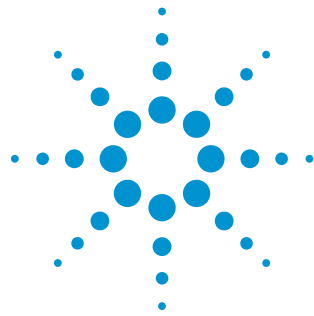


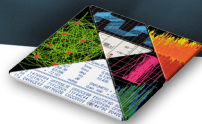
# Agilent M9393A

PXIe Performance Vector  
Signal Analyzer

9 kHz to 8.4 GHz, 14 GHz,  
18 GHz or 27 GHz



Configuration Guide



*Challenge the Boundaries of Test  
Agilent Modular Products*

*Anticipate — Accelerate — Achieve*



**Agilent Technologies**

# OVERVIEW

This configuration guide contains information to help you configure your M9393A PXIe performance vector signal analyzer (PXIe performance VSA) and tailor a system to meet your requirements.

| <b>Table of contents</b>   | <b>Page number</b> |
|--|--------------------|
| <b>Hardware</b>  |                    |
| A: Select options for M9393A PXIe performance VSA.....                             | 3                  |
| B: Add M9300A PXIe frequency reference .....                                       | 3                  |
| C: Select controller .....   | 4                  |
| D: Select a chassis & accessories.....   | 6                  |
| <b>Physical connection diagram for controllers, chassis &amp; accessories.....</b> | <b>7</b>           |
| <b>Software</b>  |                    |
| E: Select software for M9393A PXIe performance VSA.....                            | 8                  |
| <b>Services</b>  |                    |
| F: Select services: Warranty, calibration, start-up assistance .....               | 10                 |
| <b>Configuration</b>   |                    |
| Single M9383A PXIe performance VSA.....  | 11                 |
| <b>Other</b>   |                    |
| Upgrading your system .....  | 12                 |
| Using an M9393A in a non-Agilent chassis.....                                      | 12                 |
| PC requirements for M9393A control .....   | 13                 |
| Related literature .....   | 13                 |

## A. Select options for M9393A PXIe performance VSA

### Step 1. Start with M9393A PXIe performance VSA base configuration

|                                  |   |                    |   |
|----------------------------------|---|--------------------|---|
| <input checked="" type="radio"/> | The M9393A PXIe performance VSA base configuration (occupies 4 slots) includes: |                    |   |
|                                  | M9308A  | PXIe synthesizer   | <ul style="list-style-type: none"> <li>• Frequency range 9 kHz - 8.4 GHz</li> <li>• Analysis bandwidth 40 MHz</li> <li>• Memory 128 MSa (512 MB)</li> <li>• One day start up assistance</li> <li>• Modular interconnect cables</li> <li>• Software, example programs and product information on CD</li> <li>• Return to Agilent warranty - 3 years</li> </ul> |
|                                  | M9365A  | PXIe downconverter |   |
|                                  | M9214A  | PXIe IF digitizer  |   |
|                                  |   |                    |   |

### Step 2. Choose a frequency range

|                                  |            |                 |                                |
|----------------------------------|------------|-----------------|--------------------------------|
| <input checked="" type="radio"/> | M9391A-F08 | 9 kHz – 8.4 GHz | Included in base configuration |
| <input type="radio"/>            | M9391A-F14 | 9 kHz – 14 GHz  |                                |
| <input type="radio"/>            | M9391A-F18 | 9 kHz – 18 GHz  |                                |
| <input type="radio"/>            | M9391A-F27 | 9 kHz – 27 GHz  |                                |

### Step 3. Choose an analysis bandwidth

|                                  |            |         |                                |
|----------------------------------|------------|---------|--------------------------------|
| <input checked="" type="radio"/> | M9393A-B04 | 40 MHz  | Included in base configuration |
| <input type="radio"/>            | M9393A-B10 | 100 MHz |                                |
| <input type="radio"/>            | M9393A-B16 | 160 MHz |                                |

### Step 4. Choose memory size

|                                  |            |          |                                |
|----------------------------------|------------|----------|--------------------------------|
| <input checked="" type="radio"/> | M9393A-M01 | 128 MSa  | Included in base configuration |
| <input type="radio"/>            | M9393A-M05 | 512 MSa  |                                |
| <input type="radio"/>            | M9393A-M10 | 1024 MSa |                                |

### Step 5. Add fast switching speed (optional)

*Accelerates test throughput and stepped spectrum analysis*

|                       |            |             |  |
|-----------------------|------------|-------------|--|
| <input type="radio"/> | M9393A-UNZ | Fast tuning |  |
|-----------------------|------------|-------------|--|

### Step 6. Add pre-amplifier (optional)

*Enhances sensitivity to detect low-level signals*

|                       |            |                   |  |
|-----------------------|------------|-------------------|--|
| <input type="radio"/> | M9393A-P08 | 100 kHz – 8.4 GHz |  |
| <input type="radio"/> | M9393A-P14 | 100 kHz – 14 GHz  |  |
| <input type="radio"/> | M9393A-P18 | 100 kHz – 18 GHz  |  |
| <input type="radio"/> | M9393A-P27 | 100 kHz – 27 GHz  |  |

## B. Add M9300A PXIe frequency reference

### Step 1. Add an M9300A PXIe frequency reference (occupies 1 slot)

*One frequency reference required per chassis to meet data sheet specifications. It can support up to four M9393A PXIe VSAs*

|                       |            |                                      |   |
|-----------------------|------------|--------------------------------------|---|
| <input type="radio"/> | M9393A-300 | Adds M9300A PXIe frequency reference | Five 100 MHz outputs<br>One 10 MHz output<br>Internal 10 MHz OCXO timebase output |
|-----------------------|------------|--------------------------------------|---|

## C. 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, 4GB RAM  
  
*Select the M9036A for mid-performance, lower cost or if your application requires XP operating system*



- **M9037A-M04**  
High-performance embedded controller  
Intel i7-4700EQ quad-core processor, 2.4 GHz, 8 thread, 4GB 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 GB to 8 GB RAM

For M9037A

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

### Step 3. Select an operating system

For M9036A

- **M9036A-WE3** Microsoft Windows Embedded Standard 7 (32-bit)
- **M9036A-WE6** Microsoft Windows Embedded Standard 7 (32-bit)




For M9037A

- **M9037A-WE3** Microsoft Windows Embedded Standard 7 (32-bit)
- **M9037A-WE6** Microsoft Windows Embedded Standard 7 (32-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.

## C. Select controller (either embedded controller or via PC) <sup>1</sup> (continued)

### To use your Laptop PC as a controller

|                       |        |  |   |
|-----------------------|--------|--|---|
| <input type="radio"/> | M9045B | PCIe ExpressCard adaptor                   |  |
| <input type="radio"/> | Y1200B | PCIe cable                                 |  |
| <input type="radio"/> | M9021A | PCIe cable interface <sup>2</sup> : 1 slot |  |

### To use your Desktop PC as a controller

|                       |        |  |   |
|-----------------------|--------|--|---|
| <input type="radio"/> | M9048A | PCIe desktop adaptor                       |    |
| <input type="radio"/> | Y1202A | PCIe cable                                 |   |
| <input type="radio"/> | M9021A | PCIe cable interface <sup>2</sup> : 1 slot |  |

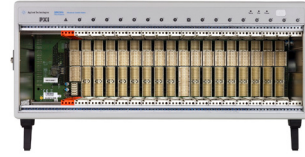
1. For list of qualified external controllers, please see Tested Computer List Technical Note literature no. [5990-7632EN](#). See physical connections diagram on page 8.

2. The M9021A is used for either PC control option and can only be used with the Agilent M9018A 18-slot chassis.

## D. 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

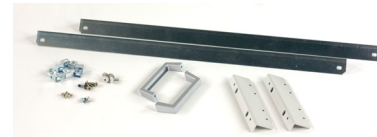


- Y1213A PXI EMC filler panel kit: 5 slots



### 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.*

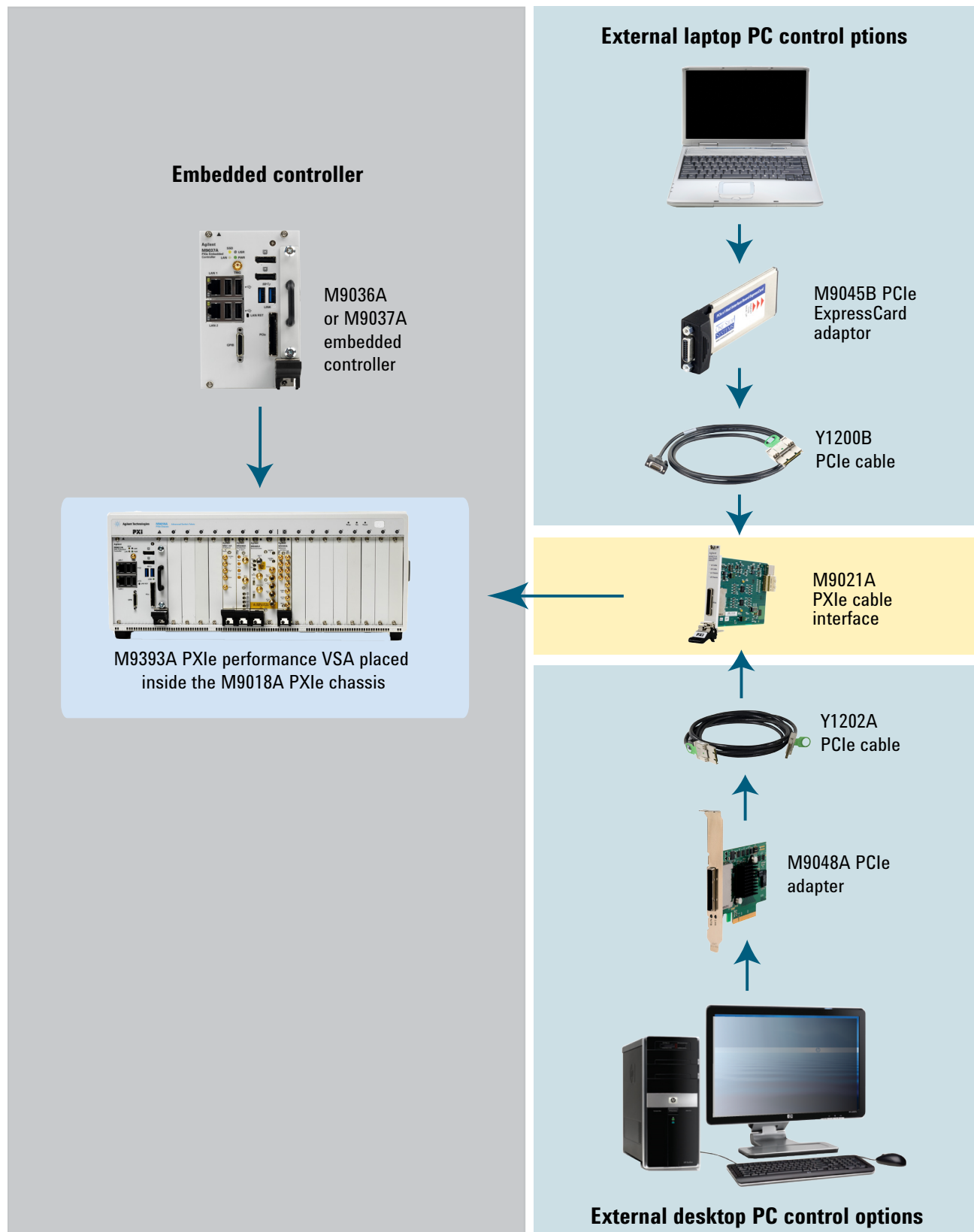
- Y1214A Air inlet kit: M9018A 18-slot chassis<sup>1</sup>



1. Available in 1-slot, 2-slot or 3-slot options depending on the chassis configuration. For more information, please visit [www.agilent.com/find/m9018a](http://www.agilent.com/find/m9018a)

# PHYSICAL CONNECTIONS

## Physical connection diagram for controllers



## E. Select software for M9393A PXIe performance VSA

### Step 1. Start with M9393A base configuration

- The M9393A comes standard with the following software:
  - Agilent 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++), Agilent VEE <sup>2</sup>
  - Sample waveforms and programming examples

### Step 2. Download free Agilent 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, Agilent VEE or Agilent 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 for Modular Instruments <sup>4</sup> (optional)

*Provides essential RF conformance measurements and tasks for specific communications standards. Transportable, perpetual licenses support up to 4 modular VSAs in one chassis.*

|                       |          |                            |
|-----------------------|----------|----------------------------|
| <input type="radio"/> | M9080A/B | LTE FDD, LTE-Advanced FDD  |
| <input type="radio"/> | M9082A/B | LTE TDD, LTE-Advanced TDD  |
| <input type="radio"/> | M9073A   | W-CDMA/HSPA+               |
| <input type="radio"/> | M9071A   | GSM/EDGE/EVO               |
| <input type="radio"/> | M9079A   | TD-SCDMA/HSPA              |
| <input type="radio"/> | M9076A   | 1xEV-DO                    |
| <input type="radio"/> | M9072A   | cdma2000®/cdmaOne          |
| <input type="radio"/> | M9077A   | WLAN 802.11a/b/g/n/ac      |
| <input type="radio"/> | M9063A   | Analog modulation          |
| <input type="radio"/> | M9064A   | VXA vector signal analysis |
| <input type="radio"/> | M9081A   | Bluetooth®                 |

1. Both IO library (version 16.3 or newer) and Connection Expert software need to be installed on the PC controlling the equipment. To download, visit [www.agilent.com/find/iosuite](http://www.agilent.com/find/iosuite)
2. Find latest versions of this software at [www.agilent.com/find/m9393a](http://www.agilent.com/find/m9393a)
3. To download or get more information on Command Expert, visit [www.agilent.com/find/commandexpert](http://www.agilent.com/find/commandexpert)
4. For more information, see "Accelerate PXI VSA Measurements with X-Series Measurement Applications", literature number [5991-2604EN](#).



## E. Select software for M9393A PXIe performance VSA (cont'd)

| Step 4. Add 89600 VSA Software <sup>1</sup> (optional)   |            |   |
|--|------------|---|
| <i>Provides time, spectrum and stepped spectrum measurements, powerful displays, data recording and playback, links to Matlab and more</i> |            |   |
| <input type="radio"/>  | 89601B-200 | Basic 89600 VSA software  |
| <input type="radio"/>  | 89601B-300 | Hardware connectivity to over 40 Agilent instruments, including the M9393A PXIe VSA   |
| Measurement options  |            |   |
| <input type="radio"/>  | 89601B-SSA | Spectrum analysis <sup>2</sup>  |
| <input type="radio"/>  | 89601B-AYA | General purpose vector modulation analysis of over 30 types of presets                |
| <input type="radio"/>  | 89601B-BHF | Custom OFDM modulation analysis of proprietary and pre-standard OFDM formats          |
| <input type="radio"/>  | 89601B-B7R | WLAN 802.11a/b/g/j/p  |
| <input type="radio"/>  | 89601B-B7Z | WLAN 802.11n MIMO   |
| <input type="radio"/>  | 89601B-BHJ | WLAN 802.11ac MIMO (requires 89601B-B7Z)  |
| <input type="radio"/>  | 89601B-BHD | LTE FDD   |
| <input type="radio"/>  | 89601B-BHG | LTE-Advanced FDD  |
| <input type="radio"/>  | 89601B-BHE | LTE TDD   |
| <input type="radio"/>  | 89601B-BHH | LTE-Advanced TDD  |
| <input type="radio"/>  | 89601B-B7T | cdma2000 <sup>®</sup> /cdmaOne  |
| <input type="radio"/>  | 89601B-B7U | W-CDMA/HSPA+  |
| <input type="radio"/>  | 89601B-B7W | 1xEV-DO   |
| <input type="radio"/>  | 89601B-B7X | TD-SCDMA  |
| <input type="radio"/>  | 89601B-B7R | 3G Bundle (includes cdma2000 <sup>®</sup> , W-CDMA/HSPA+, 1xEV-DO & TD-SCDMA options) |
| <input type="radio"/>  | 89601B-BHC | RFID  |
| <input type="radio"/>  | 89601B-BHK | Custom IQ   |

1. For more information, see 89600 VSA software configuration guide literature number [5990-6386EN](#).

2. For best speed, M9393A-UNZ and -B16 are recommended.

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

|   |                                      |   |
|---|--------------------------------------|---|
| ● | One day start-up assistance          | Included in base configuration  |
| ● | Return to Agilent warranty - 3 years | Included in base configuration  |
| ○ | R-51B-001-5Z                         | Return to Agilent warranty - 5 years  |
| ○ | M9393A-UK6                           | Commercial calibration certificate with test data for M9393A (M9308A, M9365A, M9214A) |
| ○ | M9300A-UK6                           | Commercial calibration certificate with test data for M9300A                          |
| ○ | R-51B-001-3X                         | Express warranty - 5 day turnaround For 3 years                                       |
| ○ | R-51B-001-5X                         | Express warranty - 5 day turnaround For 5 years                                       |
| ○ | N7800A                               | Calibration and adjustment software   |

### Global warranty

Agilent Technologies provides the peace of mind that today's high tech industry requires. Your investment is protected by Agilent'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. Agilent'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

An Agilent 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 M9393A PXIe performance VSA is supported by the Agilent 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 M9393A PXIe performance VSA is supported by Agilent's calibration and adjustment software. This is the same software used at Agilent'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.agilent.com/find/contactus](http://www.agilent.com/find/contactus)

Or call: 1 800 829-4444 US

Repair and Calibration: [www.agilent.com/find/infoline](http://www.agilent.com/find/infoline)

Parts and Accessories: [www.parts.agilent.com](http://www.parts.agilent.com)

For all modular products: [www.agilent.com/find/modular](http://www.agilent.com/find/modular)

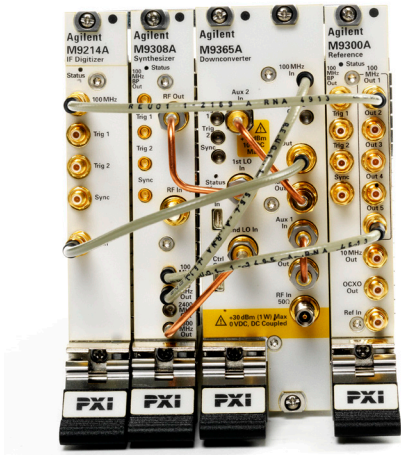
# CONFIGURATION

In the base configuration shown below, the M9300A PXIe frequency reference is ordered as an option to the M9393A PXIe performance VSA.

Cables for module to module connections are shipped with the product. Additional cables for external connections shipped with the product are listed below.

Please see the M9393A startup guide for detailed cabling diagram and parts list.

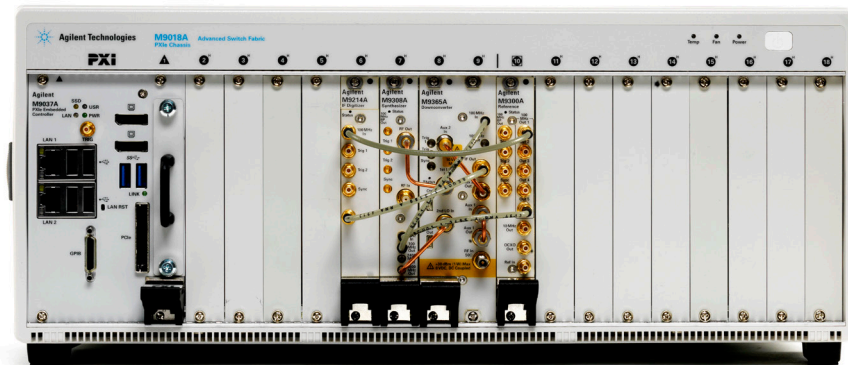
## Single M9393A PXIe performance VSA



Additional cables shipped:

- One 8121-2063 (BNC Male-SMB Female 1200mm) for external reference connection
- One 8120-5091 (SMB Female-SMB Female 120mm) for longer connection from M9300A 100 MHz Out to M9214A 100 MHz In
- One 8121-2636 (SMB Female-SMP Female 240mm) for longer connection from M9300A 100 MHz Out to M9308A 100 MHz In

## Single PXIe performance VSA (M9393A) in chassis



## Upgrading your system

---

Your product can be easily upgraded after the initial purchase. All PXIe VSA options are controlled by a licensing key and can be quickly upgraded by the user.

### How to upgrade your M9393A PXIe performance VSA:

1. Contact your Agilent 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 Agilent License Manager.
  5. Begin using the new capability.
- 

## Using a non-Agilent chassis

---

The M9393A (with M9300A frequency reference) can be successfully installed in a non-Agilent PXI chassis. Please use the following guidelines.

- Ensure that the chassis has 5 consecutive PXIe or PXI-H slots which can be used by the M9393A 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.

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

---

## PC requirements for M9393A PXIe performance VSA control <sup>1</sup>

| <b>Windows 7</b>                  |  |
|-----------------------------------|--|
| Operating system                  | Windows 7 (32 & 64 bit)  |
| Processor speed                   | 1.5 GHz dual core (x86 or x64) minimum,<br>2.4 GHz recommended<br>No support for Itanium64   |
| Available memory                  | 4 GB minimum<br>8 GB recommended   |
| Available disk space <sup>1</sup> | 1.5 GB available hard disk space includes:<br>1 GB for Microsoft.NET framework 3.5 SPI <sup>2</sup><br>100 MB for Agilent IO libraries suite<br>1.5 GB available hard disk space includes:<br>1 GB for Microsoft.NET framework 3.5 SPI <sup>2</sup><br>100 MB for Agilent IO libraries suite |
| 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](#))
- *X-Series Measurement Applications for Modular Instruments Brochure* (literature no. [5991-2604EN](#))



## 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.



## Challenge the Boundaries of Test Agilent Modular Products



**myAgilent**  
[www.agilent.com/find/myagilent](http://www.agilent.com/find/myagilent)



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



**Three-Year Warranty**  
[www.agilent.com/find/ThreeYearWarranty](http://www.agilent.com/find/ThreeYearWarranty)



**Agilent Assurance Plans**  
[www.agilent.com/find/AssurancePlans](http://www.agilent.com/find/AssurancePlans)



**Agilent Solution Partners**  
[www.agilent.com/find/solutionpartners](http://www.agilent.com/find/solutionpartners)



**Agilent Solution Partners**  
[www.agilent.com/find/solutionpartners](http://www.agilent.com/find/solutionpartners)

PICMG and the PICMG logo, CompactPCI and the CompactPCI logo, AdvancedTCA and the AdvancedTCA logo are US registered trademarks of the PCI Industrial Computers Manufacturers Group. "PCIe" and "PCI EXPRESS" are registered trademarks and/or service marks of PCI-SIG. cdma2000 is a registered certification mark of the Telecommunications Industry Association. Bluetooth and the Bluetooth logos are trademarks owned by Bluetooth SIG, Inc., USA and licensed to Agilent Technologies, Inc. WiMAX and Mobile WiMAX are US trademarks of the WiMAX Forum.

[www.agilent.com](http://www.agilent.com)  
[www.agilent.com/find/modular](http://www.agilent.com/find/modular)  
[www.agilent.com/find/m9393a](http://www.agilent.com/find/m9393a)

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at: [www.agilent.com/find/contactus](http://www.agilent.com/find/contactus)

### Americas

|               |                |
|---------------|----------------|
| Canada        | (877) 894 4414 |
| Brazil        | (11) 4197 3600 |
| Mexico        | 01800 5064 800 |
| 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) 375 8100  |

### Europe & Middle East

|                |                                  |
|----------------|----------------------------------|
| Belgium        | 32 (0) 2 404 93 40               |
| Denmark        | 45 45 80 12 15                   |
| Finland        | 358 (0) 10 855 2100              |
| France         | 0825 010 700*<br>*0.125 €/minute |
| Germany        | 49 (0) 7031 464 6333             |
| Ireland        | 1890 924 204                     |
| Israel         | 972-3-9288-504/544               |
| Italy          | 39 02 92 60 8484                 |
| Netherlands    | 31 (0) 20 547 2111               |
| Spain          | 34 (91) 631 3300                 |
| Sweden         | 0200-88 22 55                    |
| United Kingdom | 44 (0) 118 927 6201              |

For other unlisted countries: [www.agilent.com/find/contactus](http://www.agilent.com/find/contactus)

(BP-10-02-13)

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

© Agilent Technologies, Inc. 2014  
Published in USA, May 8, 2014  
5991-4580EN



**Agilent Technologies**