximize throughput
Unmatched isolation of 60 dB at 26.5 GHz	Maximize measurement accuracy and system flexibility
Soft front panel is available for each switch module	The embedded graphical user interface ease the trouble-shooting of your PXI systems

Connector compatibility: PXI-H, PXI-1, cPCI

Specifications

Hardware		
Size	M9155CH40 M9156CH40 M9157CH40	1 slot wide 2 slots wide 3 slots wide
Frequency	DC to 40 GHz	
Insertion loss*	0.42 dB at 8 GHz 0.57 dB at 18 GHz 0.70 dB at 26.5 GHz 1.1 dB at 40 GHz	
Insertion loss repeatability	< 0.03 dB	
Guaranteed operating life	5 million cycles	
Typical operating life	10 million cycles	
Isolation* (M9157CH40)	100 dB at 12 GHz 70 dB at 20 GHz 65 dB at 40 GHz	
VSWR*	1.35 at 8 GHz 1.45 at 18 GHz 1.70 at 26.5 GHz 1.95 at 40 GHz	
Impedance	50 Ω	
RF connector	2.92 mm (f) for M9155/6/7CH40	

Ordering Information

Model	Description
M9155CH40	PXIh Coaxial Switch, DC to 40 GHz, Dual SPDT, Unterminated
M9156CH40	PXIh Coaxial Switch, DC to 40 GHz, Dual Transfer
M9157CH40	PXIh Coaxial Switch, DC to 40 GHz, Single SP6T Switch, Terminated
Related products	
M9392A	PXI Vector Signal Analyzer
M9302A	PXI Local Oscillator
M9351A	PXI Downconverter (50 MHz to 2.9 GHz)
M9360A	PXI Attenuator/Preselector
M9361A	PXI Downconverter (2.75 GHz to 26.5 GHz)

Agilent M9170A
PXI Attenuator/Switch Driver

www.agilent.com/find/pxidriver

Industries and Applications

- Automatic Test Equipment (ATE)
- RF communications
- Engineering verification
- RF parametric measurements

Product Description

M9170A attenuator/switch driver module provides drive control for programmable attenuators and electromechanical switches. It is a PXI-hybrid compliant module, that comes with a full-featured graphical interface soft front panel (SFP) for easy control and trigger.

Main Features and Benefits

Product features	Your benefit
Drive up to 12 external SPDT switches, or 4 external SP4T/6T switches, or 12 transfer switches, or 2 external attenuators[1]	Maximize the PXI chassis slot utilization, which ultimately improves testing efficiency
Dual voltage supply of 5V and 24V, and dual driving mode of pulse and continuous	Ensure biasing compatibility with most switches on the market and hence increase system flexibility
Soft front panel provides a dynamic dashboard view and control of the connected attenuators or switches	Allows the selection of device models and the subsequent switch paths or attenuation levels
Point-to-point interface cable options available for connection between driver and switching device	Intuitive configuration for all Agilent switches and attenuators

1. The amount of switches and attenuators that can be driven is dependent on the type of switch configuration and attenuator section configuration.

Connector compatibility: cPCI, PXI-H, PXI-1

Specifications and Characteristics

Hardware				
Size	1 slot wide module			
Voltage	+3.3V	+5V	-12V	+12V
Current	0.5A	30 mA(min) 5.6 A (max)	0	30 mA(min) 0.8 A(max)
Attenuator types	Accepts most attenuators available today			
Switch types	Accepts most switches available today			

Ordering Information

Model	Description
M9170A	PXI-h Attenuator/Switch Driver Module
Options	
001	Interface cable, 20 pin to 10 pin DIP (x6) for transfer switch
002	Interface cable, 20 pin to 10 pin DIP for step attenuator
003	Interface cable, 20 pin to 12 pin Viking connector for step attenuator
201	Interface cable, 20 pin to 16 pin bare wire for solder lug switch
501	Interface cable, 20 pin to 9 pin DSUB (x6) for N1810x SPDT switch
601	Interface cable, 20 pin to 16 pin DIP (x2) for 8710x/ L710x switch

Related products	
M9018A	18-slot PXIe chassis
87106C	Multiport Coaxial Switch, DC to 26.5 GHz, SP6T
8765C	Coaxial Switch, DC to 26.5 GHz, SPDT
8496G	Programmable Attenuator, 4 GHz, 110 dB, 10 dB steps

Agilent M9216A PXI 32-Channel High Voltage Data Acquisition Module

www.agilent.com/find/m9216a

Industries and Applications

- Automotive
- Electronic test

Product Description

The M9216A is a high voltage data acquisition module that allows simultaneous measurement of eight channels of positive voltages ranging from 1 mV to 100 V. Each channel in the module comes with concurrent 5 V and 100 V measurement ranges - each channel capable of acquiring digital signals that fluctuate between very low and very high voltage levels without switching ranges and doing separate measurements.

The built-in 32 to eight multiplexer enables 32 measurement ports to be connected to the eight acquisition channels expanding it to a full 32-channel acquisition module. These channels can also be routed via an auxiliary output connector for additional measurements without requiring extra multiplexers or pin matrix cards. The fast parallel voltage level measurements with guaranteed accuracy is ideal for the automotive applications. The16-bit ADC utilizes positive voltages for enhanced resolution, and accuracy.

Main Features and Benefits

Product features	Your benefit
Large input range with dual concurrent measurement range for each channel	Enables voltage level acquisition to be done for very low and very high voltages without the need for switching ranges
Built-in 32 to 8 multiplexer	Expanding to 32-channel high speed voltage acquisition capability
Auxiliary outputs from the acquisition channels	Enables additional measurements to be done without requiring external multiplexers and pin matrix cards

Specifications

Hardware	
Size	2 slots, 3 U
Resolution	16 bit
Accuracy	Zero offset: 5 V range – 200 uV, 100 V range – 1 mV Gain (% of reading): 5 V range – 0.05%, 100 V range – 0.05% Noise @ 3 sigma: 5 V range – 200 uV, 100 V range – 2 mV

Ordering Information

Model	Description
M9216A	M9216A PXI high voltage data acquisition module, 32-channel, 250KS/S, 16-BIT, 100 V input

Chassis slot compatibility: cPCI(J1, J2), PXI-1, PXIe Hybrid

PXI DIGITAL INPUT OUTPUT

Agilent Technologies offers digital IO modules to meet your needs for digital sensing and control of simple devices and digital functional testing. In the PXI modular format, Agilent offers a PXI digital IO for system monitoring and controlling devices such as external relays.

Product Features and your Benefits

Applications

- For monitoring digital states and controlling external devices

Functionality

- 32 input channels with programmable thresholds of 0.3 V to 50 V
- 32 output channels with 0.5 A low sink/0.4 A high source

Performance characteristics

- 100 V input protection
- Fully protected outputs
- High-quality D-Sub connectors

Agilent M9187A Digital IO

Agilent M9187A Digital IO

www.agilent.com/find/pxi-dio

Agilent M9187A
PXI Digital I/O Control Module

www.agilent.com/find/pxi-dio

Industries and Applications

- Aerospace/defense, semiconductor, electronic test
- Automotive, medical

Product Description

The M9187A digital I/O control module has 32 input/output channels. The input channels can be used for comparing inputs to user-defined thresholds between 0.3V and 50V, with 12.5mV setting resolution. Each input is protected up to 100V. The 32 output channels can drive high or low outputs, and are capable of sourcing 0.4A from the high-side or sink 0.5A from the low-side of each channel. These outputs are protected against over-voltage or over-current conditions.

Main Features and Benefits

Product features	Your benefit
32 input/output channels	Provides the flexibility to meet your testing needs
100V input protection and fully protected outputs	Reliable performance
Software drivers support the most common programming environments	Work in your environment of choice and reduce development time
Optional connector block, soft front panels, and Agilent Connection Expert	Fast and easy installation and configuration

Specifications and Characteristics

Input specifications	
Input impedance	1 MΩ
Max input voltage *(typ)*	+50Vpk, with 100Vpk over voltage protection
Thresholds	Dual programmable 0.3 to 50V, 12.5mV resolution

Chassis slot compatibility: cPCI (J1), PXI-1, PXIe Hybrid

Specifications (cont'd)

Output specifications	
Max voltage *(typ)*	+50Vpk
Max current	0.5A for low-side drivers 0.4A for high-side drivers 10A module total
Output states	Driven high, driven low, or off
Low-side driver output voltage	0.3V @ Isink = 0.5A
High-side driver output voltage	Vext – 1.5V @ Isource = 0.4A

Ordering Information

Model	Description
M9187A	PXI digital I/O: 32 input/output channels 0.3V to 50V
Related products	
M9018A	18-slot PXIe chassis
M9021A	PCIe® cable interface
M9120A	4x32, 2-wire matrix switch
M9103A	99-ch, 1-wire multiplexer switch
M9135A	20-ch SPST general purpose switch
Accessories	
Y1181A	PXI connector block: 78-pin, shielded, female DSub (recommended)
Y1187A	PXI connector cable: 78-pin, male-to-female, 1Meter
Y1188A	PXI connector cable: 78-pin, male-to- female, 2Meter

Software Information

Operating systems	Microsoft Windows XP Microsoft Windows Vista (32/64-bit) Microsoft Windows 7 (32/64-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW, MATLAB
Supported application development environments (ADE)	VisualStudio (C/C++,C#, VB.NET), LabVIEW, LabWindows/CVI, MATLAB, VEE
Agilent IO Libraries	Includes: VISA Libraries, Agilent Connection Expert, IO Monitor

PXI DIGITAL MULTIMETERS

Agilent Technologies M9182A and M9183A Digital Multimeters (DMM) deliver market-leading speed at their price points. These fast reading speeds translate into higher test system throughput and lower cost of test. These DMM modules measure common parameters such as DCV, DCI, ACV, ACI, 2- and 4-wire resistance as well as capacitance, temperature and frequency. Each offers 40 ppm basic DCV accuracy and inputs up to 300 volts.

The M9181A delivers a low cost PXI DMM with basic features. This DMM measures common parameters such as DCV, DCI, ACV, ACI, 2 and 4-wire resistance. The M9181A also offers 90 ppm basic DCV accuracy and inputs up to 240 V.

Agilent's family of PXI digital multimeters deliver results you can trust.

Product features and your benefits

Applications

- DMM measurements in automated systems
- DMM measurements in functional test systems

Functionality

- DCV, DCI, ACV, ACI, 2- and 4-wire resistance
- Frequency/period, capacitance, temperature
- Advanced triggering

Performance characteristics

- 40 ppm basic DCV 1-yr accuracy
- Measurement speeds up to 15,000 rdgs/s
- 6½ digits of resolution (22 bits)
- Floating isolation (CATII) for inputs up to 300 V

Agilent Digital Multimeters M9181A, M9182A and M9183A

www.agilent.com/find/pxi-dmm

PXI DIGITAL MULTIMETERS

Digital Multimeters

	Description	Type # of slots	Resolution	Maximum reading rate at 4 ½ digits	Basic DCV accuracy & maximum range	Resistance, temperature, capacitance	Measurements and functions	DC source
M9181A	Basic features PXI DMM	PXI 1-slot	6½ digits	150 rdgs/sec	90 ppm 200 V	2 & 4-wire Ω	DCV, ACV, DCI, ACI	n/a
M9182A	High-performance PXI DMM	PXI-H 1-slot	6½ digits	4,500 rdgs/sec	40 ppm 300 V	2 & 4-wire Ω, temperature capacitance	DCV, ACV, DCI, ACI, plus frequency/period, temperature, and capacitance	n/a
M9183A	Enhanced performance PXI DMM	PXI-H 1-slot	6½ digits	15,000 rdgs/sec	40 ppm 300 V	2 & 4-wire Ω, temperature capacitance	All of the above plus duty cycle, counter/totalizer, DC source	± 10 V ± (1.2 µA to 12 mA)

Driver information

Supported operating systems	Microsoft Windows 7 (32/64-bit), Windows Vista (32/64-bit), Windows XP (32-bit)
Supported application development environments (ADE)	M9181A: Visual Studio (VB.NET, C#, C/C++), LabVIEW, LabWindows/CVI, MATLAB M9182A & M9183A: Visual Studio (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, MATLAB
Application code examples	VB.NET, C#, C/C++

www.agilent.com/find/pxi-dmm

Agilent M9181A
Basic Features PXI DMM

www.agilent.com/find/pxi-dmm

Industries and Applications

- Aerospace and defense
- Automotive
- Electronic test

Product Description

The Agilent M9181A 6½ digit PXI digital multimeter (DMM) offers the most common measurement functions at an affordable price. The M9181A provides six built-in measurement types with all the reliability and stability you would expect from an Agilent PXI DMM.

Main Features and Benefits

Product features	Your benefits
Basic DCV accuracy of 90 ppm	Measurements you can trust
Measurements: DCV, ACV, DCI, ACI 2- & 4-wire Ω	Basic digital multimeter measurements for the most common measurement applications
Software drivers to support the most common programming environments	Work in your environment of choice and reduce development time
Soft front panel and Agilent Connection Expert	Fast and easy installation, configuration, and calibration

Specifications and Characteristics

Resolution	6½ digit
DCV basic 1-year accuracy	90 ppm
Maximum reading rate (4½ digits)	150 rdgs/s
Floating Isolation (CAT II)	240 V
Measurement ranges	
DCV, ACV; 4 ranges	200 mV to 200 V
DCI, ACI; 4 ranges	2 mA to 2 A
2- and 4-wire resistance; 6 ranges	200 Ω to 20 MΩ

Specifications (cont'd)

Sensitivity		
Function	Lowest range	Sensitivity
DCV	200.0000 mV	100 nV
ACV	200.0000 mV	100 nV
Resistance	20.0000 Ω	100 µΩ
DCI	2.000000 mA	10 nA
ACI	2.000000 mA	1 nA
Resolution vs. aperture and reading rate for DCV, DCI, Ω		
Measurement aperture	Maximum readings per second	Resolution
1.28 s	0.8	6½ Digits (21 bits)
160 ms	6	6 Digits (20 bits)
20 ms	45	5½ Digits (18 bits)
10 ms	85	5 Digits (17 bits)
5 ms	150	4½ Digits (16 bits)

Ordering Information

Model	Description
M9181A	PXI digital multimeter, 6½ digit, basic features
Accessories	
34138A	Test lead set
Related Products	
M9018A	18 slot PXI chassis
M9021A	PXIe system interface
M9101A	PXI high-density multiplexer, 64 ch, reed relays
M9120A	PXI matrix switch, 4 x 32, armature relays
M9182A	PXI multimeter, 6½ digit, high performance
M9183A	PXI multimeter, 6½ digit, enhanced performance

Chassis slot compatibility: PXI-1, (J-1)

Agilent M9182A/M9183A High-Performance PXI DMMs

www.agilent.com/find/pxi-dmm

Product Description

Agilent's M9182A and M9183A 6½ digit high-performance PXI digital multimeters offer fast development, fast operation, and reliable results. The M9182A provides nine built-in measurement types with all the accuracy and stability you would expect from an Agilent 6½ digital multimeter (DMM). The M9183A provides the same capabilities as the M9182A plus market-leading measurement speed, additional ranges, and advanced triggering.

Main Features and Benefits

Product features	Your benefits
Measurement speeds up to 15,000 readings/second; single reading interval time: 66 µs	Fast single reading test throughput saves functional test time, especially when taking several different measurements with the DMM
Basic DCV accuracy of 40 ppm	Measurements you can trust
Measurements: DCV, ACV, DCI, ACI, 2 & 4-wire Ω, frequency/period, temperature, capacitance	Reduces instrumentation and accessories required
Software drivers support the most common programming environments	Work in your environment of choice and reduce development time
Soft front panels and Agilent connection expert	Fast and easy installation and configuration

Specifications and Characteristics

Hardware	M9182A	M9183A
Resolution	6½ digit	6½ digit
DCV basic 1-year accuracy	40 ppm	40 ppm
4½ digit rdg/s	4,500	15,000
Triggering	External, threshold level, pre- or post-	
Measurement ranges		
DCV, ACV	200 mV to 300 V	200 mV to 300 V
DCI	2 mA to 2 A	200 nA to 2 A
ACI	2 mA to 2 A	2 mA to 2 A
2 & 4-wire resistance	200 Ω to 20 MΩ	20 Ω to 200 MΩ
Frequency/period	1 Hz to 300 kHz	1 Hz to 300 kHz
Capacitance	1 nF to 10 mF	1 nF to 10 mF

Specifications (cont'd)

	M9182A	M9183A
Temperature	Thermocouple (B, E, J, K, N, R, S, T), RTD (6 types), Thermistor (2.25 kΩ, 5 kΩ, 10 kΩ)	
Other measurements	n/a	Offset compensated ohms, pulse width & duty cycle, totalizer/ event counter
DC Source	n/a	± 10 V, ± 12 mA
Floating isolation (Cat-II)	300 Vrms	300 Vrms
Sensitivity		
Function	Lowest Range	Sensitivity
DCV	200.0000 mV	0.1 µV
ACV	200.0000 mV	0.1 µV
Resistance (M9183A)	20.00000 Ω	10 µΩ
Resistance (M9182A)	200.0000 Ω	100 µΩ
DCI (M9183A)	200.0000 nA	0.1 pA
DCI (M9182A)	2.000000 mA	10 nA
ACI	2.000000 mA	1 nA
Capacitance	1000.0 pF	0.1 pF
Resolution vs. aperture and reading rate for DCV, DCI, Ω		
Measurement aperture	Maximum readings per sec	Resolution
10 ms	98	6½ digits (22 bits)
625 µs	1,200	5½ digits (18 bits)
130 µs	4,500	4½ digits (14 bits)
2.5 µs (M9183A only)	15,000	4½ digits (14 bits)

Ordering Information

Model	Description
M9182A	PXI Digital Multimeter-6½ Digit
M9183A	PXI Digital Multimeter-6½ Digit, Enhanced Performance
Accessories	
34138A	Test Lead Set

Chassis slot compatibility: PXI-1, (J-1)

PXI DIGITIZERS

Agilent offers modular digitizers in PXI-1, PXI-H and PXIe formats. Agilent's digitizers are analog-to-digital converter versatile cards based on a modular architecture enabling an easy integration in customer application systems.

Agilent's portfolio of PXI high-speed digitizers address test and measurement applications in industries as widespread as RF/uW, ultrasonics, biotechnology, semiconductors, aerospace and high energy physics. These digitizers provide very high-speed measurements on wideband signals while maintaining high acquisition quality.

Product features and your benefits

Applications

- Aerospace & defense: Research and design validation in radar, satellite and microwave communications.
- Wireless communications: Research, design validation and test in emerging standards including 802.11ac, LTE-A.
- Wideband and high-resolution signal measurements

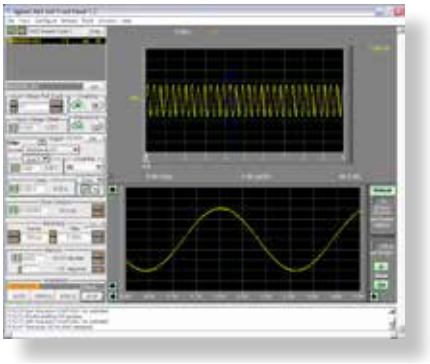
Agilent M9202A PXIe IF Digitizer.

Functionality

- Large number of phase coherent channels
- On-board real-time signal processing
- Long signal capture time and streaming
- Various scope-like features (programmable full scale ranges, offsets, impedance, triggering functions, etc)
- Segmented acquisition

Performance characteristics

- Up to 3 GHz instantaneous analog bandwidth and 4 GS/s sampling rate
- > 80 dB dynamic range (i.e., 50 MHz wide signals)
- Up to 500 MB/s data transfer speed



Agilent MD1 soft front panel

High-speed digitizers are also available in other form factors such AXIe, PCI, PCIe®, cPCI and VME.

For further information on these products, visit www.agilent.com/find/embedded-digitizers

www.agilent.com/find/pxi-digitizers

PXI DIGITIZERS

Digitizing Scopes[1]								
	Description	Type # of slots	Resolution	Number of channels	Max. sample rate	Bandwidth	Memory depth	On-board processing
M9210A	Digitizing scope	PXI-H 1-slot	10-bit	2	2 to 4 GS/s	1.4 GHz	512 MS	N/A
N2100B	10.3125 Gb/s digital communication analyzer	PXI-H 4-slots	12-bit	1 optical, 1 electrical	160 MS/s	12 GHz (electrical), 7.5 GHz (optical, unfiltered)	1 MS	N/A

IF Digitizer[1]								
	Description	Type # of slots	Resolution	Number of channels	Max. sample rate	Bandwidth	Memory depth	On-board processing
M9202A	Digitizer	PXIe 1-slot	12-bit	1	2 GS/s	1 GHz	256 MS	DDC, Virtex-6 FPGA
M9211A	Digitizer	PXI-H 1-slot	10-bit	1	4 GS/s	3 GHz	512 MS	N/A

1. High-speed digitizers are also available in other form factors such PCI, PCIe®, cPCI and VME. For more information visit: www.agilent.com/find/embedded-digitizers.

Driver information	
Supported operating systems	Microsoft Windows 7 (32/64-bit), Windows Vista (32/64-bit), Windows XP (32-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW, MATLAB
Supported application development environments (ADE)	Visual Studio (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, MATLAB
Agilent IO Libraries	Includes: VISA Libraries, Agilent Connection Expert, IO Monitor

Soft Front Panel

Agilent high-speed PXI digitizers include the Agilent MD1 soft front panel (SFP) graphical interface. This simple software application can be used to control, verify the functionality and explore the capabilities of your high-speed digitizers. The MD1 SFP contains two main windows, a control window and a display window. The control window may be set in either Oscilloscope mode or in Transient Recorder mode, and contains functions that allow you to manipulate the acquisition parameters of the card. The top display window shows the full acquisition, and the lower display window may be configured to show either a zoom on part of the waveform or the FFT of the acquired data. The Agilent MD1 SFP also provides several different display settings and standard pre-configured measurements, like standard deviation, peak-peak/RMS value, overshoot, etc.

www.agilent.com/find/pxi-digitizers

Agilent M9202A PXI Express 12-bit Wideband IF Digitizer

www.agilent.com/find/m9202a

Industries and Applications

- Aerospace and defense
- Wireless communications
- Radar and wideband signal capture

Product Description

The M9202A PXIe Wideband IF Digitizer runs at 2 GS/s, with up to 1 GHz instantaneous analog bandwidth and offers DDR3 memory. Through firmware options and the Xilinx Virtex-6 FPGA, the M9202A provides different functionalities. The BAS option provides basic digitizer functionality (signal capture, storing of data, transfer of data, etc). The DDC option additionally offers real-time digital down-conversion (DDC) algorithm in the 300 MHz to 700 MHz band, enabling improved analog performance and reducing data upload time.

Main Features and Benefits

Product features	Your benefit
2 GS/s sampling rate	Fastest 12-bit PXIe Digitizer
Up to 1 GHz bandwidth	Able to capture wide bandwidth signals
512 MB DDR3 memory	Large on-board memory
Real-time digital down-conversion (DDC) algorithm	Data decimation, analog performance improvement
On-board Xilinx Virtex-6 FPGA	On-board processing capability
Software support for easy integration	Reduced development time
PXIe backplane	Fastest digitized data upload, continuous data steaming

Chassis slot compatibility: PXIe Hybrid, PXIe

Specifications and Characteristics

Hardware	
Size	1 slot 3U
Resolution	12 bits
Sample rate	2 GS/s
Bandwidth	30 MHz *(nominal)* to 1 GHz
Streamed analog bandwidth	up to 50 MHz, or up to 100 MHz
Impedance	50 Ω *(nominal)*
Coupling	AC
Full scale (FS) range	+4 dBm (1 V pk-pk in 50 Ω)
Spurious-free dynamic range (SFDR)	60 dBc *(typical)* in basic digitizer mode 84 dBc *(typical)* after digital down-conversion (with DDC option)[1]
Effective number of bits (ENOB)	9 bits *(typical)*
Sample clock sources	Internal (with internal or external 100 MHz ref) or external

Ordering Information

Model	Description
M9202A	PXIe IF Digitizer: 12-bit, 1 GHz
M9202A-C01	Single channel
M9202A-F02	Frequency range: 2 GS/s
M9202A-M05	Standard memory: 512 MB
For complete list of available options, please see datasheet.	
Related products	
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
M9351A	PXI Downconverter: 50 MHz to 2.9 GHz
M9361A	PXI Downconverter: 2.75 GHz to 26.5 GHz
M9362A-D01	PXIe MW Quad Downconverter: 10 MHz to 26.5 GHz
M9360A	PXI Attenuator/Preselector: 100 kHz to 26.5 GHz
M9392A	PXI Vector Signal Analyzer
M9211A	PXI-H UWB IF Digitizer: 10-bit, 4 GS/s, 3 GHz
M9018A	18-slot PXIe Chassis
M9021A	PCIe® Cable Interface
89601B	89600 VSA software

Agilent M9210A
PXI-H 10-bit Digitizing Scope

www.agilent.com/find/m9210a

Industries and Applications

- Aerospace/defense
- Wireless communication
- UWB applications (e.g. radar)
- Semiconductor testing

Product Description

The M9210A is a single-slot 3U PXI-Hybrid high-speed Digitizing Scope featuring 2 channels with 1.4 GHz/300 MHz (50 Ω/1 MΩ input) analog bandwidth and up to 4 GS/s real-time sampling rate. The M9210A Digitizing Scope comes with on-board memory of up to 512 MSamples. Making it the best alternative to the Agilent VXI E1428.

Main Features and Benefits

Product features	Your benefit
10-bit resolution	Best accuracy measurements
Up to 2-4 GS/s real-time sampling rate	Fastest digitizing scope
> 1.4 GHz bandwidth in 50 Ω > 300 MHz bandwidth in 1 MΩ	Measure the fastest signals
Selectable 50 Ω/1 MΩ input	Scope-like input feature
256 MSamples/channel memory	Large on-board memory
Auto-synchronous bus system with picoseconds-level accuracy	Multi-module synchronization
Software support for easy integration	Reduced development time

Chassis slot compatibility: cPCI(J1/J2), PXI-1, PXIe Hybrid

Specifications and Characteristics

Hardware	
Size	1 slot 3U
Resolution	10 bits
Sample rate	10 MS/s to 2 GS/s (4 GS/s interleaving)
Bandwidth	50 Ω : DC to 1.5 GHz *(typical)* 1 MΩ: DC to 300 MHz *(typical)*
Impedance	Selectable 50 Ω/1 MΩ *(nominal)*
Coupling	Selectable AC/DC
Full scale (FS) range	0.05, 0.1, 0.2, 0.5, 1, 2, 5 V peak-peak in 50 Ω 0.5, 1, 2, 5, 10, 20, 50 V peak-peak in 1 MΩ
Offset range	± 2 V for ≤ 500 mV full scale ranges 50 Ω: ± 5 V for 1 to 5 V full scale ranges 1 MΩ: ± 20 V for 1 to 5 V full scale ranges 1 MΩ: ± 200 V for 10 to 50 V full scale ranges
DC accuracy	± 2.5% FS in 50 mV full scale range ± 2% FS in full scale ranges ≥ 100 mV
Effective Number Of Bits (ENOB)	7.2 in 50 Ω *(typical)* 7.0 in 1 MΩ *(typical)*

Ordering Information

Model	Description
M9210A	PXI-H high-speed Digitizing Scope: 10-bit, 2-4 GS/s
M9210A-M06	Memory: 64 Msample acquisition
For complete list of available options, please see datasheet.	
Related products	
M9211A	PXI-H UWB IF Digitizer: 10-bit, 4 GS/s, 3 GHz
M9362A-D01	PXIe Microwave Quad Downconverter: 10 MHz to 26.5 GHz
M9018A	18-slot PXIe Chassis
M9021A	PCIe® Cable Interface
Accessories	
U1093A-AS5	AS bus 2 connector

Agilent M9211A
PXI-H 10-bit UWB IF Digitizer

www.agilent.com/find/m9211a

Industries and Applications

- Aerospace and defense
- Wireless communications
- Radar and wideband signal capture

Product Description

The M9211A is a single-slot 3U PXI-Hybrid single-channel ultra-wideband IF Digitizer able to capture signals of up to 3 GHz and running at up to 4 GS/s. The M9211A comes with on-board memory of up to 512 MSamples.

Main Features and Benefits

Product features	Your benefit
Up to 4 GS/s real-time sampling rate	Fastest IF Digitizer
3 GHz analog bandwidth	Measure the fastest signals
512 MSamples memory	Large on-board memory
Auto-synchronous bus system with picoseconds-level accuracy	Multi-module synchronization
Software support for easy integration	Reduced development time

Chassis slot compatibility: cPCI(J1/J2), PXI-1, PXIe Hybrid

Specifications and Characteristics

Hardware	
Size	1 slot 3U
Resolution	10 bits
Sample rate	10 MS/s to 4 GS/s
Bandwidth	> 3 GHz
Impedance	50 Ω *(nominal)*
Coupling	DC
Full scale (FS) range	+4 dBm (1 V pk-pk in 50 Ω)
Spurious-Free Dynamic Range (SFDR)	53 dB

Ordering Information

Model	Description
M9211A	PXI-H high-speed UWB IF Digitizer: 10-bit, 4 GS/s, 3 GHz
M9211A-M51	M51 Memory, 512 Msample acquisition
For complete list of available options, please see datasheet.	

Related products	
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
M9361A	PXI Downconverter: 2.75 GHz to 26.5 GHz
M9360A	PXI Attenuator/Preselector: 100 kHz to 26.5 GHz
M9202A	PXIe IF Digitizer: 12-bit, 1 GHz
M9210A	PXI-H Digitizing Scope: 10-bit, 2-4 GS/s
M9018A	18-slot PXIe Chassis
M9021A	PCIe® Cable Interface
Accessories	
U1093A-AS5	AS bus 2 connector

PXI DIGITAL TO ANALOG CONVERTERS

Agilent's PXI digital to analog converters and V/I sources are capable of supplying high and low voltages levels as well as source currents on one or multiple channels.

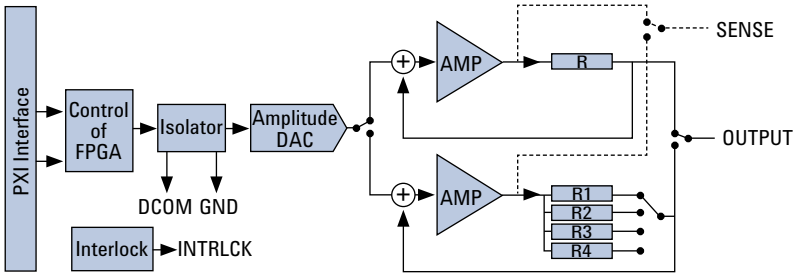
Equipped with the ability of supplying a wide range of voltage and current levels, the modules suit perfectly for the automotive industry where high input voltage or current ranges comes as a very common requirement for functional testing.

Product Features and your Benefits

- Supply high-voltage levels in parallel of up to 16 channels
- Large voltage current range
- SENSE input for guaranteed accuracy
- High-voltage device protection

Agilent M9185 PXI 8/16-Channel Isolated D/A Converter

Agilent M9186 PXI Isolated Single Channel Voltage/Current Source



M9186A system connections with SENSE input

www.agilent.com/find/pxi-converters

PXI DIGITAL TO ANALOG CONVERTERS

Applications

- I/O pin parametric leakage
- Bias current
- Impedance
- Threshold and clamp voltage

V/I Source							
	Description	Type # of slots	Channels/ crosspoints	Scan channel/ second	Max voltage	Max current	Frequency range
M9185A	D/A converter	PXI 2-slot (8 channel) PXI 3-slot (16 channel)	8 or 16 channels	N/A	16 V	20 mA	N/A
M9186A	V/I source	PXI 2-slots	1	N/A	100 V at 20 mA 16 V at 200 mA	200 mA	N/A

Driver information	
Supported operating systems	Microsoft Windows 7 (32/64-bit), Windows Vista (32/64-bit), Windows XP (32-bit)
Included device drivers	IVI-COM, IVI-C, LabVIEW G
Included GUI	Soft front panel

www.agilent.com/find/pxi-converters

Agilent M9185A PXI 8/16-Channel Isolated D/A Converter

www.agilent.com/find/m9185a

Industries and Applications

- Automotive
- Electronic test

Product Description

The M9185A is a fully independent, isolated digital/analog converter (D/A converter) that is capable of supplying high voltage levels in parallel of up to eight or 16 channels. Each channel is able to output up to 16 V as stimulus signals to device under tests (DUTs). The M9185A also provides a built-in SENSE mechanism, which detects output voltage levels and feeds the information to the circuitry of the converter to compensate for the voltage drop at the receiving end of a DUT. This feature ensures the accuracy of the stimulus signals being provided to the DUT for better test performance.

The M9185A is an ideal module for automotive applications where signal accuracy is of high importance.

Main Features and Benefits

Product features	Your benefit
High output voltage levels	Provides higher voltage levels as stimulus without the need for a pull up circuit
Built-in SENSE mechanism	Enables an auto feedback feature to the DAC compensation circuitry for voltage output adjustments to guarantee better accuracy

Chassis slot compatibility: cPCI (J1, J2), PXI-1, PXIe Hybrid

Specifications

Hardware		
Size	2-slot for 8-channel, 3-slot for 16-channel, 3 U	
DC Voltage	Range:	±16 V up to 10 mA
	Resolution:	16-bit = 500 µV
	Accuracy:	± (0.05% + 3.0 mV)
DC Current	Range:	±20 mA
	Resolution:	16-bit = 630 nA
	Accuracy:	± (0.09% + 5.0 µA)
Temperature range	Operating:	0° C to 55° C
	Storage:	–40° C to 70° C
Relative humidity	80%, 0° C to 40° C (non condensing)	
Physical characteristics	Dimensions: 8-channel, 2-slot: 40.30 mm x 128.40 mm x 215.00 mm (1.59 in x 5.06 in x 8.46 in) 16-channel, 3-slot: 60.50 mm x 128.40 mm x 215.00 mm (2.38 in x 5.06 in x 8.46 in) Weight: 8-channel: 0.47 kg (1.04 lb) 16-channel: 0.6 kg (1.32 lb) Output connector: Stacked VHDCI receptacle	

Ordering Information

Model	Description
M9185A	M9185A PXI D/A converter, 8/16-channel, 16-bit, ±16 V
M9185A-001	8-channel configuration for M9185A
M9185A-002	16-channel configuration for M9185A

Agilent M9186A PXI Isolated Single Channel Voltage/Current Source

www.agilent.com/find/m9186a

Industries and Applications

- Automotive
- Electronic test

Product Description

The M9186A two-slot, PXI based V/I source module enables the sourcing of a voltage or current to perform measurements on the resultant current or voltage through another module. It consists of two separate amplifiers - one low voltage and one high voltage - that share a common output connection. Both amplifiers can sense the amount of current flowing while forcing a constant voltage.

A unique safety interlock feature automatically disables the high-voltage amplifier and opens all relays when the interlock circuit is broken, providing protection to the device under test during the presence of high voltages.

10

Main Features and Benefits

Product features	Your Benefit
Large voltage-current range 16 V at 200 mA to 100 V at 20 mA	Enables device under test characterization required in parametric testing of device under test I/O pin
SENSE input	Enables accurate power source supply to device under test
Safety interlock	Protects the device under test from damage due to high voltages

Chassis slot compatibility: cPCI (J1, J2), PXI-1, PXIe Hybrid

Specifications and Characteristics

Hardware	
Size	2 slots, 3 U
Resolution	16 bit
Accuracy	±16 V up to 200 mA: 0.02 % + 3 mV –10 to + 100 V at up to 20 mA: 0.02 % + 40 mV

Voltage Source Accuracy (% of output + offset)	
16 V Range	Up to 200 mA: 0.02 % + 3 mV Current Sense using the SENSE pin with respect to OUTPUT: 200 mA range: 1.5 % + 500 µA 20 mA range: 0.5 % +50 µA 2 mA range: 0.5 % + 10 µA 200 µA range: 0.3 % + 5 µA
–10 to + 100 Range	Up to 20 mA: 0.02 % + 20 mV Current Sense using the SENSE pin with respect to OUTPUT: 0.75 % + 300 µA

Current Source Accuracy (% of output + offset)	
± 200 mA Range	0.3 % + 500 µA (Over ± 16 V)
± 20 mA Range	0.1 % + 50 µA
± 2 mA Range	0.3 % + 5 µA
± 200 µA Range	0.1 % + 0.5 µA
± 20 mA Range	0.2 % + 200 µA (Over –10 to +100 Vdc)

Ordering Information

Model	Description
M9186A	M9186A PXI isolated single channel voltage/current source, 100 V

PXI FUNCTION AND ARBITRARY WAVEFORM GENERATORS

Agilent's modular arbitrary waveform generators deliver unprecedented performance for creation of complex wideband waveforms. High sampling rate and high bit resolution provided in a single instrument enable designers to create ideal waveforms for accurate test of radar, satellite and frequency agile systems. Providing up to 500 MHz of modulation bandwidths and over 65 dBc of spurious free dynamic range, modular arbitrary waveform generators can be combined with a wideband I/Q upconverter to achieve modulation bandwidth of 1 GHz at microwave frequencies for authentic signal simulations for IF and RF subsystem test.

Product Features and your Benefits

Applications

- High resolution with wide bandwidth
- DDS and Dynamic sequencing options

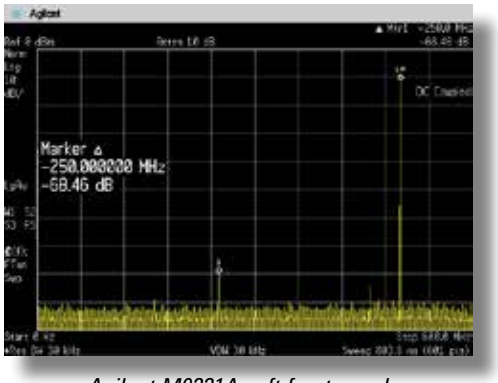
Functionality

- Very high signal quality arbitrary waveform generator
- Wide bandwidth

Performance characteristics

- 10- or 15-bit resolution
- 1.25 GS/s sampling rate for 500 MHz of bandwidth per channel
- Advanced sequencing engine

Agilent M9331A Arbitrary Waveform Generator 10-bit 1.25 GS/s



Agilent M9331A soft front panel

www.agilent.com/find/pxi-awg

FUNCTION AND ARBITRARY WAVEFORM GENERATORS

Function and Arbitrary Waveform Generators

	Description	Type # of slots	Resolution	Number of channels	Bandwidth per channel	Modulation bandwidth	Sampling rate	Memory depth
M9330A	Arbitrary waveform generator	PXI-H 4-slots	15-bit	2 ch	500 MHz	1 GHz	1.25 GS/s	16 MS
M9331A	Arbitrary waveform generator	PXI-H 4-slots	10-bit	2 ch	500 MHz	1 GHz	1.25 GS/s	16 MS

Driver information

Supported operating systems	Microsoft Windows 7 (32/64-bit), Windows Vista (32/64-bit), Windows XP (32-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW, MATLAB
Supported application development environments (ADE)	Visual Studio (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, MATLAB
Agilent IO Libraries	Includes: VISA Libraries, Agilent Connection Expert, IO Monitor

www.agilent.com/find/pxi-awg

Agilent M9330A PXI-H Arbitrary Waveform Generator

www.agilent.com/find/m9330a

Industries and Applications

- Aerospace Defense, wireless
- Radar & satellite test
- Semiconductor testing

Product Description

The M9330A is a high resolution, wide-bandwidth arbitrary waveform generator (AWG) capable of creating the most realistic waveforms for radar, satellite, and frequency agile communication systems, thanks to its 15-bit vertical resolution and 1.25 GS/s sampling rate.

Main Features and Benefits

Product features	Your benefit
1.25 GS/s and 15 bits of vertical resolution per channel	Provides exceptionally realistic wideband waveforms
Dual output channels	Can generate the I and Q components for wideband signal modulation
Extended waveform memory and advanced sequencing engine	Offers long scenario simulations
Multiple module synchronization	Provides multi-emitter simulations
Multiple programmatic interfaces	Enable easy integration into existing test environments

Specifications and Characteristics

Size	4 slots, 3U
Resolution	15 bits
Maximum sample rate	1.25 GS/s
Bandwidth	500 MHz per channel, 1 GHz modulated *(nominal)*

Chassis slot compatibility: cPCI(J1/J2), PXI-1, PXIe Hybrid

Specifications (cont'd)

Impedance	50 Ω *(nominal)*
Output spectral purity	Harmonic distortion –65 dBc for DC to 500 MHz *(nominal)* Non-harmonic spurious –75 dBc for 1 kHz to 500 MHz *(nominal)*
Phase noise	1 kHz: –95 dBc/Hz *(nominal)* 10 kHz: –115 dBc/Hz *(nominal)* 100 kHz: –138 dBc/Hz *(nominal)* 1 MHz: –150 dBc/Hz *(nominal)*
Noise floor	–150 dBc/Hz *(nominal)*
Sample clock	Internal or external

Ordering Information

Model	Description
M9330A	PXI-H arbitrary waveform generator: 1.25 GS/s, 15-bit
M9330A-M08	Memory: 8 MS per channel
M9330A-125	Clock operation, 1.25 GS/s
M9330A-200	Arbitrary waveform generator software
For a complete list of available options, please see product brochure	
Related products	
E8267D	PSG vector signal generator
M9331A	PXI-H Arbitrary Waveform Generator: 10-bit, 1.25 GS/s
M9392A	PXI Vector Signal Analyzer
M9202A	PXIe IF Digitizer: 12-bit, 2 GS/s, 1 GHz
M9018A	18-slot PXIe Chassis
M9021A	PCIe® Cable Interface
N7509A	Waveform Generation for Wideband Signal Simulation
N7620B	Signal Studio for Pulse Building
N7621B	Signal Studio for Multitone Distortion
Accessories	
Y1176A	Kit to synchronize two M933XA series AWG

Agilent M9331A PXI-H Arbitrary Waveform Generator

www.agilent.com/find/m9331a

Industries and Applications

- Telecommunication
- T&M ATE
- Aerospace Defense T&M
- Semiconductor testing

Product Description

The M9331A is a wide-bandwidth arbitrary waveform generator (AWG) capable of creating the ideal waveforms for compliance testing of digital radios targeted for use with communication standards such as MB-OFDM ultra wideband, 802.11n, MIMO, and proprietary wideband formats.

Main Features and Benefits

Product features	Your benefit
1.25 GS/s and 10 bits of vertical resolution per channel	Provides wideband waveforms with high signal quality
Dual output channels	Can generate the I and Q components for wideband signal modulation
Extended memory and advanced sequencing engine	Allows for extended simulations of complex waveform propagation models
Multiple module synchronization	Provides multi-emitter simulations suitable for MIMO applications
Multiple programmatic interfaces	Enable easy integration into existing test environments

Specifications and Characteristics

Size	4 slots, 3U
Resolution	10 bits
Maximum sample rate	1.25 GS/s

Chassis slot compatibility: cPCI(J1/J2), PXI-1, PXIe Hybrid

Specifications (cont'd)

Bandwidth	500 MHz per channel, 1 GHz modulated *(nominal)*
Impedance	50 Ω *(nominal)*
Output spectral purity	Harmonic distortion –50 dBc for DC to 500 MHz *(nominal)* Non-harmonic spurious –75 dBc for 1 kHz to 500 MHz *(nominal)*
Phase noise	1 kHz: –95 dBc/Hz *(nominal)* 10 kHz: –115 dBc/Hz *(nominal)* 100 kHz: –138 dBc/Hz *(nominal)* 1 MHz: –150 dBc/Hz *(nominal)*
Noise floor	–150 dBc/Hz *(nominal)*
Sample clock	Internal or external

Ordering Information

Model	Description
M9331A	PXI-H arbitrary waveform generator: 1.25 GS/s, 10-bit
M9331A-M08	Memory: 8 MS per channel
M9331A-125	Clock operation, 1.25 GS/s
M9331A-200	Arbitrary waveform generator software
For a complete list of options, please see product brochure	

Related products	
E8267D	PSG vector signal generator
M9330A	PXI-H Arbitrary Waveform Generator: 15-bit, 1.25 GS/s
M9392A	PXI Vector Signal Analyzer
M9202A	PXIe IF Digitizer: 12-bit, 2 GS/s, 1 GHz
M9018A	18-slot PXIe Chassis
M9021A	PCIe® Cable Interface
N7509A	Waveform Generation for Wideband Signal Simulation
N7620B	Signal Studio for Pulse Building
N7621B	Signal Studio for Multitone Distortion
Y1176A	Kit to synchronize two M933XA series AWG

PXI LOGIC ANALYSIS AND PROTOCOL TEST

For designers and integrators of RFIC and BBIC chipsets using DigRF v4, Agilent´s PXI protocol test solution enables comprehensive stimulus and analysis capabilities in the digital and RF domains as well as across domains. See the RDX solution to enable RF physical domain stimulus and analysis across an RFIC chip. Our tools provide the fastest insight into the performance of your mobile handset design from turn on through to integration and verification.

Product features

- For RFIC test, simulates a BB-IC
- RFIC prototype turn-on and characterization
- RFIC integration and troubleshooting
- Automated test
- Gear2 and multi-lane support
- Real-time DigRF stimulus and analysis
- Bit level to modulation level measurements for RF and digital design teams

Agilent M9252A DigRF Host Adapter

Software

The Agilent M9252A supports configurable traffic generation with customizable headers, payloads, and frame-sequence control. The host adapter allows the user to characterize and analyze RFIC performance with LTE-Advanced transmit and receive waveforms.

- Automatic support of ARQ in hardware
- Precise control of timing for each DigRF frame sent
- Inject a group of DigRF frames under software (API) control while transmission is active
- Control ‘clustering’ of multiple DLCs
- Create valid GSM symbols over the TX sublink
- Supports multiple (2) independent DLC channels

- Convert IQ data to DigRF from a variety of input formats such as ASCII files, Signal Studio, SystemVue and ADS. Internal 128 MB data memory is used as transmit source
- Automatically extract the IQ data from the DigRF data stream in hardware. The data is written into the internal 256-MB DDR memory. The data can be evaluated using the 89600 VSA software
- Programmable IQ resolution per DLC and number of IQ samples in a DigRF frame per DLC
- Selectable sample rate per DLC on TX and RX sublink
- IQ samples and resolution automatic selection based on air-standard

Driver information	
Supported operating systems	Microsoft Windows XP (32-bit)
	Microsoft Windows 7 (32/64-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW

www.agilent.com/find/m9252a

Agilent M9252A DigRF Host Adapter

www.agilent.com/find/m9252a

Industries and Applications

DigRF is used in mobile terminals for Long Term Evolution (LTE) and WiMAX™ communications, including:

- RFIC development test
- RFIC validation
- RFIC device integration

Product Description

The M9252A DigRF Host Adapter, part the Agilent RDX family, provides the serial stimulus capabilities required for the MIPI™ Alliance DigRF v4-based RFIC evaluation and characterization. A single module combines stimulus and Rx side capture capabilities to generate configurable control and data traffic and observe the response from the Device Under Test (DUT). It allows engineers to work in the domain (digital or RF) of their choice to quickly characterize the DUT's digital and wireless behavior.

Main Features and Benefits

Product features	Your benefit
For RFIC test, simulates a BB-IC	Control and configure the RFIC to match the test setup
Gear 2 (HS2x) support	Test high throughput to the latest MIPI specifications
Multi-link	Support for 1Rx/1Tx at low power or 4Rx/2Tx at Gear 2 high speed
Automation API	Complete programmatic control for complete production testing requirements
Seamless integration with Agilent 89600 VSA software	Immediate access to the industry's broadest, most advanced standards-based demodulation and signal analysis

Chassis slot compatibility: PXIe, PXIe Hybrid

Specifications and Characteristics

Hardware	
Size	1 slot 3U
DigRF v4	Version 1.0 and 1.1
DUT connection	Samtec 50-pin ERF8-025-05.0-L-DV
GPIO bus	A 6-pin-width GPIO bus can stimulate and sense proprietary interfaces
Trigger Input/Output	MMCX connections for external device synchronization
Link speeds	Low power (LP)
	High speed (HS1x) Gear 1
	High speed (HS2x) Gear 2 (Option 001)
Link support	1 link
	2 links (Option 002)
Lane configurations	Primary and secondary lanes
	1Tx/1Rx
	1Tx/2Rx
	2Tx/4Rx (Option 003)

Ordering Information

Model	Description
M9252A	PXIe DigRF host adapter
M9252A-001	Enable Gear 2 (HS2x)
M9252A-002	Enable secondary link
M9252A-003	Link extension (2Tx/4Rx lanes) (cannot be used with Option 002)
Interface cable	
M9255A	DUT connection cable Samtec 50-pin ERF8-025-05.0-L-DV
M9256A	DigRF interface converter for M9255A to SMA connectors
Upgrades	
M9252AU-001	G2 speed enhancement license
M9252AU-002	Upgrade to 2 links (2Rx/1Tx each)
M9252AU-003	Link upgrade to 4Rx/2Tx license
M9252A-112	Twelve month core software update subscription service (Standard)
M9252AU-112	Twelve month M9252A core software update subscription renewal
M9252AU-124	Twenty-four month core software update subscription service renewal

PXIe OPTICAL EXTENDERS FOR INSTRUMENTS

Agilent's Optical Extenders for Instruments can transmit your RF or Microwave signal without the power loss of coaxial cables and undesired mixing products of downconversion techniques—and with the isolation of fiber for extended distances up to and beyond 1000 meters. Adaptable to a broad range of applications requiring long RF transmission paths, the modules are configurable to meet the requirements of your application.

Product family

M9403A RF to Optical Converter

M9404A Optical to RF Receiver

M9404A 30dB RF Amplifier

M9406A USB Optical to USB 2.0

M9407A Optical to 4 port USB 2.0 Hub

M9408A Dual Reflectometer

Typical link conversion loss using the Agilent M9403A optical transmitter and M9404A optical receiver without an amplifier.

Typical link performance using the Agilent M9403A optical transmitter and M940A4 optical receiver with the M9405A amplifier.

Product features and your benefits

Applications

- Antenna ranges
- Network analyzer port extender
- Isolated measurements

Performance characteristics

- 300 kHz to 26.5 or 50 GHz
- 5 dB of loss @ 13 GHz with preamp
- Achieve transmission lengths up to and beyond 1 Kilometer
- Full PNA port extension

Agilent M9403A PXIe Optical Transmitter, M9404A PXIe Optical Receiver, M9405A PXIe Amplifier, M9406A PXIe Optical to USB 2.0, M9407A PXIe Optical to 4 Port USB 2.0 Hub and M9408A PXIe Remote RF Reflectometer.

www.agilent.com/find/pxi-opticalextenders

OPTICAL EXTENDERS

Agilent PXIe
Optical Extenders for Instruments

www.agilent.com/find/pxi-opticalextenders

Industries and Applications

- Antenna ranges, remote antennas, earth stations
- Network analyzer port extenders
- Isolated measurements

Product Description

Agilent's Optical eXtenders for Instruments can deliver your RF or Microwave signal without the power loss of coaxial cables, without the unwanted mixing products of downconversion techniques, and with the isolation of fiber at distances up to and beyond 1000 meters. Choose the combination of modules that best fits your requirements today with the confidence that you can scale the solution to meet the requirements of tomorrow by taking advantage of the modularity, scalability and upgradability of PXI.

Main Features and Benefits

Product features	Your benefit
Minimal insertion loss	Transmit your signal over long distances and make measurements of large devices
Operate from 300 kHz to 26.5 or 50 GHz	Eliminate the need for expensive down conversion equipment
Remote systems without the need for a controller or software development	Install your cards, connect your cables and power up. It's that simple.
Flexible system configurations	Select the combination of modules that meets your requirements
Ability to add USB keyboard, mouse, power sensor, e-Cal and USB-to-VGA converter	Full remote control

Characteristic Performance *(nominal)*

Frequency Range	*Option F26: 300 kHz to 26.5 GHz* *Option F50: 300 kHz to 50 GHz*
Spurious Free Dynamic Range	*> 90 dB/Hz* *> 110 dB/Hz*
Noise Figure:	Opt H01 (unamp): *26.5 GHz, 34 dB, 50 GHz, 42 dB* Opt H02 (amp): *26.5 GHz, 8 dB, 50 GHz, 12 dB*
Link Gain	*Option H01: > -30 dB* *Option H02: > -4 dB*

Characteristic *(nominal)* cont'd

M9406A USB Optical		
Data Rate	1.5, (USB 1.0), 12, (USB 1.1) and 480 (USB 2.0) Mbps	
Optical Link RF Performance (M9403A, M9404A) *(nominal)*		
Input Power	Unamplified (Opt H01)	Amplified (Opt H02)
Min RF Input Level	*-120 dBm (based on PNA-X noise floor measurements)*	
Max Optimum RF Input Level	*7 dBm*	*-25 dBm*
Return Loss	300 kHz to 26.5 GHz (Opt F26)	300 kHz to 50 GHz (Opt F50)
RF Source Return Loss	*> 10 dB*	*> 6 dB*
RF Receiver Return Loss	*> 8 dB*	*> 8 dB*

Ordering Information

Model	Description
Local Chassis	
M9403A	Optical Transmitter, Unamplified (H01) 300 kHz to 26.5 GHz (F26) or 50 GHz (F50)
M9406A	USB to Optical
Remote Chassis	
M9404A	Optical Receiver, with Unamplified (H01) 300 kHz to 26.5 GHz (F26) or 50 GHz (F50)
M9407A	Optical to 4 Port USB 2.0 Hub

Related products	
N5242A	PNA-X Network Analyzer, 26.5 GHz
N5245A	PNA-X Network Analyzer, 50 GHz
M9155C	PXI Hybrid Dual SPDT Coaxial Switch, 26.5 GHz
U2002A	USB Power Sensor, 50 MHz to 24 GHz, 3.5mm
N4691B	Electronic Calibration Module, 26.5 GHz, 2-port
M9018A	18-slot PXIe Chassis

Chassis slot compatibility: PXIe, PXIe Hybrid

PXI SIGNAL ANALYZERS AND SIGNAL CONDITIONING

Be ready for tomorrow - today

RF requirements keep growing while timelines keep shrinking. To help ease the technical and business pressures, the right test solution provides continuity in measurements and longevity in capability. The new M9391A PXIe RF Vector Signal Analyzer (PXI VSA) is the next logical step in RF signal analysis. The PXI VSA combined with the M9381A PXIe RF Vector Signal Generator - the new VSA/G - provides fast and high quality measurements optimized for RF manufacturing test environments. Agilent's broad portfolio of software applications enable use of the same measurement algorithms from design to manufacturing.

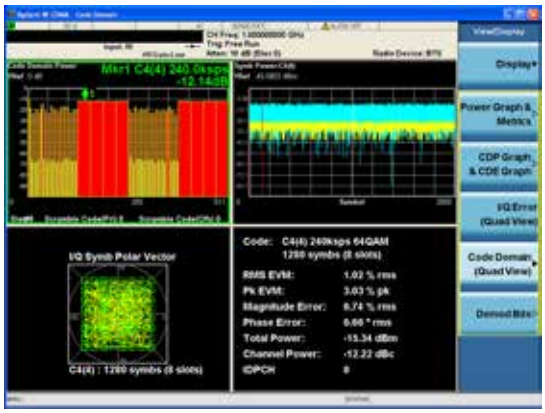
Product features and your benefits

NEW

- The **M9391A PXIe RF Vector Signal Analyzer** for frequencies from 1 MHz to 6 GHz works seamlessly with the M9381A PXIe RF Vector Signal Generator for fast, high quality RF measurements. To help you get proven results even faster, Agilent's X-Series Measurement Applications for Modular Instruments, 89600 VSA and SystemVue software enable you to investigate, validate and test your RF communications designs.

Agilent M9391A PXIe RF Vector Signal Analyzer

- The **M9392A PXI Microwave Vector Signal Analyzer** combined with the Agilent 89600 VSA software, delivers a complete microwave vector signal analyzer solution enabling analysis of signals from 50 MHz to 26.5 GHz with 250 MHz of instantaneous bandwidth.
- The **Dual Channel PXI Vector Signal Analyzer** configuration, based on two M9392A PXI vector signal analyzers, delivers simultaneous, independently tuned, wide bandwidth analysis of two RF/uW signals. Typical applications include gapless recording over long durations and multichannel streaming.
- The **Wideband MIMO PXI Vector Signal Analyzer** configuration delivers simultaneous bandwidth analysis up to 800 MHz on four channels. For engineers working on 802.11ac applications, this PXI configuration provides analysis capabilities for up to 4x4 MIMO and is ideal for 80 + 80 MHz SISO and 80 MHz or 160 MHz MIMO 802.11ac measurements.



Agilent M9073A X-Series Measurement Application for W-CDMA/HSPA+

Agilent Dual Channel PXI Vector Signal Analyzer

Agilent Wideband MIMO PXI Vector Signal Analyzer

www.agilent.com/find/pxi-vsa

PXI SIGNAL ANALYZERS AND SIGNAL CONDITIONING

Achieve continuity in measurements

Agilent's broad portfolio of world-class software applications accelerate your project's design to manufacturing cycle. From model-based system level design validation, to detailed measurement data analysis of complex devices to RF standard conformance measurements, Agilent provides ways to achieve more confidence and continuity in measurements from R&D to manufacturing.

Software application features and your benefits

- **SystemVue** system-level design automation software enables you to create model-based design validation from design concept to hardware manufacturing. SystemVue can be used with the M9391A PXI VSA.
- Accelerate development with a consistent set of tools using the **89600 VSA software** to characterize complex signals in the time, frequency and modulation domains. The 89600 VSA software ensures comparable measurement results across all stages of design with support for more than 40 Agilent hardware platforms.
- The **X-Series measurement applications for modular instruments** transforms the M9391A PXI VSA into standards based RF transmitter testers. They provide fast RF conformance measurements to help quickly test components and devices in high volume manufacturing.

X-Series measurement applications for modular instruments, pictured with the Agilent M9391A and M9381A PXI VSA/G.

Software Applications for PXI Vector Signal Analyzers		
Model	Description	Modular Instruments Supported
89601B	89600 VSA software	M9391A PXIe RF Vector Signal Analyzer M9392A PXI Microwave Vector Signal Analyzer
M9071A - M9082A	X-Series Measurement Applications for Modular Instruments	M9391A PXIe RF Vector Signal Analyzer
W1461BP	SystemVue	M9381A PXIe Vector Signal Generator M9391A PXIe Vector Signal Analyzer

PXI SIGNAL ANALYZERS AND SIGNAL CONDITIONING

Spectrum and Signal Analyzers

	Description	Type # of slots	Frequency range	Phase noise (10 kHz offset)	DANL at 1 GHz	3rd order intercept (TOI) at 1 GHz	Analysis bandwidth	Software applications
M9391A	PXIe RF Vector Signal Analyzer	PXI PXIe 4-slot	1 MHz to 6 GHz	< -120 dBc/Hz (at 1 GHz, 20 kHz offset)			40 MHz 100 MHz or 160 MHz	X-Series Meas App SystemVue 89600 VSA
M9392A	PXIe MW Vector Signal Analyzer	PXI PXIe 8-slot	50 MHz to 26.5 GHz	-115 dBc/Hz (at 10 GHz) nominal	-158 dBm/Hz nominal	-10 dBm (two -40 dB tones, 1 MHz apart)	250 MHz (≥ 2.75 GHz)	89600 VSA
M9302A	Local Oscillator	PXI 2-slot	3 GHz to 10 GHz	-115 dBc/Hz (at 10 GHz) nominal	N/A	N/A	N/A	N/A
M9351A	Downconverter	PXI 1-slot	50 MHz to 2.9 GHz	N/A	N/A	-10 dBm (two -40 dB tones, 1 MHz apart)	40 MHz	N/A
M9360A	Attenuator/ Preselector	PXI 3-slot	100 KHz to 26.5 GHz	N/A	N/A	N/A	40 MHz min (3 dB BW, YIG-tuned filter YTF)	N/A
M9361A	Downconverter	PXI 1-slot	2.75 GHz to 26.5 GHz	N/A	N/A	-10 dBm (two -40 dB tones, 1 MHz apart)	250 MHz	N/A
M9202A	IF Digitizer	PXIe 1-slot	2 GS/s (sampling rate)	N/A	-144 dBm/ Hz (noise density)	N/A	30 MHz to 1 GHz	N/A
M9362A-D01	Quad Downconverter	PXI 3-slot	10 MHz to 26.5 GHz	N/A	N/A	N/A	1.5 GHz/ Channel	N/A

Signal Conditioning Modules

	Description	Type # of slots	Frequency range	Bandwidth	Noise figure	TOI	IF center frequency	Min/max power
M9168C	Attenuator	PXI 2-slot	DC to 26.5 GHz	DC to 26.5 GHz	N/A	N/A	N/A	+30 dBm (max)
M9351A	Downconverter	PXI 1-slot	50 MHz to 2.9 GHz	40 MHz	10 dB max	-10 dBm (two -40 dB tones, 1 MHz apart)	500 MHz	-160 dBm/ -30 dBm
M9352A	PXI Hybrid Amplifier/ Attenuator	PXI 1-slot	10 MHz to 1 GHz	Analog Bandwidth (3dB) 1 GHz	3 dB	+43 dBm	n/a	n/a
M9361A	Downconverter	PXI 1-slot	2.75 GHz to 26.5 GHz	250 MHz	30 dB at 26.5 GHz	-10 dBm (two -40 dB tones, 1 MHz apart)	500 MHz	-30 dBm (max)
M9360A	Attenuator/ Preselector	PXI 3-slot	100 kHz to 26.5 GHz	35 MHz to 120 MHz (3 dB BW, YTF)	N/A	N/A	N/A	+30 dBm (max)
M9362A-D01	Quad Downconverter	PXI 3-slot	10 MHz to 26.5 GHz	1.5 GHz	N/A	N/A	N/A	N/A

Driver information

Supported operating systems	Microsoft Windows 7 (32/64-bit), Windows Vista (32/64-bit), Windows XP (32-bit) M9168C does not support Windows Vista
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW, MATLAB
Supported application development environments (ADE)	Visual Studio (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, MATLAB
Agilent IO Libraries	All except M9168C: VISA Libraries, Agilent Connection Expert, IO Monitor

www.agilent.com/find/pxi-vsa

Agilent X-Series Measurement Applications for Modular Instruments

www.agilent.com/find/pxi-x-series_apps

Industries and Applications

- LTE-FDD, LTE-TDD
- WCDMA/TD-SCDMA/HSPA, HSPA+
- GSM/EDGE/EVO
- 1xEV-DO, cdma2000®/cdmaOne
- WLAN 802.11a/b/g/n/ac

Product Description

Eight of Agilent's popular X-Series measurement applications - the same applications used with the X-Series signal analyzers - expand the capabilities of the M9391A PXIe Vector Signal Analyzer (PXI VSA). Combining these applications with the raw hardware speed of the PXI VSA enables faster measurements and lowers the cost of test, while ensuring measurement continuity from design to manufacturing.

X-Series measurement applications for modular instruments transform PXI VSAs into standards based RF transmitter testers. They provide fast RF conformance measurements to help quickly test components and devices in high volume manufacturing.

Main Features and Benefits

Product features	Your benefit
Shared SCPI programming commands	Minimizes effort and cost of creating new test systems.
Unique resource manager in X-Series measurement applications for modular instruments	Provides fast switching between raw data measurements and standards based measurements.
Proven measurement algorithms and results	Consistent test results from design to manufacturing
Standards-based measurements	Confidence that tests meet required standards
Transportable license	Supports up to four PXI VSA measurement channels in one PXI chassis.

Resource Manager

Agilent's X-Series measurement applications for modular instruments include a unique resource manager that provides direct access to PXI VSA hardware drivers for the fastest power and spectrum-based measurements while simultaneously using fast modulation quality measurements provided in the X-Series measurement applications. Time spent switching between different applications is also significantly faster, thanks to the resource manager.

Ordering Information

Model	Description
M9071A	GSM/EDGE/EVO Measurement Application
M9072A	cdma2000/cdmaOne Measurement Application
M9073A	W-CDMA/HSPA+ Measurement Application
M9076A	1xEV-DO Measurement Application
M9077A	WLAN 802.11a/b/g/n/ac Measurement Application
M9079A	TD-SCDMA/HSPA Measurement Application
M9080A	LTE FDD Measurement Application
M9082A	LTE TDD Measurement Application

Software Information

Software operating systems	Microsoft Windows XP (32-bit) Microsoft Windows 7 (32/64-bit) Microsoft Windows Vista SP1 and SP2 (32/64-bit)
3rd party applications and development environment integrated with X-Series Apps	VisualStudio (C/C++, C#, VB.NET), LabVIEW, LabWindows/CVI, MATLAB, VEE

Agilent 89600 VSA Software

www.agilent.com/find/89600

Industries and Applications

- Cellular communications
- Wireless connectivity
- Aerospace/defense

Product Description

Development becomes more complex when faster data rates intersect with today's crowded spectral environment. Finding a signal problem is essential --but achieving the clarity to pinpoint the answer is the crucial challenge. The 89600 VSA software is a comprehensive set of tools for de-modulation and vector signal analysis. These tools enable you to explore virtually every facet of a signal and optimize your most advanced designs. As you assess the tradeoffs, the 89600 VSA helps you see through the complexity.

Main Features and Benefits

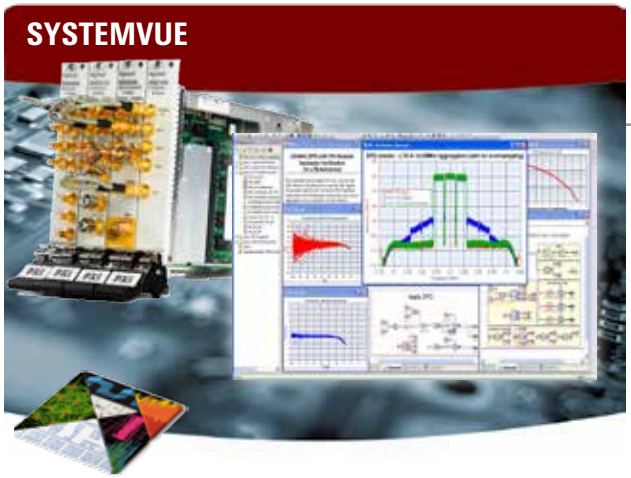
Product features	Your benefits
Supports more than 75 signal standards and modulation types.	Measure *your* signal
Multiple simultaneous views in time, frequency and modulation domains.	View signal performance quickly.
Consistent measurement science from baseband to RF.	Accelerate development with consistent measurements across broad frequency range from R&D to manufacturing.

Ordering Information

Model	Description
89601B	89600 VSA software, transportable license
89601B-200	Basic vector signal analysis
89601B-300	Hardware connectivity
89601B-AYA	Vector modulation analysis
89601B-B7T	cdma2000®/1xEV-DO
89601B-B7U	W-CDMA/HSPA+
89601B-B7R	WLAN 802.11a/b/g
89601B-B7Z	WLAN 802.11n
89601B-BHJ	WLAN 802.11ac
89601B-B7X	TD-SCDMA/HSPDA GSM/EDGE/Evo
89601B-BHD	LTE FDD
89601B-BHG	LTE - Advanced FDD
89601B-BHE	LTE TDD
89601B-BHH	LTE - Advanced TDD
89601B-BHF	Custom OFDM
89601B-BHC	RFID

Software Information

Software operating systems	Microsoft Windows XP (32-bit) Microsoft Windows 7 (32/64-bit) Microsoft Windows Vista SP1 and SP2 (32/64-bit)
Agilent software applications that are tightly integrated with SystemVue	**Agilent test software:** I/O Libraries, Command Expert **Agilent EDA software:** Advanced Design System, SystemVue
3rd party applications and development environments integrated with 89600 VSA software	VisualStudio (C/C++, C#, VB.NET), LabVIEW, LabWindows/CVI, MATLAB, VEE



Agilent SystemVue

System Level Design & Verification

www.agilent.com/find/systemvue

Typical Applications

- Signal generation with fading & impairments
- Early standards support
- Wideband system validation

Product Description

Agilent SystemVue is a system-level EDA environment that accelerates design and verification of defense and communications systems at the physical layer, where advanced digital signal processing meets RF. SystemVue brings together baseband algorithm modeling, accurate RF, trusted Reference IP, and measurement automation in a single environment for high-performance RF/DSP co-design.

Main Features and Benefits

Product features	Your benefits
Popular modeling languages: C++, MATLAB .m, HDL, or graphical dataflow schematics	Open, vendor-neutral formats reduce costs and connect Agilent Test with Enterprise EDA tools
Superior RF simulation speed & accuracy, with links to RF EDA	Virtualize RF/MIMO components for earliest system validation with high confidence
World-class IP references for LTE-Advanced, 802.11ac/ad, Radar, and other standards	Create and re-use TX/RX and MIMO verification suites with confidence across the whole lifecycle from design to test
Superior integration of Simulation with Test & Measurement	Bring "Drive Test" accuracy into 4G design, while creating custom personalities around test
Interoperates with a wide variety of Agilent equipment and software, including 89600 VSA and Command Expert	Makes highest use of best-in-category assets, while unifying DSP and RF design lifecycles into a coherent flow

Agilent SystemVue combines with Agilent Modular Products to create an expandable platform for modeling, implementing, and validating next-generation communications systems and defense systems. A modular approach enables a virtual system to be verified from the first day of the project - beginning with simulation models and incorporating measurements as the project progresses.

Ordering Information

Recommended Products & Environments
Core Environment • W1461BP SystemVue Comms Architect **People who use Agilent Modular Instruments often buy:** • W1716EP Digital Pre-Distortion Builder • W1905EP Radar Model Library • W1902EP Digital Modem Library • W1918EP LTE-Advanced Baseband Verification Library

Software Information

Software operating systems	Microsoft Windows 8 (32/64-bit) Microsoft Windows 7 (32/64-bit) Microsoft Windows XP (32-bit)
Available Add-on Applications and Design Flow Personalities	Fixed-point models, HDL Code-Generation, C++ Code Generation, Adaptive EQ, DPD Builder, MIMO Channel Builder, RF System Architectures
Available Standards Reference Libraries	**Comms:** LTE-Advanced, LTE, HSPA+, WCDMA, cdma2000®, CDMA, WiMAX™, 802.11a/ac/ad, DVB-S2/T2, Custom OFDM, Bluetooth, Zigbee, and nearly 40 general purpose formats for Milcomm/Satcomm. **Radar:** Doppler, UWB, SAR, DAR, FMCW, Phased Array, Beamforming
Agilent software applications that are tightly integrated with SystemVue	**Agilent test software:** 89600 VSA, FlexDCA, I/O Libraries, Command Expert, Waveform Creator. **Agilent EDA software:** Advanced Design System, GoldenGate
3rd party applications and development environments that are integrated with SystemVue	Microsoft VisualC++,MATLAB, VHDL/ Verilog, FPGA Hardware-in-Loop, (HIL), STK (Analytical Graphics) and more.

Agilent M9391A
PXIe Vector Signal Analyzer

www.agilent.com/find/m9391a

Industries and Applications

- Cellular picocell and femtocell test
- RF component manufacturing test
- Wireless transceiver design validation
- WLAN production test
- Military radio test
- Public safety and homeland security radio test

Product Description

The Agilent M9391A PXIe vector signal analyzer (PXI VSA) is a modular solution that provides frequency coverage from 1 MHz to 6 GHz and works seamlessly with the M9381A PXI VSG. The combined PXI VSA/G provides a complete solution for fast, high quality measurements optimized for RF manufacturing test environments.

In addition to the raw hardware speed enabled by Agilent's exclusive technology innovations, the PXI VSA produces high quality measurements. Agilent's industry leading software applications further increase the efficiency of the PXI VSA, including X-series measurement applications.

Main Features and Benefits

Product features	Your benefit
Fast amplitude and frequency switching speed with ***fastune***	Accelerate test throughput
Embedded power measurement mode	Reduces test times from 3s to less than 600 ms with outstanding linearity
Unique resource manager in X-Series Measurement Applications for modular instruments	Provides fast switching between raw data measurements and standards-based measurements.

Chassis slot compatibility: PXIe, PXIe Hybrid

Specifications and Characteristics

Hardware	
Frequency range	1 MHz to 3 GHz or 6 GHz
fastune switching speed	Frequency switching up to *15 µs, nominal*
Phase noise	< -120 dBc/Hz (1 GHz, 20 kHz offset)
Repeatability	*<0.05 dB, nominal*
Amplitude accuracy	*±0.45 dB, typical*
Analysis bandwidth	40 MHz (flatness: *±0.08 dB, nominal)* 100 MHz (flatness: *±0.09 dB, nominal)* 160 MHz (flatness: *±0.17 dB, nominal)*
EVM	WLAN 802.11ac *-47.5 dB,* 5.8 GHz, 160 MHz BW *nominal*
ACLR	W-CDMA *-68.1 dBc, typical* (adjacent) W-CDMA *-70.7 dBc, typical* (alternate)
Size	4-slot

Ordering Information

Model	Description
M9391A	PXIe vector signal analyzer: 1 MHz to 3 or 6 GHz Includes: M9301A PXIe synthesizer, M9350A PXIe downconverter, M9214A PXIe IF digitizer
Base Configuration	
M9391A-F03	Frequency range: 1 MHz to 3 GHz
M9391A-B04	Analysis bandwidth: 40 MHz
M9391A-M01	Memory: 128 MSa
M9391A-300 Required for warranted specifications	PXIe frequency reference: 10 MHz and 100 MHz Adds M9300A PXIe frequency reference: 10 MHz and 100 MHz (M9300A module can support multiple M9391A modular instruments)
Other Options	
M9391A-F06	Frequency range: 1 MHz to 6 GHz
M9391A-UNZ	Fast switching
M9391A-B10	Analysis bandwidth: 100 MHz
M9391A-B16	Analysis bandwidth: 160 MHz
M9391A-M05	Memory: 512 MSa
M9391A-M10	Memory: 1024 MSa

Agilent Dual Channel PXI Vector Signal Analyzer

www.agilent.com/find/pxi-vsa-dualchannel

Industries and Applications

- Aerospace and defense
- Wireless communications
- Radar and wideband signal capture
- Electronic test

Product Description

The Dual Channel PXI Vector Signal Analyzer is designed to deliver simultaneous, wide bandwidth analysis of two RF/Microwave signals. For applications requiring gapless recording over long durations, this configuration enables simultaneous streaming of each channel—at up to 100 MHz analog bandwidth—to a local drive or large capacity RAID storage device. Streaming detects elusive problems that may be missed by single capture analysis to find the root cause of intermittent issues.

Main Features and Benefits

Product features	Your benefit
Multichannel analysis	Detect and identify sources of interference
100 MHz streaming capability	Capture and analyze intermittent problems at high frequencies and bandwidths.
Real-time digital downconversion (DDC) algorithm	Data decimation, analog performance improvement
Seamless integration with Agilent 89600 VSA software	Immediate access to the industry's broadest, most advanced standards-based demodulation and signal analysis

Chassis slot compatibility: PXIe, PXIe Hybrid

Specifications and Characteristics

Hardware	
Channel	Up to 2 channels in a single chassis
Frequency range	50 MHz to 26.5 GHz
Sample rate	2 GS/s
3 dB Bandwidth	35 MHz min (preselected, < 3 GHz) 40 MHz min (preselected, ≥ 3 GHz) 40 MHz min (< 2.75 GHz, bypass) 250 MHz min (≥ 2.75 GHz, bypass)
Maximum streamed analog bandwidth (config dependent)	Up to 100 MHz streamed analog bandwidth on each channel
EVM	< -40 dB at 80 MHz BW, 5.8 GHz (nominal)
DANL	-158 dBm/Hz, ≤ 9.5 GHz, (nominal) -147 dBm/Hz, > 9.5 GHz, (nominal)
Absolute amplitude accuracy	± 0.6 dB, < 2.75 GHz, (nominal), after field calibration (corrected) ± 0.5 dB, ≥ 2.75 GHz, (nominal), after field calibration (corrected) ± 2 dB, (nominal), without field calibration (uncorrected)

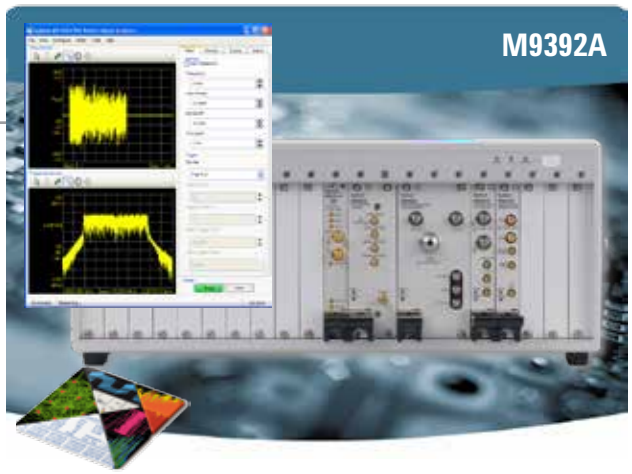
Ordering Information

Model	Description
M9392A	PXI microwave vector signal analyzer (1 for each channel)
Optional Modules	
M9351A	PXI downconverter: 50 MHz to 2.9 GHz (1 for each channel)
89600 VSA Software	
89601B	89600 VSA software, transportable license
89601B-200	Basic vector signal analysis
89601B-300	Hardware connectivity
89601B-AYA	Vector modulation analysis

For more detailed configuration information, please see the M9392A Configuration Guide, literature no. 5990-8254EN.

Agilent M9392A PXI Vector Signal Analyzer 50 MHz to 26.5 GHz

www.agilent.com/find/m9392a



Industries and Applications

- Aerospace and defense
- Wireless communications
- Digital pre-distortion (DPD)

Product Description

The Agilent M9392A[1] is a PXI Vector Signal Analyzer with frequency coverage from 50 MHz to 26.5 GHz with 250 MHz of instantaneous bandwidth and up to 100 MHz streamed analog bandwidth. Achieve multichannel analysis capability by combining 2 PXI vector signal analyzers--Agilent M9392A--in one chassis. Combine with the Agilent 89600 VSA software, for a complete Microwave Vector Signal Analyzer solution enabling analysis of communications, radar, and avionics signals in a modular, open-system standard.

Main Features and Benefits

Product features	Your benefit
12-bit, 2 GS/s digitizer	Measure broadband communications and radar signals
Multichannel analysis	Detect and identify sources of interference. Measure 80+80 MHz 802.11ac devices
Real-time digital down-conversion (DDC) algorithm	Data decimation, analog performance improvement
Seamless integration with Agilent 89600 VSA software	Immediate access to the industry's broadest, most advanced standards-based demodulation and signal analysis

Chassis slot compatibility: cPCI (J1), PXI-1, PXI Hybrid

Specifications

Hardware	
Frequency range	50 MHz to 26.5 GHz
Size	7 or 8 slots-wide multiple modules
Sample rate	2 GS/s
3 dB bandwidth	35 MHz min (preselected, < 3 GHz)
	40 MHz min (preselected, ≥ 3 GHz)
	40 MHz min (< 2.75 GHz, bypass)
	250 MHz min (≥ 2.75 GHz, bypass)
Maximum streamed analog bandwidth (config dependant)	up to 50 MHz (with V05 option) up to 100 MHz (with V10 option)
EVM	< -40 dB at 80 MHz BW, 5.8 GHz *(nominal)*
DANL	-158 dBm/Hz, ≤ 9.5 GHz, *(nominal)*
	-147 dBm/Hz, > 9.5 GHz, *(nominal)*
Absolute amplitude accuracy	± 0.6 dB, < 2.75 GHz, *(nominal)*, after field calibration (corrected)
	± 0.5 dB, ≥ 2.75 GHz, *(nominal)*, after field calibration (corrected)
	± 2 dB, *(nominal)*, without field calibration (uncorrected)

Ordering Information

Model	Description
M9392A	PXI Vector Signal Analyzer 50 MHz to 26.5 GHz Includes: M9202A PXIe IF digitizer, M9302A PXI local oscillator, M9360A PXI attenuator/preselector, M9351A and M9361A PXI downconverters
M9018A	18-slot PXIe Chassis
M9036A	PXIe Embedded Controller
89601B	89600 VSA software, transportable License
89601B-200	Basic vector signal analysis
89601B-300	Hardware connectivity
89601B-AYA	Vector modulation analysis

Agilent Wideband MIMO PXI Vector Signal Analyzer

www.agilent.com/find/pxi-vsa-mimo

Industries and Applications

- 802.11ac applications
- Wireless device test
- Wireless transceiver design validation
- WLAN production test

Product Description

The wideband MIMO PXI Vector Signal Analyzer delivers simultaneous, wide bandwidth analysis on up to 4 channels. For engineers working on 802.11ac applications, this PXI configuration provides analysis capabilities for up to 4x4 MIMO, and is ideal for 80 + 80 MHz SISO, and 80 MHz or 160 MHz MIMO 802.11ac measurements. Additionally, it provides up to 800 MHz analysis bandwidth to address current and future wireless standards.

Main Features and Benefits

Product features	Your benefit
Flexible 2 to 4 channels	Analysis capabilities for up to 4x4 MIMO
800 MHz Analysis Bandwidth	Supports current and future wireless standards
Seamless integration with Agilent 89600 VSA software	Immediate access to the industry's most advanced standards based demodulation and signal analysis
Support of 802.11ac format	Standards-based measurements
Physical layer parametric measurements	Analyze EVM by symbol, carrier or burst, measure I/Q parameters, center frequency, bandwidth, power, ACPR, demodulate to bit level

Chassis slot compatibility: PXIe, PXIe Hybrid

Specifications and Characteristics

Hardware	
Channel	Up to 4 channels in a single chassis
Frequency Range	10 MHz to 26.5 GHz
Analysis Bandwidth	Up to 800 MHz
Error Vector Magnitude	< - 42 dB Exceeds 802.11ac standards
IF Digitizer resolution	12-bits
Sample Rate	2 GS/s
Size	4U rack space for 3 channel configuration

Ordering Information

Model	Description
M9018A	PXIe 18 slot chassis
M9036A	PXIe embedded controller
M9202A	12-bit 2 GSa/s IF digitizer (1 module per channel)
M9362A-001	4-channel downconverter
M9352A	4-channel IF amplifier/attenuator
M9302A	Local oscillator (1 module for 1 to 3 channels)
M9168C	PXIe attenuator (1 module per channel)
89600 VSA Software	
89601B	89600 VSA software, transportable license
89601B-200	Basic vector signal analysis
89601B-300	Hardware connectivity
89601B-AYA	Vector modulation analysis
89601B-B7Z	WLAN 802.11n modulation analysis
89601B-BHJ	WLAN 802.11ac modulation analysis
Cables	
Y1240A Option 001	2-Channel trigger distribution kit
Y1240A Option 002	3 and 4-channel trigger distribution kit
Y1240A Option 003	3 and 4-channel 100 MHz distribution kit
Y1240A Option 004	LO distribution kit
Y1240A Option 005	2-channel RF distribution kit

For detailed configuration information, please see the M9362A-D01 Configuration Guide, literature no. 5990-9968EN.

Agilent M9362A-D01 PXIe Microwave Quad Downconverter

www.agilent.com/find/m9362a-d01

Industries and Applications

- Aerospace and defense
- Wireless communications
- Radar and wideband signal capture

Product Description

The Agilent M9362A-D01, option F26, is a PXIe 3-slot, 4-channel, coherent microwave downconverter with frequency coverage from 10 MHz to 26.5 GHz, along with 1.5 GHz of instantaneous bandwidth per channel. The M9362A-D01 is well suited for wideband signal capture where multiple channels are required for applications such as multi-channel coherent signal analysis, radar, SIGNIT, ELINT, MASINT, EW signal capture and analysis, and RF and microwave recording and analysis.

When combined with an Agilent M9302A Local Oscillator and one or more Agilent M9210A 4GS/s Digitizers, the M9362A-D01 Downconverter can be used to synchronously capture up to 4 signals in up to 1.4 GHz bandwidth, with 10-bit resolution.

Main Features and Benefits

Product features	Your benefit
Frequency range	10 MHz to 26.5 GHz
Four-channel synchronous downconversion	Multi-channel coherent signal analysis
PXIe form-factor	Conforms to Modular Open Systems Approach (MOSA)
Software support for easy integration	Reduced development time

Specifications

Hardware	
Size	3-slot
Operating Range	10 MHz to 26.5 GHz
Bandwidth	1.5 GHz per channel
Noise Figure	24 dB, *(nominal)*
Impedance	50 Ω, *(nominal)*

Ordering Information

Model	Description
M9362A-D01	PXIe Quad Downconverter:
M9362AD01-F26	10 MHz to 26.5 GHz
M9362AD01-CA1	IF Jumper Cables for use with 4-M9202A Single CH Digitizers
M9362AD01-CA2	IF Jumper Cables for use with 2-M9202A Dual CH Digitizers
M9362AD01-CA3	IF Jumper Cables for use with the M9210A
M9362AD01-CA4	LO Interconnect Kit for use with the M9302A
Related Products	
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
M9210A	PXI-H High-speed Digitizing Scope: 10-bit, 2-4 GS/s
M9018A	18-slot PXIe chassis
M9036A	PXIe Embedded Controller

Chassis slot compatibility: PXIe, PXIe hybrid

Agilent M9168C PXI Programmable Step Attenuator Module

www.agilent.com/find/pxiattenuator

Industries and Applications

- RF signal path attenuation simulation
- Engineering verification
- RF receiver sensitivity test
- Adjacent channel interference

Product Description

M9168C is a programmable step attenuator module based on the PXI hybrid platform, operating from DC to 26.5 GHz with a guaranteed 0.03 dB insertion loss repeatability for each section throughout the 5 million cycles operating life. Its excellent attenuation accuracy across a wide operating temperature range, ensures precise measurement. M9168C is a signal conditioning module that enhances the measurement accuracy and flexibility of PXI based RF and microwave test systems.

Main Features and Benefits

Product features	Your benefit
Guaranteed 0.03 dB insertion loss repeatability throughout the operating life of up to 5 million cycles	Reduce downtime for recalibration, improve testing efficiency, therefore maximizing throughput
Broad attenuation range of 0 to 101 dB with 1 dB step	Maximize measurement accuracy and system flexibility
High attenuation accuracy and flatness of +/- 0.4 dB at 26.5 GHz	Superior attenuation accuracy ensures precise measurements, across a wide temperature range

Chassis slot compatibility: cPCI, PXI-H, PXI-1

Specifications

Hardware	
Size	2 slots wide module
Frequency	DC to 26.5 GHz
Attenuation resolution	1 dB, 5 dB and 10 dB step
Attenuation accuracy	Refer to Table 1 on page 2. Specified across operating frequency of 0°C to 50°C
Repeatability	0.03 dB guaranteed
Life cycle	5 million cycles per section (guaranteed)
Maximum input power	1 W (+30 dBm) avg. 50 W peak, (10 µs max)
Maximum reverse power	1 W avg. 50 W peak (10 µs max)
RF connector	3.5 mm (f), SMA compatible

Ordering Information

Model	Description
M9168C	PXI-h Programmable Attenuator Module, DC to 26.5 GHz
Typical product configuration	
M9018A	PXIe Chassis, 18- slots, 3U, 8 GB/s
M9202A	PXIe IF Digitizer: 12-Bit, 1 GHz
M9361A	PXI Downconverter: 2.75 to 26.5 GHz
M9168C	PXI-h Programmable Attenuator Module, DC to 26.5 GHz
Related products	
M9392A	PXI Vector Signal Analyzer
M9351A	PXI Downconverter (50 MHz to 2.9 GHz)
M9360A	PXI Attenuator/Preselector
M9155/6/7C	PXI Switch Modules, DC to 26.5 GHz

Agilent M9202A PXI Express 12-bit Wideband IF Digitizer

www.agilent.com/find/m9202a

Industries and Applications

- Aerospace and defense
- Wireless communications
- Radar and wideband signal capture

Product Description

The M9202A PXIe Wideband IF Digitizer runs at 2 GS/s, with up to 1 GHz instantaneous analog bandwidth and offers DDR3 memory. Through firmware options and the Xilinx Virtex-6 FPGA, the M9202A provides different functionalities. The BAS option provides basic digitizer functionality (signal capture, storing of data, transfer of data, etc). The DDC option additionally offers real-time digital down-conversion (DDC) algorithm in the 300 MHz to 700 MHz band, enabling improved analog performance and reducing data upload time.

Main Features and Benefits

Product features	Your benefit
2 GS/s sampling rate	Fastest 12-bit PXIe Digitizer
Up to 1 GHz bandwidth	Able to capture wide bandwidth signals
512 MB DDR3 memory	Large on-board memory
Real-time digital down-conversion (DDC) algorithm	Data decimation, analog performance improvement
On-board Xilinx Virtex-6 FPGA	On-board processing capability
Software support for easy integration	Reduced development time
PXIe backplane	Fastest digitized data upload, continuous data steaming

Chassis slot compatibility: PXIe Hybrid, PXIe

Specifications and Characteristics

Hardware	
Size	1 slot 3U
Resolution	12 bits
Sample rate	2 GS/s
Bandwidth	30 MHz *(nominal)* to 1 GHz
Streamed analog bandwidth	up to 50 MHz, or up to 100 MHz
Impedance	50 Ω *(nominal)*
Coupling	AC
Full scale (FS) range	+4 dBm (1 V pk-pk in 50 Ω)
Spurious-free dynamic range (SFDR)	60 dBc *(typical)* in basic digitizer mode 84 dBc *(typical)* after digital down-conversion (with DDC option)[1]
Effective number of bits (ENOB)	9 bits *(typical)*
Sample clock sources	Internal (with internal or external 100 MHz ref) or external

Ordering Information

Model	Description
M9202A	PXIe IF Digitizer: 12-bit, 1 GHz
M9202A-C01	Single channel
M9202A-F02	Frequency range: 2 GS/s
M9202A-M05	Standard memory: 512 MB
For complete list of available options, please see datasheet.	
Related products	
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
M9351A	PXI Downconverter: 50 MHz to 2.9 GHz
M9361A	PXI Downconverter: 2.75 GHz to 26.5 GHz
M9362A-D01	PXIe MW Quad Downconverter: 10 MHz to 26.5 GHz
M9360A	PXI Attenuator/Preselector: 100 kHz to 26.5 GHz
M9392A	PXI Vector Signal Analyzer
M9211A	PXI-H UWB IF Digitizer: 10-bit, 4 GS/s, 3 GHz
M9018A	18-slot PXIe Chassis
M9021A	PCIe® Cable Interface
89601B	89600 VSA software

Agilent M9302A PXI Local Oscillator

www.agilent.com/find/m9302a

Industries and Applications

- Aerospace and defense
- Wireless communications
- Radar and wideband signal capture

Product Description

The Agilent M9302A PXI Local Oscillator (LO) is a VCO-based 3 GHz to 10 GHz LO optimized for fast settling time to allow for fast frequency down conversion applications. The fast switching time and low phase noise of this LO make it an ideal component of a microwave vector signal analyzer.

Main Features and Benefits

Product features	Your benefit
Frequency range	3 GHz to 10 GHz
0.1 Hz tuning resolution	Greater frequency accuracy
1 ms settling time	Speeds up your test time
Multiple programmatic interfaces	Easy integration into existing test environments and reduced development time
PXI form-factor	Conforms to Modular Open Systems Approach (MOSA)

Chassis slot compatibility: cPCI (J1), PXI-1, PXI Hybrid

Specifications

Hardware	
Size	2 slot 3U
Phase noise	-115 dBc/Hz at 10 GHz, 10 kHz offset
Frequency switching speed	1 ms, 500 µs, typical
Power	+16 dBm ± 2 dB
Frequency output	REF OUT: 10 MHz, *(nominal)*
	REF 1 OUT: 100 MHz, *(nominal)*
	REF 2 OUT: 100 MHz, *(nominal)*
Amplitude	REF OUT: 0 dBm ± 3 dB (at 25 °C ± 5 °C)
	REF 1 OUT: 0 dBm ± 3 dB (at 25 °C ± 5 °C)
	REF 2 OUT: 0 dBm ± 3 dB (at 25 °C ± 5 °C)
Frequency temperature stability	± 0.5 ppm (over 0 °C to 50 °C)
Aging (after 30 days of operation)	± 1.0 ppm/year

Ordering Information

Model	Description
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
Related products	
M9202A	PXIe IF Digitizer: 12-bit, 2 GS/s
M9360A	PXI Attenuator/Preselector: 100 kHz to 26.5 GHz
M9361A	PXI Downconverter: 2.75 MHz to 26.5 GHz
M9351A	PXI Downconverter: 50 MHz to 2.9 GHz
M9392A	PXI Vector Signal Analyzer: 50 MHz to 26.5 GHz
M9036A	PXIe Embedded Controller

Agilent M9351A PXI Downconverter

www.agilent.com/find/m9351a

Industries and Applications

- Aerospace and defense
- Wireless communication
- Radar and wideband signal capture

Product Description

The Agilent M9351A is a one-slot 3U PXI Downconverter that converts RF signals from 50 MHz to 2.9 GHz into baseband frequency signals for use with Agilent's newest generation of PXI digitizers. The built-in pre-amp enables very low level signal measurements, down to -160 dBm, and the built-in calibration simplifies system power budget calculations.

Main Features and Benefits

Product features	Your benefit
Built-in pre-amp	Able to acquire low-level signals
Image protected conversion	No need for a preselector
Bypass path	Route specific signals directly to the digitizer
40 dB solid state IF attenuator with 0.5 dB steps	Fast IF power control
Multiple programmatic interfaces	Easy integration into existing test environments and reduced development time

Chassis slot compatibility: cPCI (J1), PXI-1, PXI Hybrid

Specifications

Hardware	
Size	1 slot 3U
Frequency range	50 MHz to 2.9 GHz
	50 MHz to 625 MHz (usable to 1 MHz) (bypass mode)
Operating range	-160 dBm to -30 dBm, *(nominal)*
Bandwidth (3 dB)	40 MHz, min
RF to IF Gain	38 dB, *(nominal)*
Center frequency (user adjustable)	500 MHz, *(nominal)*
Residuals, RF and LO input terminated	-75 dBm
LO input frequency range	3.5 GHz to 6.4 GHz
LO input power	+15 dBm ± 2 dB
Impedance	50 Ω, *(nominal)*

Ordering Information

Model	Description
M9351A	PXI Downconverter: 50 MHz to 2.9 GHz
Related products	
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
M9202A	PXIe IF Digitizer: 12-bit, 2 GS/s
M9360A	PXI Attenuator/Preselector: 100 kHz to 26.5 GHz
M9361A	PXI Downconverter: 2.75 MHz to 26.5 GHz
M9392A	PXI Vector Signal Analyzer: 50 MHz to 26.5 GHz
M9018A	18-slot PXIe Chassis
M9036A	PXIe Embedded Controller

Agilent M9352A
PXI Hybrid Amplifier/Attenuator

www.agilent.com/find/m9352a

Industries and Applications

- Aerospace/defense
- Wireless communications
- Radar and wideband signal capture

Product Description

The Agilent M9352A is a one-slot, 4-channel, PXI Hybrid IF Amplifier/Attenuator with 1 GHz analog bandwidth providing excellent IF signal conditioning for use in multi-channel modular solutions.

Combine with the M9362A-D01 PXI Quad Downconverter, up to four M9202A IF Digitizers, and a local oscillator for wideband signal capture where multiple channels are required for applications such as multi-channel coherent signal analysis.

Main Features and Benefits

Product features	Your benefits
Frequency range	10 MHz to 1 GHz
Multiple programmatic interfaces	Easy integration into existing test environments and reduced development time
PXI form-factor	Conforms to Modular Open Systems Approach

Chassis slot compatibility: cPCI (J1), PXI-1, PXIe hybrid

Characteristic Performance

Hardware	
Size	One-slot
Channels	4
Bandwidth	1 GHz analog
Attenuation Range	31.5 dB in .5 dB steps
Minimum Gain: Maximum Gain:	≥ 5 dB ≥ 36 dB
Noise Figure	3 dB
Input TOI	+43 dBm

Ordering Information

Model	Description
M9352A	PXI Amplifier/Attenuator Module: 1 GHz
Related Products	
M9018A	18-slot PXIe Chassis
M9036A	PXIe Embedded PC Controller
M9202A	PXIe IF Digitizer: 12-bit, 2 GS/s (with options C01, F02, M05, DDC)
M9202A-V05	50 MHz BW Streaming
M9202A-V10	100 MHz BW Streaming
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
M9362A-D01	PXIe Quad Downconverter: 10 MHz to 26.5 GHz
M9362AD01-CA1	IF Jumper Cables for use with 4-M9202A Single CH Digitizers
M9362AD01-CA2	IF Jumper Cables for use with 2-M9202A Dual CH Digitizers
M9362AD01-CA3	IF Jumper Cables for use with the M9210A
M9362AD01-CA4	LO Interconnect Kit for use with the M9302A

Agilent M9360A
PXI Attenuator/Preselector

www.agilent.com/find/m9360a

Industries and Applications

- Aerospace and defense
- Wireless communications
- Radar and wideband signal capture

Product Description

The M9360A PXI Attenuator/Preselector is a 3-slot 3U, combination module providing attenuation and preselection signal conditioning for numerous system applications with an electronically tuneable, 4-stage, YIG-tuned filter based RF-input pre-selector, and broadband switches for signal distribution.

Main Features and Benefits

Product features	Your benefit
Bypass path	Automatically route signals around the band limited preselector for additional bandwidth
35 MHz to 120 MHz bandwidth (preselected, < 3 GHz)	Allows you to analyze large bandwidth signals
40 MHz to 120 MHz bandwidth (preselected, ≥ 3 GHz)	
70 dB input step attenuator	Increased dynamic range
Multiple programmatic interfaces	Easy integration into existing test environments and reduced development time

Chassis slot compatibility: cPCI (J1), PXI-1, PXI Hybrid

Specifications

Hardware	
Frequency range	100 kHz to 26.5 GHz
Size	3 slot 3U
Tuning speed	< 5 ms @ 50 MHz step, *(nominal)*
Maximum power	RF IN: +30 dBm
	LO IN: +20 dBm
3 dB bandwidth	35 MHz min, 120 MHz max (preselected, < 3 GHz)
	40 MHz min, 120 MHz max (preselected, ≥ 3 GHz)
Attenuator	0 dB to 70 dB in 10 dB steps
Switches	SP2T mechanical type

Ordering Information

Model	Description
M9360A	PXI Attenuator/Preselector: 100 kHz to 26.5 GHz
Related products	
M9202A	PXIe IF Digitizer: 12-bit, 2 GS/s
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
M9361A	PXI Downconverter: 2.75 MHz to 26.5 GHz
M9351A	PXI Downconverter: 50 MHz to 2.9 GHz
M9392A	PXI Vector Signal Analyzer: 50 MHz to 26.5 GHz
M9018A	18-slot PXIe Chassis
M9036A	PXIe Embedded Controller

Agilent M9361A PXI Downconverter

www.agilent.com/find/m9361a

Industries and Applications

- Aerospace and defense
- Wireless communications
- Radar and wideband signal capture

Product Description

The M9361A is a one-slot 3U PXI Downconverter that converts microwave signals from 2.75 GHz to 26.5 GHz into baseband frequency signals centered at an IF frequency of 500 MHz. The built-in pre-amp enables very low level signal measurements, down to -160 dBm, and built-in calibration simplifies system power budget calculations.

Main Features and Benefits

Product features	Your benefit
250 MHz bandwidth	Able to capture wide bandwidth signals
Built-in pre-amp	Able to acquire low-level signals
40 dB solid state IF attenuator with 0.5 dB steps	Fast IF power control
Auxiliary input/switch for signal routing	Effectively gives you the option to route signals directly from other downconverters to a digitizer without external switching
Multiple programmatic interfaces	Easy integration into existing test environments and reduced development time

Chassis slot compatibility: cPCI (J1), PXI-1, PXI Hybrid

Specifications

Hardware	
Size	1 slot 3U
Frequency range	2.75 GHz to 26.5 GHz
Operating range	< 9.5 GHz: -160 dBm to -30 dBm, *(nominal)*
	9.5 GHz to 26.5 GHz: -146 dBm to -30 dBm, *(nominal)*
Bandwidth (3 dB)	250 MHz, min
Impedance	50 Ω, *(nominal)*
RF to IF Gain	38 dB, *(nominal)*
Center frequency (user adjustable)	500 MHz, *(nominal)*
Residuals, RF and LO input terminated	-75 dBm
LO input frequency range	3 GHz to 10 GHz
LO input power	+15 dBm ± 2 dB
Impedance	50 Ω, *(nominal)*

Ordering Information

Model	Description
M9361A	PXI Downconverter: 2.75 GHz to 26.5 GHz
Related products	
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
M9202A	PXIe IF Digitizer: 12-bit, 2 GS/s
M9360A	PXI Attenuator/Preselector: 100 kHz to 26.5 GHz
M9351A	PXI Downconverter: 50 MHz to 2.9 GHz
M9392A	PXI Vector Signal Analyzer: 50 MHz to 26.5 GHz
M9018A	18-slot PXIe Chassis
M9036A	PXIe Embedded Controller

PXI SIGNAL GENERATORS (SOURCE)

Agilent's growing family of PXIe RF Signal Generators and Signal Analyzers includes the recently released M9381A PXIe Vector Signal Generator, which provides fast, high quality measurements with an exclusive baseband tuning technology innovation. The M9381A PXIe VSG works seamlessly with the new M9391A PXIe Vector Signal Analyzer to provide a complete solution that includes software, programming examples and services aimed at reducing the cost of RF manufacturing test.

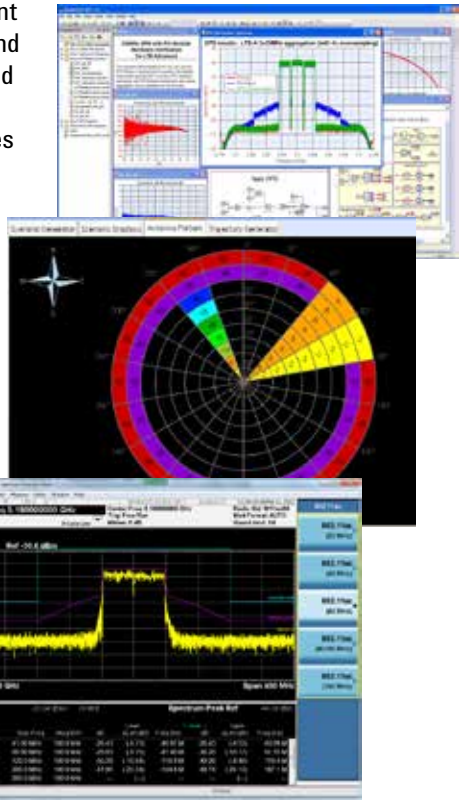
Achieve confidence and continuity in measurements

Agilent's modular products combined with its broad portfolio of world-class software applications accelerate your project's design to manufacturing cycle. From model-based system level design validation, to detailed measurement data analysis of complex devices to RF standard conformance measurements, Agilent provides ways to achieve more confidence and continuity in measurements from R&D to manufacturing.

Features and benefits

Reduce your RF test time and accelerate test throughput with the **M9381A PXIe Vector Signal Generator's** fast amplitude and frequency switching speeds. The one-step software installation, integrated soft front panel and one day start up assistance service provided by an Agilent expert will help you get started quickly making your first measurements. The M9381A PXIe VSG, M9380A PXIe CW Source and M9300A PXIe Frequency Reference are all backed by Agilent's 3 year warranty and worldwide technical support organization.

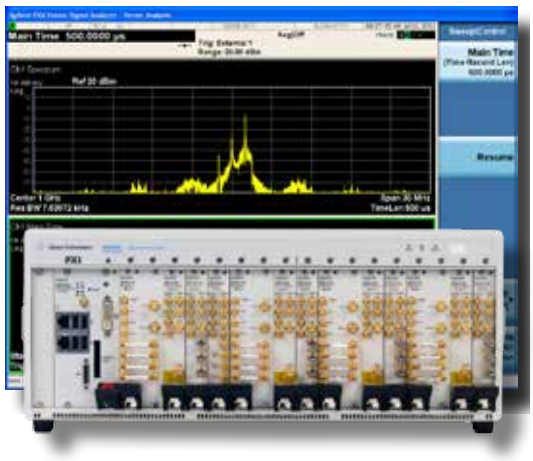
SystemVue is a focused electronic design automation (EDA) environment for electronic system level (ESL) design. It enables system architects and algorithm developers to innovate the physical layer (PHY) of wireless and aerospace/defense communication systems. Superior integration with PXI modular instruments accelerates real-world maturity and streamlines your model-based design flow from architectures to verification



Signal Studio is a flexible suite of easy to use signal creation tools that reduce the time spent on signal creation and simulation. With Signal Studio you can create performance optimized reference signals validated by Agilent, supporting a wide variety of communications standards including LTE, W-CDMA, and WLAN 802.11ac.

Waveform Creator provides easy development of complex baseband and vector signals used in the validation and test of digital communications products. It supports multiple waveform types and instruments to be "plugged in" for design validation.

NEW



www.agilent.com/find/pxi-vsg

PXI SIGNAL GENERATORS (SOURCE)

PXI Signal Generator Modules

Model	Description	Type # of slots	Frequency range	Frequency switching speed	Output power	Level accuracy	SSB phase noise (1 GHz, 20 kHz offset)	Harmonics	Internal baseband generator RF BW
M9300A	PXIe Frequency Reference	PXIe, PXI Hybrid 1-slot	100 MHz (Out 1 to 5) 10 MHz	n/a	≥ 10 dBm (100 MHz out)	n/a	< *-168 dBc/Hz (nominal)*	n/a	n/a
M9380A	PXIe CW Source	PXIe, PXI Hybrid 3-slot	1 MHz to 6 GHz	*5 ms (nominal)*	+18 dBm (1 MHz to 5 GHz) +19 dBm (> 5 to 6 GHz)	±0.4 to 1 dB	< *–122 dBc/Hz (typical)*	< -29 dBc	n/a
M9381A	PXIe Vector Signal Generator	PXIe, PXI Hybrid 5-slot	1 MHz to 6 GHz	*< 10 µs to 240 µs (nominal)*	+18 dBm (1 MHz to 5 GHz) +19 dBm (> 5 to 6 GHz)	±0.4 to 1 dB	< *–122 dBc/Hz (typical)*	< -35 dBc	160 MHz

Software Applications for PXI Signal Generators

Model	Description	Modular Instruments Supported
M9099	Waveform Creator	M9381A PXIe Vector Signal Generator
W1461BP	SystemVue	M9381A PXIe Vector Signal Generator M9391A PXIe Vector Signal Analyzer
N7600B - N7625B	Signal Studio	M9381A PXIe Vector Signal Generator

Driver information

Supported operating systems	Microsoft Windows 7 (32/64-bit), Windows Vista (32/64-bit), Windows XP (32-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW, MATLAB
Supported application development environments (ADE)	Visual Studio (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, MATLAB
Agilent IO Libraries	Includes: VISA Libraries, Agilent Connection Expert, IO Monitor

www.agilent.com/find/pxi-vsg

Agilent M9099
Waveform Creator Software

www.agilent.com/find/m9099

Industries and Applications

- Satellite communcations
- Military communications and secure backhaul
- Component validation with wideband test equipment

Product Description

Waveform Creator is a modular software application focused on 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 multi-format, multi-track waveforms with waveform segments displaced in frequency and time. Its modularity supports multiple waveform types and VSG/AWG instruments to be "plugged in" for current and future waveform types and instruments.

Main Features and Benefits

Product features	Your benefits
Plug in capability supporting popular digital modulation and custom waveforms	Saves you time and effort to create and manage complex waveforms
Simple interface to set desired signal parameters and compose waveform segments	Powerful capabilities delivered in easy to use, intuitive interface
List of functional waveform plug-ins or develop your own	Starting points provided to easily customize waveforms
Playback waveforms on M9381A PXIe Vector Signal Generator	Standard output plug-in for quick deployment

Ordering Information

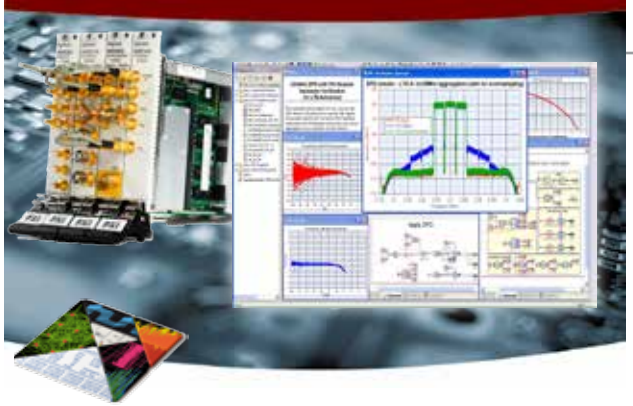
Model	Description
M9099T	Waveform Creator software - transportable, perpetual license
M9099T-LIC	Core product w/utility & multi-tone plug-ins (required)
M9099T-LIC-12M	Premium support program - 1 year
M9099T-AYA	Digital modulation plug-in
M9099T-AYA-12M	Premium support program - 1 year
M9099T-SVM	SystemVue plug-in licenses (requires SystemVue software)
M9099T-SVM-12M	Premium support program - 1 year
M9099T-DFW	File-based write (unencrypted waveform license)
M9099T-DFW-12M	Premium support program - 1 year
M9099T-MED	Software & documentation media (DVD)

Premium support program renewals available

Software Information

Software operating systems	Microsoft Windows 7 (32/64-bit)
Agilent software applications that are tightly integrated with Waveform Creator	**Agilent test software:** 89600 VSA, I/Q Libraries, Command Expert, Signal Studio. **Agilent EDA software:** SystemVue
3rd party applications and development environments that are integrated with Waveform Creator	Microsoft VisualC++,MATLAB, VHDL/ Verilog, FPGA Hardware-in-Loop, (HIL), STK (Analytical Graphics) and more.

SYSTEMVUE



Agilent SystemVue

System Level Design & Verification

www.agilent.com/find/systemvue

Typical Applications

- Signal generation with fading & impairments
- Early standards support
- Wideband system validation

Product Description

Agilent SystemVue is a system-level EDA environment that accelerates design and verification of defense and communications systems at the physical layer, where advanced digital signal processing meets RF. SystemVue brings together baseband algorithm modeling, accurate RF, trusted Reference IP, and measurement automation in a single environment for high-performance RF/DSP co-design.

Main Features and Benefits

Product features	Your benefits
Popular modeling languages: C++, MATLAB .m, HDL, or graphical dataflow schematics	Open, vendor-neutral formats reduce costs and connect Agilent Test with Enterprise EDA tools
Superior RF simulation speed & accuracy, with links to RF EDA	Virtualize RF/MIMO components for earliest system validation with high confidence
World-class IP references for LTE-Advanced, 802.11ac/ad, Radar, and other standards	Create and re-use TX/RX and MIMO verification suites with confidence across the whole lifecycle from design to test
Superior integration of Simulation with Test & Measurement	Bring "Drive Test" accuracy into 4G design, while creating custom personalities around test
Interoperates with a wide variety of Agilent equipment and software, including 89600 VSA and Command Expert	Makes highest use of best-in-category assets, while unifying DSP and RF design lifecycles into a coherent flow

Agilent SystemVue combines with Agilent Modular Products to create an expandable platform for modeling, implementing, and validating next-generation communications systems and defense systems. A modular approach enables a virtual system to be verified from the first day of the project - beginning with simulation models and incorporating measurements as the project progresses.

Ordering Information

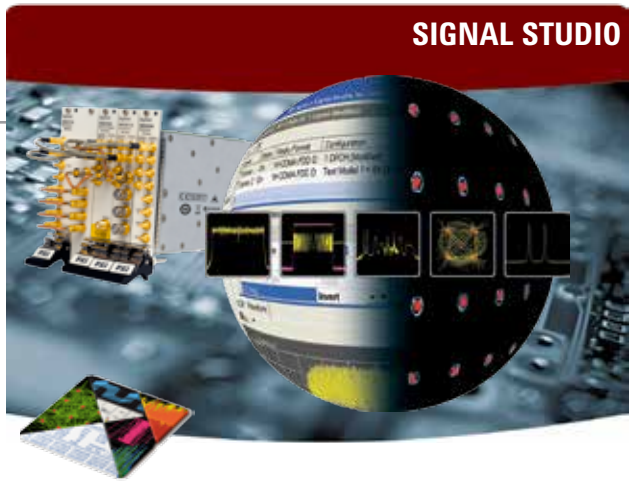
Recommended Products & Environments
Core Environment • W1461BP SystemVue Comms Architect **People who use Agilent Modular Instruments often buy:** • W1716EP Digital Pre-Distortion Builder • W1905EP Radar Model Library • W1902EP Digital Modem Library • W1918EP LTE-Advanced Baseband Verification Library

Software Information

Software operating systems	Microsoft Windows 8 (32/64-bit) Microsoft Windows 7 (32/64-bit) Microsoft Windows XP (32-bit)
Available Add-on Applications and Design Flow Personalities	Fixed-point models, HDL Code-Generation, C++ Code Generation, Adaptive EQ, DPD Builder, MIMO Channel Builder, RF System Architectures
Available Standards Reference Libraries	**Comms:** LTE-Advanced, LTE, HSPA+, WCDMA, cdma2000®, CDMA, WiMAX™, 802.11a/ac/ad, DVB-S2/T2, Custom OFDM, Bluetooth, Zigbee, and nearly 40 general purpose formats for Milcomm/Satcomm. **Radar:** Doppler, UWB, SAR, DAR, FMCW, Phased Array, Beamforming
Agilent software applications that are tightly integrated with SystemVue	**Agilent test software:** 89600 VSA, FlexDCA, I/O Libraries, Command Expert, Waveform Creator. **Agilent EDA software:** Advanced Design System, GoldenGate
3rd party applications and development environments that are integrated with SystemVue	Microsoft VisualC++,MATLAB, VHDL/Verilog, FPGA Hardware-in-Loop, (HIL), STK (Analytical Graphics) and more.

Agilent
Signal Studio Software

www.agilent.com/find/SignalStudio



Industries and Applications

- Cellular communications
- Wireless connectivity
- Audio/video broadcasting

Product Description

Signal Studio is a flexible suite of easy to use signal creation tools that reduce the time spent on signal creation and simulation. It offers performance optimized reference signals validated by Agilent, supporting a wide variety of communications standards including LTE, W-CDMA, and WLAN 802.11ac.

- Create reference signals for mobile communications, wireless connectivity and digital broadcast standards
- Create test patterns for advanced detection, positioning, tracking and navigation systems
- Create virtually distortion free test signals for component analysis.

Main Features and Benefits

Product features	Your benefits
Application-specific test signals at baseband, RF and MW frequencies	Reduce the time you spend on signal simulation
Download capability to benchtop or modular signal generators	Apply your signals in real world testing
Waveform playback and real-time modes	Create and customize waveform files needed to test components and receivers. Perform advanced testing with real-time mode.
Signal Studio waveforms can be programatically initiated with SCPI commands or through soft front panels.	Accelerate testing on production line

Ordering Information[1]

Model	Description
N7600B	W-CDMA/HSPA+
N7601B	cdma2000®/1xEV-DO
N7602B	GSM/EDGE/Evo
N7606B	Global Navigation Satelite Systems (GNSS)
N7609B	Bluetooth
N7611B	Broadcast Radio
N7612B	TD-SCDMA/HSPDA
N7615B	Mobile WiMAX™
N7617B	WLAN 802.11a/b/g/n/ac
N7623B	Digital Video
N7624B	LTE/LTE-Advanced FDD
N7625B	LTE/LTE-Advanced TDD

1. List of Signal Studio software products which connect to M9381A PXI VSG. Playback on up to four channels per license

- *N76xxB-9TP transportable perpetual license*
- *N76xxB-9FP fixed perpetual license*
- *N7650B-2xx provides 5/50 waveform pack licenses*

Software Information

Software operating systems	Microsoft Windows 7 (32/64-bit) Microsoft Windows XP (32-bit)
Agilent software applications that are tightly integrated with Signal Studio	**Agilent test software:** 89600 VSA, I/O Libraries, Command Expert, Waveform Creator. **Agilent EDA software:** SystemVue, GoldenGate
3rd party applications and development environments that are integrated with Signal Studio	Microsoft VisualC++,MATLAB, FPGA Hardware-in-Loop, (HIL), STK (Analytical Graphics) and more.

Agilent M9381A
PXIe Vector Signal Generator

www.agilent.com/find/m9381a

Industries and Applications

- Cellular picocell and femtocell test
- RF component manufacturing test
- Wireless transceiver design validation
- WLAN production test
- Military radio & public safety radio test

Product Description

The Agilent M9381A PXIe vector signal generator provides frequency coverage from 1 MHz to 6 GHz. The M9381A accelerates test throughput with with ***fastune,*** an exclusive baseband tuning technology innovation, enabling you to switch amplitude and frequency in less than 10 µs.

The M9381A works seamlessly with the M9391A PXIe VSA, and Agilent's world class software applications including Waveform Creator, Signal Studio and SystemVue.

Main Features and Benefits

Product features	Your benefit
Fast amplitude and frequency switching speed	Accelerate test throughput
fastune	Reduce test time
Accurate power linearity	Improve ability for servo loop to converge in fewer steps
License-key based upgrades without returning modules	Purchase what you need today and easily upgrade later
Calibrated Core Exchange Strategy	Fast repair and turnaround time

Chassis slot compatibility: PXIe, PXIe Hybrid

Specifications and Characteristics

Frequency range	1 MHz to 3.0 GHz or 6.0 GHz
RF switching speed (nom)	• 240 µs for frequency and amplitude • 105 µs for amplitude-only changes
fastune switching speed (nominal)	≤ 10 µs for frequency and amplitude changes within RF modulation bandwidth
Phase noise (typical)	< -122 dBc/Hz (1 GHz, 20 kHz offset)
Output power (at 1 GHz)	+18 dBm across the frequency range +19 dBm from 1 MHz to 5 GHz
Amplitude accuracy	±0.4 to 1 dB
RF modulation bandwidth	40 MHz (flatness: < *±0.2 dB, typical)* 100 MHz (flatness: < *±0.3 dB, typical)* 160 MHz (flatness: < *±0.5 dB, typical)*
Modulation	AM, FM, PM, Pulse, Multitone
Modulation quality	≤-70 dBc ACLR for W-CDMA 64 DPCH <0.5% EVM for WLAN 160 MHz 802.11ac

Ordering Information

Model	Description
M9381A	PXIe vector signal generator: 1 MHz to 3 or 6 GHz Includes: M9301A PXIe synthesizer, M9310A PXIe source output, M9311A PXIe digital vector modulator
Base Configuration	
M9381A-F03	Frequency range: 1 MHz to 3 GHz
M9381A-B04	RF modulation bandwidth: 40 MHz
M9381A-M01	Memory: 32 MSa
M9381A-300 for warranted specifications	PXIe frequency reference: 10 MHz and 100 MHz Adds M9300A PXIe frequency reference -M9300A module can support multiple M9381A instruments
Configurable Options	
M9381A-F06	Frequency range: 1 MHz to 6 GHz
M9381A-1EA	High output power
M9381A-UNZ	Fast switching
M9381A-B10	RF modulation bandwidth: 100 MHz
M9381A-B16	RF modulation bandwidth: 160 MHz
M9381A-M05	Memory: 512 MSa
M9381A-M10	Memory: 1024 MSa
M9381A-UNT	Analog modulation

Agilent M9380A PXIe CW Source

www.agilent.com/find/m9380a

Industries and Applications

- Cellular picocell and femtocell test
- RF component manufacturing test
- Wireless transceiver design validation
- WLAN production test
- Military radio & public safety radio test

Product Description

The Agilent M9380A PXIe CW source provides frequency coverage from 1 MHz to 6.0 GHz. A typical M9380A configuration includes three individual PXIe modules—the M9310A source output, M9301A synthesizer and M9300A frequency reference—designed for fast data interfaces and high-speed automated test systems. Instrument control is provided through a soft front panel and programmatic interfaces tuned to your application development environment of choice.

Main Features and Benefits

Product features	Your benefit
License-key based upgrades without returning modules	Purchase what you need today and easily upgrade later
One-step software install and integrated soft front panel	Reduce startup time
Multiple programmatic interfaces	Easy integration into test environments and reduced development time
Calibrated Core Exchange Strategy	Fast repair and turnaround time

Specifications and Characteristics

Hardware	
Frequency range	1 MHz to 3.0 GHz or 6.0 GHz
Output power	+18 dBm across the frequency range +19 dBm from 1 MHz to 5 GHz
Phase noise (typical)	< -122 dBc/Hz (1 GHz, 20 kHz offset)
Amplitude accuracy	±0.4 to 1 dB
Size	3-slot

Ordering Information

Model	Description
M9380A	PXIe CW source: 1 MHz to 3 or 6 GHz Includes: M9301A PXIe synthesizer, M9310A PXIe source output
Base Configuration	
M9380A-F03	Frequency range: 1 MHz to 3 GHz
M9380A-300 Required for warranted specifications	PXIe frequency reference: 10 MHz and 100 MHz Adds M9300A PXIe frequency reference - M9300A module can support multiple M9380A instruments
Configurable Options	
M9380A-F06	Frequency range: 1 MHz to 6 GHz
M9380A-1EA	High output power
Related Products	
M9036A	PXIe embedded controller
M9018A	18-Slot PXIe chassis

Chassis slot compatibility: PXIe, PXIe Hybrid

Agilent M9300A
PXIe Frequency Reference

www.agilent.com/find/m9300a

Industries and Applications

- Cellular picocell and femtocell test
- RF component manufacturing test
- Wireless transceiver design validation
- WLAN production test
- Military radio & public safety radio test

Product Description

The M9300A PXIe frequency reference is a PXIe compatible compact modular instrument that can be configured as part of the M9391A PXIe Vector Signal Analyzer, M9381A PXIe Vector Signal Generator, M9380A CW Source or other PXI solutions. One M9300A can support multiple modular instruments.

Main Features and Benefits

Product features	Your benefit
Five 100 MHz outputs	Use a common module with multiple vector signal generators
Locks to another reference with a value from 1 to 110 MHz.	Flexible module synchronization
Calibrated Core Exchange Strategy	Fast repair and turn-around time

Chassis slot compatibility: PXIe, PXIe Hybrid

Specifications and Characteristics

Hardware	
Outputs	• Five 100 MHz outputs • One 10 MHz output • Internal 10 MHz OCXO timebase output
100 MHz Output:	
Amplitude	≥ 10 dBm
Connectors	5 SMB snap-on
Impedance	*50 Ω, (nominal)*
10 MHz Output:	
Amplitude	*9.5 dBm, (nominal)*
Connectors	1 SMB snap-on
Impedance	50 Ω, *(nominal)*
OCXO Output:	
Amplitude	*11.5 dBm, (nominal)*
Connectors	1 SMB snap-on
Impedance	*50 Ω, (nominal)*
Size	1-slot

Ordering Information

Model	Description
M9300A	PXIe Frequency Reference Includes: Software, example programs and product information on CD Return to Agilent Warranty—3 Years
Related products	
M9381A	PXIe Vector Signal Generator
M9380A	PXIe CW Source
M9018A	18-slot PXIe Chassis
M9036A	PXIe Embedded Controller [1]

AXIE MODULAR PRODUCTS

AXIe modular products are designed for high-performance, scalable instrumentation and offer fast data transfers to the host controller. AXIe's product portfolio includes:

- Chassis and Controllers
- Multi-Channel Digitizers
- Arbitrary Waveform Generators
- Logic Analyzers
- PCI Express® Protocol Analyzers
- HDMI Protocol Analyzers
- MIPI M-PHY and D-PHY Protocal Analyzers

Agilent U4431A AXIe Protocol Analyzer for MIPI™ M-PHY Interfaces

Agilent M9703A AXIe Digitizers in the M9505A 5-slot AXIe Chassis

Agilent M8190A AXIe Arbitrary Waveform Generator in the M9502A 2-slot AXIe chassis

Chassis

Model	Description	Height	Number of slots	Type of slots	Maximum data bandwidth	System slot	Inut power Consumption	Power per slot
M9502A	2-slot AXIe Chassis	2U	2	AXIe 1.0	2 GBps module to module	ESM module included	800 VA	200 W
M9505A	5-slot AXIe Chassis	4U	5	AXIe 1.0	2 GBps module to module	ESM module included	1280 VA	200 W

Controllers

Model	Description	Type # of slots	Processor	RAM (min/max)	HDD	Maximum data bandwidth	Cable interface	Front panel connections
M9536A	AXIe Embedded PC Controller	AXIe 1.0 1-slot	Intel Xeon EP Quad Core L5518 at 2.13 GHz	8 GB standard, 16 GB optional 24 GB maximum	2.5" SATA II SSD 160 GB	2GB/s to AXIe backplane	N/A	USB (3), 10/100/1000 LAN (2), VGA (up to 1600x1200), RS-232

www.agilent.com/find/axie

AXIe MODULES

Digitizers

Model	Description	Type # of slots	Resolution	Number of channels	Max sample rate	Bandwidth	Memory depth	On-Board processing
M9703A	AXIe Digitizer	AXIe 1.0 1-slot	12-bit	8-4	1.6 GS/s - 3.2 GS/s	DC - 1 GHz	Up to 4 GB (256 MSamples/ch)	Four Xilinx Virtex-6 FPGAs

Arbitrary Waveform Generators (AWG)

Model	Description	Type # of slots	Resolution	Number of channels	Bandwidth per channel	Modulation bandwidth	Sampling rate	Memory depth
M8190A	AXIe Arbitrary Waveform Generator	AXIe 1.0 2-slot	12-bits up to 12 GSa/s 14-bits up to 8 GSa/s	Up to 2 channels	5 GHz	5 GHz	125 MSa/s to 12 GS/s	2 GSa

Logic Analyzer

Model	Description	Type # of slots	Number of channels	Supported Signal Types	Max state data rate	Max state clock	Minimum State clock frequency	Minimum data valid window
U4154A	AXIe Logic Analyzer Module	AXIe 1.0 1-slot	136 (Full Channel mode)	Single ended and differential	2.5 Gb/s on 136 channels 4 Gb/s on 68 channels	2.5 GHz	12.5 MHz (single edge) 6.25 MHz (both edges)	100 ps

Protocol Analyzers

Model	Description	Type # of slots	Protocol Supported	Bus Configuration	Speed	Memory Depth	Trigger Sequencer	Test Modes
U4301A	PCIe® Gen3 Protocol Analyzer	AXIe 1.0 1-slot	136 (Full Channel mode)	x8 lanes per module	2.5 GT/s (Gen1) 5.0 GT/s (Gen2) 8.0 GT/s (Gen3)	4 GB	4 states	Analyzer
U4421A	MIPI™ D-PHY Protocol Analyzer/ Exerciser	AXIe 1.0 1-slot	MIPI™ D-PHY DSI & CSI	1, 2, 4 channels	1.5 Gbps	up to 16 GB	8 states	Analyzer/ Exerciser
U4431A	MIPI™ M-PHY Protocol Analyzer	AXIe 1.0 1-slot	MIPI™ M-PHY			up to 16 GB		Analyzer
U4998A	HDMI 1.4b Analyzer/Generator	AXIe 1.0 1-slot	HDMI 1.4b	1 source 1 sink port	3.4 Gbps	4 GB	N/A	Analyzer Generator Compliance

Connectivity External PC cards[1]

	Description	Type # of slots	Maximum data bandwidth	Cable interface	PC host interface
M9045B	PCIe ExpressCard adapter: Gen 1	ExpressCard 34 1-slot	250 MB/s	x1 Gen 1 PCIe	x1 Gen 1 PCIe
M9048A	PCIe desktop PC Adapter: Gen 2, Clock Isolation	PCIe x 8 or x 16 1-slot	4 GB/s	x 8 Gen 2 PCIe	x 8 Gen 2 PCIe

[1] *Detailed product information for the connectivity modules is available in section 5 of this catalog.*

Driver information

Supported operating systems	Microsoft Windows 7 (32/64-bit), Windows Vista (32/64-bit), Windows XP (32-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW, MATLAB
Supported application development environments (ADE)	Visual Studio (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, MATLAB
Agilent IO Libraries	Includes: VISA Libraries, Agilent Connection Expert, IO Monitor

Agilent M9502A and M9505A AXIe Chassis

www.agilent.com/find/axie-chassis

Industries and Applications

- Aerospace and defense, communications
- Electronics, semiconductor test

Product Description

The M9502A and M9505A AXIe chassis are fully compatible with the AXIe 1.0 specification. They provide 2 or 5 slots for AXIe instrument modules, and have an embedded system module that does not take up an instrument slot. The embedded system module provides Gigabit LAN and x8 PCIe® interfaces for connecting the chassis to an external controller. To minimize rack space, the instrument module slots are arranged horizontally. In addition, both the power supply and fan tray can be removed while the chassis remains in the rack for maintenance.

Main Features and Benefits

Product features	Your benefit
Compact size	2-slot chassis is ideal for transportable applications, while 5-slot saves rack space
Gen 2 x4 links to module slots and 62 local bus pairs	Enables high-performance applications
Embedded AXIe system module	System module does not take up a slot, resulting in a smaller chassis
High cooling capacity	Provides cooling for high-performance modules

Specifications and Characteristics

	M9502A	M9505A
Size	2U	4U
Number of slots	2	5
Power supply output voltage, *(nominal)*	*50 VDC*	*52 VDC*
Total DC module power	400 W	1000 W

Specifications (cont'd)

	M9502A	M9505A
Input power consumption	800 VA	1280 VA

System module type	Embedded
System module front panel connectors	X8 Gen 2 PCIe, multiframe in/out, trigger in/out, clock in/out, and Gbit LAN
Maximum power dissipation per slot	200 W
Local bus pairs	62 pairs between adjacent slots
Data bandwidth	2 GB/s user slot-to-system slot 4 GB/s system slot-to-host

Ordering Information

Model	Description
M9502A	AXIe chassis: 2-slot with embedded system module
M9505A	AXIe chassis: 5-slot with embedded system module
Opt 900-932	Power cord options
Opt U20	ESM with USB 2.0 includes USB cable

USB port is only supported for a limited set of Agilent AXIe modules. Go to: www.agilent.com/find/axie-chassisusb for compatibility information

Related products	
M9536A	Embedded AXIe PC controller
M9045B	PCIe ExpressCard adaptor: Gen 1
Y1200B	PCIe cable: x1 to x8, 2m
M9048A	PCIe PC adapter
Y1202A	PCIe cable: x8, 2.0m (used with M9048A)
Accessories	
Y1225A	Rack mount kit for M9502A
Y1226A	Rack mount kit for M9505A
Y1223A	AXIe multi-frame cable: 0.5m
Y1224A	AXIe multi-frame cable: 3m
Y1232A	Soft carry bag for M9502A
N5650-00080	Single-slot AXIe filler module

Agilent M9536A
AXIe Embedded PC Controller

www.agilent.com/find/m9536a

Industries and Applications

- Aerospace/defense
- Communications
- Computation
- Electronic test
- Semiconductor testing
- High-energy physics

Product Description

The Agilent M9536A is an AXIe-compatible, embedded PC controller which provides a high-performance PCIe® Gen2 link to the AXIe backplane. It is the first AXIe embedded controller available on the market. The M9536A provides a powerful, one-slot computer that can be used to build compact AXIe systems while also integrating easily with LXI instruments with the built-in Gigabit LAN interface.

Main Features and Benefits

Product features	Your benefits
Gen 2 PCIe link to backplane	Faster data transfer rates across the backplane
Intel Xeon EP Quad Core L5518 processor	Faster system performance for multi-threaded applications
16 GB RAM option	Support for large, data-intensive tasks
Preloaded with Agilent I/O libraries and operating system	Reduced test system development time
Designed for AXIe systems	Provides choice between embedded and external controllers
Solid-state drive (SSD)	Improved reliability

Specifications and Characteristics

Hardware	
Size	1-slot, AXIe module
CPU	Intel Xeon EP L5518 processor at 2.13 GHz
Storage Type Size	 2.5" SATA II SSD 160 GB
Memory	8 GB standard, 16 GB optional 24 GB maximum
AXIe PCIe link configuration	x4, Gen 2
AXIe PCIe data bandwidth (max)	2GB/s to AXIe backplane
AXIe Ethernet fabric channel	10/100/1000BASE-T
Front panel connections	USB (3), 10/100/1000 LAN (2), VGA (up to 1600x1200), RS-232

Ordering Information

Model	Description
M9536A	AXIe embedded PC controller
M9536A-M16	Memory upgrade from 8GB RAM to 16 GB RAM
M9536A-WE6	Microsoft Windows Embedded Standard 7 Operating System (64-bit)
M9505A	5-slot AXIe chassis
Related Products	
M9536A-WE3	Microsoft Windows Embedded Standard 7 Operating System (32-bit)
M9502A	2-slot AXIe chassis

Chassis slot compatibility: AXIe 1.0 secondary hub-slot (slot #1 in the M9502A and M9505A)

Agilent M9703A
High-Speed AXIe Digitizer

www.agilent.com/find/m9703a

Industries and Applications

- Large scale applied physics experiments such as hydrodynamics or plasma fusion
- Radar and satellite communication applications such as multi-antenna calibration/test or beam-forming

Product Description

The M9703A is a revolutionary 8-channel digitizer, able to capture signals from DC to 2 GHz at 1.6 GS/s with 12-bit resolution. An interleaving capability allows signal acquisition at 3.2 GS/s on four channels with the best measurement accuracy. The Agilent M9703A internal FPGAs can feature an optional real-time digital downconverter (DDC) allowing tuning and zooming on the analyzed signal. This allows improving the dynamic range, extending the capture time, and accelerating measurement speed for your application. Combine with the Agilent 89600 VSA software for advanced measurement analysis.

Main Features and Benefits

Product features	Your benefit
8 channels (4 if interleaving is enabled)	Easily build large scale acquisition systems
12-bit resolution	High dynamic range at GHz speed
Up to 3.2 GS/s sampling rate	Digitize wideband very fast signals
DC to 2 GHz input frequency range	Fast and wide signals capture
Real-time digital downconverter	Tune and zoom on signals for reduced test time
Up to 4 GB (256 MSamples/ch) on-board memory	Long data acquisition time

Specifications and Characteristics

Size	1 slot
Resolution	12 bits

Specifications (cont'd)

Channels		8
Sample rate	-SR1	1 GS/s (2 GS/s when interleaved)
	-SR2	1.6 GS/s (3.2 GS/s when interleaved)
Input frequency range (–3 dB bandwidth)		DC to 2 GHz (non-interleaved mode)
Full scale (FS) range		1 V / 2 V
Spurious-free dynamic range (SFDR)		60 dBc *(typical)*
Effective number of bits (ENOB)		8.8 bits *(typical)*
Signal-to-noise ratio (SNR)		57 dB *(typical)*
DDC analysis bandwidth		300 MHz, then 160 MHz/2^N, N = 0, 1, 2, ... 18

Ordering Information

Model	Description
M9703A	AXIe 12-bit Digitizer
M9703A-SR1	1 GS/s sampling rate
M9703A-SR2	1.6 GS/s sampling rate
M9703A-INT	Interleaved channel sampling functionality
M9703A-F05[1]	Input frequency: DC to 650 MHz
M9703A-F10	Input frequency: DC to 2 GHz (not interleaved) DC to 1 GHz (interleaved)
M9703A-M10[1]	1 GB (64 MS/ch) acquisition memory
M9703A-M20	2 GB (128 MS/ch) acquisition memory
M9703A-M40	4 GB (256 MS/ch) acquisition memory
M9703A-DDC	Digital down-converter firmware
These options are included in the default configuration of the M9703A	
Related products	
M9502A	2-slot AXIe chassis
M9505A	5-slot AXIe chassis
M9536A	Embedded AXIe controller
U1092A	AcqirisMAQS Multichannel Acquisition Software
89601B	89600 VSA software, transportable license

Agilent M8190A Arbitrary Waveform Generator

www.agilent.com/find/m8190a

Industries and Applications

- Aerospace and defense
- Radar and satellite testing
- Wideband signal generation
- Wireless communications
- Consumer and computation
- Education and research

Product Description

From low-observable systems to high-density communications, testing is more realistic with precision arbitrary waveform generation. Now you can take reality to the extreme. An Agilent AWG is the source of greater fidelity, delivering high resolution and wide bandwidth—simultaneously. This unique combination lets you create signal scenarios that push your designs to the limit and bring new insights to your analysis. Get bits and bandwidth—enhance your reality.

Main Features and Benefits

Product features	Your benefits
5 GHz analog bandwidth	The modulation bandwidth meets market requirements today and tomorrow
14 bit with 8 GSa/s	Best SFDR in the market
Switchable between 12 bit, 12 GSa/s and 14 bit and 8 GSa/s	Adopt the application to your needs
2 GSa memory	Test your application with realistic scenarios over long periods of time
Digial upconversion	Change parameters on the fly
Streaming for download	Modify waveforms while playing them, for infinite playtime

Chassis compatibility: AXIe

Specifications and Characteristics

Hardware	
Size	2-slot AXIe module
Sample rate	125 MSa/s to 12 GSa/s
Resolution	12 bits up to 12 GSa/s 14 bits up to 8 GSa/s
Analog Bandwidth	5 GHz
Spurious-free-dynamic range (SFDR)	Up to 80 dBc typical
Harmonic distortion (HD)	Up to -72 dBc typical
Transition times	50 ps (20/80)
Memory depth	2 GSa
Type of output	Single-ended or differential, DC-coupled
Impedance	50 Ω (nom)

Ordering Information

Model	Description
M8190A	Product only with required accessories
M8190A-001 M8190A-002	1 channel 2 channel
M8190A-14B	14 bit, 8 GSa/s
M8190A-12G	12 GSa/s, 12 bit
M8190A-02G	2048 MSa per channel
M9132A	50-ch SPST general purpose switch
M8190A requires 2-slot or 5-slot chassis with PCIe® card adapter & cable	
Related products	
M8192A	Synchronization module for up to 12 M8190A channels
M9045B	PCIe ExpressCard adaptor
M9048A	PCIe desktop adaptor
M9502A	2-slot AXIe chassis
M9505A	5-slot AXIe chassis
M9536A	AXIe controller

Agilent U4154A 4Gb/s AXIe Logic Analyzer Module

www.agilent.com/find/u4154a

Industries and Applications

- Digital debug and logic analysis
- High Speed DDR memory applications
- Analog to digital converter verification
- High-speed ASIC/FPGA debug and validation

Product Description

The Agilent U4154A AXIe logic analyzer system combines reliable data capture up to 136 channels with powerful analysis and validation tools to enable you to quickly and confidently validate and debug high-speed digital designs operating at speeds up to 4 Gb/s. Confidence in the state mode captures, and bus-level signal integrity insight, make the U4154A logic analyzer the ideal tool for DDR memory measurement and debug work.

Main Features and Benefits

Product features	Your benefits
Up to 4 Gb/s state speed	Real time capture on high speed busses
100 ps data valid window	Reliable data capture even with small eye diagrams
12.5 GHz timing zoom	Get simultaneous state and high-resolution timing measurements
Dual sample mode	Sample DDR reads and writes simultaneously Achieves highest data rates
200 M sample memory depth	Debug problems where the cause and symptoms are separated by several seconds
2.5 Gb/s trigger sequencer	Enabling accurate and precise triggering—even on complex burst events

Chassis compatibility: AXIe

Specifications and Characteristics

Hardware	
Size	1-slot AXIe module
Number of channels (multiple modules can be merged)	136 (full channel mode) per module
Supported signal types	Single-ended and differential
Max state data rate	2.5 Gb/s on 136 channels 4 Gb/s on 68 channels
Max state clock	2.5 GHz
Minimum state clock frequency	12.5 MHz (single edge) 6.25 MHz (both edges)
Minimum data valid window	100 ps
Minimum eye height	100 mV
Timing sample rate	2.5 GHz (full channel mode) 5 GHz (half channel mode)
Timing zoom sampling rate	12.5 GHz
Max trigger sequence speed	2500 MHz (400ps)

Ordering Information

Model	Description
U4154A U4154A-02G	Logic analyzer module State speed 136-channel, 2.5 Gb/s state 68 channel, 4Gb/s state (Other State speed option is –01G 136-channel, 1.4 Gb/s state 68 channel, 2.8 Gb/s state) 16M memory (other options: 2M, 4M, 8M, 32M, 64M, 128M, 200M)
U4201A	Logic analyzer probe cable (4 per U4154A)
Application SW tools and Probes	Refer to ordering information in data sheet 5990-7513EN
M9502A / M9505A	2-slot AXIe chassis 2-slot AXIe chassis

Agilent U4301A PCI Express® 3.0 Protocol Analyzer Module

www.agilent.com/find/u4301a

Industries and Applications

- PCI Express Chipset turn-on, Debug and Validation
- Root Complex and End-point Debug and validation

Product Description

The U4301A helps test engineers and validation labs address the challenges of transitioning to PCIe® 3.0 by addressing the high speeds, new encoding scheme, and advanced protocol features.

The U4301A protocol analyzer module supports all PCI Express 3.0 speeds, including 2.5 GT/s and 5.0 GT/s through PCIe 8 GT/s with x1 through x16 support.

Main Features and Benefits

Product features	Your benefits
Support for Gen1/Gen2/ Gen3, x1 through x16 link width	Support all modes of operation and all generations of PCI Express
Trace capture mode with lane view and triggering	Ensure data visibility even in the face of significant PHY layer issues
4 GB of capture buffer per module	Debug problems where the cause and symptoms are separated by large time gaps
Non-intrusive probing that leverages ESP technology	Reliable capture even with small eye diagrams
Mid-bus, Slot Interposer, and Flying Lead probe, x1 to x16 support	Variety of probing to meet your specific needs

Chassis compatibility: AXIe

Specifications and Characteristics

Hardware	
Size	1-slot AXIe module
Number of lanes	x16 single direction lanes per module or bi-direction up to x8 lanes per module
Memory depth	4 GB per module (8 GB for x16 lanes)
Supported speeds	2.5 GT/s (Gen1) 5.0 GT/s (Gen2) 8.0 GT/s (Gen3)
Speed detection	Automatic among Gen1, Gen2, Gen 3
Trigger sequencer states	4 states

Ordering Information

Model	Description
U4301A	Analyzer module for PCIe 8Gbps
U4301A-A08 or U4301A-A16	Analyzer linkwidth x8 or Analyzer linkwidth x16 (2 modules required for x16 analysis)
U4301A-AN3	Analyzer software license for PCIe 8 Gbps
U4301A-AN2	Analyzer software license for PCIe 5 Gbps
U4321A-A08	Slot interposer 3.0 for PCIe 8 Gbps x8
U4322A	Mid-bus probe 3.0 for PCIe 8 Gbps (bi-directional x8)
Related products	
M9502A	2-slot AXIe chassis
M9505A	5-slot AXIe chassis
M9536A	AXIe controller

Agilent U4421A Protocol Analyzer and Exerciser for MIPI™ D-PHY Interfaces

www.agilent.com/find/dphy_analyzer

Industries and Applications

- Mobile chipset debug and test
- Mobile embedded systems
- MIPI™ D-PHY design protocol test
- CSI and DSI prototype debug
- D-PHY camera and display test

Product Description

The U4421A MIPI D-PHY Analyzer/Exerciser for CSI-2 and DSI provides deep insight into mobile computing designs. The U4421A MIPI D-PHY Exerciser option for CSI-2 and DSI provides the record length necessary to stimulate designs with high-definition images and video that best simulates traffic from a wide variety of device busses of varying signal performance.

Main Features and Benefits

Product features	Your benefit
MIPI D-PHY Exerciser	Simulate missing devices in your design, and test it to the corners of the specification
MIPI D-PHY protocol analyzer for DSI and CSI-2 traffic, including trigger and filters	Deep insight into your mobile computing designs
Flexible probing solution	Facilitate reliable capture of high speed MIPI D-PHY signals
Image level pattern generation and analysis	Simulate real world conditions
Deep memory	Record and generate long duration events
Change signal data rate Slew rate and lane timing	Bring the "plug fest" experience to your bench

Chassis compatibility: AXIe

Specifications and Characteristics

Lane Width	Up to 4 lanes	
Memory Depth	Up to 16 GB (4GB standard)	
Display Protocol Support	Display Serial Interface (DSI) v1.1 Display Serial Interface (DSI) v1.02.00 Display Serial Interface Version 1.01.00 Display Command Set (DCS) v1.1 Display Command Set (DCS) v1.02.00 Display Command Set v1.01.00 Stereoscopic Display Formats (SDF) v1.0	
Camera Protocol Support	Camera Serial Interface 2 v1.01.00 Camera Serial Interface 2 v1.00 (CSI-2)	
	High speed mode	Low power mode
Max Bit rate	1.5 Gbps data rate	10 Mbps
Min Bit rate	80 Mbps	800 Kbps

Ordering Information

Model	Description
U4421A	Exerciser/analyzer
U4421A-601	Analyzer only
U4421A-602	Exerciser only
U4421A-603	Analyzer/exerciser
U4421A-402	2-lane analysis/stimulus option
U4421A-404	4-lane analysis/stimulus option
U4421A-701	CSI-2 protocol
U4421A-702	DSI protocol
U4421A-703	CSI-2 and DSI protocol
U4421A-M04	4GB memory depth
U4421A-M16	16 GB memory depth
U4421A-001	Image extractor (requires option 601 or 603)
U4421A-002	Image inserter (requires option 602)
Probing and Accessories	
U4201A	Analyzer logic cable (required)
E5381A	Analyzer flying lead adapter
E5405A	Analyzer soft touch adapter
U4422A	Exerciser SMA cable, MIPI D-PHY,13 leads/1.5Gbps

Agilent U4431A Protocol Analyzer MIPI™ M-PHY Interfaces

www.agilent.com/find/mphy_analyzer

Industries and Applications

- High resolution cameras
- High-speed peripherals
- Advanced graphics adapters
- Massive memory buffers

Product Description

The increasing demand for bandwidth has driven the expansion of the MIPI™ M-PHY specification, the backbone of next generation mobile computing designs, to include 4 lane, 6.0 Gbs options. The U4431A offers up to 16 GB of analysis memory on each lane, allowing designers to capture tens of seconds of system traffic, even at high speeds. The U4431A also offers "raw mode", a feature that enables viewing of time-correlated 8b/10b data underlying each protocol.

Main Features and Benefits

Product features	Your benefit
Up to gear 3 HS data rates, 16 GB trace depth & 4 data lanes	Power to meet the needs of today's and tomorrow's designs
Track multiple M-PHY busses from the PHY to application layer. Raw mode 8b/10b data views	Deep insight into your complex, mobile computing designs
Infiniium Oscilloscope integration	Integrate your other instruments
Powerful user interface with customization of system views	Easily customize the solution to meet your needs
N-way if/then/else trigger branching with and/or logic	Sophisticated, powerful triggers
PHY and protocol error triggers, 50 macros, event timers and more	

Specifications and Characteristics

Hardware	
Minimum Vdiff	100 mV
Input impedance (DC) • U4433A + N5426A • U4432A	 *700 Ω, typical* *128 Ω, typical*
Lane width	Up to 4 with option 414
Clocking architecture	Type 1
Analysis direction	Tx or Rx (both with option 612)
Lane remapping	User selectable
Lane polarity	User selectable
Multiple blade support	Up to 5 time-corrected blades in one frame
HS modes supported	G1 to G3
PWM modes supported	G0 to G7
Rate series supported	A and B
Symbol lock time • Fast (HS-G1) • Slow (HS-G2, HS-G3)	 1 symbol, typical < 128 symbols
Auto speed detection and tracking	Supported (with no RSE-PO-TX support)
Memory	1 GB standard, (4GB & 16 GB, optional)

Ordering Information

Model	Description
U4431A	Protocol analyzer
Analyzer Probes	
U4433A	Probe, ZIF flying leads, MIPI M-PHY (one probe both directions)
U4432A	SMA cable, MIPI, M-PHY (one probe both directions)
N5426A	ZIF tip, 12 GHz InfiniMax - Kit of 10

Chassis compatibility: AXIe

Agilent U4998A HDMI 1.4b Protocol Analyzer and Generator Module

www.agilent.com/find/u4998a

Industries and Applications

- HDMI Authorized Test Centers (ATCs)
- HDMI chipset debug and validation
- Consumer computer video devices incorporating HDMI debug and validation

Product Description

The Agilent U4998A HDMI 1.4b Protocol Audio Video analyzer and generator module enables you to test your devices to ensure they are HDMI 1.4b CTS compliant. The module supports source and sink compliance testing of video formats, including 4K x 2K, 3D, and deep color, up to the maximum data rate of 3.4 Gbps. The U4998A also enables test of legal codes, basic protocol, packet type, pixel encoding, video format timing, AVI Infoframe, ACR, audio sample packet jitter, deep color, 3D video format and more.

Main Features and Benefits

Product features	Your benefits
Maximum data rate of 3.4 Gbps	Most complete coverage of HDMI data rates. Supports 4K x 2K, 3D and deep color video formats
HDMI 1.4b capture and generation with compliance tests	Gain confidence in obtaining CTS certification of HDMI source and sink devices
Passive monitoring with pass-through and mirror capabilities *(optional)*	Monitor the output of a source device so you can debug and troubleshoot source and sink issues.
Remote control via COM commands	Automate your HDMI testing and remotely control the U4998A using the COM server embedded in the application software

Chassis compatibility: AXIe

Specifications and Characteristics

Hardware	
Size	1-slot AXIe module
Maximum data rate	3.4 Gbps
Memory depth	4 GB
HDMI 1.4b compliance test support	Source Tests: 7-16 through 7-19, 7-23 through 7-40 Sink Tests: 8-16, 8-21, 8-23, 8-25*, 8-29, 8-30*, 8,31, *(*with E4887A Signal Generator)*
HPD (Hot Plug Detect)	Emulate removal and connection of HDMI cable between tests
Internal frequency counter	Automatically detects clock frequency without external equipment
Operating modes	Capture/compliance Generate/compliance Passive Monitoring (pass-through/mirror)

Ordering Information

Model	Description
U4998A	HDMI 1.4b Protocol Analyzer & Generator
U4998A-PSV	Passive monitoring (pass through/mirror)
M9502A	2-slot AXIe chassis (Requires either external host PC or M9536A AXIe embedded PC controller)
Related products	
M9536A	AXIe embedded PC controller
N5998U-DBG	Software license. Export HDMI captured data for further evaluation/analysis

Connect to:	Desktop PC	Laptop PC
M9048A Y1202A	PC adapter Gen2, x8 PCIe® cable: x8, 2.0m	
M9045B Y1200B		PCIe ExpressCard adaptor: Gen 1 PCIe cable: x4 to x8, 2.0m

Agilent M9045B PCIe® ExpressCard Adapter

www.agilent.com/find/m9045b

Industries and Applications

- Aerospace and defense
- Communications
- Electronics test
- Semiconductor testing

Product Description

The M9045B is a PCIe® interface card that can be used with an Agilent AXIe chassis, such as the M9502A/5A, or a PCIe cable interface, such as the M9021A.

This adapter uses the ExpressCard 34 format typically found in laptop computers. It provides a x1 Gen 1 link to the computer (One Stop OSS-PCIE-HIB2-EC-x1).

Main Features and Benefits

Product features	Your benefit
ExpressCard format and low power consumption	Provides a transportable solution
Standard PCIe over cable	Allows use with any computer with PCIe ExpressCard interfaces
Transparent operation with application software	Delivers ease of installation

Specifications and Characteristics

Hardware	
Card format	PCIe ExpressCard 34
Dimensions	34 mm (1.34 in) x 110.8 mm (4.36 in)
Number of PC slots	1
Data bandwidth (max)	250 MB/s
Connector	x1 PCIe cable connector
Cable length	Up to a 7-meter passive cable supported

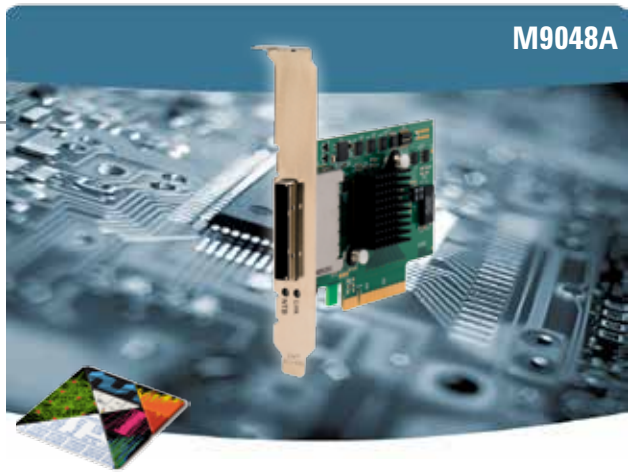
*For more complete specifications and manuals, visit the OSS Web site: **http://www.onestopsystems.com**/*
This product comes with a one year warranty and can be returned to either Agilent or OSS for warranty service.

Ordering Information

Model	Description
M9045B	PCIe ExpressCard adapter: Gen 1
Related Products	
M9021A	PCIe cable interface: Gen 2, x8
M9502A	2-slot AXIe chassis
M9505A	5-slot AXIe chassis
Accessories	
Y1200B	PCIe cable: x1 to x8, 2.0m (used with M9045B)

Agilent M9048A
PCIe® Desktop PC Adapter

www.agilent.com/find/m9048a



Industries and Applications

- Aerospace and defense
- Wireless communications
- Electronics test
- Semiconductor testing

Product Description

The M9048A PCIe® desktop PC adapter provides a high-performance (Gen 2 x8) link between a host PC and PXIe or AXIe chassis.

The M9048A utilizes a PCIe switch and clock isolation to provide a high-quality clock source driven down the PCIe cable to the PXIe or AXIe chassis. As a result, the adapter always provides the same, high-performance Gen 2 link, independent of the PC. It can also operate in most Gen 3 PC slots because the PC can train to Gen 2. The adapter is compatible with desktop or rackmount computers that have either x8 or x16 PCIe expansion slots (mechanical). It connects directly to the M9502A/5A AXIe or M9018A PXIe chassis with a Y1202A PCIe cable.

Main Features and Benefits

Product features	Your benefit
PC host clock isolation	Provides superior computer compatibility
IDT PCIe switch	Compatibility with PCs that have Gen 3 PCIe slots
Gen 2 x8 PCIe capability	Enables high-performance applications
Standard PCIe over cable	Connects a PXIe or AXIe chassis to PCs with expansion slots
Transparent operation with application software	Delivers ease of installation

Specifications and Characteristics

Hardware	
Card format	PCIe half-card format (half-height and half-width)
Computer expansion slot compatibility	x8 and x16, Gen 1, 2, or 3*
Dimensions	55 mm (2.2 in) x 114 mm (4.5 in)
Number of PC slots	1
Data bandwidth (max)	4 GB/s (Gen 2 x8 PC slot)
Connector	x8 PCIe IPASS cable connector
Card indicators	LEDs for link status and transport mode
Power consumption	7 W (typ)
Cable length	Up to 2-meter passive cable
PCI bracket	Includes both low profile and standard profile brackets
Operating temperature	0 C - 55 C

** The M9048A is designed to be compatible with most Gen 3 PCIe PC slots, but the PC will train to Gen 2.*

Ordering Information

Model	Description
M9048A	PCIe desktop PC adapter: Gen 2, x8, clock isolation
Related products	
M9018A	PXIe chassis: 18-slot, 3U, 8GB/s
M9021A	PCIe cable interface: Gen 2, x8
M9045B	PCIe ExpressCard adapter
M9502A	AXIe chassis: 2-slot with integrated system module
M9505A	AXIe chassis: 5-slot with integrated system module
Accessories	
Y1202A	PCIe cable: x8, 2.0m

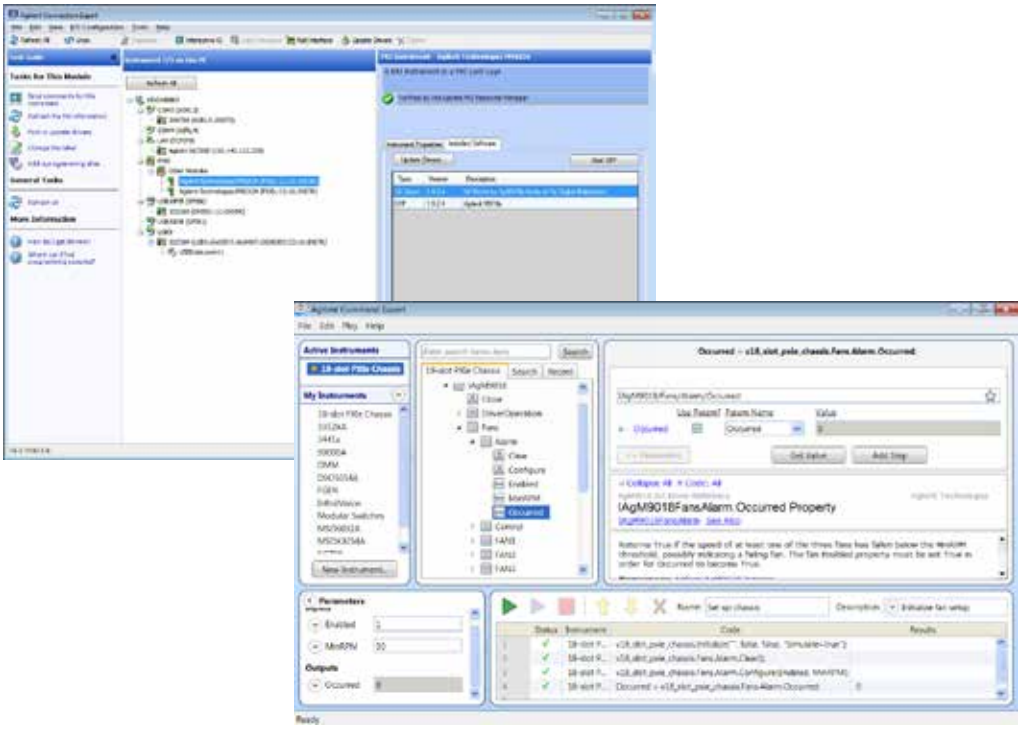
PROGRAMMING ENVIRONMENT

Agilent's modular products benefit from multiple software advantages:

- A single entry point - the Agilent IO Libraries Suite - for access to instrument control and programming software of your choice.
- Programming assistance through Agilent's Command Expert
- Access to Agilent's Measurement Science and latest measurement algorithms

Agilent IO Libraries Suite offers fast and easy connection to PXI modular instruments and traditional instruments and reduces system setup and configuration time to mere minutes.

Agilent's Command Expert provides fast and easy instrument control with combined instrument commands, documentation, syntax checking and command execution all in one simple interface. Instrument command sets are available for instruments that use IVI-COM drivers or Standard Commands for Programmable Instrumentation (SCPI).



Agilent IO Libraries Suite 16

www.agilent.com/find/iosuite

Industries and Applications

- Aerospace and defense, wireless communications, electronic test
- Radar and Wideband Signal Capture

Product Description

The Agilent IO Libraries Suite 16 provides all of the software needed to quickly detect and connect to instruments of all types and manage the communication between the PC and chassis and instruments for PXI instruments as well as GPIB, USB, LAN, RS-232 and VXI.

Agilent VISA and Connection Expert support PXI, PXIe, and PCIe® devices. Instrument drivers and soft front panels can be updated and launched from Connection Expert. The PXI Resource Manager will discover and display chassis and modules. New interfaces and new capabilities continue to be added to the connectivity software to provide users with an improved connection experience.

Main Features and Benefits

Product features	Your benefit
Automatically detects chassis and instruments connected to the PC.	Simplifies the connection process.
Automatically configures interfaces after detecting chassis and instruments.	Accelerates development process decreasing time to first measurement.
Compatible with all interfaces: PXI, GPIB, USB, Ethernet/LAN, RS-232 and VXI test instruments from a variety of vendors.	Supports mixed systems and maintains investments as well as future changes.
Enables instrument communication for a variety of development environments including Agilent VEE Pro, MATLAB, NI LabVIEW, Microsoft Visual Studio and more.	Flexibility for integration into the development environment of choice.
Automatic notification of updates.	Be confident that you are using the latest version of the software

Ordering Information

Model	
Agilent IO Libraries Suite 16	Free software download at: **www.agilent.com/find/iosuite**
Related Products	
Agilent Command Expert:	**www.agilent.com/find/commandexpert**
Supported development environments and supported I/O software	
VB6	VISA COM, VISA, SICL, Agilent 488, Excel VBA
C/C++, Managed C++	VISA COM, VISA, Agilent 488
.NET languages (VB.NET, C#)	VISA COM, VISA, Agilent 488
LabVIEW	VISA, Agilent 488
MATLAB	VISA
Note: Agilent IO Libraries Suite supports VEE Pro program development with drivers and/or Direct I/O.	

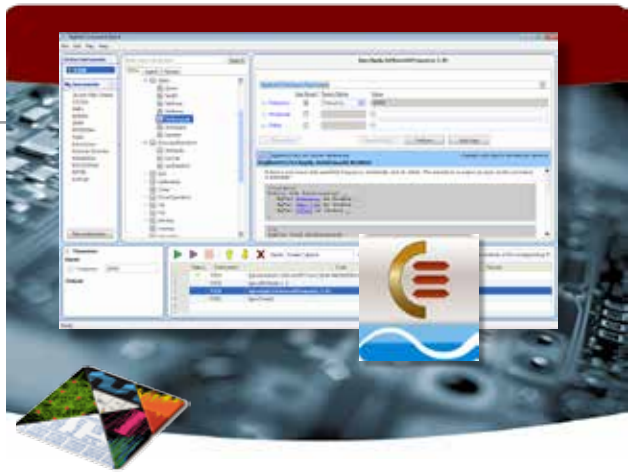
Software Information

Agilent IO Libraries Suite 16 is a Windows-based software package that can be downloaded for free from the Agilent website.

Supported operating systems	Microsoft Windows XP (32-bit) Microsoft Windows 8 (32/64-bit) Microsoft Windows 7 (32/64-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW, MATLAB
Supported application development environments (ADE)	Visual Studio (C/C++, C#, VB.NET), LabVIEW, LabWindows/CVI, MATLAB, VEE

Agilent Command Expert

www.agilent.com/find/commandexpert



Industries and Applications

- Aerospace and Defense
- Electronic Test
- Wireless Communications
- Radar and Wideband Signal Capture
- And others....

Product Description

Agilent's Command Expert is FREE software that provides fast and easy instrument control in PC application environments.

Command Expert combines instrument commands, documentation, syntax checking and command execution all in one simple interface. Instrument Command Sets are available for instruments that use IVI-COM drivers or Standard Commands for Programmable Instrumentation (SCPI).

- Find instrument commands
- Access command documentation
- Verify command syntax
- Build instrument command sequences
- Execute instrument command sequences
- Integrate sequences into PC application environments

Main Features and Benefits

Product features	Your benefits
Access all IVI-COM commands and documentation in one interface.	Spend less time searching for the right command.
Rapid prototyping of instrument commands within the interface.	Quickly create the right sequence to perform the measurements needed.
Put together sequences before the hardware is available.	Save development time by working Off-Line to build the commands then test the results once the hardware is available.
Integration with Visual Studio, Excel, VEE, SystemVue, and LabVIEW.	Save time and minimize rework with syntax checking available within the program.
Write the sequence once and reuse in other programming environments.	Save time and maximize reuse of code generated.

Ordering Information

Free Software Download	
www.agilent.com/find/commandexpert	
Related Products	
Agilent IO Libraries	www.agilent.com/find/iosuite

Software Information

Software operating systems	Microsoft Windows 7 (32/64-bit),
Standard compliant drivers	IVI-COM
Supported application development environments (ADE)	VisualStudio 2005, 2008, 2010 and above VEE Pro 9.2.2, LabVIEW 8.2.1 or above, Excel 2007 or Excel 2010
Agilent IO Libraries	Required

Agilent N6171A MATLAB Software

www.agilent.com/find/matlab

Industries and Applications

- Aerospace and defense
- Wireless communications
- Radar and Wideband Signal Generation and Capture

Product Description

MATLAB is a popular software environment and language used by over 1,000,000 engineers and scientists today. MATLAB is now available for purchase directly from Agilent as your application development environment for PXI and AXIe modular hardware.
MATLAB software extends the capabilities of Agilent modular hardware enabling you to create GUI-based applications, create custom measurement routines, generate arbitrary waveforms and more. 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.

Main Features and Benefits

Product features	Your benefit
Develop GUI-based applications in MATLAB for your PXI and AXIe hardware	Easily execute repetitive data analysis, verification or test routines
Create arbitrary or standard waveforms mathematically (multi-tones, pulsed radar, multi-carrier, etc.)	Generate the signals necessary to operate your device
Interface to your modular and bench top hardware using GPIB, LAN, USB, VISA, and through IVI or MATLAB drivers	Acquire and analyze your data in a single software environment
Access MATLAB libraries for creating filters and to demodulate signals	Perform the needed data analysis to successfully test or verify your device

Software Information

Operating systems	Microsoft Windows
Instrument interfaces	GPIB, LAN, and USB through VISA using Instrument Control Toolbox
Standard compliant drivers	Supports IVI-COM, IVI-C, and MATLAB instrument drivers using Instrument Control Toolbox
Agilent IO Libraries	Includes VISA Libraries, Agilent Connection Expert, IO Monitor

Ordering Information

Model	Description
N6171A	The MATLAB software option from Agilent: Order the -M01, -M02, or -M03 option
N6171A-M01	Basic configuration includes the MATLAB software environment and Instrument Control Toolbox
N6171A-M02	Standard configuration includes the MATLAB software environment, Instrument Control Toolbox, Communications System Toolbox DSP System Toolbox, and Signal Processing Toolbox
N6171A-M03	Advanced configuration includes the MATLAB software environment, Instrument Control Toolbox, Communications System Toolbox DSP System Toolbox, Signal Processing Toolbox, and RF Toolbox

TESTED COMPUTER LIST

M9018A PXIe Chassis
M9502A AXIe Chassis
M9505A AXIe Chassis

Overview

This personal computer and controller technical note has been prepared to provide the system designer with a list of tested computers that are compatible with Agilent Technologies PXI and AXIe chassis. Both AXIe and PXIe chassis are compatible with each computer unless otherwise noted. The testing in this guide covers both the PCIe® link and enumeration of the chassis. Compatibility can be impacted by many factors including computer BIOS and signal path within the computer and cable.

Agilent Technologies modular chassis tested:

- Agilent M9018A PXIe Chassis
- Agilent M9502A AXIe Chassis
- Agilent M9505A AXIe Chassis

Personal computing devices tested:

- Laptop PC
- Desktop PC
- Tested rack mount PCs
- Tested PXIe embedded PCs

M9018A PXIe 18-slot chassis

M9502A AXIe 2-slot chassis

TESTING CONFIGURATIONS

Testing configurations	
Agilent M9018A PXIe chassis	• Tested using cabled PCI Express® link with the M9021A PCIe® cable interface and PXIe embedded controllers. • Testing was performed with only a graphics card in its standard slot and Agilent-recommended PCIe host cable card installed [1] • Laptop testing utilized the M9045B ExpressCard and Y1200B PCIe cable • Desktop/rack-mounted PC testing utilized the M9048A PCIe interface and Y1202A PCIe cable • Tested with Microsoft Windows 7 (32/64 bits)
Agilent M9502A AXIe chassis Agilent M9505A AXIe chassis	• Tested using: cabled PCI Express link, • Testing was performed with only a graphics card in its standard slot and Agilent-recommended PCIe host cable card installed [1] • Laptop testing utilized the M9045B ExpressCard and Y1200B PCIe cable • Desktop/rack-mounted PC testing utilized the M9048A PCIe interface and Y1202A PCIe cable • Tested with Microsoft Windows 7 (32/64 bits)

1. Applies to desktop and rackmount computers only. In some cases, the graphics card must also be removed (see computer comments)

Laptop personal computers [2]					
Manufacturer	Model	BIOS	PCIe Link	Number of chassis [3]	Comments
Dell Precision	M6700	A08	x1 Gen 1	1	AXIe only in Gen 1 mode
Hewlett Packard	Elite Book 8470P	68ICF Ver F.31	x1 Gen 1	1	Select Gen 1 BIOS setting for ExpressCard
Hewlett Packard	Elite Book 8570P	68ICF Ver F.31	x1 Gen 1	1	Select Gen 1 BIOS setting for ExpressCard
Hewlett Packard	Elite Book 8570W	68IAV Ver F.31	x1 Gen 1	1	Select Gen 1 BIOS setting for ExpressCard
Note: The following models are supported, but have been discontinued by the manufacturer (they may still be available though distribution channels).					
Dell	Precision M4600	A.08	x1 Gen 1	1	
Dell	Precision M6600	A.07	x1 Gen 1	1	
Hewlett Packard	Elite Book 8460P	68SCF Ver F.22	x1 Gen 1	1	Select Gen 1 BIOS setting for ExpressCard
Hewlett Packard	Elite Book 8540P	68CVD Ver F.0A	x1 Gen 1	1	
Hewlett Packard	Elite Book 8560P	68SCF Ver F.08	x1 Gen 1	1	Select Gen 1 BIOS setting for ExpressCard
Hewlett Packard	Elite Book 8560W	68SVD Ver. F.26	x1 Gen 1	1	Early models had an ExpressCard mechanical compatbility issue
Lenovo	ThinkPad X220	8DET58WW (1.28)	x1 Gen 1	1	Select Gen 1 BIOS setting for ExpressCard
Lenovo	ThinkPad T420	83ET63WW (1.33)	x1 Gen 1	1	Select Gen 1 BIOS setting for ExpressCard

2. Laptops require the use of ExpressCard® x1 interface cards and therefore will exhibit lower performance than desktop links; however, the advantage is a thinner cable and added portability.

3. Number of chassis which are supported when connected to the computer.

TESTING CONFIGURATIONS (cont'd)

Desktop personal computers					
Manufacturer	Model	BIOS	PCIe® slots [1]	# of chassis [2]	Comments
Acer	Aspire M1	P01-A1	One x16 Gen 2	1	
Acer	Aspire M3970	P03-A1	One x16 Gen 2	1	Use GPU slot (remove video card and use onboard VGA)
Dell Precision	Optiplex 390	A08	One x16 Gen 2	1	Use GPU slot (remove video card and use onboard VGA)
Dell	T3600	A09	Two x 16 Gen 3	4	Only one slot (M9048A) supported. Move PERC RAID card to Gen 3 x16 (x4) to install M9048A. For multiple chassis, set "Bus Number" field in the BIOS to 256.
Dell	T5600	A09	Two x 16 Gen3	2	Move PERC RAID card to Gen 3 x16 (x4) to install M9048A. Move GPU to Gen 2 x16 (x4) slot if second M9048A is required. For multiple chassis, set "Bus Number" field in BIOS to 256.
Dell	T7600	A07	Two/Four x 16 Gen	4	More than two PCIe® slots requires second CPU. May have to move RAID and GPU cards to other slots. For multiple chassis, set "Bus Number" field in BIOS to 256.
Hewlett Packard	Z420	03.18 Rev A	Two x16 and One x8 Gen 3	2	Only two slots supported the third can be used for graphics
Hewlett Packard	Z620	03.18 Rev A	Two x16 and One x8 Gen 3	2	Only two slots supported the third can be used for graphics
Hewlett Packard	Z820	03.16 Rev A	Two/three x16 Gen 3 One x16 (x8) Gen 3	2	Second CPU required for third x16 and x16 (x8) slots.
The following models are supported, but have been discontinued by the manufacturer (may be available though distribution channels).					
Dell	T3500	From ftp. agilent.com	Two x8 (x4) and two x16 graphics Gen 2	1	Check ftp://ftp.agilent.com/pub/ mpusup/ BIOS for latest information including supported BIOS versions
Dell	T5500	From ftp. agilent.com	Two x16 (x8) and two x16 graphics Gen 2	3	Check ftp://ftp.agilent.com/pub/mpusup/ BIOS for latest information including supported BIOS versions
Dell	T7500	From ftp. agilent.com	Two x16 (x8) and two x16 graphics Gen 2	4	Check ftp://ftp.agilent.com/pub/mpusup/ BIOS for latest information including supported BIOS versions Move GPU to x16 (x8) slot
Dell	XPS 8300	A06	One x16 graphics Gen 2	1	M9048A only--use GPU slot (remove video card and use onboard VGA)
Hewlett Packard	ProLiant M11067	J01	One x16 Gen 2	1	
Hewlett Packard	Compaq 8200	01 v.02.09	One x16 Gen 2	1	
Hewlett Packard	ML150G6 Server	O21	One x16 Gen 2	1	
Hewlett Packard	Z400	3.54 Rev A	Two x16 Gen 2	1	Only one slot supported. The second can be used for graphics
Lenovo	ThinkStation D20	61KT48AUS	Two x16 Gen 2	1	Only one slot supported. The second can be used for graphics
Lenovo	ThinkStation S20	60KT44US	Two x16 Gen 2	1	Only one slot supported. The second can be used for graphics

1. Tested PCIe slots in the PC. There may be additional slots in the PC which are not tested/supported. First number is mechanical connection, number in parenthesis is electrical connection. For example, x8 (x4) is a x8 slot wired as a x4. PCIe slots without a second number are the same mechanical/electrical

2. Number of chassis which are supported when connected to the computer. For more information see: www.agilent.com/find/pxie-multichassis. Available slots may depend on graphics used. More than two chassis requires a 64-bit OS

TESTING CONFIGURATIONS (cont'd)

Rackmount personal computers					
Manufacturer	Model	BIOS	PCIe® Slots [1]	Number of chassis [2]	Comments
SuperLogic	SL-4U-Q67SW-WB	SWQ6710H.86A.0060. 2011.1220.1805	One x16 Gen2	1	
Dell	R5500	I01	Up to two x16 (x8) and three x16 graphics Gen2	4	Check ftp://ftp.agilent.com/pub/mpusup/BIOS for latest information including supported versions
Kontron	KISS IPC 760	08.00.15	One x16 Gen2	1	

1. Tested PCIe slots in the PC. There may be additional slots in the PC which are not tested/supported. First number is mechanical connection, number in parenthesis is electrical connection. For example, x8 (x4) is a x8 slot wired as a x4. PCIe slots without a second number are the same mechanical/electrical.

2. Number of chassis which are supported when connected to the computer. For more information see www.agilent.com/find/pxie-multichassis. Available slots may depend on graphics used. More than two chassis requires a 64-bit OS.

PXIe embedded personal computers					
Manufacturer	Model	BIOS	System Slot PCIe Links	Number of chassis [3]	Comments
Agilent	M9036A	AG20 or AG20-M	4x4 Gen 2 and 2x8 Gen 2	4	No restrictions
National Instruments	PXIe-8108	4.6.3	4x1 Gen 1	1	No restrictions
National Instruments	PXIe-8133	4.6.3	4x4 Gen 1	1	No restrictions
National Instruments	PXIe-8135	1.0.0f4	4x4 or 2x8 Gen 2	1	No restrictions
Note: The following models are supported, but have been discontinued by the manufacturer (they may still be available though distribution channels).					
National Instruments	PXIe-8101	4.6.3	4x1 Gen 1	1	No restrictions
National Instruments	PXIe-8105	1.3.3	Four link: 1x1 and 3x4 Gen 1	1	No restrictions

3. Number of chassis which are supported when connected to the computer. More than two chassis requires a 64-bit OS. For more information see www.agilent.com/find/pxie-multichassis.

AXIe embedded personal computers				
Manufacturer	Model	BIOS	System Slot PCIe Links	Comments
Agilent	M9536A	AG10	AXIe PCIe Link x4 Gen 2	AXIe slot one only

BECOME A PARTNER

Agilent's Solution Partners can create an optimized modular test system for you

Modular products have the inherent power and flexibility to provide the building blocks for any test system. However, when time is of the essence and you need a test system that addresses your measurement needs – and fast – Agilent has an extensive network of premier partners to develop systems from Aerospace and Defense to ZigBee.

Agilent's Solutions Partner Program recruits and supports mature, stable companies with the complementary skills to fulfill this role for you. Our Solutions Partners enjoy a preferential relationship and work closely with Agilent to develop systems that take advantage of all the measurement capabilities of our instruments. When you tap into the resources of our partners, you also benefit from this knowledge and experience.

Partner Value

- Software to control the system and manage test flow
- Fixturing to interface to the device under test
- Racking systems to house instrumentation and switching
- Environmental or anechoic chambers
- Services to integrate elements into a complete system
- Training for customers', operators, and engineers
- Services to install and support the test system in use

Become a Partner...

Worldwide, there are already over 200 companies involved in the Agilent Solutions Partner Program, but we are always looking for partners who can provide additional solutions for our customers. If you have the skills and expertise that can help expand our modular solutions portfolio, we want to hear from you.
As a first step, simply follow the "Become a Partner" link at www.agilent.com/find/solutionspartners, complete and submit the form.

www.agilent.com/find/solutionspartners

SPECIFICATIONS DEFINITIONS

Specifications describe the warranted performance of calibrated instruments that have been stored for a minimum of two hours within the operating temperature range of 0 °C to 55 °C, unless otherwise stated, and after a 45 minute warm-up period. Data represented in this document are specifications unless otherwise noted.

Characteristics describe product performance that is useful in the application of the product, but that is not covered by the product warranty. Characteristics are often referred to as Typical or Nominal values and represented in italics.

Typical *describes characteristic performance, which 80% of instruments will meet when operated over a 20 °C to 30 °C temperature range. Typical performance is not warranted.*

Nominal *describes representative performance that is useful in the application of the product when operated over a 20 °C to 30 °C temperature range. Nominal performance is not warranted.*

Note: All graphs contain measured data from several units at room temperature unless otherwise noted.

CUSTOMER SUPPORT AND WARRANTY INFORMATION

Customer Support

For your ease of ordering, the product information pages within this catalog come complete with product descriptions and model numbers. In addition, the ordering information includes: typical product configuration, typical system configuration, related products and accessories.

Product Information: www.agilent.com/find/contactus

or call 1 800 829-4444 US

Repair and Calibration: www.agilent.com/find/infoline

Parts and Accessories: www.parts.agilent.com

Email updates: www.agilent.com/find/emailupdate

For all modular products: www.agilent.com/find/modular

Advantage Services: Calibration and Warranty

What is covered by warranty?

Standard 3-year Global Warranty

Agilent Technologies provides the peace-of-mind that today's high-tech industry requires. Your investment is protected by Agilent's global reach in more than 100 countries (either directly or through distributors). Convenient, the warranty gives you standard coverage for the country in which the product is in use, eliminating the need to ship equipment back to the country of purchase. Agilent warranty services provide:

- All parts and labor necessary to return your instrument to full specified performance
- Recalibration for products supplied originally with a calibration certificate
- Return shipment

Warranty Coverage

Agilent warrants Agilent hardware products against defects in materials and workmanship and that Agilent hardware products conform to Agilent published specifications. Warranty does not cover visible abuse, negligence or shipping damage, nor does it apply to defects resulting from improper or inadequate maintenance or calibration by Customer or unauthorized parties, Customer-supplied software, interfacing or supplies, unauthorized modification or improper use of Product, operation outside of the published environmental specifications for the Product, or improper site preparation or maintenance by Customer. For specific operation environment specifications, refer to the product manual.

Advantage Services: Calibration and Warranty	
Agilent Advantage Services is committed to your success throughout your equipment's lifetime.	
R1282A	Annual calibration
Standard	Return-to-Agilent warranty 3 years
R-51B-001-5C	3 year return-to-Agilent warranty extended to 5 years

www.agilent.com/find/advantageservices

INDEX BY MODEL NUMBER

MODEL	DESCRIPTION	PAGE
Dual Channel System	PXI Dual Channel Vector Signal Analyzer	76
E2300	Command Expert Software	111
E2094	IO Libraries Suite	110
MIMO System	PXI Wideband MIMO Vector Signal Analyzer	78
M8190A	AXIe Arbitrary Waveform Generator	100
M9018A	PXIe Chassis: 18 slot, 3U, 8 GB/s	19
M9021A	PCIe® Cable Interface: x8	20
M9036A	PXIe Controller	21
M9045B	PCIe® Laptop Adapter: x1	22, 106
M9048A	PCIe® Desktop PC Adapter: Gen 2, Clock Isolation	23, 107
M9099	Waveform Creator software	89
M9101A	PXI High Density Multiplexer: 64-ch, 2-wire, 100 Vdc/1 A, Reed Relays	37
M9102A	PXI High Density Multiplexer: 128-ch, 1-wire, 100 Vdc/1 A, Reed Relays	37
M9103A	PXI High Density Multiplexer: 99-ch, 2-wire, 100 Vdc/1 A, EM Relays	37
M9120A	PXI Matrix Switch: 4x34, 2-wire, 100 Vdc/2 A, EM Relays	38
M9121A	PXI Matrix Switch: 4x64, 2-wire, 100 Vdc/.5A, Reed Relays	38
M9122A	PXI Matrix Switch: 8x32, 1-wire, 100 Vdc/2A, EM Relays	38
M9128A	PXI RF Matrix Switch: 300 MHz, 8x12, 50 Ω	39
M9130A	PXI SPDT Switch: 26-ch, 100 Vdc/2 A, EM Relays	40
M9131A	PXI SPDT Switch: 64-ch, 100 Vdc/2 A, Reed Relays	40
M9132A	PXI SPST Switch: 50-ch, 100 Vdc/1 A, Reed Relays	40
M9133A	PXI SPST Switch: 100-ch, 10 Vdc/1 A, Reed Relays	40
M9135A	PXI SPST Power Relay, 20-ch, 10 A @ 250 Vac, 300 W	40
M9146A	PXI RF Multiplexer: 3 GHz, Dual 1x4, 50 Ω, Terminated	39
M9147A	PXI RF Multiplexer: 3 GHz, Dual 1x4, 50 Ω, Terminated Common	39
M9148A	PXI RF Multiplexer: 3 GHz, 1x8, 50 Ω	39
M9149A	PXI RF High Density RF Multiplexer: 3 GHz, Dual 1x16, 50 Ω	39
M9150A	PXI RF Multiplexer: 3 GHz, Dual 1x4, 75 Ω	39
M9151A	PXI RF Multiplexer: 3 GHz, Quad 1x4, 75 Ω	39
M9152A	PXI RF Multiplexer: 3 GHz, 1x8, 75 Ω	39
M9153A	PXI RF Multiplexer: 3 GHz, 1x16, 75 Ω	39
M9155C	PXI Hybrid Dual SPDT Coaxial Switch, DC to 26.5 GHz	41
M9156C	PXI Hybrid Dual Transfer Switch, DC to 26.5 GHz	41
M9157C	PXI Hybrid Single SP6T Switch, DC to 26.5 GHz	41
M9155CH40	PXI Hybrid Dual SPDT Coaxial Switch, DC to 40 GHz	42
M9156CH40	PXI Hybrid Dual Transfer Switch, DC to 40 GHz	42
M9157CH40	PXI Hybrid Single SP6T Switch, DC to 40 GHz	42
M9168C	PXI Programmable Step Attenuator Module	80
M9170A	PXI Attenuator/Switch Driver module	43
M9181A	Basic Features PXI DMM	49

INDEX BY MODEL NUMBER (CONTINUED)

MODEL	DESCRIPTION	PAGE
M9182A	PXI Digital Multimeter: 6½ digit	50
M9183A	PXI Digital Multimeter: 6½ digit, Enhanced Performance	50
M9185A	PXI 8/16-Channel Isolated D/A Converter	59
M9186A	PXI Isolated Single Channel Voltage/Current Source, 100V	60
M9187A	PXI Digital IO: 32-ch, 0.3 to 50 V	46
M9202A	PXIe IF Digitizer: 12 bit, 1 GHz	53, 81
M9210A	PXI-H Digitizing Scope: 10-bit, 2-4 GS/s	54
M9211A	PXI-H UWB IF Digitizer: 10-bit, 4 GS/s, 3 GHz	55
M9216A	PXI 32-Channel High Voltage Data Acquisition Module	44
M9252A	PXIe DigRF Host Adapter	66
M9300A	PXIe Frequency Reference	94
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz	82
M9330A	PXI-H Arbitrary Waveform Generator: 15-bit, 1.25 GS/s	63
M9331A	PXI-H Arbitrary Waveform Generator: 10-bit, 1.25 GS/s	64
M9351A	PXI Downconverter: 50 MHz to 2.9 GHz	83
M9352A	PXI Hybrid Amplifier Attenuator	84
M9360A	PXI Attenuator/Preselector: 100 kHz to 26.5 GHz	85
M9361A	PXI Downconverter: 2.75 GHz to 26.5 GHz	86
M9362A-D01	PXIe Quad Downconverter	79
M9380A	PXIe CW Source	93
M9381A	PXIe Vector Signal Generator	92
M9391A	PXIe Vector Signal Analyzer	75
M9392A	PXI Vector Signal Analyzer: 50 MHz to 26.5 GHz	77
M9403A	PXIe Optical Transmitter: 300 kHz to 26.5 GHz or 50 GHz	68
M9404A	PXIe Optical Receiver: 300 kHz to 26.5 GHz or 50 GHz	68
M9405A	PXIe Optical Amplifier: 300 kHz to 26.5 GHz or 50 GH	68
M9406A	PXIe Optical to USB 2.0	68
M9407A	PXIe Optical to 4 Port USB 2.0 Hub	68
M9408A	PXIe Remote RF Reflectometer	68
M9502A	AXIe 2-slot Chassis	97
M9505A	AXIe 5-slot Chassis	97
M9536A	AXIe Embedded PC Controller	98
M9703A	AXIe Digitizer 12-bit, 8 Channels	99
N2099A	PXI RF Synthesizer	27
N2100B	PXI Digital Communication Analyzer	28
N2101B	PXI Bit Error Rate Tester	29
N2102B	PXI Pattern Generator	30
U4154A	AXIe Logic Analyzer 4 Gb/s	101
U4301A	AXIe Protocol Analyzer PCI Express® 3.0	102
U4421A	AXIe Protocol Analyzer and Exerciser for MIPI™ D-PHY Interfaces	103
U4431A	AXIe Protocol Analyzer for MIPI™ M-PHY Interfaces	104
U4998A	AXIe Protocol Analyzer HDMI 1.4b	105
89601B	89600 VSA software, transportable license	73
N6171A	Matlab software	112
Signal Studio	Signal Studio software	91
W1461BP	SystemVue Software	74, 90
X-Series	X-Series Measurement Applications for Modular Instruments	72

INDEX BY PRODUCT DESCRIPTION

PRODUCT DESCRIPTION	MODEL	PAGE
Adaptor (PCIe® desktop PC Adapter: Gen 2, Clock Isolation)	M9048A	23, 107
Adaptor (PCIe Laptop Adaptor: x1)	M9045B	22, 106
Amplifier/Attenuator (PXI Hybrid)	M9352A	84
Attenuator (PXI Programmable Step Attenuator Module)	M9168C	80
Attenuator/Preselector (PXI 100 kHz to 26.5 GHz (PXI)	M9360A	85
Attenuator (PXI Switch Driver module)	M9170A	43
AWG (AXIe Arbitrary Waveform Generator)	M8190A	100
AWG (PXI-H Arbitrary Waveform Generator: 10-bit, 1.25 GS/s)	M9331A	64
AWG (PXI-H Arbitrary Waveform Generator: 15-bit, 1.25 GS/s)	M9330A	63
Bit Error Rate Tester (PXI)	N2101B	29
Chassis (AXIe 5-slot)	M9505A	97
Chassis (AXIe 2-slot)	M9502A	97
Chassis (PXIe Chassis: 18-slot, 3U, 8 GB/s)	M9018A	19
Controller (AXIe Embedded PC)	M9536A	98
Controller (PXIe)	M9036A	21
D/A Converter (PXI 8/16-Channel Isolated)	M9185A	59
Data Acquisition Module (PXI 32-Channel High Voltage)	M9216A	44
DCA (PXI Digital Communication Analyzer)	N2100B	28
Digital IO (PXI: 32-ch, 0.3 to 50 V)	M9187A	46
Digitizer (AXIe 12-bit, 8 Channels)	M9703A	99
Digitizer (PXIe IF Digitizer: 12-bit, 1 GHz)	M9202A	53, 81
Digitizer (PXI-H UWB IF Digitizer: 10-bit, 4 GS/s, 3 GHz)	M9211A	55
DigRF Host Adapter	M9252A	66
DMM (PXI Digital Multimeter: 6½ digit)	M9182A	50
DMM (PXI Digital Multimeter: 6½ digit, Enhanced Performance)	M9183A	50
DMM (PXI)	M9181A	49
Downconverter: 2.75 GHz to 26.5 GHz (PXI)	M9361A	86
Downconverter: 50 MHz to 2.9 GHz (PXI)	M9351A	83
Frequency Reference (PXIe Frequency Reference)	M9300A	94
IO Libraries Suite	E2094	110
LO (PXI Local Oscillator: 3 GHz to 10 GHz)	M9302A	82
Logic Analyzer 4 Gb/s (AXIe)	U4154A	101
Matlab software	N6171A	112
Multiplexer (PXI High Density : 128-ch, 1-wire, 100 Vdc/1 A, Reed Relays)	M9102A	37
Multiplexer (PXI High Density : 64-ch, 2-wire, 100 Vdc/1 A, Reed Relays)	M9101A	37
Multiplexer (PXI High Density : 99-ch, 2-wire, 100 Vdc/1 A, EM Relays)	M9103A	37
Multiplexer (PXI RF Multiplexer: 3 GHz, 1x16, 75 Ω)	M9153A	39
Multiplexer (PXI RF Multiplexer: 3 GHz, 1x8, 50 Ω)	M9148A	39
Multiplexer (PXI RF Multiplexer: 3 GHz, 1x8, 75 Ω	M9152A	39
Multiplexer (PXI RF Multiplexer: 3 GHz, Dual 1x4, 50 Ω, Terminated Common)	M9147A	39
Multiplexer (PXI RF Multiplexer: 3 GHz, Dual 1x4, 50 Ω, Terminated)	M9146A	39
Multiplexer (PXI RF Multiplexer: 3 GHz, Dual 1x4, 75 Ω)	M9150A	39
Multiplexer (PXI RF Multiplexer: 3 GHz, Quad 1x4, 75 Ω)	M9151A	39

INDEX BY PRODUCT DESCRIPTION (CONTINUED)

PRODUCT DESCRIPTION	MODEL	PAGE
Optical Amplifier (PXIe 300 kHz to 26.5 GHz or 50 GH)	M9405A	68
Optical Receiver (PXIe 300 kHz to 26.5 GHz or 50 GHz)	M9404A	68
Optical Reflectometer (PXIe Remote RF)	M9408A	68
Optical Transmitter (PXI 300 kHz to 26.5 GHz or 50 GHz)	M9403A	68
Optical USB (PXIe USB 2.0)	M9406A	68
Optical USB (PXIe 4 Port USB 2.0 Hub)	M9407A	68
Pattern Generator (PXI)	N2102B	30
Power Relay (PXI SPST Power Relay, 20-ch, 10 A @ 250 Vac, 300 W)	M9135A	40
Protocol Analyzer HDMI 1.4 (AXIe)	U4998A	105
Protocol Analyzer (AXIe Analyzer Exerciser for MIPI™ D-PHY Interfaces)	U4421A	103
Protocol Analyzer (AXIe Analyzer for MIPI™ M-PHY Interfaces)	U4431A	104
Protocol Analyzer PCI Express® 3.0 (AXIe)	U4301A	102
PXI-H Digitizing Scope: 10-bit, 2-4 GS/s	M9210A	54
Quad Downconverter (PXIe)	M9362A-D01	79
RF Multiplexer (PXI RF High Density RF Multiplexer: 3 GHz, Dual 1x16, 50 Ω)	M9149A	39
RF Synthesizer (PXI)	N2099A	27
Software (Command Expert)	E2300	111
Software (Signal Studio)	Signal Studio	91
Software (SystemVue)	W1461BP	74, 90
Software (X-Series Measurement Applications for Modular Instruments)	X-Series	72
Software (Waveform Creator)	M9099	89
Software (89600 VSA)	89601B	73
Source (PXIe CW Source)	M9380A	93
Switch (PXI Hybrid Dual SPDT Coaxial Switch, DC to 26.5 GHz)	M9155C	41
Switch (PXI Hybrid Dual Transfer Switch, DC to 26.5 GHz)	M9156C	41
Switch (PXI Hybrid Single SP6T Switch, DC to 26.5 GHz)	M9157C	41
Switch (PXI Hybrid Dual SPDT Coaxial Switch, DC to 40 GHz)	M9155CH40	42
Switch (PXI Hybrid Dual Transfer Switch, DC to 40 GHz)	M9156CH40	42
Switch (PXI Hybrid Single SP6T Switch, DC to 40 GHz)	M9157CH40	42
Switch (PXI Matrix Switch: 4x34, 2-wire, 100 Vdc/2 A, EM Relays)	M9120A	38
Switch (PXI Matrix Switch: 4x64, 2-wire, 100 Vdc/.5A, Reed Relays)	M9121A	38
Switch (PXI Matrix Switch: 8x32, 1-wire, 100 Vdc/2A, EM Relays)	M9122A	38
Switch (PXI RF Matrix Switch: 300 MHz, 8x12, 50 Ω)	M9128A	39
Switch (PXI SPDT Switch: 26-ch, 100 Vdc/2 A, EM Relays)	M9130A	40
Switch (PXI SPDT Switch: 64-ch, 100 Vdc/2 A, Reed Relays)	M9131A	40
Switch (PXI SPST Switch: 100-ch, 10 Vdc/1 A, Reed Relays)	M9133A	40
Switch (PXI SPST Switch: 50-ch, 100 Vdc/1 A, Reed Relays)	M9132A	40
System Interface x8 (PCIe® cable interface)	M9021A	20
VI Source (PXI Isolated Single Channel Voltage/Current Source, 100 V)	M9186A	60
Vector Signal Analyzer (PXI Dual Channel)	Dual Channel	76
Vector Signal Analyzer (PXI Vector Signal Analyzer: 50 MHz to 26.5 GHz)	M9392A	77
Vector Signal Analyzer (PXI Wideband MIMO)	MIMO System	78
Vector Signal Analyzer (PXIe)	M9391A	75
Vector Signal Generator (PXIe)	M9381A	92

The Modular Tangram

The four-sided geometric symbol that appears in this document is called a tangram. The goal of this seven-piece puzzle is to create identifiable shapes—from simple to complex. As with a tangram, the possibilities may seem infinite as you begin to create a new test system. With a set of clearly defined elements—hardware, software—Agilent can help you create the system you need, from simple to complex.

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