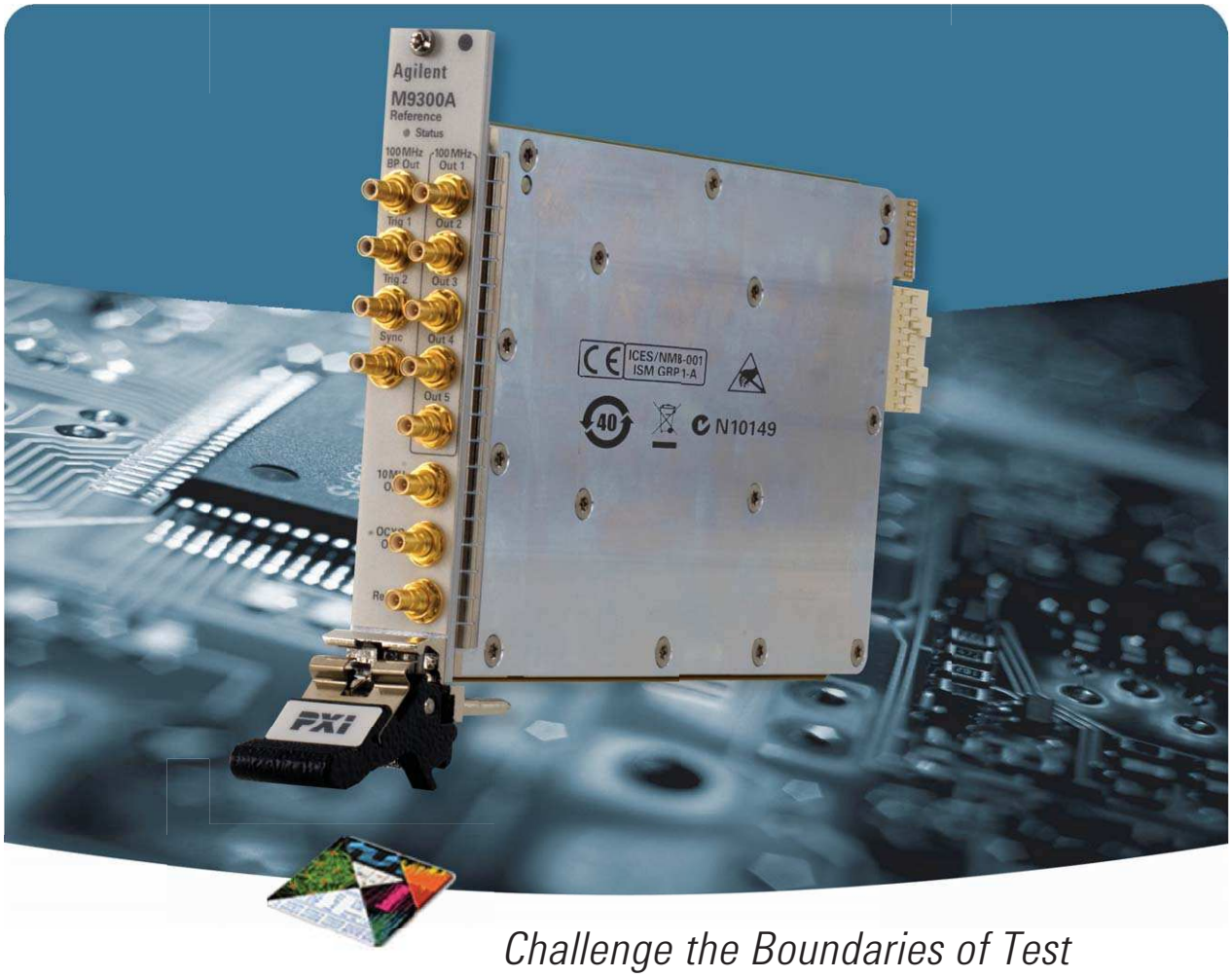
Agilent M9300A PXIe Frequency Reference

Data Sheet



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Agilent Modular Products

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OVERVIEW

Product Description

The M9300A PXIe frequency reference is a PXIe compatible compact modular instrument that can be used with the Agilent M9301A synthesizer, M9310A source output and M9311A modulator to create the world's fastest vector signal generator, the M9381A.

It can also be used with the M9301A and M9310A to create a CW source, the M9380A or as the 10 MHz or 100 MHz reference with other PXI solutions.

Instrument control is provided through a soft front panel and programmatic interfaces tuned to your application development environment of choice.

Product Features

- Locks to another reference with a value from 1 to 110 MHz.
- Five 100 MHz outputs
- One 10 MHz output
- Internal 10 MHz OCXO timebase output

Uncompromising values

- Reduces development time and simplifies integration into existing test environments with multiple drivers and programmatic interfaces.
- Reduces startup time with Agilent IO libraries easy con figuration, one-step software install, and soft front panel.
- Fast repair turn-around time with Calibrated Core Exchange strategy.

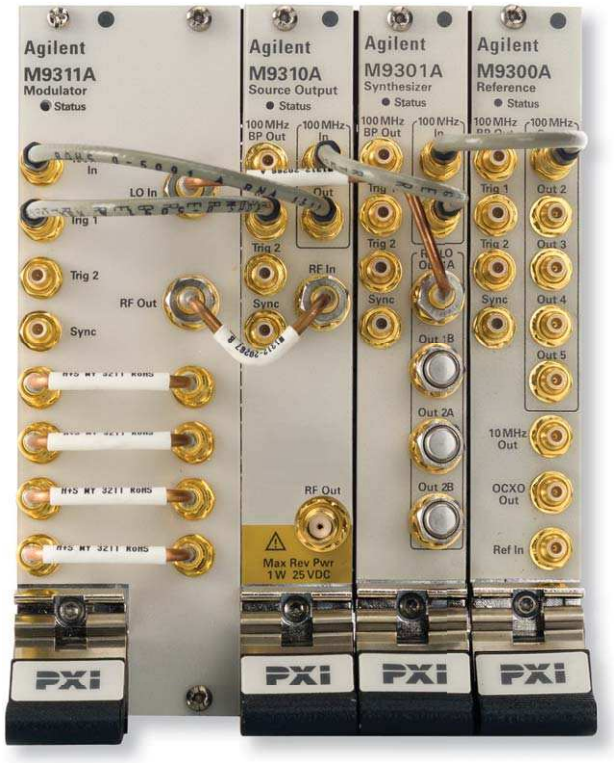


Figure 1. M9300A PXIe frequency reference as part of M9381A PXIe (with option 300) vector signal generator.

EASY SETUP

Software platform

IO Libraries

Agilent IO Libraries Suite offers fast and easy connection to instruments and the newest version extends that capability to include modular instruments.

The Agilent IO Libraries Suite automatically detects instruments connected to the PC and configures the interface. Included with the IO Libraries is the Agilent Connection Expert (ACE). With ACE, the PXI resource manager will discover and display the chassis and all the PXI, PXIe, and PCIe modules in your system, whether Agilent or other vendor's. From ACE you can find the right driver, view information about the installed software or launch the module's soft front panel. Agilent ensures interoperability in PXI systems making it truly an open standard.

Drivers

Agilent provides instrument drivers that work with your choice of software that saves time and preserves software and hardware investments. The M9300A comes with IVI-COM, IVI-C, LabView and MATLAB software drivers. Software can be developed using VisualStudio® (VB. NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, and MATLAB.

Drivers

The M9300A features a one step driver installation that installs the module driver, example programs and documentation. This saves time during the initial installation and start up and makes it easier to manage the software components.

Included are application code examples for VisualStudio® (VB.NET, C#, C/C++), VEE, LabWindows/CVI, LabVIEW and MATLAB which provide set up and basic data acquisition functionality. The examples can be easily modified to quickly integrate the module into your measurement system.

EASY TEST

Hardware platform

The M9300A is PXIe compliant, designed to benefit from fast data interfaces and integrate with other test and automation modules in cPCI (J1), PXI-1, or PXIe hybrid chassis slots. The PXI format offers high performance in a small, rugged package. It is an ideal deployment platform for many automated test systems. A wide array of complementary PXI products are currently available. Products include multimeters, waveform generators, local oscillators, digitizers and switch multiplexers.

Software application interfaces

The Agilent soft front panels provide easy to use instrument communications. The M9300A's graphical user interface guides developers through module setup. Users can quickly configure the instrument parameters. More sophisticated functions are available through the instrument's numerous programmatic interfaces. The modular products support interfaces for VisualStudio, MATLAB, and LabVIEW. The interfaces are implemented using the IVI standard supporting both IVI-COM and IVI-C.

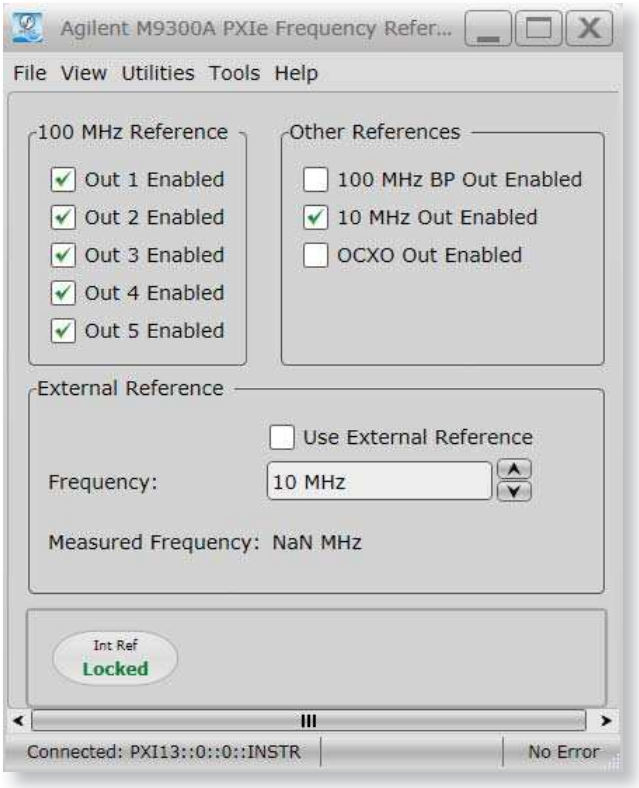


Figure 2. Agilent M9300A PXIe frequency reference soft front panel .

EASY MAINTENANCE

Calibration

The modular products are factory calibrated and shipped with an ISO-9002, NIST-traceable calibration certificate. A one year calibration cycle is recommended.

The M9300A is supported by the N7800A Calibration Software to perform calibrations that test all product specifications and is compliant with ISO 17025:2005, ANSI/NCSL Z540.3-2006, and Measurement Uncertainty per ISO Guide to Expression of Measurement Uncertainty, 1995.

The Calibration Status utility helps ensure your M9300A is calibrated by managing the calibration interval and providing messages regarding instrument and module calibration status.

Repair

Replacement Core Exchange Assembly allows for fast and easy module repairs while retaining the module's original serial number.

Express Warranty

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.

Self Test

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

Block Diagram

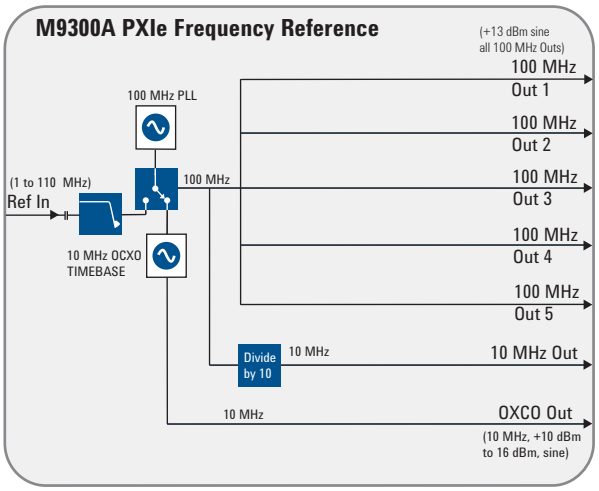


Figure 3. M9300A PXIe frequency reference block diagram.

Definitions for Specifications

Specifications describe the warranted performance of calibrated instruments that have been stored for a minimum of 2 hours within the operating temperature range of 0 to 55 °C, *(and individual module temperature of ≤ 75 °C)*, unless otherwise stated. Data represented in this document are specifications unless otherwise noted.

Specifications are warranted under the following conditions:

- 30 minute warm-up time
- Calibration cycle maintained

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 are italicized.*

- ***Typical*** *describes characteristic performance, which 80% of instruments will meet when operated over a 20 to 30 °C temperature range.*
- ***Nominal*** *describes representative performance that is useful in the application of the product when operated over a 20 to 30 °C temperature range.*

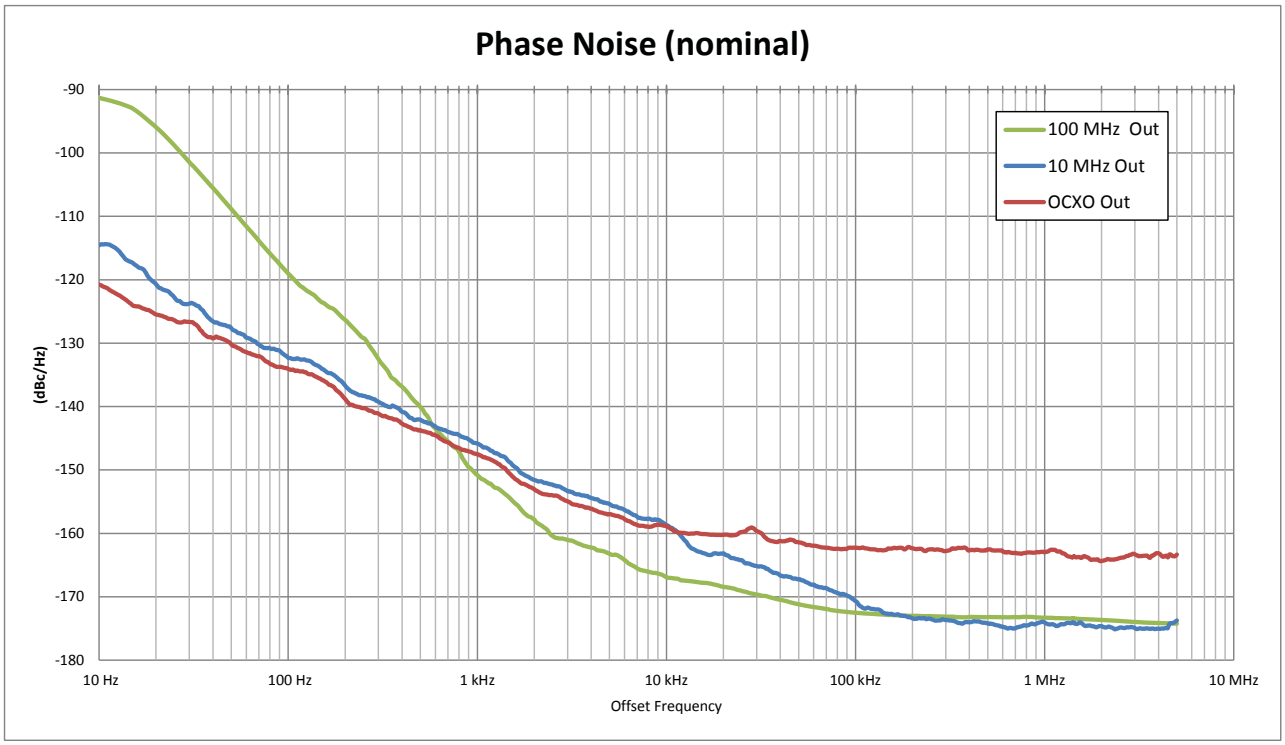
Note: All graphs contain measured data from several units at room temperature unless otherwise noted.

Recommended Best Practices in Use

- Use slot blockers and EMC filler panels in empty module slots to ensure proper operating temperatures.
- Agilent chassis and slot blockers optimize module temperature performance and reliability of test.
- At ambient temperatures above 45 °C, chassis fan should be set to high.

TECHNICAL SPECIFICATIONS AND CHARACTERISTICS

Reference Outputs	
100 MHz Out (Out 1 through Out 5)	
Amplitude	≥ 10 dBm *13 dBm, typical*
Connectors	5 SMB snap-on
Impedance	*50 Ω, nominal*
10 MHz Out	
Amplitude	*9.5 dBm, nominal*
Connectors	1 SMB snap-on
Impedance	*50 Ω, nominal*
OCXO Out	
Amplitude	*11.5 dBm, nominal*
Connectors	1 SMB snap-on
Impedance	*50 Ω, nominal*



TECHNICAL SPECIFICATIONS AND CHARACTERISTICS

Frequency Accuracy
Same as accuracy of internal time base or external reference input

Internal Timebase	
Accuracy	± aging rate ± temperature effects ± gravitational sensitivity
Frequency Stability - Aging rate	
Daily	*< ± .5 ppb/day, after 72 hour warm-up*
Yearly	*< ± .10 ppm/year, after 72 hours warm-up*
Total 10 years	*< ± 0.6 ppm/10yrs, after 72 hours warm-up*
Frequency Stability - Temperature effects	
20 to 30 °C	*< ± 10 ppb at +20 to +30 °C (referenced to 25 °C)*
Full temperature range	*< ± 50 ppb -10 to +70 °C (referenced to 25 °C)*
Frequency Stability - Warm up	
5 minutes over +20 to +30 °C, with respect to 1 hour	*< ± 0.1 ppm*
15 minutes over +20 to +30 °C, with respect to 1 hour	*< ± 0.01 ppm*
Frequency Stability - Gravitational sensitivity	
In any of the 3 orthogonal axis	*< 5 ppb/g*

External Reference Input	
Frequency	1 MHz to 110 MHz, sine wave
Lock range	*± 1 ppm, nominal*
Amplitude	*0 to 10 dBm, nominal*
Connector	1 SMB snap-on
Impedance	*50 Ω, nominal*

TECHNICAL SPECIFICATIONS AND CHARACTERISTICS

Environmental and physical specifications				
Temperature	Operating Non-Operating (Storage)		0 to 55 °C -40 to +70 °C	
Humidity [1]			Type tested at 95%, +40 °C (non-condensing)	
Altitude			Up to 15,000 feet (4,572 meters)	
EMC			Complies with European EMC Directive 2004/108/EC • IEC/EN 61326-2-1 • CISPR Pub 11 Group 1, class A • AS/NZS CISPR 11 • ICES/NMB-001 This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB-001 du Canada.	
Warm-up time			30 minutes	
Size			1 PXIe slot	
Dimensions		**Length**	**Width**	**Height**
		210 mm	22 mm	130 mm
Weight			0.551 kg (1.215 lbs)	
Power drawn from chassis			≤ 18 W	

System requirements		
Topic	Windows® 7 and Vista Requirements	Windows® XP Requirements
Operating systems	Windows 7 (32-bit and 64-bit) Windows Vista, SP1 and SP2 (32-bit and 64-bit)	Windows XP, Service Pack 3
Processor speed	1 GHz 32-bit (x86), 1 GHz 64-bit (x64) (no support for Itanium 64)	600 MHz or higher required 800 MHz recommended
Available memory	4 GB minimum 8 GB or greater recommended	3 GB minimum
Available disk space [2]	1.5 GB available hard disk space, includes: • 1 GB available for Microsoft .NET Framework 3.5 SP1 [28] • 100 MB for Agilent IO Libraries Suite [3]	1.5 GB available hard disk space, includes: • 1 GB available for Microsoft .NET Framework 3.5 SP1 [28] • 100 MB for Agilent IO Libraries Suite
Video	Support for DirectX 9 graphics with 128 MB graphics memory recommended (Super VGA graphics is supported)	Super VGA (800 x 600) 256 colors or more
Browser	Microsoft® Internet Explorer 7.0 or greater	Microsoft® Internet Explorer 6.0 or greater

1. Samples of this product have been type tested in accordance with the Agilent Environmental Test Manual and verified to be robust against the environmental stresses of Storage, Transportation and End-use; those stresses include but are not limited to temperature, humidity, shock, vibration, altitude and power line conditions. Test Methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3

2. Because of the installation procedure, less memory may be required for operation than is required for installation.

3. NET framework runtime components are installed by default with Windows® 7 and Windows® Vista. Therefore, you may not need this amount of available disk space.

CONFIGURATION AND ORDERING INFORMATION

Ordering Information

Model	Description
M9300A	PXIe Frequency Reference Includes: Software, example programs and product information on CD Return to Agilent Warranty—3 Years

Software Information

Supported operating systems	Microsoft Windows® XP (32-bit) Microsoft Windows® 7 (32/64-bit) Windows Vista®, SP1 and SP2 (32-bit and 64-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW, MATLAB
Supported application development environments (ADE)	VisualStudio® (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, MATLAB
Agilent IO Libraries (version 16.2 or newer)	Includes: VISA Libraries, Agilent Connection Expert, IO Monitor

Accessories

Model	Description
Y1212A	Slot Blocker Kit: 5 modules
Y1213A	PXI EMC Filler Panel Kit: 5 slots
Y1214A	Air Inlet Kit: M9018A 18-slot chassis
Y1215A	Rack Mount Kit: M9018A 18-slot chassis

Related Products

Model	Description
M9381A	PXIe Vector Signal Generator
M9380A	PXIe CW Source
M9018A	18-slot PXIe Chassis
M9036A	PXIe Embedded Controller [1]

Advantage Services: Calibration and Warranty

Agilent Advantage Services is committed to your success throughout your equipment's lifetime

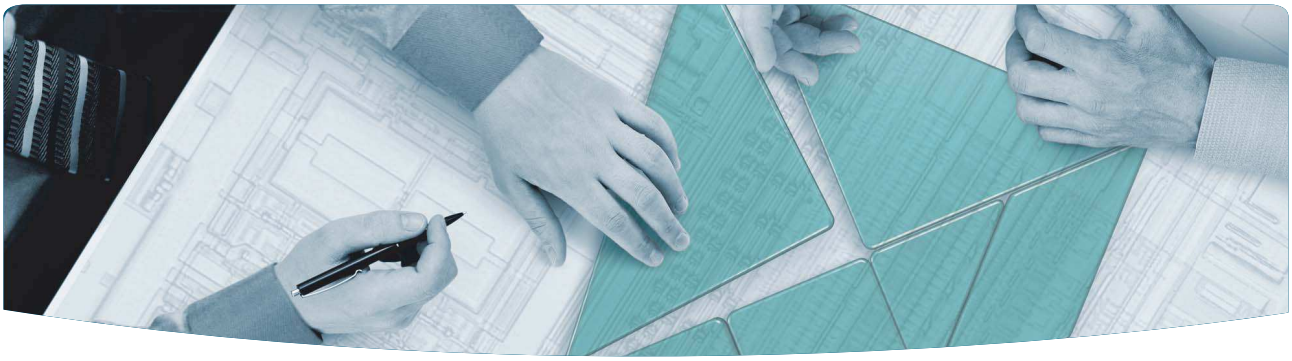
R-51B-001-5C	Return to Agilent Warranty - 5 years

Express Warranty

R1280X	Express Warranty - 5 day turnaround [2]

[1] *PC desktop and PC laptop controllers are also availalble. Please see the M9381A PXIe VSG Configuration Guide (literature no. 5991-0897EN) for more information.*

[2] *Express warranty is available in the US, Japan, China and many EU countries.*



The Modular Tangram

The four-sided geometric symbol that appears throughout this document is called a tangram. This seven-piece puzzle originated in China a few centuries ago. The goal is to create shapes—from simple to complex—that form an identifiable silhouette. 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—architecture, hardware, software—Agilent can help you create the system you need, from simple to complex.

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