

# Keysight M9290A

## CXA-m PXIe X-Series Signal Analyzer

10 Hz to 3.0, 7.5, 13.6 or 26.5 GHz

### Configuration Guide



# Overview

This configuration guide contains information to help you configure your M9290A CXA-m PXIe signal analyzer to meet your requirements. Ordering optional capabilities at time of purchase provides the lowest overall cost.

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## Hardware

### A. Select options for M9290A CXA-m PXIe signal analyzer

<b>Step 1. Choose a frequency range (required option; frequency range not upgradeable)</b>			
<input type="radio"/>	M9290A-F03	Frequency range, 10 Hz to 3.0 GHz	
<input type="radio"/>	M9290A-F07	Frequency range, 10 Hz to 7.5 GHz	
<input type="radio"/>	M9290A-F13	Frequency range, 10 Hz to 13.6 GHz	
<input type="radio"/>	M9290A-F26	Frequency range, 10 Hz to 26.5 GHz	
<b>Step 2. Add a preamplifier</b>			
<b>Enhances sensitivity to detect low-level signals</b>			
<input type="radio"/>	M9290A-P03	Preamplifier, 100 kHz to 3 GHz	
<input type="radio"/>	M9290A-P07	Preamplifier, 100 kHz to 7.5 GHz	
<input type="radio"/>	M9290A-P13	Preamplifier, 100 kHz to 13.6 GHz	
<input type="radio"/>	M9290A-P26	Preamplifier, 100 kHz to 26.5 GHz	
<b>Step 3. Add precision amplitude accuracy</b>			
<input type="radio"/>	M9290A-PAA	Precision amplitude accuracy	Improves amplitude accuracy to $< \pm 0.6$ dB at full band
<b>Step 4. Choose frequency reference</b>			
<input checked="" type="radio"/>	Standard	Frequency reference	Aging rate: $\pm 1 \times 10^{-6}$ /year
<input type="radio"/>	M9290A-PFR	Precision frequency reference	Reduces frequency drift for more accurate measurements; Aging rate: $\pm 1 \times 10^{-7}$ /year
<b>Step 5. Choose an attenuator</b>			
<input checked="" type="radio"/>	Standard	Mechanical attenuator	10 dB steps, 0 to 70 dB
<input type="radio"/>	M9290A-FSA	Fine resolution step attenuator	Allows 2 dB steps for the full range of the attenuator, up to 7.5 GHz
<b>Step 6. Choose analysis bandwidth</b>			
<input checked="" type="radio"/>	Standard	10 MHz analysis bandwidth	
<input type="radio"/>	M9290A-B25	25 MHz analysis bandwidth	
<b>Step 7. Add optional features</b>			
<input type="radio"/>	M9290A-EDP	Enhanced display package	Includes spectrogram, trace zoom, and zone span
<input type="radio"/>	M9290A-EMC	Basic precompliance EMI	Perform EMI precompliance measurements with CISPR 16-1-1 detectors and bandwidths; measure at marker is also available
<b>Step 8. Choose localized getting started guides</b>			
<input type="radio"/>	M9290A-AB1	Getting started guide CXA-m Korean localization	
<input type="radio"/>	M9290A-AB2	Getting started guide CXA-m Chinese localization	
<input type="radio"/>	M9290A-ABD	Getting started guide CXA-m German localization	
<input type="radio"/>	M9290A-ABF	Getting started guide CXA-m French localization	
<input type="radio"/>	M9290A-ABJ	Getting started guide CXA-m Japanese localization	
<input type="radio"/>	M9290A-AKT	Getting started guide CXA-m Russian localization	

## B. Select controller (Either embedded controller or via PC) <sup>1</sup>

### Step 1. If selecting an embedded controller, select either M9036A or M9037A <sup>2</sup>

**M9036A-M04**

Mid-performance embedded controller  
Intel i5-520E dual-core, 2.4 GHz, 4 thread, 4 GB RAM

*Select the M9036A for mid-performance and lower cost*



**M9037A-M04**

High-performance embedded controller  
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 applications, 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 connector from front for connection to second chassis*



### Step 2. Upgrade from standard memory size (optional)

**For M9036A**

- M9036A-M08      Memory upgrade from 4 to 8 GB RAM

**For M9037A**

- M9037A-M08      Memory upgrade from 4 to 8 GB RAM  
 M9037A-M16      Memory upgrade from 4 to 16 GB RAM

### Step 3. Select an operating system

**For M9036A**

- M9036A-WE6      Microsoft Windows Embedded Standard 7 (64-bit)

**For M9037A**

- M9037A-WE6      Microsoft Windows Embedded Standard 7 (64-bit)

1. For list of qualified external controllers, please see Tested Computer List Technical Note literature no. 5990-7632EN. The M9021A is used for both PC controllers and can only be used in the M9018A chassis.  
 2. The M9018A 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.

## B. Select controller (Either embedded controller or via PC) <sup>1</sup> (Continued)

### To use your Laptop PC as a controller

- M9045B      PCIe ExpressCard adaptor



- Y1200B      PCIe cable



- M9021A      PCIe cable interface <sup>2</sup>: 1 slot



### To use your Desktop PC as a controller

- M9048A      PCIe desktop adaptor



- Y1202A      PCIe cable



- M9021A      PCIe cable interface <sup>1</sup>: 1 slot

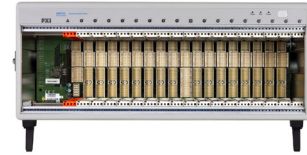


1. For list of qualified external controllers, please see Tested Computer List Technical Note literature no. 5990-7632EN. See physical connections diagram on page 7.
2. The M9021A is used for either PC control option and can only be used with the Keysight M9018A 18-slot chassis.

## C. Select a chassis and accessories

### Step 1. Select a chassis

- M9018A 18-slot PXIe chassis



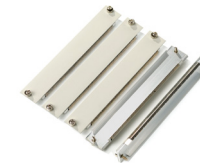
### Step 2. Choose enough slot blocker kits and EMC filler panels to fill every open slot

#### Recommended to achieve data sheet specifications

- Y1212A Slot blocker kit: 5 slots



- Y1213A PXI EMC filler panel kit: 5 slots



### Step 3. Choose a rack mount kit (optional)

- Y1215A Rack mount kit for M9018A 18-slot PXIe chassis



### Step 4. Choose an air inlet kit <sup>1</sup> (optional)

#### Recommended for rack mounted systems with less than 1U space below chassis

- Y1214A Air inlet kit: M9018A 18-slot chassis <sup>1</sup>



### Step 5. Choose a noise source connecting cable (optional)

#### Required to connect M9290A and Keysight 346 series or SNS series noise source, for noise figure measurement

- Y1282A

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](http://www.keysight.com/find/m9018a)

## Physical Connection Diagram for Controllers, Chassis and Accessories

### Embedded controller



M9036A or  
M9037A  
embedded  
controller



M9290A CXA-m PXIe signal analyzer  
placed inside the M9018A PXIe chassis

### External laptop PC control options



M9045B PCIe  
ExpressCard  
adaptor



Y1200B  
PCIe cable



M9021A  
PXIe cable  
interface



Y1202A  
PCIe cable



M9048A PCIe  
adapter



External desktop  
PC control  
options

## Software

### D. Select software for M9290A CXA-m PXIe signal analyzer

#### Step 1. Start with M9290A base configuration

- The M9290A comes standard with the following software:
  - Keysight IO Libraries Suite including Connection Expert <sup>1</sup>
  - Instrument software, soft front panel, drivers for use with MATLAB, LabVIEW, Visual Studio (including VB Net, C#, C/C++), Keysight VEE <sup>2</sup>
  - Sample programming examples

#### Step 2. Download free Keysight Command Expert software <sup>3</sup> (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 X-Series Measurement Applications (optional)

**The last two letters of the ordering numbers indicate the license type—FP stands for fixed perpetual, TP for transportable perpetual. Licenses support up to 4 CXA-m analyzers in one chassis.**

● Spectrum analyzer	Standard	Traditional spectrum analysis plus many new and enhanced functions; power measurements based on industry specifications
○ Analog demodulation	W9063A-2TP	One-button AM/FM/PM demodulation with metrics, and AF spectrum
	W9063A-3TP	Adds FM Stereo and RDS; requires 2TP
○ Phase noise	W9068A-2TP	One-button phase noise measurements in frequency domain (log plot) and time domain (spot frequency)
○ Noise figure	W9069A-1TP (requires preamplifier; requires Y1282A connecting cable)	One-button noise figure, gain, and related measurements; requires preamplifier to meet specifications; works with Keysight N400xA Series smart noise sources and 346 Series noise sources
	W9069A-2TP	Advanced NF measurement features including external LO control over LAN/USB, multi-stage converter tests with system LO, and manual mode to simulate the legacy NF meter; requires 1TP
○ SCPI command language compatibility	W9062A-2FP	Adds capability to emulate the R&S FSP/FSU/FSE spectrum analyzers
○ MATLAB software	N6171A	Extends capability to make custom measurements, analyze and visualize data, create arbitrary waveforms, control instruments and build test systems.

1. Both IO library (version 17 or newer) and Connection Expert software need to be installed on the PC controlling the equipment. To download, visit [www.keysight.com/find/iosuite](http://www.keysight.com/find/iosuite)
2. Find latest versions of this software at [www.keysight.com/find/m9290a](http://www.keysight.com/find/m9290a)
3. To download or get more information on Command Expert, visit [www.keysight.com/find/commandexpert](http://www.keysight.com/find/commandexpert)



## Services

### E. Select services: Warranty, calibration, start-up assistance

<input checked="" type="radio"/>	Standard	Return to Keysight warranty - 3 years	
<input type="radio"/>	R-51B-001-5Z	Return to Keysight warranty - 5 years	
<input type="radio"/>	M9290A-UK6	Commercial calibration certificate with test data	Calibration certificate only available at time of instrument purchase; only provides measurement results
<input type="radio"/>	R-50C-011-3	Calibration Assurance Plan, Return-to-Keysight, 3 years	Keysight tests your instrument against its original specifications and automatically makes adjustments if outside of specified parameters; pre- and post-adjustment measurement data reports also provided
<input type="radio"/>	PS-S20-01	Service: 1-day start-up assistance	Training on how to operate your instrument effectively
<input type="radio"/>	N7800A Calibration and adjustment software		

### Global warranty

Keysight Technologies 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

### Calibration services

The modular products are factory calibrated. A one year calibration cycle is recommended. The M9290A CXA-m PXIe signal analyzer 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 and adjustment software

The M9290A CXA-m PXIe signal analyzer 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](http://www.keysight.com/find/contactus)  
Or call: 1 800 829-4444 US

#### Repair and calibration:

[www.keysight.com/find/infoline](http://www.keysight.com/find/infoline)

#### Parts and accessories:

[www.parts.keysight.com](http://www.parts.keysight.com)

#### For all modular products:

[www.keysight.com/find/modular](http://www.keysight.com/find/modular)

## Upgrading your system

Your product can be easily upgraded after the initial purchase. Fast license-key upgrades for performance options that do not require additional hardware:

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 <sup>1,2</sup>.

Installation and testing information is available at:  
[www.keysight.com/find/cxa-m\\_upgrades](http://www.keysight.com/find/cxa-m_upgrades)

Description	Upgrade number
<input type="radio"/> Add preamplifier, 3 GHz	M9290AU-P03
<input type="radio"/> Add preamplifier, 7.5 GHz	M9290AU-P07
<input type="radio"/> Add preamplifier, 13.6 GHz	M9290AU-P13
<input type="radio"/> Add preamplifier, 26.5 GHz	M9290AU-P26
<input type="radio"/> Upgrade to the precision amplitude accuracy	M9290AU-PAA
<input type="radio"/> Upgrade to the precision frequency reference	M9290AU-PFR
<input type="radio"/> Add fine resolution step attenuator	M9290AU-FSA
<input type="radio"/> Increase analysis bandwidth from 10 to 25 MHz	M9290AU-B25
<input type="radio"/> Add basic EMI precompliance features	M9290AU-EMC
<input type="radio"/> Add enhanced display package	M9290AU-EDP
<input type="radio"/> Getting started guide CXA-m Korean localization	M9290AU-AB1
<input type="radio"/> Getting started guide CXA-m Chinese localization	M9290AU-AB2
<input type="radio"/> Getting started guide CXA-m German localization	M9290AU-ABD
<input type="radio"/> Getting started guide CXA-m French localization	M9290AU-ABF
<input type="radio"/> Getting started guide CXA-m Japanese localization	M9290AU-ABJ
<input type="radio"/> Getting started guide CXA-m Russia localization	M9290AU-AKT

## Using an M9290A in a non-Keysight chassis

The M9290A can be successfully installed in a non-Keysight PXI chassis. Please use the following guidelines.

- Ensure that the chassis has 4 consecutive PXIe or PXI-H slots which can be used by the M9290A.
- Ensure that the chassis and controller supports peer-to-peer PXI Express I/O switch topology.
- Ensure that controller selected is compatible with chassis.

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

1. At the time of manufacture, the hardware related to many of these options was fully adjusted and the option performance was verified to be within its warranted specifications. Within one year of the initial calibration date of the analyzer, this option is fully calibrated with no further adjustment or verification testing.
2. If this analyzer has been adjusted as part of a repair or calibration during its first year, or if the analyzer is more than one year old, additional adjustment and performance verification tests are required to ensure that some newly installed options are functioning properly. However, the completion of these tests does not guarantee that the analyzer meets all warranted specifications.

## PC requirements for M9290A control <sup>1</sup>

<b>Windows 7</b>	
Operating system	Windows 7 (64 bit)
Processor speed	Single Core with hyper threading, 1.86 GHz minimum
Available memory	4 GB minimum 8 GB recommended
Available disk space <sup>1</sup>	4 GB
Video	Support for DirectX 9 graphics with 128 MB graphics recommended (SuperVGA supported)
Browser	Microsoft Internet Explorer 7.0 or greater

## Related literature

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

- *M9018A PXIe 18 slot Chassis Data Sheet* (literature no. 5990-6583EN)
- *M9037A PXIe High Performance Embedded Controller Data Sheet* (literature no. 5991-3661EN)
- *M9036A PXIe Embedded Controller Data Sheet* (literature no. 5990-8465EN)

1. For a list of computers compatible with Keysight Technologies PXIe M9018A Chassis, refer to Tested Computer Technical Note (literature no. 5990-7632EN).

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A personalized view into the information most relevant to you.

[www.pxisa.org](http://www.pxisa.org)



PCI eXtensions for Instrumentation (PXI) modular instrumentation delivers a rugged, PC-based high-performance measurement and automation system.

**Three-Year Warranty**

[www.keysight.com/find/ThreeYearWarranty](http://www.keysight.com/find/ThreeYearWarranty)

Keysight's commitment to superior product quality and lower total cost of ownership. The only test and measurement company with three-year warranty standard on all instruments, worldwide.



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[www.keysight.com/find/AssurancePlans](http://www.keysight.com/find/AssurancePlans)

Up to five years of protection and no budgetary surprises to ensure your instruments are operating to specification so you can rely on accurate measurements.



[www.keysight.com/go/quality](http://www.keysight.com/go/quality)

Keysight Technologies, Inc.

DEKRA Certified ISO 9001:2008

Quality Management System



**Keysight Channel Partners**

[www.keysight.com/find/channelpartners](http://www.keysight.com/find/channelpartners)

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[www.keysight.com/find/modular](http://www.keysight.com/find/modular)

[www.keysight.com/find/m9290a](http://www.keysight.com/find/m9290a)

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**Americas**

Canada	(877) 894 4414
Brazil	55 11 3351 7010
Mexico	001 800 254 2440
United States	(800) 829 4444

**Asia Pacific**

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

**Europe & Middle East**

Austria	0800 001122
Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	800 000154
Sweden	0200 882255
Switzerland	0800 805353
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United Kingdom	0800 0260637

For other unlisted countries:  
[www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)  
 (BP-09-23-14)

