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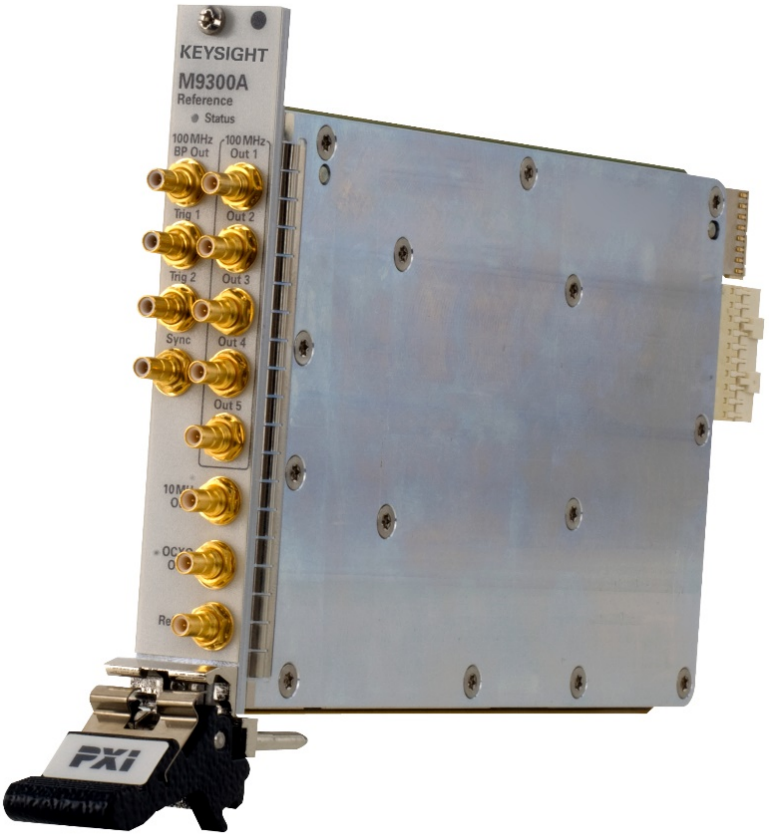
M9300A PXIe Frequency Reference

Overview

Product description

The Keysight Technologies, Inc. M9300A PXIe frequency reference is a PXIe modular instrument that can be used as a 10 MHz or 100 MHz reference in various solutions. A single M9300A can be shared with up to four PXI VSAs, VSGs or VXTs in one chassis, as shown in Figure 1, to form a multi-channel solution.

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 Keysight IO libraries easy configuration, one-step software install, and soft front panel.
- Fast repair turnaround time with Calibrated Core Exchange strategy.



Figure 1. M9300A PXIe Frequency Reference inserted in slot 10, above, can be shared with four M9393A PXIe Vector Signal Analyzers in one chassis.

Technical Specifications and Characteristics

Block diagram

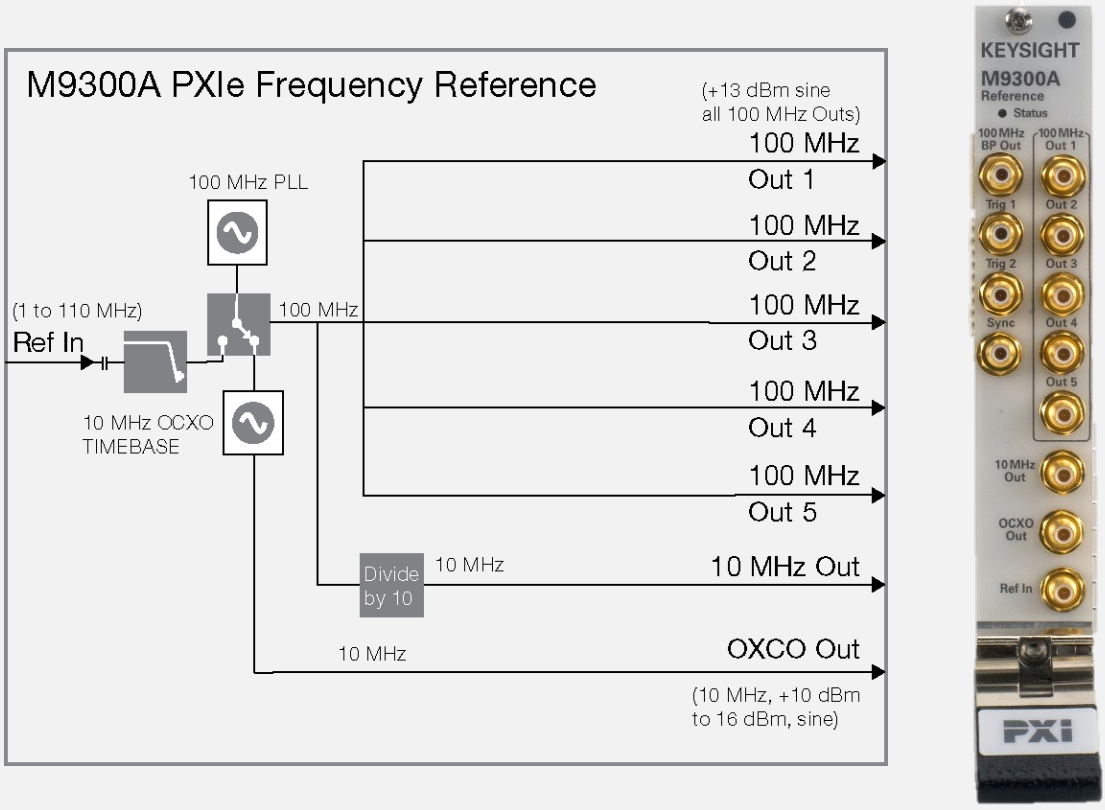


Figure 2. M9300A PXIe frequency reference block diagram.

Definitions for specifications

Temperatures referred to in this document are defined as follows:

- Operating ambient temperature = 0 to 55 °C and individual module temperature of ≤ 75 °C
- Room temperature = 20 to 30 °C and individual module temperature of ≤ 55 °C

Specifications describe the warranted performance of calibrated instruments. Data represented in this document are specifications unless otherwise noted.

Specifications are warranted under the following conditions:

- Calibrated instruments that have been stored for a minimum of 2 hours within the operating ambient temperature range
- 30 minute warm-up time
- Calibration cycle maintained

Characteristics describe product performance that is useful in the application of the product. 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 at room temperature.
- **Nominal** describes representative performance that is useful in the application of the product when operated at room temperature.

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.
- Keysight chassis and slot blockers optimize module temperature performance and reliability of test.
- At operating ambient temperatures above 45 °C, chassis fan should be set to high.

Reference outputs	
100 MHz Out (Out 1 through Out 5)	
Amplitude	≥ 10 dBm, *13 dBm, typical*
Connectors	SMB (M) 5 ports
Impedance	*50 Ω, nominal*
10 MHz Out	
Amplitude	*9.5 dBm, nominal*
Connectors	SMB (M) 1 port
Impedance	*50 Ω, nominal*
OCXO Out	
Amplitude	*11.5 dBm, nominal*
Connectors	SMB (M) 1 port
Impedance	*50 Ω, nominal*

Phase noise	Offset	100 MHz/10 MHz/OCXO Out, dBc/Hz, nominal
Standard	10 Hz	–97/–117/–124
	100 Hz	–127/–147/–140
	1 kHz	–157/–165/–146
	10 kHz	–169/–173/–147
	100 kHz	–173/–181/–161
	1 MHz	–174/–182/–162
Option S01	10 Hz	–91/–111/–124
	100 Hz	–114/–135/–140
	1 kHz	–139/–158/–146
	10 kHz	–160/–172/–147
	100 kHz	–173/–177/–161
	1 MHz	–174/–178/–162

Frequency accuracy	
Same as accuracy of internal time base or external reference input	
Internal timebase	
Accuracy	± (time since last adjustment x aging rate)
	± temperature effects
	± calibration accuracy
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
Achievable initial calibration accuracy (at time of shipment)	
	± 5 x 10^{-8}
Frequency stability - Temperature effects	
20 to 30 °C	< ± 10 ppb
Full temperature range	< ± 50 ppb
External reference input	
Frequency	1 MHz to 110 MHz, sine wave
Lock range	*± 1 ppm, nominal*
Amplitude	*0 to 10 dBm, nominal*
Connector	SMB (M) 1 port
Impedance	*50 Ω, nominal*

Environmental and physical specifications		
Temperature	Operating	0 to 55 °C
	Non-Operating (Storage)	–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 210 mm, Width 22 mm, Height 130 mm
Weight		0.551 kg (1.215 lbs)
Power drawn from chassis		≤ 18 W
System requirements		
Operating systems	Windows 7 (32-bit and 64-bit)	
Processor speed	1 GHz 32-bit (x86), 1 GHz 64-bit (x64) (no support for Itanium 64)	
Available memory	4 GB minimum	
	8 GB or greater recommended	
Available disk space [2]	1.5 GB available hard disk space, includes:	
	• 1 GB available for Microsoft .NET Framework 3.5 SP1	
	• 100 MB for Keysight IO Libraries Suite	
Video	Support for DirectX 9 graphics with 128 MB graphics memory recommended (Super VGA graphics is supported)	
Browser	Microsoft Internet Explorer 7.0 or greater	

1. Samples of this product have been type tested in accordance with the Keysight 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. NET framework runtime components are installed by default with Windows 7. Therefore, you may not need this amount of available disk space.

Software

Instrument connection software			
	Keysight IO Library	The Suite offers a single entry point for connection to the most common instruments including AXIe, PXI, GPIB, USB, Ethernet/LAN, RS-232, and VXI test instruments from Keysight and other vendors. It automatically discovers interfaces, chassis, and instruments. The graphical user interface allows you to search for, verify and update IVI instrument and soft front panel drivers for modular and traditional instruments. The Suite safely installs in side-by-side mode with NI I/O software.	Free software download at www.keysight.com/find/iosuite
Module setup and usage			
	Keysight Soft Front Panel	The PXI module includes a Soft Front Panel (SFP), a software-based Graphical User Interface (GUI) which enables the instrument's capabilities from your PC.	Included on CD-ROM shipped with module or online
Programming			
Driver		**Development environments**	
IVI-COM		Visual Studio	Included on CD-ROM shipped with module or online
IVI-C		(VB.NET, C#, C/C++)	
LabVIEW		VEE	
MATLAB		LabVIEW, LabWindows/CVI, MATLAB	
Programming assistance			
	Command Expert	Assists in finding the right instrument commands and setting correct parameters. A simple interface includes documentation, examples, syntax checking, command execution and debug tools to build sequences for integration in Excel, MATLAB, Visual Studio, LabVIEW, VEE, SystemVue.	Free software download at www.keysight.com/find/commandexpert

Calibration and traceability		
Factory Calibration	The M9300A PXIe Frequency Reference ships factory calibrated with an ISO-9002, NIST-traceable calibration certificate.	Included in base configuration
Calibration Cycle	A one year calibration cycle is recommended	
Calibration Sites	At Keysight's Worldwide Service Centers	More information visit www.keysight.com/find/infoline
	On-site by Keysight	
	By self-maintainers	
R1282A Annual Calibration Service	Keysight Calibration	Additional service, not included in the warranty
	Keysight Calibration + Uncertainties	
	Keysight Calibration + Uncertainties + Guardbanding	
	Standards Compliance	
	ANSI Z540.3-2006, ISO 17025:2005, ANSI Z540-1-1994, ISO 9001:2008	
N7800A Calibration and Adjustment Software	The M9300A is supported by Keysight's Calibration and Adjustment Software. This is the same software used at Keysight Service Centers to automate calibration. The software offers compliance tests for ISO 17025:2005, ANSI/NCSL Z540.3-2006, and measurement uncertainty per ISO Guide to Expression of Measurement Uncertainty.	Licensed software.For more information, visit www.keysight.com/find/calibrationsoftware
Keysight Calibration Status Utility	The Keysight Calibration Status utility helps ensure your M9300A is calibrated by managing the calibration interval and providing messages regarding instrument and module calibration status.	Included in base configuration

Support

Support		
Core Exchange Program	Keysight'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.	For qualified self-maintainers in US only
Self-Test Utility	A self-test utility runs a set of internal tests which verifies the health of the modules and reports their status	Included in base configuration

Configuration and Ordering Information

Ordering Information

Model	Description
M9300A	PXIe Frequency Reference
	Includes: Software, example programs and product information on CD

Software Information

	Description
Supported operating systems	Microsoft Windows 7 (32/64-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
Keysight IO Libraries(version 16.3 or newer)	Includes: VISA Libraries, Keysight 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
M9393A	PXIe Performance Vector Signal Analyzer
M9391A	PXIe Vector Signal Analyzer
M9381A	PXIe Vector Signal Generator
M9380A	PXIe CW Source
M9420A	PXIe Vector Transceiver
M9018A	18-slot PXIe Chassis
M9037A	PXIe Embedded Controller
M9036A	PXIe Embedded Controller
M9393A	PXIe Performance Vector Signal Analyzer
M9391A	PXIe Vector Signal Analyzer
M9381A	PXIe Vector Signal Generator

Advantage services: Calibration	
Keysight Advantage Services is committed to your success throughout your equipment's lifetime	
N7800A	Calibration and Adjustment Software

Learn more at: www.keysight.com

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

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