Agilent M9302A
PXI Local Oscillator

3 GHz to 10 GHz

Data Sheet

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Agilent Technologies

OVERVIEW

Introduction

The Agilent Technologies M9302A PXI Local Oscillator (LO) is optimized for fast settling time to allow for fast frequency down conversion in Aerospace and Defense applications such as Radar and wideband signal capture and in wireless communications applications.

Product description

The M9302A is a two-slot 3U PXI VCO-based 3 GHz to 10 GHz LO. The fast switching time and low phase noise of this LO make it an ideal component of a microwave vector signal analyzer.

When integrated in the Agilent M9392A PXI Vector Signal Analyzer, and combined with the VSA software, the M9302A provides a complete signal analyzer solution enabling analysis of communications, radar and avionics signals to 26.5 GHz in a modular open-system standard.

Applications

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

Features

- Frequency range: 3 GHz to 10 GHz
- 0.1 Hz tuning resolution
- 1 ms settling time
- Phase Noise: -115 dBc/Hz at 10 GHz, 10 kHz offset
- Chassis slot compatibility: cPCI(J1), PXI-1, PXIe Hybrid
- PXI form factor

Customer values

- Tuning resolution provides greater frequency accuracy
- 1 ms settling time speeds up your test time
- Multiple programmatic interfaces enable easy integration into existing test environments and reduced development time
- Included drivers, soft front panels and programming examples in VisualStudio® (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, and MATLAB
- Conforms to Modular Open Systems Approach (MOSA)

EASY SETUP ... TEST ... AND MAINTENANCE

Hardware platform

Compliance

The M9302A is PXI compliant, using either a cPCI(J1), PXI-1, or PXIe hybrid slot. Designed to benefit from fast data interfaces, the products can be integrated 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 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.

NEW support for PXI -- The Agilent IO Libraries Suite helps you display ALL of the modules in your system, whether they are PXI, PXIe, or PCIe. From here you can view information about the installed software or start the module's soft front panel. Launch the module's soft front panel directly from Agilent Connection Expert.

NEW easy way to find the right driver from Agilent Connection Expert.

Drivers

Agilent provides instrument drivers that work with your choice of software that saves time and preserves software and hardware investments. Agilent modular instruments come with IVI-COM, IVI-C, LabVIEW and MATLAB software drivers that work in the most popular T&M development environments including, VisualStudio (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, and MATLAB.

With the multiple drivers included and minimum software adjustments, any Agilent PXI local oscillator can be swapped out, replaced, or upgraded with the latest PXI local oscillator.

Easy software integration

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

Software applications

Agilent soft front panels provide easy to use instrument communications for diagnostics and basic hardware setup. The M9302A'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 M9302A supports interfaces for Visual Studio, MATLAB, and LabVIEW. The interfaces are implemented using the IVI standard supporting both IVI-COM and IVI-C.

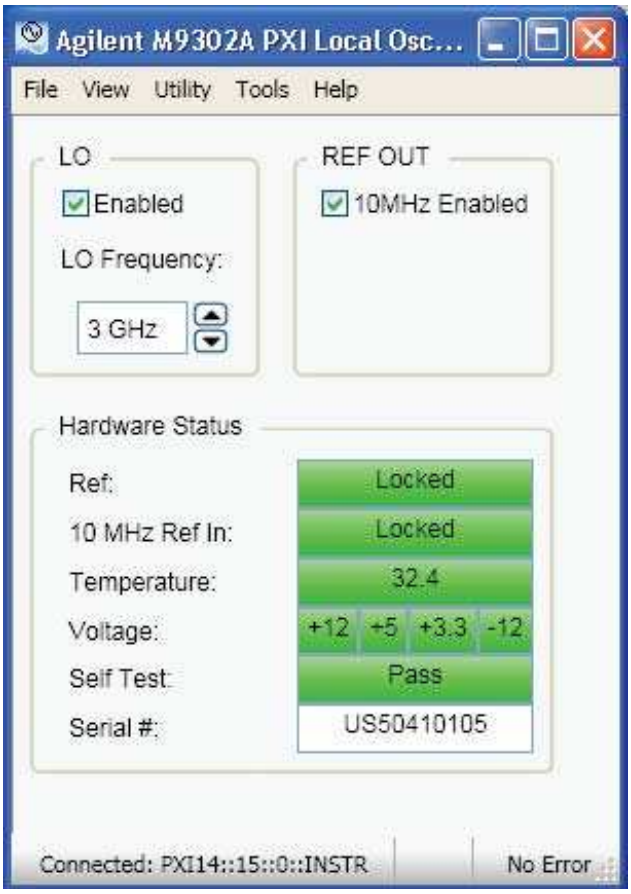


Figure 1. Agilent M9302A PXI Local Oscillator, software interface

Calibration intervals

The M9302A is factory calibrated and shipped with an ISO-9002, NIST-traceable calibration certificate. A one year calibration cycle is recommended.

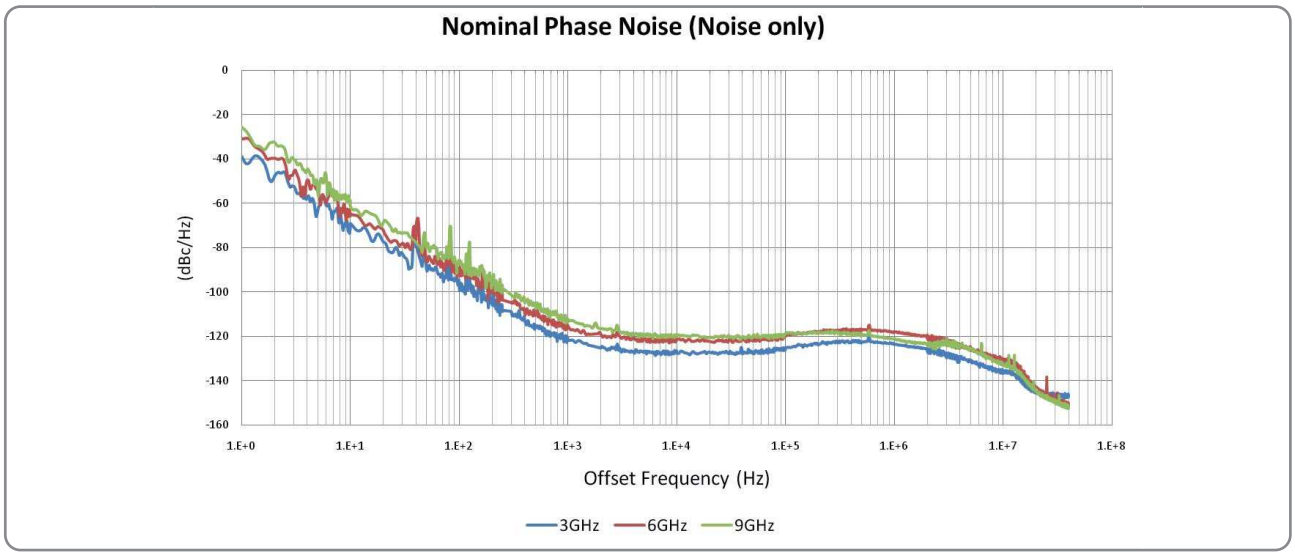
TECHNICAL SPECIFICATIONS AND CHARACTERISTICS

Output specifications

Frequency range		3 GHz to 10 GHz (under range to 2.75 GHz) [1]
Frequency step size resolution		0.1 Hz
Frequency switching speed (to within 0.1 ppm of final frequency or within 100 Hz, whichever is greater)		1 ms, 500 µs typical
Power		+16 dBm ± 2 dB
Impedance		50 Ω, nominal

Spectral purity

Harmonics	2.75 GHz to 6 GHz 6 GHz to 10 GHz	-20 dBc [2] -12 dBc [2]
Non-Harmonic spurious		-70 dBc, nominal
Phase noise		-115 dBc/Hz at 10 GHz, 10 kHz offset
Power line related spurious		-40 dBc min, nominal



Reference frequency specifications

Frequency output	REF OUT REF 1 OUT REF 2 OUT	10 MHz, nominal 100 MHz, nominal 100 MHz, nominal
Amplitude	REF OUT REF 1 OUT REF 2 OUT	0 dBm ±3 dB [1] 0 dBm ±3 dB [1] 0 dBm ±3 dB [1]
Aging (after 30 days of operation)		± 1.0 ppm/year
Frequency temperature stability		± 0.5 ppm (over 0 °C to 50 °C)
Impedance		50 Ω, nominal
REF IN	Frequency Lock frequency range Level range	10 MHz, nominal 10 MHz ±3 ppm 0 ±4 dBm

[1] All specifications and characteristics apply to the under range frequencies 2.75 to 3.0 GHz except as noted.
[2] At room temperature (25° C ± 5° C).

TECHNICAL SPECIFICATIONS AND CHARACTERISTICS, CONTINUED

Environmental and physical specifications

Temperature	Operating Non-Operating	0 °C to 55 °C -40 °C to +55 °C
Connectors	LO OUT 10 MHz REF IN 10 MHz REF OUT 100 MHz REF 1 OUT 100 MHz REF 2 OUT	SMA (f) SMB (f) SMB (f) SMB (f) SMB (f)
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		15 minutes, max

Power dissipation:				
+3.3 V	+5 V	+12 V	-12 V	Total power
0.5 A	0.5 A	0.75 A	0.1 A	15 W max

Dimensions	• 3U/2-slot PXI/CompactPCI standard • Chassis slot compatibility: cPCI(J1), PXI-1, PXIe Hybrid • Front panel complies with IEEE1101.10 certification and compliance
Weight	2 lb/ 1 kg

System requirements

Operating Systems	Windows® XP, Service Pack 3 or later (32-bit)	Windows® Vista, SP1 and SP2 (32-bit and 64-bit), Business, Ultimate, Enterprise, Home Basic, and Home Premium	Windows® 7 (32-bit and 64-bit) Starter, Home Basic, Home Premium, Professional, Ultimate, Enterprise
Processor speed	600 MHz or higher required 800 MHz recommended	1 GHz 32-bit (x86), 1 GHz 64-bit (x64), no support for Itanium 64	1 GHz 32-bit (x86), 1 GHz 64-bit (x64), no support for Itanium 64
Available Memory	256 MB minimum (1 GB or greater recommended)	1 GB minimum	1 GB minimum
Available Disk Space [1]	1.5 GB available hard disk space, includes: • 1 GB available for Microsoft .NET Framework 3.5 SP1 [2] • 100 MB for Agilent IO Libraries Suite	1.5 GB available hard disk space, includes: • 1 GB available for Microsoft .NET Framework 3.5 SP1 [2] • 100 MB for Agilent IO Libraries Suite	1.5 GB available hard disk space, includes: • 1 GB available for Microsoft .NET Framework 3.5 SP1 [2] • 100 MB for Agilent IO Libraries Suite
Video	Super VGA (800x600) 256 colors or more	Support for DirectX 9 graphics with 128 MB graphics memory recommended (Super VGA graphics is supported)	Support for DirectX 9 graphics with 128 MB graphics memory recommended (Super VGA graphics is supported)
Browser	Microsoft® Internet Explorer 6.0 or greater	Microsoft® Internet Explorer 7 or greater	Microsoft® Internet Explorer 7 or greater

[1] *Because of the installation procedure, less memory may be required for operation than is required for installation.*

[2] *NET Framework Runtime Components are installed by default with Windows Vista and Windows 7. Therefore, you may not need this amount of available disk space.*

CONFIGURATION

Hardware [1]

	Model	Description
☑	M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
☑	*Recommended configuration*	

[1] *For the M9302A to work properly, at least one PXI chassis and one PXI controller type must be available.*

Accessories

Software, example programs, and product information on CD

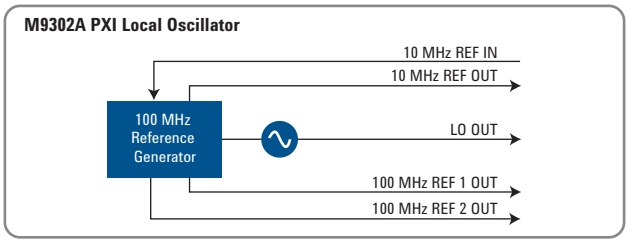


Figure 2. Simplifed block diagram of the M9302A PXI Local Oscillator.

Related products

Model	Description
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
M9018A	18-slot PXIe Chassis

Software

Model	Description
Supported operating systems	Microsoft Windows® XP (32-bit), 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® (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, MATLAB
Agilent IO Libraries	Includes: VISA Libraries, Agilent Connection Expert, IO Monitor

ORDERING

Model [1]	Description
M9302A	PXI Local Oscillator: 3 GHz to 10 GHz
Includes	Software and product information on CD

[1] *For the M9302A to work properly, at least one PXI chassis and one PXI controller type must be available.*

WARRANTY AND CALIBRATION

Advantage Services: Calibration and Warranty

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

Calibration	
R1282A	Annual calibration
M9302A-UK6	Commercial calibration certificate with test data [2]
Warranty	
	Standard warranty is 1 year
R-51B-001-3C	1 year return-to-Agilent warranty extended to 3 years
R-51B-001-5C	1 year return-to-Agilent warranty extended to 5 years

[2] *Options not available in all countries.*

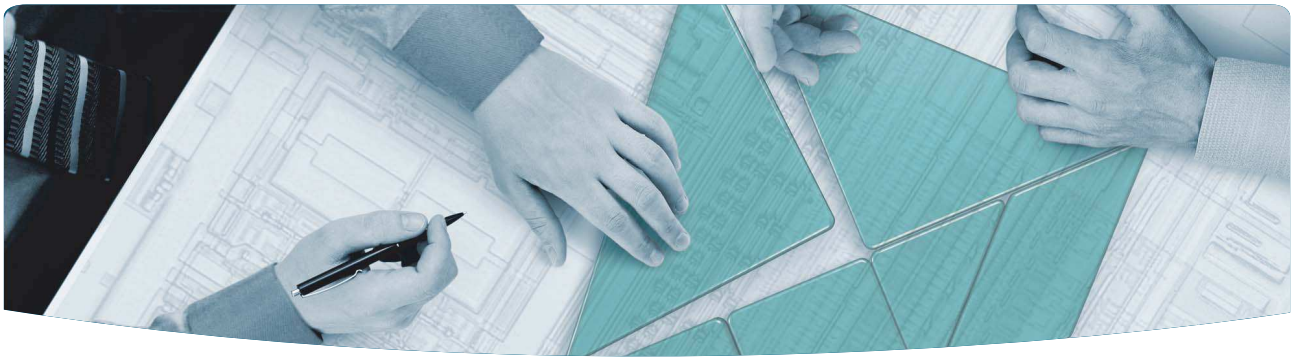
Definitions for specifications

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 °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.*

- ***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.



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.

DISCOVER the Alternatives ...
... Agilent **MODULAR** Products

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Product specifications and descriptions in this document subject to change without notice.

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