Keysight Technologies

M9383A PXIe Microwave Signal Generator

1 MHz to 14, 20, 31.8 or 44 GHz

Configuration Guide

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Overview

This configuration guide contains information to help you configure your M9383A PXIe Microwave Signal Generator and create solutions to meet your requirements.

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HARDWARE

A. Select Options for M9383A PXIe Microwave Signal Generator

Steps 1 through 4 determine the modules needed for the M9383A.

Step 1. Choose a frequency range

M9383A-F14	1 MHz to 14 GHz	Adds M9312A module (3 slots)
M9383A-F20	1 MHz to 20 GHz	Adds M9312A module (3 slots)
M9383A-F32	1 MHz to 31.8 GHz	Adds M9312A module (3 slots) and M9314A module (2 slots)
M9383A-F44	1 MHz to 44 GHz	Adds M9312A module (3 slots) and M9314A module (2 slots)

Step 2. Choose a synthesizer technology

Refer to the datasheet for the differences in phase noise, spurious signals and switching speed for these options.

M9383A-ST1	Synthesizer VCO, standard performance	Adds M9303A module (1 slot)
M9383A-ST2	Synthesizer VCO, enhanced performance	Adds M9303A module (1 slot)
M9383A-ST4	Synthesizer VCO + DDS, enhanced performance	Adds M9303A module (1 slot) and M9305A module (2 slots)

Step 3. Choose the maximum I/Q bandwidth

Bandwidths listed are available through the internal arbitrary waveform generator. Refer to the datasheet for wider bandwidths available through the external I/Q inputs.

M9383A-A01	No vector modulation and memory capability	Adds no additional modules
M9383A-B04	RF modulation bandwidth, 40 MHz, for use with option F14 or F20	Adds M9316A module (3 slots)
M9383A-B05	RF modulation bandwidth, 40 MHz, for use with option F32 or F44	Adds M9316A module (3 slots)
M9383A-B16	RF modulation bandwidth, 160 MHz, for use with option F14 or F20	Adds M9316A module (3 slots)
M9383A-B17	RF modulation bandwidth, 160 MHz, for use with option F32 or F44	Adds M9316A module (3 slots)
M9383A-C05	RF modulation bandwidth, 500 MHz, for use with option F14 or F20	Adds M9318A module (3 slots)
M9383A-C06	RF modulation bandwidth, 500 MHz, for use with option F32 or F44	Adds M9318A module (3 slots)
M9383A-C10	RF modulation bandwidth, 1 GHz, for use with option F14 or F20	Adds M9318A module (3 slots)
M9383A-C11	RF modulation bandwidth, 1 GHz, for use with option F32 or F44	Adds M9318A module (3 slots)

Step 4. Choose a frequency reference

An M9300A PXIe Frequency Reference is required to meet data sheet specifications. The M9300A provides five 100 MHz outputs. Select M9383A-000 if you already have an M9300A with an unused output.

M9383A-000	No frequency reference required	Adds no additional modules
M9383A-300	Frequency reference, 10 MHz and 100 MHz	Adds M9300A module (1 slot)

Step 5. Calculate M9383A PXI slot usage

To determine how many slots will be used by your selections in steps 1 through 4, add the slot widths shown in column 3.

Step 6. Choose memory size

Option A01 does not use I/Q waveforms so no selection is required for Option A01- no vector modulation and memory capability.

M9383A-M01	Memory, 32 MSa for I/Q waveforms (default)
M9383A-M05	Memory, 512 MSa for I/Q waveforms
M9383A-M10	Memory, 1024 MSa for I/Q waveforms

Step 7. Choose external I/Q inputs (optional)

Not available with Option A01

M9383A-016	I/Q inputs, differential external wide band

Step 8. Choose frequency switching speed (optional)

M9383A-UNQ	Fast switching, band limited
M9383A-UNZ	Fast switching, 250 µs

Step 9. Choose high power (optional)

M9383A-1EA	High output power

Step 10. Choose output step attenuator for increased power range (optional)

M9383A-1E1	Step attenuator

Step 11. Choose additional filters for lower harmonics (optional)

M9383A-1EH	Improved harmonics below 2 GHz

Step 12. Choose AM, FM and phase modulation (optional)

M9383A-UNT	Amplitude, frequency, phase modulation, and low frequency output

Step 13. Choose pulse modulation (optional)

M9383A-PM1	Pulse modulation, modified 30 ns
M9383A-PM2	Pulse modulation, <25 ns

Step 14. Choose pulse train generator (optional)

M9383A-320	Pulse train generator	Requires Option PM1 or PM2.

B. Select Controller (either embedded controller or via PC)

Step 1. Select embedded controller [1]

M9037A High-performance embedded controller, Gen 3
Intel i7-4700EQ quad-core processor, 2.4 GHz, 8 thread, 4 GB RAM

Select M9037A for the best performance if you have memory intensive applica-
tions, multiple applications running in parallel or if a lot of data is sent to the PC
from the PXIe chassis. Features removable SSD drive for security and x8 PCIe®
connector on front for connection to second chassis

Step 2. Upgrade from standard memory size (optional)	
M9037A-M08	Memory upgrade from 4 GB to 8 GB RAM (Win 7, 64-bit only)
M9037A-M16	Memory upgrade from 4 GB to 16 GB RAM (Win 7, 64-bit only)
Step 3. Select an operating system	
M9037A-WE3	Microsoft Windows Embedded Standard 7 (32-bit)
M9037A-WE6	Microsoft Windows Embedded Standard 7 (64-bit)

To use your desktop PC as a controller [2, 3]

M9048A	PCIe Host Adapter: Gen 2, x8
M9048B	PCIe Host Adapter: Single Port (x8), Gen 3
M9049A	PCIe Host Adapter: Dual Port (x16), Gen 3

Y1202A	PCIe cable

M9021A[4]	PCIe Cable Interface: Gen 2, x8
M9022A	PXIe System Module: Single Port (x8), Gen 3
M9023A	PXIe System Module: Dual Port (x16), Gen 3
M9024A	PXIe System Module with Connectivity Expansion: Dual Port (x16) Gen 3

1. The M9018B or M9019A 18-slot chassis includes empty space to the left of the 1st functional slot. The embedded controller occupies that empty space and the 1st functional slot.
2. For list of qualified external controllers, please see Test Computer List Technical Note literature no. 5990-7632EN.
3. For more detailed chassis configuration information including multi-chassis, see Interface Modules and Adapters for PXIe and AXIe Systems literature no. 5992-0377EN
4. The M9021A can only be used with the Keysight M9018B

C. Select a Chassis and Accessories

Step 1. Select a chassis

M9018B	18-slot PXIe chassis Gen 2
M9019A	18-slot PXIe chassis Gen 3

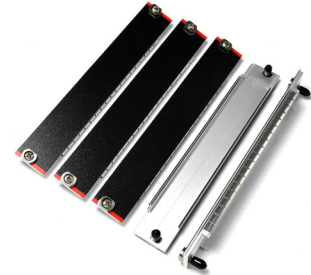**Step 2. Choose enough slot blocker kits and EMC filler panels to fill every open slot**
Recommended to achieve data sheet specifications

Y1212A	Slot blocker kit: 5 slots

Y1213A	PXI EMC filler panel kit: 5 slots Non-EMC filler panels are included with the M9018B or M9019A PXIe 18-slot chassis.

Step 3. Choose a rack mount kit (optional)

Y1215C Y1216B	Rack mount kit for M9018B or M9019A 18-slot PXIe chassis For more information on the rack mount kit, see the chassis data sheet, literature number **5992-1481EN.**

Step 4. Choose an air inlet kit[1] (optional)
Recommended for rack mounted systems with less than 1U space below chassis.

Y1214A	Air inlet kit: M9018B or M9019A 18-slot chassis

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1. Available in 1-slot, 2-slot or 3-slot options depending on the chassis configuration. For more information, please visit www.keysight.com/find/m9018a.

SOFTWARE

D. Select Software for M9383A PXIe Microwave Signal Generator

Step 1. Start with the M9383A base configuration.

The M9383A comes standard with the following software:

– Keysight IO Libraries Suite including Connection Expert[1]
– Soft front panel, drivers[2] for use with Matlab, LabVIEW, Visual Studio (including VB Net, C#, C/C++), Keysight VEE
– Sample waveforms and programming examples

Step 2. Download free Keysight Command Expert software[3] (optional)

FREE software that provides fast and easy instrument control for the PC. Command Expert combines instrument command sets, command sequences, documentation, syntax checking and command execution in one simple interface. Command Expert helps you to:

– Find instrument commands
– Access command documentation
– Verify command syntax
– Build instrument command sequences
– Execute instrument command sequences
– Integrate sequences in MATLAB, Visual Studio, Excel, LabVIEW, Keysight VEE or Keysight SystemVue PC application environment
– Generate code for command sequences in MATLAB, Visual C#, Visual Basic.NET and Visual C/C++
– Profile command execution time
– Debug command sequences using breakpoints and single stepping

Step 3. Add Signal Studio software[4] (optional)

Generate standard-compliant test signals validated by Keysight for receiver and component test.
Perpetual licenses available in fixed (option 9FP), transportable (option 9TP), 5 pack or 50 pack waveforms.
File export mode is currently supported, live connectivity has not yet been enabled for the M9383A.

– N7600B Signal Studio for W-CDMA/HSPA+
– N7601B Signal Studio for cdma2000®/1xEV-DO
– N7602B Signal Studio for GSM/EDGE/Evo
– N7608B Signal Studio for custom 5G modulation
– N7612B Signal Studio for TD-SCDMA/HSPA
– N7617B Signal Studio for WLAN 802.11
– N7624B Signal Studio for LTE/LTE-Advanced FDD
– N7625B Signal Studio for LTE/LTE-Advanced TDD
– N7630C Signal Studio for pre-5G
– N7650B Signal Studio Waveform Licenses

1. Both IO library (version 17.0 or newer) and Connection Expert software need to be installed on the PC controlling the PXI instruments.
   To download, visit www.keysight.com/find/iosuite.
2. Find latest versions of this software at www.keysight.com/find/m9383a.
3. To download or get more information on Command Expert, visit www.keysight.com/find/commandexpert.
4. For more information, see Signal Studio brochure, literature number 5989-6448EN or Signal Studio configuration assistant at
   http://rfmw.em.keysight.com/wireless/helpfiles/all-in-one_config_asst/ssconfig.html.

Step 4. Add Waveform Creator Application software[1] (optional)

M9099T	Waveform Creator Application
M9099T-LIC	Waveform Creator core with utility and multi-tone plug-ins (required)
M9099T-AYA	Digital modulation plug-in
M9099T-SVM	SystemVue plug-in (requires SystemVue v2013.08 or later)
M9099T-DFW	File based write unencrypted waveform license
M9099T-xxx-12M	Adds premium support for the above licenses for one year

Step 5. Add SystemVue software[2] (optional)

Provides baseband libraries and applications to validate design concepts in prototypes or manufactured units

W1461	SystemVue architect
Baseband Libraries and Applications	
W1918	LTE - Advanced
W1910	LTE
W1916	3G - GSM/EDGE/CDMA/cdma2000/W-CDMA/HSPA+
W1911	WiMAX 802.16e
W1917	WLAN 802.11a/b/g/n/ac
W1915	mmWave WPN 802.15c/802.11ad
W1919	Global navigation satellite system
W1914	DVB-x2
W1905	Radar
W1716	Digital Predistortion Builder

Step 6. Add MATLAB software[3] (optional)

Create arbitrary waveforms, customize measurement and data analysis routines, create your own instruments applications and test systems, automate measurements, signal generation, and report generation

N6171A-M01	MATLAB basic package
N6171A-M02	MATLAB standard package
N6171A-M03	MATLAB advanced package

1. For more information, see Waveform Creator Application Software Technical Overview, literature number 5991-3153EN.
2. For more information, see Wideband Digital Pre-Distortion with SystemVue and PXI Modular Instruments, literature number 5990-8883EN.
3. For more information on MATLAB software, visit www.keysight.com/find/n6171a.

SERVICES

E. Warranty, Calibration, Start-Up Assistance

	One day start-up assistance	Included in base configuration
	Return to Keysight warranty – 3 years	Included in base configuration
R-51B-001-5Z	Return to Keysight warranty – 5 years	
M9383A-UK6	Commercial calibration certificate with test data for M9383A	Calibration certificate with measurement results available only at time of purchase.
M9300A-UK6	Commercial calibration certificate with test data for M9300A	Calibration certificate with measurement results available only at time of purchase.
R-51B-001-3X	Express warranty – 5 day turnaround For 3 years	Available in the US, Japan, China and many EU countries
R-51B-001-5X	Express warranty –5 day turnaround For 5 years	Available in the US, Japan, China and many EU countries
N7800A	Calibration and adjustment software	

Global warranty

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

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

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

One day start-up assistance

A Keysight Technologies applications engineer will get you started quickly by helping you install the modules in a chassis, configure the controller, load software and start making measurements.

Calibration services

The modular products are factory calibrated and shipped with an ISO-9002, NIST-traceable calibration certificate. A one year calibration cycle is recommended. The M9383A PXIe microwave signal generator is supported by the Keysight 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.

N7800A calibration & adjustment software

The M9383A PXIe microwave signal generator is supported by Keysight's calibration and adjustment software. This is the same software used at Keysight's 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.

Product Information: www.keysight.com/find/contactus
Or call: 1 800 829-4444 US
Repair and Calibration: www.keysight.com/find/infoline
For all modular products: www.keysight.com/find/modular

Upgrading Your System

Your product can be easily upgraded after the initial purchase. Some PXIe microwave signal generator options are controlled by a licensing key and can be quickly installed by the user. To upgrade these options:

1. Contact your Keysight representative to place an order for an option upgrade.
2. You will receive your hardware entitlement certificate via email.
3. Redeem the certificate online by following the instructions provided to receive a license key file.
4. Install the license key file using the Keysight License Manager.
5. Begin using the new capability.

Some PXIe microwave signal generator options require additional hardware. Contact your Keysight representative for assistance with hardware upgrades.

Using a Non-Keysight Chassis

The M9383A and M9300A frequency reference can be successfully installed in a non-Keysight PXI chassis. Please use the following guidelines.

– Ensure that the chassis has enough consecutive PXIe or PXI-H slots to accommodate the M9383A and M9300A.
– Ensure that the chassis and controller supports peer-to-peer PXI Express I/O switch topology.
– Ensure that controller selected is compatible with chassis.

The Keysight M9018B or M9019A PXIe chassis is required for channel synchronization capability.

Please contact your Keysight representative for more detailed information. For technical assistance with non-Keysight equipment, please refer to the equipment manufacturer's website.

Related Literature

For more detailed product and specification information refer to the following literature and web pages:

Description	Pub Number
M9018B and M9019A PXIe 18 slot Chassis, Data Sheet	5992-1481EN
M9037A PXIe High Performance Embedded Controller, Data Sheet	5991-3661EN
Signal Studio Software, Brochure	5989-6448EN

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www.keysight.com/find/m9383a

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www.keysight.com/find/contactus

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